

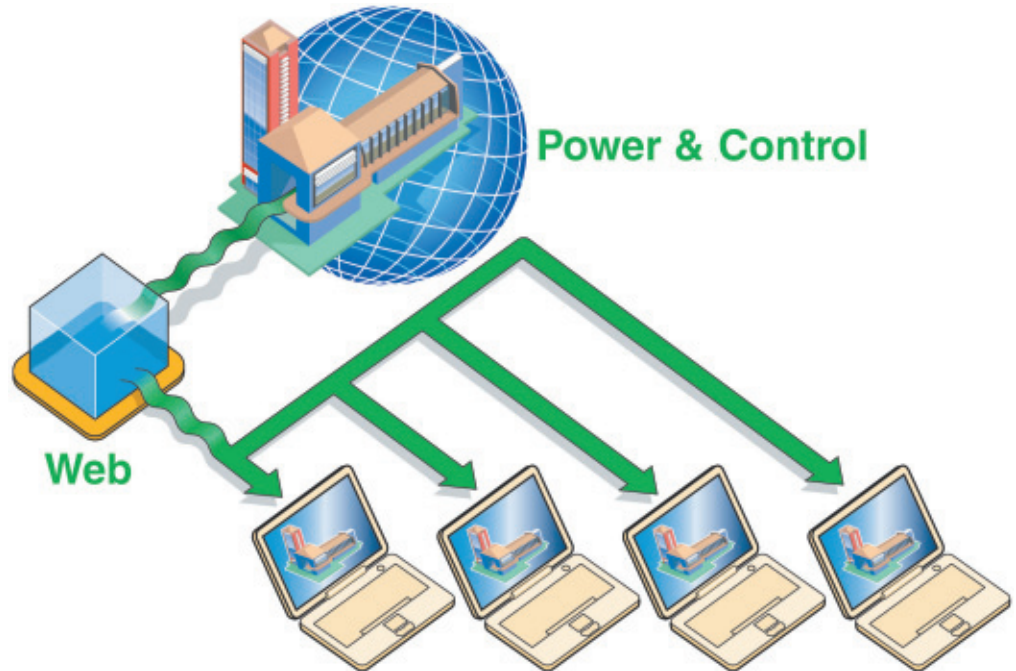
# PowerLogic System

Energy management, revenue metering and power quality monitoring

Catalogue  
2009



# PowerLogic System is...



PowerLogic System helps you control the **cost, quality and reliability** of electric power.

With PowerLogic System, you can determine where extra capacity exists, identify over-loaded equipment and balance loads on substations, switchboards and other power equipment. By optimising your electrical system, you extend the life of your installation.

Introduced more than ten years ago, PowerLogic System has proven its cost-effectiveness and continues to help customers improve their productivity and profitability every day.

PowerLogic System makes full use of Web-enabled technology. In this way, our commercial and industrial power distribution expertise spans from single buildings to geographically dispersed enterprise systems.

With PowerLogic System, Schneider Electric gives you the best of the New Electric World, where and when you need it.

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SMS

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# Why use PowerLogic System?

## Get all the information you need to manage your electrical installation

Today, cost management and improved continuity of service can boost your competitiveness. For this, you need more information concerning the operation of your electrical installation: consumption data, load curves, disturbances, harmonic pollution, available power, etc.

**PowerLogic System brings you all this information. Information you can count on, where and when you need it.**

## PowerLogic System, the metering and monitoring solution

**PowerLogic System** offers a complete, consistent power metering and monitoring solution for optimal management of your electrical installation.

### A complete solution

- covering all electrical installation management needs, from simple current metering right through to remote monitoring of power quality
- backed by the most complete range of metering/monitoring devices and power-monitoring software on the market
- suited to the widest variety of applications in both industrial and service sectors.

### A consistent solution

- integrating all low and medium voltage metering, monitoring and protection devices
- offering communication software and gateways pre-configured for easy integration of Schneider Electric devices.



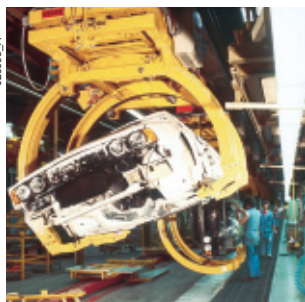
Public buildings



Hospitals

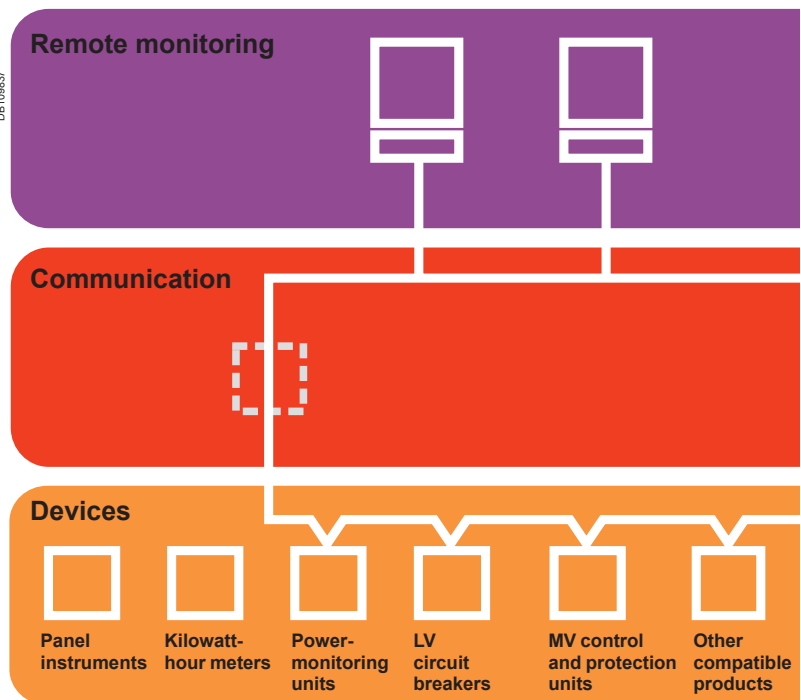


Semiconductor manufacturers



Automobile industry

*PowerLogic System, the metering and monitoring solution suited to the widest variety of applications.*



### A PowerLogic System solution integrates

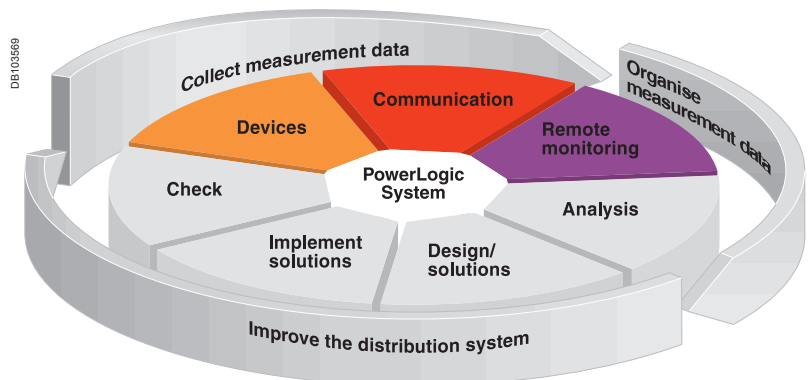
- PowerLogic range products:
  - metering and monitoring devices, both communicating and non-communicating
  - communication interfaces
  - power-monitoring software
- Masterpact and Compact circuit breakers equipped with Micrologic control units
- Sepam and Vigirex protection relays
- any other Modbus-compatible device.

# Why use PowerLogic System? (cont.)

## PowerLogic System, the key to improving your electrical distribution system

PowerLogic System serves 3 functions:

- collection of measurement data
- organisation and transmission of measurement data to facilitate analysis by the different departments concerned: production, maintenance, accounting, site management
- checking of the results obtained after implementing electrical distribution system improvement solutions.



## With PowerLogic System, you control your electrical installation

PowerLogic System helps you

### Reduce energy costs

Get a clearer view of your consumption

- identification of major consumers and allocation of costs
- management of consumption peaks and optimisation of your utility contract.

### Improve continuity of service

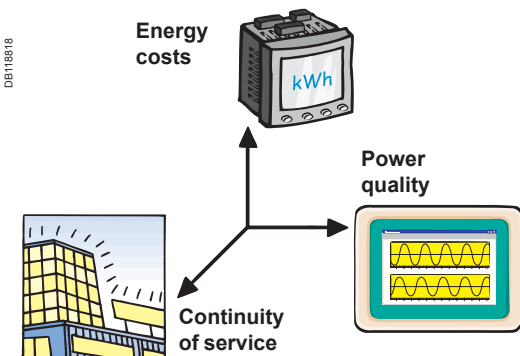
Use the full capacity of your installation

- analysis of the electrical distribution system
- diagnosis of failures.

### Improve power quality

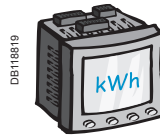
Increase power-system reliability and optimise your operating costs

- monitoring of harmonics
- lower maintenance costs
- reduced production losses, etc.



# Why use PowerLogic System? Benefits and applications

## Reduce energy costs



**PowerLogic System** helps you reduce power consumption and the cost of the energy you use through sub-billing and electrical contract optimisation.

### Sub-billing and cost allocation to reduce consumption

Metering of energy consumption to:

- identify major consumers
- allocate costs
- make users aware of expenditures.

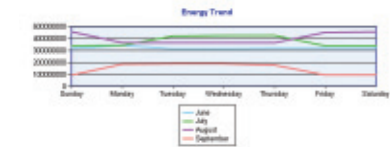
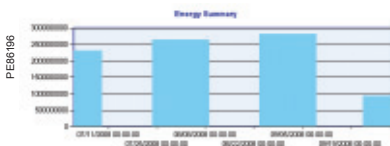
### Optimisation of power contract and load curves to reduce energy costs

Recording of energy consumption and load curves to:

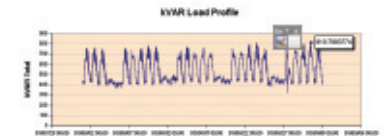
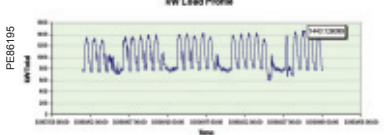
- optimise the power contract
- aggregate multi-site costs and negotiate global contracts
- identify spare capacity for electrical installation extensions
- manage peaks and avoid penalties:
  - improve power factor by power factor correction solutions
  - avoid subscribed-power overruns by automatic load-shedding.

### Monitoring of other utilities

Count pulses received from other utility meters (water, gas, steam, etc.) for global, centralised utility management.



Energy summaries



Trend curves

## Improve continuity of service



Electricity is vital to site operation. However, the phenomena that cause faults are not always easy to understand.

**PowerLogic System** gives a better understanding of the electrical distribution system and offers tools for analysis.

It lets you manage the system in real time and thereby increase reliability.

### Real time monitoring of your electrical installation

#### Panel instrumentation

For local display of measurement data and checks on installation operation.

#### Remote monitoring

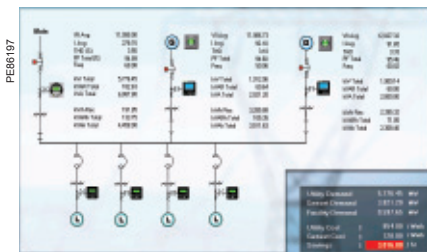
Monitoring of the electrical installation to get the right information to the right person at the right time:

- switchgear status and measurements for the facility manager
- alarms and events for the maintenance department
- cost allocation for the accounting department, etc.

Open, flexible communication system allowing intervention by an external expert when required.

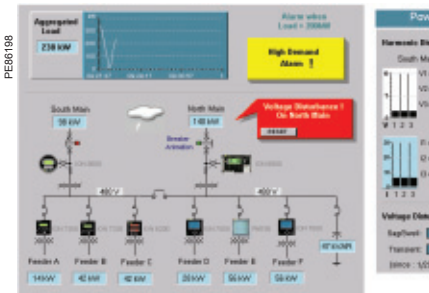
#### Easy access to information via Web technologies

With the EGX300 integrated gateway-server, you can now access all the information you need wherever you are and whenever you want via a standard browser like Internet Explorer®.



Real time monitoring of your electrical installation

# Why use PowerLogic System? Benefits and applications (cont.)



Alarm notification

## Preventive and corrective maintenance

### Preventive maintenance

Detection of problems in advance based on key parameters, to avoid equipment failures and downtime.

### Corrective maintenance

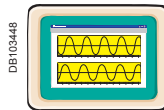
Clear, complete information for the facility manager regarding fault circumstances in order to get power restored as quickly as possible:

- local or remote alarms (e.g. by telephone or pager)
- fault locating, overall vision, summary tables, etc.

Detailed information for experts in charge of analysing the causes of faults and designing solutions to improve the electrical distribution system:

- event and alarm logs
- waveform capture, etc.

## Improve power quality



Power quality has a direct impact on operating costs:

- direct costs: over-consumption due to increased power losses
- indirect costs:
  - production losses: process malfunctions, unnecessary tripping
  - equipment costs: shorter service life, lower efficiency, oversized equipment.

**PowerLogic System** lets you assess the quality of your power, identify the causes of any problems and check the effectiveness of remedial measures.

Four main functions are used to check power quality:

- monitoring of harmonics
- detection of voltage sags and swells
- detection of transients
- EN 50160 electricity supply compliance checking.

### Measurement of total harmonic distortion and individual harmonic content

- identify sources of harmonic distortion and separate them from sensitive loads
- determine causes of malfunctions
- derate power devices (transformers, cables, etc.)
- implement filtering solutions.

### Detection and waveform capture of voltage sags and swells

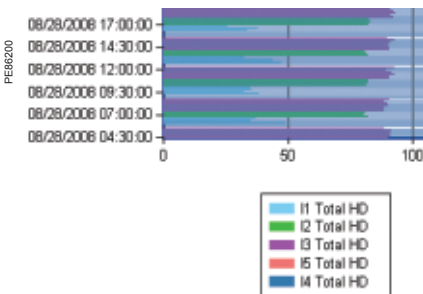
Determine the origin of production losses or shutdowns.

### Detection and waveform capture of transients

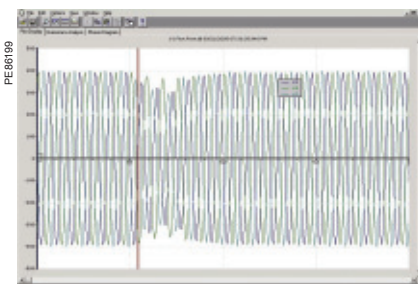
Determine the causes of malfunctions and breakdowns.

### EN 50160 electricity supply compliance checking

To assess the quality of distributed power according to the European standard EN 50160 and check that the distributor complies with the standard.



Trending of harmonics



Disturbance capture

# Panorama of the PowerLogic range

## Current transformers



### CT

current transformer

### Installation

- insulated cable, diameter 21 to 35 mm, trough transformer
- busbar through transformer
- cable connections

### Characteristics

- transformation ratio: 40/5 A to 6000/5 A
- accuracy: class 0.5 to 3
- maximum rated operational voltage: 720 V AC
- tropicalised

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## Panel instruments



<b>Name</b>	<b>AMP / VLT</b>	<b>AMP / VLT</b>	
<b>Function</b>	ammeter, voltmeter	ammeter, voltmeter	

### Applications

#### Sub-billing and cost allocation

Energy consumption	
Consumption for different time periods	
Consumption of other utilities	
Optimisation of power contract and load curves	

#### Installation monitoring

Panel instrumentation	I/U	I/U	
Remote monitoring			
Advanced remote monitoring			

#### Power quality analysis

Monitoring of harmonics (THD)	
Analysis of individual harmonic content	
Detection of voltage sags and swells	
EN 50160 compliance checking	

### Characteristics

Measurement accuracy	class 1.5	± 0.5 % ± 1 digit	
Installation	DIN rail 4 x 18 mm modules	DIN rail 2 x 18 mm modules	
Voltage measurement	VLT : 500 V AC direct or external VT	VLT : 600 V AC direct or external VT	
Current measurement	AMP : 30 A direct or external CT	AMP : 10 A direct or external CT	
Communication ports			
Inputs / Outputs			
Memory capacity			

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**Kilowatt-hour meters**



**AMP / VLT**

ammeter, voltmeter

**FRE**

frequency meter

**CH / CI**

hour counter  
pulse counter

**EN40 / ME**

kilowatt-hour meters

I / U

F

hours / pulses

E

class 1.5

± 0.5 % ± 1 digit

class 1

flush mounted  
72 x 72 mm  
96 x 96 mm

DIN rail  
2 x 18 mm modules

CI, CH: DIN rail  
2 x 18 mm modules  
CH: flush mount

DIN rail  
1.2 or 4 x 18 mm modules

VLT :  
500 V AC direct  
or external VT

400 V AC direct

400 V AC direct

AMP :  
external CT

40 to 63 A direct  
or external CT

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# Panorama of the PowerLogic range (cont.)

## Basic energy metering



## Mid-range metering



<b>Name</b>	<b>PM9 / PM9P / PM9C</b>	<b>PM200/PM200P/PM210</b>	<b>PM700 / PM700P/PM710/ PM750</b>	
<b>Function</b>	power meter IEC 61557-12 PMD/S-/K55/1	power meter IEC 61557-12 PMD/S-/K55/1	power meter IEC 61557-12 PMD/S-/K55/1 IEC 61557-12 PMD/S-/K55/0.5 (PM750 only)	

### Applications

#### Sub-billing and cost allocation

Energy consumption				
Consumption for different time periods				
Consumption of other utilities				
Optimisation of power contract and load curves				

#### Installation monitoring

Panel instrumentation	I, U, F, P, Q, S, PF, E (Power demand and maximum demand)	I, U, F, P, Q, S, PF, E (Power and current demand)	I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)	
Remote monitoring		PM210 only	PM710 and PM750. PM750 includes alarms	
Advanced remote monitoring				

#### Power quality analysis

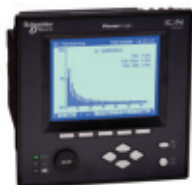
Monitoring of harmonics (THD)				
Analysis of individual harmonic content				
Detection of voltage sags and swells				
EN 50160 compliance checking				

#### Characteristics

Measurement accuracy	class 1 (active energy)	class 1 (active energy)	class 1 (active energy) class 0.5 S (PM750 only)	
Installation	DIN rail 4 x 18 mm modules	flush mount and DIN rail 96 x 96 mm	flush mount and DIN rail 96 x 96 mm	
Voltage measurement	450 V AC direct or external VT	480 V AC direct or external VT	480 V AC direct or external VT	
Current measurement	external CT	external CT	external CT	
Communication ports	1	1 (PM210 only)	1 (PM710 and PM750 only)	
Inputs / Outputs	1 O	2 O (PM200P only)	2 O (PM700P only) 2 I / 1 O (PM750 only)	
Memory capacity				

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## Advanced energy metering



PM810	PM820/ PM850	PM870
power meter IEC 61557-12 PMD/S-/K70/0.5		

ION7550	ION7650	ION8600	ION8800
		A B C	A B C
power meter		power meter	

with PM810 LOG		
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clock/cal. (PM810 LOG)	time-stamped alarms... and data logs
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I, U, F, P, Q, S, PF, E (demand, minimum and maximum values)							
--	--	--	--	--	--	--	--

with PM810 LOG		
	PM850 only	

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class 0.5S (active energy)	class 0.5S (active energy)	class 0.5S (active energy)
flush mount and DIN rail 96 x 96 mm	flush mount and DIN rail 96 x 96 mm	flush mount and DIN rail 96 x 96 mm
600 V AC direct or external VT	600 V AC direct or external VT	600 V AC direct or external VT
external CT	external CT	external CT
1	1	1
16 I/O	16 I/O	16 I/O
80 kbytes with PM810 LOG	80 / 800 kbytes	800 kbytes

class 0.2S (active energy)	class 0.2S (active energy)	class 0.2S (active energy)
DIN 192 standard cutout (186 x 186 mm)	ANSI socket mount 9S, 35S, 36S, 39S and 76S; FT21 switchboard case	DIN 43862 rack
347 V L - NAC 600 V L - LAC	277 V L-NAC (9S, 39S, 36S and 76S); 480 V L-LAC (35S)	288 V L-NAC (500 V L-LAC)
external CT	external CT	external CT
5	5	5
32 I/O	25 I/O	16 I/O
up to 10 MB	10 MB 5 MB 2 MB	up to 10 MB

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# Panorama of the PowerLogic range (cont.)

## Communications



Name	EGX100	EGX300	ION7550RTU
Function	Ethernet gateway	Integrated gateway-server	Ethernet gateway-server + onboard I/O

## Monitoring software



PowerView	SMS	ION Enterprise
Power monitoring software	Power management software	Power management software

## Applications

### Ethernet communication

RS485 / Ethernet gateway			
Devices supported	PM9C, PM710, PM750, PM800 series, CM3000 series, CM4000 series, Sepam, Micrologic	PM9, all PM200, PM700, PM800 series, all CM3000, CM4000 series, ION8800, ION8600, ION7550/7650, Sepam, Micrologic, Compact NSX	ION8800, ION8600, ION7550/7650, ION6200, Modbus devices
Web server with standard HTML pages			
Web server with custom HTML pages			

PM9C, PM200, PM710, PM750, PM800 series, ION6200, Micrologic, Compact NSX	PM9C, PM710, PM750, PM800 series, all CM3000, CM4000 series, Sepam, Micrologic	ION8800, ION8600, ION7550/7650, PM800 series, ION7300 series, PM710, PM750, ION6200, PM210, all CM3000, CM4000 series, BCPM, Sepam, Micrologic, Compact NSX

### Remote monitoring

Real time data			
Historical data			
Automatic notification			
Alarm and event logs			
Waveform display			
Custom animated graphics			
Manual reports			
Automatic reports			


### Characteristics

Ethernet ports	10/100 Base TX port	10/100 Base TX port	10/100 Base TX port
Modbus TCP/IP protocol			
RS485 (2-wire / 4-wire) ports	1	1	1
Modbus protocol			
Number of devices connected directly	32	64	64
RS232 configuration ports	1		1
Miscellaneous			modem port I/O ( 24 I/30 O max)
Installation	DIN rail	DIN rail	DIN 192 cutout (186 x 186 mm)


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# General information on power-monitoring software

Software, a tool serving site operation. A site can be compared to a living organism. The power system manager has no control over the changes that affect this organism, but must ensure that it continues to receive the energy it requires. Similar to a doctor, the power system manager must carry out preventive measures and diagnose and remedy any problems that occur. The goal is to maintain the site in a healthy state, without generating any secondary effects. Software enables managers to diagnose the causes of most problems encountered on electrical systems.

More and more devices are capable of communicating. The number of available measurements is also on the rise, creating the need for a tool to successfully manage all the information..

The main purpose of software is to simplify complex sites so that they can be managed by humans:

- make the site and its operation intelligible
- make the power system tangible and visible.

## The role of software

### All measurements at a single location

All measured values may be accessed via a PC.

### Organisation and use of measurements

Before they may be used, certain measurements must be organised, processed or integrated in special tools.

### Device setup

Simple devices may be set up on their front panels.

For devices with advanced functions, local setup is often difficult and even impossible for some functions.

Software greatly facilitates device setup.

### Automatic tasks

Software can execute tasks automatically, triggered by:

- a date
- an event
- an alarm.

These tasks may concern devices (reset, start of a particular function) or system users (transmission of an e-mail, etc.).

### Manual commands

Power-monitoring software can also be used to control devices (e.g. open or close a circuit breaker).

Certain control/monitoring functions (automatic action on electrical-distribution system) are carried out by PLCs integrated in the PowerLogic System architecture.

## Access via the Web

Information must be adapted to user needs and then made available to them.

Software can handle the adaptation by preparing custom reports.

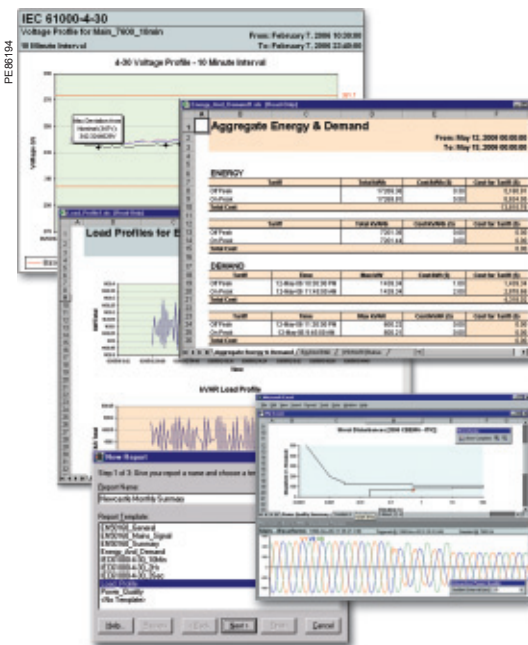
These reports can then be accessed by any PC on the site using a standard Web browser.

## Software and architecture

Software must be capable of meeting a large number of needs:

- single-user or multi-user operation
- data organisation according to user profiles
- adaptation to different site topologies
- data exchange with other systems
- etc.

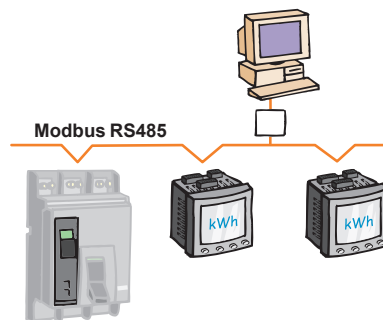
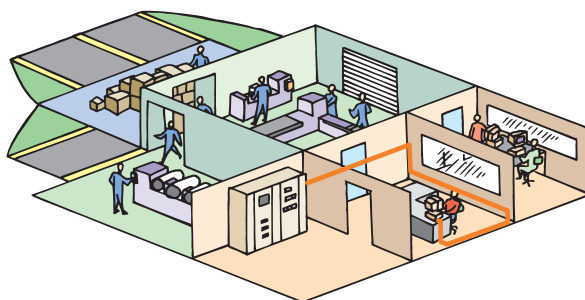
This set of constraints means that a single product is not sufficient; a range of software products is required.



**PowerLogic System** can be used in a number of different architectures depending on the layout of the site. It also offers different user profiles simultaneously.

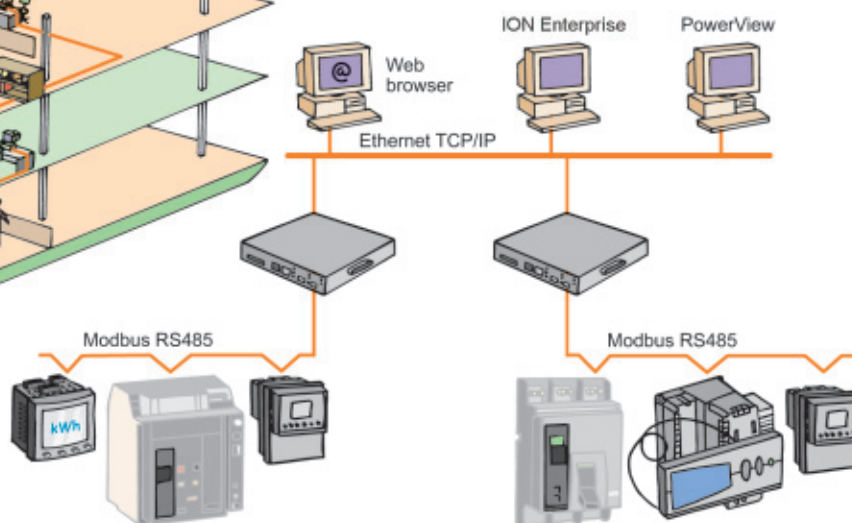
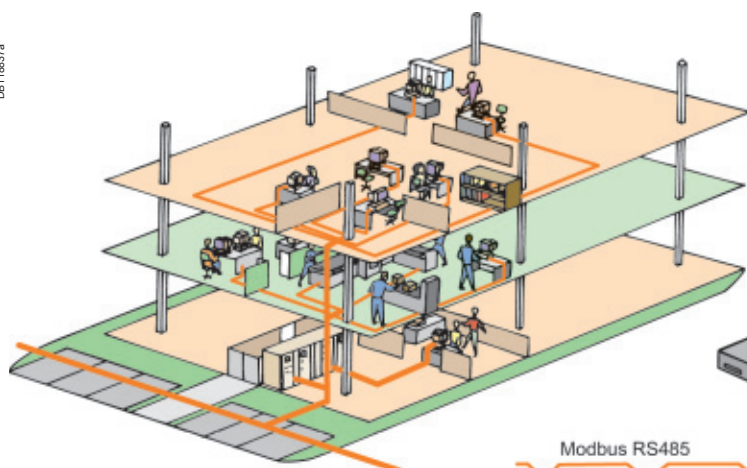
### Example 1

- installation in a small building or isolated equipment room
- one or more metering/monitoring units connected to a simple PC (directly or via modem)
- for electrical installation monitoring by the maintenance department.



### Example 2

- installation in a building with a number of users interconnected by a local Intranet
- connection of metering/monitoring units to EGX gateways for integration in the company Ethernet network
- for shared management of the electrical installation by different departments:
  - simple monitoring, with no dedicated software, using a Web browser,
  - complete power-monitoring using ION Enterprise, System Manager or PowerView softwares.

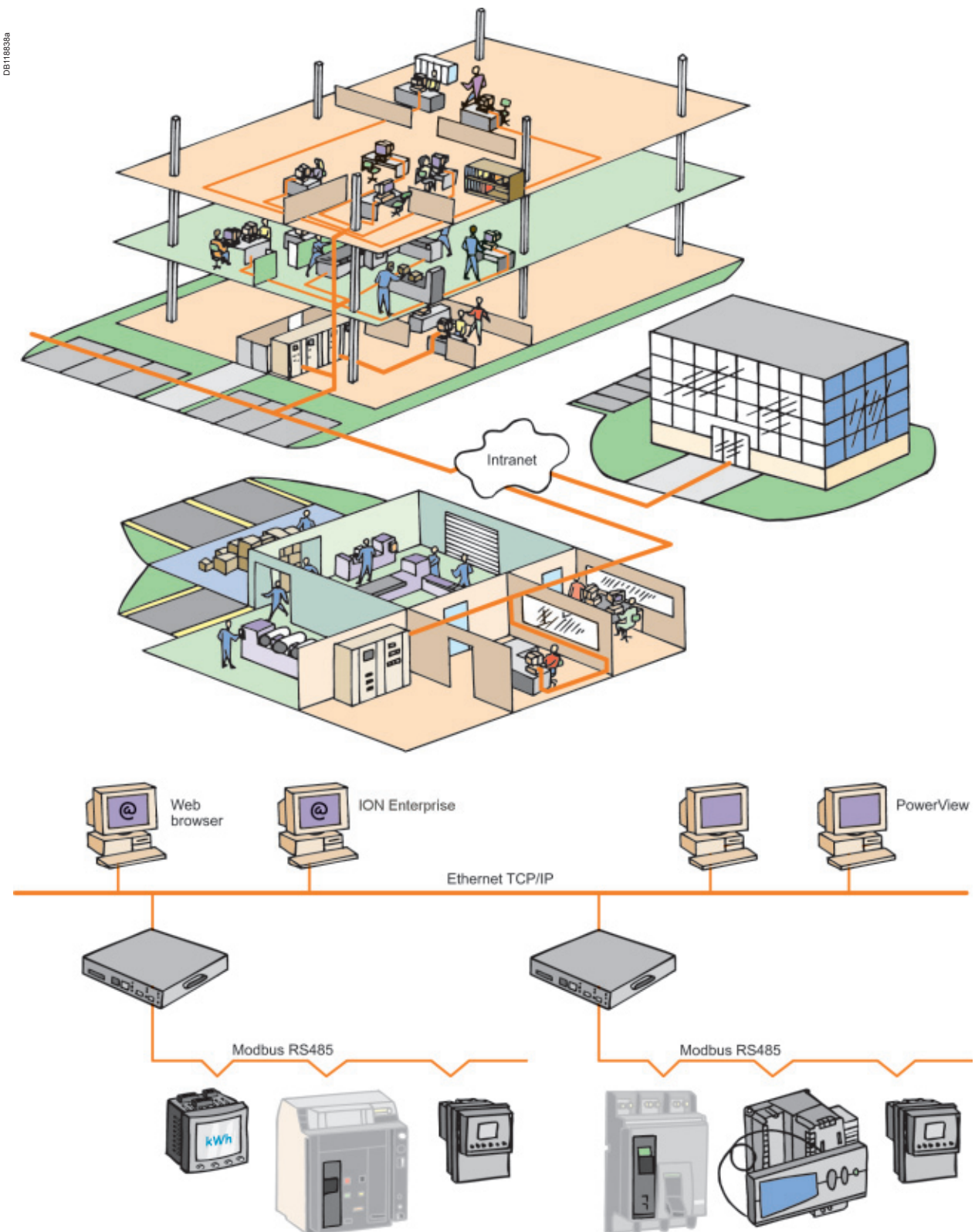


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### Example 3

- installation in a number of buildings linked by a company Intranet
- connection of metering/monitoring units to EGX Web servers for integration in the company Ethernet network
- all sectors of the company connected to the Intranet have direct access to essential data on the electrical installation via their Web browser.



DB118338a

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16453.



16462.



16542.



16453 + 16550.



Sealable cover.

## Function

The Ip/5A ratio current transformers deliver at the secondary a current of 0 to 5 A that is proportional to the current measured at the primary. They are available in two major families:

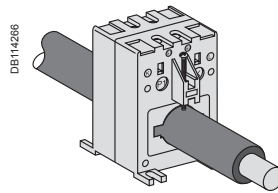
- cable current transformers
- bar current transformers.

This allows them to be used in combination with measurement instruments: ammeters, kilowatt-hour meters, measurement units, control relays, etc.

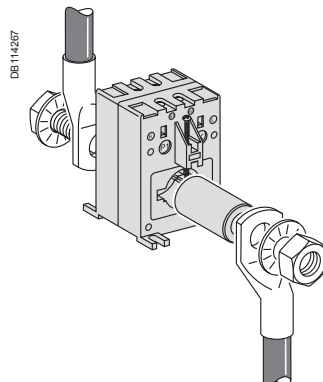
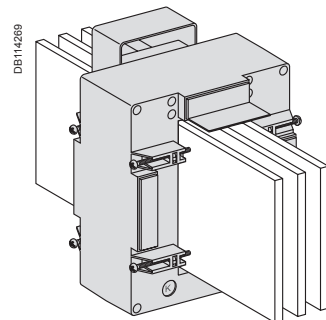
## Common technical data

- Secondary current: 5 A
- Max. voltage rating  $U_e$ : 720 V
- Frequency: 50/60 Hz
- Safety factor (sf):
  - 40 to 4,000 A :  $sf \leq 5$
  - 5,000 to 6,000 A :  $sf \leq 10$ .
- Degree of protection: IP20
- Operating temperature: tropicalised range,  $-25\text{ }^\circ\text{C}$  to  $+60\text{ }^\circ\text{C}$ , relative humidity  $> 95\%$
- Compliance with standards: IEC 60044-1 and VDE 0414
- Secondary connection (as per model):
  - by terminals for lug
  - by tunnel terminals
  - by screws.

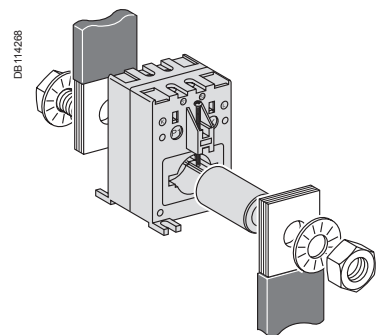
## Connection



CT with let-through primary.



CT with primary connection by screw and nut.  
Use of cylinder 16550 or 16551.



The three references 16482, 16483 and 16534 have a double connection output at the secondary: twice S1 and twice S2. The terminals are in parallel, as there is only one secondary winding.  
The unused secondary outputs must not be connected.

## Catalogue numbers

Rating Ip/5 A	Power (VA) Accuracy class:			Insulated cable:		Dimension opening for bars	Weight (g)	Cat. no.		
	0.5	1	3	maximum diameter <sup>(1)</sup> (mm)	maximum cross-section <sup>(1)</sup> (mm <sup>2</sup> )			Tropicalised CT	Cylinder <sup>(2)</sup>	Sealable cover
40 A	-	-	1	21	120	-	200	16500	16550 <sup>(3)</sup>	built-in
50 A	-	1.25	1.5	21	120	-	200	16451	16550	built-in
75 A	-	1.5	2.5	21	120	-	200	16452	16550	built-in
100 A	2	2.5	3.5	21	120	-	200	16453	16550	built-in
125 A	2.5	3.5	4	21	120	-	200	16454	16550	built-in
150 A	3	4	5	21	120	-	200	16455	16550	built-in
200 A	1.5	5.5	6.5	22	150	30 x 10	270	16459	16551 <sup>(4)</sup>	16552
	4	5.5	6	21	120	-	200	16456	16550	built-in
250 A	4	7	8.5	22	150	30 x 10	270	16460	16551	16552
	-	2	5	-	-	65 x 32	600	16476	-	built-in
	6	9	11	22	150	30 x 10	270	16461	16551	16552
300 A	2.5	5	8	35	240	40 x 10	430	16468	-	16553
	1	4	6	-	-	65 x 32	600	16477	-	built-in
	7.5	11	13.5	22	150	30 x 10	270	16462	16551	16552
400 A	4	8	12	35	240	40 x 10	430	16469	-	16553
	1.5	6	7	-	-	65 x 32	600	16478	-	built-in
	10.5	15	18	22	150	30 x 10	270	16463	16551	16552
500 A	8	12	15	35	240	40 x 10	430	16470	-	16553
	4	8	10	-	-	65 x 32	600	16479	-	built-in
	12	18	22	22	150	30 x 10	270	16464	16551	16552
600 A	10	12	15	35	240	40 x 10	430	16471	-	16553
	2	4	6	-	-	64 x 11 51 x 31	500	16473	-	built-in
	8	10	12	-	-	65 x 32	600	16480	-	built-in
	14.5	21.5	26	22	150	30 x 10	270	16465	16551	16552
800 A	4	6	8	-	-	64 x 11 51 x 31	500	16474	-	built-in
	8	12	15	-	-	65 x 32	600	16481	-	built-in
	12	15	20	-	-	65 x 32	600	16482	-	built-in
1000 A	15	20	25	-	-	65 x 32	600	16483	-	built-in
1250 A	15	20	25	-	-	65 x 32	600	16534	-	built-in
	12	15	20	-	-	84 x 34	700	16537	-	built-in
	8	12	-	-	-	127 x 38	1500	16540	-	built-in
1500 A	20	25	30	-	-	65 x 32	600	16535	-	built-in
	15	20	25	-	-	84 x 34	700	16538	-	built-in
	10	15	-	-	-	127 x 38	1000	16541	-	built-in
2000 A	15	20	-	-	-	127 x 38	1000	16542	-	built-in
2500 A	20	25	-	-	-	127 x 38	1000	16543	-	built-in
	30	50	60	-	-	127 x 52	1300	16545	-	built-in
3000 A	25	30	-	-	-	127 x 38	1000	16544	-	built-in
	40	60	60	-	-	127 x 52	1300	16546	-	built-in
4000 A	50	60	60	-	-	127 x 52	1300	16547	-	built-in
5000 A	60	120	-	-	-	165 x 55	5000	16548	-	built-in
6000 A	70	120	-	-	-	165 x 55	5000	16549	-	built-in

(1) Cable(s) that can be routed through the CT

(2) For CT with primary connection by screw and nut.

(3) Cylinder with inner dia. 8.5 mm, L = 32 mm

(4) Cylinder with inner dia. 12.5 mm, L = 62 mm

## Fastening mode

CT cat. no.	Adapter for DIN rail	Mounting plate	Insulated locking screw
16451...16456	■	■	-
16459...16471	■	■	■
16473 and 16474	-	■	■
16476...16483	-	-	■
16500	■	■	-
16534...16549	-	-	■

### Choosing a current transformer

Choice of a CT depends on 2 criteria:

- the Ip/5 A ratio
- the installation type.

#### The Ip/5 A ratio

We recommend that you choose the ratio immediately higher than the maximum measured current (In).

Example: In = 1103 A; ratio chosen = 1250/5.

For small ratings from 40/5 to 75/5 and for an application with digital devices, we recommend that you choose a higher rating, for example 100/5.

This is because small ratings are less accurate and the 40 A measurement, for example, will be more accurate with a 100/5 CT than with a 40/5 CT.

#### The installation type

Choice of a CT model depends on the installation type:

- insulated cables
- mounting on bars.

### Important precaution

Never open the secondary circuit of a current transformer when the primary circuit is energised.

Prior to working on the secondary circuit, the secondary terminals of the current transformer must be short-circuited.

### Determining the accuracy class of a CT

The accuracy class depends on the apparent power (VA) of the transformer and on consumption of the complete measurement system.

The latter allows for consumption of all the devices and the connecting cables.

For a given accuracy class, consumption of the measurement system must not exceed apparent power (VA) of the CT transformer.

Copper cable cross-section (mm <sup>2</sup> )	Power in VA per doubled meter at 20 °C
1	1
1.5	0.685
2.5	0.41
4	0.254
6	0.169
10	0.0975
16	0.062

For each temperature variation per 10 °C bracket, the power drawn up by the cables increases by 4 %.

Schneider Electric device	Consumption of the current input in VA
Ammeter 72 x 72 / 96 x 96	1.1
Analog ammeter	1.1
Digital ammeter	0.3
PM700, PM800, CM3000, CM4000	0.15
ME4zrt	0.05
PM9	0.55

### Example: consumption of a measurement system at 20 °C

PM9		0.55 VA
4 meters of 2.5 mm <sup>2</sup> doubled wires	+	1.64 VA
i.e. a measurement system consumption	=	<b>2.19 VA</b>

Based on the result, the CT accuracy class is determined (see previous page):

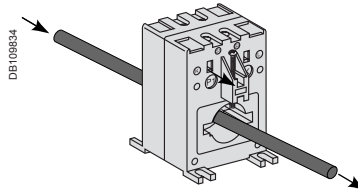
- class 3 for a 75/5 ratio CT
- class 1 for a 100/5 ratio CT
- class 0.5 for a 125/5 ratio CT.

**Specific case of the motor starter**

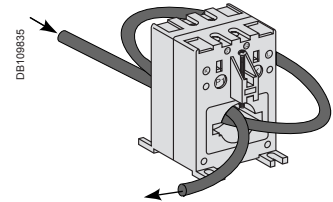
To measure motor starter current, you must choose a CT with primary current  $I_p = I_d/2$  ( $I_d$  = motor starting current).

**Practical advice**

Use a current transformer to measure a nominal current of 50 A.



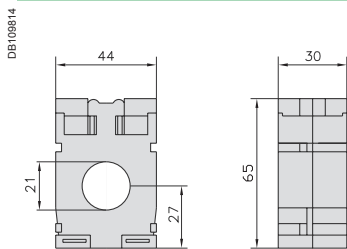
50/5 A CT:  $I_{max} = 50$  A



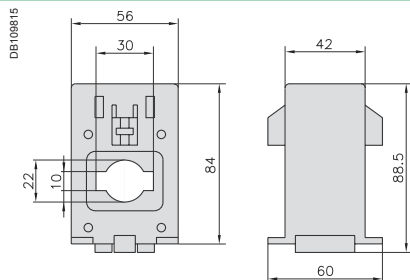
100/5 A CT, 2 cable openings:  $I_{max} = 50$  A

To divide by 2 the nominal current of a transformer, you only need to pass the current to be measured twice through this transformer.

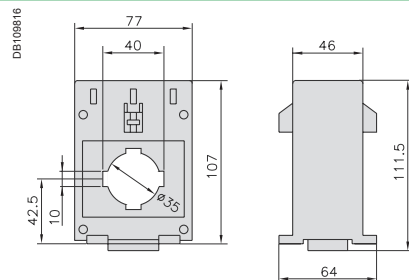
## CT current transformers



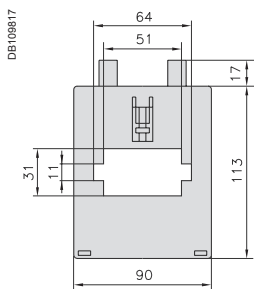
Cat. no. 16500, 16451 to 16456



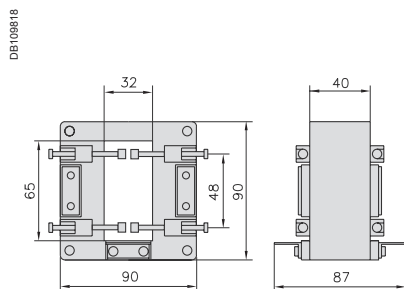
Cat. no. 16459 to 16465



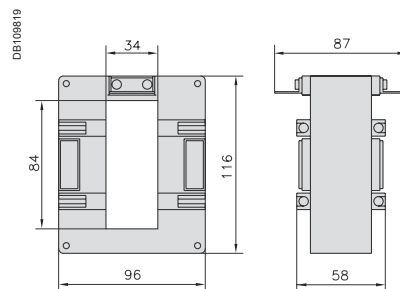
Cat. no. 16468 to 16471



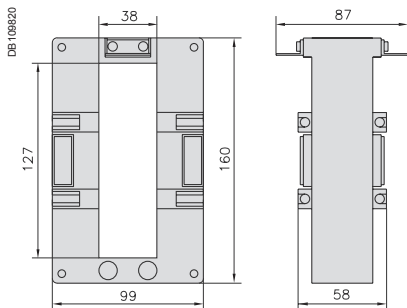
Cat. no. 16473 and 16474



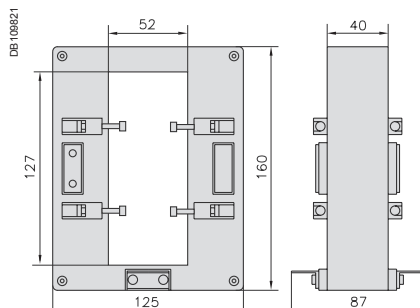
Cat. no. 16534 to 16535, 16476 to 16483



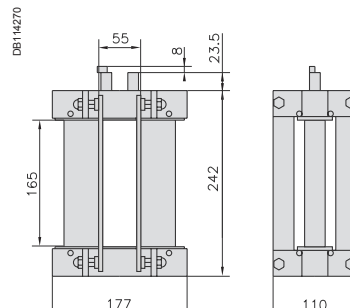
Cat. no. 16537 and 16538



Cat. no. 16540 to 16544

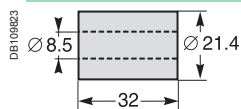


Cat. no. 16545 to 16547



Cat. no. 16548 and 16549

## Cylinders



Cat. no. 16550



Cat. no. 16551

# DIN rail analog ammeters and voltmeters



AMP.



VLT.

## Function

### AMP

Ammeters measure the current flowing through an electric circuit in amps.

### VLT

Voltmeters measure the potential (voltage) difference of an electric circuit in volts.

## Common technical data

- Accuracy: class 1.5.
- Complies with standards IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- Ferromagnetic device.
- Pseudo-linear scale over 90°.
- Ammeters (except catalogue number 16029):
  - connection on CT, ratio In/5, to be ordered separately
  - interchangeable dials.
- Temperature:
  - operating temperature: -25 °C to +55 °C.
  - reference temperature: 23 °C.
  - Influence of temperature on accuracy: ±0.03 % / °C.
- Utilisation frequency: 50/60 Hz.
- Consumption:
  - AMP: 1.1 VA
  - VLT catalogue number 15060: 2.5 VA
  - VLT catalogue number 16061: 3.5 VA.
- Permanent overload:
  - AMP: 1.2 In
  - VLT: 1.2 Un.
- Maximum overload for 5 s:
  - AMP: 10 In
  - VLT: 2 Un.
- Connection: tunnel terminals for 1.5 to 6 mm<sup>2</sup> rigid cables.

## Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
<b>AMP with direct connection</b>				
	0-30 A	no	8	<b>16029</b>
<b>AMP with connection on CT</b>				
Basic device (delivered without dial)		X/5	8	<b>16030</b>
Dial	0-5 A			<b>16031</b>
	0-50 A	50/5		<b>16032</b>
	0-75 A	75/5		<b>16033</b>
	0-100 A	100/5		<b>16034</b>
	0-150 A	150/5		<b>16035</b>
	0-200 A	200/5		<b>16036</b>
	0-250 A	250/5		<b>16037</b>
	0-300 A	300/5		<b>16038</b>
	0-400 A	400/5		<b>16039</b>
	0-500 A	500/5		<b>16040</b>
	0-600 A	600/5		<b>16041</b>
	0-800 A	800/5		<b>16042</b>
	0-1000 A	1000/5		<b>16043</b>
	0-1500 A	1500/5		<b>16044</b>
	0-2000 A	2000/5		<b>16045</b>
<b>VLT</b>				
	0-300 V		8	<b>16060</b>
	0-500 V		8	<b>16061</b>

# DIN rail digital ammeters, voltmeter and frequency meter



AMP.



VLT.



FRE.

## Function

### AMP

Ammeters measure in amps the current flowing through an electric circuit.

### VLT

Voltmeters measure in volts the potential (voltage) difference of an electric circuit.

### FRE

The frequency meter measures in hertz the frequency of an electric circuit from 20 to 600 V AC.

## Common technical data

- Supply voltage: 230 V.
- Operating frequency: 50/60 Hz.
- Display by red LED: 3 digits, h = 8 mm.
- Accuracy at full-scale : 0.5 % ±1 digit.
- Consumption: max. 5 VA or rated 2.5 VA.
- Degree of protection:
  - IP40 on front face
  - IP20 at terminal level.
- Connection: tunnel terminals for 2.5 mm<sup>2</sup> cables.

## Specific data

### 10 A direct reading ammeter

- Minimum value measured: 4 % of rating.
- Measurement input consumption: 1 VA.

### Multi-rating ammeter

- Ratings:
  - in direct reading: 5 A
  - by CT (not supplied) configurable on the front face of the ammeter: 10, 15, 20, 25, 40, 50, 60, 100, 150, 200, 250, 400, 500, 600, 800, 1000, 1500, 2000, 2500, 4000, 5000 A.
- Minimum value measured: 4 % of rating.
- Measurement input consumption: 0.55 VA.

### Voltmeter

- Direct measurement: 0...600 V.
- Input impedance: 2 MΩ.
- Minimum value measured: 4 % of rating.

### Frequency meter

- Minimum value measured: 20 Hz.
- Maximum value measured: 100 Hz.
- Full-scale display: 99.9 Hz.

### Compliance with standards

- Safety: IEC/EN 61010-1.
- EMC electromagnetic compatibility: IEC/EN 65081-1 and IEC/EN 65082-2.

## Catalogue numbers

Type	Scale	Connection with CT	Width in mod. of 9 mm	Cat. no.
Direct reading AMP	0-10 A	No	4	15202
	0-5000 A	As per rating	4	15209
VLT	0-600 V		4	15201
	20-100 Hz		4	15208



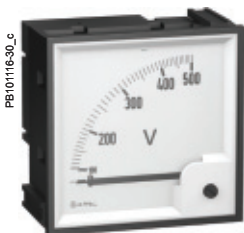
# 72 x 72 analog ammeters and voltmeter



AMP for standard feeder.



AMP for motor feeder.



VLT.

## Function

The 72 x 72 measurement devices are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

### AMP

The ammeters measure in amps the current flowing through an electrical circuit.

### VLT

The voltmeter measure in volts the potential difference (voltage) of an electrical circuit.

## Common technical data

- Accuracy: class 1.5.
- Compliance with standard IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- Ferromagnetic device.
- Scale length: 62 mm over 90°.
- Mounting in enclosure or in cubicle.
- Degree of protection: IP52.
- Maximum operating position: 30° / vertical.
- Temperature:
  - operation: -25 °C to +50 °C
  - reference: 23 °C.
- Influence of temperature on accuracy: ±0.003 % / °C.
- Utilisation frequency: 50/60 Hz.

## AMP specific technical data

- Needs a In/5 CT to be ordered separately.
- Interchangeable dials to be ordered separately.
- Consumption: 1.1 VA.
- Permanent overload: 1.2 In.
- Maximum overload for 5 s: 10 In.

## VLT specific technical data

- Consumption: 3 VA.
- Permanent overload: 1.2 Un.
- Maximum overload for 5 s: 2 Un.

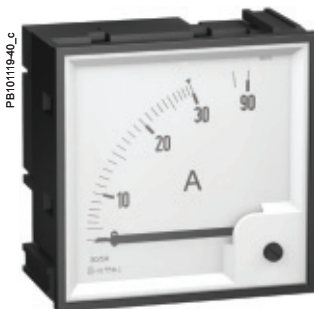
## Catalogue numbers

Type	Scale	Connection on CT	Cat. no.
<b>AMP for standard feeder</b>			
Basic device (delivered without dial)		X/5	<b>16004</b>
1.3 In dial	0-50 A	50/5	<b>16009</b>
	0-100 A	100/5	<b>16010</b>
	0-200 A	200/5	<b>16011</b>
	0-400 A	400/5	<b>16012</b>
	0-600 A	600/5	<b>16013</b>
	0-1000 A	1000/5	<b>16014</b>
	0-1250 A	1250/5	<b>16015</b>
	0-1500 A	1500/5	<b>16016</b>
	0-2000 A	2000/5	<b>16019</b>
<b>AMP for motor feeder</b>			
Basic device (delivered without dial)		X/5	<b>16003</b>
3 In dial	0-30-90 A	30/5	<b>16006</b>
	0-75-225 A	75/5	<b>16007</b>
	0-200-600 A	200/5	<b>16008</b>
<b>VLT</b>			
	0-500 V		<b>16005</b>

# 96 x 96 analog ammeters and voltmeter



AMP for standard feeder.



AMP for motor feeder.



VLT.

## Function

The 96 x 96 measurement devices are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

### AMP

The ammeters measure in amps the current flowing through an electrical circuit.

### VLT

The voltmeter measure in volts the potential difference (voltage) of an electrical circuit.

## Common technical data

- Accuracy: class 1.5.
- Compliance with standard IEC 60051-1, IEC 61010-1 and IEC 61000-4.
- Ferromagnetic device.
- Scale length: 80 mm over 90°.
- Mounting in enclosure or in cubicle.
- Degree of protection: IP52.
- Maximum operating position: 30° / vertical.
- Temperature:
  - operation: -25 °C to +50 °C
  - reference: 23 °C.
- Influence of temperature on accuracy: ±0.003 % / °C.
- Utilisation frequency: 50/60 Hz.

## AMP specific technical data

- Needs a In/5 CT to be ordered separately.
- Interchangeable dials to be ordered separately.
- Consumption: 1.1 VA.
- Permanent overload: 1.2 In.
- Maximum overload for 5 s: 10 In.

## VLT specific technical data

- Consumption: 3 VA.
- Permanent overload: 1.2 Un.
- Maximum overload for 5 s: 2 Un.

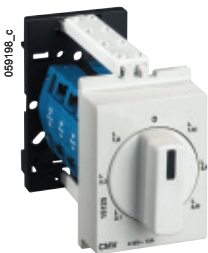
## Catalogue numbers

Type	Scale	Connection on CT	Cat. no.
<b>AMP for standard feeder</b>			
Basic device (delivered without dial)		X/5	<b>16074</b>
1.3 In dial	0-50 A	50/5	<b>16079</b>
	0-100 A	100/5	<b>16080</b>
	0-200 A	200/5	<b>16081</b>
	0-400 A	400/5	<b>16082</b>
	0-600 A	600/5	<b>16083</b>
	0-1000 A	1000/5	<b>16084</b>
	0-1250 A	1250/5	<b>16085</b>
	0-1500 A	1500/5	<b>16086</b>
	0-2000 A	2000/5	<b>16087</b>
	0-2500 A	2500/5	<b>16088</b>
	0-3000 A	3000/5	<b>16089</b>
	0-4000 A	4000/5	<b>16090</b>
	0-5000 A	5000/5	<b>16091</b>
	0-6000 A	6000/5	<b>16092</b>
<b>AMP for motor feeder</b>			
Basic device (delivered without dial)		X/5	<b>16073</b>
3 In dial	0-30-90 A	30/5	<b>16076</b>
	0-75-225 A	75/5	<b>16077</b>
	0-200-600 A	200/5	<b>16078</b>
<b>VLT</b>			
	0-500 V		<b>16075</b>

# DIN rail CMA and CMV selector switches



CMA.



CMV.

## Function

### CMA

This 4-position ammeter selector switch uses a single ammeter (using current transformers) for successive measurement of the currents of a three-phase circuit.

### CMV

This 7-position voltmeter selector switch uses a single voltmeter for successive measurement of voltages (phase-to-phase and phase-to-neutral) of a three-phase circuit.

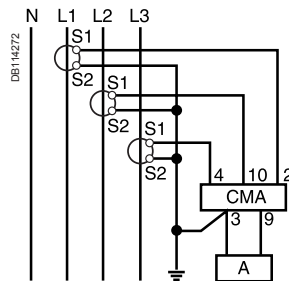
## Common technical data

- Rotary handle.
- Maximum operating voltage: 440 V, 50/60 Hz.
- Nominal thermal current: 10 A.
- Operating temperature: -20 °C to +55 °C.
- Storage temperature: -25 °C to +80 °C.
- Mechanical durability (AC21A-3 x 440 V): 2 000 000 operations.
- Degree of protection:
  - IP66 on front face
  - IP20 at terminal level.
- Electrical durability: 1 000 000 operations.
- Connection: jumper terminals with captive screws, for cables up to 1.5 mm<sup>2</sup>.
- Complies with standards: IEC/EN 60947-3.

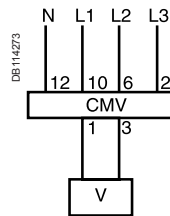
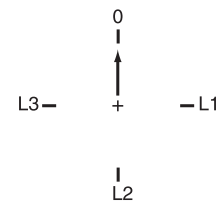
## Catalogue numbers

Type	Rating (A)	Voltage (V AC)	Width in mod. of 9 mm	Cat. no.
CMA	10	415	4	15126
CMV	10	415	4	15125

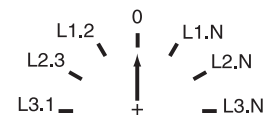
## Connection



CMA.



CMV.



# 48 x 48 CMA and CMV selector switches



CMA.



CMV.

### Function

The 48 x 48 selector switches are designed for flush-mounted installation on doors, wicket doors and front plates of enclosures and cubicles.

#### CMA

The ammeter selector switch uses a single ammeter (by means of current transformers) for successive measurement of the currents of a three-phase circuit.

#### CMV

The voltmeter selector switch uses a single voltmeter for successive measurement of the voltages (phase-to-phase and phase-to-neutral) of a three-phase circuit.

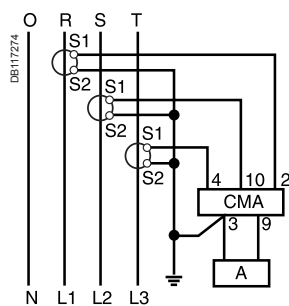
### Common technical data

- Durability:
  - electrical: 100 000 operations
  - mechanical: 2 000 000 operations.
- AgNi contact.
- Operating temperature: -25 °C to +50 °C.
- Compliance with standards IEC/EN 60947-3.
- Degree of protection:
  - IP65 on front face
  - IP20 at terminal level.

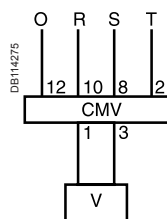
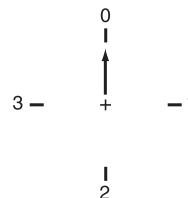
### Catalogue numbers

Type	Rating (A)	Voltage (V)	Number of positions	Cat. no.
CMA	20		4	16017
CMV		500	7	16018

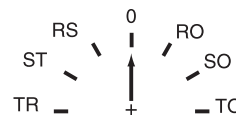
### Connection



CMA.



CMV.



Reading 3 phase-to-earth voltages + 3 phase-to-phase voltages.

**Note:** when connecting do not remove the pre-cablings.



CH "DIN".



CH "48 x 48".

### Function

Electromechanical counter that counts the operating hours of a machine or piece of electrical equipment. Giving a precise indication of operating time, the counter is used to decide when to carry out preventive maintenance.

### Common technical data

- Electromechanical display.
- Maximum display: 99999.99 hours.
- Display accuracy: 0.01 %.
- Without reset.
- Storage temperature: -25 °C to +85 °C.
- Connection: tunnel terminals for 2.5 mm<sup>2</sup> cable.

### Specific technical data

#### CH "DIN"

- Consumption: 0.15 VA.
- Operating temperature: -10 °C to +70 °C.
- Mounting on DIN rail.

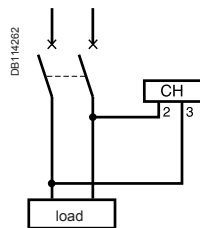
#### CH "48 x 48"

- Consumption:
  - 15607: 0.25 VA
  - 15608: 0.15 VA
  - 15609: 0.02 VA to 12 V and 0.3 VA to 36 V.
- Operating temperature: -20 °C to + 70 °C.
- Degree of protection: IP65 on front face.
- Mounting on front face of monitoring switchboards.

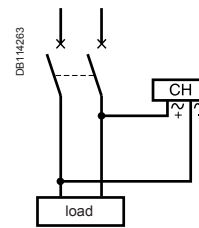
### Catalogue numbers

Type	Voltage (V)	Width in mod. of 9 mm	Cat. no.
CH "DIN"	230 V AC ± 10%/50 Hz	4	15440
CH "48 x 48"	24 V AC ± 10%/50 Hz		15607
	230 V AC ± 10%/50 Hz		15608
	12 to 36 V DC		15609

### Connection



CH "DIN".



CH "48 x 48".

DB119004



## Function

Electromechanical counter designed to count impulses emitted by: kilowatt hour meters, temperature overrun detectors, people meters, speed meters, etc.

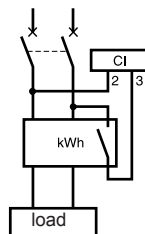
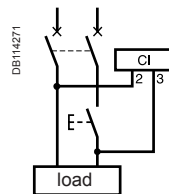
## Common technical data

- Supply and metering voltage: 230 V AC  $\pm$  10%, 50/60 Hz.
- Consumption: 0.15 VA.
- Maximum display: 9 999 999 impulses.
- Without reset.
- Metering data:
  - minimum impulse time: 50 ms
  - minimum time between 2 impulses: 50 ms.
- Storage temperature: -25 °C to +85 °C.
- Operating temperature: -10 °C to +70 °C.
- Connection: tunnel terminals for 2.5 mm<sup>2</sup> cable.

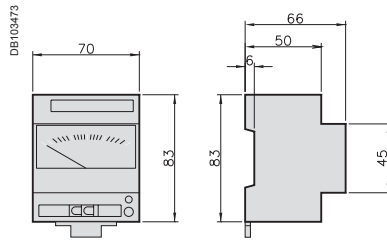
## Catalogue number

Type	Width in mod. of 9 mm	Cat. no.
CI	4	15443

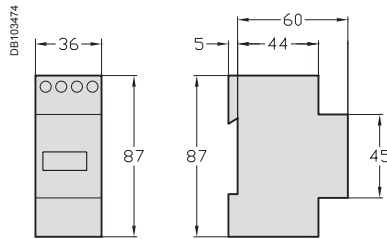
## Connection



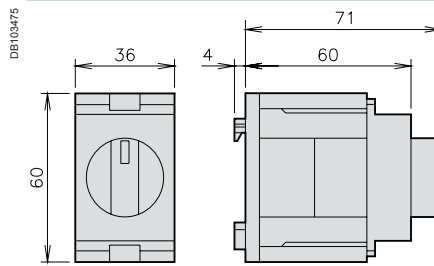
### Analog ammeters and voltmeters



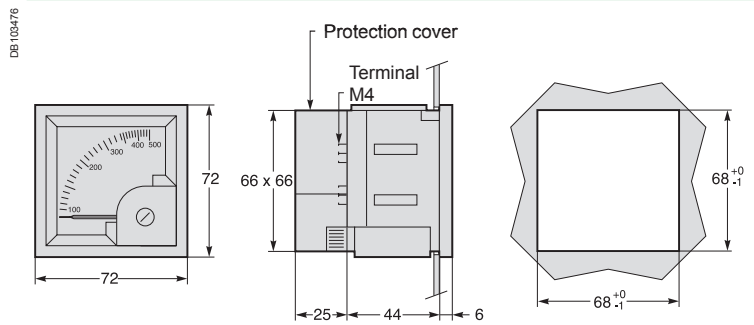
### Digital ammeters, voltmeter and frequency meter



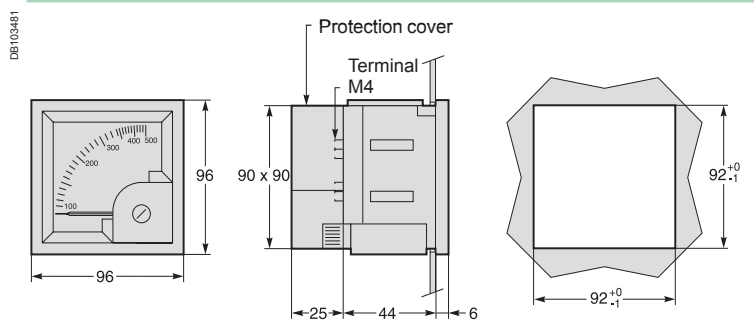
### CMA and CMV selector switches



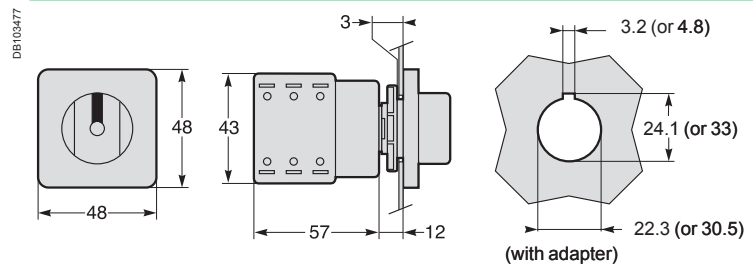
### 72 x 72 analog ammeters and voltmeter



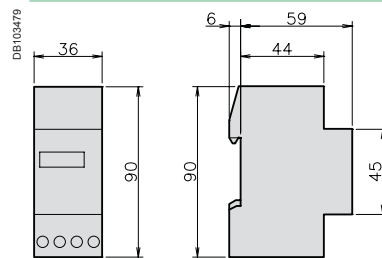
### 96 x 96 analog ammeters and voltmeter



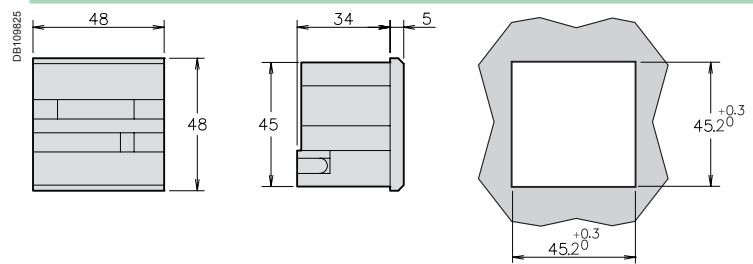
## 48 x 48 CMA and CMV selector switches



## CI impulse counter and CH hour counter



## 48 x 48 CH hour counters







EN'clik.



EN40.



EN40p.



ME1zr.



ME3zr.



ME4zrt.

**Function**

Digital kilowatt-hour meters designed for sub-metering of active energy (rms) consumed by a single-phase or three-phase electric circuit with or without distributed neutral.

**EN'clik**

40 A DuoLine single-phase kilowatt-hour meter.

**EN40**

40 A single-phase kilowatt-hour meter.

**EN40p**

40 A single-phase kilowatt-hour meter with remote transfer of metering impulses (static output).

**ME1**

Single-phase kilowatt-hour meter.

**ME1z**

Single-phase kilowatt-hour meter with partial meter.

**ME1zr**

Single-phase kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

**ME3**

Three-phase kilowatt-hour meter without neutral.

**ME3zr**

Three-phase kilowatt-hour meter without neutral, with partial meter and remote transfer of metering impulses (relay output).

**ME4**

Three-phase + neutral kilowatt-hour meter.

**ME4zr**

Three-phase + neutral kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

**ME4zrt**

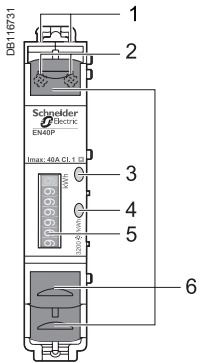
Three-phase kilowatt-hour meter with or without neutral associated with external CTs (not supplied), with partial meter and remote transfer of metering impulses (relay output).

**Catalogue numbers**

Type	Rating (A)	Voltage (V AC)	Tolérance (V AC)	Width in mod. of 9 mm	Cat. no.
<b>Single-phase circuit (1L + N)</b>					
EN'clik	40	230	±20	2	15237
EN40	40	230	±20	2	15238
EN40p	40	230	±20	2	15239
ME1	63	230	±20	4	17065
ME1z	63	230	±20	4	17066
ME1zr	63	230	±20	4	17067
<b>Three-phase circuit (3L)</b>					
ME3	63	3 x 400-3 x 230	±20	8	17075
ME3zr	63	3 x 400-3 x 230	±20	8	17076
ME4zrt	40...6000	3 x 400-3 x 230	±20	8	17072
<b>Three-phase + neutral circuit (3L + N)</b>					
ME4	63	3 x 230/400	±20	8	17070
ME4zr	63	3 x 230/400	±20	8	17071
ME4zrt	40...6000	3 x 230/400	±20	8	17072

**Main technical data**

	ME	EN'clik / EN40 / EN40p
Accuracy class	1	1
Frequency	48/62 Hz	48/62 Hz
Consumption	2.5 VA	< 10 VA
Operating temperature	-25°C to +55°C	-25°C to +55°C -25°C to +65°C (32 A)
Connection by tunnel terminals	Top terminals: 6 mm <sup>2</sup> Bottom terminals: 16 mm <sup>2</sup>	Top terminals: 4 mm <sup>2</sup> Bottom terminals: 10 mm <sup>2</sup>
Compliance with standard	IEC 61557-12 : - PMD/DD/K55/1 - PMD/SD/K55/1 (ME4zrt)	IEC 62053-21 / IEC 61557-12 : - PMD/DD/K55/1
	IEC 62053-21 (accuracy)	Pending MID approval
Sealable screw shield	Except ME4zrt	Yes

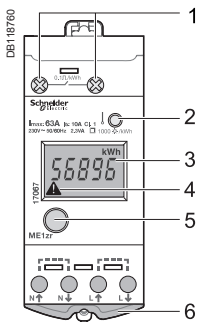


EN40p.

## Description

### EN'clic, EN40, EN40p

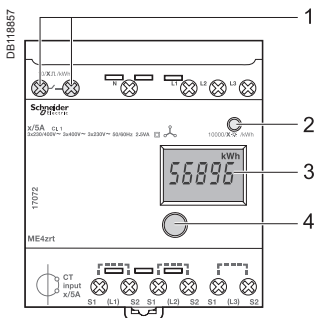
- 1 Allow the comb busbar to pass.
- 2 Remote transfer pulse output (EN40p).
- 3 Green power-on indicator light.
- 4 Yellow metering indicator light (flashing).
- 5 Display unit.
- 6 Seal.



ME1zr.

### ME1, ME1z, ME1zr

- 1 Pulse output for remote transfer (ME1zr).
- 2 Flashing meter indicator.
- 3 Total or partial meter display (ME1z, ME1zr).
- 4 Wiring error indicator.
- 5 Push-button: total or partial meter display, reset partial meter (ME1z, ME1zr).
- 6 Sealing connection.



ME4zrt.

### ME3, ME3zr, ME4, ME4zr, ME4zrt

- 1 Pulse output for remote transfer (ME3zr, ME4zr, ME4zrt).
- 2 Flashing meter indicator.
- 3 Total or partial meter display (ME3zr, ME4zr, ME4zrt) and CT rating display (ME4zrt).
- 4 Push-button: total or partial meter display (ME3zr, ME4zr, ME4zrt), reset partial meter, display or selection of CT rating (ME4zrt).

## Installation

- The front panel of the product is IP40 and its housing is IP20.
- Its installation must be appropriate to the operating conditions.
- The protection must not be less than IP65 for outdoor use.

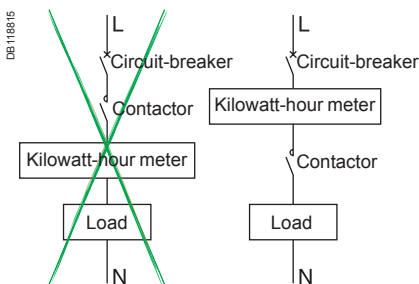
## Use with a contactor

A measurement instrument is normally continually supplied.

For a non-continuous supply (load switching), we recommend that you place the breaking device downstream from the measurement instrument to limit disturbances on the module inputs.

These disturbances, particularly on inductive loads, may result in early ageing of the device.

You must also place the measurement instrument at a distance from the breaking device to limit the risk of disturbance.



Example: meter on a load switching

Specific technical data

EN'clac, EN40, EN40p, ME1, ME1z and ME1zr specific technical data						
	EN'clac	EN40	EN40p	ME1	ME1z	ME1zr
Direct measurement	Up to 40 A			Up to 63 A		
Metering and activity indicator light (yellow)	3,200 flashes per kWh			1,000 flashes per kWh		
Wiring error indicator	Yes					
Total meter (max. capacity) on one phase	999 999.9 kWh			999.99 MWh		
Total meter display	In kWh with 7 significant digits			In kWh or MWh with 5 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh		
Partial meter (max. capacity) on one phase with RESET	-			-	99.99 MWh	
Partial meter display	-			-	In kWh or MWh with 4 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh	
Remote transfer	-		By static output: - ELV insulation voltage: 4 kV, 50 Hz - 20 mA/35 V DC max. - 100 impulses of 120 ms per kWh	-	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) per kWh

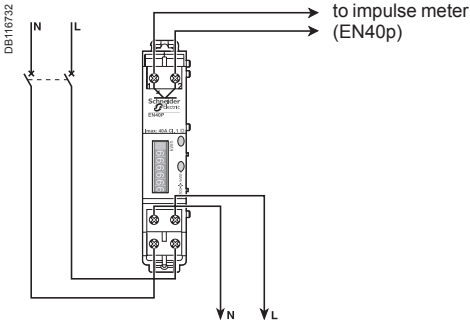
ME3 and ME3zr specific technical data		
	ME3	ME3zr
Direct measurement	Up to 63 A	
Metering and activity indicator light (yellow)	100 flashes per kWh	
Total meter (max. capacity) on one phase	999.99 MWh	
Total meter display	In kWh or MWh with 5 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh	
Partial meter (max. capacity) on one phase with RESET	-	99.99 MWh
Partial meter display	-	In kWh or MWh with 4 significant digits. 1 digit after the decimal point in kWh
Remote transfer	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) every 10 kWh

ME4, ME4zr and ME4zrt specific technical data			
	ME4	ME4zr	ME4zrt
Direct measurement	Up to 63 A		-
Measurement by CT	-		Ratio of 40/5 to 6,000/5 (configurable)
CT ratings choice	-		see page 16
Consumption of each measurement input	-		0.05 to 5 A
Metering and activity indicator light (yellow)	100 flashes per kWh		10,000/x flashes per kWh <sup>(1)</sup> (x = CT rating)
Total meter (max. capacity) on all 3 phases	999.99 MWh		Where CT ≤ 150 A : 999.99 MWh Where CT > 150 A : 9,999.9 MWh
Total meter display	In kWh or MWh with 5 significant digits. No decimal point in kWh; 2 digits after the decimal point in MWh		
Partial meter (max. capacity) on all 3 phases with RESET	-	99.99 MWh	Where CT ≤ 150 A : 99.99 MWh Where CT > 150 A : 999.99 MWh
Partial meter display	-	In kWh or MWh with 4 significant digits. 1 digit after the decimal point in kWh	
Remote transfer	-	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 1 impulse of 200 ms (contact closing) every 10 kWh	By NO impulse contact: - ELV insulation voltage: 4 kV, 50 Hz - 18 mA/24 V DC, 100 mA/230 V AC - 10/x impulse of 200 ms (contact closing) per kWh = x/10 kWh per impulse <sup>(2)</sup> (x = CT rating)

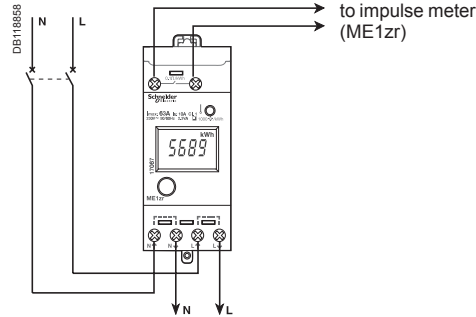
(1) example: 500/5 CT = 10,000/500 flashes per kWh = 20 flashes per kWh  
 (2) example: 500/5 CT = 500/10 kWh per impulse = 50 kWh per impulse

## Connection

### Single-phase circuit

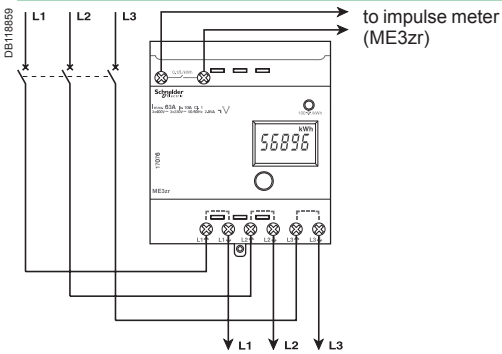


EN'clac / EN40 / EN40p.

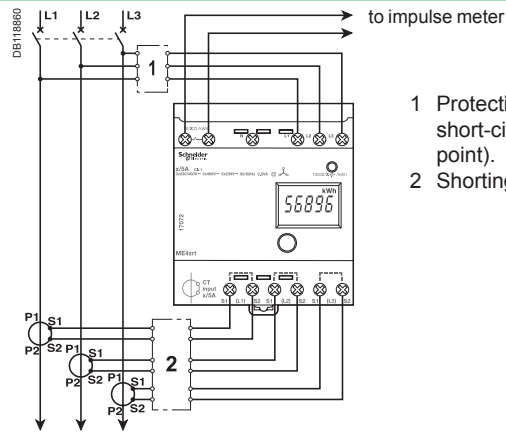


ME1 / ME1zr.

### Three-phase circuit



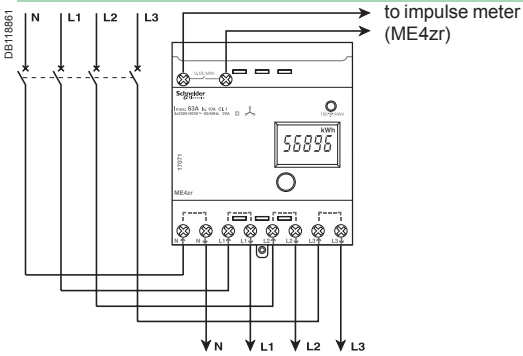
ME3 / ME3zr.



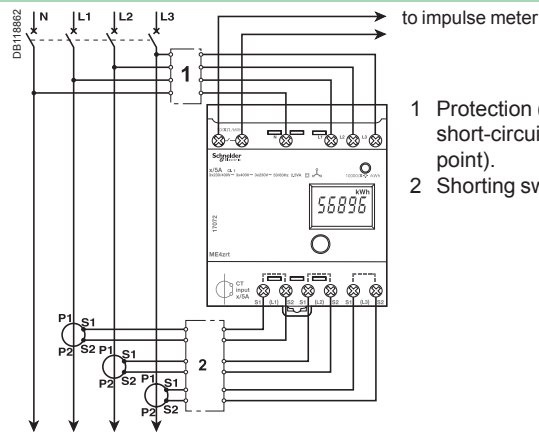
ME4zrt.

- 1 Protection (to be adapted to suit the short-circuit current at the connection point).
- 2 Shorting switch unit.

### Three-phase + neutral circuit



ME4 / ME4zr.



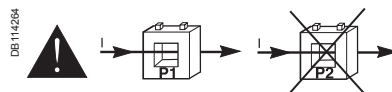
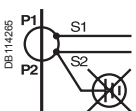
ME4zrt.

- 1 Protection (to be adapted to suit the short-circuit current at the connection point).
- 2 Shorting switch unit.

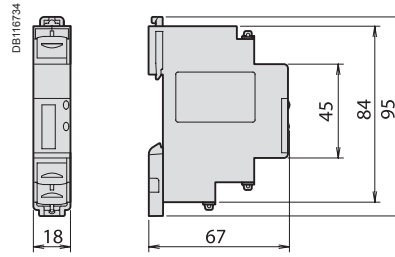
### Caution

■ Do not earth the CT secondary (S2).

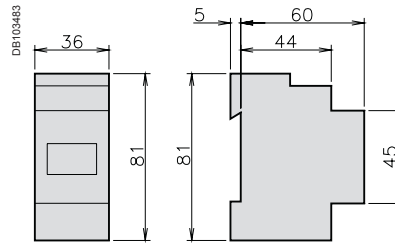
■ You must comply with the routing direction of power cables in the current transformer primary. Cables enter in "P1" and leave in "P2" to the loads.



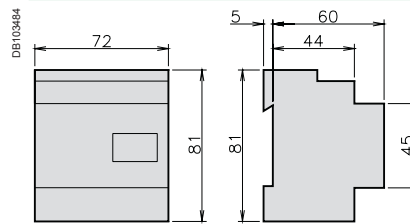
**EN'clic, EN40 and EN40p kilowatt-hour meters**













**ME1, ME1z and ME1zr kilowatt-hour meters**



**ME3, ME3zr, ME4, ME4zr, ME4zrt kilowatt-hour meters**



# Product selection according to measurement functions

	Power Meter											
												
	PM9/PM9P/PM9C	PM200	PM200P	PM210	PM700	PM700P	PM710	PM750	PM810	PM820	PM850	PM870
<b>General selection criteria</b>												
Installation	On DIN rail	Flush or DIN rail mount			Flush or DIN rail mount				Flush or DIN rail mount			
Use on LV distribution systems	■	■	■	■	■	■	■	■	■	■	■	■
Use on LV and HV distribution systems	-	■	■	■	■	■	■	■	■	■	■	■
Current / voltage accuracy	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %	0.4 % Current 0.3 % Voltage	0.1 %	0.1 %	0.1 %	0.1 %
Power / active energy accuracy	1 %	Class 1 % IEC 62053-21			1 %	1 %	1 %	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %
<b>Instantaneous rms values</b>												
Current	■ Phases	■	■	■	■	■	■	■	■	■	■	■
	■ Neutral	-	-	-	■	■	■	■	■	■	■	■
	■ Extended Measurement range	-	-	-	-	-	-	-	-	-	-	-
3 - Phase Voltage	■	■	■	■	■	■	■	■	■	■	■	■
Voltage per phase	■	-	-	-	■	■	■	■	■	■	■	■
Frequency	■	■	■	■	■	■	■	■	■	■	■	■
Total power	■ Active	■	signed	signed	signed	signed	signed	signed	■	■	■	■
	■ Reactive	■	signed	signed	signed	signed	signed	signed	■	■	■	■
	■ Apparent	■	■	■	■	■	■	■	■	■	■	■
Power per phase	■ Active	■	-	-	-	signed	signed	signed	signed	■	■	■
	■ Reactive	■	-	-	-	signed	signed	signed	signed	■	■	■
	■ Apparent	-	-	-	■	■	■	■	■	■	■	■
Power factor	■ Total	■	signed	signed	signed	signed	signed	signed	■	■	■	■
	■ Per phase	-	-	-	-	-	-	-	■	■	■	■
<b>Energy values</b>												
Active energy	■	signed	signed	signed	signed	signed	signed	signed	In/Out	In/Out	In/Out	In/Out
Reactive energy	■	signed	signed	signed	signed	signed	signed	signed	In/Out	In/Out	In/Out	In/Out
Apparent energy	-	■	■	■	■	■	■	■	■	■	■	■
User-set accumulation mode	-	-	-	-	-	-	-	-	■	■	■	■
<b>Demand values</b>												
Current - Present and maximum values	-	Thermal	Thermal	Thermal	Thermal	Thermal	Thermal	Thermal	■	■	■	■
Total active power - Present and maximum values	■ <sup>(3)</sup>	■	■	■	■	■	■	■	■	■	■	■
Total reactive power - Present and maximum values	■ <sup>(3)</sup>	■	■	■	■	■	■	■	■	■	■	■
Total apparent power - Present and maximum values	■ <sup>(3)</sup>	■	■	■	■	■	■	■	■	■	■	■
Total predicted demand - kW, kVAR, kVA	-	-	-	-	-	-	-	-	■	■	■	■
Synchronisation of calculation window	-	-	-	-	-	-	-	■	■	■	■	■
User-set calculation mode	-	■	■	■	■	■	■	■	■	■	■	■
<b>Other measurements</b>												
Hour counter	■	-	-	-	■	■	■	■	■	■	■	■

<sup>(1)</sup> Measurement sensors included.

<sup>(2)</sup> Not available with Digipact communication card.

<sup>(3)</sup> Active power or reactive power or apparent power.



# Product selection according to measurement functions (cont.)

Power Meter													
	PM9/ PM9P/ PM9C	PM200	PM200P	PM210	PM700	PM700P	PM710	PM750	PM810	PM820	PM850	PM870	
<b>Power quality measurement</b>													
Interharmonics	-	-	-	-	-	-	-	-	-	-	-	-	
Total harmonic distortion	Voltage	-	-	-	■	■	■	■	■	■	■	■	
	Current	-	-	-	■	■	■	■	■	■	■	■	
Individual harmonic content (current and voltage)	-	-	-	-	-	-	-	-	31 <sup>(1)</sup>	31	63	63	
Waveform capture	-	-	-	-	-	-	-	-	-	-	■	■ <sup>(2)</sup>	
Detection of voltage sags and swelles	-	-	-	-	-	-	-	-	-	-	-	■	
Programmable (logic and mathematical functions)	-	-	-	-	-	-	-	-	-	-	-	-	
Detection and capture of transients	-	-	-	-	-	-	-	-	-	-	-	-	
Flicker	-	-	-	-	-	-	-	-	-	-	-	-	
EN 50160 compliance checking	-	-	-	-	-	-	-	-	-	-	■ <sup>(4)</sup>	■ <sup>(4)</sup>	
True rms measurement	15	15	15	15	15	15	15	15	63	63	63	63	
Maximum harmonic number	-	32	32	32	32	32	32	32	128	128	128	128	
Sampling rate	-	-	-	-	-	-	-	-	-	-	-	-	
Points per cycle	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Data recording</b>													
Min/Max of instantaneous values	-	-	-	-	■	■	■	■	■	■	■	■	
Data logging	-	-	-	-	-	-	-	-	2 <sup>(1)</sup>	2	4	4	
Event logging	-	-	-	-	-	-	-	-	■ <sup>(1)</sup>	■	■	■	
Trend curves	-	-	-	-	-	-	-	-	-	-	■	■	
Alarms	-	-	-	-	-	-	-	■	■	■	■	■	
Alarm notification via email	-	-	-	-	-	-	-	-	Optional with PM8ECC Card				
Sequence of Events Recording	-	-	-	-	-	-	-	-	-	-	-	-	
Date and time stamping	-	-	-	-	-	-	-	-	■ <sup>(1)</sup>	■	■	■	
GPS time synchronisation	-	-	-	-	-	-	-	-	-	-	-	■	
Storage capacity	-	-	-	-	-	-	-	-	80 kB <sup>(1)</sup>	80 kB	800 kB	800 kB	
<b>Display, sensors, inputs/ outputs</b>													
Front-panel display	■	■	■	■	■	■	■	■	■	■	■	■	
Built-in current and voltage sensors	-	-	-	-	-	-	-	-	-	-	-	-	
Digital or analogue inputs (max. number)	-	-	-	-	-	-	-	2 digit	13 digit. / 4 analog.				
Pulse outputs	1 (PM9P)	-	2	-	-	2	-	1	1	1	1	1	
Digital or analogue outputs (max. number including pulse outputs)	1 (PM9P)	-	2 digit	-	-	2 digit	-	1 digit	5 digit. / 4 analog.				
Direct voltage connections without external VT	450 V	277 V L-N 480 V L-L			277 V L-N 480 V L-L	277 V L-N 480 V L-L	277 V L-N 480 V L-L	277 V L-N 480 V L-L	347 V L-N 600 V L-L	347 V L-N 600 V L-L	347 V L-N 600 V L-L	347 V L-N 600 V L-L	
<b>Power supply</b>													
AC/DC version	AC	230 V	100 to 415 V 50 Hz - 60 Hz				100 to 415 V 50 Hz - 60 Hz			115 to 415 V (+/- 10%) 45-67 Hz or 350 to 450 Hz			
	DC	-	125 to 250 V (+/- 20%)			125 to 250 V (+/- 20%)			125 to 250 V (+/- 20%)				
DC version	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Communication</b>													
RS 485 port	■ (PM9C)	-	-	■	-	-	■	■	2- wire (on board) 4- wire (with remote display or PM8ECC)				
Infra-red port	-	-	-	-	-	-	-	-	-	-	-	-	
RS 232 port	-	-	-	-	-	-	-	-	With remote display				
Modbus (M), Digipact (D) protocol	M	-	-	M	-	-	M	M	M	M	M	M	
Ethernet port (Modbus/TCP/IP protocol)	-	-	-	-	-	-	-	-	Option	Option	Option	Option	
HTML Web-page server	-	-	-	-	-	-	-	-	Option	Option	Option	Option	
Ethernet gateway for other products on an RS 485 link	-	-	-	-	-	-	-	-	Option	Option	Option	Option	

<sup>(1)</sup> With PM810LOG.

<sup>(2)</sup> Configurable.

<sup>(3)</sup> Not available with Digipact communication card.

<sup>(4)</sup> Except for interharmonics, signalling voltage, flicker and transients.

<sup>(5)</sup> Maximum only.

<sup>(6)</sup> Self-powered.



# Product selection according to measurement functions (cont.)

ION7550		ION7650	ION8600			ION8800		
			A	B	C	A	B	C
-	■	■	-	-	-	■	■	-
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
-	■	■	-	-	-	■	-	-
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
-	20 μs	78 μs	-	-	-	20 μs	-	-
-	■	■	-	-	-	■	■	-
-	■	■	-	-	-	■	■	-
63	63	63	63	63	31	63	63	63
256	256	256	256	256	256	1024	1024	1024
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
■	■	- (7)	- (7)	- (7)	- (7)	- (7)	- (7)	- (7)
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
■ (8)	■ (8)	■ (8)	■ (8)	■ (8)	■ (8)	■ (8)	■ (8)	■ (8)
■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■
Up to 10 MB		10 MB	5 MB	2 MB		Up to 10 MB		
■	■	■	■	■	■	■	■	■
-	-	-	-	-	-	-	-	-
20	20	11	11	11	3	3	3	3
1	1	2	2	2	1	1	1	1
12	12	14	14	14	13	13	13	13
347 V L-N 600 V L-L		277 V L-N (9S, 39S, 36S and 76S) 480 V L-L (35S)			288 V L-N 500 V L-L			
85 to 240 V		120 to 227 V, 120 to 480 V (35S) / 57 to 70 V / 65 to 120 V / 160 to 277 V			85 to 240 V (+/- 10%) 47-63 Hz			
110 to 300 V		80 to 160 V / 200 to 350 V			110 to 270 V (+/- 10%)			
-	-	-	-	-	-	-	-	-
■	■	■	■	■	Option	Option	Option	
■	■	■	■	■	■	■	■	■
■	■	■	■	■	Option	Option	Option	
M	M	M	M	M	M	M	M	M
Option	Option	Option	Option	Option	Option	Option	Option	Option
Option	Option	Option	Option	Option	Option	Option	Option	Option
Option	Option	Option	Option	Option	Option	Option	Option	Option

Micrologic for Compact NSX		Micrologic control units for low voltage circuit-breakers		
A	E	A	P	H
-	-	-	-	-
-	■	-	-	■
-	■	-	-	■ (3)
-	-	-	-	■ (3)
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
15	15	12	31	31
39	39	24	64	64
■	■	■ (5)	■ (3)	■ (3)
-	■	-	-	-
-	■	-	■ (3)	■ (3)
-	-	-	-	-
■	■	-	■	■
-	-	-	-	-
-	-	-	-	-
■	■	-	■	■
-	-	-	-	-
-	-	-	-	-
■	■	■	■	■
■	■	■	■	■
-	-	-	-	-
■	■	■	■	■
-	-	-	-	-
2	2	6	6	6
-	400 V L-N 690 V L-L	690 V	690 V	690 V
-	-	(6)	(6)	(6)
-	-	(6)	(6)	(6)
24 V	24 V	(6)	(6)	(6)
-	-	Option	Option	Option
-	-	-	-	-
-	-	-	-	-
M (9)	M (9)	M, D	M, D	M, D
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Separate catalogue

(7) The ION8600 and ION8800 do trending with software but not from the meter's front panel.

(8) Sequence of Events Recording is a manual process in ION meters. It is not the meters interacting with Software X as with the CMs.

(9) Through IFM module.

# Power Meter Series PM9

## Functions and characteristics



Power Meter Series PM9.

The PowerLogic Power Meter Series PM9 offers the basic measurement capabilities required to monitor an electrical installation in a 4-module case (18 mm modules).

They can be used to monitor 2-, 3- and 4-wire low-voltage systems and connect to external current transformers. With the large backlit display, you can monitor all three phases at the same time.

Three versions are available for one supply voltage (220 to 240 V AC):

- PM9 for basic measurements
- PM9P for basic measurements with pulse output
- PM9C for basic measurements with Modbus RS485 output.

### Applications

Panel instrumentation.  
Sub-billing / cost allocation.  
Remote monitoring of an electrical installation.

### Characteristics

#### Only 72 mm wide (four 18 mm modules)

Compact design for optimised installation.

#### Large backlit display

Simultaneous monitoring of all three phases.

#### Demand power

Monitoring of subscribed-power overruns.

#### Compliance with standards

Complies with IEC 61557-12 PMD/S-/K55/1 standard for Power Meter.  
IEC 62053-21 class 1 accuracy for active energy for sub-billing and cost-allocation applications.

### Part numbers

Type	Voltage	Width in 9 mm modules	Part no.
Power Meter PM9	220 to 240 V AC	8	15199
Power Meter PM9P	220 to 240 V AC	8	15197
Power Meter PM9C	220 to 240 V AC	8	15198

# Power Meter Series PM9

## Functions and characteristics (cont.)

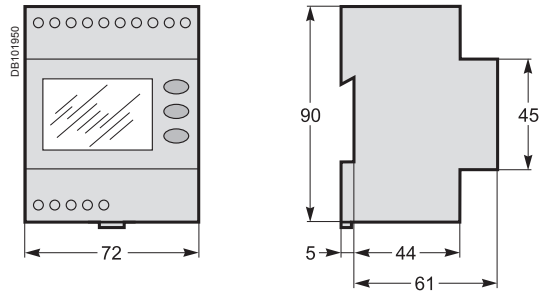
Selection guide		PM9	PM9P	PM9C
<b>General</b>				
Use on LV systems only	1P + N, 3P, 3P + N	■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Energy and power accuracy		1 %	1 %	1 %
Direct voltage connection		450 V	450 V	450 V
<b>Instantaneous rms values</b>				
Current	3 phases and neutral	■	■	■
Voltage	Phase-to-neutral and phase-to-phase	■	■	■
Frequency		■	■	■
Active and reactive power	Total and per phase	■	■	■
Apparent power	Total	■	■	■
Power factor	Total	■	■	■
<b>Energy values</b>				
Active energy		■	■	■
Partial active energy		■	■	■
Reactive energy		■	■	■
<b>Demand values</b>				
Active, reactive, apparent power	Present and max. values	■	■	■
<b>Other measurements</b>				
Hour counter		■	■	■
<b>Display and I/O</b>				
Backlit LCD display		■	■	■
Pulse output		-	1	-
<b>Communication</b>				
RS485 port		-	-	■
Modbus protocol		-	-	■

# Power Meter Series PM9

## Functions and characteristics (cont.)

Electrical characteristics		
Type of measurement		On single-phase (1P + N) or three-phase (3P, 3P + N) AC systems
Measurement accuracy	Current and voltage	0.5 % of reading
	Power	1 % of reading from pf 0.8 leading to 0.5 lagging
	Frequency	0.2 Hz
	Power factor	2 % from 0.8 leading to 0.5 lagging
	Active energy	Class 1 as defined by IEC 62053-21 and IEC 61557-12
	Reactive energy	Class 2 as defined by IEC 62053-23 and IEC 61557-12
Input-voltage characteristics	Measured voltage	50 to 450 V AC (direct) and up to 1000 V AC (with external VT)
	Permissible overload	1.15 Un
	Frequency measurement range	45 to 65 Hz
Input-current characteristics	CT ratings	Adjustable from 5 to 10000 A
	Secondary	5 A
	Metering over-range	15 mA to 6 A
	Permissible overload	6 A continuous 20 A 10 s 50 A 1 s
	Load	0.55 VA
	Input current	Not isolated
Control Power	AC	220 to 240 V AC ( $\pm 10\%$ ), < 5 VA
Pulse output (PM9P)		Static output, 350 V AC/DC max., 130 mA max. at 25 °C, derating 1 mA/°C above 25 °C, 5 kV insulation
Mechanical characteristics		
Weight		0.3 kg
IP degree of protection		IP52 (front display)
Dimensions		72 x 90 x 66 (mm)
Connection		Tunnel terminals, 1 x 4 mm <sup>2</sup>
Environmental conditions		
Operating temperature		-5 °C to +55 °C
Pollution degree		2
Installation category		III for distribution systems up to 260/450 V
Electromagnetic compatibility	Electrostatic discharge	Level III (IEC 61000-4-2)
	Immunity to radiated fields	Level III (IEC 61000-4-3)
	Immunity to fast transients	Level IV (IEC 61000-4-4)
	Immunity to impulse waves	Level IV (IEC 61000-4-5)
	Conducted and radiated emissions	Class B (CISPR11)
Safety		
		CE
Communication		
RS485 port (PM9C) remote reading		2-wire, 9600 or 19200 bauds, Modbus RTU, ELSV circuit, 6 kV impulse withstand (double insulation)
Standards compliance		
IEC 61557-12		PMD/SD/K55/1 PMD/SS/K55/1

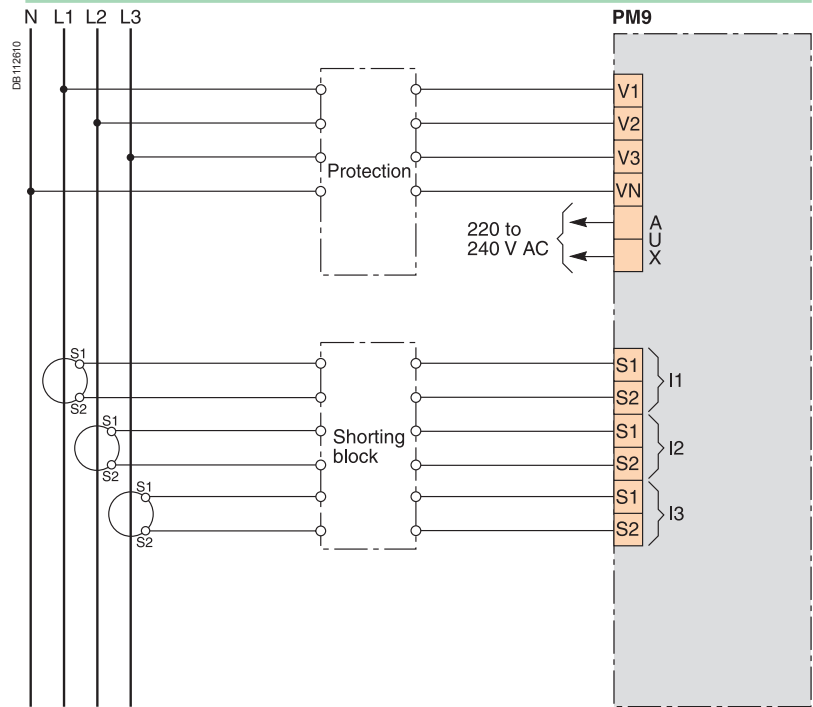
### Dimensions



# Power Meter Series PM9

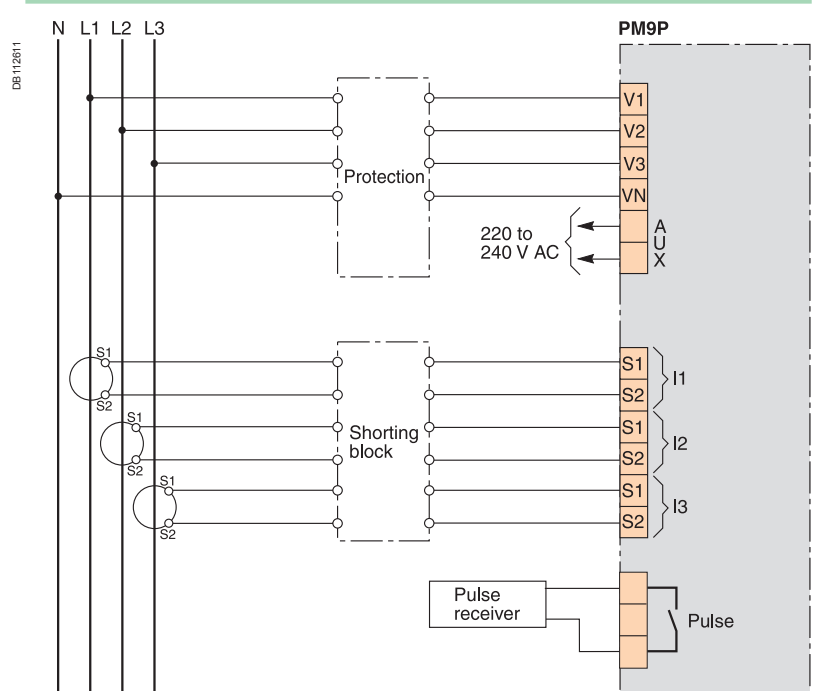
## Installation and connection (cont.)

### PM9/4-wire connection with 3 CTs



Connection example.

### PM9P/4-wire connection with 3 CTs



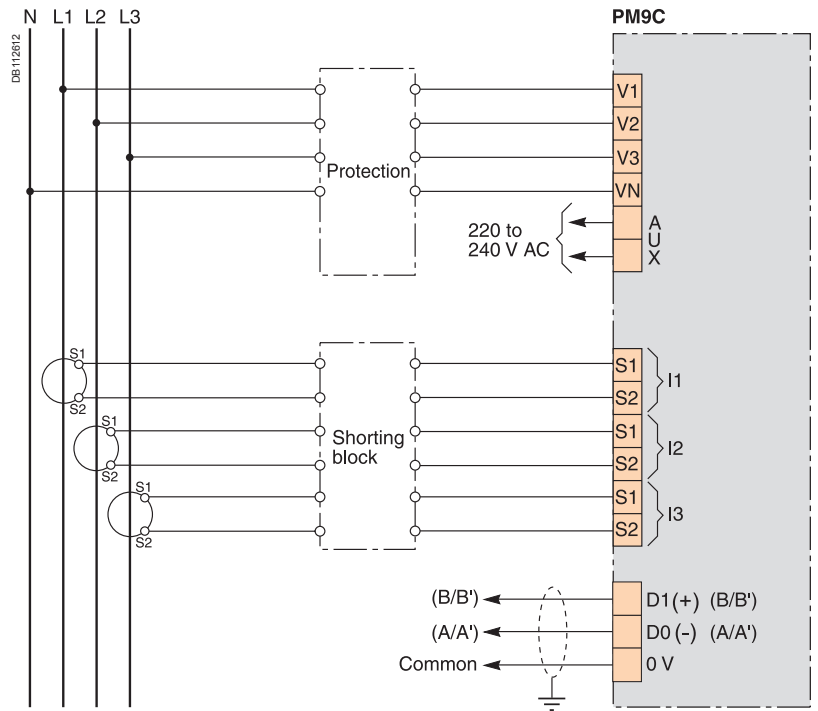
Connection example.

Note: other types of connection are possible. See product documentation.

# Power Meter Series PM9

## Installation and connection (cont.)

### PM9C/4-wire connection with 3 CTs



Connection example.

*Note: other types of connection are possible. See product documentation.*

# Power Meter Series PM200

## Functions and characteristics

PE60156



The PowerLogic PM200 series power meter is an easy-to-use, cost effective meter that offers the basic measurement capabilities required to monitor an electrical installation. The compact 96 x 96 mm meter simultaneously monitors all three phases of voltage and current. Energy and demand readings provide the information needed to measure and control energy costs.

The meter includes an easy-to-read, anti-glare, back-lit LCD display. It features an intuitive interface with context-based navigational menus. Summary screens and bar charts provide system status at a glance. The default screen displays real energy and per-phase current values. The energy summary screen displays total real, reactive, and apparent energy. The power demand summary screen displays real, reactive, and apparent demand. The current demand summary screen provides the per-phase and peak values needed to understand circuit performance and loading.

The PowerLogic PM200 series power meter is available in three versions:

- PM200, basic version
- PM200P, basic version plus two pulse outputs for energy metering
- PM210, basic version plus an RS485 port for Modbus communication.

### Applications

- OEM applications.
- Panel instrumentation.
- Applications with space restrictions.
- Remote monitoring of an electrical installation.
- Sub-billing / cost allocation / utility billing verification.
- Cost constrained applications.

### Characteristics

#### Compact

With a mounting depth of only 50 mm, the PM200 series is the perfect space saver.

#### Large, easy-to-read display

Summary screens for current, voltage, energy and demand on an anti-glare, green back-light display.

#### Bar charts

Graphical representation of system loading and Outputs (PM200P) provide system status at a glance.

#### Easy to operate

Intuitive navigation with context-based menus for easy use.

#### Modbus communications and digital outputs

The PM210 provides standard Modbus communications. The PM200P provides two integrated digital outputs.

#### IEC 62053-21 Class 1 for real energy

Accurate measurement for sub-billing and cost allocation.

#### IEC 61557-12 performance standards

Meets IEC 61557-12 PMD/S-/K55/1 requirements for combined Performance Measuring and monitoring Devices (PMD).

#### Direct connection for metering voltage inputs

No external PTs needed for voltages up to 480 V AC (L-L).

#### Easy to install

Uses only two clips. No tools needed.

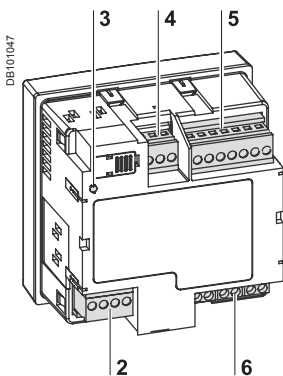
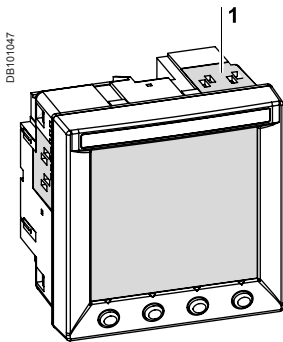
### Part numbers

Description	Schneider Electric
<b>Power Meter with Integrated Display</b>	
Power Meter PM200 with basic readings, demand, and summary screens	<b>PM200MG</b>
Same as PM200 plus two digital outputs	<b>PM200PMG</b>
Same as PM200 plus an RS485 communication port	<b>PM210MG</b>
<b>Parts and accessories</b>	
DIN-rail Mounting Kit	<b>PM72DINRAILKIT</b>
Set of connectors	<b>PM7AND2HWKIT</b>



# Power Meter Series PM200

## Functions and characteristics (cont.)



PM200 series power meter.

- 1 Mounting slots.
- 2 RS485 communications (PM210) or 2 pulse outputs (PM200P).
- 3 Heartbeat LED.
- 4 Power supply.
- 5 Voltage inputs.
- 6 Current inputs.

Meter selection guide		PM200	PM200P	PM210
<b>General</b>				
Use from LV to HV power systems		■	■	■
Current and voltage accuracy		0.5 %	0.5 %	0.5 %
Active and reactive power accuracy		1 %	1 %	1 %
Active energy accuracy		1 %	1 %	1 %
Reactive energy accuracy		2 %	2 %	2 %
Sampling rate (samples/cycle)		32	32	32
<b>Instantaneous rms values</b>				
Current	Per-phase	■	■	■
Voltage	Ph-Ph and Ph-N	■	■	■
Frequency		■	■	■
Active and reactive power ; and apparent power		signed <sup>(1)</sup>	signed <sup>(1)</sup>	signed <sup>(1)</sup>
Power factor	Total	signed <sup>(2)</sup>	signed <sup>(2)</sup>	signed <sup>(2)</sup>
<b>Energy values</b>				
Active, reactive, apparent energy	Total	signed <sup>(1)</sup>	signed <sup>(1)</sup>	signed <sup>(1)</sup>
<b>Demand values</b>				
Current (thermal calculation mode only)	Present and max. values	■	■	■
Active, reactive, apparent power	Present and max. values	■	■	■
Setting of power demand calculation mode	Sliding, fixed, rolling block	■	■	■
<b>Inputs and outputs</b>				
Digital pulse output		-	2 <sup>(3)</sup>	-
<b>Display and outputs</b>				
Green backlit LCD display		■	■	■
IEC or IEEE menu mode		■	■	■
<b>Communication</b>				
RS485 (one port)		-	-	2-wire
Modbus protocol		-	-	■

(1) Real and reactive power and energy. The power meter includes net values only.

(2) See register 4048. Negative sign "-" indicates lag. PM210 only.

(3) kWh and kVARh pulse output mode only.

# Power Meter Series PM200

## Functions and characteristics (cont.)

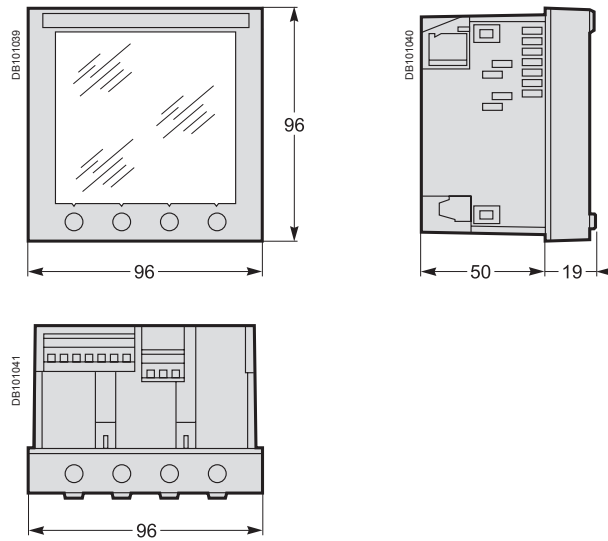


Rear view of PowerLogic PM200 series meter.

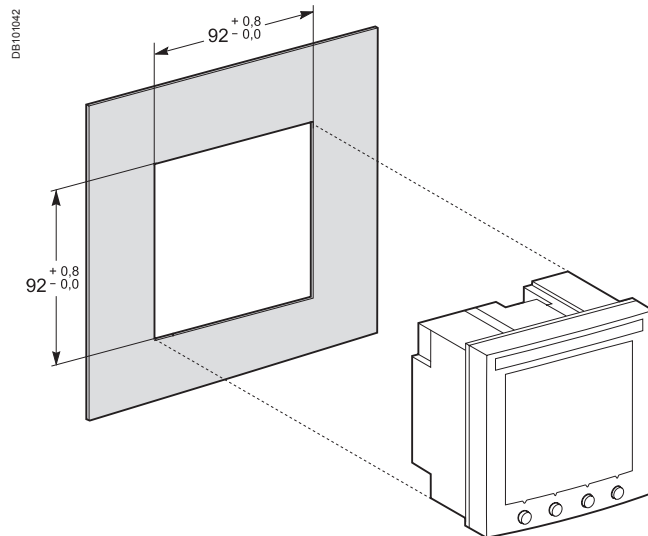
Electrical characteristics		
Type of measurement	True rms up to the 15 <sup>th</sup> harmonic on single, two or three-phase (3P, 3P + N) AC systems 32 samples per cycle	
Measurement accuracy	Current	± 0.5% from 1 A to 6 A
	Voltage	± 0.5% from 50 V to 277 V
	Power factor	± 0.031, from 1A to 6A and from -0.5 to +0.5
	Power	± 1%
	Frequency	± 0.02 Hz from 45 to 65 Hz
	Active energy	IEC 62053-21 Class 1
Reactive energy	IEC 62053-23 Class 2	
Data update rate	1 s	
Input-voltage	Measured voltage	10 to 480 V AC (direct Ph-Ph) 10 to 277 V AC (direct Ph-N) 0 to 1.6 MV AC (with external VT)
	Metering over-range	1.2 Un
	Impedance	2 MΩ (Ph-Ph) / 1 MΩ (Ph-N)
	Frequency range	45 to 65 Hz
Input-current	CT ratings	Primary Adjustable from 5 A to 32767 A Secondary 5 A or 1 A starting at 10 mA
	Measurement input range	5 mA to 6 A
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 120 A for 1 second per hour
	Impedance	< 0.12 Ω
Control power	AC	100 to 415 ± 10 % V AC, 5 VA; 50 to 60 Hz
	DC	125 to 250 ± 20 % V DC, 3 W
	Ride-through time	100 ms at 120 V AC
Output	Pulse outputs (PM200P)	Static output 240 ± 10 % V AC, 100 mA max. at 25 °C, (derate 0.56 mA per °C above 25 °C), 2.41 kV rms isolation, 30 Ω on-resistance at 100 mA
Mechanical characteristics		
Weight	0.37 kg	
IP degree of protection (IEC 60529)	Designed to IP52 front display, IP30 meter body	
Dimensions	96 x 96 x 69 mm (meter with display) 96 x 96 x 50 mm (mounting depth)	
Environmental characteristics		
Operating temperature	Meter	- 5 °C to + 60 °C
	Display	- 10 °C to + 50 °C
Storage temperature	Meter + display	- 40 °C to + 85 °C
Humidity rating	5 to 95 % RH at 50 °C (non-condensing)	
Pollution degree	2	
Metering category (voltage inputs and control power)	CAT III, for distribution systems up to 277 V Ph-N / 480 V AC Ph-Ph	
Dielectric withstand	EN 61010, UL508 Double insulated front panel display	
Altitude	3000 m	
Electromagnetic compatibility		
Electrostatic discharge	Level III (IEC 61000-4-2)	
Immunity to radiated fields	Level III (IEC 61000-4-3)	
Immunity to fast transients	Level III (IEC 61000-4-4)	
Immunity to impulsive waves	Level III (IEC 61000-4-5)	
Conducted immunity	Level III (IEC 61000-4-6)	
Immunity to magnetic fields	Level III (IEC 61000-4-8)	
Immunity to voltage dips	Level III (IEC 61000-4-11)	
Conducted and radiated emissions	C commercial environment/FCC part 15 class B EN 55011	
Harmonics	IEC 61000-3-2	
Flicker emissions	IEC 61000-3-3	
Safety		
Europe	CE as per IEC 61010-1	
U.S. and Canada	UL508	
Communication		
RS485 port (PM210)	2-wire, up to 19200 bauds, Modbus RTU, SELV circuit, 6 kV impulse (double insulation)	
Display characteristics		
Dimensions 73 x 69 mm	Back-lit green LCD (6 lines total, 4 concurrent values)	

(1) Lower limit of measurement range depends upon PT ratio.

### Dimensions



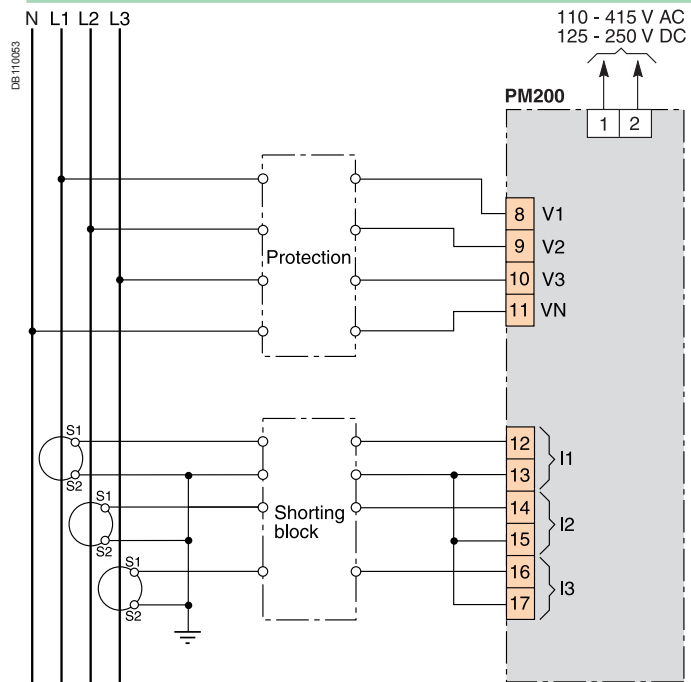
### Front-panel mounting



# Power Meter Series 200

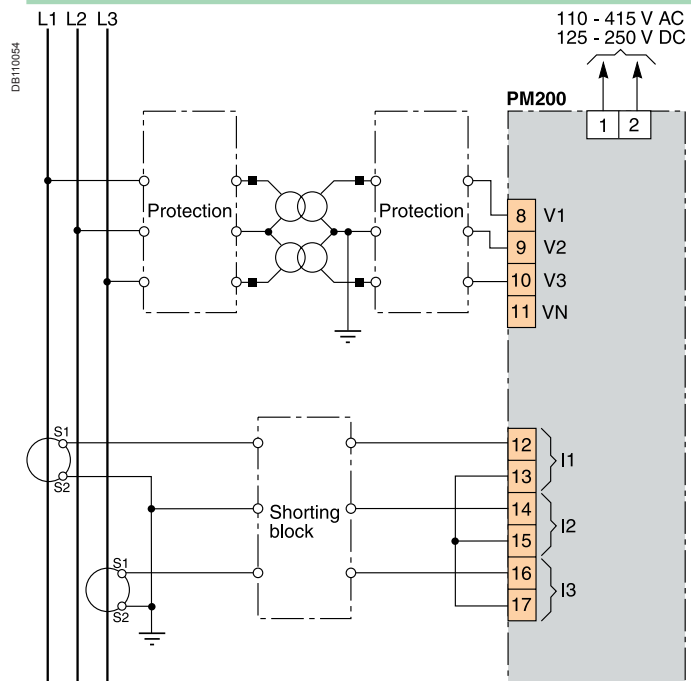
## Installation and connection (cont.)

### 4-wire connection with 3 CTs and no PT



Connection example.

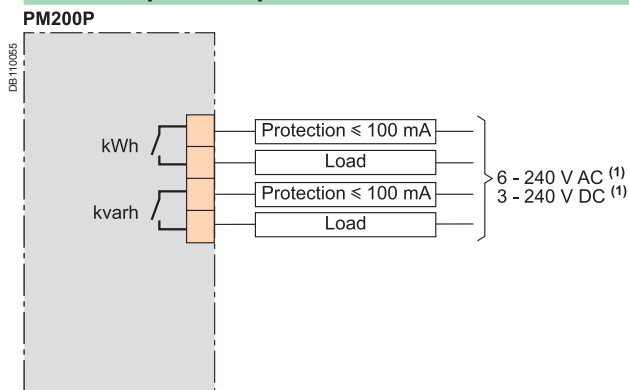
### 3-wire connection with 2 CTs and 2 PTs



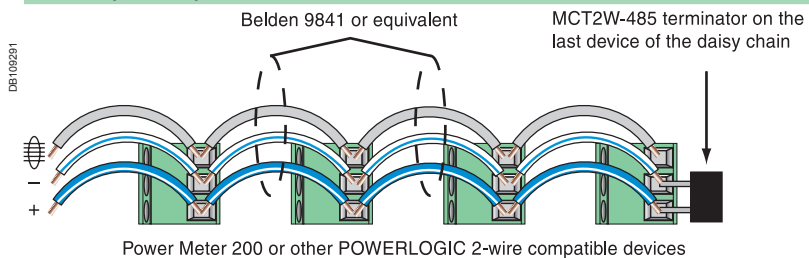
Connection example.

Note: Other types of connection are possible. See product documentation.

### PM200P : pulse outputs connection



### Meter (2-wire)



Belden 9841 wire colors: blue with white stripe (+), white with blue stripe (-), and silver (shield)

# Power Meter Series PM700

## Functions and characteristics

PE66157



PowerLogic PM700.

The PowerLogic PM700 series power meter offers all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit extending only 50 mm behind the mounting surface.

With its large display, you can monitor all three phases and neutral at the same time. The anti-glare display features large 11 mm high characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles.

The PowerLogic PM700 series meters are available in four versions:

- PM700, basic metering with THD and min/max readings
- PM700P, same functions as the PM700, plus two solid-state pulse outputs for energy metering
- PM710, same functions as the PM700, plus one RS 485 port for Modbus communication
- PM750, same functions as the PM710, plus two digital inputs, one digital output and alarms.

### Applications

Panel instrumentation.  
Sub-billing and cost allocation.  
Remote monitoring of an electrical installation.  
Harmonic monitoring (THD).  
Alarming with under/over conditions and I/O status (PM750).

### Characteristics

#### Requires only 50 mm behind mounting surface

The Power Meter Series 700 can be mounted on switchboard doors to maximise free space for electrical devices.

#### Large back lit display with integrated bar charts

Displays 4 measurements at a time for fast readings.

#### Intuitive use

Easy navigation using context-sensitive menus.

#### Power and current demand, THD and min/max reading in basic version

A high-performance solution for trouble-free monitoring of your electrical installation.

#### Active energy class IEC 62053-22 class 0.5S (PM750) and IEC 62053-21 class 1 (PM700, PM700P, PM710)

Suitable for sub-billing and cost-allocation applications.

#### Performance measuring and monitoring devices

Meet IEC 61557-12 PMD/S-/K55/0.5 (PM750) and IEC 61557-12 PMD/S-/K55/1 (PM700, PM700P, PM710) that specifies requirements for combined Performance Measuring and monitoring Devices (PMD).

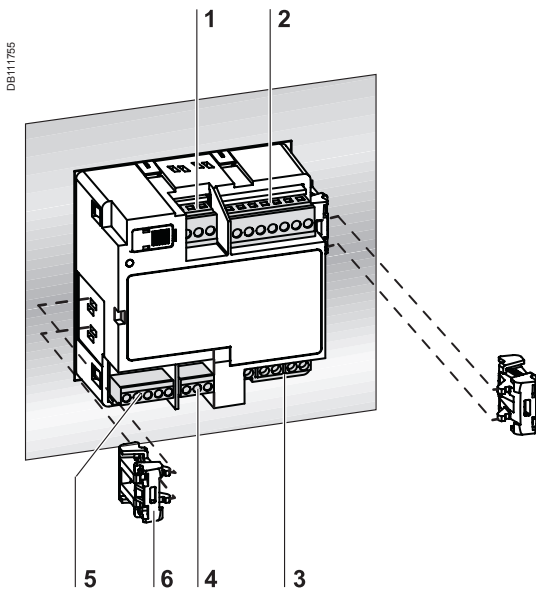
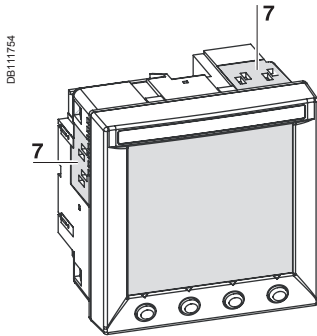
#### Innovative Power Meter

RS 485 communications, alarming and digital I/O in a single Power Meter (PM750).

Part numbers	
Power Meter	Schneider Electric brand
PM700 Power Meter - with basic readings including THD and Min/Max	<b>PM700MG</b>
PM700P Power Meter - same as PM700 plus two pulse outputs	<b>PM700PMG</b>
PM710 Power Meter - same as PM700 plus RS 485 port	<b>PM710MG</b>
PM750 Power Meter - same as PM700 plus RS 485 port, 2 Digital inputs and 1 Digital output, and alarms	<b>PM750MG</b>
Parts and accessories	
DIN-rail Mounting Kit	<b>PM72DINRAILKIT</b>
Set of connectors replacement (PM700, PM700P, PM710)	<b>PM7AND2HWKIT</b>
Set of connectors replacement (PM750 only)	<b>PM750HWKIT</b>

# Power Meter Series PM700

## Functions and characteristics (cont.)



- Power Meter 750.**
- 1 Control power.
  - 2 Voltage inputs.
  - 3 Current inputs.
  - 4 RS 485 port.
  - 5 Digital input/output.
  - 6 Mounting clips.
  - 7 Mounting slot.

Selection guide		PM700	PM700P	PM710	PM750
<b>General</b>					
Use on LV and HV systems		■	■	■	■
Current accuracy		0.5 %	0.5 %	0.5 %	0.4 %
Voltage accuracy		0.5 %	0.5 %	0.5 %	0.3 %
Active energy accuracy		1.0 %	1.0 %	1.0 %	0.5 %
Active and reactive power accuracy		1.0 %	1.0 %	1.0 %	0.5 %
Reactive energy accuracy		2 %	2 %	2 %	2 %
Sampling rate (samples/cycle)		32	32	32	32
<b>Instantaneous rms values</b>					
Current	Total, Phases and neutral	■	■	■	■
Voltage	Total, Ph-Ph and Ph-N	■	■	■	■
Frequency		■	■	■	■
Real and reactive power; and apparent power <sup>(1)</sup>	Total and per phase	signed	signed	signed	signed
Power factor	Total	signed	signed	signed <sup>(2)</sup>	signed <sup>(2)</sup>
<b>Energy values</b>					
Active and reactive energy; and apparent energy <sup>(1)</sup>		signed	signed	signed	signed
<b>Demand values</b>					
Current	Present and max.	■	■	■	■
<small>Thermal calculation mode only</small>					
Active, reactive, apparent power	Present and max.	■	■	■	■
Setting of power demand calculation mode	Sliding, fixed and rolling block	■	■	■	■
<b>Other measurements</b>					
Hour counter		■	■	■	■
<b>Power quality measurements</b>					
Harmonic distortion	Current and voltage	■	■	■	■
<b>Data recording</b>					
Min/max of instantaneous values		■	■	■	■
Alarms		-	-	-	■ <sup>(3)</sup>
<b>Display and I/O</b>					
Backlit LCD display		■	■	■	■
Digital inputs		-	-	-	2 <sup>(4)</sup>
Digital outputs		-	2 <sup>(5)</sup>	-	1 <sup>(6)</sup>
<b>Communication</b>					
RS 485 port		-	-	■	■
Modbus protocol		-	-	■	■

(1) Real and reactive power and energy. The power meter includes net values only.

(2) See register 4048. Negative sign "-" indicates lag.

(3) 15 user-configurable under and over conditions and in combination with digital inputs or output status.

(4) 2 operation modes are available: normal or input demand synchronisation.

(5) kWh and kVARh pulse output mode only.

(6) 3 operation modes are available: external, alarm or kWh pulse output.

# Power Meter Series PM700

## Functions and characteristics (cont.)



Rear view of Power Meter Series 700 (PM750).

Electrical characteristics			
Type of measurement		True rms up to the 15th harmonic on three-phase (3P, 3P + N) two-phase and single-phase AC systems 32 samples per cycle	
Measurement accuracy	Current	± 0.5% from 1A to 6A (PM700, PM700P, PM710) ± 0.4% from 1A to 6A (PM750)	
	Voltage	± 0.5% from 50V to 277V (PM700, PM700P, PM710) ± 0.3% from 50V to 277V (PM750)	
	Power Factor	± 0.031, from 1A to 6A and from -0.5 to +0.5(1) ± 0.034, from 1A to 6A and from -0.5 to +0.5 (2)	
	Power	± 1% (PM700, PM700P, PM710) ± 0.5% (PM750)	
	Frequency	± 0.02 Hz from 45 to 65 Hz	
	Active Energy	Class 1 as defined by IEC 62053-21 (1) Class 0.5S as defined by IEC 62053-22 (2)	
	Reactive Energy	Class 2 as defined by IEC 62053-23	
Data update rate		1 s	
Input-voltage characteristics	Measured voltage	10 to 480 V AC (direct Ph-Ph) 10 to 277 V AC (direct Ph-N) up to 1.6 MV AC (with external VT) the lower limit of the measurement range depends on the PT ratio	
	Metering over-range	1.2 Un	
	Impedance	2 MΩ (Ph-Ph) / 1 MΩ (Ph-N)	
	Frequency range	45 to 65 Hz	
Input-current characteristics	CT ratings	Primary	Adjustable from 1 A to 32767 A
		Secondary	1 A or 5 A
	Measurement input range		5 mA to 6 A
	Permissible overload		15 A continuous, 50 A for 10 seconds per hour, 120 A for 1 second per hour
	Impedance		< 0.12 Ω
Power supply	AC		100 to 415 ±10 % V AC, 5 VA; 50-60 Hz
	DC		125 to 250 ±20 % V DC, 3 W
	Ride-through time		100 ms at 120 V AC
Input	Digital inputs (PM750)		12 to 36 V DC, 24 V DC nominal, 12 kΩ impedance, 2.5 kV rms isolation, max. frequency 25 Hz, response time 10 ms
Output	Pulse outputs (PM700P)		3 to 240 V DC or 6 to 240 V AC, 100 mA at 25 °C, derate 0.56 mA per °C above 25 °C, 2.41 kV rms isolation, 30 Ω on-resistance at 100 mA
	Digital or pulse output (PM750)		8 to 36 V DC, 24 V DC nominal at 25 °C, 3.0 kV rms isolation, 28 Ω on-resistance at 100 mA
Mechanical characteristics			
Weight			0.37 kg
IP degree of protection (IEC 60529)			IP52 front display, IP30 meter body
Dimensions			96 x 96 x 69 mm (meter with display)
			96 x 96 x 50 mm (behind mounting surface)
Environmental conditions			
Operating temperature	Meter		-5 °C to +60 °C
	Display		-10 °C to +50 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 50 °C (non-condensing)
Pollution degree			2
Metering category			III, for distribution systems up to 277/480 V AC
Dielectric withstand			As per EN 61010, UL508 - Double insulated front panel display
Altitude			3000 m max.
Electromagnetic compatibility			
Electrostatic discharge			Level III (IEC 61000-4-2)
Immunity to radiated fields			Level III (IEC 61000-4-3)
Immunity to fast transients			Level III (IEC 61000-4-4)
Immunity to impulse waves			Level III (IEC 61000-4-5)
Conducted immunity			Level III (IEC 61000-4-6)
Immunity to magnetic fields			Level III (IEC 61000-4-8)
Immunity to voltage dips			Level III (IEC 61000-4-11)
Conducted and radiated emissions			CE commercial environment/FCC part 15 class B EN 55011
Harmonics emissions			IEC 61000-3-2
Flicker emissions			IEC 61000-3-3

(1) PM700, PM700P, PM710.  
(2) PM750.



# Power Meter Series PM700

## Functions and characteristics (cont.)

### Safety

Europe	C $\in$ , as per IEC 61010-1 $\square$ (1)
U.S. and Canada	UL508

### Communication

RS 485 port (PM710 and PM750)	2-wire, up to 19200 bauds, Modbus RTU (double insulation)
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### Display characteristics

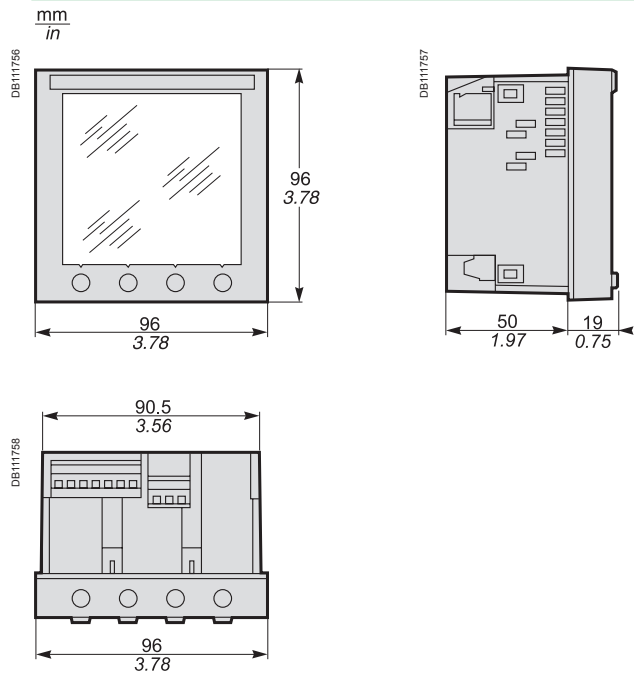
Dimensions 73 x 69 mm	Back-lit green LCD (6 lines total, 4 concurrent values)
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### Firmware characteristics

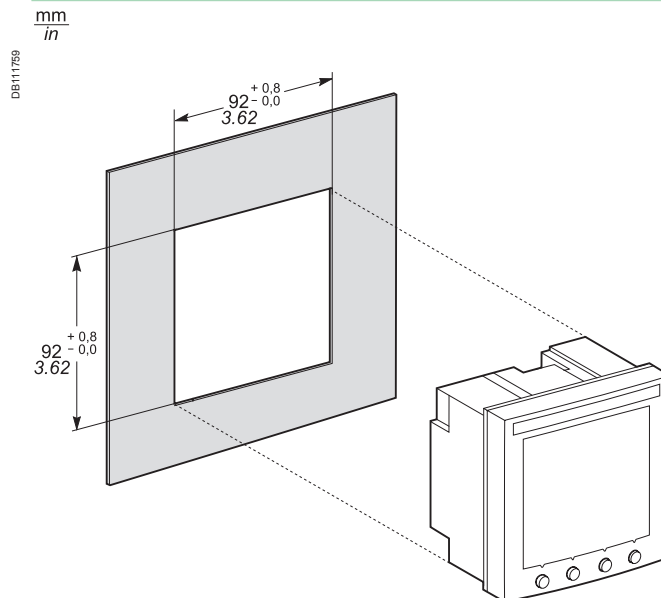
Min./max.	Worst min. and max. with phase indication for voltages, currents and THD. Min. and max. values for power factor, power (P, Q, S) and frequency
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(1) Protected throughout by double insulation .

### Dimensions



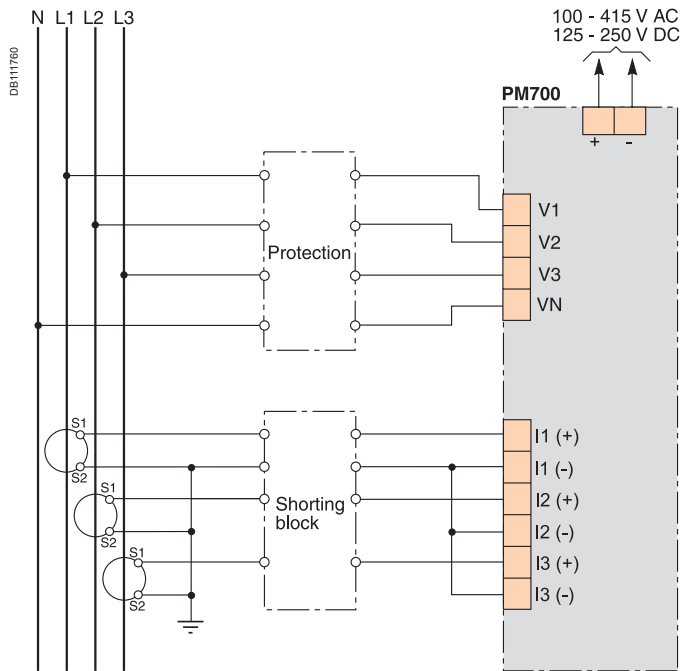
### Front-panel mounting



# Power Meter Series 700

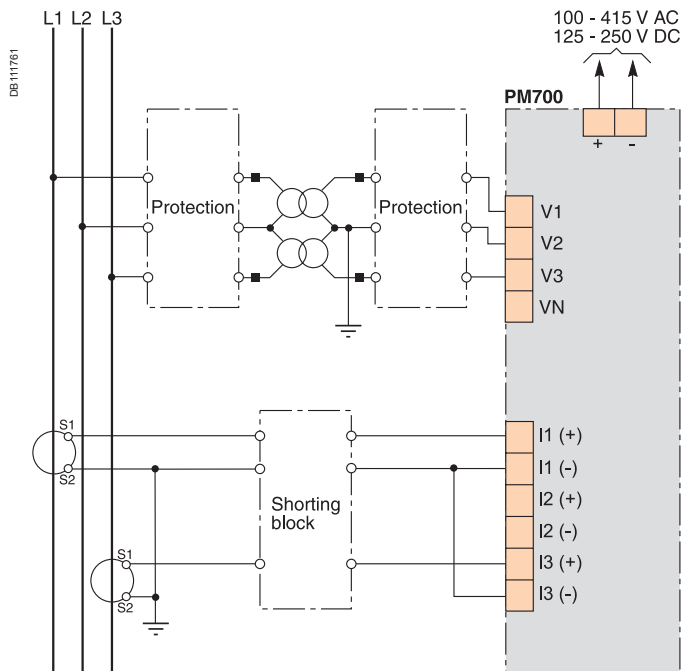
## Installation and connection (cont.)

### 4-wire connection with 3 CTs and no PT



Connection example.

### 3-wire connection with 2 CTs and 2 PTs



Connection example.

**Note:** other types of connection are possible. See product documentation.

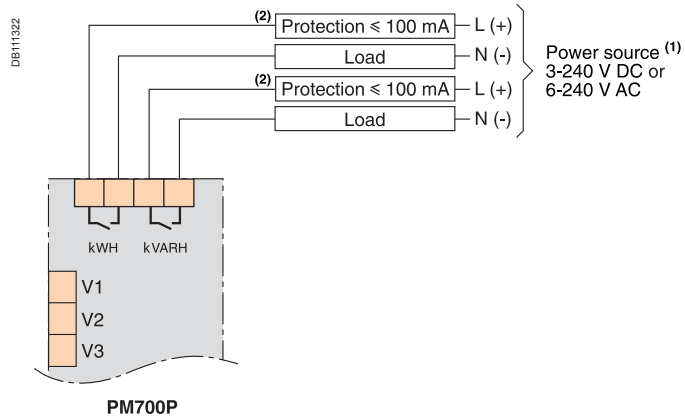
# Power Meter Series 700

## Installation and connection (cont.)

### PM700P pulse output capabilities

There are two solid-state KY outputs. One is dedicated to kWh and the other to kVARh.

**Pulse Output:** KY is a solid state pulse output rated for 240 V AC/DC max.

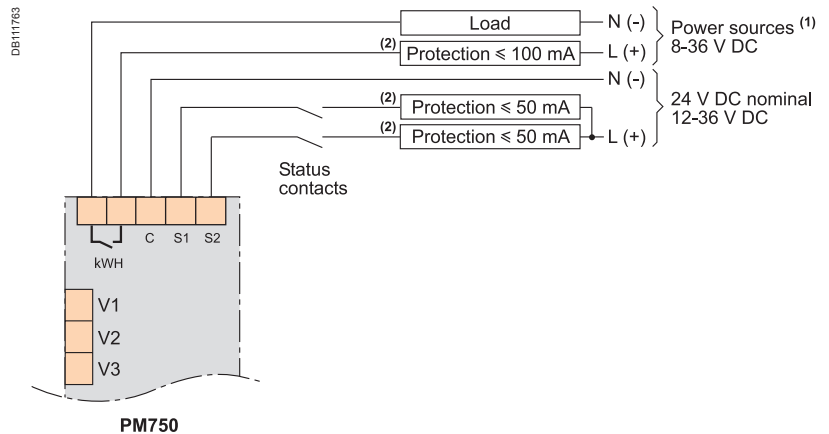


- (1) The power source should not be a safety extra low voltage (SELV) circuit. Pulse outputs are not SELV rated.
- (2) Overcurrent protective device (not supplied). This device must be rated for short circuits at the connection point.

### PM750 input/output capabilities

The PM750 has two digital inputs and one digital output. The digital inputs have two operating modes: Normal and Demand Sync.

The digital output has three operating modes: External Control (default), Alarm and kWh Pulse mode. When configured in Alarm mode, the digital output can be controlled by the meter in response to an alarm condition.

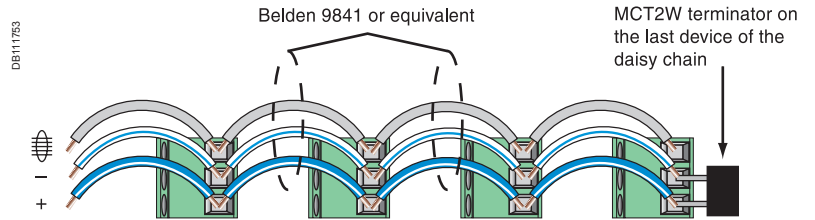


- (1) The power source should not be a safety extra low voltage (SELV) circuit. Pulse outputs are not SELV rated.
- (2) Overcurrent protective device (not supplied). This device must be rated for short circuits at the connection point.

# Power Meter Series 700

## Installation and connection (cont.)

### Communications (PM710 and PM750) 2-wire daisy-chain connection of devices (RS 485)



*Belden 9841 wire colors: blue with white stripe (+), white with blue stripe (-), and silver (shield).*

# Power Meter Series 800

## Functions and characteristics

PE86194



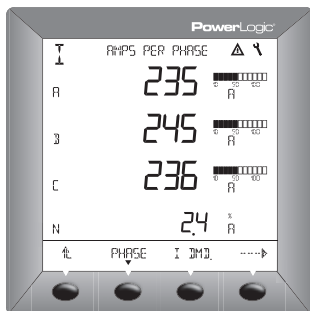
Front view of Power Meter Series 800 meter with integrated display.

PE101823-50



Rear view of Power Meter Series 800 meter.

DE11799



Power Meter PM800 Series meter display screen showing bar graphs.

The PowerLogic Power Meter Series 800 offers many high-performance capabilities needed to meter and monitor an electrical installation in a compact 96 x 96 mm unit. All models include an easy-to-read display that presents measurements for all three phases and neutral at the same time, an RS-485 Modbus communication port, one digital input, one KY-type digital output, total harmonic distortion (THD) metering, and alarming on critical conditions. Four models offer an incremental choice of custom logging and power quality analysis capabilities. Expand any model with field-installable option modules that offer a choice of additional digital inputs and outputs, analog inputs and outputs, and Ethernet port.

### Applications

- Panel instrumentation
- Sub-billing, cost allocation and energy management
- Remote monitoring of an electrical installation
- Power quality analysis
- Utility bill verification, utility contract optimization and load preservation.

### Characteristics

#### Easy to install

Mounts using two clips, with no tools required. Direct connect the voltage inputs, with no need for potential transformers (PTs) up to 600 VAC.

#### Easy to operate

Intuitive navigation with self-guided, language-selectable menus.

#### System status at a glance

Large, anti-glare display with back-light provides summary screens with multiple values. Bar charts graphically represent system loading and I/O.

#### Custom alarming with time stamping

Over 50 alarm conditions, including over or under conditions, digital input changes, phase unbalance and more. The models PM850 and PM870 offer boolean logic that can be used to combine up to four alarms.

#### Power quality analysis

The PM800 series offers an incremental range of features for troubleshooting and preventing power quality related problems. All models offer THD metering. The PM810 with PM810LOG option and PM820 offer individual current and voltage harmonics readings. The PM850 and PM870 offer waveform capture (PM870 is configurable) and power quality compliance evaluation to the international EN50160 standard. The PM870 offers voltage and current disturbance (sag/swell) detection.

#### Extensive on-board memory

All models offer billing (energy and demand), maintenance, alarm and customizable data logs, all stored in non-volatile memory (PM810 requires PM810LOG option).

#### IEC 62053-22 class 0.5S accuracy for active energy

Accurate energy measurement for sub-billing and cost allocation.

#### IEC 61557-12 performance standard

Meets IEC 61557-12 PMD/S-/K70/0.5 requirements for combined Performance Measuring and monitoring Devices (PMD).

#### Trend curves and short-term forecasting

The models PM850 and PM870 offer trend logging and forecasting of energy and demand readings to help compare load characteristics and manage energy costs.

#### Expandable I/O capabilities

Use the on-board or optional digital inputs for pulse counting, status/position monitoring, demand synchronization or control (gating) of the conditional energy metering. Use the on-board or optional digital outputs for equipment control or interfacing, controllable by internal alarms or externally through digital input status. Use the optional analog inputs and outputs for equipment monitoring or interfacing.

#### Metering of other utilities (WAGES)

All models offer five channels for demand metering of water, air, gas, electricity or steam utilities (WAGES) through the pulse counting capabilities of the digital inputs. Pulses from multiple inputs can be summed through a single channel.

#### Modular and upgradeable

All models offer easy-to-install option modules (memory, I/O and communications) and downloadable firmware for enhanced meter capabilities.

#### Remote display

The optional remote display can be mounted as far as 10 m from the metering unit. The adapter includes an additional 2- or 4-wire RS-485/RS-232 communication port.

# Power Meter Series 800

## Functions and characteristics (cont.)

PE8101814-36



Power Meter Series 800 without display.

PE86134



Power Meter Series 800 with integrated display.

PE8101822-48



Power Meter Series 800 with remote display.

PE86135



Remote display adapter with display and cable.

PE8101819-32



Remote display adaptor alone.

### Part Numbers

#### Description

##### Power Meter without display

Use the base meter unit without display to comply with voltage limitations for local regulations when door mounting is not possible, or when meter voltage exceeds regulations, or when local display is not required. When the meter is used without a display, configuration of the communications port is limited to the default (address 1, 9600 baud, parity even). Requires software to read data.

<b>PM810 power meter</b> unit only, no display, basic instrumentation, THD, alarming, 80 kB logging (with PM810LOG)	<b>PM810UMG</b>
<b>PM820 power meter</b> unit only, no display, basic instrumentation, THD, alarming, 80 kB logging	<b>PM820UMG</b>
<b>PM850 power meter</b> unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, waveform capture	<b>PM850UMG</b>
<b>PM870 power meter</b> unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, configurable waveform capture and disturbance detection	<b>PM870UMG</b>

##### Power Meter with integrated display

Use the meter with integrated display for panel mounting when door space is available and when voltage usage is within the local regulation limits.

<b>PM810 power meter</b> with integrated display,	<b>PM810MG</b>
<b>PM820 power meter</b> with integrated display	<b>PM820MG</b>
<b>PM850 power meter</b> with integrated display	<b>PM850MG</b>
<b>PM870 power meter</b> with integrated display	<b>PM870MG</b>

##### Power Meter with remote display

Conveniently packaged kit consist of a base meter (810, 820, 850 or 870) with a remote display, remote display adapter, and remote display cable 3 m (9.ft 10 inches).

<b>PM810 power meter</b> with remote display	<b>PM810RDMG</b>
<b>PM820 power meter</b> with remote display	<b>PM820RDMG</b>
<b>PM850 power meter</b> with remote display	<b>PM850RDMG</b>
<b>PM870 power meter</b> with remote display	<b>PM870RDMG</b>

##### Parts and accessories

<b>Remote display adapter with remote display and a 3 m (9 ft 10 inch) cable</b> Use this combination of remote display, adapter, and 3 m cable to equip a base meter unit for use with a remote display. In addition, the display can be carried from meter to meter, enabling you to purchase one display for multiple meters. Each base unit meter must be equipped with a remote display adapter (PM8RDA).	<b>PM8RDMG</b>
<b>Remote display adapter alone</b> When added to the front of the base unit (PM8xxU), the adapter brings two additional communication ports: one for the remote display and one 4-wire/2-wire RS 485/RS 232.	<b>PM8RDA</b>

Part number list continued on next page.



Power Meter PM870 with ECC module (bottom view showing connectors and configuration switches).



ECC module (front view)



ECC module (side view showing LED indicators).



PM8M26 module.



Power Meter PM800 with PM8M22 and PM8M26 modules.

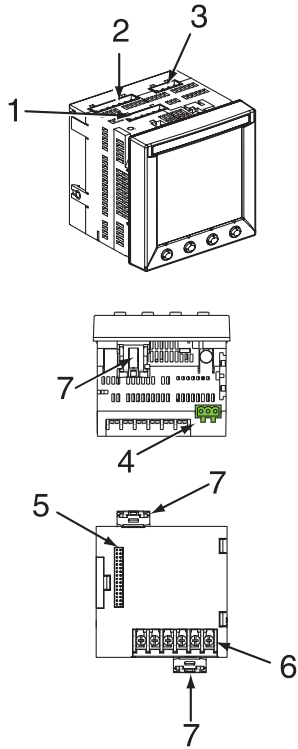
### Part Numbers - continued

Description	
<b>Optional modules</b>	
Ethernet communication module provides a 10/100BaseTx UTP port, an RS-485 Modbus serial master port, Ethernet-to-serial line gateway functionality, and an embedded web server that is fully compliant with Transparent Ready - Level 1 (TRe1) systems.	<b>PM8ECC</b>
2 digital outputs (relays), 2 digital inputs	<b>PM8M22</b>
2 digital outputs (relays), 6 digital inputs	<b>PM8M26</b>
2 digital outputs (relays), 2 digital inputs, 2 analog outputs, 2 analog inputs	<b>PM8M2222</b>
PM810 optional logging module for on-board data recording, uses a non-volatile, battery-backed internal clock	<b>PM810LOG</b>
RJ11 Extender kit to mount RJ11 jack in panel door (for use with PM800, CM3000, and CM4000 series meters)	<b>RJ11EXT</b>
Cable for remote display adapter 1.25 m (4 ft)	<b>CAB4</b>
Cable for remote display adapter 3 m (9 ft 10 inch)	<b>CAB12</b>
Cable for remote display adapter 9.14 m (30 ft)	<b>CAB30</b>



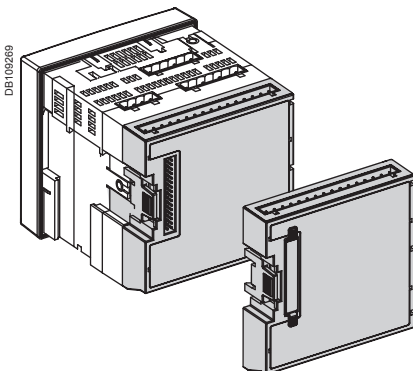
# Power Meter Series 800

## Functions and characteristics (cont.)



**Power Meter Series 800 connectors.**

1. Control power.
2. Voltage inputs.
3. Digital input/output.
4. RS 485 port.
5. Option module connector.
6. Current inputs.
7. Mounting clips.



Power Meter PM800 Series with I/O module.

Selection guide		PM810	PM820	PM850	PM870
<b>General</b>					
Use on LV and HV systems		■	■	■	■
Current and voltage accuracy		0.1 %	0.1 %	0.1 %	0.1 %
Active energy accuracy		0.5 %	0.5 %	0.5 %	0.5 %
Number of samples per cycle		128	128	128	128
<b>Instantaneous rms values</b>					
Current, voltage, frequency		■	■	■	■
Active, reactive, apparent power		Total and per phase		■	■
Power factor		Total and per phase		■	■
<b>Energy values</b>					
Active, reactive, apparent energy		■	■	■	■
Configurable accumulation mode		■	■	■	■
<b>Demand values</b>					
Current		Present and max.		■	■
Active, reactive, apparent power		Present and max.		■	■
Predicted active, reactive, apparent power		■	■	■	■
Synchronisation of the measurement window		■	■	■	■
Demand calculation mode		Block, sliding, thermal		■	■
<b>Other measurements</b>					
Hour counter		■	■	■	■
<b>Power quality measurements</b>					
Harmonic distortion		Current and voltage		■	■
Individual harmonics		Current and voltage		31 <sup>(1)</sup>	31
Waveform capture		-	-	■	■ <sup>(2)</sup>
Sag and swell detection		-	-	-	■
<b>Data recording</b>					
Min/max of instantaneous values		■	■	■	■
Data logs		2 <sup>(1)</sup>	2	4	4
Event logs		-	■	■	■
Trending / forecasting		-	-	■	■
Alarms		■	■	■	■
Time stamping		■ <sup>(1)</sup>	■	■	■
<b>Display and I/O</b>					
White backlit LCD display		■	■	■	■
Multilingual: (Other languages available)		■	■	■	■
Digital input		1	1	1	1
Digital output (KY)		1	1	1	1
Input metering capability (number of channels)		5	5	5	5
<b>Communication</b>					
RS 485 port		2-wire	2-wire	2-wire	2-wire
Modbus protocol		■	■	■	■
RS 232/RS 485, 2- or 4-wire Modbus RTU/ASCII (with addition of PM8RDA module)		■	■	■	■

(1) With PM810LOG, battery-backed internal clock and 80 kB memory. (2) Configurable.

**Option modules selection guide**

The PM800 can be fitted with 2 optional modules, unless otherwise indicated <sup>(3)</sup>

**PM8ECC module**

10/100BaseTx UTP port, RS-485 Modbus serial master port, Ethernet to serial line gateway, embedded web server

**PM8M22 module**

2 digital outputs (relays)  
2 digital inputs

**PM8M26 module**

2 digital outputs (relays)  
6 digital inputs  
This module includes a 24 V DC power supply that can be used to power the digital inputs

**PM8M2222 module**

2 digital outputs (relays)  
2 digital inputs  
2 analog outputs 4-20 mA  
2 analog inputs 0-5 V or 4-20 mA

(3) When using two PM8M2222 the temperature should not exceed 25 °C.

# Power Meter Series 800

## Functions and characteristics (cont.)

### Electrical characteristics

Type of measurement	63rd harmonic, 128 samples per cycle		
Measurement accuracy	Current	0.325 % from 1 A to 10 A	
	Voltage	0.375 % from 50 V to 277 V	
	Power Factor	0.1 % from 1 A to 10 A	
	Power	0.2 %	
	Frequency	± 0.02 % from 45 to 67 Hz	
	Active Energy	IEC 62053-22 Class 0.5S	
Reactive Energy	IEC 62053-23 Class 2		
Data update rate	1 s		
Input-voltage characteristics	Measured voltage	0 to 600 V AC (direct L-L) 0 to 347 V AC (direct L-N) up to 3.2 MV AC (with external VT)	
	Metering over-range	1.5 Un	
	Impedance	5 MΩ	
	Frequency measurement range	45 to 67 Hz and 350 to 450 Hz	
Input-current characteristics	CT ratings	Primary	Adjustable from 5 A to 32767 A
		Secondary	1 A or 5 A
	Measurement input range	5 mA to 10 A	
	Permissible overload	15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour	
	Impedance	< 0.1 Ω	
Load	< 0.15 VA		
Control Power	AC	115 to 415 ±10 % V AC, 15 VA with options	
	DC	125 to 250 ±20 % V DC, 10 W with options	
	Ride-through time	45 ms at 120 V AC	
Onboard input/output	Digital output (KY)	6 to 220 ±10 % V AC or 3 to 250 ±10 % V DC, 100 mA max. at 25 °C, 1350 V rms isolation	
	Digital input	20 to 150 V AC/DC (±10 %) < 5 mA max. burden	

### Options

PM8M22	Digital outputs (relay)	6 to 240 V AC or 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour	
	Digital inputs	19 to 30 V DC, 5 mA max. at 24 V DC	
PM8M26	Digital outputs (relay)	6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour	
	Digital inputs	20 to 150 V AC/DC, 2 mA max.	
	24 V internal supply	20 - 34 V DC, 10 mA max. (feeds 6 digital inputs)	
PM8M2222	Digital outputs (relay)	6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour	
	Digital inputs	20 to 150 V AC/DC, 2 mA max.	
	Analog outputs	4 to 20 mA dc into 600 ohms maximum	
	Analog inputs	Adjustable from 0 to 5 V DC or 4-20 mA	
Switching frequency	PM8M22	Input/output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
	PM8M26 and PM8M2222	Input	25 Hz, 50 % duty cycle (20 ms ON/OFF)
		Output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
Mechanical endurance (digital outputs)	15 million operations		
Electrical endurance (digital outputs)	250000 commutations at 2 A / 250 V AC		

### Mechanical characteristics

Weight (meter with integrated display)	0.6 kg		
IP degree of protection (IEC 60529)	IP52 front display, IP30 meter body		
Dimensions	Without options	96 x 96 x 70 mm (mounting surface)	
	With 1 option	96 x 96 x 90 mm (mounting surface)	

### Environmental conditions

Operating temperature	Meter	-25 °C to +70 °C <sup>(1)</sup>	
	Display	-10 °C to +50 °C	
Storage temp.	Meter + display	-40 °C to +85 °C	
Humidity rating	5 to 95 % RH at 40 °C (non-condensing)		
Pollution degree	2		
Installation category	III, for distribution systems up to 347 V L-N / 600 V AC L-L		
Dielectric withstand	As per EN 61010, UL508		
Altitude	3000 m max.		

**(1) 65 °C if control power is above 305 V AC.**

# Power Meter Series 800

## Functions and characteristics (cont.)

### Electromagnetic compatibility

Electrostatic discharge	Level III (IEC 61000-4-2)
Immunity to radiated fields	Level III (IEC 61000-4-3)
Immunity to fast transients	Level III (IEC 61000-4-4)
Immunity to impulse waves	Level III (IEC 61000-4-5)
Conducted immunity	Level III (IEC 61000-4-6)
Immunity to magnetic fields	Level III (IEC 61000-4-8)
Immunity to voltage dips	Level III (IEC 61000-4-11)
Conducted and radiated emissions	C $\epsilon$ industrial environment/FCC part 15 class A EN 55011
Harmonics emissions	IEC 61000-3-2
Flicker emissions	IEC 61000-3-3

### Safety

Europe	C $\epsilon$ , as per IEC 61010-1 <sup>(1)</sup>
U.S. and Canada	UL508

### Onboard communications

RS 485 port	2-wire, up to 38400 baud, Modbus
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### Model-dependent characteristics

Data Logs	PM810 with PM810LOG, PM820, PM850 and PM870: - 1 billing log - 1 customizable log PM850 and PM870 only: 2 additional custom logs
Min./max.	Worst min. and max. with phase indication for Voltages, Currents, Voltage unbalance, and THD. Min. and max. values for power factor (True and Displacement), power (P, Q, S) and frequency
One event log	Time stamping to 1 second
Trend curves (PM850 and PM870 only)	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve
Hour counter	Load running time in days, hours and minutes
Energy per interval	Up to three user-defined intervals per day Available for all models (the PM810 requires the PM810LOG module)
Forecasting (PM850 and PM870 only)	Forecasting of the values for the trended parameters for the next four hours and next four days
PM850 waveform capture	Triggered manually or by alarm, 3-cycle, 128 samples/cycle on 6 user configurable channels
PM870 enhanced waveform capture	From 185 cycles on 1 channel at 16 samples per cycle up to 3 cycles on 6 channels at 128 samples per cycle
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm Historical and active alarm screens with time stamping Response time: 1 second Boolean combination of four alarms is possible using the operators NAND, OR, NOR and XOR on PM850 and PM870 Digital alarms: status change of digital inputs
Memory available for logging and waveform capture <sup>(2)</sup>	80 kbytes in PM810 with PM810LOG and PM820 800 kbytes in PM850 and PM870
Firmware update	Update via the communication ports File download available free from powerlogic.com website
Bar graphs	Graphical representation of system performance

### Display characteristics

Languages	Contact Schneider Electric representative for additional languages	
Display screen	Back-lit white LCD (6 lines total, 4 concurrent values)	
Dimensions	Display screen viewable area	73 x 69 mm
	Integrated display Overall	96 x 96 mm
		Depth meter + display
Weight	Remote display Overall	96 x 96 x 40 mm
	Meter with remote display adapter	0.81 kg
	Remote display	0.23 kg

(1) Protected throughout by double insulation.

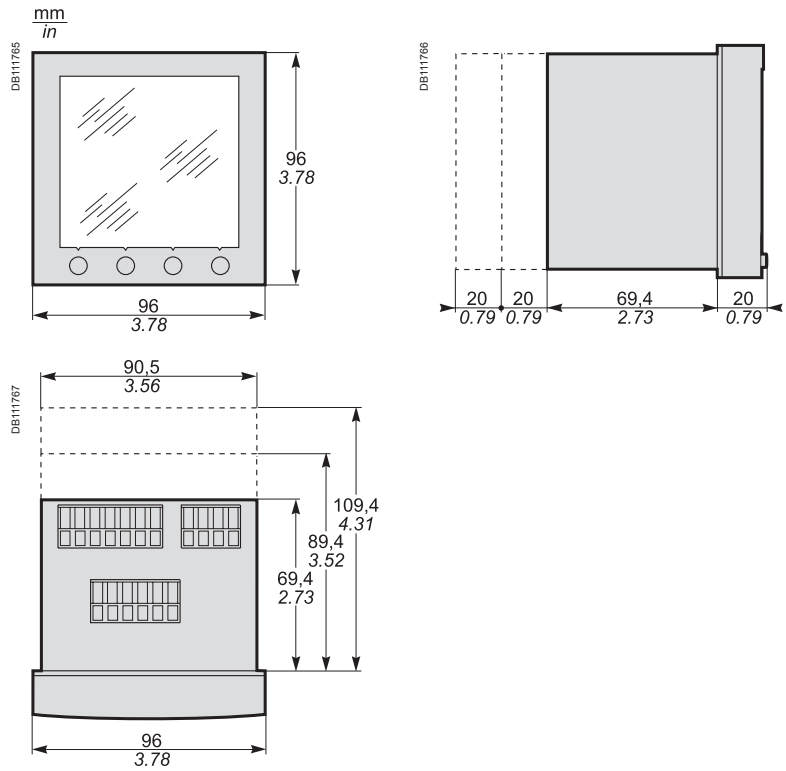
(2) Waveform capture with PM850 and PM870 only.

# Power Meter Series 800

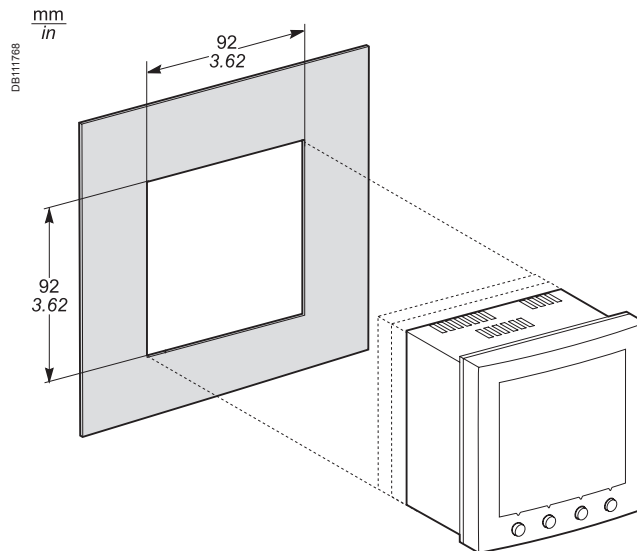
## Installation and connection

### Power meter with integrated display

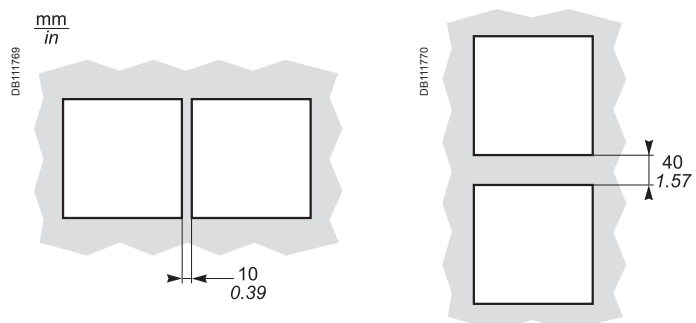
#### Dimensions



### Front-panel mounting (meter with integrated display)



### Spacing between units

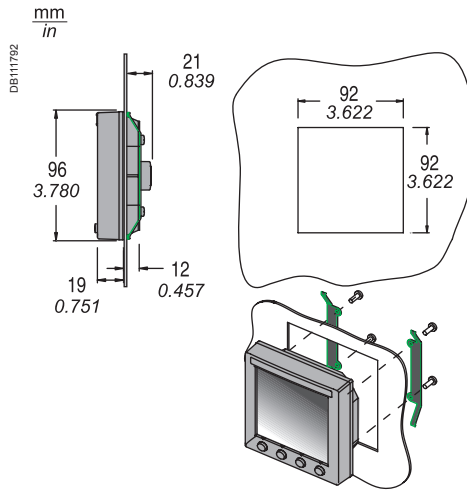


# Power Meter Series 800

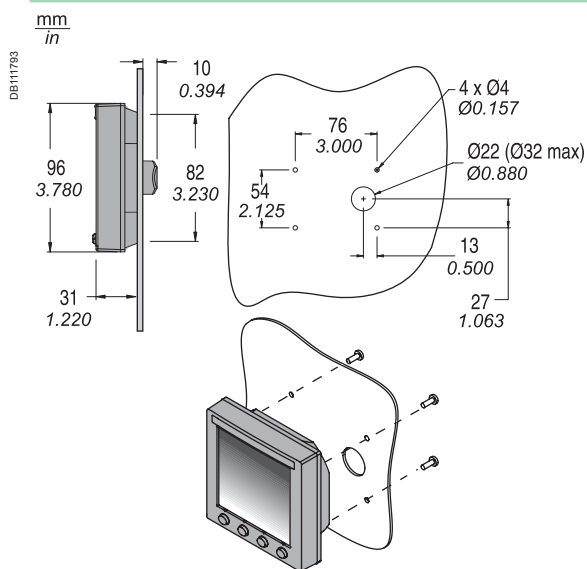
## Installation and connection (cont.)

### Remote display door mounting

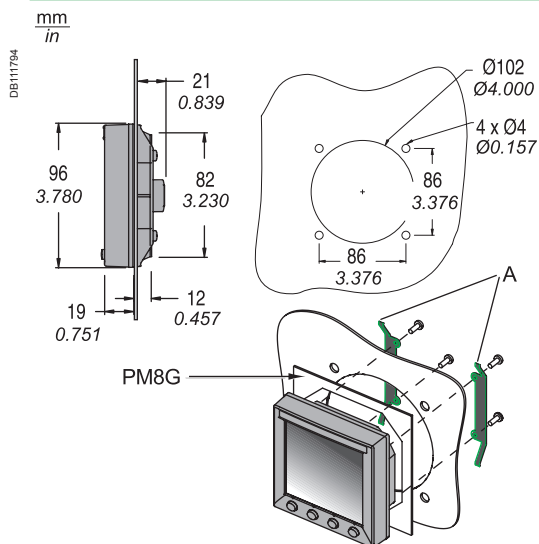
#### Flush mounting



#### Surface mount



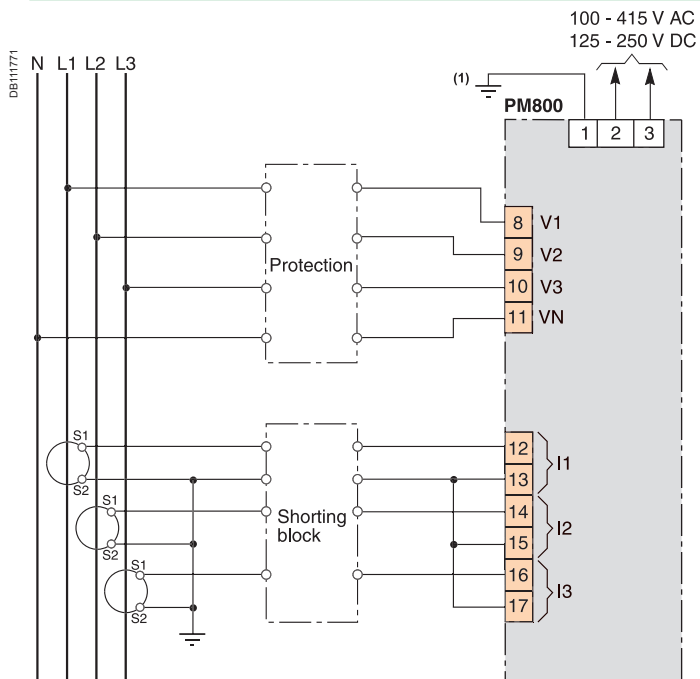
#### Mounting in a Ø102 cutout (replace analogue device: ammeter, voltmeter, etc.)



# Power Meter Series 800

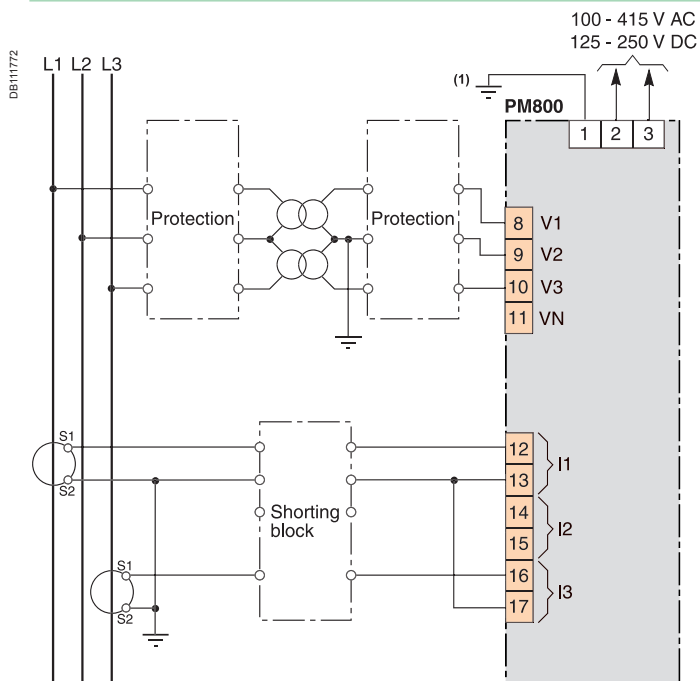
## Installation and connection (cont.)

### 4-wire connection with 3 CTs and no PT



Connection example.

### 3-wire connection with 2 CTs and 2 PTs



Connection example.

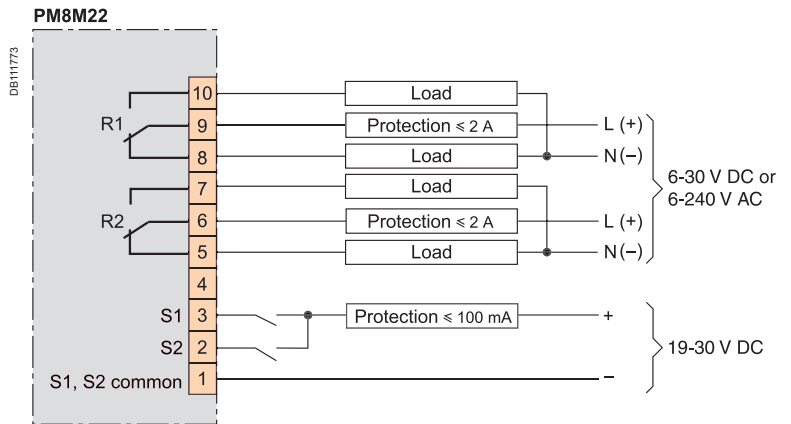
(1) Functional earth terminal.

**Note:** other types of connection are possible. See product documentation.

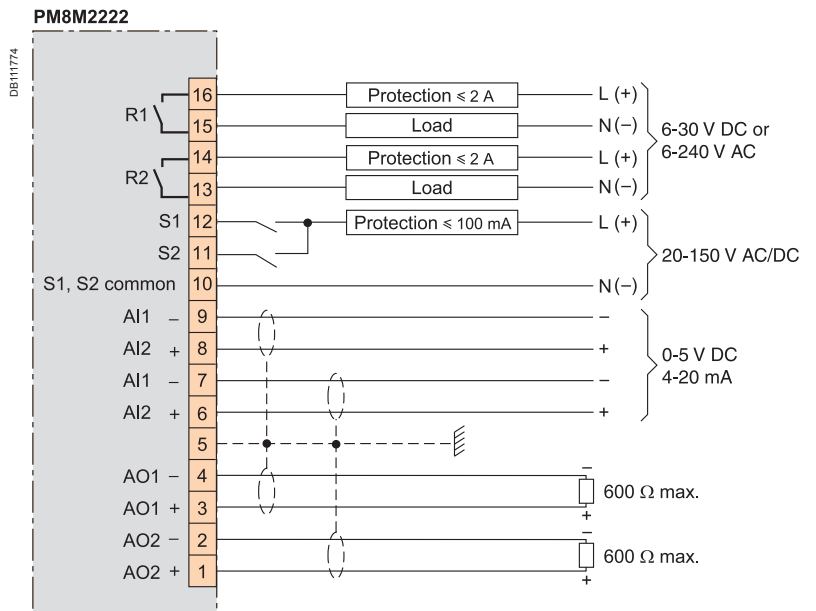
# Power Meter Series 800

## Installation and connection (cont.)

### PM8M22 module



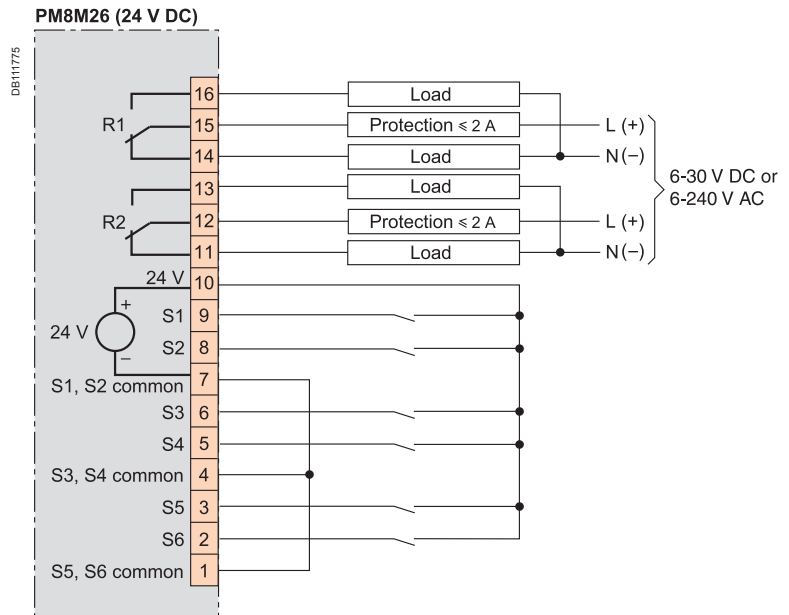
### PM8M2222 module



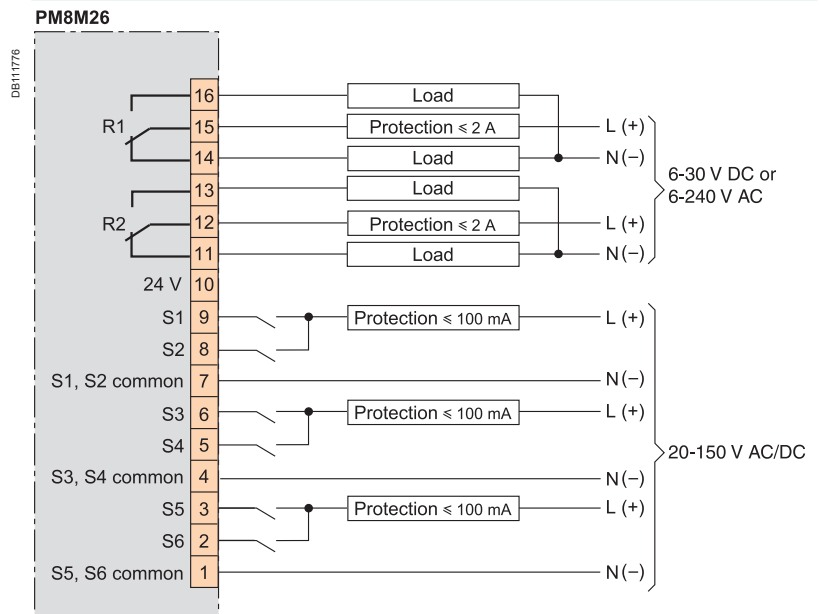
# Power Meter Series 800

## Installation and connection (cont.)

### PM8M26 module internal 24 V DC power supply



### PM8M26 module external power supply

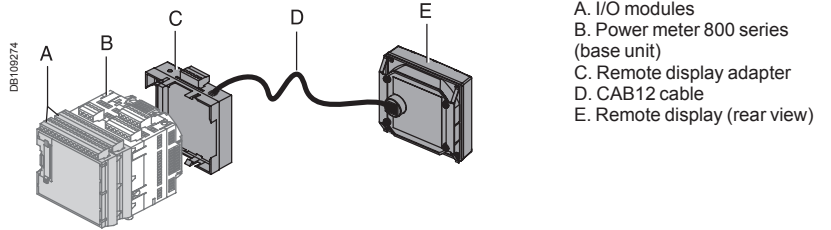




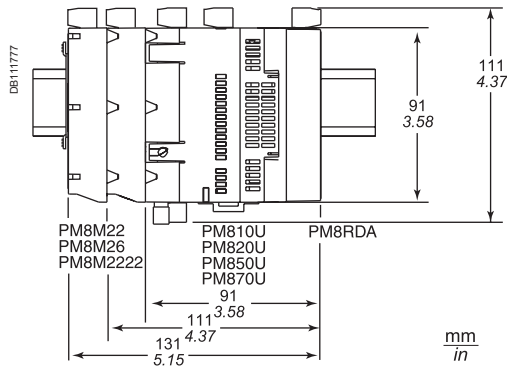
# Power Meter Series 800

## Installation and connection (cont.)

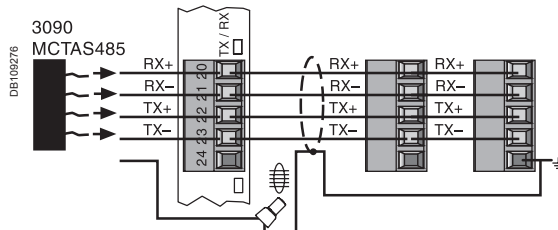
### Remote display kit



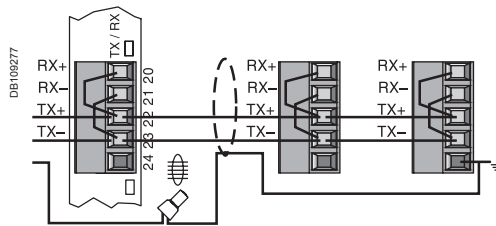
### Dimension (meter with I/O and remote display adapter)



### 4-wire connection (RS 485) of remote display adapter



### 2-wire connection (RS 485) of remote display adapter



### RS-485 wiring color codes

#### 2-wire connections

##### Belden 9841 cable:

- (+) blue, white stripe
- (-) white, blue stripe
- (shield)

#### 4-wire connections

##### Belden 9843 cable:

- (TX+) blue, white stripe
- (TX-) white, blue stripe
- (RX+) orange, white stripe
- (RX-) white, orange stripe
- (SG) green, white stripe
- (unused) white, green stripe
- (shield)

##### Belden 9842 cable:

- (TX+) blue, white stripe
- (TX-) white, blue stripe
- (RX+) orange, white stripe
- (RX-) white, orange stripe
- (shield)

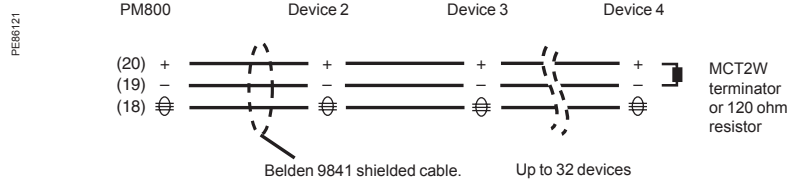
##### Belden 8723 cable:

- (TX+) green
- (TX-) white
- (RX+) red
- (RX-) black
- (shield)

### Surge protection

For surge protection, it is recommended that the PM8ECC signal ground wire be connected directly to an external earth ground at a single point.

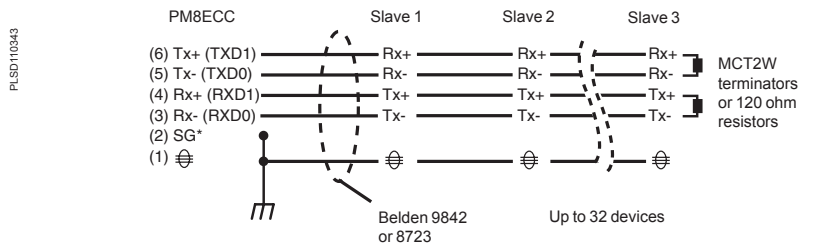
### PM800 meter unit RS-485 port 2-wire daisy-chain connection



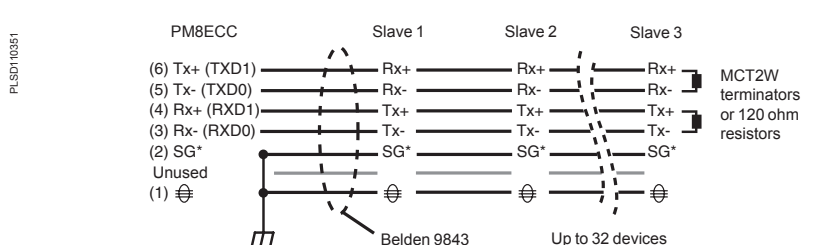
# Power Meter Series 800

## Installation and connection (cont.)

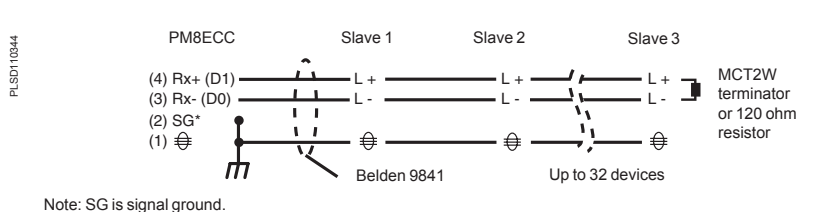
### PM8ECC module RS-485 port connections for 4-wire devices that do not support separate signal ground and shield wire



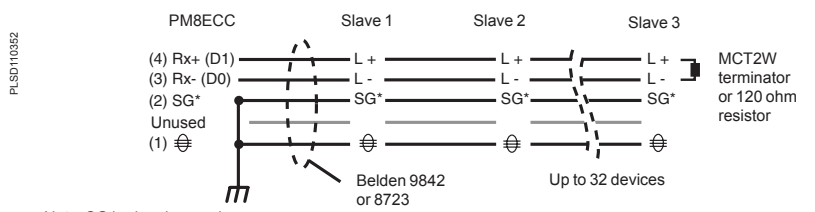
### PM8ECC module RS-485 port connections for 4-wire devices that support separate signal ground and shield wire



### PM8ECC module RS-485 port connections for 2-wire devices that do not support separate signal ground and shield wire



### PM8ECC module RS-485 port connections for 2-wire devices that support separate signal ground and shield wire



### PM8ECC module RS-485 port biasing and termination

