

# UPT210

## Multi-Function Energy Meter



- Compact 6 DIN Modules Size
- High Contrast LCD Display
- True RMS Measurement
- Active, Reactive and Apparent Energy (4 Counters)
- Neutral Current Measurement
- More than 35 Electrical Parameters Measured and Displayed (Enhanced Version)
- Optional Power and Current Demand Calculation
- Optional RS485 or Lonbus Communication Port
- Programmable Transformer Ratios
- Two Digital Outputs for Energy Pulsing
- Indication of Phase Sequence and Wrong CT Connection
- Accuracy Class 1 or 2 according EN62053 (ex EN61036)



### General Description

The UPT210 is a programmable multi-function energy meter able to measure the energy consumption and the main electrical parameters on three-phase systems.

It provides accurate measurements even for distorted waveform.

Up to two energies can be re-emitted on the optoisolated outputs.

The high contrast LCD display allows the user to check all the measured values. The working parameters can be easily set up by instrument keypad.

The optional RS485 serial communication port allows to transfer the three phase electrical parameters from the instrument.

The WINTOOL, free of charge software, allows to show on a PC all the measured values and to program the instrument in a fast way.

The UPT210 replaces multiple analog meters as well as single function meters such as voltmeters, ammeters, wattmeters, varmeters, frequency-meters, powerfactor-meters, energy-meters, etc.

The UPT210 is a compact, cost effective multi-function transducer suitable for energy monitoring and electrical network management.

WINTOOL Communication Software  
available for free on the Web

### Benefits

- The UPT210 basic version provides four energy counters (two quadrants) and the main electrical parameters for a quick and easy check of the load conditions.
- The programmable transformer ratios allow to count and display the primary values .
- A diagnostic function detects the current transformer polarity and the phase sequence in order to indicate on the LCD any connection or installation error.
- It is suitable for conventional meters replacing since it is ultracompact and easy on mounting.
- Via communication port it is possible to read and log on a PC all the readings (more than 35 electrical parameters) . The remote connection allow to generate on a PC consumption profiles, logged values trends, cost allocation and reports as well as to identify critic values.

### Applications

- Switchboards, gensets, motor control centers, etc.
- Replacement of electromechanical meters for household, industrial and commercial applications
- Power monitoring & control systems
- Individual machine load monitoring
- Capacitor bank operation supervision
- Remote metering and cost allocation

**Main Features**

**Measurements**

- Single phase and three-phase 3-wire or 4-wire unbalanced load operation
- True RMS metering provides accurate measurement even for distorted waveform
- More than 35 electrical parameters are measured. The basic version displays on the LCD the system values for a quick and easy check of the load conditions. The table on the right shows the measured parameters and the available options
- Programmable 1A / 5A current full scale allows to fit the standard CTs
- CT primary value is programmable up to 9999 to show the real energy consumption values

**Front Panel Display**

- High contrast LCD display
- Two keys ensure the selection of the information on the LCD display and the instrument programming
- Password protected setup and resetting operations

**Communication**

- RS485 optoisolated communication port (option)
- Modbus protocol or standard ASCII protocol
- Communication speed programmable up to 57600 bps
- Optional built in Lonbus port

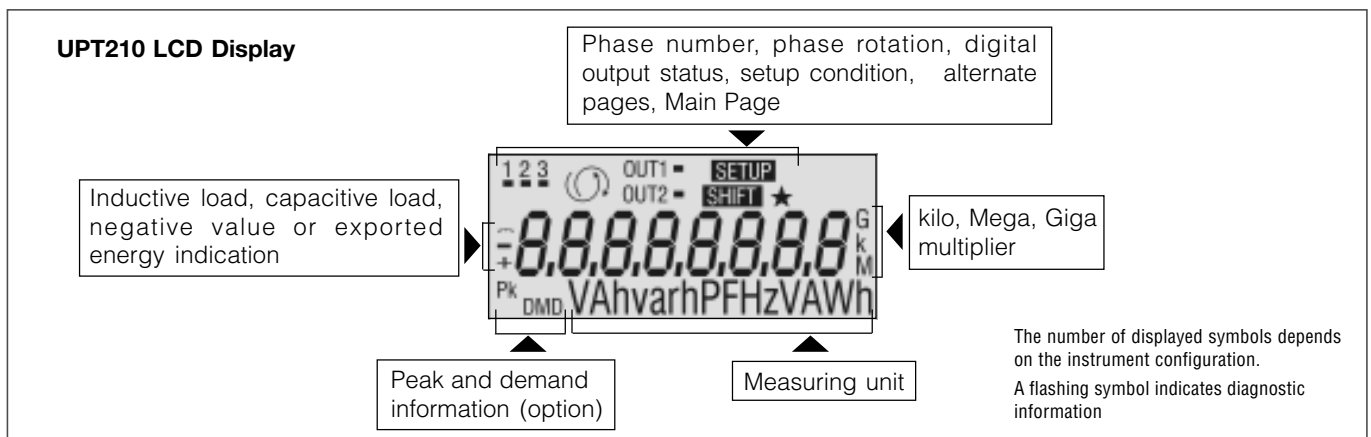
**Inputs & Outputs**

- Two digital optoisolated outputs for energy pulsing. The pulse value is programmable

**Advanced Diagnostic Functions**

- Wrong current transformer polarity and phase sequence connection errors are indicated on the LCD display
- Over / undervoltage, overcurrent and frequency out of range are detected to indicate the uncorrect working conditions
- Pulse emission frequency too high or CT too high are checked to indicate programming mistakes

INSTANTANEOUS MEASUREMENTS		
PHASE VOLTAGE	$V_{L1-N} - V_{L2-N} - V_{L3-N}$ [V]	●
LINE VOLTAGE	$V_{L1-L2} - V_{L2-L3} - V_{L3-L1}$ [V]	●
SYSTEM VOLTAGE	V [V]	●
LINE CURRENT	$I_{L1} - I_{L2} - I_{L3} - I_N$ [A]	■
SYSTEM CURRENT	I [A]	■
POWER FACTOR	PF <sub>L1</sub> - PF <sub>L2</sub> - PF <sub>L3</sub>	●
SYSTEM POWER FACTOR	PF	●
APPARENT POWER	$S_{L1} - S_{L2} - S_{L3}$ [VA]	■
SYSTEM APPARENT POWER	S [VA]	■
ACTIVE POWER	$P_{L1} - P_{L2} - P_{L3}$ [W]	■
SYSTEM ACTIVE POWER	P [W]	■
REACTIVE POWER	$Q_{L1} - Q_{L2} - Q_{L3}$ [var]	■
SYSTEM REACTIVE POWER	Q [var]	■
FREQUENCY	f [Hz]	●
PHASE REVERSAL	123 / 132	●
DEMAND (AVERAGE VALUES)	$4 \times I_{AVG} - S_{AVG} - P_{AVG}$	○
STORED DATA		
SYSTEM ACTIVE ENERGY	[Wh]	■
SYSTEM APPARENT ENERGY	[VAh]	■
SYSTEM LAGGING REACTIVE ENERGY	[varh ind]	■
SYSTEM LEADING REACTIVE ENERGY	[varh cap]	■
PEAK VALUES	$3 \times V_{L-N} - 3 \times V_{L-L} - 3 \times I_L - 3 \times I_{AVG} - P_{AVG} - S_{AVG}$	○
● = Standard ○ = Optional ■ = Bi-directional value (BIDIR option only)		



**Specifications**

**Power supply (1)**

Rated voltage: powered from measuring inputs (1)  
 Consumption: 0,8VA max

**Voltage inputs**

Rated voltage: A) 3x230/400VAC +15% -20% - 4 wires  
 B) 3x120/208VAC +15% -20% - 4 wires  
 C) 3x400VAC +15% -20% - 3 wires  
 D) 3x208÷230VAC +15% -20% - 3 wires  
 E) 3x100÷120VAC +15% -20% - 3 wires  
 Input impedance: >1.3 MOhm  
 Burden: max 0.15 VA per phase  
 Frequency: 45 - 65 Hz

**Current inputs**

Rated current (Ib): 1 / 5 A<sub>RM</sub>s programmable  
 Min / max measurable current: 20 mA / 7 A<sub>RM</sub>s  
 Maximum overload: 10A<sub>RM</sub>s continuous - 100 A<sub>RM</sub>s for 1 sec.  
 Input impedance: 0.02 Ohm approximately  
 Burden: max 0,5 VA per phase  
 Insulation voltage: 150 VAC max between phases

**Typical accuracy**

Voltage: ± 0.3% reading ± 0.05% full scale  
 Current: ± 0.5% reading ± 0.05% full scale  
 Active power: ± 1% reading ± 0.1% full scale (PF=1)  
 Power factor: 1,5% reading (0.5 inductive - 0.8 capacitive)  
 Active energy: 1% reading (0.5 inductive - 0.8 capacitive)  
 Frequency: ± 0.05% reading ± 2 digits from 45 to 65 Hz

**Display and operating controls**

Display: High contrast LCD display 43 x 19 mm  
 eight digits for energies and other parameters + symbols  
 Keypad: 2 push-buttons

**Communication port (option) (2)**

Type: optoisolated RS485 or Lonbus  
 Baud Rate: 2400 to 57600 Baud (78,6 kbps for Lonbus)

**Digital outputs**

Type: No.2 optoisolated (50V-100mA<sub>DC</sub>)

**Environmental conditions**

Operating temperature: from -15 °C to +60 °C  
 Storage temperature: from -25 °C to +75 °C  
 Relative humidity: 80% max. without condensation

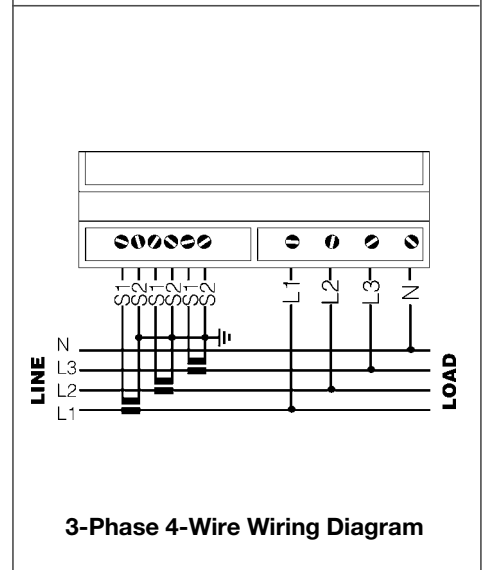
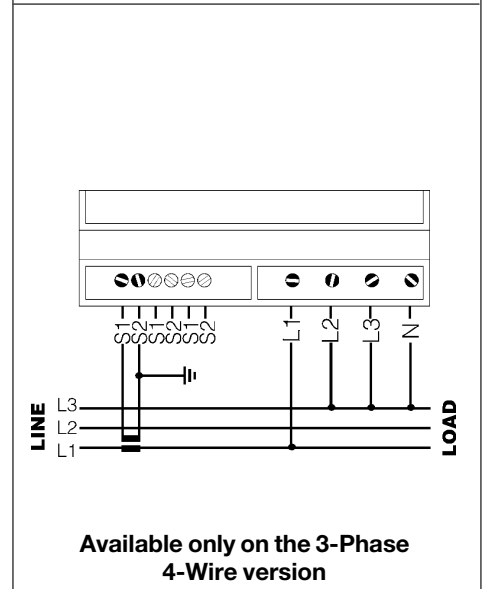
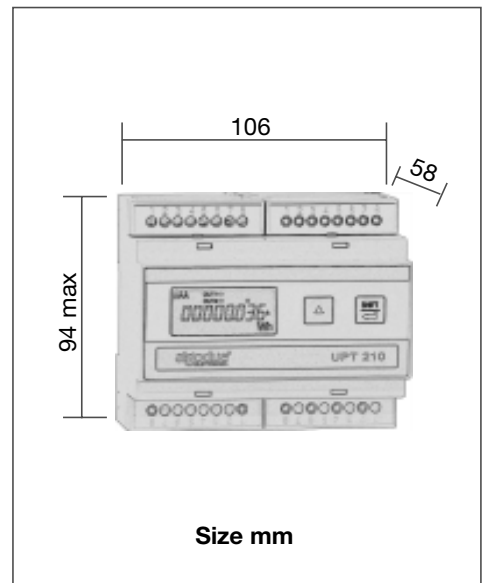
**Mechanical characteristics**

Material: Plastic enclosure - noryl UL94-V0  
 Protection degree: IP51 (front panel); IP20 (terminals)  
 Terminals: Conductors 2.5mm<sup>2</sup>  
 Size / Weight: 106x90x57mm 6 DIN-RAIL modules 300gr

**Standards compliance**

Safety: 73/23/EEC and 93/68/EEC directives, EN61010.1 safety standard  
 EMC: 89/366/EEC directive and following modifications 93/31/EEC and 93/68/EEC, EN50081-2, EN50082-2, EN61326/A1

- (1) The basic instrument is powered from L1, L2, L3 and N (4-wire version) or L1, L2, L3 (3-wire version). The presence of only one of the three phases (4-wire version) or two phases (3-wire version) ensures the normal counting and displaying operations.
- (2) The serial port is powered from L1 and N (4-wire version) or L1 and L2 (3-wire version) . The communication function is ensured only if the L1 phase (or L1 and L2 for 3-wire) is present and within the specified range.



**ORDERING INFORMATION**

AUR A A X X X X

**UPT210**

**Series**

**User's Manual Language**

- D = German
- I = Italian
- U = English

**RS485 Comm. Protocol**

- X = Without RS485 port
- B = ASCII Standard
- C = Modbus
- L = Lonbus (2)

**Voltage Input**

- A = 3x230/400V<sub>AC</sub> +15% -20% - 4 wires
- B = 3x120/208V<sub>AC</sub> +15% -20% - 4 wires
- C = 3x400V<sub>AC</sub> +15% -20% - 3 wires
- D = 3x208÷230V<sub>AC</sub> +15% -20% - 3 wires
- E = 3x100÷120V<sub>AC</sub>+15% -20% - 3 wires

**Serial Port**

- X = None
- 5 = RS485

**Memory**

- X = None

**Firmware Options**

- A = Basic version - two quadrant measurement (1)
- B = BIDIR - Bi-directional four quadrant measurements
- C = PEAK - Peak values + demand calculation on power and current
- D = BIDIR + PEAK

**Other**

- 2 = Basic version - class 2
- 1 = ENH - Enhanced version - class 1

**Inputs**

- X = None

**Analog Outputs**

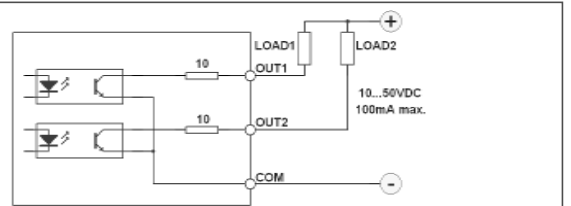
- X = None

**Digital Outputs**

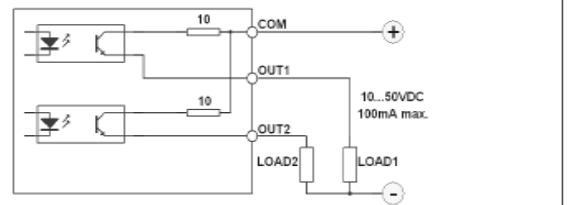
- 2 = Basic version with No.2 on-board optoisolated outputs NPN type
- 3 = Basic version with No.2 on-board optoisolated outputs PNP type

**Hardware Options**

- X = None



Digital Outputs - NPN Type



Digital Outputs - PNP Type

**NOTES**

- (1) The basic instrument configuration includes:
- Voltage Input: on request, as indicated above
  - Mono-directional measurements (two quadrants) - Accuracy class 2
  - Current Input: programmable 1/5ARMS. The CT value is programmable to 9999
  - No.2 optoisolated outputs (50V - 100mADC) for energy pulsing

**NOTES**

- (2) The Lonbus version is available in the following configurations only:
- **Voltage Input:** A
  - **Firmware Options:** A (two quadrants)
- Other parameter as indicated above -  
Under serial port it is necessary to select X=none

Subject to change without notice



**ENERGY MEASUREMENT AND CONTROL**

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