Single phase import meters operating under export conditions – manufacturer poll.

Summary of responses received

December 2003

Summary

In October 2003, Ofgem undertook an exercise to poll industry representatives on the functionality of existing certified single phase electricity meters operating under export conditions (the original letter is annexed to this document). The attached document summarises the responses received as at 31 December 2003.

Comments on the document would be welcomed via email, to alistair.peat@ofgem.gov.uk .

1. What impact does reverse energy flow have on the meter's register (e.g. if the meter is mechanical in nature, does it have a back stop device to prevent the register decrementing)?

Manufacturer	Notes
Elster	Depends on the meter – all electromechanical meters are fitted with a backstop device. All electronic meters can be configured to deal with reverse energy flow. One in particular can be configured in an "Import/Export mode". All meters can be configured to an "Imp/Rev flagging mode" – in this configuration the meter stores reverse energy flow in a separate (non-TOU) register. The main import register does not decrement in this mode. All meters can be configured to "Power flow insensitive" mode. In this configuration the import register will increment irrespective of the direction of power flow. Reverse energy flow is also stored in a separate (non-Time Of Use) register.
PRI[1]	Reverse energy flow does not cause the import register to decrement.
ISKRA	There is no impact on the register under reverse flow conditions
KAMSTRUP	No currently certified single phase meters – one is pending pattern approval, but this meter will be subject to reverse energy flow testing.
Horstmann	Forward energy registers do not decrement if reverse energy is passed through the meter (for all Horstmann models).
Actaris	There is no impact on any of Actaris' certified meters' registers under reverse energy conditions.
Landis + Gyr	Ferraris meters: Most Ferraris meters registers will decrement under reverse energy conditions. However, many meters can be fitted with a "Reverse-running Stop Option". For those meters with this option, or those with built in back stop's there is some form of indication on the face plate (see response to Q2). Static meters: Reverse energy flow has no impact on import registers. However, some meters have a reverse energy register, which can be read with customised hardware.
Ampy	Reverse energy will not affect the operation of the import register. The register will stop at the point that forward energy is no longer being consumed.

[1] PRI only have one single phase product listed in Schedule 4– the Liberty Keypad Prepayment meter

2. Do your meters have any external indication that a backstop has been fitted and if so what is the indication (e.g. numbering, barcode or symbol)?

Manufacturer	Notes
Elster	For all electronic meters, a symbol is stamped on the nameplate to indicate if provision is made for dealing with reverse energy flow.
PRI	There is no external indication indicating the meter has a backstop.
ISKRA	Information not provided in response.
KAMSTRUP	No currently certified single phase meters – one is pending pattern approval, but this meter will be subject to reverse energy flow testing.
Horstmann	There is no external indication indicating the meter has a backstop.
Actaris	All of the electromechanical meters have the option of fitting backstops. Those meters fitted with a backstop are indicated by the symbol in BS EN 60387 10.5
Landis + Gyr	Ferraris Meters: For those meters with backstops fitted or the "Reverse-running Stop" option installed, there is some form of designation on the front face plate (either 'h' or '9'). Static Meters: N/A to static meters – no impact on import registers
Ampy	No mechanical meters produced.

3. Is there a flag to indicate reverse energy flow (e.g. an LED)? If so how is this flag reset?

Manufacturer	Notes
Elster	When the meter (A100) is configured to operate in "Import/Export" mode, export energy is a valid condition so no symbol appears. For other meters (and configurations), a symbol appears on the display if the export threshold of 5Wh is exceeded (in a single incident). These are reset by either cycling the power (in the A100 range – stored in volatile memory) or by issuing a FLAG command to the meters CPU (A120 and A140 meter – stored in non-volatile memory).
PRI	Commencement and cessation of reverse running can be reported as separate events in a file retrieved by a hand-held unit.
ISKRA	Information not provided in response.
KAMSTRUP	No currently certified single phase meters – one is pending pattern approval, but this meter will be subject to reverse energy flow testing.
Horstmann	There is an indicator on the LCD display to indicate that reverse energy flow has occurred. This can only be reset by communicating with the optical FLAG port.
Actaris	Those electromechanical meters with backstops do not have any reverse energy flag. Static electricity meters either flag reverse energy flow by a green LED or an indication on the LCD (red). LEDs are reset by resetting the power. Those with an indication on the LCD are reset via the meters Optical Comms port.
Landis + Gyr	Ferraris Meters: There is no flag on any Ferraris meters to indicate reverse energy flow has occurred. Static Meters: Most (but not all) static meters flag reverse energy flow. The majority of meters can be programmed to suppress the flags display. In some cases reverse energy flow is flagged by a green LED which is reset by power cycling or by operating a secure push button.
Ampy	If reverse energy is detected in Ampy meters above a defined current limit for a pre-determined period of time then a flag can be set (if the utility wishes to have the option enabled). This causes the display to alternate between the current tariff and an indicator message 'rEd' (reverse Energy detected). The resultant message can only be cleared via the optical port using specific software supplied to the utility by Ampy. During the period of reverse energy consumption the kWh LED will not flash but will remain in the on state. The LED will start to pulse again when forward energy is once again flowing through the meter.

4. Are there any other steps employed to deal with reverse energy flow (e.g. fraud prevention)?

Manufacturer	Notes
Elster	Different measures for different meters are provided to detect fraud. In some cases a count of reverse energy flow incidents is time recorded, and in other cases steps are employed to detect gross by passing.
PRI	The technology used is sufficiently flexible to support additional 'tamper detection' facilities.
ISKRA	Information not provided in response.
KAMSTRUP	No currently certified single phase meters – one is pending pattern approval, but this meter will be subject to reverse energy flow testing.
Horstmann	Reverse energy measured by the meter is stored in a Reverse Energy Register. In the case of Import/Export meters independent registers are used for import and export energy.
Actaris	No other steps to deal with reverse energy flow
Landis + Gyr	Ferraris Meters: In all Ferraris meters but one, there are no other steps to deal with reverse energy flow. In the case of the exception, the load is disconnected after a certain number of reverse revolutions. Static Meters: Most meters record reverse energy flow in a Reverse Energy Register – this register is normally hidden but can be read with associated customised hardware/software tools.
Ampy	In addition to part 4 the meter also contains a register of reverse energy that is stored internally to the meter. Data from this register can be retrieved with the aid of software via the optical flag port by the utility.

5. Are there any other implications on meter functionality of prolonged exposure to export energy conditions?

Manufacturer	Notes
Elster	No impact on all meters provided the maximum current rating is not exceeded. If the meter is not an export configured meter, the register storing reverse energy flow will eventually roll over.
PRI	Prolonged reverse running has no detrimental effect on any of PRI's meters.
ISKRA	Information not provided in response.
KAMSTRUP	No currently certified single phase meters – one is pending pattern approval, but this meter will be subject to reverse energy flow testing.
Horstmann	Prolonged exposure to export energy has no effect on meters functionality.
Actaris	Prolonged reverse running has no detrimental effect on any of Actaris' meters.
Landis + Gyr	Prolonged reverse running has no detrimental effect on any of L+G's meters.
Ampy	Prolonged reverse running has no detrimental effect on any of Ampy's meters.

ANNEX 1 - Letter submitted to industry

Your Ref:
Our Ref:
Direct Dial: 020 7901 7030
Email: adrian.rudd@ofgem.gov.uk

16 October 2003

Dear ,

Measurement of export energy on import only single phase meters

Given the increasing role of distributed electrical generation in today's society, it is important that Ofgem confirm industry understanding of the functionality of existing certified single phase import meters[2] under export energy conditions.

Accordingly, I would be grateful if you could provide me with the following details for all your currently certified meters:

1. What impact does reverse energy flow have on the meter's register (e.g. if the meter is mechanical in nature, does it have a back stop device to prevent the register decrementing)?
2. Do your meters have any external indication that a backstop has been fitted and if so what is the indication (e.g. numbering, barcode or symbol)?
3. Is there a flag to indicate reverse energy flow (e.g. an LED)? If so how is this flag reset?
4. Are there any other steps employed to deal with reverse energy flow (e.g. fraud prevention)?
5. Are there any other implications on meter functionality of prolonged exposure to export energy conditions?

It is intended that the information provided should not have a great technical content, but should provide a simple overview of the functionality of the meter under export conditions.

I would appreciate your response by early November.

Yours sincerely

Adrian Rudd
Technical Adviser

[2] Those single phase meters listed under Schedule 4 of The Meters (Certification) Regulations