

**METRALINE | ENERGY**

Three-phase Digital Energy Meter  
CT connected (.../5 A or .../1 A)

**Operating instructions**

The Energy Meter provides all relevant measures for the evaluation of an electrical network: I, U, PF, F, THD%, Powers (displayed for each phase and 3-phase) and Imported/Exported Active/Reactive Energies.



- Current range 0.01-1 (6), two possible secondary nominal currents: .../1 A or .../5 A
- All models are three phase digital Energy Meter with 2 tariffs and with IR lateral communication available.

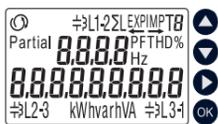
The built-in communication depends on the model:

Model	Communication
U289A	2 SO Pulse outputs MID certified
U289B	Built in RS-485 Modbus RTU MID certified
U289C	Built in M-Bus (1 unit Load) MID certified

**RISK OF ELECTRIC SHOCK, BURNS OR EXPLOSION**

This device must be installed and maintained ONLY by qualified and duly authorized personnel.  
During its installation, be sure there is no voltage applied.

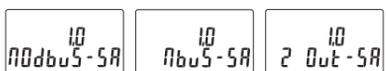
**Frontal of the Energy Meters**



- UP button: to scroll pages and change parameters
- DOWN button: to scroll pages and change parameters
- MENU/ESC button: to change menu and stop modification procedure of a parameter
- OK button: to confirm the modification of a parameter

**Device Switch-on**

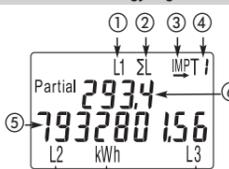
When the device is switched on, the firmware version and the model appear on the display for one second. (Preliminary Page)



**Display Back light**

- If no button is pushed for 40 seconds, the display goes back to the Main Page and the backlight is switched off.
- The first button pushing does not change the page but is used to switch the backlight on.

**Main Energy Page**



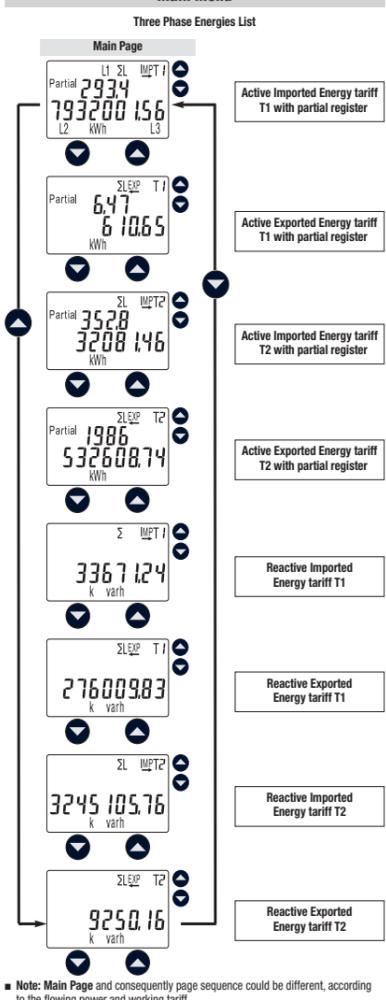
- Appears if V (L-N) >= 92 VAC
- Three-phase energy
- "Imported" / "Exported" flowing power direction
- working tariff
- Three-phase Active Energy register
- Corresponding Partial Energy register
- Energy Unit

**Selecting values at secondary side**

After a long press (5 seconds) on OK button in the Main Page, for 120 seconds the whole set of parameters displayed and transmitted through bus, are referred to Secondary Side of CTs.

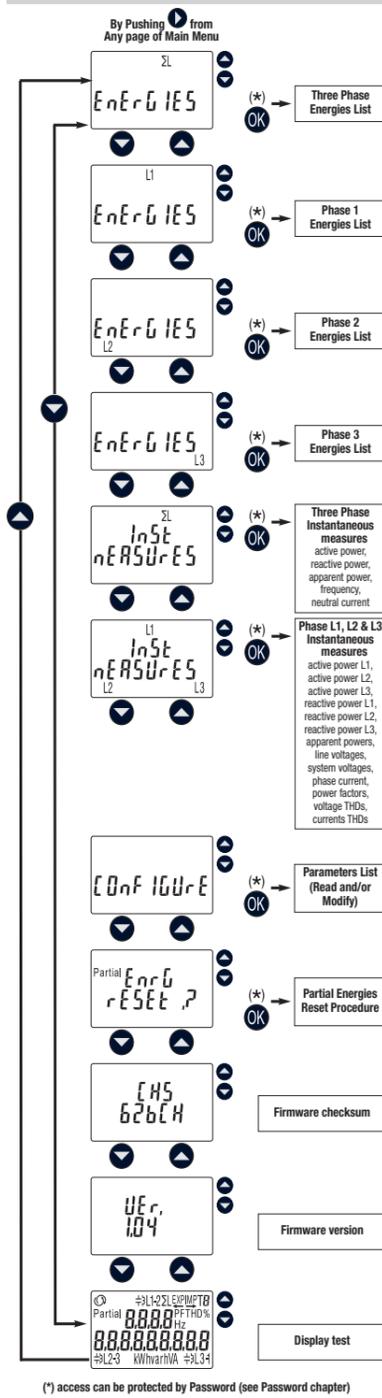


**Main Menu**

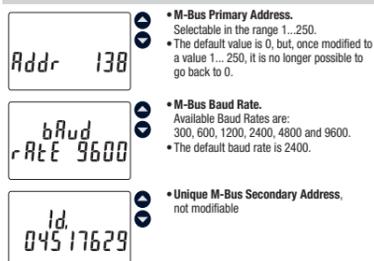


Note: Main Page and consequently page sequence could be different, according to the flowing power and working tariff

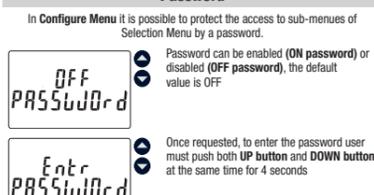
**Selection Menu**



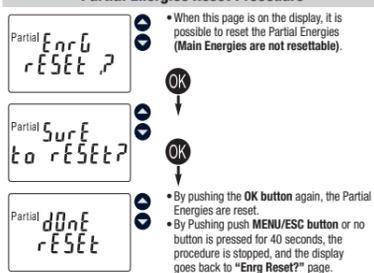
**Parameters in models with M-Bus on-board**



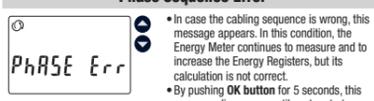
**Password**



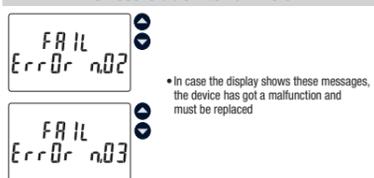
**Partial Energies Reset Procedure**



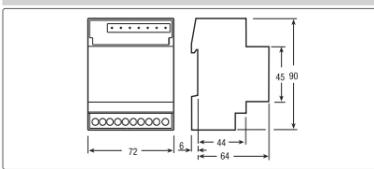
**Phase Sequence Error**



**Unrecoverable Internal Errors**

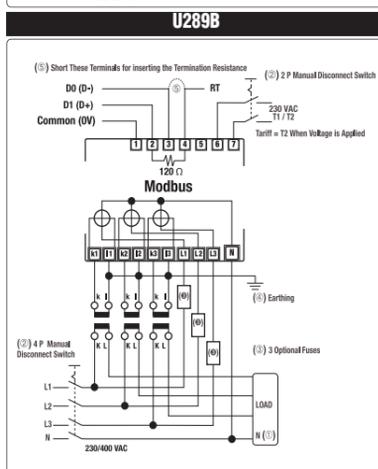
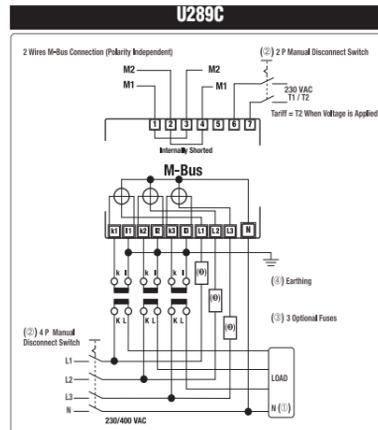
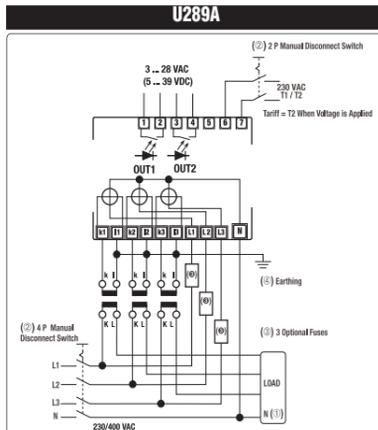


**Dimension**



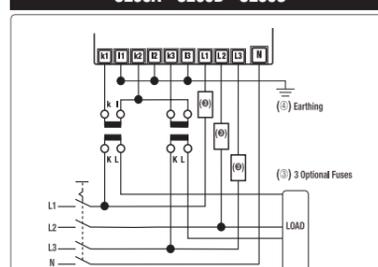
**Wiring diagram**

The Energy Meter has OVERVOLTAGE CATEGORY III (according 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.



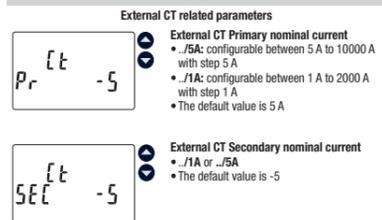
- The connection of the Neutral Wire to the "N" terminal of the Power Meter is mandatory. Its connection to the Load is optional, but, in the case, only 3-phase measures (Powers and Energies) are meaningful, while measures referred to L1, L2, and L3 are meaningless.
- These manual disconnect switches 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.

**U289A - U289B - U289C**

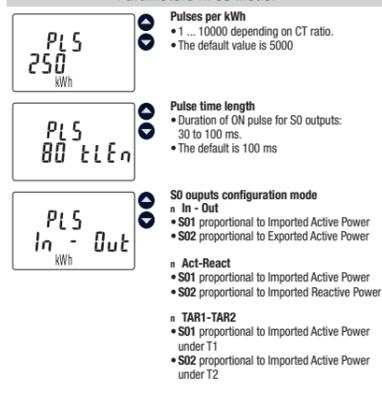


Alternative wiring diagram, with only 2 external CTs.  
To be used only under the following conditions:  
• The load is 3 wires (no neutral) and there is no current leakage (I1 - I2 - I3 = 0)  
• Only 3-phase measures (Power and Energies) are meaningful.

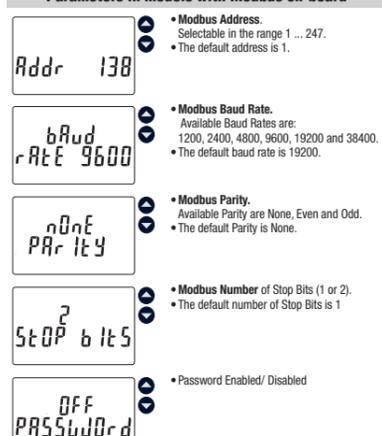
**Parameters List**



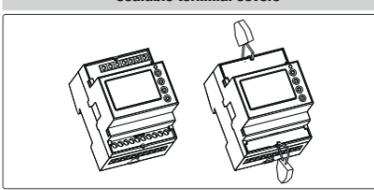
**Parameters in SO model**



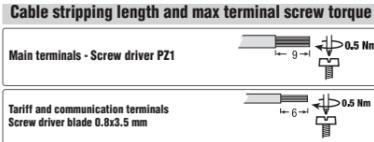
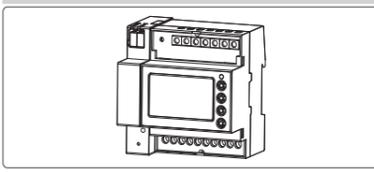
**Parameters in models with Modbus on-board**



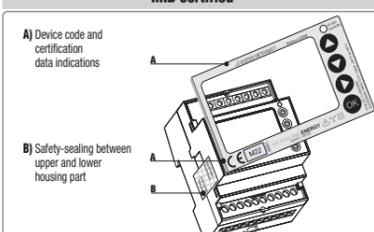
**Sealable terminal covers**



**Connectable IR Communication Modules**



**MID certified**



**Applications**

Please read this important information!  
**Intended Use / Use for Intended Purpose**  
The instrument is a digital multifunctional energy meter certified in accordance with MID. Integrated 4-quadrant measurement permits measurement of energy import and export.  
Thanks to MID certification, acquired data (display) can also be used for the purpose of billing energy costs to third parties.  
Via integrated communication interfaces, the values are also forwarded to superordinate management systems. Protection against tampering is provided through adequate measures (tamper-proof cover).  
Safety of the operator, as well as that of the instrument, is only assured when it's used for its intended purpose

**Use for Other than Intended Purpose**

Using the instrument for any purposes other than those described in the product documentation is contrary to use for intended purpose.

**Liability and Guarantee**

Gossen Metrawatt GmbH assumes no liability for property damage, personal injury or consequential damage resulting from improper or incorrect use of the product, in particular due to failure to observe the product documentation. Furthermore, all guarantee claims are rendered null and void in such cases. Nor does Gossen Metrawatt GmbH accept any liability for data loss.

**Scope of Delivery**

- 3 instrument (U289A) - (U289B) - (U289C)
- 1 operating instructions

**Safety Instructions**

Read and follow these instructions carefully and completely in order to ensure safe and proper use. Keep for future reference.



**Life endangering due to electric arcs!**

- Touching voltage conducting components is life endangering!
- The installation and any work performed on the instrument may only be carried out by a qualified electrician.
- Observe and comply with all safety regulations which are applicable for your work environment.
- Wear suitable and appropriate personal protective equipment (PPE) whenever working with the instrument.
- During installation, the installation environment must be voltage-free. For that, observe the five safety rules in accordance with DIN VDE 0105-100.

**ATTENTION**

**Faulty installation & incorrect operation**

- Faulty installation/incorrect operation can damage your instrument/system. Risk of malfunctions and disruptions
- Comply with the specified technical data and conditions
- Do not install the instrument in potentially explosive atmospheres.
- Do not install the instrument in locations where it may be exposed to direct sunlight.
- Install and operate the instrument only if it and all connection cables and leads are in good working order and damage-free. Inspect the instrument at regular intervals.
- If the instrument doesn't function flawlessly, permanently remove it from operation and secure it against inadvertent use.

## Symbols on the Instrument

European conformity marking



Double insulation (protection category II)



CE and metrology mark with indication of year (M22) and registration number of the notified body for module D, country-specific calibration validity period

CE M 22 0051398 / MID

## Standards, Regulations and Directives

– DIN 43880  
– EN 50470-1  
– EN 50470-3  
– EN 60715  
– EN 62053-31  
– IEC 62053-23

## Transport &amp; Storage

Transport and store the instrument only within the limits of permissible ambient conditions. Also use suitable packaging in order to ensure adequate protection against environmental influences and mechanical stress.

## Maintenance

The instrument is maintenance-free. Keep outside surfaces clean.  
Clean the instrument only with a dry cloth.

## Recalibration

Comply with national recalibration regulations and laws. The calibration period in Germany is 8 years.  
A broken manufacturer's seal means equals invalidated calibration. The instrument must not be used for billing purposes.

## Repairs &amp; Manufacturer's Guarantee

If your instrument requires repair, please contact our service department; see Support & Contact.  
Unauthorized modification of the instrument is prohibited. This also includes opening the meter.  
If it can be ascertained that the instrument has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages. If the manufacturer's seal is damaged or removed, all guarantee claims are rendered null and void.  
The instruments are guaranteed for a period of 2 years after shipment. The manufacturer's guarantee covers materials and workmanship. Damage resulting from use for any other than the intended purpose or operating errors, as well as any and all consequential damage, are excluded.

## Disposal &amp; Environmental Protection



- The following comments refer specifically to the legal situation in the Federal Republic of Germany. Owners or end users who are subject to other national requirements are required to comply with the respectively applicable national requirements and to implement them correctly on site
- The symbol on the left depicting a crossed-out garbage can on wheels refers to the legal obligation of the owner or end user (German electrical and electronic equipment act ElektroG and German battery act BattG) not to dispose of used electrical equipment and batteries with unsorted municipal waste ("household trash").
- Old devices, electrical or electronic accessories and waste batteries (including rechargeable batteries) used in Germany can be returned free of charge to Gossen Metrawatt GmbH or the service provider responsible for their disposal. Further information can be found on our website.

## Support and Contact

Please contact us at  
+49 911 8602-0  
Monday – Thursday: 08:00 Uhr – 16:00 Uhr  
Friday: 08:00 Uhr – 14:00 Uhr  
support.industrie@gossenmetrawatt.com

Please contact GMC-I Service GmbH for repairs, replacement parts and calibration:  
+49 911 817718-0  
service@gossenmetrawatt.com  
www.gmci-service.com

## CE Declaration

The device fulfills all requirements of applicable EU directives and national regulations.  
We confirm this with the CE mark.  
The CE declaration is available on our website:  
<https://www.gmci-instruments.de/en/services/download-center/download-center/>

**GOSSEN METRAWATT**

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## Technical Data

Data in compliance with CLC/TR 50579 , EN 62059-32-1, EN 50470-1, EN 50470-3		CT connected Pulse output S0	CT connected built-in communication Modbus / M-Bus
<b>General characteristics</b>			
• Housing	DIN 43880	DIN	4 modules
• Mounting	EN 60715	35 mm	DIN rail
• Depth		mm	70
• Weight		g	335
<b>Operating features</b>			
• Connectivity	to three-phase network	n° wires	4
• Storage of energy values and configuration	internal FLASH memory	-	yes
• Display tariffs identifier	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
		A	50
		A	3 (4)
• Reference Frequency (fn)		A	50
• Number of phases (number of wires)		A	3 (4)
• Certified Measures		kWh	→ kWh, ← kWh
• 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	800
	1 second; phase/N	VAC	300
	continuous	A	6
	Temporary (0.5 s)	A	120
• Current		A	120
<b>Measuring Features</b>			
• Voltage range	phase/phase	VAC	160 ... 480
	phase/N	VAC	92 ... 276
		A	0.002 ... 6
• Current range (secondary winding)		A	0.002 ... 6
• Frequency range		Hz	45 ... 65
• Measured Quantities		-	kWh
<b>Display features</b>			
• Phase sequence error indication		-	PHASE Err
• Display type	LCD backlightet	n° digits	3x4 digits-9 digits (Energy)
	digit dimensions	mm x mm	6.00 x 3
• Active energy: 1 display, 9 digit - 2 tariffs + display import or export (arrow)		kWh	0.01 / 9999999.9
• Working tariff indications	1-digit	-	T1 or T2
• Display refresh period		s	1
<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	class	V0
• Safety-sealing between upper and lower housing part		yes	yes
<b>Pulse Outputs (S0 signals)</b>			
• Pulse Output 1	acc. to IEC 62053-3	-	kWh (T1) →, kWh →, kWh →
• Pulse Output 2	adjustable	-	kWh (T2) →, kWh ←, kvarh →
• Pulse Rate	adjustable	p/kWh	1 ... N (+)
			(+) N - dep. on CT-ratio and Pulse on Time
• Pulse ON-time	adjustable	ms	30 ... 100
• Operating Voltage	Min - Max	VAC (VDC)	3 ... 28 VAC (5 ... 39 VDC)
• Pulse ON maximum current		mA	90
• Pulse OFF leakage current		µA	1
• Isolation class		-	SELV circuit
<b>Embedded communication Modbus</b>			
• Physical interface	RS485 - 3 Wire	-	-
• 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>Embedded communication M-Bus</b>			
• Baud rate	adjustable	-	300-600-1200-2400
• Unit load		-	1
• Isolation class		-	SELV circuit
<b>Optical metrological LED</b>			
• Front mounted red LED (meter constant)	proportional to active imp/exp Energy	p/kWh	10.000
<b>IR Connectable Communication Modules</b>			
• For communication moduls connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX)		-	yes
<b>Connection terminals</b>			
• Screwdriver for mains terminals	head with Z +/-	POZIDRIV	PZ1
• Screwdriver for tariff and communication terminals	stuffed head	mm	0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max)	mm²	0 (4)
	stranded wire with sleeve min. (max)	mm²	0 (4)
• Terminal capacity for tariff and communication	solid wire min. (max)	mm²	0 (2.5)
	stranded wire with sleeve min. (max)	mm²	0 (2.5)
<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.

## Notes