Kilowatt-hour meters

PB110836



iEM2000T

PB108400



iEM2000

PB108401



iEM2010

iME1_IMAGE.eps



iME1zr.

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.

iEM2000T
40 A single-phase kilowatt-hour meter without display, with remote transfer of metering impulses (static output).

iEM2000
40 A single-phase kilowatt-hour meter.

iEM2010
40 A single-phase kilowatt-hour meter with remote transfer of metering impulses (static output).

iME1
Single-phase kilowatt-hour meter.

iME1z
Single-phase kilowatt-hour meter with partial meter.

iME1zr
Single-phase kilowatt-hour meter with partial meter and remote transfer of metering impulses (relay output).

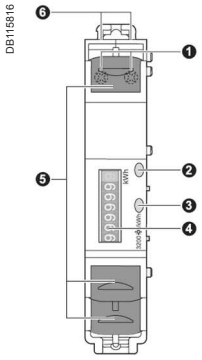
Catalogue numbers

Type	Rating (A)	Voltage (V AC)	Tolerance (V AC)	Width in mod. of 9 mm	Cat. no.
Single-phase circuit (1L + N)					
iEM2000	40	230	±20	2	**A9MEM2000**
iEM2010	40	230	±20	2	**A9MEM2010**
iEM2000T	40	230	±20	2	**A9MEM2000T**
iME1	63	230	±20	4	**A9M17065**
iME1z	63	230	±20	4	**A9M17066**
iME1zr	63	230	±20	4	**A9M17067**

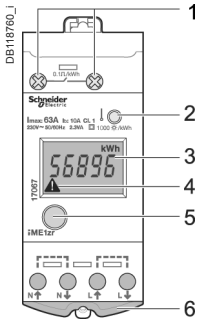
Main technical data

	iEM2000T	iEM2000/iEM2010	iME
Accuracy class	1	1	1
Frequency	48/62 Hz	48/62 Hz	48/62 Hz
Consumption	<10VA	<10VA	2.5 VA
Operating temp	-10°C to +55°C	-10°C to +55°C	-25°C to +55°C
Connection by tunnel terminals	Top terminals: 4 mm^2	Top terminals: 4 mm^2	Top terminals: 6 mm^2
	Bottom terminals: 10 mm^2	Bottom terminals: 10 mm^2	Bottom terminals: 16 mm^2
Compliance with standard	IEC 61557-12 : - PMD/DD/K55/1	IEC 61557-12 : - PMD/DD/K55/1	IEC 61557-12 : - PMD/DD/K55/1
	IEC 62053-21 (accuracy)	IEC 62053-21 (accuracy)	IEC 62053-21 (accuracy)
Sealable screw shield	Yes	Yes	Yes
MID Compliance	No	Yes	No

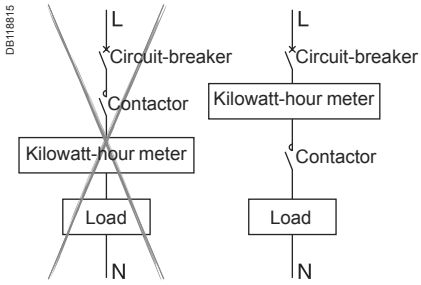
Kilowatt-hour meters (cont.)



iEM2010



iME1zr.



Example: meter on a load switching

Description

iEM2000, iEM2010, iEM2000T

1 Remote transfer pulse output (iEM2000T, iEM2010).
2 Green power-on indicator light.
3 Yellow metering indicator light (flashing).
4 Display unit (iEM2000, iEM2010).
5 Seal.
6 Allow the comb busbar to pass.

iME1, iME1z, iME1zr

1 Pulse output for remote transfer (iME1zr).
2 Flashing meter indicator.
3 Total or partial meter display (iME1z, iME1zr).
4 Wiring error indicator.
5 Push-button: total or partial meter display, reset partial meter (ME1z, ME1zr).
6 Sealing connection.

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.

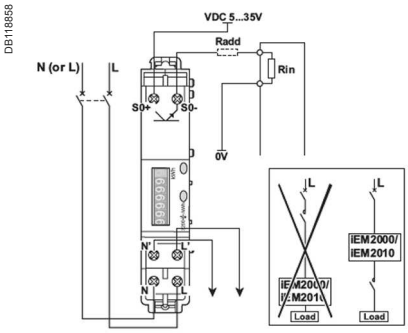
Kilowatt-hour meters (cont.)

Specific technical data

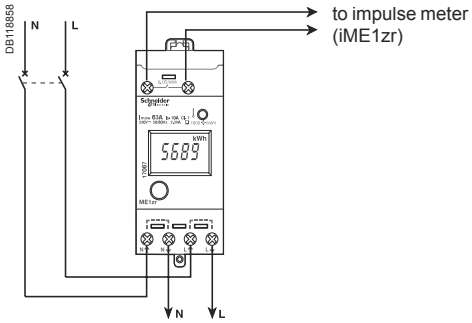
iEM2000, iEM2010, iEM2000T, iME1, iME1z and iME1zr specific technical data						
	iEM2000	**iEM2010**	**iEM2000T**	**iME1**	**iME1z**	**iME1zr**
Direct measurement	Up to 40 A			Up to 63 A		
Metering and activity indicator light (yellow)	3,200 flashes per kWh			1,000 flashes per kWh		
Wiring error indicator	Yes					
Total meter (max. capacity) on one phase	999 999.9 kWh			999.99 MWh		
Total meter display	In kWh with 7 significant digits (not for iEM2000T)			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

Connection

Single-phase circuit



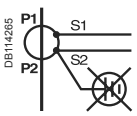
iEM2010



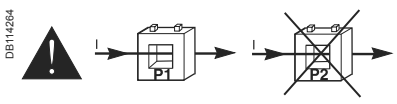
iME1 / iME1z / iME1zr.

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.



Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

Meter model and description	Current measurement	Part no.
iEM3100 basic energy meter	Direct connected 63 A	**A9MEM3100**
iEM3110 energy meter with pulse output	Direct connected 63 A	**A9MEM3110**
iEM3115 multi-tariff energy meter	Direct connected 63 A	**A9MEM3115**
iEM3135 advanced multi-tariff energy meter & electrical parameter plus M-Bus comm port	Direct connected 63 A	**A9MEM3135**
iEM3150 energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 63 A	**A9MEM3150**
iEM3155 advanced multi-tariff energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 63 A	**A9MEM3155**
iEM3165 advanced multi-tariff energy meter & electrical parameter plus BACnet MS/TP comm port	Direct connected 63 A	**A9MEM3165**
iEM3175 advanced multi-tariff energy meter & electrical parameter plus LON TP/FT-10 comm port	Direct connected 63 A	**A9MEM3175**
iEM3200 basic energy meter	Transformer connected 5 A	**A9MEM3200**
iEM3210 energy meter with pulse output	Transformer connected 5 A	**A9MEM3210**
iEM3215 multi-tariff energy meter	Transformer connected 5 A	**A9MEM3215**
iEM3235 advanced multi-tariff energy meter & electrical parameter plus M-Bus comm port	Transformer connected 5 A	**A9MEM3235**
iEM3250 energy meter & electrical parameter plus Modbus RS485 comm port	Transformer connected 5 A	**A9MEM3250**
iEM3255 advanced multi-tariff energy meter & electrical parameter plus Modbus RS485 comm port	Transformer connected 5 A	**A9MEM3255**
iEM3265 advanced multi-tariff energy meter & electrical parameter plus BACnet MS/TP comm port	Transformer connected 5 A	**A9MEM3265**
iEM3275 advanced multi-tariff energy meter & electrical parameter plus LON TP/FT-10 comm port	Transformer connected 5 A	**A9MEM3275**
iEM3300 basic energy meter	Direct connected 125 A	**A9MEM3300**
iEM3310 energy meter with pulse output	Direct connected 125 A	**A9MEM3310**
iEM3335 advanced multi-tariff energy meter & electrical parameter plus M-Bus comm port	Direct connected 125 A	**A9MEM3335**
iEM3350 energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 125 A	**A9MEM3350**
iEM3355 advanced multi-tariff energy meter & electrical parameter plus Modbus RS485 comm port	Direct connected 125 A	**A9MEM3355**
iEM3365 advanced multi-tariff energy meter & electrical parameter plus BACnet MS/TP comm port	Direct connected 125 A	**A9MEM3365**
iEM3375 advanced multi-tariff energy meter & electrical parameter plus LON TP/FT-10 comm port	Direct connected 125 A	**A9MEM3375**

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

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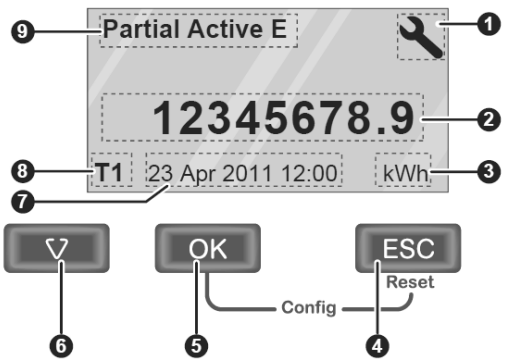
Acti 9 iEM3100/3200 energy meter

PB113590



Acti 9 iEM3300 energy meter

PB105323



Front Panel Display and Buttons

1 Configuration mode
2 Values and parameters
3 Unit
4 Cancellation
5 Confirmation
6 Selection
7 Date and time
8 Tariff currently used (on select models)
9 Functions/Measurements

The Acti 9 iEM3000 Energy Meter Series offers a cost-attractive, competitive range of DIN rail-mounted energy meters ideal for sub-billing and cost allocation applications.

Combined with communication systems, like Smart Link, the Acti 9 iEM3000 Series makes it easy to integrate electrical distribution measurements into customer's facility management systems. It's the right energy meter at the right price for the right job.

Three versions are available: 63A direct measure (iEM3100 models), current transformers associated meter (iEM3200 models), and 125A direct measure (iEM3300 models). For each range, eight versions are available (seven for the iEM3300) to satisfy basic to advanced applications:

- iEM3100/iEM3200/iEM3300: kWh meter with partial counter
- iEM3110/iEM3210/iEM3310: kWh meter with partial counter and pulse output. MID certified.
- iEM3115/iEM3215: multi-tariff meter controlled by digital input or internal clock, MID certified.
- iEM3135/iEM3235/iEM3335: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. M-Bus communication, digital I/O and MID certified.
- iEM3150/iEM3250/iEM3350: kWh meter with partial counter and current, voltage, power measurement. Modbus communication.
- iEM3155/iEM3255/iEM3355: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. Modbus communication, digital I/O, MID certified.
- iEM3165/iEM3265/iEM3365: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. BACnet communication, digital I/O and MID certified.
- iEM3175/iEM3275/iEM3375: energy meter, four quadrant, multi-tariffs with partial counter and current, voltage, power measurement. LON communication, digital input and MID certified.

Innovative design makes the meters smart and simple:
- Easy to install for panel builders
- Easy to commission for contractors and installers
- Easy to operate for end users

Applications

Cost management applications
- Bill verification
- Sub-billing, including WAGES view (four user-defined tariffs)
- Cost allocation, including WAGES view

Network management applications
- Basic electrical parameters like current, voltage and power
- Onboard overload alarm to avoid circuit overload and trip
- Easy integration with PLC systems by input/output interface

■ Market segments
- Buildings & Industry
- Data centres and networks
- Infrastructure (airports, road tunnels, telecom)

■ Characteristics
- Self-powered meters
- Chain measurement (meters + CTs) accuracy class 1
- Compliance with IEC 61557-12, IEC 62053-21/22, IEC 62053-23, EN50470-3
- Compact, 5 module width
- Graphical display for easy viewing
- Onboard Modbus, LON, M-Bus or BACnet communication
- Easy wiring (without CTs) Acti 9 iEM3100 and iEM3300 models
- Double fixation on DIN rail (horizontal or vertical)
- Anti-tamper security features ensure the integrity of your data
- MID compliant (selected models) providing certified accuracy and data security

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

Function guide		iEM3100 iEM3200 iEM3300	iEM3110 iEM3210 iEM3310	iEM3115 iEM3215	iEM3135 iEM3235 iEM3335	iEM3150 iEM3250 iEM3350	iEM3155 iEM3255 iEM3355	iEM3165 iEM3265 iEM3365	iEM3175 iEM3275 iEM3375
Width (18 mm module, DIN rail mounting)		5 / 5 / 8	5 / 5 / 8	5 / 5	5 / 5	5 / 5 / 8	5 / 5 / 8	5 / 5	5 / 5
Direct measurement (up to 63A or 125A)		63A / – / 125A	63A / – / 125A	63A / –	63A / –	63A / – / 125A	63A / – / 125A	63A / –	63A / –
Measurement inputs through CTs (1A, 5A)		– / ■ / –	– / ■ / –	– / ■	– / ■ / –	– / ■ / –	– / ■ / –	– / ■ / –	– / ■ / –
Measurement inputs through VTs					– / ■ / –	– / ■ / –	– / ■ / –	– / ■ / –	– / ■ / –
Active Energy measurements class (Total & partial kWh)		1 / 0.5S / 1	1 / 0.5S / 1	1 / 0.5S	1 / 0.5S / 1	1 / 0.5S / 1	1 / 0.5S / 1	1 / 0.5S / 1	1 / 0.5S / 1
Four Quadrant Energy measurements					■		■	■	■
Electrical measurements (I, V, P, ...)					■	■	■	■	■
Multi-tariff (internal clock)				4	4		4	4	4
Multi-tariff (external control)				4	2		2	2	2
Measurement display (number of lines)		3	3	3	3	3	3	3	3
Digital inputs	Programmable (Tariff control or WAGES input)				1		1	1	1
	Tariff control only			2					
Digital ouputs	Programmable (kWh pulse or kW alarm)				1		1	1	
	kWh pulse only		1						
kW overload alarm					1		1	1	
M-Bus protocol					■				
Modbus protocol						■	■		
BACnet protocol								■	
LON									■
MID (legal metrology certification)			■	■	■		■	■	■

PB108423



Acti 9 iEM3100 models direct connected (63 A) Direct connected up to 63 A

PB108424



Acti 9 iEM3200 models (1 A / 5 A CT connected)

Connectivity advantages	
Programmable digital input	External tariff control signal (4 tariffs) Remote Reset partial counter External status, e.g. breaker status Collect WAGES pulses
Programmable digital output	kWh overload alarm (iEM3135, iEM3155, iEM3165 iEM3235, iEM3255, iEM3265, EM3335, iEM3355, iEM3365) kWh pulses
Graphic LCD display	Scroll energies Current, voltage, power, frequency, power factor
Communication	Serial communication options are available with M-Bus, Modbus, BACnet or LON protocols
Standards	
IEC standards	IEC 61557-12, IEC 61036, IEC 61010, IEC 62053-21/22 Class 1 and Class 0.5S, IEC 62053-23

Multi-tariff capability
The Acti 9 iEM3000 Series allows arrangement of kWh consumption in four different registers. This can be controlled by:
- Digital Inputs. Signal can be provided by PLC or utilities
- Internal clock programmable by HMI
- Through communication

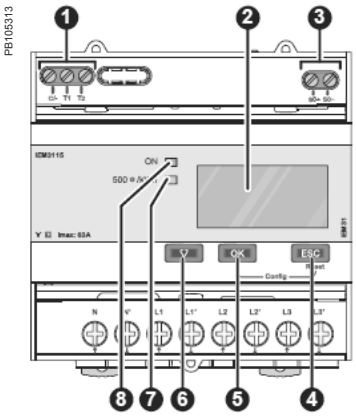
This function allows users to:
- Make tenant metering for dual source applications to differentiate backup source or utility source
- Understand well the consumption during working time and non working time, and between working days and weekends
- Follow up feeders consumption in line with utility tariff rates

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

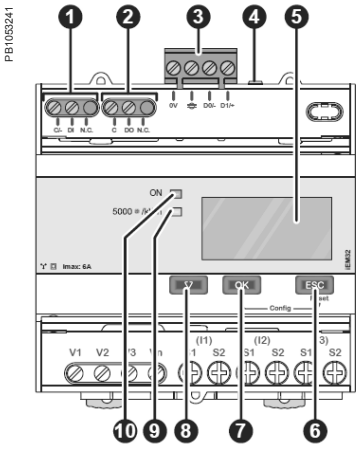
Specification guide	iEM3100/iEM3300 Models							
	iEM3100 iEM3300	iEM3110 iEM3310	iEM3115	iEM3135 iEM3335	iEM3150 iEM3350	iEM3155 iEM3355	iEM3165 iEM3365	iEM3175 iEM3375
Current (max.) Direct connected (iEM31xx)	63A for iEM3100 models, 125A for iEM3300 models							
Meter constant LED	500/kWh							
Pulse output		Up to 1000p/kWh		Up to 1000p/kWh		Up to 1000p/kWh		
Multi-tariff			4 tariffs	4 tariffs		4 tariffs		
Communication				M-bus	Modbus	Modbus	BACnet	LON
DI/DO		0/1	2/0	1/1		1/1	1/1	1/0
MID (EN50470-3)		■		■		■	■	■
Network	1P+N, 3P, 3P+N							
Accuracy class	Class 1 (IEC 62053-21 and IEC61557-12) Class B (EN50470-3)							
Wiring capacity	16 mm² for iEM3100 models, 50 mm² for iEM3300 models							
Display max.	LCD 99999999.9kWh							
Voltage (L-L)	3 x 100/173 V AC to 3 x 277/480 V AC (50/60 Hz)							
IP protection	IP40 front panel and IP20 casing							
Temperature	-25°C to 55°C (K55)							
Product size	5 x 18 mm for iEM3100 models, 8 x 18 mm for iEM3300 models							
Overvoltage and measurement	Category III, Degree of pollution 2							
kWh	■	■	■	■	■	■	■	■
kVARh				■		■	■	■
Active power				■	■	■	■	■
Reactive power				■		■	■	■
Currents and voltages				■	■	■	■	■
Overload alarm				■		■	■	■
Hour counter				■		■	■	■

Specification guide	iEM3200 Models							
	iEM3200	iEM3210	iEM3215	iEM3235	iEM3250	iEM3255	iEM3265	iEM3275
1 A / 5 A CTs (max current)	6 A							
Meter constant LED	5000/kWh							
Pulse output frequency		Up to 500p/kWh		Up to 500p/kWh		Up to 500p/kWh		
Multi-tariff			4 tariff	4 tariffs		4 tariffs		
Communication				M-bus	Modbus	Modbus	BACnet	LON
DI/DO		0/1	2/0	1/1		1/1	1/1	1/0
MID (EN50470-3)		■	■	■		■	■	■
Network	1P+N, 3P, 3P+N support CTs			1P+N, 3P, 3P+N support CTs & VTs				
Accuracy class	Class 0.5S (IEC 62053-22 and IEC61557-12) Class C (EN50470-3)(1)							
Wiring capacity	6 mm² for currents and 4 mm² for voltages							
Display max.	LCD 99999999.9kWh or 99999999.9MWh							
Voltage (L-L)	3 x 100/173 V AC to 3 x 277/480 V AC (50/60 Hz)							
IP protection	IP40 front panel and IP20 casing							
Temperature	-25°C to 55°C (K55)							
Product size	5 steps of 18 mm							
Overvoltage & measurement	Category III, Degree of pollution 2							
kWh	■	■	■	■	■	■	■	■
kVARh				■		■	■	■
Active power				■	■	■	■	■
Reactive power				■		■	■	■
Currents and voltages				■	■	■	■	■
Overload alarm				■		■	■	■
Hour counter				■		■	■	■
(1) For 1 A CTs Class 1 (IEC6253-21 and IEC61557-12 Class B (EN50470-3)								

Acti 9 iEM3000 Series Energy Meters
Functions and characteristics

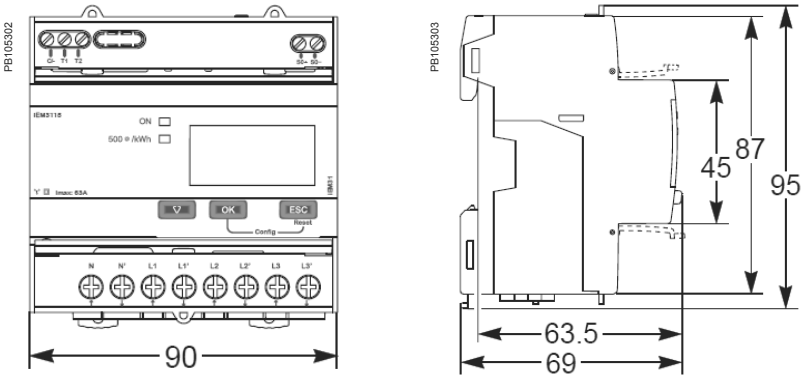


Acti 9 iEM3000 Series parts
1. Digital inputs for tariff control (iEM3115 / iEM3215)
2. Display for measurement and configuration
3. Pulse out for remote transfer (iEM3110 / iEM3210)
4. ESC Cancellation
5. OK Confirmation
6. ▽ Selection
7. Flashing yellow meter indicator to check accuracy
8. Green indicator: on/off, error

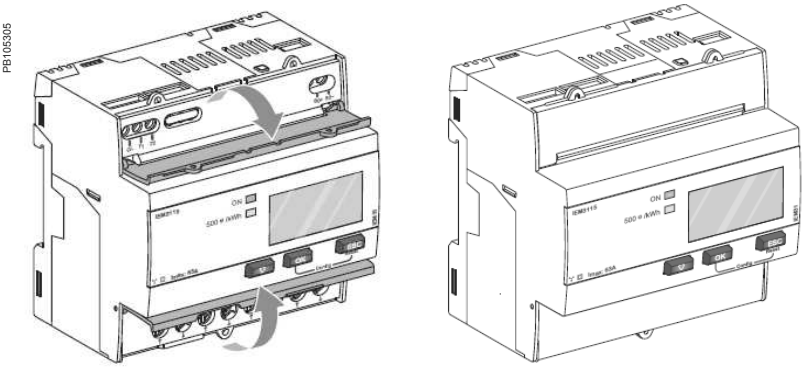


Acti 9 iEM3000 Series parts
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6. ▽ Selection
7. Flashing yellow meter indicator to check accuracy
8. Green indicator: on/off, error

iEM3000/iEM3200 series dimensions



Acti 9 iEM3100/iEM3200 Series front flaps open and closed



iEM3300 series dimensions

