Electricity Prepayment Meters

Cashpower Gem Lite

Technical Specification Sheet

The Cashpower Gem Lite is a single phase, two wire, 80 Amp, STS keypad prepayment meter in a compact British Standard housing,

The meter has specifically been developed to provide utilities with a quality, low cost, highly reliable STS keypad prepayment metering solution, while maintaining conformance to internationally standards such as IEC62055-31.

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Overview

The Cashpower Gem Lite is a compact single phase, two wire, 80 Amp, STS keypad prepayment meter in a British Standard (BS) housing.

The meter is suitable for new installations or retrofitting of existing bottom connected electromechanical or electronic watt-hour meters.

The meter is easy to install and boasts an easy to read, language independent Liquid Crystal Display (LCD) and a wide range of information registers which can be easily accessed by pressing the information button on the keypad and then entering the number of the register. (Refer to the User Guide for more information.)

The meter operates on Landis+Gyr's version 12.3 meter firmware, and therefore provides only for STS prepayment functionality mode.

Features

- Single phase, two wire, keypad prepayment meter
- Proven Cashpower keypad technology
- Maximum current: 80 Amps
- Compact meter in BS format
- Meter fitted with LCD and a keypad
- Clear language independent icons on the display and membrane of the meter
- Clear load switch status indicator
- Scrolling display for 11 digit STS meter serial number
- Displays last 50 vouchers entered. (Displays the 20 digit STS voucher and the date and time of the voucher)
- Mechanically sealed against tampering
- Significant Reverse Energy detection
- Programmable software power limit
- Advanced decommissioning and commissioning feature for easy installation process
- Tamper detection facility
- Meter enclosure manufactured with UV stable, flame-retardant plastic material
- Degree of protection, IP54
- Improved sealing against ingress of insects
- Supports short codes (refer to user guide)
- Conforms to IEC62055-31
- Exceeds IEC62055-31 requirements for voltage Impulse withstand
- Fully STS compliant (IEC62055-41/51)

Tamper Detection Facility

Cashpower Gem Lite is mechanically sealed against tampering through the use of a factory-sealed screw plug on the rear panel and a utility-sealed wire seal on the front of the meter. The use of these mechanical seals ensures that there are visible signs of tampering if unauthorised entry to the system is attempted.

In addition, the meter is equipped with a tamper sensor that will automatically disconnect the power to the load in the event of tampering.

The meter includes a Significant Reverse Energy (SRE) detection feature. If the line and load wires are swapped during installation, the meter will continue to operate and decrement credit, however, the meter can be factory-programmed to tamper and disconnect the load should SRE be detected.

Virtual Token Carrier (VTC) port

The Gem Lite is fitted with an industry standard VTC port at the rear of the meter. While this port is typically used to program the meter during the manufacturing process, it can also be used to extract vital meter information, such as remaining credit.

Surge Immunity

The meter exceeds the IEC62055-31 Voltage Impulse Withstand of 4kV.

Cashpower Gem Lite Technical specifications

General Information

Meter Format
Single phase, 2 wire (Line1, N, N, Load1) directly connected keypad prepayment meter

Meter Type Variants

Single Phase, 2 Wire	230V, 50 Hz
Single Phase, 2 Wire	220V, 50 Hz
Single Phase, 2 Wire	120V, 60 Hz

Operation

General
Prepayment Mode only

Credit Entry Mechanism
20 digit STS encrypted numbers, via the keypad of the meter

Token Encryption Mechanism
20 digit STS[1] according to IEC62055-41

Electrical Ratings

Nominal Voltage (U_n) – Rated Voltage
Refer to “Meter Type Variants”

Nominal Frequency
50 Hz and 60 Hz variants available

Operating Voltage Range
80% to 120% of U_n

Maximum Continuous Current (I_{max})
80 Amps (programmable to lower power limits)

Burden

Voltage circuit	<1.5W / <10VA @ 230V, 50Hz
Current circuit	<2.5 VA @ I_b=10A

Protective Class (according to IEC62052-11)
Class II (double insulated)

Disconnection Device

Type

1 (single pole) latching contactor	100 A

Terminals

Layout
According to British Standard, BS5685

Mains Terminals

Type	Double screw (M6) moving cage terminal
Material	Mild Steel, yellow passivated
Maximum cable size	25mm^2

Terminal Block Material
UV Stable Polycarbonate with flame-retardant

Resistance to heat & fire
Complies with 960°C glow wire (IEC60695-2-1)

Resistance to spread of fire
UL94-V0 rated @ 1.5mm. No toxic gases emitted: “Green Material”

Main Enclosure

Enclosure Details

Type	Bottom connected according to BS5685

Enclosure Material
UV Stable Polycarbonate with flame-retardant

Resistance to heat & fire
Complies with 960°C glow wire (IEC60695-2-1)

Resistance to spread of fire
UL94-V0 rated @ 1.5mm. No toxic gases emitted: “Green Material”

Rating

Degree of protection	IP54 (IEC60529)

Mounting Arrangements
Two mounting screws at the bottom (spacing according to BS5685). Top mounting bracket available as an option

Sealing

Terminal cover	1 sealing screw
Meter enclosure	Factory sealed with screw sealing plugs inserted at the time of manufacture

[1] STS = Standard Transfer Specification (Industry standard according to IEC62055-41)

Weight and Dimensions

Weight

Approximately	536 grams

External Dimensions

Width	122 mm
Height (with long terminal cover)	168.5 mm
Depth	68 mm

Metrological Performance

Measurement Direction

Forward and reverse power detection and metering[2] (credit is decremented in both directions)

Metrological (General)

Meter constant (LED Flash rate)	1000 pulses/kWh
Basic reference current (I_b)	10A
Accurate metering range	$0.05I_b$ to $1.25I_{max}$[3]
Starting current (Class 2)	$0.005\ I_b$[4]
Accuracy Class Index	Class1 & Class2 available
Maximum error	$\leq \pm 2\%$ (Cl 2) and $\leq \pm 1\%$ (Cl 1)[5]

Power Threshold (Creep)

Out of threshold	9.2W (approx 40mA @230V)[6]
Into threshold	6.4W (approx 28mA @230V)

Insulation and Overvoltage

Insulation & Overvoltage

Insulation system classification	Protective Class II[7]
Insulation level	4kV for 1 minute
Overvoltage withstand	440Vac for 48 hours 600Vdc for 1 minute

Surge Immunity

Voltage Impulse Withstand

Differential In excess of 6kV, 1.2/50µS, with 2Ω source impedance (according to SANS1524-1)

Current Impulse Withstand

Service Rating	5kA 8/20µS[8]
Withstand Rating	30kA 4/10µS[9]

[2] Will accurately measure energy if Line and Load are reversed.

[3] The meter is accurate within specified limits. Should a meter be momentarily operated outside its specified maximum current rating, it will meter up to 1.25 I_{max}

[4] For Class 1 meter, starting current = $0.004I_b$)

[5] Over range 0.1 I_b to I_{max}; $0.5 \leq \text{Cos}(\varphi) \leq 1.0$ (lead or lag)

[6] At Cos φ = 1. The power threshold represents the minimum load power that the meter will register. The value is programmable, with the recommended level for a base 10A meter. Values shown are for Class 2 metering only

[7] According to IEC 62052-11

[8] With optional surge arrestor fitted externally

Specification Compliance

SABS1524-1, IEC 62052-11

Electromagnetic Compatibility (EMC)

General EMC

Radio Interference	Complies with CISPR22
Immunity to fast transient bursts	4kV
Electrostatic discharge	15kV air discharge

Immunity to HF Fields

80Mhz to 2Ghz @10V/m with load, 80Mhz to 2Ghz @30V/m no load

Specification Compliance

IEC 6100-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-6, CISPR 22

Operating Environment

Area of application	Indoor Meter
Operating temperature range	-10°C to +55°C
Storage temperature range	-25°C to +70°C
Relative humidity	Max ≤95%; Annual mean 75%

Man-Machine Interface

Type

Language independent

Components

Pictographic / numeric LCD display, keypad, LED Rate of consumption indicator, audio feedback for key press.

Liquid Crystal Display (LCD)

Size Area 5.5 mm^2 [39.6mm (W) x 14mm (H)]
LCD Icon information Happy face, Sad face, Switch open, Switch closed, Information icon, Watts, kWh, Alert Icon, 4 segment credit wedge.

Keypad

12-key international standard layout including “Information” and “Backspace” keys

Buzzer

Audio feedback on key-press

Rate of consumption Indicator

Visual Red, 1000 pulses per kWh[10]

[9] With optional surge arrestor fitted externally

[10] Can be used together with suitable test equipment, to verify meter’s accuracy

Diagnostic Information
Additional meter parameters accessible via the information key.

External Interfaces

Virtual Token Carrier (VTC) Port
Rear programming port according to Eskom DISCAAA9 and IEC62055-52

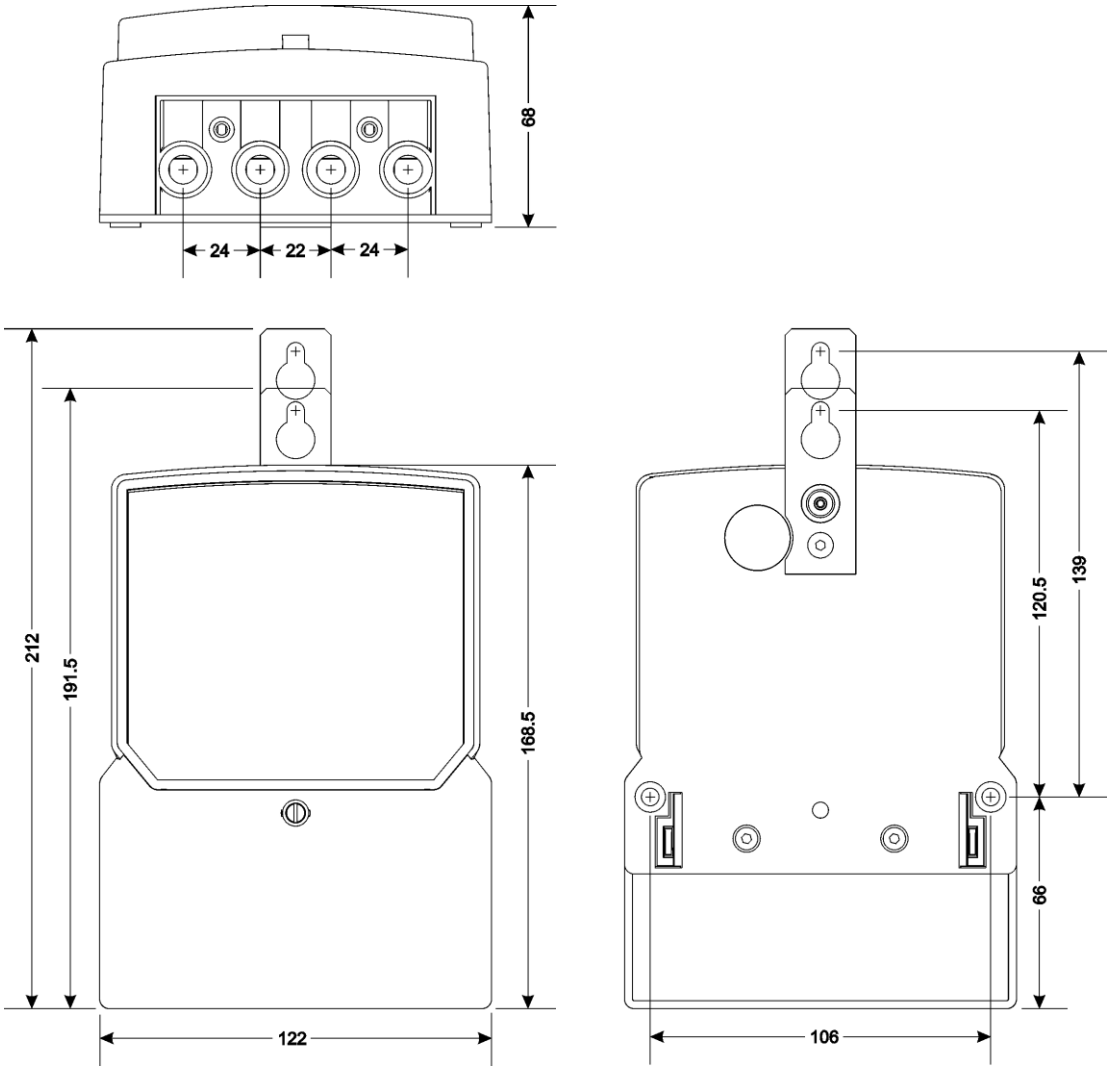
Specification Compliance & Approvals

IEC
IEC62055-31

STS
IEC62055-41/51

BS
Conforms to BS5685:1979

Cashpower Gem Lite Dimensions



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