SDM630 100A Series

Three Phase Multifunction Din Rail Energy Meter

Eastron VCX POWER

User Manual V2.0

1. Introduction

This document provides operating, maintenance and installation instructions. These units measure and displaythe characteristics of single phase two wires(1P2W), three phase three wires(3P3W) and three phase four wires(3P4W) networks. The measuring parameters include voltage (V), frequency (Hz), current (A), power (kW/kVA/kVAr), import, export and total energy (kWh/kVArh). The units can also measure maximum current demand and power demand, this is measured over preset periods of up to 60 minutes.

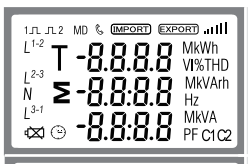
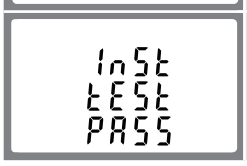
These units are Max.100A direct connected and do not need to connect with external current transformers(CT).
The unit is built-in with pulse,RS485/Mbus outputs. Configuration is password protected.

1.1 Unit Characteristics

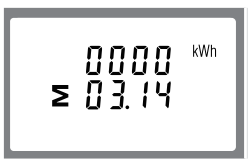
The SDM630 100A series meters have 6 models:
SDM630-P, SDM630-MT, SDM630-MB, SDM630-M, SDM630-2T, SDM630-MB-2T.

Model	Measurement	Communication	Tariff
SDM630-P	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	NO	Single Tariff
SDM630-M	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	Single Tariff
SDM630-MB	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	Mbus EN13757-3	Single Tariff
SDM630-MT	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	4 Tariffs (RTC)
SDM630-2T	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	RS485 Modbus	2 Tariffs (dual source)
SDM630-MB-2T	kWh/kVArh, kW/kVAr, kVA, P, F, PF, dmd, V, A, THD, etc.	Mbus EN13757-3	2 Tariffs (dual source)

2. Start Up Screens

	The first screen lights up all display segments and can be used as a display check.
	Software version information (This information is for reference only, in kind prevail.)
	The interface performs a self-test and indicates the result if the test passes.

*After a short delay, the screen will display active energy interface as follows:

	Total active energy in kWh.

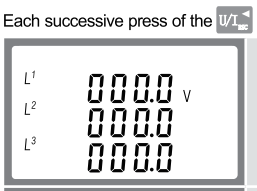
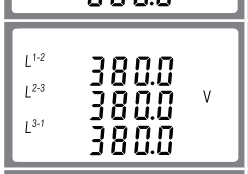
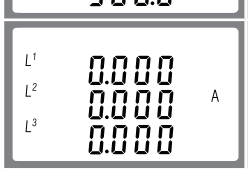
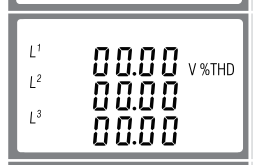
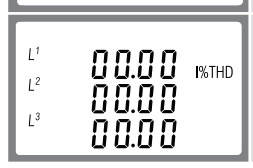
3. Measurements

The buttons operate as follows:

U/I ESC	Selects the Voltage and Current display screens. In Set-up Mode, this is the “Left” or “Back” button.
M	Select the Frequency and Power factor display screens. In Set-up Mode, this is the “Up” button.
P	Select the Power display screens. In Set-up Mode, this is the “Down” button.
E	Select the Energy display screens. In Set-up mode, this is the “Enter” or “Right” button.

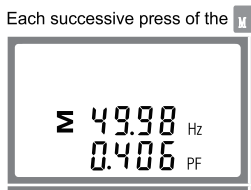
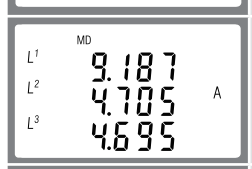
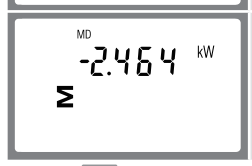
3.1 Voltage and Current

Each successive press of the U/I button selects a new parameter:

	Phase to neutral voltages. *Not available under 3P3W
	Phase to phase voltages *Not available under 1P2W
	Current on each phase.
	Neutral current *Not available under 3P3W, 1P2W.
	Phase to neutral voltage THD%
	Current THD% for each phase

3.2 Frequency and Power Factor and Demand

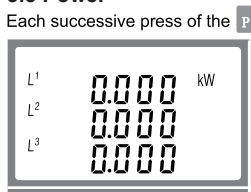
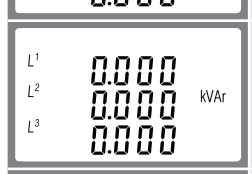
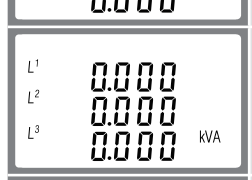
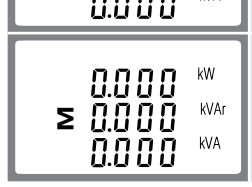
Each successive press of the M button selects a new range:

	Frequency and Power Factor (total).
	Power Factor of each phase. *Not available under 3P3W, 1P2W.
	Maximum Current Demand.
	Maximum Power Demand.

*Hold the M button for 3s to check the COMM. Setting, software version, CRC and full display pages.

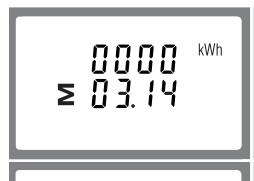
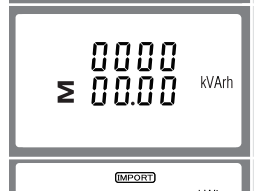
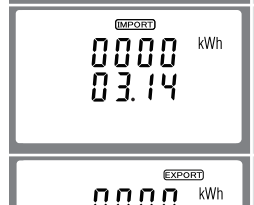
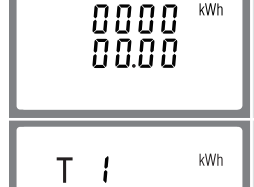
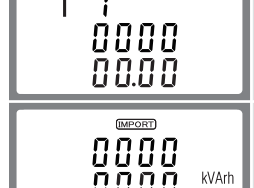
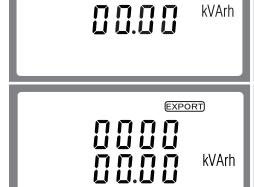
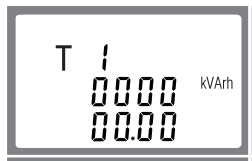
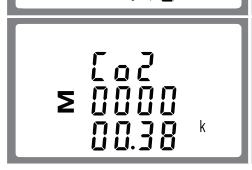
3.3 Power

Each successive press of the P button select a new range:

	Instantaneous Active Power in kW. *Not available under 3P3W, 1P2W.
	Instantaneous Reactive Power in kVAr. *Not available under 3P3W, 1P2W.
	Instantaneous Volt-Amps in KVA. *Not available under 3P3W, 1P2W.
	Total kW, kVAr, kVA.

3.4 Energy Measurements

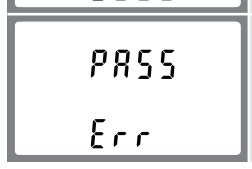
Each successive press of the E button selects a new range:

	Total active energy in kWh.
	Total reactive energy
	Import active energy in kWh. *Not shown on tariff models.
	Export active energy in kWh. *Not shown on tariff models.
	Tariff 1~4 active energy *For SDM630-MT only Tariff 1~2 active energy *For SDM630-2T and SDM630-MB-2T
	Import reactive energy *Not shown on tariff models.
	Export reactive energy *Not shown on tariff models.
	Tariff 1~4 reactive energy *For SDM630-MT only Tariff 1~2 reactive energy *For SDM630-2Tand SDM630-MB-2T
	Date Year/month/day. 1st, Jan, 2000 (default) *For SDM630-MT only
	Time Hour/minute/second Example:00:02:16 *For SDM630-MT only
	Carbon emissions

***The parameters of date and time can only be set via RS485 communication.**

4. Set Up

To enter set-up mode, press the E button for 3 seconds until the password screen appears.

	Setting up is password-protected. The user must enter the correct password (default ‘1000’) before processing.
	If an incorrect password is entered, the display will show: PASS Err

To exit setting-up mode, press U/I repeatedly until the measurement screen is restored.

4.1 Set-up Entry Methods

Some menu items, such as password, require a four-digits number entry while others, such as supply system, require selection from a number of menu options.

4.1.1 Menu Option Selection

1. Use the M and P buttons to scroll through the different options of the set up menu.
2. Press E to confirm your selection
3. If an item flashes, then it can be adjusted by the M and P buttons.
4. Having selected an option from the current layer, press E to confirm your selection.
5. Having completed a parameter setting, press U/I to return to a higher menu level. and you will be able to use the M and P buttons for further menu selection.
6. On completion of all setting-up, press U/I repeatedly until the measurement screen is restored.

4.1.2 Number Entry Procedure

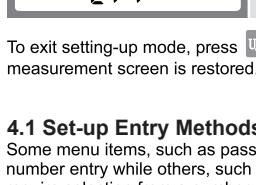
When setting up the unit, some screens require the entering of a number. In particular, when entry to the setting up section, a password must be entered. Digits are set individually, from left to right. The procedure is as follows:

1. The current digit to be set flashes and is set using the M and P buttons
2. Press E to confirm each digit setting.
3. After setting the last digit, press U/I to exit the number setting routine.

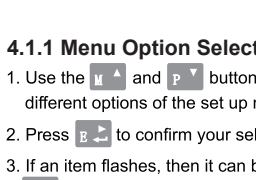
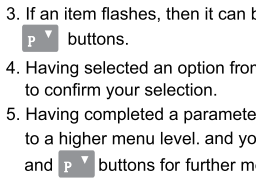
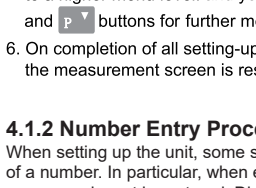
4.2 Communication

4.2.1 RS485 / Mbus Primary Address

***Not for SDM630-P**



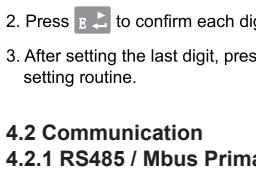
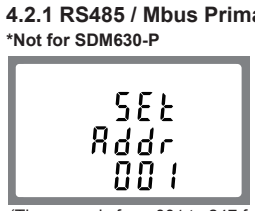
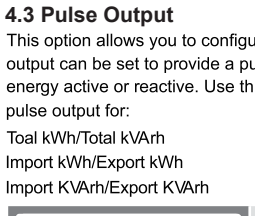
(The range is from 001 to 247 for Modbus and 001 to 250 for Mbus)

	From the set-up menu,press M and P buttons to select the address ID.
	Press E button to enter the selection routine. The current setting will flash.
	Use M and P buttons to choose Modbus or Mbus primary address

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.2 Mbus Secondary Address

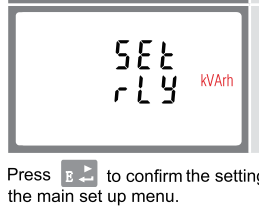
***For SDM630-MB and SDM630-MB-2T only**

	Secondary address: 00 00 00 01 to 99 99 99 99 From the set-up menu, use M and P buttons to find the setting page.
	Press E to enter the selection routine. The current setting will flash.
	Use M and P buttons to set the secondary address

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.3 Baud Rate

Baud rate range for Modbus RTU: 2.4k, 4.8k, 9.6k, 19.2k, 38.4k.
For Mbus: 0.3k, 0.6k, 2.4k, 4.8k, 9.6k.

	From the set-up menu, use M and P buttons to select the baud rate option.
	Press E to enter the selection routine. The current setting will flash.
	Use M and P buttons to choose baud rate.

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.4 Parity

	From the set-up menu, use M and P buttons to select the parity option.
	Press E to enter the selection routine. The current setting will flash.
	Use M and P buttons to choose parity (EVEN / ODD / NONE).

Press E to confirm the setting and press U/I to return to the main set up menu.

4.2.5 Stop Bits

	From the set-up menu, use M and P buttons to select the stop bit option.
	Press E to enter the selection routine. The current setting will flash.
	Use M and P buttons to choose stop bit (2 or 1) Note: Default is 1, and only when the parity is NONE that the stop bit can be changed to 2.

Press E to confirm the setting and press U/I to return to the main set up menu.

4.3 Pulse Output

This option allows you to configure the pulse output 1. The output can be set to provide a pulse for a defined amount of energy active or reactive. Use this section to set up the pulse output for:
Toal kWh/Total kVArh
Import kWh/Export kWh
Import KVArh/Export KVArh

	From the set-up menu, use M and P buttons to select the pulse output option.
	Press E to enter the selection routine. The unit symbol will flash.
	Use M and P buttons to choose the selection

Press E to confirm the setting and press U/I to return to the main set up menu.

4.3.1 Pulse Rate

Use this to set the energy represented by each pulse.
Rate can be set to 1 pulse per dFt/0.01/0.1/1/10/100 kWh/kVArh.

(It shows 1 pulse = 10kWh/kVArh)

	From the set-up menu, use M and P buttons to select the pulse rate option.

SEt rATE 10	Press E to enter the selection routine. The current setting will flash. When it's dFt (default),it means 2.5Wh/VArh.

Use M and P buttons to choose pulse rate, then press E to confirm the setting and press U/I to return to the main set up menu.

4.3.2 Pulse Duration

The pulse width can be selected as 200, 100 (default) or 60ms.

SEt PULS 100	

(It shows pulse width of 100ms)

SEt PULS 100	From the set-up menu, use M and P buttons to select the pulse width option.
SEt PULS 100	Press E to enter the selection routine. The current setting will flash.

Use M and P buttons to choose pulse rate, then press E to confirm the setting and press U/I to return to the main set up menu.

4.4 DIT Demand Integration Time

This sets the period in minutes over which the current and power readings are integrated for maximum demand measurement. The options are: 0, 5, 8,10,15,20,30,60 minutes.

SEt dIt 10	From the set-up menu, use M and P buttons to select the DIT option. The screen will show the currently selected integration time.
SEt dIt 10	Press E to enter the selection routine. The current time interval will flash.
SEt dIt 20	Use M and P buttons to select the time required. Press E to confirm the selection.

Press U/I to exit the DIT selection routine and return to the menu.

4.5 Backlit Set-up

Backlit lasting time is settable,default lasting time is 60minutes

SEt LP 60	it is set as 5,the backlit will be off in 5 minutes if there is no more further operation.
SEt LP 60	Press E to enter the selection routine.The current time interval will flash The options are: 0(always on)/5/10/30/60/120

Press M and P to select the time interval. Then press E to confirm the set-up.

4.6 Supply System

The unit has a default setting of 3 phase 4 wire (3P4W)
Use this section to set the type of electrical system.

SYS 3P3	From the set-up menu, use M and P buttons to select the system option. The screen will show the currently selected system type.
SYS 3P3	Press E to enter the selection routine. The current selection will flash.
SYS 3P4	Use M and P buttons to select the required system option: 1P2 (W), 3P3 (W), 3P4 (W). Press E to confirm the selection.

Press U/I to exit the system selection routine and return to the menu.

4.7 CO2 Setup

SEt CO2 rATE	Long press button E to enter the CO2 setup.
SEt 0. 5703	Press button M and P to set up the CO2 rate. Default: (0.5703)

4.8 CLR

The meter provides a function to reset the maximum demand value of current and power.

CLr	From the set-up menu, use M and P buttons to select the reset option.
MD CLr	Press E to enter the selection routine. The MD will flash.

Press E to confirm the reset and press U/I to return to the main set up menu.

4.9 Change Password

SEt PASS 1000	Use the M and P to choose the change password option.
SEt PASS 1000	Press the E to enter the change password routine. The new password screen will appear with the first digit flashing.
SEt PASS 1000	Use M and P to set the first digit and press E to confirm your selection. The next digit will flash.
SEt PASS 1100	Repeat the procedure for the remaining three digits. After setting the last digit, Press E to confirm the selection.

Press U/I to exit the number setting routine and return to the Set-up menu.

5. Specifications

5.1 Measured Parameters

The unit can monitor and display the following parameters of a single phase two wires (1P2W), three phase three wires (3P3W) or three phase four wires (3P4W) system.

5.1.1 Voltage and Current

- Phase to neutral voltages 176 to 276V a.c. (not for 3p3w supplies).
- Voltages between phases 304 to 480V a.c. (3p supplies only).
- Percentage total voltage harmonic distortion (THD%) for each phase to N (not for 3p3w supplies).
- Percentage voltage THD% between phases (three phase supplies only).
- Current THD% for each phase

5.1.2 Power Factor and Frequency and Max. Demand

- Frequency in Hz
- Power factor
- Instantaneous power:
- Power 0 to 99999 W
- Reactive power 0 to 99999 VAr
- Volt-amps 0 to 99999 VA
- Maximum demanded power since last reset
- Maximum neutral demand current, since the last reset (for three phase supplies only)

5.1.3 Energy Measurements

• Import active energy	0 to 999999.99 kWh
• Export reactive energy	0 to 999999.99 kVArh
• Import active energy	0 to 999999.99 kWh
• Export reactive energy	0 to 999999.99 kVArh
• Total active energy	0 to 999999.99 kWh
• Total reactive energy	0 to 999999.99 kVArh

5.2 Measured Inputs

Voltage inputs through 4-way fixed connector with 25mm² stranded wire capacity. single phase two wire (1p2w), three phase three wire (3p3w) or three phase four wire (3p4w) unbalanced. Line frequency measured from L1 voltage or L3 voltage.

Voltage AC (Un)	3x230(400)V
Voltage Range	80~120% Un
Base Current (Ib)	10A AC
Max. Current (Imax)	100A AC
Min. Current (Imin)	0.3A
Starting current	0.4% of Ib
Power consumption	≤ 2W/10VA for the voltage measuring circuit ≤ 4VA for the current measuring circuit

5.3 Accuracy

• Voltage	0.5% of range maximum
• Current	0.5% of nominal
• Frequency	0.2% of mid-frequency
• Power factor	1% of unity (0.01)
• Active power (W)	±1% of range maximum
• Reactive power (VAr)	±1% of range maximum
• Apparent power (VA)	±1% of range maximum
• Active energy (Wh)	Class 1 or 0.5 IEC62053-21; Class B or C EN50470-3:2022 (MID version)
• Reactive energy (VArh)	Class 2 IEC 62053-23
• Response time to step input	1s, typical, to >99% of final reading, at 50 Hz.

5.4 Reference Conditions of Influ ence Quantities

Influence Quantities are variables that affect measurement errors to a minor degree. Accuracy is verified under nominal value (within the specified tolerance) of these conditions.

• Ambient temperature	23°C ± 2°C
• Input frequency	50 or 60Hz ±2%
• Input waveform	Sinusoidal (distortion factor < 0.005)
• Magnetic field of external origin	Terrestrial flux

5.5 Environment

• Operating temperature	-40℃ to + 70℃
• Storage temperature	-40℃ to + 70℃
• Relative humidity	0 to 95%, non-condensing
• Altitude	Up to 2000m
• Warm up time	5s
• Vibration	10Hz to 50Hz, IEC 60068-2-6, 2g
• Shock	30g in 3 planes

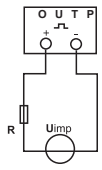
*** Maximum operating and storage temperatures are in the context of typical daily and seasonal variation.**

5.6 Mechanics

• DIN rail dimensions	72 x 100 mm (WxH) per DIN 43880
• Mounting	DIN rail (DIN35mm)
• Ingress protection	IP51 (indoor)
• Material	Self-extinguishing UL94 V-0

5.7 Pulse output

The meter is equipped with pulse output, which is fully isolated from the inside circuit. That generates pulses in proportion to the measured energy. The pulse output is polarity dependent, passive transistor output requiring an external voltage source for correct operation. For this external voltage source, the voltage shall be 5-27V DC, and the maximum input current shall be 27mA DC.



ATTENTION: Pule output must be fed as shown in the wiring diagram on the left. Scrupulously respect polarities and the connection mode.
Opto-coupler with potential-free SPST-NO Contact.

Contact range:5~27VDC
Max. current Input:27mA DC

The unit provides two pulse outputs. Both pulse outputs are passive type.
Pulse output 1 is configurable. The pulse output can be set to generate pulses to represent total kWh or kVarh.
The pulse constant can be set to generate 1 pulse per:
0.01 = 10 Wh/VArh
0.1 = 100 Wh/VArh
1 = 1 kWh/kVArh
10 = 10 kWh/kVArh
100 = 100 kWh/kVArh
1000=1000 kWh/kVArh

Pulse width: 200/100(default)/60ms
Pulse output 2 is non-configurable. It is fixed at total kWh.
The constant is 400imp/kWh.

5.8 RS485 Serial-Modbus RTU

***Not For SDM630-P, SDM630-MB or SDM630-MB-2T**
RS485 serial port with Modbus RTU protocol to provide a means of remotely monitoring and controlling the unit.Set-up screens are provided for setting up the RS485 port.

5.9 Mbus

***For SDM630-MB and SDM630-MB-2T only**
This uses a MBus port with EN13757-3 protocol to provide a means of remotely monitoring and controlling the unit.
Set-up screens are provided for setting up the MBus port.

*If the Modbus / Mbus protocol document is required, please contact contact Eastron for it.

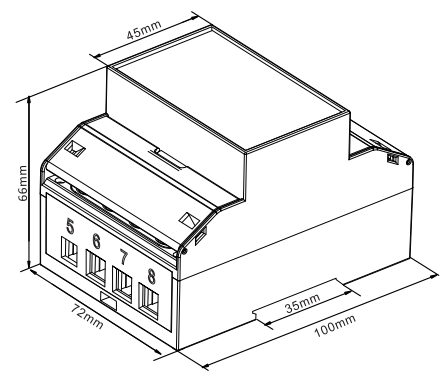
5.10 Dual Power Source

***For SDM630-2T and SDM630-MB-2T only**
The meter can measure energy from two different power supplies. For example, when public grid is power off and electric generator is on, the meter switches to tariff 2 measurement automatically.
The meter can also be used as a tariff meter. The tariff is controlled by an external time relay. Itself doesn't measure or record time information.

5.11 Multi-tariffs by RTC

***For SDM630-MT only**
The internal clock circuit of this unit has time automatic switching function. Date, clock and rate can be set and adjusted through RS485, at least 4 tariffs and 8 time segments can be set within a natural day.

6. Dimensions



7. Installation

7.1 Safety Instruction

Information for Your Own Safety
Important safety information is contained in the maintenaned section. Familarize yourself with this information before attempting installation or other procedures. Symbols used in this documents:

Risk of Danger
This means to call attention to a high risk, for example: "High voltage". Failure to observe the instruction can result in death, serious injury or considerable material damage.

Caution
This means hazard of electric shock and failure to take thenecessary safety precautions will result in death, serious injury or considerable material damage.

Qualified Personnel
Operation of the equipment (module, device) described in this manual may only be performed by qualified personnel. Qualified personnel in this manual means person who are authorized to commission, start up, ground and label devices, systems and circuits according to safety and regulatory standards. The installer is responsible for coordinating the rating and the characteristics of the supply side overcurrent protection devices with the maximum current rating and, in the case of direct connected meters, with the UC rating of the metering equipment.

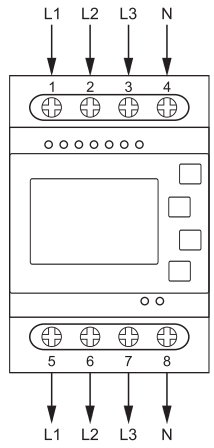
Proper Handling
The equipment (device, module) may only be used for the application specified in the catalogue and the user manual, and only be connected with devices and components recommended and approved by EASTRON.

- The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.
- Use only insulating tools.
- Do not connect while circuit is live (hot).
- Place the meter only in dry surroundings.
- Do not mount the meter in an explosive area or expose the meter to dust, mildew and insects.
- Make sure the used wires are suitable for the maximum current of this meter.
- Make sure the AC wires are connected correctly before activating the current/voltage to the meter.
- Do not touch the meter connecting clamps directly with your bare hands, with metal, blank wire or other material as you may get an electrical shock.
- Make sure the protection cover is placed after installation.
- Installation, maintenance and reparation should only be done by qualified personnel.
- Never break the seals and open the front cover as this might influence the functionality of the meter, and will avoid any warranty.
- Do not drop, or allow physical impact to the meter as there are high precision components inside that may break.
- An external switch or circuit-breaker should be installed on the power supply wires, which will be used to disconnect the meter and the device supplying energy. It is recommended that this switch or circuit-breaker is placed near the meter because that is more convenient for the operator. The switch or circuit-breaker must comply with the specifications of the building' selectrical design and all local regulations

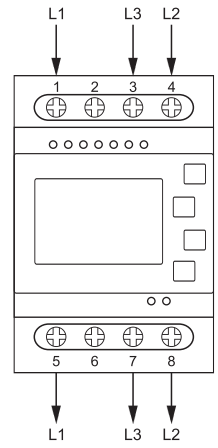
7.2 Maintance

In normal use, little maintenance is needed. As appropriate for service conditions, isolate electrical power, inspect the unit and remove any dust or other foreign material present. Periodically check all connections for freedom from corrosion and screw tightness, particularly if vibration is present. The front of the case should be wiped with a dry cloth only. Use minimal pressure, especially over the viewing window area. If necessary wipe the rear case with a dry cloth. If a cleaning agent is necessary, isopropyl alcohol is the only recommended agent and should be used sparingly. Water should not be used. If the rear case exterior or terminals should be contaminated accidentally with water, the unit must be returned to EASTRON for inspection and testing.

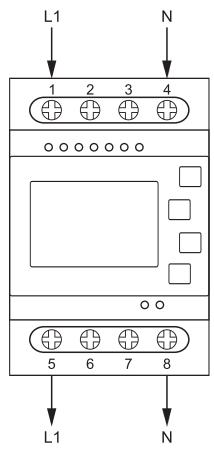
8. Wiring Diagram



Three Phase Four Wires



Three Phase Three Wires

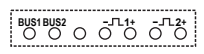


Single Phase Two Wires

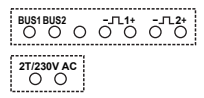
*** For reverse wiring needs, kindly notify our sales team before placing an order**

8.1 Definitions of Other Terminals

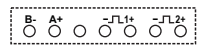
SDM630-MB



SDM630-MB-2T

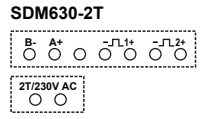


SDM630-M / SDM630-MT



SDM630-P

SDM630-2T



8.2 Terminals Capacity and Screw Torque

Terminals		
COMM/Pulse/2T	0.5~1.5mm²	0.2Nm
Load	4~25mm²	2.5~3Nm

Biuro:Plac Wolnica 13/10 31-060 Kraków,
www.vcx.com.pl, email: biuro@vcx.com.pl

Zhejiang Eastron Electronic Co.,Ltd.
No. 52, Dongjin Road, Nanhu, Jiaxing, Zhejiang, China
Tel:86 573 83698881
Email:sales@eastrongroup.com
Web:www.eastrongroup.com

CE RoHS MID Eastron DH-SMS-0453