



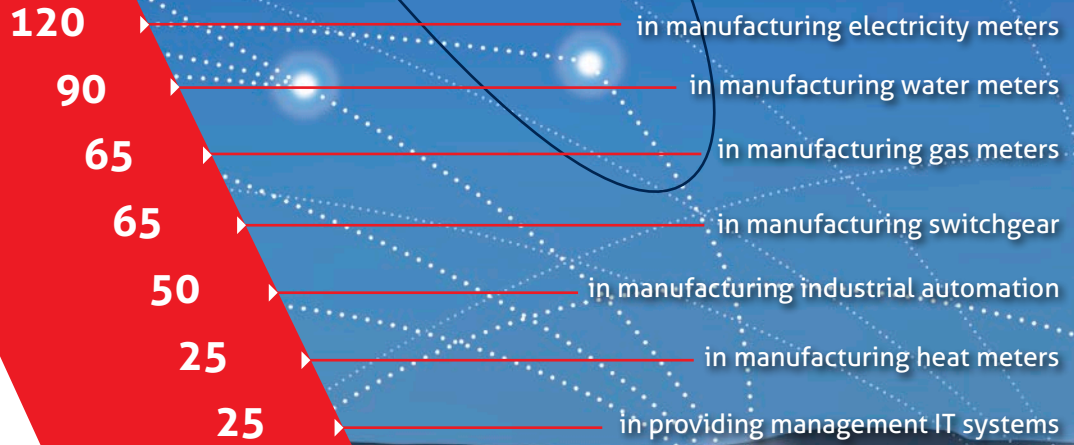
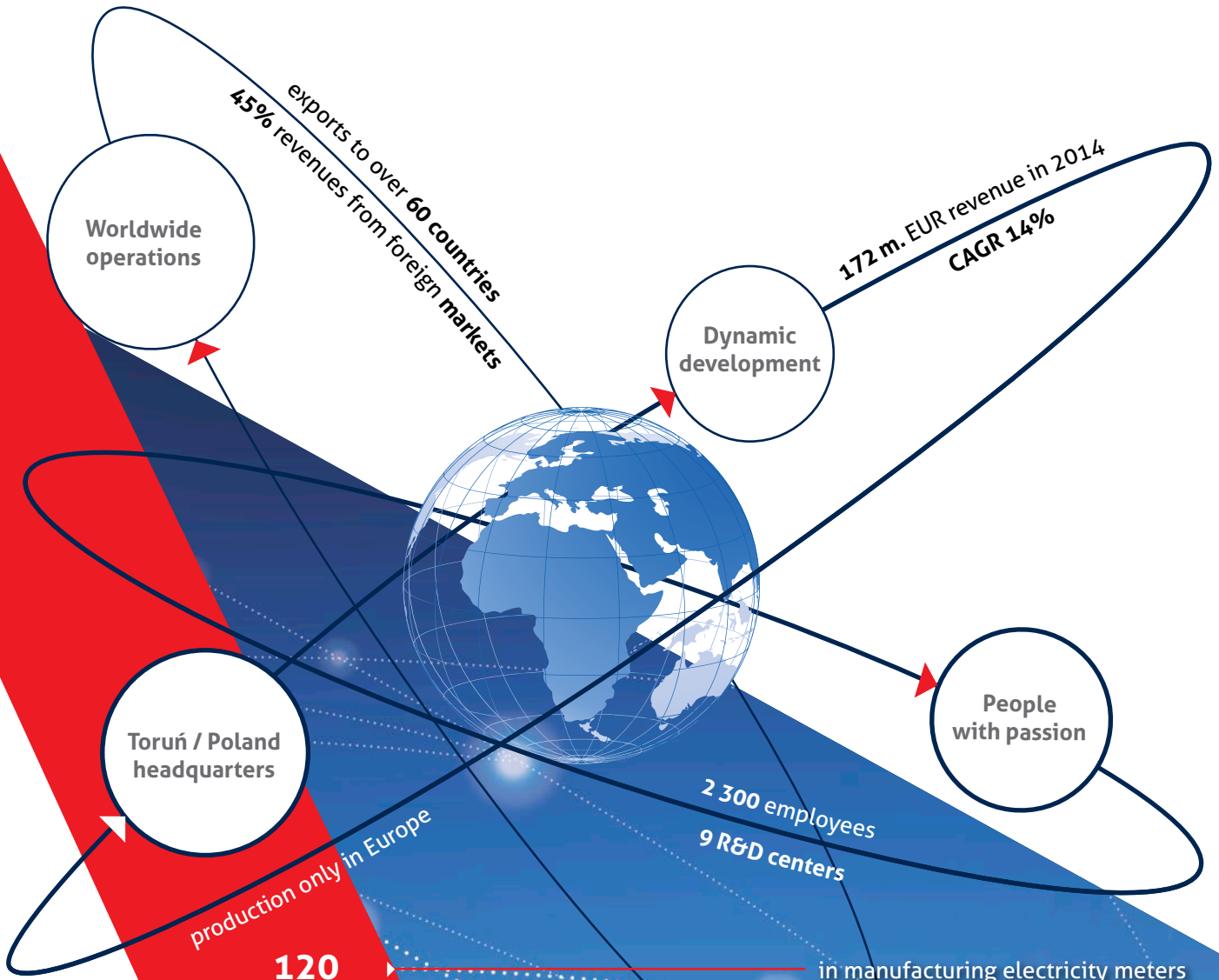
Smart solutions  
for smart utility





# APATOR

TRUST OUR EXPERIENCE



years



# Mission

## Apator Group

is the partner of entities managing distribution infrastructure of all kinds of utility services in the scope of development and innovative deliveries and consistent to open standards of the systems, equipment and services providing effective and safe operation of power grid assets. Safety and social responsibility are the indicators of our activity.

# Vision

## Apator Group

is leading supplier of measuring-data read out systems and equipment for all utility services with particular consideration of electricity distribution sector.

# Apator Business Units

## Metering Systems

Water  
and heat

Gas

Electricity

## Power Grid Automation

Power grid  
control and  
supervision

ICT  
solutions

Smart  
switchgear

smart  
thinking



# ELECTRICITY METERING



## smartEMU

### One or three-phase electricity meter

Multipurpose electricity smart meter for power network, enables direct measurement of active and reactive power. Designed for use with smart systems. Intended for municipal customers of all tariff groups.

- ▶ Bidirectional measurement of active power
- ▶ Four-quadrant measurement of reactive power
- ▶ Energy logging in four rate plans
- ▶ Measurement of voltage, current, instantaneous power and maximum power
- ▶ 15-minute and daily load profile
- ▶ Billing data logging on a monthly basis
- ▶ Built-in contactor allowing disconnection of the current circuit
- ▶ Power limiter function
- ▶ Communication protocol: DLMS/COSEM, AES128 encryption standard
- ▶ Local communication: optical port, serial port (optional)
- ▶ Communication with AMI system: PLC PRIME, PLC OSGP, GSM/3G or other
- ▶ Wireless M-Bus module or/and USB port that supports communication module for home area network
- ▶ Remotely upgradeable firmware
- ▶ Extensive event logging

# smartESOX

## Three-phase electricity meter

Multi tariff, four-quadrant electricity meter in threephase, 3- or 4-wire network for HV, MV or LV consumers of all tariff groups. It has extended measuring and registering abilities and a wide range of communication. It is an optimal solution for AMI systems. Typical use: the meter for electricity consumers of tariff groups: A, B, C; balancing meter.



- ▶ Measurement of active, reactive and apparent energy
- ▶ Measurement of instantaneous, maximum, redundant, cumulative powers
- ▶ Measurement of losses in the transformer (OLA, NLA, OLR, NLR,  $I^2t$ ,  $U^2t$ )
- ▶ Measurement of power grid parameters (voltages, currents, harmonic voltages and currents, frequency, THD, asymmetry factor, neutral current)
- ▶ Monitoring power grid parameters (voltage drops and rises, long power outages, current and voltage asymmetry, current flow no applied voltage, the lack of current flow, current over the limit)
- ▶ Direct connection (smartESOX B) or indirect by current and, optionally, voltage transformers (smartESOX P)
- ▶ Registering energy in 6 tariff zones switched by a built-in real-time clock
- ▶ Wide abilities to register measured parameters (4 independently configurable profiles, registration interval, high memory capacity, registering 20 parameters with 15-minutes interval for 200 days, energy quality profile - option)
- ▶ Enhanced event logging (7 groups of events recorded in independent registers, 500 events in every register, sending instant event notifications to a host device/system)
- ▶ DLMS/COSEM communications protocol
- ▶ Three built-in communication ports: one optical port, two serial ports
- ▶ Interchangeable communication module: 3G/GPRS, PLC, Ethernet
- ▶ The built-in uninterruptible power supply (UPS) connected to external power supply

# CANGU / EQUUS

## One / three-phase electricity meter

Multipurpose electricity meter with extended functionality. It allows direct measurement of active and reactive energy in multi-rate prepayment metering mode or in a fully autonomous credit mode. Interchangeable communication modules and a built-in contactor make the device a perfect foundation for Smart Metering systems.



- ▶ Bidirectional and reverse measurement of active and reactive energy
- ▶ Measurement of power grid parameters: effective current and voltage, frequency, power factor
- ▶ Measurement of instantaneous power and maximum power
- ▶ Load profile logging
- ▶ Built-in contactor which allows disconnection of current circuits
- ▶ Operating mode: prepayment, credit or switched prepayment-credit
- ▶ Advanced prepayment functions
- ▶ Manual or automatic ending of a billing period
- ▶ Memory of at least 21 billing periods data
- ▶ Real-time clock managing two switchable complex calendars
- ▶ Calendars supporting 16 time zones and allowing to define any number of special days and permanent and 240 movable holidays
- ▶ Current and power limiting features
- ▶ Optical port and built-in communication port: serial (RS-485 or RS-232), M-Bus slave, M-Bus concentrator
- ▶ Removable communication module: PLC, GSM, RS-232/RS-485, LAN, SRD radio or other.



# GAS METERING

## iSmart

### Modular Concept of Smart Electronic Index



- ▶ Electronic and traditional mechanical seals for: MID, battery and communication compartments
- ▶ Real time battery life monitoring
- ▶ Safe valve opening procedure
- ▶ Optional valve closure upon tamper detection
- ▶ Detection of the external magnetic field
- ▶ Tamper detection in case of unauthorised opening of the cover or trying to remove index
- ▶ Earthquake detection
- ▶ Elaborate password system
- ▶ RFID as special safety item and for traceability
- ▶ Prepayment functionality optional
- ▶ Event log books with 200 logs for connecting, tamper etc.
- ▶ Load profile 13 months long, 30 min periods
- ▶ COSEM/DLMS Firmware compliant
- ▶ Up to 48 TOU tariffs
- ▶ Up to 8x8 TOU/BLOCK matrix size
- ▶ Firmware remotely upgradeable

## SEI smart gas meter



- ▶ New 2nd generation index design
- ▶ Very low pressure drop using ball valve technology
- ▶ Display and Main Board protected MID cover and primary tamper evident MID seal
- ▶ Interoperability with Smart Electricity Meters and In Home Display Units (IHD)
- ▶ Low power, electronic solid state, GWi Hall Effect sensor (patent pending)
- ▶ High tech / state of the art electronic design with high quality components
- ▶ In service replacement of communications module
- ▶ Remotely upgradeable firmware
- ▶ Configurable time-of-use tariffs
- ▶ Profile recorder - 2 channels with independently configurable data capture
- ▶ Data logger with five independent FIFO buffers (up to 50 events)
- ▶ Firmware upgrade through RF communication channel
- ▶ Communication module – universal interface for various connections including:
  - ▶ ZigBee RF
  - ▶ Wireless M-Bus 868 MHz – OMS standard
  - ▶ Wireless M-Bus 169 MHz
  - ▶ GSM
- ▶ Tamper protection
- ▶ Optional prepayment feature
- ▶ Available as either Front Viewing or Top Viewing Index (TVI) / Semi Concealed



# HybridSmart

HybridSmart is dedicated for flexible Smart Gas Metering solutions. Retaining the best functionality from the traditional conservative mechanical index while implementing various of Smart Technology including Shut-Off-Valve, Temperature Compensation and Radio Modules. This package is MID-approved whilst offering OEM-customers enough space in separate compartments to integrate their own printed circuit boards providing additional functionalities as communication modules, valve control with related PAYG functionalities and others.



- ▶ Additional internal electronic modules offers various combination of extended functionalities
- ▶ Compatible with UG-series 1.2 L and 2.2 L measuring units offering meters ranging from G1,6 to G6 with bosses spacing: DN25, 100 mm, 110 mm, 130 mm, 6", 160 mm, 220 mm, 250 mm
- ▶ Zero pressure drop Shut-Off-Valve
- ▶ Absolute Encoder - High-End IP protected Swiss technology offers real-state scanning of the mechanical index
- ▶ Incremental Encoder (as a cost-effective option to Absolute Encoder)
- ▶ Radio Modules with dedicated internal antennas:
  - ▶ 868 Mhz Wireless M-BUS in accordance with EN13757-3 and OMS
  - ▶ 169 Mhz Wireless M-BUS N-mode in accordance with EN13757-4:2013. It meets additional specifications required by the Italian Gas Metering market regulations
  - ▶ GSM/GPRS quad band. Full compliant ARG155/08, UNI/TS11291 and subsequent (Italian reference of AEEG standard)
- ▶ DLMS protocol implemented
- ▶ Mechanical or electronic temperature compensation

# UniSmart

UniSmart is communication module for gas meters dedicated for AMR systems in the gas industry and constitutes a cheaper alternative to the smart meter. It is designed for customers and users not requiring full functionality offered by smart gas meters, and also where low gas consumption and lower frequency of reading requires the use of economic relevant technologies. At the same time, it is a product offering broad functionality for reading gas and its balancing in the network, in line with European standards.



- ▶ Versatility – suitable to be connected to any type of meter equipped with a burglary Apator Metrix S.A. index, produced after 2005.
- ▶ Easy to install and setup – connected as a standard impulse transmitter in the meter hanging in the network and configured wirelessly.
- ▶ Interoperability – the usage of open communication protocol in accordance with standards EN 13757-3 and BS EN 13757-4 provides interoperability with devices of other manufacturers and the ability to communicate within a single system AMR. Reading is carried out by radio. The product is compatible with other existing technical specifications in the EU countries, such as OMS and NTA.
- ▶ Flexibility – can be used in walk-by or stationary systems. We also offer software for these systems operating on readily available equipment (e.g. Psion).



# WATER METERING



## Smart C+

### Single-jet vane-wheel water meters DN15-20

Smart C+ is adapted for installing the radio module which enables the remote reading of indications. It is secured vane-wheel water meter, resistant to the external magnetic field. The water meter is designed on the basis of the MID Directive with the indicating range corresponding the value of R=160.

- ▶ Standard water meter is suitable for remote readings in AMR system
- ▶ Used in waterworks for cold water of the temperature up to 30°C or 50°C and for hot water up to 90°C, in the single and multi-family houses
- ▶ Hermetic counter (with a increased tightness) resistant to mist over
- ▶ The full resistance of the data transmission device to the external magnetic field achieved thanks to the retro-reflective pointer as an element of the optical data transfer from the water meter to the radio module
- ▶ Protection against the external mechanical interference in the counting device, obtained by using the seal on the clamp and the guard with the element of external pressure detection
- ▶ Interlock of the counting device rotation, with a higher rotation than the 360° angle
- ▶ Very high resistance of the water meter Smart C+ to the activity of the external magnetic field SN+ resulting from using special magnetic screens and double multi-field magnets
- ▶ Protection ensuring the consequences of water freezing in the matter of a specially formed seal plate
- ▶ Bilaterally impeller bearing (with a usage of a high quality pivots and stone bearings) it ensures the running within the legalization period with saving the normative legalization parameters
- ▶ Installing in both horizontal position with counter set upwards (H) or sideways (V), and in vertical position (V)



# Master C+

## Single-jet vane-wheel water meters Dn 25-40

Master C+ is a single-jet dry dial water meter for precise measuring of supplied water consumption. With the modern structural solutions, it is possible to mount a radio or reed contact to enable remote reading. With the latest anti-fraud solutions, this water meter provides the best protection against strong magnetic field. The water meter is compliant with the MID Directive for the measurement range corresponding to the value of R=160.



- ▶ Standard water meter is suitable for remote readings in AMR system
- ▶ Used in waterworks for cold water of the temperature up to 30°C or 50°C and for hot water up to 130°C, in the family houses and public buildings
- ▶ The total resistance of the data transmission system to the external magnetic field obtained by applying the reflection pointer as part of the optical transmission of data from the water meter to the radio attachment
- ▶ Counter (with higher water tightness) resistant to fogging up
- ▶ Rotation lock for counting mechanism to prevent from multiple rotation
- ▶ Magnetic shielding and specially shaped outer casing to provide high resistance to external magnetic fields
- ▶ Double-side rotor bearing to ensure stable operation and use during the inter-verification period
- ▶ Installing in both horizontal position with counter set upwards (H) or sideways (V), and in vertical position (V)

# MWM Nubis

## Propeller water meter with horizontal impeller axle DN50-300

Nubis is propeller, dry water meter Woltman's type, with horizontal impeller axle, parallel to pipe axes. Nubis water meters are characterized by modern construction and technology solutions, which make them long-lasting and perfectly proved in cooperation with pulse transmitters and remote system for metering data readings. Water meters are assigned to industrial measurements of water usage up to 50°C of cold water and up to 130°C of hot water in relatively regular and strong flow rate.



- ▶ Standard water meter is suitable for remote readings in AMR system
- ▶ Permanent and efficient construction, ensuring the flow of water in low loss of pressure and easiness in assembly in random waterworks installations
- ▶ Lowered weight of water meter
- ▶ Interchangeable and unified metering layer fitting to several sizes of body and assuring optimal water meter management
- ▶ The possibility of mounting the water meter in the intermediate position without the influence on the metrological parameters, larger possibilities in designing and modernizing new used water meters connections
- ▶ Very good anticorrosive and mechanical qualities of paint coat (powder paint- epoxy)
- ▶ Resistant to the external magnetic field, according to EN14154-3
- ▶ Low starting slow rate
- ▶ Wide measuring range
- ▶ Ease read-out due to a freely adjustable rotary counter dial placed in the casing
- ▶ Possibility of electronic check-up of the metrological parameters of the water meter
- ▶ Modular structure
- ▶ Removable measuring insert in covered casing
- ▶ Magnetic clutch



# HEAT METERING



## FAUN

### Calculator for heat meters

FAUN is a high quality, reliable and high class heat calculator designed for measurement of energy in heating and cooling installations. Depending on its design and configuration, the calculator can work as: heat meter for heating installation, heat meter for cooling installation or heat meter for heating and cooling installation in one circuit.

- ▶ Possibility of cooperation with 2 ultrasonic and/or rotor flow transducers with impulse output
- ▶ Possibility of cooperation with temperature sensors Pt100, Pt500 or Pt1000, in a 2 or 4-wire system
- ▶ Possibility of installation directly on flow transducers
- ▶ Environmental class C (M1, E1)
- ▶ Possibility of mounting (without legalisation infringement) two independent communication modules and a selection of communication protocols
- ▶ Power supply versions: battery (possible application of various types of batteries, battery life 6 or 12 years) or internal power supply 24 V AC or 230 V AC
- ▶ In standard version 4 configurable impulse inputs (additional possibility of functional change into alarm inputs or inputs for digital communication with a transducer)
- ▶ Independent optical port
- ▶ More than 5000 registers of measuring data archiving, to be configured by the user
- ▶ Two independent tariff registers (superliminal registers), possible configuration of the following thresholds: power, flow, power supply temperature, return temperature, temperature difference, tariff data archiving
- ▶ Independent registers of occurrences and failure modes, configuration changes
- ▶ Additional digital communication with ultrasonic transducer that identifies the transducer errors, among others the return flow, weaker measuring signal, air-locks
- ▶ Possibility of individual configuration of the calculator according to particular requirements, configuration of parameters, functions, communication, type and range of data displayed on LCD through a dedicated program (on PC)
- ▶ Possibility of manual configuration of some parameters of the calculator using the buttons

# Elf

## Compact heat meter

A precise, reliable, high class heat meter with archive of many measurement data, characterizes by modern design.



- ▶ Flow rates 0,6; 1,0; 1,5; 2,3 m<sup>3</sup>/h available
- ▶ Flow transducer in 2 accuracy class according to standards EN-1434
- ▶ Electronic detection of rotor rotation – total resistance to strong magnetic fields
- ▶ Wide communication possibilities, inter alia M-Bus, radio, impulse output, possibility of connecting 4 additional devices (4 additional impulse inputs)
- ▶ Plentiful archive of measurement data configured by the user
- ▶ Archive of failure situations
- ▶ Data archive in 4 time cycles
- ▶ Self-diagnosis – detection and signaling of failure situations of the measurement system, e.g. failure of impulse from the water meter, damage of the temperature sensor, too high flow, battery voltage drop

# E-ITN 30.5

## Double-sensored electronic heating cost allocator

E-ITN 30.5 is designed for calculate the heating consumption costs in the space with heating systems. Preferable usage range – horizontal and vertical heating systems with one or two pipes with minimum design heating transmitter temperature equal or higher than 35°C and maximum, equal or lower than 90°C.



- ▶ The wireless data transmission system is realized by infrared detector or radio interface which is reducing the time of the calculation and lowering its costs. The radio reading takes place in front of an apartment (or a building), without entering it
- ▶ The divisor is equipped with ergonomically placed LCD display, which ensures that the user can check the reading of current amounts of heating consumption. What is more important, the data are saved on the internal memory module, due to that, there is a possibility of getting full analysis of heating consumption and the conditions in which the allocator was working during the heating season
- ▶ Not only can the E-ITN 30.5 divisor take a precise heater temperature measurement but also has an option which enables it to register a medium temperature of a space in which it was placed. Installation and configuration of additional instruments is not required. Moreover, the divisor uses a kind of software which takes into account the real heating consumption of a given space, counting in the heat coming from plumb-line and heating exchange among neighbours
- ▶ Each time an unauthorised manipulation (breaking a seal), try of dismantling the heater connected to the divisor or placing a heating blockades in front of a heater (furniture, curtains etc.) takes place, it is registered with the exact date of its occurrence. The information about the manipulation is required during the next heating reading



## Electricity metering

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