

Energy counting and measurement

In the current context of research of energy saving, counting and measurement of consumption become unavoidable. We offer new residential and tertiary solutions, to better control energy consumption.



Energymeters	6.4
Modular analogue voltmeters and ammeters	6.6
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Current transformers	6.11
Selector switches	6.12
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Impulse concentrator

Energymeters

single phase

three phase

direct 32A

direct 63A

direct 63A

direct 100A

connection via CT
5/6000A

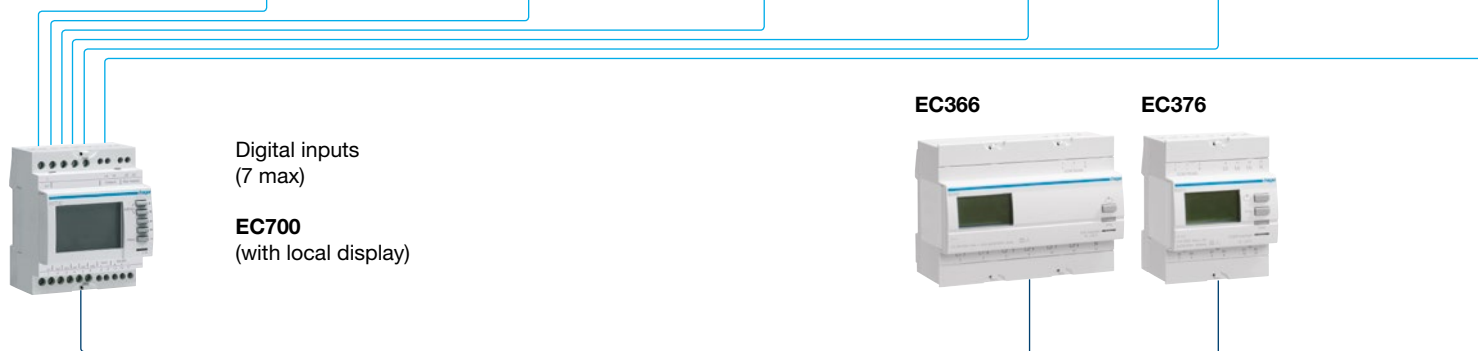
EC051

**EC150
EC152**

**EC350
EC352**

**EC360
EC362
EC365B**

**EC370
EC372**



Other communication protocols

M-BUS communication protocol



EC368

EC378

KNX TP Communication protocol



TE360

TE370

Multi-function meters

Changeover switches

other metering devices

modular

flush mounted

gaz, water, calories,... via C.T.

via C.T. with network analysis

via C.T.

flowmeter
calorimeter

SM103E

SM102E

HIC4xxE

SM101C

SM211

SM210

SM211

SM103E

SM214

HIC4xxE

SM103E

HIC4xxE

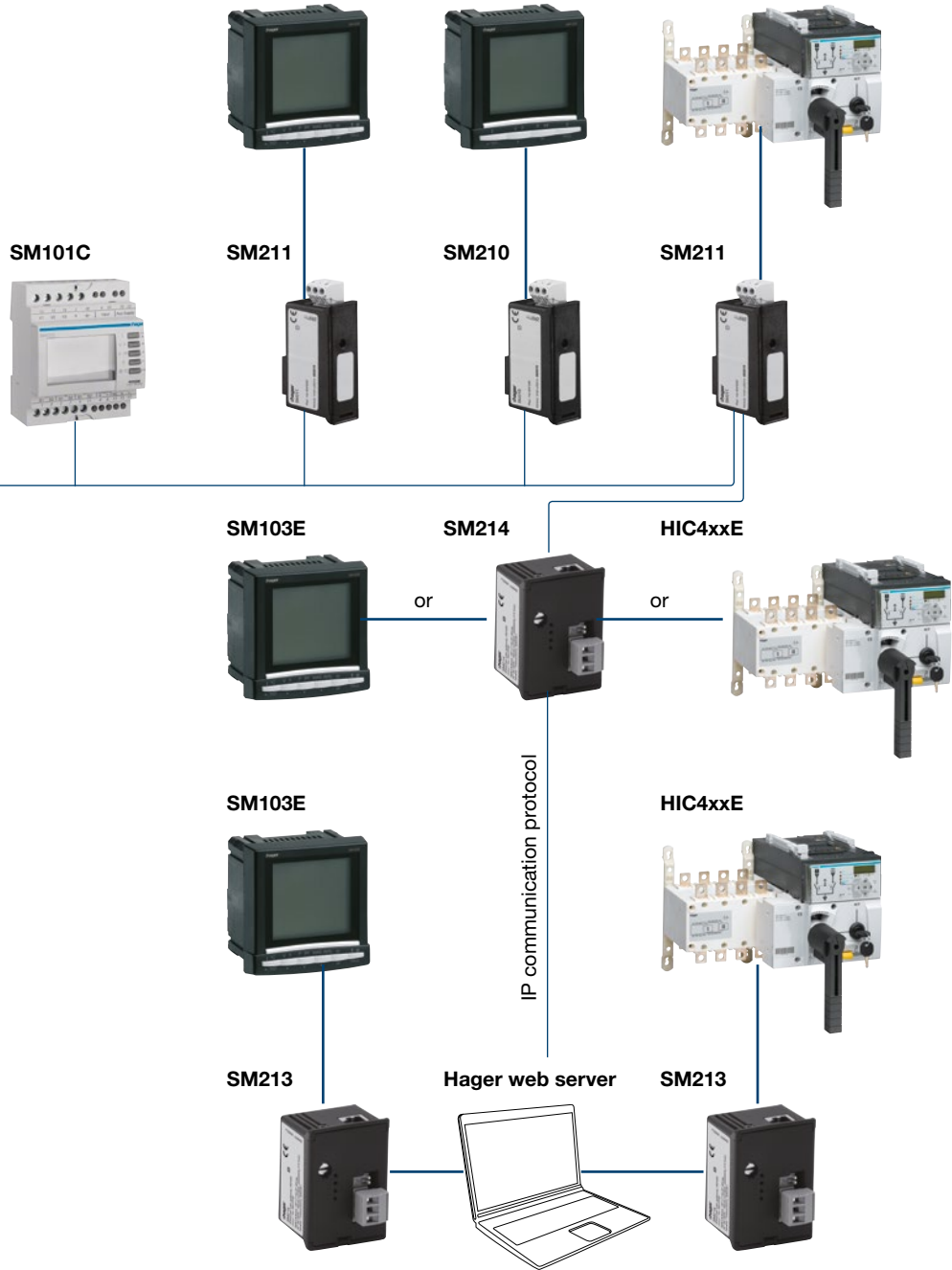
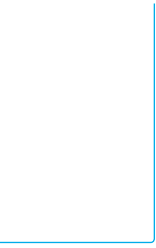
SM213

Hager web server

SM213

IP communication protocol

Counting and measurement



Energymeters are aimed to measure the active energy consumed by an installation. They can control the real cost of an installation and permit to divide the consumption between the different appliances.

- LED flashing according to consumption
- option: tariff 1 / tariff 2.
- three phase energymeters are adapted to all kind of networks
- display indication in case of bad wiring.

Technical data

- class 1
- accuracy 1%
- energy readout: 7 digits
- backlighted display
- indication of instantaneous power consumption
- total / partial counter
- pulsed output
- unlimited saving of measures

Connection capacity

- flexible 6 mm²
- rigid 4 mm²

Complies with EN 60053-21



EC050

Single phase - direct 32A

- voltage: 230V AC 50 / 60Hz

Description	Width in module 17.5 mm	Cat. ref.
single tariff, without pulsed output	1	EC050
single tariff, with pulsed output	1	EC051



EC150

Single phase - direct 63A

- voltage: 230V AC 50 / 60Hz
- starting current: 40mA
- base current: 10A
- max current: 63A

Description	Width in module 17.5 mm	Cat. ref.
with pulsed output and total / partial	3	EC150
with pulsed output, total / partial counter and 2 tariffs	3	EC152



EC350

Three phase - direct 63A

- voltage: 230/400V AC 50 / 60Hz
- starting current: 40mA
- base current: 10A
- max current: 63A

Description	Width in module 17.5 mm	Cat. ref.
with pulsed output and total / partial	4	EC350
with pulsed output, total / partial counter and 2 tariffs	4	EC352



EC360

Three phase - direct 100A

- voltage: 230/400V AC 50 / 60Hz
- starting current: 80mA
- base current: 20A
- max current: 100A

Description	Width in module 17.5 mm	Cat. ref.
with pulsed output and total / partial	7	EC360
with pulsed output, total / partial counter and 2 tariffs	7	EC362

Three phase - connection via current transformers 6000/5A

- to be connected with CT with 5A on the secondary
- voltage: 230/400V AC 50 / 60Hz
- starting current: 10mA
- max current on CT secondary: 6A

Description	Width in module 17.5 mm	Cat. ref.
with pulsed output and total / partial	4	EC370
with pulsed output, total / partial counter and 2 tariffs	4	EC372



EC370

Hour counters

- 230V 50Hz

Description	Width in module 17.5 mm	Cat. ref.
hour counters	2	EC100



EC100



SM500

Analogue voltmeter

- for commercial and industrial installations.
- single phase: direct connection
- three phase: use of a voltmeter selector switch SK602 - see page 6.12
- frequency: 50/60Hz
- accuracy: 1,5% (full scale)

- consumption : 3VA
- connection capacity:
rigid conductor 10 mm²
flexible conductor 6 mm²
- comply with IEC 60 054-1

Description	Width in module 17.5 mm	Cat. ref.
analogue voltmeter, 0 - 500V	4	SM500



SM030

Analogue ammeters

- For commercial and industrial installations.
- direct reading: up to 30A
- indirect reading via current transformers:
see page 6.11 from 50 to 600A
- connection capacity:
rigid conductor 10 mm²
flexible conductor 6 mm²

- comply with IEC 60 054-1

Description	Width in module 17.5 mm	Cat. ref.
0 - 5A	4	SM005
0 - 15A	4	SM015
0 - 30A	4	SM030



SM150

Ammeters current transformers (CT) operated

- accuracy: 1,5% (full scale)

Description	Scale	Width in module 17.5 mm	Cat. ref.
reading via CT SRA00505	0 - 50A	4	SM050
reading via CT SRA01005	0 - 100A	4	SM100
reading via CT SRA01505	0 - 150A	4	SM150
reading via CT SRA02505	0 - 250A	4	SM250
reading via CT SRC04005	0 - 400A	4	SM400
reading via CT SRC06005	0 - 600A	4	SM600

Digital voltmeter

- for domestic and commercial installations
- three phase: use of a voltmeter selector switch SK602
- connection capacity:
 - rigid conductor 10 mm²
 - flexible conductor 6 mm²

- complies with IEC 60 054-1
- voltage rating: 220/230V - 50/60Hz
- accuracy: ±1%
- consumption: 4.5VA
- scale: 0 -500V



Description	Width in module 17.5 mm	Cat. ref.
digital voltmeter	4	SM501

SM501

Digital ammeters

- SM020 : direct reading
- from SM151 to SM601: reading via a current transformer (see page 6.11)
- connection capacity:
 - rigid conductor 10 mm²
 - flexible conductor 6 mm²

- comply with IEC 60 054-1



Description	Scale	Width in module 17.5 mm	Cat. ref.
direct	0 - 20A	4	SM020
reading via CT 150/5A SRA01505	0 - 150A	4	SM151
reading via CT 400/5A SRC04005	0 - 400A	4	SM401
reading via CT 600/5A SRC06005	0 - 600A	4	SM601

SM020

Multi-function meters

- SM101E and SM101C are multifunction meters for electrical values for the low voltage network in modular format
- they allow visualization of all electrical parameters and to operate the functions of measuring, metering, energy and communication
- voltage rating: 200 to 277 V AC +/- 15 %
- frequency: 50/60Hz
- consumption: < 5VA
- network: 1L, 2L, 3L, 3L + N

- IP degree: IP20 case degree protection and IP51 with front cover
- communication mode: Jbus /Modbus
- connection capacity:
 - rigid/flexible conductor 4 mm² (power)
 - rigid/flexible conductor 4 mm² (communication)
- complies with: IEC61557-12, IEC62053-22 (class 0.5S), IEC62053-23 (class 2)



SM101E

Description	Width in module 17.5 mm	Cat. ref.
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multi-function meters

measured values: Inst&Max values: I, U, V, F, P, PF, h	4	SM101E
measured values: Inst&Max values: I, U, THD, F, P, PF, E, h pulses output RS485 Jbus/Modbus communication	4	SM101C

Flush mounting kit 4 modules width

for SM101C, SM101E, ECxxx modules energy meters, EC700 pulse concentrator	1	SM002
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SM002

Multi-function meter measure the extent of electrical values for all LV or LV/HV networks. It allows starting from the front panel to configure and display all the electric parameters and to exploit the functions of measurement, metering and energy management, harmonics analysis, remote control and control the state of devices, communication and detection of high voltages, peaks and voltage disconnections. This device is a multi-function meter for measuring electrical values for single, two and three phase low and high voltage networks.

Common equipments:

- backlit LCD screen
- direct access key for currents (instantaneous and max. values), current THD and set up wiring correction
- direct access key for voltages, frequency and voltage THD,
- direct access key for active, reactive and apparent power (instantaneous and max. values) and power factor
- direct access key for energies and hour meters



SM102E

Low voltage multi-function meter

- measurement in real effective values (TRMS) of:
 - current per phase and neutral in instant and maximum value,
 - phase-to-neutral and phase-to phase voltages,
 - In instant,
 - frequency, In instant,
 - active positive power total in instant and maximum value,
 - reactive positive power total in instant and maximum value,
 - apparent positive power total in instant and maximum value,
 - power factor (PF) total with inductive or capacitive indication
- harmonic distortion rate (THD) up to 51 on phase-to-neutral and phase-to-phase voltages and currents (THD 3U, THD 3V, THD 3I) energy meters
- positive active energy meter
- positive reactive energy meter - programmable hour run meter
- connection capacity:
 - voltage: rigid or flexible conductors 2,5 mm²
 - current: rigid or flexible conductors 6 mm²
- comply with IEC 61 557-12, IEC, 62 053-22 class 0.5 S and IEC 62 053-23 class II

Description

Cat. ref.

low voltage multi-function meter

SM102E



SM103E

Low and high voltage multi-function meter and network analyser

- same measures as for SM102E with average values,
- active and reactive power on 4 quadrants (\pm),
- harmonic distortion rate (THD) up to 51 on phase-to-neutral and phase-to-phase voltages and currents (THD 3U, THD 3V, THD 3I, THD In)
- metering:
 - active and reactive power meter on 4 quadrants,
 - apparent power meter,
 - programmable hour run meter.
- connection capacity:
 - voltage: rigid or flexible conductors 2,5 mm²
 - current: rigid or flexible conductors 6 mm²
- comply with IEC 61 557-12, IEC, 62 053-22 class 0.5 S and IEC 62 053-23 class II

Description

Cat. ref.

low and high voltage multi-function meter and network analyser

SM103E



SM200

Low and high voltage multi-function meter and network analyser

- 2 pulse outputs cable for configuration (kWh, kvarh, kVah)

Description

Cat. ref.

for meter SM102E with 1 adjustable output

SM200

for meter SM103E with 2 adjustable outputs

SM201

Input / output plug-in module

- 2 inputs, 2 outputs cable for configuration on various measurement

Description	Cat. ref.
for meter SM103E (3 modules max. can be connected)	SM202

Analogue outputs plug-in module

- 2 outputs cable for configuration on various measurement

Description	Cat. ref.
for meter SM103E (3 modules max. can be connected)	SM203



SM203

Temperature inputs plug-in module

- temperature indication:
 - internal
 - external sensor PT 100 (T°C 1)
 - external sensor PT 100 (T°C 2)
 - external sensor PT 100 (T°C 3)

Description	Cat. ref.
for meter SM103E	SM205



SM205

Memory plug-in module

- storing up to a maximum of 62 days of P+, P-, Q+, Q-
- storing of 10 hour-dated last alarms
- storing of the last minimum and maximum instantaneous values for 3U, 3V, 3I, In, F, ΣP±, Q±, S, THD 3U, THD 3V, THD, 3U, THD, 3V, THD, 3I, THD In
- storing of 3U, 3V and F average values based on synchronisation function (maximum 60 days)

Description	Cat. ref.
for meter SM103E	SM204



SM204

Communication modules

Description	Cat. ref.
RS485 JBUS/MODBUS	
for meter SM102E	SM210
for meter SM103E	SM211
Ethernet JBUS/MODBUS	
for meter SM103E	SM213
Ethernet + RS485 JBUS/MODBUS	
for meter SM103E	SM214



SM213

The EC700 is a pulse concentrator equipped with 7 digital inputs (logical signal or pulse) and a RS485 JBUS/MODBUS protocol binding. It centralizes and memorizes the impulses or logic signals output of electricity, gas, oil, water, compressed air counters or multi-function meters.

Connection solid/stranded:
6/4mm² (inputs)
2.5/2.5mm² (communication)

Improved customisation

- Selection of the measuring unit: kWh, m³, liters.
- Selection of the currency unit: €, k€, £, \$.

Values can be displayed in the unit of your choice and energy costs can be directly calculated.



EC700

Pulse concentrator

- IP20 for the case and IP51 for the front
- multi-utility meter
- total, partial and programmable metering day, week, month, year)
- RS485 Jbus/Modbus communication
- 7 pulse inputs
- 1 digital output
- backlight LCD display
- power supply U=110...400 VAC ± 10 %

Description	Width in module 17.5 mm	Cat. ref.
pulse concentrator	4	EC700

Current transformers are used to feed analog and digital ammeters and energy meters. The current on the secondary circuit (0 - 5A) is proportional to the current on primary circuit. The range of current transformers is composed of direct reading type, up to 30A, and indirect reading type, via current transformers, from 50 to 4000A. The range is adapted to any type of mounting: edgewise or flat mounting, DIN-rail or backplate mounting

- primary current: In from 50 to 4000A
- continuous thermal current: 1.2xIn (according to IEC/EN 61869-2)
- operating temperature: -40 to +40°C

- Connection capacity: 1.5 to 6 mm²
- rigid conductor 4mm²
 - flexible conductor 4mm²

Technical data

- secondary current: 5A
- frequency: 50/60Hz
- isolating voltage: 0.72kV at 3kV/50Hz/1s)

Complies with IEC/EN 61869-2

Current transformers (C.T.)

C.T ratio	Geometry	Width in module 17.5 mm	Cat. ref.
50 / 5 A	BG213	4	SRA00505
75 / 5 A	BG113	3	SRA00755
100 / 5 A	BG213	4	SRA010051
125 / 5 A	BG113		SRA01255
150 / 5A	BG113	3	SRA01505
200 / 5A	BG113	3	SRA02005
250 / 5 A	BG113	3	SRA02505
300 / 5 A	BG413	4	SRI03005
400 / 5 A	BG413	3	SRI04005
600 / 5 A	BG413	3	SRI06005
800 / 5 A	BG613	5	SRD08005
1000 / 5A	BG613	5	SRD10005
1000 / 5 A	BG814	6	SRE100051
1250 / 5 A	BG814	6	SRE12505
1250 / 5 A	BG1034	8	SRF12505
1500 / 5 A	BG613	5	SRD15005
1600 / 5 A	BG814	6	SRE16005
1600 / 5 A	BG1034	8	SRF16005
2000 / 5 A	BG814	6	SRE20005
2000 / 5 A	BG1034	8	SRF20005
2500 / 5 A	BG1034	8	SRF25005
3000 / 5 A	BG1254	10	SRG30005
3000 / 5 A	BG1274	10	SRH30005
4000 / 5 A	BG1254	10	SRG40005
4000 / 5 A	BG1274	10	SRH40005



SRA01005



SRD10005

Counting and measurement

Accessory

- to mount BG113, BG213 and BG413 geometry CT on DIN rails



Description	Cat. ref.
DIN rail mounting accessory	SRZH01

SRZH01

To provide command signals or program selection in electrical control schemes.
For domestic and commercial installations.

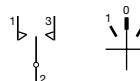
Isolating voltage: 400V AC
Nominal current: 10-20A
Comply with IEC 947-3 and IEC 60 947-3

Connection capacity
- rigid conductor: 1.5 to 10 mm²
- flexible conductor: 1 to 6 mm²



1 pole selector switch

- 20A 400V AC
- non spring return

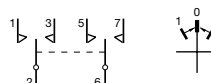


Description	Width in module	Cat. ref.
1 pole selector switch	3	SK600

SK600

2 pole selector switch

- 20A 400V AC
- non spring return

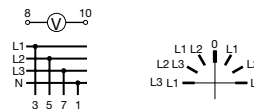


Description	Width in module	Cat. ref.
2 pole selector switch	3	SK601



Voltmeter selector

- 20A 400V AC
- 3Ph&N
- 3 readings between phases
- 3 readings between phase & neutral
- null position (no reading)



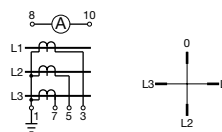
Description	Width in module	Cat. ref.
voltmeter selector	3	SK602

SK602



Ammeter selector

- 20A 400V AC
- 4 positions
- use in 3Ph&N
- reading by phase
- 0 position (no reading)
- should be used with current transformer (CT)



Description	Width in module	Cat. ref.
ammeter selector	3	SK603

SK603

4 ways selector switch with "0"

- 20A 400V AC

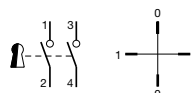
Description	Width in module	Cat. ref.
4 ways selector switch with "0"	3	SK604



3 ways keys selector switch with "0"

- 10A 400V AC

Description	Width in module	Cat. ref.
3 ways keys selector switch with "0"	3	SK606



SK606

The function of a control relay in an electrical installation is overseeing electrical characteristics, like U (voltage) and I (current), of a specific circuit or equipment.

The installation of a control relay allows to inform and/or disconnect the equipment if fluctuations in network may damage. Control relays are intended to be installed in the installation where the monitoring and visualization of an electrical value is required.

EU100/101/301

Voltage control relays dedicated to protect air conditioning equipments:

- EU100, EU101 single phase
- EU301 three phase.

They monitor the compressor power supply and disconnect the compressor when the voltage is faulty.

EU102/302

Voltage control relay used to survey DC or AC voltage:

- EU102 single phase product to monitor DC or AC
- EU302 three phase control relay used to check AC voltage.

They survey a voltage and close contact as soon as the measurement is not ok.

EU103

Current control relay used to survey DC or AC current:

- EU103 single phase product to monitor DC or AC current direct via current transformer.

It surveys a current and closes a contact as soon as the measurement is not ok.

Phase control relay EU300 to verify phase parameters (asymmetry, loss of phase, undervoltage)

The two digital control relays EU102 and EU103 are equipped with an LCD indicator. During normal operation, the LCD displays the measured voltage (EU102) or current (EU103).

The LCD and the local push buttons are also used to enter the parameter settings (type of signal, monitored levels,...) In case of an error, the relay will close a contact (changeover contact 8A)

Single phase compressor control relay

- power supply 230V AC 50/60 Hz
- under/over voltage control
- Umin: 0.75 Un - Umax: 1.2 Un
- restart duration (5 or 10 minutes) selected via bridge
- output: changeover contact 8A AC1 250V AC



Description	Width in module	Cat. ref.
single phase compressor control relay	17.5 mm	EU100
	2	EU100

Single phase compressor control relay

- power supply 230V AC 50/60 Hz
- under/over voltage control
- Umin/Umax: +/-5% to +/-20% Un set via potentiometer
- restart duration (5 or 10 minutes) selected via switch
- output: changeover contact 8A AC1 250V AC



Description	Width in module	Cat. ref.
single phase compressor control relay	17.5 mm	EU101
	2	EU101

Three phase compressor control relay

- power supply 400V AC 50/60 Hz
- under/over voltage control
- Umin/Umax: +/-5% to +/-20% Un set via potentiometer
- restart duration (5 or 10 minutes) selected via switch
- output: changeover contact 8A AC1 250V AC



Description	Width in module	Cat. ref.
three phase compressor control relay	17.5 mm	EU301
	2	EU301



EU300

Phase control relay

- power supply: 400V AC 50/60 Hz
- under / over voltage control
- loss of phase, phase order control
- asymmetry control: +/-5% to +/-20% set via potentiometer
- output: changeover contact 8A AC1 250V AC

Description	Width in module 17.5 mm	Cat. ref.
phase control relay	2	EU300



EU102

Voltage control relay with LCD

- power supply 230V AC 50/60 Hz
- voltage monitored DC 15 to 700V or AC 15 to 480V AC
- under / over voltage or both control bands
- parameter setting via push button and LCD indicator
- output: changeover contact 8A AC1 250V AC

Description	Width in module 17.5 mm	Cat. ref.
voltage control relay with LCD	2	EU102



EU302

Three phase voltage control relay

- power supply U_n 400V AC 50/60 Hz
- under/over voltage control
- U_{min}/U_{max} : +/-5% to +/-20% U_n set via potentiometer
- output: changeover contact 8A AC1 250V AC

Description	Width in module 17.5 mm	Cat. ref.
three phase voltage control relay	2	EU302



EU103

Current control relay single phase with LCD

- power supply U_n 230V AC 50/60 Hz
- current control DC or AC, direct 0.1A to 10A or via current transformer
- under / over current or both control bands
- parameter setting via push button and LCD indicator
- output: changeover contact 8A AC1 250V AC

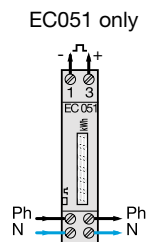
Description	Width in module 17.5 mm	Cat. ref.
current control relay single phase with LCD	2	EU103

Technical data

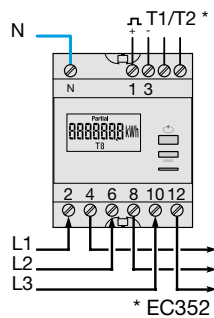
	EC050	EC051	EC150	EC152	EC350	EC352	EC360	EC362	EC370	EC372	
Electrical characteristics											
voltage	230V AC +/- 15%				230V AC +/- 15%, 400V AC +/- 15%						
frequency	50 / 60Hz										
consumption	<8 VA		<0.2W and 1.3VA		EC350/352: <0.6W and 2.8VA EC360/362: <0.6W and 2.5 VA per phase EC370/372: <0.6W and 2.8 VA per phase						
Metrological data											
connection	direct								via current transformer		
display	5 + 1 digits		6 + 1 digits		7 + 1 digits						
accuracy	1%, class 1 EN62053-21		1%, class 1 EN62053-21								
I max	32 A direct		63 A direct				100 A direct		6A on sec. of CT		
I starting	20 mA		40 mA				80 mA		10mA on sec. of CT		
base current	10 A		10 A				20 A		5 A		
Metrological LED											
LED	1 Wh/pulse				2 Wh/pulse				0.1 Wh x CT ratio		
Pulsed output											
Pulsed output	no		1 pulse = 100Wh / 100ms / 20 - 30V DC max (except on KNX meters)								
Tariff											
tariff	1	1	1	2	1	2	1	2	1	2	
Mechanical characteristics											
width	1 module		3 modules		4 modules		7 modules		4 modules		
protection degree	IP20		IP20, IP51 (front part)								
storage temperature	-20 to +70°C		-25 to +70°C								
operating temperature	-10 to +55°C		-10 to +55°C								
connection capacity	rigid: 1.5 to 10 mm ² flexible: 1 to 6 mm ²		rigid: 1.5 to 16 mm ² flexible: 1 to 16 mm ²				rigid: 2.5 to 35 mm ² flexible: 2.5 to 35 mm ²		rigid: 1.5 to 10 mm ² flexible: 1 to 6 mm ²		

Connection diagram

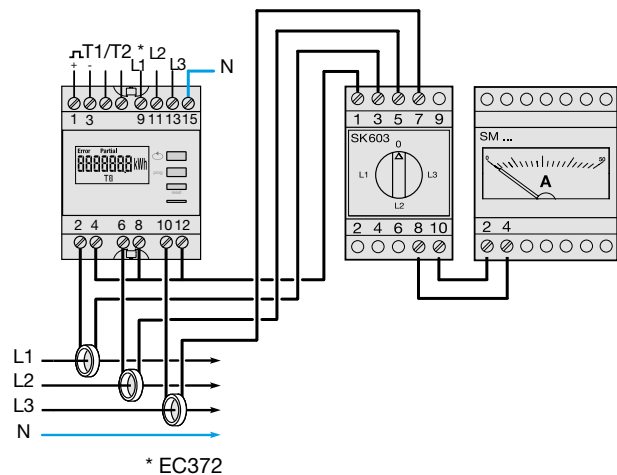
EC050, EC051



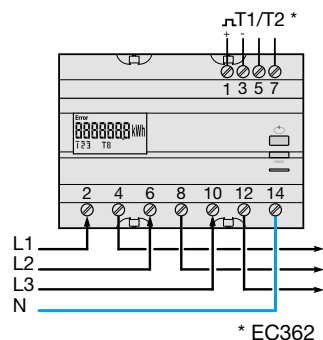
EC350, EC352



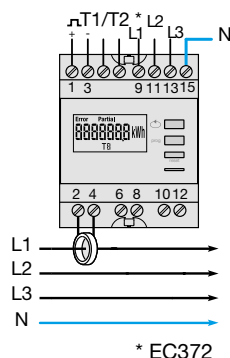
Metering for 3 phase network associated with an ammeter and its phase switch 230 / 400V AC



EC360, EC362



EC370, EC372



Analogic voltmeters and ammeters

Technical specifications

Electrical characteristics

- direct reading voltmeter: 500V for 50/60Hz
- direct reading ammeter: 5, 15, 30A
- ammeter with CT: CT/5A
- consumption:
 - voltmeter < 3VA
 - ammeter < 1.1VA
- isolating voltage: 2kV

Environment

- ref T° : 23 +/-2°C
- working T°: 25 to 50°C
- storage T°: -40°C to +80°C

Connection capacity

- flexible: 1 to 6 mm²
- rigid: 1.5 to 10 mm²

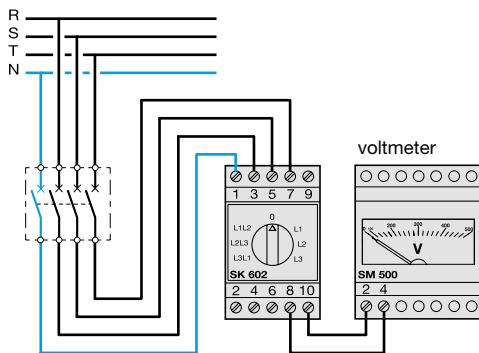
Voltmeters range

ref.	scale	reading
SM500	0-500V	direct

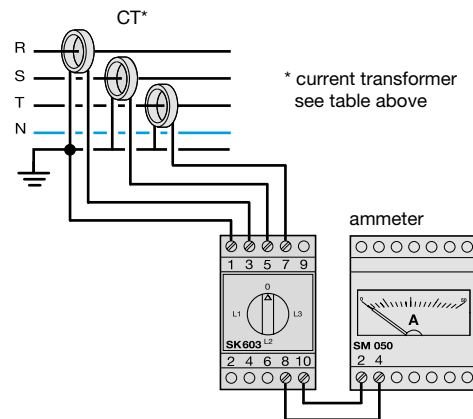
Ammeters range

ref.	scale	reading
SM005	0-5A	direct
SM015	0-15A	direct
SM030	0-30A	direct
SM050	0-50A	via CT/5A
SM100	0-100A	via CT/5A
SM150	0-150A	via CT/5A
SM250	0-250A	via CT/5A
SM400	0-400A	via CT/5A
SM600	0-600A	via CT/5A

Electrical connection



Electrical connection



Digital voltmeter and ammeter

Technical specifications

Electrical characteristics

- working voltage: 220/230V AC 50/60Hz
- consumption: < 1VA

Environment

- working T°: -10 to +55°C
- storage T°: -40°C to +70°C

Connection

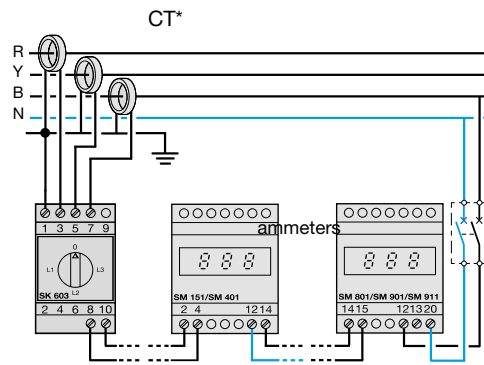
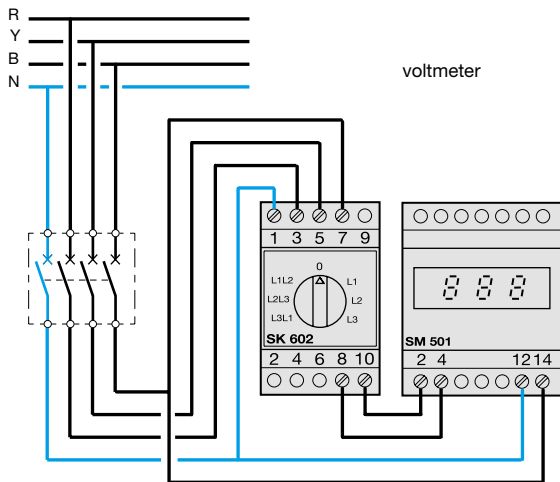
- connection capacity:
- flexible: 6 mm²
 - rigid: 10 mm²

Overload withstand of ammeters

- 2 x I_n continuous
 - 10 x I_n for 5 seconds
- These values are to allow for starting currents.

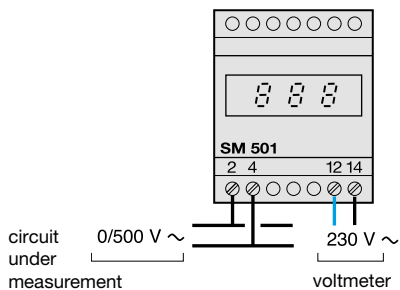
ref.	product	range	consumption	accuracy %	reference temp. °C	accuracy variation	max permanent overload	momentary overload	frequency Hz	isolating voltage
SM501	voltmeter	500 V	≤ 4.5 VA	± 1	23 ± 1°C	± 0,03% / °C	1.2 Un	2 Un/5 sec.	45 - 65	2 kV/50 Hz-1 min
SM020	direct ammeter	0 - 20 A	≤ 4.5 VA	± 1	23 ± 1°C	± 0,03% / °C	1.2 In	10 In/5 sec.	45 - 65	2 kV/50 Hz-1 min
SM151 SM401 SM601	ammeter with CT	0 - 150 A 0 - 400 A 0 - 600 A	≤ 4.5 VA	± 1	23 ± 1°C	± 0,03% / °C	2 In	10 In/5 sec.	45 - 65	2 kV/50 Hz-1 min

Electrical connection

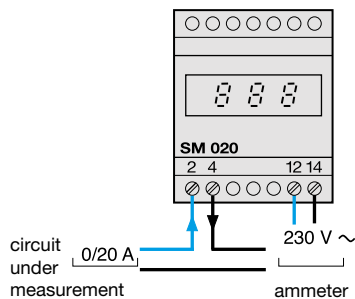


connection: SM151/401/601
* CT rating of your choice

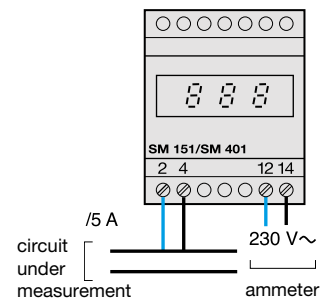
Operating principle
for SM501



for SM020



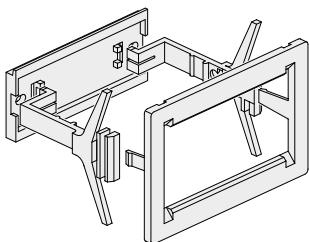
for SM151, SM401, SM601



Counting and measurement

SM002

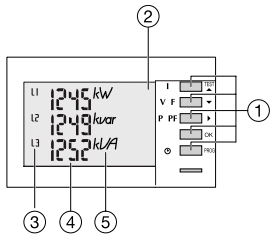
Door flush mounting kit for SM101C, SM101E, ECxxx 4 modules energy meters, EC700 pulse concentrator



	SM101E	SM101C
Voltage	200 to 277 V AC +/- 15 %	
Frequency	50/60 Hz	
Consumption	≤ 0.1 VA / phase	
Network	1L, 2L, 3L, 3L + N	
Current (TRMS)		
I (1st CT)	5 A... 9,999 A	
I (2nd CT)	5 A	
measuring current	5 mA to 9 999 A	
input consumption	0.6 VA per phase	
accuracy	0.2%	
permanent overload	6 A	
overload	60 A during 1s	120 A during 0.5s
Voltage (TRMS)		
U	50V AC...520V AC (Ph-Ph) 28V AC...300V AC (Ph-N)	
input consumption	≤ 0.1 VA	
accuracy	0.2 %	
permanent overload	760 V AC	
Frequency		
F	45Hz...65Hz	
accuracy	0.1%	
Power		
measuring range	0 to 9 999 kW / kvar / kVA	
accuracy	0.5%	
Power factor		
accuracy	0.5%	
Energy		
accuracy (Ea)	-	class 0.5 S
accuracy (Er)	-	class 2
Update period	1s	
Communication		
support	-	RS485
type	-	2/3 wires half duplex
protocol	-	JBUS/MODBUS
JBUS/MODBUS speed	-	2,400bds...38,400bds
Tariff input	-	double tariff tariff 1 = 0 V tariff 2 = 230 V
Output		
active energy (impulse)	-	20 - 30 V DC max, 27 mA max
reactive energy (impulse)	-	0,1 to 10 000 kWh, 100 to 900 ms
alarm	-	0,1 to 10 000 kWh, 100 to 900 ms
control	-	I, In, U, V, P, Q, S, THD U, THD V, THD I, hour counter, frequency, ...
Operating temperature	-10°C... +55°C	
Storage temperature	-20°C... +70°C	
Protection degree		
case	IP20	
front panel	IP51	
Connection		
current/voltage input	4 mm ² (solid or stranded)	
others	2.5 mm ² (solid or stranded)	

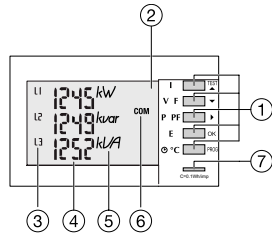
Display

SM101E



- ① Key-pad with 4 dual-function keys (display or programming)
- ② Backlit LCD display
- ③ Phase
- ④ Values
- ⑤ Unit

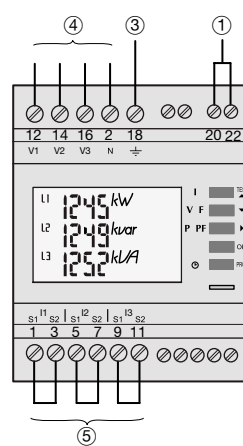
SM101C



- ① Key-pad with 4 dual-function keys (display or programming)
- ② Backlit LCD display
- ③ Phase
- ④ Values
- ⑤ Unit
- ⑥ Activity indicator on the communication bus
- ⑦ Energy metering indication

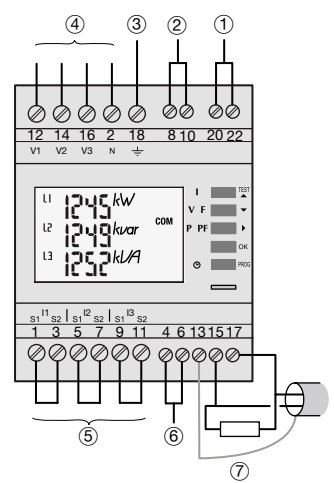
Connection

SM101E



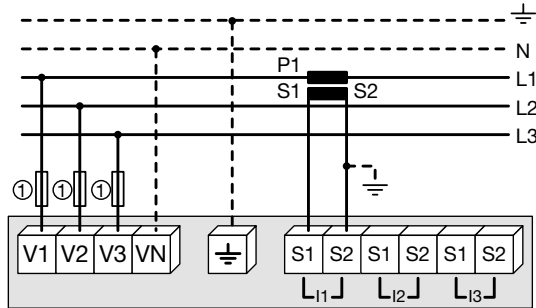
- ① Auxiliary supply
- ② Input
- ③ Earth
- ④ 3 phase network connection
- ⑤ CT connection
- ⑥ Output
- ⑦ RS 485 communication

SM101C



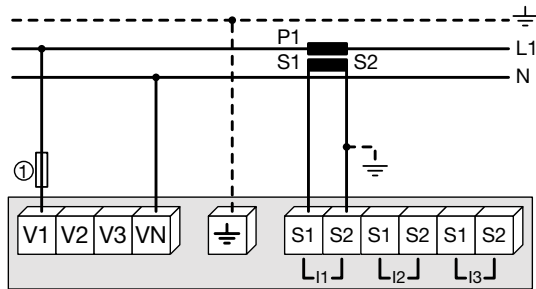
Balanced network

3BL/4BL



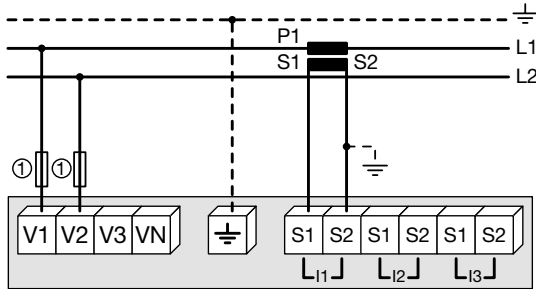
① = Fus. 0.5 A gG/ 0.5 A class CC

1BL



① = Fus. 0.5 A gG/ 0.5 A class CC

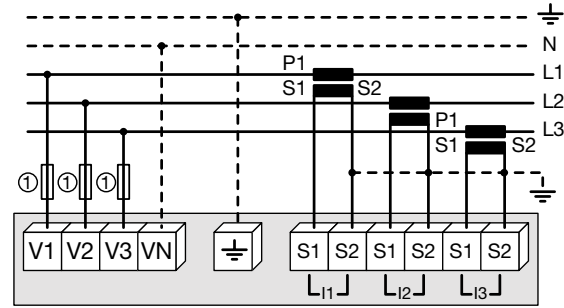
2BL



① = Fus. 0.5 A gG/ 0.5 A class CC

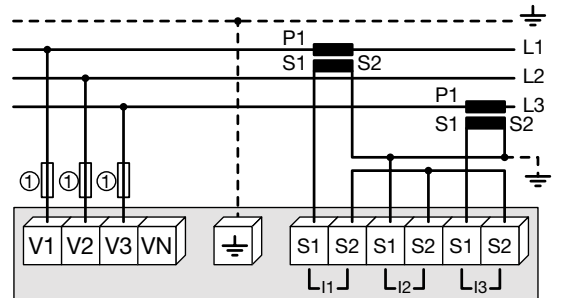
Unbalanced network

4NBL



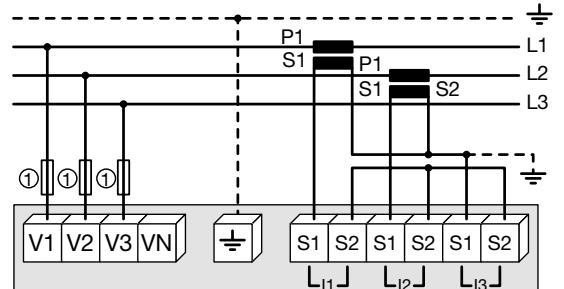
① = Fus. 0.5 A gG/ 0.5 A class CC

3NBL



① = Fus. 0.5 A gG/ 0.5 A class CC

3NBL

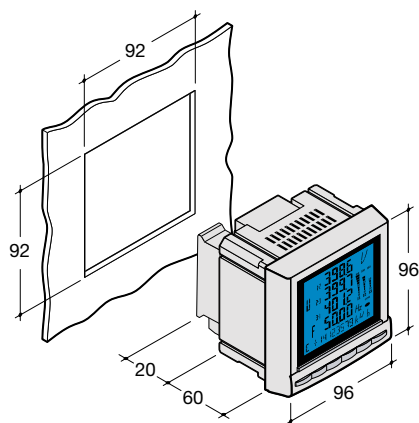


① = Fus. 0.5 A gG/ 0.5 A class CC

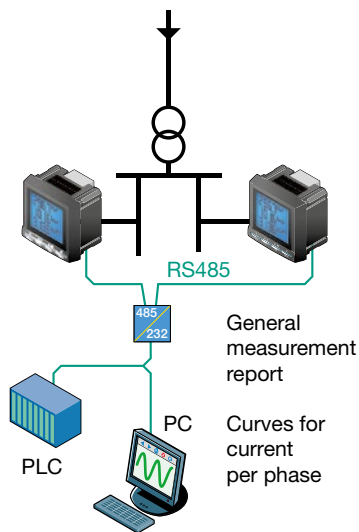
Technical characteristics

	SM102E	SM103E
Current measurement on insulated inputs (TRMS)		
CT primary	10 000 A	10 000 A
CT secondary	5 A	1 and 5 A
measurement range	0 - 11 kA	
input consumption	0,6 VA	≤ 0,1 VA
accuracy	0,2 %	
sustained overload	6 A	
intermittent overload	10 x In for 1 s	
Voltage measurement (TRMS)		
direct measurement between phases	50 - 500 V	18 - 700 V
direct measurement between phases and neutral	28 - 289 V	11 - 404 V
input consumption	≤ 0,1 VA	
accuracy	0,2 %	
power measurement accuracy	0,5 %	
power factor measurement accuracy	0,5 %	
frequency measurement range	45 - 65 Hz	
frequency measurement accuracy	0,1 %	
active energy accuracy	class 0.5 s	
reactive energy accuracy	class 2	
measurement updating period	1 s	
copper conductor connection capacity		
- voltage	flexible or rigid: 2.5 mm ²	
- current	flexible or rigid: 6 mm ²	
Auxiliary		
power supply		
- AC voltage	110 - 400 V AC ± 10 %	
- DC voltage	120 - 350 V DC ± 20 %, 12 - 48 V DC -6 to + 20 %	
frequency	50/60 Hz	
consumption	≤ 10 VA	

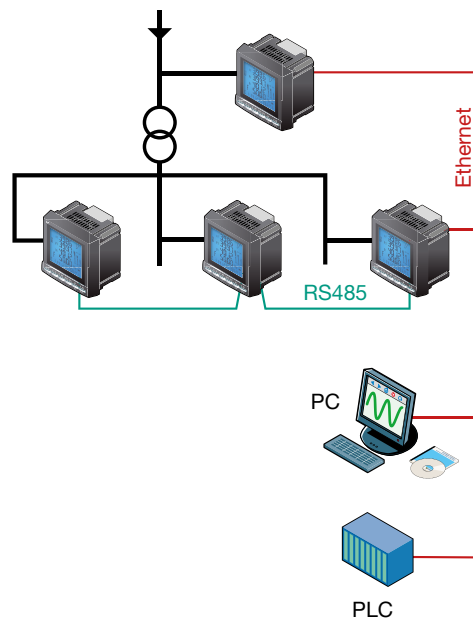
Dimensions



Application: SM102E



SM103E

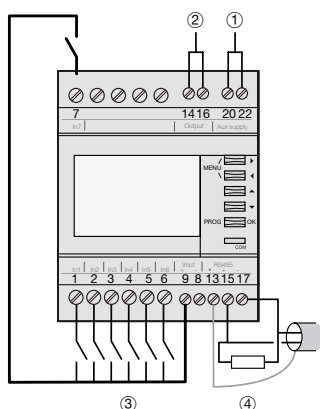


Technical characteristics

Description	Min.	Max.	Units	Comments
Auxiliary power supply				
AC voltage	100	400	V AC	+/- 10%, 45-65 Hz
DC voltage	120	300	V DC	+/-10%, 5 VA
Climate				
ambient temperature	-10	55	°C	IEC 60068-2-1/ -2-2
storage temperature	-20	70	°C	IEC 60068-2-1/ -2-2
ambient humidity		95	% RH	IEC 60068-2-30
Vibration				
vibration		2	G	IEC 60068-2-6 10 to 100 Hz
Case				
dimensions		73 x 90 x 67	mm	LxWxH
weight		215	g	
protection index of enclosure		IP51 / IP20		Front/Case
Electrical safety				
cat. Install. /degree of pollution		III / 2		IEC 61010-1 ed. 3 (300 V AC Ph/N)
Updating period				
display		1	Sec	
RS 485 communication		0.5	Sec	
Digital inputs				
direct voltage	10	30	V DC	terminal 8 reference
current	2	15	mA	according to IEC 62053-31 Class B
line length		1000	m	min. section 1.5 mm ² (#16AWG)
pulse duration	30		ms	max. 16 Hz
power consumption per input		0.4	VA	
Internal digital input polarisation power supply				
voltage	10	15	Vdc	max. 35 mA
Relay output				
set-up (contact setting)	1 contact (NC, NO)			
mechanical strength	105 cycles			
AC breaking		250 V AC/3A		
DC breaking		30 V DC/1A		
RS485 bus communication (JBUS/MODBUS protocol)				
line length		1200	m	
number of equipment		32		2 shielded wires + half duplex
modulation speed	9.6K, 19.2K, 38.4Kbds			
Connection				
connection capacity (rigid or flexible wire): 2.5 mm ² max.				
- inputs:	rigid 0.2 to 6 mm ² flexible 0.2 to 4 mm ²			
- others:	rigid 0.14 to 2.5 mm ² flexible 0.14 to 2.5 mm ²			

Counting and measurement

EC700 connection



- ① Aux.: 100 ... 400V AC
100 ... 400V AC
- ② Fus.: 0.5 A gB / BS 88 2A gB
- ③ 250V AC 3A relay
30V DC / 1A
- ④ RS485

Electrical characteristics

- primary current: from 50 to 2000A
- secondary current: 5A
- frequency : 50/60Hz
- max. permanent overload: 1.2 In
- accuracy class: 1

Connection

- flexible cable: 1 to 4 mm²
- rigid cable: 1 to 6 mm²

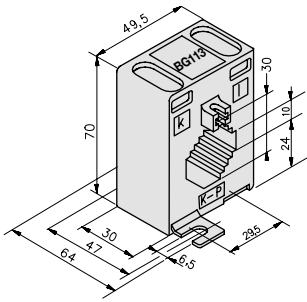
Working temperature: from -40 to +40°C

Current transformers

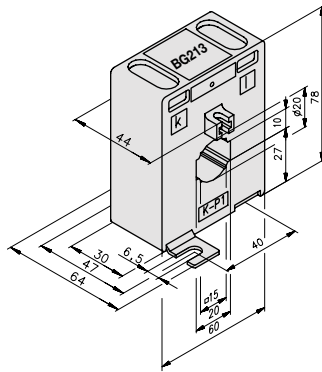
References	Primary current (A)	Geometry	Power consumption (VA)	Cable max. diameter (mm)	Busbar max. sizes (mm)
SRA00505	50	BG213	1.5	20	20 x 10, 15 x 15
SRA00755	75	BG113	1.5	29.5	30 x 10, 25 x 15, 20 x 20
SRA010051	100	BG213	2.5	20	20 x 10, 15 x 15
SRA01255	125	BG113	2.5	29.5	30 x 10, 25 x 15, 20 x 20
SRA01505	150	BG113	2.5	29.5	30 x 10, 25 x 15, 20 x 20
SRA02005	200	BG113	2.5	29.5	30 x 10, 25 x 15, 20 x 20
SRA02505	250	BG113	2.5	29.5	30 x 10, 25 x 15, 20 x 20
SRI03005	300	BG413	5	28	40 x 12
SRI04005	400	BG413	5	28	40 x 12
SRI06005	600	BG413	5	28	40 x 12
SRD08005	800	BG613	5	45	60 x 10, 50 x 30
SRD10005	1000	BG613	5	45	60 x 10, 50 x 30
SRE100051	1000	BG814	15	60	80 x 10, 60 x 30
SRE12505	1250	BG814	15	60	80 x 10, 60 x 30
SRF12505	1250	BG1034	15	85	2 x 100 x 10, 80 x 50
SRD15005	1500	BG613	5	45	60 x 10, 50 x 30
SRE16005	1600	BG814	15	60	80 x 10, 60 x 30
SRF16005	1600	BG1034	30	85	2 x 100 x 10, 80 x 50
SRE20005	2000	BG814	15	60	80 x 10, 60 x 30
SRF20005	2000	BG1034	30	85	2 x 100 x 10, 80 x 50
SRF25005	2500	BG1034	30	85	2 x 100 x 10, 80 x 30
SRG30005	3000	BG1254	15	85	3 x 120 x 10
SRH30005	3000	BG1274	15	122	4 x 120 x 10
SRG40005	4000	BG1254	15	98	3 x 120 x 10
SRH40005	4000	BG1274	15	122	4 x 120 x 10

Current transformers range

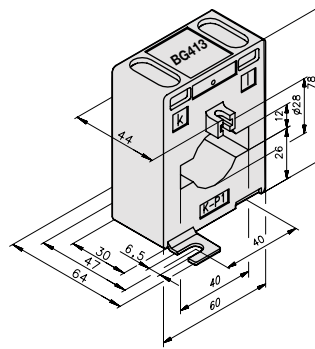
BG113



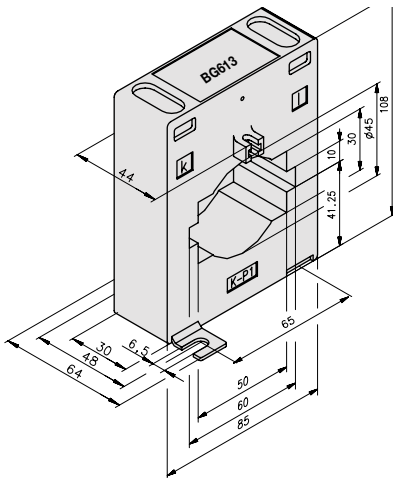
BG213



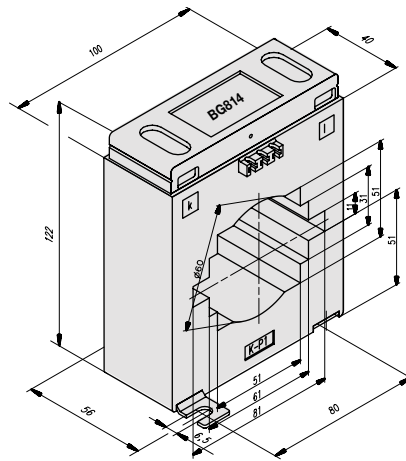
BG413



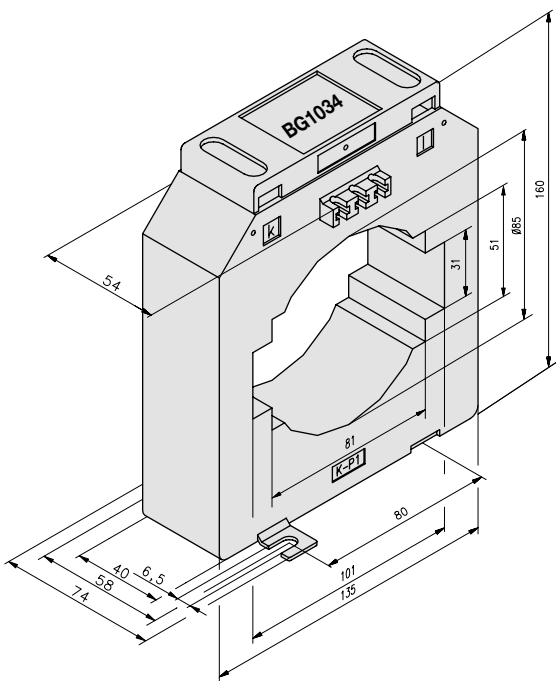
BG613



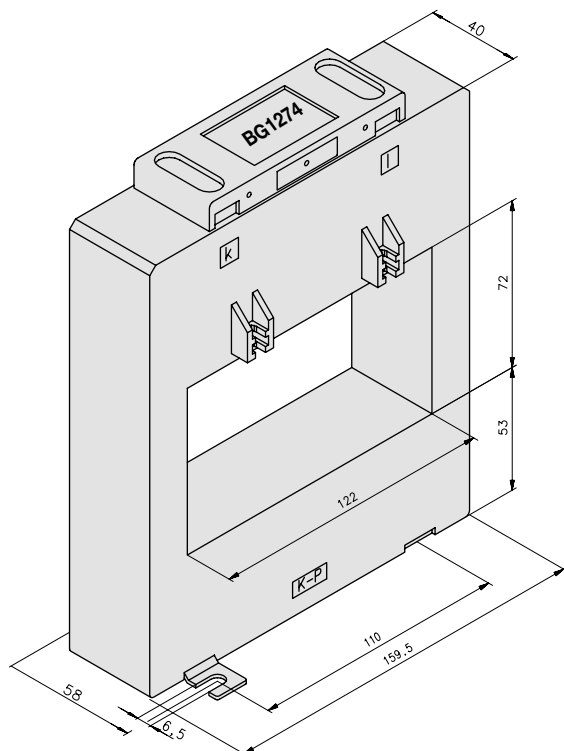
BG814



BG1034

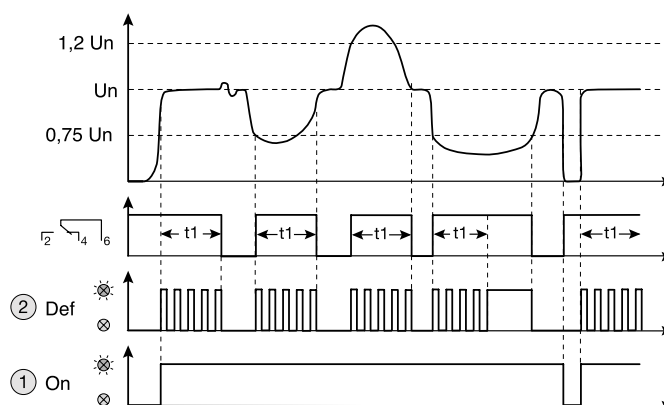
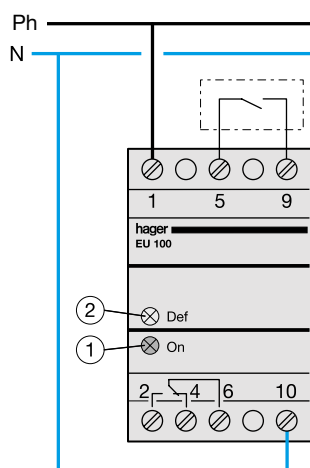


BG1274

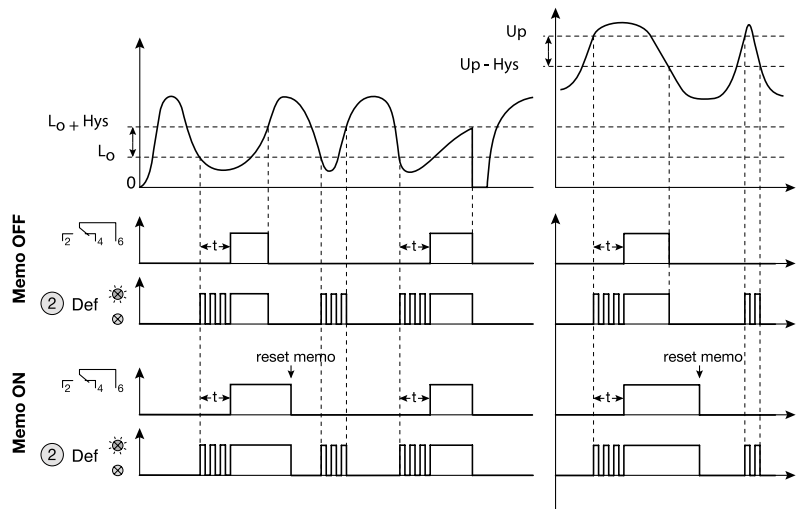
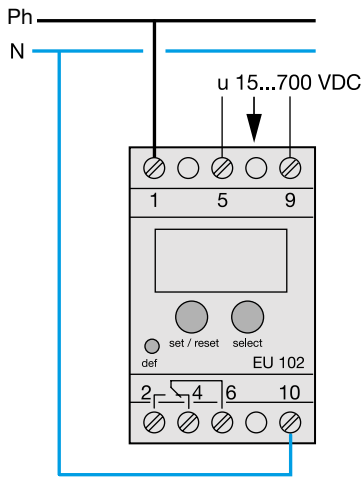


Ref.	EU100	EU101	EU301	EU302	EU300	EU102	EU103
Function	single phase compressor control relay	single phase compressor control relay	three phase compressor control relay	three phase voltage control relay	phase control relay	voltage control relay with LCD	current control relay with LCD
LCD indicator	No					measured voltage	measured current
Power supply	230 V AC +10% -15% 50/60Hz +/-2%		400 V AC +10% -15% 50/60Hz +/-2%		230 V AC +10% -15% 50/60Hz +/-2%		
Power consumption	< 5 VA						
Output contact	8A - AC1 - 250V closed: normal status opened: default status						
Disconnection time	5min / 10min			-			
Response time	200 ms			0,1..12s set via potentiometer	200 ms	200 ms	
Monitoring function	monitoring function over/under voltage				monitor. funct. under voltage loss of phase	over voltage under voltage band	over current under voltage band
Monitoring levels	Umin: 0.75Un Umax: 1.2Un	Umin/Umax: +/-5% to +/-20%Un set via potentiometer		Umin: +/-5 to +/-20% Un Umax: 1.15Un	asymmetry +/-5% to +/-20% Umin : 0.70Un	DC: 15V to 700V AC: 15V rms to 480V rms	DC: 0.1 to 10A AC: direct: 0.1to10A or via current transformer: X/5
Hysteresis						5 to 50%	
Latching function	no			yes	no	yes	
Supervised voltage	the power supply						
Width	2 modules					2 modules	
LED power supply: green	lights when powered						
LED default information: red	lights in case of fault, flashing during time elapses, off during normal status						
LED asymmetry information: yellow					asymmetry fault		
IK	3						
Ingress protection	IP 20						
Working temperature	-20 to +55°C						
Storage temperature	-40 to +70°C						
Connexion flexible	0.75 to 4mm ²						
Connexion rigid	1 to 6 mm ²						

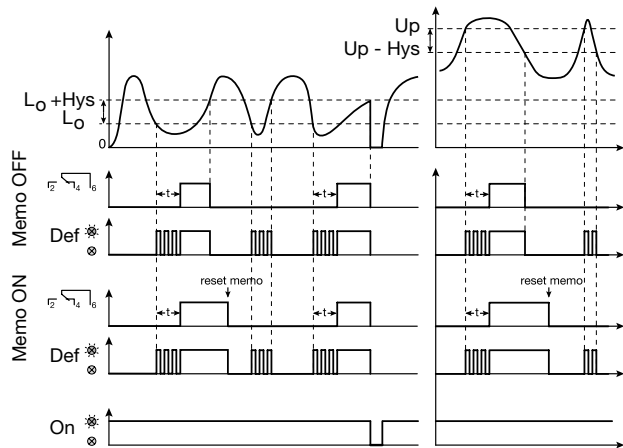
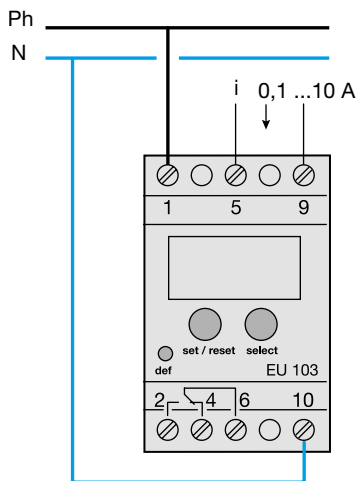
Air conditioning control relay single phase EU100



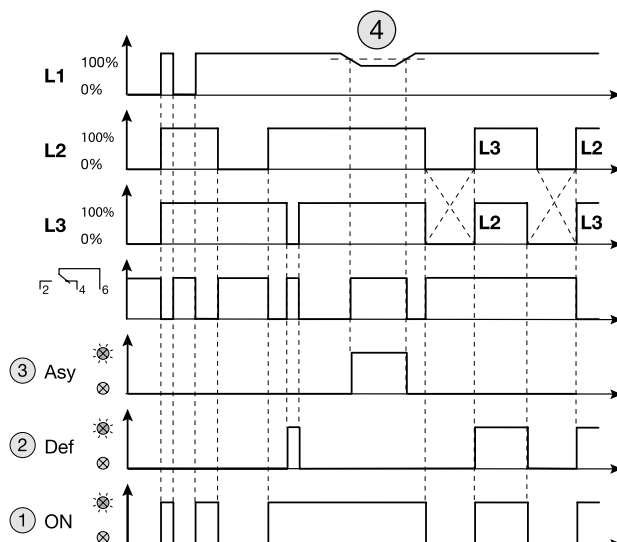
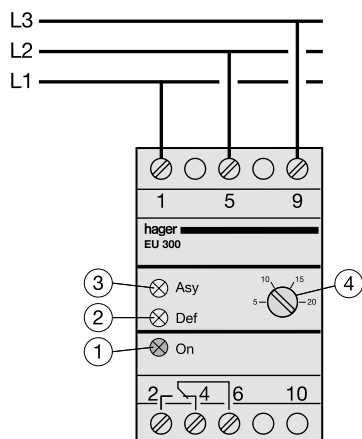
Voltage control relay single phase EU102



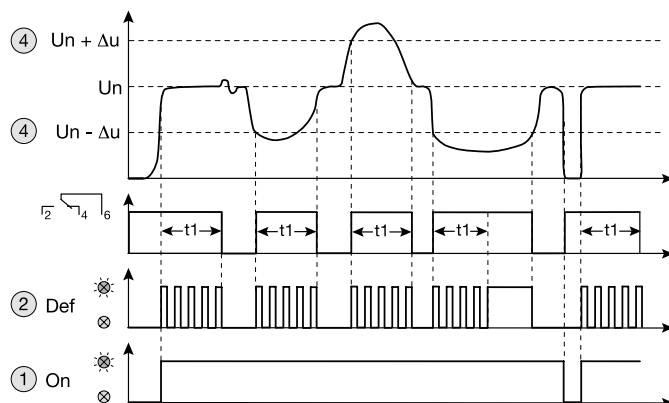
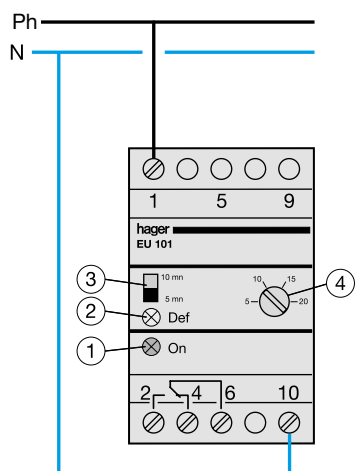
Current control relay single phase EU103



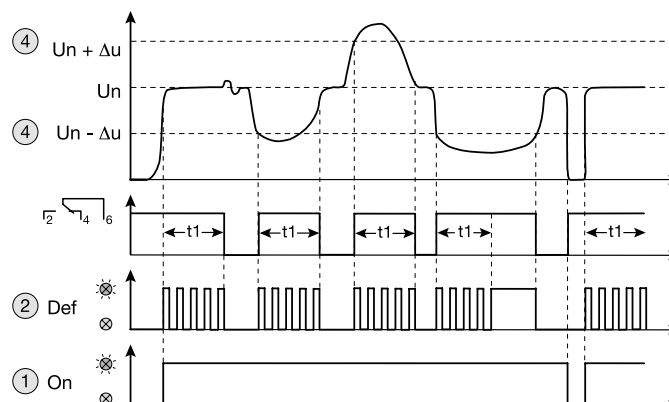
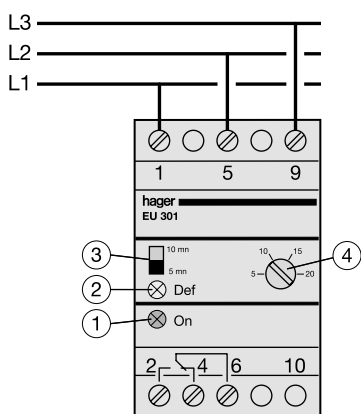
Phase control relay EU300



Air conditioning control relay single phase EU101



Air conditioning control relay three phase EU301



Voltage control relay three phase EU302

