USER MANUAL

Polyphase, multi-rate, Credit meter with pulse output and auxiliary relay

TYPE: REP3DR
5192F

Document No: CSD083

Date: 01/02/00

Issue: 1

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Introduction

Purpose

This manual covers the Operation and Installation Instructions for the Polyphase, Multi-Rate Credit Meter with Pulse Output and Auxiliary Relay.

Definitions

BS: British Standard
IEC: International Electro technical Commission
SI: Statutory Instruments
KWh: Kilo Watt Hours
RTC: Real Time Clock
LCD: Liquid Crystal Display
LED: Light Emitting Diode
HHU: Hand-Held Unit
CMI: Common Modular Interface
mS: Milli-Second

References

1. IEC1036: 1996:	Alternating current static watt-hour meters for active energy. (Classes 1 & 2)
2. BS5685: 1979: Part 1:	Specification class 0.5, 1.0 and 2.0 Single phase and Polyphase, single rate and multi-rate watt-hour meters.
3. IEC1268: 1996:	Alternating current static var-hour meters for reactive energy. (Classes 2 & 3)
4. IEC1038: 1993:	Time switches for tariff and load control.
5. IEC1107:	Data Exchange for Meter Reading, Tariff and Load Control. Direct Local Exchange.
6. SI1566: 1998:	The Meters (Certification) Regulations 1998;

Meter Overview

The meter is a whole current credit meter, capable of measuring kWh and kVArh type approved to IEC1036: 1996 class 1.0 for kWh and IEC1268: 1996 class 2.0 for kVArh. The Meter has 3 measuring elements capable of being configured as 3 phase 4 wire, 3 phase 3 wire, 2 wires of 3 phases, 1 wire of 2 phases or single phase of 3 wires. There are 8 kWh registers and 8 kVArh registers controlled by up to 16 time switches using internal RTC. A LCD display's all the meter's data and phase condition.

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Operational Requirements

Measurement

The Meter is a 220 / 380 Vac - 240 / 415 Vac per phase, 50 Hz, 20 - 120 Amp Polyphase Credit Meter. It contains 3 independent measuring elements allowing consumed energy to be measured in up to 4 wires. The meter measures and registers kWh to class 1.0 accuracy and kVArh to class 2.0 accuracy. There are 2 red LED's mounted on the front panel of the meter, pulsing at a rate of 1,000 pulses per kWh and kVArh measured in all 3 elements for energy registration.

Total kWh Register

The total kWhs measured are stored internally to 3 decimal places. The total kWhs are displayed on the meter to a maximum of 2 decimal places unless programmed via the Flag Port (see User Interfaces) to 3 decimal places for testing purposes.

- The Total kWh register range is 000000.000 - 999999.999 kWh

Total kVArh Register

The total kVArhs measured are stored internally to 3 decimal places. The total kVArhs are displayed on the meter to a maximum of 2 decimal places unless programmed via the Flag Port (see User Interfaces) to 3 decimal places for testing purposes.

- The Total kVArh register range is 000000.000 - 999999.999 kVArh

Rate 1 - 8 kWh Registers

The energy measured at any particular rate is stored internally to 3 decimal places, but only displayed to a maximum of 2 decimal places.

- The Rate kWh register range is 000000.000 - 999999.999 kWh

Rate 1 - 8 kVArh Registers

The energy measured at any particular rate is stored internally to 3 decimal places, but only displayed to a maximum of 2 decimal places.

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- The Rate kVArh register range is 000000.000 - 999999.999 kVArh

Reverse Energy

Reverse Energy is detected if export energy greater than 10 amps is measured for more than 10 seconds on any one of the 3 phases. If reverse energy is detected, the display alternates between a Reverse Energy Detected (RED) message and the default display.

Reverse Energy Register

The reverse kWhs consumed by the meter are stored internally to 3 decimal places, but only displayed to a maximum of 2 decimal places.

- The Reverse kWh register range is 000000.000 - 999999.999 kWh

Real Time Clock

The meter incorporates a RTC for internal time switching. The RTC offers full, time, day, month, year and leap year correction facilities. The clock runs on a 32Khz crystal providing a one second time base and low power consumption and is accurate to 2 minutes per year. In the event of a power failure a 3-volt battery maintains the clock. The battery will last for 3 years under continuous use, when the meter is running on the mains supply, the clock runs on the 5 volt supply.

Meter Memory

All the meters data is recorded in a Ferro-electric Random Access Memory (FRAM) under the control of the microprocessor. All the kWh registers are stored in the FRAM and are updated every 1/100th of a kWh. The FRAM is guaranteed for a minimum of 10,000,000,000 write cycles.

Anticreep

Below starting current, the meter enters into an Anticreep mode. In this state the meter registration LED's are permanently lit and the registers do not increment. The LED's remains lit until the meter current is increased in either the forward or reverse direction beyond the starting current.

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Phase Indication

The LCD gives phase indication using the legends 1,2,3 on the bottom of the display. Phase failure is indicated by non-illumination of corresponding legend.

User Interfaces

Pulse Output

The meter has an optically isolated, voltage free open collector Pulse Output that is factory configured to:-

Pulse Output:	1 pulse per kWh.
Pulse Duration:	100 mS.

Optical Interface

In situations where the pulses are to be collected and measured by a BMS system it is possible to reconfigure the **pulse duration** & **pulses/kWh** through the IEC 1107 port. **Software** and **Data Probes** for this purpose are available from your supplier.

Inductive Serial Data Port

The meter incorporates an Inductive Serial Data Port that will transmit all the information within the meter through the meter case. The data transmitted is generally in accordance with the CMI specification and can be received by any module fitted with a suitable receiver placed adjacent to the transmitter outside the case. (There is no physical connection)

Auxiliary Relay

The meter has a pair of voltage free connections for controlling secondary circuits such as central heating. The current rating of the connection is 2 amps, which must not be exceeded.

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Installation

Wiring

As per the wiring diagram shown in figure 1. Terminal arrangement conforms to BS5685, Part1, 1979.

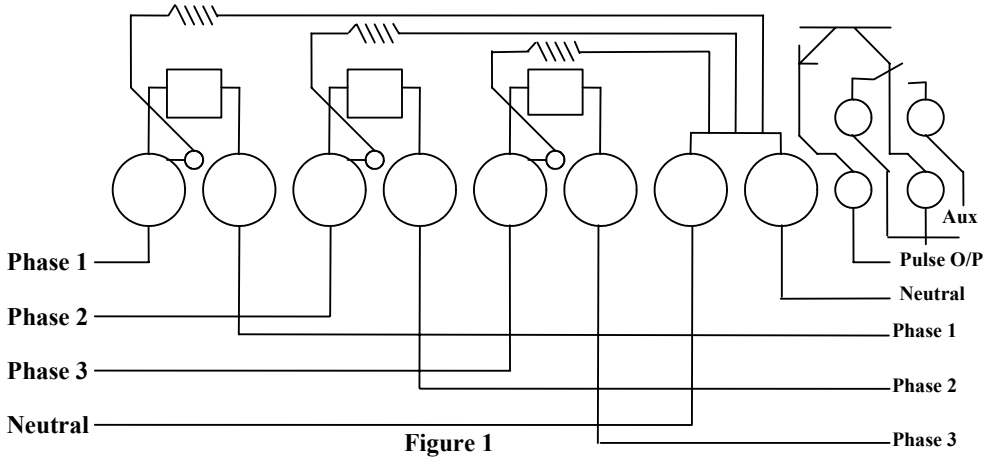

Figure 1

Technical Summary

System Voltage: -	Three element meters	240Vac Phase to Neutral 230Vac Phase to Neutral 220Vac Phase to Neutral
	Supply variation	+15% to -20%
Current: -	Direct connection	20 - 120A Ib/Imax
Burdens: -	Voltage Circuit @ 230Vac<2W <10VA Current Circuit @ Ib<0.5VA @ Imax<1VA	
Supply Frequency: -	Nominal Frequency Variation	50Hz +/- 5%
Pulse Output: -	Meets IEC62053-31: 1998, Class B	
Auxiliary Relay: -	Max Current Max Voltage	5 Amps 240 Vac
Temperature Range: -	Limit operating range Storage range	-20°C to 55°C -25°C to 70°C
Dimensions (mm):	Standard Terminal Cover H 172 x W 168 x D 57 Extended Terminal Cover H 207 x W 168 x D 57	