Itron

Knowledge to Shape Your Future

ACE2000 type 290

Single Phase Electricity Meter with Real Time Clock

> ACE2000 type 290

- *Up to 6 tariff registers*
- *Display available without mains power*
- *Maximum demand for each tariff*
- *Display is backlit*
- *Compact & light weight*
- *DIN terminal configuration*

The Itron ACE2000 type 290 meter with integral Real Time Clock is a compact meter offering complex tariff functionality at value for money prices. The meter is well equipped for the modern utility environment with a number of enhanced features including communications capabilities that meets with international standards.

LCD Display

In keeping with present day customer requirements, the meter features a large LCD with backlight and an optional facility allowing reading without power.

Tariff Management

The fully flexible program management catered for within the meter, realises full Time Of Use (TOU) metering without the need for an external timing device.

In addition the meter is able to manage load switching depending upon rate switching, thus ensuring consumers' high consumption devices are managed for maximum efficiency.

Maximum Demand information can be measured for all six tariff rates allowing optimum billing of high consumption customers in particular.

Anti-Tamper Features

The meter detects and records magnetic tamper events and uses independent seals for the terminal and meters covers. It also indicates reverse energy on the LCD.

Historic Readings

The meter can store up to 6 sets of historic meter reading data.

> Tarriff time switch specifications

Number of tarriff rates	Up to 6
Number of maximum demand rates	Up to 6
Seasonal definition	Up to 4 seasons
Weekdays/Weekends	Independent day types Weekend days configurable
Special days	Up to 12 profiles/year, 10 year calendar
Switching times	Up to 8 per day type and season
Historic registers	Up to 6 sets of data MD and kWh
Billing period	Definable (1,2,3,4,6 or 12 times/year) Meter reading taken at 00:00 on due date

Metering

The meter can be supplied with either Class 1 or Class 2 accuracy as defined by IEC 62053-21. The rated voltage of the meter can be specified for either the 220V– 240V 50 or 60Hz range. The meter has a wide and flexible current dynamic.

The two standard current ranges are 5(65)A and 10(60)A. Additionally Class accuracy of the meter is extended down to 100mA.

The meter is able to offer three registration modes to meet customer requirements for fraud prevention and home generation. The measurement mode, which is programmed at the factory prior to dispatch, allows reverse energy to be added to the meter reading, recorded separately or simply ignored.

- **Mode 1- Import only**
  The meter records only the import energy, the meter stops registering during reverse energy flow
- **Mode 2 - Uni-directional**
  The meter records the sum of the energy flow, import and export kWh in one register
- **Mode 3 - Bidirectional**
  The meter records import and reverse energy flow in separate registers, labelled import and export

Real Time Clock

The time clock used by the meter is run from a quartz crystal clocking unit with an accuracy of +/- 5ppm at 25°C.

This provides exceptional short term management of time. In addition the meter can be synchronised to the mains frequency providing long term time stability.

Optionally the ACE2000 type 290 meter can provide an output for switching load. The output relay contact (4A, 250V latching) is configured to switch load when the meter is in the highest tariff rate.

Tarriff Control

The ACE2000 type 290 meter has a built-in real time clock function that manages rate changes to enable multi rates and complex tariffs. The meter is able to manage up to six Time of Use tariff rates for both consumption and Maximum Demand values.

The meter is able to generate “End of Period” information as defined by the user, usually based around billing dates. The meter is able to save register information for both consumption and Maximum Demand for up to six billing periods. This removes the need to visit the meter on a frequent basis.

Additionally if a power outage occurs at the same time that an “end of period” reading is due, the meter will take a reading as soon as power is restored.

The tariff management engine is able to support up to four seasons and weekday / weekend tariffication possibilities. It is also possible to define which days are allocated weekend tariffs.

In addition, the meter also has provision for up to twelve Special Days for which alternative rate switching patterns can be defined.

For each of the day types up to eight switching times can be programmed. The days used for weekends can be programmed to allow for local needs.

The tariff engine is able to manage changes in time to accommodate Daylight Savings hour changes according to a look up table that can be programmed with up to twenty five years’ of adjustment information.

Maximum Demand

The meter calculates and displays Maximum Demand data for each tariff register. The Maximum Demand window is fixed at a 15 minute integration period. Maximum Demand is displayed in kW to a resolution of 00.00 kW.

Communications

The ACE2000 type 290 is fitted with an optical port to allow the unit to be programmed in the workshop or in the field under security control. Communication is in accordance with the protocol defined by IEC 62056-21 which has replaced, but which is compatible with, the IEC 61107 standard. The port is also enabled for meter reading in accordance with the same standard.

The port is secured, under password and encryption control, to prevent reprogramming access. The same level of security also applies to changes in the real time clock and the resetting of Maximum Demand and historic registers. If required, meter rate registers can also be set to zero under security control.

The programming tool can be configured on a User by User basis to allow or deny an operator access to any or all of the functions described above. In addition the tool can be configured to take a set of meter readings (all rate registers and Maximum Demand registers) before any changes are made to either the tariff or time.

As an optional alternative, the meter can be configured to download meter reading data without the need for operator intervention using one way communication only. The Hand Held terminal identifies and logs on to the meter and a full set of meters readings are taken.

The meter can also be configured with a standard pulse output in accordance with IEC 62053-31.

Types of Comms	Uses	
Optical Port	Manufacturing workshop	Field
Data port (option) 1200 or 9600 Baud rate	Field	Field data collection for AMR

Display

The LCD used on the meter has been extensively tested and offers a 20 year life. The LCD is configured with a backlight to enhance reading in low light conditions.

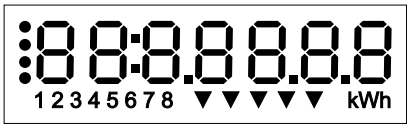
Additionally, the meter can be set to provide the capability to operate the display when the meter is not powered. This means that a reading can always be taken ending the need to re-visit due to power outage and simplifying the meter installation operation and control.

The display can either be configured to scroll automatically at a frequency that can be programmed between 2 seconds and 20 seconds per display, or to cycle under the control of a button mounted on the front cover. The order in which the displays are show is programmable.

A test display is included to verify correct operation of all display segments.

The display is also used to indicate such items as Active Rate, Rate Number etc. using icons that are not language specific. Indications include:

> Reverse energy flow
> Import/Export energy
> No load/low load
> kWh or kW reading indicator



The front panel of the meter is printed using a laser marking system allowing full configuration of iconic designation to the language and phrasing required by the customer as well as allowing logos and other information to be included as required.

Tariff registers can be reset under security control using a hand-held terminal or portable PC. Maximum Demand registers are reset in the same manner.

> Display Parameters

- *Display viewable size 15mm x 51mm*
- *Character size 8mm high x 5mm wide with minimum 2mm between characters*
- *Language independent Icons for rate and function details*
- *Display configurable to show 5, 5+1, 6 and 6+1 integer/decimal digits*
- *Display configuration reverts to 2+2 kW for Maximum Demand display*

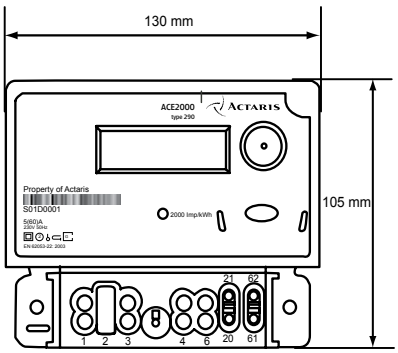
Technical Specifications

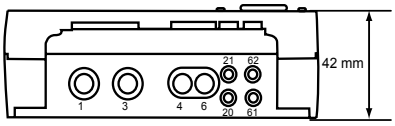
Meter type	Static, single phase watt-hour meter			
Approval	IEC 62052-11, IEC 62053-21 & MID			
Mechanical / electrical compliance	DIN standards			
Measuring scope	Active energy (both import and export)			
Registers	LCD display - up to 6 tariff rates 5+0, 5+1, 5+2, 6, 6+1 Programmable display cycling Optional push button controlled display reading Maximum Demand registers 2+2 (kW)			
Historic registers	6 sets of historic data			
Connection type	Single phase 2 wire			
Reference voltage/frequency	220V	230V	240V	50 and 60 Hz
Operating voltage	-20% to +15%			
Power consumption	Voltage circuit - <1.3W <9VA Current circuit - <0.3VA			
Class Index	Class 1 or Class 2 & Class A or Class B			
Basic current	5A or 10A			
Maximum current	40A or 65A			
Meter starting current	<20mA			
Meter constant	1000 imp/kWh			
Impulse voltage test	8kV and 12kV			
Fast transient burst test	4kV (+ & - 1min)			
Operating temperature range	-40°C to + 60°C			
Limit temperature range	-40°C to + 70°C			
Storage temperature	-45°C to + 80°C			
Relative humidity	Up to 95% for 30 days per year			
Degree of protection (IEC 60529)	IP53			
Diameter of current terminals	7.2mm (DIN) +/-0.1m			
Terminal material	Brass (copper cables) - Standard			
Load management	Relay output: 4A, 250V latching drum throw (optional)			
Optical port	IEC 62056-21 optical port, readout Read/Write			
Battery	Internal lithium battery to support RTC Display reading without power			
Pulse output	In accordance with IEC 62053-31			
Data output	Read only, streamed data output (in place of pulse output)			
Wiring capactities	Main cables must be a min. of 16mm^2 and a max. of 25mm^2			
Meter and terminal cover seals	Provision for sealing using conventional wire or plastic seals			
Meter weight	0.34kg			
Dimensions (L x W x D)	105mm x 130mm x 42mm			

The ACE2000 type 290 complies with Council Directive 89/336/EEC on Electromagnetic Compatibility as amended by Council Directive 92/31/EEC and 93/68/EEC

Manufactured under a quality system approved to ISO9001

Dimensions





> DIN standard

Terminal Identification

1. Live (in)
3. Live (out)
4. Neutral (in)
6. Neutral (out)
20. Aux (+)
21. Aux (-)
61. Relay output
62. Relay output

NOTE: Relay output numbering is optional

The mains supply and load should be connected to the meter as shown in the connection diagram which can be found inside the meter terminal cover.

NOTE: The installation of the meter should be carried out by a qualified electrician and in accordance with any current national wiring regulations which are applicable.

About Itron Inc.

Itron Inc. is a leading technology provider to the global energy and water industries. Our company is the world's leading provider of metering, data collection and utility software solutions, with nearly 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water. Our products include electricity, gas and water meters, data collection and communication systems, including automated meter reading (AMR) and advanced metering infrastructure (AMI); meter data management and related software applications; as well as project management, installation, and consulting services. To know more, start here: www.itron.com

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