

















# CVM SYSTEM ANALYZERS





## CONTENTS

		Page
	<b>Introduction</b>	<b>3</b>
	<b>Three-phase system analyzers</b>	<b>4</b>
	<b>Applications</b>	<b>5</b>
	<b>Three-phase system analyzers</b>	
	CVM-NRG 96	<b>6</b>
	CVM-96	<b>7</b>
	CVM-144	<b>8-9</b>
	CVMk	<b>10-11</b>
	<b>Analogue I/O equipment; digital I/O equipment:</b>	
	• CVM-R8C / CVM-R8D	<b>12</b>
	• CVM-R8A-C / CVM-R8A-D	<b>12</b>
	• CVM-R10-C	<b>12</b>
	CVM-Q	<b>14</b>
	CVM-MINI	<b>15</b>
	CVM-BC <sub>3</sub>	<b>16</b>
	CVM-BD	<b>17</b>
	CVM-BDM	<b>18</b>
	<b>Single-phase system analyzers</b>	
	CVM-SP	<b>20</b>
	CVM-96-SP	<b>13</b>
	<b>Power net</b>	<b>21</b>
	<b>Energy Web Server</b>	<b>22</b>
	<b>Converters</b>	<b>23</b>
	<b>Power Studio Scada software</b>	<b>24</b>
	<b>Dimensions and Connections</b>	<b>25-26-27</b>

	Measuring in 2 quadrants		Energy saving screen saver		Option for sending alarms by e-mail
	Measuring in 4 quadrants, consumption and generation meters		Harmonics measurements up the 15 <sup>th</sup> or 50 <sup>th</sup>		Multi-converter function and analogue inputs
	Measuring in true effective value		Relays with OR option		Functions added via expansion modules
	Measuring of more than 50 electrical parameters		0.5% accuracy in voltage and current		Bill creation and consumption report module
	Storage in the memory of the maximum and minimum values measured		Option for multi-point connection		
	Password protection for setup		Option for access via the Internet		

## INTRODUCTION

**CVM** Series analyzers are highly accurate measuring stations which control and supervise the main electrical parameters in three or four wire, single-phase and/or three-phase systems (in L.V. or M.V.)

Measuring is in true effective value (TRMS), using three voltage inputs and neutral for external current transformer connection with .../5A or .../1A secondaries (current inputs are insulated in ITF models).

In addition to displaying and transmitting all measured or calculated electrical parameters through communications, **CVM** analyzers include a meter function being able to store the installation's consumed and generated energy in their internal memory including without auxiliary power supply.



Panel mounted equipment



DIN rail mounted equipment

**CVM** system analyzers may include an hourly time slots according to type using a preset program. This system obtains a kWh total for each of the preset tariffs. These analyzers, like the single tariff analyzers, record active, inductive reactive, capacitive reactive and apparent power for each of the preset periods.

The whole series has a built in power demand meter built in which calculates integrated demand in a preset period. This sliding integration may be carried out for a selected parameter: three-phase current, three-phase active power, three-phase apparent power or current per phase.

The expandable or modular equipment may be supplied with additional functions from a selected expansion card or from the type of **CVM** selected. They have the option for analogue I/O (multi-converter function), digital I/O (central alarm function or impulse generation / kWh) which may be linked to any measured or calculated electrical parameter.

Due to the large volume of information from each of the **CVM** system analyzers, the equipment has communication output. Connection topology and system protocols are very varied (RS-232, RS-485, RTB modem, GSM modem, Radio (Modbus RTU, Profibus DP and Metasys N2) and Ethernet (Web or XML)).

PARAMETERS	UNIT	L1	L2	L3	III
Phase-neutral voltage	V	•	•	•	
Phase-phase voltage	V	•	•	•	
Current	A	•	•	•	•
Current	Hz		•		
Active power	kW	•	•	•	•
Inductive reactive powera	kvar L	•	•	•	•
Capacitive reactive power	kvar C	•	•	•	•
Apparent power	kV·A	•	•	•	•
Power factor	PF	•	•	•	•
cos φ	cos φ				•
Power demand	Pd			•	
Neutral current	$I_N$			•	
Harmonic decomposition		•	•	•	
Harmonic Measuring in voltage	% THD - V	•	•	•	
Harmonic measuring in current	% THD - A	•	•	•	
kWh (consumed and generated)	Wh				•
kvarh L (consumed and generated)	varh				•
kvarh C (consumed and generated)	varh				•
kVAh (consumed and generated)	VAh				•

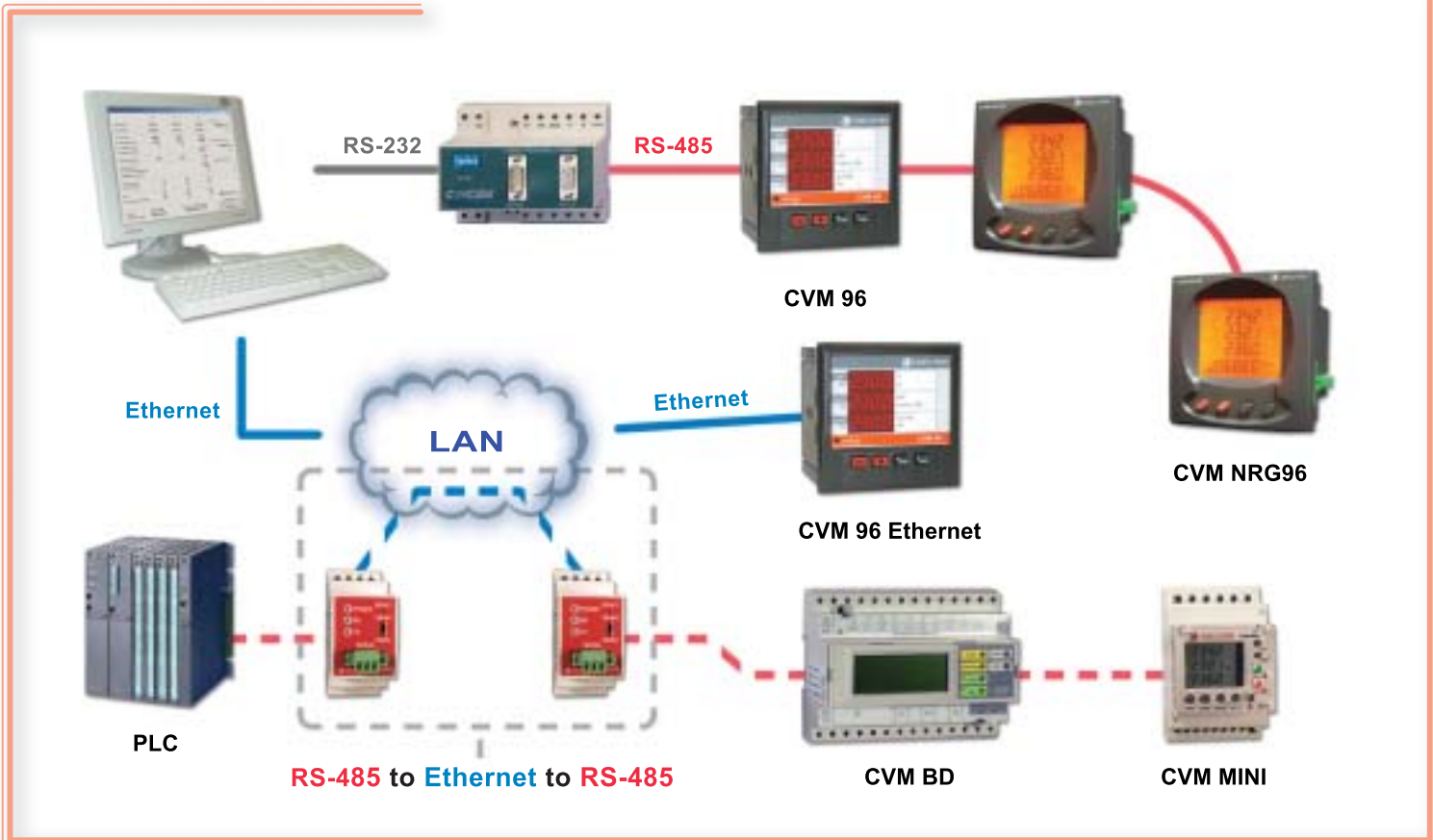
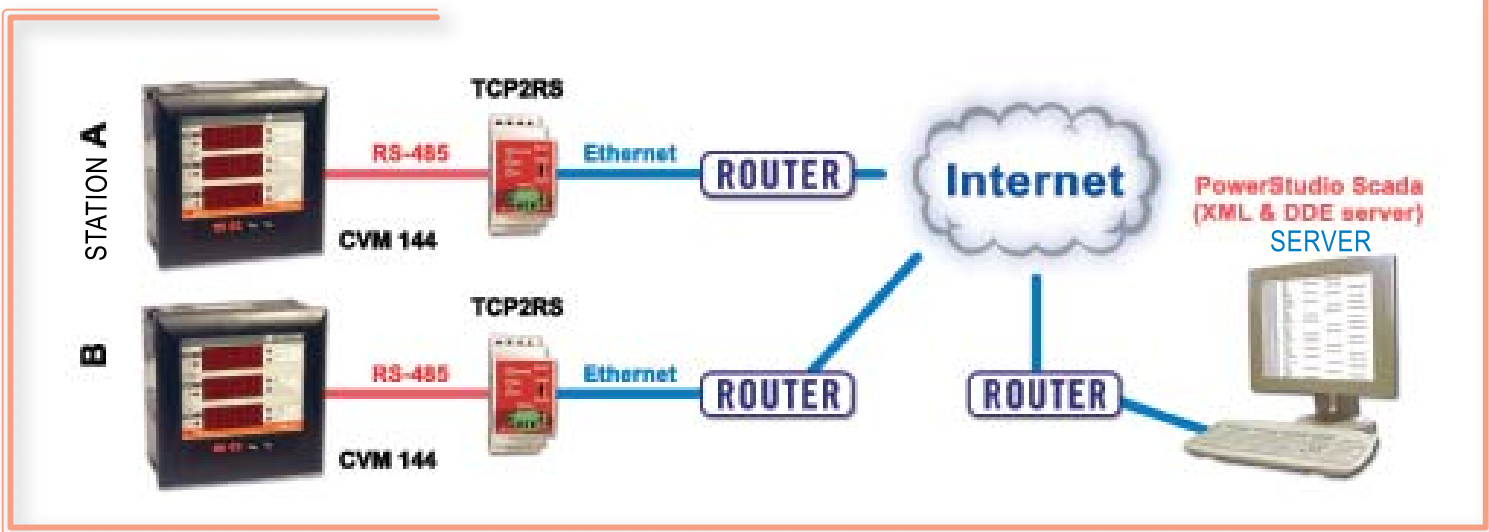
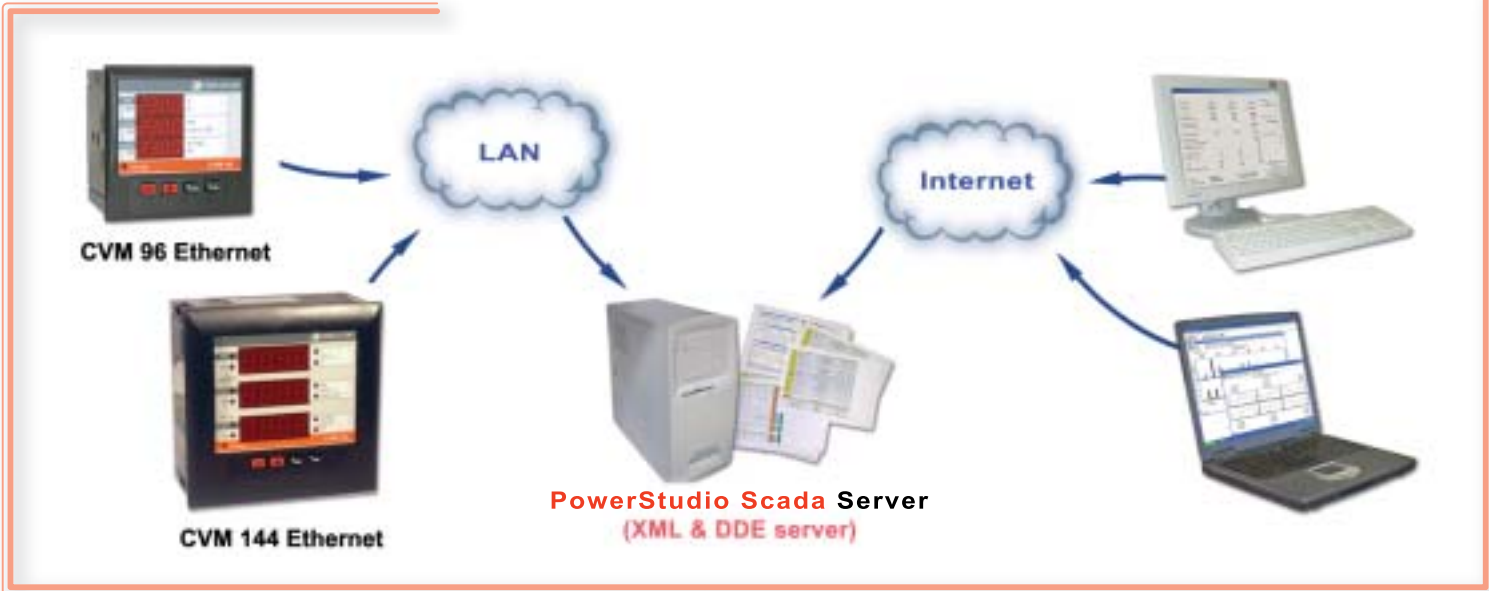


## THREE-PHASE SYSTEM ANALYZERS

	PANEL					DIN RAIL			
	96 x 96 mm					3 modules	8 modules		
	CVM-96 SP	CVM-NRG96	CVM-96	CVM-144	CVMk	CVM-MINI	CVM-BC3	CVM-BD	CVM-BDM
<b>MEASURING FEATURES</b>	-  +					-  +			
Single-phase	•								
Phase-phase voltage		•	•	•	•	•	•	•	•
True effective value (TRMS)	•	•	•	•	•	•	•	•	•
Quadrants	2	4	2	2	4	4	2	4	4
Power demand (Pd)		•	•	•	•	•	•	•	•
Neutral current (*)		•	•	•		•	•		•
Leakage current				•					
THD Measuring (V, A)	•	•	•	•	•	•	•	•	•
Harmonic decomposition		•	•	•	•	•	•		•
Energy meter (kWh, kvarh C, kvarh L)	•	•	•	•	•	•	•	•	•
Multi-tariff					•			•	
Analogue inputs (0/4...20 mA)				•					
Analogue outputs (0/4...20 mA)				•	•			•	•
Digital inputs				•					
Digital outputs	•	•	•	•	•	•	•	•	•
<b>ASSEMBLY FEATURES</b>									
Display	LCD	LCD	LED	LED	LED/LCD	LCD	LCD	LCD	LCD
Screen saver		•	•	•		•	•		•
Password protection		•	•	•		•	•		•
<b>COMMUNICATIONS FEATURES</b>									
RS-232			•	•	•			•	•
RS-485	•	•	•	•	•	•	•	•	•
Ethernet			•	•					
<b>Communications protocol</b>									
Modbus RTU	•	•	•	•	•	•	•	•	•
Profibus DP				•					
Johnson Controls			•	•	•			•	
XML (Ethernet types only)				•					

(\*) Measured or calculated, according to type

APPLICATIONS

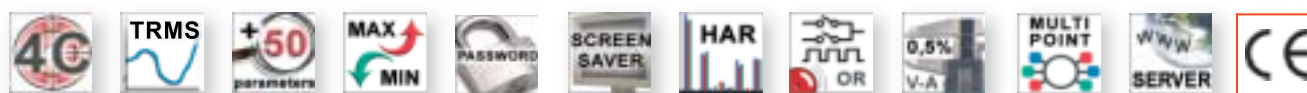




## CVM-NRG 96 COMPACT EQUIPMENT



- Panel electrical system analyzer (96 x 96 mm) which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- Slim line analyzer (only 50 mm deep)
- Power demand meter function (A / A III / kW III / kV•A III)
- Current reading using external transformers .../5A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- RS-485 communication (MODBUS RTU)
- Compatible with the **Power Studio / Scada** system
- 4 line backlit LED display
- Allows selection of default page
- Universal power supply for Plus type



Three-phase 45...65 Hz	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	True effective value	LCD Display	Digital output	Neutral current	Communications	MODBUS Protocol (RTU)	Universal power supply	Harmonics measurer (HAR) HAR decomposition V and A 15°	Type	Cod
•		•	•	•	•		•					CVM-NRG96	M51800
•	•	•	•	•	•		•					CVM-NRG96-ITF	M51900
•	•	•	•	•	•	1	•	RS-485	•			CVM-NRG96-ITF, RS485 C	M51911
•	•	•	•	•	•	1	•	RS-485	•	•		CVM-NRG96-P-ITF, RS485 C	M51A11
•	•	•	•	•	•	1	•	RS-485	•		•	CVM-NRG96-ITF-HAR, RS485 C	M51B11

## FEATURES

<b>Power supply circuit</b>	230 V a.c. (+10% / -15%) Plus 85...265 V a.c. 95...300 V d.c.	<b>Output transistor</b>	<b>Opto-insulated (open collector) NPN</b>
Consumption	5 V•A	Maximum operating voltage	24 V d.c.
Frequency	45...65 Hz	Maximum operating current	50 mA
<b>Measuring circuit</b>		Maximum impulse frequency	5 impulses / second
Rated voltage	300 V a.c. phase-neutral 520 V a.c. phase-phase	Length of impulse	100 ms
Frequency	45...65 Hz	<b>Environmental conditions</b>	
Voltage circuit consumption	0,7 V•A	Operating temperature	-10 °C / +50 °C
Current circuit consumption	ITF 0,5 / Shunt 0,75 V•A	<b>Assembly features</b>	
Rated current	$I_n \dots /5 A$ (insulated input on ITF)	Type of casing	Self extinguishing V0 plastic
Permanent overload	$1,1 I_n$	Protection: assembled equipment (front) unassembled equipment (side)	IP 51 IP 31
<b>Class</b>		Dimensions	96 x 96 x 63 mm
Voltage	0,5 % ± 2 digits	Weight	0,4 kg
Current	0,5 % ± 2 digits	<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
Power	1 % ± 2 digits	<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, 61000-6-1, 61010-1

## ACCESSORIES



Converters  
(see page M5-23)



Power Studio Scada software  
(see M.9)



Measuring transformer  
(see M.7)

## CVM-96 COMPACT EQUIPMENT



- Panel electrical system analyzer (96 x 96 mm) which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- Power demand meter function (A / A III / kW III / kV•A III)
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Different protocols (Modbus RTU, Modbus TCP, Metasys N2)
- Allows different connections (RS-232, RS-485, Ethernet)
- Compatible with the **Power Studio / Scada** system
- 3 x 4 digit LED display
- Allows selection of default page
- Varied Measuring range permitted (110, 520 866 Vf-f)
- Incorrect connection detection (flashing LED)

Ethernet system protocol  
RS-485 or RS-232 system protocol



Three-phase 45...65 Hz	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	Harmonics measurer up to 31st (A)	True effective value	LED Display	Relay output	Neutral current	Communications	MODBUS Protocol (RTU)	Type	Code
•	•	•	•	•	•	•				•	CVM 96	<b>M51100</b>
•	•	•	•	•	•	•				•	CVM 96-ITF	<b>M51200</b>
•	•	•	•	•	•	•	2		RS-485	•	CVM 96-ITF-RS485-C2	<b>M51211</b>
•	•	•	•	•	•	•	2		TCP-IP	•	CVM 96-ITF-Ethernet-C2	<b>M51231</b>
•	•	•	•	•	•	•	2		RS-485	•	CVM 96-ITF-Jonhson-C2	<b>M51711</b>
•	•	•	•	•	•	•	2	•	RS-485	•	CVM 96-F-ITF-RS485-C2-HAR-IN	<b>M51513</b>

### FEATURES

<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)	<b>Mechanical life</b>	3 x 10 <sup>7</sup> operations
Consumption	5 V·A	<b>Energy / alarm impulses</b>	1 impulse/second maximum
Frequency	45 / 65 Hz	<b>At full loading:</b> - electrical life (250 V a.c./3A) - operating frequency	1 x 10 <sup>5</sup> operations 450 operations / hour
<b>Measuring circuit</b>			
Rated voltage	300 V a.c. phase-neutral / 520 V a.c. phase-phase	<b>Assembly features</b>	
Frequency	45...65 Hz	Connection	Pluggable board
Current circuit consumption	0,75 V·A	Type of casing	Self extinguishing V0 plastic
Rated current	I <sub>n</sub> .../5 A (insulated input on ITF) (option: .../1A)	Protection	assembled equipment (front): IP 54 Unassembled equipment (side): IP 31
Permanent overload	1,2 I <sub>n</sub>	Dimensions	96 x 96 x 78 mm
<b>Class</b>			
Voltage	0,5 % ± 2 digits	Weight	0,52 kg
Current	0,5 % ± 2 digits	<b>Environmental conditions</b>	
Power	1 % ± 2 digits	Operating temperature	-10 °C / +50 °C
<b>Output transistor</b>			
Maximum operating power	750 V·A	Humidity	5 % ... 95 % (without condensation)
Maximum operating voltage	250 V a.c.	<b>Safety</b>	
Maximum operating current	3 A	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II	
		<b>Standards</b>	
		IEC 664, VDE 0110, IEC 801, UL 94, IEC 348 IEC 571-1, EN 61010-1, EN 50081-1, EN 50082-1	

(\*) Other power supplies and Measurements on request (please see price list)

### ACCESSORIES



Converters  
(see page M5-23)



Power Studio Scada software  
(see M.9)



Measuring transformer  
(see M.7)



## CVM – 144 MODULAR ANALYZER



- Panel electrical system analyzer (144 x 144 mm) which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- Harmonics Measuring up to the 20th (up to 32nd with HAR)
- Power demand meter function (A / A III / kW III / kV·A III)
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Different protocols (Modbus RTU, Modbus TCP, Metasys N2)
- Allows different connections (RS-232, RS-485, Ethernet)
- Compatible with the **Power Studio / Scada** system
- 3 x 4 digit LED display
- Allows selection of default page
- Varied Measuring range permitted (110, 520 866 Vf-f)
- Input/Output module option
- Incorrect connection detection (flashing LED)

## Ethernet system protocol

Modbus RTU

Metasys N 2

Modbus TCP



## RS-485 or RS-232 system protocol

Modbus RTU

Metasys N 2



## EXPANSION MODULE FUNCTIONS



- Alarm station function: digital inputs
- Alarm emitter function: digital output
- Multi-converter function: analogue outputs 0 / 4 ... 20 mA
- Industrial process measurer function: analogue inputs 0 / 4 ... 20 mA
- Leakage and neutral current measurer function

\* Many of these options may be combined on one single card: please enquire

## FEATURES

<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)
Consumption	5 V·A
Frequency	45...65 Hz
<b>Measuring circuit</b>	
Rated voltage	300 V a.c. phase-neutral/ 520 V a.c. phase-phase
Frequency	45...65 Hz
Voltage circuit consumption	0,75 V·A
Rated current	$I_n$ .../5 A (option: .../1 A)
Permanent overload	1,2 $I_n$
<b>Class</b>	
Voltage	0,5 % ± 2 digits
Current	0,5 % ± 2 digits
Power	1 % ± 2 digits

(\*) Other power supplies and Measurements on request (please see price list).

<b>Output transistor</b>	
Maximum operating power	750 V·A
Maximum operating voltage	250 V a.c.
Maximum operating current	3 A
Mechanical life	3 x 10 <sup>7</sup> operations
Energy / alarm impulses	1 impulse/second maximum
At full loading: - electrical life (250 V AC./3A) - operating frequency	1 x 10 <sup>5</sup> operations 450 operations / hour
<b>Analogue outputs</b>	
Output type	0 / 4 ... 20 mA
Resolution	4 000 dots (12 bits)
Maximum impedance	500 Ω
<b>Analogue inputs</b>	
Input type	0 ... 20 mA
Resolution	4 000 dots (12 bits)
Input impedance	200 Ω



## FEATURES

Assembly features		Environmental conditions	
Connection	Pluggable board	Operating temperature	-10 °C / +50 °C
Type of casing	Self extinguishing V0 plastic	Humidity	5 % ... 95 % (without condensation)
Protection: assembled equipment (front) unassembled equipment (side)	IP 54 IP 31	<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
Dimensions	144 x 144 x 76 mm	<b>Standards</b>	<b>IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1</b>
Weight	0,4 kg		

Harmonic decomposition up to the 31 <sup>st</sup> on the display (A)	Three-phase 50...60 Hz	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	True effective value	LED Display	Digital inputs	Relay output	Leakage / Neutral current	Analogue inputs	Analogue outputs	Communications	MODBUS Protocol (RTU)	PROFIBUS Protocol	Johnson Controls Protocol	Type	Code
EXPANDIBLE EQUIPMENT																	
	•		•	•	•	•										CVM 144	<b>M50600</b>
	•	•	•	•	•	•										CVM 144-ITF	<b>M50700</b>
•	•	•	•	•	•	•										CVM 144-ITF-HAR	<b>M50760</b>
	•	•	•	•	•	•						TCP-IP	•			CVM 144-ITF-ETHERNET	<b>M50750</b>
	•	•	•	•	•	•						RS485		•		CVM 144-ITF Profibus	<b>M50730</b>
	•	•	•	•	•	•						RS485			•	CVM 144-ITF Johnson Controls	<b>M50C10</b>
COMPLETE EQUIPMENT																	
	•	•	•	•	•	•		2				RS485	•			CVM 144-ITF RS485-C2	<b>M50710</b>
	•	•	•	•	•	•		2			4	RS485	•			CVM 144-ITF RS485-C2-A40	<b>M50614</b>
	•	•	•	•	•	•		2		2	2	RS485	•			CVM 144-ITF RS485-C2-A2I/2O	<b>M50618</b>
	•	•	•	•	•	•		2		2	2	TCP-IP	•			CVM 144-ITF-ETHERNET-C2-A2I/2O	<b>M50A58</b>
	•	•	•	•	•	•		2	•			TCP-IP	•			CVM 144-ITF-ETHERNET-C2-currents	<b>M50751</b>
	•	•	•	•	•	•		2		2	2	RS485		•		CVM 144-ITF Profibus-C2-A2I/2O	<b>M50A38</b>
	•	•	•	•	•	•		2	•			RS485		•		CVM 144-ITF Profibus-C2-Currents	<b>M50741</b>
	•	•	•	•	•	•		2		2	2	RS485			•	CVM 144-ITF Johnson Controls-C2-A2I/2O	<b>M50741</b>
	•	•	•	•	•	•		2	•			RS485			•	CVM 144-ITF Johnson Controls-C2-Currents	<b>M50C11</b>
INTERCHANGEABLE EQUIPMENT (for expandable equipment)																	
								2	•							Mod CVM 144 C2-Currents	<b>M51001</b>
								2				RS485	•			Mod CVM 144 RS485-C2	<b>M51010</b>
								2	•			RS485	•			Mod CVM 144 RS485-C2-Currents	<b>M51011</b>
								4	2			RS485	•			Mod CVM 144 RS485-C2-Digital	<b>M51016</b>
								2				RS232	•			Mod CVM 144 RS232-C2	<b>M51020</b>
								2	•			RS232	•			Mod CVM 144 RS232-C2-Currents	<b>M51010</b>
								4	2			RS232	•			Mod CVM 144 RS232-C2-Digital	<b>M51010</b>

## ACCESSORIES



Management software  
(see M.9)



Management software  
(see M.9)



Measuring transformer  
(see M.7)



## CVMK MODULAR ANALYZER



- Panel electrical system analyzer (144 x 144 mm) which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- Harmonics Measuring up to the 50th (with HAR)
- Double scale kW / MW
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Different protocols (Modbus RTU, Metasys N2, ASCII)
- Second RS-485 port option to connect I/O peripherals
- 3 x 4 digit LED / LCD displays
- Parameter display selection
- Allows selection of default page
- Multiple power supplies, Measuring ranges and current inputs
- Internal clock for setting and for three hourly tariffs (TOU)
- Option for tariffs with RED or RED-MAX modules
- Input/Output module option



\*1 According to type

## EXPANSION MODULE FUNCTIONS



Expansion options:

- Alarm emitter function: digital output
- Multi-converter function: analogue outputs 0 / 4 ... 20 mA

\* Many of these options may be combined on one single card: please enquire

## FEATURES

Power supply circuit (*)	230 / 400 V a.c. (+10% / -15%)
Consumption	3 V·A
Frequency	45 ... 65 Hz
<b>Measuring circuit</b>	
Rated voltage	500 V a.c. phase-neutral 865 V a.c. phase-phase
Frequency	45...65 Hz
Current circuit consumption	0,6 V·A
Rated current	$I_n$ .../5 A (insulated input on ITF)
Permanent overload	1,2 $I_n$
<b>Class</b>	
Voltage	0,5 % ± 2 digits
Current	0,5 % ± 2 digits
Power	1 % ± 2 digits

<b>Assembly features</b>	
Connection	Pluggable board
Type of casing	Self extinguishing V0 plastic
Protection: assembled equipment (front) unassembled equipment (side)	IP 41 IP 31
Dimensions (mm)	144 x 144 x 66 mm
Weight	0,750 kg
<b>Environmental conditions</b>	
Operating temperature	-10 °C / +50 °C
Humidity	5 % ... 95 % (without condensation)
<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 50081-1, EN 50082-1, EN 61010-1

Three-phase 45...65 Hz	Insulated inputs (ITF)	Voltage Measuring 500 V a.c.	THD Measuring (V, A)	True effective value	Display	Quadrants	Power supply 230/400 V a.c.	Harmonics Measuring up to 50 <sup>th</sup> (V and A)	Energy + clock	Synchronisation input / tariff change	Triple tariff	Communications	Outputs 4...20 mA	Relay outputs	Type	Code
EXPANDIBLE EQUIPMENT																
•		•		•	LCD	2	•								CVMk	M50120
•	•	•		•	LCD	2	•								CVMk-ITF	M50220
•	•	•		•	LED	2	•								CVMk-L	M50110
•	•	•		•	LED	2	•								CVM-L-ITF	M50210
				•	LCD	4	•								CVMk-4C-ITF	M50230
•	•	•	•	•	LCD	4	•								CVMk-H-ITF	M50321
•	•	•	•	•	LED	4	•								CVM-L-H-ITF	M50311
•	•	•	•	•	LCD	4	•	•							CVMk-HAR-ITF	M53310
•	•	•	•	•	LED	4	•	•							CVMk-HAR-L-ITF	M53300
INTERCHANGEABLE EQUIPMENT																
									•			RS-485			Mod CVM /ER	M50410
												RS-232			Mod CVM / 485	M50401
															Mod CVM / 232	M50402
									•			RS-485			Mod CVM / ER-485	M50411
									•			RS-232			Mod CVM / ER-232	M50412
									•			RS-485			Mod CVM / RED	M50420
									•				1		Mod CVM / ER 420-1	M50413
									•				2		Mod CVM / ER 420-2	M50414
									•				1		Mod CVM / ER C-1	M50416
									•				1	1	Mod CVM / ER C 420-1	M50415
									•	•	•	RS-485			Mod CVM / RED-MAX	M50427
									•			RS-485	1		Mod CVM / RED 420-1	M50423
									•			RS-485		2	Mod CVM / RED C-2	M50426

ACCESSORIES



Converters  
(see page M5-23)



Power Studio Scada software  
(see M.9)



Measuring transformer  
(see M.7)



## ANALOGUE I/O EQUIPMENT; DIGITAL I/O EQUIPMENT

### CVM-R8C / CVM-R8D



The **CVM-R8C / CVM-R8D** are control peripherals which interact with the pieces of equipment or loggers located in the field using their digital inputs and outputs. Their 6 digital free of power inputs offer the option to supervise the status of six dry contacts and to display these statuses on management software. It also has 2 analogue inputs and 8 relay outputs which can start or stop a piece of equipment in the installation.

The equipment has two RS-485 communication ports one of which has MODBUS RTU communication exclusively for communicating with management software. The last port (network port) is for communication with Measuring peripherals (**CVMk** and **CVM BD**) in order to make decisions based on the different electrical Measurements via programmable automated equipment.

Alarm program: up to fifty alarm conditions may be programmed with electrical parameters from an analyzer as the determinant factor. Delays and relays may even be set.

Control program: it may operate with a slave **MODBUS RTU** remotely managed by management software (**PowerStudio Scada**), or any type of electronic instruction may be internally set using its six inputs and eight outputs turning it into an automatic control device.

Type	Code
CVM-R8C + ALARM Prog.	<b>M53501</b>
CVM-R8C + CONTROL Prog.	<b>M53502</b>
CVM-R8D + CONTROL Prog.	<b>M53512</b>

### CVM-R8A-C / CVM-R8A-D



The **CVM-R8A** is a supervision and control peripheral: it has 8 analogue inputs 0...20 mA and 2 analogue outputs 0...20 mA. It has two RS-485 communication ports one of which has MODBUS RTU communication exclusively for communicating with management software. The last port (network port) is for communication with Measuring peripherals (CVMk and CVM BD) in order to make decisions based on the different electrical Measurements via programmable automated equipment. This equipment allows analogue signals to be integrated into a SCADA system.

Type	Code
CVM-R8A-C	<b>M53503</b>
CVM-R8A-D	<b>M53513</b>

### CVM-R10-C



The **CVM-R10C** is an expansion unit for the **CVM-R8** and **CVM-R8A**. It has 10 output relays, 12 digital inputs (free of power contacts) and a cable connector to connect it to a master peripheral.

Type	Code
CVM-R10-C	<b>M53600</b>

## ACCESSORIES



Converters  
(see page M5-23)



Power Studio Scada software  
(see M.9)



RS-232/485 converter  
(see page M5-23)

## CVM-96 SP



- Panel electrical system analyzer (96 x 96 mm) which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Compatible with the Power Studio / Scada System
- 3 x 4 digit LED displays
- Allows selection of default page



\*1 According to type

Single-phase 45...65 Hz	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	True effective value	LED Display	Relay output	Communications	MODBUS Protocol (RTU)	Type	Code
•		•	•	•	•			•	CVM 96-SP	<b>M51300</b>
•	•	•	•	•	•	2	RS485	•	CVM 96-SP-ITF, RS485 C2	<b>M51411</b>

### FEATURES

<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)	<b>Assembly features</b>	
Consumption	5 V·A	Connection	Pluggable board enchufable
Frequency	45 ... 65 Hz	Type of casing	Self extinguishing V0 plastic
<b>Measuring circuit</b>		Protection: assembled equipment (front) unassembled equipment (side)	IP 54 IP 31
Rated voltage	300 V a.c. phase-neutral	Dimensions (mm)	96 x 96 x 100 mm
Frequency	45...65 Hz	Weight	0,52 kg
Current circuit consumption	0,75 V·A	<b>Environmental conditions</b>	
Rated current	$I_n$ .../5 A (insulated input on ITF)	Operating temperature	-10 °C / +50 °C
Permanent overload	1,2 $I_n$	Humidity	5 % ... 95 % (without condensation)
<b>Class</b>		<b>Safety</b>	Category III-300 V AC./520 V AC. EN 61010. Electrical shock protection by double insulation class II
Voltage	0,5 % ± 1 digits	<b>Standards</b>	<b>IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-63, EN 61000-6-1, EN 61010-1</b>
Current	0,5 % ± 1 digits		
Power	1 % ± 1 digits		

### ACCESSORIES



Converters  
(see page M5-23)



Software PowerStudio  
Scada (ver M.9)



Measuring transformer  
(see M.7)



## CVM-Q



- Panel, class B electrical system analyzer (144 x 144 mm)
- Measuring in True Effective Value in low, medium and high voltage systems (using voltage secondaries) because of the option to set the voltage primary and secondary
- Multi-range voltage Measuring inputs (150/300/500 V AC phase-phase) in 3 or 4 wire
- Universal power supply 110 ... 230 V AC. / 110 ... 230 V DC.
- Internal non-volatile 1 Mb memory for quality event recording (dips, interruptions and overvoltages)
- Type of event recording, length of event, day and time when it occurred
- Setting thresholds to define supply quality events (% in terms of Un)
- Information on quality events occurring displayed
- Harmonic distortion rate in voltage measured (THD or D)
- Harmonic decomposition in voltage measured up to 31st
- Two relay outputs (alarm function)

- RS-485 communication (**MODBUS RTU**)
- EasyComm software for studying power supply quality



\*1 According to type

Type	Code
CVM-Q RS232-C2-1M	<b>M53220</b>
CVM-Q RS485-C2-1M	<b>M53210</b>

## FEATURES

<b>Power supply circuit (*)</b>	110...230 V a.c. / 110...300 V d.c.	<b>Environmental conditions</b>	
Voltage tolerance	+10% / -15%	Operating temperature	-15 °C / +70 °C
Consumption	10 V·A	Humidity	5 % ... 95 % (without condensation)
Frequency	45 ... 65 Hz	<b>Assembly features</b>	
<b>Measuring circuit</b>		Connection	Pluggable board
Rated voltage	150 / 300 / 500 V a.c.	Type of casing	Self extinguishing V0 plastic
Frequency	40...65 Hz	Protection: assembled equipment (front) unassembled equipment (side)	IP 55 IP 31
Measuring circuit consumption	0,25 V·A	Dimensions (mm)	144 x 144 x 76 mm
<b>Class</b>		Weight	0,603 kg
Voltage	0,5 % ± 2 digits	<b>Safety</b>	
<b>Relay outputs</b>		Category III-300 V AC. EN 61010. Electrical shock protection by double insulation class	
Maximum power	750 V·A	<b>Standards</b>	
Maximum voltage	250 V a.c.	IEC 664, VDE 0110, UL 94 , EN 61010-1	
Maximum current	3 A (resistive)		
Mechanical life	3 x 10 <sup>5</sup> operations		

## ACCESSORIES



Converters  
(see page M5-23)

Software PowerVision  
(ver M.9)



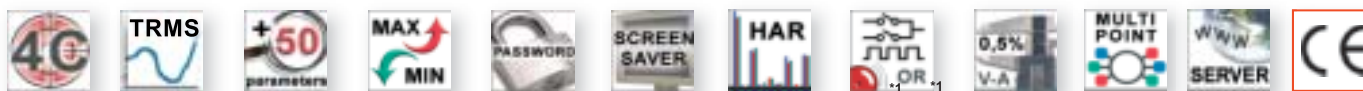
Measuring transformer  
(see M.7)

## CVM-MINI



- DIN rail (3 modules) electrical system analyzer which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- DIN rail format with only 3 modules
- 72 x 72 mm panel mounted with front adapter
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- RS-485 communication (MODBUS RTU)
- Compatible with the **Power Studio / Scada** system
- 3 line backlit LED display with magnifying glass
- Parameter display selection
- Allows selection of default page
- Universal power supply for Plus type
- Lockable

Type	Code
CVM-MINI	M52000
CVM-MINI-ITF	M52010
CVM-MINI-ITF-RS485-C2	M52021
CVM-MINI-ITF-HAR-RS485-C2	M52031



\*1 According to type

### FEATURES

<b>Power supply circuit</b>	230 V a.c. (+10% / -15%) Plus 85...265 V a.c. 95...300 V d.c.	<b>Assembly features</b>	
Consumption	3 V·A	Connection	Fixed terminals
Frequency	45 ... 65 Hz	Type of casing	Self extinguishing V0 plastic
<b>Measuring circuit</b>		Protection:	Built in equipment: IP 41 / Terminals: IP20
Rated voltage	300 V a.c. phase-neutral 520 V a.c. phase-phase	Dimensions	52,5 x 85 x 67,9 mm (3 modules)
Frequency	40...65 Hz	Weight	210 g
Voltage circuit consumption	0,7 V·A	<b>Output transistor (2)</b>	OOpto-insulated (open collector) NPN
Current circuit consumption	ITF 0,9 / Shunt 0,75 V·A	Maximum operating voltage	24 V d.c.
Rated current	$I_n$ .../5 A / $I_n$ .../1 A	Maximum operating current	50 mA
Permanent overload	$1,2 I_n$	Maximum impulse frequency	5 impulses / second
<b>Class</b>		Length of impulse	100 ms
Voltage and Current	0,5 % ± 1 digits	Harmonics measurer (HAR)	Descomposition HAR V y A , 1th
Power	1 % ± 1 digits	<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
<b>Environmental conditions</b>		<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1
Operating temperature	-10 °C / +50 °C		
Humidity	5 % ... 95 % (without condensation)		

### ACCESSORIES



Measuring transformer  
(see M.7)



Software de gestión  
(ver M.9)



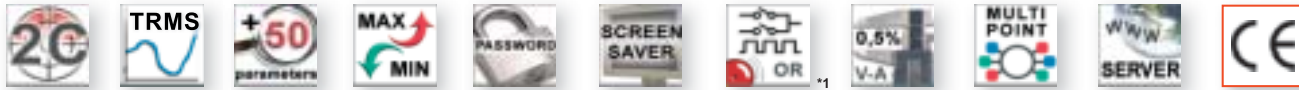
Front adapter  
(see page M5-23)



## CVM-BC3



- DIN rail (8 modules) electrical system analyzer which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- DIN rail format (8 modules)
- Harmonics Measuring up to the 20<sup>th</sup>
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- RS-485 communications (MODBUS RTU)
- Compatible with the **Power Studio / Scada** system
- 3 line backlit LCD display
- Allows selection of default page



\*1 According to type

Three-phase 45...65 Hz	True effective value	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	Maximum demand	LCD Display	Quadrants	Communications RS485	Relay outputs	Type	Code
•	•		•	•	•	•	2			CVM-BC3	<b>M52400</b>
•	•	•	•	•	•	•	2			CVM-BC3-ITF	<b>M52500</b>
•	•	•	•	•	•	•	2	•	2	CVM-BC3-ITF-RS485-C2	<b>M52511</b>

### FEATURES

<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)
Consumption	5 V·A
Frequency	45 ... 65 Hz
<b>Measuring circuit</b>	
Rated voltage	300 V a.c. phase-neutral 520 V a.c. between phases
Frequency	45...65 Hz
Current circuit consumption	0,75 V·A
Rated current	$I_n$ .../5 A (insulated input on ITF) (option: .../1 A)
Permanent overload	1,06 $I_n$
<b>Class</b>	
Voltage	0,5 % ± 2 digits
Current	0,5 % ± 2 digits
Power	1 % ± 2 digits

<b>Assembly features</b>	
Connection	Metal terminals, "Posidriv" screws
Type of casing	Self extinguishing V0 plastic
Protection: built in equipment / terminals	IP 41 IP 20
Dimensions (mm)	140 x 110 x 70 mm (8 modules)
Weight	0,4 kg
<b>Environmental conditions</b>	
Operating temperature	-10 °C / +50 °C
Humidity	5 % ... 95 % (without condensation)
<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
<b>Standards</b>	<b>IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1</b>

### ACCESSORIES



Converters  
(see page M5-23)



Software PwerStudio Scada  
(ver M.9)



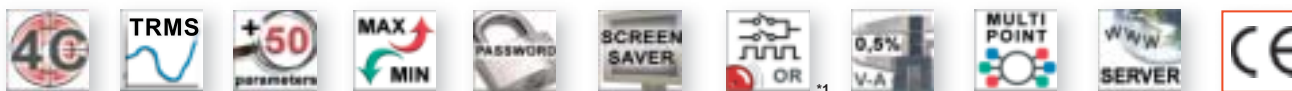
Measuring transformer  
(see M.7)



## CVM-BD



- DIN rail (8 modules) electrical system analyzer which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- DIN rail format (8 modules)
- Harmonics Measuring up to the 20<sup>th</sup>
- Double scale kW / MW
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Different protocols (Modbus RTU, Modbus TCP, Metasys N2)
- Second RS-485 port option to connect I/O peripherals
- Compatible with the Power Studio / Scada system
- 3 line backlit LCD display
- Parameter display selection
- Allows selection of default page
- Internal clock for setting and for three hourly tariffs (TOU)
- Option for tariffs with RED or RED-MAX modules



\*1 According to type

(Codes and types on page M5-19)

### FEATURES

CVM-BD		CVM-BD	
<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)	<b>Assembly features</b>	
Consumption	6 V·A	Connection	Metal terminals, "Posidrive" screws
Frequency	45 ... 65 Hz	Type of casing	Self extinguishing V0 plastic
<b>Measuring circuit</b>		Protection: built in equipment / terminals	IP 41 / IP 20
Rated voltage	500 V a.c. phase-neutral 866 V a.c. between phases	Dimensions (mm)	140 x 110 x 70 mm (8 modules)
Frequency	45...65 Hz	Weight	0,52 kg
Current circuit consumption	0,6 V·A	<b>Environmental conditions</b>	
Rated current	$I_n$ .../5 A (insulated input on ITF) (option: .../1 A)	Operating temperature	-10 °C / +50 °C
Permanent overload	1,2 $I_n$	Humidity	5 % ... 95 % (without condensation)
<b>Class</b>		<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
Voltage	0,5 % ± 2 digits	<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1
Current	0,5 % ± 2 digits		
Power	1 % ± 2 digits		

(\*) Other power supplies, on request

### ACCESSORIES



Converters  
(see page M5-23)



Power Studio Scada software  
(see M.9)



Measuring transformer  
(see M.7)



## CVM-BDM



- DIN rail (8 modules) electrical system analyzer which measures, calculates and displays the main electrical parameters in balanced and unbalanced three-phase systems
- DIN rail format (8 modules)
- Calculates flicker per phase
- Harmonics Measuring up to the 15th
- Double scale kW/MW
- Current reading using external transformers .../5A or .../1A (insulated inputs, according to type)
- Option for measuring in Low and Medium Voltage systems
- Internal 1 Mb memory
- Records selected variables in each time period
- RS-485 communication with MODBUS RTU protocol (in RS-485) & Zmodem for downloading files
- Second RS-485 port option to connect I/O peripherals
- Compatible with the **Power Vision**
- 3 line backlit LCD display
- Allows selection of default page



\*1 According to type

## FEATURES

	CVM-BDM		CVM-BDM
<b>Power supply circuit (*)</b>	230 V a.c. (+10% / -15%)	<b>Assembly features</b>	
Consumption	6 V·A	Connection	Metal terminals, "posidriv" screws
Frequency	45 ... 65 Hz	Type of casing	Self extinguishing V0 plastic
<b>Measuring circuit</b>		Protection: built in equipment / terminals	IP 41 IP 20
Rated voltage	500 V a.c. phase-neutral 866 V a.c. between phases	Dimensions (mm)	140 x 110 x 70 mm (8 modules)
Frequency	45...65 Hz	Weight	0,52 kg
Current circuit consumption	0,6 V·A	<b>Environmental conditions</b>	
Rated current	$I_n$ .../5 A (insulated input on ITF) (option: .../1 A)	Operating temperature	-10 °C / +50 °C
Permanent overload	1,2 $I_n$	Humidity	5 % ... 95 % (without condensation)
<b>Class</b>		<b>Safety</b>	Category III-300 V AC. 520 V AC. EN 61010. Electrical shock protection by double insulation class II
Voltage	0,5 % ± 2 digits	<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 61000-6-3, EN 61000-6-1, EN 61010-1
Current	0,5 % ± 2 digits		
Power	1 % ± 2 digits		
Internal memory	1 MB		

(\*) Other power supplies, on request

## ACCESSORIES



Converters  
(see page M5-23)

Software PowerVision  
(ver M.9)



Measuring transformer  
(see M.7)

**CVM - BD CVM-BDM**

Three-phase 45...65 Hz	True effective value	Insulated inputs (ITF)	Energy	Clock	THD Measuring / D (V, A)	Maximum demand	Flicker Measuring	Harmonics measurer	LCD Display	Quadrants	Communications RS232	Communications RS485	Communications RS485-RED	Internal memory (MB)	Relay outputs	Outputs 4-20 mA	Type	Code	
CVM-BD																			
•	•	•	•	•	•	•			•	4	op	•	•				CVM-BD-RED-H	M52110	
•	•	•	•	•	•	•			•	4	op	•	•		2		CVM-BD-RED-C2-H	M52111	
•	•	•	•	•	•	•			•	4							CVM-BD-H	M52100	
•	•	•	•	•	•	•			•	4						4	CVM-BD-420-4-H	M52104	
•	•	•	•	•	•	•			•	4						8	CVM-BD-420-8-H	M52105	
•	•	•	•	•	•	•			•	4	op	•	•		1	1	CVM-BD-RED-C420-H	M52122	
•	•	•	•	•	•	•			•	4	op	•	•			2	CVM-BD-RED-420-H	M52123	
CVM-BDM																			
•	•	•	•	•	•	•	•	•	•	•	4	op	•		1		CVM-BDM	M52210	
•	•	•	•	•	•	•	•	•	•	•	4	op	•		1	2	CVM-BDM-C2	M52211	
•	•	•	•	•	•	•	•	•	•	•	4	op	•		1	1	1	CVM-BDM-C420	M52212
•	•	•	•	•	•	•	•	•	•	•	4	op	•		1		2	CVM-BDM-420	M52213



## CVM-SP



- DIN rail (4 modules) electrical system analyzer which measures, calculates and displays the main electrical parameters in single-phase systems
- DIN rail format (only 4 modules)
- Direct current Measuring using toroidal current transformers built into the equipment
- RS-485 communication (MODBUS RTU)
- Compatible with the **Power Studio / Scada** System
- 3 x 4 digit LCD displays
- Allows selection of default page



Single-phase 50...60 Hz	Insulated inputs (ITF)	Energy	THD Measuring (V, A)	True effective value	Display LCD	Relay outputs	Communications RS-485	Maximum demand	Type	Code
•	•	•	•	•	•			•	CVM-SP 25A	M53001
•	•	•	•	•	•			•	CVM-SP 100 A	M53004
•	•	•	•	•	•	1	•	•	CVM-SP-RS485 C 25 A	M53011
•	•	•	•	•	•	1	•	•	CVM-SP-RS485 C 100 A	M53014

### FEATURES

<b>Power supply circuit (*)</b>	230 V a.c. (+20% / -15%)
Consumption	3 V·A
Frequency	50 ... 60 Hz
<b>Measuring circuit</b>	
Rated voltage	230 V a.c.
Frequency	45...65 Hz
Current circuit consumption	0,75 V·A
Rated current	According to type
Permanent overload	1,2 I <sub>n</sub>
<b>Class</b>	
Voltage	0,5 % ± 2 digits
Current	0,5 % ± 2 digits
Power	1 % ± 2 digits

<b>Assembly features</b>	
Current cables input	Maximum 11 mm φ
Type of casing	Modular Self extinguishing V0 plastic
Protection: built in equipment / terminals	IP 41 IP 20
Dimensions (mm)	70 x 80 x 75 mm (4 modules)
Weight	0,250 kg
<b>Environmental conditions</b>	
Operating temperature	-10 °C / +50 °C
Humidity	5 % ... 95 % (without condensation)
<b>Safety</b>	Category III-300 V AC. / 520 V AC. EN 61010. Electrical shock protection by double insulation class II
<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 50081-1, EN 50082-1, EN 61010-1

### ACCESSORIES



Converters  
(see page M5-23)

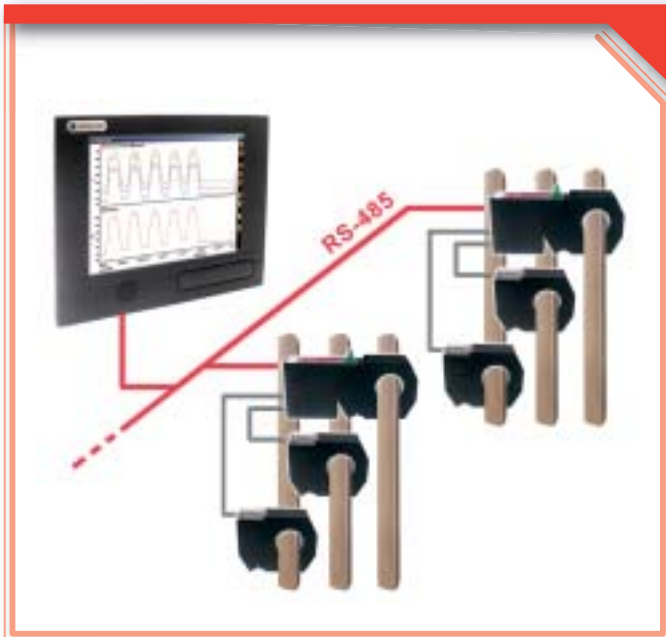


Software PowerStudio Scada  
(ver M.9)

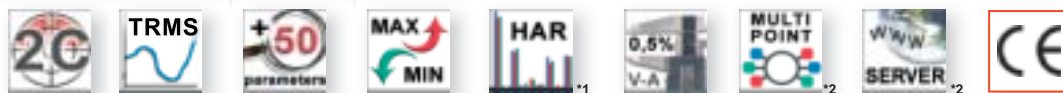


Measuring transformer  
(see M.7)

## SISTEMA POWER NET



- POWER NET is a multi-analyzer for electrical systems which includes up to 32 analyzers into one single piece of measuring equipment
- It has a self detecting system for Measuring units (**Power Net-35, Power Net-70, Power Net-90-35, Power Net-90-70**) for easy installation
- It is a user friendly system analyzer which has the user's installation diagram on a touch screen
- It has an internal memory for energy studies
- Direct current Measuring up to 1000 A
- Measuring points are made up of a **Power Net** and 2 **TC-PowerNet**



\*1 According to type / \*2 Using accessories

TOUCHNET station			M59921
Power Net			
Useful diameter $\phi$ (mm)	Current (A)	Type	Code
35	50	Power Net-35-50	M52621
35	100	Power Net-35-100	M52622
35	250	Power Net-35-250	M52623
70	500	Power Net-70-500	M52624
70	1000	Power Net-70-1000	M52625

Power Net - 90			
Useful diameter $\phi$ (mm)	Current (A)	Type	Code
35	50	Power Net-90-35-50	M52611
35	100	Power Net-90-35-100	M52612
35	250	Power Net-90-35-250	M52613
70	500	Power Net-90-70-500	M52614
70	1000	Power Net-90-70-1000	M52615
TC-Power Net			
35	50	TC-Power Net-35-50	M52631
35	100	TC-Power Net-35-100	M52632
35	250	TC-Power Net-35-250	M52633
70	500	TC-Power Net-70-500	M52634
70	1000	TC-Power Net-70-1000	M52635

### FEATURES

TOUCHNET	
<b>Power supply source</b>	
Input	90-264 V a.c. , 47-63 Hz
Output	5 V / 4 A, +12 / 2 A
Current	Max. 3.0 a 115 V a.c.
<b>Connectors</b>	
Keypad	PS/2 Keyboard
Mouse	PS/2 Mouse
Series port	RS-232
Series port	RS-232 / 422 / 485 (jumpers)
Parallel port	Conector 25-pin D-Sub
USB	3 puertos USB
LAN adaptor	RJ-45 (10 / 100 Base-T)

### ACCESSORIES



Measuring transformer (see M.7)



## ENERGY WEB SERVER



Electrical parameters Web Server.

Using its non volatile, cyclical internal memory (8 or 16 Mb according to type), it records data from up to 32 system analyzers connected to the RS-485 port on the unit.

10baseT Ethernet connection using RJ45 connector.

It has an internal application written in Java which allows the user to:

- Display all electrical parameters from the system analyzers in the field in real time
- Draw graphs and tables for history data using files saved in the memory
- Connect the equipment to a local in house system (LAN) or publish this IP making the equipment accessible from any Internet access point

The equipment does not require any internal software for the application because the system editor is built into the unit. The equipment may be questioned by more than one user at the same time using a conventional Internet browser (multi-user).

The System Analyzers compatible with the **Energy Web Server** system are:

- **CVM 144** – System Analyzer, three-phase (see page M5-8)
- **CVM 96** – System Analyzer, three-phase (see page M5-7)
- **CVM Q** – Class B Electrical Power Supply Quality Analyzer (see page M5-14)



Type	Code
Energy Web Server 8: stores up to 30 days' information with an average of 15 minutes from 16 pieces of equipment	<b>M54200</b>
Energy Web Server 16: stores up to 30 days' information with an average of 15 minutes from 32 pieces of equipment	<b>M54210</b>
PS-EWS: 7.2 V DC 1 A rechargeable battery accessory via the Energy Web Server. Once charged, 60 minutes supply without mains supply. Charge time not less than 36 hours	<b>M59911</b>

## FEATURES

<b>Power supply circuit (*)</b>	230 / 400 V a.c. (+10% / -15%)	<b>Environmental conditions</b>	
Consumption	9 V·A	Operating temperature	-10 °C / +50 °C
Frequency	45 ... 65 Hz	Humidity	5 % ... 95 % (without condensation)
<b>Assembly features</b>		<b>Safety</b>	Category III-300 V AC./520 V AC. EN 61010. Electrical shock protection by double insulation class II
Connection	Pluggable board		
Type of casing	Self extinguishing V0 plastic	<b>Standards</b>	IEC 664, VDE 0110, IEC 801, UL 94, IEC 348, IEC 571-1, EN 50081-1, EN 50082-1, EN 61010-1
Protection: assembled equipment (front) unassembled equipment (side)	IP 41 IP 31		
Dimensions (mm)	140 x 123 x 53 mm		
Weight	0,750 kg		

## ACCESSORIES



Measuring transformer  
(see M.7)

ACCESSORIES

RS-232 / 485 Converter



Type	Code
RS-232/485 intelligent converter	M54020
RS-232/485 or 422 converter (RTS signal check)	M54010

- RS-232 to RS-485 and vice versa system protocol converters
- BUS length of 1200 m permitted with RS-485 protocol
- Power supply 230 V AC
- Transmission speed: from 4,800 bps up to 38,400 bps
- RTS signal check (in intelligent model) - Power Studio

USB Converter



USB to RS-232/485 system protocol converter  
Power supply via PC's USB port.  
Transmission speed: from 4,800 bps up to 128,000 bps

Type	Code
USB-RS-232 converter	M54040
USB-RS-485 converter	M54050

CAR RS-485 Amplifier



- RS-485 signal amplifier
- Power supply: 12 V DC
- Transmission speed: from 4,800 bps up to 38,400 bps

Type	Code
CAR RS-485 Amplifier / repeater	M54060

TCP2RS, RS-232 /485 – Ethernet converter



RS-232 or RS-485 to Ethernet system protocol converters  
Power supply 85...265 V AC / 115...374 V DC  
Ethernet speed: 10/100BaseTX  
RS Bus transmission speed: from 1,200 bps up to 115,200 bps  
Applications:  

- RS-232 / 485 to Ethernet
- Ethernet to RS-232 / 485
- RS-232 / 485 to Ethernet to RS-232 / 485

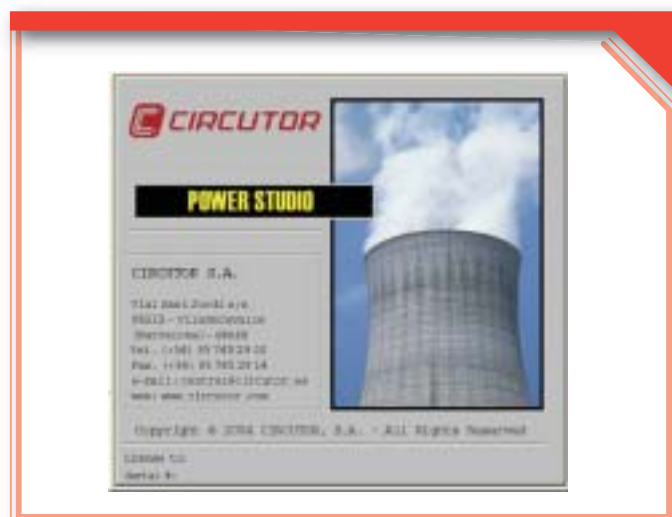
Type	Code
TCP2RS, RS-232 /485 – ETHERNET TCP/IP converter	M54030

CVM-MINI panel adapter



Front panel adapter (72 x 72 mm) for CVM-MINI

Type	Code
CVM-MINI adapter	M5ZZF1



## POWERSTUDIO

**PowerStudio** is an abbreviated version of **PowerStudio Scada**.

Its main function is communication with **CIRCUTOR** equipment and the subsequent writing of tables and graphs for recorded histories.

**PowerStudio** allows:

- Energy supervision in industrial environments
- Preventative maintenance on electrical lines and installations

The main benefits of **PowerStudio** are:

- Remote parameterisation of equipment
- Real time display of parameters
- Displaying histories using graphs or tables
- Printing graphs or tables
- Multi-point software (Web Server) using static screens
- XML server and DDE built in (for exchanges with other applications on the market)
- Highly versatile and easy to use
- Access via the Internet with password and creation of access profiles

With **PowerStudio**, the user is in complete control of the installation, knowing the status of the power lines including the installation's overall consumption (in LV and MV) in real time and at first hand.

This control is important because it can carry out excellent preventative maintenance from which a large number of electrical parameters may be checked (see table on the right).

Part of this supervision includes checking a large number of electrical and process parameters using appropriate loggers.

PARAMETERS	UNIT	L1	L2	L3	III
Phase-neutral voltage	V	•	•	•	
Phase-phase voltage	V	•	•	•	
Current	A	•	•	•	•
Frequency	Hz		•		
Active power	kW	•	•	•	•
Inductive reactive power	kvar L	•	•	•	•
Capacitive reactive power	kvar C	•	•	•	•
Apparent power	kV·A	•	•	•	•
Power factor	PF	•	•	•	•
Power demand	Pd			•	
Neutral current	$I_N$			•	
Harmonic decomposition		•	•	•	
Voltage THD	% THD - V	•	•	•	
Current THD	% THD - A	•	•	•	
kWh (consumed and generated)	Wh				•
kvarh L (consumed and generated)	varh				•
kvarh C (consumed and generated)	varh				•
kVAh (consumed and generated)	VAh				•

Generic electrical parameters measured and calculated by the **CVM** series

AVAILABLE DRIVERS		
Equipment	Division	PowerStudio / PowerStudio Scada
CVM-NRG96	Measurement	•
CVM-MINI	Measurement	•
CVM-96 III / Ethernet	Measurement	•
CVM-144 III / Ethernet	Measurement	•
CVM-BC / BC3	Measurement	•
CVM-B / BD	Measurement	•
CVMk / HAR	Measurement	•
CVM-R8 C / A	Measurement	•
DH96	Measurement	•
LM50-TCP	Measurement	•
LM24-M	Measurement	•
MK	Measurement	•
RGU-10	Protection and Control	•
CBS-8	Protection and Control	•
CDR-8	Protection and Control	•
RRM-C	Protection and Control	•
CIRWATT	Quality & Metering	•



## POWERSTUDIO SCADA SOFTWARE

The installation of **CIRCUTOR** System Analyzers aims to cover three important requirements:

- Energy supervision in industrial environments
- Preventative maintenance on electrical lines and installations
- Allocating departmental costs or production process costs

In order to attain these objectives and due to the large volume of information which each Measuring station brings, software or a control application will be necessary using a centralised data collection system which seeks to process the data and write reports in order to adopt preventative or corrective measures in the installation. For this reason **CIRCUTOR** has developed the Power Studio Scada software for complete energy management.

### MAIN FEATURES

- **Remote programming of equipment**

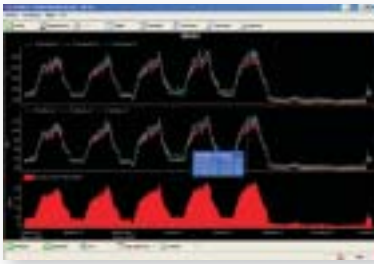
On-line programming of all connected equipment, configuring all of the equipment from the control unit.

The following may be programmed from **PowerStudio Scada**: voltage and current transformation ratios, digital outputs, analogue inputs/outputs, etc.



- **Real time display of parameters**

Real time display measured all connected equipment thanks to continuous communication (pulling). In this way the behaviour of the installation and the status of the electrical distribution lines are known at all time.



- **Histories**

Automatic recording of histories without the need for programming (from when a piece of equipment is added its parameters are recorded by the software). Creation of tables and/or graphs based on the recorded data (grouped by day, week or month). Using the information represented the development of any electrical parameter or process may be shown over time including displaying the increase in the totalled variable over time (energy). Option for printing any table or graph generated.

- **Alarm module**

With the alarm module and a preset programming, the user may display in real time any incident that may occur in the installation. The alarms may be associated with any integrated parameters in the software.

- **Multi-point software (web server)**

Internal web server allowing all in-house system users (LAN) to display data offered by Power Studio Scada in real time or to consult recorded histories. Unlimited number of users and the option to create access filter to limit the published information.

- **Built in DDE and XML server**

For dynamic data exchange to integrate energy supervision into an overall control system.



- **Construction of personalized screens**

These screens may show anything from single wire diagrams of the installation right up to personalized screens simulating a production process. In this way parameter or status display labels may be attached to indicate the status of a specific point in the installation or line.

Unlimited number of personalized screens. Option for creating synchronized display screens for each point in the installation.

- **Remote control functions**

By using **CIRCUTOR** equipment there is the option to carry out remote control functions on parts of the installation (forcing them to start or stop).

- **Report generator and bill simulator module**

**Power Studio Scada** has the most powerful report generator and bill simulator on the market. Any variable logged and recorded by the software is stated on a summary report where anything from energy consumption over a predetermined period of time up to a summary of events or incidents may be included.

Personalised reports for each. Mathematical functions may be applied to the log variables to obtain production ratios or consumption receipts for an issued electrical bill.

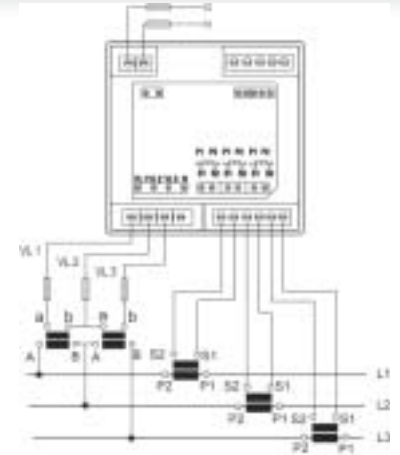
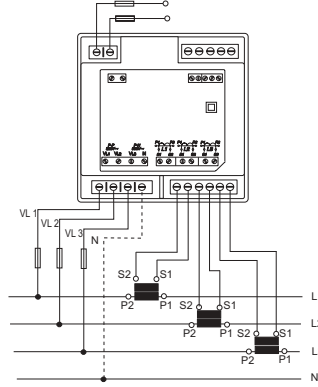
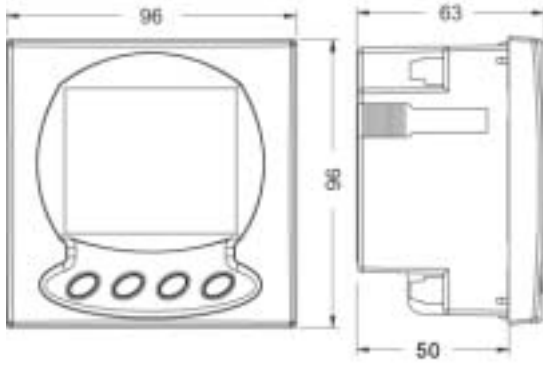
- **Highly versatile and very easy to use**

Easy and intuitive tool. To create a Scada application it is not necessary to know about programming or data acquisition systems.

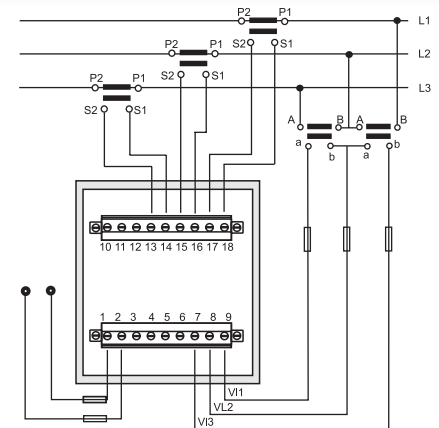
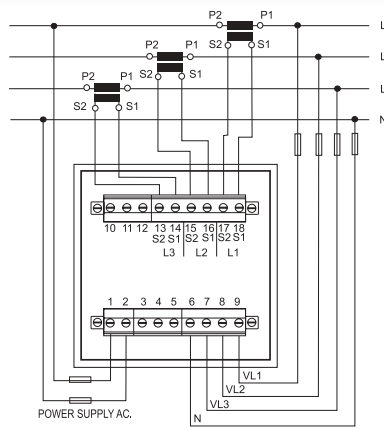
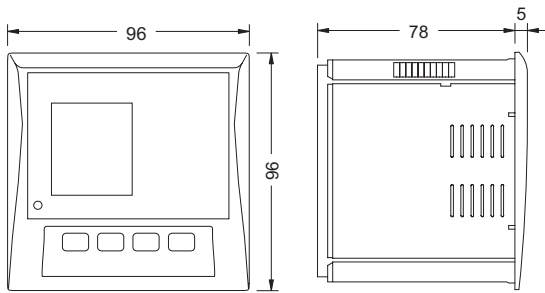


DIMENSIONS / CONNECTIONS

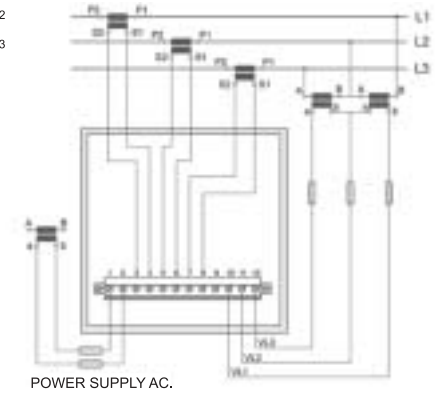
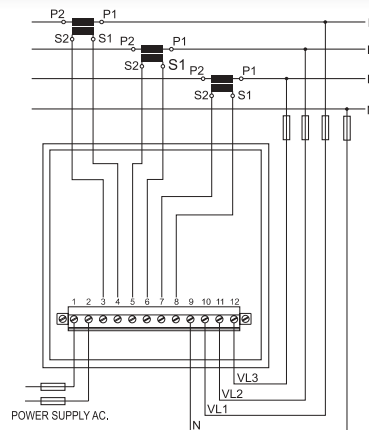
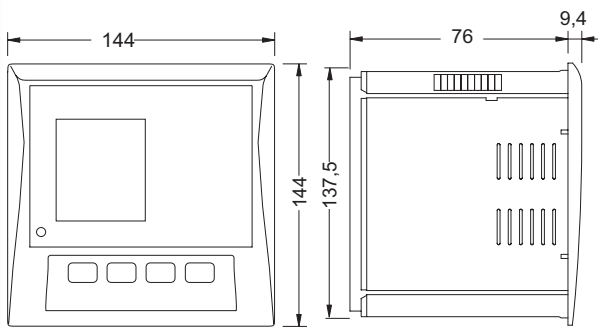
CVM-NRG96



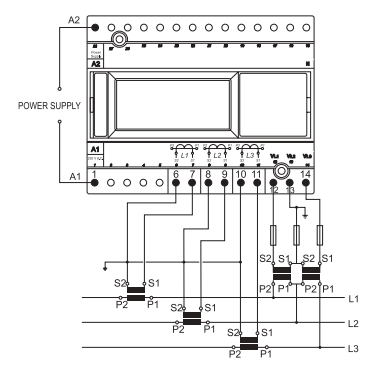
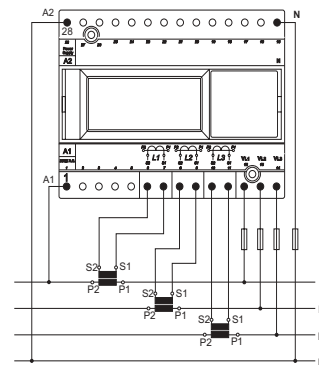
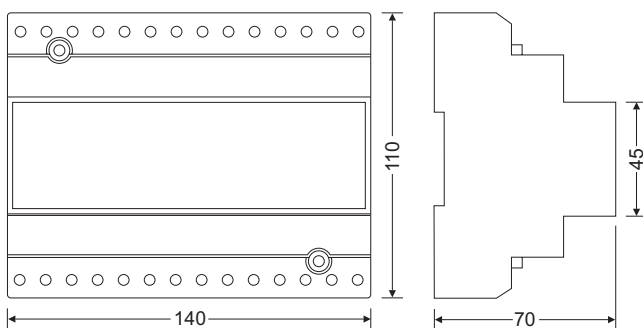
CVM-96



CVM-144

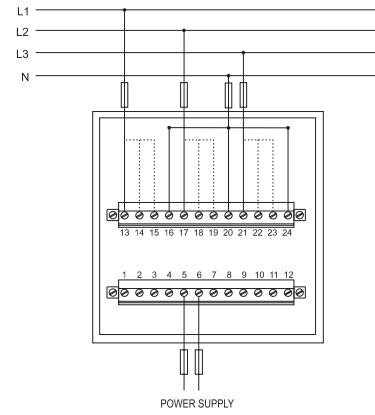
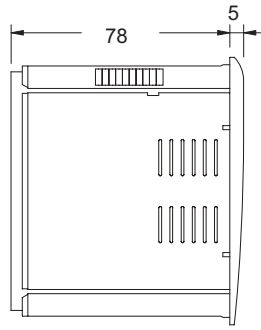
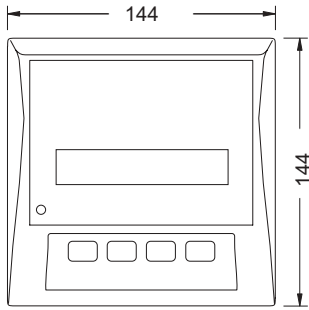


CVM-BC3/BD/BDM

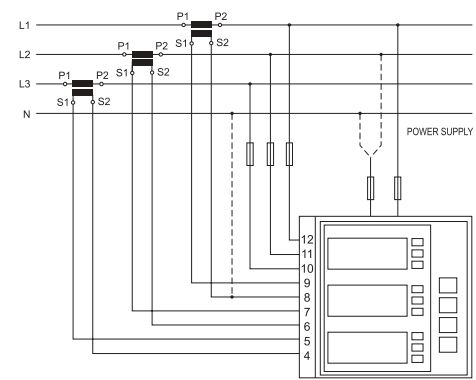
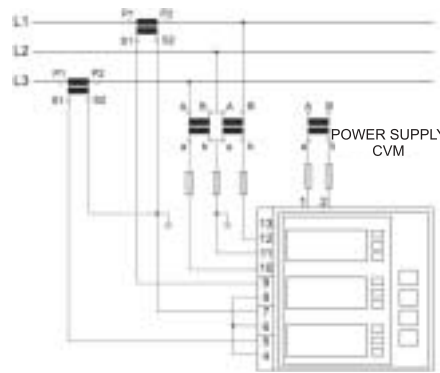
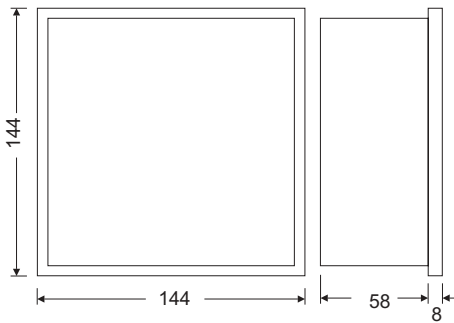


**DIMENSIONS / CONEXIONADO**

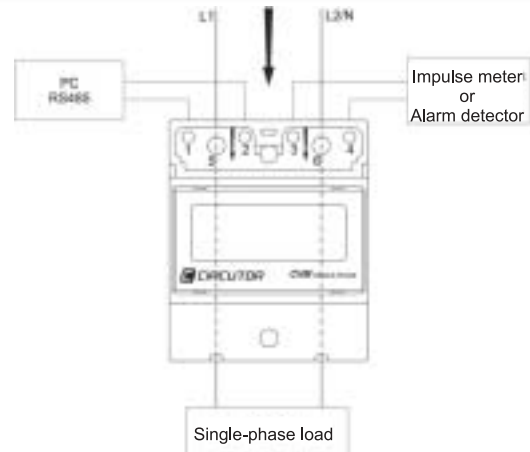
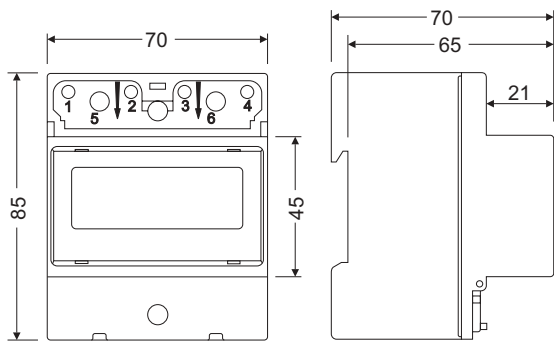
**CVM-Q**



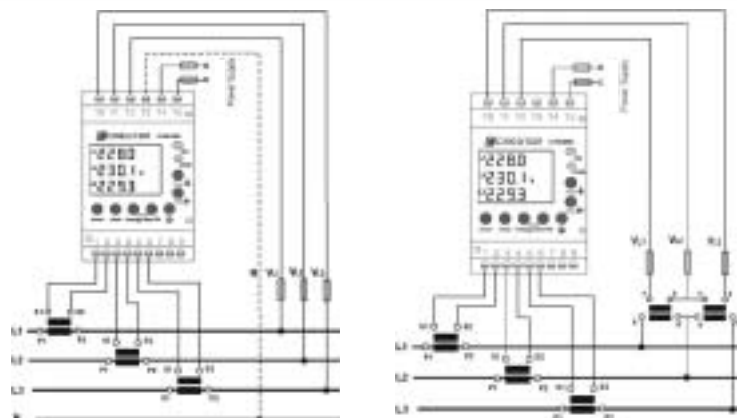
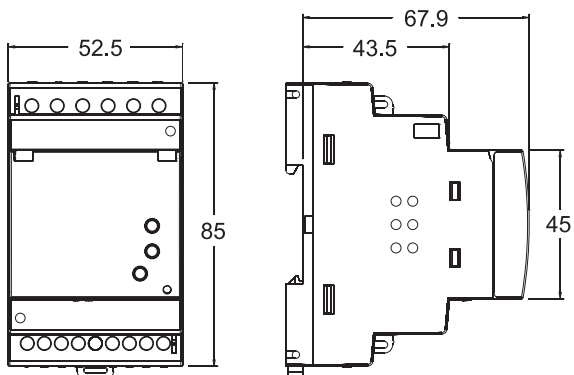
**CVMK**



**CVM-SP**



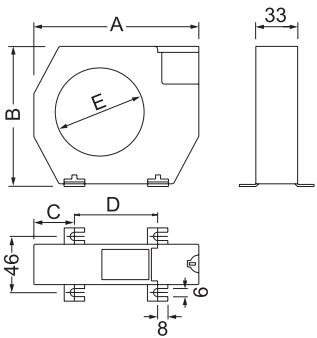
**CVM-MINI**



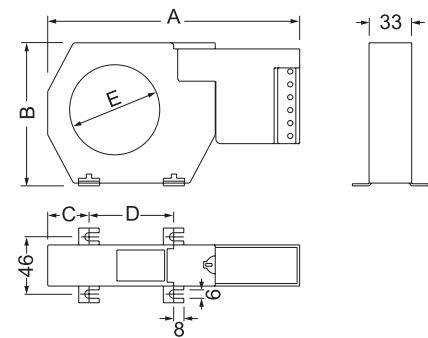


**DIMENSIONS / CONNECTIONS**

**TC-POWER NET**



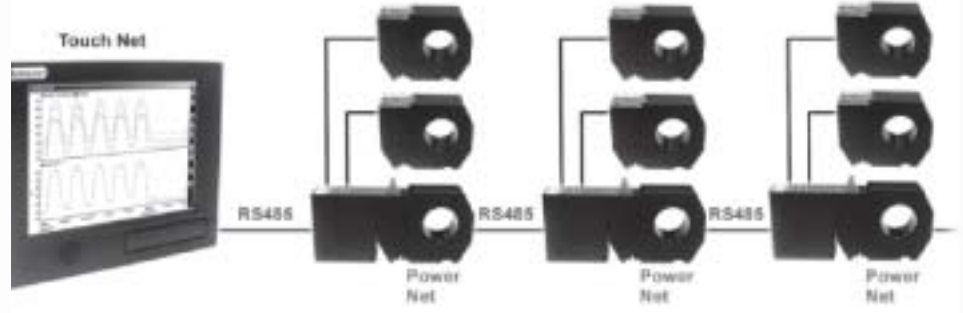
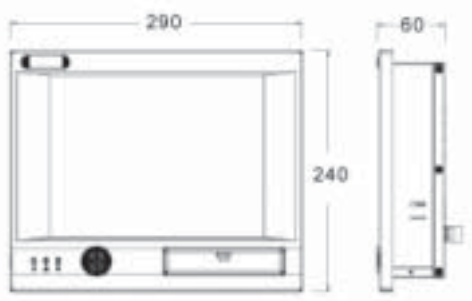
**POWER NET**



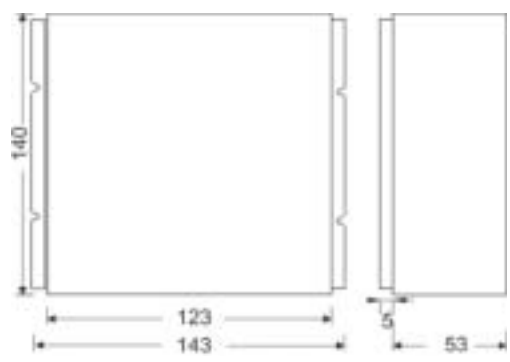
Type	A	B	C	D	E
<b>TC-PowerNet-35</b>	100	79	26	48,5	35
<b>TC-PowerNet-70</b>	130	110	32	66	70

Type	A	B	C	D	E
<b>PowerNet-35</b>	166	79	26	48,5	35
<b>PowerNet-70</b>	196	110	32	66	70

**TOUCH NET**



**ENERGY WEB SERVER**



Vial Sant Jordi, s/n  
08232 Viladecavalls  
Barcelona (Spain)  
Tel. (+34) 93 745 29 00  
Fax: (+34) 93 745 29 14  
e-mail: central@circutor.es  
web: www.circutor.com

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