



User Manual
Revision 2.001
English

Smart Energy Meter

OB737 0.5-10(100)A



Benefits and Main Features

- Three phase metering
- Standard DIN rail Format (DIN43880)
- EN50470-3 Class B.
- IEC62053-21
- Import & Export active energy
- Import & Export reactive energy
- Instant Volt, Amp, Power factor, Frequency, Active power, Reactive power, Apparent power
- Isolated pulse output and IR (DIN43864)
- LCD display, 6 integer 2 decimal
- Large clear backlight display
- Internal transformer
- Direct metering up to 100A
- Optional single-phase model
- RS485 communication port, Modbus protocol
- IR port
- Program by button on the nameplate
- Memory back-up (EEPROM)
- 7 DIN modules
- MID approval



- The meter is intended to be installed in a Mechanical Environment 'M1', with Shock and Vibrations of low significance, as per 2004/22/EC Directive and should be installed in Electromagnetic Environment 'E2', as per 2004/22/EC Directive.

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1. Safety notice

The smart energy meter OB737 series does not require special mechanical or electrical tools for its installation. Mounting position (with any angle of tilt) has no effect on the measurement functions of the meter.

Connection of the meter must be made according to applicable wiring diagram.

Incorrect connection of the meter to an electricity network causes major display problems and can also cause serious damage to the meter.

Before starting meter operation, it must be ensured the local conditions of the energy system are consistent with data on the nameplate of the meter.

Preferably use shielded cables for the RS485 connections.

Make sure that connecting cables are not damaged during installation of the meter not energized and free of non-mechanical stress.

Meter Installation or removal of the meter cover can only be carried out by qualified electricians who are familiar with the associated risks.

Capacitors in the meter may still be charged even if the meter is disconnected from all energy sources.

2. Content of delivery

Three phase electronic energy meter, installation instructions


ID setting

Baud rate setting

Password setting

3. Technical description

3.1 Performance criteria

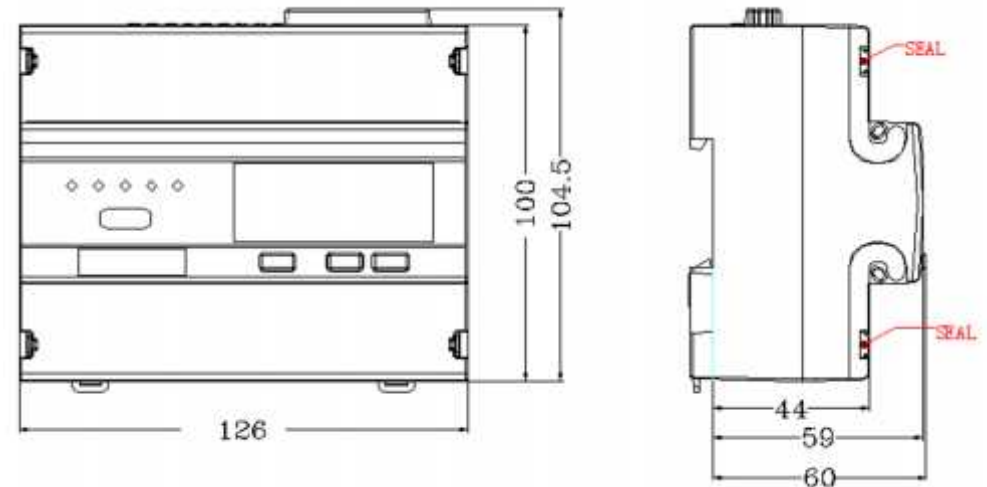
Operating humidity	≤ 75%
Storage humidity	≤ 95%
Limit range of operating temperature	-25°C - +55°C(3K6)
Limit range for storage temperature	-25°C - +55°C(1K4)
EN50470-3	75% yearly average,95% on 30 days/year
International standard	EN50470-3 & IEC62053-21
Accuracy class	Class B
Protection against penetration of dust and water	IP51
Insulating encased meter protective class	
Connection area main terminals	
Current terminals flexible 1×mm ²	0-16mm ²
Another terminal flexible 1×mm ²	0-2.5mm ²

3.2 Meter specification

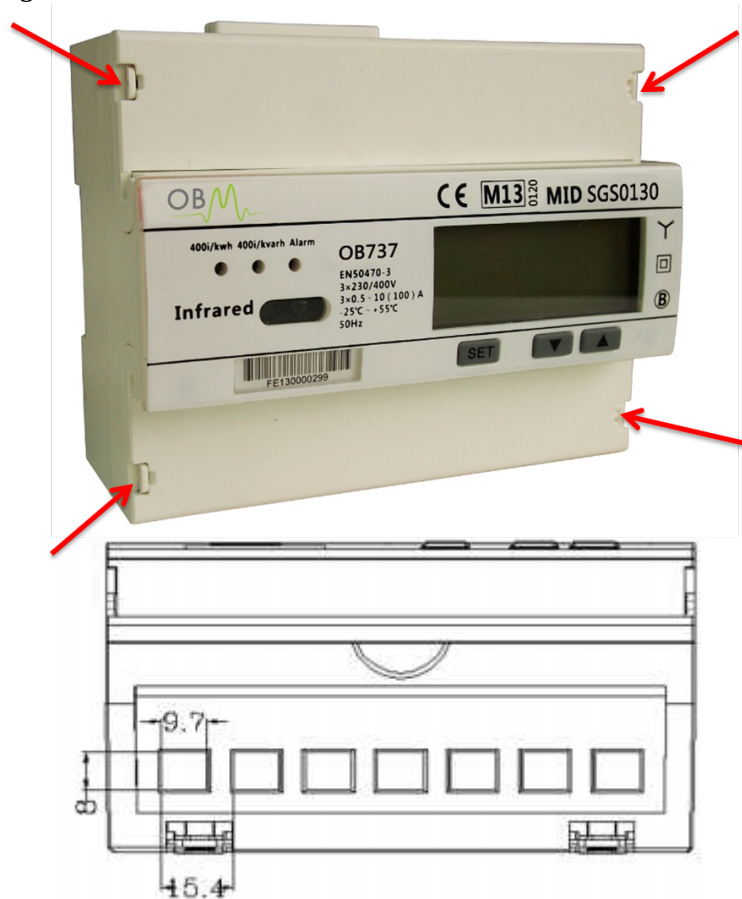
	Direct connected meters
Voltage(v)	3 × 230/400V
Operational voltage	±70%Un
Current(A)	
- Iref	10A
- Itr	1A
- Imax	100A
- Imin	0.5A
- Ist	40mA
Power consumption of current circuits(VA)	< 0.01
Power consumption of voltage circuits(W)	< 1.3W
General data	
Frequency (Hz)	50
Memory back-up	EEprom
Environment resistance to heat and fire	Terminal 960 °C Cover 650 °C
Upper	ABS+PC
Lower	ABS+PC
Pulse output	
Pulse width(ms)	80

Pulse constant(imp/kWh)	400
LED constant	400
Width (mm)	126
Height (mm)	104.5
Depth (mm)	60

4. Dimensions and sealing points

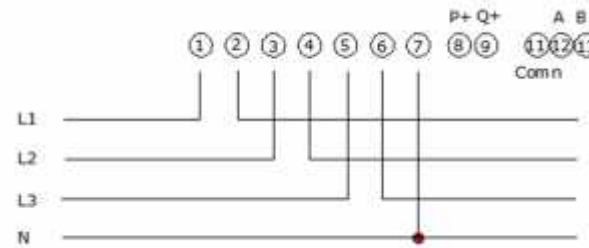


Sealing Points



5. Wiring diagrams

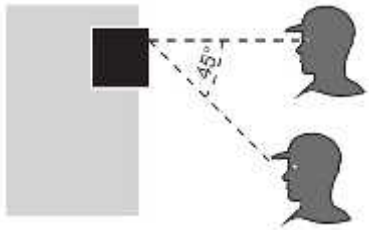
Note: the following types of wiring diagrams show the energy meter including terminals for pulse output and the RS485 communication interface.



- 1/2 L1 in & out
- 3/4 L2 in & out
- 5/6 L3 in & out
- 7 Neutral
- 8 & 11 Active test pulse output contact (11 — ,8+)
- 9 & 11 Reactive test pulse output contact (11 — ,9+)
- 12 & 13 RS485 communication contact (13 TX/RX(-), 12 TX/RX(+))

6. Meter reading

The Operators viewing angle should be 45°



7. Main functions

a) Measurement Functions

On the OB737'S front panel, there are three LED, active/reactive energy pulse lights, and alarm indicator lights.

The Meter can measure import & export active energy, import & export reactive energy. The measurement types can be set.

7.2 Display function

This Smart meter has two display cycles: Auto cycle & manual cycle via buttons.

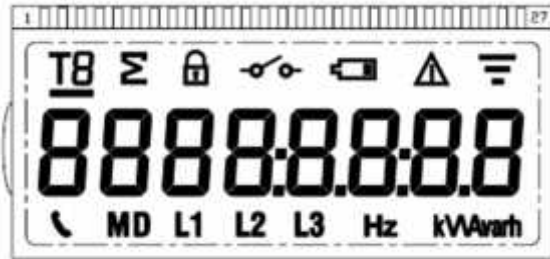
When pressing the button, User can set parameters accordingly.

Pressing the buttons will illuminate the LCD. Display cycle can be set within 5~20 seconds, the default is 5 seconds. The display items are as follows:

Code	Display item	Code	Display item
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0010	UL1	0110	QL1	FF18
0012	UL2	0112	QL2	
0014	UL3	0114	QL3	
004E	Frequency	0116	ΣQ	
0050	IL1	0150	PFL1	
0052	IL2	0152	PFL2	
0054	IL3	0154	PFL3	
0056	In	0156	ΣPF	
0090	PL1	0524	Modbus id	
0092	PL2	0525	RS485 Baud rate	
0094	PL3	0A00	Import Reactive Energy	
0096	ΣP	0B00	Export Reactive Energy	
00D0	SL1	0700	Total Active energy	
00D2	SL2	0800	Import active energy	
00D4	SL3	0900	Export active energy	
00D6	ΣS	FF00	High byte of serial number	
Code	Display item	Code	Display item	
FF01	Low byte of serial number	FF09	Meter's constant	

LCD contents



Description of LCD symbols displayed

Symbol	Description
kVVarh	kWh—active energy kW—active power kvarh—reactive energy kvar—reactive power kVA—apparent power
M	Total
🔒	Unpermitted programming
⚠️	LCD alarm indicator
📞	Communication symbols

7.3 electricity parameters measurement and monitoring

Measure record and display voltage, current, power and power factors. error is not more than $\pm 1\%$.

7.4 Communication Function


With Infrared COM & RS485 COM. Its physical layers are independent of each other. One communication channel will not be affected by the other one. The meter can realize data acquisition, broadcast time setting, read, program and management through hand-held terminals, data acquisition terminal, test equipments and computers.

Communication protocols fit Modbus RTU standard.

RS485 circuit and energy meter internal circuit can realize electrical isolation and failure protection of circuit.

RS485 communications transfer rates allow selected at 1200bps, 2400bps, 4800 bps and 9600bps, default is 2400bps.

7.5 Alarm function

When the meter is wire incorrectly, example: current reverse, lost phase and reversed phase sequence, the meter will display , and the ALARM led will be on.

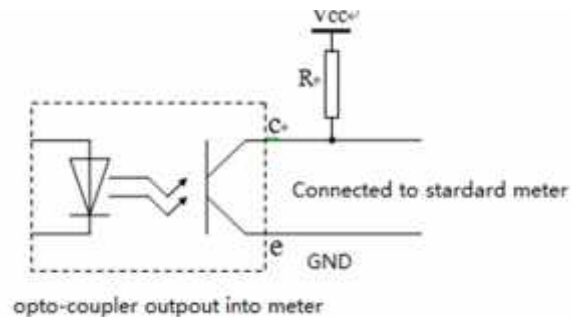
7.6 Pulse output function

This Smart meter is equipped with a pulse output which is fully separated from the live circuits. That generates pulses in proportion to the measured energy including the testing pulse output of active energy and reactive energy.

8/ 11 Test pulse output contact (P+/P-), 9/ 11 Test pulse output contact (Q+/Q-)

The test pulse output is a polarity dependant, passive transistor output requiring from an external voltage source for correct operation. For this external voltage source, the voltage (Ui) should be 5-27V DC, and the maximum input current (Imax) should be 27mA DC.

To connect the impulse output, connect 5-27V DC to connector 8&9 (anode), and the signal wire (S) to connector 11 (cathode). The meter pulse is indicated on the front panel.



8 Programming

By holding the “SET” key pressed for at least 3 sec., starts menu programming mode. LCD will show:



8.1 password verify

On the smart meter display will appear: PA followed by the currently memorized value. “PA” means “Password”; “0000” means the 4 digits of the Password. we can use press “Page Down” button to decrease the input value, and press “Page Up” to increase the input value, press the “SET” button to switch the input Password digits, when the Password is correct, the meter will enter “program status” and display the “ID” program interface.

Remarks:

Please remember the Password, Password default (8888).

8.2 ID setting

After the Password authentication, the meter will display the “ID XX” setup interface. As the following picture “Id 00” it means the current ID address is 00 (the ID address is hex code)



Press “Page Down” button to decrease the digits. press “Page Up” to increase the digits, press “SET” button to save the setup, the interface will switch to Baud rate setup interface automatically. Press “SET” button to enter next interface if you do not need to change the baud rate.

8.3 Baud rate setting



we can use press “Page Down” button to decrease the input value, and press “Page Up” to increase the input value ,press the “SET” button to switch the input digits, when the baud rate is correct, the meter will enter “program status” and display the “CT” programing interface.

Remarks:

1. Default baud rate will be 2400bps
2. 1200/2400bps /4800bps/9600bps can be set

8.4 Password settings:



The meter will display the current password after enter the password setup interface; press the “SET” to change the password. Use “page down” and “page up” button to input password as you want. After 30 seconds the meter will save the password you changed.

Remarks:

- 1 **Do not forget the password you setup.**
- 2 Please press the button to check programming is correct after installation.
- 3 Password setup interface “-” symbol will blink.

The management system of

Owen Brothers Metering UK Limited

Unit 6 Glen Trading Estate, Wellyhole Street,
Oldham, OL4 3BF, United Kingdom

has been assessed and certified as meeting the requirements of

Directive 2004/22/EC

Annex D

For the following activities

Manufacture of electricity meters listed below

Model Number	Instrument Traceable Number
OB400+	0120/SGS0111
OB100+	TCM221/12/4959
OB737	0120/SGS0130

This certificate is valid from 10 October 2013 until 11 July 2016 and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 04 July 2016
Issue 2. Certified since 11 July 2013

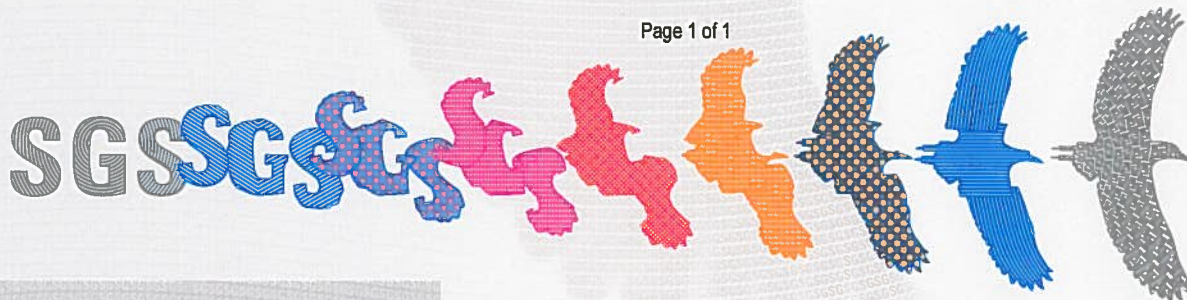
Authorised by

SGS United Kingdom Limited, Notified Body 0120

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SGS CE 03 0311

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EC Type Examination Certificate Number: **0120/SGS0130**

Owen Brothers Metering UK Ltd

Unit 6 Glen Trading Estate
Wellyhole Street
Oldham
OL4 3BF

Instrument Identification:
OB737

Instrument Traceable Number
0120/SGS0130

Poly Phase, Active Import/ Export, Indoor, Electricity Meter

has been assessed and certified as meeting the requirements of

EC Directive 2004/22/EC **Measuring Instruments Annex B**

It is certified that the manufacturer's technical design and specimen for the above instrument has been examined and, based on the evidence submitted, it is considered that the instrument conforms to the requirements of MI-003 of EC Directive 2004/22/EC

This certificate must be used in conjunction with a certificate covering the product verification as required in Annex D or Annex F.

This certificate is valid for 10 years from 6th June 2013 to 5th June 2023
Issue 1

Certification is based on report number(s) SHES130300061001 dated 3rd June 2013


Authorised Signature

Jan Saunders




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	EC-Type Examination Certificate Number:	
	0120/ SGS0130	
	Issue Number: 1	Dated: 12 th August 2013


1. Technical Data

Manufacturer	Owen Brothers Metering UK Ltd
Meter Type	OB737
Voltage Rating (U_n)	3x230/400V
Current Rating ($I_{min} - I_{ref} (I_{max})$)	0.5-10(100)A
Frequency (F_n)	50Hz
Active Accuracy Class (kWh)	A or B (kWh)
Type of circuit	3p4w
Temperature Range	-25°C to +55°C
Software Version No.	0737.00.03
Identification Location	LCD
Bill Of Materials No.'s	FQ-JS-001-007
IP Rating	IP51
Insulation Protective Class	Class II
LED Pulse Constant	400 imp/ kWh
Impulse Voltage Rating	6kV
AC Voltage Rating	4kV
Main Cover Sealing Type	4 x Wire & Crimp
Integrity of meter	Inaccessible without breaking seals
Intended Location of the Meter	Indoor
Type of Register	LCD
Terminal Arrangement(s)	BS

	EC-Type Examination Certificate Number:	
	0120/ SGS0130	
	Issue Number: 1	Dated: 12 th August 2013

2. Photograph of Meter and Sealing Plan



	EC-Type Examination Certificate Number:	
	0120/ SGS0130	
	Issue Number: 1	Dated: 12 th August 2013

3. Influence factors for temperature, frequency and voltage


Influence Factors for temperature, frequency and voltage							
Current	PF Cos	-25	-10	5	30	40	55
I _{min}	1.0	0.00	0.10	0.01	0.01	0.21	0.02
I _{tr}	1.0	0.03	0.08	0.02	0.01	0.10	0.02
10I _{tr}	1.0	0.11	0.10	0.02	0.21	0.21	0.20
I _{max}	1.0	0.18	0.17	0.02	0.02	0.07	0.06
I _{tr}	0.5ind	0.01	0.08	0.09	0.06	0.18	0.32
10I _{tr}	0.5ind	0.04	0.07	0.02	0.19	0.04	0.01
I _{max}	0.5ind	0.27	0.24	0.26	0.25	0.34	0.24
I _{tr}	0.8cap	0.02	0.03	0.17	0.02	0.17	0.27
10I _{tr}	0.8cap	0.05	0.05	0.02	0.19	0.04	0.11
I _{max}	0.8cap	0.04	0.04	0.31	0.04	0.04	0.05

During the type approval examination the influence factors for temperature, frequency and voltage are determined per load point. The table below presents the sum of the square values per load, determined via the following formula:-

$$\delta e(T, U, f) = \sqrt{(\delta e^2(T, I, \cos\phi) + \delta e^2(U, I, \cos\phi) + \delta e^2(f, I, \cos\phi))}$$

where

$\delta e(T, I, \cos\phi) =$ Additional error due to variation of the temperature at the same load
 $\delta e(U, I, \cos\phi) =$ Additional error due to variation of the voltage at the same load
 $\delta e(f, I, \cos\phi) =$ Additional error due to variation of the frequency at the same load

	EC-Type Examination Certificate Number:	
	0120/ SGS0130	
	Issue Number: 1	Dated: 12 th August 2013

4. Annex of Variants

Product Variant Identification Details:

Type Designation	Description of meter
OB737 0,5-10(100)A – Poly Phase, Active Import/Export kWh, Multifunction, Electricity Meter	

Modifications to the meter(s) described according to approval No. **0120/SGS0130** must be notified to the issuing body to confirm the meter(s) continuing compliance to the relevant pattern approval standard(s).

5. Document Revision History

Issue	Date	Comments
1	12/08/2013	Initial Issue