



VAMP

Power monitoring unit type VAMP 260

formerly known as VMAC 260

Power monitoring unit type VAMP 260

The complete source of information



Power monitoring unit type VAMP 260

The complete source of information

Users

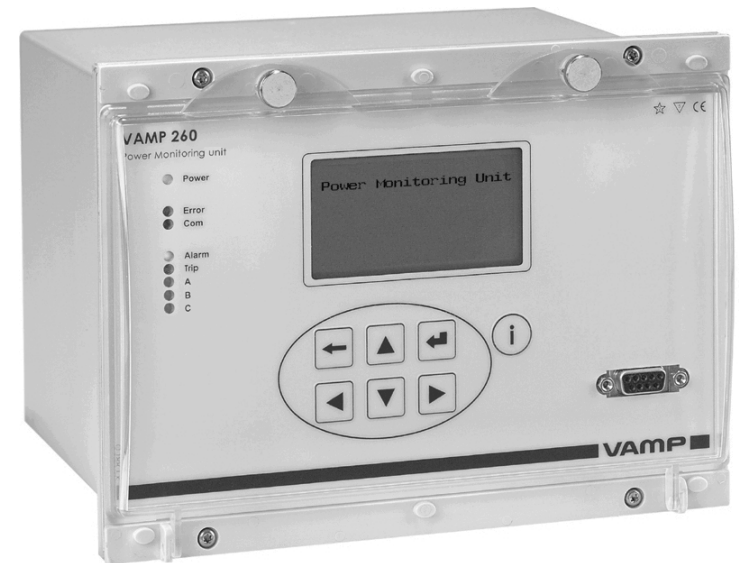
- utilities
- industry
- power plants

Used for

- local monitoring
- remote monitoring

Customers

- Wärtsila NSD, ABB Transmit, Stora Enso, Turku Energy, Joutseno Pulp, Duke Energy, Outokumpu, Elkamo, Reyrolle, West Coast Paper Mills, etc.



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Saves cost, more functions

Installation

- work
- material

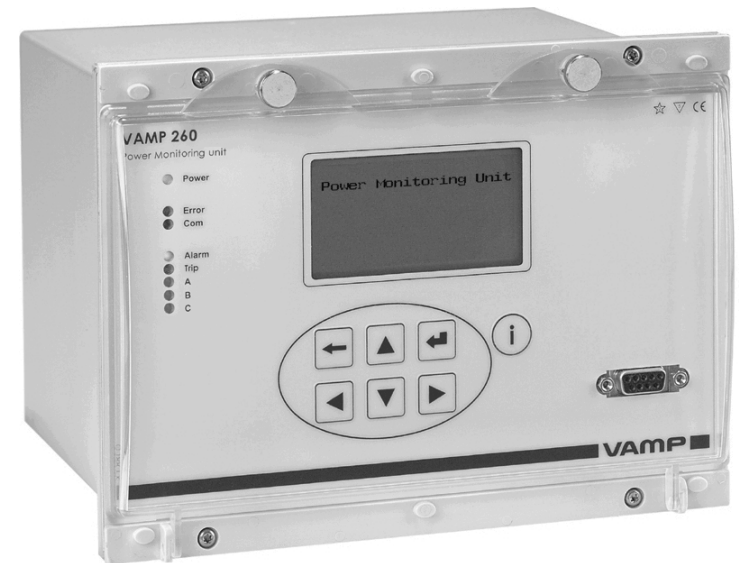
Control systems

- data collecting

Equipment

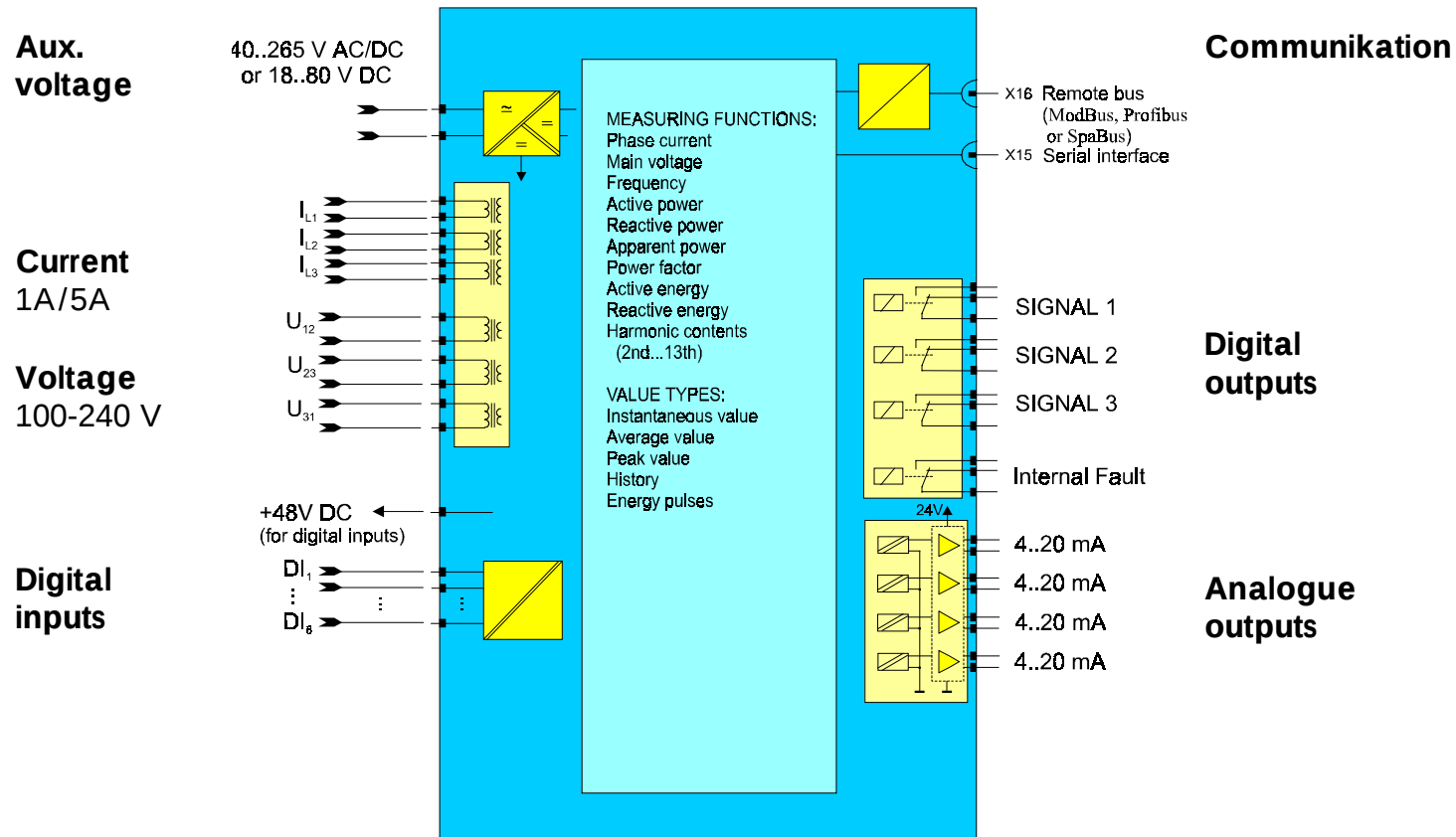
- replace instruments

**More information at
lower costs !**



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Connections



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Functions

Measuring

IL1, IL2, IL3, min, max, average

Ua, Ub, Uc, U12, U23, U31, min, max, f

Calculation

P, Q, S, min, max, average

E+, E-, Eq+, Eq-, total, trip

Harmonics: U, I, total, 2nd to 13th, Power factor

Transducer

Four mA outputs for any relevant signals

Alarms

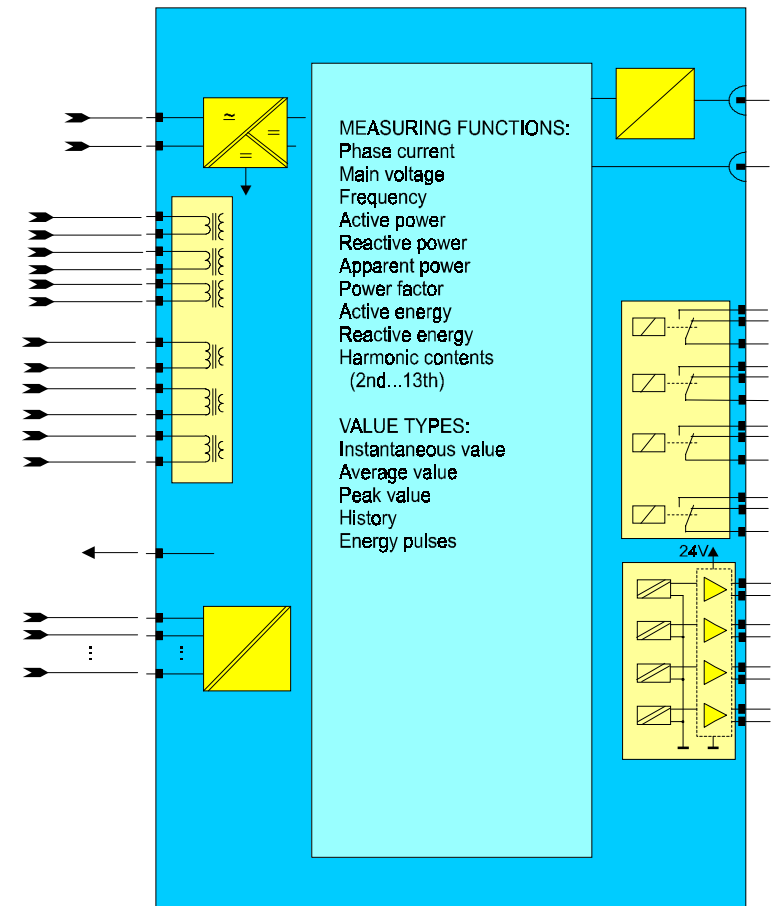
Any relevant function, 8 stages

Information

Operating hours, cos ϕ , tan ϕ , I_o, I₂/I₁, U_o, U₂/U₁

Communication

SPA, ModBus RTU, Modbus TCP, Profibus DP, IEC 60870-5-103



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Measuring

Current

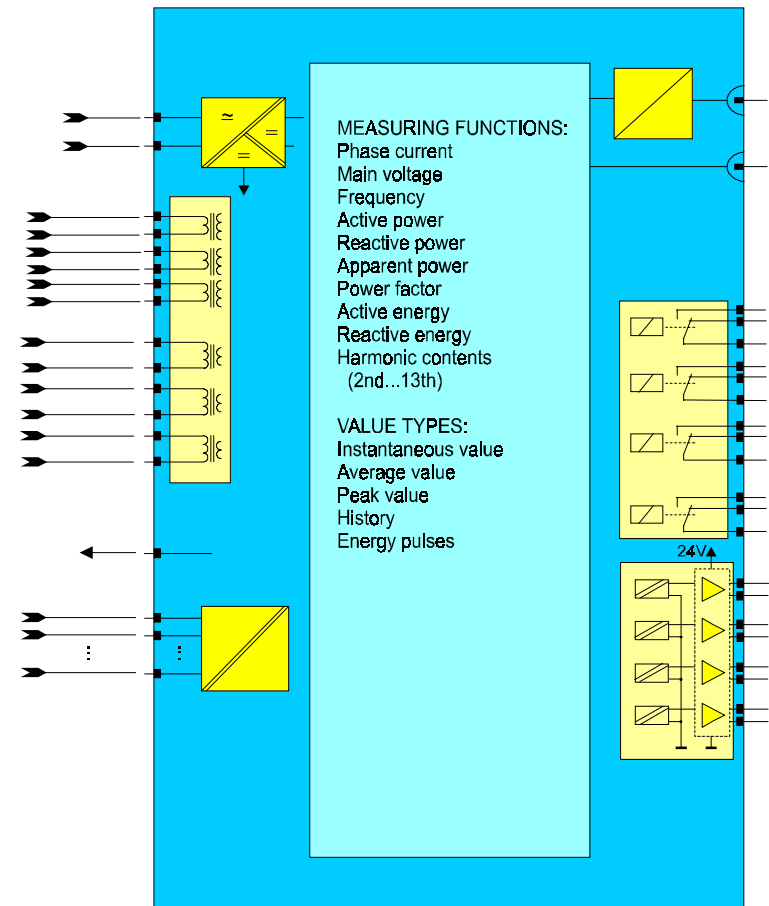
- phase current I_{L1-3}
 - minimum I_{L1-3}
 - maximum I_{L1-3}
 - scaling
- Accuracy $\pm 0.3\%$ ($0.5 \dots 1.5 \cdot I_N$)

Voltage

- main voltages U_{1-3}
 - phase voltages U_{L1-3}
 - minimum U_{1-3}
 - maximum U_{1-3}
 - scaling
- Accuracy $\pm 0.2\%$ ($0.1 \dots 1.2 \cdot U_N$)

Frequency

Accuracy $\pm 0.01\%$



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Calculation

Active power

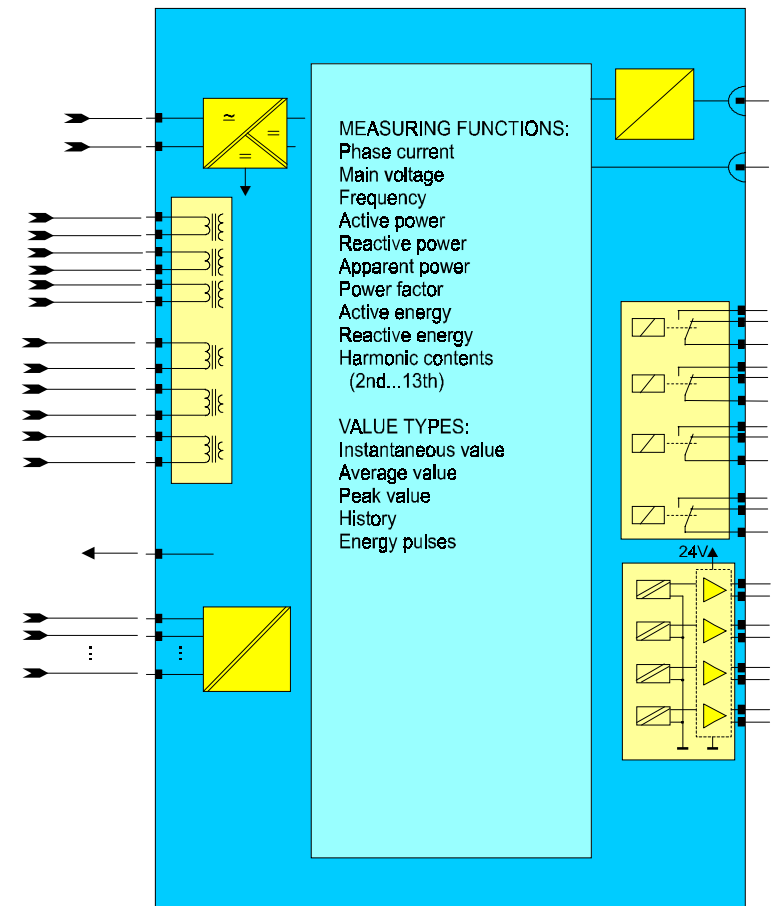
- active power P
 - active power P_{L1-3}
 - min/max/med P
- Accuracy $\pm 0.5\%$ ($0.6 \dots 1.6 \cdot I_N$)

Reactive power

- reactive power Q
 - reactive power Q_{L1-3}
 - min/max/med Q
- Accuracy $\pm 0.5\%$ ($0.6 \dots 1.0 \cdot I_N$)

Apparent power

- apparent power S
- apparent power S_{L1-3}



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Calculation

Energy

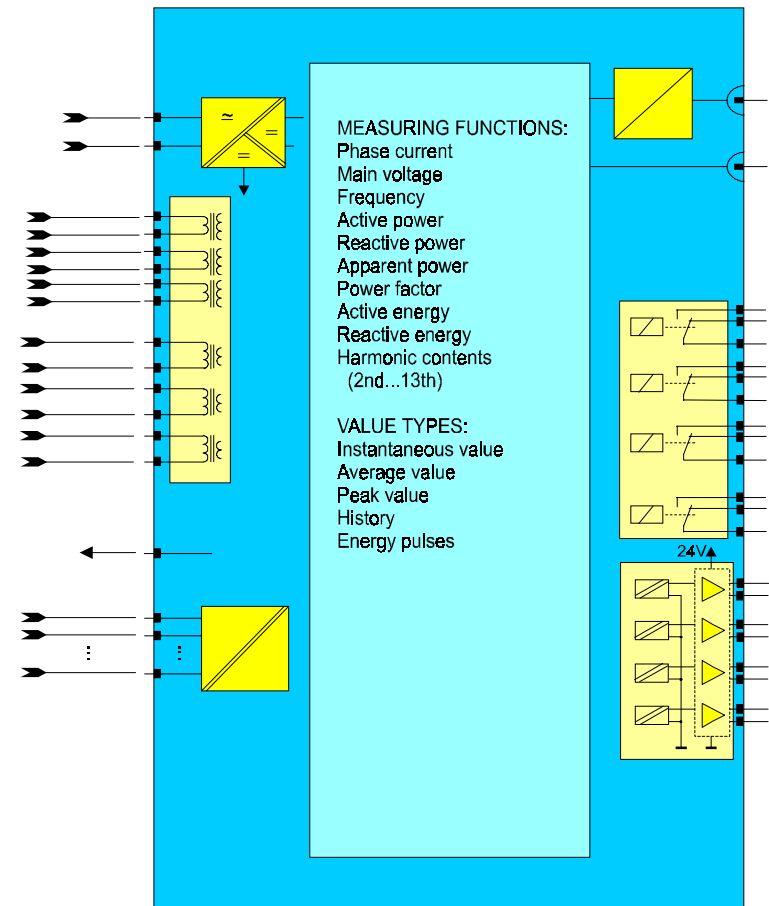
- active/reactive energy
 - imported/exported
 - total
 - trip meter
- Accuracy $\pm 0.5\%$ ($0.6 \dots 1.6 \cdot I_N$)

Harmonic distortion

- THD U/I_{L1-3}
- Graphic $HD_{1-13} U/I_{L1-3}$

Others

- Cos fii, Tan fii
- powerfactor PF_{L1-3}
- Cos fii L_{1-3}
- phase sequence I/U
- operating time

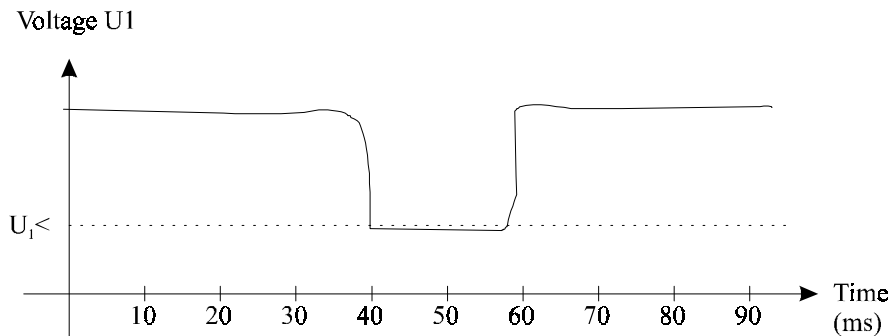


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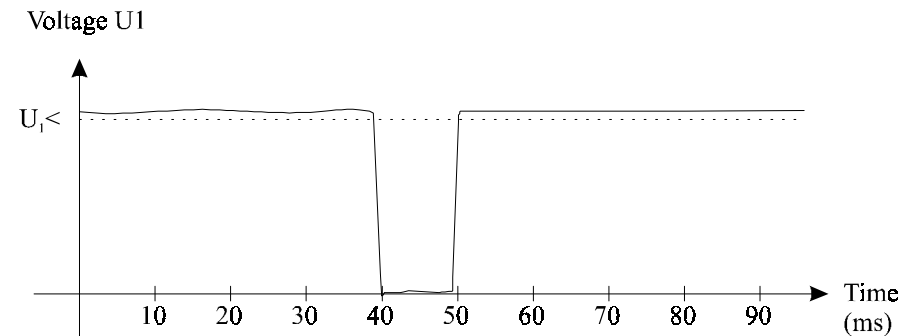
Monitoring

Voltage interruption

- number of interruptions
- total time of interruptions
- adjustable voltage limit based on positive sequence undervoltage
- adjustable monitoring period:
 - 8 hours, one day, one week, one month, one year



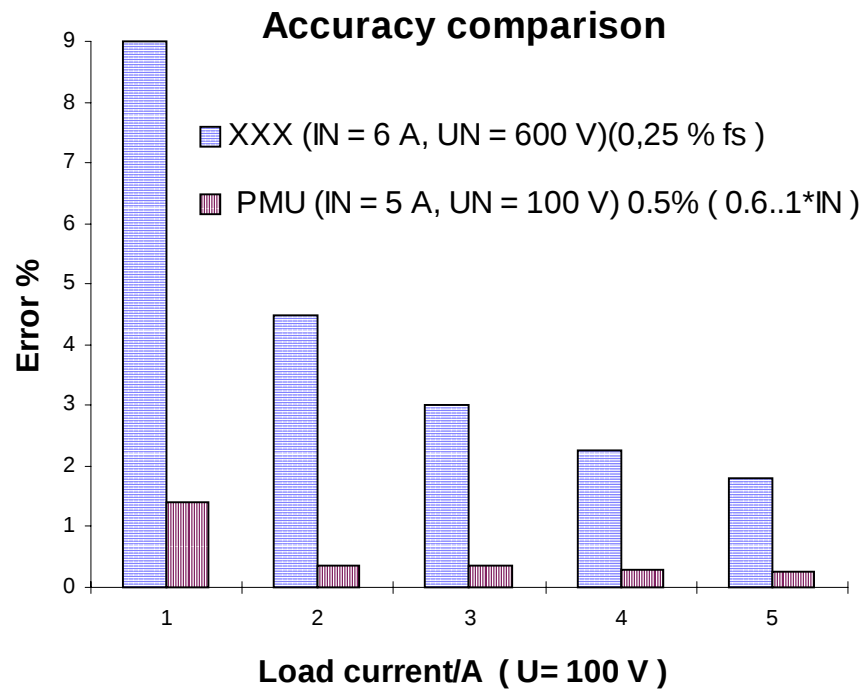
Shortest recognized interruption time is 40 ms (worst case)



Should the depth of the voltage dip be large a shorter than 40 ms interruption time can be detected

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Accuracy



Accuracy is not always what it seems to be

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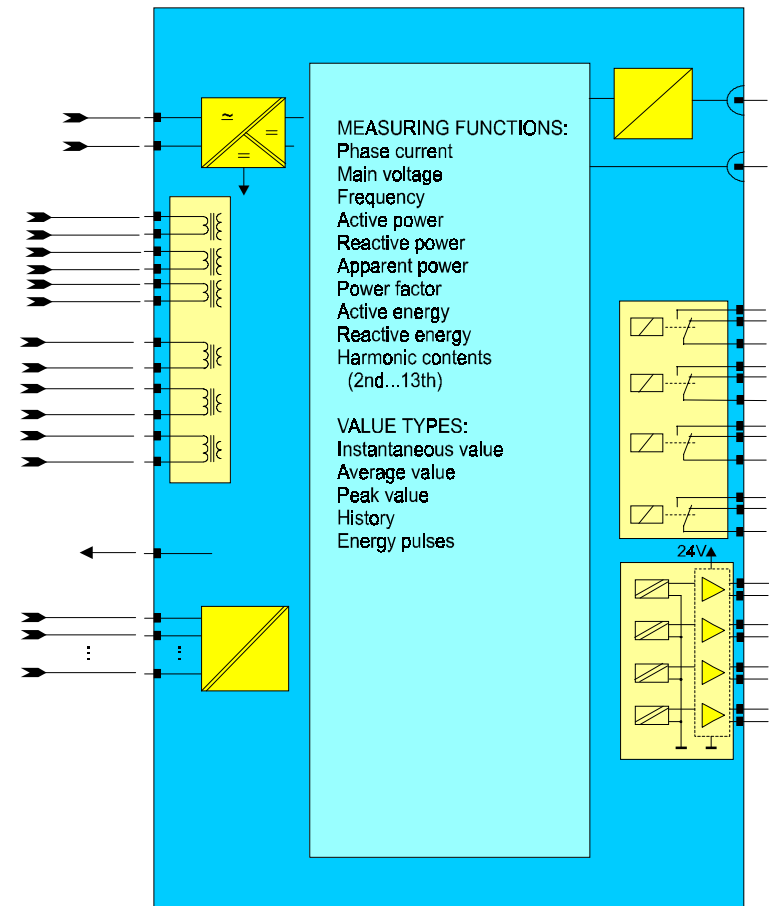
Transducer

Four analogue outputs

- most important measured or calculated values can be used
- 2 standard signals
- min/max scalable
- exception control
- test position

Pulse outputs (relay)

- programmable kWh/pulse
- scaling
- max number of pulses 2/sec
- shortest pulse 100 msec



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Alarm handling

Eight alarm channels

- measured/calculated values
- limits
- >/<
- test position
- digital inputs
- time delay

Five digital outputs

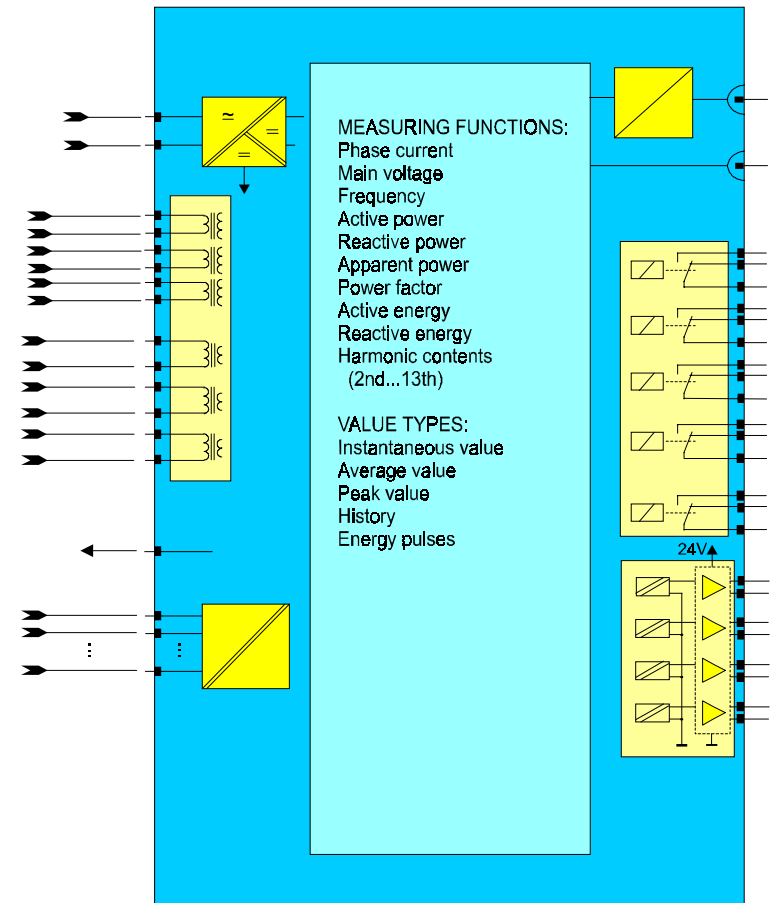
- free selection of channels
- latching/non-latching
- test position

Five LED-indications

- free selection of channels
- latching/non-latching

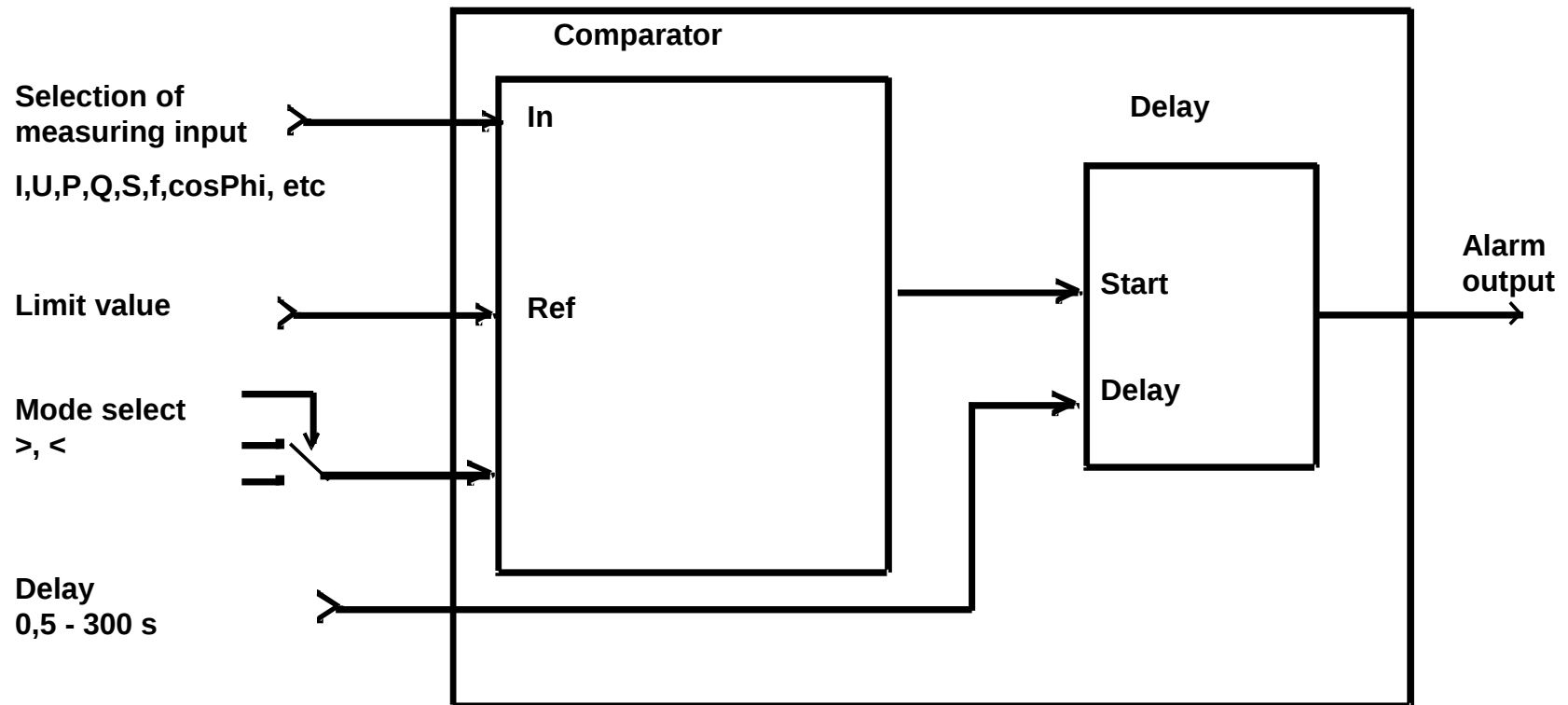
Event register

- 50 events



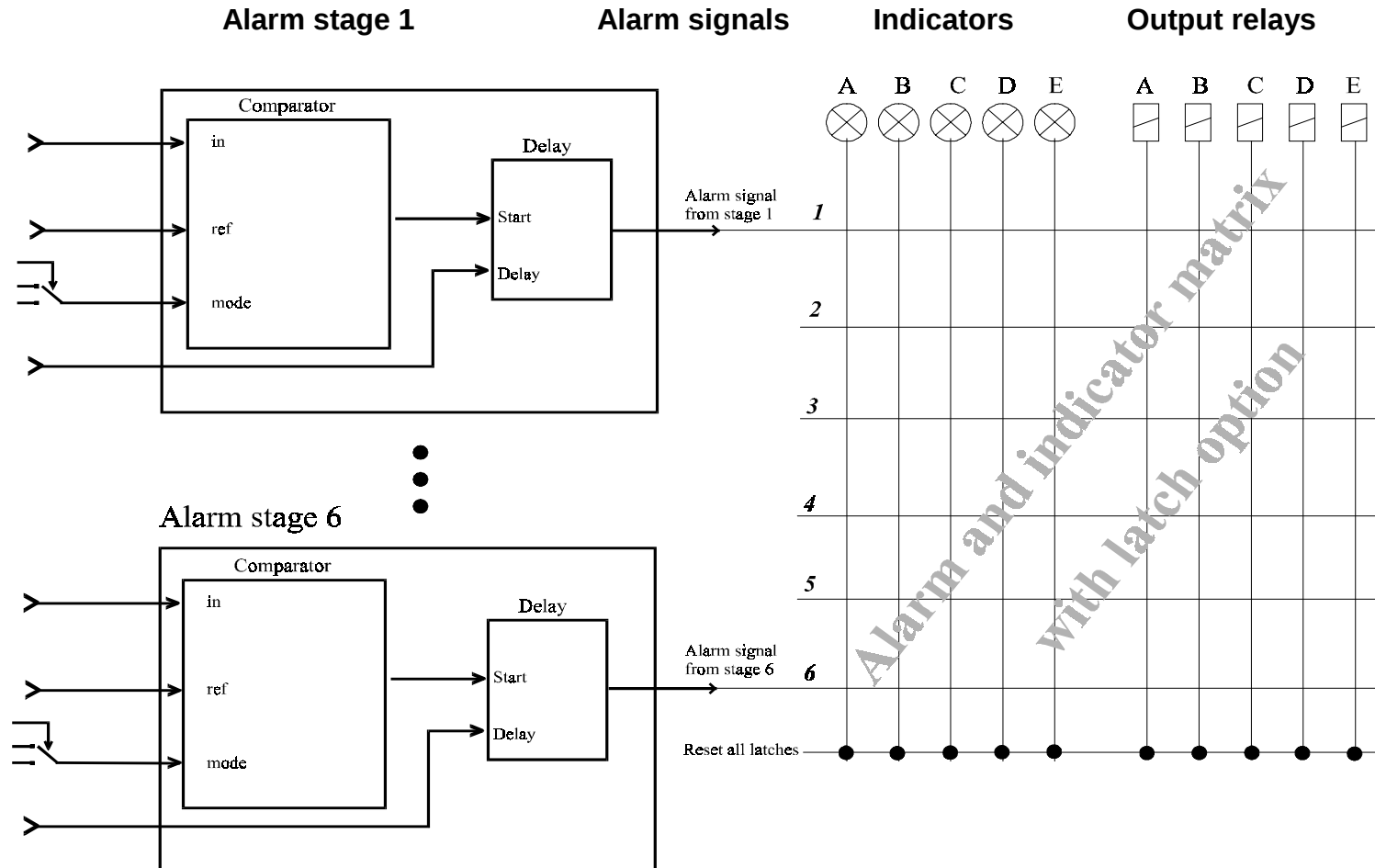
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Alarm channel



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Alarm indications and -outputs



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Information

Local indications

- 8*22 alfa-numeric/graphic display

LED indications

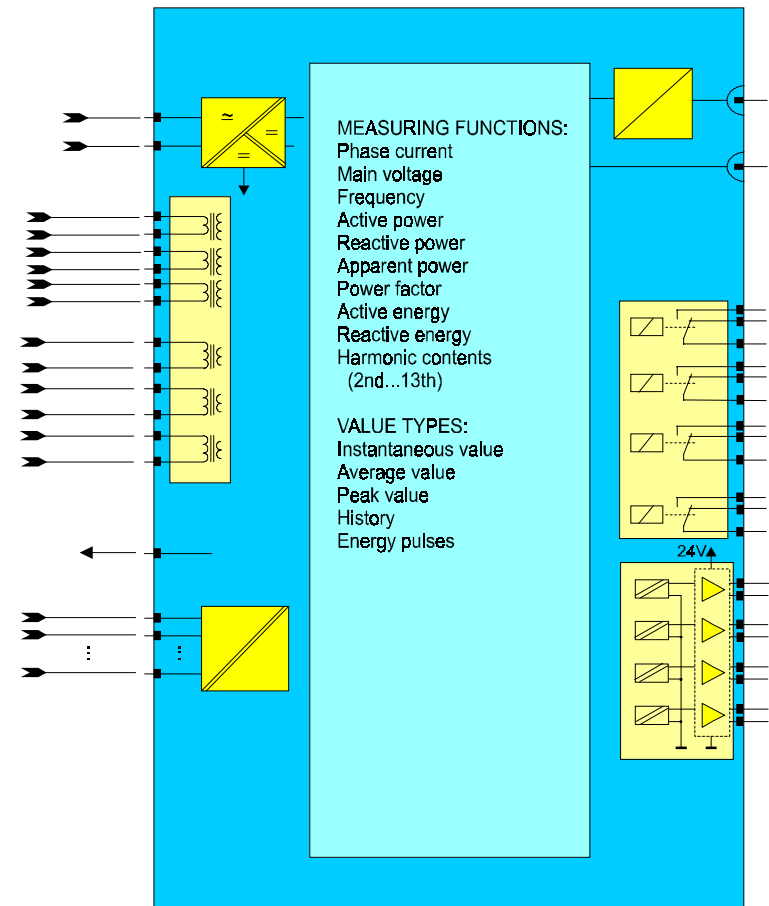
- five status indication
- five alarm indication

Outputs

- four analogue outputs
 - 4-20 mA, 0-20 mA
- five digital outputs
 - 250 VAC, 8 A

Local PC

- all information
- parametrisation
- documentation



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Communication

Open standard protocol

- Profibus DP
- SPA-bus
- Modbus RTU, Modbus TCP
- IEC 60870-5-103

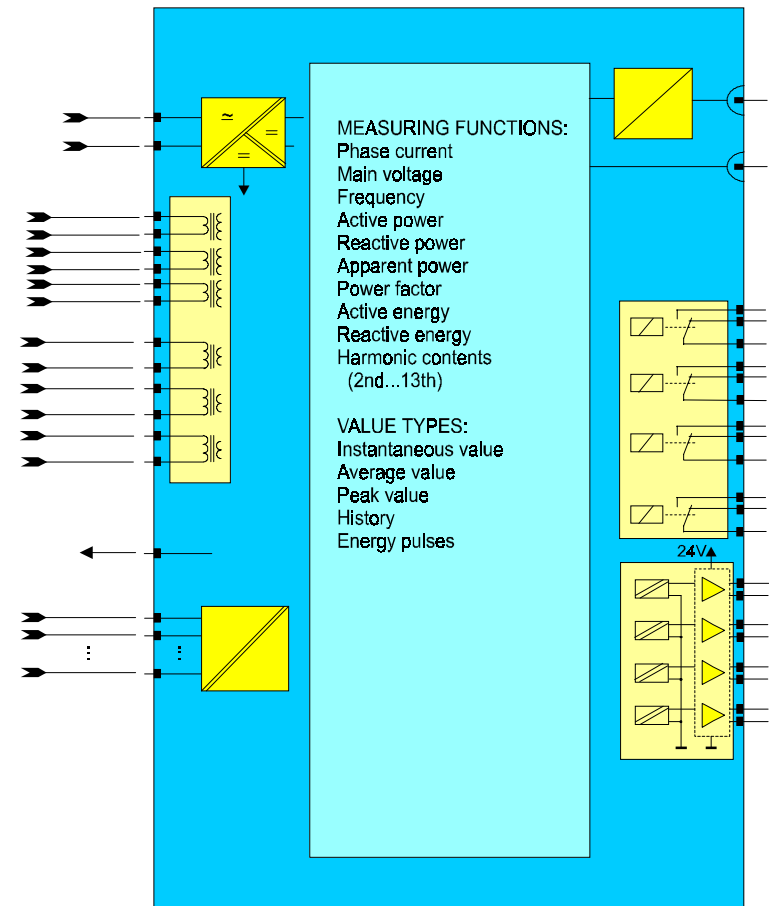
Information

- measured values
- calculated values
- digital inputs

Programming

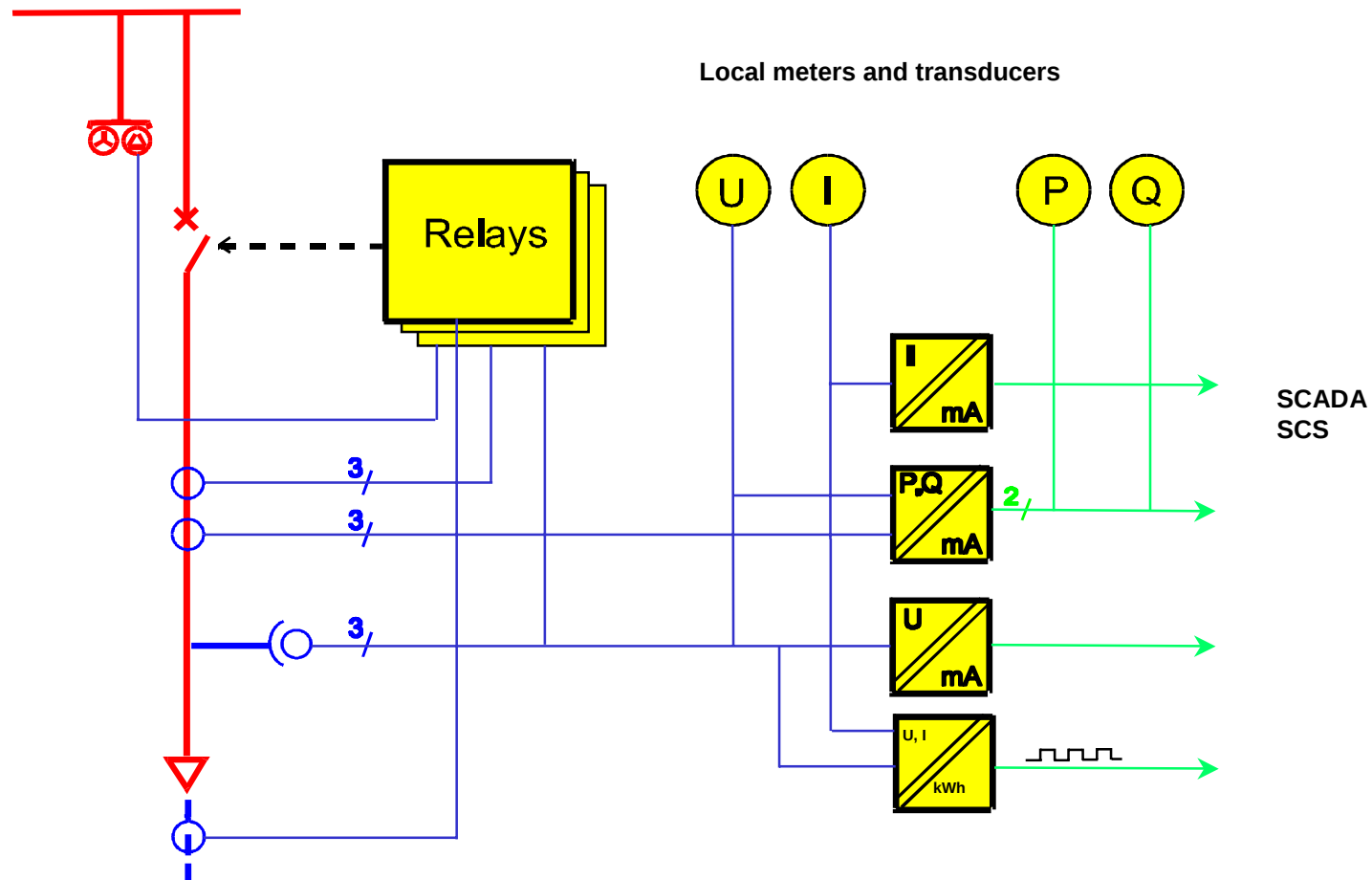
- parametrisation

Communication to most remote-
and process control systems



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Conventional technology



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Modern installation

