Short-Form catalogue
2022-07

COMPLETE RANGE OF SOLUTIONS FOR ELECTRICAL ENERGY EFFICIENCY

The future is efficiency

Circutor

Circutor

Technology development to offer products and comprehensive solutions to the market of electric power efficiency and electric mobility.

We create and develop new ways of managing electric power, tracing possible paths to a more efficient world.

We respond to energy needs, reducing their environmental impact. Committed to our own future.

We offer comprehensive solutions that allow for the optimisation of energy consumption.

Tailor-made and customised service. We treat your concerns as ours.

From 1973

2017.
Technology for energy efficiency.
–
1992.
Energy control technology.
–
1984.
Technology for energy saving.
–
1982.
Rational use of electric power

CIRCUTOR headquarters in Viladecavalls, Barcelona.

Present in all sectors

Photovoltaic facilities

Energy distribution

Telecommunications, Data centres and critical facilities

Industrial sector

Tertiary sector, buildings and infrastructures

Electric mobility

Innovation and development

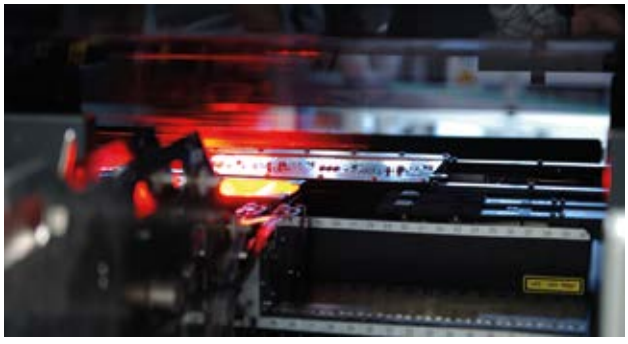
We are committed to innovation, incorporating cutting-edge technology to continue proposing more efficient solutions in the electric sector.

Production centres

We manufacture our own products in 6 centres located in Viladecavalls, Barcelona, Madrid, Santa Perpètua, Czech Republic and Mexico.

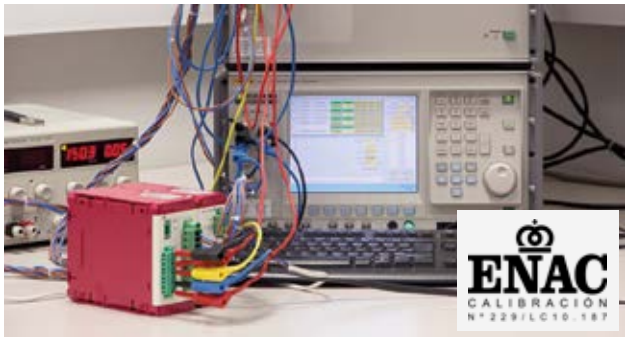
CIRCUTOR technology

Boasting an in-house R&D team made up of more than 100 engineers who work designing new products to meet market demand..



Testing laboratory

CIRCUTOR boasts in-house laboratories for compatibility testing (EMC/EMI), calibration and official metrological verification laboratory, which guarantee the highest quality.



With all CIRCUTOR Services

Pre-sale Services

- Low voltage capacitor bank sizing
- Harmonic filtering sizing
- MV reactive power compensation projects
- Energy efficiency systems installation (EMS)
- Data analysis for energy audits
- Assessment to collaborators

Support
Monday - Friday from 08 am to 6 pm.
(+34) 937 452 900

Technical Assistance Service (TAS)
Monday to Thursday
9 am to 2 pm and 3 pm to 5 pm.
Friday from 9 am to 2 pm.
(+34) 937 452 919
sat@circutor.com

After-sales services

Maintenance or repair of devices, is guaranteed through the comprehensive TAS service of CIRCUTOR.

Logistics
More than 3,000 references available in stock.

Technical support
Specialists at your disposal to answer any technical questions.

Equipment calibration
Equipment calibration service in in-house laboratory with ENAC certification.

Continuous training programmes for partners and customers

- Online training sessions all year round
- On-site technical training
- Visits and specific sessions for training centres

→ More information at **circutor.com**

Energy Management Systems

What is energy efficiency?
Energy efficiency consists of optimising the energy resources of an electrical installation to reduce power consumption and improve productivity without affecting the usual activity, whether in buildings, industries or distribution networks.

Why is it necessary?
Because proper energy management allows you to obtain the following benefits:

I Reduce the economic cost of operating facilities and processes, by optimising and reducing consumption (kWh, kvarh).
I Avoiding penalties, whether for reactive energy consumption or for maximum demand.
I Ensure the sustainability of the economic system and the preservation of the environment by reducing CO_2 emissions.
I Optimising the performance of the facilities, avoiding unnecessary consumption and improving technical management.
I Avoiding indirect costs due to production process failures or breakdowns (leak control and harmonic filtering).

How to apply it?
CIRCUTOR has the necessary equipment within its 6 product families:

MEASUREMENT AND CONTROL
Measurement and supervision of the main electrical parameters of the installation.

PROTECTION AND CONTROL
Protection of facilities, equipment and people.

METERING
Consumption and billing management through energy meters.

REACTIVE COMPENSATION
Power factor correction and harmonic filtering to save on energy bill.

ELECTRIC MOBILITY
Smart points for recharging electric vehicles.

RENEWABLE ENERGY SOURCES
Integral solutions for the monitoring of photovoltaic installations.

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Fixed power analyzers

		CVM-A1500 CVM-A1500A	CVM-B150 CVM-B100	CVM-C10	CVM-C11	CVM-C4	CVM-E3-MINI	Line-CVM-D32	CVM NET	CVM NET4+	CVM-D41DC
Mounting	Panel (mm)	144x144	144x144 / 96x96	96x96	96x96	96x96	OP (72x72)	OP (72x72)	OP (72x72)	–	–
	DIN rail (modules)	–	–	–	–	–	3	3	3	6	6
AC Measurement	Three-phase 3/4 wires	Config	Config	Config	Config.	Config	Config	Config.	•	•	–
	Single-phase	Config	Config	Config	Config.	Config	Config	Config.	–	•	●
	Quadrants	4	4	4	4	4	4	4	4	4	4
	Hamonics	63	50	31	31	-	31	40	–	15	–
	Phase parameters	•	•	•	●	•	•	•	•	•	●
	Maximum demand	•	•	•	●	–	•	•	•	•	–
	Tariffs	3	3	3	3	2	2	1	1	1	–
	Hours, cost, $kgCO_2$	•	•	•	–	–	•	•	–	–	–
Voltage input	Direct (V)	600 V_{ph-N}* 1000 V_{ph-ph}	600 V_{ph-N}* 1000 V_{ph-ph}	300 V_{ph-N} 520 V_{ph-ph}	300 V_{F-N} 520 V_{F-F}	230 V_{ph-N} 400 V_{ph-ph}	300 V_{ph-N} 520 V_{ph-ph}	300 V_{ph-N} 520 V_{ph-ph}	300 V_{ph-N} 520 V_{ph-ph}	300 V_{ph-N} 520 V_{ph-ph}	1500 V_{F-N}
	Indirect (V)	Config.	Config.	Config.	Config.	Config.	Config.	Config.	Config.	Config.	
Current Input	Direct	–	–	–	–	–	–	–	–	–	Shunt
	Indirect (ITF)	●	●	T	●	●	T	●	T	–	–
	MC System (/250 mA)	●	●	T	–	–	T	●	T	•	–
	Rogowski sensors	T	–	T	–	–	T	–	–	–	–
Communications	RS-485	•	•	•	●	•	T	•	•	•	●
	TCP/IP	•	OP	–	–	–	T	–	–	–	–
	WIFI	–	–	–	–	–	T	–	–	–	–
	web server	•	OP	–	–	–	T	–	–	–	–
	APP	–	–	–	–	–	–	–	–	–	–
	Bluetooth	–	–	–	–	–	T	–	–	–	–
Protocols	ModBus/RTU	●	●	●	●	●	T	●	●	●	●
	ModBus/TCP	OP	OP	–	–	–	T	–	–	–	–
	XML	•	OP	–	–	–	–	–	–	–	–
	MBUS	OP	OP	–	–	–	–	–	–	–	–
	BACnet	•	•	•	●	–	•	–	–	–	–
	Profibus	OP	OP	–	–	–	–	–	–	–	–
	LonWorks	OP	OP	–	–	–	–	–	–	–	–
Otthers	Display	Colour graph	Colour graph	Custom LCD	LCD	LED	LCD	TFT RGB	—	—	LCD
	Expandible	•	•	–	–	–	–	•	–	–	–
Optional	Digital inputs (n.max)	2	2	2	2	2	1(T)	–	–	–	2
	Digital outputs (n.max)	4	4	2+2R	2+2R	4	1(T)	2(OP*1)	2	4	2 R
	Analogue inputs (n.max)	OP	OP	–	–	–	–	(OP*1)	–	–	–
	Analogue outputs (n.max)	OP	OP	–	–	–	–	(OP*1)	–	–	1
	Historical data record	•	OP	–	–	–	–	(OP*1)	–	–	–
Standards	UL certificated	•	•	•	–	–	–	–	–	–	–
	Measurement in acc. with MID	•	•	•	–	–	•	•	–	–	–
	Measurement in acc with IEC 61000-4-30	T	–	–	–	–	–	–	–	–	–
	Calibration certificate in compliance with IEC 61000-4-30	T	–	–	–	–	–	–	–	–	–
	Page	18	12	13		13	14	15	14	14	

(T) - depending on the type / (OP) - Optional

Panel mounted power analyzers

CVM-A

Power quality analyzers, colour display, panel mounted

Power supply 100...240 Vac / 120...300 Vdc, 600 V_{Ph-N} / 1000 V_{Ph-Ph} measurement

Type	Code	Energy accuracy	Input current	Tr. output	Relay output	Digital inputs	Communications	Protocol	Harmonics	Certification	Memory
CVM-A1500A-ITF-485-ICT2	[2] M563110000A00	0,2S (.../5A)	.../5 A | .../1 A | 250 mA	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	IEC 61000-4-30 (Class A)	200 MB
CVM-A1500A-FLEX-485-ICT2	[2] M563510000A00	1	Rogowski	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	IEC 61000-4-30 (Class A)	200 MB
CVM-A1500-ITF-485-ICT2	[*] M56311.	0,2S (.../5A)	.../5 A | .../1 A | 250 mA	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	-	200 MB
CVM-A1500-FLEX-485-ICT2	[*] M56351.	1	Rogowski	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	-	200 MB

Four-quadrant measuring device with PowerStudio embedded. Integrated Datalogger module. Optional Modbus/TCP. 200MB Internal memory
See expansion modules and accessories (sealing gaskets) for CVM-A/CVM-B.
Precision power without connected sensors.

CVM-B

Power analyzer, colour display, panel mounted

Power supply100...240 Vac / 120...300 Vdc, 600 V_{Ph-N} / 1000 V_{Ph-Ph} measurement

Type	Code	Size (mm)	Energy accuracy	Input current	Transistor output	Relay output	Digital inputs	Communications	Protocol
CVM-B150-ITF-485-ICT2	[*] M56111.	144 x 144	0,5 S (.../5A)	.../5 A | .../1 A | .../250 mA	2	2	2	RS-485	Modbus/RTU | BACnet
CVM-B100-ITF-485-ICT2	[*] M56011.	96 x 96	0,5 S (.../5A)	.../5 A | .../1 A | .../250 mA	2	2	2	RS-485	Modbus/RTU | BACnet

4-quadrant measuring unit. See expansion modules and accessories (Sealing gaskets) for CVM-A / CVM-B

M-CVM-AB

Expansion modules for CVM-A and CVM-B

Type	Code	Transistor output	Relay output	Digital inputs	Analogue Input	Analog output	Communications	Protocol	Memory
M-CVM-AB-8I-8OTR	[*] M56E01.	8	-	8	-	-	-	-	-
M-CVM-AB-8I-8OR	[*] M56E02.	-	8	8	-	-	-	-	-
M-CVM-AB-4AI-8AO	[*] M56E03.	-	-	-	4 (0/4 ... 20 mA)	8 (0/4 ... 20 mA)	-	-	-
M-CVM-AB-Modbus-TCP (bridge)	[*] M56E05.	-	-	-	-	-	Ethernet	Modbus/TCP (gateway to RS485)	-
M-CVM-AB-Modbus-TCP (switch)	[*] M56E0A.	-	-	-	-	-	Ethernet	Modbus/TCP (gateway to TCP)	-
M-CVM-B-DATALOGGER	[*] M56E06.	-	-	-	-	-	Ethernet	Webserver | HTML5 | XML	200 MB
M-CVM-AB-MBUS	[*] M56E07.	-	-	-	-	-	M-BUS	M-BUS	-
M-CVM-AB-LonWorks	[*] M56E08.	-	-	-	-	-	LonWorks	LonTalk (ISO/IEC 14908, ANSI/EIA 7091)	-
M-CVM-AB-Profibus	[*] M56E09.	-	-	-	-	-	DB-9	ProfiBus	-

Adapters

Type	Code	Description
IP65-AB-96	[*] M5ZZ5U.	IP 65 airtight seal for CVM-AB (96x96)
IP65-AB-144	[*] M5ZZ5V.	IP 65 airtight seal for CVM-AB (144x144)

CVM-C10

Power analyzer, panel mounted 96 x96

96x96 panel - 85...265 Vac / 95...300 Vdc power supply, 300 V_{Ph-N} / 520 V_{Ph-Ph} measurement

Type	Code	Measuring Channels	Input current	Transistor output	Relay output	Digital inputs	Commu-nications	Protocol	Harmonics
CVM-C10-ITF-485-ICT2	[*] M55911.	3	.../5 A | .../1 A	2	2	2	RS-485	Modbus/RTU | BACnet	31
CVM-C10-MC-485-ICT2	[*] M55921.	3	.../250 mA	2	2	2	RS-485	Modbus/RTU | BACnet	31
CVM-C10-ITF-IN-485-IC2	[*] M55942.	4	.../5 A | .../1 A	-	2	2	RS-485	Modbus/RTU | BACnet	31
CVM-C10-mV-485-ICT2	[*] M559210000V00	3	.../333 mV	2	2	2	RS-485	Modbus/RTU | BACnet	31
CVM-C10-FLEX-IN-485-I2	[*] M55963.	4	Rogowski	-	-	2	RS-485	Modbus/RTU | BACnet	31

FLEX-MAG

Flexible sensors for FLEX devices

Type	Code	Measurement Range (A)	A Max.	Usefull diam.(mm)	Lenght
FLEX-MAG70	[*] M818110041500	1000 A / 100 mV	2000 (*1) 10000 (*2)	70	2 m
FLEX-MAG120	[*] M818120041500	1000 A / 100 mV	2000 (*1) 10000 (*2)	120	2 m
FLEX-MAG70-5M	[*] M818110041900	1000 A / 100 mV	2000 (*1) 10000 (*2)	70	5 m
FLEX-MAG120-5M	[*] M818120041900	1000 A / 100 mV	2000 (*1) 10000 (*2)	120	5 m

(*1) Series CVM-C10 and CVM-E3-MINI
(*2) Serie CVM-A1500/A1500A

Adapters

Type	Code	Description
IP64-C10-96	[*] M5ZZ5T.	IP 64 airtight seal for CVM-C10 (96x96)

CVM-C11

Power analyzer, panel mounted 96 x96

100... 270 Vac /Vdc power supply voltage

Type	Code	Power supply	Measuring Channels	Input current	Tr. output	Relay output	Digital inputs	Commu-nications	Protocol	Harmonics
CVM C11-ITF-IN-485-ICT2	[*] M58541.	100...270 Vac/dc	3	.../5 A | .../1 A	2	2	2	RS-485	Modbus/RTU | BACnet	31
CVM C11-ITF-IN-485-ICT2	[*] M5854100G0000	20...60 Vdc	-	.../5 A | .../1 A	2	2	2	RS-485	Modbus/RTU | BACnet	31

CVM–C4

Power analyzer, panel mounted 96x96

96x96 panel - 80...270 Vac / 80...270 Vdc power supply

Type	Code	Measuring Channels	Input current	Transistor output	Relay output	Digital inputs	Communi-cations	Protocol
CVM-C4-ITF-485-ICT2	[C] M52706.	3	.../5 A | .../1 A	2	2	2	RS-485	Modbus/RTU

4-quadrant measuring unit. Can be used to program the voltage transformer ratio

TABLE OF ADDITIONAL FEATURES

CVM-B, CVM-A

M	5	X	X	X	X	0	0	X	X	X	X	X	
Code								Internal code					Delivery time
Power supply voltage								Standard (100...270 V_{ac} / 120...300 V_{dc}				0	-
								20...120 V_{dc}				F	1
Others								Metric fork terminals 3 - CAT III 300 V			B	T	-

CVM C10

M	5	X	X	X	X	0	0	X	
								Internal code	Delivery time
Power supply voltage								Standard (85...265 V_{ac} / 120...300 V_{dc}	0 -
								20...120 V_{dc}	F 1

CVM-C4

M	5	X	X	X	X	0	0	X	
Code								Internal code	Delivery time
Power supply voltage								Estándard (80...270 V_{ac} / $_{dc}$)	0 -
								18 ...36 V_{dc}	3 1

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

DIN rail power analyzers

CVM-E3-MINI

Power analyzer, three-phase DIN rail

Type	Code	Power supply	Input current	Transistor output	Digital inputs	Communications	Protocol	Harmonics
CVM-E3-MINI-ITF-485-IC	[*] M56414.	207...253 Vac	.../5 A | .../1 A	1	1	RS-485	Modbus/RTU | BACnet	31
CVM-E3-MINI-MC-485-IC	[*] M56424.	207...253 Vac	.../250 mA	1	1	RS-485	Modbus/RTU | BACnet	31
CVM-E3-MINI-FLEX-485-IC	[*] M56454.	207...253 Vac	Rogowski	1	1	RS-485	Modbus/RTU | BACnet	31
CVM-E3-MINI-ITF-WiEth	[*] M56470.	90...264 Vac/Vdc	.../5 A | .../1 A	-	-	Ethernet | Wi-Fi | Bluetooth	Modbus/TCP	31
CVM-E3-MINI-MC-WiEth	[*] M56480.	90...264 Vac/Vdc	.../250 mA	-	-	Ethernet | Wi-Fi | Bluetooth	Modbus/TCP	31
CVM-E3-MINI-FLEX-WiEth	[*] M56490.	90...264 Vac/Vdc	Rogowski	-	-	Ethernet | Wi-Fi | Bluetooth	Modbus/TCP	31

Bluetooth is built into every WiEth model, which can be set up using the free MyConfig app. RS-485 models, option to switch power supplies. Consult additional services

FLEX-MAG

Flexible sensors for FLEX devices

Type	Code	Measurement Range (A)	A Max.	Usefull diam.(mm)	Lenght
FLEX-MAG70	[*] M818110041500	1000 A / 100 mV	2000 (*1) 10000 (*2)	70	2 m
FLEX-MAG120	[*] M818120041500	1000 A / 100 mV	2000 (*1) 10000 (*2)	120	2 m
FLEX-MAG70-5M	[*] M818110041900	1000 A / 100 mV	2000 (*1) 10000 (*2)	70	5 m
FLEX-MAG120-5M	[*] M818120041900	1000 A / 100 mV	2000 (*1) 10000 (*2)	120	5 m

(*1) Series CVM-C10 and CVM-E3-MINI

(*2) Serie CVM-A1500/A1500A

Adapters

Type	Code	Description
ADP. CVM-E3-MINI/ RGU-100B/CBS-400B	[*] M5ZZF100000E3	Panel adapter CVM-E3-MINI, RGU-100B, CBS-400B (72 x 72)

CVM-NET

Power analyer, three-phase DIN rail

Analyzer without display, DIN rail (3 modules) - 230 Vac Power supply

Type	Code	Input current	Transistor output	Communications	Protocol
CVM-NET-ITF-485-C2	[*] M54B21.	.../5 A	2	RS-485	Modbus/RTU
CVM-NET-MC-ITF-485-C2	[*] M54B31.	.../250 mA	2	RS-485	Modbus/RTU
CVM-NET-333-485-C2	[*] M54B310000V00	.../333 mV	2	RS-485	Modbus/RTU

The CVM-NET-MC units require the use of efficient transformers of the MC series, which are not included in the price.

CVM-NET4+

Power analyzer, 4 analyzers in a single unit, DIN rail

Unit without display, DIN rail (6 modules) - 85...265 Vac / 95...300 Vdc Power supply

Type	Code	Input current	Transistor output	Communications	Protocol	Harmonics
CVM-NET4+-ITF-MC-RS485-C4	[*] M55782.	.../250 mA	4	RS-485	Modbus/RTU	15

Requires the installation efficient transformers of the MC series. Not included in the price Configurable, 4 three-phase channels to 12 single-phase channels

CVM-D41 DC

Programmabled DC measurement device

100... 270 Vac /Vdc power supply voltage

Type	Code	System	Parameters	Measurement Range U	Measurement Range I	Out. relay	Digital inp.	Analog output	Power supply	Commu-nications	Protocol
Multimeter											
CVM-D41 DC mA	[*] M56638.	DC (Shunt)	V/A/kW/kWh	± 150...1500 Vdc	50 ... 600 mV	2	2	1 (20 mA)	100...270 Vac/dc	RS-485	Modbus/RTU
CVM-D41 DC mA	[*] M566380040000	DC (Shunt)	V/A/kW/kWh	± 150...1500 Vdc	50 ... 600 mV	2	2	1 (20 mA)	20...60 Vdc	RS-485	Modbus/RTU
CVM-D41 DC V	[*] M5663A.	DC (Shunt)	V/A/kW/kWh	± 150...1500 Vdc	50 ... 600 mV	2	2	1 (0 ... 10V)	100...270 Vac/dc	RS-485	Modbus/RTU
CVM-D41 DC V	[*] M5663A0040000	DC (Shunt)	V/A/kW/kWh	± 150...1500 Vdc	50 ... 600 mV	2	2	1 (0 ... 10V)	20...60 Vdc	RS-485	Modbus/RTU

TABLE OF ADDITIONAL FEATURES

CVM NET

M	5	X	X	X	X	0	0	X

Code		Internal code	Delivery time	+ €
Power supply voltage	Standard 230 V_{ac}	0	-	
	(*) 85...265 V_{ac} 95...300 V_{dc}	C	1	

CVM-E3-MINI (With RS-485)

M	5	X	X	X	X	0	0	X

Code		Internal code	Delivery time	+ €
Power supply voltage	Standard 207...253 Vac	0	-	
	90...264 Vac/Vdc	D	1	

Line system

Line-CVM-D

Power analyzer, Line series

Type	Code	Measuring Channels	Input current	Transistor output	Communications	Protocol	Harmonics
Line-CVM-D32	[*] M58100.	3	.../5 A | .../1 A | .../250 mA	2	RS-485 | Bus-Line	Modbus/RTU	40

Bus-Line: RS-485 communications system, with lateral side connector between modules

New

Line-M

Expansion modules, Line system

Type	Code	Transistor output	Relay output	Digital inputs	Analogue Input	Analog output	Commu-nications	Protocol
Input/Output Modules								
Line-M-4I0-T	[*] M58E01.	4	-	4	-	-	Bus-Line	Modbus/RTU
Line-M-4I0-R	[*] M58E02.	-	4	4	-	-	Bus-Line	Modbus/RTU
Line-M-8I6O-R	[*] M58E08.	-	6	8	-	-	Bus-Line	Modbus/RTU
Line-M-4I0-A	[*] M58E03.	-	-	-	4 (0/4 ... 20 mA)	4 (0/4 ... 20 mA) | 4 (0/2 ... 10 Vdc)	Bus-Line	Modbus/RTU
Line-M-4I0-RV	[*] M58E04.	-	4	4 (230 V)	-	-	Bus-Line	Modbus/RTU
Line-M-20I	[C] M58E06.	-	-	20	-	-	Bus-Line	Modbus/RTU

Transistor I/O expansion modules, Line system

New

Type	Code	Description
Power supply		
Line-M-EXT-PS	[*] M58E0A.	110-277 V ~ (P-N)/110-480 V ~ (P-P) power supply for maximum of 3 Line devices
Modem		
Line-M-3G	[*] M58E05.	3G communications modem and Bus-Line to communicate with the Line-EDS devices
Ethernet converter		
Line-TCPRS1	[C] M62411.	RS-485/RS-232 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (MyConfig) for configuration

3G Modem, expansion modules, Line system

Accessories

MC1

Triple scale single-phase efficient transformers

Type	Code	Measurement Range (A)	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
MC1-15-75	[*] M73112.	75	75	0.25	Single-phase	15
MC1-20-50/100/150 A	[*] M73118.	50/100/150	150	0.25	Single-phase	20
MC1-35-50/100/150 A	[*] M73116.	50/100/150	150	0.25	Single-phase	35
MC1-20-150/200/250 A	[*] M73113.	150/200/250	250	0.25	Single-phase	20
MC1-30-250/400/500 A	[*] M73114.	250/400/500	500	0.25	Single-phase	30
MC1-55-500/1000/1500 A	[*] M73115.	500/1000/1500	1500	0.25	Single-phase	55
MC1-80 1000/1500/2000 A	[*] M73117.	1000/1500/2000	2000	0.25	Single-phase	80

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

MC3

Three-phase current transformers

Type	Code	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
MC3 - 63 A	[*] M73121.	63	0.1	Three-phase	7,1
MC3 - 125 A	[*] M73122.	125	0.1	Three-phase	14,6
MC3 - 250 A	[*] M73123.	250	0.1	Three-phase	26

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

SC3

Split three-phase current transformers

Type	Code	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
SC3-125	[*] M73602.	125	0.1	Three-phase	15

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

Energy meters

CEM-C5

Direct Single-phase active energy meter

Type	Code	Quadrants	Measurement Range (V)	Measurement Range (A)	Transistor output	Certification	Módules	Display
CEM-C5	[*] Q25112.	2	1 x 230	5 (50) A	1	IEC	1	LCD

Frecuency: 50/60 Hz. Parameters: kWh

CEM-C12

Direct Single-phase energy meter with basic analyser parameters

Type	Code	Quadrants	Measurement Range (V)	Measurement Range (A)	Tariff	Certification	Módules	Communi-cations	Protocol
CEM-C12	[*] Q27111.	4	1 x 230	10 (100) A	1	IEC	1	RS-485	Modbus/RTU
CEM-C12-MID	[*] Q27112.	4	1 x 230	0.25 ... 5 (100) A	1	MID	1	RS-485	Modbus/RTU

Frecuency: 50/60 Hz. Parameters: V, A, kW, kVA, kWh, cos phi

CEM-C

Energy meter

Power supply 230 Vac, 50 ... 60 Hz

Type	Code	Qua-drants	Measurement Range (V)	Measu-rement Range (A)	I Max. (A)	Tariff	Tr. ou-tput	Digital inputs	Certifi-cation	Mó-dules	Commu-nications	Protocol
Direct single-phase												
CEM C10 212	[*] Q21112.	Abs.	1 x 230	5 (65) A	65	1	1	-	IEC	2	-	-
CEM C10 212 MID	[*] Q21114.	Abs.	1 x 230	5 (65) A	65	1	1	-	MID	2	-	-
Direct three-phase												
CEM-C21-T1	[*] Q22411.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	IEC	4	-	-
CEM-C21-485-T1	[*] Q22421.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	IEC	4	RS-485	Modbus/RTU
CEM-C21-485-DS	[*] Q22431.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	2	-	1	IEC	4	RS-485	Modbus/RTU
CEM-C21-T1-MID	[*] Q22412.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	MID	4	-	-
CEM-C21-485-T1-MID	[*] Q22422.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	MID	4	RS-485	Modbus/RTU
CEM-C21-485-DS-MID	[*] Q22432.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	2	-	1	MID	4	RS-485	Modbus/RTU
Indirect three-phase												
CEM-C31-T1	[*] Q23511.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	IEC	4	-	-
CEM-C31-485-T1	[*] Q23521.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	IEC	4	RS-485	Modbus/RTU
CEM-C31-485-DS	[*] Q23531.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	2	-	1	IEC	4	RS-485	Modbus/RTU
CEM-C31-T1-MID	[*] Q23512.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	MID	4	-	-
CEM-C31-485-T1-MID	[*] Q23522.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	MID	4	RS-485	Modbus/RTU
CEM-C31-485-DS-MID	[*] Q23532.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	2	-	1	MID	4	RS-485	Modbus/RTU

CEM-C10 and CEM-C21/C31 without built-in RS-485 communications can optionally communicate with CEM-M-ETH and CEM-M-RS485 modules.
Devices with absolute measurements (Abs). For 2 or 4 quadrants, see the
CEM-XXX-TI encoding table - Devices with pulse output (transistor)
CEM-XXX-DS-Devices with digital input for tariff change and impulse meter

Modules for CEM

Type	Code	Communications	Protocol
CEM-M-RS485	[*] Q23100.	RS-485	Modbus/RTU
CEM-M-ETH	[C] Q23400.	Ethernet	Modbus/TCP

Compatible with CEM-C10 and CEM-C21/C31 meters without built-in RS-485 communications

TABLE OF ADDITIONAL FEATURES

CEM-10 / CEM-C21/ CEM-C31

Q	2	X	X	X	X	0	0	X	X	X	X	X	
Code						Internal code					↑	↑	Delivery time
			Standard (ABS)								0	0	-
			Quadrants	2							0	1	2
				4							0	2	2

ABS = Energy Consumed + Energy Generated

Power quality analyzers

		CVM-A1500A	CVM-A1500
		Class A	Acc. Class A
Assembly	Panel (mm)	144 x 144	144 x 144
	DIN rail (modules)	–	–
	Wall-mounted	–	–
Connection	Three-phase 3/4-wire	Config.	Config.
	Quadrants	4	4
Power supply		85-265V_{ac} / 120-300V_{dc} 20-120V_{dc} (OP)	85-265V_{ac} / 120-300V_{dc} 20-120V_{dc} (OP)
Parameters	Parameters per phase	●	●
	Power	0,2	0,2
	Active energy	0,2S (.../5A)	0,2S (.../5A)
	Reactive energy	1	1
	Maximum demand	●	●
	Harmonics	63	63
	THD U / THD I	●	●
	Tariffs	3	3
	Hours, cost, kgCO2	●	●
Quality parameter measurements	Events (overvoltages, gaps and interruptions)	●	●
	EN50160 parameters	●	●
	Transients	●	●
Voltage input	Direct	600 V_{ph-N} 1000 V_{ph-ph}	600 V_{ph-N} 1000 V_{ph-ph}
	Indirect	Config	Config.
Input Current	../5 A	●	●
	../1 A	●	●
	../250 mA	●	●
Inputs/outputs	Digital inputs	2	2
	Digital outputs	2	2
	Relay outputs	2	2
Communications	RS-232	–	–
	RS-485	●	●
	TCP/IP	●	●
Interface	Colour screen	●	●
Protocols	ModBus/RTU	●	●
	ModBus/TCP	OP	OP
	XML	●	●
	MBUS	OP	OP
	BACnet	●	●
	Profibus	OP	OP
	LonWorks	OP	OP
	Web server	HTML5	HTML5
	FTP	–	–
Expansion modules	Digital inputs/outputs	OP (8 + 8)	OP (8 + 8)
	Digital inputs / Relay outputs	OP (8 + 8)	OP (8 + 8)
	Analogue inputs/outputs	OP (4 + 8)	OP (4 + 8)
Standards	Measuring in accordance with IEC 61000-4-30	Class A	According Class A
	According to UL	(certificate)	(certificate)
	Measuring in accordance with MID	●	●

T - Depending on type / OP - Optional

CVM-A

Power quality analyzers, colour display, panel mounted

Power supply 100...240 Vac / 120...300 Vdc, 600 V_{Ph-N} / 1000 V_{Ph-Ph} measurement

Type	Code	Energy accuracy	Input current	Tr. output	Relay output	Digital inputs	Commu-nications	Protocol	Harmo-nics	Certification	Memory
CVM-A1500A-ITF-485-ICT2	[2] M563110000A00	0,2S (.../5A)	.../5 A | .../1 A | 250 mA	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	IEC 61000-4-30 (Class A)	200 MB
CVM-A1500A-FLEX-485-ICT2	[2] M563510000A00	1	Rogowski	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	IEC 61000-4-30 (Class A)	200 MB
CVM-A1500-ITF-485-ICT2	[*] M56311.	0,2S (.../5A)	.../5 A | .../1 A | 250 mA	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	-	200 MB
CVM-A1500-FLEX-485-ICT2	[*] M56351.	1	Rogowski	2	2	2	RS-485 | Ethernet	Modbus/RTU | BACnet | webserver (HTTP) | XML | HTML5	63	-	200 MB

Four-quadrant measuring device with PowerStudio embedded. Integrated Datalogger module. Optional Modbus/TCP. 200MB Internal memory
See expansion modules and accessories (sealing gaskets) for CVM-A/CVM-B.
Precision power without connected sensors.

M-CVM-AB

Expansion modules for CVM-A and CVM-B

Type	Code	Transistor output	Relay output	Digital inputs	Analogue Input	Analog output	Commu-nications	Protocol	Memory
M-CVM-AB-8I-8OTR	[*] M56E01.	8	-	8	-	-	-	-	-
M-CVM-AB-8I-8OR	[*] M56E02.	-	8	8	-	-	-	-	-
M-CVM-AB-4AI-8AO	[*] M56E03.	-	-	-	4 (0/4 ... 20 mA)	8 (0/4 ... 20 mA)	-	-	-
M-CVM-AB-Modbus-TCP (bridge)	[*] M56E05.	-	-	-	-	-	Ethernet	Modbus/TCP (gateway to RS485)	-
M-CVM-AB-Modbus-TCP (switch)	[*] M56E0A.	-	-	-	-	-	Ethernet	Modbus/TCP (gateway to TCP)	-
M-CVM-B-DATALOGGER	[*] M56E06.	-	-	-	-	-	Ethernet	Webserver | HTML5 | XML	200 MB
M-CVM-AB-MBUS	[*] M56E07.	-	-	-	-	-	M-BUS	M-BUS	-
M-CVM-AB-LonWorks	[*] M56E08.	-	-	-	-	-	LonWorks	LonTalk (ISO/IEC 14908, ANSI/EIA 7091)	-
M-CVM-AB-Profibus	[*] M56E09.	-	-	-	-	-	DB-9	ProfiBus	-

TABLE OF ADDITIONAL FEATURES

CVM-A

M	5	X	X	X	X	0	0	X	X	X	X	X	
Code							Internal code						Delivery time
Power supply voltage			Standard (100...270Vac / 120...300 Vdc					0					-
			20...120 Vdc					F					1
Others			Metric fork terminals 3 - CAT III 300 V								B	T	-

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Accessories

Communication converters

Type	Code	Description
RS		
RS2RS	[*] M62141.	RS-232/485 Intelligent converter and amplifier (RTS control) for PC
USB		
USB-RS 485	[*] M54040.	USB to RS-485 Converter
USB-RS 232	[*] M54050.	USB to RS-232 Converter
M-BUS		
CMBUS-8	[*] M540A0.	M-Bus to Modbus Converter, up to 8 Mbus slaves
CMBUS-24	[*] M540B0.	M-Bus to Modbus Converter, up to 24 Mbus slaves
LoRa		
LR1RS+PSAC	[2] M6215A.	LoRa to RS-485 Converter (Modbus/RTU) . AC power supply (110...264 Vac)
LR1RS+PSDC	[2] M6215C.	LoRa to RS-485 Converter (Modbus/RTU) . DC power supply (12 Vdc)
Ethernet		
TCPRS1+	[*] M62422.	RS-485 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (***MyConfig Wifi***) for configuration

New

Communications accessories

Type	Code	Description
CM-GSM/3G	[*] Q30251.	RS-232/RS-485 GSM/3G Modem
SGE-3G/GPRS	[*] Q30230.	GPRS-3G Modem with Ethernet communications (includes PS + antenna + cable)
ANTENA GSM	[1] Q4994E.	Antenna 9 dB (for GSM modem)

PowerStudio

Energy management software

Type	Code	Description
SCADA software		
PowerStudio	[*] M90211.	Configuration, monitoring in real time, display of graphs and tables
PowerStudio-Scada	[*] M90231.	Software with USB HASP licence. Configuration, monitoring in real time, display of graphs and tables, generation of reports, creation of SCADA screens and alarms
PowerStudio-Deluxe	[C] M90241.	Software with USB HASP licence. Software PowerStudio-Scada with Generic Modbus driver used to connect to other devices available in the market
OPC Server PS/PSS	[1] M91111.	Software with USB HASP licence. **OPC Server** for PowerStudio is an integration platform that can easily integrate the parameters received from PowerStudio (or any of its versions) in any SCADA platform available in the market with a simple approach.
SQL DATA EXPORT	[1] M91301.	Software with USB HASP licence. SQL Data Export is a software tool for the integration of data from PS/PSS/PSSD to a new or existing SQL database.

License 4.0 version 4.0

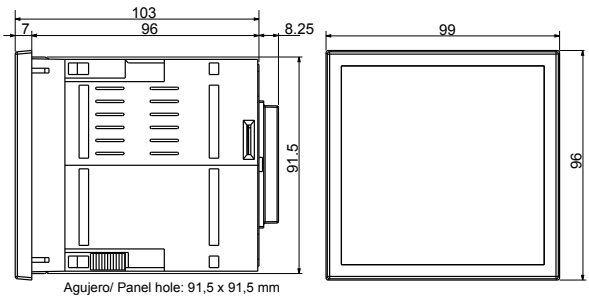
New

Change PowerStudioSCADA physical licence to virtual licence

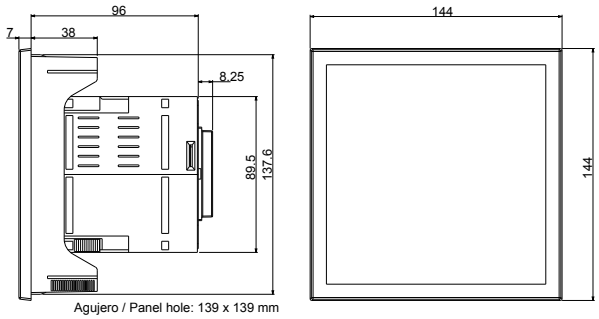
Type	Code	Description
Phi-to-Vir-PSS	[1] M902310055000	Replacement of physical USB licence for PowerStudioSCADA with software licence (requires returning physical licence)
Phi-to-Vir-PSS-Deluxe	[1] M902410055000	Replacement of physical USB licence for PowerStudioSCADA Deluxe with software licence (requires returning physical licence)

Dimensions

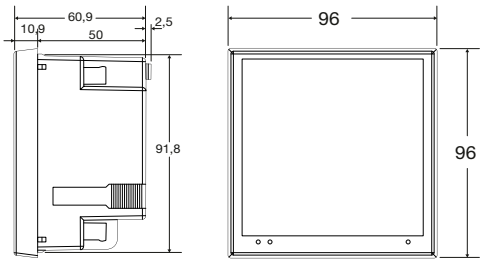
CVM B100



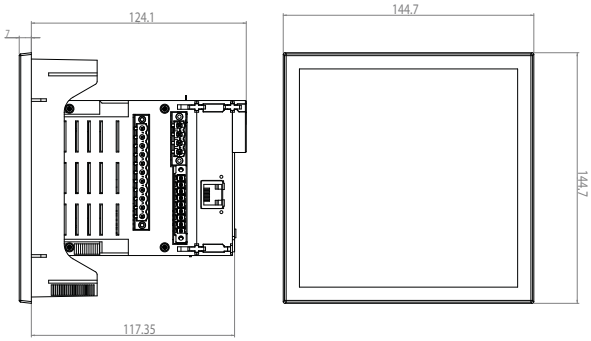
CVM B150



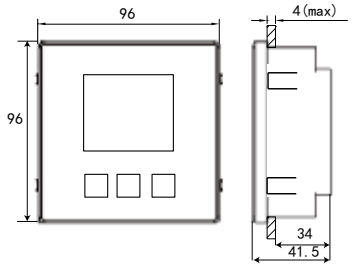
CVM C10



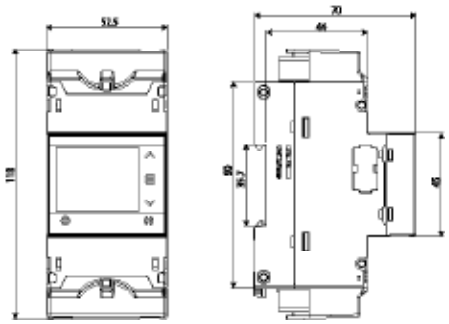
CVM A 1500 / CVM A 1500A



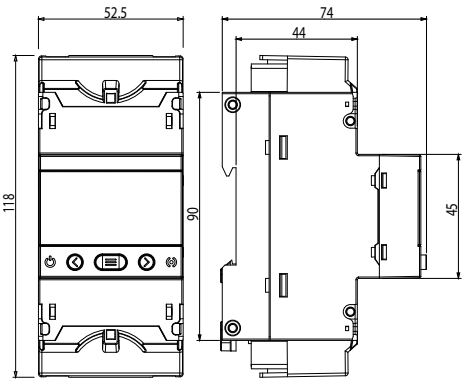
CVM C4



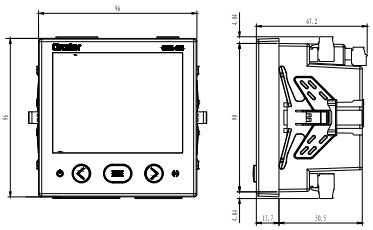
Line-CVM-D32



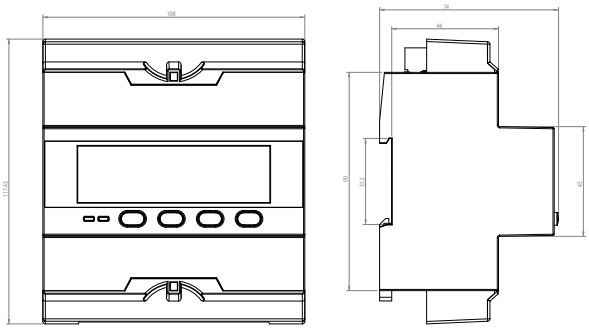
CVM-E3-MINI



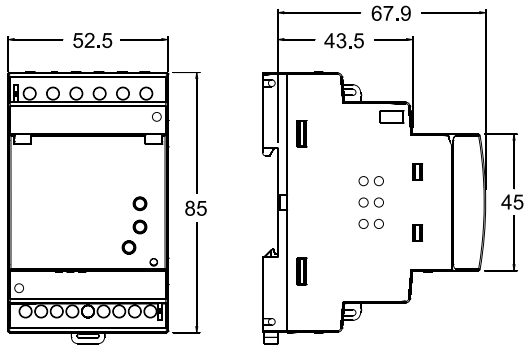
CVM C11



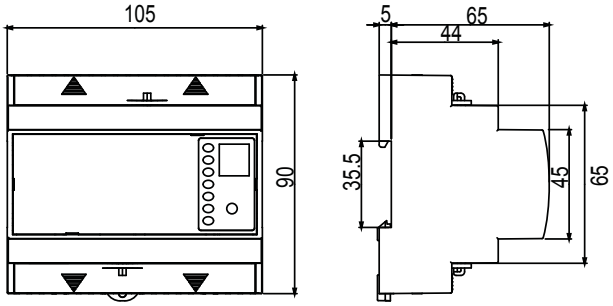
CVM D41



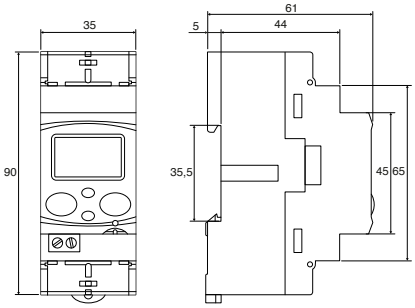
CVM NET



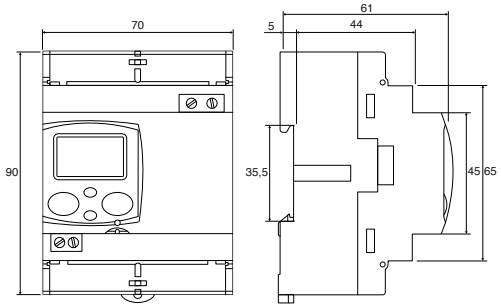
CVM NET4+



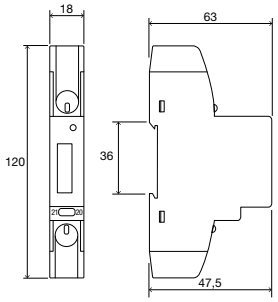
CEM-C10



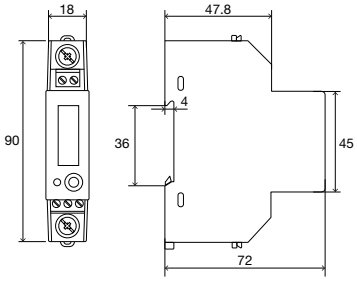
CEM-C21 / CEM-C31



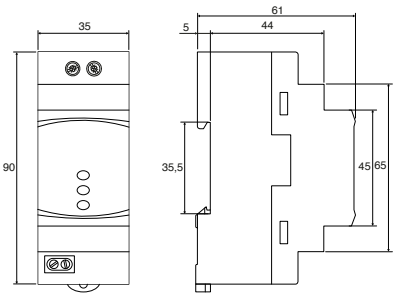
CEM-C5



CEM-C12



CEM-M



Measuring transformers and shunts

Table: Current transformers and shunts selection

		TD	TCH	TA	TQ New	TP	TQR New	STP	MC	TM 45	TRMC	TRM	SH
AC Measurement	For billing meters	–	–	–	–	–	–	–	–	–	●	–	–
	For measuring instruments	●	●	●	●	●	●	●	●	●	–	●	●
	Wound primary	–	–	T	–	–	–	–	–	●	T	–	–
	Passing bar	●	●	T	●	●	●	–	●	–	T	●	–
	Split-core	–	–	–	●	●	●	●	–	–	–	–	–
	Minimum range (A)	40 A	50 A	5 A	100 A	250 A	400 A	100 A	50 A	1 A	50 A	75 A	–
	Maximum range (A)	1600 A	4000 A	5000 A	1000 A	6000 A	2000 A	300 A	2000 A	50 A	3000 A	5000 A	–
	High accuracy	–	●	–	–	–	–	–	–	–	–	–	–
	Three-phase	–	–	–	–	–	–	–	T	–	T	–	–
DC measurement	Minimum range (A)	–	–	–	–	–	–	–	–	–	–	–	1 A
	Maximum range (A)	–	–	–	–	–	–	–	–	–	–	–	20000 A
Other parameters	Secondary output	.../5 A (*2)	.../5 A (*1)	.../5 A (*1)	.../5 A (*2)	.../5 A (*1)	.../5 A (*2)	../5 A (*2)	250 mA	.../5 A (*1)	.../5 A (*1)	.../5 A (*1)	.../60 mV (*3)
	in resin	OP	OP	–	–	–	–	–	–	–	●	●	–
	Sealable	●	T	–	●	●	–	–	–	–	–	–	–
	UL Certificate	–	T	T	–	–	–	–	–	–	–	–	–
	Individual certificate	OP	OP	OP	OP	OP	OP	–	–	–	OP	OP	–
	Page	23	25	30	26	28	27	28	29	29	31	32	33

T - Depending on the type
OP - Optional
(*1) .../1 On demand
(*2) .../1 A, .../250 mA on request
(*3) Possibility of other outputs (secundary values)

TD

Current transformers narrow section

Type	TD4				TD5				TD5.2			
	width x height x depth (mm) 50 x 80 x 48				width x height x depth (mm) 58 x 84 x 53				width x height x depth (mm) 58 x 84 x 53			
ø (mm)	20								22			
Flat strip(mm)					15 x 15 | 20 x 10 | 25 x 5				25 x 10 | 30 x 10 | 20 x 12			
A/V-A	Class			Code	Class			Code	Class			Code
	0.5	1	3		0.5	1	3		0.5	1	3	
40/5	-	-	1,25	[*] M75011.								
50/5	-	1	1,5	[*] M75012.	-	0,5	1,5	[*] M75022.				
60/5	-	1,25	2,5	[*] M75013.	-	1	2,5	[*] M75023.				
75/5	-	1,5	3,75	[*] M75014.	-	1,5	3,5	[*] M75024.				
100/5	1,5	2,5	5	[*] M75015.	1,5	2,5	3,75	[*] M75025.	-	-	1	[*] M750A5.
125/5	2,5	3,75	5	[*] M75016.	1,5	2,5	3,75	[*] M75026.	-	1	1,5	[*] M750A6.
150/5	3,75	5	5	[*] M75017.	1,5	2,5	3,75	[*] M75027.	1	1,5	2,5	[*] M750A7.
200/5	5	7,5	7,5	[*] M75018.	2,5	3,75	5	[*] M75028.	1,5	2,5	3,5	[*] M750A8.
250/5					2,5	3,75	5	[*] M75029.	2,5	3,5	5	[*] M750A9.
300/5									2,5	3,5	5	[*] M750AA.
400/5									2,5	3,5	5	[*] M750AB.
500/5									5	7,5	10	[*] M750AC.
600/5									5	7,5	10	[*] M750AD.

For other configurations see table of additional features

Type	TD6.2				TD6				TD8			
	width x height x depth (mm) 66 x 91 x 53				width x height x depth (mm) 66 x 91 x 53				width x height x depth (mm) 85 x 109 x 59			
ø (mm)	25				28				43			
Flat strip(mm)	25 x 12 |30 x 10 |20 x 20				20 x 25 |30 x 15 |40 x 10				50 x 30 | 60 x 12| 13 x 45			
A/V-A	Class			Code	Class			Code	Class			Code
	0.5	1	3		0.5	1	3		0.5	1	3	
100/5	1	2,5	3,5	[*] M75055.								
125/5	1,5	3,5	5	[*] M75056.								
150/5	2,5	3,5	5	[*] M75057.	1	2,5	3,5	[*] M75047.				
200/5	3,5	5	5	[*] M75058.	1,5	3,5	5	[*] M75048.				
250/5	3,5	5	5	[*] M75059.	2,5	5	5	[*] M75049.				
300/5	5	7,5	7,5	[*] M7505A.	2,5	5	5	[*] M7504A.	2,5	3,5	3,5	[*] M7506A.
400/5	5	7,5	7,5	[*] M7505B.	2,5	5	5	[*] M7504B.	2,5	3,5	5	[*] M7506B.
500/5	5	7,5	10	[*] M7505C.	5	7,5	7,5	[*] M7504C.	2,5	5	5	[*] M7506C.
600/5	5	7,5	10	[*] M7505D.	5	7,5	7,5	[*] M7504D.	2,5	5	5	[*] M7506D.
750/5					5	7,5	10	[*] M7504E.	2,5	5	5	[*] M7506E.
800/5					5	7,5	10	[*] M7504F.	5	7,5	7,5	[*] M7506F.
1000/5									5	7,5	10	[*] M7506G.
1200/5									5	7,5	10	[*] M7506H.
1250/5									7,5	10	10	[*] M7506J.
1500/5									7,5	10	15	[*] M7506K.
1600/5									7,5	10	15	[*] M7506L.

For other configurations see table of additional features

Accessories for TD transformers

Type	Code	Description
DIN-FIX 50x50	[*] M75102.	DIN rail fixing 50 x 50 mm (TD4, TD5, TD5.2, TD6, TD6.2)
DIN-FIX 50x84	[*] M75103.	DIN rail fixing 50 x 84 mm (TD8, TD10)
TD4-COVER	[*] M75111.	Terminal cover/label for TD4 + secondary cap
TD5/TD5.2-COVER	[*] M75121.	Terminal cover/label for TD5 / TD5.2 + secondary cap
TD6/TD6.2-COVER	[*] M75141.	Terminal cover/label for TD6 / TD6.2 + secondary cap
TD8-COVER	[*] M75161.	Terminal cover/label for TD8 + secondary cap
TD10-COVER	[*] M75171.	Terminal cover/label for TD10 + secondary cap
TD12-COVER	[*] M75181.	Terminal cover/label for TD12 + secondary cap

TD

Current transformers narrow section

Type	TD10				TD12			
	width x height x depth (mm) 108 x 131 x 69				width x height x depth (mm) 134 x 151 x 69			
ø (mm)	63				50			
Flat strip(mm)	50 x 50 | 60 x 30 | 80 x 30				100 x 50			
A/V-A	Class 0.5	1	3	Code	Class 0.5	1	3	Code
600/5	2,5	5	7,5	[*] M7507D.				
750/5	2,5	5	7,5	[*] M7507E.				
800/5	2,5	5	7,5	[*] M7507F.	2,5	5	7,5	[*] M7508F.
1000/5	2,5	5	7,5	[*] M7507G.	2,5	5	7,5	[*] M7508G.
1200/5	2,5	5	7,5	[*] M7507H.	5	10	15	[*] M7508H.
1250/5	2,5	5	7,5	[*] M7507J.	5	10	15	[*] M7508J.
1500/5	5	10	15	[*] M7507K.	7,5	15	20	[*] M7508K.
1600/5	5	10	15	[*] M7507L.	7,5	15	20	[*] M7508L.
2000/5	5	10	15	[*] M7507M.	7,5	15	20	[*] M7508M.
2500/5	5	10	15	[*] M7507N.	10	20	25	[*] M7508N.
3000/5	5	10	15	[*] M7507P.	10	20	25	[*] M7508P.
4000/5					15	20	25	[*] M7508Q.

For other configurations see table of additional features

TABLE OF ADDITIONAL FEATURES

TD / TC

M	7	X	X	X	X	0	0	X	
Code						Internal code			Delivery time
Secundary			Standard (.../ 5 A)					0	-
			.../ 1 A					1	1
			.../250 mA					A	1

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

TCH

Current transformers narrow section and high accuracy

Type	TCH6.2				TCH6				TCH8			
	width x height x depth (mm) 74 x 87.15 x 71.12				width x height x depth (mm) 64 x 87.5 x 71.2				width x height x depth (mm) 84.1 x 114 x 83			
Flat strip(mm)	20 x 20 |25 x 12 |30 x 10				30 x 15 |20 x 10 |40 x 10				50 x 30 |60 x 12			
A/V-A	Class				Class				Class			
	0.2	0.2S	0.5S	Code	0.2	0.2S	0.5S	Code	0.2	0.2S	0.5S	Code
50/5	0,5	-	-	[*] M7044B.								
60/5	0,5	-	-	[*] M7044C.								
100/5	1,5	1	2,5	[*] M70441.								
125/5	1,5	1	2,5	[*] M70442.								
150/5	3,5	2,5	3,5	[*] M70443.	1,25	1	1,5	[*] M70431.				
200/5	5	3,5	5	[*] M70444.	1,5	1,25	2	[*] M70432.				
250/5	5	5	5	[*] M70445.	1,75	1,5	2,25	[*] M70433.				
300/5	5	5	5	[*] M70446.	2	1,75	2,5	[*] M70434.				
400/5	7,5	7,5	7,5	[*] M70447.	5	1	5	[*] M70435.				
500/5					7,5	5	7,5	[*] M70436.				
600/5					7,5	5	7,5	[*] M70437.	10	5	10	[*] M70463.
750/5					10	7,5	10	[*] M70438.	10	7,5	10	[*] M70464.
800/5					10	7,5	10	[*] M70439.	10	7,5	10	[*] M70465.
1000/5									15	10	15	[*] M70466.
1200/5									15	10	15	[*] M70467.
1250/5									15	10	15	[*] M7046A.
1500/5									15	10	15	[*] M70468.
1600/5									15	10	15	[*] M70469.

For other configurations see table of additional features

Type	TCH10				TCH12			
	width x height x depth (mm) 108 x 137 x 78				width x height x depth (mm) 129 x 155 x 78			
Flat strip(mm)	50 x 50 |60 x 30 |80 x 30				100 x 50			
A/V-A	Class				Class			
	0.2	0.2S	0.5S	Code	0.2	0.2S	0.5S	Code
800/5	10	7,5	10	[*] M70472.				
1000/5	10	7,5	10	[*] M70473.				
1200/5	10	10	10	[*] M70474.	15	10	15	[*] M70482.
1250/5	10	10	10	[*] M7047C.	15	10	15	[*] M7048C.
1500/5	10	10	15	[*] M70475.	15	10	15	[*] M70483.
1600/5	10	10	15	[*] M70476.	15	10	15	[*] M70484.
2000/5	10	10	15	[*] M70477.	15	10	15	[*] M70485.
2500/5	10	10	15	[*] M70478.	20	15	20	[*] M70486.
3000/5	10	10	15	[*] M70479.	25	20	25	[*] M70487.
3200/5					25	20	25	[*] M7048B.
4000/5					30	25	30	[*] M70488.

For other configurations see table of additional features

New

TQ

Current transformers split core, button opening

Type	TQ-6				TQ-8			
	width x height x depth (mm) 80 x 98.5 x 28				width x height x depth (mm) 120 x 148.5 x 28			
Flat strip(mm)	20 x 30				60 x 80			
A/V-A	Class				Class			
	0.5	1	3	Code	0.5	1	3	Code
100/5	0	0	1	[*] M74023.				
150/5	0	0	1	[*] M74025.				
200/5	0	0	2	[*] M74026.				
250/5	0	1	2	[*] M74027.				
300/5	0,5	1	2	[*] M74028.	0	1	2,5	[*] M74035.
400/5	1	2,5	4	[*] M7402A.	1	1,5	3	[*] M74037.
500/5					2	5	7,5	[*] M74039.
600/5					2	5	8	[*] M7403B.
700/5					2	5	8	[*] M7403D.
750/5					2,5	5	10	[*] M7403E.
800/5					3	6	10	[*] M7403F.
1000/5					5	8	15	[*] M7403I.

For other configurations see table of additional features

Opening easy button

TABLE OF ADDITIONAL FEATURES

TCH										
M	7	X	X	X	X	0	0	X		
Code						Internal code			Delivery time	
Secundary			Standard (.../ 5 A)					0	-	
			.../ 1 A					1	1	
			.../250 mA					A	1	

TQ										
M	7	X	X	X	X	0	0	X	X	
Code						Internal code				Delivery time
Secundary			Standard (.../ 5 A)					0		-
			.../ 1 A					1		1
			.../250 mA					A		1
			.../100 mA					7		
Certificate			-						0	-
			Test report (*)						1	

(*) A certificate is attached for every transformer

New

TQR

Current transformers split core

Type	TQR-8				TQR-10			
				width x height x depth (mm) 216 x 173 x 43.1				width x height x depth (mm) 240 x 198.71 x 43.41
ø (mm)	80				105			
Flat strip(mm)								
A/V-A	Class 0.5	1	3	Code	Class 0.5	1	3	Code
400/5	0	1,5	3	[*] M76037.				
500/5	1	1,5	3	[*] M76039.				
600/5	1,5	2	4	[*] M7603B.	1,5	2	4	[C] M7604B.
700/5	2	4	8	[*] M7603D.	2	4	8	[C] M7604D.
750/5	2,5	5	10	[C] M7603E.	2,5	5	10	[C] M7604E.
800/5	3	7	15	[*] M7603F.	3	7	15	[C] M7604F.
1000/5	5	8	16	[*] M7603J.	5	8	16	[C] M7604J.
1250/5	6	10	20	[*] M7603L.	6	10	20	[C] M7604L.
1500/5	6	10	20	[*] M7603M.	6	10	20	[C] M7604M.
2000/5	8	15	25	[*] M7603N.	8	15	25	[C] M7604N.

For other configurations see table of additional features

TABLE OF ADDITIONAL FEATURES

TQR

M	7	X	X	X	X	0	0	X	X	X	
Code							Internal code	↑	↑	↑	Delivery time
Secundary			Standard (.../ 5 A)					0			-
			.../ 1 A					1			1
			.../250 mA					A			1
			.../100 mA					7			Consult
Certificate			-						0		-
			Test report (*)						1		1
IP65 protection (cable meters)										0	
			IP 65 (1 m)							1	
			IP 65 (2 m)							2	
			IP 65 (3 m)							3	
			IP 65 (4 m)							4	
			IP 65 (5 m)							5	
			IP 65 (6 m)							6	
			IP 65 (7m)							7	
			IP 65 (8 m)							8	
			IP 65 (9 m)							9	
			IP 65 (10 m)							A	

(*) A certificate is attached for every transformer

TP

M	7	X	X	X	X	0	0	X	X	
Code						Internal code	↑	↑	Delivery time	
Secundary		Standard (.../ 5 A)					0		-	
		.../ 1 A					1		1	
		.../250 mA					A		1	
		.../333 mV					V		1	
Certificate		-						0	-	
		Test report (*)						1	Consult	

(*) A certificate is attached for every transformer

TP

Current transformers, split core

Type	TP-88				TP-812				TP-816			
				width x height x depth (mm) 145 x 144 x 50				width x height x depth (mm) 185 x 144 x 50				width x height x depth (mm) 245 x 184 x 70
Flat strip(mm)	80 x 80				80 x 120				80 x 160			
A/V-A	Class			Code	Class			Code	Class			Code
	0.5	1	3		0.5	1	3		0.5	1	3	
250/5	-	2	4	[*] M70131.								
300/5	1,5	3	6	[*] M70132.								
400/5	1,5	3	10	[*] M70133.								
500/5	2,5	5	15	[*] M70134.	-	4	12	[*] M70141.	3	-	-	[3] M7015F.
600/5	2,5	5	17,5	[*] M70135.	-	5	14	[*] M70142.	3	-	-	[3] M7015H.
750/5	3	6	18	[*] M70136.	2,5	6	17	[*] M70143.	5	-	-	[3] M70158.
800/5	3	7	18	[*] M70137.	3	7	18	[*] M70144.				
1000/5	5	10	20	[*] M70138.	5	9	20	[*] M70145.	10	15	20	[*] M70151.
1200/5					6	11	24	[*] M70146.				
1250/5					7	15	28	[*] M70147.	8	-	-	[3] M7015A.
1500/5					8	17	30	[*] M70148.	15	20	25	[*] M70152.
1600/5					8	17	30	[*] M70149.	8	-	-	[3] M7015B.
2000/5									15	20	25	[*] M70153.
2500/5					10	17	25	[*] M7014A.	15	20	25	[*] M70154.
3000/5									20	25	30	[*] M70155.
3200/5									20	-	-	[3] M7015C.
4000/5									20	25	30	[*] M70156.
5000/5									20	25	30	[*] M70157.
6000/5									20	-	-	[3] M7015E.

For other configurations see table of additional features

TP outdoor protection

Type	Code	Description
TET 114	[*] M79972.	TP-58 outdoor protector
TET 144	[*] M79973.	TP-88/TP-812 outdoor protector

STP

Current transformers, split core

Type	STP-24								
	Size (mm) width xheight xdepth 55x66x24								
Flat strip(mm)	24 mm								
Secundary	5A			1A			250mA		
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
100	3	1	[C] M73323.	3	1	[C] M733230010000	3	0,1	[C] M7332300G0000
150	3	1	[C] M73325.	3	1	[C] M733250010000	3	0,1	[C] M7332500G0000
200	3	1	[C] M73326.	3	0,5	[C] M733260010000	3	0,1	[C] M7332600G0000
250	3	1	[C] M73327.	1	1	[C] M733270010000	1	0,1	[C] M7332700G0000
300	3	1	[C] M73328.	1	1	[C] M733280010000	1	0,1	[C] M7332800G0000

SC3

Split three-phase current transformers

Type	Code	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
SC3-125	[*] M73602.	125	0.1	Three-phase	15

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

MC3

Three-phase current transformers

Type	Code	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
MC3 - 63 A	[*] M73121.	63	0.1	Three-phase	7,1
MC3 - 125 A	[*] M73122.	125	0.1	Three-phase	14,6
MC3 - 250 A	[*] M73123.	250	0.1	Three-phase	26

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

MC1

Triple scale single-phase efficient transformers

Type	Code	Measurement Range (A)	A Max.	Class 0,5 Power (VA)	System	Usefull diam.(mm)
MC1-15-75	[*] M73112.	75	75	0.25	Single-phase	15
MC1-20-50/100/150 A	[*] M73118.	50/100/150	150	0.25	Single-phase	20
MC1-35-50/100/150 A	[*] M73116.	50/100/150	150	0.25	Single-phase	35
MC1-20-150/200/250 A	[*] M73113.	150/200/250	250	0.25	Single-phase	20
MC1-30-250/400/500 A	[*] M73114.	250/400/500	500	0.25	Single-phase	30
MC1-55-500/1000/1500 A	[*] M73115.	500/1000/1500	1500	0.25	Single-phase	55
MC1-80 1000/1500/2000 A	[*] M73117.	1000/1500/2000	2000	0.25	Single-phase	80

The MC/SC3 transformers with a 250 mA output are only compatible with CVM NET-MC, CVM-A, CVM-B, CVM-E3-MINI and CVM-C units.

TM45

Current transformers, winding primary, DIN rail

Type				
	width x height x depth (mm) 52.5 x 85 x 70			
ø (mm)	0			
Flat strip(mm)	Winding primary			
A/V-A	Class			Code
	0.5	1	3	
1/5	2,5	5	7	[C] M70609.
5/5	2,5	5	7	[*] M70601.
10/5	2,5	5	7	[*] M70602.
15/5	2,5	5	7	[*] M70603.
20/5	2,5	5	7	[*] M70604.
25/5	2,5	5	7	[*] M70605.
30/5	2,5	5	7	[*] M70606.
40/5	2,5	5	7	[*] M70607.
50/5	2,5	5	7	[*] M70608.

For other configurations see table of additional features

TABLE OF ADDITIONAL FEATURES

TM45

M	7	X	X	X	X	0	0	X	
Code							Internal code	↑	Delivery time
Secundary				Standard (.../ 5 A)				0	-
				.../ 1 A				1	1
				.../250 mA				A	1

TA

M	7	X	X	X	X	0	0	X	
Code							Internal code	↑	Delivery time
Secundary				Standard (.../ 5 A)				0	-
				.../ 1 A				1	1
				.../250 mA				A	1

TA210

Current transformers, winding primary

width x height x depth (mm)
75 x 104.5 x 134

Flat strip(mm)	Winding primary			
A/V-A	Class			
	0.5	1	3	Code
5/5	15	20	30	[*] M70541.
10/5	15	20	30	[*] M70542.
15/5	15	20	30	[*] M70543.
20/5	15	20	30	[*] M70544.
25/5	15	20	30	[*] M70545.
30/5	15	20	30	[*] M70546.
40/5	15	20	30	[*] M70547.
50/5	15	20	30	[*] M70548.
60/5	15	20	30	[*] M70549.
75/5	15	20	30	[*] M7054A.
80/5	15	20	30	[1] M7054K.
100/5	15	20	30	[*] M7054B.
125/5	15	20	30	[*] M7054C.
150/5	15	20	30	[*] M7054D.
200/5	15	20	30	[*] M7054E.
250/5	15	20	30	[*] M7054F.
300/5	15	20	30	[*] M7054G.
400/5	15	20	30	[*] M7054H.

Sealable terminal cover and anchoring base included

TA

Current transformers

Type	TA400				TA500				TA600			
	width x height x depth (mm) 95 x 165 x 59				width x height x depth (mm) 115 x 185 x 63				width x height x depth (mm) 124 x 192 x 62			
Flat strip(mm)	100 x 20				100 x 30				125 x 60			
A/V-A	Class				Class				Class			
	0.5	1	3	Code	0.5	1	3	Code	0.5	1	3	Code
300/5	5	10	15	[3] M7059A.								
400/5	5	10	15	[3] M70591.								
500/5	15	20	30	[3] M70592.								
600/5	15	20	30	[3] M70593.								
750/5	15	20	30	[*] M70594.								
800/5	15	20	30	[*] M70595.					15	15	-	[3] M705BB.
1000/5	15	20	30	[*] M70596.	15	20	30	[3] M705A2.	15	20	30	[*] M705B1.
1200/5	15	20	30	[*] M70597.	15	20	30	[3] M705A3.	15	20	30	[3] M705B2.
1500/5	15	30	40	[*] M70598.	15	30	40	[*] M705A4.	15	20	30	[*] M705B3.
2000/5	20	40	50	[*] M70599.	20	40	50	[*] M705A6.	15	20	30	[*] M705B5.
2500/5	20	40	50	[C] M7059B.	20	40	50	[*] M705A7.	20	30	40	[*] M705B6.
3000/5					20	45	60	[*] M705A8.	30	40	60	[*] M705B7.
3200/5									30	40	60	[3] M705BA.
4000/5					35	50	70	[*] M705A9.	35	50	70	[*] M705B8.
5000/5									40	60	80	[*] M705B9.

For other configurations see table of additional features

kit3-TRMC210 Kit of 3 current transformers for energy meters, primary winding

Type	kit3-TRMC210			kit3-TRMC210-05			kit3-TRMC210.2		
	Size (mm) width xheight xdepth 145x110x86								
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
100/5	0.5S	10	[3] Q309010000001	0.5	10	[3] Q309610000001	0.5S	2,5	[3] Q309810000001
150/5	0.5S	10	[3] Q309020000001	0.5	10	[3] Q309620000001	0.5S	2,5	[3] Q309820000001
200/5	0.5S	10	[3] Q309030000001	0.5	10	[3] Q309630000001	0.5S	2,5	[3] Q309830000001
300/5	0.5S	10	[3] Q309040000001	0.5	10	[3] Q309640000001	0.5S	2,5	[3] Q309840000001
400/5	0.5S	10	[3] Q309050000001	0.5	10	[3] Q309650000001	0.5S	2,5	[3] Q309850000001
500/5	0.5S	10	[3] Q309060000001	0.5	10	[3] Q309660000001	0.5S	2,5	[3] Q309860000001
600/5	0.5S	10	[3] Q309070000001	0.5	10	[3] Q309670000001	0.5S	2,5	[3] Q309870000001

Check availability.../1 A

kit3-TRMC400 Sets of 3 current transformers for energy meters

Type	kit3-TRMC400			kit3-TRMC400-05			kit3-TRMC400.2		
	Size (mm) width xheight xdepth 99x160x68								
Flat strip(mm)	100x20 mm								
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
750/5	0.5S	10	[3] Q309110000001	0.5	10	[3] Q309710000001	0.5S	2,5	[3] Q309A10000001
1000/5	0.5S	10	[3] Q309120000001	0.5	10	[3] Q309720000001	0.5S	2,5	[3] Q309A20000001
1500/5	0.5S	10	[3] Q309130000001	0.5	10	[3] Q309730000001	0.5S	2,5	[3] Q309A30000001
2000/5	0.5S	10	[3] Q309140000001	0.5	10	[3] Q309740000001	0.5S	2,5	[3] Q309A40000001
3000/5							0.5S	2,5	[3] Q309A60000001

Check availability.../1 A

TRMCx3

Current transformers for energy meters

Type	Code	Measurement Range (A)	Class 0,5S Power (VA)	Usefull diam.(mm)	Cable (m)
Outdoor					
TRMC-X3 100/5 Ext	[C] Q301T1010E000	100/5	2.5	38	7
TRMC-X3 200/5 Ext	[C] Q301T2010E000	200/5	2.5	38	7
TRMC-X3 300/5-ext	[C] Q301T3010E000	400/5	2.5	38	7
TRMC-X3 400/5 Ext	[C] Q301T4010E000	300/5	2.5	38	7

TABLE OF ADDITIONAL FEATURES

TRM								
P	5	X	X	X	X	0	0	X
Code						Internal code		Delivery time
Secundary			Standard (.../ 5 A)				0	-
			... / 1A				1	3

TRM

Measuring transformers encapsulated in resin

Type	TRM30			TRM40			TRM60		
	Size (mm) width xheight xdepth 50x110x30			Size (mm) width xheight xdepth 38x135x40			Size (mm) width xheight xdepth 36x135x60		
Flat strip(mm)	30 mm			40 mm			60 mm		
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
75	1	2	[4] P50101.						
100	1	5	[4] P50102.						
150	1	5	[4] P50103.	0.5	5	[4] P50111.			
200	0.5	10	[4] P50104.	0.5	7,5	[4] P50112.			
250	0.5	15	[4] P50105.	0.5	10	[4] P50113.	0.5	5	[4] P50121.
300	0.5	20	[4] P50106.	0.5	15	[4] P50114.	0.5	7,5	[4] P50122.
400	0.5	25	[4] P50107.	0.5	20	[4] P50115.	0.5	10	[4] P50123.
500				0.5	25	[4] P50116.	0.5	15	[4] P50124.
600				0.5	30	[4] P50117.	0.5	20	[4] P50125.
800				0.5	35	[4] P50118.	0.5	25	[4] P50126.
1000							0.5	30	[4] P50127.
1200							0.5	35	[4] P50128.

Type	TRM80			TRM100		
	Size (mm) width xheight xdepth 36x135x80			Size (mm) width xheight xdepth 38x175x100		
Flat strip(mm)	80 mm			100 mm		
A/V-A	Class	VA	Code	Class	VA	Code
500	0.5	5	[4] P50131.			
600	0.5	7,5	[4] P50132.			
750	0.5	10	[4] P50133.	0.5	15	[4] P50141.
1000	0.5	15	[4] P50134.	0.5	20	[4] P50142.
1500	0.5	20	[4] P50135.	0.5	20	[4] P50144.
2000	0.5	25	[4] P50136.	0.5	20	[4] P50145.
2500	0.5	30	[4] P50137.	0.5	20	[4] P50146.
3000				0.5	25	[4] P50147.

Type	TRM140			TRM180		
	Size (mm) width xheight xdepth 40x223x140			Size (mm) width xheight xdepth 40x223x180		
Flat strip(mm)	140 mm			180 mm		
A/V-A	Class	VA	Code	Class	VA	Code
1000	0.5	15	[4] P50151.			
1250	0.5	20	[4] P50152.	0.5	15	[4] P50161.
1500	0.5	25	[4] P50153.	0.5	20	[4] P50162.
2000	0.5	30	[4] P50154.	0.5	20	[4] P50163.
2500	0.5	35	[4] P50155.	0.5	20	[4] P50164.
3000	0.5	35	[4] P50156.	0.5	20	[4] P50165.
4000	0.5	35	[4] P50157.	0.5	20	[4] P50166.
5000				0.5	20	[4] P50167.

SH

Shunts for direct current measurement

Type	SHP		SHB		SH	
Accuracy	1		0.5			
Relation	Type	Code	Type	Code	Type	Code
1A/60mV			SHB 1A/60mV	[3] M71221.		
1.5A/60mV			SHB 1.5A/60mV	[3] M71222.		
2.5A/60mV			SHB 2.5A/60mV	[3] M71223.		
4A/60mV			SHB 4A/60mV	[3] M71224.		
5A/60mV			SHB 5A/60mV	[3] M71225.		
6A/60mV			SHB 6A/60mV	[3] M71226.		
10A/60mV			SHB 10A/60mV	[*] M71227.		
15A/60mV			SHB 15A/60mV	[*] M71228.		
25A/60mV			SHB 25A/60mV	[*] M71229.		
30A/60mV	SHP 30A/60mV	[3] M71211.	SHB 30A/60mV	[*] M7122A.	SH 30A/60mV	[*] M71231.
40A/60mV	SHP 40A/60mV	[3] M71212.	SHB 40A/60mV	[*] M7122B.	SH 40A/60mV	[2] M71232.
50A/60mV	SHP 50A/60mV	[3] M71213.	SHB 50A/60mV	[*] M7122C.	SH 50A/60mV	[*] M71233.
60A/60mV	SHP 60A/60mV	[3] M71214.	SHB 60A/60mV	[*] M7122D.	SH 60A/60mV	[*] M71234.
75A/60mV	SHP 75A/60mV	[3] M71215.				
80A/60mV			SHB 80A/60mV	[*] M7122E.	SH 80A/60mV	[*] M71235.
100A/60mV	SHP 100A/60mV	[3] M71216.	SHB 100A/60mV	[*] M7122F.	SH 100A/60mV	[*] M71236.
150A/60mV	SHP 150A/60mV	[3] M71217.			SH 150A/60mV	[*] M71237.
200A/60mV	SHP 200A/60mV	[3] M71218.	SHB 200A/60mV	[2] M7122N.	SH 200A/60mV	[*] M71238.
250A/60mV					SH 250A/60mV	[*] M71239.
300A/60mV					SH 300A/60mV	[*] M7123A.
400A/60mV					SH 400A/60mV	[*] M7123B.
500A/60mV					SH 500A/60mV	[*] M7123C.
600A/60mV					SH 600A/60mV	[*] M7123D.
750A/60mV					SH 750A/60mV	[2] M7123E.
800A/60mV					SH 800A/60mV	[2] M7123F.
1000A/60mV					SH 1000A/60mV	[*] M7123G.
1200A/60mV					SH 1200A/60mV	[3] M7123H.
1500A/60mV					SH 1500A/60mV	[*] M7123J.
2000A/60mV					SH 2000A/60mV	[3] M7123K.
2500A/60mV					SH 2500A/60mV	[3] M7123L.
3000A/60mV					SH 3000A/60mV	[3] M7123M.
4000A/60mV					SH 4000A/60mV	[3] M7123N.
5000A/60mV					SH 5000A/60mV	[3] M7123P.
6000A/60mV					SH 6000A/60mV	[3] M7123Q.
7500A/60mV					SH 7500A/60mV	[3] M7123R.
8000A/60mV					SH 8000A/60mV	[C] M7123S.
10000A/60mV					SH 10000A/60mV	[C] M7123T.
12500A/60mV					SH 12500A/60mV	[C] M7123U.
15000A/60mV					SH 15000A/60mV	[C] M7123V.
18000A/60mV					SH 18000A/60mV	[C] M7123Z.
20000A/60mV					SH 20000A/60mV	[C] M7123O.

Insulating base socket for type SHB (up to 100 A)
All shunts are supplied with 1.5 m long cables with a 1.5 mm² cross-section

SHP / SHB / SH

M	7	X	X	X	X	0	0	X
Code						Internal code	↑	Delivery time
Outputs			Standard .../60 mV				0	-
			.../50 mV				1	2
			.../75 mV				7	Consult
			.../100 mV				2	2
			.../150 mV				3	2
			.../200 mV				4	2
			.../250 mV				8	Consult
			.../300 mV				5	Consult
			.../400 mV				9	Consult
			.../600 mV				6	Consult

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

VT
Measurement voltage transformers

Type	Code	Class 0,5 Power (VA)	Class 1 Power (VA)	Relation
VT2311 230V/110V	[3] M72311.	10	25	230/110V
VT3823 380V/230V	[3] M72352.	10	25	380/230V
VT4011 400V/110V	[3] M72321.	10	25	400/110V
VT4023 400V/230V	[3] M72322.	10	25	400/230V
VT4411 440V/110V	[3] M72331.	10	25	440/110V
VT4423 440V/230V	[3] M72332.	10	25	440/230V
VT4811 480V/110V	[3] M72341.	10	25	480/110V
VT4823 480V/230V	[3] M72342.	10	25	480/230V
VT7011 700V/110V	[3] M72381.	10	25	700/110V
VT7023 700V/230V	[3] M72382.	10	25	700/230V

For other voltage ratios, please ask

TSR
Current adding transformer

Type	Code	Input current	Class 0,5 Power (VA)	Class 1 Power (VA)	Measuring Channels
TSR-2	[*] M70701.	5 A	15	30	2
TSR-3	[*] M70702.	5 A	15	30	3
TSR-4	[*] M70703.	5 A	15	30	4
TSR-5	[*] M70704.	5 A	15	30	5

Current adding transformers must have the same primary ratio For other ratios, please ask

TE
Impedance elevator transformer

Type	Code	Class 1 Power (VA)	Relation
TE-5/0.1	[*] M70911.	15	5 /0,1 A

For Protection current transformers SEE SECTION Protection and Control/Protection current transformers

TABLE OF ADDITIONAL FEATURES

TSR

M	7	X	X	X	X	0	0	X
Code						Internal code		

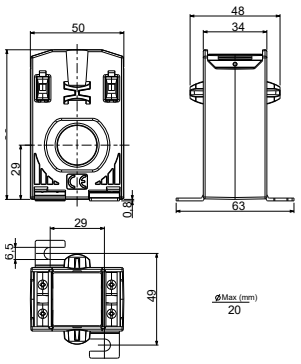
Secundary	Standard (.../ 5 A)	0	-
	.../ 1 A	1	1
	.../250 mA	A	1

Delivery time

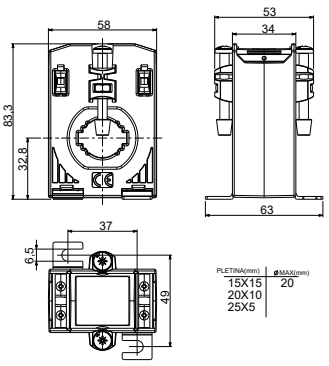
Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Dimensions

TD 4



TD 5



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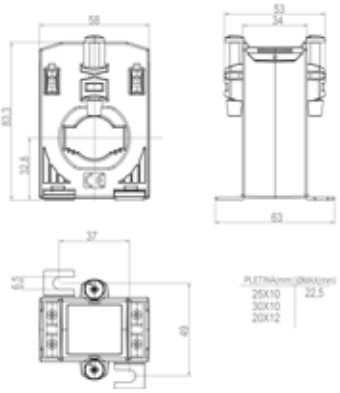
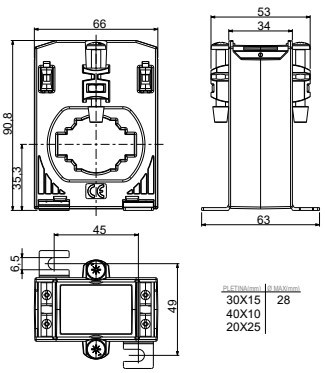
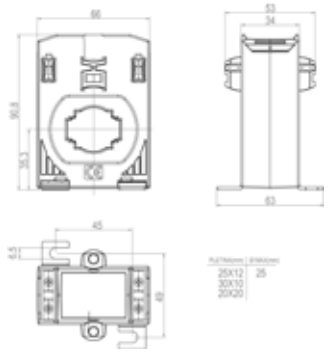


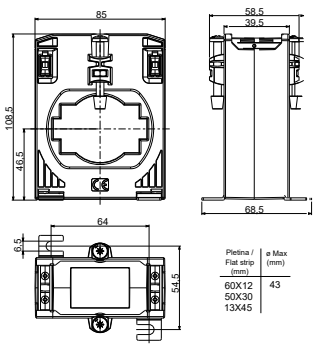
TD 6



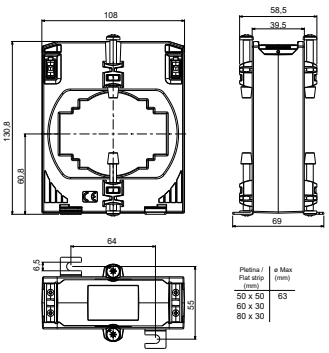
TD 6.2



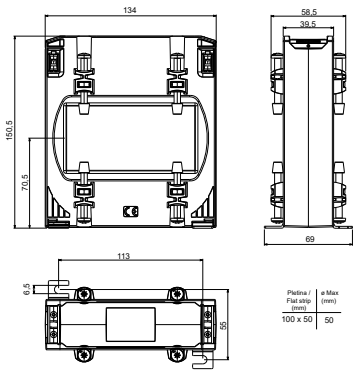
TD 8



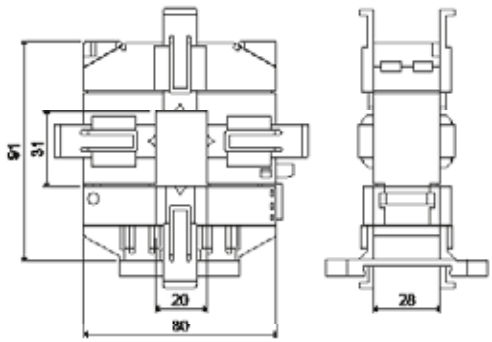
TD 10



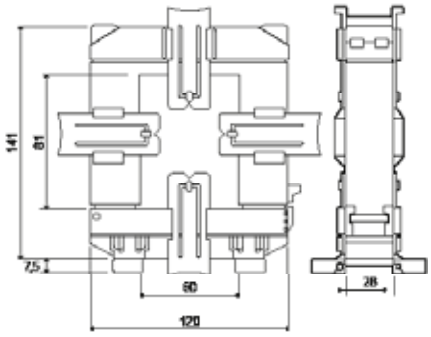
TD 12



TQ-6



TQ-8



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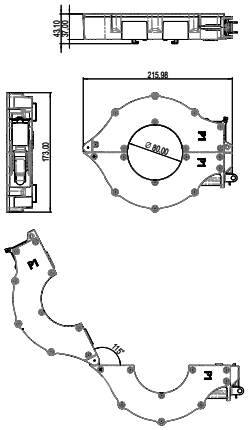

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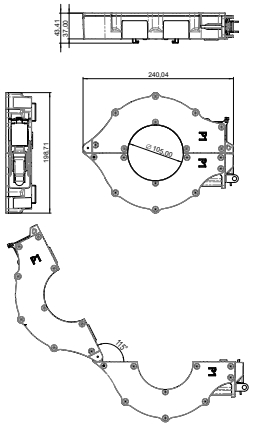
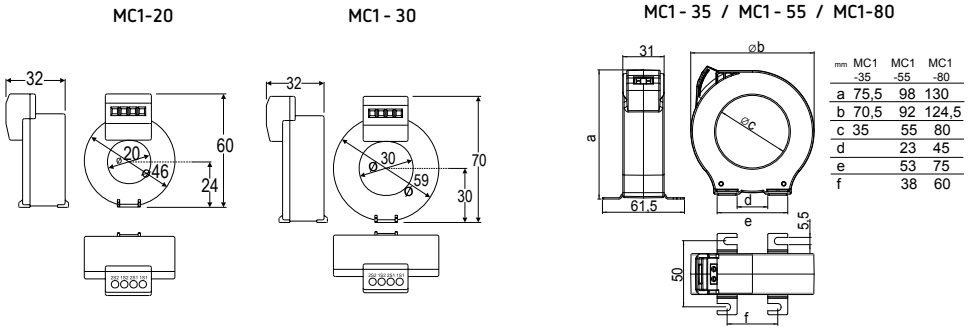
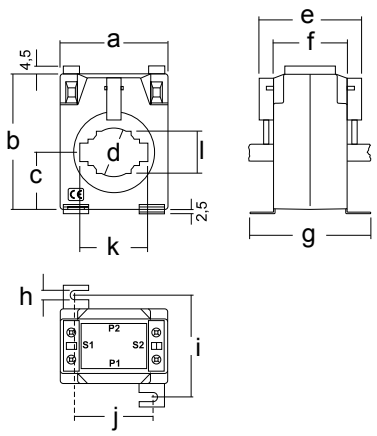


MC1

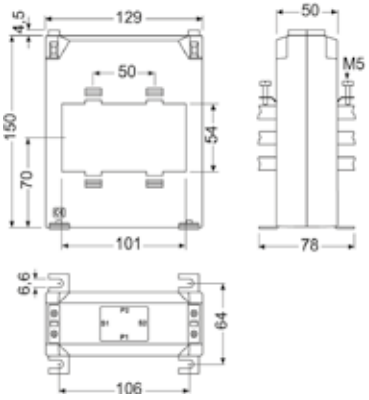


TC / TCH

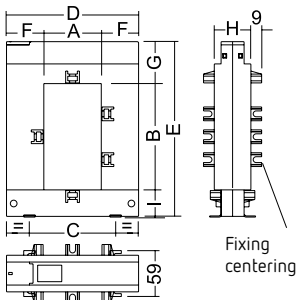


Dimensions (mm)	TC 5 TCH 5	TC 5.2 TCH 5.2	TC 6.2 TCH6.2	TC 6 TCH 6	TC 8 TCH 8	TC 10 TCH 10
a	58	58	64	64	84,5	108
b	70	70	80,5	80,5	102	130
c	29	29	34	34	46	61
d	20,3	22	26	28,5	44	63
e	45	45	60,5	66,5	69	---
f	32	32	44	44	50	50
g	59	59	71	71,2	78	78
h	5,6	5,6	5,6	5,6	6,6	6,6
i	48	48	60	60	64	64
j	39	39	46	46	62	86
k	25,6	30,6	30,6	40,6	60,6	80,6
l	15,6	15,6	20,6	25,2	30,6	50,8

TC 12 / TCH 12



TP



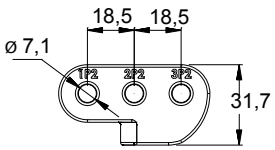
Fixing centering units

mm	TP-23	TP-58	TP-88	TP-812	TP-816
a	20	50	80	80	80
b	30	80	80	120	160
c	51	78	108	108	120
d	89	114	144	144	184
e	110	145	145	185	245
f	34	32	32	32	52
g	47	32	32	32	47
h	40	32	32	32	52
i	32	32	32	32	38

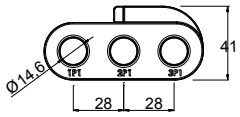
Note: All types have fixing centering units, except TP-23

MC3

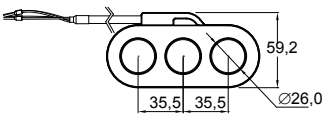
MC3-63



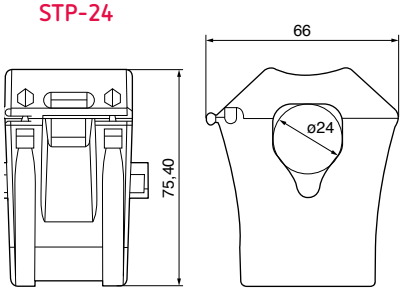
MC3 -125



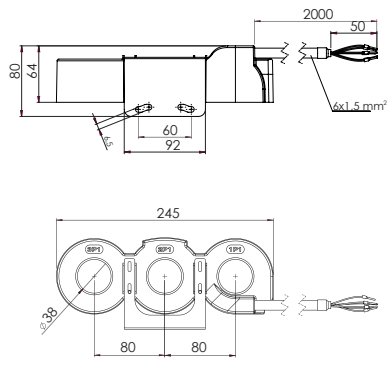
MC3-250



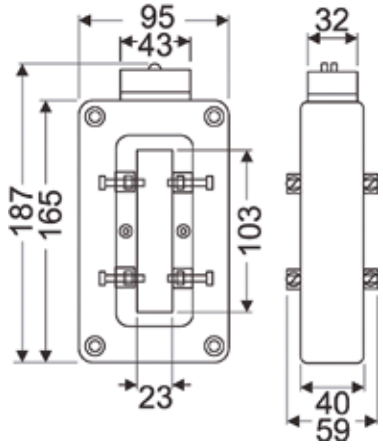
STP-24



TRMCx3



TA 400



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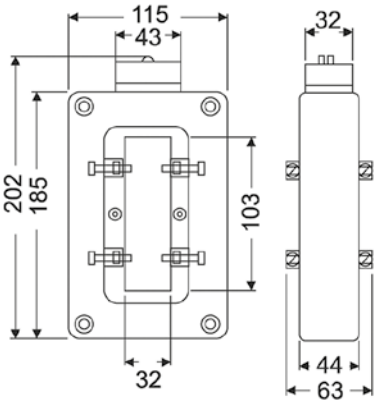

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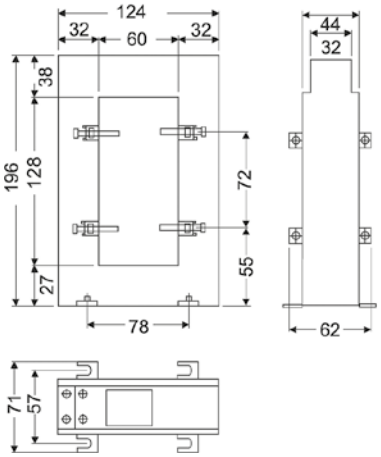
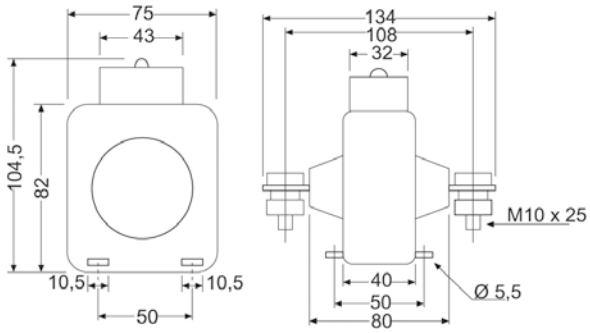
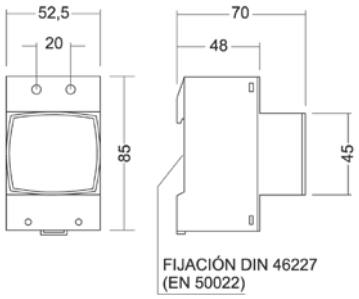


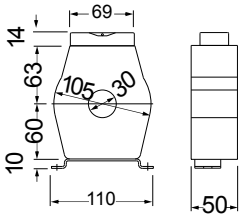
TA 210



TM 45



TRM30



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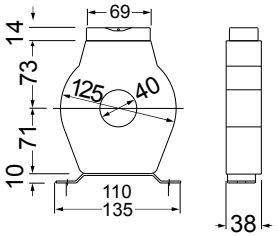

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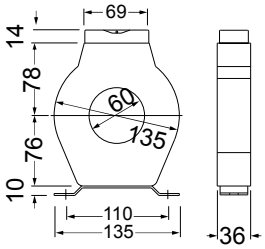

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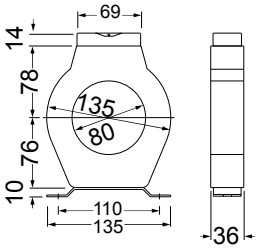

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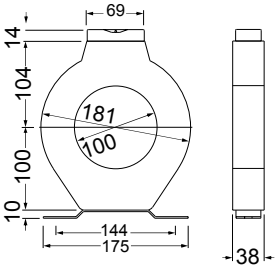

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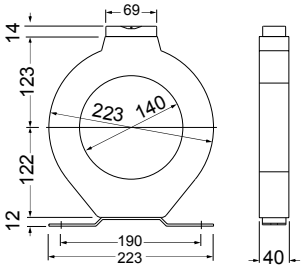
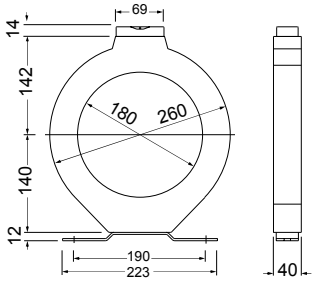
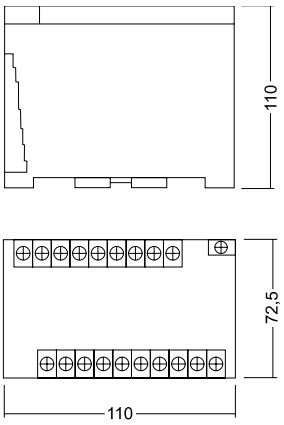


TRM180



TSR



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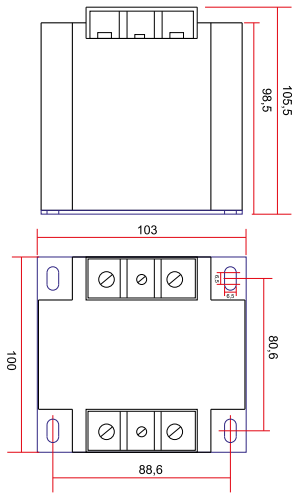

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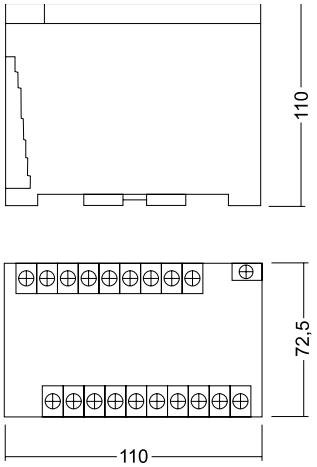
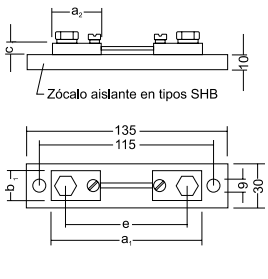
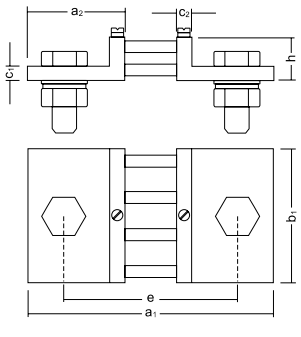


Shunts

Voltage drop mV (1)	Range A (1)	Fig.	a1	a2	b1	b2	b3	c1	c2	e	h	N° Current connections	Current connections			Voltage connections
													Hexagonal screws DIN 933	Washer DIN 125	DIN 934 nut	
60	1-1 , 5-2, 5-4-6-10-15-25	1	90	28	20	-	-	8	-	78	-	2 x 1	M5 x 12	5,3	-	2 Screws M5 x 8 DIN 84 & 2 Washer 5,3 DIN 433
	30-40-60-100-150		100	33	20	-	-	8	-	80	-	2 x 1	M8 x 16	8,4	-	
	250	2	145	55	30	15	-	10	10	105	30	2 x 1	M12 x 40	13	M12	
	400-600				40	20						2 x 1	M16 x 45	17	M16	
	800		165	65	60	30	-	10	10	115	30	2 x 1	M20 x 50	21	M20	
	1500				90	21	48					2 x 2	M16 x 45	17	M16	
	2500				120	30	60	10	10	115	30	2 x 2	M20 x 50	21	M20	
150	1-1 , 5-2 , 5-4-6-10-15-25	1	90	25	20	-	-	8	-	78	-	2 x 1	M5 x 12	5,3	-	
	40-60-100-150		225	33	25	-	-	8	-	205	-	2 x 1	M8 x 16	8,4	-	
	250	2	270	55	30	15	-	10	10	230	50	2 x 1	M12 x 40	13	M12	
	400-600				40	20						2 x 1	M16 x 45	17	M16	
	800		290	65	70	35	-	10	10	240	60	2 x 1	M20 x 50	21	M20	



SHUNT 1-150



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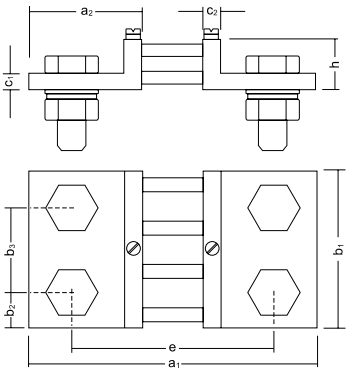


SHUNT 1500-2500

Control devices

		Page
Energy manager	Line-EDS	39
Maximum demand control device	MDC-20	40
	MDC-4	40
Impulse and contact centralisers	Kit Line-TCPRS1/M, LM	40
Communication accesories	Communication converters	41
	Modems	41

Sistema Line

New

Line-EDS

Energy manager (Efficiency Data Server)

Type	Code	Integrated Software	Transistor output	Generic Modbus	Communications	Protocol
Line-EDS-cloud	[*] M61055.	API's de: AZURE AWS GOOGLE DEXCELL MyCIRCUTOR	2	●	Ethernet | Wi-Fi | RS-485 | Bus-Line	Modbus | API's | web
Line-EDS-PS	[*] M61095.	PowerStudio	2	●	Ethernet | Wi-Fi | RS-485 | Bus-Line	Modbus (Circutor + generic) | XML
Line-EDS-PSS	[*] M61085.	PowerStudio Scada	2	●	Ethernet | Wi-Fi | RS-485 | Bus-Line	Modbus (Circutor + generic) | XML
Line-EDS-PSS PRO	[*] M61065.	PowerStudio Scada PRO	2	●	Ethernet | Wi-Fi | RS-485 | Bus-Line	Modbus (Circutor + generic) | XML

Bus-Line: RS-485 communications system, with lateral side connector between modules

	line-EDS-PS	Line-EDS-PSS	Line-EDS-PSS-Pro
SCADA screen customization	-	2	5
Report customization (Bill simulation)	-	2	5
Programming of events	10	20	40
Programming of calculated variables	10	20	40
Modbus RTU and TCP slave equipment CIRCUTOR or generic	5	10	20

Line-CVM-D

Power analyzer, Line series

Type	Code	Measuring Channels	Input current	Transistor output	Communications	Protocol	Harmonics
Line-CVM-D32	[*] M58100.	3	.../5 A | .../1 A | .../250 mA	2	RS-485 | Bus-Line	Modbus/RTU	40

Bus-Line: RS-485 communications system, with lateral side connector between modules

New

Line-M

Expansion modules, Line system

Type	Code	Transistor output	Relay output	Digital inputs	Analogue Input	Analog output	Communi-cations	Protocol
Input/Output Modules								
Line-M-4I0-T	[*] M58E01.	4	-	4	-	-	Bus-Line	Modbus/RTU
Line-M-4I0-R	[*] M58E02.	-	4	4	-	-	Bus-Line	Modbus/RTU
Line-M-8I6O-R	[*] M58E08.	-	6	8	-	-	Bus-Line	Modbus/RTU
Line-M-4I0-A	[*] M58E03.	-	-	-	4 (0/4 ... 20 mA)	4 (0/4 ... 20 mA) |4 (0/2 ... 10 Vdc)	Bus-Line	Modbus/RTU
Line-M-4I0-RV	[*] M58E04.	-	4	4 (230 V)	-	-	Bus-Line	Modbus/RTU
Line-M-20I	[C] M58E06.	-	-	20	-	-	Bus-Line	Modbus/RTU

Analogue I/O expansion modules, Line series

Type	Code	Description
Power supply		
Line-M-EXT-PS	[*] M58E0A.	110-277 V ~ (P-N)/110-480 V ~ (P-P) power supply for maximum of 3 Line devices
Modem		
Line-M-3G	[*] M58E05.	3G communications modem and Bus-Line to communicate with the Line-EDS devices
Ethernet converter		
Line-TCPRS1	[C] M62411.	RS-485/RS-232 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (MyConfig) for configuration

Power supply modules, Line system

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

New

Kit Line-TCPRS1/M

Impulse and contact centralisers

Type	Code	Modules	Digital inputs	Communications	Protocol
Kit line-TCPRS1/M-20I	[C] M62510.	6	20	Ethernet | WiFi	ModbusTCP | TCP | UDP
Kit line-TCPRS1/2xM-20I	[C] M62520.	9	40	Ethernet | WiFi	ModbusTCP | TCP | UDP

LM

Impulse and contact centralisers

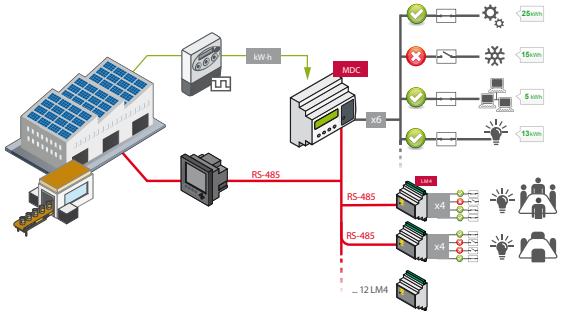
Type	Code	Modules	Relay output	Digital inputs	Analogue Inputs	Communications	Protocol
LM4I-40-M	[*] M31563.	4	4	4	-	RS-485	Modbus/RTU
LM4A-2I0-M	[*] M31565.	4	2	2	4 (0...20mA)	RS-485	Modbus/RTU

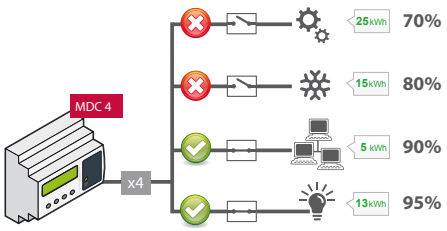
(*) Digital inputs (logic 0 / 1) or energy impulses

MDC

Maximum demand control devices

Type	Code	Description
MDC-20, 6 local Loads, expandable, predictive control		
MDC-20	[*] M61410.	8 digital inputs for logical states or counting impulse signals (electric energy meters, water meters, gas meters, etc.). Load status feedback (inputs/outputs). Expandable via auxiliary LM range units. Historical records of over one year with a log of up to 4500 electrical variables, averaged every 15 minutes, maximum and minimum values over the period (Period can be modified. Ring buffer). RS-485 BUS for connecting up to 12 LM4 i/o
MDC4, 4 loads, level control		
MDC-4	[*] M61430.	Maximum demand control unit, by level. Includes a built-in three-phase power analyzer and 4 relay outputs of up to 6 A for controlling non-priority loads





TH-DG

Temperature probe

Type	Code	Description
TH-DG-RS485	[*] M61310.	Temperature and humidity probe with RS-485 communications (ModBus/RTU).. Needs a 9...24 V ac/cc power supply. PowerStudio supported

ReadWatt

Impulse collection with communication

Type	Code	Description
PS 100..240Vac	[*] M62331.	ReadWatt power supply
ReadWatt	[*] M62311.	Impulse collector with RS232/RS485 Modbus communications. Built in transistor output. PowerStudio supported

Accessories

Communication converters

Type	Code	Description
RS		
RS2RS	[*] M62141.	RS-232/485 Intelligent converter and amplifier (RTS control) for PC
USB		
USB-RS 485	[*] M54040.	USB to RS-485 Converter
USB-RS 232	[*] M54050.	USB to RS-232 Converter
M-BUS		
CMBUS-8	[*] M540A0.	M-Bus to Modbus Converter, up to 8 Mbus slaves
CMBUS-24	[*] M540B0.	M-Bus to Modbus Converter, up to 24 Mbus slaves
LoRa		
LR1RS+PSAC	[2] M6215A.	LoRa to RS-485 Converter (Modbus/RTU) . AC power supply (110...264 Vac)
LR1RS+PSDC	[2] M6215C.	LoRa to RS-485 Converter (Modbus/RTU) . DC power supply (12 Vdc)
Ethernet		
New TCPRS1+	[*] M62422.	RS-485 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (***MyConfig Wifi***) for configuration

Communications accessories

Type	Code	Description
CM-GSM/3G	[*] Q30251.	RS-232/RS-485 GSM/3G Modem
SGE-3G/GPRS	[*] Q30230.	GPRS-3G Modem with Ethernet communications (includes PS + antenna + cable)
ANTENA GSM	[1] Q4994E.	Antenna 9 dB (for GSM modem)

PowerStudio

Energy management software

Type	Code	Description
SCADA software		
PowerStudio	[*] M90211.	Configuration, monitoring in real time, display of graphs and tables
PowerStudio-Scada	[*] M90231.	Software with USB HASP licence. Configuration, monitoring in real time, display of graphs and tables, generation of reports, creation of SCADA screens and alarms
PowerStudio-Deluxe	[C] M90241.	Software with USB HASP licence. Software PowerStudio-Scada with Generic Modbus driver used to connect to other devices available in the market
OPC Server PS/PSS	[1] M91111.	Software with USB HASP licence. **OPC Server** for PowerStudio is an integration platform that can easily integrate the parameters received from PowerStudio (or any of its versions) in any SCADA platform available in the market with a simple approach.
SQL DATA EXPORT	[1] M91301.	Software with USB HASP licence. SQL Data Export is a software tool for the integration of data from PS/PSS/PSSD to a new or existing SQL database.

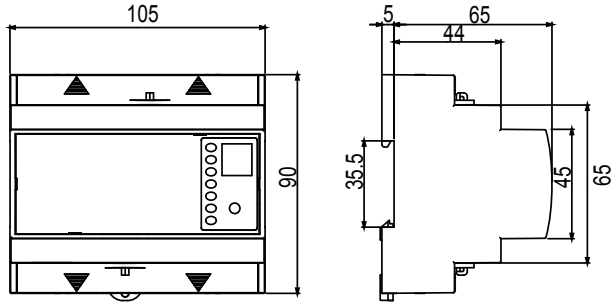
License 4.0 version 4.0

New Change PowerStudioSCADA physical licence to virtual licence

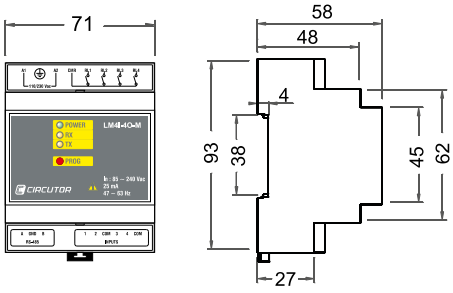
Type	Code	Description
Phi-to-Vir-PSS	[1] M902310055000	Replacement of physical USB licence for PowerStudioSCADA with software licence (requires returning physical licence)
Phi-to-Vir-PSS-Deluxe	[1] M902410055000	Replacement of physical USB licence for PowerStudioSCADA Deluxe with software licence (requires returning physical licence)

Dimensions

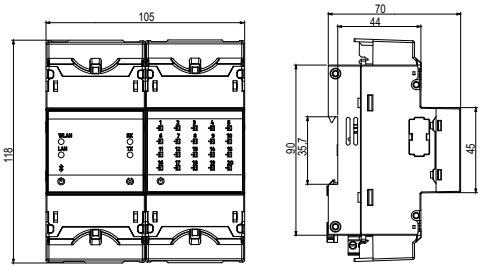
MDC-4 / MDC-20



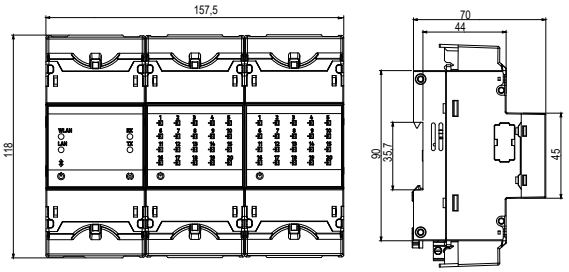
LM4I/4O-M / LM4A-2IO



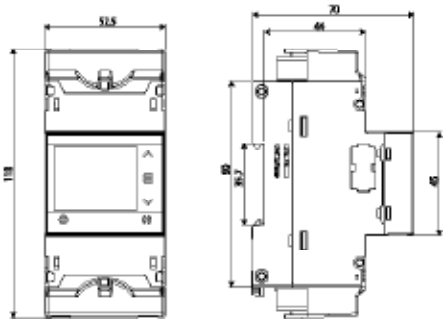
Line-LM20i-TCP

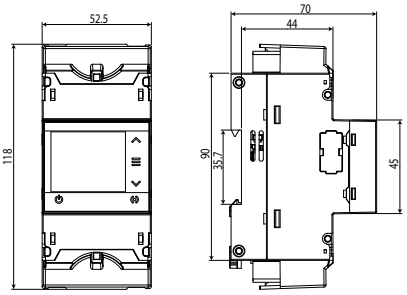


Line-LM40i-TCP

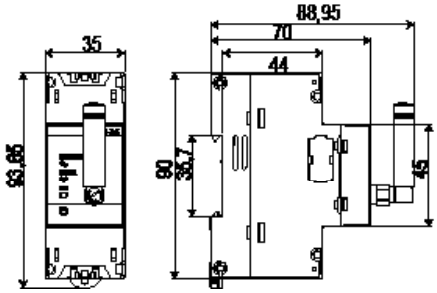


Line-EDS, line-CVM-D32, line-M





line-M-3G



Management software

PowerVision

Data management sofware for devices with memory

Type	Code	Description
Data management software		
PowerVisionPlus	[*] M90413.	Software for reading, downloading and processing files for devices equipped with memories (depending on type). Elaboration of graphs and tables from information. Automatic downloading for QNA Power Quality Analyzers. Other related units: AR5, AR5-L, QNA, CLP, CVM-BD M, CIR-E3 and AR6 series

PowerStudio

Energy management software

Type	Code	Description
SCADA software		
PowerStudio	[*] M90211.	Energy supervision software for buildings and industrial installations, with the possibility of viewing reports, layouts and single-line diagrams. Other functions include: Remote parameterisation of the units Real-time display of parameters Recording and printout of logs in table or graphic format Multi-station Web Server and integrated XML Server Creation of access users and profiles for the application with user name and password Great versatility and very simple use Compatible with OPC software for PS/PSS Custom event configuration (Alarms, Calculations, Sending Emails) Construction of customised screens Possibility of performing control actions on the units Report generator and energy bill simulator module Possibility to emulate tariffs or time periods Parameterisation of custom calculations to obtain EnPIs Comparison of historical data stored in the system Management of multi-point remote systems in combination with EDS and EDS-3G data servers Compatible with the 32 and 64-bit Windows 7 and 8 platforms
PowerStudio-Scada	[*] M90231.	Energy monitoring software for industrial buildings and installations. It allows each installation to be controlled, providing the power line status in real time and first-hand, as well as the general consumption of the installation both at low and medium voltage. Its main features are: Configuring CIRCUTOR units connected to the communications network Displaying the parameters from the measuring units installed on site in real time Creating databases Recording and searching the historical data stored on a computer in graphical or table format Built-in XML server Exporting to text files and spreadsheets Access to information through a conventional Internet browser
PowerStudio-Deluxe	[C] M90241.	In addition to the performance features offered by the standard module, Power Studio Scada, Deluxe can: Generic Modbus driver used to connect to other devices available in the market RS-485 with Modbus/RTU protocol (driver composition). Transparent Ethernet connections with the UDP, TCP and Modbus/TCP protocols Variables to be integrated must have a hexadecimal format. Acquisition of data with the OPC/DA protocol (real-time data). Connection and display of video surveillance cameras with an IP connection (no recording functions). Connection of PSSDs in cascade. Generic driver used to download meters with the IEC 870 protocol (standard ASDUS) Global integration of remote PowerStudio applications in a single server Compatible with 64-bit Windows platforms Compatible with OPC software for PS/PSS
OPC Server PS/PSS	[1] M91111.	OPC Sever for PowerStudio is an integration platform that can easily integrate the parameters received from PowerStudio (or any of its versions) in any SCADA platform available in the market with a simple approach. The format of requests that can be integrated will be DA real time data. It includes the Tunnelling function, establishing OPC connections over IP through a corporate network. In addition, it can establish decentralised or remote connections (routing). Therefore, any SCADA platform available in the market with an OPC/DA client function can immediately integrate all parameters received from the CIRCUTOR platform
SQL DATA EXPORT	[1] M91301.	SQL Data Export is a software tool for the integration of data from PS/PSS/PSSD to a new or existing SQL database. Main advantages of SQL Data Export: Exporting historic data stored in SQL databases Optional selection of devices or databases to be exported Programming the download frequency Multiple architectures

License 4.0 version 4.0

New

Change PowerStudioSCADA physical licence to virtual licence

Type	Code	Description
Phi-to-Vir-PSS-Deluxe	[1] M902410055000	Replacement of physical USB licence for PowerStudioSCADA Deluxe with software licence (requires returning physical licence)
Phi-to-Vir-PSS	[1] M902310055000	Replacement of physical USB licence for PowerStudioSCADA with software licence (requires returning physical licence)

Databox

Cloud platform

Type	Code	Description
DataBox	[C] DataBox	Software with licence in the cloud (Databox cloud platform) for complete management of all parameters required for the optimum performance of Energy Audits. The Databox system combines data recording, display and operation from any location using any PC, smartphone or tablet.

SBOX

Gateway for DataBox platform

Type	Code	Description
SBOX 3G VPN	[*] M61920.	Gateway with 3G communications via VPN network (1) and SIM card fully configured to send data from the units connected to the RS-485 port or Ethernet to the Databox cloud platform in order to carry out energy audits and improvements related to electrical energy efficiency
SBOX 3G NET	[*] M61930.	Gateway with 3G communications (SIM card must be provided by the user) to send data from the units connected to the RS-485 port or Ethernet to the Databox cloud platform in order to carry out energy audits and improvements related to Electrical Energy Efficiency

Portable power analyzers

Table: Portable power analyzers

		MYeBOX-A	MYeBOX 1500	MYeBOX 150	VLOG-10
Connection	Single-phase	•	•	•	•
	Three-phase	•	•	•	–
Parameters	Voltage	•	•	•	•
	Current	•	•	•	–
	Neutral current	•	•	•	–
	Leakage current	•	•	–	–
	Neutral-earth voltage	•	•	–	–
	Power	•	•	•	–
	Energy (active and reactive)	•	•	•	–
	Harmonics	•	•	•	–
	Flicker	•	•	•	–
Quality parameter measurements	Events (overvoltages, gaps and interruptions)	•	•	•	•
	EN50160 parameters	•	•	•	–
	Transients	•	•	•	–
Inputs/outputs	Digital inputs	2	2	–	–
	Digital outputs	2	2	–	–
Other features	Memory	•	•	•	•
	Communications	WiFi 3G µUSB	WiFi 3G µUSB	WiFi µUSB	USB
	Display	LCD	LCD	LCD	–
	Display of parameters	Display Smartphone & tablet (APP) Software + cloud	Display Smartphone & tablet (APP) Software + cloud	Display Smartphone & tablet (APP) Software + cloud	Software
	Display of files	Smartphone & tablet (APP) Software + cloud	Smartphone & tablet (APP) Software + cloud	Smartphone & tablet (APP) Software + cloud	Software
Standards	Measuring in accordance with IEC 61000-4-30	Class A certified	According Class A	According Class A	Class B
	Measuring in accordance with UL	• (certified)	• (certified)	• (certified)	–
	Page	47	47	47	48

T - Depending on Type

MYeBOX-A

Portable power analyzer with recording of quality events and transients Calibration Certificate (IEC 61000-4-30 Ed.2) Class A

Type	Code	Clamp	Measuring Channels	Transistor output	Digital inputs	Communications
MYeBOX-1500	[2] M840330000A00	-	5	2	2	Wi-Fi | 3G
Portable analyzer kits with current sensors						
MYeBOX-1500-3 FLEX-R45	[2] M8405B0000A00	3 FLEX-R45	5	2	2	Wi-Fi | 3G
MYeBOX-1500- 4 FLEX-R45	[2] M8405C0000A00	4 FLEX-R45	5	2	2	Wi-Fi | 3G
MYeBOX-1500-3 FLEX-R80	[2] M8405D0000A00	3 FLEX-R80	5	2	2	Wi-Fi | 3G
MYeBOX-1500-4 FLEX-R80	[2] M8405E0000A00	4 FLEX-R80	5	2	2	Wi-Fi | 3G
MYeBOX-1500- 3 CPG-100	[2] M840530000A00	3 CPG-100	5	2	2	Wi-Fi | 3G
MYeBOX-1500- 3 CPRG-500	[2] M840550000A00	3 CPRG-500	5	2	2	Wi-Fi | 3G

Analyser with built-in SD memory and Cloud Includes voltage cables, alligator clips, USB cable, fastening strap, magnetic support, battery, power supply and carrying bag. Please contact us for other clamp or clamp length combinations

MYeBOX

Portable power analyzer with recording of quality events and transients in accordance with (IEC 61000-4-30 Ed.2) Class A

Type	Code	Clamp	Measuring Channels	Transistor output	Digital inputs	Communications
MYeBOX-150	[*] M84023.	-	4	-	-	Wi-Fi
MYeBOX-1500	[*] M84033.	-	5	2	2	Wi-Fi | 3G
Portable analyzer kits with current sensors						
MYeBOX-150+3 FLEX-R45	[*] M8404B.	3 FLEX-R45	4	-	-	Wi-Fi
MYeBOX-1500+3 FLEX-R45	[*] M8405B.	3 FLEX-R45	5	2	2	Wi-Fi | 3G
MYeBOX-150-4 FLEX-R45	[*] M8404C.	4 FLEX-R45	4	-	-	Wi-Fi
MYeBOX-1500-4 FLEX-R45	[*] M8405C.	4 FLEX-R45	5	2	2	Wi-Fi | 3G
MYeBOX-150-3 FLEX-R80	[*] M8404D.	3 FLEX-R80	4	-	-	Wi-Fi
MYeBOX 1500+3 FLEX-R80	[*] M8405D.	3 FLEX-R80	5	2	2	Wi-Fi | 3G
MYeBOX-150-4 FLEX-R80	[*] M8404E.	4 FLEX-R80	4	-	-	Wi-Fi
MYeBOX-1500-4 FLEX-R80	[*] M8405E.	4 FLEX-R80	5	2	2	Wi-Fi | 3G
MYeBOX-150 + 3 CPG-100	[*] M84043.	3 CPG-100	4	-	-	Wi-Fi
MYeBOX-1500 + 3 CPG-100	[*] M84053.	3 CPG-100	5	2	2	Wi-Fi | 3G
MYeBOX-150 + 3 CPRG-500	[*] M84045.	3 CPRG-500	4	-	-	Wi-Fi
MYeBOX-1500 + 3 CPRG-500	[*] M84055.	3 CPRG-500	5	2	2	Wi-Fi | 3G

Analyser with built-in SD memory and Cloud Includes voltage cables, alligator clips, USB cable, fastening strap, magnetic support, battery, power supply and carrying bag. Please contact us for other clamp or clamp length combinations

Accessories for MYeBOX

Type	Code	Description
V-Wire x3	[*] M8401B.	set of 3 600 V CAT III cables
V-Wire x4	[*] M8401C.	set of 4 600 V CAT III cables
V-Wire x5	[*] M8401D.	set of 5 600 V CAT III cables
MYeBOX-BAT	[*] M84011.	MyEBOX battery
MYeBOX-PS	[*] M84012.	MYEBOX power cable
MYeBOX-PS480	[*] M8401A.	MYEBOX power supply (480 V)
MYeBOX-MARKER	[*] M84014.	Markers
MYeBOX-CARRYING BAG	[*] M84015.	Carrying bag
MYeBOX-BELT	[*] M84016.	MyEBOX strap
MYeBOX-MAG SUPPORT	[*] M84017.	MyEBOX magnetic base

Accessories

Type	Code	Description
Brida-AM54-FLEX	[*] M82502.	AM54-flex clamps, 5 colours tie bars
VCC-1	[*] M89909.	Crocodile clamp (1 unit)
MAG-ADAP	[*] M8990H.	Voltage adapter, magnetic tip Ø 6.6 mm
MAG-ADAPx3	[*] M8990J.	Kit 3 voltage adapters, magnetic tip Ø 6.6 mm
MAG-ADAPx4	[*] M8990K.	Kit 4 voltage adapters, magnetic tip Ø 6.6 mm
MAG-ADAPx5	[*] M8990L.	Kit 5 voltage adapters, magnetic tip Ø 6.6 mm

TABLE OF ADDITIONAL FEATURES

MYeBOX

M	8	4	0	X	X	0	0	0	0	X	X	X	
Code						Internal code							Delivery time
class A calibration certificate										A			2
MYeBOX kit with rugged IP clamps for outdoor use											0	2	4

FLEX-R

M	8	1	6	X	X	0	0	0	X	0	X	X	
Code						internal code							Delivery time
REDEL connector (PFG.M0.4GL. AC52GZ+protection (GMA.1B.054.DG)									2				1
Rugged IP for outdoor use											0	1	4

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

FLEX-R

Flexible sensors for MYeBOX analysers

Type	I min (A)	Measurement Range (A)	ø (mm)	Sensor lenght	Nr Sensors	Code	Nr Sensors	Code	Nr Sensors	Code
FLEX-R45	1 | 10 | 500	10 ... 100 A / 100 ... 1000 A / 1000 ... 10000 A	140	45 cm	1	[*] M81611.	3	[*] M81631.	4	[*] M81641.
FLEX-R80			250	80 cm	1	[*] M81612.	3	[*] M81632.	4	[*] M81642.
FLEX-R120			380	120 cm	1	[*] M81613.	3	[*] M81633.	4	[*] M81643.

FLEX-RMG

Flexible sensors for MYeBOX analysers

Type	I min (A)	Measurement Range (A)	ø (mm)	Sensor lenght	Nr Sensors	Code	Nr Sensors	Code	Nr Sensors	Code
FLEX-RMG70	1 | 10 | 500	10 ... 100 A / 100 ... 1000 A / 1000 ... 10000 A	70	22 cm	1	[*] M81911.	3	[*] M81931.	4	[*] M81941.
FLEX-RMG120			120	38 cm	1	[*] M81912.	3	[*] M81932.	4	[*] M81942.

CPG

Clamps

Type	I min (A)	Measurement Range (A)	ø (mm)	Nr Sensors	Code	Nr Sensors	Code	Nr Sensors	Code
CPG-5	0.05	0,05 ... 5 A	20	1	[*] M810B1.	3	[*] M810C1.	4	[*] M810D1.
CPG-100	1	1 ... 100 A		1	[*] M810B2.	3	[*] M810C2.	4	[*] M810D2.
CPRG-500		1 ... 500 A	52	1	[*] M810B3.	3	[*] M810C3.	4	[*] M810D3.
CPRG-1000		1 ... 1000 A		1	[*] M810B4.	3	[*] M810C4.	4	[*] M810D4.
CPRG-200/2000	1 | 10	1 ... 200 A / 10 ... 2000 A	64	1	[*] M810B5.	3	[*] M810C5.	4	[*] M810D5.

CFG

Residual current sensors (leaks)

Type	Code	Measurement Range (A)	I min	Usefull diam.(mm)	Flat strip(mm)
CFG-5	[3] M810BD.	0,01 ... 5 A	0.01	52	1 - 50 x 5 |4 - 30 x 5
CFG-10	[*] M810BE.	0,005 ... 10 A	0.05	100	5 - 80 x 5 |3 -80 x 10

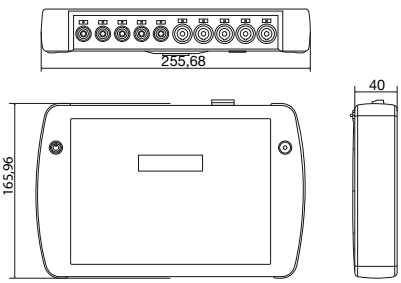
VLOG

Single-phase Power quality analyzer

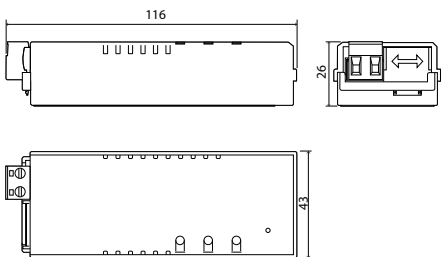
Type	Code	Description
VLOG-10	[C] M84101.	Single-phase analyzer to collect and record outages, gaps, overvoltages and voltage load profile

Dimensions

MYeBOX



VLOG



Digital instruments

Table: Digital intruments selection

		DCB	DHB	DHC-96	DCP-96
				New	
Mounting	Pannel	48 x 48 72 x 72	96 x 48	96 x 48	96 x 96
	DIN rail	–	–	–	–
AC measurement	Single-phase	●	●	●	●
	Three-phase	–	–	–	●
AC measurement Parameters	Voltage	DCB-xx-Vac	DHB-324	DHC-96 Vac	DCP-96 Vac
	Current	DCB-xx-Aac	DHB-324	DHC-96 Aac	DCP-96 Aac
	Active power (W)	–	DHB-324	-	-
	Frequency (Hz)	DCB-xx-Vac / DCB-xx-Aac	DHB-324	DHC-96 Vac DHC-96 Aac	●
	Maximum demand (A)	–	DHB-324	–	–
DC measurement Parameters	Voltage	DCB-xx-HVdc	-	DHC-96 Vdc DHC-96 CPM DHC-96 CPM HS DHC-96 HVdc DHC-96 CPM 1500	
	Voltage (mV) - Indirect current mV Shunt	DCB-xx-mVdc	DHB-424	DHC-96 mVdc DHC-96 CPM DHC-96 CPM 1500	–
	Current	DCB-xx-Adc	–	DHC-96 Adc	–
	Process signal (±10 V)	DCB-xx-LVdc	DHB-424	DHC-96 LVdc DHC-96 Vdc	–
	Process signal (mA)	DCB-xx-mAdc	-	DHC-96 mAdc	
Accuracy	0,5%	●	●	●	●
No electric parameters	Hour run meter	–	DHB-124	–	–
	Temperature	–	DHB-424	–	–
	Chronometer, impulse meter	–	DHB-124	–	–
	Tachometer (r/min)	–	DHB-124	–	–
Other options	Auxiliar output relay	DCB-72xx-2OR	DHB-124 (3) DHB-424 (4) DHB-324 (4)	2	–
	Analog output	–	1	1	–
	Transistor input	–	–	2	–
	Communications port	–	RS-485 (Modbus RTU)	RS-485 (Modbus RTU)	–
	Auxliar power supply	80...270 Vca/Vcc 18...36 Vcc	85...235 Vca/Vcc	80...270 Vca/Vcc 18...36 Vcc (OP) 20... 60 Vdc (OP)	80...270 Vca 18...36 Vcc (OP)
	Frontal adapter	●	●	●	–
	Page	49	49	50	49

OP - Opcional / T - Depending on the type

DCB

Digital instrument

80 ... 270 Vac /Vdc power supply voltage

Type	Code	System	Output relay	Scale	Size(mm)
Voltmeters					
DCB-48 Vac	[*] M22110.	AC	-	63,5 V / 100 V / 110 V /230 V /380 V /480 V	48 x 48
DCB-72 Vac	[*] M22210.	AC	-	63,5 V / 100 V / 110 V /230 V /380 V /480 V	72 x 72
DCB-72 Vac-2OR	[*] M22212.	AC	2	63,5 V / 100 V / 110 V /230 V /380 V /480 V	72 x 72
DCB-48 LVdc	[*] M22120.	DC	-	± 10 V	48 x 48
DCB-72 LVdc	[*] M22220.	DC	-	± 10 V	72 x 72
DCB-72 LVdc-2OR	[*] M22222.	DC	2	± 10 V	72 x 72
DCB-48 HVdc	[*] M22130.	DC	-	± 500 V	48 x 48
DCB-72 HVdc	[*] M22230.	DC	-	± 1500 V	72 x 72
DCB-72 HVdc-2OR	[*] M22232.	DC	2	± 1500 V	72 x 72
Ammeters					
DCB-48 Aac	[*] M22150.	AC	-	1 A / 5 A	48 x 48
DCB-72 Aac	[*] M22250.	AC	-	1 A / 5 A	72 x 72
DCB-72 Aac-2OR	[*] M22252.	AC	2	1 A / 5 A	72 x 72
DCB-48 Adc	[*] M22170.	DC	-	1 A / 5 A	48 x 48
DCB-72 Adc	[*] M22270.	DC	-	1 A / 5 A	72 x 72
DCB-72 Adc-2OR	[*] M22272.	DC	2	1 A / 5 A	72 x 72
Process indicators					
DCB-48 mVdc	[*] M22140.	DC	-	60 mV / 75 mV / 100 mV / 150 mV / 200 mV	48 x 48
DCB-72 mVdc	[*] M22240.	DC	-	60 mV / 75 mV / 100 mV / 150 mV / 200 mV	72 x 72
DCB-72 mVdc-2OR	[*] M22242.	DC	2	60 mV / 75 mV / 100 mV / 150 mV / 200 mV	72 x 72
DCB-48 mAdc	[*] M22160.	DC	-	-20 ... +20 mA / 0...20 mA / 4...20 mA	48 x 48
DCB-72 mAdc	[*] M22260.	DC	-	-20 ... +20 mA / 0...20 mA / 4...20 mA	72 x 72
DCB-72 mAdc-2OR	[*] M22262.	DC	2	-20 ... +20 mA / 0...20 mA / 4...20 mA	72 x 72

DCP-96

Digital instruments 96 x 96

80...270 Vac / Vdc power supply voltage.

Type	Code	System	Parameters	Scale
DCP-96 VAC	[2] M22410.	AC	V, Hz	3 x 230 / 400V
DCP-96 AAC	[2] M22450.	AC	A,Hz	.../5A, .../1A

TABLE OF ADDITIONAL FEATURES

DCB

Code								Internal Code	
M	2	X	X	X	X	0	0	X	
								↑	Delivery time
Auxiliary supply			Standard (80... 270 V_{ac})					0	
			18 ... 36 V_{dc}					3	-

DHC-96

Digital instruments 96 x 48

80 ... 270 Vac /Vdc power supply voltage

Type	Code	System	Parameters	Output relay	Digital inputs	Analog output	Scale	Commu-nications	Protocol
Voltmeters									
DHC-96 Vac	[*] M22318.	AC	V ~	2	2	1 (20 mA)	63,5 V / 100 V / 110 V /230 V /380 V /480 V	RS-485	Modbus/RTU
DHC-96 Vdc	[*] M22388.	DC	V dc	2	2	1 (20 mA)	0...20 mA / 4...20 mA / 4...12...20 mA	RS-485	Modbus/RTU
DHC-96 HVdc	[*] M22338.	DC	V dc	2	2	1 (20 mA)	± 1500 V	RS-485	Modbus/RTU
Ammeters									
DHC-96 Aac	[*] M22358.	AC	A ~	2	2	1 (20 mA)	1 A~ / 5 A~	RS-485	Modbus/RTU
DHC-96 Adc	[*] M22378.	DC	A dc	2	2	1 (20 mA)	1 Adc / 5 Adc	RS-485	Modbus/RTU
DHC-96 mVdc	[*] M22348.	DC	V dc	2	2	1 (20 mA)	60 mV / 75 mV / 100 mV / 150 mV / 200 mV	RS-485	Modbus/RTU
Process indicators									
DHC-96 LVdc	[*] M22328.	DC	V dc	2	2	1 (20 mA)	± 10 V	RS-485	Modbus/RTU
DHC-96 mAdc	[*] M22368.	DC	mA dc	2	2	1 (20 mA)	-20 ... +20 mA / 0...20 mA / 4...20 mA	RS-485	Modbus/RTU

Option of 0/2... 10 VDC outputs on demand

New

DHC-96 CPM

Digital instruments: Programmabled DC measurement Central

100... 270 Vac /Vdc power supply voltage

Type	Code	System	Parameters	Measurement Range U	Measurement Range I	Output relay	Digital inputs	Analog output	Commu-nications	Protocol
Multimeter										
DHC-96 CPM	[*] M223A8.	DC (Shunt)	V/A/kW/ kWh dc	± 150 / 300 /600 Vdc	50 / 60 / 75 / 100 / 150 / 200 / 250 / 300 / 400 / 600 mV	2	2	1 (20 mA)	RS-485	Modbus/RTU
DHC-96 CPM-HS	[C] M223B8.	DC (Hall)	V/A/kW/ kWh dc	± 150 / 300 /600 Vdc	4 Vdc	2	2	1 (20 mA)	RS-485	Modbus/RTU
DHC-96 CPM 1500	[*] M223C8.	DC (Shunt)	V/A/kW/ kWh dc	± 150 / 300 /600 / 1000 / 1500 Vdc	50 / 60 / 75 / 100 / 150 / 200 / 250 / 300 / 400 / 600 mV	2	2	1 (20 mA)	RS-485	Modbus/RTU

Option of 0/2... 10 VDC outputs on demand

Adaptador frontal

Type	Code	Description
Adap.Frontal 72x72 -> 96x96	[*] M29914.	Frontal adapter 72x72 > 96x96
Adap.Frontal 48x48 -> 72x72	[4] M29911.	Frontal adapter 48x48 > 72x72
Adap.Frontal 48x48 -> 96x96	[4] M29912.	Frontal adapter 48x48 > 96x96
Adap.Frontal 48x96 -> 96x96	[*] M29913.	Frontal adapter 48x48 > 96x96

TABLE OF ADDITIONAL FEATURES

DHC, DCP

M	2	X	X	X	X	0	0	X	
Code						Internal Code	↑	Delivery time	
Auxiliary supply	Standard (85... 270 V_{ac}/V_{dc})						0		
	18 ... 36 V_{dc}						3	-	

DHC-96-CPM, DHC-96 Vdc

M	2	2	X	X	X	0	0	X	
Code						Internal Code	↑	Delivery time	
Auxiliary supply	Standard (100... 270 V_{ac}/V_{dc})						0	-	
	20 ... 60 V_{dc}						4	1	

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Table: Measurement transducer selection

Voltage (V ac)	**CVE / CV-A**	Active power (kW)	**CW**
Voltage (V ac)	**CV-D**	Reactive power (kvar)	**CY**
Current (A ac)	**CCE / CC-A / TP-420 / TC-020 / TCB / TCM**	Frequency (Hz)	**CFE / CF**
Current (A dc)	**CC-D**	Temperature	**CT-PT100**

CVE/CCE/CFE

Narrow section transducers

Narrow-profile transducers, 230 Vac, 45 ... 65Hz.

Type	Code	System	Parameters	Measure	Output type	Analog output
AC Voltage transducer						
CVE-A	[*] M25011.	-	V ~	300 Vac	2	4...20mA
CVE-A-AP	[3] M25021.	-	V ~	230 Vac	1	0...20mA
AC Current transducer						
CCE-A	[*] M25111.	-	A ~	5 A	2	4...20mA
CCE-A-AP	[*] M25121.	-	A ~	5 A	1, 3	0...20mA
Frequency transducers						
CFE	[3] M25511.	Network voltage: 50 ... 600 Vac	-	45 ..... 55 Hz	2	4...20mA
CFE-AP	[3] M25521.	Selecting Network voltage: 115 / 240 / 400 Vac	-	45 ..... 55 Hz	1	0...20mA

Specify ACCORDING TO THE CODE TABLE: 1. Code/ 2. Input range / 3. Output range / 4. Auxiliary power supply / 5. Specify the network voltage for CFE-AP. xxx-AP types external auxiliary supply not required. 4...20 mA output not possible.

For other values, see coding table on following pages

Converters

CV

Voltage transducer

Type	Code	Parameters	Measure	Output type	Analog output
AC Voltage. Accuracy: ± 0,2 % reading, 40...90 Hz					
CV-A-AP Out1	[1] M25041.	V ~	300 Vac	1	0...20mA
CV-A Out1	[1] M25031.	V ~	300 Vac	1	0...20mA
CV-A Out2	[1] M25032.	V ~	300 Vac	2	4...20mA
CV-A-RMS Out1	[1] M25051.	V ~	300 Vac	1	0...20mA
CV-A-RMS Out2	[1] M25052.	V ~	300 Vac	2	4...20mA
DC Voltage. Auxiliary supply 230 V, 40...90 Hz, Accuracy: ± 0,5 % reading					
CV-D Out1,3	[1] M25061.	Vdc	10 Vdc	1, 3	0...20mA
CV-D Out2	[1] M25062.	Vdc	10 Vdc	2	4...20mA

-AP type: Accuracy: ± 0,5 % reading, 40...90 Hz. External auxiliary supply not required. Specify: Zero value, full scale and output type.

For other values, see coding table on following pages

CC

Current transducer

Type	Code	Parameters	Measure	Output type	Analog output
AC Current. Accuracy: ± 0,2 % reading, 40...90 Hz					
CC-A Out1	[1] M25131.	A ~	5 Aac	1	0...20mA
CC-A Out2	[*] M25132.	A ~	5 Aac	2	4...20mA
CC-A-AP	[*] M25141.	A ~	5 Aac	1	0...20mA
CC-A-RMS Out1	[1] M25151.	A ~	5 Aac	1	0...20mA
CC-A-RMS Out2	[*] M25152.	A ~	5 Aac	2	4...20mA
C.C.Current. Auxiliary supply 230 V, 40...90 Hz, Accuracy: ± 0,5 % reading.					
CC-D Out1	[1] M25161.	A dc	20 mA	1, 3	0...20mA
CC-D Out2	[1] M25162.	A dc	20 mA	2	4...20mA

-AP type: Accuracy: ± 0,5 % reading, 40...90 Hz. External auxiliary supply not required. Specify: Zero value, full scale and output type.

For other values, see coding table on following pages

CW
Active power transducer

Type	Code	System	Parameters	Output type	Analog output
Active power. Auxiliary supply 230 V, 40...90 Hz, Accuracy: ± 0,5 % reading					
CW-M Out1,3	[1] M25211.	Single-phase	kW	1, 3	0...20mA
CW-M Out2	[1] M25212.	Single-phase	kW	2	4...20mA
CW-TE Out1,3	[1] M25221.	Balanced three-phase	kW	1, 3	0...20mA
CW-TE Out2	[1] M25222.	Balanced three-phase	kW	2	4...20mA
CW-TA Out1,3	[1] M25231.	Unbalanaced three-phase ARON (3 wires)	kW	1, 3	0...20mA
CW-TA Out2	[1] M25232.	Unbalanaced three-phase ARON (3 wires)	kW	2	4...20mA
CW-TAN Out1,3	[1] M25241.	Unbalanaced three-phase (4 wires)	kW	1, 3	0...20mA
CW-TAN Out2	[1] M25242.	Unbalanaced three-phase (4 wires)	kW	2	4...20mA

Indicate: Zero value, fullscale, type of output, Un (between phases), In and fn.

For other values, see coding table on following pages

CY
Reactive power transducer

Type	Code	System	Parameters	Output type	Analog output
Reactive power. Auxiliary supply 230 V, 40...90 Hz, Accuracy: ± 0,5 % reading					
CY-M Out1,3	[1] M25251.	Single-phase	kvar	1, 3	0...20mA
CY-M Out2	[1] M25252.	Single-phase	kvar	2	4...20mA
CY-TE Sal.1,3	[1] M25261.	Balanced three-phase	kvar	1, 3	0...20mA
CY-TE Sal.2	[1] M25262.	Balanced three-phase	kvar	2	4...20mA
CY-TA Out1,3	[1] M25271.	Unbalanaced three-phase ARON (3 wires)	kvar	1, 3	0...20mA
CY-TA Out2	[1] M25272.	Unbalanaced three-phase ARON (3 wires)	kvar	2	4...20mA
CY-TAN Sal1,3	[1] M25281.	Unbalanaced three-phase (4 wires)	kvar	1, 3	0...20mA
CY-TAN Out2	[1] M25282.	Unbalanaced three-phase (4 wires)	kvar	2	4...20mA

Indicate: Zero value, fullscale, type of output, Un (between phases), In and Fn.

For other values, see coding table on following pages

CF
Frequency transducers

Type	Code	Measure	Output type	Analog output
Auxiliary supply 230 V, 40...90 Hz, Accuracy: ± 0,2 % reading				
CF Out1	[3] M25531.	45 ... 55 Hz (10 ... 660 Vac)	1	0...20mA
CF Out2	[1] M25532.	45 ... 55 Hz (10 ... 660 Vac)	2	4...20mA

Indicate: Zero value, fullscale and type of output.

For other values, see coding table on following pages

CT-PT
Temperature transducer

Type	Code	Measure	Output type	Analog output
Temperature				
CT-PT100 Out1,3	[1] M25651.	According probe PT-100	1, 3	0...20mA
CT-PT100 Out2	[*] M25652.	According probe PT-100	2	4...20mA

Indicate: Zero value, fullscale and type of output.

For other values, see coding table on following pages

TABLE OF ADDITIONAL FEATURES

Narrow section transducers

M 2 X X X X 0 0 X X X X X

Code		Internal code					Delivery time
Voltage CVE-A	Standard (300 V)	0					-
	110 V	1					2
	400 V	2					2
	500 V	3					2
	690 V	4					2
Voltage CVE-A-AP	Standard (230 V)	0					-
	110 V	1					2
	400 V	2					2
Current CCE	Standard (5 A)	0					-
	1 A	1					2
	10 A	4					2
Frequency CFE	Standard (45...55 Hz)	0					-
	55...65 Hz	1					2
	47...53 Hz	2					2
	45...65 Hz	3					2
	0...100 Hz	4					2
	380...420 Hz	5					2
	360...440 Hz	6					2
	340...460 Hz	7					2
Output 2 CVE-A, CCE-A, CFE	Standard (4...20 mA)		0				-
	0...20 mA		1				2
	0...10 V		2				2
	2...10 V		3				2
Output 1,3 CVE-A-AP, CCE-A-AP, CFE-AP	Standard (0...20 mA)		0				-
	0...10 V		1				2
Auxiliary supply	Standard (220...240 V)			0			-
	380...400 Vca 40/60 Hz			3			2
	18...36 Vdc			7			2
Network voltage CFE-AP	Standard (230 V)				0	0	2
	110 V				0	1	2
	400 V				0	2	2

For other values consult

Transducers

M 2 X X X X 0 0 X X X

Code		Internal code				Delivery time
AC Voltage CV-A	Standard (300 V)	0				-
	110 V	1				1
	400 V	2				1
	500 V	3				1
	690 V	4				1
AC Current CC-A	Standard (5 A)	0				
	1 A	1				1
	10 A	4				1
DC Voltage CV-D	Standard (10 V)	0				
	60 mV	1				1
	1 V	2				1
	100 V	3				1
	500 V	4				1
DC Current CC-D	Standard (20 mA)	0				
	200 mA	1				1
	1 A	2				1
	10 A	3				1
Power CW, CY	300 V, .../5 A	N				1
	110 V, .../5 A	1				1
	400 V, .../5 A	2				1
	500 V, .../5 A	3				1
	600 V, .../5 A	4				1
	300 V, .../1 A	5				1
	110 V, .../1 A	6				1
	400 V, .../1 A	7				1
	500 V, .../1 A	8				1
	600 V, .../1 A	9				1
Temperature CT-PT	Standard (-200...+200 °C)	0				
	-200...+800 °C	1				1
Frequency CF	Standard (45...55 Hz)	0				
	55...65 Hz	1				1
	47...53 Hz	2				1
	57...63 Hz	3				1
	0...100 Hz	4				1
Outputs 1, 3	Standard (20 mA)		0			-
	0...1 mA		1			1
	0...10 mA		2			1
	2 V		3			1
	5 V		4			1
	0...10 V		5			1
	-20...0...20 mA		6			1
	-10...0...10 V		7			1
	-5...0...5 V		8			1
Outputs 2	Standard (4...20 mA)		0			
	2...10 V		2			1
Auxiliary supply	Standard (220...240 V)			0		-
	100...120 Vac			1		2
	380...400 Vca 40/60 Hz			3		2
	18...36 Vdc			7		2
	40...170 Vdc			9		2

For others values, consult

TI

Current transformer with converter 4 ... 20 mA

Type	TI-420			TP-420		TCM-420	TCB-420	
	TI-420-35	TI-420-70	TI-420-105	TP-420-23	TP-420-58	TCM-420-25	TCB-420-35	TCB-420-70
ø (mm)	35	70	105	-	-	25	35	70
Flat strip(mm)	-	-	-	20 x 30	50 x 80	-	-	-
Size (mm) width xheight xdepth	100x79x33	130x110x33	170x146x33	110x89x58	145x114x50	70x87x70	166x79x33	196x110x33
	10...28 Vdc supply, Output 4...20 mA					Output internal supply 4...20 mA (230 Vac Auxiliary supply)		
A	**Code**	**Code**	**Code**	**Code**	**Code**	**Code**	**Code**	**Code**
2.5	[1] M70811.					[2] M71041.	[3] M71011.	
5	[*] M70812.			[*] M70211.		[*] M71042.	[*] M71012.	
10	[*] M70813.			[*] M70212.		[*] M71043.	[*] M71013.	
20	[*] M70814.			[*] M70213.		[*] M71044.	[*] M71014.	
50	[*] M70815.			[*] M70214.		[*] M71045.	[*] M71015.	
100	[*] M70816.	[*] M70821.		[*] M70215.	[*] M70221.	[*] M71046.	[*] M71016.	[1] M71021.
200				[*] M70216.		[*] M71047.		
250	[*] M70817.	[*] M70822.	[1] M70831.	[*] M70217.	[*] M70222.		[*] M71017.	[*] M71022.
500		[*] M70823.	[1] M70832.	[*] M70218.	[*] M70223.			[*] M71023.
750		[*] M70824.	[1] M70833.		[*] M70224.			[*] M71024.
1000			[1] M70834.					
For greater currents, use: transformer + transducer								
EUR								

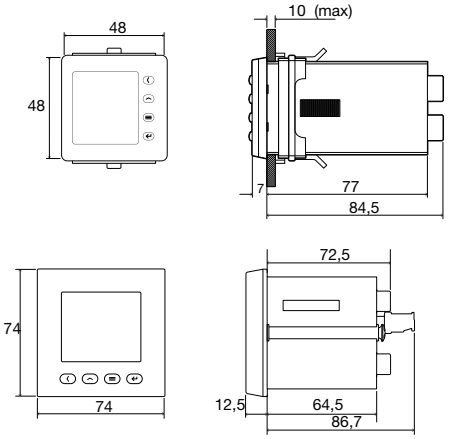
TC-420

Current transformers with converter 4 ... 20 mA or 0 ... 20 mA

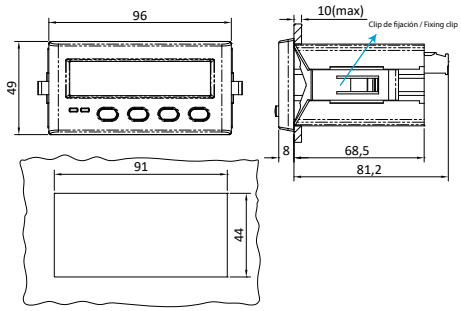
Type	TC5-420	TC6-420	TC8-420	TC6-020	TC8-020
ø (mm)	**20**	**28**	**44**	**28**	**44**
Flat strip(mm)	25 x 5	40 x 10	60 x 12	40 x 10	60 x 12
Size (mm) width xheight xdepth	58x70x32	64x80.5x44	84.5x102x50	64x80.5x44	84.5x102x50
	Output 4...20 mA, ext. supply 7,5...36 Vdc			Output 0...20 mA	
A	Code	Code	Code	Code	Code
5	[*] M72112.				
10	[*] M72113.				
20	[*] M72114.				
50		[*] M72131.		[*] M72031.	
100		[*] M72132.		[*] M72032.	
		[*] M72134.		[*] M72034.	
300		[*] M72136.		[*] M72036.	
500			[*] M72151.		[3] M72051.
1000			[*] M72152.		[1] M72052.
For greater currents, use: transformer + transducer					
EUR					

Dimensions

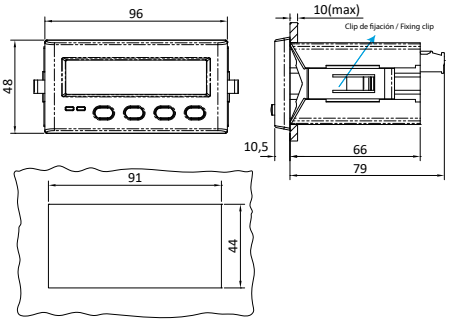
DCB



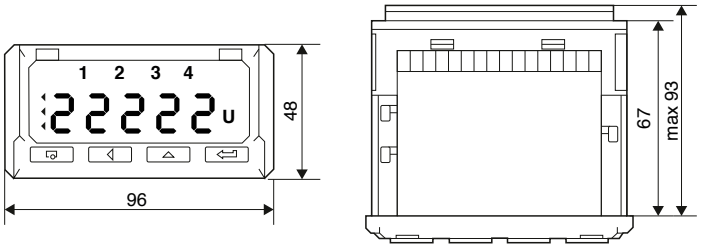
DHC-96



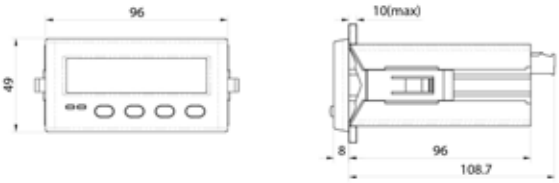
DHC-96 CPM



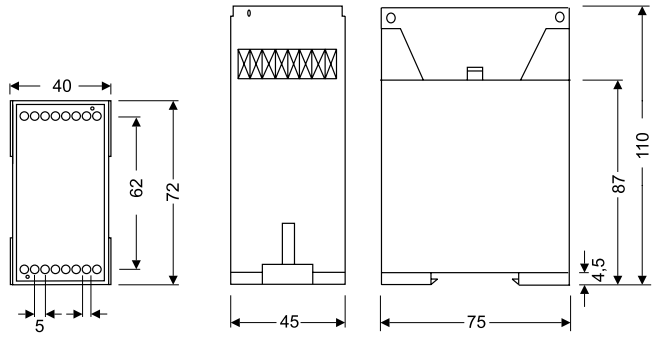
DHB



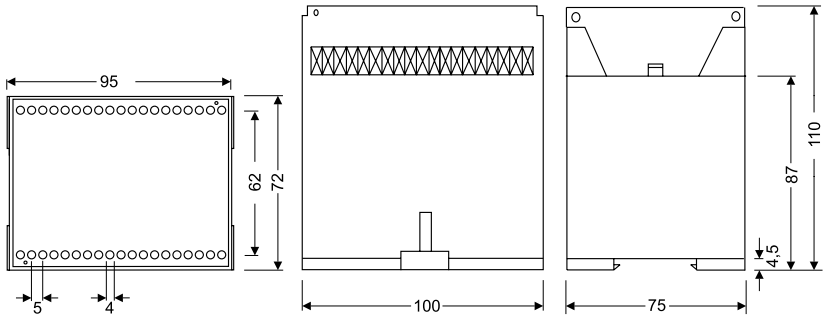
DHC-96 CPM-1500



CV-A / CV-D / CC-A / CC-D / CR2 / CT-PT100 / CUP / CF



CW / CY / CPF / CCOS / CFD



Analogue instruments

Analogue instrument selection table

	Measurement system	Assembly	Specifications	Range	Size mm	Accuracy class	Scale angle	Scale extension	Type
Ammeters	AC	Panel	Miliammeter	100...600 mA	48 x 48, 72 x 72, 96 x 96, 144 x 144	1,5	90°	P2	EC
	~		-	5...100 A ,.../5A					EC
				.../5A	72 x 72, 96 x 96		240°		EZC
			With switch	.../5A			90°	P1	EC FA
			With relays	.../5A	96 x 96				CEC
		DIN rail	-	5...60 A, .../5A	85 x 52			P2	EMSC 45
	CC	Panel	-	5...60 A, .../60 mV	48 x 48, 72 x 72, 96 x 96, 144 x 144			P1	BC
	⎓		With relays	.../ 60 mV	96 x 96				CBC
		DIN rail	-	5...60 A, .../60 mV	85 x 52				BMSC 45
Voltmeters	AC	Panel	-	150 ... 600 V, .../110 V	48 x 48, 72 x 72, 96 x 96, 144 x 144	1,5	90°	P1	EC
	~			250 V, 500 V	72 x 72, 96 x 96		240°		EZC
				150 ... 600 V					EC F
			With relays	150 ... 600 V, .../110 V	96 x 96		90°		CEC
		DIN rail	-	300 V, 500 V, .../110 V	85 x 52				EMSC 45
	CC	Panel	-	0...600 V	48 x 48, 72 x 72, 96 x 96, 144 x 144			P1	BC
	⎓		With relays	.../ 60 mV	96 x 96			P1	CBC
		DIN rail	-	15...150 V	85 x 52				BMSC 45
Process indicators	CC	Panel	-	0...10 V, 0/4... 20 mA	48 x 48, 72 x 72, 96 x 96, 144 x 144	1,5	90°	P1	BC
	⎓			0...10 V, 4... 20 mA, .../60 mV			240°	P1	ZC
		DIN rail		0...10 V, 0/4... 20 mA	85 x 52		90°		BMSC 45
Maximeters	-	Panel	Bimetallic	.../5 A				P1,2	MC
			Bimetallic + HM					P2	EMC
Sheet	Needle	Panel	-	45...65 Hz depending type	48 x 48, 72 x 72, 96 x 96, 144 x 144	0,5	90°	-	HC
		DIN rail	-		85 x 52		90°		HMSC
	Sheets	Panel	-		72 x 72, 96 x 96, 144 x 144		-		HLC
Wattmeter		Panel	Single-phase	400 V, .../5 A	96 x 96, 144 x 144	1,5	90°	P1	WMC
			Three-phase						WTC
Phase-meters Electronic		Panel	Single-phase	cos φ 0,5 - 1 - 0,5	96 x 96, 144 x 144	1,5	90°	P1	FEMC
			Three-phase						FETC

EC / EM / EZC / CEC

Moving Iron Miliammeters and Ammeter

Miliammeters and Ammeters, 90º - P2 - Class 1,5

Type					New
	EC 48	EC 72	EC 96	EC 144	EMSC 45
a	48	72	96	144	85
b	48	72	96	144	52
c	86,2	69,2	69,2	91,8	65
mA					
100	[1] M10111.	[*] M10121.	[1] M10131.	[1] M10141.	[1] M10161.
150	[1] M10112.	[1] M10122.	[1] M10132.	[1] M10142.	[1] M10162.
250	[1] M10114.	[1] M10124.	[1] M10134.	[1] M10144.	[1] M10164.
300	[1] M10115.	[1] M10125.	[1] M10135.	[1] M10145.	[1] M10165.
400	[1] M10116.	[1] M10126.	[1] M10136.	[1] M10146.	[1] M10166.
500	[1] M10117.	[1] M10127.	[1] M10137.	[1] M10147.	[1] M10167.
600	[1] M10118.	[1] M10128.	[1] M10138.	[1] M10148.	[1] M10168.
A					
5	[*] M10212.	[*] M10222.	[*] M10232.	[3] M10242.	[1] M10262.
10	[*] M10213.	[*] M10223.	[*] M10233.	[3] M10243.	[*] M10263.
15	[*] M10214.	[*] M10224.	[*] M10234.	[3] M10244.	[*] M10264.
20	[*] M10215.	[*] M10225.	[*] M10235.	[3] M10245.	[1] M10265.
25	[*] M10216.	[*] M10226.	[*] M10236.	[3] M10246.	[*] M10266.
30	[*] M10217.	[*] M10227.	[1] M10237.	[3] M10247.	[*] M10267.
40	[*] M10218.	[*] M10228.	[*] M10238.	[3] M10248.	[*] M10268.
50	[*] M10219.	[*] M10229.	[*] M10239.	[3] M10249.	[3] M10269.
60	[*] M1021A.	[*] M1022A.	[*] M1023A.	[3] M1024A.	[3] M1026A.
75	-	[*] M1022B.	[1] M1023B.	[3] M1024B.	-
100	-	[*] M1022C.	[*] M1023C.	[3] M1024C.	-
.../5 A (*1)	[*] M10210.	[*] M10220.	[*] M10230.	[3] M10240.	[*] M10260.

(*1) Exchangeable scales. See next page.

	Ammeters, 240°		Ammeters with phase switch		Ammeters with 2 relays
Type	**EZC 72**	**EZC 96**	**EC 72 FA**	**EC 96 FA**	**CEC 96**
Class	5		1,5		1,5
Scale	240º, P2		90º, P1		90º, P2
a	72	96	72	96	96
b	72	96	72	96	96
c	69,2	69,2	69,2	69,2	110
A	(*2) .../5 A	(*2) .../5 A	(*2) .../5 A(*1)	(*2) .../5 A(*1)	(*2) .../5 A
(*2) .../5 A(*1)	[3] M10920.	[3] M10930.	[*] M10521.	[*] M10531.	[*] M14810.

(*1) Exchangeable scales. See next page.
(*2) Specify primary current of the measuring transformer

Exchangeable scales, moving iron ammeters

Type	SEC 48	SEC 72	SEC 96	SEMSC 45	SEC 72 FA	SEC 96 FA
Equipment	EC 48	EC 72	EC 96	EMSC 45	EC 72 FA	EC 96 FA
A						
5/5	[*] M102Z2.	[*] M102Y2.	[*] M102X2.	-	-	-
10/5	[*] M102Z3.	[*] M102Y3.	[*] M102X3.	-	-	-
15/5	[*] M102Z4.	[*] M102Y4.	[*] M102X4.	-	-	-
20/5	[*] M102Z5.	[*] M102Y5.	[*] M102X5.	-	-	-
25/5	[*] M102Z6.	[*] M102Y6.	[*] M102X6.	-	-	-
30/5	[*] M102Z7.	[*] M102Y7.	[*] M102X7.	-	-	-
40/5	[*] M102Z8.	[*] M102Y8.	[*] M102X8.	-	-	-
50/5	[*] M102Z9.	[*] M102Y9.	[*] M102X9.	[*] M102U9.	[*] M105Y9.	[*] M105X9.
60/5	[*] M102ZA.	[*] M102YA.	[*] M102XA.	[*] M102UA.	[2] M105YA.	[*] M105XA.
75/5	[*] M102ZB.	[*] M102YB.	[*] M102XB.	[*] M102UB.	[*] M105YB.	[*] M105XB.
100/5	[*] M102ZC.	[*] M102YC.	[*] M102XC.	[*] M102UC.	[*] M105YC.	[*] M105XC.
125/5	[*] M102ZD.	[*] M102YD.	[*] M102XD.	[*] M102UD.	[2] M105YD.	[*] M105XD.
150/5	[*] M102ZE.	[*] M102YE.	[*] M102XE.	[*] M102UE.	[*] M105YE.	[2] M105XE.
200/5	[*] M102ZF.	[*] M102YF.	[*] M102XF.	[*] M102UF.	[*] M105YF.	[*] M105XF.
250/5	[*] M102ZG.	[*] M102YG.	[*] M102XG.	[1] M102UG.	[*] M105YG.	[*] M105XG.
300/5	[*] M102ZH.	[*] M102YH.	[*] M102XH.	[*] M102UH.	[*] M105YH.	[*] M105XH.
400/5	[*] M102ZJ.	[*] M102YJ.	[*] M102XJ.	[*] M102UJ.	[*] M105YJ.	[*] M105XJ.
500/5	[2] M102ZK.	[*] M102YK.	[*] M102XK.	[*] M102UK.	[*] M105YK.	[*] M105XK.
600/5	[*] M102ZL.	[*] M102YL.	[*] M102XL.	[*] M102UL.	[*] M105YL.	[*] M105XL.
750/5	[*] M102ZM.	[*] M102YM.	[*] M102XM.	[*] M102UM.	[*] M105YM.	[*] M105XM.
800/5	[*] M102ZN.	[*] M102YN.	[*] M102XN.	[*] M102UN.	[*] M105YN.	[*] M105XN.
1 000/5	[*] M102ZP.	[*] M102YP.	[*] M102XP.	[1] M102UP.	[*] M105YP.	[*] M105XP.
1 200/5	[*] M102ZQ.	[*] M102YQ.	[*] M102XQ.	[1] M102UQ.	[*] M105YQ.	[*] M105XQ.
1 500/5	[*] M102ZR.	[*] M102YR.	[*] M102XR.	[1] M102UR.	[*] M105YR.	[*] M105XR.
2 000/5	[*] M102ZS.	[*] M102YS.	[*] M102XS.	[1] M102US.	[*] M105YS.	[*] M105XS.
2 500/5	[*] M102ZT.	[*] M102YT.	[*] M102XT.	[1] M102UT.	[*] M105YT.	[*] M105XT.
3 000/5	[*] M102ZU.	[*] M102YU.	[*] M102XU.	[1] M102UU.	[*] M105YU.	[*] M105XU.
4 000/5	[*] M102ZV.	[*] M102YV.	[*] M102XV.	[1] M102UV.	[*] M105YV.	[*] M105XV.
5 000/5	[*] M102ZW.	[2] M102YW.	[*] M102XW.	[1] M102UW.	[*] M105YW.	[*] M105XW.

TABLE OF ADDITIONAL FEATURES

EC, EMSC and EZC

Code		Internal code			Delivery time	+ €
M 1 X X X X 0 0		X	X	X		
Adjustment	Standard 2P	0			-	-
	1P	1			2	
	5P	6			2	
Current input	Standard (.../5 A)		0		-	
	.../1 A		1		1	
Scales(*)	1			1	2	
	5			2	2	
	10			3	2	
	15			4	2	
	20			5	2	
	25			6	2	
	30			7	2	
	40			8	2	
	50			9	2	
	60			A	2	
	75			B	2	
	100			C	2	
	125			D	2	
	150			E	2	
	200			F	2	
	250			G	2	
	300			H	2	
	400			J	2	
	500			K	2	
	600			L	2	
	750			M	2	
	800			N	2	
	1000			P	2	
	1200			Q	2	
	1500			R	2	
	2000			S	2	
	2500			T	2	
	3000			U	2	
	4000			V	2	
	5000			W	2	

SEC, SEM, EM

Code		Internal code		Delivery time	+ €
M 1 X X X X 0 0		X	X		
Adjustment	Standard 2P	0		-	
	1P	1		2	
	5P	6		2	
Current input	Standard (.../5 A)		0	-	
	.../1 A		1	1	

CEC (A)

Code		Internal code		Delivery time
M 1 X X X X 0 0		X	X	
Scales	60	A		-
	75	B		-
	100	C		-
	125	D		-
	150	E		-
	200	F		-
	250	G		-
	300	H		-
	400	J		-
	500	K		-
	600	L		-
	750	M		-
	800	N		-
	1000	P		-
	1200	Q		-
	1500	R		-
	2000	S		-
	2500	T		-
	3000	U		-
Current input	Standard (.../5 A)		0	-
	.../1 A		1	1
	/10 A		4	1

EC (mA), EMSC (mA)

Code		Internal code	Delivery time
M 1 X X X X 0 0		X	
Adjustment	Standard 2P	0	-
	1P	1	2
	5P	6	2

EC / EMSC / EZC / CEC

Moving Iron Voltmeters

	Voltmeters, 90°				Voltmeters, 90°	Voltmeters, 240°	
					New		
Type	**EC 48**	**EC 72**	**EC 96**	**EC 144**	**EMSC 45**	**EZC 72**	**EZC 96**
Class	1,5				1,5	5	
Scale	90° , P1				90° , P1	240°, P1	
a b c	48 48 86,2	72 72 69,2	96 96 69,2	144 144 91,8	85 52 65	72 72 69,2	96 96 69,2
V							
250	[*] M10415.	[*] M10425.	[*] M10435.	[3] M10445.	-	[*] M11125.	[*] M11135.
300	[*] M10416.	[*] M10426.	[*] M10436.	[3] M10446.	[*] M10476.		
400	[*] M10417.	[*] M10427.	[*] M10437.	[3] M10447.	-	-	-.
500	[*] M10418.	[*] M10428.	[*] M10438.	[3] M10448.	[*] M10478.	[*] M11128.	[*] M11138.
600	[1] M10419.	[*] M10429.	[*] M10439.	[3] M10449.	-	-	-.
.../110 V(*1)	[1] M10410.	[*] M10420.	[*] M10430.	[3] M10440.	[1] M10470.	-	-

(*1) Exchangeable scales, Voltmeters 90°

	Voltmeters with phases switch					Voltmeters with 2 relays
	Three-phase 3 wire		Three-phase 4 wire		with sequence meter	
Type	**EC 72 F III**	**EC 96 F III**	**EC 72 F III +N**	**EC 96 F III +N**	**EC 96 FN-S**	**CEC 96**
Class	1,5					1,5
Scale	90° , P1					90°, P1
a b c	72 72 69,2	96 96 69,2	72 72 69,2	96 96 69,2	96 96 69,2	96 96 110
V						
150	-	-	-	-	-	[3] M14821.
250	[*] M10625.	[3] M10635.	[*] M10725.	[3] M10735.	-	[3] M14822.
300	[*] M10626.	[*] M10636.	[*] M10726.	[*] M10736.	-	[3] M14823.
400	[*] M10627.	[3] M10637.	[*] M10727.	[3] M10737.	-	[3] M14824.
500	[*] M10628.	[*] M10638.	[*] M10728.	[*] M10738.	[2] M11038.	[3] M14825.
600	[*] M10629.	[3] M10639.	[*] M10729.	[3] M10739.	-	[3] M14826.
(1).../110 V	-	[2] M10632.	-	-	-	[3] M14820.

(1) Specify primary voltage of the measuring transformers

Exchangeable scales, moving iron voltmeters, 1,2P

Type	SEC 48	SEC 72	SEC 96	SEMSC 45
Equipment	EC 48	EC 72	EC 96	EMSC 45
V				
1 000/110	[1] M104Z1.	[1] M104Y1.	[1] M104X1.	[1] M104U1.
3 300/110	[1] M104Z2.	[1] M104Y2.	[1] M104X2.	[1] M104U2.
6 600/110	[1] M104Z3.	[1] M104Y3.	[1] M104X3.	[1] M104U3.
13 200/110	[1] M104Z4.	[1] M104Y4.	[1] M104X4.	[1] M104U4.
15 000/110	[1] M104Z5.	[1] M104Y5.	[1] M104X5.	[1] M104U5.
20 000/110	[1] M104Z6.	[1] M104Y6.	[1] M104X6.	[1] M104U6.
22 000/110	[1] M104Z7.	[1] M104Y7.	[1] M104X7.	[1] M104U7.
25 000/110	[1] M104Z8.	[1] M104Y8.	[1] M104X8.	[1] M104U8.

TABLE OF ADDITIONAL FEATURES

EC Voltmeters with external transformer and EMSC, EZC

Code		Internal code			Delivery time	
M 1 X X X X 0 0		X	X	X		
Adjustment	Standard 1,2P	0			-	
	1P	1			2	
Voltage input	Standard (.../110 V)		0		=	-
	.../100 V		1		1	-
	.../63,5 V		2		1	-
	.../57,8 V		3		1	-
Scales (For equipments with external transformer and all EC)	1000			1	2	
	3300			2	2	
	6600			3	2	
	13200			4	2	
	15000			5	2	
	20000			6	2	
	22000			7	2	
	25000			8	2	

EC and EC-F direct Voltmeters

Code		Internal code	Delivery time
M 1 X X X X 0 0		X	
Adjustment	Standard 1P	0	-
	1,2P	2	2

EC scales and EMSC Voltmeters and scales

Code		Internal code		Delivery time
M 1 X X X X 0 0		X	X	
Adjustment	Standard 1,2P	0		-
	1P	1		2
Voltage inputs	Standard (.../110 V)		0	-
	.../100 V		1	1
	.../63,5 V		2	1
	.../57,8 V		3	1

BC / BMSC / CBC

Moving coil ammeters

	Ammeters, 90°				Ammeters, 90°	ammeters with 2 relays
					New	
Type	BC 48	BC 72	BC 96	BC 144	BMSC 45	CBC 96
Class	1,5				1,5	1,5
Scale	90° , P1				90° , P1	90°, P1
a b c	48 48 86,2	72 72 69,2	96 96 69,2	144 144 91,8	85 52 65	96 96 110
A						
5	[3] M11412.	[*] M11422.	[3] M11432.	[3] M11442.	[3] M11462.	-
10	[3] M11413.	[*] M11423.	[3] M11433.	[3] M11443.	[*] M11463.	-
25	[*] M11416.	[*] M11426.	[*] M11436.	[3] M11446.	[3] M11466.	-
50	[3] M11419.	[*] M11429.	[3] M11439.	[3] M11449.	[*] M11469.	-
60	-	[3] M1142A.	[3] M1143A.	[3] M1144A.	-	-
../60 mV(*1)	[*] M11410.	[*] M11420.	[*] M11430.	[3] M11440.	[3] M11460.	[3] M14830.

(*1) Exchangeable scales. See M.7 for external shunts

Exchangeable Scales

Type	**SBC 48**	**SBC 72**	**SBC 96**	**SBMSC 45**	**Type**	**SBC 48**	**SBC 72**	**SBC 96**	**SBMSC 45**
Device	**BC 48**	**BC 72**	**BC 96**	**BMSC 45**	**Device**	**BC 48**	**BC 72**	**BC 96**	**BMSC 45**
A / mV					**A / mV**				
50/60	[1] M114Z9.	[1] M114Y9.	[*] M114X9.	[1] M114U9.	300/60	[1] M114ZH.	[1] M114YH.	[1] M114XH.	[1] M114UH.
60/60	[1] M114ZA.	[1] M114YA.	[1] M114XA.	[1] M114UA.	400/60	[1] M114ZJ.	[1] M114YJ.	[*] M114XJ.	[1] M114UJ.
75/60	[1] M114ZB.	[1] M114YB.	[1] M114XB.	[1] M114UB.	600/60	[1] M114ZL.	[*] M114YL.	[*] M114XL.	[1] M114UL.
100/60	[1] M114ZC.	[*] M114YC.	[*] M114XC.	[1] M114UC.	1 000/60	[1] M114ZP.	[1] M114YP.	[*] M114XP.	[1] M114UP.
150/60	[1] M114ZE.	[1] M114YE.	[1] M114XE.	[1] M114UE.	1 500/60	[1] M114ZR.	[1] M114YR.	[1] M114XR.	[1] M114UR.
200/60	[1] M114ZF.	[*] M114YF.	[*] M114XF.	[1] M114UF.	2 500/60	[1] M114ZT.	[1] M114YT.	[1] M114XT.	[1] M114UT.
250/60	[1] M114ZG.	[1] M114YG.	[1] M114XG.	[1] M114UG.					

TABLE OF ADDITIONAL FEATURES

BC and BMSC 45 ammeter

Code		Internal code		Delivery time
M 1 X X X X 0 0		X	X X	
Adjustment	Standard	0		-
	central zero	1		2
Shunt input range	Standard (.../60 mV)		0	-
	.../50 mV		1	2
	.../150 mV		3	2
	.../300 mV		5	2
Scale	50		9	2
	60		A	2
	75		B	2
	100		C	2
	150		E	2
	200		F	2
	250		G	2
	300		H	2
	400		J	2
	500		K	2
	600		L	2
	1000		P	2
	1500		R	2
	2500		T	2

SBC, SBMSC 45 scales

Code		Internal code		Delivery time
M 1 X X X X 0 0		X	X	
Adjustment	Standard	0		-
	central zero	1		2
Shunt input range	Standard (.../60 mV)		0	-
	.../50 mV		1	2
	.../150 mV		3	2
	.../300 mV		5	2

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

BC / BM / CBC

Moving coil voltmeters

	Voltmeters, 90º				Voltmeters, 90º	Voltmeters with relay
					New	
Type	BC 48	BC 72	BC 96	BC 144	BMSC 45	CBC 96
Class	1,5				1,5	1,5
Scale	90° , P1				90° , P1	90°, P1
a b c	48 48 86,2	72 72 69,2	96 96 69,2	144 144 91,8	85 52 65	96 96 110
V						
0...10 V (*1)	[*] M11813.	[*] M11823.	[*] M11833.	[3] M11843.	-	-
1	[2] M11711.	[1] M11721.	[1] M11731.	[3] M11741.	-	-
15	[*] M11714.	[*] M11724.	[*] M11734.	[3] M11744.	[3] M11764.	-
30	[*] M11716.	[*] M11726.	[*] M11736.	[3] M11746.	[3] M11765.	-
60	[*] M11718.	[*] M11728.	[*] M11738.	[3] M11748.	[3] M11766.	-
100	[3] M11719.	[*] M11729.	[*] M11739.	[3] M11749.	[3] M11767.	
150	[3] M1171A.	[*] M1172A.	[*] M1173A.	[3] M1174A.	[*] M11768.	[3] M14841.
250	[3] M1171B.	[*] M1172B.	[*] M1173B.	[3] M1174B.	-	[3] M14842.
300	-	-	-	-	-	[3] M14843.
400	[3] M1171D.	[*] M1172D.	[*] M1173D.	[3] M1174D.	-	[3] M14844.
500	[3] M1171E.	[*] M1172E.	[1] M1173E.	[3] M1174E.	-	[3] M14845.
600	[3] M1171F.	[1] M1172F.	[1] M1173F.	[3] M1174F.	[3] M1176F.	[3] M14846.

(*1) Scale NOT included

TABLE OF ADDITIONAL FEATURES

BC and BMSC equipment

Code								Internal code	
M	1	X	X	X	X	0	0	X	
								↑	Delivery time
Adjustment				Standard				0	-
				Central zero				1	2

BC / BMSC / ZC

Process indicators

Process indicators, 90°

					New
Type	**BC 48**	**BC 72**	**BC 96**	**BC 144**	**BMSC 45**
Class	1,5				1,5
Scale	90° , P1				90° , P1
a b c	48 48 86,2	72 72 69,2	96 96 69,2	144 144 91,8	85 52 65
Scope					
0...10 V	[*] M11813.	[*] M11823.	[*] M11833.	[3] M11843.	[3] M11863.
0...20 mA	[1] M11812.	[1] M11822.	[1] M11832.	[3] M11842.	[3] M11862.
4...20 mA	[*] M11811.	[*] M11821.	[*] M11831.	[3] M11841.	[3] M11861.

Scales NOT included

Exchangeable scales

Type	**SIP 48**	**SIP 72**	**SIP 96**	**SIPMSC 45**
Equipment	**BC 48**	**BC 72**	**BC 96**	**BMSC 45**
Scope				
0...10 V	[3] M118Z3.	[3] M118Y3.	[3] M118X3.	[1] M118U3.
0...20 mA	[3] M118Z2.	[3] M118Y2.	[3] M118X2.	[1] M118U2.
4...20 mA	[3] M118Z1.	[3] M118Y1.	[3] M118X1.	[1] M118U1.

Process indicators, 240°

Type			
	ZC 72	**ZC 96**	**ZC 144**
Class	1,5		
Scale	240°, P1		
a b c	72 72 69,2	96 96 69,2	144 144 91,8
Scope			
0...10 V	[1] M12523.	[1] M12533.	[1] M12543.
4...20 mA(*)	[1] M12521.	[1] M12531.	[1] M12541.
.../60 mV	[1] M12520.	[1] M12530.	[1] M12540.

(*) Scale included in the price
The 6-digit code already includes the 4...20 mA scale

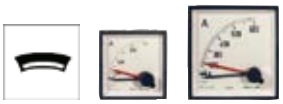
TABLE OF ADDITIONAL FEATURES

BC BMSC and ZC process indicators

Code		Internal code			Delivery time
M 1 X X X X 0 0		X	X	X	
Adjustment	Standard	0			-
	Central zero	1			2
Scale	1		1		2
	5		2		2
	10		3		2
	15		4		2
	20		5		2
	25		6		2
	30		7		2
	40		8		2
	50		9		2
	60		A		2
	75		B		2
	100		C		2
	125		D		2
	150		E		2
	200		F		2
	250		G		2
	300		H		2
	400		J		2
	500		K		2
	600		L		2
	750		M		2
	800		N		2
	1000		P		2
	1200		Q		2
	1500		R		2
	2000		S		2
	2500		T		2
	3000		U		2
	4000		V		2
	5000		W		2
Unit	-			0	2
	mA			1	2
	A			2	2
	kA			3	2
	mV			4	2
	V			8	2
	kV			9	2
	rpm			A	2
	rpm x 1000			B	2
	l (litros)			C	2
	m			G	2
	m^2			H	2
	m^3			J	2
	%			K	2

MC /EMC

Maximeter ammeters

	Bimetallic maximeter ammeter				Bimetallic maximeter ammeters + moving iron ammeters		
							
Type	MC 48	MC 72	MC 96	MC 144	EMC 72	EMC 96	EMC 144
Class	3				Bimetallic: 3 Moving iron:1,5		
Scale	90° , P1,2				Double Scale 90º, P1,2, moving iron P2		
a b c	48 48 86,2	72 72 69,2	96 96 69,2	144 144 91,8	72 72 69,2	96 96 69,2	144 144 91,8
A							
.../ 5 A	[1] M12211.	[*] M12221.	[*] M12231.	[3] M12241.	[*] M12622.	[*] M12632.	[3] M12642.
	Scales NOT included						
Scale	120% 90° , P1,2						
.../ 5 A		[3] M15521.	[3] M15531.				
	Scale included						

Exchangeable scales

Type	SMC 48	SMC 72	SMC 96	SEMC 72	SEMC 96
Equipment	MC 48	MC 72	MC 96	EMC 72	EMC 96
A					
100/5	[1] M122ZC.	[*] M122YC.	[*] M122XC.	[*] M126YC.	[*] M126XC.
200/5	[*] M122ZF.	[*] M122YF.	[*] M122XF.	[*] M126YF.	[*] M126XF.
300/5	[*] M122ZH.	[*] M122YH.	[*] M122XH.	[*] M126YH.	[*] M126XH.
400/5	[*] M122ZJ.	[*] M122YJ.	[*] M122XJ.	[*] M126YJ.	[*] M126XJ.
500/5	[*] M122ZK.	[*] M122YK.	[*] M122XK.	[*] M126YK.	[*] M126XK.
600/5	[1] M122ZL.	[3] M122YL.	[*] M122XL.	[3] M126YL.	[*] M126XL.
750/5	[1] M122ZM.	[3] M122YM.	[*] M122XM.	[*] M126YM.	[*] M126XM.
800/5	[1] M122ZN.	[*] M122YN.	[*] M122XN.	[*] M126YN.	[*] M126XN.
1 000/5	[1] M122ZP.	[*] M122YP.	[*] M122XP.	[*] M126YP.	[*] M126XP.
1 500/5	[1] M122ZR.	[*] M122YR.	[*] M122XR.	[*] M126YR.	[*] M126XR.
2 000/5	[1] M122ZS.	[*] M122YS.	[*] M122XS.	[*] M126YS.	[*] M126XS.

TABLE OF ADDITIONAL FEATURES

MC and EMC maximeters and SMC and SEMC scales

M 1 X X X X 0 0	X	X	X
Code	Internal code		Delivery time
Adjustment: Standard (15 min.)	0		-
Adjustment: 8 minutes	1		1
Adjustment: 30 minutes	2		2
Current input: Standard (.../5 A)	0		-
Current input: .../1 A	1		1
Scale: 100		C	2
Scale: 125		D	2
Scale: 150		E	2
Scale: 200		F	2
Scale: 250		G	2
Scale: 300		H	2
Scale: 400		J	2
Scale: 500		K	2
Scale: 600		L	2
Scale: 750		M	2
Scale: 800		N	2
Scale: 1000		P	2
Scale: 1200		Q	2
Scale: 1500		R	2
Scale: 2000		S	2
Scale: 2500		T	2
Scale: 3000		U	2
Scale: 4000		V	2
Scale: 5000		W	2

HC / HMSC

Pointer type frequencymeters

	90° , 230 V			90 ª , 230 V
				New
Type		**HC 72**	**HC 96**	**HC 144**	**HMSC 45**
Class	0,5				0,5
Scale	90°				90°
a b c		72 72 69,2	96 96 69,2	144 144 91,8	85 52 65
45...55 Hz		[*] M12721.	[*] M12731.	[3] M12741.	[2] M12761.

HLC

Reed type frequencymeters

Tipo	**HLC 48**	**HLC 72**	**HLC 96**	**HLC 144**
Class		0,5		
a b c		72 72 69,2	96 96 69,2	144 144 91,8
Hz				
48,5...51,5 Hz / 7 reeds	[c] M1291100A0000			
58,5...61,5 Hz / 7 reeds.	[c] M1291100B0000			
47...53 Hz / 13 reeds.		[c] M1292100C0000	[c] M1293100C0000	
57...63 Hz / 13 reeds.		[c] M129210010000	[c] M129310010000	
46...54 Hz / 17 reeds. (*)			[c] M129310080000	
56...64 Hz / 17 reeds. (*)			[c] M129310090000	
45...55 Hz / 21 reeds.(*)				[c] M129410060000
55...65 Hz / 21 reeds .(*)				[c] M129410070000

(*1) Metal enclosure

TABLE OF ADDITIONAL FEATURES

HC and HMSC frequencymeters

Code		Internal code		
M 1 X X X X 0 0 X X				
				Delivery time
Frequency	Standard (45...55 Hz)	0		-
	57...63 Hz	1		2
	55...65 Hz	3		2
	45...65 Hz	4		2
	47...53 Hz	5		2
Voltage	Standard (230 V)		0	-
	100 ... 120 V		1	2
	380 ... 400 V		3	2
	440 V		4	2
	(*) 380 ... 440 V		6	

(*) Only HC

HLC frequencymeters

Code		Internal code		
M 1 X X X X 0 0 X X				
				Delivery time
Voltage	Standard (230 V)		0	-
	100 V		7	3
	110 V		8	3
	400 V		9	3
	440 V		4	3

WMC / WTC
Wattmeters

WATTMETERS, 45 ... 65 Hz

Type								
	Single-phase		**Balanced three-phase**		**Three-phase 3 wire (ARON)**		**Three-phase 4 wire**	
	WMC 96	**WMC 144**	**WTC 96E**	**WTC 144E**	**WTC 96A**	**WTC 144A**	**WTC 96AN**	**WTC 144AN**
Class	1,5							
Scale	90° P1							
aa	96	144	96	144	96	144	96	144
bb	96	144	96	144	96	144	96	144
cc	69,2	91,8	69,2	91,8	82,9	91,8	82,9	91,8
$U_{phase-phase}$	400 V		400 V		110 V (*1)		400 V	
	[*] M13031.	[4] M13041.	[*] M13032.	[4] M13042.	[3] M13034.	[4] M13044.	[*] M13033.	[4] M13043.

Exchangeable scales for the WMC 96, WTC 96E and WTC 96AN equipment. Scales NOT included
(*1) Specify primary voltage and current of the measuring transformers, and power at full scale

Wattmeters Exchangeable scales

	Single-phase		**Three-phase**		
Type		**SWM 96**		**SWT 96E (*1)**	**SWT 96AN (*2)**
Equipment		**WMC 96**		**WTC 96E**	**WTC 96AN**
A	**Full scale**	Code	**Full scale**	Code	Code
50/5	20 kW	[1] M130J9.	30 kW	[1] M130K9.	[1] M130L9.
75/5	-	-	50 kW	[1] M130KB.	[1] M130LB.
100/5	40 kW	[1] M130JC.	60 kW	[1] M130KC.	[1] M130LC.
150/5	60 kW	[1] M130JE.	90 kW	[1] M130KE.	[1] M130LE.
200/5	80 kW	[1] M130JF.	120 kW	[1] M130KF.	[1] M130LF.
300/5	120 kW	[1] M130JH.	180 kW	[1] M130KH.	[1] M130LH.
400/5	160 kW	[1] M130JJ.	240 kW	[1] M130KJ.	[1] M130LJ.
500/5	200 kW	[1] M130JK.	300 kW	[1] M130KK.	[1] M130LK.
600/5	240 kW	[1] M130JL.	360 kW	[1] M130KL.	[1] M130LL.
1 000/5	400 kW	[1] M130JP.	600 kW	[1] M130KP.	[1] M130LP.
1 500/5	600 kW	[1] M130JR.	900 kW	[1] M130KR.	[1] M130LR.
2 000/5	800 kW	[1] M130JS.	1,2 MW	[1] M130KS.	[1] M130LS.
3 000/5	1,2 MW	[1] M130JU.	1,8 MW	[1] M130KU.	[1] M130LU.
4 000/5	1,6 MW	[1] M130JV.	2,4 MW	[1] M130KV.	[1] M130LV.
5 000/5	2,0 MW	[1] M130JW.	3 MW	[1] M130KW.	[1] M130LW.

(*1) Balanced three-phase wattmeters type WTC 96E 230 V, 400 V
(*2) Unbalanced three-phase wattmeters type WTC 96AN 400 V

TABLE OF ADDITIONAL FEATURES

Wattmeters scales

Code								Internal code		
M	1	X	X	X	X	0	0	X	X	
										Delivery time
Current input								Standard .../ 5 A	0	-
								.../ 1 A	1	2
Voltages (V)								Standard (400 V)	0	-
								110 (a)	1	2
								230	2	2
								440	5	2
								460	6	2

(a) In ARON unbalanced three-phase Wattmeters (3 wires), the standard voltage is 110 V

Wattmeters

Code								Internal code		
M	1	X	X	X	X	0	0	X	X	X
Current input								Standard .../ 5 A	0	-
								.../ 1 A	1	2
Voltage								Standard (400 V_{ph-ph})	0	-
								110 V_{ph-ph} (a)	1	2
								230 V_{ph-ph}	2	2
								440 V_{ph-ph}	5	2
								460 V_{ph-ph}	6	2
Scale ranges Primary current transformer								50	9	2
								75	B	2
								100	C	2
								150	E	2
								200	F	2
								300	H	2
								400	J	2
								500	K	2
								600	L	2
								1000	P	2
								1500	R	2
								2000	S	2
								3000	U	2
								4000	V	2
								5000	W	2

(a) In ARON unbalanced three-phase Wattmeters (3 wires), the standard voltage is 110 V

FEMC / FETC

Electronic Phasemeters

90 °, 50 Hz

Type	Single-phase		Balanced three-phase	
	FEMC 96	FEMC 144	FETC 96	FETC 144
Class	1,5			
Scale	90° P1			
a b c	96 96 82,9	144 144 91,8	96 96 82,9	144 144 91,8
V **V**	cos *phi* 0,5-1-0,5			
100/√3	[1] M13431.	[3] M13441.	-	-
110/√3	[1] M13432.	[3] M13442.	-	-
100	[1] M13433.	[3] M13443.	[1] M1343C.	[3] M1344C.
110	[1] M13434.	[3] M13444.	[1] M1343D.	[3] M1344D.
230	[1] M13435.	[3] M13445.	[3] M1343E.	[3] M1344E.
400	[1] M13436.	[3] M13446.	[*] M1343F.	[3] M1344F.
440	[1] M13437.	[3] M13447.	[1] M1343G.	[3] M1344G.
500	[1] M13438.	[3] M13448.	[1] M1343H.	[3] M1344H.

Current range: from 0,1 to 1,2 In. To connect to .../ 5 A transformers. Electronic converter included.

PGR

Protection Wattmeters

Protective dual bidirectional wattmeter, 230 V

Type	Single-phase	Balanced three-phase	Three-phase 3 wire (ARON)	Three-phase 4 wire
	PGR 96 M	**PGR 96E**	**PGR 96A**	**PGR 96AN**
Converter	CW-M	CW-TE	CW-TA	CW-TAN
Class	1,5			
Scale	90° , P2			
a b c	96 96 110			
U / I				
100/ √3... 500 V .../ 5 A	[4] M14721.	-	-	-
100...500 V .../5 A	-	[4] M14722.	[4] M14724.	[4] M14723.

MUST SELECT THE REST OF PARAMETERS ON THE ATTACHED TABLE
The instrument includes the analogue converter and indicator.
Specify the primary voltage and current of the current transformers, the full scale power value and main voltage. Included and exchangeable scales. Standarized scales.

TABLE OF ADDITIONAL FEATURES

Electronic phasemeters

Code		Internal code	
M 1 X X X X 0 0 X			
			Delivery time
Secondary current	Standard .../ 5 A	0	-
	.../ 1 A	1	3

PGR

Code		Internal code		
M 1 X X X X 0 0 X X X				
				Delivery time
Scale	50	9		-
	60	A		3
	75	B		3
	100	C		3
	125	D		3
	150	E		3
	200	F		3
	250	G		3
	300	H		3
	400	J		3
	500	K		3
	600	L		3
	750	M		3
	800	N		3
	1000	P		3
	1200	Q		3
	1500	R		3
	2000	S		3
	2500	T		3
	3000	U		3
	4000	V		3
	5000	W		3
input current	Standard (.../ 5 A)		0	-
	.../ 1 A		1	3
Power Supply	Standard 220...240 V		0	2
	380 ... 400 V 40/60 Hz		3	3

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

2EC / 2HC / 2HLC / SMC / STC / UC / SynchroMAX, Synchronization and marine applications equipment

2EC, Double voltmeters

Type	2 EC 96	2 EC 144
Class	1,5	
Scale	90°	
a b c	96 96 69,2	144 144 91,8
V		
2 x .../100	[3] M13831.	[4] M13841.
2 x .../110	[3] M13832.	[4] M13842.
2 x 220	[3] M13833.	[4] M13843.
2 x 380	[3] M13834.	[*] M13844.
2 x 440	[3] M13835.	[4] M13845.

Specify voltage transformers

SMC / STC, Synchroscopes, 50 Hz

Type	Single-phase		Three-phase	
	SMC 96	SMC 144	STC 96	STC 144
Class	1,5		1,5	
a b c	96 96 121,2	144 144 122	96 96 121,2	144 144 122
V				
110	[3] M14431.	[4] M14441.	[*] M14435.	[4] M14445.
230	[3] M14432.	[4] M14442.	[3] M14436.	[4] M14446.
400	[3] M14433.	[4] M14443.	[*] M14437.	[4] M14447.
500	[3] M14434.	[4] M14444.	[3] M14438.	[4] M14448.

SynchroMAX, Synchronization equipment

Power Supply 400 V

Type	SynchroMAX	SynchroMAX PID
PID Control	No	Yes
a a b b c c	96 96 82,9	
Frequency	30 ... 70 Hz	
$V_{Measurement}$		
30...150	[*] M14624.	[*] M14634.
110...600	[*] M14625.	[4] M14635.

UC / CUC, Phase sequence indicators, 50 Hz

Type	UC 72	UC 96	CUC 96
Control Relay	No		Yes
a b c	72 72 82,9	96 96 82,9	96 96 82,9
V			
100...150	[1] M13726.	[1] M13736.	-
150...500	[1] M13721.	[*] M13731.	-
230	-	-	[3] M13754.
400	-	-	[*] M13755.

2HC, Double frequencymeters

Pointer Type, 230 V

Tipo	2 HC 96	2 HC 144
Class	0,5	
Scale	90°	
a b c	96 96 82,9	144 144 91,8
Hz		
45...55	[3] M12732.	[4] M12742.

2HLC, Double Reed type frequencymeters

Reed, 230 V

Tipo	2 HLC 96	2 HLC 144
Class	0,5	
Scale	-	
a b c	96 96 82,9	144 144 91,8
Hz		
47...53 Hz / 13 reed	[c] M1293200C0000	
57...63 Hz / 13 reed	[c] M129320010000	
46...54 Hz / 17 reed (*1)	[c] M129320080000	
56...64 Hz / 17 reed (*1)	[c] M129320090000	
45...55 Hz / 21 reed (*1)		[c] M129420060000
55...65 Hz / 21 reed (*1)		[c] M129420070000

(*1) Metal enclosure

CH

Hour run meters

Type	CH 48	CH 72	CH 96	CH 45
	5 + 2			
Display a b c	48 48 86,2	72 72 69,2	96 96 69,2	
Code	[*] M14911.	[*] M14921.	[2] M14931.	[4] M14951.

MEG-1000

Insulation resistance meter

230 V (*), 50...60 Hz

Type	MEG-1000
Class	1,5
Scale	90º
Frequency	50...60 Hz
a a b b c c	96 96 132
Ω (double Scales)	0...500 kΩ 0.5...5 MΩ
Code	[*] M15051.

(*) Power Supply 440 Vac +10% €

TABLE OF ADDITIONAL FEATURES

2 EC

Code		Internal code	
M 1 X X X X 0 0		X	Delivery time
Nominal scale value (Full scale)	400 (640)	0	-
	440 (700)	1	3
	660 (1050)	2	3
	1000 (1600)	3	3
	1200 (1920)	4	3
	2500 (4000)	5	3
	3000 (4800)	6	3
	3300 (5280)	7	3
	4000 (6400)	8	3
	5000 (8000)	9	3
	5500 (8800)	A	3
	6600 (10560)	B	3
	7200(11520)	C	3
	9000 (14400)	D	3
	10000 (16000)	E	3
	11000 (17600)	F	3
	12500 (20000)	G	3
	15000 (24000)	H	3
	20000 (32000)	J	3
	22000 (35200)	K	3
	24000 (38400)	L	3
	25000 (40000)	M	3

2HC frequencymeters

Code		Internal code		
M 1 X X X X 0 0		X	X	Delivery time + €
Frequency (Hz)	Standard (45...55 Hz)	0		-
	57...63	1		2
	55...65	3		2
	45...65	4		2
	47...53	5		2
Voltage (V)	Standard (230 V)		0	-
	100 ... 120		1	3
	380 ... 400		3	3
	440		4	3

SMC, STC, UC

Code		Internal code	
M 1 X X X X 0 0		X	Delivery time
Frequency	Standard (50 Hz)	0	-
	60 Hz	1	3

SynchroMAX

Code		Internal code	
M 1 X X X X 0 0		X	Delivery time
Voltage supply	Standard (400 V)	0	-
	110 Vac	1	-
	230 Vac	2	-
	40...170 Vdc	D	2

2HLC frequencymeters

Code		Internal code		
M 1 X X X X 0 0 X		X	Delivery time	+ €
Voltage	Standard (230 V)	0	-	-
	100 V	7	3	-
	110 V	8	3	-
	400 V	9	3	
	440 V	4	3	-

CH

Code		Internal code		
M 1 X X X X 0 0 X		X	X	Delivery time
Frequency	Standard 50 Hz	0		-
	60 Hz	1		2
Voltage	Standard (230 V)		0	-
	24 Vc.a.		6	2
	110 Vc.a.		1	2
	10...80 Vc.c.		8	2
	80...200 Vc.c.		A	2

Accessories / Options for analogue instruments

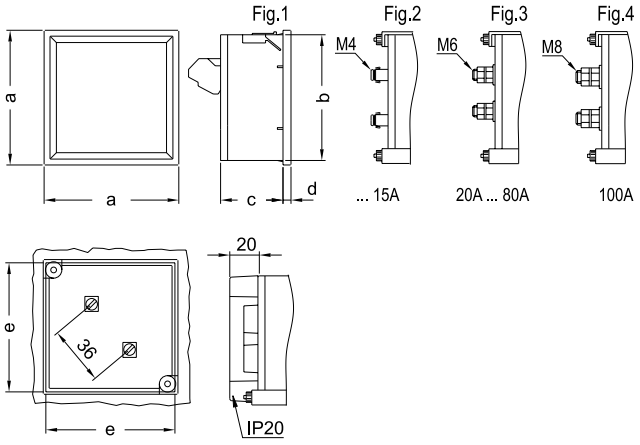
GENERAL options for analogue instruments

Type	Code
IP 54 airtight seal , **48 x 48**	[1] M1ZZ52.
IP 54 airtight seal, **72 x 72**	[1] M1ZZ53.
IP 54 airtight seal, **96 x 96**	[1] M1ZZ54.
IP 54 airtight seal, **144 x 144**	[1] M1ZZ55.
Protection IP 65, 48 x 48	[1] M19941.
Protection IP 65, 72 x 72	[1] M19942.
Protection IP 65, 96 x 96	[1] M19943.
Protection IP 65, 144 x 144	[1] M19944.
Terminal covers (IP 20) 48 x 48	[3] M19921.
Terminal covers (IP 20) 72x 72	[*] M19922.
Terminal covers (IP 20) 96 x 96	[*] M19923.

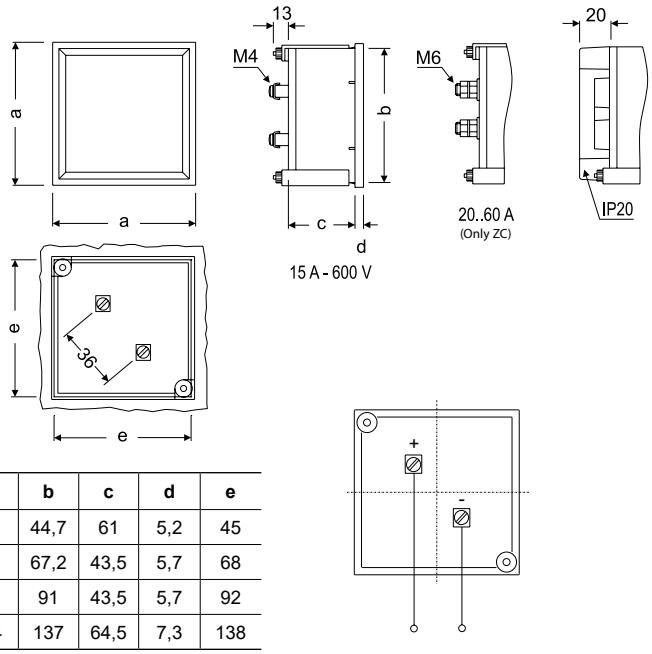
M 1 X X X X 0 0 X X X X X			
			Delivery time
Other options	Tropical proof (assembly panel only)	0 1	2
	Externally regulated pointer	0 2	2
	Anti-reflection glass	0 3	2
	Makrolon glass	0 4	2
	Interior lighting (6-12-48 V dc) panel only	0 5	2
	Tropical proof + Anti-reflection glass	0 6	2
	Tropical proof + Makrolon glass	0 7	2

Dimensions

EC / BC

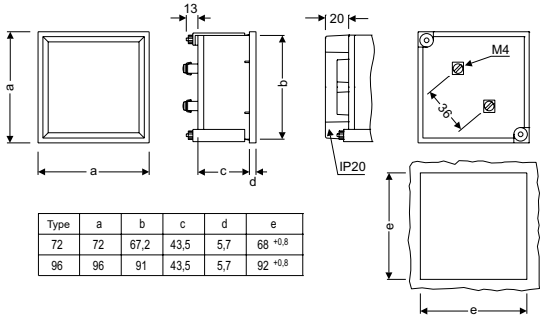


EZC / ZC



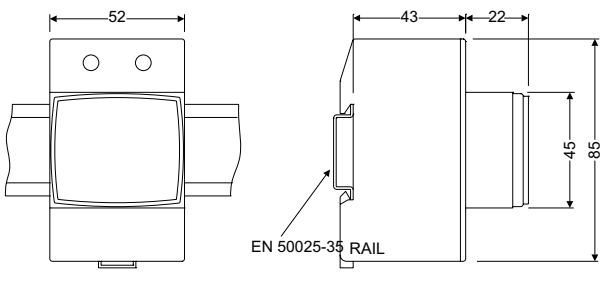
Typ	Fig. EC	Fig. BC	Fig. ZC	Fig. EZC	a	b	c	d	e
48	1-3	1-3	1	-	48	44,7	61	5,2	45
72	1-3-4	2-3-4	1	1	72	67,2	43,5	5,7	68
96	1-3-4	2-3-4	1	1	96	91	43,5	5,7	92
144	2-3-4	2-3-4	1	-	144	137	64,5	7,3	138

EC-FA, EC-F, EC-FN

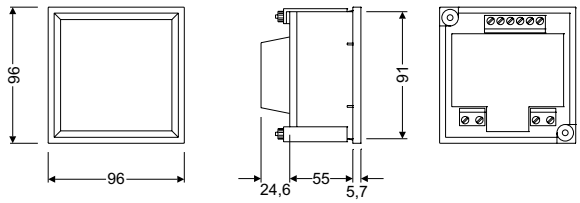


Type	a	b	c	d	e
72	72	67,2	43,5	5,7	68 $^{+0,8}$
96	96	91	43,5	5,7	92 $^{+0,8}$

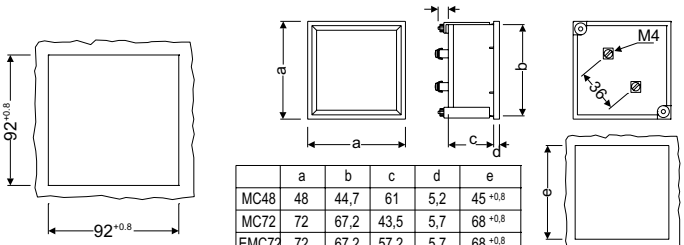
EMSC 45 / BMSC 45 / HMSC 45



CEC/ CBC / PGR

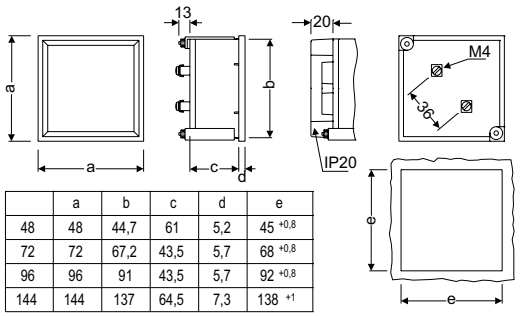


EMC / MC



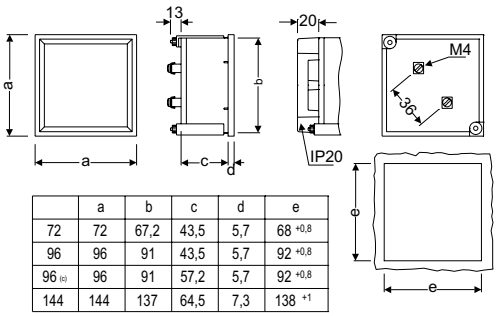
	a	b	c	d	e
MC48	48	44,7	61	5,2	45 +0,8
MC72	72	67,2	43,5	5,7	68 +0,8
EMC72	72	67,2	57,2	5,7	68 +0,8
96	96	91	43,5	5,7	92 +0,8
144	144	137	64,5	7,3	138 +1

HC



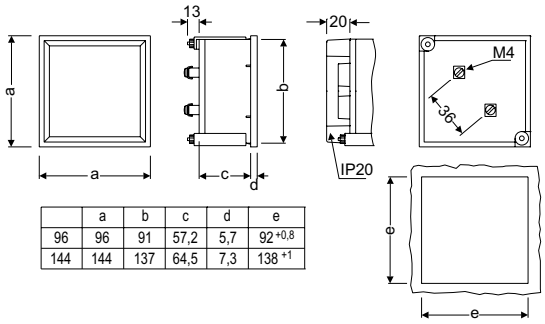
	a	b	c	d	e
48	48	44,7	61	5,2	45 +0,8
72	72	67,2	43,5	5,7	68 +0,8
96	96	91	43,5	5,7	92 +0,8
144	144	137	64,5	7,3	138 +1

HLC



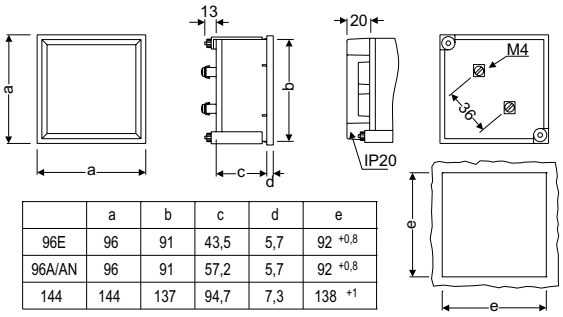
	a	b	c	d	e
72	72	67,2	43,5	5,7	68 +0,8
96	96	91	43,5	5,7	92 +0,8
96 (c)	96	91	57,2	5,7	92 +0,8
144	144	137	64,5	7,3	138 +1

FEMC / FETC



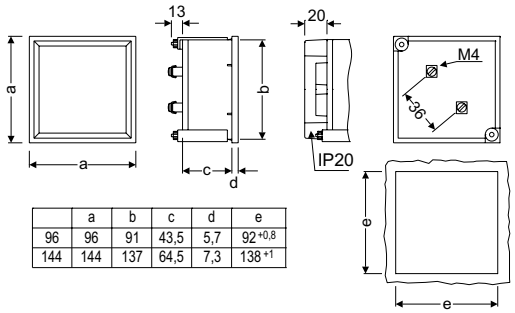
	a	b	c	d	e
96	96	91	57,2	5,7	92 +0,8
144	144	137	64,5	7,3	138 +1

WMC / WTC



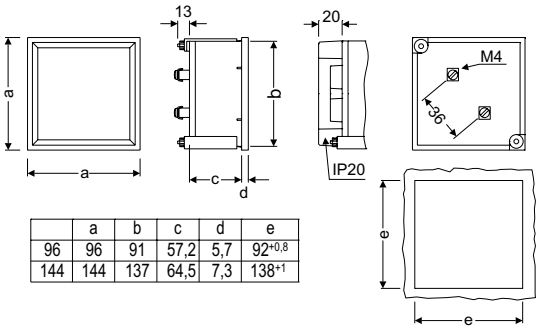
	a	b	c	d	e
96E	96	91	43,5	5,7	92 +0,8
96A/AN	96	91	57,2	5,7	92 +0,8
144	144	137	94,7	7,3	138 +1

2 EC



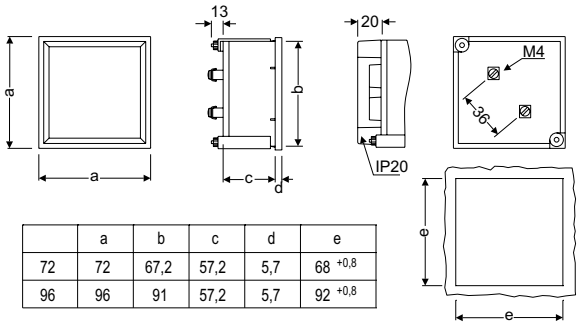
	a	b	c	d	e
96	96	91	43,5	5,7	$92^{+0,8}$
144	144	137	64,5	7,3	138^{+1}

2 HC / 2 HLC



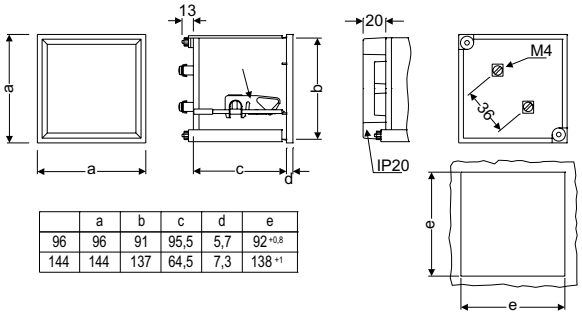
	a	b	c	d	e
96	96	91	57,2	5,7	$92^{+0,8}$
144	144	137	64,5	7,3	138^{+1}

UC / CUC



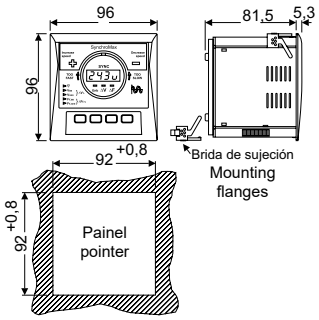
	a	b	c	d	e
72	72	67,2	57,2	5,7	$68^{+0,8}$
96	96	91	57,2	5,7	$92^{+0,8}$

SMC / STC



	a	b	c	d	e
96	96	91	95,5	5,7	$92^{+0,8}$
144	144	137	64,5	7,3	138^{+1}

SYNCROMAX



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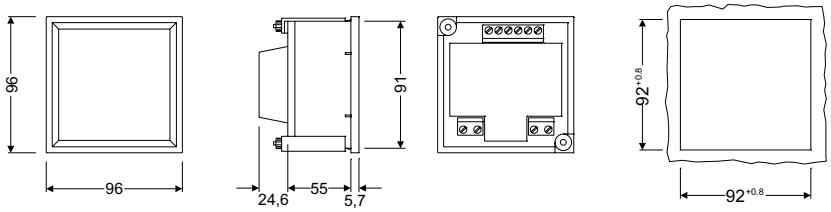

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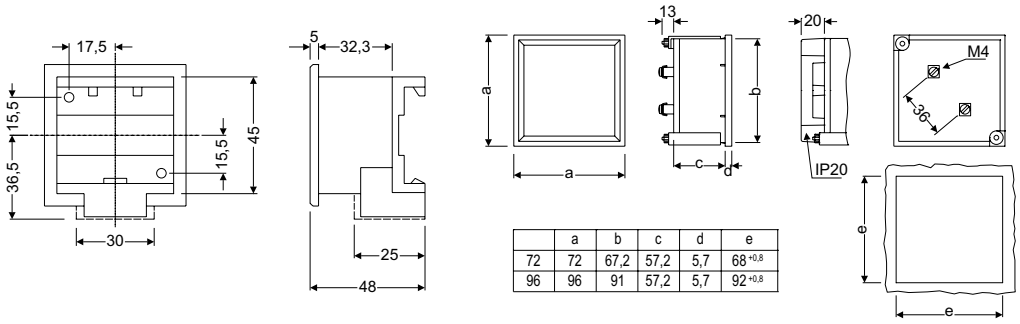

	a	b	c	d	e
72	72	67,2	57,2	5,7	$68^{+0,8}$
96	96	91	57,2	5,7	$92^{+0,8}$

Metering

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Multifunction electrical energy meters

Table: multi-function electrical energy meters Selection

		B502	B505	B410T	B410D	B410TP	B410DP	B410 RCP	B200 RCP	B101	B102
Connection	2 wires	–	–	–	–	–	–	–	●	●	●
	4 wires Direct	–	–	–	●	●	–	●	–	–	–
	3/4 wires Indirect	●	●	●	–	–	●	–	–	–	–
Measurement	4 Quadrants	●	●	●	●	●	●	●	●	●	●
Voltage	1x230 V_{ca}	–	–	–	–	–	–	–	●	●	●
	3x63,5/110 V_{ca}	T	T	T	–	–	–	–	–	–	–
	3x127/220 V_{ca}	T	T	T	T	T	T	T	–	–	–
	3x230/400 V_{ca}	T	T	T	T	T	T	T	–	–	–
	3x127/220 V_{ca}...3x230/400 V_{ca}	–	–	–	T	–	–	–	–	–	–
	3x57/100 Vca ...3x230/400 V_{ca}	T	T	T	–	–	–	–	–	–	–
Frequency	50 Hz	T	T	T	T	T	T	T	T	T	T
	60 Hz	T	T	T	T	T	T	T	T	T	T
Protocol	IEC 870	●	●	●	●	–	–	–	–	–	–
	DLMS	–	–	–	–	●	●	●	●	–	–
	IEC 62056-21	–	–	–	–	–	–	–	–	●	T
	Modbus/RTU	●	●	●	●	–	–	–	–	–	T
Comunications	RS-485	–	–	–	–	–	–	–	–	–	●
	PRIME	–	–	–	–	●	●	●	●	–	–
	RS-232/232	T	T	T	T	–	–	–	–	–	–
	RS-485/485	T	T	T	T	–	–	–	–	–	–
	RS-232/485	T	T	T	T	–	–	–	–	–	–
	RS-232/Ethernet	T	T	T	T	–	–	–	–	–	–
	RS-485/Ethernet	T	T	T	T	–	–	–	–	–	–
Circuit breaker		–	–	–	–	–	–	●	●	–	–
	Page	**77**	**77**	**77**	**77**	**78**	**78**	**78**	**78**	**77**	**77**
	OP - Optional / T - According to type										

CIRWATT B III

Three-phase energy meters (Measuring, load profiling, multi configurable billling calendar)

Type	Code	Class (Active/ Reactive)	Quadrants	Measurement Range (V)	Measurement Range (A)	Freq. (Hz)	Communications
CIRWATT B 502							
402-VT5A-90B10	[1] QBL10	0.2S/0.5	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | RS-485
402-VT5A-80B10	[1] QBL80	0.2S/0.5	4	3x57/100 ... 3x230/400	.../5	50	RS-485 | RS-485
402-VT5A-A0B10	[1] QBL20	0.2S/0.5	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | Ethernet
402-VT5B-90B10	[1] QBL50	0.2S/0.5	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | RS-485
402-VT5B-A0B10	[1] QBL60	0.2S/0.5	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | Ethernet
CIRWATT B 505							
405-VT5A-90B10	[1] QBK10	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | RS-485
405-VT5A-80B10	[1] QBK80	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../5	50	RS-485 | RS-485
405-VT5A-A0B10	[1] QBK20	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | Ethernet
405-VT5B-90B10	[1] QBK50	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | RS-485
405-VT5B-A0B10	[1] QBK60	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | Ethernet
405-VT7A-90B10	[1] QBN00	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../ 1	50	RS-232 | RS-485
405-VT7A-A0B10	[1] QBN10	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../ 1	50	RS-232 | Ethernet
405-VT7B-90B10	[1] QBN30	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../ 1	60	RS-232 | RS-485
410-VT7B-A0B10	[1] QBN40	C (0,5S)/1	4	3x57/100 ... 3x230/400	.../ 1	60	RS-232 | Ethernet
CIRWATT B 410T							
410-QT5A-80B10	[1] QB8A0	B (1) / 2	4	3x230/400	.../5	50	RS-485 | RS-485
410-QT5A-90B10	[1] QB870	B (1) / 2	4	3x230/400	.../5	50	RS-232 | RS-485
410-QT5A-A0B10	[1] QB880	B (1) / 2	4	3x230/400	.../5	50	RS-232 | Ethernet
410-VT5A-90B10	[1] QBJ10	B (1) / 2	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | RS-485
410-VT5A-A0B10	[1] QBJ20	B (1) / 2	4	3x57/100 ... 3x230/400	.../5	50	RS-232 | Ethernet
410-QT5B-90B10	[1] QB8D0	B (1) / 2	4	3x230/400	.../5	60	RS-232 | RS-485
410-QT5B-A0B10	[1] QB8E0	B (1) / 2	4	3x230/400	.../5	60	RS-232 | Ethernet
410-VT5B-90B10	[1] QBJ60	B (1) / 2	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | RS-485
410-VT5B-A0B10	[1] QBJ70	B (1) / 2	4	3x57/100 ... 3x230/400	.../5	60	RS-232 | Ethernet
410-QT7A-90B10	[1] QBN0B	B (1) / 2	4	3x230/400	.../ 1	50	RS-232 | RS-485
410-QT7A-A0B10	[1] QBN1B	B (1) / 2	4	3x230/400	.../ 1	50	RS-232 | Ethernet
410-VT7A-90B10	[1] QBN0J	B (1) / 2	4	3x57/100 ... 3x230/400	.../ 1	50	RS-232 | RS-485
410-VT7A-A0B10	[1] QBN1J	B (1) / 2	4	3x57/100 ... 3x230/400	.../ 1	50	RS-232 | Ethernet
410-QT7B-90B10	[1] QBN2B	B (1) / 2	4	3x230/400	.../ 1	60	RS-232 | RS-485
410-QT7B-A0B10	[1] QBN3B	B (1) / 2	4	3x230/400	.../ 1	60	RS-232 | Ethernet
410-VT7B-90B10	[1] QBN2J	B (1) / 2	4	3x57/100 ... 3x230/400	.../ 1	60	RS-232 | RS-485
410-VT7B-A0B10	[1] QBN3J	B (1) / 2	4	3x57/100 ... 3x230/400	.../ 1	60	RS-232 | Ethernet
CIRWATT B 410D							
410-QD1A-90B10	[1] QB4B0	B (1) / 2	4	3x230/400	10 (100)	50	RS-232 | RS-485
410-QD1A-80B10	[1] QB4E0	B (1) / 2	4	3x230/400	10 (100)	50	RS-485 | RS-485
410-QD1A-A0B10	[1] QB4C0	B (1) / 2	4	3x230/400	10 (100)	50	RS-232 | Ethernet
410-QD1B-90B10	[1] QB4H0	B (1) / 2	4	3x230/400	10 (100)	60	RS-232 | RS-485
410-QD1B-A0B10	[1] QB4I0	B (1) / 2	4	3x230/400	10 (100)	60	RS-232 | Ethernet

CIRWATT B II

Single-phase energy meter

Type	Code	Class (Active/ Reactive)	Quadrants	Measu-rement Range (V)	Measu-rement Range (A)	Freq. (Hz)	Tariff	Impulse output	Output relay	Change tariff input	Certifi-cation	Communications
CIRWATT B101												
210-ES7A-01B20	[1] QBM03	B (1)	Abs.	230	5 (65)	50	3	1	-	-	IEC	-
210-ES7A-0EB20	[1] QBM07	B (1)	Abs.	230	5 (65)	50	2	-	-	1	IEC	-
CIRWATT B102												
212-ES7A-21B20	[1] QBM83	B (1) / 2	Abs.	230	5 (65)	50	3	1	-	-	IEC	RS-485 (IEC 62056-21)
212-ES7A-23B20	[1] QBM85	B (1) / 2	Abs.	230	5 (65)	50	3	-	1	-	IEC	RS-485 (IEC 62056-21)
212-ES7A-2EB20	[1] QBM87	B (1) / 2	Abs.	230	5 (65)	50	2	-	-	1	IEC	RS-485 (IEC 62056-21)
212-ES7A-21B20	[1] QBMD3	B (1) / 2	Abs.	230	5 (65)	50	3	1	-	-	IEC	RS-485 (Modbus/RTU)
212-ES7A-23B20	[1] QBMD5	B (1) / 2	Abs.	230	5 (65)	50	3	-	1	-	IEC	RS-485 (Modbus/RTU)
212-ES7A-2EB20	[1] QBMD7	B (1) / 2	Abs.	230	5 (65)	50	2	-	-	1	IEC	RS-485 (Modbus/RTU)

PRIME Remote Management

Compact-DC

PRIME PLC Concentrator

Type	Code	Digital inputs	Communications	LV supervisor	2° transformer connection	Size (mm) width x height x depth
Compact DC-S 3G BAT	[1] Q46274.	-	PRIME | 3G	1	-	241x120x130
Compact DC-S MINI	[1] Q4628C.	-	PRIME	No	-	127x120x130
Compact DC-S 3G	[1] Q46210.	-	PRIME | 3G	1	-	203x120x130
Compact DC-S 4I	[1] Q46220.	4	PRIME	1	-	203x120x130
Compact DC-S SBT	[1] Q46230.	-	PRIME	1	-	165x120x130
Compact DC-S BASIC	[1] Q46240.	-	PRIME | 3G	No	-	165x120x130
Compact DC 2	[1] Q46050.	4	PRIME	2	●	279x120x130
Compact DC 2 3G	[1] Q46090.	-	PRIME | 3G	2	●	279x120x130
Compact DC TGB	[1] Q46070IB00000	-	PRIME | 3G	1	-	203x120x130
Compact DC CCT	[1] Q460B0IB00000	-	PRIME	1	-	216x132x135

Isolated digital inputs, 10 kV/1 min

CIRWATT B III PRIME

Three-phase energy meters with PLC system (measuring, load profiling, multi configurable billing calendar)

Type	Code	Class (Active/ Reactive)	Quadrants	Measurement Range (V)	Measurement Range (A)	Freq. (Hz)	Output relay	Discon. relay	Communi-cations
CIRWATT B 410TP, indirect connection									
410-QT5A-B0B10	[1] QB8I0	B (1) / 2	4	3x230/400	.../5	50	-	-	RS-232 | PRIME
CIRWATT B 410DP, direct connection									
410-QD1A-B0B10	[1] QB4N0	B (1) / 2	4	3x230/400	10 (100)	50	-	-	RS-232 | PRIME

CIRWATT-repeater

Repeater for amplification of the PLC signal for the PRIME system

Type	Code	Description
CIRWATT Repeater	[C] QM4011.	Three-phase repeater to amplify the PLC system of the PRIME system (3 x 127/200 ... 3 x 230/ 400 V)

Advanced low voltage monitoring

R-SABT

Advanced Low-voltage Remote Monitoring

Type	Code	Description
Advanced Low-voltage Remote Monitoring		
R-SABT	[C] Q46300.	Advanced low voltage remote monitoring
Advanced Low-voltage Monitoring Cards		
T-SABT	[C] Q32000.	Advanced low voltage monitoring card
T-SABT-BRIDGE	[C] Q32400.	Bridge card for backup line
Advanced Monitoring Accessories		
VTN	[C] Q32200.	Neutral to earth voltage monitor
Feeder supervisor		
CAP-CRADY-T2 400A	[C] Q32100.	Low voltage output module for vertical three-pole base 400A, size 2 Crady
CAP-PRONUTEC-T2 400A	[C] Q32101.	Low voltage output module for vertical three-pole base 400A, size 2 Pronutec
CAP-JEANMULLER-T2 400A	[C] Q32102.	Low voltage output module for vertical three-pole base 400A, size 2 Jean Muller

CMBT-SABT

Advanced low-voltage monitoring cabinets

Type	Code	Device	Surge Protection (SPD)	Cabinet	Communications	Size (mm) width x height x depth
Indoor						
CMBT-SABT-INT-1	[C] Q5WGC0.	1 R-SABT	-	Reinforced polyester	Ethernet	360x315x180
CMBT SABT-INT-2	[C] Q5WLJ0.	1 R-SABT | 1 VTN	●	Reinforced polyester	Ethernet	360x315x180
Outdoor						
CMBT-SABT-TP-EXT-1	[C] Q54LL40080100	1 R-SABT | 3 T-SABT | 1 VTN	●	Reinforced polyester	Ethernet | 3G	600x500x250
CMBT-SABT-TP-EXT-2	[C] Q54LL40080200	1 R-SABT | 6 T-SABT | 1 VTN	●	Reinforced polyester	Ethernet | 3G	600x500x250
CMBT-SABT-TP-EXT-3	[C] Q54LL40080300	1 R-SABT | 9 T-SABT | 1 VTN	●	Reinforced polyester	Ethernet | 3G	600x500x250

CMBT-SABT-ext requires current transformers that are not included **(3 transformers with .../1 A secundary for each LV output)**

Accessories

kit3-TRMC210 Kit of 3 current transformers for energy meters, primary winding

Type	kit3-TRMC210			kit3-TRMC210-05			kit3-TRMC210.2		
	Size (mm) width xheight xdepth 145x110x86								
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
100/5	0.5S	10	[3] Q309010000001	0.5	10	[3] Q309610000001	0.5S	2,5	[3] Q309810000001
150/5	0.5S	10	[3] Q309020000001	0.5	10	[3] Q309620000001	0.5S	2,5	[3] Q309820000001
200/5	0.5S	10	[3] Q309030000001	0.5	10	[3] Q309630000001	0.5S	2,5	[3] Q309830000001
300/5	0.5S	10	[3] Q309040000001	0.5	10	[3] Q309640000001	0.5S	2,5	[3] Q309840000001
400/5	0.5S	10	[3] Q309050000001	0.5	10	[3] Q309650000001	0.5S	2,5	[3] Q309850000001
500/5	0.5S	10	[3] Q309060000001	0.5	10	[3] Q309660000001	0.5S	2,5	[3] Q309860000001
600/5	0.5S	10	[3] Q309070000001	0.5	10	[3] Q309670000001	0.5S	2,5	[3] Q309870000001

Check availability.../1 A

kit3-TRMC400 Sets of 3 current transformers for energy meters

Type	kit3-TRMC400			kit3-TRMC400-05			kit3-TRMC400.2		
	Size (mm) width xheight xdepth 99x160x68								
Flat strip(mm)	100x20 mm								
A/V-A	Class	VA	Code	Class	VA	Code	Class	VA	Code
750/5	0.5S	10	[3] Q309110000001	0.5	10	[3] Q309710000001	0.5S	2,5	[3] Q309A10000001
1000/5	0.5S	10	[3] Q309120000001	0.5	10	[3] Q309720000001	0.5S	2,5	[3] Q309A20000001
1500/5	0.5S	10	[3] Q309130000001	0.5	10	[3] Q309730000001	0.5S	2,5	[3] Q309A30000001
2000/5	0.5S	10	[3] Q309140000001	0.5	10	[3] Q309740000001	0.5S	2,5	[3] Q309A40000001
3000/5							0.5S	2,5	[3] Q309A60000001

Check availability.../1 A

TRMCx3

Current transformers for energy meters

Type	Code	Measurement Range (A)	Class 0,5S Power (VA)	Usefull diam.(mm)	Cable (m)
Outdoor					
TRMC-X3 100/5 Ext	[C] Q301T1010E000	100/5	2.5	38	7
TRMC-X3 200/5 Ext	[C] Q301T2010E000	200/5	2.5	38	7
TRMC-X3 300/5-ext	[C] Q301T3010E000	400/5	2.5	38	7
TRMC-X3 400/5 Ext	[C] Q301T4010E000	300/5	2.5	38	7

LOC
CIRWATT optical reader

Type	Code	Description
Loc-USB	[*] Q30302.	CIRWATT optical reader with USB port

ReadWatt
Impulse collection with communication

Type	Code	Description
PS 100..240Vac	[*] M62331.	ReadWatt power supply
ReadWatt	[*] M62311.	Impulse collector with RS232/RS485 Modbus communications. Built in transistor output. PowerStudio supported

Modems
Communication accessories

Type	Code	Description
CM-GSM/3G	[*] Q30251.	RS-232/RS-485 GSM/3G Modem
SGE-3G/GPRS	[*] Q30230.	GPRS-3G Modem with Ethernet communications (includes PS + antenna + cable)
ANTENA GSM	[1] Q4994E.	Antenna 9 dB (for GSM modem)

RS2RS/TCPRS/CMBUS/MBUS
Communication converters

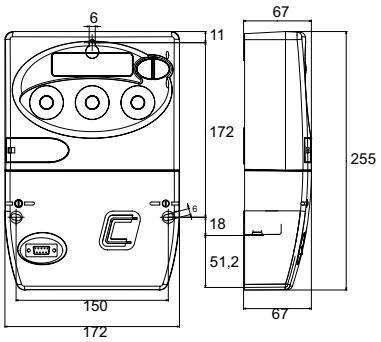
Type	Code	Description
RS		
RS2RS	[*] M62141.	RS-232/485 Intelligent converter and amplifier (RTS control) for PC
USB		
USB-RS 485	[*] M54040.	USB to RS-485 Converter
USB-RS 232	[*] M54050.	USB to RS-232 Converter
M-BUS		
CMBUS-8	[*] M540A0.	M-Bus to Modbus Converter, up to 8 Mbus slaves
CMBUS-24	[*] M540B0.	M-Bus to Modbus Converter, up to 24 Mbus slaves
LoRa		
LR1RS+PSAC	[2] M6215A.	LoRa to RS-485 Converter (Modbus/RTU) . AC power supply (110...264 Vac)
LR1RS+PSDC	[2] M6215C.	LoRa to RS-485 Converter (Modbus/RTU) . DC power supply (12 Vdc)
Ethernet		
TCPRS1+	[*] M62422.	RS-485 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (***MyConfig Wifi***) for configuration

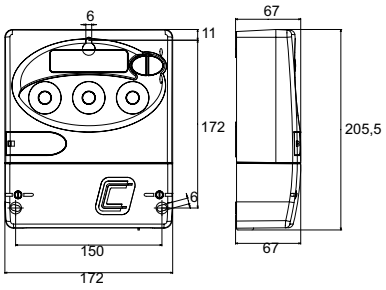
PowerWatt
Software for energy meters

Type	Code	Description
PowerWatt LT SQL	[*] Q30423.	Software for downloading information from CIRWATT IEC meters (load curves, bill closures and events)

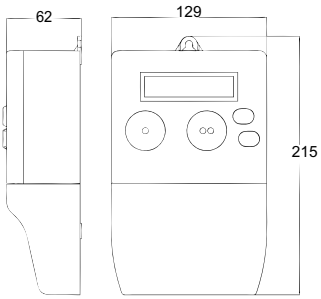
Dimensions

CIRWATT B502 /505 / 410T / 410D

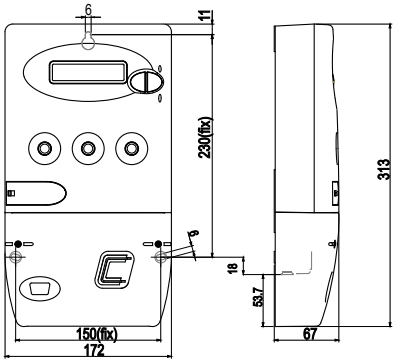


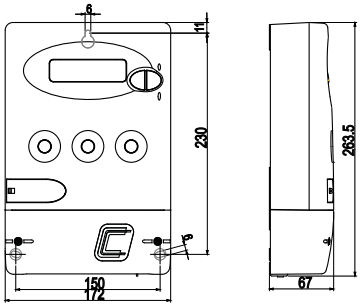


CIRWATT B 101 / 102 / 200 RCP

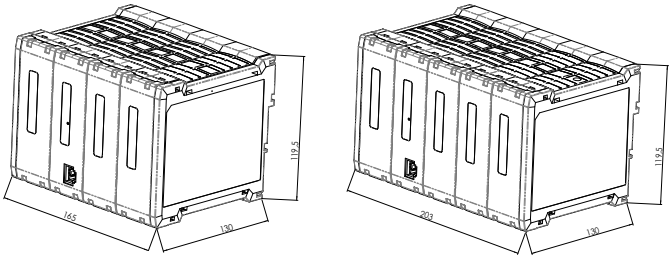


CIRWATT B 410 RCP

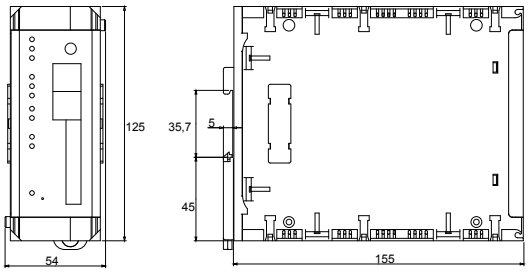




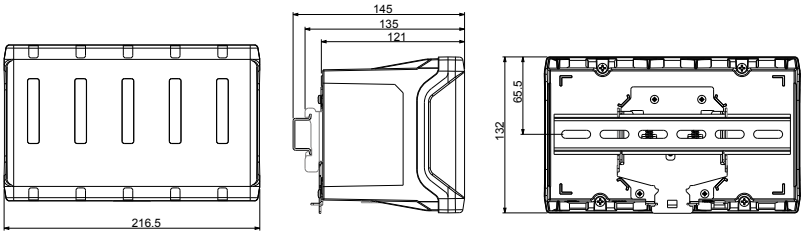
Compact DC + SBT



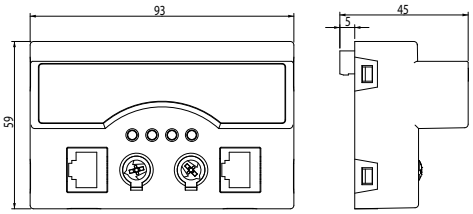
SGE 3G/GPRS



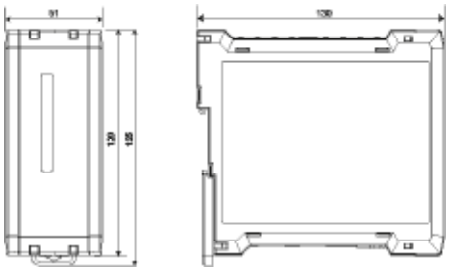
R-SABT



T-SABT



VTN



Partial consumption energy meters

Table: Selection of partial consumption electrical energy meters

		CEM-C5	CEM-C12	CEM-C10	CEM-C21-T1	CEM-C21-DS	CEM-C31-T1	CEM-C31-DS
Mounting	DIN rail (modules)	1	1	2	3	3	3	3
AC measurement	Three-phase 3/4 wires	-	-	-	•	•	•	•
	Single-phase	•	•	•	-	-	-	-
	Quadrants	2	4	ABS	ABS	ABS	ABS	ABS
Parameters	Active energy (kWh)	•	•	•	•	•	•	•
	Reactive energy (kvarh)	-	•	•	•	•	•	•
	V, A, W, Hz,FP	-	•	•	•	•	•	•
	Tariffs	1	1	1	1	2	1	2
	Cost	-	-	•	•	•	•	•
	CO_2 emisions	-	-	•	•	•	•	•
	Working time	-	-	•	•	•	•	•
Current Input	Direct	5 (50) A	10 (100) A 5 (100) A MID	5 (65) A 10(60) A	5 (60) A 10(60) A	5 (60) A 10(60) A	-	-
	Indirect	-	-	-	-	-	.../5(10)A	.../5(10) A
Communications	RS-485	-	•	OP	T	•	T	•
	Ethernet	-	-	OP	OP (T)	OP (T)	OP (T)	OP (T)
Inputs/outputs	Digital inputs	-	-	-	-	1	-	1
	Digital outputs	1	-	1	1	-	1	-
Optional	MID certification	-	• (T)	• (T)	• (T)	• (T)	• (T)	• (T)
	IEC certification	•	• (T)	• (T)	• (T)	• (T)	• (T)	• (T)
	Auxiliary power supply	-	-	-	•	•	•	•
	Sealable	•	•	•	•	•	•	•
	Page	89	89	90	90	90	90	90

T - Depending on the Type/ OP - Optional

CEM-C5

Direct Single-phase active energy meter

Type	Code	Quadrants	Measurement Range (V)	Measurement Range (A)	Transistor output	Certification	Módules	Display
CEM-C5	[*] Q25112.	2	1 x 230	5 (50) A	1	IEC	1	LCD

Frecuency: 50/60 Hz. Parameters: kWh

CEM-C12

Direct Single-phase energy meter with basic analyser parameters

Type	Code	Quadrants	Measurement Range (V)	Measurement Range (A)	Tariff	Certification	Módules	Communi-cations	Protocol
CEM-C12	[*] Q27111.	4	1 x 230	10 (100) A	1	IEC	1	RS-485	Modbus/RTU
CEM-C12-MID	[*] Q27112.	4	1 x 230	0.25 ... 5 (100) A	1	MID	1	RS-485	Modbus/RTU

Frecuency: 50/60 Hz. Parameters: V, A, kW, kVA, kWh, cos phi

CEM-C

Energy meter

Power supply 230 Vac, 50 ... 60 Hz

Type	Code	Quadrants	Measurement Range (V)	Measurement Range (A)	I Max. (A)	Tariff	Tr. output	Digital inputs	Certification	Módules	Communications	Protocol
Direct single-phase												
CEM C10 212	[*] Q21112.	Abs.	1 x 230	5 (65) A	65	1	1	-	IEC	2	-	-
CEM C10 212 MID	[*] Q21114.	Abs.	1 x 230	5 (65) A	65	1	1	-	MID	2	-	-
Direct three-phase												
CEM-C21-T1	[*] Q22411.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	IEC	4	-	-
CEM-C21-485-T1	[*] Q22421.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	IEC	4	RS-485	Modbus/RTU
CEM-C21-485-DS	[*] Q22431.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	2	-	1	IEC	4	RS-485	Modbus/RTU
CEM-C21-T1-MID	[*] Q22412.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	MID	4	-	-
CEM-C21-485-T1-MID	[*] Q22422.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	1	1	-	MID	4	RS-485	Modbus/RTU
CEM-C21-485-DS-MID	[*] Q22432.	Abs.	3 x 127/220...3 x 230/400	5 (65) A	65	2	-	1	MID	4	RS-485	Modbus/RTU
Indirect three-phase												
CEM-C31-T1	[*] Q23511.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	IEC	4	-	-
CEM-C31-485-T1	[*] Q23521.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	IEC	4	RS-485	Modbus/RTU
CEM-C31-485-DS	[*] Q23531.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	2	-	1	IEC	4	RS-485	Modbus/RTU
CEM-C31-T1-MID	[*] Q23512.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	MID	4	-	-
CEM-C31-485-T1-MID	[*] Q23522.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	1	1	-	MID	4	RS-485	Modbus/RTU
CEM-C31-485-DS-MID	[*] Q23532.	Abs.	3 x 57/100...3 x 230/400	.../ 5 (10) A	10	2	-	1	MID	4	RS-485	Modbus/RTU

CEM-C10 and CEM-C21/C31 without built-in RS-485 communications can optionally communicate with CEM-M-ETH and CEM-M-RS485 modules.
Devices with absolute measurements (Abs). For 2 or 4 quadrants, see the
CEM-XXX-TI encoding table - Devices with pulse output (transistor)
CEM-XXX-DS-Devices with digital input for tariff change and impulse meter

Comunication module

Type	Code	Communications	Protocol
CEM-M-RS485	[*] Q23100.	RS-485	Modbus/RTU
CEM-M-ETH	[C] Q23400.	Ethernet	Modbus/TCP

Compatible with CEM-C10 and CEM-C21/C31 meters without built-in RS-485 communications

TABLE OF ADDITIONAL FEATURES

CEM-10 / CEM-C21/ CEM-C31

Q	2	X	X	X	X	0	0	X	X	X	X	X	
Code						Internal code					↑	↑	Delivery time
Quadrants			Standard (ABS)								0	0	-
			2								0	1	2
			4								0	2	2

ABS = Energy Consumed + Energy Generated

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

LM Impulse centralisers, see section **Measurement/Control devices**

Communication converters

Type	Code	Description
RS		
RS2RS	[*] M62141.	RS-232/485 Intelligent converter and amplifier (RTS control) for PC
USB		
USB-RS 485	[*] M54040.	USB to RS-485 Converter
USB-RS 232	[*] M54050.	USB to RS-232 Converter
M-BUS		
CMBUS-8	[*] M540A0.	M-Bus to Modbus Converter, up to 8 Mbus slaves
CMBUS-24	[*] M540B0.	M-Bus to Modbus Converter, up to 24 Mbus slaves
LoRa		
LR1RS+PSAC	[2] M6215A.	LoRa to RS-485 Converter (Modbus/RTU) . AC power supply (110...264 Vac)
LR1RS+PSDC	[2] M6215C.	LoRa to RS-485 Converter (Modbus/RTU) . DC power supply (12 Vdc)
Ethernet		
New TCPRS1+	[*] M62422.	RS-485 to Ethernet/Wi-Fi converter (ModbusTCP/TCP/UDP) Integrated web server and mobile app (***MyConfig Wifi***) for configuration

Communications accessories

Type	Code	Description
CM-GSM/3G	[*] Q30251.	RS-232/RS-485 GSM/3G Modem
SGE-3G/GPRS	[*] Q30230.	GPRS-3G Modem with Ethernet communications (includes PS + antenna + cable)
ANTENA GSM	[1] Q4994E.	Antenna 9 dB (for GSM modem)

PowerStudio

Energy management software

Type	Code	Description
SCADA software		
PowerStudio	[*] M90211.	Configuration, monitoring in real time, display of graphs and tables
PowerStudio-Scada	[*] M90231.	Software with USB HASP licence. Configuration, monitoring in real time, display of graphs and tables, generation of reports, creation of SCADA screens and alarms
PowerStudio-Deluxe	[C] M90241.	Software with USB HASP licence. Software PowerStudio-Scada with Generic Modbus driver used to connect to other devices available in the market
OPC Server PS/PSS	[1] M91111.	Software with USB HASP licence. **OPC Server** for PowerStudio is an integration platform that can easily integrate the parameters received from PowerStudio (or any of its versions) in any SCADA platform available in the market with a simple approach.
SQL DATA EXPORT	[1] M91301.	Software with USB HASP licence. SQL Data Export is a software tool for the integration of data from PS/PSS/PSSD to a new or existing SQL database.

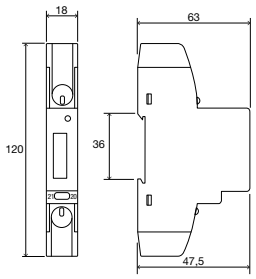
License 4.0 version 4.0

Change PowerStudioSCADA physical licence to virtual licence

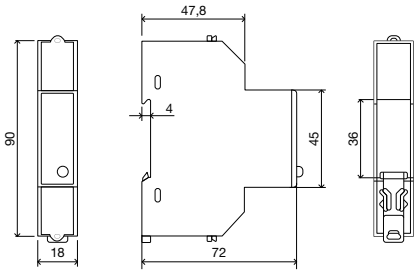
Type	Code	Description
New Phi-to-Vir-PSS	[1] M902310055000	Replacement of physical USB licence for PowerStudioSCADA with software licence (requires returning physical licence)
Phi-to-Vir-PSS-Deluxe	[1] M902410055000	Replacement of physical USB licence for PowerStudioSCADA Deluxe with software licence (requires returning physical licence)

Dimensions

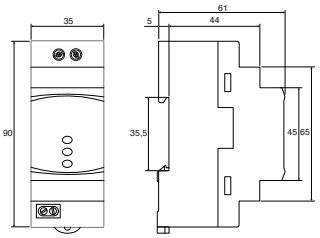
CEM-C5



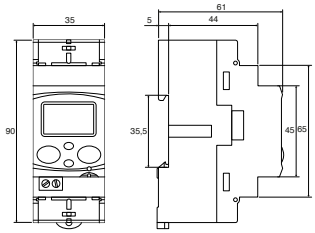
CEM-C12



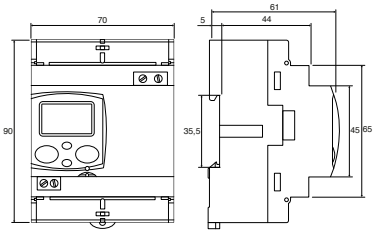
CEM-M



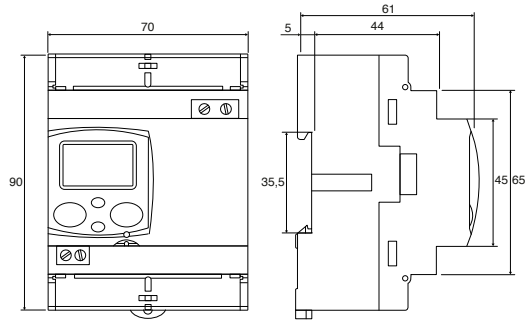
CEM-C10



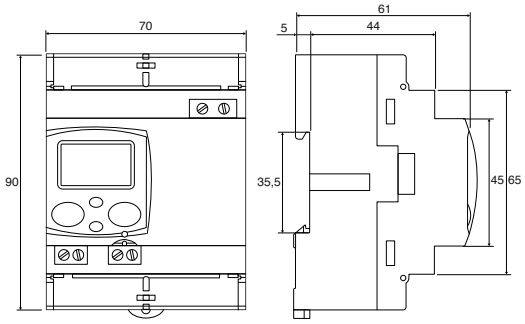
CEM-C21 / CEM-C31



CEM-C21-485



CEM-C31-485



Protection and control

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Residual current protection

Selection table for Type A devices

	RG1M	RGE-R	WGBU	RGU-2	WRU-10	RGU-10	CBS-4
Installation type							
Single phase, three-phase, 3 and 4 wires	●	●	●	●	●	●	●
Features / performance							
Ultra-immunized system	●	●	●	●	●	●	●
Monitoring	–	–	–	●	●	●	●
Pre-alarm	–	●	●	●	●	●	●
Remote control	–	–	–	●	●	●	●
Technical characteristics							
Residual current type	A	A	A	A	A	A	A
Measurement channels	1	1	1	1	1	1	4
Constant current sensitivity	●	–	–	–	–	–	–
Adjustable current sensitivity	–	●	●	●	●	●	●
Fixed delay time	●	–	–	–	–	–	–
Adjustable delay time	–	●	●	●	●	●	●
Built-in current transformer	–	–	35...210	–	28	–	–
External current transformer, WGC Ø 20...500x200 mm	●	●	–	●	–	●	●
Trigger output	●	●	●	●	●	●	●
Pre-alarm output	–	●	–	●	●	●	●
Remote control input	–	–	●	●	●	●	●
RS-485 Communications	–	–	–	–	–	ST	ST
Module size	1	2	-	2	3	3	3

ST - According to type

RG1M

Residual current relays 1 module

Type	Code	IΔn (A)	N° relays	Módules	Mounting	Delay	Power supply
RG1M - 0,03	[*] P12204.	0,03 A	1	1	DIN rail	0,02 s	230 Vac
RG1M - 0,3	[*] P12214.	0,3 A	1	1	DIN rail	0,02 s	230 Vac

Requires a WGC residual current transformer

RGE-R

Residual current relay, type A, for WGC transformer, 2 modules with visual prealarm.

Type	Code	IΔn (A)	N° relays	Módules	Mounting	Delay	Power supply
RGE-RL	[*] P12A32.	0,03 ... 5 A	1	2	DIN rail	0,02 ... 5 s	230 Vac
RGE-R	[*] P122320040000	0,03 ... 5 A	1	2	DIN rail	0,02 ... 5 s	24...48 Vac | 24...125 Vdc

Requires a WGC residual current transformer To encode other parameters, such as the auxiliary power supply voltage, see the table at the end of the section

RGU-2

Programmable residual current relay, 2 modules with display and static prealarm output

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Power supply
RGU2	[*] P11A61.	0,03 ... 5 A	1	●	2	DIN rail	0,1 ... 5 s, INS, SEL	120...230 Vac

The delay is cancelled in all relays with a 0.03 A sensitivity adjustment, according to IEC 60947-2, annex M INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a tripping time < 0.02 s Requires a WGC residual current transformer

RGU-10

Residual current relay, type A, for ultra-immunised WGC Transformer, 3 modules with display and programmable pre-alarm output.

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Commu-nications	Protocol	Power supply
Possibility UL on demand										
RGU-10	[*] P11941.	0,03 ...30 A	1	●	3	DIN rail	0,02 ... 10 s, INS, SEL	-	-	230 Vac
RGU-10C	[*] P11944.	0,03 ...30 A	1	●	3	DIN rail	0,02 ... 10 s, INS, SEL	RS-485	Modbus/RTU	230 Vac

The delay is cancelled in all relays with a 0.03 A sensitivity adjustment, according to IEC 60947-2, annex M INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a tripping time < 0.02 s Requires a WGC residual current transformer To encode other parameters, such as the auxiliary power supply voltage, see the table at the end of the section

CBS-4

4 channels residual current relays, type A, 3 modules with display and programmable prealarm output.

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Commu-nications	Protocol	Power supply
CBS-4	[*] P12711.	0,03 ...30 A	4	●	3	DIN rail	0,02 ... 10 s, INS, SEL	-	-	230 Vac
CBS-4C	[*] P12712.	0,03 ...30 A	4	●	3	DIN rail	0,02 ... 10 s, INS, SEL	RS-485	Modbus/RTU	230 Vac

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M Delay: INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a trip time < 0.02 s Optional UL certification in CBS-4 at 230 Vac (not available for other power supply values). To encode other parameters, such as the auxiliary power supply voltage, see the table at the end of the section

Type	Code	Description
ADP CVM-MINI/ RGU10/CBS4	[*] M5ZZF1.	Panel adapter CVM MINI / RGU-10 / CBS-4 (72 x 72)

TABLE OF ADDITIONAL FEATURES

RGU-10, RGE, CBS-4, WRU-10, RGU-10B

P	1	X	X	X	X	0	0	X	X	X	X	X	
Code							Internal code						Delivery time
Power supply voltage							Standard (230 V_{ac})	0					-
							110 V_{ac} (RGU-10, RGU-10B)	1					1
							400 V_{ac} (RGE, RGU-10)	3					1
							24...48 V_{ac} 24...125 V_{dc} (RGE, RGU-10, RGU-10B)	4					1
							Certificate UL (RGU10/10C - 230 V_{ac})				0	7	2
							Certificate CCC (RGU10 - 230 V_{ac})				0	8	2

Associated Transformers

WGC

Residual current transformer

Type	Code	Usefull diam.(mm)	Imax.(A)	Cable (m)	weight (kg)
WGC-20-SC	[*] P10181.	20	63	0.5	0,08
WGC-30-SC	[*] P10182.	30	63	0.5	0,09
WGS-20	[*] P10131.	20	63	-	0,06
WGS-30	[*] P10132.	30	63	-	0,07
WGC-25	[*] P10151.	25	63	-	0,08
WGC-35	[*] P10152.	35	80	-	0,11
WGC-55	[*] P10153.	55	160	-	0,17
WGC-80	[*] P10154.	80	250	-	0,29
WGC-110	[*] P10155.	115	400	-	0,41
WGC-140	[*] P10156.	140	630	-	0,68
WGC-180	[*] P10157.	180	800	-	0,91
WGC-220x105	[C] P10158.	220 x 105	1250	-	3,90
WGC-350x150	[C] P10159.	350 x 150	2000	-	6,80
WGC-500x200	[C] P10160.	500 x 200	4000	-	11,00

Type	Code	Description
PA-TC/WG	[*] P19921.	DIN rail mounting accessory for WGC-25, WGC-35 and WGC-55

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

TP-WGC

Split-core residual current transformers

Type	Code	Usefull diam.(mm)	IΔn (A)	IΔn min.(A)	weight (kg)
TP58 WGC	[C] P11121.	80 x 50	acc. relay > 0,3A	0.3	0,80
TP88 WGC	[C] P11131.	80 x 80	acc. relay > 0,3A	0.3	1,05
TP812 WGC	[C] P11141.	120 x 80	acc. relay > 0,3A	0.3	1,06
TP816 WGC	[C] P11151.	160 x 80	acc. relay > 0,3A	0.3	2,45

Only for RGU-2, RGU-10/10C, CBS-4/4C

WRU-10

Residual current relay, type A, with built-in transformer, ultra-immunised

Programmable residual current relay, 3 modules with display and two configurable pre-alarm outputs. 230 Vac Auxiliary power supply

Type	Code	Usefull diam.(mm)	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Nr. reclo-sures	Power supply
WRU-10	[*] P14035.	28	0,03 ...30 A	1	●	3	DIN rail	0,02 ... 10 s, INS, SEL	-	230 Vac
WRU-10-HS	[C] P14036.	28	0,01 ... 0,5 A	1	●	3	DIN rail	0,02 ... 10 s, INS, SEL	30	230 Vac

The delay is cancelled in all relays with a 0.03 A sensitivity adjustment, according to IEC 60947-2, annex M Delay: INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a tripping time < 0.02 s To encode other parameters, such as the auxiliary power supply voltage, see the table at the end of the section

RGMD

Residual current protection type A, assembly with miniature circuit breaker, ultra-immunised

Type	Code	In (A)	Mounting	Poles	Sensi-tivity
RGMD Series, type A - 2 poles					
RGMD-2-16-30	[1] P13231.	16 A	DIN rail	2	30 mA
RGMD-2-25-30	[1] P13251.	25 A	DIN rail	2	30 mA
RGMD-2-32-30	[1] P13261.	32 A	DIN rail	2	30 mA
RGMD-2-40-30	[1] P13271.	40 A	DIN rail	2	30 mA
RGMD-2-63-30	[1] P13291.	63 A	DIN rail	2	30 mA
RGMD-2-16-300	[1] P13233.	16 A	DIN rail	2	300 mA
RGMD-2-25-300	[1] P13253.	25 A	DIN rail	2	300 mA
RGMD-2-32-300	[1] P13263.	32 A	DIN rail	2	300 mA
RGMD-2-40-300	[1] P13273.	40 A	DIN rail	2	300 mA
RGMD-2-63-300	[1] P13293.	63 A	DIN rail	2	300 mA

Type	Code	In (A)	Mounting	Poles	Sensi-tivity
RGMD Series, type A - 4 poles					
RGMD-4-16-30	[1] P13431.	16 A	DIN rail	4	30 mA
RGMD-4-25-30	[1] P13451.	25 A	DIN rail	4	30 mA
RGMD-4-32-30	[1] P13461.	32 A	DIN rail	4	30 mA
RGMD-4-40-30	[1] P13471.	40 A	DIN rail	4	30 mA
RGMD-4-63-30	[1] P13491.	63 A	DIN rail	4	30 mA
RGMD-4-16-300	[1] P13433.	16 A	DIN rail	4	300 mA
RGMD-4-25-300	[1] P13453.	25 A	DIN rail	4	300 mA
RGMD-4-32-300	[1] P13463.	32 A	DIN rail	4	300 mA
RGMD-4-40-300	[1] P13473.	40 A	DIN rail	4	300 mA
RGMD-4-63-300	[1] P13493.	63 A	DIN rail	4	300 mA

It features an RG1M residual current relay, WGS/WGC residual current transformer and C curve circuit breaker, 6 kA (IEC 60898) with 230 Vac trigger coil. Curve 10 kA (IEC 60947-2) check

WGBU

Transformer with built-in residual current relay, type A

Configurable residual current relay with visual pre-alarm. 230 Vac Auxiliary power supply

Type	Code	Usefull diam.(mm)	IΔn (A)	N° relays	Mounting	Delay
WGBU-35	[C] P16011.	35	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-70	[C] P16012.	70	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-105	[C] P16013.	105	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-140	[C] P16014.	140	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-210	[C] P16015.	210	0,03 ... 3 A	1	Panel background	0,02...1 s
Relay mounted at 90°. It allows to reduce the mounting space						
WGBU-90-35	[C] P16021.	35	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-90-70	[C] P16022.	70	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-90-105	[C] P16023.	105	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-90-140	[C] P16024.	140	0,03 ... 3 A	1	Panel background	0,02...1 s
WGBU-90-210	[C] P16025.	210	0,03 ... 3 A	1	Panel background	0,02...1 s

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M

Selection table for Type B devices

	IDB-4	WGB-35-TB	RGU-10B	RGMD-TB	RGU-100B	CBS-400B
Installation type						
Single phase, three-phase, 3 and 4 wires	●	●	●	●	●	●
Features / performance						
Monitoring	–	–	●	●	●	●
Pre-alarm	–	–	●	●	●	●
Remote control	–	●	●	●	●	●
Technical characteristics						
Residual current type	B	B	B	B	B	B
Measurement channels	1	1	1	1	1	4
Fixed current sensitivity	●	●	–	–	–	–
Adjustable current sensitivity	–	–	●	●	●	●
Fixed delay time	●	●	–	–	–	–
Adjustable delay time	–	–	●	●	●	●
Built-in current transformer	●	35	–	–	–	–
External current transformer, WGC-TB or WGB	–	–	WGC-TB	WGC-TB	WGB	WGB
Trigger output	–	●	●	●	●	●
Pre-alarm output	–	–	●	●	●	●
Remote control input	–	–	●	●	●	●
Communications	–	–	–	–	●	●
Module size	4	-	3	8	3	3

RGU-10B

Residual current current monitoring relay, type B

Type	Code	IΔn (A)	Nº relays	Pre-alarm relay	Módules	Mounting	Delay	Power supply
RGU-10B	[*] P11951.	0,1...3 A	1	●	3	DIN rail	0,1 ... 10 s	230 Vac

Requires an residual current transformer, WGC-TB type. See coding table for other options.

Type	Code	Description
ADP CVM-MINI/ RGU10/CBS4	[*] M5ZZF1.	Panel adapter CVM MINI / RGU-10 / CBS-4 (72 x 72)

WGC-TB

Residual current transformers for type-B relays

Type	Code	Usefull diam.(mm)	IΔn min.(A)	Imax.(A)	weight (kg)
WGS-20-TB	[*] P11731.	20	0.1	63	0,08
WGC-25-TB	[*] P11751.	25	0.1	63	0,12
WGC-35-TB	[*] P11752.	35	0.1	80	0,11
WGC-55-TB	[*] P11753.	55	0.3	160	0,18
WGC-80-TB	[*] P11755.	80	0.5	250	0,25
WGC-110 TB	[*] P11756.	110	0.5	400	0,38
WGC-140 TB	[*] P11757.	140	0.5	630	0,48
WGC-180 TB	[*] P11758.	180	0.5	800	0,20

Only for RGU-10B type relays

TABLE OF ADDITIONAL FEATURES

RGU-10B

P	1	X	X	X	X	0	0	X	
Code						Internal code		↑	Delivery time
Power supply voltage			Standard (230 V_{ac})					0	-
			24...48 V_{ac} / 24...125 V_{dc}					4	1

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

RGU-100B

Residual current current monitoring relay, type B

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Commu-nications	Protocol	Power supply
RGU-100B	[*] P11961.	0,03 ... 3 A	1	●	3	DIN rail	0,02 ... 10 s, INS, SEL	RS-485	Modbus/RTU	230 Vac

Associated with WGB-type residual current transformers

CBS-400B

4 channels residual current relays, type B, 3 modules

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	Módules	Mounting	Delay	Commu-nications	Protocol	Power supply
CBS-400B	[*] P12721.	0,03 ... 3 A	4	●	3	DIN rail	0,02 ... 10 s, INS, SEL	RS-485	Modbus/RTU	230 Vac

Associated with WGB-type residual current transformers

WGB

Residual current transformers for type-B relays

Type	Code	Usefull diam.(mm)	IΔn (A)	Imax.(A)	weight (kg)
WGB-35	[C] P11B52.	35.5	0.03 ... 3 A	80	0,22
WGB-55	[C] P11B53.	55.5	0.03 ... 3 A	160	0,33
WGB-80	[C] P11B54.	80.5	0.03 ... 3 A	250	0,53
WGB-110	[C] P11B55.	110.5	0.03 ... 3 A	400	0,69

Only for relays type RGU-100B and CBS-400B

Type	Code	Description
ADP. CVM-E3-MINI/ RGU-100B/CBS-400B	[*] M5ZZF100000E3	Panel adapter CVM-E3-MINI, RGU-100B, CBS-400B (72 x 72)

WGB-35-TB

Relay Type B built-in residual current current transformer

Type	Code	Usefull diam.(mm)	N° relays	Delay	Sensitivity	weight (kg)
WGB-35-TB30	[C] P16111.	35	1	INS	30 mA	0,25
WGB-35-TB300	[C] P16121.	35	1	INS	300 mA	0,27
WGB-35-TB300S	[C] P16131.	35	1	SEL	300 mA	0,25

IDB-4

Type B RCCB

Type	Code	In (A)	Mounting	Poles	Sensitivity
IDB-4 4P-40A-30 mA	[*] P17221.	40 A	DIN rail	4	30 mA
IDB-4 4P-40A-300 mA	[*] P17222.	40 A	DIN rail	4	300 mA
IDB-4 4P-63A -30 mA	[*] P17231.	63 A	DIN rail	4	30 mA
IDB-4 4P-63A -300mA	[*] P17232.	63 A	DIN rail	4	300 mA

For three-phase and single-phase networks

RGMD-TB

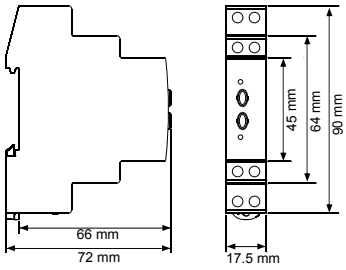
Differential protection set type B with magneto-thermal protection and trip coil included

Type	Code	IΔn (A)	N° relays	Pre-alarm relay	In (A)	Módules	Mounting	Delay	Poles
RGMD-TB Series, type B - 4 poles									
RGMD-TB-4-16	[C] P15001.	0,1...3 A	1	●	16 A	8	DIN rail	0,1 ... 10 s	4
RGMD-TB-4-20	[C] P15002.	0,1...3 A	1	●	20 A	8	DIN rail	0,1 ... 10 s	4
RGMD-TB-4-25	[C] P15003.	0,1...3 A	1	●	25 A	8	DIN rail	0,1 ... 10 s	4
RGMD-TB-4-32	[C] P15004.	0,1...3 A	1	●	32 A	8	DIN rail	0,1 ... 10 s	4
RGMD-TB-4-40	[C] P15005.	0,1...3 A	1	●	40 A	8	DIN rail	0,1 ... 10 s	4
RGMD-TB-4-63	[C] P15006.	0,1...3 A	1	●	63 A	8	DIN rail	0,1 ... 10 s	4

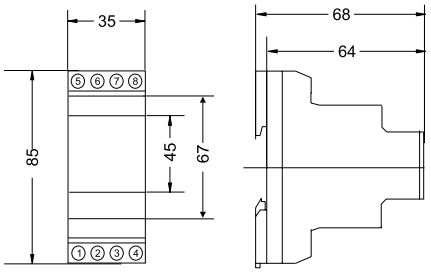
It includes an RGU-10B residual current relay, transformer (25 mm Ø) and a coil circuit breaker, C curve, 6 kA (EN 60898). Curve 10 kA (IEC 60947-2) check

DImensions

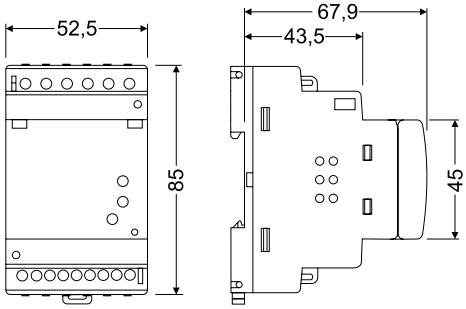
RG1M



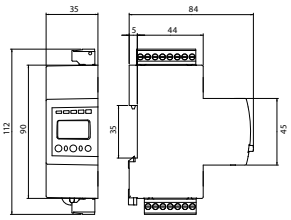
RGE



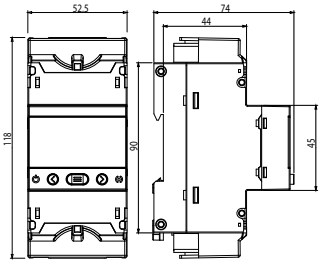
RGU-10 / CBS-4 / RGU-10B



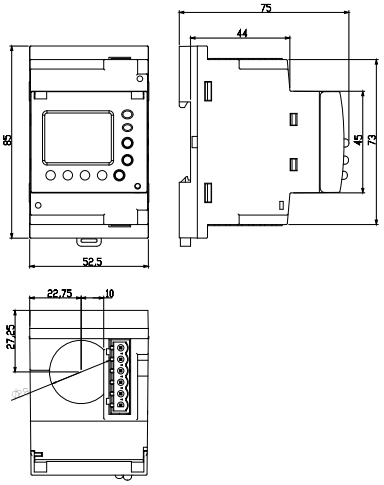
RGU-2



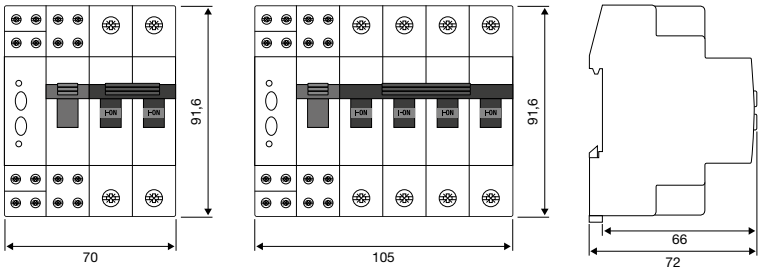
RGU-100B / CBS-400B



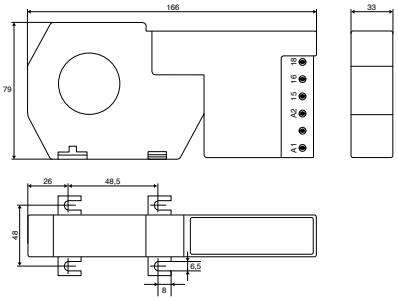
WRU-10



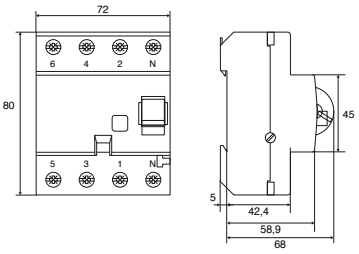
RGMD 2P / RGMD 4P



WGB-35-TB

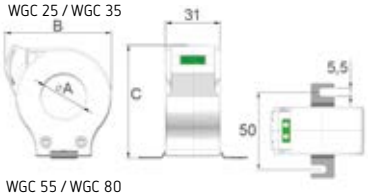


IDB-4

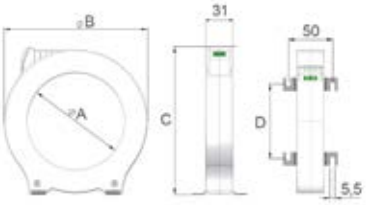


WGC / WGC-TB

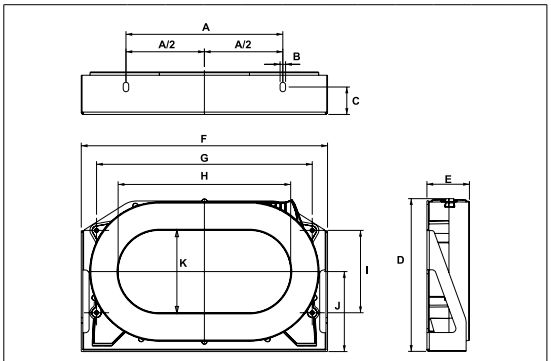
WGC 25 / WGC 35



WGC 55 / WGC 80
WGC 110 / WGC 140

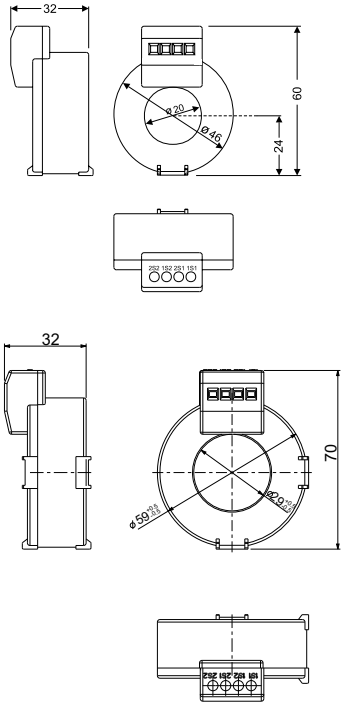


Modelo	A	B	C	D
WGC 25	25	60,5	64	
WGC 35	35	70,5	75,5	
WGC 55	55	92	98	38
WGC 80	80	124,5	130	60
WGC 110	110	163	168	84,5
WGC 140	140	201	206	110
WGC 180	180	252	256	144

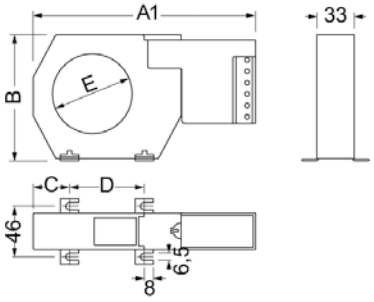


	A	B	C	D	E	F	G	H	I	J	K
WGC 220x105	200	7	35	195	54,2	314	275	220	105	102	105
WGC 350x150	340	7	30	279	50,2	479	430	350	165	143	150
WGC 500x200	460	7	40	306	64	614	550	500	180	155	200

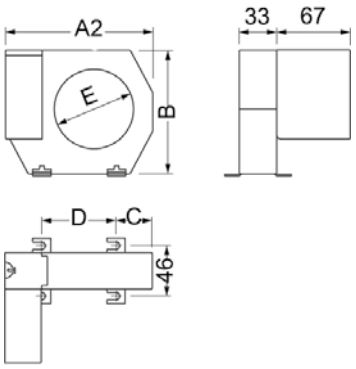
WGS



WGBU

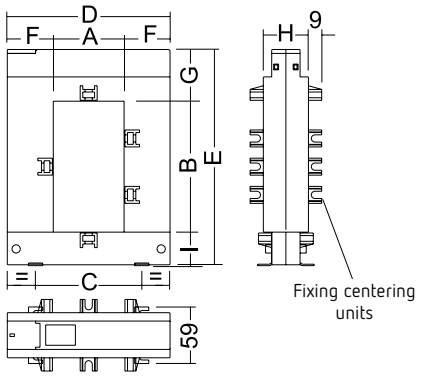


WGBU-90



Type	A1	A2	B	C	D	E
WGBU-35 (A1) / WGBU-90-35 (A2)	166	100	79	26	48,5	35
WGBU-70 (A1) / WGBU-90-70 (A2)	196	130	110	332	66	70
WGBU-105 (A1) / WGBU-90-105 (A2)	236	170	146	38	94	105
WGBU-140 (A1) / WGBU-90-140 (A2)	286	220	196	48,5	123	140
WGBU-210 (A1) / WGBU-90-210 (A2)	365	299	284	69	161	210

TP-WGC



Dimensions (mm)	TP-58	TP-88	TP-812	TP-816
a	50	80	80	80
b	80	80	120	160
c	78	108	108	120
d	114	144	144	184
e	145	145	185	245
f	32	32	32	52
g	32	32	32	47
h	32	32	32	52
i	32	32	32	38

Self-reclosing overcurrent and Residual current protection

Table of residual current device and circuit breaker devices with automatic reclosing system

RCCBs	REC4, REC4-C, RECB, RECB-C	95
Residual current relays	WRU-10 RAL, RGU-10 RAL, CBS4-RA	**98**
Residual current and circuit breaker protection	RGU-10MT, RECMaxLPD, RECMaxCVM,	**101**
Overcurrent self-reclosing	RECMaxP	

Selection table RCCBs	**REC4**	**REC4-C**	**RECB**	**RECB-C**
		New		New
Protection type				
Residual current	●	●	●	●
Reclosure type				
Residual current	●	●	●	●
Installation type				
Single phase, three-phase, 3 and 4 wires	●	●	●	●
Circuit breaker				
Switch (included)	●	●	●	●
Features / performance				
Status indication	–	●	–	●
Insulation monitoring	●	●	–	–
Technical specifications				
Residual current type	A	A	B	B
Fixed current sensitivity	●	●	●	●
FIxed delay time	●	●	●	●
Built-in current transformer	●	●	●	●
Output status	–		–	●
Self-reclosing	●	●	●	●
Module size	"3 (2P) 5 (4P)"	"3 (2P) 5 (4P)"	5 (4P)"	5 (4P)"

Residual current protection and self-reclosing

REC4

RCCB with self-reclosing system, type A

Type	Code	N° relays	Breaking element	In (A)	Poles	Sensitivity	Reclosing mode
REC4-2P-40-30	[*] P26A21.	1	built-in	40 A	2	30 mA	Insulation
REC4-2P-40-300	[C] P26A23.	1	built-in	40 A	2	300 mA	Time
REC4-2P-63-30	[C] P26A31.	1	built-in	63 A	2	30 mA	Insulation
REC4-2P-63-300	[C] P26A33.	1	built-in	63 A	2	300 mA	Time
REC4-4P-40-30	[C] P26F21.	1	built-in	40 A	4	30 mA	Time
REC4-4P-40-300	[C] P26F23.	1	built-in	40 A	4	300 mA	Time
REC4-4P-63-30	[C] P26F31.	1	built-in	63 A	4	30 mA	Time
REC4-4P-63-300	[C] P26F33.	1	built-in	63 A	4	300 mA	Time

3 reconnections: 3, 20, 180 s.

New

REC4-C

RCCB with self-reclosing system, type A with status output

Type	Code	N° relays	Breaking element	In (A)	Poles	Sensitivity	Reclosing mode
REC4-C 2P 40 30	[C] P27A21.	1	built-in	40 A	2	30 mA	Time
REC4-C 2P 40 300	[C] P27A31.	1	built-in	40 A	2	300 mA	Time
REC4-C 2P 63 30	[C] P27A23.	1	built-in	63 A	2	30 mA	Time
REC4-C 2P 63 300	[C] P27A33.	1	built-in	63 A	2	300 mA	Time
REC4-C 4P 40 30	[C] P27F21.	1	built-in	40 A	4	30 mA	Time
REC4-C 4P 40 300	[C] P27F31.	1	built-in	40 A	4	300 mA	Time
REC4-C 4P 63 30	[C] P27F23.	1	built-in	63 A	4	30 mA	Time
REC4-C 4P 63 300	[C] P27F33.	1	built-in	63 A	4	300 mA	Time

3 reconnections: 3, 20, 180 s.

RECB

RCCB with self-reclosing system, type B

Type	Code	N° relays	Breaking element	In (A)	Poles	Sensitivity	Reclosing mode
RECB-4P-40-30	[C] P26G21.	1	built-in	40 A	4	30 mA	Time
RECB-4P-40-300	[C] P26G23.	1	built-in	40 A	4	300 mA	Time
RECB-4P-63-30	[C] P26G31.	1	built-in	63 A	4	30 mA	Time
RECB-4P-63-300	[C] P26G33.	1	built-in	63 A	4	300 mA	Time

3 reconnections: 3, 20, 180 s.

RECB-C

Reclosing RCCB with status output

12 VAC auxiliary power supply

Type	Code	N° relays	Breaking element	In (A)	Poles	Sensitivity	Reclosing mode
RECB-C-4P-40-300	[C] P26M01.	1	built-in	40 A	4	300 mA	remote control
RECB-C-4P-63-300	[C] P26M11.	1	built-in	63 A	4	300 mA	remote control

New

(*1) Not included in the reference

Residual current protection and reclosing system

Selection table residual current relays

Residual current and circuit breaker protection

	WRU-10 RAL	RGU-10 RAL	CBS4-RA
Protection type			
Residual current	●	●	●
Reclosure type			
Residual current	●	●	●
Installation type			
Single phase, three-phase, 3 and 4 wires	●	●	●
Circuit breaker			
Contact (not included)	●	●	●
Features / performance			
Monitoring	●	●	●
Pre-alarm	●	●	
Remote control	●	●	●
Technical specifications			
Residual current type	A	A	A
Circuit breaker: contact	●	●	●
Measurement channels	1	1	4
Adjustable current sensitivity	●	●	●
Adjustable delay time	●	●	●
Built-in current transformer (Ø mm)	28 mm	–	–
External current transformer, WGC Ø 20...500x200	-	●	●
Trigger output	●	●	●
Pre-alarm output	●	●	–
Remote control input	●	●	●
Adjustable reclosing time	●	●	●
Communications	–	ST	ST
Module size	3	3	3

ST - Depending on type

Complete set formed by: Residual current relay + Contactor (*1)

WRU RM/RA

Residual current relay with built-in transformer

Type	Code	Usefull diam. (mm)	IΔn (A)	N° relays	Breaking element	Delay	Nr. reclosures	Time betwen reclosures
WRU-10-RAL	[*] P24453.	28	0,03 ... 3 A | 0,03 ... 30 A	1	Contactor	0,02...10 s, INS, SEL	Programmable	Programmable
WRU-10-RAL0,3-1	[*] P24457.	28	0,3 ... 1 A	1	Contactor	0,02 INS	Programmable	Programmable

The delay is cancelled in all relays with a 0.03 A sensitivity adjustment, according to IEC 60947-2, annex M. INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a tripping time ≤ 0.02 s
The breaking element to be associated must be a contactor (not included).
To encode other parameters, see the table at the end of the section.

Set composed of: Residual current relay+ Contactor (*1) + WGC transformers (*1)

RGU-10 RAL

Reclosing protection relays and residual current reclosing with WGC external transformer

Type A ultra-immunised residual current relay, programmable, 3 modules with display and locking status release by reclosing. 230 Vac auxiliary power supply.

Type	Code	IΔn (A)	N° relays	Breaking element	Delay	Communications	Nr. reclosures
RGU-10 RAL	[*] P24622.	0,03 ... 30 A	1	Contactor	0,02...10 s, INS, SEL	-	Programmable
RGU-10C RAL	[*] P24662.	0,03 ... 30 A	1	Contactor	0,02...10 s, INS, SEL	RS-485	Programmable

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M.
INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a trip time <0.02 s
Requires an residual current transformer, WGC type (not included)
The breaking element to be associated must be a contactor not included.
To encode other parameters, see the table at the end of the section

CBS4-RA

Central protection and residual current reclosing with WGC external transformer

Station with 4 Type A ultra-immunised residual current relays, programmable, 4 modules with display and locking status release by reclosing. 230 Vac Auxiliary power supply

Type	Code	IΔn (A)	N° relays	Breaking element	Delay	Communications	Nr. reclosures
CBS-4 RA	[*] P24911.	0,03 ... 30 A	4	Contactor	0,02...10 s, INS, SEL	-	Programmable
CBS-4C-RA	[*] P24912.	0,03 ... 30 A	4	Contactor	0,02...10 s, INS, SEL	RS-485	Programmable

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M
INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a trip time <0.02 s
Requires an residual current transformer, WGC type and contactor (not included)
To encode other parameters, see the table at the end of the section

WGC

Residual current transformer

Type	Code	Usefull diam.(mm)	Imax.(A)	Cable (m)	weight (kg)
WGC-20-SC	[*] P10181.	20	63	0.5	0,08
WGC-30-SC	[*] P10182.	30	63	0.5	0,09
WGS-20	[*] P10131.	20	63	-	0,06
WGS-30	[*] P10132.	30	63	-	0,07
WGC-25	[*] P10151.	25	63	-	0,08
WGC-35	[*] P10152.	35	80	-	0,11
WGC-55	[*] P10153.	55	160	-	0,17
WGC-80	[*] P10154.	80	250	-	0,29
WGC-110	[*] P10155.	115	400	-	0,41
WGC-140	[*] P10156.	140	630	-	0,68
WGC-180	[*] P10157.	180	800	-	0,91
WGC-220x105	[C] P10158.	220 x 105	1250	-	3,90
WGC-350x150	[C] P10159.	350 x 150	2000	-	6,80
WGC-500x200	[C] P10160.	500 x 200	4000	-	11,00

TP-WGC

Split-core residual current transformers

Type	Code	Usefull diam.(mm)	IΔn (A)	IΔn min.(A)	weight (kg)
TP58 WGC	[C] P11121.	80 x 50	acc. relay > 0,3A	0.3	0,80
TP88 WGC	[C] P11131.	80 x 80	acc. relay > 0,3A	0.3	1,05
TP812 WGC	[C] P11141.	120 x 80	acc. relay > 0,3A	0.3	1,06
TP816 WGC	[C] P11151.	160 x 80	acc. relay > 0,3A	0.3	2,45

Only for RGU-2, RGU-10/10C, CBS-4/4C
(*1) Not included in the reference

Residual current and circuit breaker protection

Selection table residual current and circuit breaker protection

Residual current protection and reclosure control	WRU-10MT	RGU-10MT	RECMaxLPD	RECMaxCVM	RECMaxP
Circuit breaker protection	**RECMaxMP | MT-TSD**	**RECMaxMP | MT-TSD**			
Protection type					
Residual current	●	●	●	●	–
Circuit breaker	●	●	●	●	●
Reclosure type					
Residual current	●	●	●	●	–
Circuit breaker	●	●	●	●	●
Installation type					
Single phase, three-phase, 3 and 4 wires	●	●	●	●	●
Circuit breaker					
Switch (included)	●	●	●	●	●
Features / performance					
Monitoring	●	●	●	●	–
Remote control	●	●	●	●	●
Power analyzer	–	–	–	●	–
Technical specifications					
Residual current type	A	A	A	A	–
Adjustable current sensitivity	●	●	●	●	–
Adjustable delay time	●	●	●	●	–
Built-in current transformer	28 mm	–	–	–	–
External current transformer, WGC Ø 20...500x200 mm	–	●	●	●	–
Digital output	–	–	–	●	–
Reclosing end output	●	●	●	●	●
Switch status output	●	●	●	●	●
Alarm output	●	●	●	●	●
Reclosing blocked output	–	–	–	●	–
Remote control input	●	●	●	●	●
Self-reclosing	–	–	–	–	●
Adjustable reclosing time	●	●	●	●	–
Communications	–	ST	–	–	–
Module size	7,5 (2P) 9,5 (4P)	7,5 (2P) 9,5 (4P)	4,5 (2P) 6,5 (4P)	4,5 (2P) 6,5 (4P)	7,5 (2P) 9,5 (4P)

Overcurrent and residual current protection and reclosing

RECmax-CVM

Self-reclosing residual current relay with power analyzer functions, transformers included

Type	Code	In (A)	Mó-dules	Commu-nications	Poles
2 Poles, C Curve					
RECmax-CVM 2P C2-10	[2] P2B111.	10 A	6.5	RS-485	2
RECmax-CVM 2P C2-16	[2] P2B112.	16 A	6.5	RS-485	2
RECmax-CVM 2P C2-20	[2] P2B113.	20 A	6.5	RS-485	2
RECmax-CVM 2P C2-25	[2] P2B114.	25 A	6.5	RS-485	2
RECmax-CVM 2P C2-32	[2] P2B115.	32 A	6.5	RS-485	2
RECmax-CVM 2P C2-40	[2] P2B116.	40 A	6.5	RS-485	2
RECmax-CVM 2P C2-50	[2] P2B117.	50 A	6.5	RS-485	2
RECmax-CVM 2P C2-63	[2] P2B118.	63 A	6.5	RS-485	2
4 Poles, C Curve					
RECmax-CVM 4P C4-10	[2] P2B121.	10 A	8.9	RS-485	4
RECmax-CVM 4P C4-16	[2] P2B122.	16 A	8.9	RS-485	4
RECmax-CVM 4P C4-20	[2] P2B123.	20 A	8.9	RS-485	4
RECmax-CVM 4P C4-25	[2] P2B124.	25 A	8.9	RS-485	4
RECmax-CVM 4P C4-32	[2] P2B125.	32 A	8.9	RS-485	4
RECmax-CVM 4P C4-40	[2] P2B126.	40 A	8.9	RS-485	4
RECmax-CVM 4P C4-50	[2] P2B127.	50 A	8.9	RS-485	4
RECmax-CVM 4P C4-63	[2] P2B128.	63 A	8.9	RS-485	4

Type	Code	In (A)	Mó-dules	Commu-nications	Poles
2 Poles, D Curve					
RECmax-CVM 2P D2-10	[2] P2B131.	10 A	6.5	RS-485	2
RECmax-CVM 2P D2-16	[2] P2B132.	16 A	6.5	RS-485	2
RECmax-CVM 2P D2-20	[2] P2B133.	20 A	6.5	RS-485	2
RECmax-CVM 2P D2-25	[2] P2B134.	25 A	6.5	RS-485	2
RECmax-CVM 2P D2-32	[2] P2B135.	32 A	6.5	RS-485	2
RECmax-CVM 2P D2-40	[2] P2B136.	40 A	6.5	RS-485	2
RECmax-CVM 2P D2-50	[2] P2B137.	50 A	6.5	RS-485	2
RECmax-CVM 2P D2-63	[2] P2B138.	63 A	6.5	RS-485	2
4 Poles, D Curve					
RECmax-CVM 4P D4-10	[2] P2B141.	10 A	8.9	RS-485	4
RECmax-CVM 4P D4-16	[2] P2B142.	16 A	8.9	RS-485	4
RECmax-CVM 4P D4-20	[2] P2B143.	20 A	8.9	RS-485	4
RECmax-CVM 4P D4-25	[2] P2B144.	25 A	8.9	RS-485	4
RECmax-CVM 4P D4-32	[2] P2B145.	32 A	8.9	RS-485	4
RECmax-CVM 4P D4-40	[2] P2B146.	40 A	8.9	RS-485	4
RECmax-CVM 4P D4-50	[2] P2B147.	50 A	8.9	RS-485	4
RECmax-CVM 4P D4-63	[2] P2B148.	63 A	8.9	RS-485	4

All models feature the WGC20/30-SC residual current transformer and MC-3 or MC-1 measuring transformer with connected terminal
Residual current relay with adjustable sensitivity (0.03 A, up to 1 A), adjustable delay (with curve, INS/SEL, or by time, from 0.1 to 1 s) and programmable automatic reclosing system
The 0.03 A sensitivity adjustment cancels the delay for a specific period of time, IEC 60947-2, annex M
C/D curve circuit breaker with 6 kA cut off power (IEC 60898). Curve 10 kA (IEC 60947-2) check.

RECmaxLPD

Self-reclosing residual current relay with circuit breaker, used with an external residual current transformer

Type	Code	In (A)	Módules	Poles
2 Poles, C Curve				
RECmaxLPd-C2-6	[1] P2A110.	6 A	5.3	2
RECmaxLPd-C2-10	[1] P2A111.	10 A	5.3	2
RECmaxLPd-C2-16	[1] P2A112.	16 A	5.3	2
RECmaxLPd-C2-20	[1] P2A113.	20 A	5.3	2
RECmaxLPd-C2-25	[1] P2A114.	25 A	5.3	2
RECmaxLPd-C2-32	[1] P2A115.	32 A	5.3	2
RECmaxLPd-C2-40	[1] P2A116.	40 A	5.3	2
RECmaxLPd-C2-50	[1] P2A117.	50 A	5.3	2
RECmaxLPd-C2-63	[1] P2A118.	63 A	5.3	2
4 Poles, C Curve				
RECmaxLPd-C4-6	[1] P2A120.	6 A	7.7	4
RECmaxLPd-C4-10	[1] P2A121.	10 A	7.7	4
RECmaxLPd-C4-16	[1] P2A122.	16 A	7.7	4
RECmaxLPd-C4-20	[1] P2A123.	20 A	7.7	4
RECmaxLPd-C4-25	[1] P2A124.	25 A	7.7	4
RECmaxLPd-C4-32	[1] P2A125.	32 A	7.7	4
RECmaxLPd-C4-40	[1] P2A126.	40 A	7.7	4
RECmaxLPd-C4-50	[1] P2A127.	50 A	7.7	4
RECmaxLPd-C4-63	[1] P2A128.	63 A	7.7	4

Type	Code	In (A)	Módules	Poles
2 Poles, D Curve				
RECmaxLPd-D2-6	[1] P2A130.	6 A	7.7	2
RECmaxLPd-D2-10	[1] P2A131.	10 A	5.3	2
RECmaxLPd-D2-16	[1] P2A132.	16 A	5.3	2
RECmaxLPd-D2-20	[1] P2A133.	20 A	5.3	2
RECmaxLPd-D2-25	[1] P2A134.	25 A	5.3	2
RECmaxLPd-D2-32	[1] P2A135.	32 A	5.3	2
RECmaxLPd-D2-40	[1] P2A136.	40 A	5.3	2
RECmaxLPd-D2-50	[1] P2A137.	50 A	5.3	2
RECmaxLPd-D2-63	[1] P2A138.	63 A	5.3	2
4 Poles, D Curve				
RECmaxLPd-D4-6	[1] P2A140.	6 A	7.7	4
RECmaxLPd-D4-10	[1] P2A141.	10 A	7.7	4
RECmaxLPd-D4-16	[1] P2A142.	16 A	7.7	4
RECmaxLPd-D4-20	[1] P2A143.	20 A	7.7	4
RECmaxLPd-D4-25	[1] P2A144.	25 A	7.7	4
RECmaxLPd-D4-32	[1] P2A145.	32 A	7.7	4
RECmaxLPd-D4-40	[1] P2A146.	40 A	7.7	4
RECmaxLPd-D4-50	[1] P2A147.	50 A	7.7	4
RECmaxLPd-D4-63	[1] P2A148.	63 A	7.7	4

Residual current relay with adjustable sensitivity (0.03 to 1 A), adjustable delay (by curve, INS/SEL, or defined time span from 0.1 to 1 s) and automatic programmable reclosing.
The 0.03 A sensitivity adjustment cancels the delay for a specific period of time, IEC 60947-2, annex M
WGS-20/30 and WGC-25/35 residual current transformers
C/D curve circuit breaker with 6 kA cut off power (IEC 60898). Curve 10 kA (IEC 60947-2) check

RGU-10 MT

Reclosing residual current relay for motorized circuit breakers

Type	Code	IΔn (A)	Breaking element	Delay	Communications	Nr. reclosures	Time betwen reclosures
RGU-10 MT	[*] P24642.	0,03 ... 30 A	RECmaxMP | MT-TSD	0,02...10 s, INS, SEL	-	Programmable	Programmable
RGU-10C MT	[*] P24652.	0,03 ... 30 A	RECmaxMP | MT-TSD	0,02...10 s, INS, SEL	RS-485	Programmable	Programmable

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M.
INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a trip time < 0.02 s
Requires a WGS/WGC residual current transformer (not included). To operate with RECmax MP (In ≤ 63 A), with MT-FDE (In > 63 A),
To encode other parameters, see the table at the end of the section

WRU-10-MT

Residual current relay with built-in transformer

Type	Code	Usefull diam.(mm)	IΔn (A)	Delay	Nr. reclosures	Time betwen reclosures
WRU-10-MT	[C] P24275.	28	0,03 ... 30 A	0,02...10 s, INS, SEL	Programmable	Programmable

The delay is cancelled in all relays with a sensitivity adjustment of 0.03 A, IEC 60947-2, annex M. (*1)) INS, SEL trip curves, according to IEC 61008-1, for trigger coils with a trip time ≤ 0.02 s
To operate with RECmax MP (In ≤ 63 A), with MT-TSD (In > 63 A), To encode other parameters, see the table at the end of the section

RECmaxMP

Motorized circuit breakers (up to 63 A)

Type	Code	In (A)	Módules	Poles
2 Poles, C Curve				
RECmax MP-C2-6	[1] P27110.	6 A	5.3	2
RECmax MP-C2-10	[1] P27111.	10 A	5.3	2
RECmax MP-C2-16	[1] P27112.	16 A	5.3	2
RECmax MP-C2-20	[1] P27113.	20 A	5.3	2
RECmax MP-C2-25	[1] P27114.	25 A	5.3	2
RECmax MP-C2-32	[1] P27115.	32 A	5.3	2
RECmax MP-C2-40	[1] P27116.	40 A	5.3	2
RECmax MP-C2-50	[1] P27117.	50 A	5.3	2
RECmax MP-C2-63	[1] P27118.	63 A	5.3	2
4 Poles, C Curve				
RECmax MP-C4-6	[1] P27120.	6 A	7.7	4
RECmax MP-C4-10	[1] P27121.	10 A	7.7	4
RECmax MP-C4-16	[1] P27122.	16 A	7.7	4
RECmax MP-C4-20	[1] P27123.	20 A	7.7	4
RECmax MP-C4-25	[1] P27124.	25 A	7.7	4
RECmax MP-C4-32	[1] P27125.	32 A	7.7	4
RECmax MP-C4-40	[1] P27126.	40 A	7.7	4
RECmax MP-C4-50	[1] P27127.	50 A	7.7	4
RECmax MP-C4-63	[1] P27128.	63 A	7.7	4

Type	Code	In (A)	Módules	Poles
2 Poles, D Curve				
RECmax MP-D2-6	[1] P27130.	6 A	5.3	2
RECmax MP-D2-10	[1] P27131.	10 A	5.3	2
RECmax MP-D2-16	[1] P27132.	16 A	5.3	2
RECmax MP-D2-20	[1] P27133.	20 A	5.3	2
RECmax MP-D2-25	[1] P27134.	25 A	5.3	2
RECmax MP-D2-32	[1] P27135.	32 A	5.3	2
RECmax MP-D2-40	[1] P27136.	40 A	5.3	2
RECmax MP-D2-50	[1] P27137.	50 A	5.3	2
RECmax MP-D2-63	[1] P27138.	63 A	5.3	2
4 Poles, D Curve				
RECmax MP-D4-6	[1] P27140.	6 A	7.7	4
RECmax MP-D4-10	[1] P27141.	10 A	7.7	4
RECmax MP-D4-16	[1] P27142.	16 A	7.7	4
RECmax MP-D4-20	[1] P27143.	20 A	7.7	4
RECmax MP-D4-25	[1] P27144.	25 A	7.7	4
RECmax MP-D4-32	[1] P27145.	32 A	7.7	4
RECmax MP-D4-40	[1] P27146.	40 A	7.7	4
RECmax MP-D4-50	[1] P27147.	50 A	7.7	4
RECmax MP-D4-63	[1] P27148.	63 A	7.7	4

C/D curve circuit breakers with 6 kA cut off power (IEC 60898). Curve 10 kA (IEC 60947-2) check

TABLE OF ADDITIONAL FEATURES

RGU-10/C RAL / RGU-10/C MT

P	2	X	X	X	X	0	0	X	0	0	X	X

Code		Internal code			Delivery time
Power supply voltage	Standard (230 V_{AC})	0			-
	110 V_{AC} (WRU-10 RAL / MT)	1			2
	24...48 V_{AC} / 24...125 V_{DC} (RGU-10/C RAL RGU-10/C MT)	4			1
	Certificate UL (Only RGU-10C MT 230 V_{AC})		0	7	2

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

New

MT-TS

Motorised circuit-breaker

Type	Code	In (A)	Poles
3 poles			
MT-TS- 80A- 3P	[1] P20H60.	80 A	3
MT-TS- 100A- 3P	[1] P20H61.	100 A	3
MT-TS- 125A- 3P	[1] P20H62.	125 A	3
MT-TS- 160A- 3P	[1] P20H63.	160 A	3
MT-TS- 250A- 3P	[1] P20H64.	250 A	3
MT-TS- 400A- 3P	[1] P20H65.	400 A	3
MT-TS- 630A- 3P	[1] P20H66.	630 A	3

Type	Code	In (A)	Poles
4 poles			
MT-TS- 80A- 4P	[1] P20H70.	80 A	4
MT-TS- 100A- 4P	[1] P20H71.	100 A	4
MT-TS- 125A- 4P	[1] P20H72.	125 A	4
MT-TS- 160A- 4P	[1] P20H73.	160 A	4
MT-TS- 250A- 4P	[1] P20H74.	250 A	4
MT-TS- 400A- 4P	[1] P20H75.	400 A	4
MT-TS- 630A- 4P	[1] P20H76.	630 A	4

Fixed magnetic and adjustable thermal protection

New

MT-TSD

Motorised circuit-breaker suitable for residual current protection

Type	Code	In (A)	Poles
3 poles			
MT-TSD- 80A- 3P	[1] P20K60.	80 A	3
MT-TSD- 100A- 3P	[1] P20K61.	100 A	3
MT-TSD- 125A- 3P	[1] P20K62.	125 A	3
MT-TSD- 160A- 3P	[1] P20K63.	160 A	3
MT-TSD- 250A- 3P	[1] P20K64.	250 A	3
MT-TSD- 400A- 3P	[1] P20K65.	400 A	3
MT-TSD- 630A- 3P	[1] P20K66.	630 A	3

Type	Code	In (A)	Poles
4 poles			
MT-TSD- 80A- 4P	[1] P20K70.	80 A	4
MT-TSD- 100A- 4P	[1] P20K71.	100 A	4
MT-TSD- 125A- 4P	[1] P20K72.	125 A	4
MT-TSD- 160A- 4P	[1] P20K73.	160 A	4
MT-TSD- 250A- 4P	[1] P20K74.	250 A	4
MT-TSD- 400A- 4P	[1] P20K75.	400 A	4
MT-TSD- 630A- 4P	[1] P20K76.	630 A	4

Fixed magnetic and adjustable thermal protection

Overcurrent self-reclosing

RECmaxP

Self-reclosing motorized circuit breakers, up to 63 A

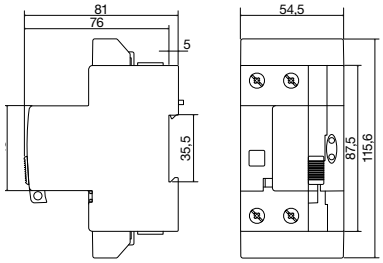
Type	Code	In (A)	Poles
2 Poles, C Curve			
RECmax P-C2-6	[1] P28110.	6 A	2
RECmax P-C2-10	[1] P28111.	10 A	2
RECmax P-C2-16	[1] P28112.	16 A	2
RECmax P-C2-20	[1] P28113.	20 A	2
RECmax P-C2-25	[1] P28114.	25 A	2
RECmax P-C2-32	[1] P28115.	32 A	2
RECmax P-C2-40	[1] P28116.	40 A	2
RECmax P-C2-50	[1] P28117.	50 A	2
RECmax P-C2-63	[1] P28118.	63 A	2
4 Poles, C Curve			
RECmax P-C4-6	[1] P28120.	6 A	4
RECmax P-C4-10	[1] P28121.	10 A	4
RECmax P-C4-16	[1] P28122.	16 A	4
RECmax P-C4-20	[1] P28123.	20 A	4
RECmax P-C4-25	[1] P28124.	25 A	4
RECmax P-C4-32	[1] P28125.	32 A	4
RECmax P-C4-40	[1] P28126.	40 A	4
RECmax P-C4-50	[1] P28127.	50 A	4
RECmax P-C4-63	[1] P28128.	63 A	4

Type	Code	In (A)	Poles
2 Poles, D Curve			
RECmax P-D2-6	[1] P28130.	6 A	2
RECmax P-D2-10	[1] P28131.	10 A	2
RECmax P-D2-16	[1] P28132.	16 A	2
RECmax P-D2-20	[1] P28133.	20 A	2
RECmax P-D2-25	[1] P28134.	25 A	2
RECmax P-D2-32	[1] P28135.	32 A	2
RECmax P-D2-40	[1] P28136.	40 A	2
RECmax P-D2-50	[1] P28137.	50 A	2
RECmax P-D2-63	[1] P28138.	63 A	2
4 Poles, D Curve			
RECmax P-D4-6	[1] P28140.	6 A	4
RECmax P-D4-10	[1] P28141.	10 A	4
RECmax P-D4-16	[1] P28142.	16 A	4
RECmax P-D4-20	[1] P28143.	20 A	4
RECmax P-D4-25	[1] P28144.	25 A	4
RECmax P-D4-32	[1] P28145.	32 A	4
RECmax P-D4-40	[1] P28146.	40 A	4
RECmax P-D4-50	[1] P28147.	50 A	4
RECmax P-D4-63	[1] P28148.	63 A	4

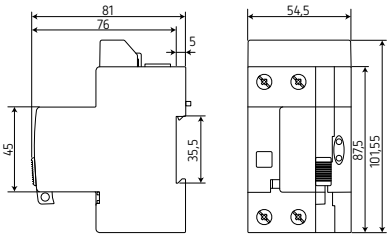
C/D curve circuit breakers with 6 kA cut off power (IEC 60898). Curve 10 kA (IEC 60947-2) check

Dimensiones

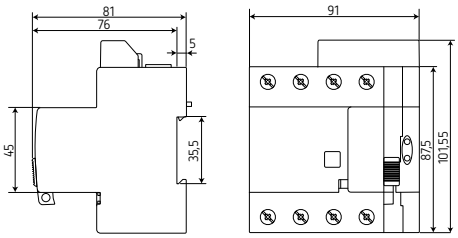
REC4 2P 30



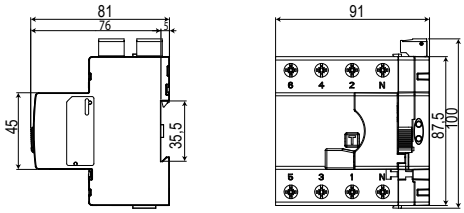
REC4 2P 300



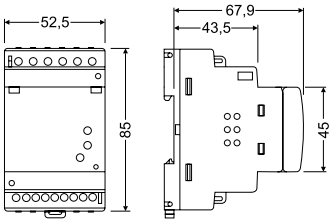
REC4 4P / RECB



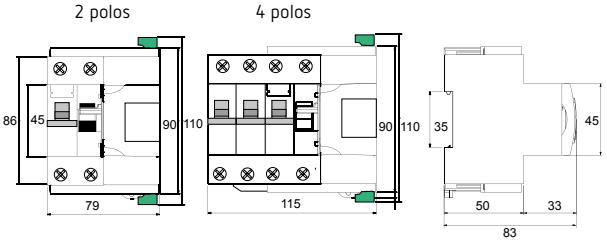
RECB-C



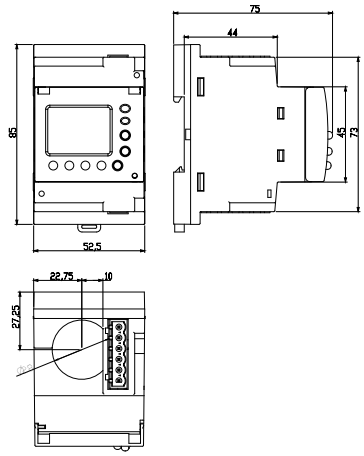
RGU-10 / CBS-4



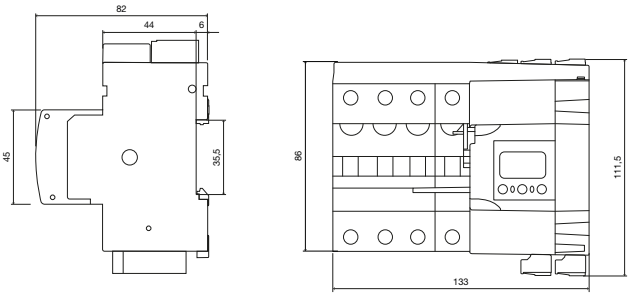
RECmax



WRU-10



RECmax CVM



Residual current protection for electric vehicles

Selection table RCCBs

	IDA-EV	REC4-EV	REC4-EV-C	RECB-EV-C
		New	New	New
Protection type				
Residual current	●	●	●	●
Installation type				
Single phase, three-phase, 3 and 4 wires	●	●	●	●
Circuit breaker				
Switch (included)	●	●	●	●
Features / performance				
Status LEDs	–	●	●	●
Switch status output	–	–	●	●
Remote reclosing input	–	–	●	●
Remote trigger input	–	–	●	●
Technical specifications				
Earth leakage type	A + 6 mAdc	A + 6 mAdc	A + 6 mAdc	B
Self-powered	●	●	–	–
Auxiliary power supply	–	–	●	●
Constant current sensitivity	●	●	●	●
Fixed delay time	●	●	●	●
Built-in current transformer	●	●	●	●
Self-reclosing	–	●	–	–
Remote control	–	–	●	●
Module size	4	5	5	5

Residual current protection for electric vehicles

IDA-EV

6 mADC type A RCCB with monitoring

Type	Code	In (A)	Mounting	Poles	Sensitivity
IDA-EV-40-30	[*] P17321.	40 A	DIN rail	4	30 mA + 6 mAdc
IDA-EV-63-30	[*] P17322.	63 A	DIN rail	4	30 mA + 6 mAdc

Residual current protection and reclosing system for electric vehicles

New

REC4-EV

6mADC reclosing type A RCCB with monitoring

Type	Code	In (A)	Poles	Sensitivity	Reclosing mode
REC4-EV-4P-40-30	[C] P26H00.	40 A	4	30 mA	Time
REC4-EV-4P-63-30	[C] P26H01.	63 A	4	30 mA	Time

3 reconnections: 3, 20, 180 s. Complies with the EN 50557 Standard

New

REC4-EV-C

6mADC reclosing type A RCCB with monitoring

12 VAC auxiliary power supply

Type	Code	In (A)	Poles	Sensitivity	Reclosing mode
Self-reclosing RCCB with status output					
REC4-EV-C-4P-40-30	[*] P26L00.	40 A	4	30 mA	remote control
REC4-EV-C-4P-63-30	[*] P26L01.	63 A	4	30 mA	remote control

3 reconnections: 3, 20, 180 s. Complies with the EN 50557 Standard

New

RECB-EV-C

Type-B self-reclosing RCCB

12 VAC auxiliary power supply

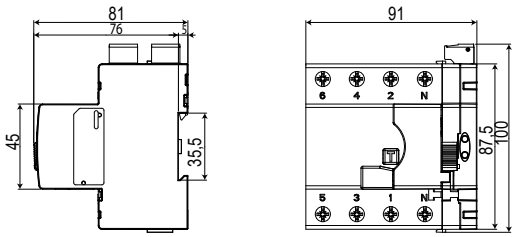
Type	Code	In (A)	Poles	Sensitivity	Reclosing mode
Reclosing RCCB with status output					
RECB-EV-C-4P-40-30	[C] P26M00.	40 A	4	30 mA	remote control
RECB-EV-C-4P-63-30	[C] P26M10.	63 A	4	30 mA	remote control

REC4-EV-C

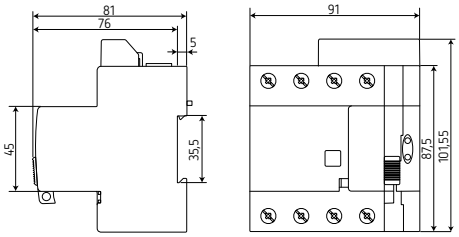
P	2	X	X	X	X	0	0	X
Code						Internal code	↑	Delivery time
Frecuency		Standard 50 Hz					0	-
		60 Hz					1	1

Dimensions

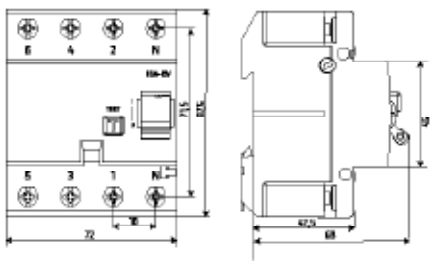
REC4-EV-C/ RECB-EV-C



REC4-EV 4P



IDA-EV



Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Relays and control elements

IMD-2R

Offline insulation relay

Type	Code	Description
IMD-2R	[*] P33020.	Monitoring relay for offline insulation. It controls and monitors the insulation resistance of the receivers that are occasionally disconnected from the electrical network

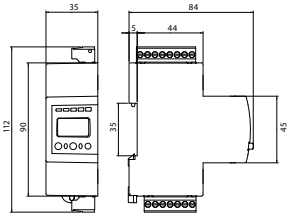
WI

Current detector relay

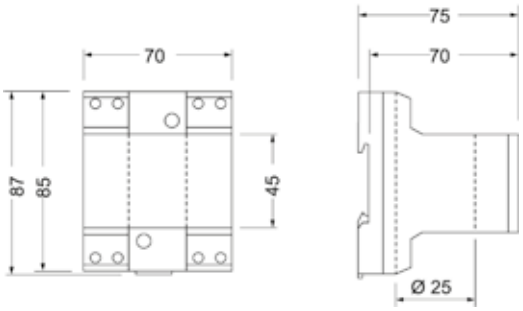
Type	Code	Trip time (adjustabla)	Margin of setting (adjustabla)
WI/005-30	[*] P32011.	0,5 ... 30 s	0,5 ... 5 A
WI/010-30	[*] P32012.	0,5 ... 30 s	1 ... 10 A
WI/020-30	[*] P32013.	0,5 ... 30 s	2 ... 20 A
WI/050-30	[*] P32014.	0,5 ... 30 s	5 ... 50 A
WI/100-30	[*] P32015.	0,5 ... 30 s	10 ... 100 A
WI/TS	[*] P32010.	0,5 ... 30 s	s / transf. .../ 5 A

Dimensions

IMD-2R



WI



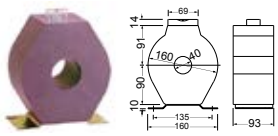
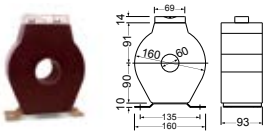
Protection current transformer

TRP model selection table, according to:
- Primary current intensity
- Maximum wiring diameter
- Assigned VA power
- Assigned accuracy/protection class

	TRP 40	TRP 60	TRP 80	TRP 100	TRP 140	TRP 180
	5P10-5P20	5P10-5P20	5P10-5P20	5P10-5P20	5P10-5P20	5P10-5P20
	Power (VA)					
100/5	5					
150/5	5	2.5				
200/5	10	2.5				
250/5	10	5	5			
300/5	15	5	5			
400/5	20	7.5	7.5			
500/5	25	10	10	Cable Cable Ø 100 mm		
600/5	Cable Cable Ø 40 mm	10	10			
750/5		15	15	5	Cable Cable Ø 140 mm	
800/5		15	15	5		
1 000/5		20	20	7.5	5	
1 200/5		Cable Cable Ø 60 mm	25	10	5	Cable Ø 180 mm
1 250/5			25	10	5	
1 500/5			30	10	10	5
1 600/5			30	15	10	5
1 800/5			35	15	10	5
2 000/5			Cable Cable Ø 80 mm	15	10	7.5
2 500/5				20	10	10
3 000/5				25	15	10
4 000/5					15	15
5 000/5						15

TRP

Protection transformers encapsulated in resin

Type	TRP40-5P10			TRP40-5P20			TRP60-5P10			TRP60-5P20		
												
Usefull diam.(mm)	ø 40 mm						ø 60 mm					
Accuracy	5P10			5P20			5P10			5P20		
A	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)
100	5	[4] P50311.	5,00	5	[4] P50211.	9,30						
150	5	[4] P50312.	5,00	5	[4] P50212.	9,40	2.5	[4] P50321.	2,60	2.5	[4] P50221.	13,30
200	10	[4] P50313.	5,00	10	[4] P50213.	9,40	2.5	[4] P50322.	2,70	2.5	[4] P50222.	13,30
250	10	[4] P50314.	5,00	10	[4] P50214.	9,50	5	[4] P50323.	2,70	5	[4] P50223.	13,30
300	15	[4] P50315.	5,10	15	[4] P50215.	9,60	5	[4] P50324.	2,70	5	[4] P50224.	13,40
400	20	[4] P50316.	5,10	20	[4] P50216.	9,60	7.5	[4] P50325.	2,80	7.5	[4] P50225.	13,50
500	25	[4] P50317.	5,20	25	[4] P50217.	9,80	10	[4] P50326.	2,80	10	[4] P50226.	13,60
600							10	[4] P50327.	2,90	10	[4] P50227.	13,80
750							15	[4] P50328.	3,00	15	[4] P50228.	13,90
1000							20	[4] P50329.	3,20	20	[4] P50229.	13,80

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Type	TRP80-5P10			TRP80-5P20			TRP100-5P10			TRP100-5P20		
Usefull diam.(mm)	ø 80 mm						ø 100 mm					
Accuracy	5P10			5P20			5P10			5P20		
A	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)
250	5	[4] P50331.	3,20	5	[4] P50231.	5,90						
300	5	[4] P50332.	3,30	5	[4] P50232.	6,00						
400	7.5	[4] P50333.	3,30	7.5	[4] P50233.	5,60						
500	10	[4] P50334.	3,40	10	[4] P50234.	6,20						
600	10	[4] P50335.	3,50	10	[4] P50235.	6,10						
750							5	[4] P50341.	3,40	5	[4] P50241.	5,60
800	15	[4] P50336.	3,60	15	[4] P50236.	6,00						
1000	20	[4] P50337.	3,70	20	[4] P50237.	6,40	7.5	[4] P50342.	3,40	7.5	[4] P50242.	7,30
1200	25	[4] P50338.	3,80	25	[4] P50238.	6,40	10	[4] P50343.	3,40	10	[4] P50243.	7,00
1500	30	[4] P50339.	4,00	30	[4] P50239.	6,60	10	[4] P50344.	3,60	10	[4] P50244.	7,40
2000							15	[4] P50346.	3,70	15	[4] P50246.	8,20
2500							15	[4] P50347.	3,90	15	[4] P50247.	9,00
3000							20	[4] P50348.	4,56	20	[4] P50248.	7,65

Type	TRP140-5P10			TRP140-5P20			TRP180-5P10			TRP180-5P20		
Usefull diam.(mm)	ø 140 mm						ø 180 mm					
Accuracy	5P10			5P20			5P10			5P20		
A	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)	VA	Code	weight (kg)
1000	5	[4] P50351.	3,70	5	[4] P50251.	12,20						
1250	5	[4] P50352.	3,80	5	[4] P50252.	12,30						
1500	10	[4] P50353.	3,90	10	[4] P50253.	12,50	5	[4] P50361.	4,50	5	[4] P50261.	8,10
2000	10	[4] P50354.	5,00	10	[4] P50254.	12,80	7.5	[4] P50362.	4,50	7.5	[4] P50262.	16,10
2500	10	[4] P50355.	4,50	10	[4] P50255.	9,25	10	[4] P50363.	5,00	10	[4] P50263.	16,60
3000	15	[4] P50356.	4,60	15	[4] P50256.	8,00	10	[4] P50364.	5,20	10	[4] P50264.	17,20
4000	15	[4] P50357.	5,20	15	[4] P50257.	8,90	15	[4] P50365.	5,70	15	[4] P50265.	9,70
5000							15	[4] P50366.	6,20	15	[4] P50266.	10,60

TRP

P	5	X	X	X	X	0	0	X	
Code						Internal code	↑	Delivery time	
Secondary current	Standard (.../ 5 A)						0	-	
	.../ 1A						1	5	

TRM, Measure current transformers encapsulated in resin, see section **Measurements and control / Measuring current transformers and shunts**

Measuring and testing equipments for substations

GETEST

Indirect earth contact simulator

Type	Code	Description	Communications
GETEST 5...50A	[C] P6012300A0000	Indirect earth contact simulator 5 ... 50 A, includes PDA	Bluetooth
Trolley GETEST	[C] P6990A.	Transport trolley GETEST	-
GETEST Probe	[C] P69928.	Measurement electrode	-

Includes the CIRCUTOR laboratory certificate

CR

Relay tester

Type	Code	Description
Relay tester		
CR-50	[C] P6021100A0000	Relay tester 50 A (carrying case version)
CR-100	[C] P6021200A0000	Relay tester 100 A (carrying case version)
CR-250	[C] P6021300A0000	Relay tester 250 A
Accessories		
Trafo 2500 para CR-250	[C] P69903.	Transformer 2500 A for CR-250
Cable 1,5M/2500A	[C] P69902.	Cable: Lenght 1,5 m / 2500 A
MPC-CR	[C] P69901.	Transport trolley CR250

Includes the CIRCUTOR laboratory certificate

OT2

Dielectric strenght tester

Type	Code	Description
OT2-60 D	[C] P6031200A0000	Dielectric strenght tester for insulating oil 60 kV

Includes the CIRCUTOR laboratory certificate

MH

Microohmmeter

Type	Code	Description	Communications
MH-10r	[C] P6071500A0000	Microohmmeter (Thomson Bridge)	Bluetooth
MH-10/100u	[C] P6071400A0000	Microohmmeter 10 / 100 A	-

MD

Digital Megaohmmeters

Type	Code	Description	Communications
Digital megaohmmeter			
MD-5060e	[C] P6052100A0000	Digital megaohmmeter 5 kV (with memory and communications)	-
MD-10kVr	[C] P6052300A0000	Digital megaohmmeter 10 kV	Bluetooth
Analogue megaohmmeter			
MI-20kV	[C] P6051400A0000	Analogue megaohmmeter 20 kV	-

TL6

Earth resistance meter

Type	Code	Description	Communications
TL-6r	[C] P6062300A0000	4-way earth resistance meter	Bluetooth

TABLE OF ADDITIONAL FEATURES

P	6	X	X	X	X	0	0	X	
Code						Internal Code	↑	Delivery time	
Certificate		ENAC calibration certificate					E	C	

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Power factor correction and harmonic filtering

Power factor regulators

Fast power factor regulator (static switching) ... 113
computer C Wi-Fi, Power factor regulator with communications ... 113
computer SMART III, Three-phase power factor regulators. Regulation, measurement, leakage control and communications ... 113
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TCLZ, IP 54 covers for CLZ-FP ... 114
CLZ-FP-M, Single-phase tubular power capacitor ... 114
CLZ-FP HD 50Hz, Three-phase tubular power capacitor (Heavy Duty range) ... 114
CLZ-FP HD 60Hz, Three-phase tubular power capacitor (Heavy Duty range) ... 116
RD, Fast discharging resistors ... 117
ELEB, CSB coils ... 117
CMC B, Contactors ... 117
IR, Current limiting impedances ... 117
CSB, Power capacitors for LV ... 118
CFB, Power capacitors for detuned filters, type P=7% (fres=189 Hz) ... 118
RZ-RBZ, Reactors III for detuned filters ... 119
RZ-RBZ-60Hz, Reactors III for detuned filters, 60 Hz ... 119
CFB-6B, Power capacitors for harmonics filters with static switching operation of the FRE series ... 120
REZ-RBEZ, Reactors III for detuned static filters for FRE static switching bank ... 120
Basic fixed compensation ... 121
CLP, Power capacitor with miniature circuit breaker, 50 Hz ... 121
CLP-C, CLZ Capacitor with miniature circuit breaker and contactor, 50 Hz ... 121
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CSB-F, Power capacitors with fuse protection, 50 Hz ... 121
Advanced fixed compensation ... 122
CCF, CSB capacitor with contactor and fuses, 50 Hz ... 122
CPA, Fixed capacitors with automatic 50-Hz switch protection ... 122
OPTIM FRF, Fixed capacitors with detuned reactor of P = 7% (fres=189 Hz), 50 Hz ... 122
OPTIM FRM, Fixed capacitors with detuned reactor of P = 7% (fres=189 Hz), 50 Hz ... 122

Low voltage capacitor banks

Table: Selection of the OPTIM ... 125
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OPTIM EMK, Automatic capacitor banks with static contactor, 50 Hz. ... 132
EMF / EMB, Three-phase static switching units for 6-terminal capacitors. ... 132
CPC3, Zero-crossing control board (for EMF / EMB modules) ... 132
EMB-2PH, Three-phase static switching units for 3-terminal capacitors. ... 132
Table: Selection of Static automatic capacitor banks with rejection filters ... 133
OPTIM FRE, Automatic capacitor banks with rejection filters (static contactor), 50 Hz. ... 133

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AFQm, Active multifunction filter, 50 / 60 Hz ... 137
LRZ / LRBZ, Filter reactors for power converters (network side), 50 Hz ... 138
SINUS, Filter for PWM, 400 V / 50 Hz ... 138
FB3, Third harmonic blocking filter for 50 Hz network ... 138
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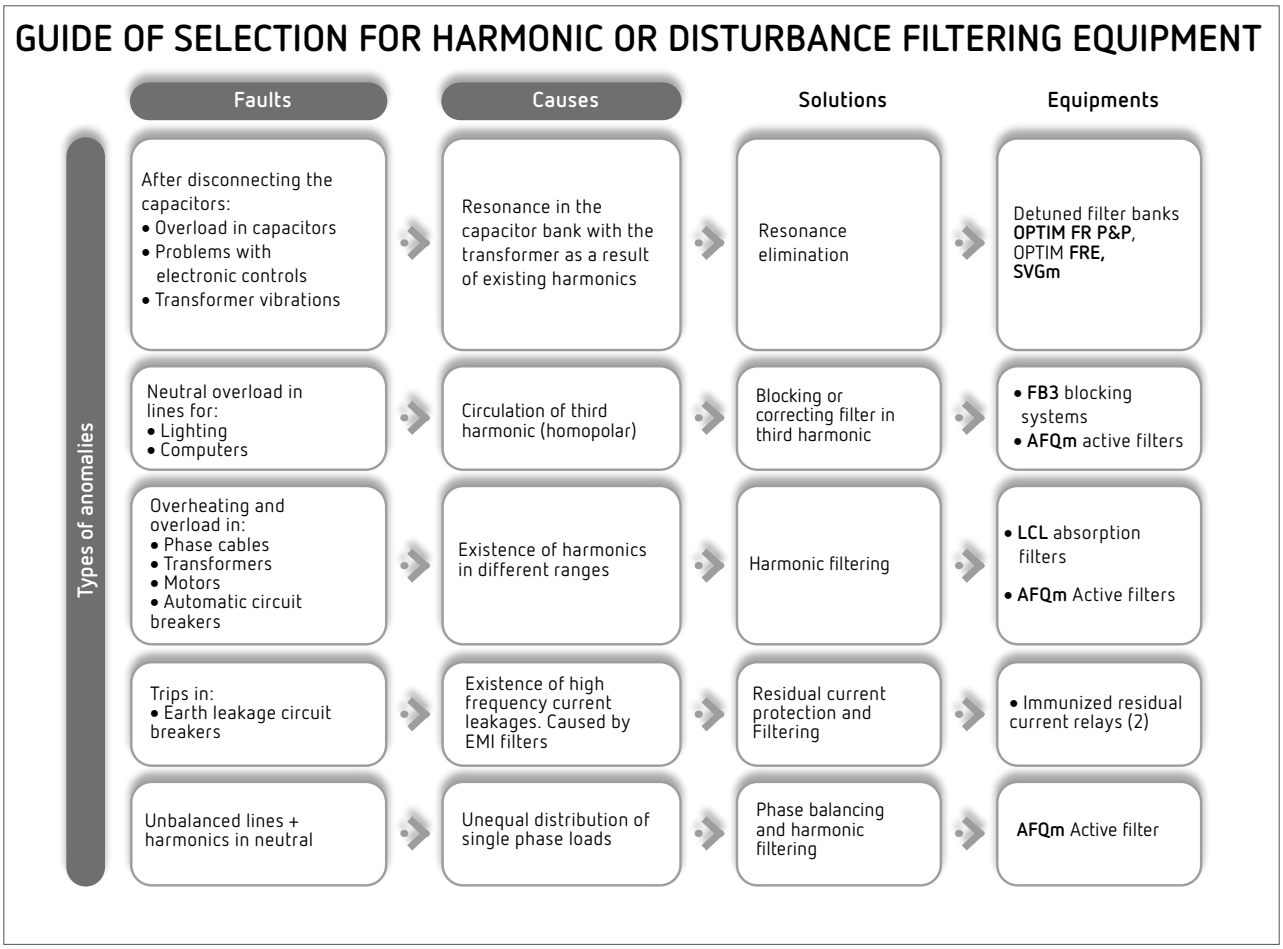


Power factor regulators

computer C Wi-Fi

Power factor regulator with communications

Type	Code	Power supply	Measurement Range (V)	Input current	Switching unit	Nr steps	Alarm relay	Communi-cations	Size (mm) width x height x depth
computer C6 Wi-Fi	[*] R14831.	400 Vac	400	.../ 5A	Contactor	6	●	Wi-Fi	144x144x54.85
computer C6 Wi-Fi	[*] R148310020000	230 Vac	230	.../ 5A	Contactor	6	●	Wi-Fi	144x144x54.85
computer C12 Wi-Fi	[*] R14842.	400 Vac	400	.../ 5A	Contactor	12	●	Wi-Fi	144x144x54.85
computer C12 Wi-Fi	[*] R148420020000	230 Vac	230	.../ 5A	Contactor	12	●	Wi-Fi	144x144x54.85

Compatible with Anti Reactive Surveillance System - VAR. Programming via the MyConfig app.

computer SMART III

Three-phase power factor regulators. Regulation, measurement, leakage control and communications

Type	Code	Power supply	Measurement Range (V)	Input current	Switching unit	IΔn	Nr steps	Alarm relay	Commu-nications	Size (mm) width x height x depth
computer SMART III 6	[*] R13851.	100...520 Vac	20...300	.../5A | .../1A	Contactor	yes	6	●	RS-485	144x144x71
computer SMART III 12	[*] R13862.	100...520 Vac	20...300	.../5A | .../1A	Contactor	yes	12	●	RS-485	144x144x71
computer SMART III 14	[*] R13864.	100...400 Vac	20...300	.../5A | .../1A	Contactor	yes	14	●	RS-485	144x144x71

Fast power factor regulator (static switching)

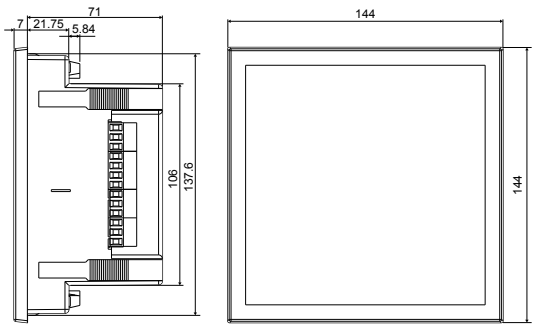
computer SMART III-Fast

Power factor regulators for static switching

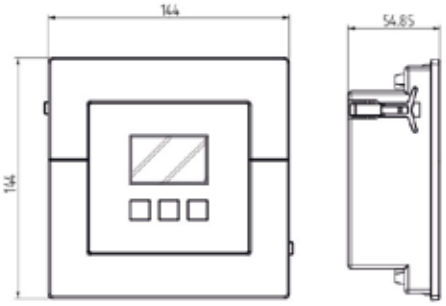
Type	Code	Power supply	Measurement Range (V)	Input current	Switching unit	IΔn	Nr steps	Alarm relay	Commu-nications	Size (mm) width x height x depth
computer SMART III F6-12Vdc	[*] R13953.	100...520 Vac	100...520	.../5A | .../1A	EMB-2PH	yes	6	●	RS-485	144x144x71
computer SMART III F12-12Vdc	[*] R13964.	100...520 Vac	100...520	.../5A | .../1A	EMB-2PH	yes	12	●	RS-485	144x144x71
computer SMART III Fast 6	[*] R13951.	100...520 Vac	100...520	.../5A | .../1A	EMF / EMB	yes	6	●	RS-485	144x144x71
computer SMART III Fast 12	[*] R13962.	100...520 Vac	100...520	.../5A | .../1A	EMF / EMB	yes	12	●	RS-485	144x144x71

Dimensions

computer Smart III / computer SMART III fast



computer C Wi-Fi



Low voltage power capacitors

TCLZ

IP 54 covers for CLZ-FP

Type	Code	Cover (opc.)
TCLZ-FP85	[*] R29911.	1
TCLZ-FP116	[*] R29917.	2
TCLZ-FP100	[*] R29918.	7

CLZ-FP-M

Single-phase tubular power capacitor

230 V, with terminal block

Type	Code	230 V kvar	240 V kvar	Hz	dia.x height (mm)	Cover (opc.)
CLZ-FP-M-23/2,5	[1] R205C4.	2.5	2.7	50	85 x 245	1
CLZ-FP-M-23/5	[1] R205C8.	5	5.4	50	85 x 245	1
CLZ-FP-M-23/7,5	[1] R205CM.	7.5	8.2	50	116 x 245	2
CLZ-FP-M-23/10	[1] R205CN.	10	10.9	50	116 x 245	2

CLZ-FP HD 50Hz

Three-phase tubular power capacitor (Heavy Duty range)

CLZ-FPT - Capacitors with Faston terminal / CLZ-FP - Capacitors with terminal block

Type	Code	220 V kvar	230 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 230 V / 50 Hz								
CLZ-FPT-23/1,25-HD	[C] R2H511.	1.15	1.25	50	63,5 x 127	0,44	-	F
CLZ-FPT-23/2,5-HD	[C] R2H812.	2.3	2.5	50	63,5 x 175	0,60	-	F
Terminal block, Un = 3 x 230 V / 50 Hz								
CLZ-FP-23/5-HD	[C] R2H516.	4.6	5	50	85 x 175	0,81	1	A
CLZ-FP-23/6,25-HD	[C] R2H517.	5.7	6.25	50	85 x 245	1,00	1	A
CLZ-FP-23/7,5-HD	[C] R2H518.	6.8	7.5	50	85 x 245	1,07	1	A
CLZ-FP-23/10-HD	[C] R2H51B.	9.15	10	50	100 x 245	1,38	7	A
CLZ-FP-23/12,5-HD	[C] R2H51D.	11.4	12.5	50	100 x 245	1,60	7	A
CLZ-FP-23/15-HD	[C] R2H51E.	13.75	15	50	116 x 245	1,94	2	B
Type	**Code**	**400 V kvar**	**440 V kvar**	**Hz**	**dia.x height (mm)**	**weight (kg)**	**Cover (opc.)**	**Terminal**
Faston terminal, Un = 3 x 440 V / 50 Hz								
CLZ-FPT-44/1,25-HD	[C] R2H541.	1	1.25	50	63,5 x 98	0,36	-	F
CLZ-FPT-44/2,5-HD	[*] R2H542.	2	2.5	50	63,5 x 127	0,44	-	F
CLZ-FPT-44/3-HD	[C] R2H543.	2.5	3	50	63,5 x 127	0,46	-	F
CLZ-FPT-44/3,75-HD	[C] R2H544.	3	3.75	50	63,5 x 127	0,47	-	F
CLZ-FPT-44/5-HD	[*] R2H546.	4	5	50	63,5 x 175	0,62	-	F
CLZ-FPT-44/6,25-HD	[*] R2H547.	5	6.25	50	63,5 x 175	0,62	-	F
CLZ-FPT-44/7,5-HD	[*] R2H848.	6.25	7.5	50	63,5 x 202	0,71	-	F
Terminal block, Un = 3 x 440 V / 50 Hz								
CLZ-FP-44/10-HD	[*] R2H54B.	8	10	50	85 x 245	0,90	1	A
CLZ-FP-44/12,5-HD	[*] R2H54D.	10	12.5	50	85 x 245	1,01	1	A
CLZ-FP-44/15-HD	[*] R2H54E.	12.5	15	50	85 x 245	1,09	1	A
CLZ-FP-44/18,2-HD	[C] R2H54G.	15	18.2	50	100 x 245	1,38	7	A
CLZ-FP-44/20-HD	[*] R2H54J.	16	20	50	100 x 245	1,46	7	A
CLZ-FP-44/25-HD	[*] R2H54L.	20	25	50	100 x 245	1,69	7	B
CLZ-FP-44/28-HD	[C] R2H54M.	23	28	50	116 x 245	1,92	2	B
CLZ-FP-44/30-HD	[*] R2H54N.	25	30	50	116 x 245	1,99	2	B
CLZ-FP-44/40-HD	[C] R2H54R.	32	40	50	136 x 261	5,00	-	B
CLZ-FP-44/50-HD	[*] R2H54S.	40	50	50	136 x 355	5,18	-	C
Type	**Code**	**440 V kvar**	**460 V kvar**	**Hz**	**dia.x height (mm)**	**weight (kg)**	**Cover (opc.)**	**Terminal**
Faston terminal, Un = 3 x 460 V / 50 Hz								
CLZ-FPT-46/6,25-HD	[*] R2H857.	5.7	6.25	50	63,5 x 202	0,70	-	F
Terminal block, Un = 3 x 460 V / 50 Hz								
CLZ-FP-46/12,5-HD	[*] R2H55D.	11.4	12.5	50	85 x 245	1,10	1	A
CLZ-FP-46/15-HD	[*] R2H55E.	13.7	15	50	85 x 245	1,27	1	A
CLZ-FP-46/19-HD	[*] R2H55H.	17.4	19	50	100 x 245	1,53	7	A
CLZ-FP-46/25-HD	[*] R2H55L.	22.9	25	50	116 x 245	2,03	2	B
CLZ-FP-46/30-HD	[*] R2H55N.	27.4	30	50	136 x 220	2,45	-	B
CLZ-FP-46/33.3-HD	[C] R2H55P.	30.5	33.3	50	136 x 261	3,20	-	B

All models are of the inert gas type, except for those with a 63.5 mm diameter and 136x355 mm size The dimensions (dxh) are shown for the tube only. Please consult the dimensions drawing at the end of this section for more information about the actual dimensions Terminal: maximum cross-section of type A cables: 16 mm2, type B: 25 mm2, type C: 35 mm2, F: Faston 6.3x0.8 mm and 12 A maximum current

CLZ-FP HD 50Hz

Three-phase tubular power capacitor (Heavy Duty range)

CLZ-FPT - Capacitors with Faston terminal / CLZ-FP - Capacitors with terminal block

Type	Code	460 V kvar	480 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 480 V / 50 Hz								
CLZ-FPT-48/2,5-HD	[C] R2H862.	2.3	2.5	50	63,5 x 127	0,90	-	F
CLZ-FPT-48/5-HD	[C] R2H866.	4.6	5	50	63,5 x 175	1,50	-	F
CLZ-FPT-48/7,5-HD	[C] R2H868.	6.9	7.5	50	63,5 x 202	1,20	-	F
Terminal block, Un = 3 x 480 V / 50 Hz								
CLZ-FP-48/10-HD	[C] R2H56B.	9.2	10	50	85 x 245	0,93	1	A
CLZ-FP-48/12,5-HD	[C] R2H56D.	11.5	12.5	50	85 x 245	1,07	1	A
CLZ-FP-48/15-HD	[C] R2H56E.	13.8	15	50	85 x 245	1,18	1	A
CLZ-FP-48/20-HD	[C] R2H56J.	18.4	20	50	100 x 245	1,53	7	A
CLZ-FP-48/25-HD	[C] R2H56L.	23	25	50	116 x 245	1,90	2	B
CLZ-FP-48/30-HD	[C] R2H56N.	27.6	30	50	116 x 245	2,15	2	B
CLZ-FP-48/40-HD	[C] R2H56R.	36.75	40	50	136 x 261	2,90	-	B

Type	Code	500 V kvar	525 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 525 V / 50 Hz								
CLZ-FPT-52/2,5-HD	[C] R2H872.	2.3	2.5	50	63,5 x 127	0,70	-	F
CLZ-FPT-52/3-HD	[C] R2H873.	2.7	3	50	63,5 x 127	0,70	-	F
CLZ-FPT-52/4-HD	[C] R2H875.	3.6	4	50	63,5 x 175	0,70	-	F
CLZ-FPT-52/5-HD	[*] R2H876.	4.5	5	50	63,5 x 175	0,61	-	F
CLZ-FPT-52/6,25-HD	[C] R2H877.	5.7	6.25	50	63,5 x 202	0,72	-	F
CLZ-FPT-52/7,5-HD	[C] R2H878.	6.8	7.5	50	63,5 x 202	0,90	-	F
Terminal block, Un = 3 x 525 V / 50 Hz								
CLZ-FP-52/8-HD	[C] R2H579.	7.25	8	50	85 x 175	0,86	1	A
CLZ-FP-52/10-HD	[*] R2H57B.	9.1	10	50	85 x 245	0,99	1	A
CLZ-FP-52/12,5-HD	[*] R2H57D.	11.3	12.5	50	85 x 245	1,13	1	A
CLZ-FP-52/15-HD	[*] R2H57E.	13.6	15	50	85 x 245	1,20	1	A
CLZ-FP-52/20-HD	[*] R2H57J.	18.15	20	50	100 x 245	1,62	7	A
CLZ-FP-52/25-HD	[*] R2H57L.	22.7	25	50	116 x 245	1,63	2	B
CLZ-FP-52/30-HD	[*] R2H57N.	27.2	30	50	116 x 245	2,18	2	B
CLZ-FP-52/40-HD	[C] R2H57R.	36.3	40	50	136 x 261	2,80	-	B
CLZ-FP-52/50-HD	[C] R2H57S.	45.4	50	50	136 x 355	5,24	-	C

All models are of the inert gas type, except for those with a 63.5 mm diameter and 136x355 mm size The dimensions (dxh) are shown for the tube only. Please consult the dimensions drawing at the end of this section for more information about the actual dimensions Terminal: maximum cross-section of type A cables: 16 mm2, type B: 25 mm2, type C: 35 mm2, F: Faston 6.3x0.8 mm and 12 A maximum current

Faston terminal, Un = 3 x 690 V / 50 Hz								
CLZ-FPT-69/2,5-HD	[C] R2H892.	2.3	2.5	50	63,5 x 127	0,70	-	F
CLZ-FPT-69/5-HD	[C] R2H896.	4.6	5	50	63,5 x 175	0,80	-	F
Terminal block, Un = 3 x 690 V / 50 Hz								
CLZ-FP-69/7,5-HD	[C] R2H598.	6.9	7.5	50	85 x 175	0,95	1	A
CLZ-FP-69/10-HD	[C] R2H59B.	9.15	10	50	85 x 245	1,00	1	A
CLZ-FP-69/12,5-HD	[C] R2H59D.	11.4	12.5	50	85 x 245	1,10	1	A
CLZ-FP-69/15-HD	[C] R2H59E.	13.7	15	50	85 x 245	1,20	1	A
CLZ-FP-69/20-HD	[C] R2H59J.	18.3	20	50	100 x 245	1,70	7	A
CLZ-FP-69/25-HD	[C] R2H59L.	22.9	25	50	116 x 245	1,90	2	B
CLZ-FP-69/30-HD	[C] R2H59N.	27.5	30	50	136 x 220	3,30	-	B
CLZ-FP-69/40-HD	[C] R2H59R.	36.6	40	50	136 x 355	5,00	-	C
CLZ-FP-69/50-HD	[C] R2H59S.	45.75	50	50	136 x 355	5,50	-	C

All models are of the inert gas type, except for those with a 63.5 mm diameter and 136x355 mm size The dimensions (dxh) are shown for the tube only. Please consult the dimensions drawing at the end of this section for more information about the actual dimensions Terminal: maximum cross-section of type A cables: 16 mm2, type B: 25 mm2, type C: 35 mm2, F: Faston 6.3x0.8 mm and 12 A maximum current

CLZ-FP HD 60Hz

Three-phase tubular power capacitor (Heavy Duty range)

CLZ-FPT - Capacitors with Faston terminal / CLZ-FP - Capacitors with with terminal block

Type	Code	230 V kvar	240 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 240 V / 60 Hz								
CLZ-FPT-24/2,5-60Hz-HD	[C] R2H622.	2.3	2.5	60	63,5 x 127	0,57	-	F
Terminal block, Un = 3 x 240 V / 60 Hz								
CLZ-FP-24/5-60Hz-HD	[C] R2H626.	4.6	5	60	85 x 175	0,85	1	A
CLZ-FP-24/6,25-60Hz-HD	[C] R2H627.	5.75	6.25	60	85 x 175	0,84	1	A
CLZ-FP-24/7,5-60Hz-HD	[C] R2H628.	6.9	7.5	60	85 x 245	0,96	1	A
CLZ-FP-24/10-60Hz-HD	[C] R2H62B.	9.2	10	60	85 x 245	1,06	1	A
CLZ-FP-24/12,5-60Hz-HD	[C] R2H62D.	11.5	12.5	60	85 x 245	1,25	1	A
CLZ-FP-24/15-60Hz-HD	[C] R2H62E.	13.8	15	60	100 x 245	1,51	7	A

Type	Code	400 V kvar	440 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 440 V / 60 Hz								
CLZ-FPT-44/1,25-60Hz-HD	[C] R2H641.	1	1.25	60	63,5 x 98	0,37	-	F
CLZ-FPT-44/2,5-60Hz-HD	[C] R2H642.	2.1	2.5	60	63,5 x 127	0,44	-	F
CLZ-FPT-44/3-60Hz-HD	[C] R2H643.	2.5	3	60	63,5 x 127	0,50	-	F
CLZ-FPT-44/3,75-60Hz-HD	[C] R2H644.	3.1	3.75	60	63,5 x 127	0,44	-	F
CLZ-FPT-44/5-60Hz-HD	[C] R2H646.	4.15	5	60	63,5 x 127	1,20	-	F
Terminal block, Un = 3 x 440 V / 60 Hz								
CLZ-FP-44/6,25-60Hz-HD	[C] R2H647.	5.2	6.25	60	85 x 175	0,67	1	A
CLZ-FP-44/7,5-60Hz-HD	[C] R2H648.	6.2	7.5	60	85 x 175	0,75	1	A
CLZ-FP-44/10-60Hz-HD	[C] R2H64B.	8.3	10	60	85 x 175	0,87	1	A
CLZ-FP-44/12,5-60Hz-HD	[C] R2H64D.	10.3	12.5	60	85 x 245	0,90	1	A
CLZ-FP-44/15-60Hz-HD	[C] R2H64E.	12.4	15	60	85 x 245	0,98	1	A
CLZ-FP-44/20-60Hz-HD	[C] R2H64J.	16.5	20	60	85 x 245	1,14	1	A
CLZ-FP-44/25-60Hz-HD	[C] R2H64L.	20.7	25	60	100 x 245	1,46	7	A
CLZ-FP-44/30-60Hz-HD	[C] R2H64N.	24.8	30	60	116 x 245	1,78	2	B
CLZ-FP-44/40-60Hz-HD	[C] R2H64R.	33.1	40	60	136 x 220	2,38	-	B
CLZ-FP-44/50-60Hz-HD	[C] R2H64S.	41.3	50	60	136 x 355	5,10	-	C

Type	Code	460 V kvar	480 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 480 V / 60 Hz								
CLZ-FPT-48/2,5-60Hz-HD	[C] R2H762.	2.3	2.5	60	63,5 x 127	0,47	-	F
CLZ-FPT-48/5-60Hz-HD	[C] R2H766.	4.6	5	60	63,5 x 175	0,62	-	F
CLZ-FPT-48/6,25-60Hz-HD	[C] R2H767.	5.75	6.25	60	63,5 x 175	0,90	-	F
CLZ-FPT-48/7,5-60Hz-HD	[C] R2H768.	6.9	7.5	60	63,5 x 175	0,61	-	F
Terminal block, Un = 3 x 480 V / 60 Hz								
CLZ-FP-48/10-60Hz-HD	[C] R2H66B.	9.2	10	60	85 x 175	0,85	1	A
CLZ-FP-48/12,5-60Hz-HD	[C] R2H66D.	11.5	12.5	60	85 x 245	0,97	1	A
CLZ-FP-48/15-60Hz-HD	[C] R2H66E.	13.8	15	60	85 x 245	1,07	1	A
CLZ-FP-48/20-60Hz-HD	[C] R2H66J.	18.4	20	60	100 x 245	1,32	7	A
CLZ-FP-48/25-60Hz-HD	[C] R2H66L.	23	25	60	100 x 245	1,57	2	B
CLZ-FP-48/30-60Hz-HD	[C] R2H66N.	27.6	30	60	116 x 245	1,86	2	B
CLZ-FP-48/40-60Hz-HD	[C] R2H66R.	36.75	40	60	136 x 220	2,43	-	B
CLZ-FP-48/50-60Hz-HD	[C] R2H66S.	46	50	60	136 x 355	5,00	-	C

Type	Code	480 V kvar	525 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 525 V / 60 Hz								
CLZ-FPT-52/2,5-60Hz-HD	[C] R2H772.	2.1	2.5	60	63,5 x 127	0,45	-	F
CLZ-FPT-52/5-60Hz-HD	[C] R2H776.	4.2	5	60	63,5 x 175	3,00	-	F
CLZ-FPT-52/6,25-60Hz-HD	[C] R2H777.	5.2	6.25	60	63,5 x 175	0,72	-	F
CLZ-FPT-52/7,5-60Hz-HD	[C] R2H778.	6.25	7.5	60	63,5 x 202	0,33	-	F
Terminal block, Un = 3 x 525 V / 60 Hz								
CLZ-FP-52/8,5-60Hz-HD	[C] R2H67A.	7.1	8.5	60	85 x 175	0,85	1	A
CLZ-FP-52/10-60Hz-HD	[C] R2H67B.	8.4	10	60	85 x 175	0,91	1	A
CLZ-FP-52/11,5-60Hz-HD	[C] R2H67C.	9.6	11.5	60	85 x 245	0,97	1	A
CLZ-FP-52/12,5-60Hz-HD	[C] R2H67D.	10.5	12.5	60	85 x 245	0,99	1	A
CLZ-FP-52/15-60Hz-HD	[C] R2H67E.	12.5	15	60	85 x 245	1,11	1	A
CLZ-FP-52/17-60Hz-HD	[C] R2H67I.	14.2	17	60	85 x 245	1,17	1	A
CLZ-FP-52/20-60Hz-HD	[C] R2H67J.	16.7	20	60	100 x 245	1,45	7	A
CLZ-FP-52/22,5-60Hz-HD	[C] R2H67K.	18.8	22.5	60	100 x 245	1,50	7	A
CLZ-FP-52/25-60Hz-HD	[C] R2H67L.	20.9	25	60	100 x 245	1,66	7	A
CLZ-FP-52/30-60Hz-HD	[C] R2H67N.	25	30	60	116 x 245	1,95	2	B
CLZ-FP-52/34-60Hz-HD	[C] R2H67P.	28.4	34	60	116 x 245	2,13	2	B
CLZ-FP-52/40-60Hz-HD	[C] R2H67R.	33.4	40	60	136 x 261	5,00	-	B

All models are of the inert gas type, except for those with a 63.5 mm diameter and 136x355 mm size The dimensions (dxh) are shown for the tube only. Please consult the dimensions drawing at the end of this section for more information about the actual dimensions Terminal: maximum cross-section of type A cables: 16 mm2, type B: 25 mm2, type C: 35 mm2, F: Faston 6.3x0.8 mm and 12 A maximum current

CLZ-FP HD 60Hz

Three-phase tubular power capacitor (Heavy Duty range)

CLZ-FPT - Capacitors with Faston terminal / CLZ-FP - Capacitors with with terminal block

Type	Code	600 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 600 V / 60 Hz							
CLZ-FPT-60/2,5-60Hz-HD	[C] R2H782.	2.5	60	63,5 x 127	0,70	-	F
CLZ-FPT-60/5-60Hz-HD	[C] R2H786.	5	60	63,5 x 175	1,20	-	F
CLZ-FPT-60/6,25-60Hz-HD	[C] R2H787.	6.25	60	63,5 x 175	0,90	-	F
CLZ-FPT-60/7,5-60Hz-HD	[C] R2H788.	7.5	60	63,5 x 175	1,20	-	F
Terminal block, Un = 3 x 600 V / 60 Hz							
CLZ-FP-60/10-60Hz-HD	[C] R2H68A.	10	60	85 x 175	1,50	1	A
CLZ-FP-60/12,5-60Hz-HD	[C] R2H68B.	12.5	60	85 x 245	1,50	1	A
CLZ-FP-60/15-60Hz-HD	[C] R2H68E.	15	60	85 x 245	1,30	1	A
CLZ-FP-60/17,5-60Hz-HD	[C] R2H68I.	17.5	60	85 x 245	1,25	1	A
CLZ-FP-60/20-60Hz-HD	[C] R2H68J.	20	60	100 x 245	1,60	7	A
CLZ-FP-60/21-60Hz-HD	[C] R2H68K.	21	60	100 x 245	1,60	7	A
CLZ-FP-60/25-60Hz-HD	[C] R2H68L.	25	60	100 x 245	1,60	7	A
CLZ-FP-60/30-60Hz-HD	[C] R2H68N.	30	60	116 x 245	2,40	2	B
CLZ-FP-60/34,5-60Hz-HD	[C] R2H68P.	34.5	60	136 x 261	3,00	-	B

Type	Code	660 V kvar	690 V kvar	Hz	dia.x height (mm)	weight (kg)	Cover (opc.)	Terminal
Faston terminal, Un = 3 x 690 V / 60 Hz								
CLZ-FPT-69/2,5-60Hz-HD	[C] R2H792.	2.3	2.5	60	63,5 x 127	0,50	-	F
CLZ-FPT-69/5-60Hz-HD	[C] R2H796.	4.6	5	60	63,5 x 175	1,00	-	F
CLZ-FPT-69/7,5-60Hz-HD	[C] R2H798.	6.9	7.5	60	63,5 x 202	1,10	-	F
Terminal block, Un = 3 x 690 V / 60 Hz								
CLZ-FP-69/10-60Hz-HD	[C] R2H69B.	9.15	10	60	85 x 245	1,50	1	A
CLZ-FP-69/12,5-60Hz-HD	[C] R2H69D.	11.4	12.5	60	85 x 245	1,50	1	A
CLZ-FP-69/15-60Hz-HD	[C] R2H69E.	13.7	15	60	85 x 245	1,40	1	A
CLZ-FP-69/20-60Hz-HD	[C] R2H69J.	18.3	20	60	100 x 245	2,00	7	A
CLZ-FP-69/25-60Hz-HD	[C] R2H69L.	22.9	25	60	116 x 245	1,76	2	B
CLZ-FP-69/30-60Hz-HD	[C] R2H69N.	27.5	30	60	116 x 245	2,50	2	B
CLZ-FP-69/40-60Hz-HD	[C] R2H69R.	36.6	40	60	136 x 220	3,00	-	B
CLZ-FP-69/50-60Hz-HD	[C] R2H69S.	45.75	50	60	136 x 355	5,00	-	C

All models are of the inert gas type, except for those with a 63.5 mm diameter and 136x355 mm size The dimensions (dxh) are shown for the tube only. Please consult the dimensions drawing at the end of this section for more information about the actual dimensions Terminal: maximum cross-section of type A cables: 16 mm2, type B: 25 mm2, type C: 35 mm2, F: Faston 6.3x0.8 mm and 12 A maximum current

CMC B

CMC-B contactors

Type	Code	220-240V kvar	400-440-480 V kvar	500-550 V kvar	660-690 V kvar	Hz	Size (mm) width x height x depth	weight (kg)
Maximum operating power (Kvar)								
CMC 7.5 B	[C] R281A5.	5	7.5	9	11	50 / 60	44.8x72.2x71	0,28
CMC 12 B	[C] R281A6.	6.7	12.5	15	18	50 / 60	44.8x72.2x107.9	0,32
CMC 20 B	[C] R281A4.	11	20	24	30	50 / 60	54.8x72.2x107.9	0,38
CMC 32 B	[C] R281A8.	14	25	30	35	50 / 60	54.6x80x121.4	0,47
CMC 40 B	[C] R281A1.	20	30	35	40	50 / 60	54.8x80x124.5	0,60
CMC 75 B	[C] R281A9.	29	50	60	70	50 / 60	64.6x120x150	1,00
CMC 85 B	[C] R281A3.	32	60	70	80	50 / 60	64.6x120x150	0,85
CMC 150 B	[C] R281AD.	45	80	100	115	50 / 60	130x158x145	2,40

RD

Fast discharging resistors

Type	Code	Impedance (Ω)	Dissipated power (w)
RD-60 2X1000	[*] R3Z220.	2 x 1000	10
RD-100 2X1000	[*] R3Z230.	2 x 1000	15

IR

Current limiting impedances

Type	Code	Cable section (mm2)
IR-6	[*] R3Z310.	6
IR-10	[*] R3Z320.	10
IR-25	[*] R3Z330.	25
IR-35	[*] R3Z340.	35
IR-50	[*] R3Z350.	50

ELEB

CSB coils

Type	Code	Use voltage (V)	µF
ELEB10100PCA	[1] R213A8.	230	100
ELEB10150PCA	[1] R213AE.	230	150
ELEB14055PCA	[1] R2139D.	400/440/690(*)	55
ELEB14069PCA	[1] R2139H.	400/440/690(*)	69
ELEB14082PCA	[1] R2139R.	400/440/690(*)	82

Type	Code	Use voltage (V)	µF
ELEB18027PCA	[1] R2137T.	460	27.4
ELEB18035PCA	[1] R2137A.	460	35
ELEB18050PCA	[1] R2137P.	460	50
ELEB20019PCA	[1] R2138D.	480/525/550	19.2
ELEB20038PCA	[1] R2138G.	480/525/550	38.4

(*) Wye (star) connection

CSB

Power capacitors for LV

Type	Code	kvar 50 Hz	kvar 60 Hz	Size (mm) width x height x depth	weight (kg)
230 Vac					
CSB-23/10	[*] R2321C.	10	12.5	359x330x120	6,37
CSB-23/12,5	[2] R2321D.	12.5	15	360x330x120	3,30
CSB-23/15	[*] R2321E.	15	17.5	360x330x120	6,00
CSB-23/20	[*] R2321F.	20	25	360x330x120	6,80
CSB-23/25	[2] R2321G.	25	30	360x330x120	7,90
CSB-23/30	[2] R2321H.	30	35	360x330x120	8,00
CSB-23/40	[*] R2321J.	40	50	360x520x120	12,00
CSB-23/50	[*] R2321K.	50	60	360x520x120	12,00
400 Vac					
CSB-40/15	[*] R2323E.	15	17.5	360x330x120	5,76
CSB-40/20	[*] R2323F.	20	25	360x330x120	6,01
CSB-40/25	[*] R2323G.	25	30	360x330x120	5,68
CSB-40/30	[*] R2323H.	30	35	360x330x120	6,70
CSB-40/40	[*] R2323J.	40	50	360x330x120	7,70
CSB-40/50	[*] R2323K.	50	60	360x330x120	7,60
CSB-40/60	[*] R2323L.	60	70	360x520x120	10,80
CSB-40/80	[*] R2323Q.	80	95	360x520x120	12,85
CSB-40/100	[*] R2323R.	100	120	360x520x120	13,50
440 Vac					
CSB-44/15	[*] R2324E.	15	17.5	360x330x120	4,70
CSB-44/20	[*] R2324F.	20	25	360x330x120	4,90
CSB-44/25	[2] R2324G.	25	30	360x330x120	5,90
CSB-44/30	[*] R2324H.	30	35	360x330x120	5,60
CSB-44/40	[*] R2324J.	40	50	360x330x120	7,00
CSB-44/50	[*] R2324K.	50	60	360x330x120	7,80
CSB-44/60	[*] R2324L.	60	70	360x330x120	7,30
CSB-44/80	[*] R2324Q.	80	95	360x520x120	11,80
CSB-44/100	[*] R2324R.	100	120	360x520x120	12,90
460 Vac					
CSB-46/15	[2] R2325E.	15	17.5	360x330x120	6,00
CSB-46/20	[*] R2325F.	20	25	360x330x120	6,11
CSB-46/25	[2] R2325G.	25	30	360x330x120	6,90
CSB-46/30	[*] R2325H.	30	35	360x330x120	6,95
CSB-46/40	[*] R2325J.	40	50	360x330x120	7,60
CSB-46/50	[*] R2325K.	50	60	360x520x120	8,20
CSB-46/60	[*] R2325L.	60	70	360x520x120	11,40
CSB-46/80	[*] R2325Q.	80	95	360x520x120	13,00
CSB-46/100	[*] R2325R.	100	120	360x610x120	16,00
480 Vac					
CSB-48/10	[C] R277AC.	8	10	360x330x120	12,00
CSB-48/15	[C] R277AE.	12.5	15	360x330x120	7,10
CSB-48/20	[C] R277AF.	16.7	20	360x330x120	12,00
CSB-48/25	[C] R277AG.	20.8	25	360x330x120	12,00
CSB-48/30	[C] R277AH.	25	30	360x330x120	12,00
CSB-48/40	[C] R277AJ.	33.3	40	360x330x120	12,00
CSB-48/50	[C] R277AK.	41.7	50	360x520x120	12,00
CSB-48/60	[C] R277AL.	50	60	360x520x120	12,00
525 Vac					
CSB-52/10	[C] R2326C.	10	12.5	360x330x120	2,60
CSB-52/15	[C] R2326E.	15	17.5	360x330x120	3,30
CSB-52/20	[C] R2326F.	20	25	360x330x120	3,30
CSB-52/25	[C] R2326G.	25	30	360x330x120	7,10
CSB-52/30	[C] R2326H.	30	35	360x330x120	13,00
CSB-52/40	[C] R2326J.	40	50	360x330x120	8,50
CSB-52/50	[C] R2326K.	50	60	360x520x120	10,80
CSB-52/60	[C] R2326L.	60	70	360x520x120	11,70
CSB-52/70	[C] R2326M.	70	85	360x520x120	12,00
690 Vac					
CSB-69/10	[3] R232BC.	10	12.5	360x330x120	2,60
CSB-69/15	[3] R232BE.	15	17.5	360x330x120	3,30
CSB-69/20	[3] R232BF.	20	25	360x330x120	5,00
CSB-69/25	[3] R232BG.	25	30	360x330x120	3,30
CSB-69/30	[3] R232BH.	30	35	360x330x120	4,20
CSB-69/40	[3] R232BJ.	40	50	360x330x120	5,00
CSB-69/50	[3] R232BK.	50	60	360x330x120	8,10
CSB-69/60	[3] R232BL.	60	70	360x520x120	13,80
CSB-69/80	[3] R232BQ.	80	95	360x520x120	11,00
CSB-69/100	[3] R232BR.	100	0	360x520x120	9,00

1100 VAC for low-voltage networks (≤ 1000 VAC)

CFB

Power capacitors for detuned filters, type P=7% (fres=189 Hz)

Type	Code	400 V kvar	440 V kvar	690 V kvar	For reactor	Size (mm) width x height x depth	weight (kg)
CFB 460							
CFB-46/6	[1] R2415A.	5	6.25	-	RZ-6,25-460	360x330x120	3,30
CFB-46/12,5	[1] R2415D.	10	12.5	-	RZ-10-400	360x330x120	6,00
CFB-46/15	[1] R2415E.	12.5	15	-	RZ-12,5-400	360x330x120	3,90
CFB-46/19	[1] R2415F.	15	18.5	-	RZ-15-400	360x330x120	5,80
CFB-46/25	[1] R2415G.	20	25	-	RBZ-20-400	360x330x120	6,80
CFB-46/30	[1] R2415H.	25	30	-	RBZ-25-400	360x330x120	6,80
CFB-46/37	[1] R2415J.	30	40	-	RBZ-30-400	360x330x120	7,60
CFB-46/50	[*] R2415K.	40	50	-	RBZ-40-400	360x520x120	10,50
CFB-46/62	[*] R2415L.	50	60	-	RBZ-50-400	360x520x120	11,00
CFB-46/74	[*] R2415P.	60	75	-	RBZ-60-400	360x520x120	12,90
CFB-46/100	[*] R2415R.	80	100	-	RBZ-80-400	360x610x120	16,10
CFB 790							
CFB-79/6	[C] R241DA.	-	-	5	REZ-5-400	360x330x120	2,60
CFB-79/12,5	[C] R241DD.	-	-	10	REZ-10-400	360x330x120	2,60
CFB-79/19	[C] R241DF.	-	-	15	REZ-15-400	360x330x120	3,30
CFB-79/25	[C] R241DG.	-	-	20	REZ-20-400	360x330x120	6,10
CFB-79/30	[C] R241DH.	-	-	25	REZ-25-400	360x330x120	7,00
CFB-79/37	[C] R241DI.	-	-	30	REZ-30-400	360x330x120	7,00
CFB-79/50	[C] R241DK.	-	-	40	REZ-40-400	360x520x120	11,00
CFB-79/62	[C] R241DL.	-	-	50	RBEZ-50-400	360x520x120	13,00
CFB-79/74	[C] R241DP.	-	-	60	RBEZ-60-400	360x520x120	14,00
CFB-79/100	[C] R241DR.	-	-	80	RBEZ-80-400	360x610x120	15,00

NOTE: The capacitor has been sized for 460/790 V and a power that is 20% higher than that indicated in all columns to compensate for the overvoltage effect of the reactor.

RZ-RBZ

Reactors III for detuned filters

Type	Code	400 V kvar	Hz	For capacitor	In (A)	L(mH)	Losses (W)	Size (mm) width x height x depth	weight (kg)
400 Vac, 50 Hz, f resonance = 189 Hz / p= 7%									
RZ-5-400	[*] P73110.	5	50	CLZ-FP-46/6,25	7,2	7.66	26	155x165x92	4,00
RZ-6,25-400	[*] P73112.	6.25	50	CLZ-FP-52/10	9	6.1	33	180x190x100	6,00
RZ-10-400	[*] P73115.	10	50	CLZ-FP-46/12,5	15	3.83	52	180x190x100	6,50
RZ-12,5-400	[*] P73117.	12.5	50	CLZ-FP-46/15	18	3.05	57	180x192x110	7,00
RZ-15-400	[*] P73120.	15	50	CLZ-FP-46/19	22	2.55	59	180x190x110	8,00
RBZ-20-400	[*] P73125.	20	50	CLZ-FP-46/25	29	1.91	79	235x165x125	14,00
RBZ-25-400	[*] P73130.	25	50	CLZ-FP-46/30	36	1.53	93	235x165x125	14,00
RBZ-30-400	[*] P73135.	30	50	2 x CLZ-FP-46/19	43	1.27	124	255x200x125	19,00
RBZ-40-400	[*] P73140.	40	50	2 x CLZ-FP-46/25	58	0.95	149	255x200x125	20,00
RBZ-50-400	[*] P73145.	50	50	2 x CLZ-FP-46/30	72	0.76	189	255x220x145	25,00
RBZ-60-400	[*] P73150.	60	50	3 x CLZ-FP-46/25	87	0.63	210	255x240x145	28,00
RBZ-80-400	[*] P73155.	80	50	3 x CLZ-FP-46/33,3	115	0.48	241	305x255x155	31,00
400 Vac, 50 Hz, f resonance = 134 Hz / p= 14%									
RZ-5-400-14%	[C] P731100000300	5	50	CLZ-FP-52/7,5-HD | CFB-52/7,5	7,2	16.31	62	180x195x100	6,00
RZ-10-400-14%	[C] P731150000300	10	50	CLZ-FP-52/15-HD | CFB-52/15	15	8.15	91	250x245x130	16,00
RZ-12,5-400-14%	[C] P731170000300	12.5	50	CLZ-FP-52/20-HD | CFB-52/19	18	6.52	130	250x245x130	16,00
RZ-15-400-14%	[C] P731200000300	15	50	CLZ-FP-52/25-HD | CFB-52/23	22	5.43	130	250x245x145	20,00
RZ-20-400-14%	[C] P731250000300	20	50	CLZ-FP-52/30-HD | CFB-52/30	29	4.07	150	250x245x145	21,00
RBZ-25-400-14%	[C] P731300000300	25	50	CLZ-FP-52/12,5-HD + CLZ-FP-52/30-HD | CFB-52/38	36	3.26	168	250x245x145	22,00
RBZ-30-400-14%	[C] P731350000300	30	50	CLZ-FP-52/25-HD + CLZ-FP-52/20-HD | CFB-52/46	43	2.71	191	300x255x155	36,00
RBZ-40-400-14%	[C] P731400000300	40	50	2 x CLZ-FP-52/30-HD | CFB-52/60,5	58	2.03	267	345x255x155	40,00
RBZ-50-400-14%	[C] P731450000300	50	50	3 x CLZ-FP-52/25-HD | CFB-52/76	72	1.63	341	345x275x175	52,00
RBZ-60-400-14%	[C] P731500000300	60	50	3 x CLZ-FP-52/30-HD | CFB-52/91	87	1.35	421	375x275x185	61,00

RZ-RBZ-60Hz

Reactors III for detuned filters, 60 Hz

Type	Code	480 V kvar	Hz	For capacitor	L(mH)	weight (kg)
480 Vac, 60 Hz, f resonance = 227 Hz / p= 7%						
RZ-7,5-480-60 Hz-7%	[C] P731130017000	7.5	60	CLZ-FP-52/8,5-60Hz-HD	6.12	4,00
RZ-10-480-60Hz-7%	[C] P731150017000	10	60	CLZ-FP-52/11,5-60Hz-HD	4.58	5,00
RZ-12,5-480-60 Hz-7%	[C] P731170017000	12.5	60	CLZ-FP-52/15-60Hz-HD	3.66	6,00
RZ-15-480-60 Hz-7%	[C] P731200017000	15	60	CLZ-FP-52/17-60Hz-HD	3.06	7,00
RBZ-20-480-60Hz-7%	[C] P731250017000	20	60	CLZ-FP-52/22,5-60Hz-HD	2.29	15,00
RBZ-25-480-60 Hz-7%	[C] P731300017000	25	60	CLZ-FP-52/30-60Hz-HD	1.83	18,00
RBZ-30-480-60 Hz-7%	[C] P731350017000	30	60	CLZ-FP-52/34-60Hz-HD	1.53	18,00
RBZ-40-480-60Hz-7%	[C] P731400017000	40	60	2 x CLZ-FP-52/22,5-60Hz-HD	1.15	20,00
RBZ-50-480-60 Hz-7%	[C] P731450017000	50	60	2 x CLZ-FP-52/30 -60Hz-HD	0.92	24,00
RBZ-60-480-60 Hz-7%	[C] P731500017000	60	60	2 x CLZ-FP-52/34-60Hz-HD	0.76	25,00
RBZ-80-480-60Hz-7%	[C] P731550017000	80	60	3 x CLZ-FP-52/30-60Hz-HD	0.58	35,00
480 Vac, 60 Hz, f resonance = 160 Hz / p= 14%						
RZ-12,5-480-60Hz-14%	[C] P731170017300	12.5	60	CLZ-FP-60/17,5-60Hz-HD	7.81	16,00
RZ-15-480-60Hz-14%	[C] P731200017300	15	60	CLZ-FP-60/21-60Hz-HD	6.52	16,00
RBZ-25-480-60Hz-14%	[C] P731300017300	25	60	CLZ-FP-60/34,5-60Hz-HD	3.91	26,00
RBZ-30-480-60Hz-14%	[C] P731350017300	30	60	2 x CLZ-FP-60/21-60Hz-HD	3.26	41,00
RBZ-50-480-60Hz-14%	[C] P731450017300	50	60	2 x CLZ-FP-60/34,5-60Hz-HD	1.95	51,00

TABLE OF ADDITIONAL FEATURES

RZ, RBZ

P	7	X	X	X	X	0	0	X	X	X	
Code						Internal code					Delivery time
Frequency			Standard (50 Hz)					0			=
			60 Hz					1			C
Voltage			Standard (400 $V_{c.a.}$)						0		-
			230 $V_{c.a.}$						1		C
			Other voltages						C		C
Factor P %			Standard (7 %)							0	-
			5,67 %							4	C
			8,7 %							6	C
			14 %							3	C

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

CFB-6B

Power capacitors for harmonics filters with static switching operation of the FRE series

Capacitors with 6 terminals for CPCb boards. f resonance = 189 Hz

Type	Code	400 V kvar	440 V kvar	For reactor	Size (mm) width x height x depth	weight (kg)
400 Vac						
CFB-46/6-6B	[C] R2425A.	5	6.25	REZ-5-400	360x330x120	3,30
CFB-46/12,5-6B	[C] R2425D.	10	12.5	REZ-10-400	360x330x120	3,90
CFB-46/19-6B	[C] R2425F.	15	18.5	REZ-15-400	360x330x120	3,90
CFB-46/25-6B	[C] R2425G.	20	25	REZ-20-400	360x330x120	7,10
CFB-46/30-6B	[C] R2425H.	25	30	REZ-25-400	360x330x120	4,60
CFB-46/37-6B	[C] R2425J.	30	40	REZ-30-400	360x330x120	7,10
CFB-46/50-6B	[C] R2425K.	40	50	REZ-40-400	360x520x120	10,70
CFB-46/62-6B	[C] R2425L.	50	60	RBEZ-50-400	360x520x120	11,00
CFB-46/74-6B	[C] R2425P.	60	75	RBEZ-60-400	360x520x120	13,00
CFB-46/100-6B	[C] R2425R.	80	100	RBEZ-80-400	360x610x120	16,30

NOTE: The capacitor has been sized for 460/260 V and a power that is 20 % higher than that indicated in kvar columns to compensate for the overvoltage effect of the reactor.

New

REZ-RBEZ

Reactors III for detuned static filters for FRE static switching bank

For capacitors with 6 terminals

Type	Code	400 V kvar	Hz	For capacitor	In (A)	L(mH)	Losses (W)	Size (mm) width x height x depth	weight (kg)
400 V, 50 Hz, f resonance = 189 Hz / p= 7%									
REZ-5-400	[4] P73210.	5	50	CFB-46/6-6B	5 A	23.67	63	90x155x150	4,00
REZ-10-400	[4] P73215.	10	50	CFB-46/12,5-6B	9 A	11.27	69	110x195x180	7,00
REZ-15-400	[4] P73220.	15	50	CFB-46/19-6B	13 A	7.5	70	120x195x180	9,00
REZ-20-400	[4] P73225.	20	50	CFB-46/25-6B	17 A	5.68	91	130x245x250	15,00
REZ-25-400	[4] P73230.	25	50	CFB-46/30-6B	21 A	4.68	110	130x245x250	16,00
REZ-30-400	[4] P73235.	30	50	CFB-46/37-6B	26 A	3.84	109	130x245x250	17,00
RBEZ-40-400	[4] P73240.	40	50	CFB-46/50-6B	35 A	2.84	179	180x235x300	30,00
RBEZ-50-400	[4] P73245.	50	50	CFB-46/62-6B	42 A	2.29	189	180x235x300	30,00
RBEZ-60-400	[4] P73250.	60	50	CFB-46/74-6B	51 A	1.89	252	180x235x300	30,00
RBEZ-80-400	[4] P73255.	80	50	CFB-46/100-6B	68 A	1.42	263	195x255x345	40,00

Supplement selection table to adapt **CSB / CFB** capacitor height to a capacitor bank equipped with **CS / CF** capacitors

CS / CF Capacitor TO REPLACE		**CSB / CFB** capacitor				
Total capacitor height (box + terminals) (mm)	Height box capacitor (mm)	Total heigh of capacitor (box+terminals) (mm)	Capacitor box height (mm)			
390	330	330	270	**SP-60**	[*] **R2ZZZ1**	
610	550	520	460	**SP-90**	[*] **R2ZZZ2**	
760	700	610	550	**SP-150**	[*] **R2ZZZ3**	

TABLE OF ADDITIONAL FEATURES

REZ, RBEZ

P	7	X	X	X	X	0	0	X	X	X	
Code						Internal code					Delivery time
Frequency								0			-
								1			C
Voltage									0		-
									1		C
									C		C
Factor P %										0	-
										4	C
										6	C
										3	C

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Basic fixed compensation

CLP

CLZ Power capacitor with miniature circuit breaker, 50 Hz

Type	Code	440 V kvar	Hz	In (A)	Cut off power	IP	Size (mm) width x height x depth	weight (kg)
440 Vac / 50Hz								
CLP-44/2,5	[2] R21574.	2.5	50	3.28	6 kA	20	80x350x85	1,20
CLP-44/3	[2] R21575.	3	50	3.94	6 kA	20	80x350x85	1,20
CLP-44/5	[2] R21578.	5	50	6.57	6 kA	20	80x350x85	1,20
CLP-44/6,25	[2] R21579.	6.25	50	8.21	6 kA	20	80x350x85	1,20

CLP-C

CLZ Capacitor with miniature circuit breaker and contactor, 50 Hz

Type	Code	440 V kvar	Hz	In (A)	Cut off power	IP	Size (mm) width x height x depth	weight (kg)
440 Vac / 50Hz								
CLP-C-44/2,5	[C] R22574.	2.5	50	3.28	6 kA	20	215x490x147	1,20
CLP-C-44/3	[C] R22575.	3	50	3.94	6 kA	20	215x490x147	1,20
CLP-C-44/5	[C] R22578.	5	50	6.57	6 kA	20	215x490x147	1,20
CLP-C-44/6,25	[C] R22579.	6.25	50	8.21	6 kA	20	215x490x147	1,20
CLP-C-44/7,5	[C] R2257A.	7.5	50	9.85	6 kA	20	215x490x147	1,20
CLP-C-44/10	[C] R2257C.	10	50	13	6 kA	20	215x490x147	1,20
CLP-C-44/12,5	[C] R2257D.	12.5	50	16	6 kA	20	215x490x147	1,20
CLP-C-44/15	[C] R2257E.	15	50	20	6 kA	20	215x490x147	5,00
CLP-C-44/20	[C] R2257F.	20	50	26	6 kA	20	215x490x147	5,00
CLP-C-44/25	[C] R2257G.	25	50	33	6 kA	20	215x490x147	1,20

CSB-M

Power capacitors with miniature circuit breaker protection, 50 Hz

Type	Code	400 V kvar	440 V kvar	Cut off power	Aut.Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
440 Vac, 50 Hz								
CSB-M-5-440	[1] R23948.	4	5	6 kA	10	6	140x381x280	5,50
CSB-M-7,5-440	[1] R2394A.	6	7.5	6 kA	16	6	140x381x280	6,00
CSB-M-10-440	[1] R2394C.	8	10	6 kA	20	6	140x381x280	6,00
CSB-M-12,5-440	[*] R2394D.	10	12.5	6 kA	25	6	140x381x280	6,20
CSB-M-15-440	[1] R2394E.	12.5	15	6 kA	32	6	140x381x280	4,90
CSB-M-20-440	[*] R2394F.	17	20	6 kA	40	10	140x381x280	7,20
CSB-M-25-440	[*] R2394G.	21	25	6 kA	50	10	140x381x280	6,90
CSB-M-30-440	[*] R2394H.	25	30	6 kA	63	16	140x381x280	6,80
CSB-M-37,5-440	[*] R2394J.	31	37.5	10 kA	80	25	140x381x280	8,10
CSB-M-50-440	[*] R2394K.	42	50	10 kA	100	25	140x381x280	9,80
CSB-M-60-440	[*] R2394L.	50	60	10 kA	125	35	140x571x280	9,00
CSB-M-75-440	[*] R2394M.	66	75	10 kA	160	50	140x571x280	13,00

CSB-F

Power capacitors with fuse protection, 50 Hz.

Type	Code	400 V kvar	440 V kvar	Cut off power	Fuses (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
440 V, 50 Hz								
CSB-F-5-440	[1] R23958.	4	5	120 kA	16	6	140x381x280	7,00
CSB-F-7,5-440	[1] R2395A.	6	7.5	120 kA	20	6	140x381x280	7,50
CSB-F-10-440	[1] R2395C.	8	10	120 kA	25	6	140x381x280	7,80
CSB-F-12,5-440	[1] R2395D.	10	12.5	120 kA	35	6	140x381x280	8,10
CSB-F-15-440	[1] R2395E.	12.5	15	120 kA	50	6	140x381x280	8,30
CSB-F-20-440	[1] R2395F.	17	20	120 kA	50	10	140x381x280	8,00
CSB-F-25-440	[1] R2395G.	21	25	120 kA	50	10	140x381x280	8,00
CSB-F-30-440	[1] R2395H.	25	30	120 kA	80	16	140x381x280	8,00
CSB-F-37,5-440	[1] R2395J.	31	37.5	120 kA	100	25	140x381x280	9,22
CSB-F-50-440	[1] R2395K.	42	50	120 kA	125	25	140x381x280	10,00
CSB-F-60-440	[1] R2395L.	50	60	120 kA	160	35	140x571x280	10,00
CSB-F-75-440	[1] R2395P.	63	75	120 kA	160	50	140x571x280	13,00
CSB-F-100-440	[1] R2395Q.	80	100	120 kA	160	70	140x571x280	15,00

Advanced fixed compensation

New

CCF

CSB capacitor with contactor and fuses, 50 Hz

Type	Code	400 V kvar	440 V kvar	In (A)	Cut off power	Fuses (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
440 V / 50 Hz									
CCF-12,5-440	[1] R3SA21.	10	12.5	16	120 kA	35	6	360x814x196	12,00
CCF-15-440	[1] R3SA31.	12.5	15	20	120 kA	35	10	360x814x196	13,00
CCF-20-440	[1] R3SA41.	17	20	26	120 kA	50	10	360x814x196	14,00
CCF-25-440	[1] R3SA51.	21	25	33	120 kA	63	10	360x814x196	15,00
CCF-30-440	[1] R3SA61.	25	30	39	120 kA	80	16	360x814x196	15,00
CCF-37,5-440	[1] R3SA81.	31	37.5	49	120 kA	80	25	360x814x196	17,00
CCF-50-440	[1] R3SA91.	42	50	66	120 kA	125	35	360x814x196	21,00
CCF-60-440	[1] R3SAA1.	50	60	79	120 kA	160	50	360x1004x196	22,00
CCF-75-440	[1] R3SAB1.	63	75	99	120 kA	160	50	360x1004x196	24,00
CCF-100-440	[1] R3SAD1.	80	100	131	120 kA	160	70	360x1004x196	29,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the particularities of each installation and type of cable

New

CPA

Fixed capacitors with automatic 50-Hz switch protection

Type	Code	400 V kvar	440 V kvar	Cut off power	Aut.Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
CPA-15-440	[2] R24A3D.	12.5	15	50 kA	63	16	360x814x196	10,00
CPA-25-440	[2] R24A3H.	21	25	50 kA	63	16	360x814x196	16,00
CPA-37,5-440	[2] R24A3G.	31	37.5	50 kA	80	25	360x814x196	13,00
CPA-50-440	[2] R24A3J.	42	50	50 kA	100	25	360x814x196	15,00
CPA-60-440	[2] R24A3K.	50	60	50 kA	125	35	360x814x196	18,00
CPA-75-440	[2] R24A3L.	62	75	50 kA	160	50	360x1004x196	21,00
CPA-100-440	[2] R24A3M.	83	100	50 kA	200	70	360x1004x196	22,00
CPA-120-440	[2] R24A3N.	100	120	50 kA	250	95	360x1004x196	28,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the particularities of each installation and type of cable

OPTIM FRF

Fixed capacitors with detuned reactor of P = 7% (fres=189 Hz), 50 Hz

Type	Code	400 V kvar	440 V kvar	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM FRF, fuse protection APR, 440 V, 50 Hz						
OPTIM FRF-25-440	[2] R5X350.	21	25	10	650x1060x420	78,00
OPTIM FRF-37,5-440	[2] R5X370.	31	37.5	16	650x1060x420	82,00
OPTIM FRF-50-440	[2] R5X380.	42	50	25	650x1060x420	85,00
OPTIM FRF-60-440	[2] R5X390.	50	60	35	650x1060x420	90,00
OPTIM FRF-75-440	[2] R5X3A0.	62	75	50	650x1060x420	96,00
OPTIM FRF-100-440	[2] R5X3B0.	83	100	70	650x1060x420	110,00

See CFB capacitor and RZ /RBZ reactor components in the Low Voltage Capacitor and Reactor Section. Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the particularities of each installation and type of cable

OPTIM FRM

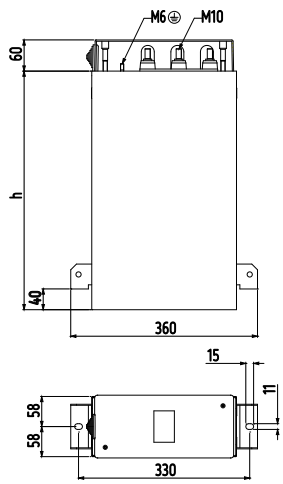
Fixed capacitors with detuned reactor of P = 7% (fres=189 Hz), 50 Hz

Type	Code	400 V kvar	440 V kvar	Cut off power	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM FRM, molded case circuit breaker protection, 440 V, 50 Hz							
OPTIM FRM-25-440	[2] R5Y350.	21	25	50 kA	10	650x1060x420	78,00
OPTIM FRM-37,5-440	[2] R5Y370.	31	37.5	50 kA	16	650x1060x420	82,00
OPTIM FRM-50-440	[2] R5Y380.	42	50	50 kA	25	650x1060x420	85,00
OPTIM FRM-60-440	[2] R5Y390.	50	60	50 kA	35	650x1060x420	90,00
OPTIM FRM-75-440	[2] R5Y3A0.	62	75	50 kA	50	650x1060x420	96,00
OPTIM FRM-100-440	[2] R5Y3B0.	83	100	50 kA	70	650x1060x420	110,00

See CFB capacitor and RZ /RBZ reactor components in the Low Voltage Capacitor and Reactor Section. Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the particularities of each installation and type of cable

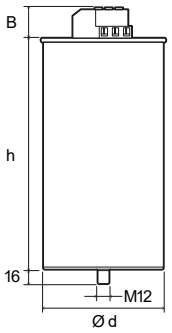
Dimensions

CSB / CFB



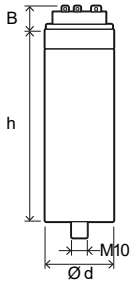
H (mm)
650
550
460
270

CLZ-FP



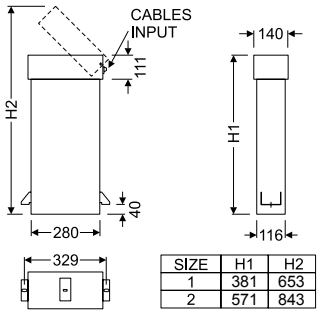
mm	d Ø	h	B	A Ø
85x175	85	175	31	90
85x245	85	245	31	90
100x245	100	245	31	105
116x245	116	245	35	121
136x220	136	220	35	141
136x261	136	261	35	141
136x355	136	355	46	141

CLZ-FPT



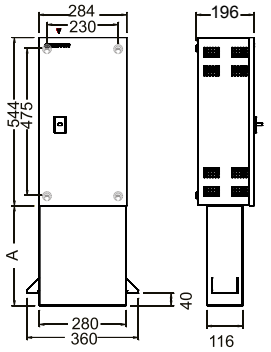
mm	d Ø	h	B	A Ø
63,5x98	63,5	98	13	68,5
63,5x127	63,5	127	13	68,5
63,5x175	63,5	175	13	68,5
63,5x202	63,5	202	13	68,5

CSB-F / CSB-M



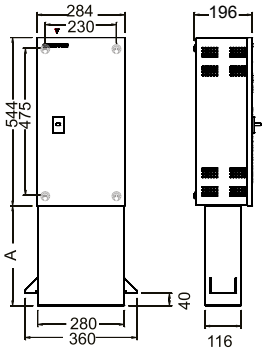
SIZE	H1	H2
1	381	653
2	571	843

CPA



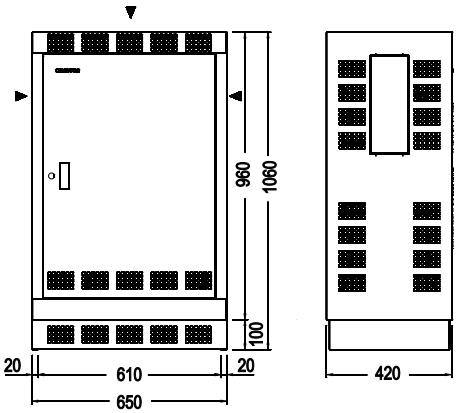
A
270
460

CCF



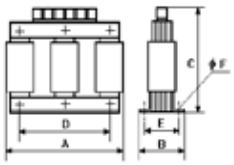
	A
ACF-40	324
ACF-60	549
ACF-80	699

OPTIM FRF / OPTIM FRM

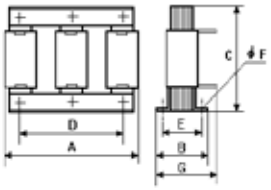


Dimensions

RZ / REZ



RBZ / RBEZ



Type	A mm	B mm	C mm	D* mm	E* mm	F mm	G mm	kg
RZ-5-400	155	76	165	75	55	7	--	4
RZ-6,24-400	180	112	190	90	75	7	--	6
RZ-10-400	180	112	190	90	75	7	--	6,5
RZ-12,5-400	180	112	190	90	85	7	--	7
RZ-15-400	180	110	190	90	85	7	--	8
RBZ-20-400	235	125	165	150	95	7	145	14
RBZ-25-400	235	125	165	150	95	7	145	14
RBZ-30-400	255	125	200	160	95	9	150	19
RBZ-40-400	255	125	200	160	95	9	150	20
RBZ-50-400	255	145	220	160	115	9	175	25
RBZ-60-400	255	145	240	180	115	9	175	28
RBZ-80-400	305	155	255	180	115	11	190	31

Type	A mm	B mm	C mm	D* mm	E* mm	F mm	G mm	kg
REZ-05-400	150	90	155	75	70	7	-	4
REZ-10-400	180	110	195	90	83	7	-	7
REZ-15-400	180	120	195	90	93	7	-	9
REZ-20-400	250	130	245	130	98	7	-	15
REZ-25-400	250	130	245	130	98	7	-	16
REZ-30-400	250	130	245	130	98	7	-	17
RBEZ-40-400	300	145	235	160	113	9	180	30
RBEZ-50-400	300	145	235	160	113	9	180	30
RBEZ-60-400	300	145	235	160	113	9	180	30
RBEZ-80-400	345	155	255	180	121	11	195	40

* Distance between fixings

Low voltage capacitor banks

Table: Selection of the reactive energy compensation unit

					Page
Multiple loads	Slow variations	Without harmonics	OPTIM P&P		130
		With harmonics	SVGm	Inmunity to harmonics	134
			OPTIM FR P&P	Elimination of resonances	132
	Fast variations	Without harmonics	OPTIM EMS-C / OPTIM EMK		135
		With harmonics	SVGm	Inmunity to harmonics	134
			OPTIM FRE	Elimination of resonances	135

Table: Selection of the OPTIM

		OPTIM 3 P&P / 5 P&P	**OPTIM 9 P&P / 8 P&P**	**OPTIM 8L / 14L / 16L**
Rated voltage		440 V	440 V	440 V
Service voltage		400 V	400 V	400 V
Power range at rated voltage		OPTIM 3: 12,5 ... 62,5 kvar OPTIM 5: 55 ... 150 kvar	OPTIM 9: 165 ... 270 kvar OPTIM 8: 300 ... 480 kvar	OPTIM 8L: 450 a 800 kvar OPTIM 14L: 900 a 1400 kvar OPTIM 16L: 1500 a 1600 kvar
Contactor switching		•	•	•
No. Steps (maximum)		3 / 5	9 / 8	8 / 14 / 16
Enclosure	Thermoplastic IP 21	–	–	–
	Metallic IP 21	•	•	•
Installation (indoor)		•	•	•
Assembly	Wall-mounted	•	–	–
	Floor-mounted	–	•	•
Regulator	computer C Wi-Fi	•	•	•
	computer Smart III	Optional	Optional	Optional
Capacitor	Cylindrical CLZ	•	•	•
Built-in protection	General miniature circuit breaker	OPTIM 3: General OPTIM 5: By step	–	–
	APR NH-00 Fuses	–	•	•
Autotransformer for aux. supply		–	•	•

Table: Recommended capacitor bank power ratings - 7.5 to 105 kvar

kvar	Recommended capacitor bank	Electrical steps (**kvar**)
7,5 ... 17,5 kvar	OPTIM 3-P&P-17,5-440	7 x 2,5
17,5 ... 31,25 kvar	OPTIM 3-P&P-31,25-440	5 x 6,25
31,25 ... 43,75 kvar	OPTIM 3-P&P-43,75-440	7 x 6,25
43,75 ... 55 kvar	OPTIM 5-P&P-55-440	11 x 5
55 ... 70 kvar	OPTIM 5-P&P-70-440	7 x 10
75 ... 105 kvar	OPTIM 5-P&P-105-440	15 + 3 x 30

OPTIM P&P

Automatic capacitor banks, 2.5 to 1600 kvar, 50 Hz.

Type	Code	400 V kvar	440 V kvar	Composition	Aut.Switch (A)	Man. Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM 3 P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM 3 P&P-12,5-440	[*] R3L110.	10	12.5	2,5+5+5	Included	-	6	400x600x260	18,00
OPTIM 3 P&P-17,5-440	[*] R3L120.	14	17.5	2,5+5+10	Included	-	6	400x600x260	18,00
OPTIM 3 P&P-25-440	[*] R3L130.	20	25	5+10+10	Included	-	10	400x600x260	18,00
OPTIM 3 P&P-31,25-440	[*] R3L140.	26	31.25	6,25+12,5+12,5	Included	-	10	400x600x260	18,00
OPTIM 3 P&P-37,5-440	[*] R3L150.	31.25	37.5	7,5+15+15	Included	-	16	400x600x260	18,00
OPTIM 3 P&P-43,75-440	[*] R3L160.	36	43.75	6,25+12,5+25	Included	-	25	400x600x260	18,00
OPTIM 3 P&P-52,5-440	[1] R3L170.	43	52.5	7,5+15+30	Included	-	25	400x600x260	20,00
OPTIM 3 P&P-62,5-440	[1] R3L180.	51	62.5	12,5+25+25	Included	-	35	400x600x260	40,00
OPTIM 5 P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM 5 P&P-55-440	[*] R3L210.	45	55	5+10+20+20	125	200	35	600x740x260	31,00
OPTIM 5 P&P-70-440	[*] R3L220.	58	70	10+3x20	125	200	50	600x740x260	31,00
OPTIM 5 P&P-90-440	[1] R3L230.	74	90	15+15+30+30	200	200	70	600x740x260	31,00
OPTIM 5 P&P-105-440	[*] R3L240.	87	105	15+30+30+30	200	200	70	600x740x260	31,00
OPTIM 5 P&P-135-440	[1] R3L250.	112	135	15+30+30+30+30	250	250	95	600x740x260	37,00
OPTIM 5 P&P-150-440	[1] R3L260.	124	150	30+30+30+30+30	250	250	120	600x740x260	39,00
OPTIM 9 P&P, automatic capacitor banks with computer C Wi-Fi regulator. Built-in power supply autotransformer									
OPTIM 9 P&P-165-440	[*] R3L310.	136	165	15+5x30	400	400	120	700x1350x440	80,00
OPTIM 9 P&P-195-440	[1] R3L320.	161	195	15+6x30	400	400	150	700x1350x440	85,00
OPTIM 9 P&P-225-440	[*] R3L330.	186	225	15+7x30	400	400	185	700x1350x440	86,00
OPTIM 9 P&P-255-440	[1] R3L340.	211	255	15+8x30	630	630	240	700x1350x440	98,00
OPTIM 9 P&P-270-440	[1] R3L350.	223	270	9x30	630	630	240	700x1350x440	100,00
OPTIM 8 P&P, automatic capacitor banks with computer C Wi-Fi regulator. Built-in power supply autotransformer									
OPTIM 8 P&P-300-440	[1] R3L410.	248	300	2x30+4x60	630	630	2x150	1000x1750x440	126,00
OPTIM 8 P&P-330-440	[1] R3L420.	273	330	30+5x60	630	630	2x150	1000x1750x440	128,00
OPTIM 8 P&P-390-440	[1] R3L430.	322	390	30+6x60	800	800	2x185	1000x1750x440	135,00
OPTIM 8 P&P-450-440	[1] R3L440.	372	450	30+7x60	800	800	2x240	1000x1750x440	142,00
OPTIM 8 P&P-480-440	[1] R3L450.	396	480	8x60	1000	1000	2x240	1000x1750x440	163,00
OPTIM 8L P&P, automatic capacitor banks with computer C Wi-Fi regulator. Built-in power supply autotransformer									
OPTIM 8L P&P-550-440	[1] R35L10.	454	550	50+5x100	1000	1000	2x240	1200x1900x650	234,00
OPTIM 8L P&P-650-440	[1] R35L20.	537	650	50+6x100	1250	1600	3x150	1200x1900x650	255,00
OPTIM 8L P&P-750-440	[1] R35L30.	620	750	50+7x100	1600	1600	3x185	1200x1900x650	280,00
OPTIM 8L P&P-800-440	[1] R35L40.	661	800	8x100	1600	1600	3x185	1200x1900x650	290,00
OPTIM 14L P&P, automatic capacitor banks with computer C Wi-Fi regulator. Built-in power supply autotransformer									
OPTIM 14L P&P-900-440	[2] R36L10.	743	900	2X50+8x100	1250+400	1600+400	3x150/185	2100x1900x650	435,00
OPTIM 14L P&P-950-440	[2] R36L20.	785	950	50+9x100	1600+400	1600+400	3x185/185	2100x1900x650	445,00
OPTIM 14L P&P-1050-440	[2] R36L30.	867	1050	50+10x100	1600+630	1600+630	3x185/240	2100x1900x650	470,00
OPTIM 14L P&P-1150-440	[2] R36L40.	950	1150	50+11x100	1600+1000	1600+1000	3x185/2x150	2100x1900x650	495,00
OPTIM 14L P&P-1200-440	[2] R36L50.	991	1200	12x100	1600+800	1600+800	3x185/2x185	2100x1900x650	505,00
OPTIM 14L P&P-1300-440	[2] R36L60.	1074	1300	100+6x200	1600+1250	1600+1600	3x185/2x240	2100x1900x650	535,00
OPTIM 14L P&P-1400-440	[2] R36L70.	1156	1400	100+100+6x200	1600+1250	1600+1600	3x185/3x120	2100x1900x650	560,00
OPTIM 16L P&P, automatic capacitor banks with computer C Wi-Fi regulator. Built-in power supply autotransformer									
OPTIM 16L P&P-1500-440	[2] R37L30.	1239	1500	100+7x200	1600+1600	1600+1600	3x185/3x150	2400x1900x650	583,00
OPTIM 16L P&P-1600-440	[2] R37L40.	1322	1600	100+100+7x200	1600+1600	1600+1600	3x185/3x185	2400x1900x650	580,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the characteristics of each installation and type of cable.

All batteries with **computer C Wi-Fi** regulator come with 1 year free of charge VAR system

Table: selection capacitor banks with rejection filters, Type P=7% (f_{res}=189 Hz), 50 Hz

		OPTIM FRS P&P	OPTIM FR P&P
Rated voltage		440 V	440 V
Service voltage		400 V	400 V
Power range at rated voltage (50 Hz)		de 31,25 a 120 kvar	OPTIM FR4 P&P: 150 a 400 kvar OPTIM FR6 P&P: 400 a 600 kvar OPTIM FR8 P&P: 600 a 800 kvar OPTIM FR10 P&P: 800 a 1000 kvar OPTIM FR12 P&P: 1050 a 1200 kvar
Contactor switching		•	•
No. Steps (maximum)		4	4 / 6 / 8 / 10 / 12
Enclosure	Metallic IP 21	•	•
Installation (indoor)		•	•
Assembly (floor-mounted)		•	•
Regulator	Computer C Wi-Fi	•	•
	Computer Smart III	Optional	Optional
Capacitor	Cylindrical CLZ	•	•
Reactors tuned to 189 Hz (ask if you require other tuning values)		•	•
Built-in protection	Miniature ircuit breaker per step	•	–
	APR NH-00 Fuses	–	•
Autotransformer for aux. supply		•	•

OPTIM FR P&P

Automatic capacitor banks with rejection filters (contactors switching), type P=7% (fres=189 Hz), 50 Hz.

Type	Code	400 V kvar	440 V kvar	Composition	Aut.Switch (A)	Man. Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM FRS-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FRS-P&P-31,25-440	[2] R54R64.	26	31.25	6,25 + 2 x 12,5	-	Included	10	800x1200x500	82,00
OPTIM FRS-P&P-43,75-440	[2] R54R74.	36	43.75	6,25 + 12,5 + 25	-	Included	25	800x1200x500	108,00
OPTIM FRS-P&P-62,5-440	[2] R54R81.	52	62.5	12,5 + 2 x 25	-	Included	35	800x1200x500	100,00
OPTIM FRS-P&P-90-440	[2] R54R88.	74	90	2 x 15 + 2 x 30	-	Included	70	800x1200x500	133,00
OPTIM FRS-P&P-105-440	[2] R54R92.	87	105	15 + 3 x 30	-	Included	70	800x1200x500	122,00
OPTIM FRS-P&P-120-440	[2] R54R95.	99	120	4 x 30	-	Included	95	800x1200x500	129,00
OPTIM FR4-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FR4-P&P-150-440	[2] R54S24.	125	150	30 + 2 x 60	400	400	95	900x1900x650	220,00
OPTIM FR4-P&P-175-440	[2] R54S25.	145	175	25 + 50 + 100	400	400	120	900x1900x650	225,00
OPTIM FR4-P&P-200-440	[2] R54S28.	165	200	50 + 50 + 100	400	400	150	900x1900x650	209,00
OPTIM FR4-P&P-250-440	[2] R54S29.	207	250	50 + 2 x 100	630	630	185	900x1900x650	242,00
OPTIM FR4-P&P-300-440	[2] R54S30.	248	300	50 + 50 + 2 x 100	630	630	240	900x1900x650	270,00
OPTIM FR4-P&P-350-440	[2] R54S32.	289	350	50 + 3 x 100	630	630	2x150	900x1900x650	299,00
OPTIM FR4-P&P-400-440	[2] R54S34.	331	400	4 x 100	800	800	2x150	900x1900x650	335,00
OPTIM FR6-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FR6-P&P-400-440	[2] R54T25.	331	400	50 + 50 + 3 x 100	800	800	2x185	1200x1900x650	370,00
OPTIM FR6-P&P-450-440	[2] R54T30.	372	450	50 + 4 x 100	800	800	2x185	1200x1900x650	376,00
OPTIM FR6-P&P-500-440	[2] R54T35.	413	500	5 x 100	1000	1000	2x240	1200x1900x650	397,00
OPTIM FR6-P&P-550-440	[2] R54T40.	455	550	50 + 5 x 100	1000	1000	2x240	1200x1900x650	465,00
OPTIM FR6-P&P-600-440	[2] R54T45.	496	600	6 x 100	1000	1000	2x240	1200x1900x650	685,00
OPTIM FR8-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FR8-P&P-600-440	[2] R54U36.	496	600	50 + 50 + 5 x 100	1250	1600	2x240	1500x1900x650	525,00
OPTIM FR8-P&P-650-440	[2] R54U38.	537	650	50 + 6 x 100	1250	1600	3x150	1500x1900x650	504,00
OPTIM FR8-P&P-700-440	[2] R54U40.	579	700	7 x 100	1250	1600	3x150	1500x1900x650	555,00
OPTIM FR8-P&P-750-440	[2] R54U42.	620	750	50 + 7 x 100	1600	1600	3x185	1500x1900x650	580,00
OPTIM FR8-P&P-800-440	[2] R54U44.	661	800	8 x 100	1600	1600	3x185	1500x1900x650	582,00
OPTIM FR10-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FR10-P&P-800-440	[2] R54V25.	661	800	8 x 100	1000+400	1000+400	2x240/ 240	2100x1900x650	695,00
OPTIM FR10-P&P-850-440	[2] R54V30.	702	850	50 + 8 x 100	1000+630	1000+630	2x240/ 240	2100x1900x650	735,00
OPTIM FR10-P&P-900-440	[2] R54V35.	744	900	9 x 100	1000+630	1000+630	2x240/ 240	2100x1900x650	775,00
OPTIM FR10-P&P-950-440	[2] R54V40.	785	950	50 + 9 x 100	1000+800	1000+800	2x240/ 2x185	2100x1900x650	800,00
OPTIM FR10-P&P-1000-440	[2] R54V45.	826	1000	10 x 100	1000+800	1000+800	2x240/ 2x185	2100x1900x650	825,00
OPTIM FR12-P&P, automatic capacitor banks with computer C Wi-Fi regulator									
OPTIM FR12-P&P-1050-440	[2] R54W50.	868	1050	50 + 10 x 100	1000+1000	1000+1000	2x240/ 2x240	2400x1900x650	890,00
OPTIM FR12-P&P-1100-440	[2] R54W55.	909	1100	11 x 100	1000+1000	1000+1000	2x240/ 2x240	2400x1900x650	930,00
OPTIM FR12-P&P-1150-440	[2] R54W60.	950	1150	50 + 11 x 100	2x1000	2x1000	2x240/ 2x240	2400x1900x650	947,00
OPTIM FR12-P&P-1200-440	[2] R54W65.	992	1200	12 x 100	2x1000	2x1000	2x240/ 2x240	2400x1900x650	980,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the characteristics of each installation and type of cable. All batteries with computer C Wi-Fi regulator come with 1 year free of charge VAR system

TABLE OF ADDITIONAL FEATURES

OPTIM P&P

R 3 X X X X 0 0 X X X				
Code		Internal code		Delivery time
Options	Standard	0		-
	Autotransformer for aux. supply	1		-
	Fan	2		-
	Policarbonate	3		-
	Autotransf. + Fan	4		- OPTIM 3 & 5 P&P
	Autotransf. + Policarbonate	5		- OPTIM 3 & 5 P&P
	Policarbonate + Fan	6		-
	Autotransf. +Policarbonate + Fan	7		- OPTIM 3 & 5 P&P
Regulator	Standard		0	-
	computer SMART III 6		S	-
	computer SMART III 12		T	-
Switch	without switch			0 -
	Manual switch 200 A			3 -
	Manual switch 250A			4 -
	Manual switch 400 A			5 -
	Manual switch 630 A			6 -
	Manual switch 800 A			7 -
	Manual switch 1000 A			8 -
	Manual switch 1600 A			9 -
	Circuit breaker 63 A			A -
	Circuit breaker 125 A			B -
	Circuit breaker 160 A / 200 A			C -
	Circuit breaker 250A			D -
	Circuit breaker 400 A			E -
	Circuit breaker 630 A			F -
	Circuit breaker 800 A			G -
	Circuit breaker 1000 A			H -
	Circuit breaker 1250 A			I -
	Circuit breaker 1600 A			J -
	Circuit breaker 63 A + Residual current			K -
	Circuit breaker 125 A + Residual current			L -
	Circuit breaker160 A + Residual current			M -
	Circuit breaker 250 A + Residual current			N -
	Circuit breaker 400 A + Residual current			O -
	Circuit breaker 630 A + Residual current			P -
	Circuit breaker 800 A + Residual current			Q -
	Circuit breaker 1000 A + Residual current			R -
	Circuit breaker 1250 A + Residual current			S -
	Circuit breaker 1600 A + Residual current			T -

OPTIM FRS P&P / OPTIM FR P&P

R 5 X X X X 0 0 X X X				
Code		Internal code		Delivery time
Options	Standard	0		-
	Fan	2		-
	Policarbonate	3		-
	Policarbonate + Fan	6		-
Regulator	Standard		0	-
	computer SMART III 6		S	-
	computer SMART III 12		T	-
Switch	without switch			0 -
	Manual switch 200 A			3 -
	Manual switch 250A			4 -
	Manual switch 400 A			5 -
	Manual switch 630 A			6 -
	Manual switch 800 A			7 -
	Manual switch 1000 A			8 -
	Manual switch 1600 A			9 -
	Circuit breaker 63 A			A -
	Circuit breaker 125 A			B -
	Circuit breaker 160 A / 200 A			C -
	Circuit breaker 250A			D -
	Circuit breaker 400 A			E -
	Circuit breaker 630 A			F -
	Circuit breaker 800 A			G -
	Circuit breaker 1000 A			H -
	Circuit breaker 1250 A			I -
	Circuit breaker 1600 A			J -
	Circuit breaker 63 A + Residual current			K -
	Circuit breaker 125 A + Residual current			L -
	Circuit breaker160 A + Residual current			M -
	Circuit breaker 250 A + Residual current			N -
	Circuit breaker 400 A + Residual current			O -
	Circuit breaker 630 A + Residual current			P -
	Circuit breaker 800 A + Residual current			Q -
	Circuit breaker 1000 A + Residual current			R -
	Circuit breaker 1250 A + Residual current			S -
	Circuit breaker 1600 A + Residual current			T -

SVGm-C

Static Var Generator with multilevel technology

Type	Code	System	230 V kvar	400 V kvar	440 V kvar	480 V kvar	500 V kvar	690 V kvar	Phase current	Size (mm) width x height x depth	weight (kg)
3 wires 480 V, Wall-mounted cabinet											
SVGm-3WF-30M-480	[2] R4P3M0.	3 wires, 230...480 V	17.4	30	30	30	-	-	44	430x530x178	21,00
SVGm-3WF-60M-480	[2] R4P3M1.	3 wires, 230...480 V	34.5	60	60	60	-	-	88	430x530x348	39,00
SVGm-3WF-100M-480	[2] R4P3M2.	3 wires, 230...480 V	57.5	100	100	100	-	-	145	439x745x288	56,00
3 wires 480 V, Floor-mounted cabinet											
SVGm-3WF-100C-480	[2] R4P3F2.	3 wires, 230...480 V	57.5	100	100	100	-	-	145	608x1890x812	190,00
SVGm-3WF-200C-480	[2] R4P3F3.	3 wires, 230...480 V	115	200	200	200	-	-	290	608x1890x812	245,00
SVGm-3WF-300C-480	[2] R4P3F4.	3 wires, 230...480 V	172.5	300	300	300	-	-	435	608x1890x812	300,00
SVGm-3WF-400C-480	[2] R4P3F5.	3 wires, 230...480 V	230	400	400	400	-	-	580	608x1890x812	355,00
3 wires 690 V, Floor-mounted cabinet											
SVGm-3WF-100C-690	[3] R4P5F2.	3 wires, 500 ... 690 V	-	-	-	-	72	100	84	608x1890x812	192,00
SVGm-3WF-200C-690	[3] R4P5F3.	3 wires, 500 ... 690 V	-	-	-	-	144	200	168	608x1890x812	249,00
SVGm-3WF-300C-690	[3] R4P5F4.	3 wires, 500 ... 690 V	-	-	-	-	216	300	210	608x1890x812	306,00
SVGm-3WF-400C-690	[3] R4P5F5.	3 wires, 500 ... 690 V	-	-	-	-	288	400	280	608x1890x812	363,00
4 wires 400 V, Wall-mounted cabinet											
SVGm-4WF-020M-400	[2] R4P4MA.	4 wires, 230...400 V	12	20.7	-	-	-	-	30	430x530x178	21,00
SVGm-4WF-040M-400	[2] R4P4MB.	4 wires, 230...400 V	24	41.4	-	-	-	-	60	430x530x348	39,00
SVGm-4WF-069M-400	[2] R4P4MC.	4 wires, 230...400 V	40	69	-	-	-	-	100	439x745x288	56,00
4 wires 400 V, Floor-mounted cabinet											
SVGm-4WF-069C-400	[2] R4P4FC.	4 wires, 230...400 V	40	69	-	-	-	-	100	608x1890x812	190,00
SVGm-4WF-138C-400	[2] R4P4FD.	4 wires, 230...400 V	80	138	-	-	-	-	200	608x1890x812	245,00
SVGm-4WF-207C-400	[2] R4P4FE.	4 wires, 230...400 V	119.1	207	-	-	-	-	300	608x1890x812	300,00
SVGm-4WF-276C-400	[2] R4P4FF.	4 wires, 230...400 V	159	276	-	-	-	-	400	608x1890x812	355,00
4 wires 550 V, Floor-mounted cabinet											
SVGm-4WF-067C-550	[3] R4P6FG.	4 wires, 440 ... 550 V	-	-	53	58	-	-	70	608x1890x812	192,00
SVGm-4WF-134C-550	[3] R4P6FH.	4 wires, 440 ... 550 V	-	-	106	116	-	-	140	608x1890x812	249,00
SVGm-4WF-201C-550	[3] R4P6FJ.	4 wires, 440 ... 550 V	-	-	159	174	-	-	210	608x1890x812	306,00
SVGm-4WF-268C-550	[3] R4P6FK.	4 wires, 440 ... 550 V	-	-	212	232	-	-	280	608x1890x812	363,00
Rack module											
SVGm-3WF-100R-480	[2] R4P3R2.	3 wires, 230...480 V	57.5	100	100	100	-	-	145	482.5x263x714.5	55,00
SVGm-4WF-069R-400	[2] R4P4RC.	4 wires, 230...400 V	40	69	-	-	-	-	100	482.5x263x714.5	55,00

All equipment has built-in EMI filters

TABLE OF ADDITIONAL FEATURES

SVGm											
R	4	P	X	X	X	0	0	X	X	0	
Code						Internal code			↑		Delivery time
Protection degree			Standard IP-20						0		-
New			IP-41						5		consult
			IP-54						7		consult

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

Table: Selection of automatic capacitor banks with a static contactor

		OPTIM EMS-C	OPTIM EMK
Rated voltage		440 V	440 V
Power range at rated voltage (50 Hz)		18,75...120 kvar	OPTIM EMK4: 175...400 kvar OPTIM EMK6: 400...600 kvar OPTIM EMK8: 600...800 kvar OPTIM EMk10: 850...1000 kvar OPTIM EMK12: 1050...1200 kvar
Thyristor operation		●	●
No. Steps (maximum)		8	4 / 6 / 8 / 10/ 12
Enclosure	Metallic IP 21	●	●
Installation (indoor)		●	●
Assembly	Wall-mounted	●	–
	Floor-mounted	–	●
Regulator	computer Max Fast	●	–
	computer Smart III Fast	Not available	Included
Capacitor	Cilindric CLZ	●	●
Built-in protection	Miniature circuit breaker per step	●	–
	APR NH-00 Fuse	–	●

OPTIM EMS

Automatic capacitor banks with static contactor, wall-mounted , 50 Hz.

No additional features are allowed

Type	Code	400 V kvar	440 V kvar	Composition	Man.Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM EMS-C-18,75-440	[C] R4A300.	15.5	18.75	(6,25 + 12,5)	Included	1 x 6	545x710x220	42,00
OPTIM EMS-C-31,25-440	[C] R4A304.	26	31.25	(6,25 + 2 x 12,5)	Included	1 x 16	545x710x220	42,00
OPTIM EMS-C-43,75-440	[C] R4A309.	36	43.75	(6,25 + 12,5 + 25)	Included	1 x 25	545x710x220	34,00
OPTIM EMS-C-68,75-440	[C] R4A318.	57	68.75	(6,25 + 12,5 + 2 x 25)	Included	1 x 50	545x710x220	42,00
OPTIM EMS-C-82,50-440	[C] R4A321.	68	82.5	(7,5 + 15 + 2 x 30)	Included	1 x 70	545x710x220	42,00
OPTIM EMS-C-105-440	[C] R4A330.	87	105	(15 + 3 x 30)	Included	1 x 70	545x710x220	42,00
OPTIM EMS-C-120-440	[C] R4A336.	99	120	(4 x 30)	Included	1 x 95	545x710x220	42,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the characteristics of each installation and type of cable.

OPTIM EMK

Automatic capacitor banks with static contactor, 50 Hz.

Type	Code	400 V kvar	440 V kvar	Composition	Aut.Switch (A)	Man. Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
OPTIM EMk4									
OPTIM EMK4-175-440	[2] R46420.	147	175	25 + 50 + 100	400	400	120	900x1900x650	170,00
OPTIM EMK4-250-440	[2] R46422.	207	250	50 + 2x100	630	630	185	900x1900x650	183,00
OPTIM EMK4-300-440	[2] R46424.	248	300	50 + 50 + 2x100	630	630	240	900x1900x650	208,00
OPTIM EMK4-350-440	[2] R46425.	289	350	50 + 3x100	630	630	240	900x1900x650	217,00
OPTIM EMK4-400-440	[2] R46426.	331	400	4x100	800	800	240	900x1900x650	231,00
OPTIM EMk6									
OPTIM EMK6-400-440	[2] R46431.	331	400	50 + 50 + 3x100	800	800	2x185	1200x1900x650	262,00
OPTIM EMK6-450-440	[2] R46435.	372	450	50 + 4x100	800	800	2x185	1200x1900x650	281,00
OPTIM EMK6-550-440	[2] R46437.	455	550	50 + 5x100	1000	1000	2x240	1200x1900x650	320,00
OPTIM EMK6-600-440	[2] R46438.	496	600	6x100	1000	1000	2x240	1200x1900x650	334,00
OPTIM EMk8									
OPTIM EMK8-600-440	[2] R46442.	496	600	50 + 50 + 5x100	1250	1600	2x240	1500x1900x650	365,00
OPTIM EMK8-650-440	[2] R46444.	537	650	50 + 6x100	1250	1600	3x150	1500x1900x650	384,00
OPTIM EMK8-750-440	[2] R46450.	620	750	50 + 7x100	1600	1600	3x185	1500x1900x650	359,00
OPTIM EMK8-800-440	[2] R46455.	661	800	8x100	1600	1600	2x240 / 240	1500x1900x650	373,00
OPTIM EMk10									
OPTIM EMK10-850-440	[2] R46505.	702	850	50 + 8x100	1000+630	1000+630	2x240 / 240	2100x1900x650	512,00
OPTIM EMK10-950-440	[2] R46604.	785	950	50 + 9x100	1000+800	1000+800	2x240 / 2x185	2100x1900x650	551,00
OPTIM EMK10-1000-440	[2] R46605.	826	1000	10x100	1000+800	1000+800	2x240 / 2x185	2100x1900x650	565,00
OPTIM EMk12									
OPTIM EMK12-1050-440	[2] R46606.	868	1050	50 + 10x100	1000+800	1000+800	2x240 / 2x240	2400x1900x650	615,00
OPTIM EMK12-1150-440	[2] R46608.	950	1150	50 + 11x100	2x1000	2x1000	2x240 / 2x240	2400x1900x650	654,00
OPTIM EMK12-1200-440	[2] R46609.	992	1200	12x100	2x1000	2x1000	2x240 / 2x240	2400x1900x650	668,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the characteristics of each installation and type of cable.

EMF / EMB

Three-phase static switching units for 6-terminal capacitors

Type	Code	400 V kvar	Size (mm) width x height x depth	weight (kg)
With fuses, serie EMF				
EMF-40/400	[2] R41133.	40	177x485x268	10,50
EMF 60/400	[2] R41136.	60	177x485x268	10,50
EMF-80/400	[2] R41137.	80	177x485x268	10,50

Type	Code	400 V kvar	Size (mm) width x height x depth	weight (kg)
With terminal, serie EMB				
EMB-40/400	[1] R41233.	40	177x485x268	10,50
EMB-60/400	[1] R41236.	60	177x485x268	11,00
EMB-80/400	[1] R41237.	80	177x485x268	10,50

CPC3

Zero-crossing control board (for EMF / EMB modules)

Type	Code	Vac	Control	Size (mm) width x height x depth	weight (kg)
CPCb-230/400	[1] R4Z111.	230 / 400	Three-phase	230x110x40	0,62

EMB-2PH

Three-phase static switching units for 3-terminal capacitors

Type	Code	230 V kvar	400 V kvar	Size (mm) width x height x depth	weight (kg)
External 12VDC activation signal required. With terminals					
EMB-2PH-25-400	[1] R41321.	12.5	25	200x220x200	5,20
EMB-2PH-50-400	[1] R41323.	27.5	50	200x220x200	5,90
EMB-2PH-80-400	[1] R41325.	45	80	200x220x200	4,00

Maximum operating voltage: 3 x 440 Vac (415 Vac with detuned reactors) Polycarbonate cover for EMB-2PH

Type	Code	Description
cover-EMB-2PH	[1] R41329.	Polycarbonate cover for EMB-2PH

Table: Selection of Static automatic capacitor banks with rejection filters

		OPTIM FRES	OPTIM FRE
Rated voltage		440 V	440 V
Service voltage		400 V	400 V
Power range at rated voltage (50 Hz)		31,25 a 120 kvar	OPTIM FRE4: 150 ... 400 kvar OPTIM FRE6: 400 ... 600 kvar OPTIM FRE8: 600 ... 800 kvar OPTIM FRE10: 800 ... 1000 kvar OPTIM FRE12: 1050 ... 1200 kvar
Thyristor operation		●	●
No. Steps (maximum)		4	4 / 6 / 8 / 10 / 12
Enclosure	Metallic IP 21	●	●
Installation (indoor)		●	●
Assembly (floor-mounted)		●	●
Regulator	Computer Max F-12DC	●	–
	Computer Smart Fast III-12DC	Optional	Included
Capacitor		Cylindrical CLZ	Cylindrical CLZ
Reactors tuned to 189 Hz (please ask about other tuning values)		●	●
Built-in protection	circuit breaker per step	·	–
	APR NH-00 Fuses	-	●

OPTIM FRE

Automatic capacitor banks with rejection filters (static contactor), 50 Hz.

Optional installation of a mains switch, f resonance =189 Hz

Type	Code	400 V kvar	440 V kvar	Composition	Aut.Switch (A)	Man. Switch (A)	Cable section (mm2)	Size (mm) width x height x depth	weight (kg)
FRES									
OPTIM FRES-31,25-440	[2] R64R64.	26	31.25	6,25 + 2 x 12,5	-	Included	10	800x1200x500	102,00
OPTIM FRES-43,75-440	[2] R64R74.	36	43.75	6,25 + 12,5 + 25	-	Included	25	800x1200x500	108,00
OPTIM FRES-62,5-440	[2] R64R81.	52	62.5	12,5 + 2 x 25	-	Included	35	800x1200x500	115,00
OPTIM FRES-90-440	[2] R64R88.	74	90	2 x 15 + 2 x 30	-	Included	70	800x1200x500	120,00
OPTIM FRES-105-440	[2] R64R92.	87	105	15 + 3 x 30	-	Included	70	800x1200x500	128,00
OPTIM FRES-120-440	[2] R64R95.	99	120	4 x 30	-	Included	95	800x1200x500	200,00
FRE4									
OPTIM FRE4-150-440	[2] R64E24.	125	150	30 + 2 x 60	400	400	95	900x1900x650	220,00
OPTIM FRE4-175-440	[2] R64E25.	145	175	25 + 50 + 100	400	400	120	900x1900x650	225,00
OPTIM FRE4-200-440	[2] R64E28.	165	200	50 + 50 + 100	400	400	150	900x1900x650	235,00
OPTIM FRE4-250-440	[2] R64E29.	207	250	50 + 2 x 100	630	630	185	900x1900x650	250,00
OPTIM FRE4-300-440	[2] R64E30.	248	300	50 + 50 + 2 x 100	630	630	240	900x1900x650	290,00
OPTIM FRE4-350-440	[2] R64E32.	289	350	50 + 3 x 100	630	630	240	900x1900x650	310,00
OPTIM FRE4-400-440	[2] R64E34.	331	400	4 x 100	800	800	240	900x1900x650	318,00
FRE6									
OPTIM FRE6-400-440	[2] R64J25.	331	400	50 + 50 + 3 x 100	800	800	2x185	1200x1900x650	370,00
OPTIM FRE6-450-440	[2] R64J30.	372	450	50 + 4 x 100	800	800	2x185	1200x1900x650	376,00
OPTIM FRE6-500-440	[2] R64J35.	413	500	5 x 100	1000	1000	2x240	1200x1900x650	440,00
OPTIM FRE6-550-440	[2] R64J40.	455	550	50 + 5 x 100	1000	1000	2x240	1200x1900x650	465,00
OPTIM FRE6-600-440	[2] R64J45.	496	600	6 x 100	1000	1000	2x240	1200x1900x650	490,00
FRE8									
OPTIM FRE8-600-440	[2] R64K36.	496	600	50 + 50 + 5 x 100	1250	1600	2x240	1500x1900x650	525,00
OPTIM FRE8-650-440	[2] R64K38.	537	650	50 + 6 x 100	1250	1600	3x150	1500x1900x650	540,00
OPTIM FRE8-700-440	[2] R64K40.	579	700	7 x 100	1250	1600	3x150	1500x1900x650	555,00
OPTIM FRE8-750-440	[2] R64K42.	620	750	50 + 7 x 100	1600	1600	3x185	1500x1900x650	580,00
OPTIM FRE8-800-440	[2] R64K44.	661	800	8 x 100	1600	1600	3x185	1500x1900x650	605,00
FRE10									
OPTIM FRE10-800-440	[2] R64C25.	661	800	8 x 100	1000+400	1000+400	2x240 / 240	2100x1900x650	695,00
OPTIM FRE10-850-440	[2] R64C30.	702	850	50 + 8 x 100	1000+630	1000+630	2x240 / 240	2100x1900x650	735,00
OPTIM FRE10-900-440	[2] R64C35.	744	900	9 x 100	1000+630	1000+630	2x240 / 240	2100x1900x650	775,00
OPTIM FRE10-950-440	[2] R64C40.	785	950	50 + 9 x 100	1000+800	1000+800	2x240 / 2x185	2100x1900x650	800,00
OPTIM FRE10-1000-440	[2] R64C45.	826	1000	10 x 100	1000+800	1000+800	2x240 / 2x185	2100x1900x650	825,00
FRE12									
OPTIM FRE12-1050-440	[2] R64L50.	868	1050	50 + 10 x 100	1000+1000	1000+1000	2x240 / 2x240	2400x1900x650	890,00
OPTIM FRE12-1100-440	[2] R64L55.	909	1100	11 x 100	1000+1000	1000+1000	2x240 / 2x240	2400x1900x650	930,00
OPTIM FRE12-1150-440	[2] R64L60.	950	1150	50 + 11 x 100	2x1000	2x1000	2x240 / 2x240	2400x1900x650	955,00
OPTIM FRE12-1200-440	[2] R64L65.	992	1200	12 x 100	2x1000	2x1000	2x240 / 2x240	2400x1900x650	980,00

Cable cross-section for installations with Un= 400 V. The installation company must ensure compliance with the low voltage directive at all times, in accordance with the characteristics of each installation and type of cable.

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

TABLE OF ADDITIONAL FEATURES

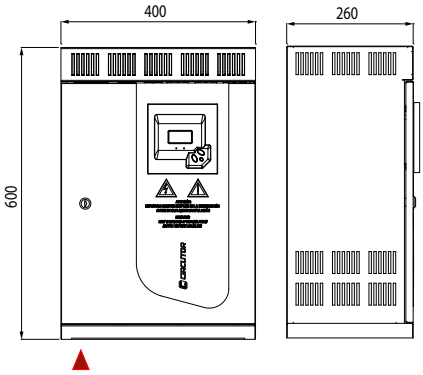
OPTIM EMK, OPTIM FRE

R X X X X X 0 0 X X X		
Code	Internal Code	Delivery time
Options	Standard 0	-
	Fan 2	-
	Policarbonate 3	-
	Policarbonate + Fan 6	-
Choose the most suitable regulator for your needs	Standard 0	-
	computer Smart III 6f / f-12Vdc 9	-
Switch	Without switch 0	-
	Manual switch 200 A 3	-
	Manual switch 250A 4	-
	Manual switch 400 A 5	-
	Manual switch 630 A 6	-
	Manual switch 800 A 7	-
	Manual switch 1000 A 8	-
	Manual switch 1600 A 9	-
	Circuit breaker 63 A A	-
	Circuit breaker 125 A B	-
	Circuit breaker 160 / 200 A C	-
	Circuit breaker 250A D	-
	Circuit breaker 400 A E	-
	Circuit breaker 630 A F	-
	Circuit breaker 800 A G	-
	Circuit breaker 1000 A H	-
	Circuit breaker 1250 A I	-
	Circuit breaker 1600 A J	-
	Circuit breaker 63 A + Residual current K	-
	Circuit breaker 125 A + Residual current L	-
	Circuit breaker 160 / 200 A + Residual current M	-
	Circuit breaker 250 A + Residual current N	-
	Circuit breaker 400 A + Residual current O	-
	Circuit breaker 630 A + Residual current P	-
	Circuit breaker 800 A + Residual current Q	-
	Circuit breaker 1000 A + Residual current R	-
	Circuit breaker 1250 A + Residual current S	-
	Circuit breaker 1600 A + Residual current T	-

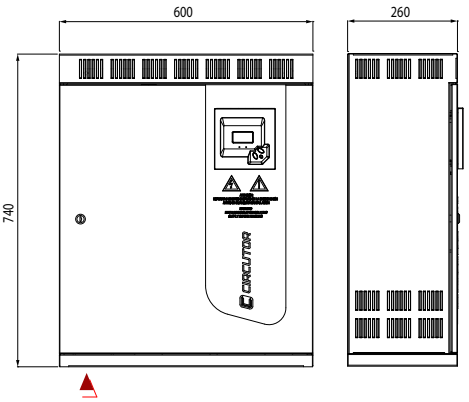
Accessories not available for EMS-C series

Dimensions

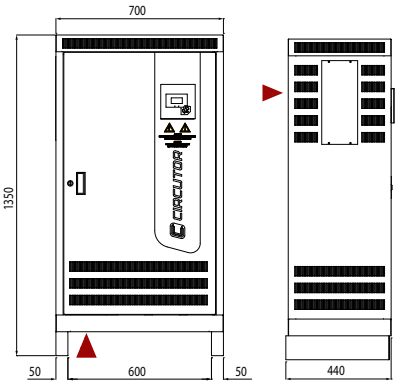
OPTIM 3 P&P



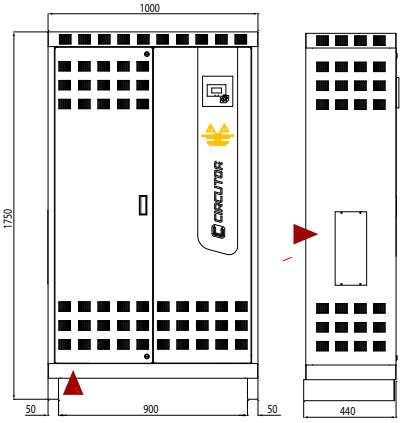
OPTIM 5 P&P



OTPIM 9 P&P



OPTIM 8



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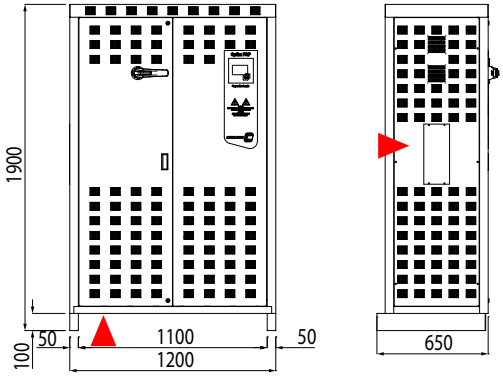

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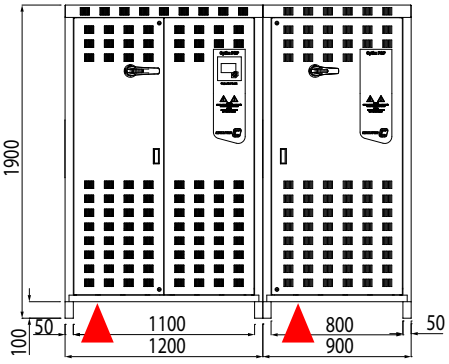
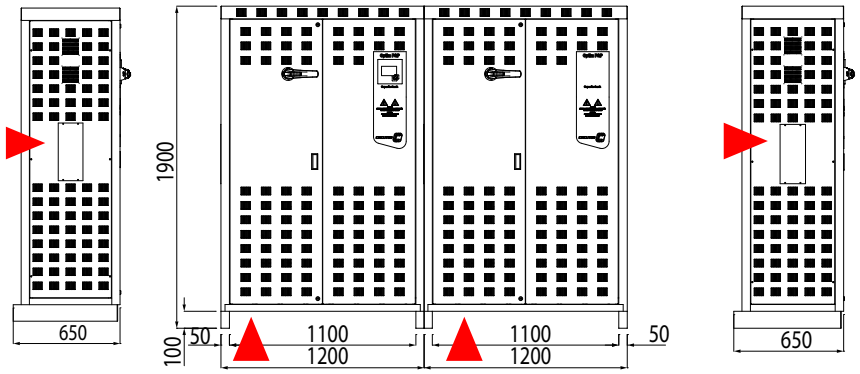
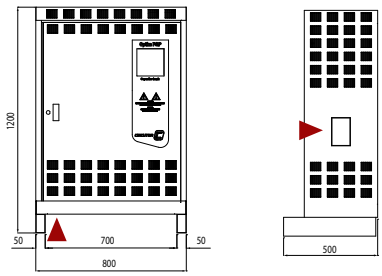


OPTIM 16L

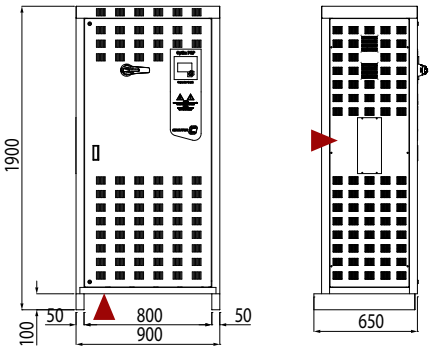


Dimensions

OPTIM FRS



OPTIM EMK4 / OPTIM FR4 / OPTIM FRE4



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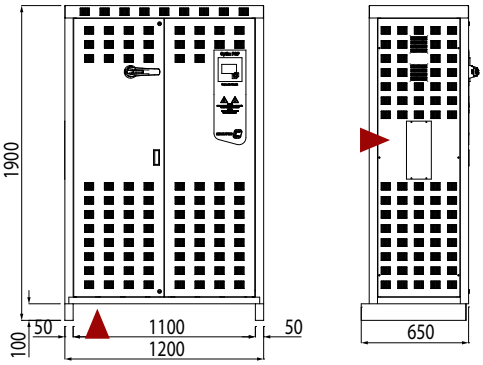
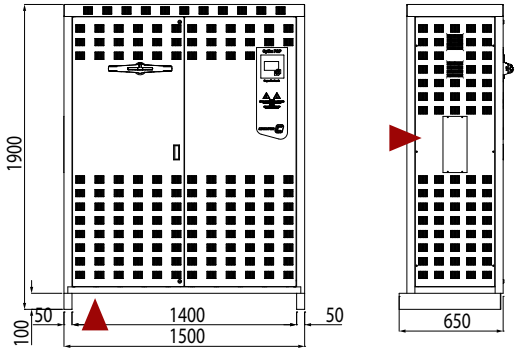
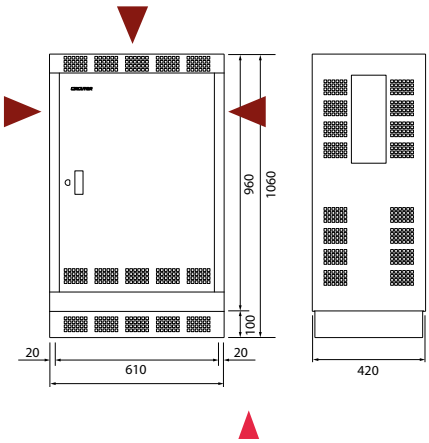


OPTIM EMK8 / OPTIM FR8 / OPTIM FRE8



OPTIM FRF / OPTIM FRM



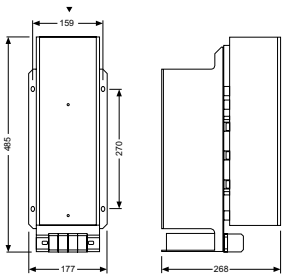
OPTIM EMk10 / OPTIM FR10 / OPTIM FRE10

OPTIM FR10 = OPTIM FR4 + OPTIM FR6. / Width: OPTIM FR4+ OPTIM FR6+100 mm

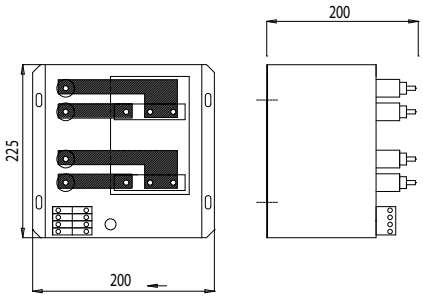
OPTIM EMk12 / OPTIM FR12 / OPTIM FRE12

OPTIM FR12 = 2 x OPTIM FR6. / Width= 2 x OPTIM FR6+100 mm

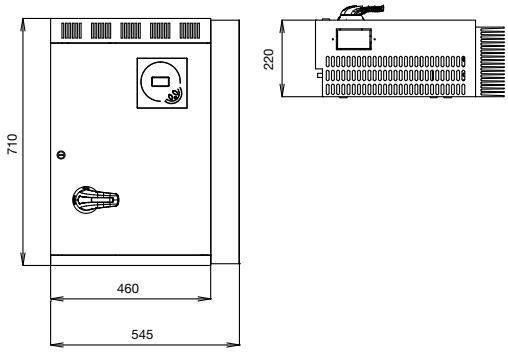
EMB / EMF



EMB-2PH



Optim EMS-C



Harmonic filters

AFQm

Active multifunction filter, 50 / 60 Hz

50/60 Hz - Harmonic filtering, phase balancing and power factor correction

Type	Code	System	Phase current	Peak current	Max.neutral current	Size (mm) width x height x depth	weight (kg)
3 wires 480 V, Wall-mounted cabinet							
AFQm-3WF-030M-480	[C] R7MM0F.	3 wires, 230...480 V	30	60	-	430x530x178	21,00
AFQm-3WF-060M-480	[C] R7MM1F.	3 wires, 230...480 V	60	120	-	430x530x348	39,00
AFQm-3WF-100M-480	[C] R7MM2F.	3 wires, 230...480 V	100	200	-	437x670x300	56,00
3 wires 480 V, Floor-mounted cabinet							
AFQm-3WF-100C-480	[C] R7MF2F.	3 wires, 230...480 V	100	200	-	608x1890x812	190,00
AFQm-3WF-200C-480	[C] R7MF3F.	3 wires, 230...480 V	200	400	-	608x1890x812	245,00
AFQm-3WF-300C-480	[C] R7MF4F.	3 wires, 230...480 V	300	600	-	608x1890x812	300,00
AFQm-3WF-400C-480	[C] R7MF5F.	3 wires, 230...480 V	400	800	-	608x1890x812	355,00
3 wires 690 V, Floor-mounted cabinet							
AFQm-3WF-070C-690	[C] R7JF6F.	3 wires, 400...690 V	70	140	-	608x1890x812	192,00
AFQm-3WF-140C-690	[C] R7JF7F.	3 wires, 400...690 V	140	280	-	608x1890x812	249,00
AFQm-3WF-210C-690	[C] R7JF8F.	3 wires, 400...690 V	210	420	-	608x1890x812	306,00
AFQm-3WF-280C-690	[C] R7JF9F.	3 wires, 400...690 V	280	560	-	608x1890x812	363,00
4 wires 400 V, Wall-mounted cabinet							
AFQm -4WF-030M-400	[C] R7RM0F.	4 wires, 230...400 V	30	60	90	430x530x178	21,00
AFQm -4WF-060M-400	[C] R7RM1F.	4 wires, 230...400 V	60	120	180	430x530x348	39,00
AFQm-4WF-100M-400	[C] R7RM2F.	4 wires, 230...400 V	100	200	300	437x670x300	56,00
4 wires 400 V, Floor-mounted cabinet							
AFQm-4WF-100C-400	[C] R7RF2F.	4 wires, 230...400 V	100	200	300	608x1890x812	190,00
AFQm-4WF-200C-400	[C] R7RF3F.	4 wires, 230...400 V	200	400	600	608x1890x812	245,00
AFQm-4WF-300C-400	[C] R7RF4F.	4 wires, 230...400 V	300	600	900	608x1890x812	300,00
AFQm-4WF-400C-400	[C] R7RF5F.	4 wires, 230...400 V	400	800	1200	608x1890x812	355,00
4 wires 550 V, Floor-mounted cabinet							
AFQm-4WF-070C-550	[C] R7NF6F.	4 wires, 400...550 V	70	140	210	608x1890x812	192,00
AFQm-4WF-140C-550	[C] R7NF7F.	4 wires, 400...550 V	140	280	420	608x1890x812	249,00
AFQm-4WF-210C-550	[C] R7NF8F.	4 wires, 400...550 V	210	420	630	608x1890x812	306,00
AFQm-4WF-280C-550	[C] R7NF9F.	4 wires, 400...550 V	280	560	840	608x1890x812	363,00
Rack module							
AFQm-3WF-070R-690	[C] R7JR6F.	3 wires, 400...690 V	70	140	-	482.5x266x714.5	55,00
AFQm-4WF-070R-550	[C] R7NR6F.	4 wires, 400...550 V	70	140	210	482.5x266x714.5	55,00
AFQm-3WF-100R-480	[C] R7MR2F.	3 wires, 230...480 V	100	200	-	482.5x266x714.5	55,00
AFQm-4WF-100R-400	[C] R7RR2F.	4 wires, 230...400 V	100	200	300	482.5x266x714.5	55,00

Please contact our technical department for networks with high THD(V) levels.

All equipment has built-in EMI filters

TABLE OF ADDITIONAL FEATURES

AFQm

R	7	P	X	X	X	0	0	X	X	0
Code						Internal code			↑	Delivery time
Protection degree			Standard IP-20						0	-
			IP-41						5	consult
New			IP-54						7	consult

LRZ / LRBZ

Filter reactors for power converters (network side), 50 Hz

Type	Code	In (A)	Motor P. (kW)	Motor P. (CV)	L(mH)	Losses (W)	Size (mm) width x height x depth	weight (kg)
LRZ 04-003	[2] P73301.	2,5	0.75	1	14.8	6	120x125x60	1,20
LRZ 04-004	[2] P73302.	4	1.5	2	7.9	8	120x125x60	1,54
LRZ 04-006	[2] P73303.	5,5	2.2	3	5.9	10	120x125x60	1,60
LRZ 04-008	[2] P73304.	7,5	3	4	4.3	12	120x125x60	2,10
LRZ 04-010	[2] P73305.	10	4	5	3.2	15	120x125x70	2,20
LRZ 04-013	[2] P73306.	13	5.5	7	2.5	18	120x125x70	2,00
LRZ 04-017	[2] P73307.	17	7.5	10	1.85	25	150x150x75	2,60
LRZ 04-022	[2] P73308.	22	11	15	1.47	30	150x152x90	3,80
LRZ 04-033	[2] P73309.	32	15	20	0.98	45	150x152x90	4,30
LRZ 04-050	[2] P7330B.	47	22	30	0.67	64	180x197x110	9,10
LRZ 04-066	[2] P7330D.	64	30	41	0.49	88	180x197x120	11,00
LRBZ 04-080	[2] P7330E.	76	37	50	0.4	110	180x160x135	12,50
LRBZ 04-115	[2] P7330G.	110	55	75	0.28	145	237x195x131	21,00
LRBZ 04-185	[C] P7330J.	180	90	122	0.17	230	242x256x154	32,00
LRBZ 04-200	[C] P7330K.	200	110	150	0.15	245	245x256x154	27,00
LRBZ 04-300	[C] P7330M.	300	160	220	0.1	355	280x300x164	48,00

SINUS

Filter for PWM, 400 V / 50 Hz

Type	Code	In (A)	Switching Frequency (kHz)	Size (mm) width x height x depth
SINUS-10A-400-IP00	[4] R7S002.	10	10	191x180x120
SINUS-25-40-00	[4] R7S004.	25	10	244x301x248
SINUS-80-40-00	[4] R7S006.	80	10	290x422x360
SINUS-155-40-00	[4] R7S008.	155	10	390x503x360
SINUS-270-40-00	[4] R7S00A.	270	2	415x557x360

FB3

Third harmonic blocking filter for 50 Hz network

Type	Code	System	Max.neutral current	Frequency (Hz)	Size (mm) width x height x depth	weight (kg)
With box (IP 21)						
FB3T-5-6-21	[C] R78121.	Three-phase + Neutral	6	50	300x200x200	12,00
FB3T-5-16-21	[C] R78123.	Three-phase + Neutral	16	50	300x200x200	16,00
FB3T-5-25-21	[C] R78124.	Three-phase + Neutral	25	50	300x200x200	-
FB3T-5-32-21	[C] R78125.	Three-phase + Neutral	32	50	370x280x300	17,00
FB3T-5-63-21	[C] R78127.	Three-phase + Neutral	63	50	370x420x370	25,00
FB3T-5-100-21	[C] R78128.	Three-phase + Neutral	100	50	650x1060x420	83,00

LRZ / LRBZ

P	7	X	X	X	X	0	0	X	X	X	
Code							Internal code				Delivery time
Voltage drop				Standard (4 %)				0			-
				3 %				1			consult
				2 %				2			consult
Frequency				Estandard (50 Hz)					0		-
				60 Hz					1		consult
System				Standard (three-phase)						0	-
				Single-phase						1	consult

Delivery time: [*] Immediate, [x] working weeks, [c] Consult

LCL

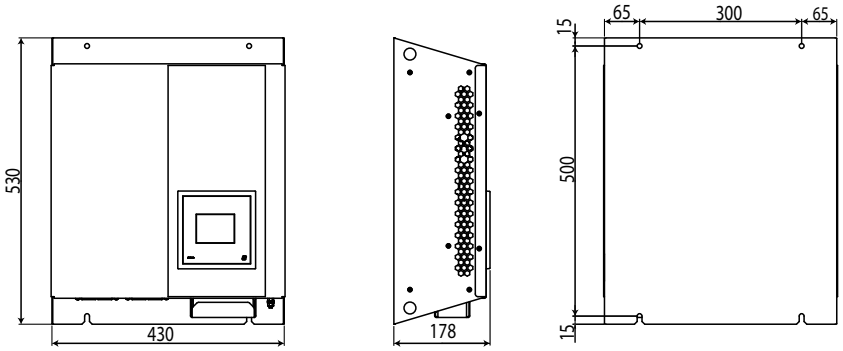
Harmonic filters for power converters

Type	Code	Q (kvar)	Load current (A)	Frequency (Hz)	Size (mm) width x height x depth
400 V					
LC L35-9A-400	[4] R73105.	1,76	9	50	365x570x217
LC L35-12A-400	[4] R73106.	2,51	12	50	365x570x217
LC L35-16A-400	[4] R73107.	3,27	16	50	365x570x217
LC L35-22A-400	[4] R73108.	4,42	22	50	460x930x230
LC L35-32A-400	[4] R73109.	6,63	32	50	460x930x230
LC L35-40A400	[4] R73110.	8,29	40	50	460x930x230
LC L35-47A-400	[4] R73111.	9,14	47	50	650x1060x420
LC L35-54A-400	[4] R73112.	10,8	54	50	650x1060x420
LC L35-64A-400	[4] R73113.	13,26	64	50	650x1060x420
LC L35-76A-400	[4] R73114.	14,92	76	50	650x1060x420
LC L35-90A-400	[4] R73115.	18,24	90	50	800x1900x650
LC L35-110A-400	[4] R73116.	23,21	110	50	800x1900x650
LC L35-150A-400	[4] R73117.	29,84	150	50	800x1900x650
LC L35-180A-400	[4] R73118.	36,48	180	50	800x1900x650
LC L35-220A-400	[4] R73119.	46,42	220	50	800x1900x650
LC L35-260A-400	[4] R73120.	53,06	260	50	800x1900x650
LC L35-320A-400	[4] R73121.	66,32	320	50	1100x1900x650
LC L35-400A-400	[4] R73122.	79,58	400	50	1100x1900x650
460 - 480 V					
LC L36-9A-480	[4] R732050070000	2,73	9	60	365x570x217
LC L36-16A-480	[4] R732070070000	4,55	16	60	365x570x217
LC L36-22A-480	[4] R732080070000	6,21	22	60	460x930x230
LC L36-32A-480	[4] R732090070000	7,59	32	60	460x930x230
LC L36-40A-480	[4] R732100070000	11,38	40	60	460x930x230
LC L36-47A-480	[4] R732110070000	15,18	47	60	650x1060x420
LC L36-54A-480	[4] R732120070000	15,18	54	60	650x1060x420
LC L36-64A-480	[4] R732130070000	18,97	64	60	650x1060x420
LC L36-76A-480	[4] R732140070000	22,77	76	60	650x1060x420
LC L36-90A-480	[4] R732150070000	26,56	90	60	800x1900x650
LC L36-110A-480	[4] R732160070000	30,36	110	60	800x1900x650
LC L36-150A-480	[4] R732170070000	45,53	150	60	800x1900x650
LC L36-180A-480	[4] R732180070000	53,12	180	60	800x1900x650
LC L36-220A-480	[4] R732190070000	60,71	220	60	800x1900x650
LC L36-260A-480	[4] R732200070000	68,3	260	60	800x1900x650
LC L36-320A-480	[4] R732210070000	91,07	320	60	1100x1900x650
LC L36-400A-480	[4] R732220070000	121,42	400	60	1100x1900x650

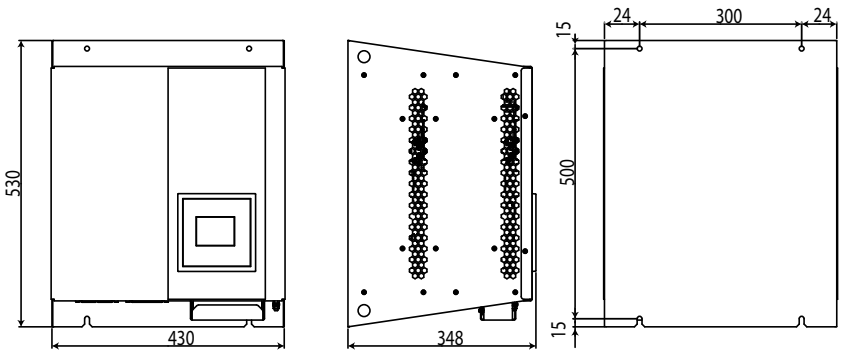
Please contact us for other current, frequency and/or voltage values Optional: Overcompensation kit

Dimensions

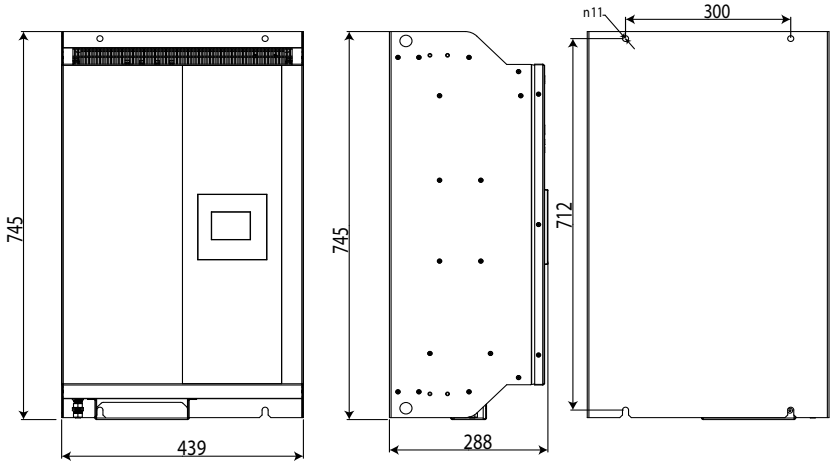
AFQm-30



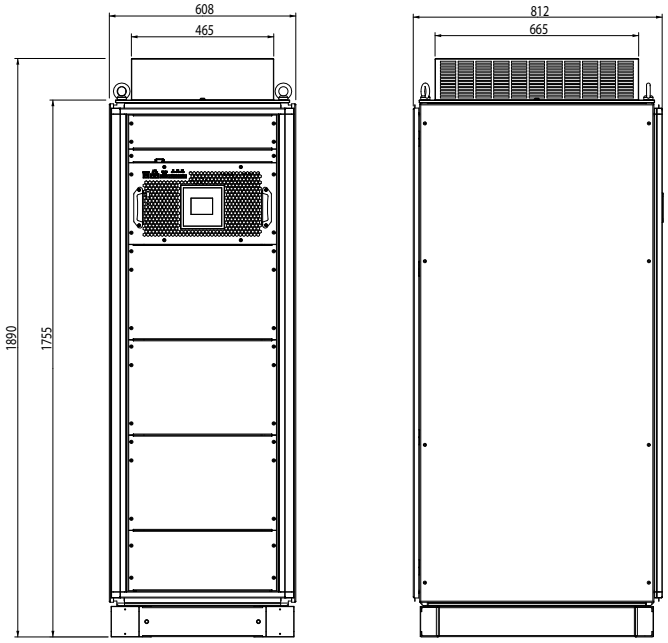
AFQm-60



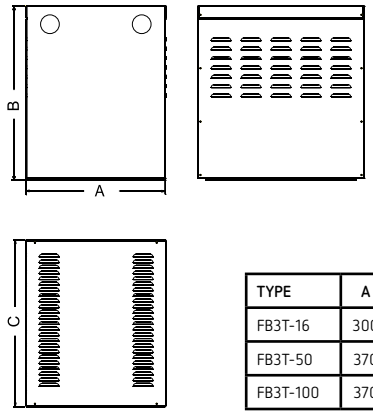
AFQm-100M



AFQm-100C
AFQm-200C
AFQm-300C
AFQm-400C

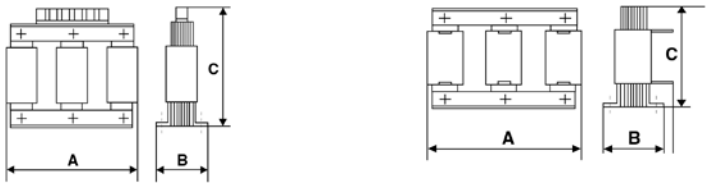


FB3T



TYPE	A	B	C
FB3T-16	300	200	200
FB3T-50	370	280	300
FB3T-100	370	480	370

LRZ / LRBZ



Type	A mm	B mm	C mm	kg
LRZ 04-003	120	60	125	1,8
LRZ 04-004	120	60	125	1,8
LRZ 04-006	120	60	125	2
LRZ 04-008	120	60	125	2
LRZ 04-010	120	70	125	2,3
LRZ 04-013	120	70	125	2,3
LRZ 04-017	150	75	150	3,5
LRZ 04-022	150	90	152	4,6
LRZ 04-033	150	90	152	5
LRZ 04-041	180	100	193	7,5
LRZ 04-050	180	110	197	9
LRZ 04-058	180	110	197	9,5
LRZ 04-066	180	120	197	11

Type	A mm	B mm	C mm	kg
LRBZ 04-080	180	135	160	13
LRBZ 04-095	237	120	195	18
LRBZ 04-115	237	131	195	21
LRBZ 04-150	237	131	215	26
LRBZ 04-185	242	154	256	32
LRBZ 04-200	245	154	256	36
LRBZ 04-250	285	154	300	44
LRBZ 04-300	280	164	300	48

Capacitor and MV accessories

10% surcharge for orders less than or equal to 3 units (per type)

The prices shown in the price list refer to capacitors for indoor/outdoor installation, with internal fuses (depending on type), 50 Hz, class C temperature and without pressure switch.

According to IEC 60871-1 and IEC 60871-4 standards

CHV-T

Three-phase MV power capacitors

Type	Code	Q (kvar)	Frequency (Hz)	Size (mm) width x height x depth	weight (kg)
BIL 20/60 kV (50 Hz) - 3,3 kV					
CHV-T 50/3,3	[C] R8K0500003305	50	50	350x422x160	18,80
CHV-T 75/3,3	[C] R8K0750003305	75	50	350x472x160	22,40
CHV-T 100/3,3	[C] R8K100000330E	100	50	350x472x160	22,80
CHV-T 150/3,3	[C] R8K150000330E	150	50	350x572x160	30,00
CHV-T 200/3,3	[C] R8K200000330E	200	50	350x632x160	34,40
CHV-T 250/3,3	[C] R8K250000330E	250	50	350x802x160	45,70
CHV-T 300/3,3	[C] R8K300000330E	300	50	350x802x160	46,70
CHV-T 333/3,3	[C] R8K333000330E	333	50	350x862x175	55,60
CHV-T 400/3,3	[C] R8K400000330E	400	50	350x892x175	58,30
CHV-T 500/3,3	[C] R8K500000330E	500	50	350x1032x175	69,40
CHV-T 600/3,3	[C] R8K600000330E	600	50	350x1182x175	81,20
CHV-T 750/3,3	[C] R8K750000330E	750	50	350x1252x200	97,30
BIL 20/60 kV (50 Hz) - 6,6 kV					
CHV-T 50/6,6	[C] R8K0500006605	50	50	350x422x160	19,20
CHV-T 75/6,6	[C] R8K0750006605	75	50	350x472x160	22,60
CHV-T 100/6,6	[C] R8K1000006605	100	50	350x472x160	23,00
CHV-T 150/6,6	[C] R8K1500006605	150	50	350x572x160	30,20
CHV-T 200/6,6	[C] R8K200000660E	200	50	350x632x160	38,30
CHV-T 250/6,6	[C] R8K250000660E	250	50	350x802x160	45,90
CHV-T 300/6,6	[C] R8K300000660E	300	50	350x802x160	46,90
CHV-T 333/6,6	[C] R8K333000660E	333	50	350x862x175	55,90
CHV-T 400/6,6	[C] R8K400000660E	400	50	350x892x175	58,60
CHV-T 500/6,6	[C] R8K500000660E	500	50	350x1032x175	69,70
CHV-T 600/6,6	[C] R8K600000660E	600	50	350x1182x175	81,20
CHV-T 750/6,6	[C] R8K750000660E	750	50	350x1252x200	97,60
BIL 28/75 kV (50 Hz) - 11 kV					
CHV-T 50/11	[C] R8L0500011005	50	50	350x422x160	19,30
CHV-T 75/11	[C] R8L0750011005	75	50	350x472x160	22,70
CHV-T 100/11	[C] R8L1000011005	100	50	350x472x160	23,00
CHV-T 150/11	[C] R8L1500011005	150	50	350x572x160	30,10
CHV-T 200/11	[C] R8L2000011005	200	50	350x632x160	34,40
CHV-T 250/11	[C] R8L2500011005	250	50	350x802x160	45,70
CHV-T 300/11	[C] R8L3000011005	300	50	350x802x160	46,50
CHV-T 333/11	[C] R8L3330011005	333	50	350x862x175	53,00
CHV-T 400/11	[C] R8L400001100E	400	50	350x892x175	56,10
CHV-T 500/11	[C] R8L500001100E	500	50	350x1032x175	67,00
CHV-T 600/11	[C] R8L600001100E	600	50	350x1182x175	80,70
CHV-T 750/11	[C] R8L750001100E	750	50	350x1252x200	92,10

Codes R8xxxxxxxxxxx5 cannot have an internal fuse.

10% surcharge for orders less than or equal to 3 units (per type)
The prices shown in the price list refer to capacitors for indoor/outdoor installation, with internal fuses (depending on type), 50 Hz, class C temperature and without pressure switch.
According to IEC 60871-1 and IEC 60871-4 standards

CHV-M

Single-phase MV power capacitors (indoor and outdoor use)

Type	Code	Q (kvar)	Frequency (Hz)	Size (mm) width x height x depth	weight (kg)
BIL 20/60 kV (50 Hz) - 3,81 kV					
CHV-M 50/3,81	[C] R8A0500003815	50	50	350x487x160	18,20
CHV-M 75/3,81	[C] R8A075000381E	75	50	350x487x160	18,50
CHV-M 100/3,81	[C] R8A100000381E	100	50	350x537x160	21,90
CHV-M 150/3,81	[C] R8A150000381E	150	50	350x637x160	29,10
CHV-M 167/3,81	[C] R8A167000381E	167	50	350x637x160	29,30
CHV-M 200/3,81	[C] R8A200000381E	200	50	350x697x160	33,50
CHV-M 250/3,81	[C] R8A250000381E	250	50	350x867x160	44,80
CHV-M 300/3,81	[C] R8A300000381E	300	50	350x867x160	45,80
CHV-M 333/3,81	[C] R8A333000381E	333	50	350x957x160	52,30
CHV-M 400/3,81	[C] R8A400000381E	400	50	350x927x175	55,30
CHV-M 500/3,81	[C] R8A500000381E	500	50	350x1097x175	68,30
CHV-M 600/3,81	[C] R8A600000381E	600	50	350x1247x175	80,20
BIL 28/75 kV (50 Hz) - 6,35 kV					
CHV-M 50/6,35	[C] R8B0500006355	50	50	350x487x160	17,90
CHV-M 75/6,35	[C] R8B0750006355	75	50	350x537x160	21,80
CHV-M 100/6,35	[C] R8B1000006355	100	50	350x537x160	21,80
CHV-M 150/6,35	[C] R8B150000635E	150	50	350x637x160	28,60
CHV-M 167/6,35	[C] R8B167000635E	167	50	350x637x160	29,10
CHV-M 200/6,35	[C] R8B200000635E	200	50	350x697x160	33,20
CHV-M 250/6,35	[C] R8B250000635E	250	50	350x757x160	37,80
CHV-M 300/6,35	[C] R8B300000635E	300	50	350x867x160	45,30
CHV-M 333/6,35	[C] R8B333000635E	333	50	350x857x175	49,40
CHV-M 400/6,35	[C] R8B400000635E	400	50	350x927x175	54,50
CHV-M 500/6,35	[C] R8B500000635E	500	50	350x1067x175	65,60
CHV-M 600/6,35	[C] R8B600000635E	600	50	350x1247x175	79,20
CHV-M 750/6,35	[C] R8B750000635E	750	50	350x1217x200	90,40
BIL 38/95 kV (50 Hz) - 9,53 kV					
CHV-M 50/9,53	[C] R8C0500009535	50	50	350x530x160	19,50
CHV-M 75/9,53	[C] R8C0750009535	75	50	350x530x160	20,20
CHV-M 100/9,53	[C] R8C1000009535	100	50	350x580x160	23,60
CHV-M 150/9,53	[C] R8C1500009535	150	50	350x680x160	31,00
CHV-M 167/9,53	[C] R8C1670009535	167	50	350x740x160	34,90
CHV-M 200/9,53	[C] R8C2000009535	200	50	350x740x160	35,40
CHV-M 250/9,53	[C] R8C2500009535	250	50	350x910x160	46,90
CHV-M 300/9,53	[C] R8C300000953E	300	50	350x910x160	48,00
CHV-M 333/9,53	[C] R8C333000953E	333	50	350x1000x160	54,70
CHV-M 400/9,53	[C] R8C400000953E	400	50	350x1000x175	59,70
CHV-M 500/9,53	[C] R8C500000953E	500	50	350x1140x175	71,00
CHV-M 600/9,53	[C] R8C600000953E	600	50	350x1290x175	83,10
CHV-M 750/9,53	[C] R8C750000953E	750	50	350x1257x200	90,40
BIL 50/125 kV (50 Hz) - 12,7 kV					
CHV-M 50/12,7	[C] R8D0500012705	50	50	350x615x160	19,70
CHV-M 75/12,7	[C] R8D0750012705	75	50	350x665x160	23,40
CHV-M 100/12,7	[C] R8D1000012705	100	50	350x715x160	26,80
CHV-M 150/12,7	[C] R8D1500012705	150	50	350x765x160	31,20
CHV-M 167/12,7	[C] R8D1670012705	167	50	350x825x160	35,10
CHV-M 200/12,7	[C] R8D2000012705	200	50	350x885x160	39,20
CHV-M 250/12,7	[C] R8D2500012705	250	50	350x995x160	47,00
CHV-M 300/12,7	[C] R8D3000012705	300	50	350x995x160	48,10
CHV-M 333/12,7	[C] R8D3330012705	333	50	350x1055x175	56,90
CHV-M 400/12,7	[C] R8D4000012705	400	50	350x1085x175	59,60
CHV-M 500/12,7	[C] R8D500001270E	500	50	350x1225x175	70,90
CHV-M 600/12,7	[C] R8D600001270E	600	50	350x1375x175	83,00
CHV-M 750/12,7	[C] R8D750001270E	750	50	350x1405x200	98,80
BIL 70/170 kV (50 Hz) - 19,05 kV					
CHV-M 50/19,05	[C] R8E0500019055	50	50	350x644x160	23,30
CHV-M 75/19,05	[C] R8E0750019055	75	50	350x644x160	23,60
CHV-M 100/19,05	[C] R8E1000019055	100	50	350x694x160	27,00
CHV-M 150/19,05	[C] R8E1500019055	150	50	350x804x160	35,00
CHV-M 167/19,05	[C] R8E1670019055	167	50	350x804x160	35,30
CHV-M 200/19,05	[C] R8E2000019055	200	50	350x864x160	39,40
CHV-M 250/19,05	[C] R8E2500019055	250	50	350x964x175	50,80
CHV-M 300/19,05	[C] R8E3000019055	300	50	350x1034x175	56,50
CHV-M 333/19,05	[C] R8E3330019055	333	50	350x1034x175	57,10
CHV-M 400/19,05	[C] R8E4000019055	400	50	350x1134x175	64,40
CHV-M 500/19,05	[C] R8E5000019055	500	50	350x1244x175	73,70
CHV-M 600/19,05	[C] R8E6000019055	600	50	350x1264x200	84,10
CHV-M 750/19,05	[C] R8E7500019055	750	50	350x1454x200	104,20

Codes R8xxxxxxxxxxx5 cannot have an internal fuse.

LVC

Three-phase contactor for MV capacitors

Type	Code	Max. voltage	Max. Current (A)	auxiliary voltage	Size (mm) width x height x depth	weight (kg)
VC-6Z44ED 6,6kV 220V	[*] R80921.	6,6 kVca	3 x 400	220 Vac	353x398.6x247	24,00
VC-6Z44ED 6,6kV 110V	[*] R809210010000	6,6 kVca	3 x 400	110 Vdc	353x398.6x247	24,00

RMV

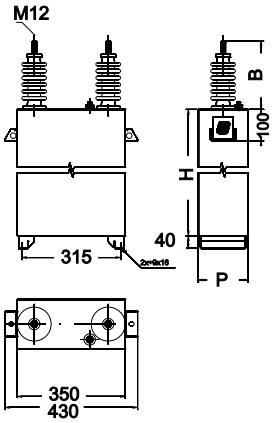
Choke reactors for MV capacitor banks

Type	Code	In (A)	L (µH)	Size (mm) width x height x depth	weight (kg)
RMV-260					
RMV-260-50-350	[2] R80628.	50	350	370x290x110	12,00
RMV-260-60-250	[2] R80637.	60	250	370x290x110	13,00
RMV-260-100-100	[*] R80664.	100	100	370x290x110	13,00
RMV-260-125-50	[2] R80672.	125	50	370x290x110	14,00
RMV-260-175-30	[2] R80691.	175	30	370x290x110	14,00
RMV-330					
RMV-330-60-450	[2] R80739.	60	450	470x355x110	20,00
RMV-330-75-350	[2] R80748.	75	350	470x355x110	21,00
RMV-330-90-250	[2] R80757.	90	250	470x355x110	26,00
RMV-330-125-100	[2] R80774.	125	100	470x355x110	22,00
RMV-330-200-50	[2] R807A2.	200	50	470x355x110	22,00
RMV-330-250-30	[2] R807B1.	250	30	470x355x110	23,00

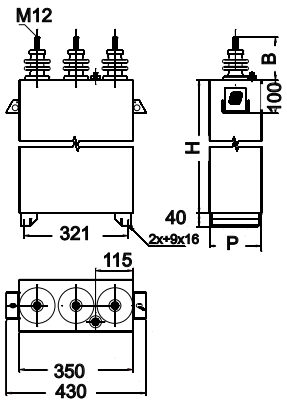
Selection parameters for RMV reactances are: * Maximum operating current (1,43 In) * Required inductance in µH * Isolating voltage kV The isolating voltage is 12 kV (28/75). Other voltages on request Thermal current is 43 In / 1 s. Other values on request Other currents and µH please request Price.

Dimensions

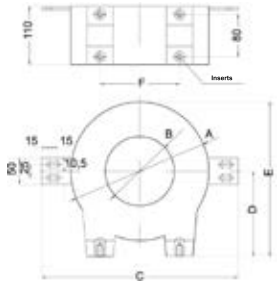
CHV-M



CHV-T



RMV



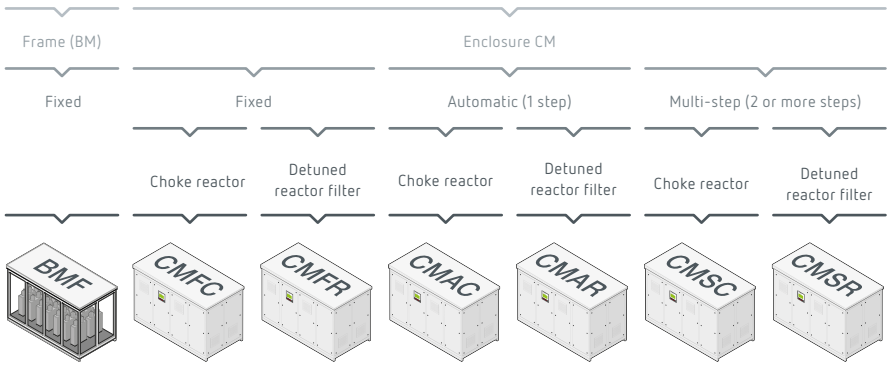
Type	A Ø mm	B Ø mm	C mm	D mm	E mm	F mm	Inserts
RMV-260	260	130	370	160	370	290	M12
RMV-330	330	150	470	190	355	210	M12/M16

MV Automatic capacitor banks

CIRKAP. Easy to choose complete products

Selection of capacitor banks

CIRKAP capacitor banks are divided in two main groups: Capacitor banks in a CM frame and capacitor banks in open BM frames.



References for CIRKAP BM

Code						
B	M	X	X	X	X X X	X X X X X
Fixed (step 1)		F				
Without choke reactor			-			
With choke reactor			C			
Number of steps (1)				n°		
Rated voltage (3 figures) 3.3 kV					033	
Rated voltage (3 figures) 4.2 kV					042	
Rated voltage (3 figures) 5.5 kV					055	
Rated voltage (3 figures) 6.0 kV					060	
Rated voltage (3 figures) 6.3 kV					063	
Rated voltage (3 figures) 6.6 kV					066	
Rated voltage (3 figures) 11 kV					110	
Rated voltage (3 figures) 13.2 kV					132	
Rated voltage (3 figures) 15 kV					150	
Rated voltage (3 figures) 16.5 kV					165	
Rated voltage (3 figures) 22 kV					220	
Rated voltage (3 figures) 33 kV					330	
Nominal capacitor bank power in kvar (5 figures)						n°

References for CIRKAP CM

Code						
C	M	X	X	X	X X X	X X X X X
Fixed (step 1)		F				
Automatic (1 step)		A				
Multistep		S				
Without choke reactor			-			
With choke reactor			C			
With detuned filter			R			
Number of steps (1...9)				n°		
Rated voltage (3 figures) 3.3 kV					033	
Rated voltage (3 figures) 4.2 kV					042	
Rated voltage (3 figures) 5.5 kV					055	
Rated voltage (3 figures) 6.0 kV					060	
Rated voltage (3 figures) 6.3 kV					063	
Rated voltage (3 figures) 6.6 kV					066	
Rated voltage (3 figures) 11 kV					110	
Rated voltage (3 figures) 13.2 kV					132	
Rated voltage (3 figures) 15 kV					150	
Rated voltage (3 figures) 16.5 kV					165	
Rated voltage (3 figures) 22 kV					220	
Rated voltage (3 figures) 33 kV					330	
Nominal capacitor bank power in kvar (5 figures)						n°

Application examples

Water treatment installation

Automatic multi-step capacitor bank with detuned filter, model CMSR, 2250 kvar at 6,6 kV, 50 Hz, 5x650 kvar composition, tuned to 189 Hz (p:7%), outdoor installation and IP44 protection degree. Details of the step with fuse protection, vacuum contactor, filtering reactor and three-phase capacitor.

Paper industry

Automatic multi-step capacitor bank with detuned filter, model CMSR, 6750 kvar at 22 kV, 50 Hz, 750+4x1500 kvar composition, tuned to 189 Hz (p:7%), outdoor installation and IP54 protection degree. Voltage presence indicator, ON/OFF step, manual or automatic step selection, reactive energy regulator with three-phase measurement and overcurrent, short-circuit and step offset protection relays.

Road infrastructures

Automatic multi-step capacitor banks with detuned filter, model CMAR,100 kvar at 3.3 kV, 50 Hz, 1x100 kvar composition, indoor installation and IP23 protection degree, tuned to 189 Hz. Details of the structure adapted to the space available in the tunnel and corporate colour requested by the client.

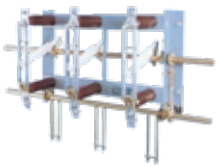
Additional components of MV capacitor banks

Pressure switch
Disconnects the step/capacitor bank with the pressure generated after a serious fault inside a capacitor, in order to prevent greater damage. It enables the power circuit to be disconnected and signals the fault when the pressure reaches the maximum value.

Voltage presence indicator
A unit that lights up permanently when the power circuit is powered to provide greater safety during operations carried out on the unit.

Smoke detector
Smoke detectors are devices that warn about the possibility of internal combustion in the capacitor bank and that send a signal to activate an alarm (in the unit or at the discretion of the user), disconnecting the of the battery if necessary.

Electric circuit with opening delay for doors
For units that are ordered with doors in the power modules, Circutor offers the possibility of including a solenoid electrical interlock system in order to prevent access to the capacitor bank's interior if the necessary time has not elapsed.



SVacuum off-load and/or earthing switch
The cut-off and/or earthing switch enables the unit to be visually disconnected and isolated at the capacitor bank input.

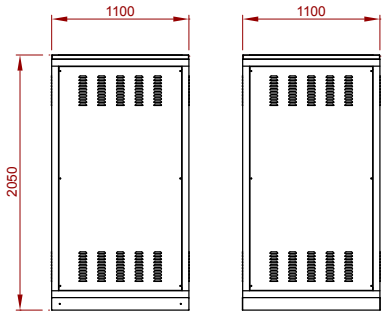
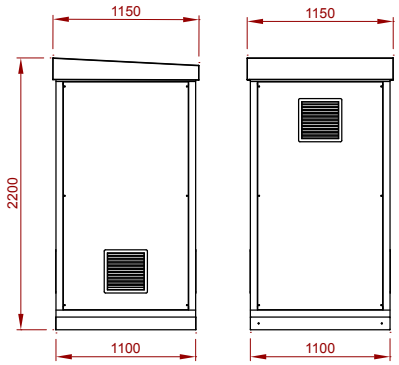
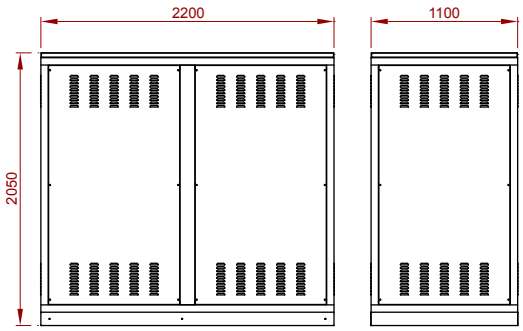
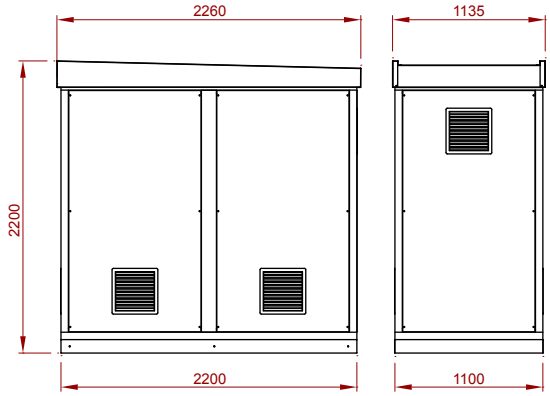
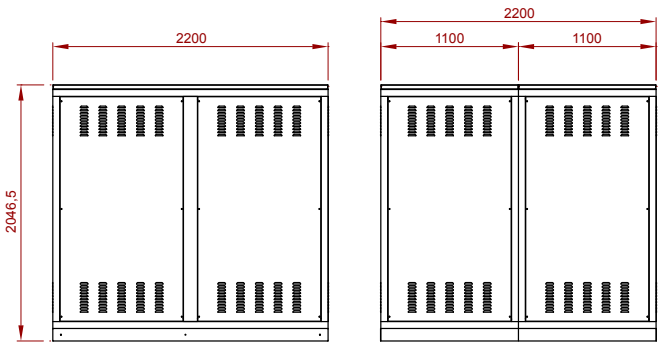
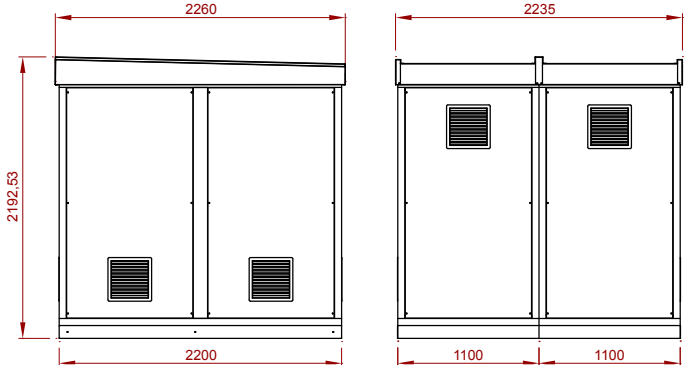
Ventilation
In the case of capacitor banks installed in environmental conditions where natural convention cooling is insufficient, an auxiliary thermostat-controlled forced air system is essential for evacuating the internal heat of the capacitor bank.

Anti-condensation heating resistors
These are used to avoid condensation due to temperature gradients during the day, under saline environmental conditions, high relative humidity and low temperatures. Heating resistors controlled by thermostat and/or hygrometer.

Step dimensions

Power	7,2 kV	12 kV	24 kV	36 kV
≤250 kvar	A	A	B	C
21-500 kvar	A	A	B	C
501-750 kvar	A	B	B	C
751-1000 kvar	A, B	B	B	C
1001-1500 kvar	B	B	C	C
1501-2000 kvar	B	B	C	C
201-2500 kvar	B	B	C	C
2501-3000 kvar	B	C	C	C
3001-4000 kvar	C	C	C	C
4001-5000 kvar	C	C	C	
5001-6000 kvar	C	C	C	
6001-7000 kvar	C	C	C	

Dimensions are approximate and may differ depending on the specifications for each team.

	INDOOR	OUTDOOR
A		
B		
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