

# VAMP WIMO

Measuring and monitoring units

VAMP 96

VAMP 260

WIMO 6CP10





## Main Characteristics

### Intelligent measuring and monitoring units

The VAMP and WIMO meters come with an extensive selection of pre-configured data screens and measurements that you can use or customize to fit your metering requirements.

- **Cost Allocation and Billing**

Determine consumed energy by production cost centers according to the EU's Energy Service Directive (ESD) 2006/32/EC.

- **Demand and Power Factor Control**

Avoid penalties with automated load shedding, scheduling, peak shaving or capacitor bank control

- **Equipment Monitoring and Control**

Improve process yields and extend equipment life. Extensive analog and digital I/O enables system monitoring and control.

- **Power quality and Disturbance Analysis**

Capturing abnormal disturbances in power quality like harmonics, voltage interruptions, voltage sags/swells and unbalancing

- **Preventative Maintenance**

Set up alarms to warn of pending problems in advance

- **Extensive communication and SCADA connectivity**

GSM, GPRS, ModbusTCP, Profibus, IEC 60870-5-101, IEC 60870-5-103, SPA, TCP/IP, Dnp 3.0, IEC 61850,

## Remote or stand-alone monitoring of industrial and utility substations

### VAMP 96 and VAMP 260 for industrial and utility applications

VAMP 96 and VAMP 260 metering devices are designed for industrial and utility applications where energy consumption and billing shall be monitored by cost centers. Demand and power factor control, equipment monitoring, alarms for preventive maintenance and disturbance capturing are standard features in VAMP 96 and VAMP 260. As a member of VAMP protection relay family these meters come with an extensive communication capabilities.

### WIMO 6CP10 for utility applications

WIMO 6CP10 meters are optimized for the utility applications suitable for secondary power distribution substations.

The load monitoring and fault detection on the power distribution network is very important part of the real time maintenance and fault tracking sequences.

Distribution transformers have been installed without supervision or with stand-alone metering in the past. WIMO 6CP10 meters can also be stand-alone but with optional communication facilities these devices can be connected to network control centers for continuous supervision.

# A right product for every application



| Solution                      | VAMP 96                                                                                             | VAMP 260                                                                                                                                       | WIMO 6CP10                                                                                                                                              |
|-------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational segment           | Industrial and utility substations                                                                  | Industrial and utility substations                                                                                                             | Utility secondary power distribution                                                                                                                    |
| Application                   | Power, energy, power quality metering, event handling and I/O unit for SCADA and process automation | Power, energy, power quality metering, event handling, control, alarming, temperature monitoring and I/O unit for SCADA and process automation | Power, energy and power quality metering, earth fault detection, alarming, temperature monitoring, alarm and load profile SCADA transfer over GSM, GPRS |
| CT and VT input connection    | Metering core                                                                                       | Metering or protection core                                                                                                                    | Metering core                                                                                                                                           |
| Auxiliary supply range        | 100 – 240 V ac<br>100 – 330 V dc<br>or<br>20 – 67 V dc                                              | 18 – 36 V dc<br>or<br>40 – 265 V dc / ac                                                                                                       | 100 – 240 V ac<br>100 – 330 V dc                                                                                                                        |
| Number of digital inputs      | 3                                                                                                   | 6                                                                                                                                              | 3                                                                                                                                                       |
| Number of RTD inputs          | -                                                                                                   | Optionally 4 - 16                                                                                                                              | 1                                                                                                                                                       |
| Number of heavy trip contacts | -                                                                                                   | 2                                                                                                                                              | -                                                                                                                                                       |
| Number of alarm contacts      | -                                                                                                   | 3 +1                                                                                                                                           | -                                                                                                                                                       |
| Number of mA outputs          | -                                                                                                   | 4                                                                                                                                              | -                                                                                                                                                       |
| Number of solid state outputs | 1 pc (NO)                                                                                           | -                                                                                                                                              | 1 pc NO / NC                                                                                                                                            |



## Product Overview

### VAMP 96 measuring and monitoring unit

The VAMP 96 is a modern basic multimeter used as a stand alone meter in industrial low and medium voltage power distribution distribution panels. This meter can be connected to **SCADA or energy management system** in order to provide required measurements, alarms, condition data, events to the operator using various communication protocols. VAMP 96 shall be connected to measurement core of the current and voltage transformers Typical application of VAMP 96 is to measure energy by production cost centers and show energy saving according to EU's directive 2006/32/EC.



VAMP 96 is a basic multimeter used either stand-alone or part of monitoring / SCADA system

### VAMP 260 power monitoring unit

The VAMP 260 is designed for a heavy duty industrial applications where the environmental and disturbance conditions are demanding. This power monitoring unit can be connected to the **protection cores of the current and voltage transformers as the** design of the unit is equal to the requirements used in protection relays. Having six digital inputs, two circuit breaker controlling, four alarming duty contacts and four analogue (mA) outputs this unit is unique in the market.



VAMP 260 is a unique high accurate meter as it can be connected to either protection or measurement core of the current transformers.

### WIMO 6CP10 measuring and monitoring unit

The WIMO 6CP10 is optimized for the utility applications especially for the secondary power distribution substations. The secondary power distribution transformers can now be monitored either stand alone or remotely using various communication protocols and channels. The distribution transformer stations located either in the rural area or basements of the houses can be taken **cost effectively** to the continuous monitoring from the electrical, water or transformer oil level, temperature, door switch, ventilation, burglar, **graffiti spraying** detection point of view to name a few typical monitored quantities.



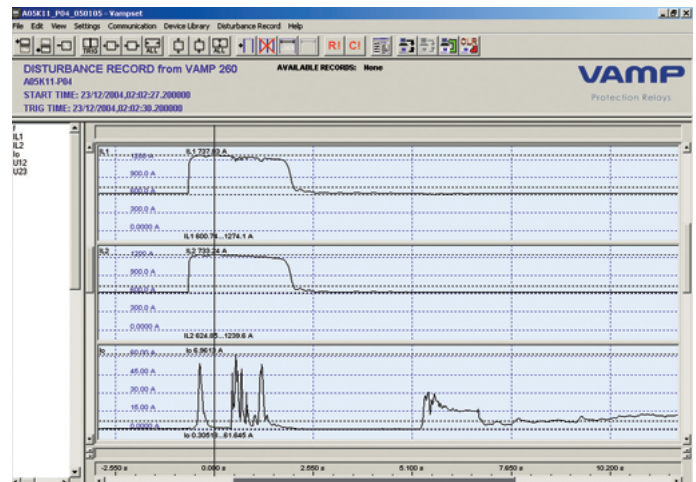
WIMO 6CP10 is used either stand-alone or it is connected to the supervision system of the utility's secondary power distribution network.

# VAMPSET Setting and Configuration Tool

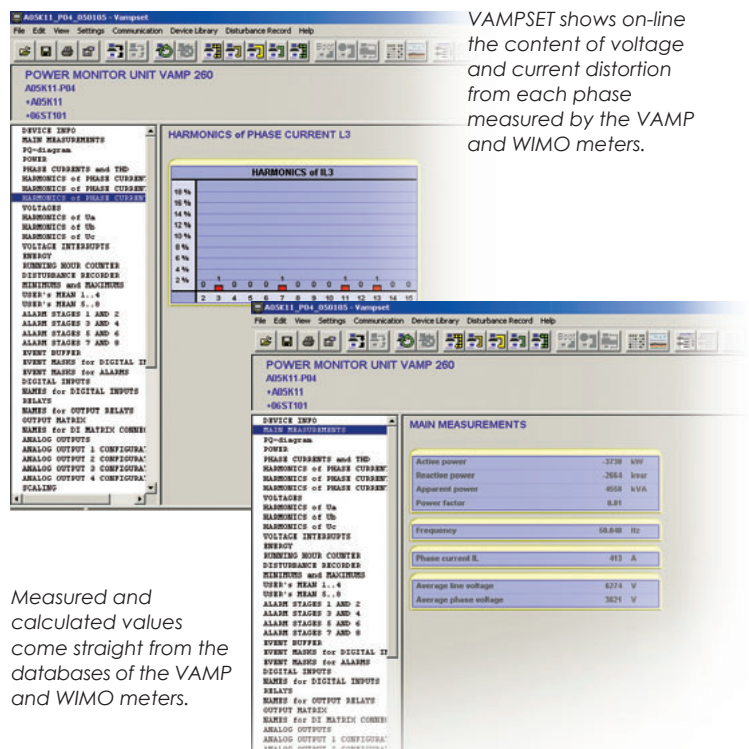
VAMPSET is a user-friendly, **free-of-charge** relay management software for setting, parameterising and configuring of VAMP relays, VAMP metering and control devices as well WIMO metering devices. Via the VAMPSET software parameters, configurations and recorded data can be swapped between the operator's PC and the VAMP and WIMO devices. Supporting the COMTRADE format VAMPSET also incorporates tools for analyzing relay events, waveforms and trends from data recorded by the VAMP or WIMO devices

Using a standard RS cable the PC running VAMPSET connects to the front or rear port of the VAMP / WIMO devices. The VAMPSET software also supports TCP/IP communication via an optional 10Base-T connection. Featuring true multi-language support the software runs on **Windows XP/2000/NT** and Windows 98/95 without any need for configuration of the PC. The VAMPSET software is future-safe supporting coming updates and new VAMP products.

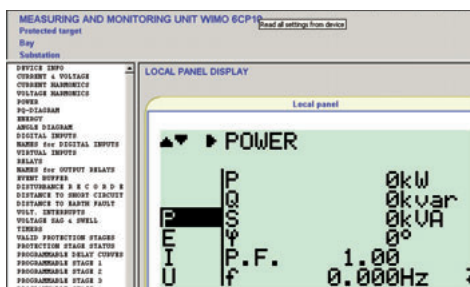
The VAMPSET software size is about 1 Mbytes; you may conveniently distribute it by e-mail or even on floppy disks saving valuable transport and waiting time – and money.



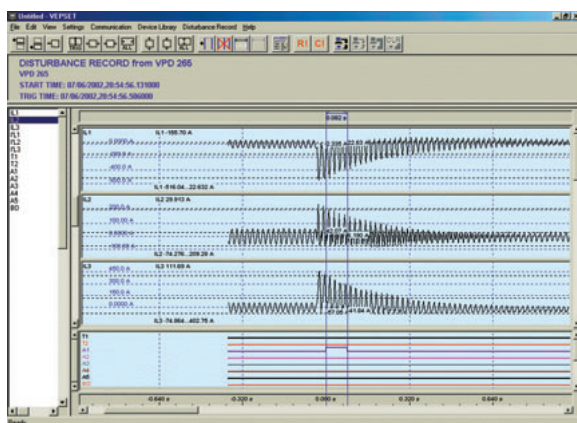
A disturbance recorder view from VAMP 260 indicating a faulty cable termination from the incoming feeder of paper mill's supply. This recording gave pre-information hence the repair action was possible before the cable termination faulted.



VAMPSET shows on-line the content of voltage and current distortion from each phase measured by the VAMP and WIMO meters.



Measurement view in VAMPSET of WIMO 6CP10 unit.



As a regular feature of the VAMP and WIMO units, standard COMTRADE type disturbance recording files can be uploaded for subsequent evaluation of any network event recorded.

Measured and calculated values come straight from the databases of the VAMP and WIMO meters.



## Functionality

|                                      | Symbol                     | Function                                                                | VAMP 96 | VAMP 260 | WIMO 6CPT0 |
|--------------------------------------|----------------------------|-------------------------------------------------------------------------|---------|----------|------------|
| Measurement and monitoring functions | IL1, IL2, IL3              | Current, 10...30 min demand                                             |         |          |            |
|                                      | IL1rms, IL2rms, IL3rms     | RMS currents, min, max                                                  |         |          |            |
|                                      | I1                         | Positive sequence current                                               |         |          |            |
|                                      | I2                         | Negative sequence current                                               |         |          |            |
|                                      | ILav                       | Average demand current, min, max                                        |         |          |            |
|                                      | Io                         | Neutral current                                                         |         |          |            |
|                                      | U12, U23, U31              | Phase to phase voltage                                                  |         |          |            |
|                                      | U12rms, U23rms, U31rms     | Phase to phase RMS voltage, min, max                                    |         |          |            |
|                                      | UL1, UL2, UL3              | Phase to ground voltage                                                 |         |          |            |
|                                      | UL1rms, UL2rms, UL3rms     | Phase to ground RMS voltage, min, max                                   |         |          |            |
|                                      | Phasors                    | Phasor diagram of IL1, IL2, IL3, UL1, UL2, UL3, U12, U23, U31, Uo, Io   |         |          |            |
|                                      | U1                         | Positive sequence voltage                                               |         |          |            |
|                                      | U2                         | Negative sequence voltage                                               |         |          |            |
|                                      | U2/U1                      | Relative voltage unbalance                                              |         |          |            |
|                                      | Uo                         | Residual voltage                                                        |         |          |            |
|                                      | P, Pda, PL1, PL2, PL3      | Active fundamental power, 10...30min demand, per phase                  |         |          |            |
|                                      | Prms                       | Active RMS power, 10...30min demand                                     |         |          |            |
|                                      | Prms                       | Active RMS power, total, min, max, 10...30min demand                    |         |          |            |
|                                      | Q, Qda, QL1, QL2, QL3      | Reactive fundamental power, 15 min demand, per phase                    |         |          |            |
|                                      | Qrms                       | Reactive RMS power, 10...30min demand                                   |         |          |            |
|                                      | Qrms                       | Reactive RMS power, total, min, max, 10...30min demand                  |         |          |            |
|                                      | S, Sda, SL1, SL2, SL3      | Apparent fundamental power, 10...30min demand, per phase                |         |          |            |
|                                      | Srms                       | Apparent RMS power, total, min, max, 15 min demand                      |         |          |            |
|                                      | PF, PFda, PFL1, PFL2, PFL3 | Power factor, per phase                                                 |         |          |            |
|                                      |                            | PQ-diagram                                                              |         |          |            |
|                                      | Cos                        | Cosine phi                                                              |         |          |            |
|                                      | Tan                        | Tan phi                                                                 |         |          |            |
|                                      | F, fda                     | System frequency, 10...30 min demand                                    |         |          |            |
|                                      | E+, E-                     | Active energy, imported / exported                                      |         |          |            |
|                                      | Eq+, Eq-                   | Reactive energy, imported / exported                                    |         |          |            |
|                                      |                            | Energy dose                                                             |         |          |            |
|                                      |                            | Number of energy pulse outputs                                          | 1       | 4        | 1          |
| Power quality                        | THD of IL1, IL2, IL3       | Total harmonic distortion of phase currents                             |         |          |            |
|                                      | H of IL1, IL2, IL3         | Harmonics of phase currents up to 15th                                  |         |          |            |
|                                      | THD of U                   | Total harmonic distortion of phase to phase or phase to ground voltages |         |          |            |
|                                      | H of U                     | Harmonics of phase to phase or phase to ground voltages up to 15th      |         |          |            |
|                                      |                            | Sag and swell                                                           |         |          |            |
| Logging, mathematical functions      |                            | Voltage interruptions                                                   |         |          |            |
|                                      |                            | Disturbance recorder, 12 channels                                       |         |          |            |
|                                      | Rh                         | Running hour counter                                                    |         |          |            |
|                                      |                            | Number of events in buffer                                              | 200     | 50       | 200        |
|                                      |                            | Alarm channels                                                          | 8       | 8        | 8          |
| Communication                        |                            | Comparison                                                              |         |          |            |
|                                      | >, <                       | AND, AND+OR, CT, INVAND, INVOR, OR, OR+AND, RS, RS_D, XOR, delays       |         |          |            |
|                                      | User's logic               | Number of day / week timers                                             | 4       | 4        | 4          |
|                                      |                            | IEC 60870-5-101                                                         |         |          |            |
|                                      |                            | IEC 60870-5-103                                                         |         |          |            |
| Hardware                             |                            | IEC 61850                                                               |         |          |            |
|                                      |                            | Modbus RTU                                                              |         |          |            |
|                                      |                            | Profibus DP                                                             |         |          |            |
|                                      |                            | SPA                                                                     |         |          |            |
|                                      |                            | DNP 3.0                                                                 |         |          |            |
|                                      |                            | Modbus RTU slave                                                        |         |          |            |
|                                      |                            | Number of phase current CT inputs, protection core                      |         | 3        |            |
|                                      |                            | Number of phase current CT inputs, measurement core                     | 3       |          | 3          |
|                                      |                            | Number of residual current CT inputs, measurement core                  |         |          | 1          |
|                                      |                            | Number of voltage inputs                                                | 3       | 3        | 3          |
|                                      |                            | Number of digital inputs                                                | 3       | 6        | 3          |
|                                      |                            | Number of heavy duty trip outputs                                       |         | 2        |            |
|                                      |                            | Number of alarm outputs                                                 | 1       | 3+1      | 1          |
|                                      |                            | Number of mA outputs                                                    |         | 4        |            |
|                                      |                            | Number of RTD inputs                                                    |         |          | 1          |
|                                      |                            | Number of optional RTD inputs *                                         |         | 4-16     | *          |

\*) Consult your dealer for details

# Communication

## Various communication alternatives to suit your demand

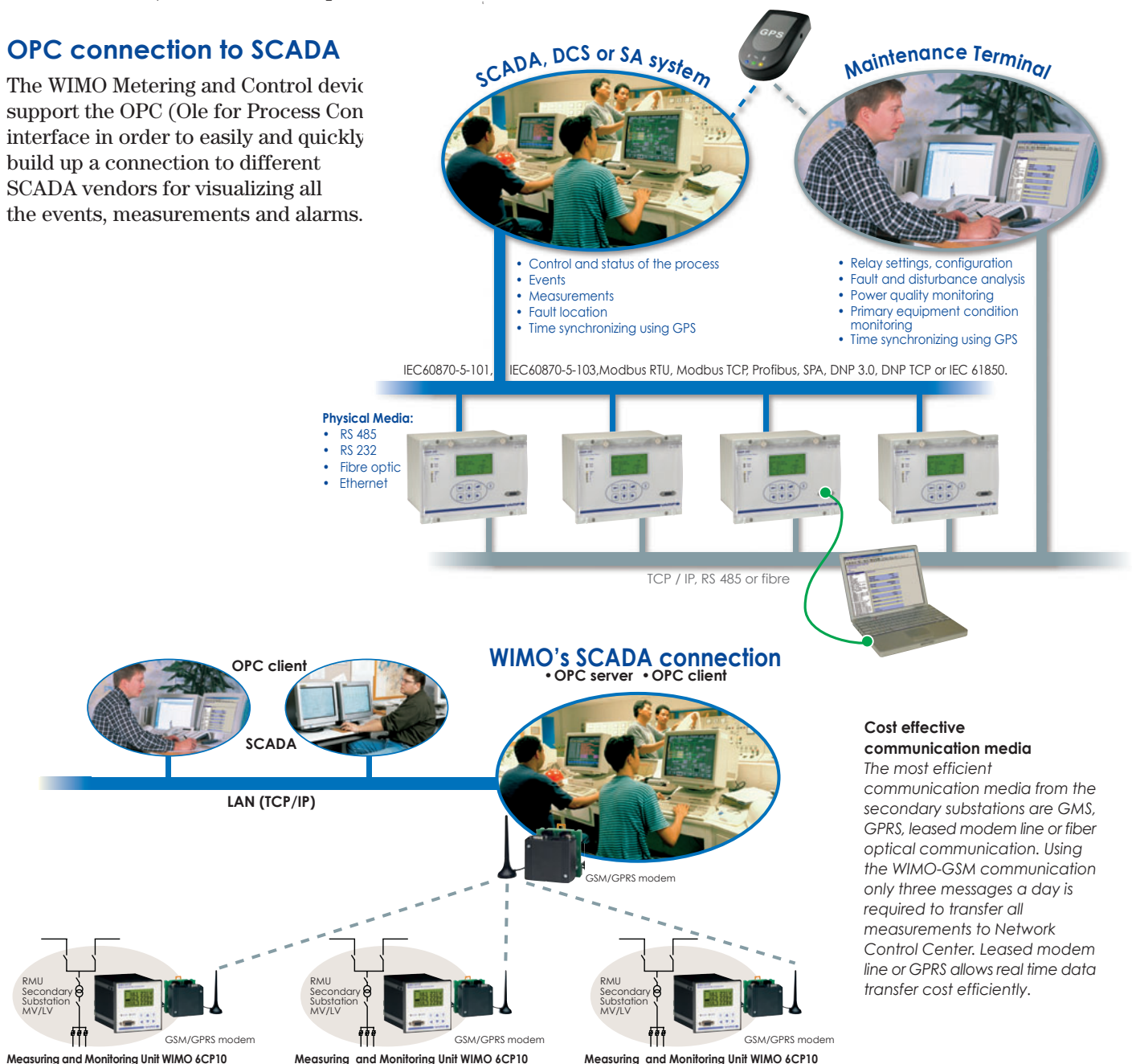
As VAMP 96 and VAMP 260 are members of VAMP protection relay family the meters benefit of the communication protocols widely used in other VAMP devices. The metering and control devices are often interfaced with Profibus DP, MODBUS TCP, Modbus RTU or SPA communication in industrial applications. Utilities request IEC 61850, IEC 60870-5-103, IEC 60870-5-103, DNP 3.0 and SPA protocols.

## OPC connection to SCADA

The WIMO Metering and Control device support the OPC (Ole for Process Control) interface in order to easily and quickly build up a connection to different SCADA vendors for visualizing all the events, measurements and alarms.

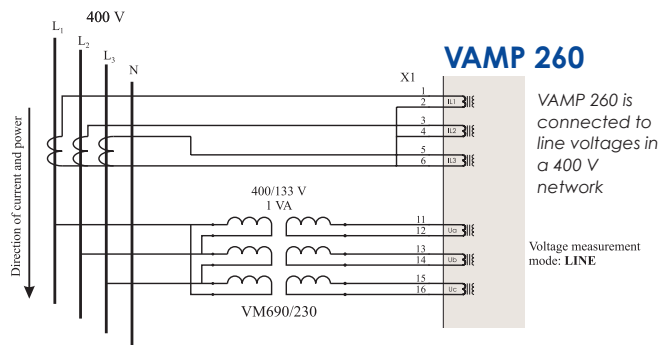
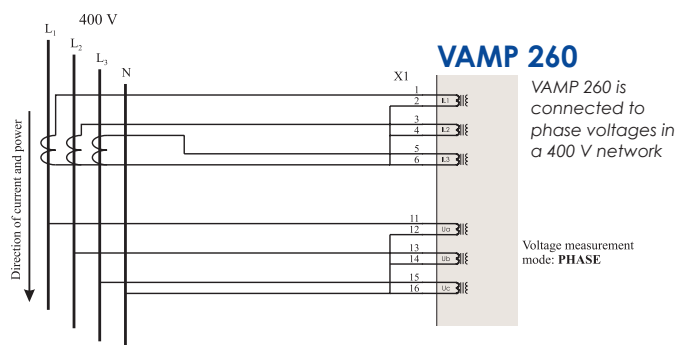
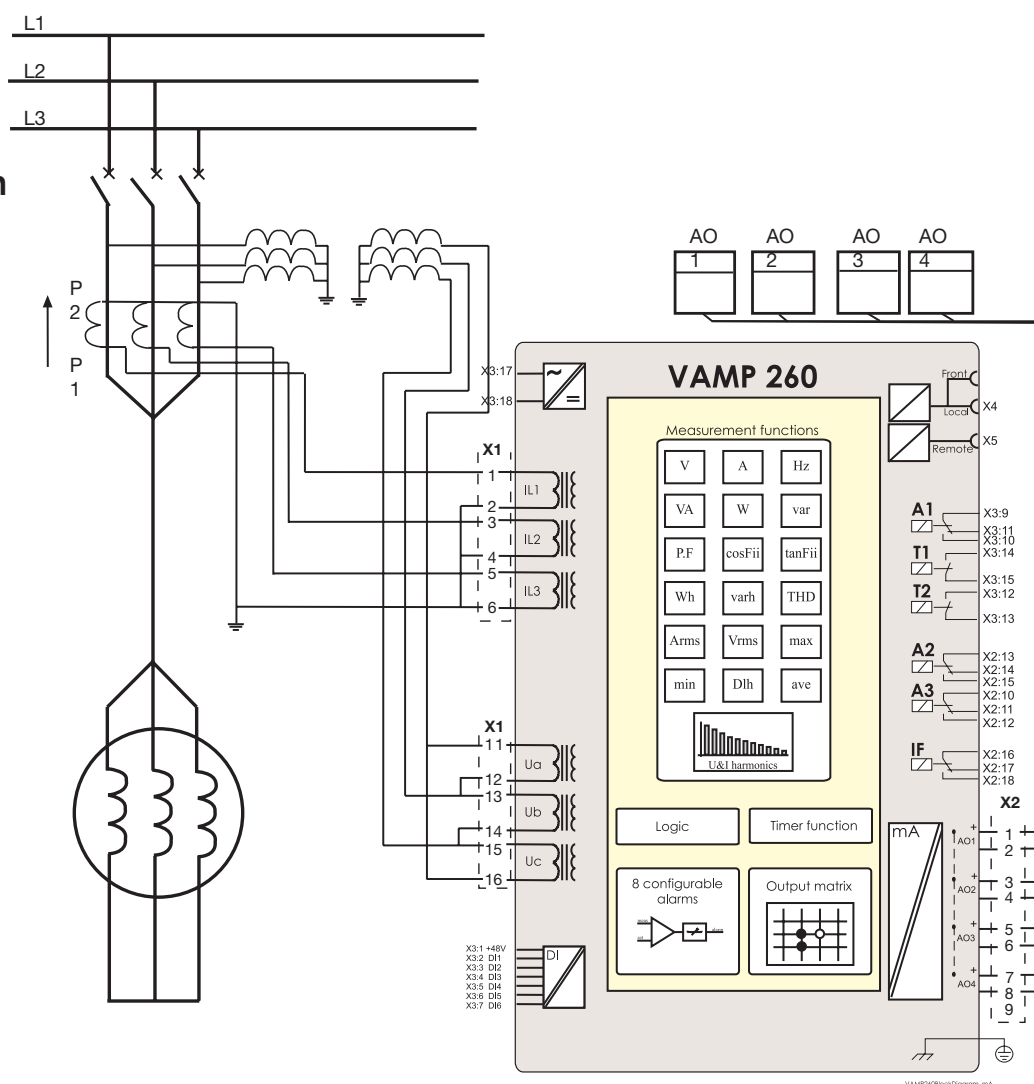
## WIMO's connectivity to SCADA

The WIMO's SCADA connection solution allows monitoring of the secondary substations over the internet. An ASP contract makes the commissioning of the WIMO fast and easy as the users of the system does not require any hardware at Network Control Center (NCC) side. Ready-made event, alarm, setting and measurement views are informative and the system enables transfer of data for instance to Word, Excel, html and txt format for further analysis.

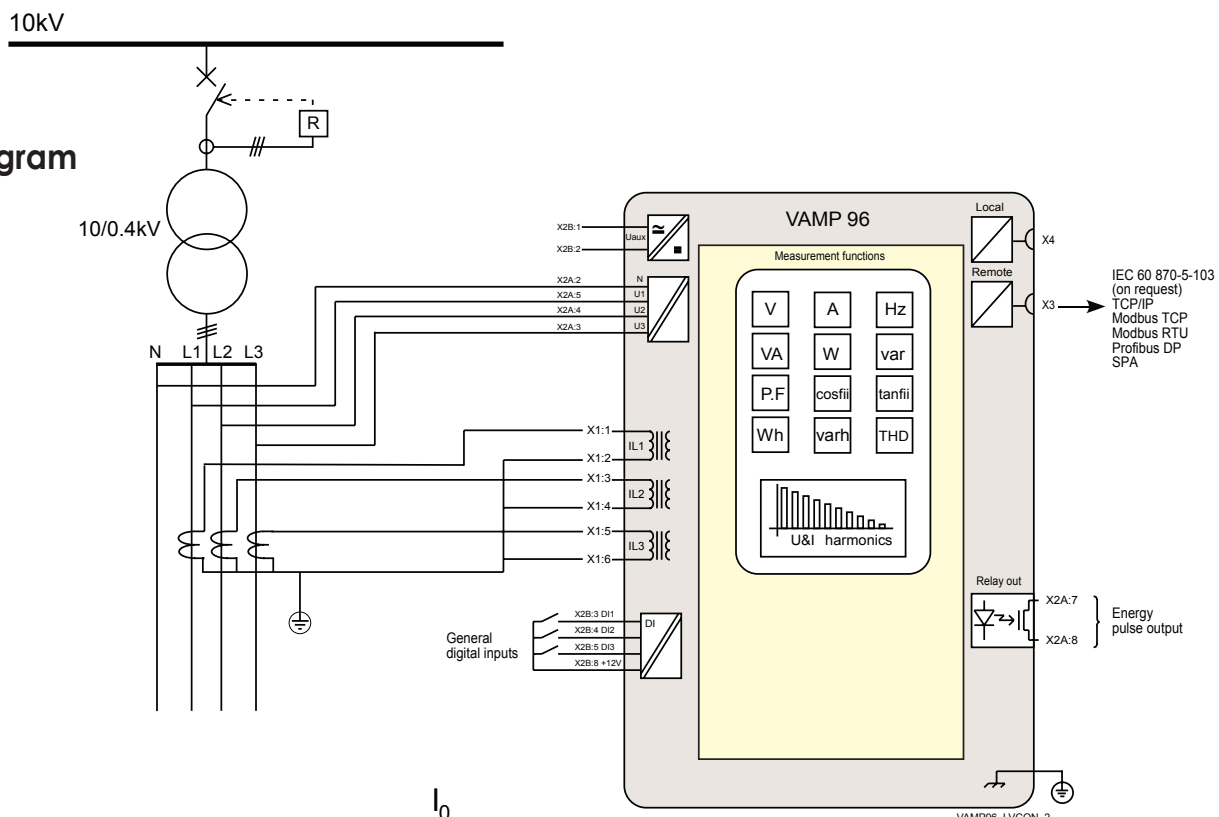


## Connection diagrams

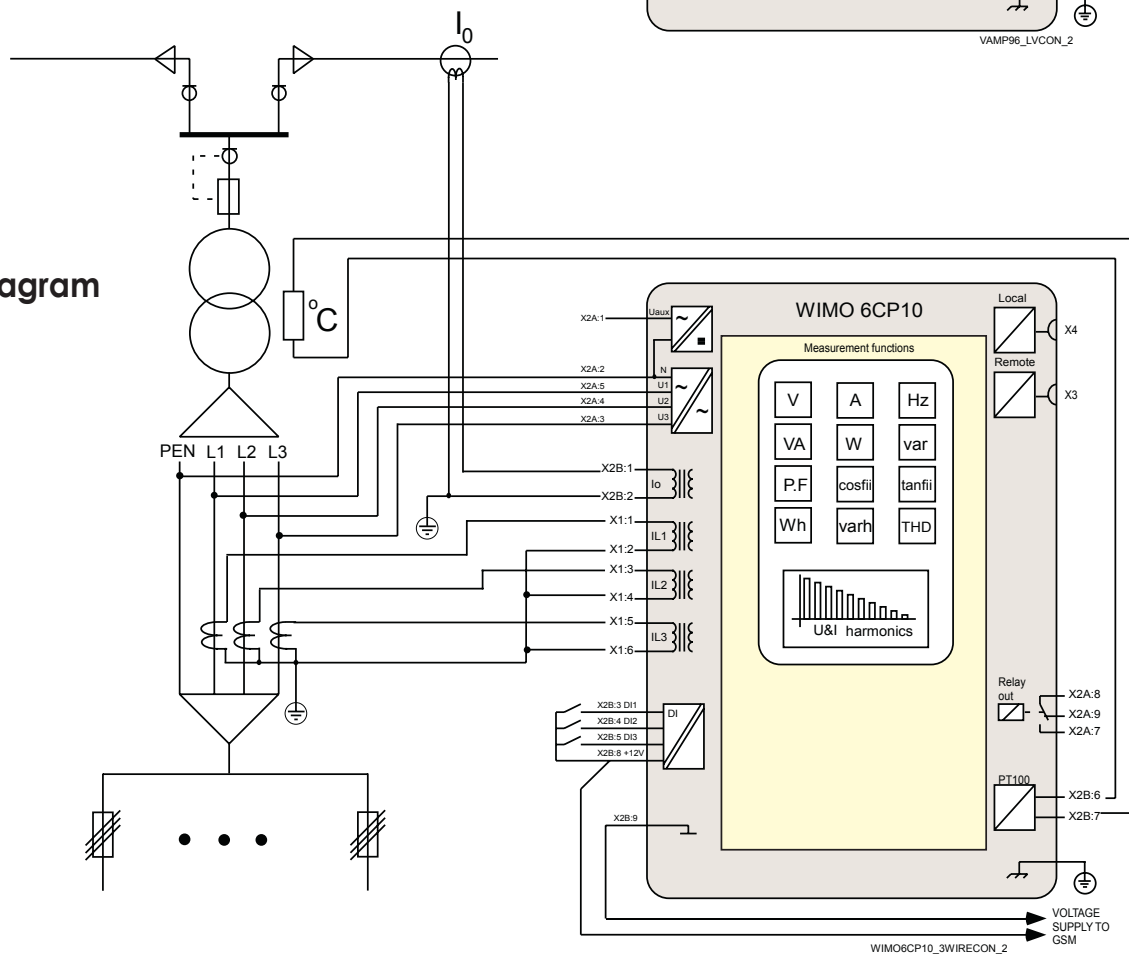
**VAMP 260**  
connection diagram



**VAMP 96  
connection diagram**



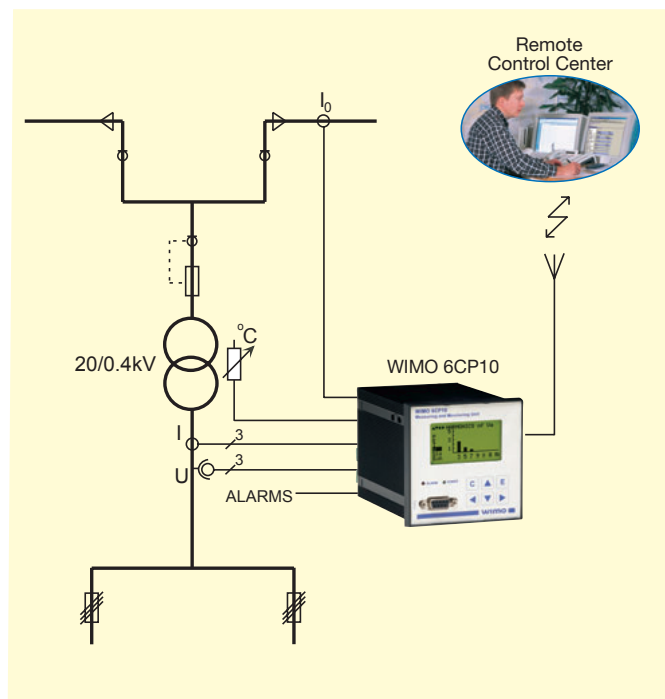
**WIMO 6CP10  
connection diagram**



## Typical applications

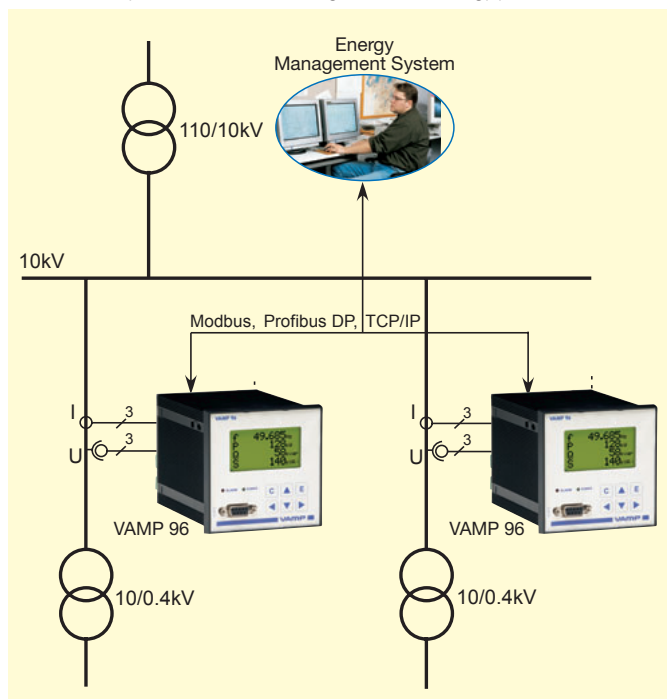
### WIMO 6CP10

Wimo 6CP10 is optimal metering and monitoring unit for utility's secondary power distribution substations



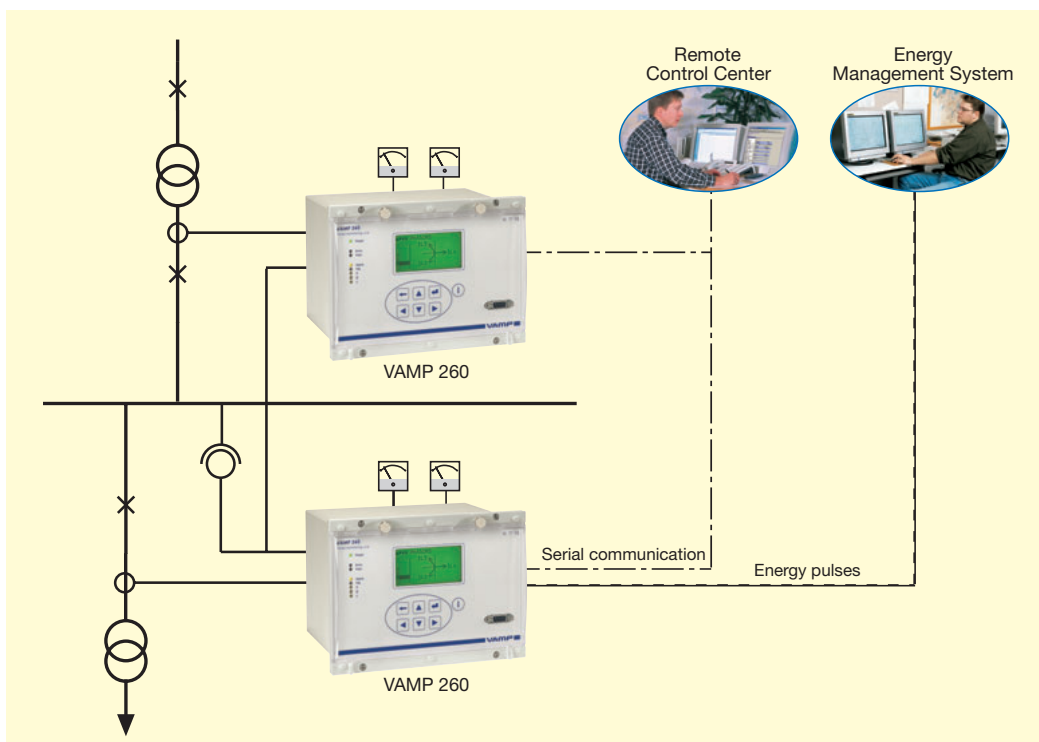
### VAMP 96

VAMP 96 is a basic metering and control device used for measuring power and energy of production cost centers in industrial applications. The same meter can be used by the utilities for detecting consumed energy per feeder.



### VAMP 260

VAMP 260 power monitoring unit applied for monitoring of power and energy at industrial power distribution. Energy pulses drive Energy Management System whereas the alarms and load information goes via the serial communication to the Control Center. The mA outputs control analogue meters of the switchgear.



# Order Codes

VAMP 260 -

□ □ 7 □ □ □



Nominal current [A]

1 = 1A

5 = 5A

Nominal Voltage [V]

C = 100.. 240

Frequency [Hz]

7 = 50/60Hz

Supply Voltage [V]

A = 40...265V ac/dc

B = 18... 36 Vdc

Optional Hardware

A = None

B = Plastic/Plastic Optic Interface

C = Profibus Interface

D = RS 485 interface

E = Glass/Glass Optic Interface

F = Rx Plastic/ Tx Glass Optic Interface

G = Rx Glass/ Tx Plastic Optic Interface

H = Ethernet interface

K = 61850 interface

Analogue Outputs

A = 4pcs, version 5 firmware

B = None, version 5 firmware

C = 4 pcs, standard firmware

D = None, standard firmware



VAMP 96

1 C 7 □ A A

Supply Voltage [V]

A = 90...264 Vdc

B = 18...75 Vdc



WIMO 6CP10 1 C 7 A A 1

Supply Voltage [V]

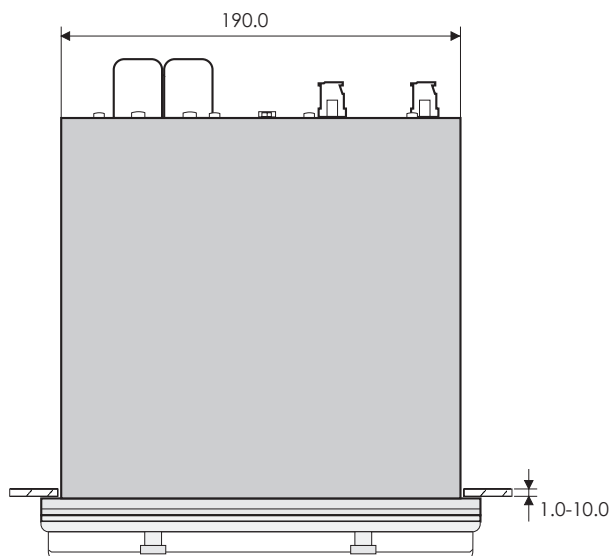
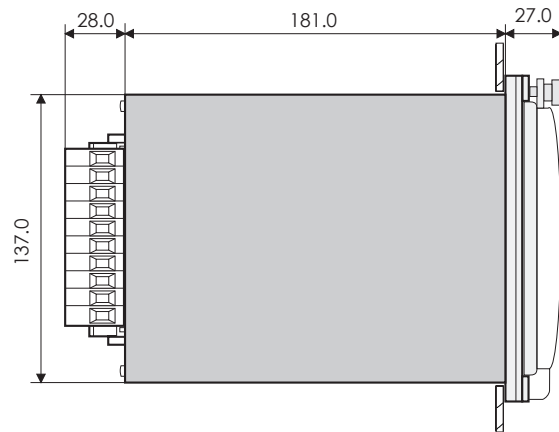
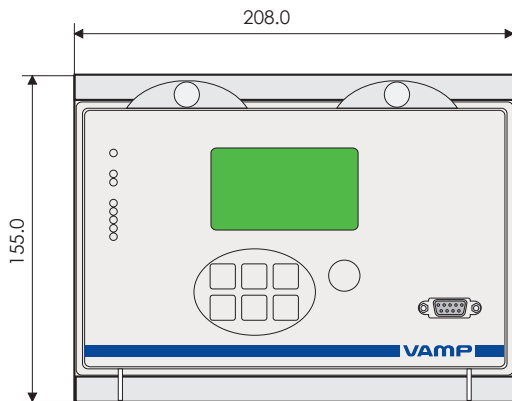
A = 90...264 Vdc

## Accessories:

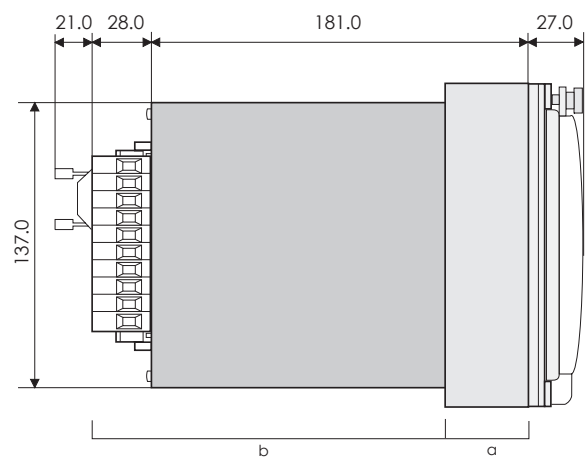
| Order Code         | Explanation                                          | Note                 | VAMP 96 | VAMP 260 | WIMO 6CP10 |
|--------------------|------------------------------------------------------|----------------------|---------|----------|------------|
| VEA 3CG            | Ethernet Interface Module                            |                      | ■       | ■        | ■          |
| VPA 3CG            | Profibus Interface Module                            |                      | ■       | ■        | ■          |
| VSE001             | Fiber optic Interface Module                         |                      | ■       | ■        | ■          |
| VSE002             | Interface Module                                     |                      | ■       | ■        | ■          |
| VSE005-1           | Ethernet, RS 485 interface module                    |                      | ■       | ■        | ■          |
| VX003-3            | Programming Cable (VAMPSet, VEA 3 CG + 200 serie)    | Cable length 3 m     | ■       | ■        | ■          |
| VX004-M3TTL/RS232  | Converter Cable (for PLC, VEA3CG+200serie )          | Cable length 3 m     | ■       | ■        | ■          |
| VX007-F3           | TTL/RS232 Converter Cable (for VPA 3 CG or VMA 3 CG) | Cable length 3 m     | ■       | ■        | ■          |
| VYX076             | Raising Frame for 200-serie                          | Height 40 mm         | ■       | ■        | ■          |
| VYX077             | Raising Frame for 200-serie                          | Height 60 mm         | ■       | ■        | ■          |
| VM690/230          | 3 Phase Nominal Voltage Matching Transformer         | 690V→230V, 400V→110V | ■       | ■        | ■          |
| VX008-4 TTL/RS232  | Converter Cable (for Modem MD42, ILPH, ...)          | Cable length 4m      | ■       | ■        | ■          |
| VX028-3            | Interface cable to VPA 3 CG (Profibus module)        | Cable length 3m      | ■       | ■        | ■          |
| VX030-3            | Interface cable to VEA 3 CG (Ethernet module)        | Cable length 3m      | ■       | ■        | ■          |
| VX032-3            | Back panel programming cable                         | Cable length 3m      | ■       | ■        | ■          |
| 20-0604-000 sensor | Short-circuit sensor                                 | Horstman             | ■       | ■        | ■          |
| 2102-sensor        | Earth-fault current sensor                           | Cableroll            | ■       | ■        | ■          |
| WIMO PT 100        | Temperature sensor                                   | Cable length 5 m     | ■       | ■        | ■          |

## Dimensional Drawings

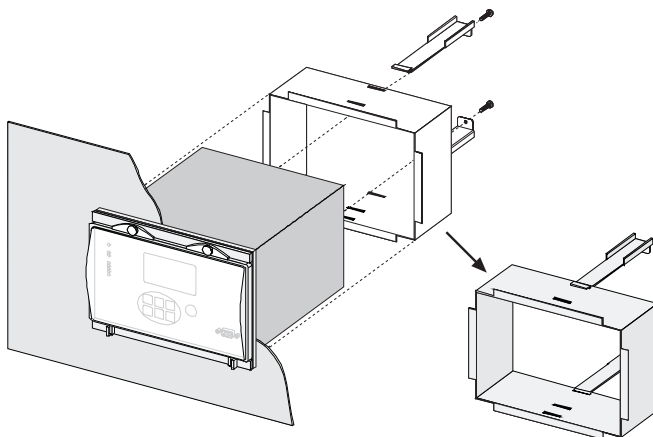
### VAMP 260 power monitoring unit



#### Semi-flush mounting

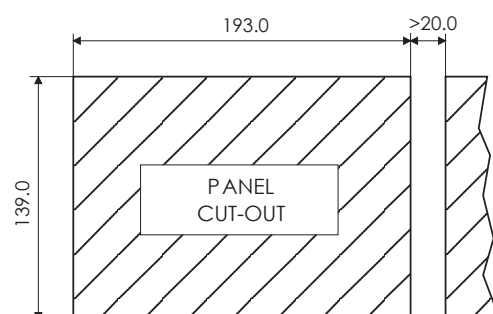


#### Panel mounting

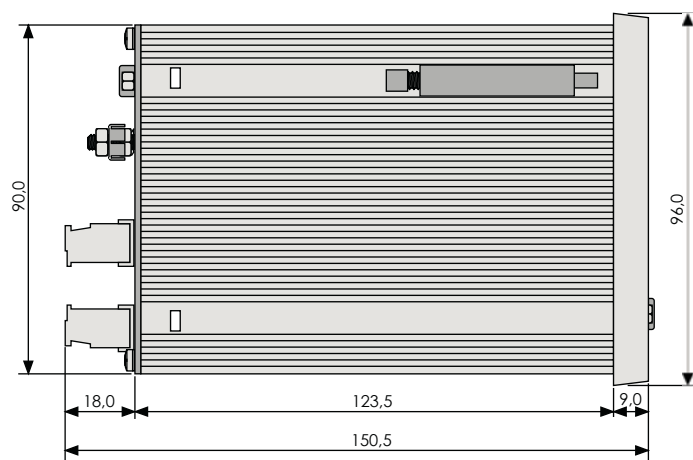
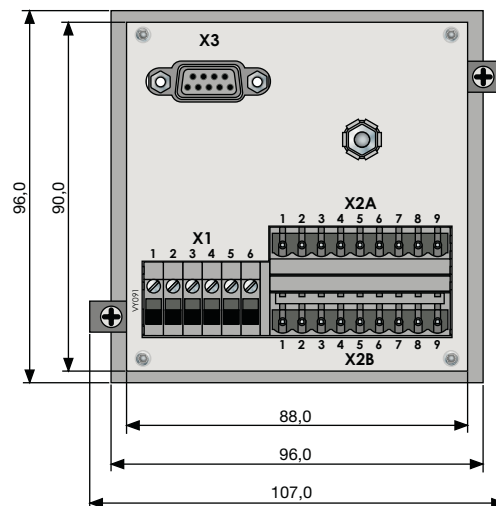
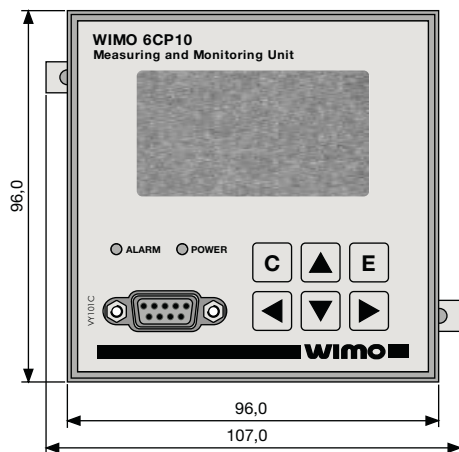


#### Depth with raising frames

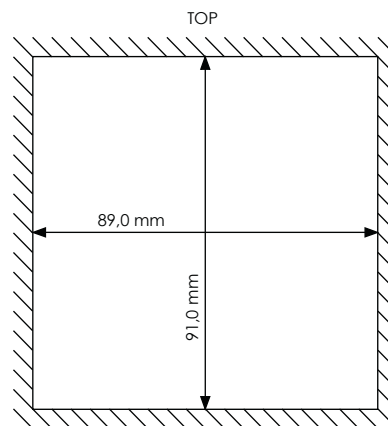
| Type designation | a      | b      |
|------------------|--------|--------|
| VYX 076          | 40 mm  | 169 mm |
| VYX 077          | 60 mm  | 149 mm |
| VYX 233          | 100 mm | 109 mm |



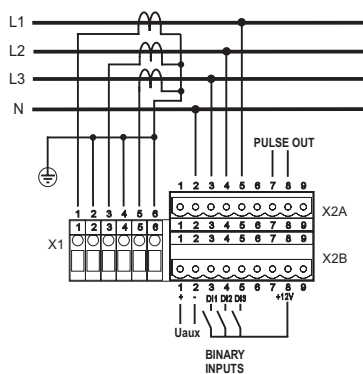
## VAMP 96 and WIMO 6CP10 measuring and monitoring units



### Panel cut-out

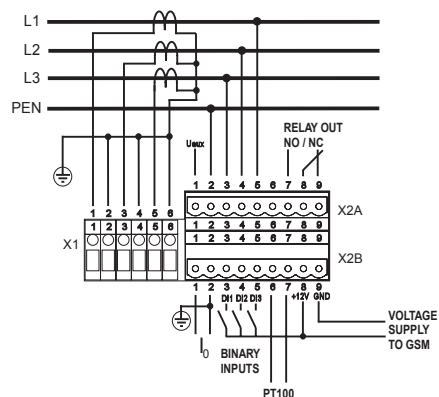


### Connection label VAMP 96



VY108B

### WIMO 6CP10



VY108B

# Technical Data, Tests and Environmental Conditions

## Measuring circuitry

|                                         | VAMP 96                                                                    | VAMP 260                                                                   | WIMO 6CP10                                                                 |
|-----------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Rated current <math>I_n</math></b>   | 1 A or 5 A                                                                 | 1 A or 5 A                                                                 | 1 A or 5 A                                                                 |
| - Current measuring range               | 0 – 1 x $I_n$                                                              | 0 – 5 x $I_n$                                                              | 0 – 1 x $I_n$                                                              |
| - Thermal withstand                     | 1,2 x $I_n$ (continuously)<br>5 x $I_n$ (for 10 s)<br>20 x $I_n$ (for 1 s) | 4 x $I_n$ (continuously)<br>20 x $I_n$ (for 10 s)<br>100 x $I_n$ (for 1 s) | 1,2 x $I_n$ (continuously)<br>5 x $I_n$ (for 10 s)<br>20 x $I_n$ (for 1 s) |
| - Burden                                | < 0.1 VA ( $I_n = 1$ A)<br>< 0.2 VA ( $I_n = 5$ A)                         | < 0.1 VA ( $I_n = 1$ A)<br>< 0.2 VA ( $I_n = 5$ A)                         | < 0.1 VA ( $I_n = 1$ A)<br>< 0.2 VA ( $I_n = 5$ A)                         |
| <b>Rated voltage <math>U_n</math></b>   | 0 – 264 V                                                                  | 50 - 240 V (configurable)                                                  | 230 V                                                                      |
| - Voltage measuring range               | 90 – 264 V                                                                 | 0 – 265 V                                                                  | 90 – 265 V                                                                 |
| - Continuous voltage withstand          | 264 V                                                                      | 275 V                                                                      | 275 V                                                                      |
| - Burden                                | < 0.5 V A                                                                  | < 0.5 V A                                                                  | < 0.5 V A                                                                  |
| <b>Rated frequency <math>f_n</math></b> | 45 – 65 Hz                                                                 | 45 – 65 Hz                                                                 | 45 – 65 Hz                                                                 |
| - Frequency measuring range             | 16 – 75 Hz                                                                 | 16 – 75 Hz                                                                 | 16 – 75 Hz                                                                 |
| <b>Terminal Block:</b>                  |                                                                            | Max. wire dimension:                                                       |                                                                            |
| - Solid or stranded wire                | 2,5 mm <sup>2</sup> (13-14 AWG)                                            | 4 mm <sup>2</sup> (10-12 AWG)                                              | 2,5 mm <sup>2</sup> (13-14 AWG)                                            |

## Auxiliary voltage

|                                           | Type A (standard)                                              | Type B (option)         | Type A (standard)                                                                   | Type B (option)                            |                                              |
|-------------------------------------------|----------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|
| <b>Rated voltage <math>U_{aux}</math></b> | 100 – 240 V ac/dc<br>110/120/220/240 V ac/dc<br>100 - 330 V dc | 20 – 67 V dc<br>24 V dc | 40 - 265 V ac/dc<br>110/120/220/240 V ac/dc<br>48/60/110/125/220 V dc               | 418 - 36 V dc<br>24 V dc<br>100 - 330 V dc | 100 – 240 V ac/dc<br>110/120/220/240 V ac/dc |
| <b>Power consumption</b>                  | 5 W (normal conditions)                                        |                         | < 7 W (normal conditions)<br>< 15 W (output relays activated)<br>< 50 ms (110 V dc) |                                            | 5 W (normal conditions)                      |
| <b>Max. permitted interruption time</b>   |                                                                |                         |                                                                                     |                                            |                                              |
| <b>Terminal Block:</b>                    | Max. wire dimension:                                           |                         | Max. wire dimension:                                                                |                                            | Max. wire dimension:                         |
| - Phoenix MVSTBW or equivalent            | 2,5 mm <sup>2</sup> (13-14 AWG)                                |                         | 2,5 mm <sup>2</sup> (13-14 AWG)                                                     |                                            | 2,5 mm <sup>2</sup> (13-14 AWG)              |

## Digital inputs

|                                         |                                        |                                        |                                        |
|-----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| <b>Number of inputs</b>                 | 3                                      | 6                                      | 3                                      |
| <b>Operation time</b>                   | 0.00 – 60.00 s (step 0.01 s)           | 0.00 – 60.00 s (step 0.01 s)           | 0.00 – 60.00 s (step 0.01 s)           |
| <b>Polarity</b>                         | NO (normal open) or NC (normal closed) | NO (normal open) or NC (normal closed) | NO (normal open) or NC (normal closed) |
| <b>Inaccuracy:</b>                      |                                        |                                        |                                        |
| - Operate time                          | ±1% or ±10 ms                          | ±1% or ±10 ms                          | ±1% or ±10 ms                          |
| <b>Internal operating voltage</b>       | 12 V dc                                | 48 V dc                                | 12 V dc                                |
| <b>Current drain when active (max.)</b> | Approx. 5mA                            | Approx. 20 mA                          | Approx. 5 mA                           |
| <b>Current drain, average value</b>     |                                        | < 1 mA                                 |                                        |
| <b>Terminal block:</b>                  | Max. wire dimension:                   | Max. wire dimension:                   | Max. wire dimension:                   |
| - Phoenix MVSTBW or equivalent          |                                        | 2,5 mm <sup>2</sup> (13-14 AWG)        |                                        |

## Trip contacts

|                                         |   |                                 |   |
|-----------------------------------------|---|---------------------------------|---|
| <b>Number of contacts</b>               | - | 2 making contacts               | - |
| <b>Rated voltage</b>                    | - | 250 V ac/dc                     | - |
| <b>Continuous carry</b>                 | - | 5 A                             | - |
| <b>Max. making current</b>              | - | 15 A                            | - |
| <b>Breaking capacity, AC</b>            | - | 2 000 VA                        | - |
| <b>Breaking capacity, DC (L/R=40ms)</b> | - | 50 W                            | - |
| <b>Contact material</b>                 | - | AgNi 90/10                      | - |
| <b>Terminal Block:</b>                  |   | Max. wire dimension:            |   |
| - Phoenix MVSTBW or equivalent          | - | 2,5 mm <sup>2</sup> (13-14 AWG) | - |

## Accuracy

|                        |                                 |                                 |                                  |
|------------------------|---------------------------------|---------------------------------|----------------------------------|
| <b>Current</b>         | +/- 0.5 % ( 0.1...1.2 x $I_n$ ) | +/- 0.3 % ( 0.5...1.5 x $I_n$ ) | +/- 0.5 % ( 0.1...1.2 x $I_n$ )  |
| <b>Voltage</b>         | +/- 0.4 % ( 0.1...1.2 x $U_n$ ) | +/- 0.2 % ( 0.1...1.2 x $U_n$ ) | +/- 0.4 % ( 0.4 ...1.2 x $U_n$ ) |
| <b>Frequency:</b>      | +/- 0.02%                       | +/- 0.01%                       | +/- 0.02%                        |
| <b>Active power</b>    | +/- 0.8 % (0.1...1.2 x $I_n$ )  | +/- 0.5 % ( 0.6...1.5 x $I_n$ ) | +/- 0.8 % (0.1...1.2 x $I_n$ )   |
| <b>Reactive power</b>  | +/- 0.8 % (0.1...1.2 x $I_n$ )  | +/- 0.5 % ( 0.6...1.5 x $I_n$ ) | +/- 0.8 % (0.1...1.2 x $I_n$ )   |
| <b>Active energy</b>   | +/- 0.8 % (0.1...1.2 x $I_n$ )  | +/- 0.5 % ( 0.6...1.5 x $I_n$ ) | +/- 0.8 % (0.1...1.2 x $I_n$ )   |
| <b>Reactive energy</b> | +/- 0.8 % (0.1...1.2 x $I_n$ )  | +/- 0.5 % ( 0.6...1.5 x $I_n$ ) | +/- 0.8 % (0.1...1.2 x $I_n$ )   |



| <b>Alarm contacts</b>                    |                                                         |                                                                                      |                                                        |
|------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------|
|                                          | <b>VAMP 96</b>                                          | <b>VAMP 260</b>                                                                      | <b>WIMO 6CP10</b>                                      |
| Number of contacts                       | 1 normally open                                         | 3 change-over contacts<br>(relays A1, A2 and A3)<br>1 change-over contact (IF relay) | 1 change-over contact (A1)                             |
| Rated voltage                            | 48 V ac/dc                                              | 250 V ac/dc                                                                          | 48 V ac/dc                                             |
| Max. make current                        | 120 mA                                                  | 15 A                                                                                 | N.O. 10 A / N.C. 3 A                                   |
| Continuous carry                         | 3 A                                                     | 5 A                                                                                  | 3 A                                                    |
| Breaking capacity, AC                    | -                                                       | 2 000 VA                                                                             | N.O. 1250 VA / N.C. 500 VA                             |
| Contact material                         | -                                                       | AgNi 0.15 goldplated                                                                 | AgAl 0.15 goldplated                                   |
| Terminal Block:                          | Max. wire dimension:                                    | Max. wire dimension:                                                                 | Max. wire dimension:                                   |
| - Phoenix MVSTBW or equivalent           | 2.5 mm <sup>2</sup> (13-14 AWG)                         | 2.5 mm <sup>2</sup> (13-14 AWG)                                                      | 2.5 mm <sup>2</sup> (13-14 AWG)                        |
| <b>Local serial communication port</b>   |                                                         |                                                                                      |                                                        |
| Number of ports                          | 1 on front and 1 shared<br>with remote on rear panel    | 1 on front and 1 on rear panel<br>on rear panel                                      | 1 on front and 1 shared<br>with remote on rear panel   |
| Electrical connection                    | RS 232                                                  | RS 232                                                                               | RS 232                                                 |
| Data transfer rate                       | 9 600 - 38 400 kb/s                                     | 9 600 - 38 400 kb/s                                                                  | 9 600 - 38 400 kb/s                                    |
| <b>Remote control connection</b>         |                                                         |                                                                                      |                                                        |
| Number of ports                          | 1 shared with local port on rear panel                  | 1 on rear panel                                                                      | 1 shared with local port on rear panel                 |
| Electrical connection                    | RS 232 (standard)                                       | TTL (standard)                                                                       | RS 232 (standard)                                      |
|                                          | TTL                                                     | RS 485 (option)                                                                      | TTL                                                    |
|                                          | RS 485 (with external module)                           | RS 232 (option)                                                                      | RS 485 (with external module)                          |
|                                          | Plastic fibre connection (with ext. module)             | Plastic fibre connection (option)                                                    | Plastic fibre connection (with ext. module)            |
| Data transfer rate                       | 9 600 kb/s                                              | 9 600 kb/s                                                                           | 9 600 kb/s                                             |
| Protocols                                | ModBus, RTU master                                      | ModBus, RTU master                                                                   | GSM                                                    |
|                                          | ModBus, RTU slave                                       | ModBus, RTU slave                                                                    | GPRS                                                   |
|                                          | SpaBus, slave                                           | SpaBus, slave                                                                        | SpaBus, slave                                          |
|                                          | IEC 60850                                               | IEC 60850                                                                            | IEC 60850                                              |
|                                          | IEC 60870-5-101                                         | IEC 60870-5-101                                                                      | IEC 60870-5-101                                        |
|                                          | IEC 60870-5-103                                         | IEC 60870-5-103                                                                      | IEC 60870-5-103                                        |
|                                          | Profibus DP (option)                                    | Profibus DP (option)                                                                 | -                                                      |
|                                          | TCP/IP (option)                                         | TCP/IP (option)                                                                      | TCP/IP (option)                                        |
|                                          | DNP 3.0                                                 | DNP 3.0                                                                              | DNP 3.0                                                |
| <b>Analogue outputs</b>                  |                                                         |                                                                                      |                                                        |
| Number of Ports                          | -                                                       | 4 (Note: common +pole)                                                               | -                                                      |
| Electrical connection:                   | -                                                       | Current output                                                                       | -                                                      |
| - Range                                  | -                                                       | 0 – 20 mA (min & max configurable)                                                   | -                                                      |
| - Load                                   | -                                                       | <800 W                                                                               | -                                                      |
| - Accuracy                               | -                                                       | <±20mA                                                                               | -                                                      |
| Isolation test voltage                   | -                                                       | 500 Vdc                                                                              | -                                                      |
| <b>Test voltages</b>                     |                                                         |                                                                                      |                                                        |
| Insulation test voltage<br>(IEC 60255-5) | 2 kV, 50 Hz, 1 min                                      | 2 kV, 50 Hz, 1 min                                                                   | 2 kV, 50 Hz, 1 min                                     |
| Surge voltage (IEC 60255-5)              | 5 kV, 1.2/50 ms, 0.5 J                                  | 5 kV, 1.2/50 ms, 0.5 J                                                               | 5 kV, 1.2/50 ms, 0.5 J                                 |
| <b>Environmental conditions</b>          |                                                         |                                                                                      |                                                        |
| Operating temperature                    | -25 to +50 °C                                           | -10 to +55 °C                                                                        | -25 to +50 °C                                          |
| Operating temperature (display)          | 0 to +50 °C                                             |                                                                                      | 0 to +50 °C                                            |
| Transport and storage temperature        | -10 to +60 °C                                           | -40 to +70 °C                                                                        | -10 to +60 °C                                          |
| Relative humidity                        | < 75 % (1 year, average value)                          | < 75% (1 year, average value)                                                        | < 75% (1 year, average value)                          |
|                                          | < 90 % (30 days per year,<br>no condensation permitted) | < 90% (30 days per year,<br>no condensation permitted)                               | < 90% (30 days per year,<br>no condensation permitted) |
| <b>Casing</b>                            |                                                         |                                                                                      |                                                        |
| Degree of protection (IEC 60529)         | IP20                                                    | IP20 / Flush mounted IP54                                                            | IP20                                                   |
| Dimensions (W x H x D) mm                | 96 x 96 x 151                                           | 208 x 155 x 236                                                                      | 96 x 96 x 151                                          |
| Material                                 | Polyphenylene Oxide                                     | 1 mm steel plate                                                                     | Polyphenylene Oxide                                    |
| Weight                                   | 0.6 kg                                                  | 4.2 kg                                                                               | 0.6 kg                                                 |
| Color code                               |                                                         | RAL 7032 (Casing)/RAL 7035 (Back plate)                                              |                                                        |
| <b>Package</b>                           |                                                         |                                                                                      |                                                        |
| Dimensions (W x H x D) mm                | 180 x 100 x 101                                         | 215 x 160 x 275                                                                      | 180 x 100 x 101                                        |
| Weight (Relay, Package and Manual)       | 0.7 kg                                                  | 5.2 kg                                                                               | 0.7 kg                                                 |



Vamp Ltd is a company specialicing in medium-voltage protection relays, arc protection systems as well as measuring and monitoring units. The company's Vamp family of products includes protection relays for all segments of electric power production and distribution and a full range of integrated arc protection systems. Its Wimo products cover a wide assortment of measuring and monitoring systems for both wired and wireless communication.

|                |                    |                                                       |
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