ENERGY METERS

- **RELEVANT FOR** UTILITY, RESIDENTIAL AND INDUSTRIAL APPLICATIONS TO MEASURE, REGISTER, DISPLAY AND TRANSMIT PARAMETERS WITH ACTIVE AND REACTIVE ENERGY AND POWER

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ENERGY METERS **SINGLE-PHASE**

WS 0010, WS 0011

ACTIVE ENERGY METERS

DIRECT CONNECTION 32 A

APPLICATIONS

WS 0010 AND WS 0011 ARE ELECTRONIC SINGLE PHASE ACTIVE ENERGY METERS. METERS MEASURE POSITIVE ACTIVE ENERGY DIRECTLY IN 2-WIRE NETWORKS. THERE ARE TWO VERSIONS, ONE WITH PULSE OUTPUT (WS 0011) AND THE OTHER WITHOUT PULSE OUTPUT (WS 0010). ACCURACY OF THE METERS IS CLASS 1, ACCORDING TO THE STANDARD EN SIST 62053-21 FOR ACTIVE ENERGY METER. METERS CAN BE MOUNTED ON DIN-RAIL (1 PITCH).

FEATURES

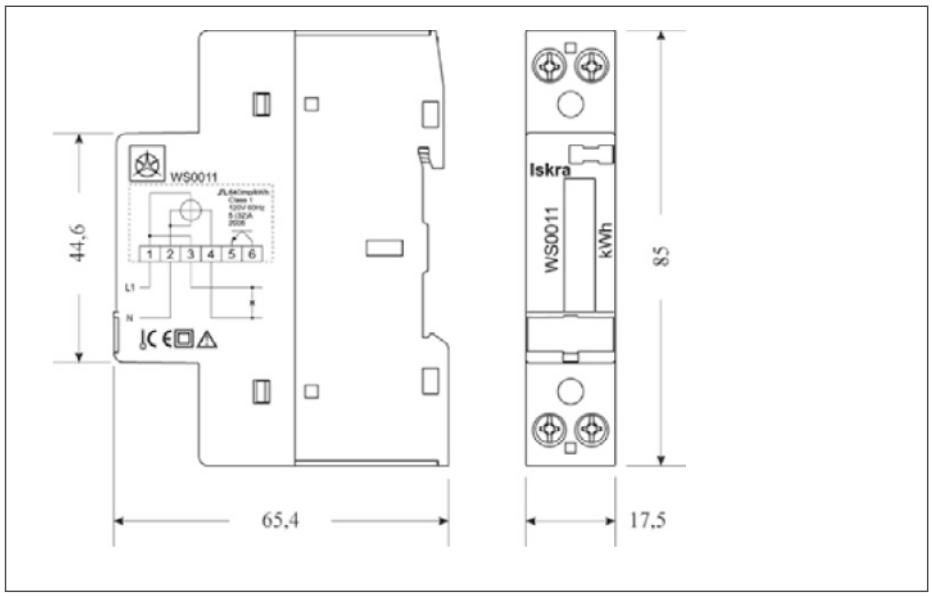
- SINGLE PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METER
- CLASS OF METER 1 ACCORDING EN 62053-21 AND EN 62052-11
- MAXIMUM CURRENT 32 A (I_{max})
- BASE CURRENT (Ib) 5 A
- STARTING CURRENT 0.004 Ib
- 120 V OR 230 V RATED SYSTEM VOLTAGE INPUT (U_n)
- VOLTAGE OPERATING RANGE -20%...+15% U_n
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION VOLTAGE CIRCUIT < 6 VA AT U_n
- POWER CONSUMPTION CURRENT CIRCUIT < 0.1 W AT I_{max}
- TEMPERATURE RANGE CLIMATIC CONDITION AS INDOOR METER ACCORDING IEC 62051-11
- DISPLAY 6+1 DIGIT (100 Wh RESOLUTION)
- RED LED FOR INDICATION OF ENERGY FLOW AND TESTING
- LED RATE FOR ENERGY FLOW 640 p/kWh
- PULSE OUTPUT (WS0011 ONLY) ACCORDING TO EN 62053-31:2001
- PULSE OUTPUT RATE 640 p/kWh
- PULSE OUTPUT TYPE OPTOCOUPLER TRANSISTOR-OPEN COLLECTOR

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 62051-11, EN 62052-11, EN 62053-21 AND EN 62053-31 — **DIRECT CONNECTION 32 A**

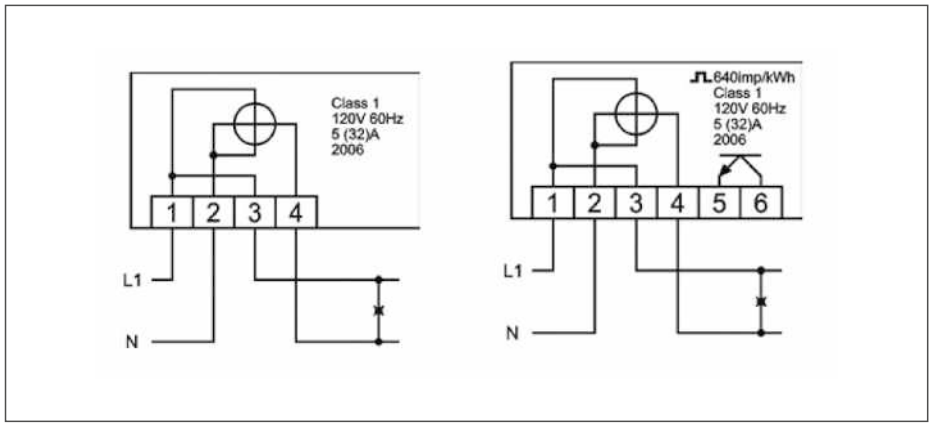
GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	65.4
Weight		g	80
OPERATING FEATURES			
Connection	to single-phase network	n° wires	2
APPROVAL (according to EN 62053-21, EN 62052-11)			
Reference voltage U_n		V AC	120 / 230
Reference current I_{ref}		A	5
Maximum current I_{max}		A	32
Starting current I_{st}		A	0.004 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 (2)
Certified measures		kWh	→ kWh T1, ← kWh T1
Accuracy	according to EN 62053-21	class	1
	according to EN 62052-11	class	1
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Maximum power dissipation (Voltage circuit) U_n		VA	< 6
Maximum VA burden (Current citcuit) I_{max}		W	< 0.1
Voltage input waveform		–	AC
MEASURING FEATURES			
Voltage range		V	0.8 ... 1.15 U_n
Current range		A	0.02 ... 32
Frequency range		Hz	50 / 60
DISPLAY FEATURES			
Display type	7 (6 + 1) digits		6 (1 decimal)
Resolution		Wh	100
OPTICAL METROLOGICAL LED			
Front mounted red LED	proportional to energy	p/kWh	640
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31:2001)	**WS0011 ONLY**		
Pulse rate		p/kWh	640
Operating voltage	max.	V	35
Pulse ON maximum current	max.	mA	20
CONNECTION TERMINALS			
Connection screws			M3.5
Pulse output screws			M3
Terminal capacity main current paths		mm^2	2.5 ... 10
Terminal capacity for mains terminals S0		mm^2	1 ... 2.5
Tightening torque for line terminals	max.	Nm	1.2
Tightening torque for pulse terminals	max.	Nm	0.6
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Installation	indoor	–	yes
IP rating	front panel / terminals	–	IP40/IP20

DIMENSIONS



INSTALLATION

(SEE FIGURES) FOR MONITORING PURPOSE ONLY
RAIL MOUNTING ACCORDING EN 60715
POWER CONTACTS CAPACITY 2.5...10 mm^2
CONNECTION SCREWS M3.5
PULSE OUTPUT CONTACT CAPACITY 1... 2.5 mm^2
PULSE OUTPUT SCREWS M3
MAX TORQE 1.2 Nm



ENERGY METERS **SINGLE-PHASE**

WS 0010, WS 0011

ACTIVE ENERGY METERS

DIRECT CONNECTION 45 A

APPLICATIONS

WS 0014 IS AN ELECTRONIC SINGLE PHASE ACTIVE ENERGY METER. THE METER MEASURES ACTIVE ENERGY DIRECTLY IN A 2-WIRE NETWORK. METER ACCURACY CLASS IS 1, ACCORDING TO THE IEC 62053-21 STANDARD FOR ACTIVE ENERGY METER. THE METER CAN BE MOUNTED ON A DIN RAIL (1-PITCH).

FEATURES

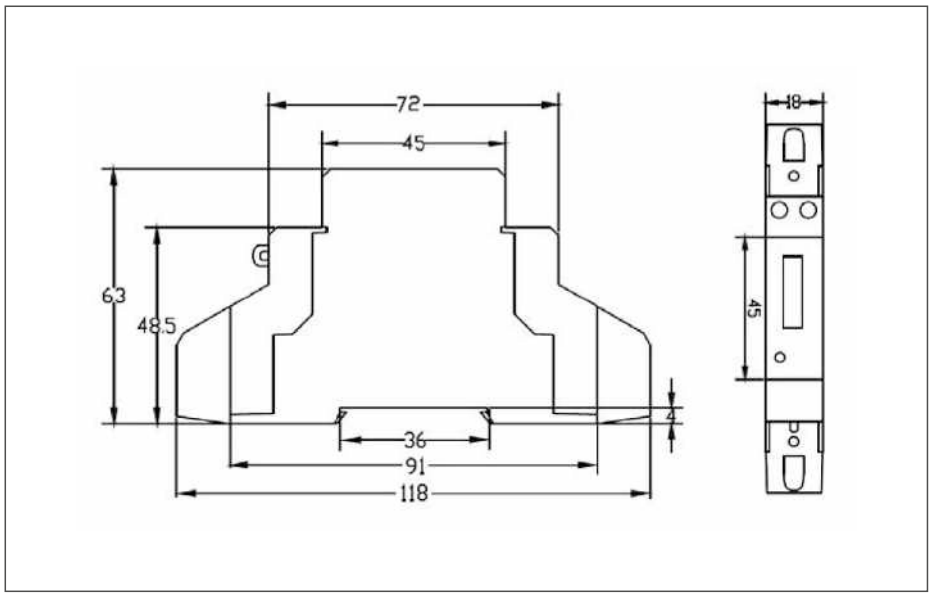
- SINGLE PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METER
- CLASS 1 ACCORDING TO IEC 62053-21
- MAXIMUM CURRENT 45 A (I_{max})
- BASIC CURRENT (Ib) 5 A
- STARTING CURRENT 0.004 Ib
- 230 V RATED SYSTEM VOLTAGE INPUT (U_n)
- VOLTAGE OPERATING RANGE -30%...+30% U_n
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION CIRCUIT < 8 VA, ≤ 0.4 W
- TEMPERATURE RANGE AS INDOOR METER ACCORDING IEC 62052-11
- 7-DIGIT LCD (5+2) 99999.99 kWh
- LED RATE FOR ENERGY FLOW 1000 imp/kWh
- PULSE OUTPUT 1000 imp/kWh:
  - VOLTAGE 12~27 V, CURRENT ≤ 27 mA
  - IMPULSE WIDTH = 90 ms
  - LIMITS OF VALUES: MAX. 60 V DC, MAX. 50 mA

TECHNICAL DATA

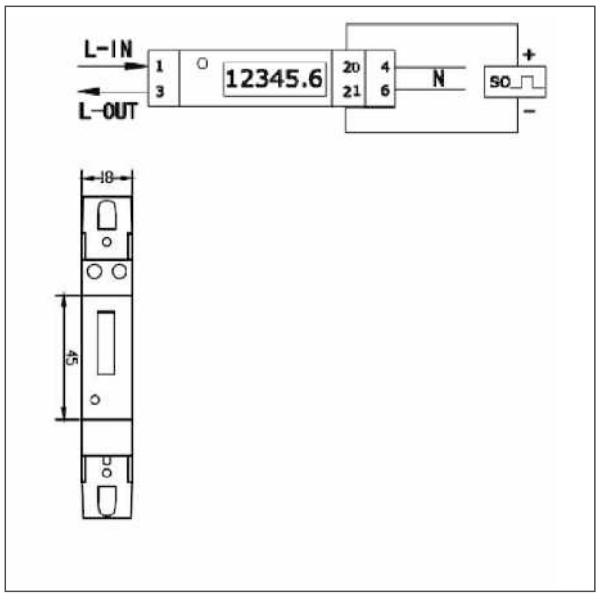
DATA IN COMPLIANCE WITH EN 62051-11, EN 62052-11, EN 62053-21 AND EN 62053-31 **DIRECT CONNECTION 45 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	63
Weight		g	90
OPERATING FEATURES			
Connection	to single-phase network	n° wires	2
APPROVAL (according to EN 62053-21)			
Reference voltage U_n		V AC	230
Reference current I_{ref}		A	5
Maximum current I_{max}		A	45
Starting current I_{st}		A	0.004 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 (2)
Accuracy	according to EN 62053-23	class	1
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.7 ... 1.3 U_n
Maximum power dissipation (Voltage circuit) U_n		VA	< 8
Maximum VA burden (Current citcuit) I_{max}		W	< 0.4
Voltage input waveform		–	AC
MEASURING FEATURES			
Voltage range		V	0.8 ... 1.3 U_n
Current range		A	0.02 ... 45
Frequency range		Hz	50 / 60
DISPLAY FEATURES			
Display type	7 (5 + 2) digits LCD	–	5 (2 decimal)
OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate		p/kWh	1000
Operating voltage		V	12 ... 27 (60 max.)
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	50
Pulse ON duration		msec	90
CONNECTION TERMINALS			
Power terminals screws			M3.5
Neutral terminal screw			M3
Power terminals capacity up to	solid wire min. (max.)	mm^2	15
Pulse output contact capacity up to	solid wire min. (max.)	mm^2	15
Power terminals torque	max.	Nm	1.2
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Installation	indoor	–	yes
IP rating	front panel / terminals	–	IP40/IP20

DIMENSIONS



INSTALLATION



FOR MONITORING PURPOSE ONLY
RAIL MOUNTING ACCORDING TO EN 60715
POWER TERMINALS CAPACITY 15 mm^2
POWER TERMINALS SCREWS M3.5
NEUTRAL TERMINAL SCREW M3.5
MAX TORQUE 1.2 Nm
PULSE OUTPUT CONTACT CAPACITY UP TO 15 mm^2

ENERGY METERS **SINGLE-PHASE**

WM1-6 / VM1M6

ACTIVE ENERGY METERS

DIRECT CONNECTION 65 A

APPLICATIONS

THE METERS WM1-6 AND WM1M6 (MID CERTIFIED) ARE INTENDED FOR ENERGY MEASUREMENTS IN SINGLE-PHASE ELECTRICAL POWER NETWORK AND CAN BE USED IN RESIDENTIAL, INDUSTRIAL AND UTILITY APPLICATIONS. METERS MEASURE ENERGY DIRECTLY IN 2-WIRE NETWORKS ACCORDING TO THE PRINCIPLE OF FAST SAMPLING OF VOLTAGE AND CURRENT SIGNALS. A BUILT-IN MICROPROCESSOR CALCULATES ENERGY AND OTHER ELECTRICAL QUANTITIES FROM THE MEASURED SIGNALS. IT ALSO CONTROLS LCD, LED AND INSTALLED MODULES. ACCURACY OF THE METERS IS CLASS 1 FOR ACTIVE ENERGY ACCORDING TO EN 62053-21, B ACCORDING TO EN 50470-3 AND CLASS 2 FOR REACTIVE ENERGY ACCORDING TO EN 62053-23. METERS CAN BE MOUNTED ON DIN-RAIL (2 PITCH).

ACCORDING TO THE CUSTOMER'S DEMANDS, METERS CAN BE EQUIPPED WITH A RS485 SERIAL COMMUNICATION (OPTION) WITH THE MODBUS PROTOCOL, WHICH ENABLES DATA TRANSMISSION AND THUS CONNECTION OF THE MEASURING PLACES INTO THE NETWORK FOR THE CONTROL AND MANAGEMENT WITH ENERGY. THEY CAN ALSO BE EQUIPPED WITH TARIFF INPUT (OPTION). A BUILT-IN PULSE OUTPUT (OPTION) IS DESIGNED FOR SENDING DATA TO THE DEVICES FOR CHECKING AND MONITORING CONSUMED ENERGY.

FEATURES

- SINGLE PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METER
- MID APPROVAL (WM1M6)
- ACTIVE ENERGY ACCURACY: CLASS 1 ACCORDING TO EN 62053-21
  CLASS B ACCORDING TO EN 50470-3
  REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- MAXIMUM CURRENT 65 A (I_{MAX})
- BASE CURRENT (Ib) 5 A
- 230 V RATED SYSTEM VOLTAGE INPUT (U_n)
- VOLTAGE OPERATING RANGE -20%...+20% U_n
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION VOLTAGE CIRCUIT < 8 VA AT U_n
- POWER CONSUMPTION CURRENT CIRCUIT < 0.8 VA AT Ib PER PHASE
- TEMPERATURE RANGE CLIMATIC CONDITION AS INDOOR METER ACCORDING IEC 62051-11
- DISPLAY LCD 7+1 DIGIT (100 Wh RESOLUTION)
- MULTIFUNCTIONAL FRONT RED LED
- PULSE OUTPUT (OPTION) ACCORDING TO EN 62053-31
- SERIAL COMMUNICATION (OPTION)
- TARIFF INPUT (OPTION)
- DIN-RAIL MOUNTING ACCORDING TO EN 60715
- SEALABLE TERMINAL COVER
- 2 DIN MODULES WIDTH
- EXTERNAL BISTABLE SWITCH CONTROL (OPTION)

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 — **DIRECT CONNECTION 65 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	2 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	65.4
Weight		g	150
OPERATING FEATURES			
Connection	to single-phase network	n° wires	2
Tariff	for active and reactive energy	n° 2	2 tariffs
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference current I_{ref}		A	5
Minimum current I_{min}		A	0.25
Maximum current I_{max}		A	65
Starting current I_{st}		mA	20
Reference frequency f_n		Hz	50 and 60
Number of phases (number of wires)			1 (2)
Accuracy	according to EN 50470-3	class	B
	according to EN 62053-21	class	1
	according to EN 62053-23	class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.2 U_n
Consumption		VA	< 8
Consumption at I_{ref}		VA	< 0.1
Voltage input waveform		–	AC
MEASURING FEATURES			
Voltage range	phase / neutral	V	0.8 ... 1.2 U_n
Current range		A	0.25 ... 65
Frequency range		Hz	0.98 ... 1.02 fn
DISPLAY FEATURES			
Display type	LCD		
	energy digits dimension	mm	4.52
Number of digits	8 (7 + 1) digits	min. ... max. kWh	0.1 ... 9999999.9
OPTICAL INTERFACE LED			
LED color			red LED
Pulse rate		imp/kWh	1
LED on			no load
SAFETY			
Protective class		class	II
AC voltage test (EN 50470)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Housing material flame resistance	UL 94	class	V0
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate output 1		p/Wh	1
Pulse ON duration		msec	32 ± 2
Rated voltage	max.	V DC	40
Pulse ON max. current	max.	mA	40
EMBEDDED COMMUNICATION			
Modbus RTU	RS485 - 3 wires (not supported on WM1-6Z)	bits/s	1200 ... 19200
	optical IR - via WM-USB adapter	bits/s	19200

TECHNICAL DATA

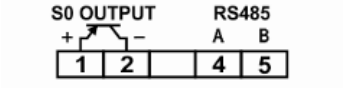
DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 — **DIRECT CONNECTION 65 A**

CONNECTION TERMINALS			
Main inputs	contacts capacity	mm^2	1.5 ... 16 (25)
	connection screws		M5
	max. torque	Nm (PZ2)	3.5
Optional modules	contacts capacity	mm^2	1 ... 2.5
	connection screws		1.2
	max. torque	Nm	1.2
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Installation	Indoor	–	yes
IP rating	Front panel / Terminals	–	IP40/IP20
CONNECTION TERMINALS			
Connection screws			M3.5
Pulse output screws			M3
Terminal capacity main current paths		mm^2	2.5 ... 10
Terminal capacity for mains terminals S0		mm^2	1 ... 2.5
Tightening torque for line terminals	max.	Nm	1.2
Tightening torque for pulse terminals	max.	Nm	0.6
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-40 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
IP rating	front panel/terminals	–	IP51/IP20

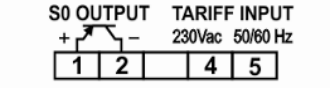
CONNECTION OF MODULES

RS485 SERIAL COMMUNICATION WITH THE MODBUS PROTOCOL, WHICH ENABLES DATA TRANSMISSION AND THUS CONNECTION OF THE MEASURING PLACES INTO THE NETWORK FOR THE CONTROL AND MANAGEMENT WITH ENERGY. THEY CAN ALSO BE EQUIPPED WITH TARIFF INPUT (OPTION). BOTH SUPPORTED ONLY ON WM1-6 AND WM1M6.
A BUILT-IN PULSE OUTPUT (OPTION) IS DESIGNED FOR SENDING DATA TO THE DEVICES FOR CHECKING AND MONITORING CONSUMED ENERGY.

WM1-6 & VM1M6

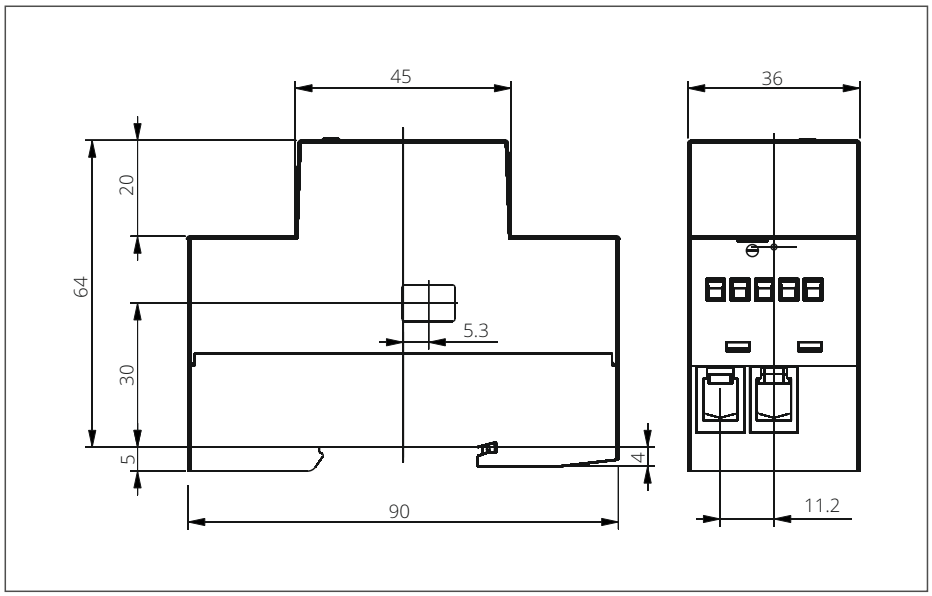


PULSE OUT. & COMMUNICATION

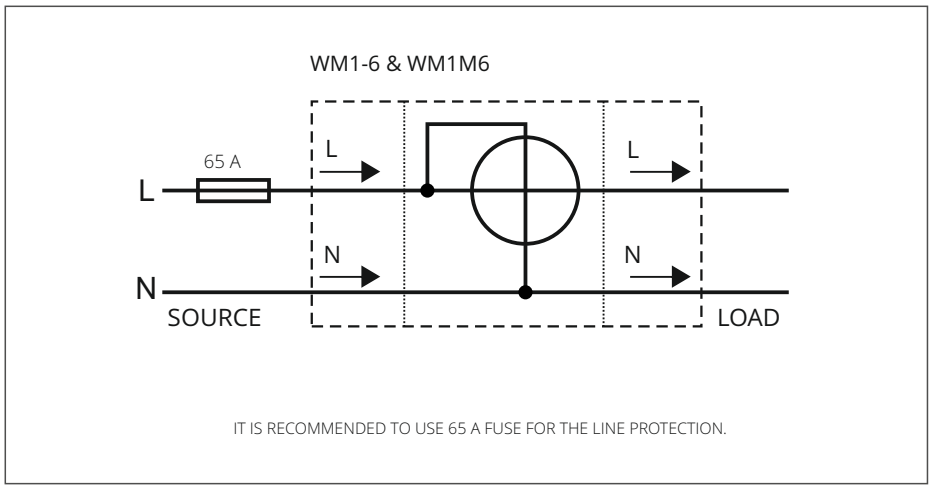


PULSE OUT. & TARIFF INPUT

DIMENSIONS



INSTALLATION



ENERGY METERS **THREE-PHASE**

WM3-6/WM3M6

ACTIVE ENERGY METERS

DIRECT CONNECTION 65 A

APPLICATIONS

THE THREE-PHASE ENERGY METERS WM3-6 AND WM3M6 (MID CERTIFIED) ARE INTENDED FOR ENERGY MEASUREMENTS IN THREE-PHASE ELECTRICAL POWER NETWORK AND CAN BE USED IN RESIDENTIAL, INDUSTRIAL AND UTILITY APPLICATIONS. METERS MEASURE ENERGY DIRECTLY IN 4-WIRE NETWORKS ACCORDING TO THE PRINCIPLE OF FAST SAMPLING OF VOLTAGE AND CURRENT SIGNALS. A BUILT-IN MICROPROCESSOR CALCULATES ACTIVE/REACTIVE/APPARENT POWER AND ENERGY, CURRENT, VOLTAGE, POWER FACTOR, POWER ANGLE, AND FREQUENCY (FOR EACH PHASE AND TOTAL SUM) FROM THE MEASURED SIGNALS. THE MICROPROCESSOR ALSO CONTROLS LCD, LED, IR COMMUNICATION AND OPTIONAL EXTENSIONS.

THE ACCURACY OF THE METERS IS CLASS 1 FOR ACTIVE ENERGY ACCORDING TO EN 62053-21, B ACCORDING TO EN 50470-3 AND CLASS 2 FOR REACTIVE ENERGY ACCORDING TO EN 62053-23. METERS CAN BE MOUNTED ON A 35 MM DIN-RAIL.

OPTIONAL THE METER CAN BE EQUIPPED WITH A RS485 SERIAL COMMUNICATION WITH THE MODBUS PROTOCOL AND WITH M-BUS SERIAL COMMUNICATION. COMMUNICATION MODULES ENABLE DATA TRANSMISSION AND THUS CONNECTION OF THE MEASURING PLACES INTO THE NETWORK FOR A PROCESS CONTROL AND ENERGY MANAGEMENT PURPOSES. INSTEAD OF COMMUNICATION MODULES, THERE CAN BE ALSO TARIFF INPUT (OPTION) OR BUILT-IN PULSE OUTPUT (OPTION). TARIFF INPUT PROVIDES A MEASUREMENT OF TWO TARIFFS FOR SELECTED ENERGY REGISTERS. PULSE OUTPUT IS SENDING DATA TO THE DEVICES FOR CHECKING AND MONITORING CONSUMED ENERGY.

FEATURES

- THREE-PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METERS UP TO MAXIMUM CURRENT (I_{MAX}) 65 A
- BASIC CURRENT 5 A (Ib)
- MID APPROVAL (OPTION FOR WM3M6 OR WM3M6Z)
  ACTIVE ENERGY ACCURACY: CLASS 1 ACCORDING TO EN 62053-21
  CLASS B ACCORDING TO EN 50470-3
- FOUR (EIGHT) PROGRAMMABLE COUNTERS. EACH COUNTER HAS TWO REGISTERS. ONE IS FIXED (NON-RESETTABLE) AND ONE IS RESETTABLE.
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- REFERENCE VOLTAGE 3x230 V/ 400 V (U_n)
- VOLTAGE OPERATING RANGE -20% ... +15 %
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION VOLTAGE CIRCUIT < 8 VA AT U_n PER PHASE
- POWER CONSUMPTION CURRENT CIRCUIT < 0.8 VA AT Ib PER PHASE
- TEMPERATURE RANGE CLIMATIC CONDITION AS INDOOR METER ACCORDING IEC 50470

ENERGY METERS **THREE-PHASE**

WM3-6/WM3M6

FEATURES

- PULSE OUTPUT (OPTION) ACCORDING TO EN 62053-31 (OPTION)
- TARIFF INPUT (OPTION)
- RS-485 SERIAL COMMUNICATION (OPTION)
- M-BUS SERIAL COMMUNICATION (OPTION)
- DISPLAY LCD 7+1 DIGIT (100 Wh RESOLUTION)
- MULTIFUNCTIONAL FRONT RED LED
- LED CONSTANT 1000 imp/kWh
- BUILT-IN OPTICAL (IR) COMMUNICATION PORT
- 3-DIN RAIL WIDTH MOUNTING ACCORDING TO EN 60715
- SEALABLE TERMINAL COVER
- 3 DIN MODULES WIDTH
- MEASUREMENTS OF
  - POWER (ACTIVE, REACTIVE, APPARENT) AND ENERGY (EACH PHASE AND TOTAL)
  - VOLTAGE (EACH PHASE)
  - CURRENT (EACH PHASE)
  - PHASE TO PHASE VOLTAGE
  - PHASE TO PHASE ANGLE
  - FREQUENCY
  - POWER FACTOR (EACH PHASE AND TOTAL)
  - POWER ANGLE (EACH PHASE AND TOTAL)
  - ACTIVE TARIFF (OPTION)

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 **DIRECT CONNECTION 65 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	3 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	69
Weight		g	216

OPERATING FEATURES			
Connection	to three-phase network	n° wires	4u
Tariff	for active and reactive energy	Tariff	2

APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference current I_{ref}		A	5
Minimum current I_{min}		A	0.25
Maximum current I_{max}		A	65
Starting current I_{st}		mA	20
Reference frequency f_n		Hz	50 and 60
Number of phases (number of wires)			3 (4)
Accuracy	according to EN 50470-3	class	B
	according to EN 62053-21	class	1
	according to EN 62053-23	class	2

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 **DIRECT CONNECTION 65 A**

SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Consumption		VA	< 8
Consumption at I_{ref}		VA	< 0.1
MEASURING FEATURES			
Voltage range	three-phase (4u)	V	0.8 ... 1.15 U_n
Current range		A	0.25 ... 65
Frequency range		Hz	0.005 fn
DISPLAY FEATURES			
Display type	LCD		
	energy digits dimension	mm	4.52
Number of digits	8 (7 + 1) digits	min. ... max. kWh	0.1 ... 9999999.9
OPTICAL INTERFACE LED			
LED color			red LED
Pulse rate		imp/kWh	1
LED on			no load
SAFETY			
Protective class		class	II
Degree of pollution		–	2
Standard	IEC 62052-31		
RF communication distance			
Enclosure	UL 94-V	class	V
PULSE OUTPUTS (EN 62053-31(A&B), OPTIONAL)			
Pulse rate		imp/kWh	1000
Pulse ON duration		msec	32 ± 2
Rated voltage	max.	V DC	40
Pulse ON max. current	max.	mA	40
EMBEDDED COMMUNICATION			
Default			
Optical communication	IR - via WM-USB adapter		19200
Optional			
M-BUS serial communication	M-BUS	bits/s	300 to 9600
Modbus RTU	RS485 - 2 wires	bits/s	1200 to 19200
Tariff input			
Digital output			
CONNECTION TERMINALS			
Power contacts	contacts capacity	mm^2	2.5 ... 25 (16)
	contacts screws		M5
	max. torque	Nm (PZ2)	3.5
Auxiliary terminals	contacts capacity	mm^2	1 ... 2.5
	contacts screws	Nm	M3
	max. torque	Nm	1.2
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-40 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
IP rating	front panel/terminals	–	IP51/IP20

CONNECTION OF MODULES

Energy meters have built-in optical (IR) communication port on the side as a standard. Special WM-USB adapter (size 1 DIN module) can easily be attached to it. It can be used for direct communication with a PC to change settings of devices without any communication installed.

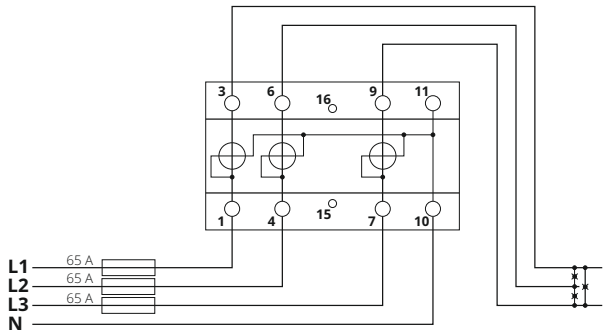
Optional the meter can be equipped with the RS485 serial communication with the MODBUS protocol and M-BUS serial communication.

Instead of communication modules, there can be also tariff input (option) or built-in pulse output (option).

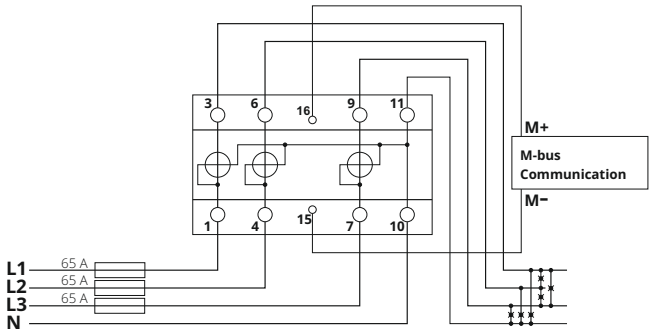
On the housing there are only two terminals, thus only one functional extension is possible (serial communication, tariff input, pulse output).

CONNECTION

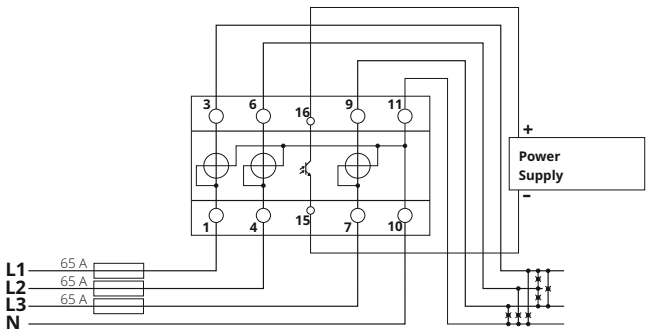
WM3-6 - NEUTRAL CONNECTION



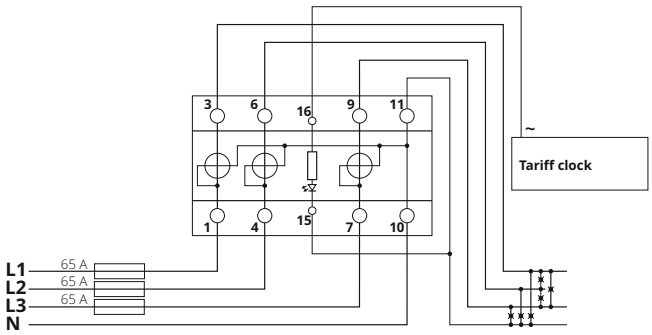
WM3-6 - M-Bus



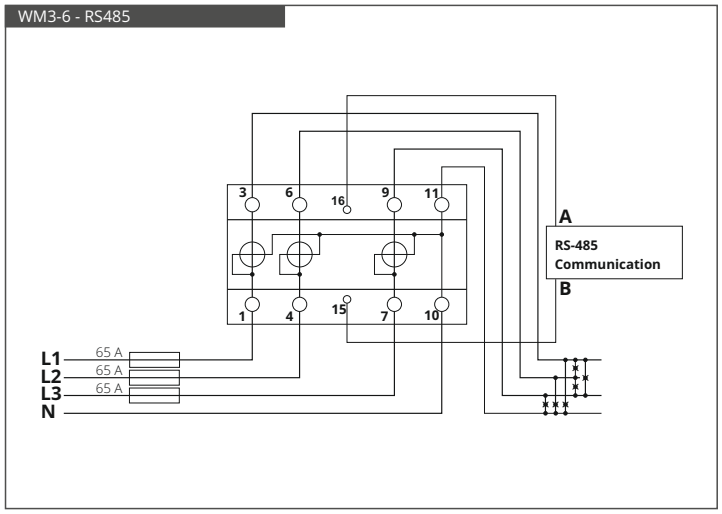
WM3-6 - PULSE OUTPUT



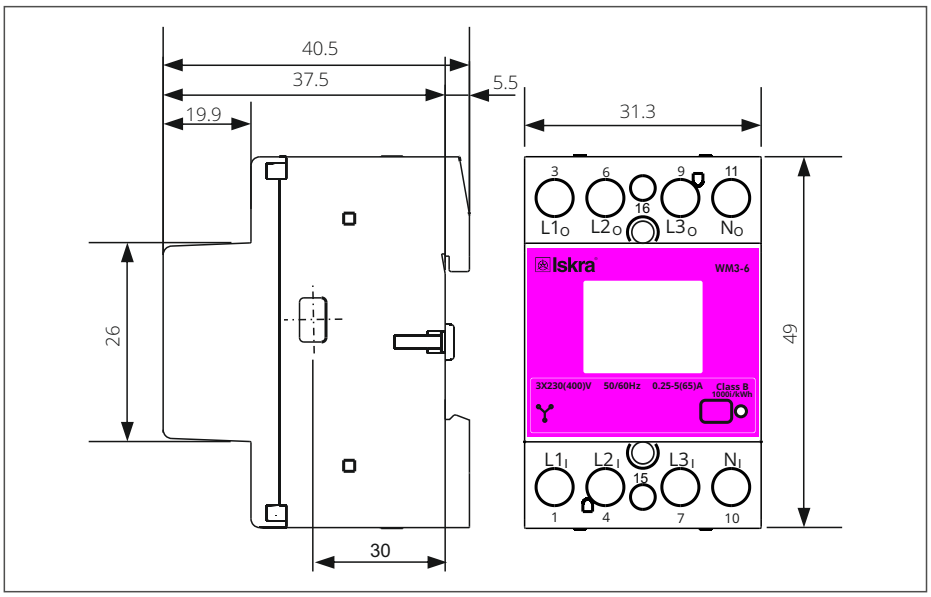
WM3-6 - TARIFF INPUT



CONNECTION



DIMENSIONS



ENERGY METERS **SINGLE-PHASE**

WS 0021

ACTIVE ENERGY METERS

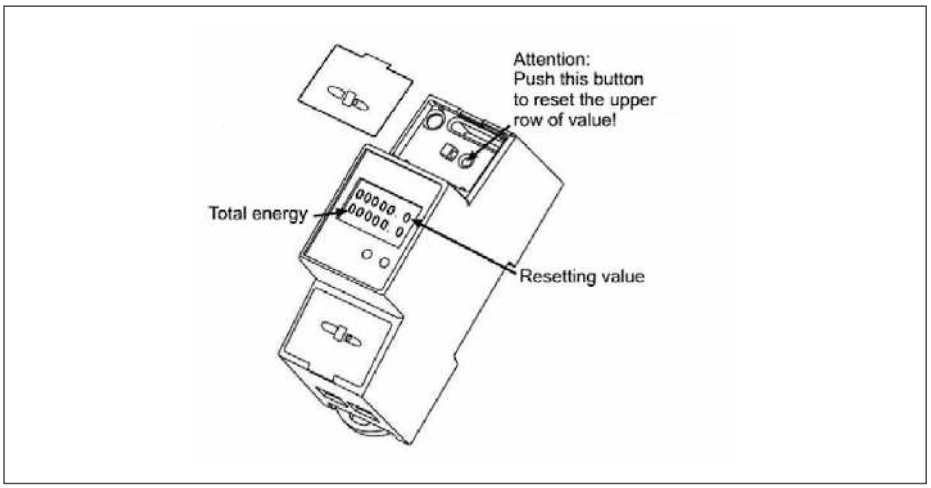
DIRECT CONNECTION 80 A

APPLICATIONS

WS 0021 IS AN ELECTRONIC SINGLE PHASE ACTIVE ENERGY METER. THE METER MEASURES POSITIVE ACTIVE ENERGY DIRECTLY IN A 2-WIRE NETWORK. METER ACCURACY CLASS IS 1, ACCORDING TO THE EN SIST 62053-21 STANDARD FOR ACTIVE ENERGY METER. THE METER CAN BE MOUNTED ON A DIN RAIL (2-PITCH).

FEATURES

- SINGLE PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METER
- CLASS OF METER 1 ACCORDING EN 62053-21 AND EN 62052-11
- MAXIMUM CURRENT 80 A (I_{max})
- BASE CURRENT (Ib) 5 A
- STARTING CURRENT 0.004 Ib
- 230 V RATED SYSTEM VOLTAGE INPUT (U_n)
- VOLTAGE OPERATING RANGE -20%...+15% U_n
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION < 8 VA
- TEMPERATURE RANGE AS INDOOR METER ACCORDING IEC 62051-11
- 7-DIGIT LCD
- LED RATE FOR ENERGY FLOW 1000 p/kWh
- PULSE OUTPUT 1000 imp/kWh
- TWO ENERGY REGISTERS – A TOTAL REGISTER AND A ZERO SETTING REGISTER

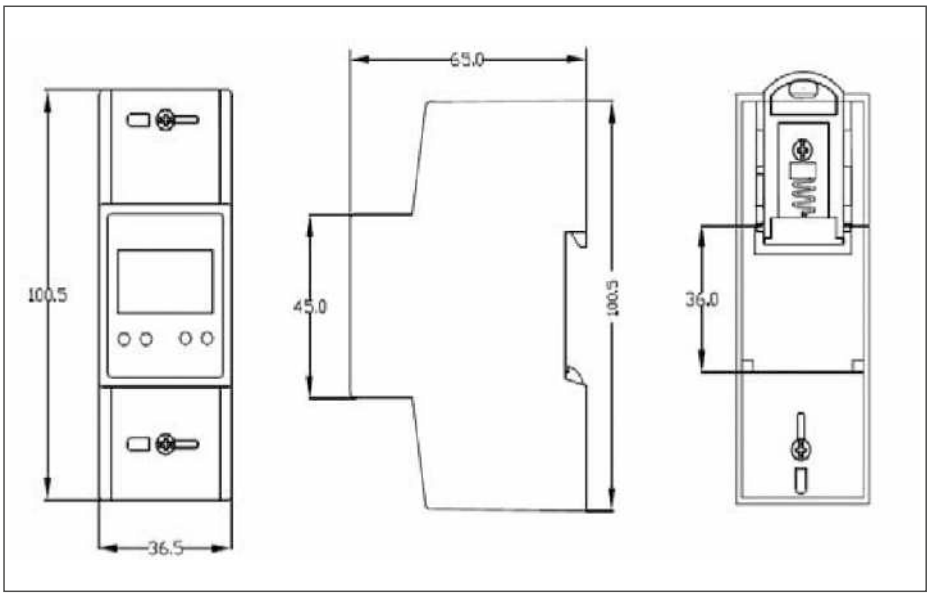


TECHNICAL DATA

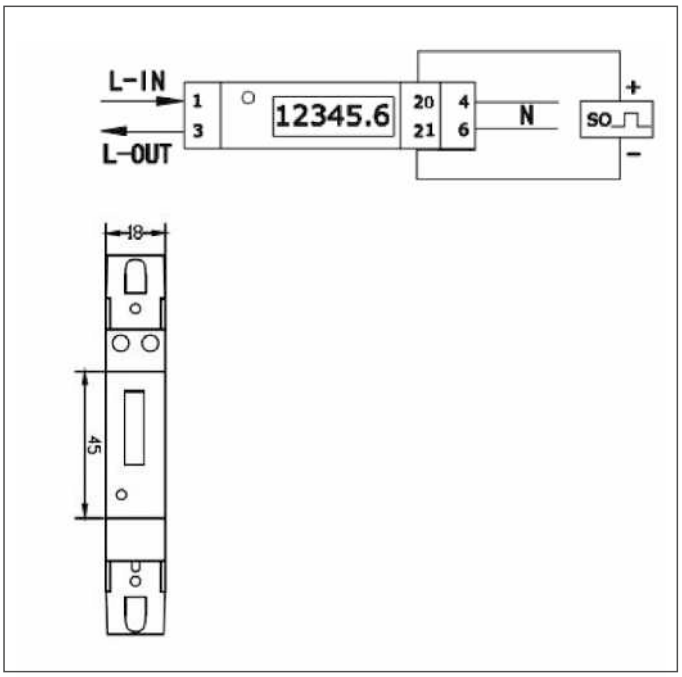
DATA IN COMPLIANCE WITH EN 62051-11, EN 62052-11, EN 62053-21 AND EN 62053-31 **DIRECT CONNECTION 80 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	2 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	65
Weight		g	120
OPERATING FEATURES			
Connection	to single-phase network	n° wires	2
APPROVAL (according to EN 62053-21, EN 62052-11)			
Reference voltage U_n		V AC	230
Reference current I_{ref}		A	5
Maximum current I_{max}		A	80
Starting current I_{st}		A	0.004 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 (2)
Accuracy	according to EN 62053-21	class	B
	according to EN 62052-11	class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Maximum power dissipation (Voltage circuit) U_n		VA	< 8
Voltage input waveform		–	AC
MEASURING FEATURES			
Voltage range		V	0.8 ... 1.15 U_n
Current range		A	0.02 ... 80
Frequency range		Hz	50 / 60
DISPLAY FEATURES			
Display type	6 digits LCD		4 (1 decimal)
Total energy register	5 digits + 1 decimal digit		0.1 ... 99999.9
Zero setting energy register	5 digits + 1 decimal digit		0.1 ... 99999.9
OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate		p/kWh - p/kvarh	1000
CONNECTION TERMINALS			
Connection screws			M3.5
Pulse output screws			M3
Terminal capacity main current paths		mm^2	2.5 ... 10
Terminal capacity for mains terminals S0		mm^2	1 ... 2.5
Tightening torque for line terminals	max.	Nm	1.2
Tightening torque for pulse terminals	max.	Nm	1.2
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Installation	indoor	–	yes
IP rating	front panel / terminals	–	IP40/IP20

DIMENSIONS



INSTALLATION



(SEE FIGURES) FOR MONITORING PURPOSE ONLY.
RAIL MOUNTING ACCORDING TO EN 60715
POWER TERMINALS CAPACITY 15 mm^2
POWER TERMINALS SCREWS M3.5
NEUTRAL TERMINAL SCREW M3.5
MAX TORQE 1.2 Nm
PULSE OUTPUT CONTACT CAPACITY UP TO 15 mm^2

ENERGY METERS **THREE-PHASE**

WS 0030, WS 0031

ACTIVE ENERGY METERS

DIRECT CONNECTION 65 A

APPLICATIONS

WS 0030 AND WS 0031 ARE ELECTRONIC THREE PHASE ACTIVE ENERGY METERS. METERS MEASURE POSITIVE ACTIVE ENERGY DIRECTLY IN 4-WIRE NETWORKS. THERE ARE TWO VERSIONS, ONE WITH PULSE OUTPUT (WS 0031) AND THE OTHER WITHOUT PULSE OUTPUT(WS 0030). ACCURACY OF THE METERS IS CLASS 1, ACCORDING TO THE STANDARD EN SIST 62053-21 FOR ACTIVE ENERGY METER. METERS CAN BE MOUNTED ON A DIN-RAIL (3 PITCH).

FEATURES

- THREE PHASE DIRECT CONNECTED DIN-RAIL MOUNTING METER
- CLASS 1 ACCORDING TO EN 62053-21AND EN 62052-11
- MAXIMUM CURRENT 65 A (I_{max})
- BASIC CURRENT (Ib) 10 A
- STARTING CURRENT 0.004 Ib
- 3 x 230/400 V RATED SYSTEM VOLTAGE INPUT (U_n)
- VOLTAGE OPERATING RANGE -20%...+15% U_n
- REFERENCE FREQUENCIES 50 OR 60 Hz
- POWER CONSUMPTION VOLTAGE CIRCUIT < 6 VA AT U_n
- POWER CONSUMPTION CURRENT CIRCUIT < 0.85 W AT I_{max}
- TEMPERATURE RANGE CLIMATIC CONDITION AS INDOOR METER ACCORDING IEC 62052-11
- DISPLAY 6+1DIGIT (100 Wh RESOLUTION)
- RED LED FOR INDICATION OF ENERGY FLOW AND TESTING
- LED RATE FOR ENERGY FLOW 500 p/kWh
- PULSE OUTPUT (WS 0031 ONLY) ACCORDING TO EN 62053-31:2001
- PULSE OUTPUT RATE 500 p/kWh
- PULSE OUTPUT TYPE OPTOCOUPLER TRANSISTOR-OPEN COLLECTOR

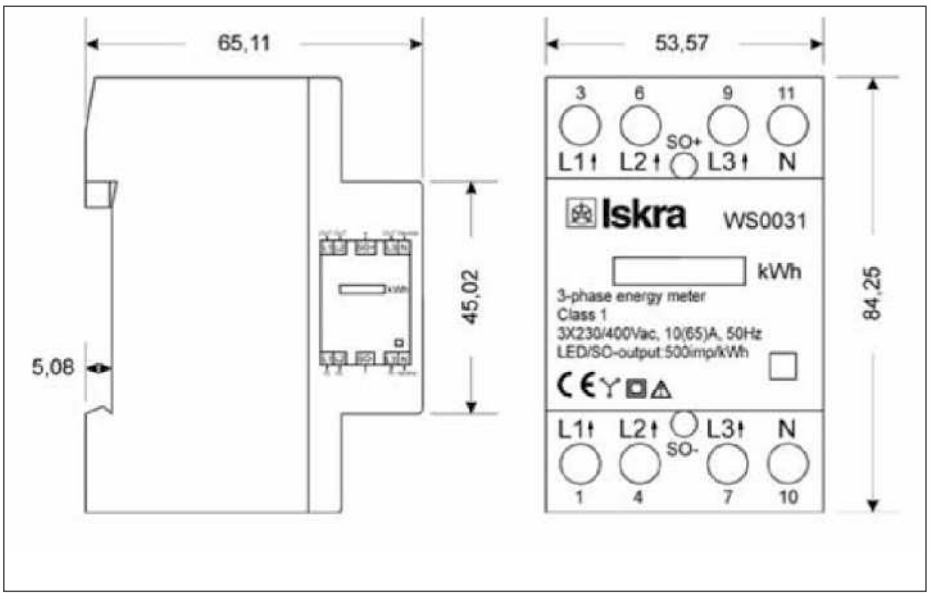
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 62051-11, EN 62052-11, EN 62053-21 AND EN 62053-31 **DIRECT CONNECTION 65 A**

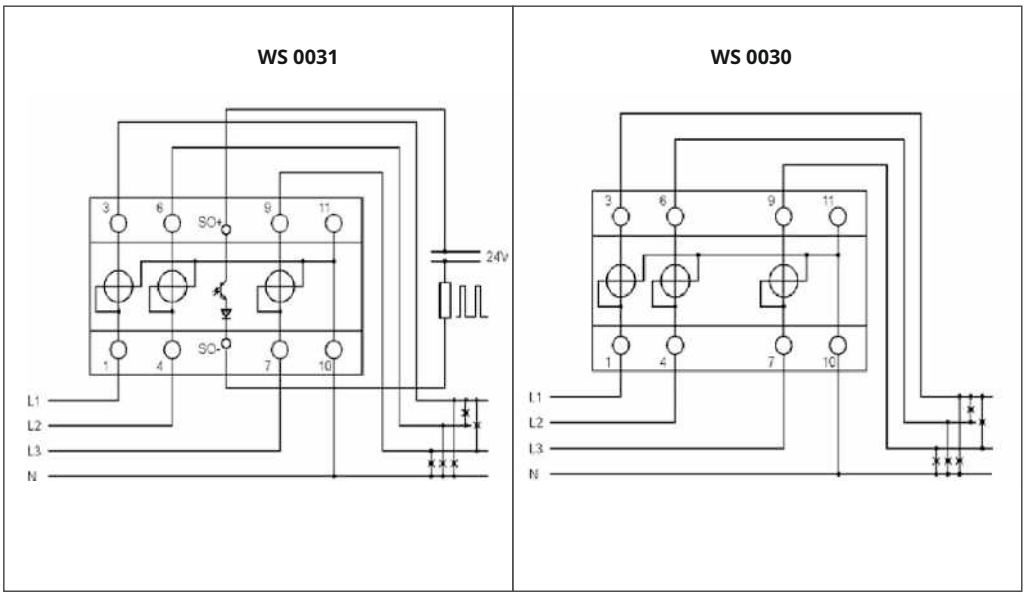
GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	3 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	65.11
Weight		g	250
OPERATING FEATURES			
Connection	to single/three phase network	n° wires	4
Tariff	for active and reactive energy	n° 2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	10
Maximum current I_{max}		A	65
Starting current I_{st}		A	0.004 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 ... 3 (2 ... 4)
Accuracy	according to EN 62053-21	class	1
	according to EN 62052-11	class	1
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Maximum power dissipation (Voltage circuit) U_n		VA	< 6
Maximum VA burden (Current circuit) I_{max}		VA	≤ 0.8
Voltage input waveform		–	AC
MEASURING FEATURES			
Voltage range	phase/phase	V	0.8 ... 1.15 U_n
	phase/neutral		0.8 ... 1.15 U_n
Current range		A	0.04 ... 65
Frequency range		Hz	50 / 60
DISPLAY FEATURES			
Display type	6 digits + 1 decimal digit	–	6 + 1
Resolution		Wh	100
OPTICAL INTERFACE (METROLOGICAL LED)			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	500
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate		p/kWh - p/kvarh	500
CONNECTION TERMINALS			
Connection screws			M5
Pulse output screws			M3
Terminal capacity main current paths		mm^2	2.5 ... 16
Terminal capacity for mains terminals S0		mm^2	1 ... 2.5
Tightening torque for pulse terminals	max.	Nm	1.2
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Installation	indoor	–	yes
IP rating	front panel / terminals	–	IP40/IP20

ENERGY METERS **THREE-PHASE**
WS 0030, WS 0031

DIMENSIONS



INSTALLATION



ENERGY METERS **THREE-PHASE**

WS 0101, WS 0102, WS 1102

ACTIVE ENERGY METERS

DIRECT CONNECTION 65 A

APPLICATIONS

THE WSX10X ENERGY METERS ARE USED FOR MEASURING ENERGY USING DIRECT CONNECTION IN THREE-PHASESYSTEMS WITH CURRENT UP TO 65A. OPTIONAL ALSO THE MEASUREMENT OF APPARENT ENERGY IS POSSIBLE. HOUSING IS PROVIDED WITH TERMINALS PROTECTION COVERS, WHICH CAN BE SEAL UP AGAINST NON-AUTHORISED ACCESS. THEY ARE BUILT TO BE FASTENED TO EN 60715 STANDARD GUIDES. THE METERS ARE MICROPROCESSOR CONTROLLED. DISPLAY OF QUANTITIES DEPENDS ON METERS TYPE. THEY CAN BE DISPLAYED ON 7 DIGIT ELECTROMECHANICAL COUNTER OR ON LCD DISPLAY.

FEATURES

- INDUSTRIAL APPLICATIONS OR METERS WITH TYPE APPROVAL ACCORDING TO EUROPEAN DIRECTIVE 2004/22/EC MID
- MAXIMUM CURRENT 65 A (I_{max})
- ACTIVE ENERGY - CLASS B IN COMPLIANCE WITH EN 50470-3, CLASS 1 IN COMPLIANCE WITH EN 62053-21
- REACTIVE ENERGY - CLASS 2 IN COMPLIANCE WITH EN 62053-23
- THREE-PHASE CONNECTION
- ENERGY MEASUREMENT IN BOTH DIRECTION (IMPORT-EXPORT)
- MICROPROCESSOR CONTROL
- 7 DIGIT ENERGY COUNTER (WS 0101)
- DOUBLE 7 DIGIT ENERGY COUNTER (WS 0102)
- LCD 9 DIGIT DISPLAY (WS 1102)
- TARIFF INPUTS (OPTION)
- COMMUNICATION (OPTION): RS485 (MODBUS PROTOCOL)
- PULSE OUTPUTS (OPTION)
- HOUSING FOR DIN RAIL MOUNTING
- PROTECTIVE COVER FOR TERMINALS (POSSIBLE SEAL UP AGAINST NON-AUTHORIZED ACCESS)

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 **DIRECT CONNECTION 65 A**

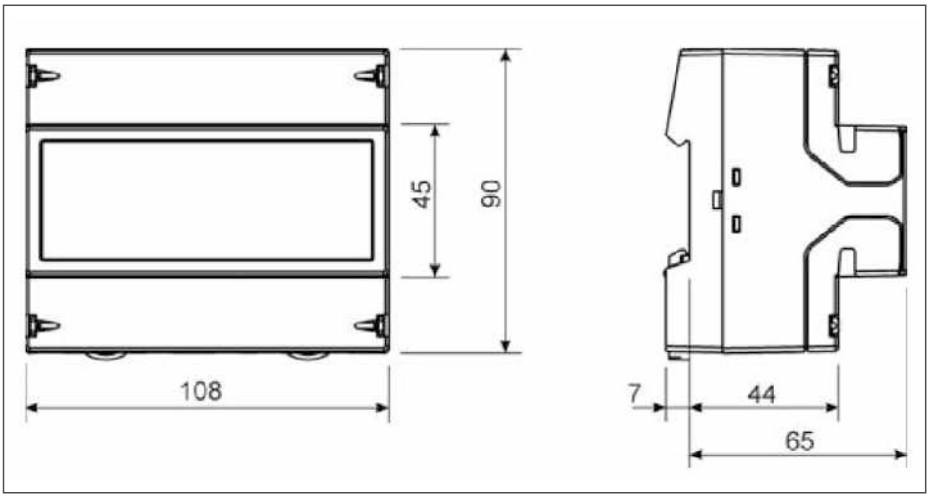
GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	6 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	72
Weight		g	560
OPERATING FEATURES			
Connection	to single/three phase network	n° wires	2-4
Tariff	for active and reactive energy	n° 2	4 tariffs
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	5 (10)
Minimum current I_{min}		A	0.25 (0.5)
Maximum current I_{max}		A	65
Starting current I_{st}		A	0.004 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 ... 3 (2 ... 4)
Accuracy	according to EN 50470-3	class	B
	according to EN 62053-21	class	1
	according to EN 62053-23	class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Consumption		VA	< 3
Consumption at I_{re}		VA	< 0.02
Voltage input waveform		–	AC
OVERLOAD CAPABILITY			
Current			
	temporarity (3 s) at U_n	A	100
	temporarity (1 s) at U_n	A	250
	temporarity (10 ms) at U_n	A	30 I_{max}
MEASURING FEATURES			
Voltage range	phase/phase	V	0.8 ... 1.15 U_n
	phase/neutral		0.8 ... 1.15 U_n
Current range		A	0.04 ... 65
Frequency range		Hz	0.98 ... 1.02 f_n
DISPLAY FEATURES			
WS 0101			
Display type	electromechanical counter	–	one counter
	energy digits dimension	mm	4 x 1.2
Primary metering	7 (6 + 1) digits	min. ... max. kWh	0.1 ... 999999.9
WS 0102			
Display type	electromechanical counter	–	two counters
	energy digits dimension	mm	4 x 1.2
Primary metering	7 (6 + 1) digits	min. ... max. kWh	0.1 ... 999999.9
Secondary metering	7 (6 + 1) digits	min. ... max. kvarh	0.1 ... 999999.9
WS 1102			
Display type	LCD	–	two counters
	energy digits dimension	mm	4.9 x 3
Primary metering	9 (7 + 2) digits	min. ... max. kWh	0.01 ... 9999999.99
OPTICAL INTERFACE (LED - ONLY WITH ELECTROMECHANICAL REGISTER)			
Run - measuring status	LED on at $I < I_{st}$		red LED
Com - communication status	at transmission		green LED
Test output	red LED	Imp/kWh	1000

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 **DIRECT CONNECTION 65 A**

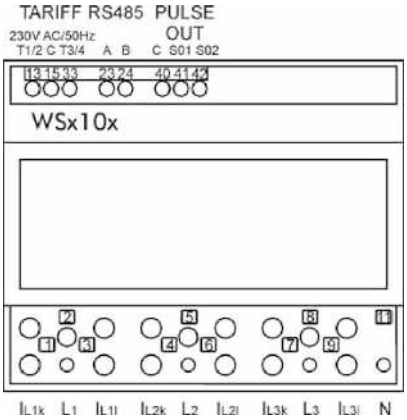
SAFETY			
Protective class		class	II
AC voltage test (EN 61010-1:2004)		kV	3.7
Degree of pollution		–	2
Operational voltage		V	300
Housing material flame resistance	UL 94	class	V0
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate Output 1		p/kWh - p/kvarh	1 ... 1000
Pulse rate Output 2		p/kWh - p/kvarh	10000
Pulse ON duration		msec	35 ± 5
U_{ext}	max.	V	40
Pulse ON maximum current	max.	mA	27
EMBEDDED COMMUNICATION			
Pulse rate Output 1	RS485 - 3 wires	bits/s	1200 ... 19200
CONNECTION TERMINALS			
Current terminals	min. (max.)	mm^2	2.5 (16)
Voltage terminals	min. (max.)	mm^2	1 (2.5)
Communication, pulse and tariff terminals	min. (max.)	mm^2	(2.5) / (2 x 1.5)
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	annual mean relative humidity	–	≤ 95 %
IP rating	terminals	–	IP20

DIMENSIONS

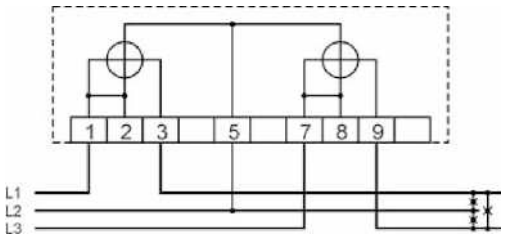


INSTALLATION

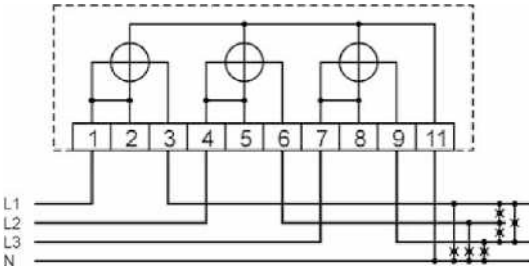
METER TERMINALS ARE POSITIONED ON THE BOTTOM AND THE TOP SIDE OF THE METER AND ARE COVERED WITH THE PROTECTION COVER. CURRENT AND VOLTAGE CIRCUITS ARE LOCATED ON THE BOTTOM SIDE AS SHOWN ON THE PICTURE BELLOW. FOR THE DIRECT CONNECTION METERS VOLTAGE INPUTS ARE EQUIPPED WITH PROTECTION BUNG, WHICH ALLOWS YOU TO PHYSICALLY BREAK CONTACT, BEFORE CONNECTING OR DISCONNECTING VOLTAGE TO THE METER. ON THE TOP SIDE ARE CONNECTION TERMINALS FOR COMMUNICATION, PULSE OUTPUTS AND TARIFF INPUTS (PICTURE 1). A LABEL WITH CONNECTIONDIAGRAM IS LOCATED ON THE BOTTOM OF THE COVER. REGARDING TO THE METER VERSION THE METER CONNECTION CAN BE THREE-PHASE WITH UNBALANCED LOAD. ITS MEASURING SYSTEM CAN BE PERFORMED EITHER IN 3 OR 4-WIRE CONNECTION.



Picture 1: picture of connection terminals WS x10x



Picture 2: Three phase system(three wire unbalanced - 3u) WS x10x



Picture 3: Three phase system(four wire unbalanced - 4u) WS x10x

ENERGY METERS **THREE-PHASE**

WS 0301, WS 0302, WS 1302

ACTIVE ENERGY METERS

CONNECTION THROUGH CT

APPLICATIONS

THE WSX30X METERS ARE USED FOR CONNECTION WITH CURRENT TRANSFORMERS. OPTIONAL ALSO THE MEASUREMENT OF APPARENT ENERGY IS POSSIBLE. HOUSING IS PROVIDED WITH TERMINALS PROTECTION COVERS, WHICH CAN BE SEAL UP AGAINST NON-AUTHORISED ACCESS. THEY ARE BUILT TO BE FASTENED TO EN 60715 STANDARD GUIDES. THE METERS ARE MICROPROCESSOR CONTROLLED. DISPLAY OF QUANTITIES DEPENDS ON METERS TYPE. THEY CAN BE DISPLAYED ON 7 DIGIT ELECTROMECHANICAL COUNTER OR ON LCD DISPLAY.

ACCORDING TO THE CUSTOMER'S DEMANDS, METERS CAN BE EQUIPPED WITH A RS485 SERIAL COMMUNICATION (OPTION) WITH THE MODBUS PROTOCOL, WHICH ENABLES DATA TRANSMISSION AND THUS CONNECTION OF THE MEASURING PLACES INTO THE NETWORK FOR THE CONTROL AND MANAGEMENT WITH ENERGY. THEY CAN ALSO BE EQUIPPED WITH TARIFF INPUT (OPTION). A BUILT-IN PULSE OUTPUT(OPTION) IS DESIGNED FOR SENDING DATA TO THE DEVICES FOR CHECKING AND MONITORING CONSUMED ENERGY.

FEATURES

- CONNECTION WITH CURRENT TRANSFORMER
- INDUSTRIAL APPLICATIONS OR METERS WITH TYPE APPROVAL ACCORDING TO EUROPEAN DIRECTIVE 2004/22/EC MID
- ACTIVE ENERGY - CLASS B IN COMPLIANCE WITH EN 50470-3, CLASS 1 IN COMPLIANCE WITH EN 62053-21
- REACTIVE ENERGY - CLASS 2 IN COMPLIANCE WITH EN 62053-23
- THREE-PHASE CONNECTION
- ENERGY MEASUREMENT IN BOTH DIRECTION (IMPORT-EXPORT)
- MICROPROCESSOR CONTROL
- 7 DIGIT ENERGY COUNTER (WS 0301)
- DOUBLE 7 DIGIT ENERGY COUNTER (WS 0302)
- LCD 9 DIGIT DISPLAY (WS 1302)
- TARIFF INPUTS (OPTION)
- COMMUNICATION (OPTION): RS485 (MODBUS PROTOCOL)
- PULSE OUTPUTS (OPTION)
- HOUSING FOR DIN RAIL MOUNTING
- PROTECTIVE COVER FOR TERMINALS (POSSIBLE SEAL UP AGAINST NON-AUTHORIZED ACCESS)
-

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 — **CT CONNECTION**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	6 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	72
Weight		g	420
OPERATING FEATURES			
Connection	to single/three phase network	n° wires	2-4
Tariff	for active and reactive energy	n° 2	4 tariffs
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	5 / 1
Minimum current I_{min}		A	0.05 / 0.01
Maximum current I_{max}		A	6 / 1.2
Starting current I_{st}		A	0.002 I_{re}
Reference frequency f_n		Hz	50 / 60
Number of phases (number of wires)		–	1 ... 3 (2 ... 4)
Accuracy	according to EN 50470-3	class	B
	according to EN 62053-21	class	1
	according to EN 62053-23	class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	0.8 ... 1.15 U_n
Consumption		VA	< 3
Consumption at I_{re}		VA	< 0.02
Voltage input waveform		–	AC
OVERLOAD CAPABILITY			
Current			
	temporarity (3 s) at U_n	A	100
	temporarity (1 s) at U_n	A	250
	temporarity (10 ms) at U_n	A	30 I_{max}
MEASURING FEATURES			
Voltage range	phase/phase	V	0.8 ... 1.15 U_n
	phase/neutral		0.8 ... 1.15 U_n
Current range		A	0.05 ... 5 / 0.01 ... 1
Frequency range		Hz	0.98 ... 1.02 f_n
DISPLAY FEATURES			
WS 0101			
Display type	electromechanical counter	–	one counter
	energy digits dimension	mm	4 x 1.2
Primary metering	7 digits	min. ... max. kWh	0.1 ... 9999999
WS 0102			
Display type	electromechanical counter	–	two counters
	energy digits dimension	mm	4 x 1.2
Primary metering	7 digits	min. ... max. kWh	0.1 ... 9999999
Secondary metering	7 (5 + 2) digits	min. ... max. kvarh	0.1 ... 99999.99
WS 1102			
Display type	LCD	–	two counters
	energy digits dimension	mm	4.9 x 3
Primary metering	9 digits	min. ... max. kWh	0.01 ... 999999999
Secondary metering	9 digits	min. ... max. kvarh	0.01 ... 999999999
OPTICAL INTERFACE (LED - ONLY WITH ELECTROMECHANICAL REGISTER)			
Run - measuring status	LED on at $I < I_{st}$		red LED
Com - communication status	at transmission		green LED
Test output	primary metering	Imp/kWh	1 ... 1000
	secondary metering	Imp/kWh	10000

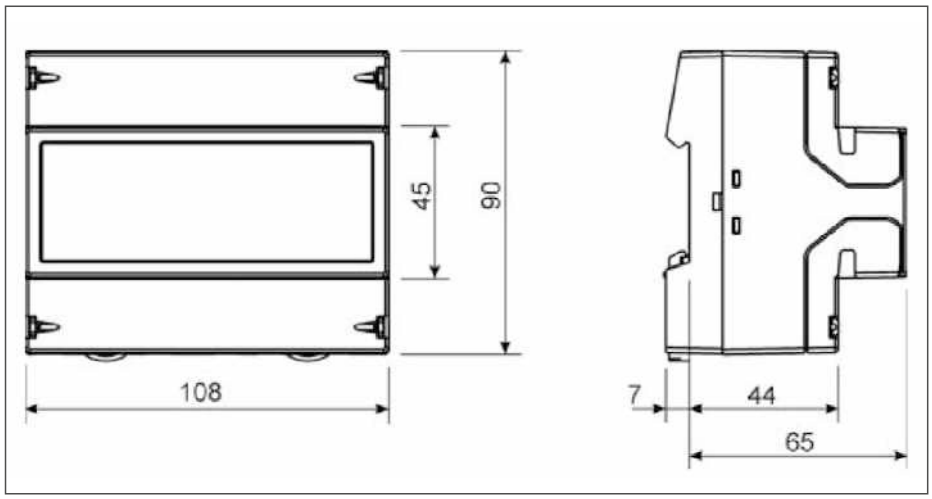
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-3, EN 62053-23 AND EN 62053-21 **CT CONNECTION**

SAFETY			
Protective class		class	II
AC voltage test (EN 61010-1:2004)		kV	3.7
Degree of pollution		–	2
Operational voltage		V	300
Housing material flame resistance	UL 94	class	V0
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate Output 1		p/kWh - p/kvarh	1 ... 1000
Pulse rate Output 2		p/kWh - p/kvarh	10000
Pulse ON duration		msec	35 ± 5
U_{ext}	max.	V	40
Pulse ON maximum current	max.	mA	27
EMBEDDED COMMUNICATION			
Pulse rate Output 1	RS485 - 3 wires	bits/s	1200 ... 19200
CONNECTION TERMINALS			
Current terminals	min. (max.)	mm^2	1 (4)
Voltage terminals	min. (max.)	mm^2	1 (2.5)
Communication, pulse and tariff terminals	min. (max.)	mm^2	(2.5) / (2 x 1.5)
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	annual mean relative humidity	–	≤ 95 %
IP rating	terminals	–	IP20

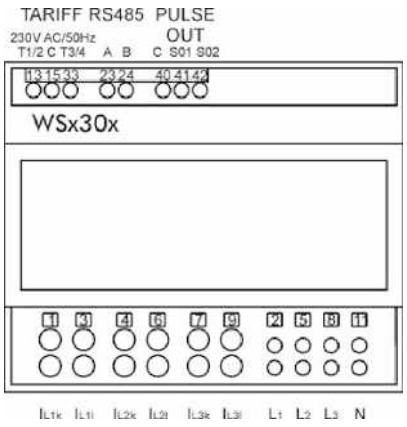
ENERGY METERS **THREE-PHASE**
WS 0301, WS 0302, WS 1302

DIMENSIONS

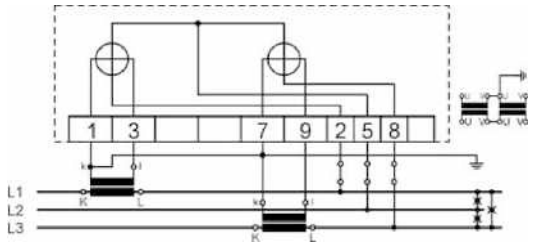


INSTALLATION

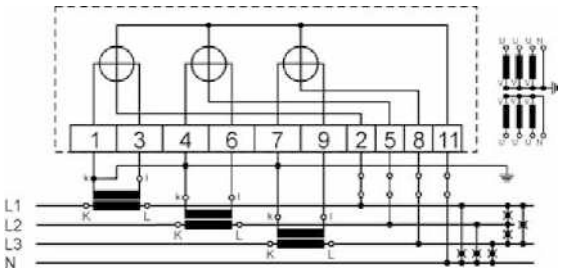
WS 0030 AND WS 0031 ARE ELECTRONIC THREE PHASE ACTIVE ENERGY METERS. METERS MEASURE POSITIVE ACTIVE ENERGY DIRECTLY IN 4- WIRE NETWORKS. THERE ARE TWO VERSIONS, ONE WITH PULSE OUTPUT (WS 0031) AND THE OTHER WITHOUT PULSE OUTPUT(WS 0030). ACCURACY OF THE METERS IS CLASS 1, ACCORDING TO THE STANDARD EN SIST 62053-21 FOR ACTIVE ENERGY METER. METERS CAN BE MOUNTED ON A DIN-RAIL (3 PITCH).



Picture 1: picture of connection terminals WS x30x



Picture 2: Three phase system (three wire unbalanced - 3u)
WS x30x – for voltage circuits direct connection or connection with voltage transformer is used



Picture 3: Three phase system (four wire unbalanced - 4u)
WS x30x – for voltage circuits direct connection or connection with voltage transformer is used

DIGITAL SINGLE-PHASE ENERGY METERS

ECS1-32/ECS1-32 MID

ACTIVE ENERGY METERS

DIRECT CONNECTION 32 A

APPLICATIONS

4 QUADRANTS (ECS1-32MID - MID CERTIFIED) ACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION, WITH 7 DIGITS LCD AND 1 S0 PULSE OUTPUT (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO ACTIVE IMPORTED ENERGY. MONITORING OF THE ENERGY-CONSUMPTION GOES VIA A S0 PULSE OUTPUT. THE PRODUCTS CAN BE SET UP TO COMMUNICATE WITH LAN, MODBUS RTU, M-BUS, KNX, SD-CARD DATALOGGER AND EVISION INTERFACES.

FUNCTION

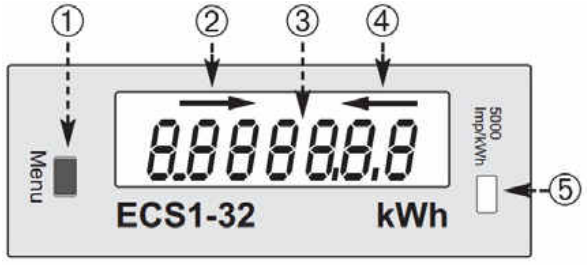
DISPLAYED VALUES

VALUE	UNIT	SYMBOL
Imported active energy	kWh	→
Exported active energy	kWh	←
Imported/exported active power	W	W→ / W←
Voltage	V	V
Current	A	A
Frequency	Hz	Fr
Power factor (4 quadrants)	–	PF

FEATURES

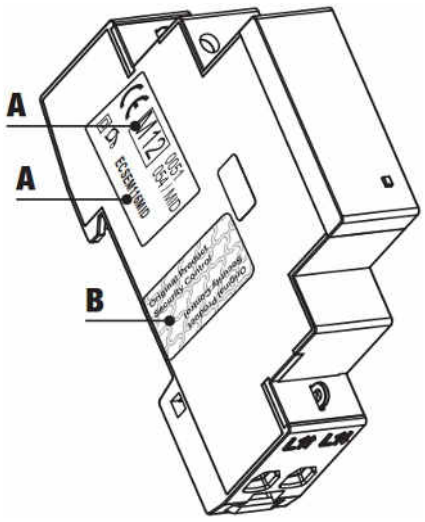
- 7 DIGITS LCD DISPLAY
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.02 ... 32 A
- INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 1 MODULE WIDE (18 mm)
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTER ARE READABLE ON DISPLAY
- ENERGY REGISTERS ARE NOT RESETTABLE (ECS1-32 MID)
- RESETTABLE ENERGY REGISTERS (ECS1-32)
- SEALABLE TERMINAL COVERS
- INSTANTANEOUS ACTIVE IMPORTED AND EXPORTED POWER ARE READABLE ON DISPLAY
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (ECS1-32 MID)

DISPLAY



1) Command Button
2) (→) imported symbol (for Energy or Power)
3) 7 digit LCD, for Energy and instantaneous values visualization)
4) (←) exported symbol (for Energy or Power)
5) Metrological LED (5000 pulses per kWh)

MID CALIBRATED



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

DIGITAL SINGLE-PHASE ENERGY METERS
ECS1-32/ECS1-32 MID

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 32 A**

GENERAL CHARACTERISTICS				
Housing		DIN 43880	DIN	1 module
Mounting		EN 60715	35 mm	DIN rail
Depth			mm	70
Weight			g	60
OPERATING FEATURES				
Connection		to single/three phase network	n° wires	2
Storage of energy values and configuration		internal flash memory	–	yes
APPROVAL (according to EN 50470-1, EN 50470-3)				
Reference voltage U_n			V AC	230
Reference current I_{ref}			A	5
Minimum current I_{min}			A	0.25
Maximum current I_{max}			A	32
Starting current I_{st}			A	0.02
Reference frequency f_n			Hz	50
Number of phases (number of wires)			–	1 (2)
Certified measures			kWh	kWh→ / kWh←
Accuracy	active energy (acc. to EN 50470-3) and active power		class	B
	reactive energy (acc. to EN 62053-23) and reactive power		class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION				
Operating supply voltage range			V	184 ... 276
Maximum power dissipation (voltage circuit)			VA (W)	≤ 8 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 1
Voltage input waveform			–	AC
Voltage impedance			MΩ	1.33
Current impedance			MΩ	≤ 1
OVERLOAD CAPABILITY				
Voltage		continuous	V	276
		temporary (1 s)	V	300
Current		continuous	A	32
		temporary (10 ms)	A	960
MEASURING FEATURES				
Voltage range			V	184 ... 276
Current range			A	0.02 ... 32
Frequency range			Hz	49 ... 51
Measured quantities			–	kWh, kW, V, A, PF, Hz
DISPLAY FEATURES				
Display type		LCD backlighted	–	7 (2 decimal)
		energy digits dimension	mm	6 x 3
Active energy		5 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 99999.99
Active power		4 digits with sign	W	0 ... 8832
Voltage		3 digits + 1 decimal digit	V	184.0 ... 276.0
Current		2 digits + 2 decimal digits	A	00.0 ... 32.00
Power factor	1 digit + 3 dec. digits + capac./induc.indic.		–	-1.00 ... +1.00
Frequency		2 digits + 3 decimal digits	Hz	49.00 ... 51.00
Display refresh period			seconds	1
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	5000
SAFETY				
Protective class			class	II
AC voltage test (EN 50470-3, 7.2)			kV	4
Degree of pollution			–	2
Operational voltage			V	300
Impulse voltage test			1.2/50 µs-kV	6
Housing material flame resistance		UL 94	class	V0
Safety-sealing between upper and lower housing part		model ECSEM88MID	–	yes

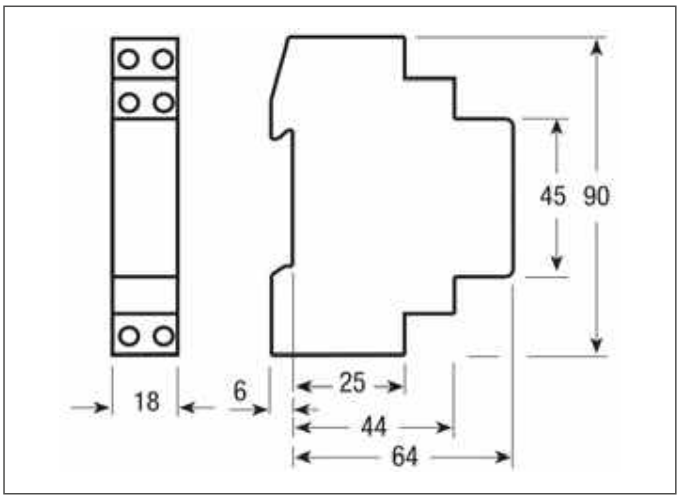
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 32 A**

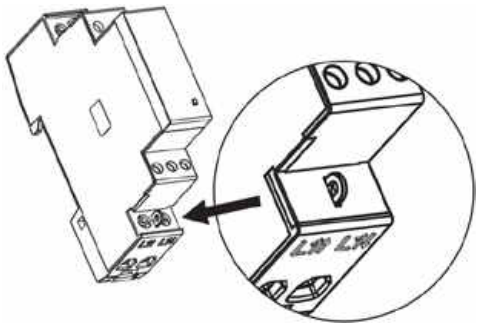
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse rate		p/kWh - p/kvarh	1000
Pulse ON duration		msec	90
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	90
Pulse OFF leakage current	in the range 3 ... 33 V AC (5 ... 70 V DC)	µA	1
Isolation class		–	SELV
IR CONNECTABLE COMMUNICATION MODULES			
For communication modules connection (LAN-TCP/IP / M-Bus / Modbus / KNX / SD-card / eVision)			yes
CONNECTION TERMINALS			
Screwdriver for main terminals	head with Z +/-	POZIDRIV	PZ1
Screwdriver for mains terminals S0	head with Z +/-	POZIDRIV	PZ0
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.65 (16)
	stranded wire with sleeve min. (max.)	mm^2	1.65 (16)
Terminal capacity for mains terminals S0	solid wire min. (max.)	mm^2	0.15 (4)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

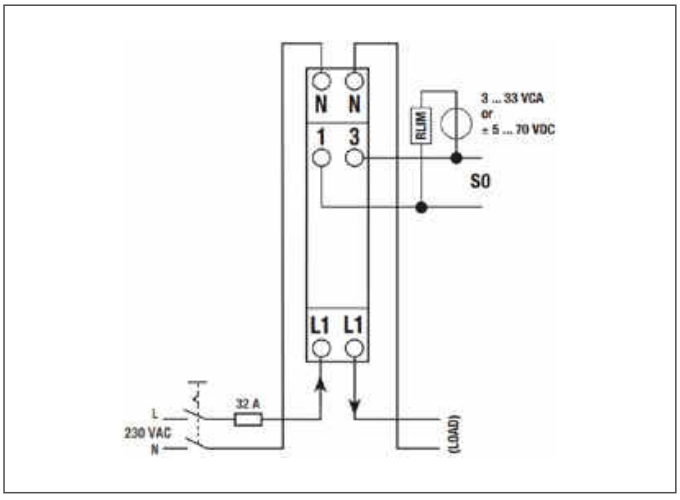
DIMENSIONS



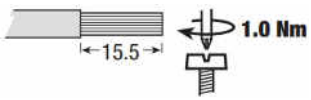
SEALABLE TERMINAL COVERS



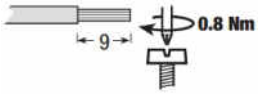
INSTALLATION



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



32 A direct connection main terminals - Screw driver PZ1



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

DIGITAL SINGLE-PHASE ENERGY METERS

ECS1-80/ECS1-80 MID

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 80 A

APPLICATIONS

4 QUADRANTS (ECS1-80 MID - MID CERTIFIED) ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION, WITH 8 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO ACTIVE AND REACTIVE IMPORTED ENERGIES. MONITORING OF THE ENERGY-CONSUMPTION GOES VIA A S0 PULSE OUTPUT. THE PRODUCTS CAN BE SET UP TO COMMUNICATE WITH LAN, MODBUS RTU, M-BUS, KNX, SD-CARD DATALOGGER AND EVISION INTERFACES. USED TO ANALYSE ENERGY CONSUMPTION TO REDUCE THE RUNNING COST TO A MINIMUM FOR INDUSTRIAL PLANTS AND BUILDINGS LIKE OFFICES, HOSPITALS, UNIVERSITIES ETC.

FUNCTION

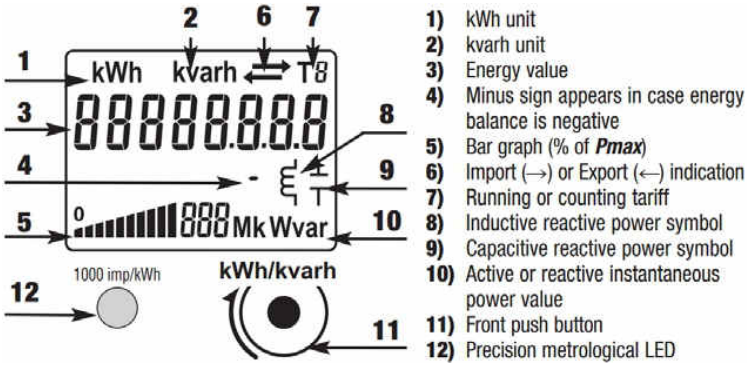
DISPLAYED VALUES

ENERGY POWER						
Ref.	Unit	Ref.	Unit	Description	Symbol	Tariff
E1	kWh	P1	MW/kW/W	Active imported	→	T1
E2	kWh	P2	MW/kW/W	Active exported	←	T1
E3	kvarh	P3	Mvar/kvar/var	Reactive imported (ind./cap.)	→	T1
E4	kvarh	P4	Mvar/kvar/var	Reactive exported (ind./cap.)	←	T1
E5	kWh	P5	MW/kW/W	Active imported	→	T2
E6	kWh	P6	MW/kW/W	Active exported	←	T2
E7	kvarh	P7	Mvar/kvar/var	Reactive imported (ind./cap.)	→	T2
E8	kvarh	P8	Mvar/kvar/var	Reactive exported (ind./cap.)	←	T2

FEATURES

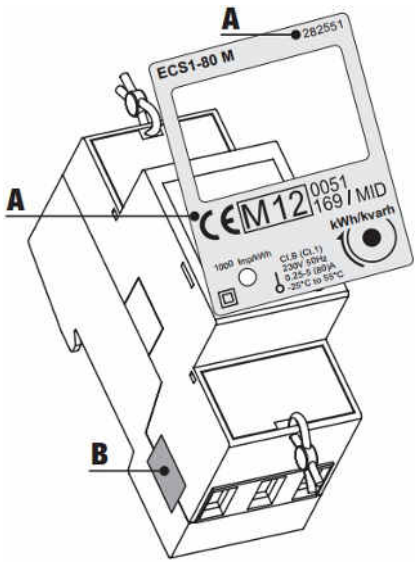
- 8 DIGITS GREEN BACK LIGHTED LCD
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.015 ... 80 A
- INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES
- IMPORTED AND EXPORTED ACTIVE AND REACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- RESETTABLE ENERGY REGISTERS (ECS1-80)
- ENERGY REGISTERS ARE NOT RESETTABLE (ECS1 – 80 M)
- INSTANTANEOUS ACTIVE AND REACTIVE, IMPORTED AND EXPORTED POWER MEASURES ARE READABLE ON DISPLAY
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 2 MODULES WIDE (36 mm)
- INSTANTANEOUS ACTIVE IMPORTED AND EXPORTED POWER ARE READABLE ON DISPLAY
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (ECS1-32 MID)

DISPLAY



1) kWh unit
2) kvarh unit
3) Energy value
4) Minus sign appears in case energy balance is negative
5) Bar graph (% of ***Pmax***)
6) Import (→) or Export (←) indication
7) Running or counting tariff
8) Inductive reactive power symbol
9) Capacitive reactive power symbol
10) Active or reactive instantaneous power value
11) Front push button
12) Precision metrological LED

MID CALIBRATED (ECS1 - 80 M)



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 80 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	2 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
Weight		g	175
OPERATING FEATURES			
Connection	to single/three phase network	n° wires	2
Storage of energy values and configuration	internal flash memory	–	yes
Tariff	for active and reactive energy	–	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n		V AC	230
Reference current I_{ref}		A	5
Minimum current I_{min}		A	0.25
Maximum current I_{max}		A	80
Starting current I_{st}		A	0.015
Reference frequency f_n		Hz	50
Number of phases (number of wires)		–	1 (2)
Certified measures		kWh	→ kWh T1, ← kWh T1
			→ kWh T2, ← kWh T2
Accuracy	according to EN 50470-3	–	B
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	110 ... 276
Maximum power dissipation (voltage circuit)		VA (W)	≤ 1.6 (0.6)
Maximum VA burden (current circuit) at I_{max}		VA	≤ 4
Voltage input waveform		–	AC
OVERLOAD CAPABILITY			
Voltage	continuous	V	276
	temporary (1 s)	V	300
Current	continuous	A	80
	temporary (10 ms)	A	2400
MEASURING FEATURES			
Voltage range		V	110 ... 276
Current range		A	0.015 ... 80
Frequency range		Hz	49 ... 61
Measured quantities		–	kWh, kvarh, kW, kvar
Measured quantities	active energy (acc. to EN 50470-3) and active power	class	B
	reactive energy (acc. to EN 62053-23) and reactive power	class	2
DISPLAY FEATURES			
Display type	LCD	–	6.2 + 3
	energy digits dimension	mm	6 x 3
Active energy	6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99
Reactive energy	6 digits + 2 decimal digits	min. ... max. kvarh	0.01 ... 999999.99
Instantaneous active power (← and →)	3 digits	MW – kW – W	0 ... 999
Instantaneousre active power (← and →)	3 digits + 2 capacitive/inductive indication	Mvar – kvar – var	0 ... 999
Power bar graph	10 segments	–	0% - 10% - 20% ... – 100%
Running tariff	1 digit	–	T1 or T2
Display refresh period		seconds	1
OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
Safety-sealing between upper and lower housing part	model 282551	–	yes

TECHNICAL DATA

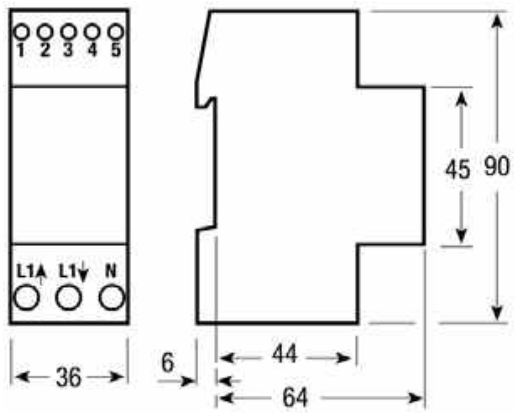
DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 80 A**

PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse Output 1	proportional to active imported energy	–	kWh →
Pulse Output 2	proportional to reactive imported energy	–	kWh →
Pulse rate		p/kWh - p/kvarh	1000
Pulse ON duration		msec	30 ± 1%
Operating voltage		V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	90
Pulse OFF leakage current	in the range 3 ... 33 V AC (5 ... 70 V DC)	µA	1
IR CONNECTABLE COMMUNICATION MODULES			
For communication modules connection (LAN-TCP/IP / M-Bus / Modbus / KNX / SD-card / eVision)			yes
CONNECTION TERMINALS			
Type cage main current paths	screw head Z +/-	POZIDRIV	PZ2
Type cage pulse output	blade for slotted screw	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.5 (36)
	stranded wire with sleeve min. (max.)	mm^2	1.5 (36)
Terminal capacity pulse output	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP20

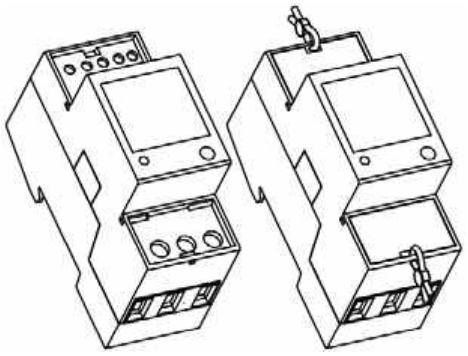
*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

DIGITAL SINGLE-PHASE ENERGY METERS
ECS1-80/ECS1-80 MID

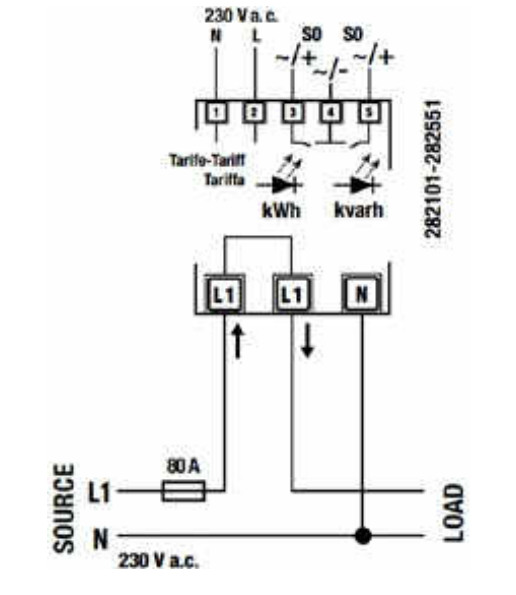
DIMENSIONS



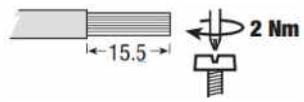
SEALABLE TERMINAL COVERS



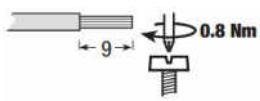
INSTALLATION



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



80 A direct connection main terminals - Screw driver PZ2



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

DIGITAL SINGLE-PHASE ENERGY METERS

ECS1-125 / ECS1-125 M-Bus / ECS1-125 Modbus

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 125 A

APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION, WITH:

- 8 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) - **ECS1-125**
- 8 DIGITS LCD, 2 TARIFFS AND BUILT-IN M-BUS (1 UNIT LOAD, 4 KV ISOLATED) - **ECS1-125 M-BUS**
- 8 DIGITS LCD, 2 TARIFFS AND BUILT-IN MODBUS RTU (3 WIRES, 4KV ISOLATED RS-485) - **ECS1-125 MODBUS**

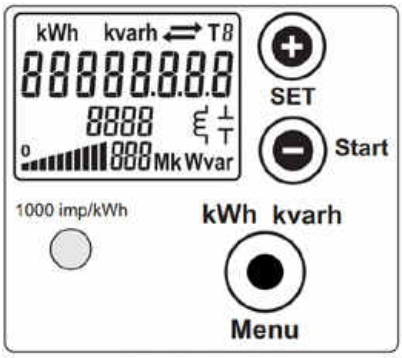
VERSIONS

TYPE	ECS1-125	ECS1-125 MID	ECS1-125 Modbus	ECS1-125 MID Modbus	ECS1-125 M-Bus	ECS1-125 MID M-Bus
Communication	2 x S0	2 x S0	Modbus	Modbus	M-Bus	M-Bus
MID certified	NO	YES	NO	YES	NO	YES

FEATURES

- 8 DIGITS GREEN BACKLIGHTED LCD
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.02 ... 125 A
- INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES (ALL MODELS)
- IN-BUILT MODBUS RTU (3 WIRES, RS-485, WITH INTERNAL SELECTABLE TERMINATION RESISTOR), AND INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES (ECS1-125 MODBUS)
- IN-BUILT STANDARD M-BUS (1 UNIT LOAD, COMPLIANT TO EN 13757-2 AND -3), AND INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES (ECS1-125 M-BUS)
- IMPORTED AND EXPORTED ACTIVE AND REACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- RESETTABLE ENERGY REGISTERS (NON MID MODELS)
- ENERGY REGISTERS ARE NOT RESETTABLE (MID MODELS)
- INSTANTANEOUS ACTIVE AND REACTIVE, IMPORTED AND EXPORTED POWER MEASURES ARE READABLE ON DISPLAY
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 1 MODULE WIDE (18 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (MID MODELS)

DISPLAY

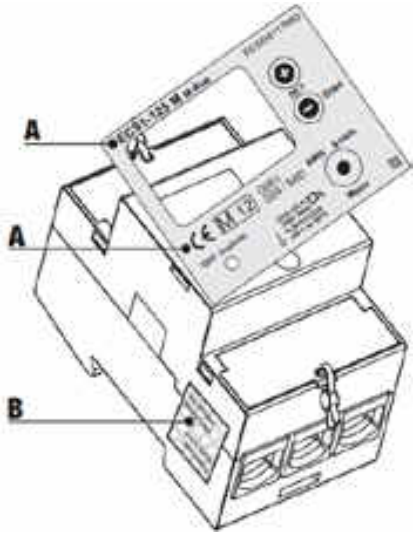


- Energy value
- kWh / kvarh display
- Running tarif, called tarif
- Energy export (absorbed ←)
- Energy import (supplied →)
- Displays inductive, reactive power
- Displays capacitative, reactive power
- Full scale current indication
- Consumption Bar display (percentage of *Pmax*)
- Precision control LED

SYMBOLS

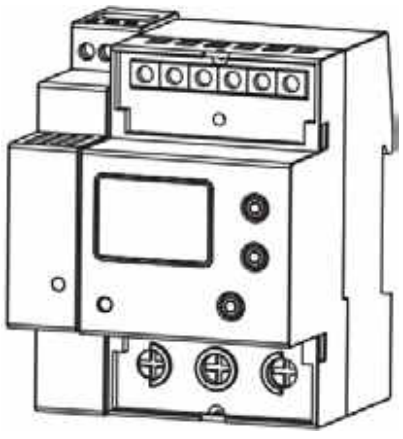
- Measuring elements
- Reversal preventing device
- Protected by double insulation

MID CALIBRATED (ECS1 - 125)



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

CONNECTABLE COMMUNICATION MODULES



TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 125 A**

TYPE					
				ECS1-125 **ECS1-125 MID**	**ECS1-125 Modbus** **ECS1-125 MID Modbus** **ESC1-125 M-Bus** **ECS1-125 MID M-Bus**
				Direct connection 125 A Pulse output S0	Direct connection 125 A In-built communication Modbus/M-Bus
GENERAL CHARACTERISTICS					
Housing		DIN 43880	DIN	2 modules	2 modules
Mounting		EN 60715	35 mm	DIN rail	DIN rail
Depth			mm	70	70
Weight			g	290	290
OPERATING FEATURES					
Connection		to single/three phase network	n° wires	2	2
Storage of energy values and configuration		internal flash memory	–	yes	yes
Tariff		for active and reactive energy	n° 2	T1 and T2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)					
Reference voltage U_n		line to neutral	V AC	230	230
Reference current I_{ref}			A	5	5
Minimum current I_{min}			A	0.25	0.25
Maximum current I_{max}			A	125	125
Starting current I_{st}			A	0.02	0.02
Reference frequency f_n			Hz	50	50
Number of phases (number of wires)			–	1 (2)	1 (2)
Certified measures			kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	active energies (acc. to I	N 50470-3) and active power	–	B	B
SUPPLY VOLTAGE AND POWER CONSUMPTION					
Operating supply voltage range			V	92 ... 276	92 ... 276
Maximum power dissipation (voltage circuit)			VA (W)	≤ 1.6 (0.8)	≤ 1.6 (0.8)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 1	≤ 1
Voltage input waveform			–	AC	AC
OVERLOAD CAPABILITY					
Voltage		continuous	V	276	276
		temporary (1 s)	V	300	300
Current		continuous	A	125	125
		temporary (10 ms)	A	3750	3750
MEASURING FEATURES					
Voltage range			V	92 ... 276	92 ... 276
Current range			A	0.02 ... 125	0.02 ... 125
Frequency range			Hz	49 ... 65	49 ... 65
Measured quantities			–	kWh, kvarh, kW, kvar	kWh, kvarh, kW, kvar
DISPLAY FEATURES					
Display type		LCD	–	6.2 + 3	6.2 + 3
		energy digits dimension	mm	6 x 3	6 x 3
Active energy		6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99	0.01 ... 999999.99
Reactive energy		6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99	0.01 ... 999999.99
Instantaneous active power (← and →)		3 digits	MW – kW – W	000 ... 999	000 ... 999
Instantaneous reactive power (← and →)		3 digits + capacitive/inductive indication	Mvar – kvar – var	000 ... 999	000 ... 999
Power bar graph		10 segments	–	0% - 10% ... – 100%	0% - 10% ... – 100%
Running tariff		1 digit	–	T1 or T2	T1 or T2
Display refresh period			seconds	1	1
OPTICAL METROLOGICAL LED					
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	1000	1000

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31

DIRECT CONNECTION 125 A

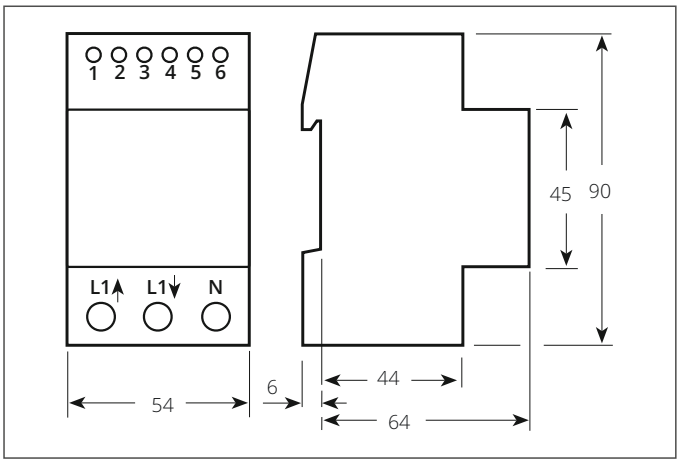
TYPE			**ECS1-125 ECS1-125 MID**	**ECS1-125 Modbus ECS1-125 MID Modbus ESC1-125 M-Bus ECS1-125 MID M-Bus**
			Direct connection 125 A Pulse output S0	Direct connection 125 A In-built communication Modbus/M-Bus
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	model 282351-ECSEM107MID ECSEM117MID	–	yes	yes
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)				
Pulse Output 1	proportional to active imported energy	–	kWh (→and←)	–
Pulse Output 2	proportional to reactive imported energy	–	kvarh (→and←)	–
Pulse rate	adjustable	p/kWh - p/kvarh	1 - 500	–
Pulse ON duration	adjustable	msec	30 - 100	–
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)	–
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	90	–
Pulse OFF leakage current	in the range 3 ... 33 V AC (5 ... 70 V DC)	µA	1	–
Isolation class		–	SELV circuit	–
EMBEDDED COMMUNICATION				
Modbus RTU	RS485 - 3 wires	–	–	up to 38.400 bps
M-Bus	2 wires	–	–	up to 9.600 bps
Isolation class		–	–	SELV circuit
IR CONNECTABLE COMMUNICATION MODULES				
For communication modules connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX / SD-c	rd / eVision)	–	yes	yes
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ2	PZ2
Screwdriver for tariff and comm. terminals	slotted head	mm	0.8 x 3.5	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	7 (50)	7 (50)
	stranded wire with sleeve min. (max.)	mm^2	7 (50)	7 (50)
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 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP20	IP51* / IP20

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

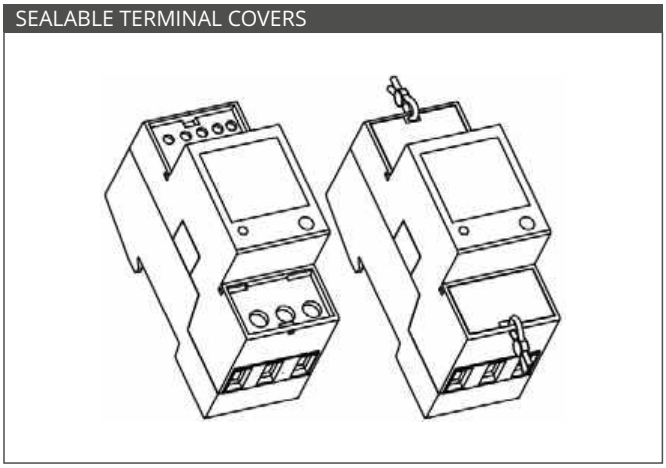
DIGITAL SINGLE-PHASE ENERGY METERS

ECS1-125 / ECS1-125 M-Bus / ECS1-125 Modbus

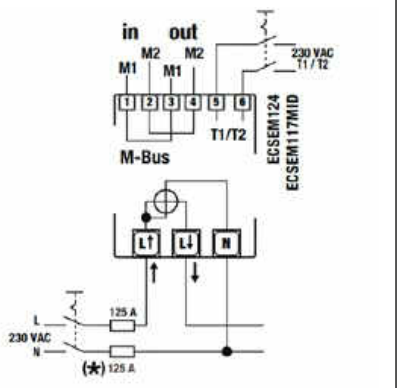
DIMENSIONS



SEALABLE TERMINAL COVERS

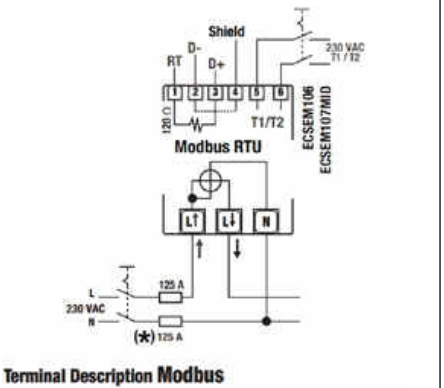


INSTALLATION



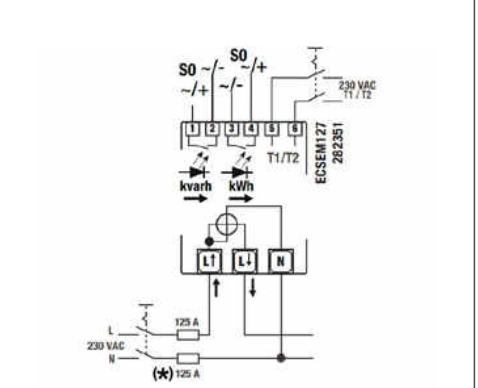
Terminal Description M-Bus

1-3: M-Bus network. These terminals are internally connected.
2-4: M-Bus network. These terminals are internally connected.
5-6: Tariff signal, isolated by a Opto Coupler. When there is a voltage of 230 VAC connected the device store energies on the Tariff 2 registers, otherwise on the Tariff 1 registers.
L1 ↑: Input for the phase conductor.
L1 ↓: Output for the phase conductor.
N: Measuring input of neutral.



Terminal Description Modbus

1: Modbus network. For the termination of the for the termination of the network short this terminal with terminal 2.
2: Modbus network. Data -
3: Modbus network. Data +
4: Modbus network. Shield
5-6: Tariff signal, isolated by a Opto Coupler. When there is a voltage of 230 VAC connected the device store energies on the Tariff 2 registers, otherwise on the Tariff 1 registers.
L1 ↑: Input for the phase conductor.
L1 ↓: Output for the phase conductor.
N: Measuring input of neutral.

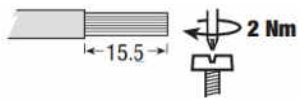


Terminal Description S0

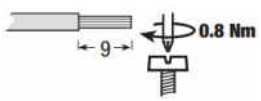
1-2: Pulse output of reactive energy imported, isolated by a OptoMOS Relay.
3-4: Pulse output of active energy imported, isolated by a OptoMOS Relay
5-6: Tariff signal, isolated by a Opto Coupler. When there is a voltage of 230 VAC connected the device store energies on the Tariff 2 registers, otherwise on the Tariff 1 registers.
L1 ↑: Input for the phase conductor.
L1 ↓: Output for the phase conductor.
N: Measuring input of neutral.

*** This fuse is recommended if neutral is not earthed.**
A fuse of 125 A is recommended for the line protection.

CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



80 A direct connection main terminals - Screw driver PZ2



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

DIGITAL THREE-PHASE ENERGY METERS
ECS3-80/ECS3-80 MID/ECS3-5/ECS3-5 MID

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 80 A
CONNECTION THROUGH CT .../ 5 A TILL 10.000/5 A

APPLICATIONS

4 QUADRANTS (ECS3-80 MID/ECS3-5MID - MID CERTIFIED) ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 8 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO ACTIVE AND REACTIVE IMPORTED ENERGIES. MONITORING OF THE ENERGY-CONSUMPTION GOES VIA A S0 PULSE OUTPUT. THE PRODUCTS CAN BE SET UP TO COMMUNICATE WITH LAN, MODBUS RTU, M-BUS, KNX, SD-CARD DATALOGGER AND EVISION INTERFACES. USED TO ANALYSE ENERGY CONSUMPTION TO REDUCE THE RUNNING COST TO A MINIMUM FOR INDUSTRIAL PLANTS AND BUILDINGS LIKE OFFICES, HOSPITALS, UNIVERSITIES ETC.

FUNCTION

DISPLAYED VALUES

ENERGY POWER								
Ref.	Unit	Description	Symbol	∑3	L1	L2	L3	Tariff
E1	MWh/kWh	Active absorbed	→	•	•	•	•	T1
E2	MWh/kWh	Active supplied	←	•	•	•	•	T1
E3	Mvarh/kvarh	Reactive absorbed	→	•	•	•	•	T1
E4	Mvarh/kvarh	Reactive supplied	←	•	•	•	•	T1
E5	MWh/kWh	Active absorbed	→	•	•	•	•	T2
E6	MWh/kWh	Active supplied	←	•	•	•	•	T2
E7	Mvarh/kvarh	Reactive absorbed	→	•	•	•	•	T2
E8	Mvarh/kvarh	Reactive supplied	←	•	•	•	•	T2

POWER VALUES

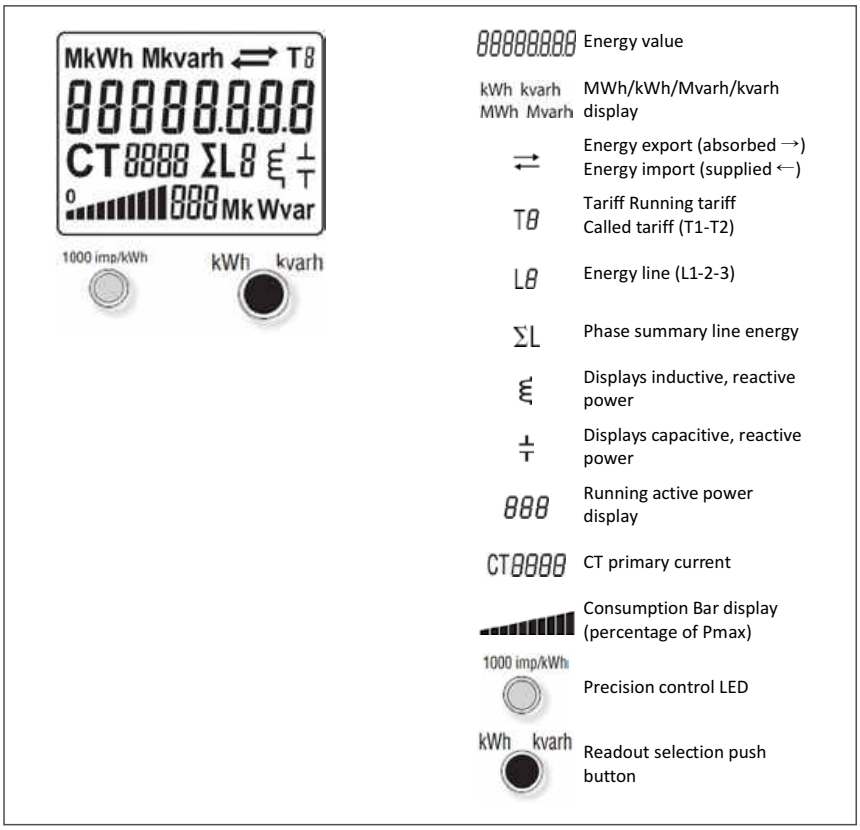
ENERGY POWER								
Ref.	Unit	Description	Symbol	∑3	L1	L2	L3	Tariff
P1	MW/kW/W	Active absorbed	→	•				T1
P2	MW/kW/W	Active supplied	←	•				T1
P3	Mvar/kvar/var	Reactive absorbed	ξ	•				T1
P4	Mvar/kvar/var	Reactive supplied	÷	•				T1
P5	MW/kW/W	Active absorbed	→	•				T2
P6	MW/kW/W	Active supplied	←	•				T2
P7	Mvar/kvar/var	Reactive absorbed	ξ	•				T2
P8	Mvar/kvar/var	Reactive supplied	÷	•				T2

DIGITAL THREE-PHASE ENERGY METERS
ECS3-80/ECS3-80 MID/ECS3-5/ECS3-5 MID

FEATURES

- 8 DIGITS GREEN BACKLIGHTED LCD
- DIRECT CONNECTION (ECS3-80/ ECS3-80 MID)
- CONNECTION THROUGH .../5 A EXTERNAL CTs (ECS3-5/ ECS3-5 MID)
- CT PRIMARY CURRENT RANGE: 5/5A TO 10000/5A, WITH STEPS OF 5A (ECS3-5/ECS3-5 MID)
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.015 ... 80 A (ECS3-80/ ECS3-80 MID)
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.003 ... 6 A THROUGH EXTERNAL .../5 A Cts (ECS3-5/ ECS3-5 MID)
- INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES
- IMPORTED AND EXPORTED ACTIVE AND REACTIVE ENERGY REGISTERS (ΣL, L1, L2, L3), UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ENERGY REGISTERS ARE RESETTABLE (ECS3 – 80/ ECS3-5)
- ENERGY REGISTERS ARE NOT RESETTABLE (ECS3-80 MID/ECS3-5 MID)
- INSTANTANEOUS ACTIVE AND REACTIVE, IMPORTED AND EXPORTED POWER MEASURES ARE READABLE ON DISPLAY
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)
- INSTANTANEOUS ACTIVE IMPORTED AND EXPORTED POWER ARE READABLE ON DISPLAY
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (ECS3-80 MID/ECS3-5 MID)

DISPLAY



DIGITAL THREE-PHASE ENERGY METERS

ECS3-80/ECS3-80 MID/ECS3-5/ECS3-5 MID

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31			DIRECT CONNECTION 80 A	CONNECTION THROUGH CT
TYPE				
			ECS3-80 ECS3-80 MID	**ECS3-5 ECS3-5 MID**
GENERAL CHARACTERISTICS				
Housing	DIN 43880	DIN	4 modules	4 modules
Mounting	EN 60715	35 mm	DIN rail	DIN rail
Depth		mm	70	70
Weight		g	424	293
OPERATING FEATURES				
Connection	to single/three phase network	n° wires	2 - 4	4
Storage of energy values and configuration	internal flash memory	–	yes	yes
Tariff	for active and reactive energy	n° 2	T1 and T2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)				
Reference voltage U_n	line to neutral	V AC	230	230
Reference voltage U_n	line to line	V AC	400	400
Reference current I_{ref}		A	5	5
Minimum current I_{min}		A	0.25	0.05
Maximum current I_{max}		A	80	6
Starting current I_{st}		A	0.015	0.003
Reference frequency f_n		Hz	50	50
Number of phases (number of wires)		–	1.3 (2.4)	3 (4)
Certified measures		kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	according to EN 50470-3	class	B	B
SUPPLY VOLTAGE AND POWER CONSUMPTION				
Operating supply voltage range		V	110 ... 276 / 190 ... 480	110 ... 276 / 190 ... 480
Maximum power dissipation (voltage circuit)		VA (W)	≤ 2 (0.6)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}		VA	≤ 0.7	≤ 0.5
Voltage input waveform		–	AC	AC
OVERLOAD CAPABILITY				
Voltage	continuous: phase/phase	V	480	480
	1 s: phase/phase		800	800
	continuous: phase/neutral		276	276
	1 s: phase/neutral		300	300
Current	continuous	A	80	6
	temporary (10 ms)		2400	120
MEASURING FEATURES				
Voltage range	phase/phase	V	190 ... 480	190 ... 480
	phase/neutral		110 ... 276	110 ... 276
Current range		A	0.015 ... 80	0.003 ... 6
Frequency range		Hz	48 ... 62	48 ... 62
Measured quantities		–	Mwh, Mvarh, kWh, kvarh, MW, Mvar, kW, kvar	Mwh, Mvarh, kWh, kvarh, MW, Mvar, kW, kvar
DISPLAY FEATURES				
Display type	LCD	–	6.2 + 3	6.2 + 3
	energy digits dimension	mm	6 x 3	6 x 3
Active energy	6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99	0.01 ... 999999.99
Reactive energy	6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99	0.01 ... 999999.99
Instantaneous active power (← and →)	3 digits	MW – kW – W	000 ... 999	000 ... 999
Instantaneous reactive power (← and →)	3 digits + capacitive/inductive indication	Mvar – kvar – var	000 ... 999	000 ... 999
Power bar graph	10 segments	–	0% - 10% ... – 100%	0% - 10% ... – 100%
Running tariff	1 digit	–	T1 or T2	T1 or T2
Display refresh period		seconds	1	1
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000	1000

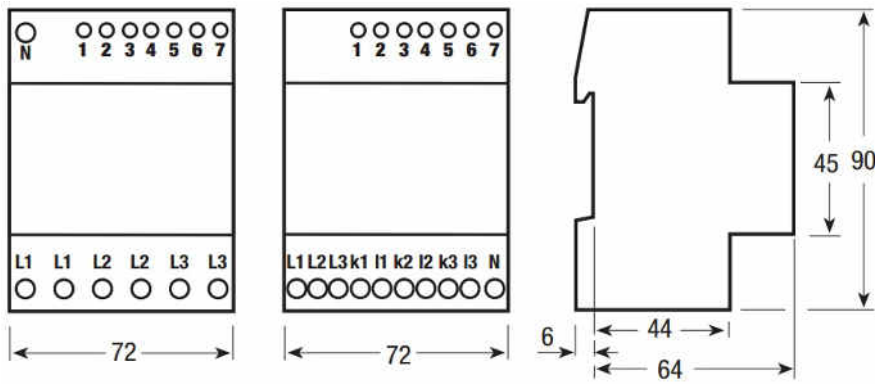
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 80 A** — **CONNECTION THROUGH CT**

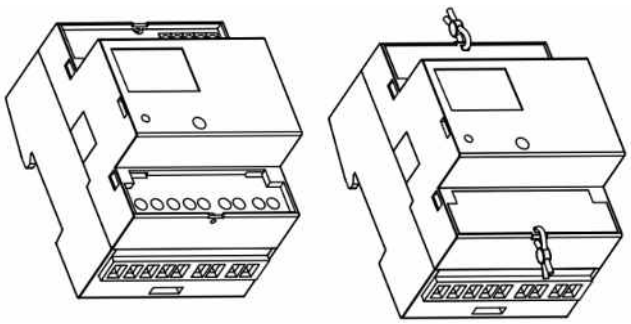
TYPE			ECS3-80 ECS3-80 MID	ECS3-5 ECS3-5 MID
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	model 282301-282141	–	yes	yes
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)				
Pulse Output 1	proportional to active imported energy	–	kWh (→)	kWh (→)
Pulse Output 2	proportional to reactive imported energy	–	kvarh (→)	kvarh (→)
Pulse rate		p/kWh - p/kvarh	500	100-10-1
Pulse ON duration		msec	50 ± 2%	50 ± 2%
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)	5 ... 33 (5 ... 70)
Pulse ON maximum current		mA	90	90
Pulse OFF leakage current		µA	1	1
Isolation class		–	SELV	SELV
IR CONNECTABLE COMMUNICATION MODULES				
For communication modules connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX / SD-c rd / eVision)		–	yes	yes
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ2	PZ2
Csrewdriver for tariff and comm. terminals	slotted head	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 (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP20	IP51* / IP20

*** The metering equipment must be installe l insid a cabinet with IP ra ng IP51 or better.**

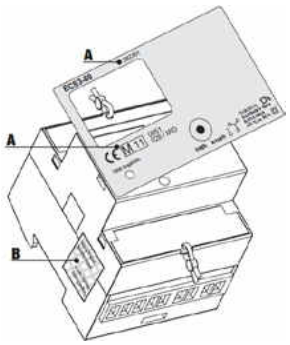
DIMENSIONS



SEALABLE TERMINAL COVERS



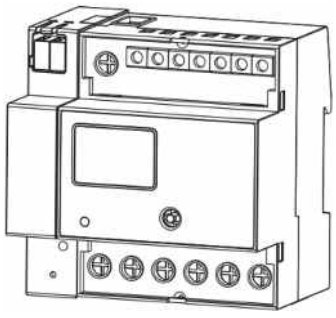
MID CALIBRATED



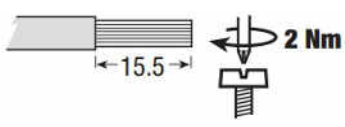
A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part

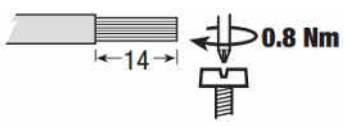
CONNECTABLE COMMUNICATION MODULES



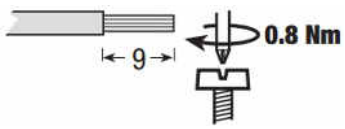
CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



80 A direct connection main terminals - Screw driver PZ2



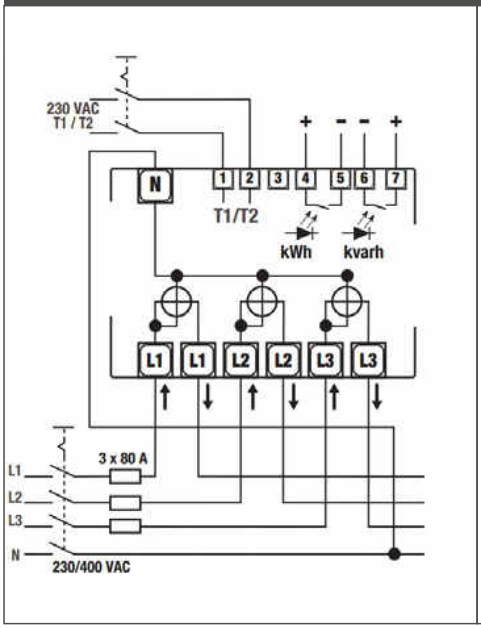
5 A CT connection main terminals - Screw driver PZ1

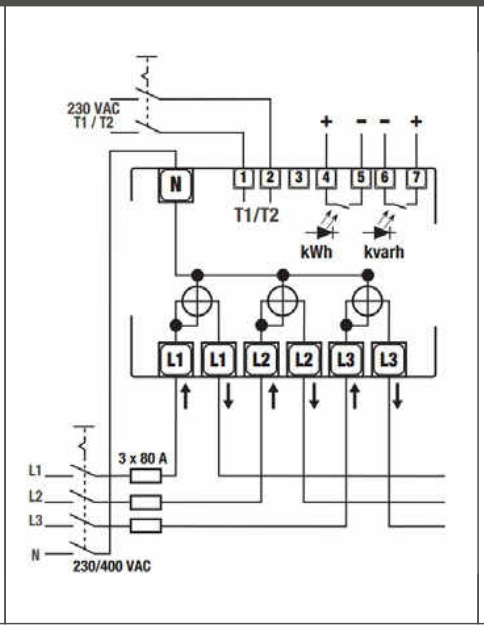


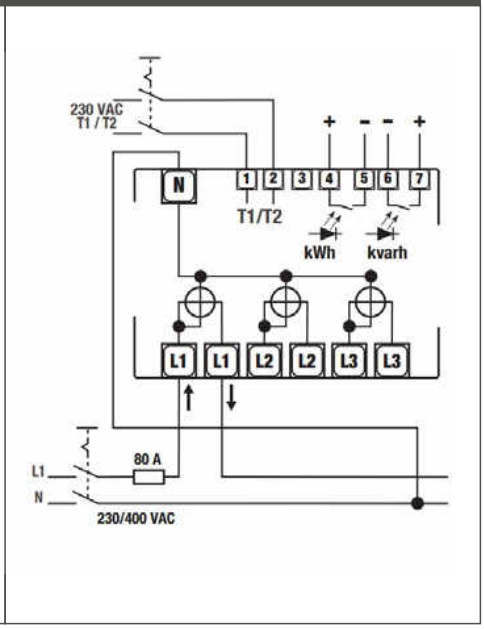
Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

INSTALLATION

DIRECT CONNECTION 80 A

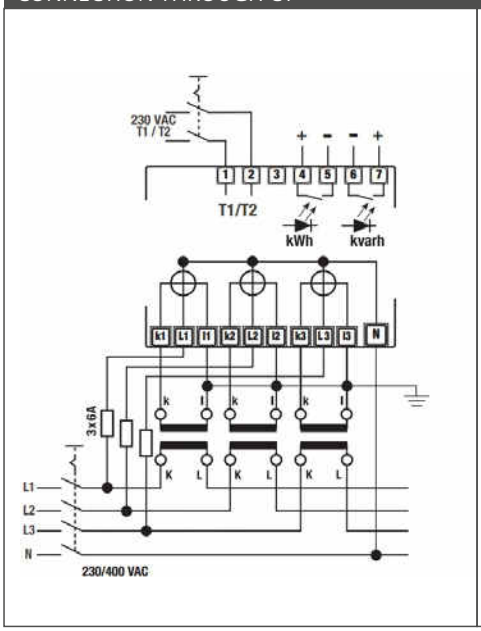


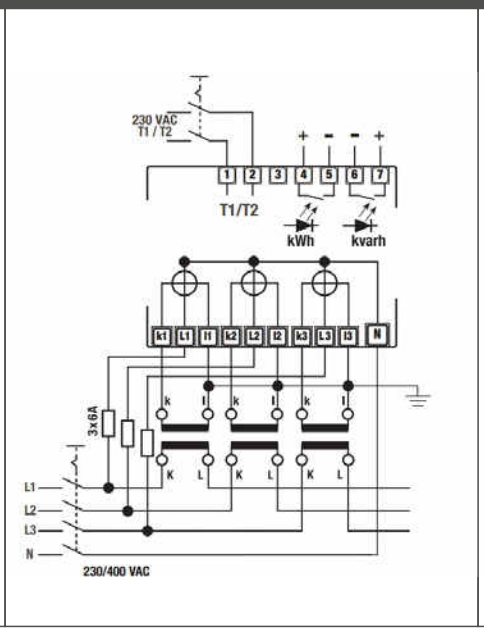


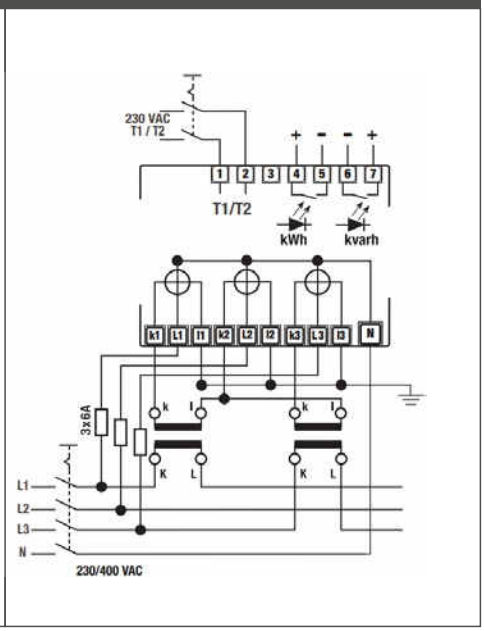


Neutral wire muste be connected to the meter

CONNECTION THROUGH CT







Neutral wire muste be connected to the meter

DIGITAL THREE-PHASE ENERGY METERS

ECS3-125/ECS3-125 MID

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 125 A

APPLICATIONS

4 QUADRANTS (ECS3-125 MID - MID CERTIFIED) ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 8 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO ACTIVE AND REACTIVE IMPORTED ENERGIES. MONITORING OF THE ENERGY-CONSUMPTION GOES VIA A S0 PULSE OUTPUT. THE PRODUCTS CAN BE SET UP TO COMMUNICATE WITH LAN, MODBUS RTU, M-BUS, KNX, SD-CARD DATALOGGER AND EVISION INTERFACES. USED TO ANALYSE ENERGY CONSUMPTION TO REDUCE THE RUNNING COST TO A MINIMUM FOR INDUSTRIAL PLANTS AND BUILDINGS LIKE OFFICES, HOSPITALS, UNIVERSITIES ETC.

FUNCTION

DISPLAYED VALUES

ENERGY POWER								
Ref.	Unit	Description	Symbol	∑3	L1	L2	L3	Tariff
E1	MWh/kWh	Active absorbed	→	•	•	•	•	T1
E2	MWh/kWh	Active supplied	←	•	•	•	•	T1
E3	Mvarh/kvarh	Reactive absorbed	→	•	•	•	•	T1
E4	Mvarh/kvarh	Reactive supplied	←	•	•	•	•	T1
E5	MWh/kWh	Active absorbed	→	•	•	•	•	T2
E6	MWh/kWh	Active supplied	←	•	•	•	•	T2
E7	Mvarh/kvarh	Reactive absorbed	→	•	•	•	•	T2
E8	Mvarh/kvarh	Reactive supplied	←	•	•	•	•	T2

POWER VALUES

ENERGY POWER								
Ref.	Unit	Description	Symbol	∑3	L1	L2	L3	Tariff
P1	MW/kW/W	Active absorbed	→	•				T1
P2	MW/kW/W	Active supplied	←	•				T1
P3	Mvar/kvar/var	Reactive absorbed	ξ	•				T1
P4	Mvar/kvar/var	Reactive supplied	÷	•				T1
P5	MW/kW/W	Active absorbed	→	•				T2
P6	MW/kW/W	Active supplied	←	•				T2
P7	Mvar/kvar/var	Reactive absorbed	ξ	•				T2
P8	Mvar/kvar/var	Reactive supplied	÷	•				T2

DIGITAL THREE-PHASE ENERGY METERS

ECS3-125/ECS3-125 MID

FEATURES

- 8 DIGITS GREEN BACKLIGHTED LCD
- DIRECT CONNECTION
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.02 ... 125 A
- INFRARED INTERFACE CONNECTABLE TO SEVERAL TYPES OF COMMUNICATION MODULES
- IMPORTED AND EXPORTED ACTIVE AND REACTIVE ENERGY REGISTERS (ΣL, L1, L2, L3), UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- RESETTABLE ENERGY REGISTERS (ECS3-125)
- ENERGY REGISTERS ARE NOT RESETTABLE (ECS3-125 MID)
- INSTANTANEOUS ACTIVE AND REACTIVE, IMPORTED AND EXPORTED POWER MEASURES ARE READABLE ON DISPLAY
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 6 MODULES WIDE (108 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (ECS3-125 MID)

DISPLAY

88888888	Energy value
kWh kvarh MWh Mvarh	MWh/kWh/Mvarh/kvarh display
⇄	Energy export (absorbed →) Energy import (supplied ←)
T8	Tariff Running tariff Called tariff (T1-T2)
L8	Energy line (L1-2-3)
ΣL	Phase summary line energy
ξ	Displays inductive, reactive power
⊥T	Displays capacitive, reactive power
888	Running active power display
CT8888	CT primary current
	Consumption Bar display (percentage of Pmax)
1000 imp/kWh	Precision control LED
kWh kvarh	Readout selection push button

DIGITAL THREE-PHASE ENERGY METERS

ECS3-125/ECS3-125 MID

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 **DIRECT CONNECTION 125 A**

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	6 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
Weight		g	700

OPERATING FEATURES			
Connection	to single/three phase network	n° wires	2 - 4
Storage of energy values and configuration	internal flash memory	–	yes
Tariff	for active and reactive energy	–	T1 and T2

APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	5
Minimum current I_{min}		A	0.25
Maximum current I_{max}		A	125
Starting current I_{st}		A	0.02
Reference frequency f_n		Hz	50
Number of phases (number of wires)		–	1.3 (2.4)
Certified measures		kWh	→ kWh T1, ← kWh T1
			→ kWh T2, ← kWh T2
Accuracy	according to EN 50470-3	–	B

SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	110 ... 276 / 190 ... 480
Maximum power dissipation (voltage circuit)		VA (W)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}		VA	≤ 1
Voltage input waveform		–	AC

OVERLOAD CAPABILITY			
Voltage	continuous: phase/phase	V	480
	1 s: phase/phase		800
	continuous: phase/neutral		276
	1 s: phase/neutral		300
Current	continuous	A	125
	temporary (10 ms)		3750

MEASURING FEATURES			
Voltage range	phase/phase	V	190 ... 480
	phase/neutral		110 ... 276
Current range		A	0.02 ... 125
Frequency range		Hz	48 ... 62
Measured quantities		–	Mwh, Mvarh,kWh, kvarh, MW, Mvar, kW, kvar

DISPLAY FEATURES			
Display type	LCD	–	6.2 + 3
	energy digits dimension	mm	6 x 3
Active energy	6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99
Reactive energy	6 digits + 2 decimal digits	min. ... max. kvarh	0.01 ... 999999.99
Instantaneous active power (← and →)	3 digits	MW – kW – W	0 ... 999
Instantaneousre active power (← and →)	3 digits + capacitive/inductive indication	Mvar – kvar – var	0 ... 999
Power bar graph	10 segments	–	0% - 10% - 20% ... – 100%
Running tariff	1 digit	–	T1 or T2
Display refresh period		seconds	1

OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000

TECHNICAL DATA

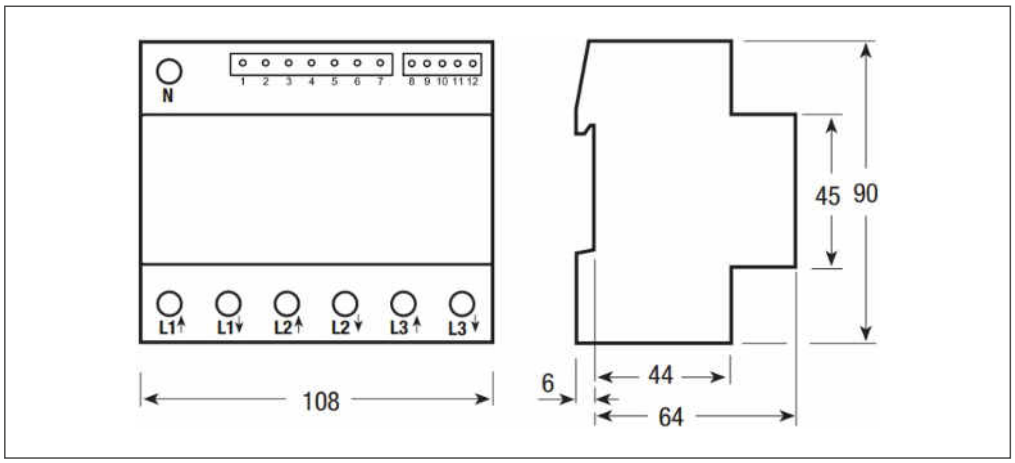
DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 125 A**

SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
Safety-sealing between upper and lower housing part	model 282551	–	yes
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)			
Pulse Output 1	proportional to active imported energy	–	kWh →
Pulse Output 2	proportional to reactive imported energy	–	kWh →
Pulse rate		p/kWh - p/kvarh	500
Pulse ON duration		msec	50 ± 1%
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current		mA	90
Pulse OFF leakage current		µA	1
IR CONNECTABLE COMMUNICATION MODULES			
For communication modules connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX / SD-card / eVision)			yes
CONNECTION TERMINALS			
Screwdriver for mains terminals	head Z +/-	POZIDRIV	PZ2
Screwdriver for tariff and comm. terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	7 (50)
	stranded wire with sleeve min. (max.)	mm^2	7 (50)
Terminal capacity pulse output	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP20

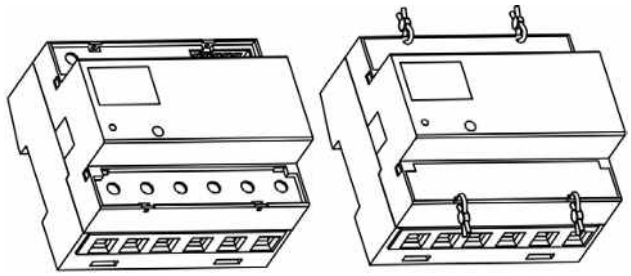
*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

DIGITAL THREE-PHASE ENERGY METERS
ECS3-125/ECS3-125 MID

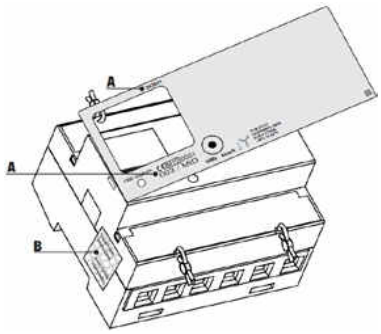
DIMENSIONS



SEALABLE TERMINAL COVERS



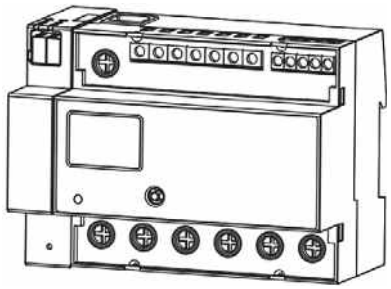
MID CALIBRATED



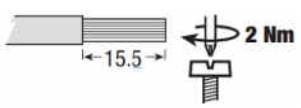
A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part

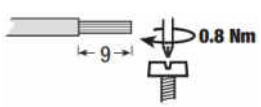
CONNECTABLE COMMUNICATION MODULES



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



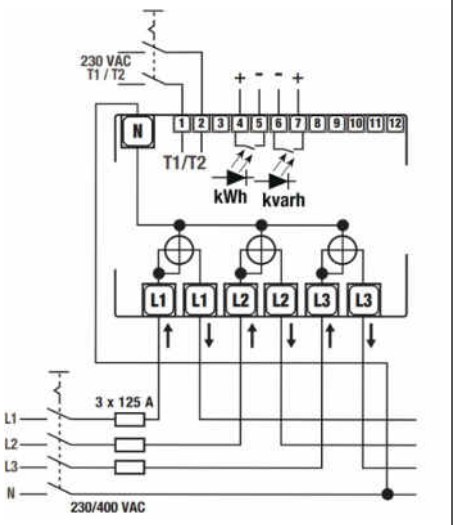
125 A direct connection main terminals - Screw driver PZ2

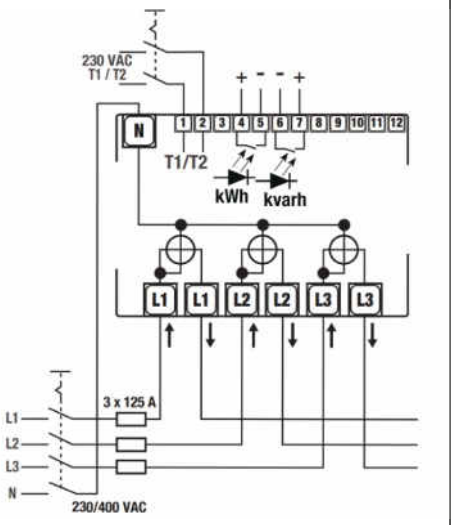


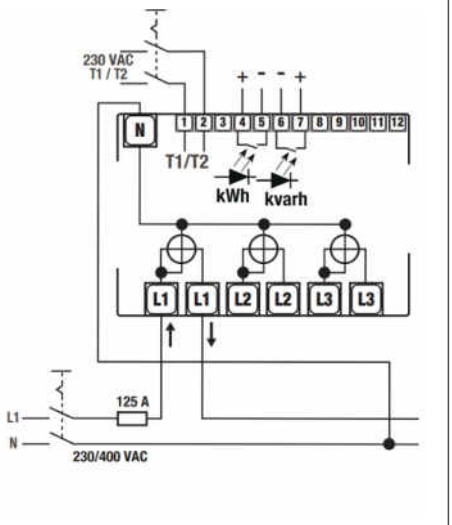
Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

INSTALLATION

DIRECT CONNECTION 125 A







Neutral wire muste be connected to the meter

SINGLE-PHASE ENERGY METERS
ECS1-32 CP M-Bus / ECS1-32 CP Modbus

ACTIVE ENERGY METERS

DIRECT CONNECTION 32 A

APPLICATIONS

4 QUADRANTS ACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION, WITH:

- 7 DIGITS LCD, 1 S0 PULSE OUTPUT (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO ACTIVE IMPORTED ENERGY AND IN-BUILT M-BUS (1 UNIT LOAD, 4KV ISOLATED) - **ECS1-32 CP MODBUS**
- WITH 7 DIGITS LCD AND IN-BUILT MODBUS RTU (3 WIRES, 4KV ISOLATED RS-485) - **ECS1-32 CP M-BUS**

THESE COMPACT DIN RAIL MOUNTING COUNTERS, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLY WITH STANDARD EN 50470-1-3. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE.

VERSIONS

TYPE	ECS1-32 CP Modbus	ECS1-32 CP Modbus MID	ECS1-32 CP M-Bus	ECS1-32 CP M-Bus MID
Communication	Modbus	Modbus	1 x S0, M-Bus	1 x S0, M-Bus
MID certified	NO	YES	NO	YES

FUNCTION

DISPLAYED VALUES

VALUE	UNIT	SYMBOL
Imported active energy	kWh	→
Exported active energy	kWh	←
Imported/exported active power	W	W→ / W←
Voltage	V	V
Current	A	A
Frequency	Hz	Fr
Power factor (4 quadrants)	–	PF

SINGLE-PHASE ENERGY METERS

ECS1-32 CP M-Bus / ECS1-32 CP Modbus

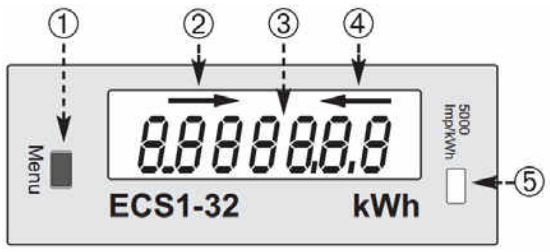
FEATURES

- 7 DIGITS LCD DISPLAY
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.02 ... 32 A
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 1 MODULE WIDE (18 mm)
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTER ARE READABLE ON DISPLAY
- ENERGY REGISTERS ARE NOT RESETTABLE (MID VERSIONS)
- RESETTABLE ENERGY REGISTERS (NON-MID VERSIONS)
- SEALABLE TERMINAL COVERS
- INSTANTANEOUS MEASURES: kW, V, I, PF, AND F READABLE ON DISPLAY
- IN-BUILT STANDARD M-BUS (1 UNIT LOAD, 4 kV ISOLATED, COMPLIANT TO EN 13757-2 AND -3) - **ECS1-32 CP M-BUS**
- IN-BUILT MODBUS RTU (3 WIRES, 4 kV ISOLATED RS-485) - **ECS1-32 CP MODBUS**

  INSTANTANEOUS ACTIVE IMPORTED AND EXPORTED POWER ARE READABLE ON DISPLAY

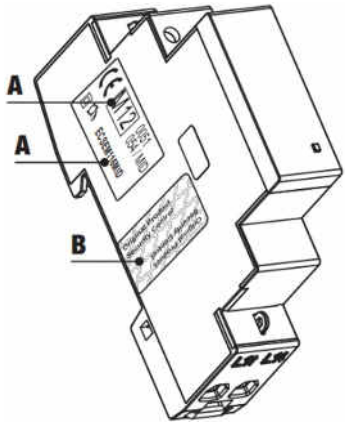
  THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE (**ECS1-32 MID**)

DISPLAY



1) Command Button
2) (→) imported symbol (for Energy or Power)
3) 7 digit LCD, for Energy and instantaneous values visualization)
4) (←) exported symbol (for Energy or Power)
5) Metrological LED (5000 pulses per kWh)

MID CALIBRATED



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 32 A**

TYPE				**ECS1-32 CP M-Bus** **ECS1-32 CP M-Bus MID** Inbuilt communications M-Bus + S0	**ECS1-32 CP Modbus** **ECS1-32 CP Modbus MID** Inbuilt communications Modbus
GENERAL CHARACTERISTICS					
Housing		DIN 43880	DIN	1 module	1 module
Mounting		EN 60715	35 mm	DIN rail	DIN rail
Depth			mm	70	70
Weight			g	60	60
OPERATING FEATURES					
Connection		to single/three phase network	n° wires	2	2
Storage of energy values and configuration		internal flash memory	–	yes	yes
APPROVAL (according to EN 50470-1, EN 50470-3)					
Reference voltage U_n		line to neutral	V AC	230	230
Reference current I_{ref}			A	5	5
Minimum current I_{min}			A	0.25	0.25
Maximum current I_{max}			A	32	32
Starting current I_{st}			A	0.02	0.02
Reference frequency f_n			Hz	50	50
Number of phases (number of wires)			–	1 (2)	1 (2)
Certified measures			kWh	→ kWh T1, ← kWh T1	→ kWh T1, ← kWh T1
Accuracy	active energies (acc. to EN 50470-3) and active power		class	B	B
	reactive energies (acc. to EN 50470-3) and active power		class	2	2
SUPPLY VOLTAGE AND POWER CONSUMPTION					
Operating supply voltage range			V	184 ... 276	92 ... 276
Maximum power dissipation (voltage circuit)			VA (W)	≤ 8 (0.6)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 1	≤ 1
Voltage input waveform			–		AC
Voltage impedance			MΩ	1.33	1.33
Current impedance			MΩ	≤ 1	≤ 1
OVERLOAD CAPABILITY					
Voltage		continuous	V	276	276
		temporary (1 s)	V	300	300
Current		continuous	A	32	32
		temporary (10 ms)	A	960	960
MEASURING FEATURES					
Voltage range			V	184 ... 276	AC 92 ... 276
Current range			A	0.02 ... 32	0.02 ... 32
Frequency range			Hz	49 ... 51	45 ... 65
Measured quantities			–	kWh, kW, V, A, PF, Hz	kWh, kW, V, A, PF, Hz
DISPLAY FEATURES					
Display type		LCD	–	7 (2 decimal)	7 (2 decimal)
		energy digits dimension	mm	6 x 3	6 x 3
Active energy		5 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 99999.99	0.01 ... 99999.99
Active power		4 digits with sign	W	0 ... 8832	0 ... 8832
Voltage		3 digits + 1 decimal digit	V	184.0 ... 276.0	92.0 ... 276.0
Current		2 digits + 2 decimal digits	A	0.00 ... 32.00	0.00 ... 32.00
Power factor		1 digit + 3 dec. digits + cap./ind. indic.	–	-1.00 ... +1.00	-1.00 ... +1.00
Frequency		2 digits + 2 decimal digits	Hz	49.00 ... 51.00	45.00 ... 65.00
Display refresh period			seconds	1	1
OPTICAL METROLOGICAL LED					
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	5000	5000

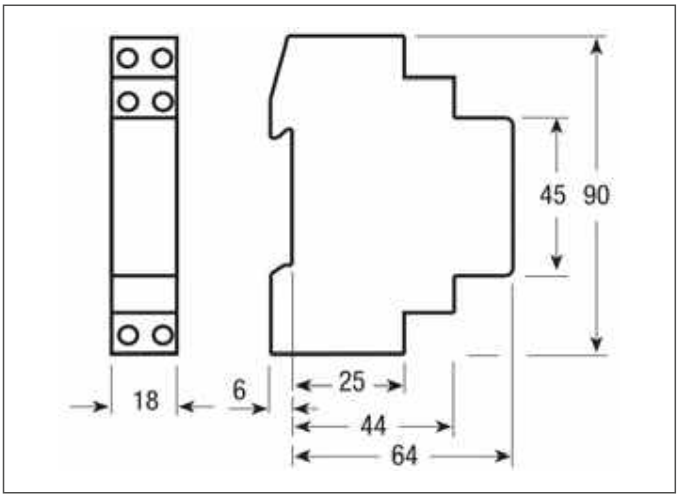
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 32 A**

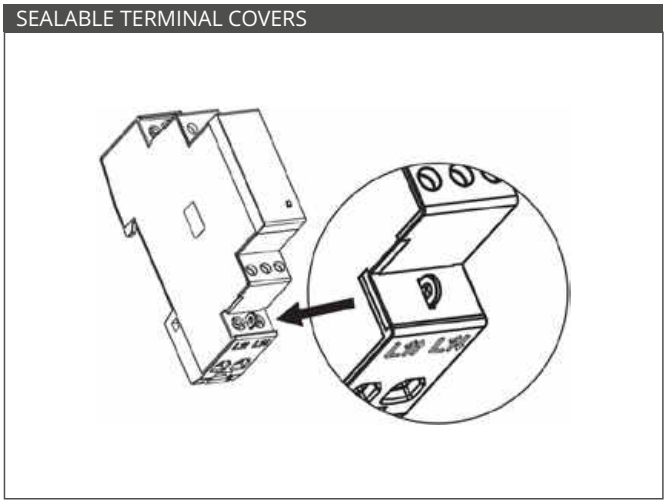
TYPE			**ECS1-32 CP M-Bus** **ECS1-32 CP M-Bus MID** Inbuilt communications M-Bus + S0	**ECS1-32 CP Modbus** **ECS1-32 CP Modbus MID** Inbuilt communications Modbus
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	model ECSEM245MID ECSEM253MID	–	yes	yes
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)				
Pulse rate		p/kWh - p/kvarh	1000	–
Pulse ON duration		msec	90	–
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)	–
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	90	–
Pulse OFF leakage current	in the range 3 ... 33 V AC (5 ... 70 V DC)	µA	1	–
Isolation class		–	SELV circuit	–
EMBEDDED COMMUNICATION M-Bus				
Baud rate		–	up to 9600 bps	–
Unit load		–	1 unit	–
Isolation class		–	–	SELV circuit
EMBEDDED COMMUNICATION Modbus				
Baud rate	adjustable	–	–	up to 19200 bps
Unit load	adjustable	–	–	Odd, Even, None
Stop bit	adjustable	–	–	1, 2
Isolation class		–	–	SELV circuit
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ1	PZ1
Screwdriver for mains terminals M-Bus / Modbus / S0	head with Z +/-	POZIDRIV	PZ0	PZ0
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.65 (16)	1.65 (16)
	stranded wire with sleeve min. (max.)	mm^2	1.65 (16)	1.65 (16)
Terminal capacity for mains terminals M-Bus / Modbus / S0	solid wire min. (max.)	mm^2	0.15 (4)	0.15 (4)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)	0.15 (4)
ENVIRONMENTAL CONDITIONS (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40	IP51* / IP40

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

DIMENSIONS

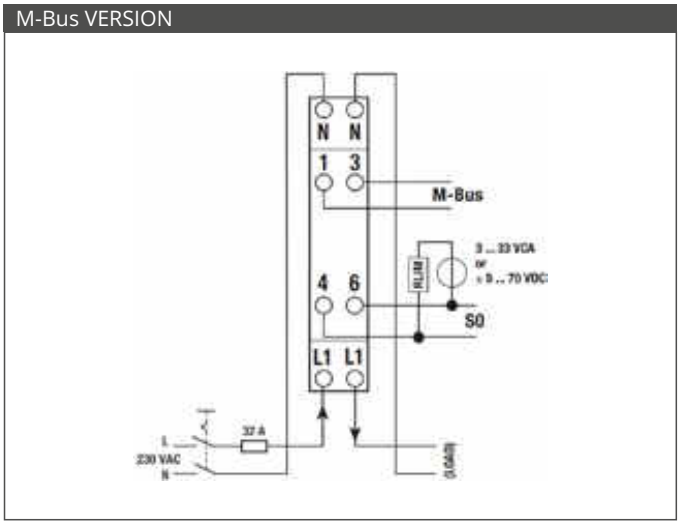


SEALABLE TERMINAL COVERS

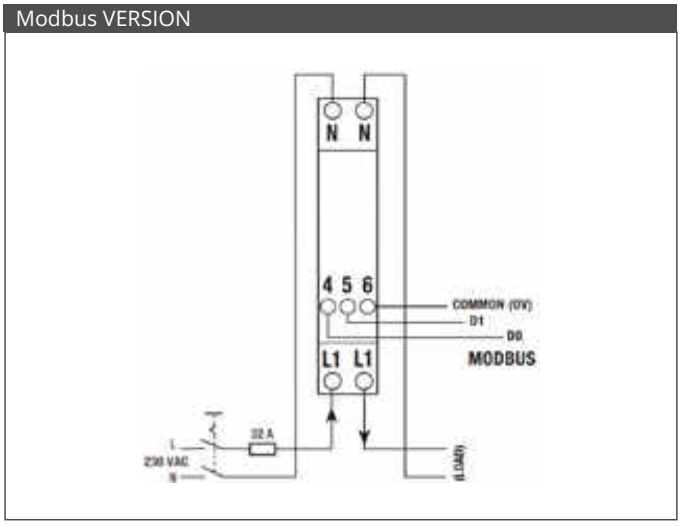


CIRCUIT DIAGRAMS

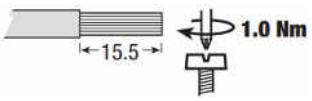
M-Bus VERSION



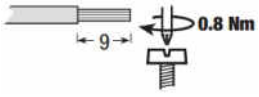
Modbus VERSION



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



32 A direct connection main terminals - Screw driver PZ1



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

SINGLE-PHASE ENERGY METERS

ECS1-32 CP KNX

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 63 A

APPLICATIONS

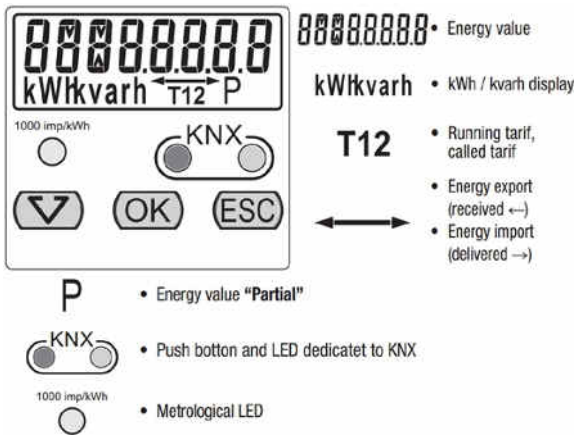
4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION. WITH 8 DIGITS LCD, 2 TARIFFS AND IN-BUILT KNX (4 kV ISOLATED).

COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3.

FEATURES

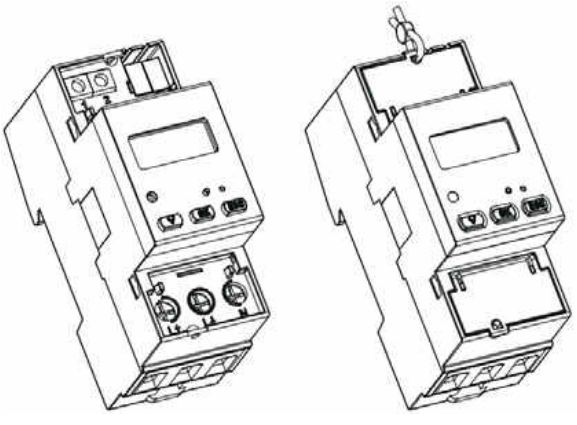
- 8 DIGITS GREEN BACK LIGHTED LCD
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) : 0.015 ... 63 A
- IMPORTED AND EXPORTED ACTIVE ANE REACTIVE ENERGY REGISTERS (T1, T2 AND TOTAL) ARE READABLE ON DISPLAY
- ALSO IMPORTED AND EXPORTED ACTIv : PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- RESETTABLE ENERGY REGISTERS
- INSTANTANEOUS MEASURES: kW, kvar, ' ', I, PF AND F READABLE ON DISPLAY
- IN-BUILD STANDARD KNX (COMPLIANT O EN-50491-X, 4 kV ISOLATED)
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 2 MODULES WIDE (36 mm)

DISPLAY



- **Scroll Key:** This key is used to scroll pages and to modify parameters value. Its pushing is accepted only if it is shorter than 1.5 second.
- **OK key:** This key is used alone to enable a new menu function or to confirm a parameter value during its modification. Its pushing is accepted only if shorter than 1.5 seconds
- **ESC key:** This key is used alone to exit from a sub-menu, to cancel a parameter modification or to go back to the main page. In these cases, its pushing is accepted only <1.5 seconds
- A long pushing (>1.5 seconds) of the **"ESC key"** is used in the Partial Energy Registers Pages to reset their values.
- A long pushing (>5 seconds) is used in the Main Energy Registers Pages to reset their values.

SEALABLE TERMINAL COVERS



SINGLE-PHASE ENERGY METERS

ECS1-32 CP KNX

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 **DIRECT CONNECTION 63 A**

TYPE				
				ECS1-63 CP KNX
				In-build communication KNX
GENERAL CHARACTERISTICS				
Housing		DIN 43880	DIN	2 modules
Mounting		EN 60715	35 mm	DIN rail
Depth			mm	70
Weight			g	175
OPERATING FEATURES				
Connection		to single-phase network	n° wires	2
Storage of energy values and configuration		internal flash memory	–	yes
Tariff		for active and reactive energy	–	T1 / T2
APPROVAL (according to EN 50470-1, EN 50470-3)				
Reference voltage U_n			V AC	230
Reference current I_{ref}			A	5
Minimum current I_{min}			A	0.25
Maximum current I_{max}			A	63
Starting current I_{st}			A	0.015
Reference frequency f_n			Hz	50
Number of phases (number of wires)			–	1 (2)
Accuracy	active energy (acc. to EN 50470-3) and active power		class	B
	reactive energy (acc. to EN 62053-23) and reactive power		class	2
SUPPLY VOLTAGE AND POWER CONSUMPTION				
Operating supply voltage range			V	92 ... 276
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (1)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 1
Voltage input waveform			–	AC
Voltage impedance			MΩ	1
Current impedance			MΩ	≤ 20
OVERLOAD CAPABILITY				
Voltage		continuous	V	276
		temporary (1 s)	V	300
Current		continuous	A	63
		temporary (10 ms)	A	1890
MEASURING FEATURES				
Voltage range			V	92 ... 276
Current range			A	0.015 ... 63
Frequency range			Hz	45 ... 65
Measured quantities			–	V, A, kWh, kvarh, PF, Hz, kW, kvar
DISPLAY FEATURES				
Display type		LCD	–	6.2 + 3
		energy digits dimension	mm	6 x 3
Active energy		6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99
Reactive energy		6 digits + 2 decimal digits	min. ... max. kvarh	0.01 ... 999999.99
Voltage		3 digits + 2 decimal digits	V	92.00 ... 276.00
Current		2 digits + 2 decimal digits	A	0.00 ... 63.00
Power factor	1 digit + 3 dec. digits cap./ind. indication		–	0.000 ... 1.000
Frequency		2 digits + 2 decimal digits	Hz	45.00 ... 65.00
Active power	2 digits + 2 decimal digits with sign		kW	0.00 ... 17.40
Running tariff		1 digit	–	T1/T2
Display refresh period			second	1
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	1000

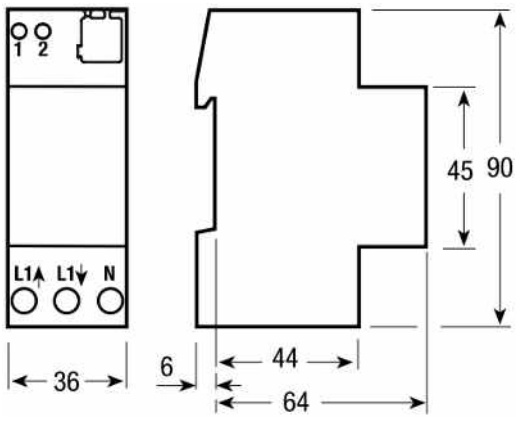
TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 63 A**

TYPE			
			ECS1-63 CP KNX
			In-build communication KNX
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
EMBEDDED COMMUNICATION			
Physical interface		–	KNX terminal
Isolation class		–	SELV circuit
TARIFF			
Tariff T1			open contact
Tariff T2		V	230 ± 20%
Input impedance		kΩ	224
CONNECTION TERMINALS			
Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ2
Screwdriver for tariff terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.65 (33)
	stranded wire with sleeve min. (max.)	mm^2	1.65 (33)
Terminal capacity for tariff	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

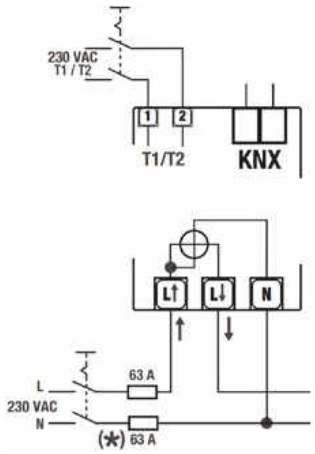
*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

DIMENSIONS

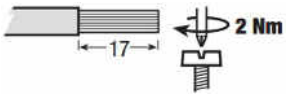


CIRCUIT DIAGRAMS

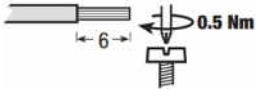
M-Bus VERSION



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



63 A direct connection main terminals - Screw driver PZ2



Tariff terminals - Screw driver blade 0.8x3.5 mm

SINGLE-PHASE ENERGY METERS

ECS1-63 CP S0 / ECS1-63 CP M-Bus / ECS1-63 CP Modbus

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 63 A

APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A SINGLE PHASE AC ELECTRICAL INSTALLATION, WITH:

- 8 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) - **ECS1-63 CP S0**
- 8 DIGITS LCD, 2 TARIFFS AND BUILT-IN M-Bus (1 UNIT LOAD, 4 kV ISOLATED) - **ECS1-63 CP M-Bus**
- 8 DIGITS LCD, 2 TARIFFS AND BUILT-IN Modbus RTU (3 WIRES, 4kV ISOLATED RS-485) - **ECS1-63 CP Modbus**

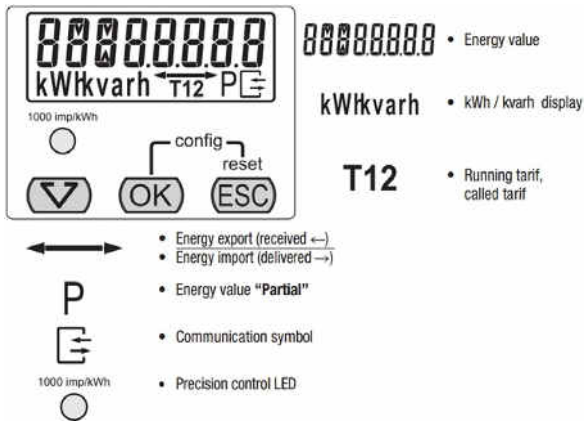
VERSIONS

TYPE	ECS1-63 CP S0	ECS1-63 CP S0 MID	ECS1-63 CP Modbus	ECS1-63 CP MID Modbus	ECS1-63 CP M-Bus	ECS1-63 CP M-Bus MID
Communication	2 x S0	2 x S0	Modbus	Modbus	M-Bus	M-Bus
MID certified	NO	YES	NO	YES	NO	YES

FEATURES

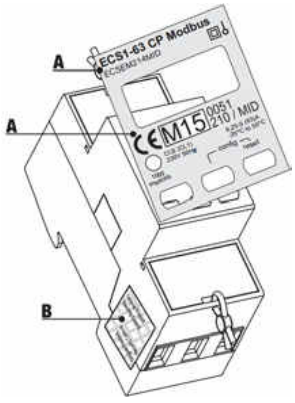
- 8 DIGITS GREEN BACK LIGHTED LCD
- DIRECT CONNECTION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) : 0.015 ... 63 A
- IMPORTED AND EXPORTED ACTIVE AND REACTIVE ENERGY REGISTERS (T1, T2 AND TOTAL) ARE READABLE ON DISPLAY
- ALSO IMPORTED AND EXPORTED ACTIVE PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- ONLY PARTIAL ENERGY REGISTERS ARE RESETTABLE
- INSTANTANEOUS MEASURES: kW, kvar, V, I, PF AND F READABLE ON DISPLAY
- IN-BUILT STANDARD M-Bus (1 UNIT LOAD, 4 kV ISOLATED, COMPLIANT TO EN 13757-2 AND -3) - **ECS1-63 CP M-Bus**
- IN-BUILT MODBUS RTU (3 WIRES, 4 kV ISOLATED RS-485) - **ECS1-63 CP Modbus**
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 2 MODULES WIDE (36 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE.

DISPLAY



- **Scroll Key:** This key is used to scroll pages and to modify parameters value. Its pushing is accepted only if it is shorter than 1.5 second.
- **OK key:** This key is used alone to enable a new menu function or to confirm a parameter value during its modification. Its pushing is accepted only if shorter than 1.5 seconds
- **ESC key:** This key is used alone to exit from a sub-menu, to cancel a parameter modification or to go back to the main page. In these cases, its pushing is accepted only <1.5 seconds
- A long pushing (>1.5 seconds) of the **"ESC key"** is used in the Partial Energy Registers Pages to reset their values.
- A long pushing (>5 seconds) is used in the Main Energy Registers Pages to reset their values.
- Push these 2 keys together, for at least 1.5 seconds, to enter into the Configuration Menu

MID CALIBRATED (ECS1-63 CP MID)



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 63 A**

TYPE				**ECS1-63 CP S0** **ECS1-63 CP S0 MID** Pulse output S0	**ECS1-63 CP Modbus** **ECS1-63 CP Modbus MID** **ECS1-63 CP M-Bus** **ECS1-63 CP M-Bus MID** Inbuilt communications Modbus/M-Bus
GENERAL CHARACTERISTICS					
Housing		DIN 43880	DIN	2 module	2 module
Mounting		EN 60715	35 mm	DIN rail	DIN rail
Depth			mm	70	70
Weight			g	175	175
OPERATING FEATURES					
Connection		to single/three phase network	n° wires	2	2
Storage of energy values and configuration		internal flash memory	–	yes	yes
Tariff		for active and reactive energy	n° 2	T1 and T2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)					
Reference voltage U_n		line to neutral	V AC	230	230
Reference current I_{ref}			A	5	5
Minimum current I_{min}			A	0.25	0.25
Maximum current I_{max}			A	63	63
Starting current I_{st}			A	0.015	0.015
Reference frequency f_n			Hz	50	50
Number of phases (number of wires)			–	1 (2)	1 (2)
Certified measures			kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	active energies (acc. to EN 50470-3) and active power		class	B	B
	reactive energies (acc. to EN 50470-3) and active power		class	2	2
SUPPLY VOLTAGE AND POWER CONSUMPTION					
Operating supply voltage range			V	92 ... 276	92 ... 276
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (1)	≤ 2 (1)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 1	≤ 1
Voltage input waveform			–	AC	AC
Voltage impedance			MΩ	1	1
Current impedance			MΩ	≤ 20	≤ 20
OVERLOAD CAPABILITY					
Voltage		continuous	V	276	276
		temporary (1 s)	V	300	300
Current		continuous	A	63	63
		temporary (10 ms)	A	1890	1890
MEASURING FEATURES					
Voltage range			V	92 ... 276	92 ... 276
Current range			A	0.015 ... 63	0.015 ... 63
Frequency range			Hz	49 ... 51	45 ... 65
Measured quantities			–	V, A, kWh, kvarh, PF, Hz, kW, kvar	V, A, kWh, kvarh, PF, Hz, kW, kvar
DISPLAY FEATURES					
Display type		LCD	–	6.2 + 3	6.2 + 3
		energy digits dimension	mm	6 x 3	6 x 3
Active energy		6 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 999999.99	0.01 ... 999999.99
Reactive power		6 digits + 2 decimal digits	min. ... max. kvarh	0.01 ... 999999.99	0.01 ... 999999.99
Voltage		3 digits + 2 decimal digit	V	92.00 ... 276.00	92.00 ... 276.00
Current		2 digits + 2 decimal digits	A	0.00 ... 63.00	0.00 ... 63.00
Power factor		1 digit + 3 dec. digits + cap./ind. indic.	–	0.000 ... 1.000	0.000 ... 1.000
Frequency		2 digits + 2 decimal digits	Hz	45.00 ... 65.00	45.00 ... 65.00
Active power		2 digits + 2 decimal digits with sign	kW	0.00 ... 17.40	0.00 ... 17.40
Reactive energy		2 digits + 2 decimal digits with sign	kvar	0.00 ... 17.40	0.00 ... 17.40
Running tariff		1 digit	–	T1/T2	T1/T2
Display refresh period			seconds	1	1

SINGLE-PHASE ENERGY METERS

ECS1-63 CP S0 / ECS1-63 CP M-Bus / ECS1-63 CP Modbus

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 50470-1, EN 50470-3, EN 62053-23 AND EN 62053-31 — **DIRECT CONNECTION 63 A**

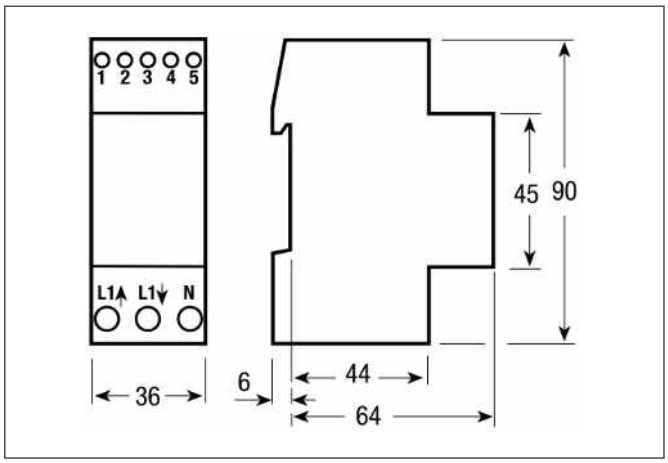
TYPE			**ECS1-63 CP S0** **ECS1-63 CP S0 MID** Pulse output S0	**ECS1-63 CP Modbus** **ECS1-63 CP Modbus MID** **ECS1-63 CP M-Bus** **ECS1-63 CP M-Bus MID** Inbuilt communications Modbus/M-Bus
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	1000	1000
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	mod. ECSEM212MID, ECSEM214MID ECSEM216MID	–	yes	yes
PULSE OUTPUTS (S0 signals, acc. to IEC 62053-31)				
Pulse output 1 or 2	selectable	–	→ kWh, ← kWh	–
			→ kWh T1, ← kWh T2	–
			→ kvarh ← kvarh	–
Pulse rate	adjustable	p/kWh - p/kvarh	1 ... 1000	–
Pulse ON duration	adjustable	msec	30 ... 100	–
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)	–
Pulse ON maximum current	in the range 3 ... 33 V AC (5 ... 70 V DC)	mA	90	–
Pulse OFF leakage current	in the range 3 ... 33 V AC (5 ... 70 V DC)	µA	1	–
Isolation class		–	SELV	–
EMBEDDED COMMUNICATION				
Modbus RTU	RS485 - 3 wire	–	–	1200 ... 38.400 bps
M-Bus	2 wires	–	–	300 ... 9.600 bps
Isolation class		–	–	SELV circuit
TARIFF				
Tariff 1		–	open contact	open contact
Tariff 2		V	230 ± 20%	230 ± 20%
Impedance		kΩ	224	224
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ2	PZ2
Screwdriver for tariff and comm. terminals	slotted head	mm	0.8 x 3.5	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.65 (33)	1.65 (33)
	stranded wire with sleeve min. (max.)	mm^2	1.65 (33)	1.65 (33)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40	IP51* / IP40

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

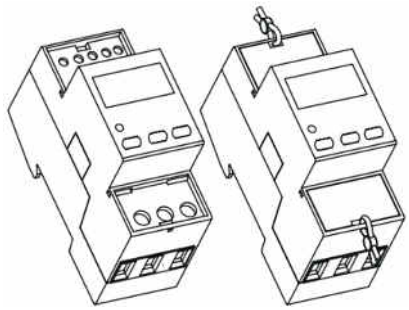
SINGLE-PHASE ENERGY METERS

ECS1-63 CP S0 / ECS1-63 CP M-Bus / ECS1-63 CP Modbus

DIMENSIONS

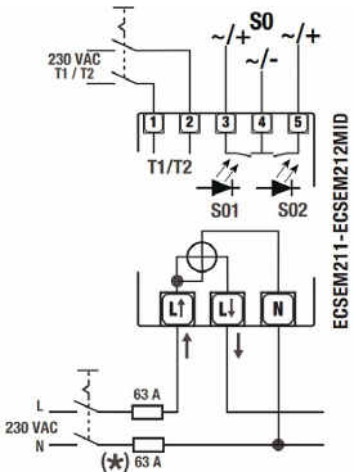


SEALABLE TERMINAL COVERS

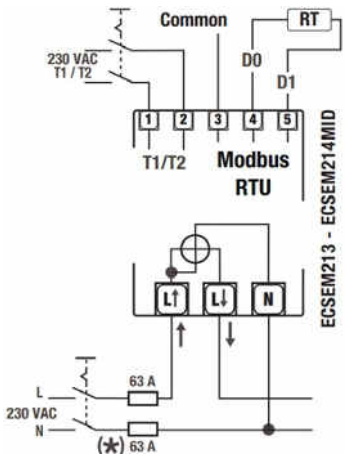


INSTALLATION

MODEL S0

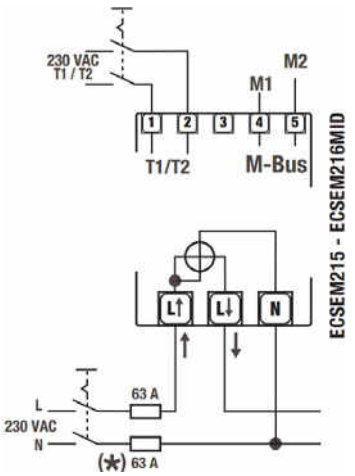


MODEL Modbus



RT = termination resistance
(apply RT in cases recommended by RS485 norm)

MODEL M-Bus



*** Fuse is recommended if neutral is not earthed**
A fuse of 63 A is recommended for the line protection.

THREE-PHASE ENERGY METERS

ECS3 1-5 CP

ACTIVE ENERGY METERS

CT CONNECTED ... 1 A or ... / 5 A

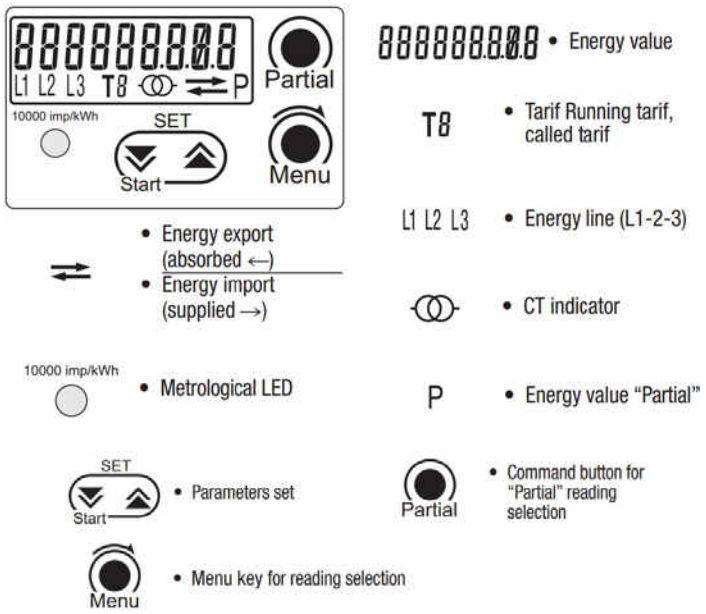
APPLICATIONS

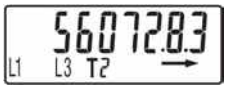
4 QUADRANTS MID CERTIFIED (ECS3 1-5 CP MID) ACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 9 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO SELECTABLE ENERGIES. COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR CONNECTION THROUGH EXTERNAL CURRENT TRANSFORMER. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

FEATURES

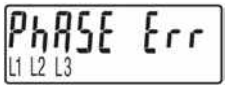
- 9 DIGITS LCD
- CONNECTION THROUGH .../5 A OR .../1 A EXTERNAL CTs
- CT PRIMARY CURRENT RANGE: 5/5 A TO 10000/5 A WITH STEPS OF 5 A, OR 1/1 A TO 2000/1 A WITH STEPS OF 1 A
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY: CLASS B (1%) ACCORDING TO EN 50470-3
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.001 ... 6 A, THROUGH EXTERNAL CTs
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ALSO THE CORRESPONDING PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- ONLY PARTIAL ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE.

DISPLAY

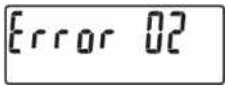




One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

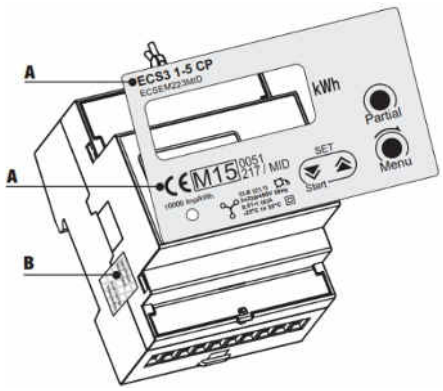


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

MID CALIBRATED (ECS3 1-5 CP MID)



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3

CT CONNECTION

TYPE				
				ECS3 1-5 CP MID **ECS3 1-5 CP**
				pulse output S0
GENERAL CHARACTERISTICS				
Housing		DIN 43880	DIN	4 modules
Mounting		EN 60715	35 mm	DIN rail
Depth			mm	70
Weight			g	250
OPERATING FEATURES				
Connection		to three-phase network	n° wires	2
Storage of energy values and configuration		internal flash memory	–	yes
Tariff		for active and reactive energy	n° 2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)				
Type of connection			–	CT ... / 5 A or ... / 1 A
Reference voltage U_n		line to neutral	V AC	230
Reference voltage U_n		line to line	V AC	400
Reference current I_{ref}			A	1
Minimum current I_{min}			A	0.01
Maximum current I_{max}			A	6
Starting current I_{st}			A	0.001
External CT		max. CT ratio	A	10.000/5 A or 2.000/1 A
External CT		ratio adjusting step	A	5 or 1
Reference frequency f_n			Hz	50
Number of phases (number of wires)			–	3 (4)
Certified measures			kWh	→ kWh T1, ← kWh T1
				→ kWh T2, ← kWh T2
Accuracy	active energy (acc. to EN 50470-3) and active power		class	B
SUPPLY VOLTAGE AND POWER CONSUMPTION				
Operating supply voltage range			V	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 0.7
Voltage input waveform			–	AC
OVERLOAD CAPABILITY				
Voltage		continuous: phase/phase	V	480
		1 second: phase/phase	V	800
		continuous: phase/neutral	V	276
		1 second: phase/neutral	V	300
Current		continuous	A	6
		temporary (5 ms)	A	120
MEASURING FEATURES				
Voltage range		phase/phase	V	160 ... 480
		phase/neutral	V	92 ... 276
Current range		secondary winding	A	0.001 ... 6
Frequency range			Hz	45 ... 65
Measured quantities			–	kWh
DISPLAY FEATURES				
Display type		LCD	–	9 (2 decimal)
		energy digits dimension	mm	6 x 3
Active energy		7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99
Running tariff		1 digit	–	T1 or T2
Display refresh period			second	1
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	10000

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3

CT CONNECTION

TYPE			**ECS3 1-5 CP MID** **ECS3 1-5 CP**
			pulse output S0
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
Safety-sealing between upper and lower housing part	model: ECSEM223MID	–	yes
PULSE OUTPUTS (S0 SIGNALS, ACC. TO IEC 62053-31)			
Pulse output 1	adjustable	–	kWh→, kWh←/ kvarh→, kvarh←
Pulse output 2	adjustable	–	kWh(T1)→, kWh(T2)→
Pulse rate	adjustable	p/kWh	1 ... N(*)
Pulse ON-time	adjustable	msec	30 ... 100
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current		mA	90
Pulse OFF leakage current		µA	1
Isolation class		–	SELV
CONNECTION TERMINALS			
Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ2
Screwdriver for tariff and communication terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

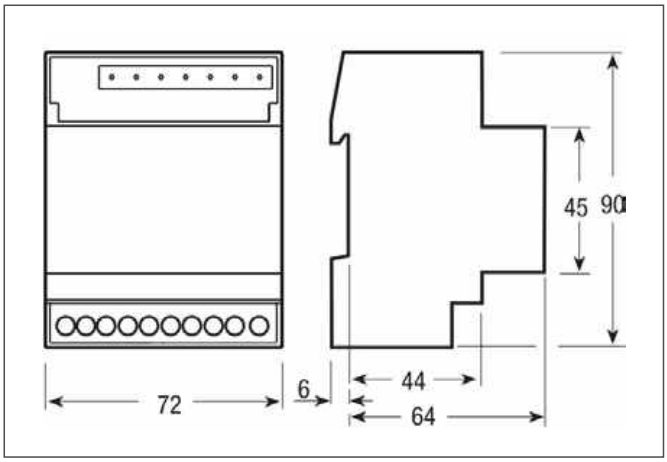
N(*) - Depends on CT-ratio and pulse on time

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

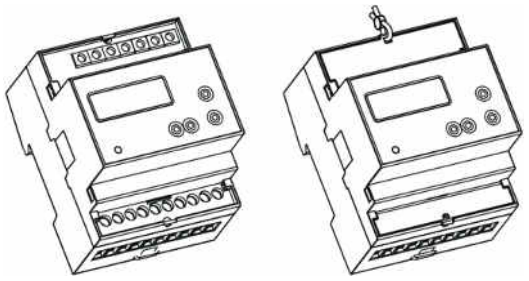
THREE-PHASE ENERGY METERS

ECS3 1-5 CP

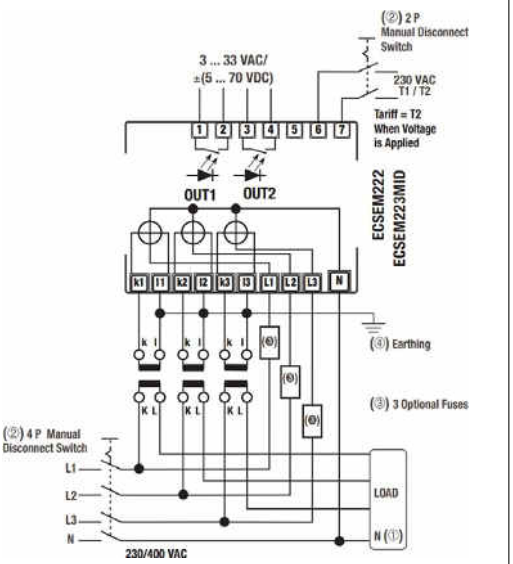
DIMENSIONS



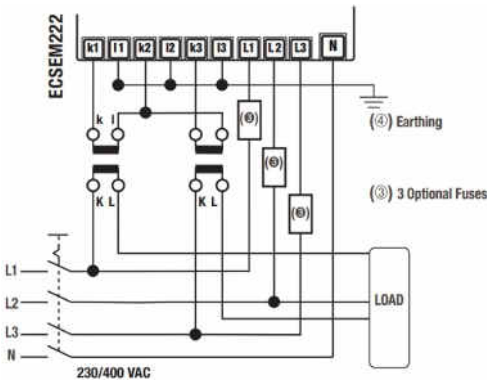
SEALABLE TERMINAL COVERS



INSTALLATION



Alternative wiring diagram (not allowed in MID installation)



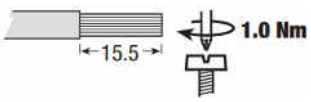
(1) The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.
Its connection to the load is optional, but, in the case, only 3-phase measures (Powers and Energies) are meaningful, while measures referred to L1, L2, and L3 are meaningless.

(2) These manual disconnect switches are mandatory for safe installing operation. Their purpose and location must be easily evident to installation personnel.

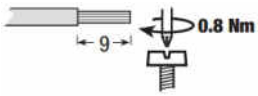
(3) These fuses are not mandatory, they are recommended to protect the line, not the device itself. Use >= 6 A fast (F) or >= 1 A delayed (T).

(4) Earthing of secondary windings of CTs is governed by the laws in force in the Countries where the device is installed. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage; furthermore, in this case the transformers are exposed to thermal overload.

CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



1 A / 5 A CT connection main terminals - Screw driver PZ1



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

THREE-PHASE ENERGY METERS

ECS3 1-5 CP KNX

ACTIVE & REACTIVE ENERGY METERS

CT CONNECTED ... 1 A or ... / 5 A

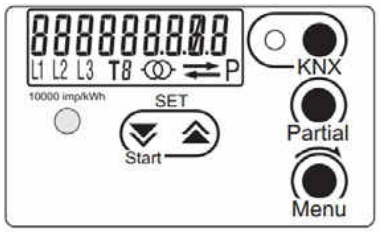
APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 9 DIGITS LCD, 2 TARIFFS, 1 S0 PULSE OUTPUT (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO A SELECTABLE ENERGY AND IN-BUILT KNX (4KV ISOLATED). COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR CONNECTION THROUGH EXTERNAL CURRENT TRANSFORMER. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

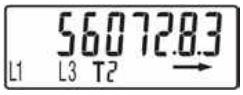
FEATURES

- 9 DIGITS LCD
- CONNECTION THROUGH .../5 A OR .../1 A EXTERNAL CTs
- CT PRIMARY CURRENT RANGE: 5/5 A TO 10000/5 A WITH STEPS OF 5 A, OR 1/1 A TO 2000/1 A WITH STEPS OF 1 A
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY: CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.001 ... 6 A, THROUGH EXTERNAL CTs
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ALSO THE CORRESPONDING PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- IN-BUILT STANDARD KNX (COMPLIANT TO EN-50491-X, 4 kV ISOLATED). ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION ARE READABLE THROUGH KNX.
- ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)

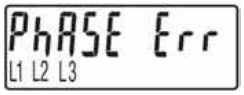
DISPLAY



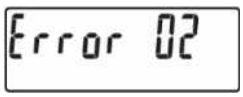
- Energy value
- Tarif Running tarif, called tarif
- Energy line (L1-2-3)
- Energy export (absorbed ←)
- Energy import (supplied →)
- CT indicator
- Metrological LED
- Energy value "Partial"
- KNX reset Button
- Link activity LED
- Parameters set
- Menu key for reading selection
- Command button for "Partial" reading selection



One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

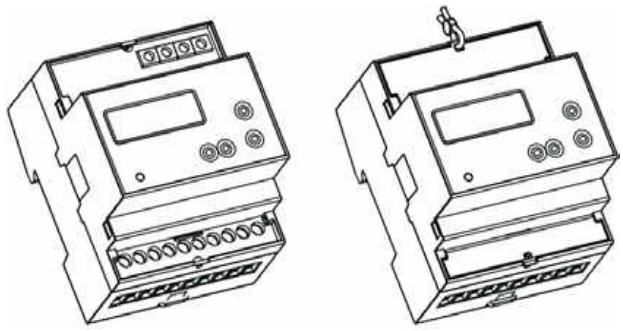


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

SEALABLE TERMINAL COVERS



TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3 — **CT CONNECTION**

TYPE			
			ECS3 1-5 CP KNX
			build-in communication KNX
GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	4 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
Weight		g	250
OPERATING FEATURES			
Connection	to three-phase network	n° wires	4
Storage of energy values and configuration	internal flash memory	–	yes
Tariff	for active and reactive energy	n° 2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)			
Type of connection		–	CT ... / 5 A or ... / 1 A
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	1
Minimum current I_{min}		A	0.01
Maximum current I_{max}		A	6
Starting current I_{st}		A	0.001
External CT	max. CT ratio	A	10.000/5 A or 2.000/1 A
External CT	ratio adjusting step	A	5 or 1
Reference frequency f_n		Hz	50
Number of phases (number of wires)		–	3 (4)
Accuracy	active energy (acc. to EN 50470-3) and active power	class	B
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)		VA (W)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}		VA	≤ 0.7
Voltage input waveform		–	AC
OVERLOAD CAPABILITY			
Voltage	continuous: phase/phase	V	480
	1 second: phase/phase	V	800
	continuous: phase/neutral	V	276
	1 second: phase/neutral	V	300
Current	continuous	A	6
	temporary (5 ms)	A	120
MEASURING FEATURES			
Voltage range	phase/phase	V	160 ... 480
	phase/neutral	V	92 ... 276
Current range	secondary winding	A	0.001 ... 6
Frequency range		Hz	45 ... 65
Measured quantities		kWh	→ kWh T1, ← kWh T1
			→ kWh T2, ← kWh T2
DISPLAY FEATURES			
Display type	LCD	–	9 (2 decimal)
	energy digits dimension	mm	6 x 3
Active energy	7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99
Running tariff	1 digit	–	T1 or T2
Display refresh period		second	1
OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	10000

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3

CT CONNECTION

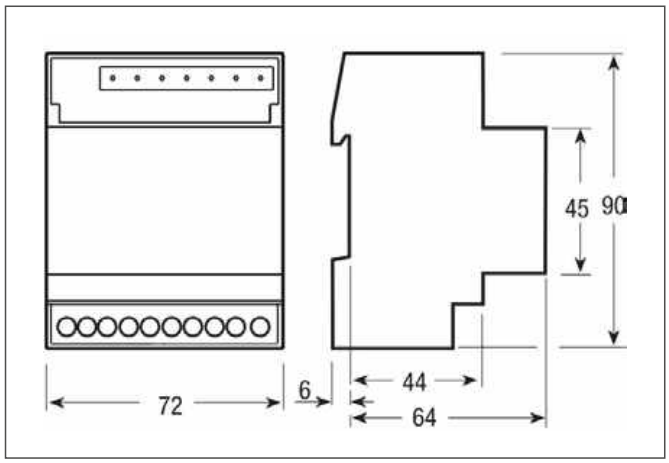
TYPE			**ECS3 1-5 CP KNX**
			build-in communication KNX
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
Safety-sealing between upper and lower housing part	model: ECSEM223MID	–	yes
PULSE OUTPUTS (S0 SIGNALS, ACC. TO IEC 62053-31)			
Pulse output	proportional to	–	kWh (→) (active imported energy)
Pulse rate	adjustable	p/kWh	1 ... N(*)
Pulse ON-time	adjustable	msec	30 ... 100
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current		mA	90
Pulse OFF leakage current		µA	1
Isolation class		–	SELV
EMBEDDED COMMUNICATION KNX			
Physical interface		–	KNX terminal
Isolation class		–	SELV circuit
CONNECTION TERMINALS			
Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ2
Screwdriver for tariff and communication terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

N(*) - Depends on CT-ratio and pulse on time

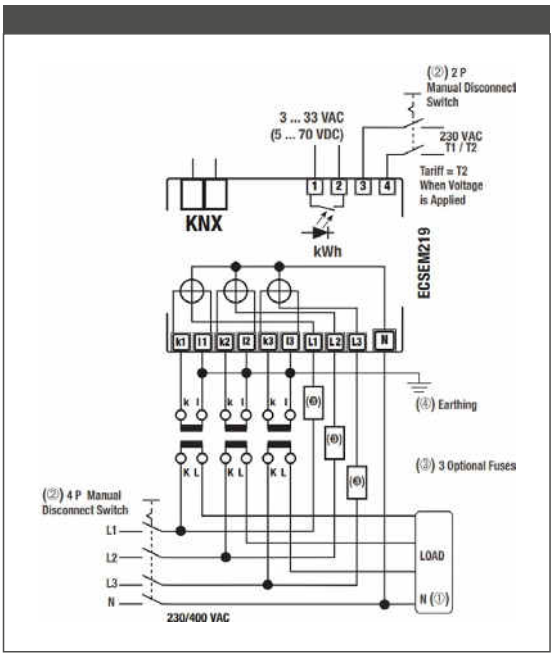
*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

THREE-PHASE ENERGY METERS
ECS3 1-5 CP KNX

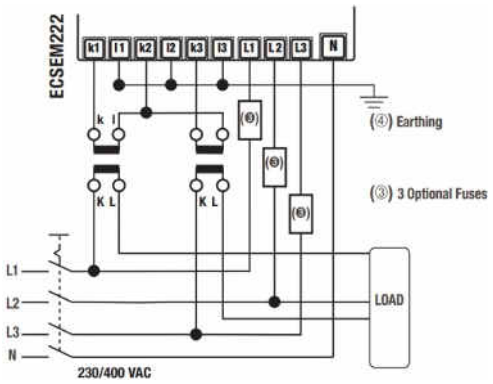
DIMENSIONS



INSTALLATION



Alternative wiring diagram (not allowed in MID installation)



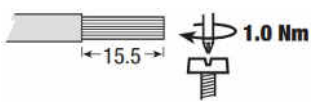
(1) The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.
Its connection to the load is optional, but, in the case, only 3-phase measures (Powers and Energies) are meaningful, while measures referred to L1, L2, and L3 are meaningless.

(2) These manual disconnect switches are mandatory for safe installing operation. Their purpose and location must be easily evident to installation personnel.

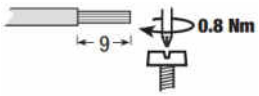
(3) These fuses are not mandatory, they are recommended to protect the line, not the device itself. Use >= 6 A fast (F) or >= 1 A delayed (T).

(4) Earthing of secondary windings of CTs is governed by the laws in force in the Countries where the device is installed. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage; furthermore, in this case the transformers are exposed to thermal overload.

CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



1 A / 5 A CT connection main terminals - Screw driver PZ1



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

THREE-PHASE ENERGY METERS

ECS3 1-5 CP M-Bus / ECS 1-5 CP Modbus

ACTIVE & REACTIVE ENERGY METERS

CT CONNECTED ... 1 A or ... / 5 A

APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH:

- 9 DIGITS LCD, 2 TARIFFS AND IN-BUILT M-Bus (1 UNIT LOAD, 4 kV ISOLATED) – **ECS3 1- 5 CP M-Bus**
- 9 DIGITS LCD, 2 TARIFFS AND IN-BUILT Modbus RTU (3 WIRES, 4 kV ISOLATED RS-485) - **ECS3 1-5 CP Modbus**

COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR CONNECTION THROUGH EXTERNAL CURRENT TRANSFORMER. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

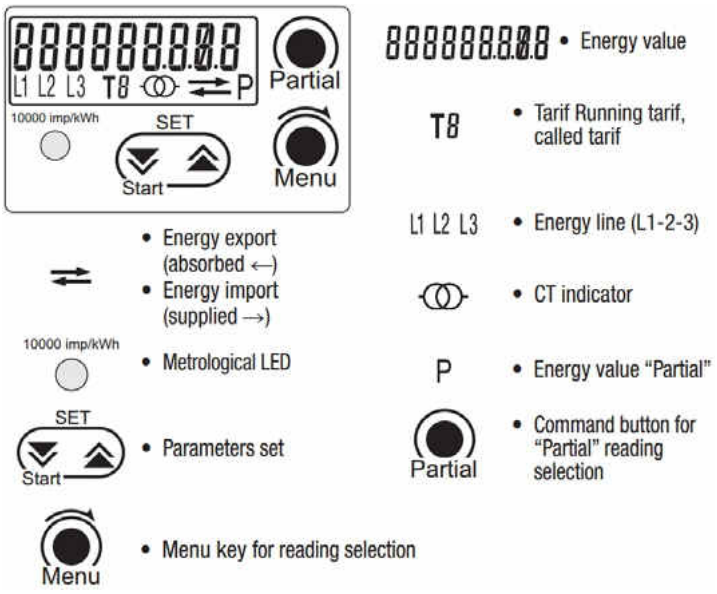
VERSIONS

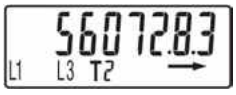
TYPE	ECS3 1-5 CP Modbus	ECS3 1-5 CP Modbus MID	ECS3 1-5 CP M-Bus	ECS3 1-5 CP M-Bus MID
Communication	Modbus	Modbus	M-Bus	M-Bus
MID certified	NO	YES	NO	YES

FEATURES

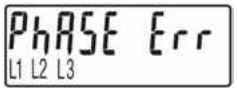
- 9 DIGITS LCD
- CONNECTION THROUGH .../5 A OR .../1A EXTERNAL Cts
- CT PRIMARY CURRENT RANGE: 5/5 A TO 10000/5 A WITH STEPS OF 5 A, OR 1/1 A TO 2000/1 A WITH STEPS OF 1 A
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.001 ... 6 A, THROUGH EXTERNAL CTs
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- IN-BUILT STANDARD M-BUS (4 kV ISOLATED, 1 UNIT LOAD, COMPLIANT TO EN 13757-2 AND -3). ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION ARE INCLUDED IN READOUT DATA MESSAGES - **ECS3 1-5 CP M-BUS**
- IN-BUILT MODBUS RTU (3 WIRES, 4KV ISOLATED RS-485, WITH INTERNAL SELECTABLE TERMINATION RESISTOR)). ITS DATABASE INCLUDES ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION - **ECS3 1- 5 CP MODBUS**
- ONLY PARTIAL ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE.

DISPLAY

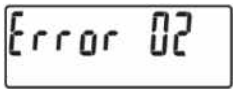




One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

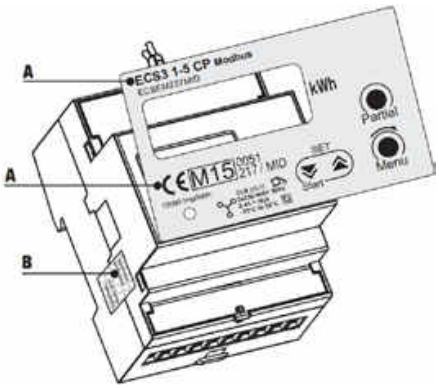


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

MID CALIBRATED (ECS3 1-5 CP MID)



A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part

THREE-PHASE ENERGY METERS

ECS3 1-5 CP M-Bus / ECS 1-5 CP Modbus

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579 , EN 62059-32-1, EN 50470-1 AND EN 50470-3

CT CONNECTION

TYPE				**ECS3 1-5 CP M-Bus** **ECS3 1-5 CP M-Bus MID** build-in communications M-Bus	**ECS3 1-5 CP Modbus** **ECS3 1-5 CP Modbus MID** build-in communications Modbus
GENERAL CHARACTERISTICS					
Housing		DIN 43880	DIN	4 module	4 module
Mounting		EN 60715	35 mm	DIN rail	DIN rail
Depth			mm	70	70
Weight			g	250	250
OPERATING FEATURES					
Connection		to three-phase network	n° wires	4	4
Storage of energy values and configuration		internal flash memory	–	yes	yes
Tariff		for active energy	n° 2	T1 and T2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)					
Type of connection			–	CT ... / 5 A or ... / 1 A	CT ... / 5 A or ... / 1 A
Reference voltage U_n		line to neutral	V AC	230	230
Reference voltage U_n		line to line	V AC	400	400
Reference current I_{ref}			A	1	1
Minimum current I_{min}			A	0.01	0.01
Maximum current I_{max}			A	6	6
Starting current I_{st}			A	0.001	0.001
Reference frequency f_n			Hz	50	50
External CT		max. CT ratio	A	10.000 / 5 A or 2.000 / 1 A	10.000 / 5 A or 2.000 / 1 A
		ratio adjusting step		5 or 1	5 or 1
Number of phases (number of wires)			–	3 (4)	3 (4)
Certified measures			kWh	→ kWh T1, ← kWh T1	→ kWh T1, ← kWh T1
				→ kWh T2, ← kWh T2	→ kWh T2, ← kWh T2
Accuracy	active energies (acc. to EN	50470-3) and active power	class	B	B
SUPPLY VOLTAGE AND POWER CONSUMPTION					
Operating supply voltage range			V	92 ... 276 / 160 ... 480	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (0.6)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 0.7	≤ 0.7
Voltage input waveform			–	AC	AC
OVERLOAD CAPABILITY					
Voltage		continuous: phase/phase	V	480	480
		1 second: phase/phase	V	800	800
		continuous: phase/neutral	V	276	276
		1 second: phase/neutral	V	300	300
Current		continuous	A	6	6
		temporary (0.5 ms)	A	120	120
MEASURING FEATURES					
Voltage range		phase/phase	V	160 ... 480	160 ... 480
		phase/neutral		92 ... 276	92 ... 276
Current range			A	0.001 ... 6	0.001 ... 6
Frequency range			Hz	49 ... 51	45 ... 65
Measured quantities			–	kWh	kWh
DISPLAY FEATURES					
Display type		LCD	–	9 (2 decimal)	9 (2 decimal)
		energy digits dimension	mm	6 x 3	6 x 3
Active energy		7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99	0.01 ... 9999999.99
Running tariff		1 digit	–	T1/T2	T1/T2
Display refresh period			seconds	1	1
OPTICAL METROLOGICAL LED					
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	10000	10000

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579 , EN 62059-32-1, EN 50470-1 AND EN 50470-3

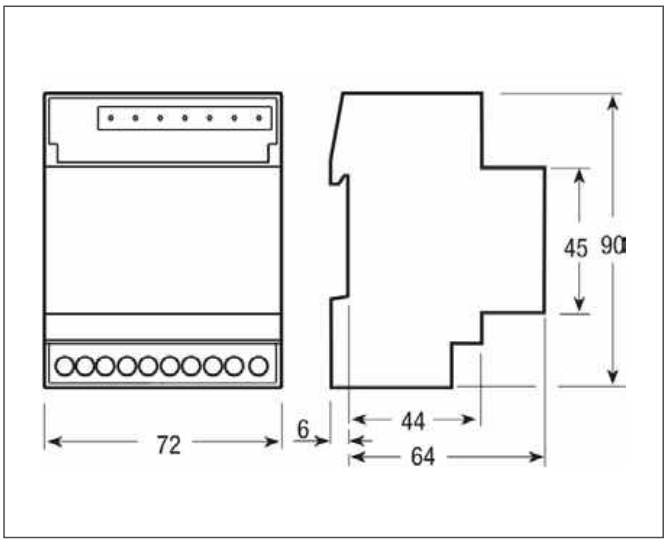
CT CONNECTION

TYPE			**ECS3 1-5 CP M-Bus** **ECS3 1-5 CP M-Bus MID** build-in communications M-Bus	**ECS3 1-5 CP Modbus** **ECS3 1-5 CP Modbus MID** build-in communications Modbus
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	mod. ECSEM212MID, ECSEM214MID ECSEM216MID	–	yes	yes
EMBEDDED COMMUNICATION M-Bus				
Baud rate	adjustable	–	up to 9600 bps	–
Unit load		–	1	–
Isolation class		–	SELV circuit	–
EMBEDDED COMMUNICATION Modbus				
Physical interface	RS485 - 3 wire	–	–	D1, D0, Common (GND)
Internal termination resistor		–	–	120 Ω
Baud rate	adjustable	–	–	up to 38400 bps
Parity	adjustable	–	–	Odd, Even, None
Stop bit	adjustable	–	–	1, 2
Address	adjustable	–	–	1 - 247
Isolation class		–	–	SELV circuit
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ2	PZ2
Screwdriver for tariff and comm. terminals	slotted head	mm	0.8 x 3.5	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1 (4)	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)	1 (4)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (4)	1 (4)
ENVIRONMENTAL CONDITIONS (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40	IP51* / IP40

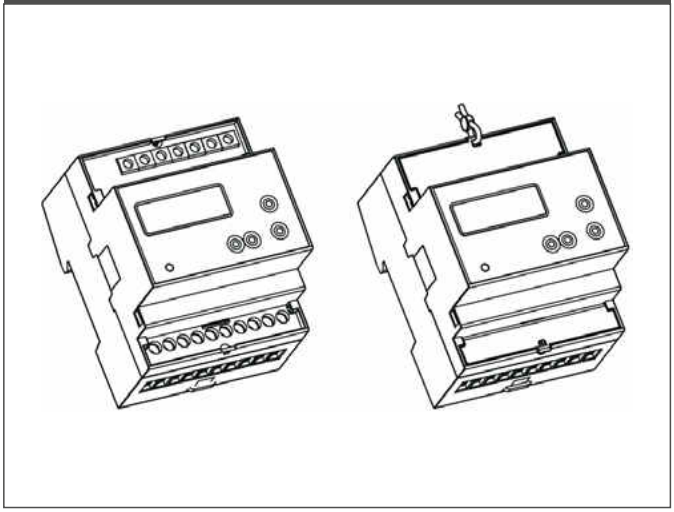
N(*) - Depends on CT-ratio and pulse on time

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

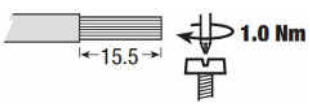
DIMENSIONS



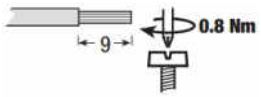
SEALABLE TERMINAL COVERS



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



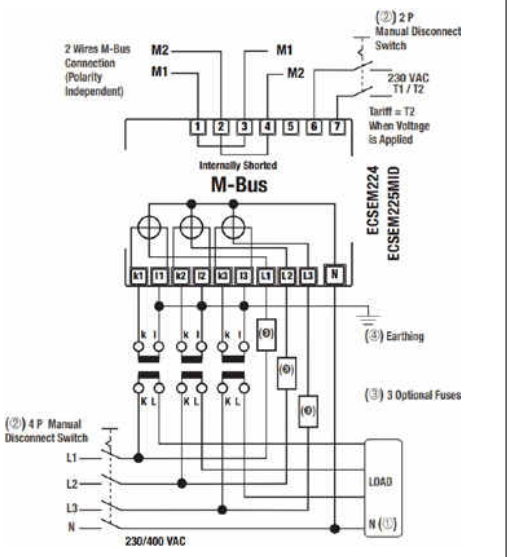
1 A / 5 A CT connection main terminals - Screw driver PZ1



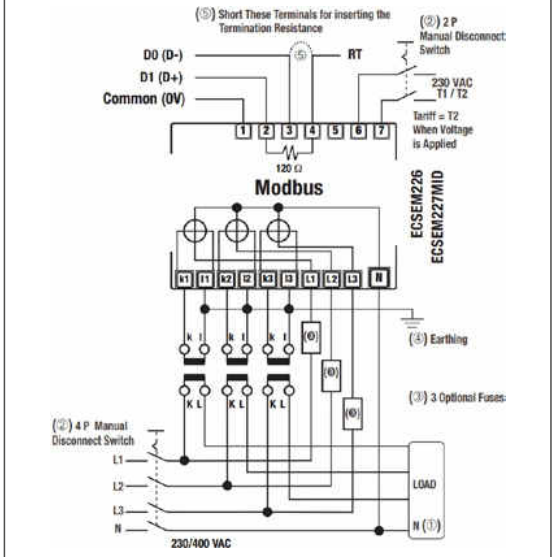
Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

INSTALLATION

WIRING DIAGRAM



WIRING DIAGRAM



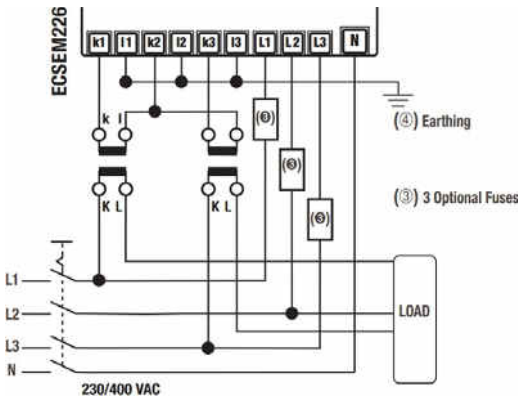
(1) The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.
Its connection to the load is optional, but, in the case, only 3-phase measures (Powers and Energies) are meaningful, while measures referred to L1, L2, and L3 are meaningless.

(2) These manual disconnect switches are mandatory for safe installing operation. Their purpose and location must be easily evident to installation personnel.

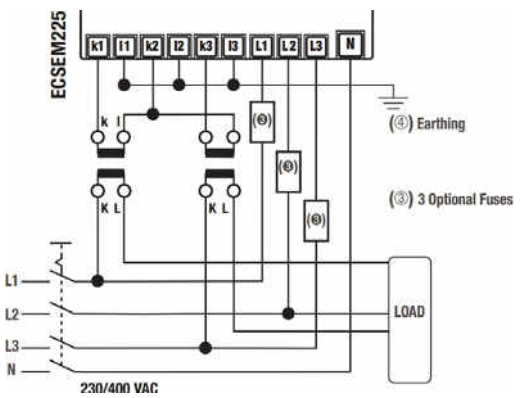
(3) These fuses are not mandatory, they are recommended to protect the line, not the device itself. Use >= 6 A fast (F) or >= 1 A delayed (T).

(4) Earthing of secondary windings of CTs is governed by the laws in force in the Countries where the device is installed. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage; furthermore, in this case the transformers are exposed to thermal overload.

ALTERNATIVE WIRING DIAGRAM



ALTERNATIVE WIRING DIAGRAM



(3) These fuses are not mandatory, they are recommended to protect the line, not the device itself. Use >= 6 A fast (F) or >= 1 A delayed (T).

(4) Earthing of secondary windings of CTs is governed by the laws in force in the Countries where the device is installed. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage; furthermore, in this case the transformers are exposed to thermal overload.

THREE-PHASE ENERGY METERS

ECS3-63 CP

ACTIVE ENERGY METERS

DIRECT CONNECTION 63 A

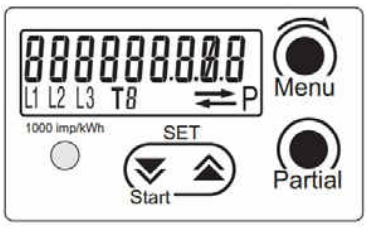
APPLICATIONS

4 QUADRANTS MID CERTIFIED (ECS3-63 CP MID) ACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 9 DIGITS LCD, 2 TARIFFS AND 2 S0 PULSE OUTPUTS (COMPLIANT TO IEC 62053-31) PROPORTIONAL TO SELECTABLE ENERGIES. COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR DIRECT CONNECTION UP TO 63 A. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

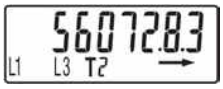
FEATURES

- 9 DIGITS LCD
- DIRECT CONNECTION
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY: CLASS B (1%) ACCORDING TO EN 50470-3
- OPERATING CURRENT RANGE (I_{st} ... I_{max}) = 0.015 ... 63 A
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ALSO THE CORRESPONDING PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- ONLY PARTIAL ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE.

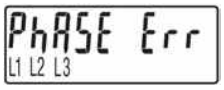
DISPLAY



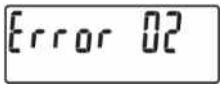
- Energy value
- T8 • Tarif Running tarif, called tarif
- Energy export (absorbed ←)
- Energy import (supplied →)
- L1 L2 L3 • Energy line (L1-2-3)
- 1000 imp/kWh • Precision control LED
- P • Energy value "Partial"
- SET Start • Parameters set
- Partial • Command button for "Partial" reading selection
- Menu • Menu key for reading selection



One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

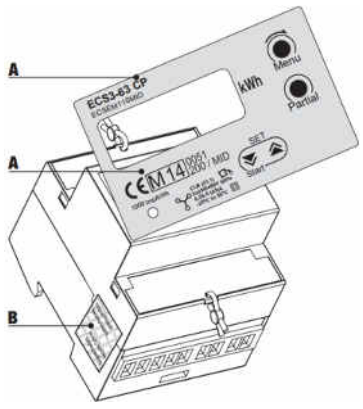


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

MID CALIBRATED (ECS3-63 CP MID)



A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-3 AND EN 62053-31

DIRECT CONNECTION

TYPE				
				ECS3-63 CP MID **ECS3-63 CP**
				pulse output S0
GENERAL CHARACTERISTICS				
Housing		DIN 43880	DIN	4 modules
Mounting		EN 60715	35 mm	DIN rail
Depth			mm	70
Weight			g	412
OPERATING FEATURES				
Connection		to three-phase network	n° wires	4
Storage of energy values and configuration		internal flash memory	–	yes
Tariff		for active and reactive energy	n° 2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)				
Reference voltage U_n		line to neutral	V AC	230
Reference voltage U_n		line to line	V AC	400
Reference current I_{ref}			A	5
Minimum current I_{min}			A	0.25
Maximum current I_{max}			A	63
Starting current I_{st}			A	0.015
Reference frequency f_n			Hz	50
Number of phases (number of wires)			–	3 (4)
Certified measures			kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	active energy (acc. to EN 50470-3) and active power		class	B
SUPPLY VOLTAGE AND POWER CONSUMPTION				
Operating supply voltage range			V	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 0.7
Voltage input waveform			–	AC
OVERLOAD CAPABILITY				
Voltage		continuous: phase/phase	V	480
		1 second: phase/phase	V	800
		continuous: phase/neutral	V	276
		1 second: phase/neutral	V	300
Current		continuous	A	63
		temporary (10 ms)	A	1890
MEASURING FEATURES				
Voltage range		phase/phase	V	160 ... 480
		phase/neutral	V	92 ... 276
Current range		secondary winding	A	0.015 ... 63
Frequency range			Hz	45 ... 65
Measured quantities			–	kWh
DISPLAY FEATURES				
Display type		LCD	–	9 (2 decimal)
		energy digits dimension	mm	6 x 3
Active energy		7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99
Running tariff		1 digit	–	T1 or T2
Display refresh period			second	1
OPTICAL METROLOGICAL LED				
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	10000

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-3 AND EN 62053-31

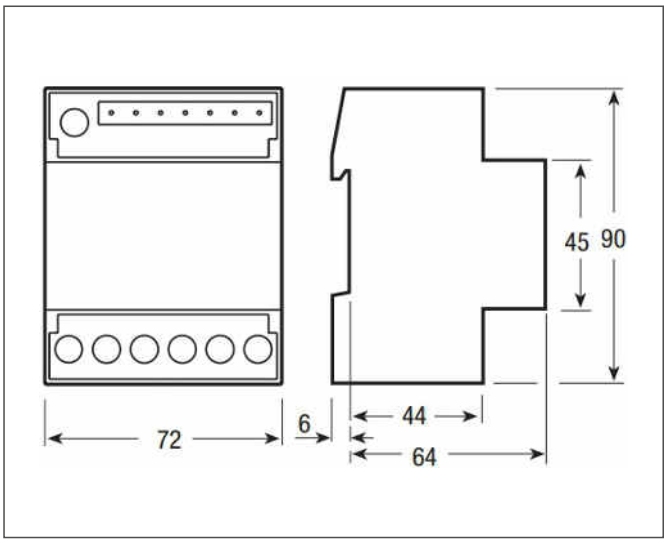
DIRECT CONNECTION

TYPE			
			ECS3-63 CP MID **ECS3-63 CP**
			pulse output S0
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
Safety-sealing between upper and lower housing part	model: ECSEM223MID	–	yes
PULSE OUTPUTS (S0 SIGNALS, ACC. TO IEC 62053-31)			
Pulse output 1	adjustable	–	kWh (→) - kWh (→) - kWh (T1)
Pulse output 2	adjustable	–	kWh (←) - kvarh (←) - kWh (T2)
Pulse rate	adjustable	p/kWh	10 ... 500
Pulse ON-time	adjustable	msec	30 ... 100
Operating voltage	min. - max.	V AC (DC)	5 ... 33 (5 ... 70)
Pulse ON maximum current		mA	90
Pulse OFF leakage current		µA	1
Isolation class		–	SELV
CONNECTION TERMINALS			
Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ2
Screwdriver for tariff and communication terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.5 (35)
	stranded wire with sleeve min. (max.)	mm^2	1.5 (35)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

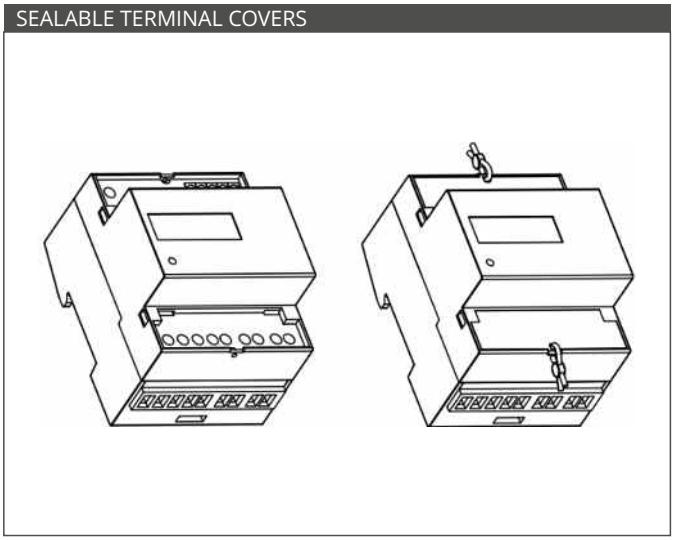
*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

THREE-PHASE ENERGY METERS
ECS3-63 CP

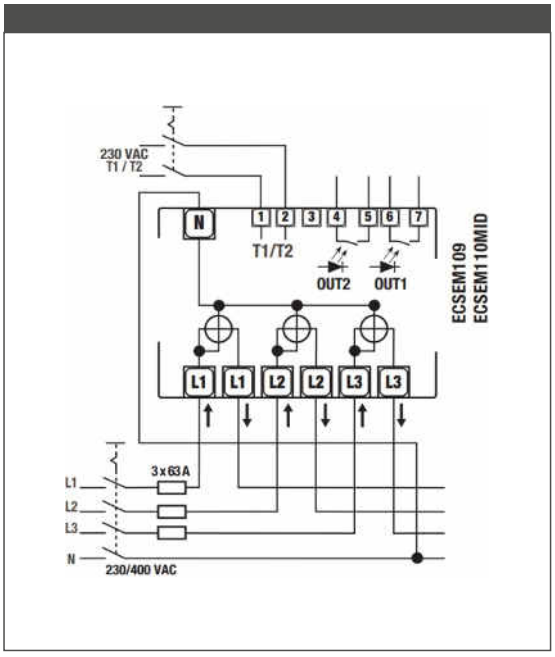
DIMENSIONS

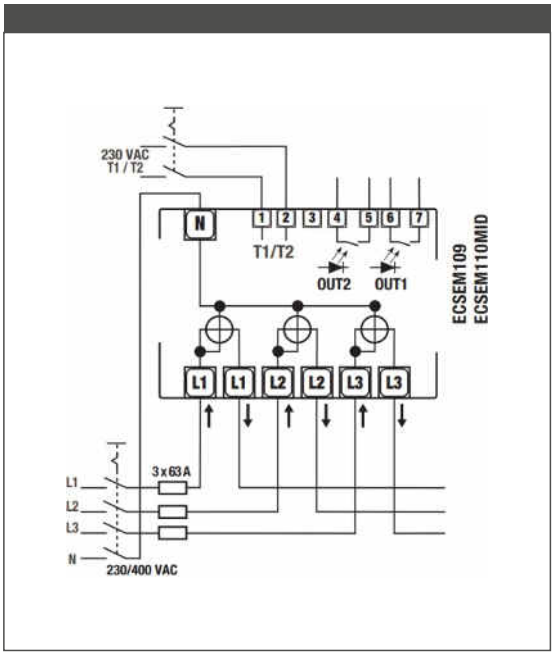


SEALABLE TERMINAL COVERS



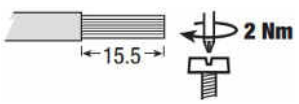
INSTALLATION



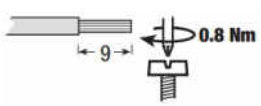


Neutral wire must be connected to the meter

CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



63 A direct connection main terminals - Screw driver PZ2



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

THREE-PHASE ENERGY METERS

ECS3-63 CP KNX

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTED 63 A

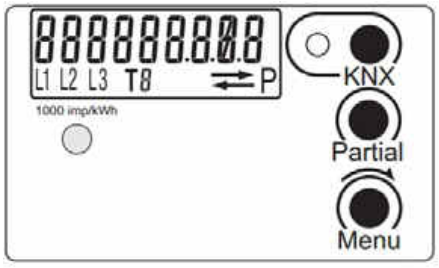
APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH 9 DIGITS LCD, 2 TARIFFS AND IN-BUILT KNX (4KV ISOLATED). COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR DIRECT CONNECTION. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

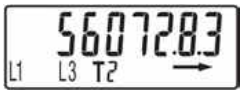
FEATURES

- 9 DIGITS LCD
- DIRECT CONNECTION
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY: CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.015 ... 63 A
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ALSO THE CORRESPONDING PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- IN-BUILT STANDARD KNX (COMPLIANT TO EN-50491-X, 4 kV ISOLATED). ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION ARE READABLE THROUGH KNX.
- ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)

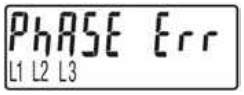
DISPLAY



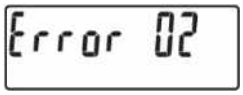
- 888888.8.8.8 • Energy value
- T8 • Tarif Running tarif, called tarif
- ⇄ • Energy export (absorbed ←) • Energy import (supplied →)
- L1 L2 L3 • Energy line (L1-2-3)
- 1000 imp/kWh • Metrological LED
- P • Energy value "Partial"
- KNX • KNX address writing
- Partial • Command button for "Partial" reading selection
- Menu • Menu key for reading selection



One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

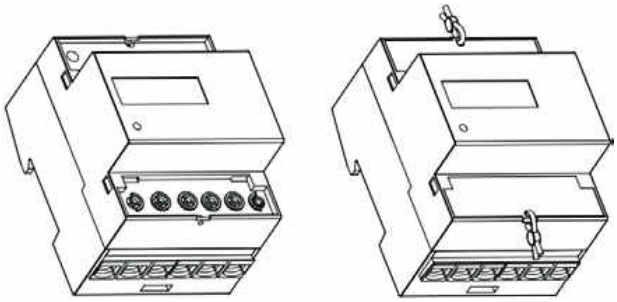


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

SEALABLE TERMINAL COVERS



THREE-PHASE ENERGY METERS
ECS3-63 CP KNX

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3			**DIRECT CONNECTION**
TYPE			**ECS3-63 CP KNX**
			build-in communication KNX
GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	4 modules
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
Weight		g	412
OPERATING FEATURES			
Connection	to three-phase network	n° wires	4
Storage of energy values and configuration	internal flash memory	–	yes
Tariff	for active and reactive energy	n° 2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)			
Reference voltage U_n	line to neutral	V AC	230
Reference voltage U_n	line to line	V AC	400
Reference current I_{ref}		A	5
Minimum current I_{min}		A	0.25
Maximum current I_{max}		A	63
Starting current I_{st}		A	0.015
Reference frequency f_n		Hz	50
Number of phases (number of wires)		–	3 (4)
Measures		kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	active energy (acc. to EN 50470-3) and active power	class	B
SUPPLY VOLTAGE AND POWER CONSUMPTION			
Operating supply voltage range		V	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)		VA (W)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}		VA	≤ 0.7
Voltage input waveform		–	AC
OVERLOAD CAPABILITY			
Voltage	continuous: phase/phase	V	480
	1 second: phase/phase	V	800
	continuous: phase/neutral	V	276
	1 second: phase/neutral	V	300
Current	continuous	A	63
	temporary (10 ms)	A	1890
MEASURING FEATURES			
Voltage range	phase/phase	V	160 ... 480
	phase/neutral	V	92 ... 276
Current range	secondary winding	A	0.015 ... 63
Frequency range		Hz	45 ... 65
Measured quantities		kWh	kWh
DISPLAY FEATURES			
Display type	LCD	–	9 (2 decimal)
	energy digits dimension	mm	6 x 3
Active energy	7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99
Running tariff	1 digit	–	T1 or T2
Display refresh period		second	1
OPTICAL METROLOGICAL LED			
Front mounted red LED (meter constant)	proportional to active imp/exp energy	p/kWh	10000

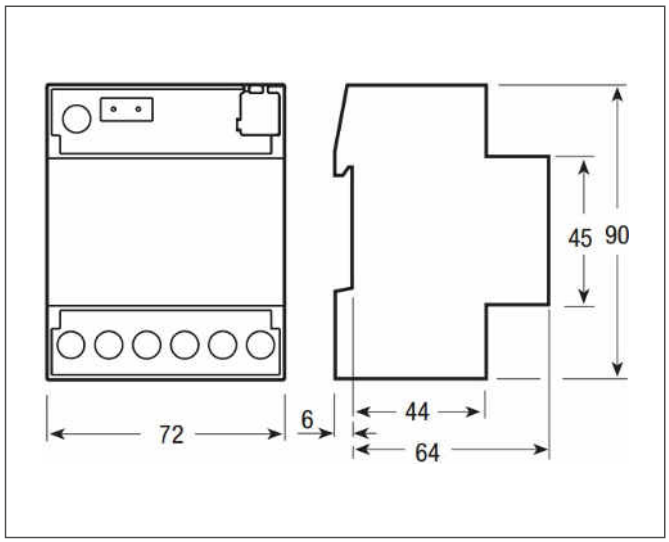
TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579, EN 62059-32-1, EN 50470-1 AND EN 50470-3			**DIRECT CONNECTION**
TYPE			**ECS3-63 CP KNX**
			build-in communication KNX
SAFETY			
Protective class		class	II
AC voltage test (EN 50470-3, 7.2)		kV	4
Degree of pollution		–	2
Operational voltage		V	300
Impulse voltage test		1.2/50 µs-kV	6
Housing material flame resistance	UL 94	class	V0
EMBEDDED COMMUNICATION KNX			
Physical interface		–	KNX terminal
Isolation class		–	SELV circuit
CONNECTION TERMINALS			
Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ2
Screwdriver for tariff and communication terminals	slotted head	mm	0.8 x 3.5
Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.5 (35)
	stranded wire with sleeve min. (max.)	mm^2	1.5 (35)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)			
Temperature range		°C	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)			
Temperature range		°C	-25 ... +55
Mechanical environment		–	M1
Electromagnetic environment		–	E2
Installation	indoor	–	yes
Altitude (max.)		meter	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40

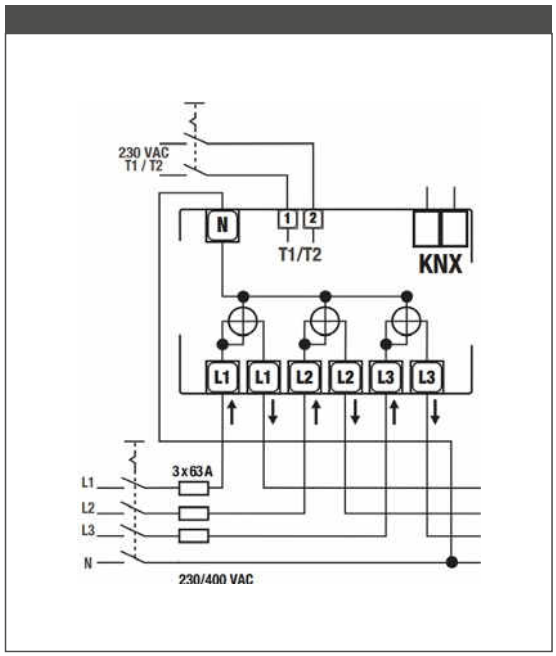
*** The metering equipment must be installed insid a cabinet witl IP rating IP51 or better.**

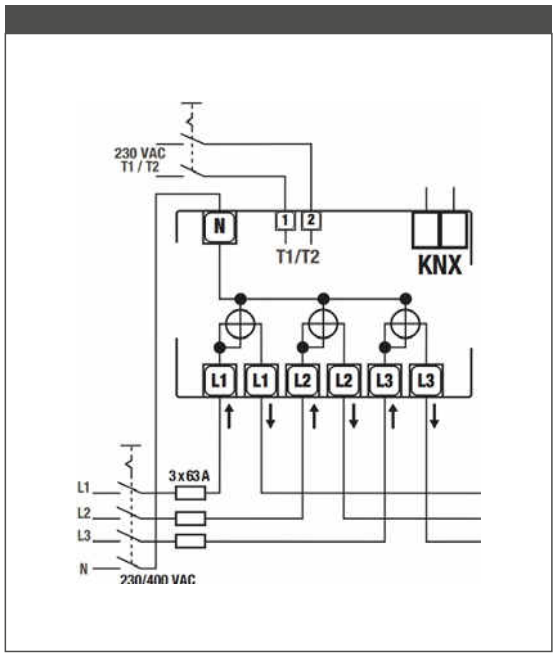
THREE-PHASE ENERGY METERS
ECS3-63 CP KNX

DIMENSIONS



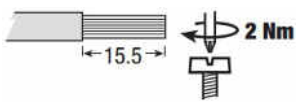
INSTALLATION



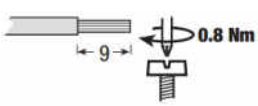


The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.

CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



63 A direct connection main terminals - Screw driver PZ2



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

THREE-PHASE ENERGY METERS
ECS3-63 CP M-Bus / ECS-63 CP Modbus

ACTIVE & REACTIVE ENERGY METERS

DIRECT CONNECTION 63 A

APPLICATIONS

4 QUADRANTS ACTIVE AND REACTIVE ENERGY METER FOR INDOOR MEASURING OF A THREE PHASE AC ELECTRICAL INSTALLATION, WITH:

- 9 DIGITS LCD, 2 TARIFFS AND IN-BUILT M-Bus (1 UNIT LOAD, 4 kV ISOLATED) – **ECS3-63 CP M-Bus**
- 9 DIGITS LCD, 2 TARIFFS AND IN-BUILT Modbus RTU (3 WIRES, 4 kV ISOLATED RS-485) - **ECS3-63 CP Modbus**

COMPACT DIN RAIL MOUNTING COUNTER, USED IN RESIDENTIAL, UTILITY AND INDUSTRIAL APPLICATIONS, COMPLIES WITH STANDARD EN 50470-1-3 AND IS DESIGNED FOR DIRECT CONNECTION. THE CERTIFIED VERSIONS ARE IN ACCORDANCE WITH THE MID DIRECTIVE. ACTIVE ENERGY AND SEVERAL ELECTRICAL VALUES ARE LOCALLY DISPLAYED. IN MID CERTIFIED VERSIONS THE ENERGY REGISTERS CANNOT BE RESET. IT HAS A DEDICATED DIGITAL INPUT FOR TARIFF SELECTION (T1/T2).

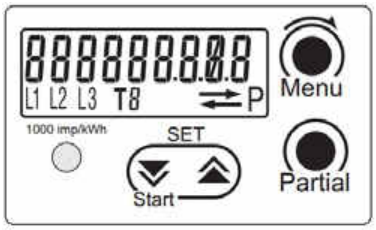
VERSIONS

TYPE	ECS3-63 CP Modbus	ECS3-63 CP Modbus MID	ECS3-63 CP M-Bus	ECS3-63 CP M-Bus MID
Communication	Modbus	Modbus	M-Bus	M-Bus
MID certified	NO	YES	NO	YES

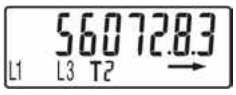
FEATURES

- 9 DIGITS LCD
- DIRECT CONNECTION
- PHASE SEQUENCE ERROR DETECTION WITH DISPLAY ERROR MESSAGE
- MISSING PHASE(S) INDICATION
- ACTIVE ENERGY ACCURACY CLASS B (1%) ACCORDING TO EN 50470-3
- REACTIVE ENERGY ACCURACY: CLASS 2 ACCORDING TO EN 62053-23
- OPERATING CURRENT RANGE AT INPUT TERMINALS (I_{st} ... I_{max}) = 0.015 ... 63 A
- IMPORTED AND EXPORTED ACTIVE ENERGY REGISTERS, UNDER TARIFFS T1 AND T2, ARE READABLE ON DISPLAY
- ALSO THE CORRESPONDING PARTIAL ENERGY REGISTERS ARE READABLE ON DISPLAY
- IN-BUILT STANDARD M-BUS (4 kV ISOLATED, 1 UNIT LOAD, COMPLIANT TO EN 13757-2 AND -3). ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION ARE INCLUDED IN READOUT DATA MESSAGES
- IN-BUILT MODBUS RTU (3 WIRES, 4KV ISOLATED RS-485, WITH INTERNAL SELECTABLE TERMINATION RESISTOR). ITS DATABASE INCLUDES ACTIVE AND REACTIVE ENERGIES AND ALL MEASURES RELEVANT FOR MONITORING THE ELECTRICAL INSTALLATION
- ONLY PARTIAL ENERGY REGISTERS ARE RESETTABLE
- SEALABLE TERMINAL COVERS
- DIN-RAIL MOUNTING, ACCORDING TO EN 60715, 4 MODULES WIDE (72 mm)
- THE METER IS COMPLIANT WITH MID DIRECTIVE WHEN IS MOUNTED INSIDE A CABINET WITH IP51 (OR HIGHER) PROTECTION DEGREE.

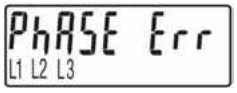
DISPLAY



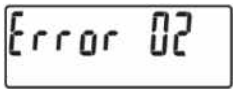
- Energy value
- T8 — Tarif Running tarif, called tarif
- Energy export (absorbed ←)
- Energy import (supplied →)
- L1 L2 L3 — Energy line (L1-2-3)
- 1000 imp/kWh — Precision control LED
- P — Energy value "Partial"
- SET / Start — Parameters set
- Partial — Command button for "Partial" reading selection
- Menu — Menu key for reading selection



One or more missing phase: In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

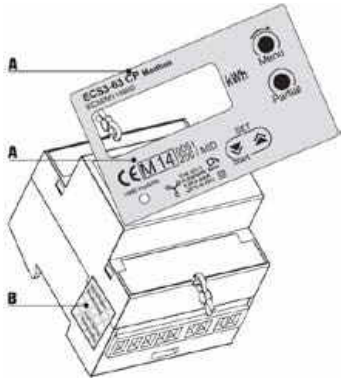


Phase sequence error: When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappears, you can keep pushed the **"Menu key"** for at least 4 seconds.



Error condition: When the display shows the message **"Error 2 or Error 3"**, the meter has got a malfunction and must be replaced.

MID CALIBRATED (ECS3 1-5 CP MID)



A) Device code and certification data indications
B) Safety-sealing between upper and lower housing part

THREE-PHASE ENERGY METERS
ECS3-63 CP M-Bus / ECS-63 CP Modbus

TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579 , EN 62059-32-1, EN 50470-1 AND EN 50470-3 — **DIRECT CONNECTION**

TYPE				**ECS3-63 CP M-Bus** **ECS3-63 CP M-Bus MID** build-in communications M-Bus	**ECS3-63 CP Modbus** **ECS3-63 CP Modbus MID** build-in communications Modbus
GENERAL CHARACTERISTICS					
Housing		DIN 43880	DIN	4 module	4 module
Mounting		EN 60715	35 mm	DIN rail	DIN rail
Depth			mm	70	70
Weight			g	412	412
OPERATING FEATURES					
Connection		to three-phase network	n° wires	4	4
Storage of energy values and configuration		internal flash memory	–	yes	yes
Tariff		for active energy	n° 2	T1 and T2	T1 and T2
APPROVAL (according to EN 50470-1, EN 50470-3)					
Reference voltage U_n		line to neutral	V AC	230	230
Reference voltage U_n		line to line	V AC	400	400
Reference current I_{ref}			A	5	5
Minimum current I_{min}			A	0.25	0.25
Maximum current I_{max}			A	63	63
Starting current I_{st}			A	0.015	0.015
Reference frequency f_n			Hz	50	50
Number of phases (number of wires)			–	3 (4)	3 (4)
Certified measures			kWh	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2	→ kWh T1, ← kWh T1 → kWh T2, ← kWh T2
Accuracy	active energies (acc. to EN 50470-3) and active power		class	B	B
SUPPLY VOLTAGE AND POWER CONSUMPTION					
Operating supply voltage range			V	92 ... 276 / 160 ... 480	92 ... 276 / 160 ... 480
Maximum power dissipation (voltage circuit)			VA (W)	≤ 2 (0.6)	≤ 2 (0.6)
Maximum VA burden (current circuit) at I_{max}			VA	≤ 0.7	≤ 0.7
Voltage input waveform			–	AC	AC
OVERLOAD CAPABILITY					
Voltage		continuous: phase/phase	V	480	480
		1 second: phase/phase	V	800	800
		continuous: phase/neutral	V	276	276
		1 second: phase/neutral	V	300	300
Current		continuous	A	63	63
		temporary (0.5 ms)	A	1890	1890
MEASURING FEATURES					
Voltage range		phase/phase	V	160 ... 480	160 ... 480
		phase/neutral		92 ... 276	92 ... 276
Current range		secondary winding	A	0.015 ... 63	0.015 ... 63
Frequency range			Hz	49 ... 51	45 ... 65
Measured quantities			–	kWh	kWh
DISPLAY FEATURES					
Display type		LCD	–	9 (2 decimal)	9 (2 decimal)
		energy digits dimension	mm	6 x 3	6 x 3
Active energy		7 digits + 2 decimal digits	min. ... max. kWh	0.01 ... 9999999.99	0.01 ... 9999999.99
Running tariff		1 digit	–	T1 or T2	T1 or T2
Display refresh period			seconds	1	1
OPTICAL METROLOGICAL LED					
Front mounted red LED (meter constant)		proportional to active imp/exp energy	p/kWh	10000	10000

THREE-PHASE ENERGY METERS
ECS3-63 CP M-Bus / ECS-63 CP Modbus

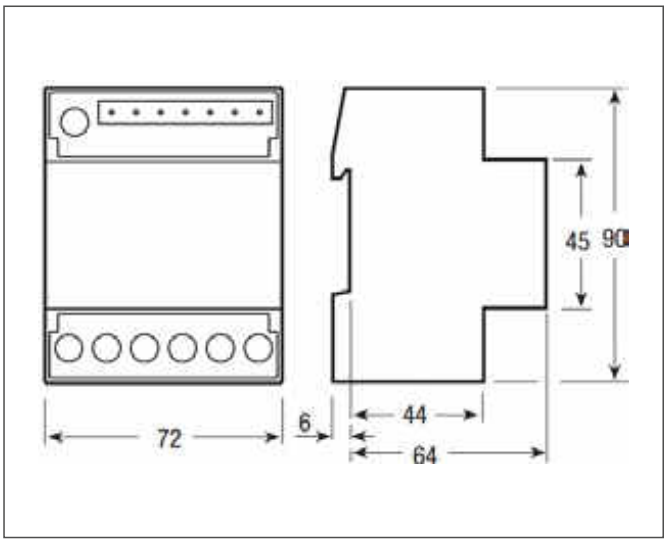
TECHNICAL DATA

DATA IN COMPLIANCE WITH CLC/TR 50579 , EN 62059-32-1, EN 50470-1 AND EN 50470-3 — **DIRECT CONNECTION**

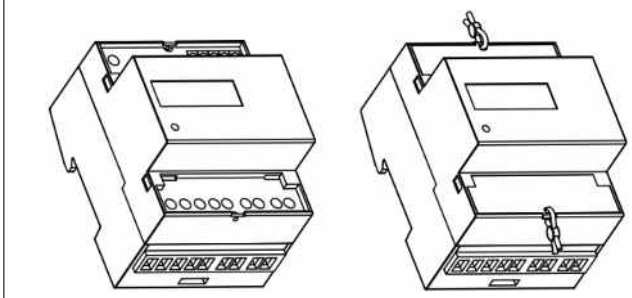
TYPE				
			ECS3-63 CP M-Bus **ECS3-63 CP M-Bus MID** build-in communications M-Bus	**ECS3-63 CP Modbus** **ECS3-63 CP Modbus MID** build-in communications Modbus
SAFETY				
Protective class		class	II	II
AC voltage test (EN 50470-3, 7.2)		kV	4	4
Degree of pollution		–	2	2
Operational voltage		V	300	300
Impulse voltage test		1.2/50 µs-kV	6	6
Housing material flame resistance	UL 94	class	V0	V0
Safety-sealing between upper and lower housing part	mod. ECSEM112MID	–	yes	yes
EMBEDDED COMMUNICATION M-Bus				
Baud rate	adjustable	–	up to 9600 bps	–
Unit load		–	1	–
Isolation class		–	SELV circuit	–
EMBEDDED COMMUNICATION Modbus				
Physical interface	RS485 - 3 wire	–	–	D1, D0, Common (GND)
Internal termination resistor		–	–	120 Ω
Baud rate	adjustable	–	–	up to 38400 bps
Parity	adjustable	–	–	Odd, Even, None
Stop bit	adjustable	–	–	1, 2
Address	adjustable	–	–	1 - 247
Isolation class		–	–	SELV circuit
CONNECTION TERMINALS				
Screwdriver for mains terminal	head with Z +/-	POZIDRIV	PZ2	PZ2
Screwdriver for tariff and comm. terminals	slotted head	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)	1.5 (35)
	stranded wire with sleeve min. (max.)	mm^2	1.5 (35)	1.5 (35)
Terminal capacity for tariff and communication	solid wire min. (max.)	mm^2	1 (4)	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)	1 (2.5)
ENVIRONMENTAL CONDITIONS (STORAGE)				
Temperature range		°C	-25 ... +70	-25 ... +70
ENVIRONMENTAL CONDITIONS (OPERATING)				
Temperature range		°C	-25 ... +55	-25 ... +55
Mechanical environment		–	M1	M1
Electromagnetic environment		–	E2	E2
Installation	indoor	–	yes	yes
Altitude (max.)		meter	≤ 2000	≤ 2000
Humidity	yearly average, not condensing	–	≤ 75 %	≤ 75 %
	on 30 days per year (not condensing)	–	≤ 95 %	≤ 95 %
IP rating	front panel / terminals	–	IP51* / IP40	IP51* / IP40

*** The metering equipment must be installed insid a cabinet with IP rating IP51 or better.**

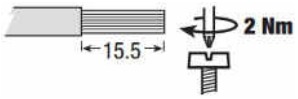
DIMENSIONS



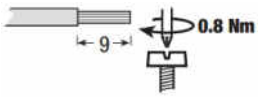
SEALABLE TERMINAL COVERS



CABLE STRIPPING LENGHT AND MAX. TERMINAL SCREW TORQUE



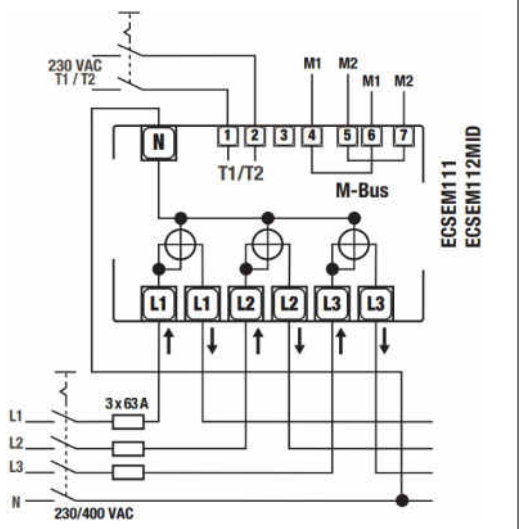
63 A direct connection main terminals - Screw driver PZ2



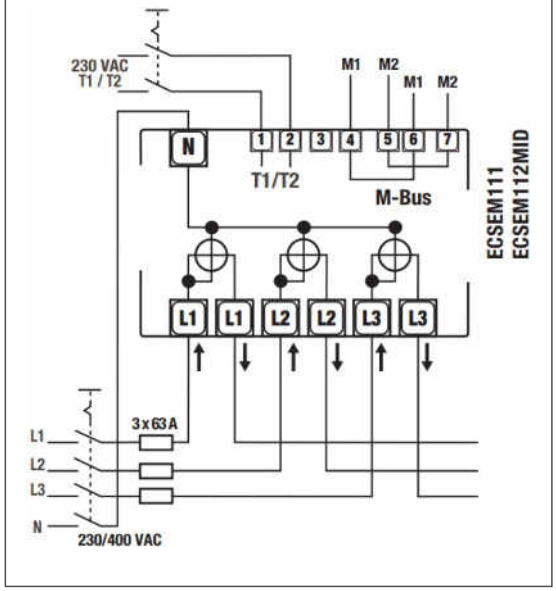
Tariff and communication terminals - Screw driver blade 0.8x3.5 mm

INSTALLATION

WIRING DIAGRAM M-Bus

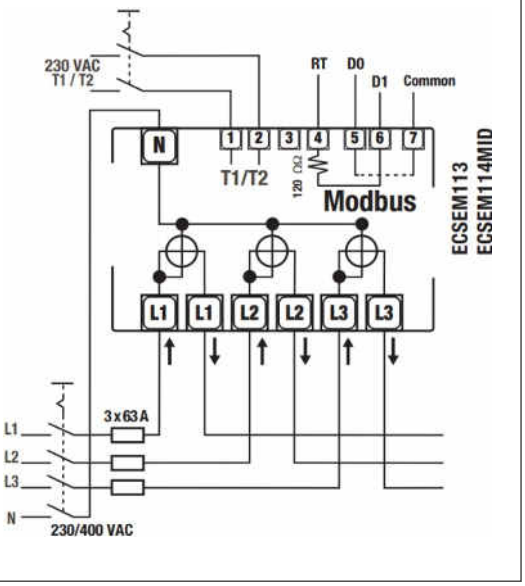


WIRING DIAGRAM M-Bus

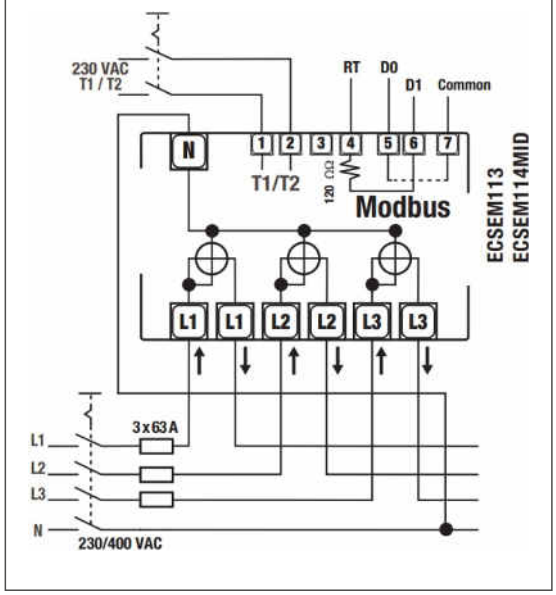


The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.

WIRING DIAGRAM Modbus



WIRING DIAGRAM Modbus



The connection of the neutral wire to the "N" terminal of the energy meter is mandatory.
When the terminals RT and D0 are shorted, a termination resistor of 120 Ω is applied inside of the energy meter

INDEX

COMMUNICATION 2

ADD-ON MODULES
COMMUNICATION MODULES SUMMARY

TECHNICAL DATA

Suitable 1/3-phase energy, Power meters and network anal.






CHARACTERISTICS							
Communication link		**M-Bus**	**Modbus**	**KNX**	**SD-CARD**	**LAN TCP/IP**	**eVISION**
Connection		through side IR	through side IR	through side IR	through side IR	through side IR	through side IR
According to EN 61000-6-2-3, EN 61000-4-2		yes	yes	yes	yes	yes	yes
According to norm general		EN 1434/IEC 60950 EN 13757-1-2-3	IEC 60950	EN 60664-1 EN 50090-2-2	IEC 60950	IEC 60950	IEC 60950
Housing DIN modules		1	1	1	1	1	1
Suitable 1/3-phase energy, Power meters and network anal.		yes	yes	yes	yes	yes	yes
POWER SUPPLY							
Voltage range		through bus	230 V ±20 %	through bus	12 - 24 V AC/DC	230 V ±20 %	230 V ±20 %
Self supplied		yes	–	yes	–	–	–
Aux. power rating		–	≤1 VA	–	≤0.5 VA	≤1.5 W	≤1.5 W
Frequency range		–	45 ... 65 Hz	–	45 ... 65 Hz	45 ... 65 Hz	45 ... 65 Hz
OPERATION FEATURE							
Memory storage		–	–	–	1 - 8 gigabyte	–	–
Bus - HW interface		2 screw clamps	5 screw clamps	black/red connector	2 screw clamps	2 screw clamps + RJ 45	2 screw clamps + RJ 45
Bus - SW protocol		acc. EN 1434	RS 485	KNX	proprietary	TCP/IP	TCP/IP
Bus - Bandrate		300 - 9600	≤38.400	9600	–	≤100 Mbit/s	≤100 Mbit/s
Addresing		primary + secondary	1 ... 247	through ETS	–	by means of its IP address	by means of its IP address
User interface for setup and management		–	–	–	–	W3C HTML 4.01	
Physical interface to instruments		infrared	infrared	infrared	infrared	infrared	infrared
Infrared data exchange		Tx/Rx	Tx/Rx	Tx/Rx	Tx/Rx	Tx/Rx	Tx/Rx
Infrared SW protocol		proprietary	proprietary	proprietary	proprietary	proprietary	proprietary
Real time clock		–	–	–	–	–	yes
SAFETY acc. to IEC 60950							
Degree of pollution		2	2	2	2	2	2
Overvoltage category		II	II	II	II	II	II
Working voltage		24 - 36	... 300 V	30 V DC max.	30 V DC max.	... 300 V	... 300 V
Test voltage impulse	(1.2/50 µs) peak value kV	2.5	2.5	2.5	2.5	4	4
	50 Hz, 1 min kV	1.35	2.5	1.35	1.35	4	4
ENVIRONMENTAL CONDITIONS							
Operating temperature		-10 to 55 °C	-10 to 55 °C	-10 to 55 °C	-10 to 55 °C	-10 to 55 °C	-10 to 55 °C
Limit temperature of storage		-25 to 70 °C	-25 to 70 °C	-25 to 70 °C	-25 to 70 °C	-25 to 70 °C	-25 to 70 °C
Relative humidity		≤80%	≤80%	≤80%	≤80%	≤80%	≤80%
Vibrations amplitude at 50 Hz		±0.25 mm	±0.25 mm	±0.25 mm	±0.25 mm	±0.25 mm	±0.25 mm
Protection class		II	II	II	II	II	II
Degree of protection		IP 20	IP 20	IP 20	IP 20	IP 20	IP 20

M-Bus INTERFACE

APPLICATIONS

M-Bus IS A STANDARD WIDELY USED FOR REMOTE READING OF VARIOUS TYPES OF UTILITY METERS AND SENSORS. THE INTERFACE RECEIVES THE MEASUREMENT DATA FROM THE ENERGY METERS BY ITS INFRARED SIDE PORT AND POWER SUPPLY DIRECTLY FROM THE BUS, SO THAT ONLY THE BUS WIRING (A STANDARD TWISTED PAIR TELEPHONE CABLE) MUST BE CONNECTED. THE INTERFACE IS SUITABLE FOR BOTH SINGLE PHASE AND THREE PHASE ENERGY METERS AND ALLOWS THE REMOTE READING OF ALL THE MEASURE REGISTERS. STATUS BYTES ARE AVAILABLE AS WELL, CONTAINING INFORMATION ABOUT THE STATUS OF THE ENERGY METERS (RUNNING TARIFF NOMINAL, VOLTAGE AND CURRENT RANGE OVERFLOW). COMMANDS CAN BE SENT VIA M-Bus FOR RESETTING THE ENERGY ACCOUNTS.

FUNCTION

MEASUREMENTS

- Remote reading of energy, power, voltage, current, frequency and cosφ.

COMMANDS

- Commands can be sent via M-Bus to the interface for resetting the energy accounts
- Commands are enabled only on relevant measuring instruments models

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm

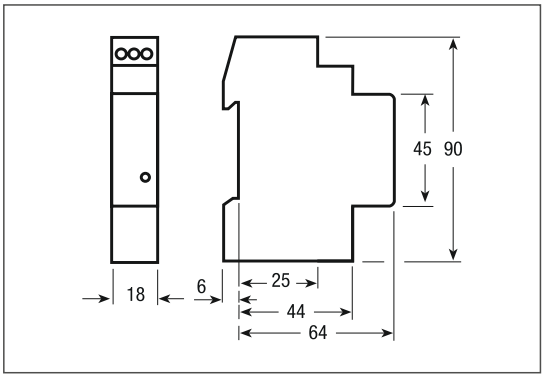
- **M-Bus interface**

TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 13757-1-2-3, IEC 60950-1, EN 61000-6-2, EN 61000-6-3 AND 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
POWER SUPPLY			
Power supply		–	through bus connection
OPERATING FEATURES			
Models available: for energy, power, V, I, cosφ, frequency			
Suitable for both single-phase and three-phase energy meters		–	yes
Modbus INTERFACE			
HW interface		–	2 screw clamps
SW protocol		–	M-Bus acc. to EN 1434
Baud rate		baud	300 - 9600
INTERFACE TO MEASURING INSTRUMENT			
HW interface	optical IR	n°	2 (Tx, Rx)
SW protocol		–	proprietary
SAFETY acc. to IEC 60950-1			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V DC	24 ... 36
Material group		–	II
Clearance		mm	≥1.5
Creepage distance	in equipment	mm	≥2.1
	on PCB (not coated)	mm	≥2.1
Test voltage	impulse (1.2/50 µs) peak value	kV	2.5
	50 Hz , 1 min	kV	1.35
Housing material flame resistance		class	V0
CONNECTION TERMINALS			
Type cage	screw head Z +/-	POZIDRIV	PZ0
Terminal capacity	solid wire min. (max.)	mm^2	0.15 (2.5)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)
ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20

DIMENSIONS



Modbus INTERFACE

APPLICATIONS

THE PRODUCT TRANSMITS THE MEASURED VALUES THROUGH AN RS-485 SERIAL LINE TO A REMOTE COLLECTION STATION USING Modbus PROTOCOL. THE MODULE IS PROVIDED WITH A SOFTWARE TOOL FOR WINDOWS, FOR CONFIGURING INSTALLATION PARAMETERS (SUCH AS Modbus ADDRESS AND BAUD RATE) AND GENERAL SETTINGS. THE INTERFACE ACTS AS A Modbus SLAVE, SO THAT THE TRANSMITTED MEASUREMENTS CAN BE COLLECTED AND DISPLAYED USING ONE OF THE Modbus MASTER SOFTWARE TOOLS AVAILABLE ON THE MARKET.

FEATURES

- M-Bus ACCORDING TO EN1434
- SUITABLE FOR BOTH SINGLE PHASE AND THREE PHASE
- ENERGY METERS
- LED FOR COMMUNICATION STATUS AND RESET BUTTON
- POWER SUPPLY FROM THE BUS

FUNCTION

CONFIGURATION

- The interface is provided with a software tool for Windows, for configuring installation parameters (such as Modbus address and baudrate) and general settings.

PLUG AND PLAY

- The interface is enabled to recognize automatically the instrument connected to its Infra-Red port.
- This is an advantage in terms of flexibility, because the same interface can be connected, for instance, to single-phase or three-phase energy meters

MEASUREMENTS

- The interface acts as a Modbus slave, so that the transmitted measurements can be collected and displayed using one of the Software tools available on the market enabled to act as a Modbus Master.

BAUDRATE

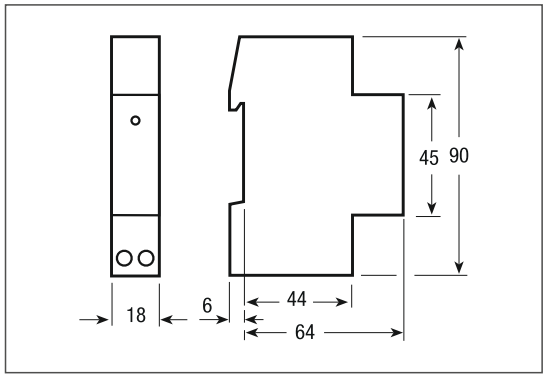
- The interface is enabled to operate with a number of baudrates, up to 115200 baud.

Modbus INTERFACE

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm

- **Modbus LE/BE**

DIMENSIONS



Modbus INTERFACE

TECHNICAL DATA

DATA IN COMPLIANCE WITH IEC 60950-1, EN 61000-6-2, EN 61000-6-3 AND EN 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70

POWER SUPPLY			
Auxiliary voltage rating U_n		V	230
Auxiliary power rating		VA	≤10
Auxiliary voltage range		V	0.80 and 1.2 x U_n
Frequency rating		Hz	50/60
Frequency range		Hz	45 ... 65

OPERATING FEATURES			
Models available:			
type FULL - LITTLE ENDIAN: for energy, power, V, I, cosφ, freq.		–	yes
type FULL - BIG ENDIAN: for energy, power, V, I, cosφ, freq.		–	yes
Suitable for both single-phase and three-phase energy meters		–	yes

Modbus INTERFACE			
HW interface	RS 485	terminals n°	3 (+/-, cable shield)
Input resistance		UL (kΩ)	1 (12)
Termination resistance		Ω	180
SW protocol	SW selectable	–	Modbus ASCII / Modbus RTU
Data transfer speed	SW selectable	boud	≤38.400 - default 19200
Parity		–	none/even - default: even
Addressing		–	1 - 247

INTERFACE TO MEASURING INSTRUMENT			
HW interface	optical IR	n°	2 (Tx, Rx)
SW protocol		–	proprietary

SAFETY acc. to IEC 60950-1			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V	300
Clearance		mm	≥4
Creepage distance		mm	≥4
Test voltage	impulse (1.2/50 µs) peak value on AC power supply	kV	2.5
	on telecommunication network	kV	1.5
	50 Hz , 1 min	kV	2.5
Housing material flame resistance	UL 94	class	V0

CONNECTION TERMINALS			
Type cage	screw head Z +/-	POZIDRIV	PZ0
Terminal capacity	solid wire min. (max.)	mm^2	0.15 (2.5)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)

ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20

KNX INTERFACE

APPLICATIONS

KNX BUS IS WIDELY USED FOR HOME AND BUILDING CONTROL APPLICATIONS. THE KNX INTERFACE MODULE IS USED TO CONNECT THE ENERGY METER TO KNX BUS. THE POWER SUPPLY COMES DIRECTLY FROM THE BUS, SO THAT ONLY THE BUS WIRING (A STANDARD TWISTED PAIR) MUST BE CONNECTED. THE INTERFACE IS PROVIDED WITH AN ETS4 APPLICATION PROGRAM, IN ORDER TO ALLOW FOR THE CONFIGURATION OF THE COMMUNICATION.THE INTERFACE RECEIVES THE MEASUREMENT DATA FROM THE ENERGY METER BY MEANS OF THE INFRARED PORT AVAILABLE ON THE SIDE OF THE ENERGY METER ITSELF. IT IS SUITABLE FOR BOTH SINGLE-PHASE AND THREE-PHASE ENERGY METERS.

FEATURES

- CONFIGURATION VIA ETS4
- ENERGY REGISTERS TRANSMITTED AS FLOAT VALUES (EIS9)
- SUITABLE FOR BOTH SINGLE PHASE AND THREE PHASE ENERGY METERS
- POWER SUPPLY FROM THE BUS
- STANDARD KNX INTERFACE CONNECTION

FUNCTION

CONFIGURATION

- The interface is provided with an application programto be imported in ETS4, in order to allow the configuration of the communication. ETS4 is the standard software for EIB-KNX systems configuration.

MEASUREMENTS

- All the active and reactive energy, voltage, current, active, reactive, apparent power, power factor, frequency registers available on the measuring instrument can be transmitted over the bus.
- Transmission modes available are "on request" and "automatic", based on an adjustable energy account increment (for instance a message every 10 KWh).

VOLTAGE LIMITS

- Upper and lower voltage limits can be set via ETS4.
- A warning message will be sent over the bus by the interface, in case the voltage value goes beyond the limits.

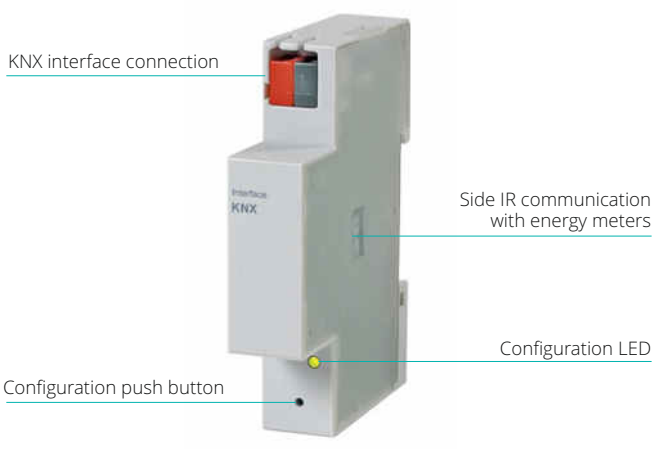
BAUDRATE

- Commands can be sent via bus to the interface for resetting the energy accounts.

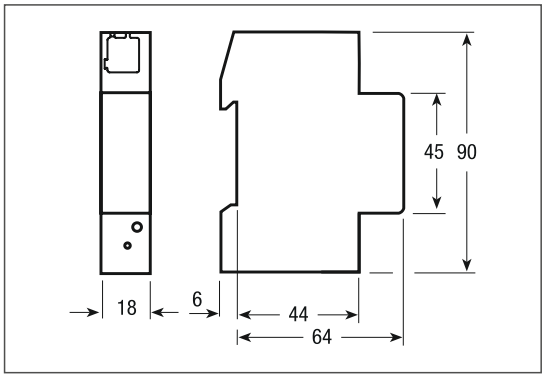
KNX INTERFACE

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm

- **KNX interface**



DIMENSIONS



TECHNICAL DATA

DATA IN COMPLIANCE WITH EN 60664-1, EN 50090-2-2, EN 61000-6-2, EN 61000-6-3 AND EN 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
POWER SUPPLY			
Power supply		–	through bus connection
OPERATING FEATURES			
Models available:	for energy register and power measurements		
Communication in compiance with KNX standard for home and building control		–	
Energy registers transmitted as float values (DPT 13. xxx)		–	
Power registers transmitted as float values (DPT 14. xxx)		–	
Status bytes available		–	
Energy account remote reset available (not active some energy meters models)		–	
Suitable for both single-phase and three-phase energy meters		–	yes
Configuration via ETS4		–	
KNX INTERFACE			
HW interface		–	black/red terminals for connection to twisted pair type 1 (TP-1)
Baud rate		–	9600 bps
INTERFACE TO MEASURING INSTRUMENT			
HW interface	optical IR	n°	2 (Tx, Rx)
SW protocol		–	proprietary
SAFETY acc. to IEC 60950-1			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V DC (max.)	30
Clearance		mm	≥1.5
Creepage distance	in equipment	mm	≥2.1
	on printed wiring boards (not coated)	mm	≥1.5
Test voltage	impulse (1.2/50 µs) peak value	kV	2.5
	50 Hz , 1 min	kV	1.35
Housing material flame resistance	UL 94	class	V0
ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20

SD-CARD DATALOGGER

APPLICATIONS

THE SD-CARD MODULE IS A DIN RAIL-MOUNTING (1 DIN MODULE, 17.5 mm); IT RECEIVES DATA FROM ENERGY METER THROUGH THE INFRA-RED INTERFACE. ITS PURPOSE IS TO STORE DATA COMING FROM THE ENERGY METER INTO A REMOVABLE SD-CARD. THE SIZE OF THE SD-CARD AND THE INTERVAL PERIOD BETWEEN 2 RECORDS STORAGE ARE ALSO CONFIGURABLE. THE POWER SUPPLY IS PROVIDED BY MEANS OF A IMQ SAFETY APPROVED DIN RAIL MOUNTED TRANSFORMER (1 DIN MODULE, 17.5 mm, 230 VAC / 12 VAC - 4 VA). IN CASE THE WHOLE SET OF DATA IS STORED IN EACH RECORD, IT IS POSSIBLE TO STORE APPROX. 1.250.000 RECORDS PER GIGABYTE. OF COURSE, THE SMALLER THE NUMBER OF DATA PER RECORD, THE LARGER THE NUMBER OF RECORDS THAT THE MODULE CAN STORE INSIDE THE SD-CARD. IN ANY MOMENT, ONE CAN REMOVE THE SD-CARD FROM THE MODULE, AND CAN INSERT IT IN A PC WITH A DEDICATED RECEPTACLE, TO WATCH THE SAVED DATA. INSIDE THE SD-CARD A CONFIGURATION FILE IS WRITTEN, THUS ALLOWING THE SELECTION OF THE PARAMETERS TO BE SAVED, OF THE RATE OF RECORDING, ETC. THE MODULE CAN MANAGE SD CARDS OF 1 TO 8GB SIZES

FEATURES

- SD-CARD MEMORY FROM 1 TO 8 GB
- PRE-INSTALLED CONFIGURATION FILE
- CONFIGURABLE SIZE, DATASET AND RECORDING RATE
- SUITABLE FOR BOTH SINGLE PHASE AND THREE PHASE ENERGY METERS
- 1 DIN MODULE WIDE (17.5 mm)
  REQUIRE AUXILIARY POWER SUPPLY TRANSFORMER 12-24 V AC/DC

FUNCTION

MEANING OF LED

- I / R-LED is the reference of IR communication with meter. REC-LED blinks for 8 seconds before a registration is performed on the memory. During registration the LED stays continuously on; in this status the memory shall not be extracted from device in order to not ruin the integrity of saved data MEM-LED is normally off and gets turned on in case less of 25% of memory is available When memory is full, LED-REC and MEM blink.

MEASUREMENTS

- If the whole set of data is selected, it is possible to store approximately 1.250.000 records for each Gigabyte, and, if the minimum rate (30 seconds) is selected, each Gigabyte ensures 3 years and 9 months of storage. If the storage frequency decreases, the SD-Card filling time increases; for example: selecting the whole set of data and selecting 1 minute, each Gigabyte ensures 7.5 years of storage.

SD-CARD DATALOGGER

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm

FRONT PANEL

- LED blinking
- LED ON
- LED OFF
- LED irrelevant

REC ◪ MEM ○ I/R ○	The recording will start within 8 seconds; don't pull the SD-Card.
REC ◪ MEM ◪ I/R ○	The SD-Card is full.
REC ● MEM ○ I/R ○	The recording is started; don't pull the SD-Card.
REC ○ MEM ○ I/R ○	Is allowed to pull the SD-Card.
REC ○ MEM ● I/R ○	Less than 25% of memory is available.
REC ○ MEM ○ I/R ○	The IR communication with meter is active.
REC ○ MEM ○ I/R ●	No communication is being.

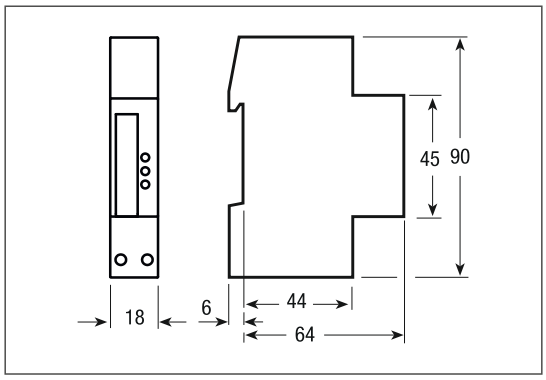
SD-CARD DATALOGGER

TECHNICAL DATA

DATA IN COMPLIANCE WITH IEC 60950, EN 61000-6-2, EN 61000-6-3 AND EN 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70
POWER SUPPLY			
Voltage rating		V	12 ... 24
Frequency range		Hz	45 ... 65
OPERATING FEATURES			
SD-card memory			1 to 8 GB
Suitable for both single-phase and three-phase energy meters		–	yes
INTERFACE TO MEASURING INSTRUMENT			
HW interface	optical IR	n°	2 (Tx, Rx)
SW protocol		–	proprietary
SAFETY acc. to IEC 60950			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V	12 ... 24
Clearance		mm	≥1.5
Creepage distance	in equipment	mm	≥2.1
Test voltage	impulse (1.2/50 µs) peak value	kV	2.5
	50 Hz , 1 min	kV	1.35
Housing material flame resistance	UL 94	class	V0
CONNECTION TERMINALS			
Type cage	screw head Z +/-	POZIDRIV	PZ0
Terminal capacity	solid wire min. (max.)	mm^2	0.15 (2.5)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)
ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20

DIMENSIONS



LAN TCP/IP INTERFACE

APPLICATIONS

LIKE ALL THE MOST RECENT NETWORK DEVICES, THE PRODUCT OFFERS A WEB-BASED CONFIGURATION INTERFACE. THIS MODULE CAN BE PLACED SIDE BY SIDE WITH AN ENERGY METER TO COLLECT THE MEASUREMENT DATA FROM THE INSTRUMENT AND TO TRANSMIT THESE DATA TO A REMOTE SYSTEM THROUGH A TCP/IP NETWORK. DATA EXCHANGE BETWEEN LAN-TCP/ IP INTERFACE AND A PC CAN USE TWO WAYS, SIMULTANEOUSLY AVAILABLE: HTTP PROTOCOL TO ACCESS THE INTERNAL SITE AND MODBUS/TCP PROTOCOL TO CONNECT THE LAN-TCP/IP INTERFACE TO A SUPERVISORY COMPUTER. THE MEASUREMENTS IN TRANSIT FROM THE INSTRUMENT TOWARDS THE TCP/IP NETWORK CAN BE INTERCEPTED AND STORED INSIDE THE COMMUNICATION MODULE ITSELF, UNTIL THE SATURATION OF THE SPACE OF MEMORY AVAILABLE.

HISTORICAL DATA CAN ALSO BE DOWNLOADED TO LOCAL PC IN CSV FORMAT FOR FURTHER ANALYSIS.
A GROUP OF LED ON THE FRONT PANEL PROVIDE INFORMATION ABOUT LINK ACTIVITY, SIDE-IRDA INTERFACE STATUS AND ERROR CONDITIONS.

FEATURES

- COLLECT ENERGY, POWER, V, I, PF, FREQ.
- 100BT/10BT LAN (RJ45)
- Modbus/TCP
- HTTP – SNTP - DHCP - DNS
- REAL TIME CLOCK
- LOG FILES (.CSV) AVAILABLE FOR REMOTE DOWNLOAD
- SUITABLE FOR SINGLE PHASE AND THREE PHASE ENERGY METERS
- RESET/FACTORY DEFAULT BUTTON

FUNCTION

CONFIGURATION

- Like all the most recent network devices, the product offers a web-based configuration interface. All the parameters that can be modified by the user can be set simply connecting to the apparatus through a normal web browser on a preset IP address. Such parameters are for instance the network parameters (IP address, subnet mask and gateway or DHCP), and the general settings.

PLUG AND PLAY

- The interface is enabled to recognize automatically the instrument connected to its Infra-Red port. This is an advantage in terms of flexibility, because the same interface can be connected, for instance, to single-phase or three-phase energy meters

LAN TCP/IP INTERFACE

FUNCTION

MEASUREMENTS LIMITS MANAGEMENT

- Limits for the measured quantities can be set via Web browser. The interface can send a warning message in case the value of the measurements is beyond the limits. The management of such warning is performed by the interface itself.

STORAGE OF THE MEASUREMENTS

- The measurements in transit from the instrument towards the TCP/IP network can be intercepted and stored inside the communication module itself, until the saturation of the space of memory available. The saturation condition depends, of course, on sampling frequency of the measurements and on the number of measurements (related to the type of energy meter connected to InfraRed port, for instance single-phase or three-phase). The data can be sto red in the interface and subsequently downloaded to user's PC, via web for a detailed examination. The data are sto red in text format (CSV, Comma Separated Values).

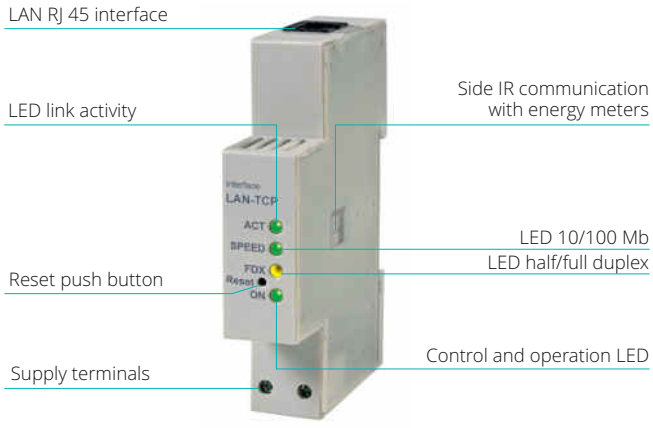
DATE AND TIME

- The interface is equipped with a Real Time Clock, and it is enabled to manage Date and time information. It has the capability to synchronize date and time using NTP (Network Time Protocol).

BAUDRATE

- The interface is enabled to operate in 10/100 Mbps networks.

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm



LAN RJ 45 interface

LAN TCP/IP INTERFACE

TECHNICAL DATA

DATA IN COMPLIANCE WITH IEEE 802.3 AS, IEC 60950, EN 61000-6-2 AND EN 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70

POWER SUPPLY			
Auxiliary voltage rating U_n		V	230
Auxiliary power rating		W	≤1.5
Auxiliary voltage range		V	0.8 and 1.2 x U_n
Frequency rating		Hz	50
Frequency range		Hz	45 ... 65

OPERATING FEATURES			
System		–	start automatic at connection of auxiliary power
LAN server data addressing	by means of it IP address	–	IP address
Data transfer speed	LAN limited	Mbit/s	≤100
User interface for setup and management	web browser	–	yes
Suitable for both single-phase and three-phase energy meters		–	yes

LAN INTERFACE			
HW interface		–	RJ 45 connector
SW protocol		–	TCP/IP
			HTTP - Modbus/TCP - FTP - SNTP -DHCP
Application level protocols		–	DNS - DynDNS - SNMP

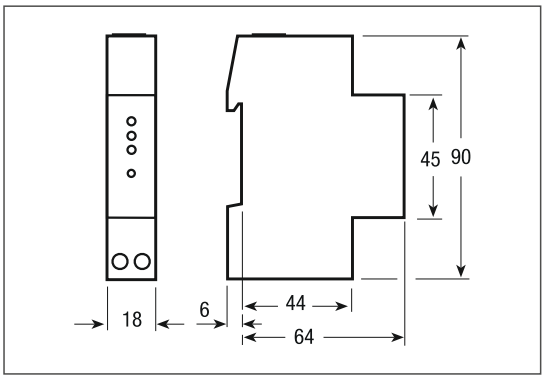
LAN INTERFACE			
HW interface		n°	2 (Tx, Rx)
SW protocol		–	proprietary

SAFETY acc. to IEC 60950			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V	300
Clearance		mm	≥4
Creepage distance	in equipment	mm	≥4
Test voltage	impulse (1.2/50 µs) peak value on AC power supply	kV	2.5
	on telecommunication network	kV	1.5
	50 Hz, 1 min	kV	2.5
Housing material flame resistance	UL 94	class	V0

CONNECTION TERMINALS			
Type cage	screw head Z +/-	POZIDRIV	PZ0
Terminal capacity	solid wire min. (max.)	mm^2	0.15 (2.5)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)

ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20

DIMENSIONS



eVISION INTERFACE

APPLICATIONS

THIS PRODUCT OFFERS A WEB-BASED CONFIGURATION INTERFACE VIA ETHERNET. THIS MODULE CAN BE PLACED SIDE BY SIDE TO THE ENERGY METER TO COLLECT MEASURED DATA FROM THE INSTRUMENT. THESE DATA ARE SHOWN BY AN ADVANCED WEB BASED GRAPHIC INTERFACE ALLOWING USER TO CHECK FOR ACTUAL AND HISTORICAL VALUES, ACTUAL AND PREVIOUS POWER CONSUMPTION, SET WARNINGS EMAIL IN CASE OF POWER/COST ARE EXCEEDED AND MUCH MORE. ALONG TO HTTP THE MODBUS/TCP PROTOCOL IS SUPPORTED AS WELL. THIS PROTOCOL ALLOWS AUTOMATIC SYSTEM TO COLLECT INDIVIDUAL OR GROUPED ELECTRICAL MEASURED FIGURES TO A SUPERVISORY COMPUTER. ON THE FRONT PANEL, FOUR LED PROVIDE INFORMATION ABOUT POWER AND ETHERNET LINK.

FUNCTION

CONFIGURATION

- Through the collected and visualized information from the embedded WEB application of eVison Module, it is possible to optimize the use of the electric energy choosing the most convenient tariff hours in order to avoid excessive charges.

MEASUREMENTS

- Data is shown by an advanced web based graphic interface allowing user to check for actual and historical values, actual and previous power consumption, set warnings email in case of power/cost are exceeded and much more.

DATE AND TIME

- The interface is equipped with a Real Time Clock, and it is enabled to manage Date and time information.

BAUDRATE

- The interface is enabled to operate in 10/100 Mbps networks.

Example

Web based graphic interface

Home: Indication of the actual consumption and hour cost of your house or office.

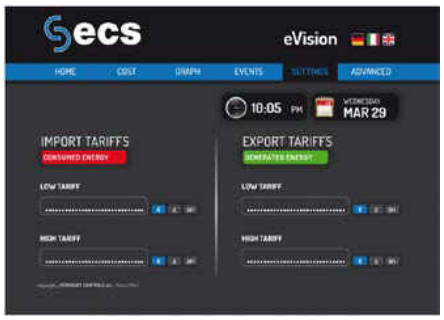
Cost: Visualization of the month and day balance showed in your currency. Possibility to have the indication of generated Energy if there are solar panels or windmills.

Graph: A clear and friendly indication of your consumption flow expressed in kWh or currency for day, week, month or year with the possibility to compare it with the previous ones.

eVISION INTERFACE

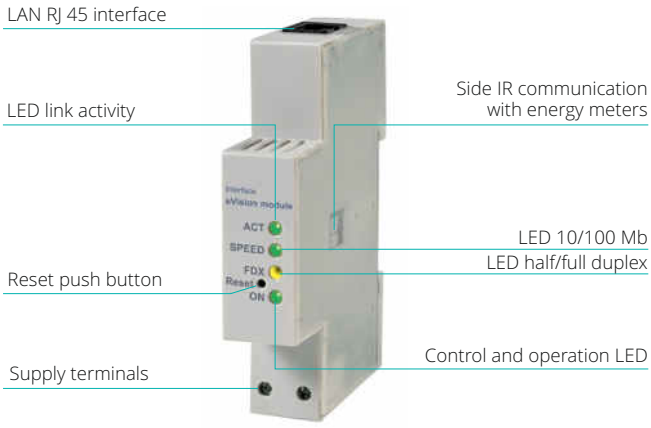
Web based graphic inerface

Events: Indication of the actual consumption and hour cost of your house or Possibility to set events. Once you will pass them, eVision and eVision Module will send you immediately an e-mail. You can receive also a day, week, month or year report whenever you wish.



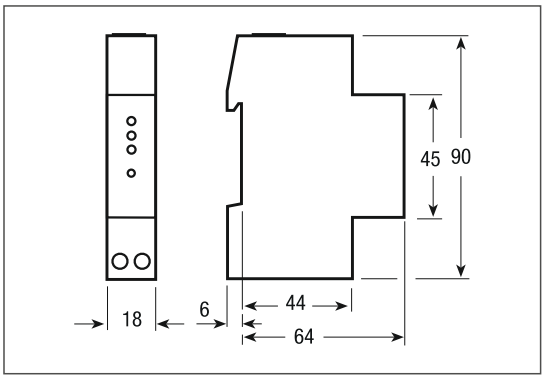
Setting: Set the Low and High Tariff cost for import and export energies.

1 standard module housing (17.5 mm wide), suitable for DIN rail mounting 35 mm



LAN RJ 45 interface

DIMENSIONS



TECHNICAL DATA

DATA IN COMPLIANCE WITH IEEE 802.3 AS, IEC 60950, EN 61000-6-2 AND EN 61000-4-2

GENERAL CHARACTERISTICS			
Housing	DIN 43880	DIN	1 module
Mounting	EN 60715	35 mm	DIN rail
Depth		mm	70

POWER SUPPLY			
Auxiliary voltage rating U_n		V	230
Auxiliary power rating		W	≤1.5
Auxiliary voltage range		V	0.8 and 1.2 x U_n
Frequency rating		Hz	50
Frequency range		Hz	45 ... 65

OPERATING FEATURES			
System		–	start automatic at connection of auxiliary power
LAN server data addressing	by means of it IP address	–	IP address
Data transfer speed	LAN limited	Mbit/s	≤100
User interface for setup and management	web browser	–	yes
Suitable for both single-phase and three-phase energy meters		–	yes

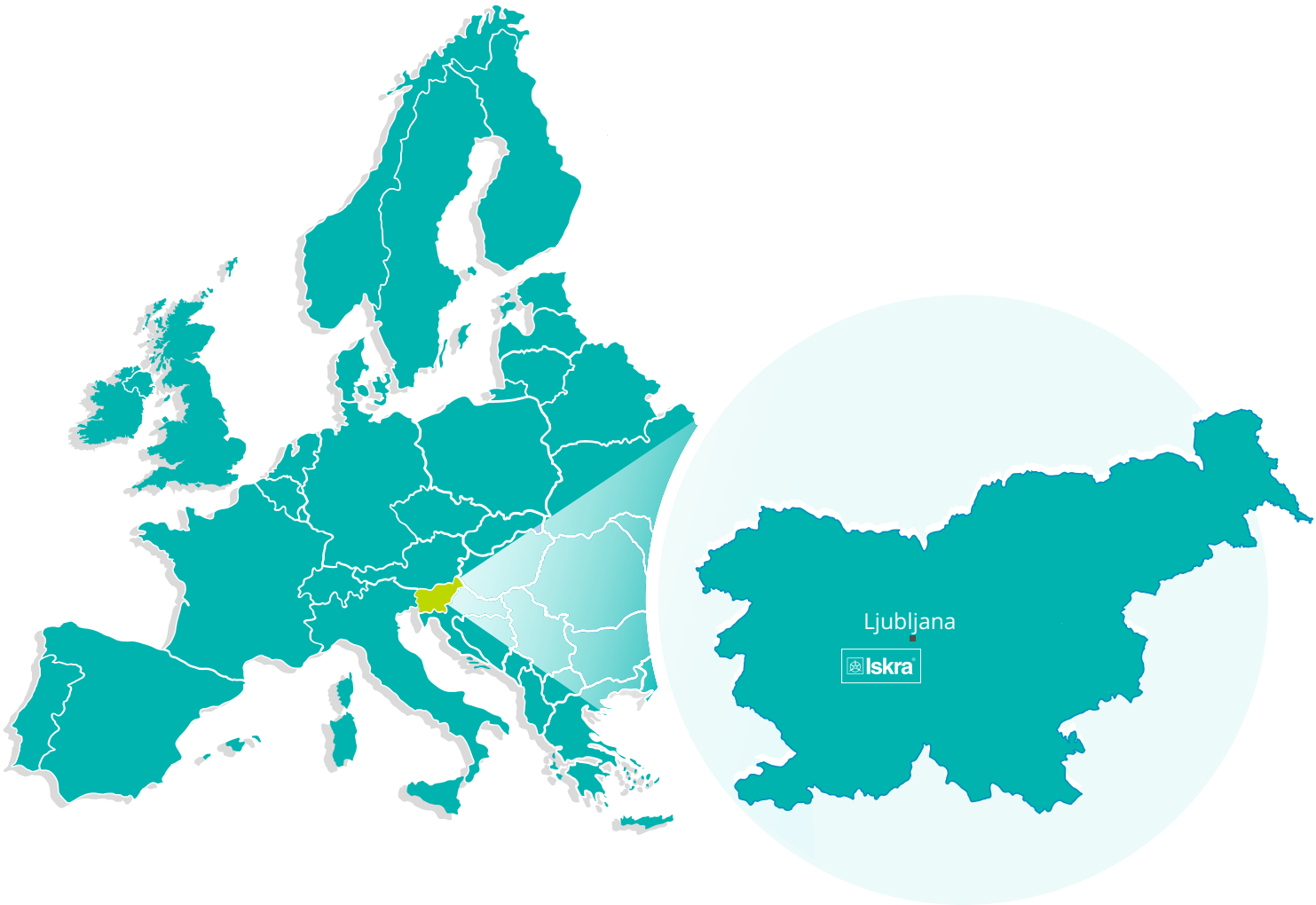
LAN INTERFACE			
HW interface		–	RJ 45 connector
SW protocol		–	TCP/IP

LAN INTERFACE			
HW interface		n°	2 (Tx, Rx)
SW protocol		–	proprietary

SAFETY acc. to IEC 60950			
Degree pollution		–	2
Overvoltage category		–	II
Working voltage		V	300
Clearance		mm	≥4
Creepage distance	in equipment	mm	≥4
Test voltage	impulse (1.2/50 µs) peak value on AC power supply	kV	2.5
	on telecommunication network	kV	1.5
	50 Hz, 1 min	kV	2.5
Housing material flame resistance	UL 94	class	V0

CONNECTION TERMINALS			
Type cage	screw head Z +/-	POZIDRIV	PZ0
Terminal capacity	solid wire min. (max.)	mm^2	0.15 (2.5)
	stranded wire with sleeve min. (max.)	mm^2	0.15 (4)

ENVIRONMENTAL CONDITIONS			
Operating temperature		°C	-10 ... +55
Limit temperature of storage		°C	-25 ... +70
Relative humidity		%	≤80
Vibrations	sinusoidal vibration amplitude at 50 Hz	mm	± 0.25
Protection class	acc. to IEC 60950-1	–	II
Degree of protection	housing when mounted in front	–	IP 20



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