



Three-phase Digital Energy meters - COMPACT LINE - CT connected (.../1 A or .../5 A)



**Operating instructions**  
**with partial active energy counter resettable and inbuilt communication Modbus - 2 tariffs**  
**Code Model Description**  
**19 5643 KE-S/5 Modbus** three-phases digital energy meter with connection by CT .../1 A up to 2000/1 A or by CT .../5 A up to 10.000/5 A 0.01-1(6) A - 2 tariffs and inbuilt communication Modbus (MID calibrated)

**WARNING**  
 Installation must be carried out and inspected by a specialist or under his supervision.  
 When working on the instrument, switch off the mains voltage!

**Main Menu**

**Main Page:**  
 The value of the currently growing Active 3-phase Energy is represented (or the last one that has grown). The Energy is always Active, and may be Active Imported (right arrow), Active Exported (left arrow), with Tariff T1 or T2, depending on the current Energy flowing.

**Second Active Energy Page**

**Third Active Energy Page**

**Fourth Energy Page:**  
 In the second, third and fourth pages the other 3 energy registers are represented

**CT Primary Winding:**  
 In this page the primary winding of the CT appears. If the secondary winding is 5 A you can modify the value between 5 to 10000, otherwise if the secondary winding is 1 A you can modify the value between 1 to 2000.

**CT Secondary Winding:**  
 In this page the CT secondary winding appears. You can choose between a secondary winding of 5 A or 1 A.

**Modbus Address Page:**  
 In this page the Modbus address appears. You can modify its value between 1 and 247. See the "editable value" section.

**Modbus Baudrate Page:**  
 In this page the Modbus baud rate appears. You can choose among 1200, 2400, 4800, 9600, 19200 and 38400 bits per second. See the "editable value" section.

**Modbus Parity Page:**  
 In this page the type of parity appears. You can choose among Odd Parity, Even Parity or No Parity.

**Modbus Stop Bit Page:**  
 In this page the number of stop bits appears. You can choose among 1 Stop Bit or 2 Stop Bits.

**Firmware Release Page:**  
 You can read the index of firmware release.

**Firmware CheckSum Page:**  
 The checksum is periodically calculated to verify that the firmware is reliable.

**Display Test Page:**  
 All the display segments are visible.

**Whenever the page on the display, if no key is pushed for at least 20 sec., the main page appears again.**

**Partial counter**

**Partial Active Energy Counters:**  
 By pushing the "Partial key" partial active energy counters are readable in the main, second, third and fourth pages (i.e. for monthly energy consumption).

These counters are resettable, see the energy reset section. By pushing the "Partial key" in any of the four pages, you go back to the Main menu

**Energy Reset**

In all pages representing an Energy value, a pressure of 20 sec. of the "Menu key" allows to enter in the zeroing menu, consequently on the display "rESEt" appears. The key must be released. In order to confirm the operation and get back to default visualization, push it again for 4 seconds, otherwise after 4 sec., the reset will have no effect.

**For meter with MID certification only the partial Energy counters are resettable.**

**Diagnostic Messages**

**One or more missing phase:**  
 In case one or more phase is not detected, the corresponding icon disappears from the bottom row of the display. E.G. L2 is not detected.

**Phase sequence error:**  
 When the three phases are not in the correct zero-crossing sequence this message appears and the icons L1 and L2 blink. To make this message to disappear, you can keep pushed the "Menu key" for at least 4 seconds.

**Error condition:**  
 When the display shows the message "Error 2 or Error 3", the meter has got a malfunction and must be replaced.

**Editable values**

In the main menu there are 3 values that you can modify. They are the Modbus baud rate and the Modbus address. For example, in the address page (from 1 to 247):

Start (↖) key kept pushed for 4 seconds →

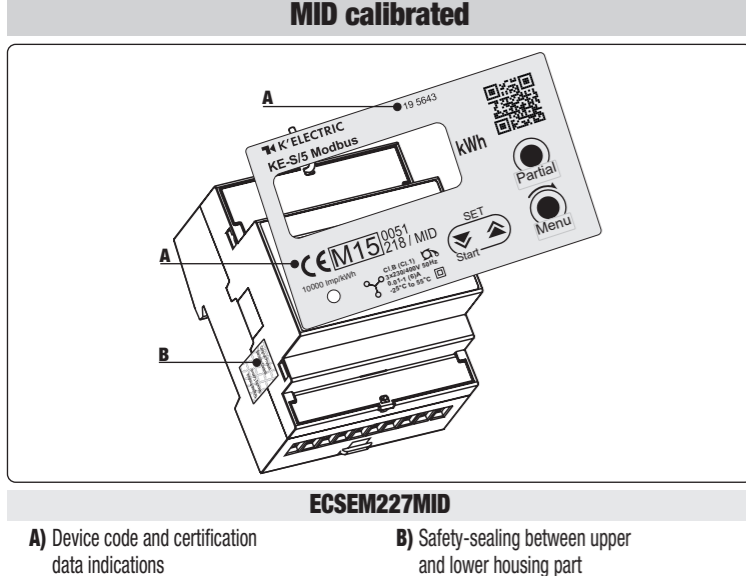
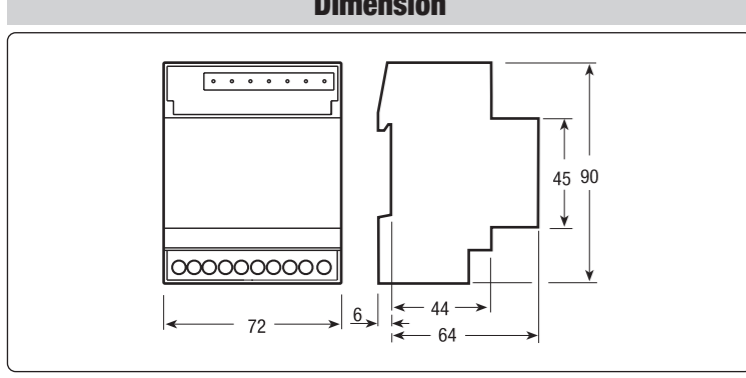
Push Start (↖) key to decrease, (↗) to increase. Push the "Menu key" to confirm, otherwise after 8 seconds the modification will be lost.

**Secondary Winding Register Menu**

On MID calibrated meters it's possible to show on display all energy registers measured at CT output (also via internal communication interface). For this, in any page of the "Main Menu", the "Menu key" must be pushed for 20 second. In this mode "⊙" appears and the meter shows the same page of the "Main Menu" but, in the first 4 pages, the energies are referred to the secondary winding of the CTs. After a minute of "Menu key" inactivity, the meter shows and communicates again the CT input energies.

Secondary winding register menu:

105607283 → 2706513  
 > 20 sec.



**Symbols**

- Measuring elements
- Reversal preventing device
- Protected by double insulation

**Display**

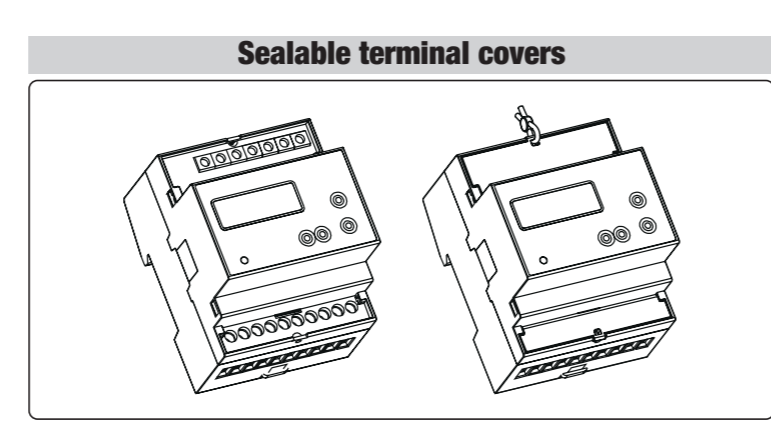
**Push - Buttons**

- Parameters set
- Command button for "Partial" reading selection
- Menu key for reading selection

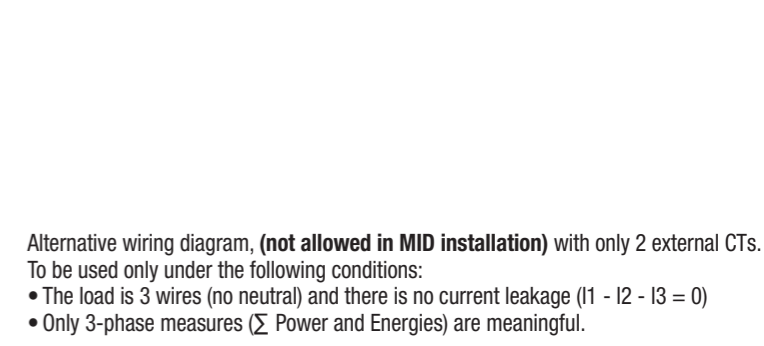
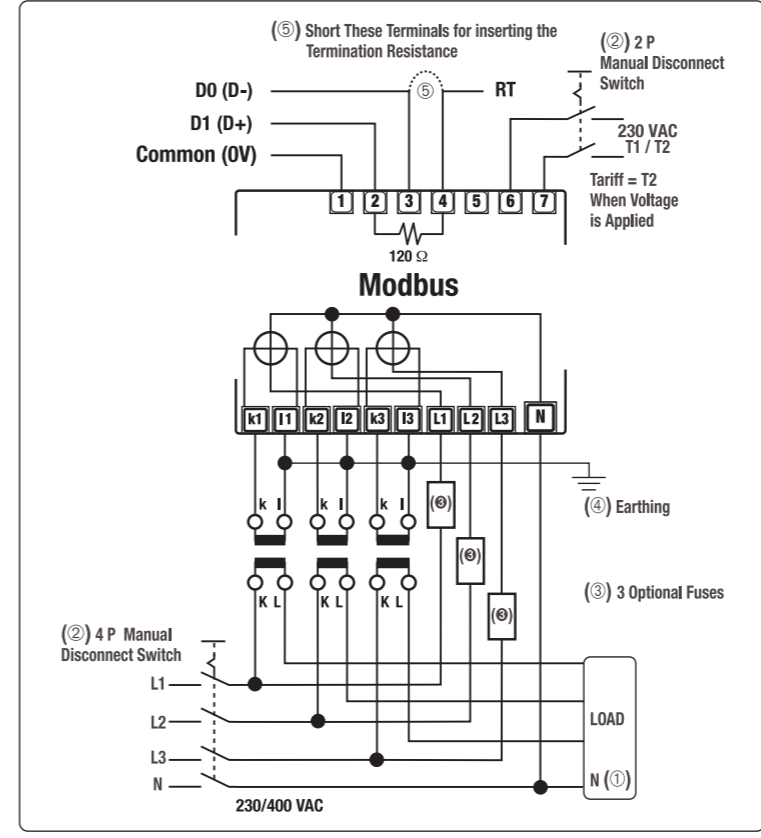
**Cable stripping length and max terminal screw torque**

**1 A / 5 A CT connection main terminals**  
 Screw driver PZ1

**Tariff and communication terminals**  
 Screw driver blade 0.8x3.5 mm



The Energy Meter has **OVERVOLTAGE CATEGORY III** (according to IEC 62052-31 that refers to IEC-60664-1 Ed. 2.0:2007), hence its direct connection to the Public Electricity Grid is not allowed. The Energy Meter is intended for **INDOOR** installation only (according to EN 50470-1 and IEC 62052-31). The Energy Meter must be installed on a DIN-rail and inside a cabinet with a protection degree (IP rating) equal to (or better than) IP51. Direct connection of currents inputs to the Energy Meter is **NOT ALLOWED**: external CTs insertion with proper insulation level are mandatory.



- The connection of the Neutral Wire to the "N" terminal of the Energy Meter is mandatory. Its connection to the Load is optional, but, in the case, only 3-phase measures (Powers and Energies) are meaningful, while measures referred to L1, L2, and L3 are meaningless.
- These manual disconnect switches are mandatory for safe installing operation. Their purpose and location must be easily evident to installation personnel
- These fuses are not mandatory, they are recommended to protect the line, not the device itself. Use >= 6 A fast (F) or >= 1 A delayed (T).
- Earthing of secondary windings of CTs is governed by the laws in force in the Countries where the device is installed. Current transformers must not be operated with open terminals since dangerous high voltages might occur which may result in personal injuries and property damage; furthermore, in this case the transformers are exposed to thermal overload.

**Technical data**

Data in compliance with CLC/TR 50579 , EN 62059-32-1, EN 50470-1, EN 50470-3		19 5643 - KE-S/5 CT connection built-in communication Modbus
<b>General characteristics</b>		
• Housing	DIN 43880	DIN 4 modules
• Mounting	EN 60715	DIN rail
• Depth		70 mm
• Weight		250 g
<b>Operating features</b>		
• Connection	to three-phase network	n° wires 4
• Storage of energy values and config.	Internal flash memory	yes
• Tariff	for active energy	n° 2 T1 and T2
<b>Approval (according to EN 50470-1, EN 50470-3)</b>		
• Type of connection		CT .../5 A or .../1 A
• Reference Voltage Un	Line to Neutral	VAC 230
• Reference Voltage Un	Line to Line	VAC 400
• Reference Current (Iref)		A 1
• Minimum Current (Imin)		A 0.01
• Maximum Current (Imax)		A 6
• Starting Current (Ist)		A 0.001
• External CT	max. CT ratio	A 10.000/5 A or 2.000/1 A
	ratio adjusting step	A 5 or 1
• Reference Frequency (fn)		A 50
• Number of phases (number of wires)		- 3 (4)
• Certified Measures		kWh → kWh T1, ← kWh T1 → kWh T2, ← kWh T2
• Accuracy	Active Energies (accor. to EN 50470-3) and Active Powers	class B
<b>Supply Voltage and Power Consumption</b>		
• Operating Supply Voltage range		VAC 92 ... 276 / 160 ... 480
• Maximum Power Dissipation (Voltage circuit)		VA (W) ≤2 (0.6)
• Maximum VA burden (Current circuit) @ Imax		VA ≤0.7
• Voltage Input Waveform		- AC
<b>Overload capability</b>		
• Voltage	continuous: phase/phase	VAC 480
	1 second: phase/phase	VAC 800
	continuous: phase/N	VAC 276
	1 second: phase/N	VAC 300
• Current	continuous	A 6
	Temporary (0,5 ms)	A 120
<b>Measuring Features</b>		
• Voltage range	phase/phase	VAC 160 ... 480
	phase/N	VAC 92 ... 276
• Current range (secondary winding)		A 0.001 ... 6
• Frequency range		Hz 45 ... 65
• Measured Quantities		- kWh
<b>Display features</b>		
• Display type	LCD	- 9 (2 Decimal)
• Active Energy	Energy digits dimension	mm 6 x 3
• Running Tariff	7 digits + 2 decimal digits	min. ... max. kWh 0.01 ... 9999999.99
• Display refresh period	1 digit	- T1 or T2
<b>Optical metrological LED</b>		
• Front mounted red LED (meter constant)	proportional to active imp/exp Energy	p/kWh 10.000
<b>Safety</b>		
• Protective class		class II
• AC voltage test (EN 50470-3, 7.2)		kV 4
• Degree of pollution		- 2
• Operational voltage		VAC 300
• Impulse voltage test		1.2/50 μs-kV 6
• Housing material flame resistance	UL 94	V0
• Safety-sealing between upper and lower housing part (mod. ECSEM227MID)		class yes
<b>Embedded communication Modbus</b>		
• Physical interface	RS485 - 3 Wire	- D1, D0, Common (GND)
• Internal termination resistor		- 120 Ω
• Baud rate	adjustable	- 1200-2400-4800-9600-19200-38400
• Parity	adjustable	- Odd, Even, None
• Stop Bit	adjustable	- 1, 2
• Address	adjustable	- 1-247
• Isolation class		- SELV circuit
<b>Connection terminals</b>		
• Screwdriver for mains terminals	head with Z +/- slotted head	POZIDRIV PZ2
• Screwdriver for tariff and communication terminals		mm 0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max)	mm² 1 (4)
	stranded wire with sleeve min. (max)	mm² 1 (4)
• Terminal capacity for tariff and communication	solid wire min. (max)	mm² 1 (4)
	stranded wire with sleeve min. (max)	mm² 1 (4)
<b>Environmental conditions (storage)</b>		
• Temperature range		°C -25 ... +70
<b>Environmental conditions (operating)</b>		
• Temperature range		°C -25 ... +55
• Mechanical environment		- M1
• Electromagnetic environment		- E2
• Installation	Indoor	- yes
• Altitude (max.)		meters ≤2000
• Humidity	yearly average, not condensing	- ≤75%
	on 30 days per year (not condensing)	- ≤95%
• IP rating		- IP51(*)/IP40

(\*) The metering equipment must be installed inside a cabinet with IP rating IP51 or better.

**Note**

