

### Generally

Unipower APM100B is a measurement transducer that measures power in kW on 3-phase symmetric loads according to the formula:

$$P = \sqrt{3} \times U \times I \times \cos\phi$$

- \* Suitable for mains voltages from 3x400V to 3x460V
- \* Built-in current converter for currents up to 80A.
- \* Programmable measurement range: 0.1kW to 70kW
- \* 0(4)-20mA and 0(2)-10V analogue output
- \* SO1 output for kWh pulses
- \* Programmable averaging function
- \* Galvanic isolation between mains net and digital inputs and analog outputs



### Features

#### Voltage input

The APM100B is suitable for mains voltages between 3x400V and 3x460V. Supply voltage and measurement voltage are common.

#### Current input

The APM100B has a built-in current converter. The converter is placed around the built-in tube, where the live wire is lead through.

#### kW measurement range

Using the BCD-switches on the front a measurement range from 0.1kW to 70kW may be chosen. The measurement range is set in steps of 0.1kW.

#### kWh output

The APM100B generates 100 or 300 pulses/h at 100% load. The pulses are available on output SO1. It is possible to choose measurement ranges, where the pulse rate is consistent with kWh or 0.1/0.01 kWh, see fig. 1. For other settings the calculation from pulses to kWh must be done in a PLC or counter.

#### Filter

At fluctuating loads a filter function is available using S2. When S2 is activated the measured value is an average of 16 "normal" measurement values.

#### Analogue output

The APM100B integrates a voltage output and a current output. By using input (S3) these outputs are set to either 0-20mA (0-10V) or 4-20mA (2-10V). It is not possible to generate 0-10V and 4-20mA simultaneously.

#### Digital input

Three digital inputs marked S1-S3 are used to configure the APM100B. S2 is changeable during operation. S1 and S3 are "read" during power up. S1-S3 are active (ON) when connected to GND.

#### LED indicators

The APM100B is equipped with 3 LED indicators. LED marked "On" indicates that the unit is connected to mains supply. LED marked "Load" is lit when the load exceeds 3% of max. load. The LED marked "kWh" reflects the SO1 output at 10 times the pulse rate set, i.e. 1000/3000 pulses/h at 100% load.

#### Mounting

When mounting the APM100B it is important to do it in accordance with the schematics on page 2. The current must be measured in the phase connected to Pin 1 and the direction must be as shown. Max cable diameter is 10mm. **Note:** The unit measures currents linearly up to 130A and is protected against currents up to 500A.

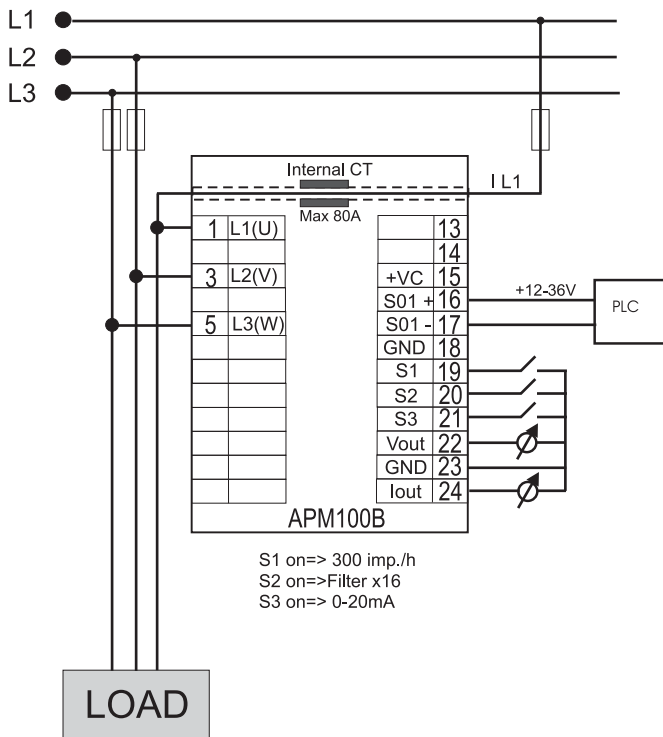
### Technical Specifications

#### Mechanical

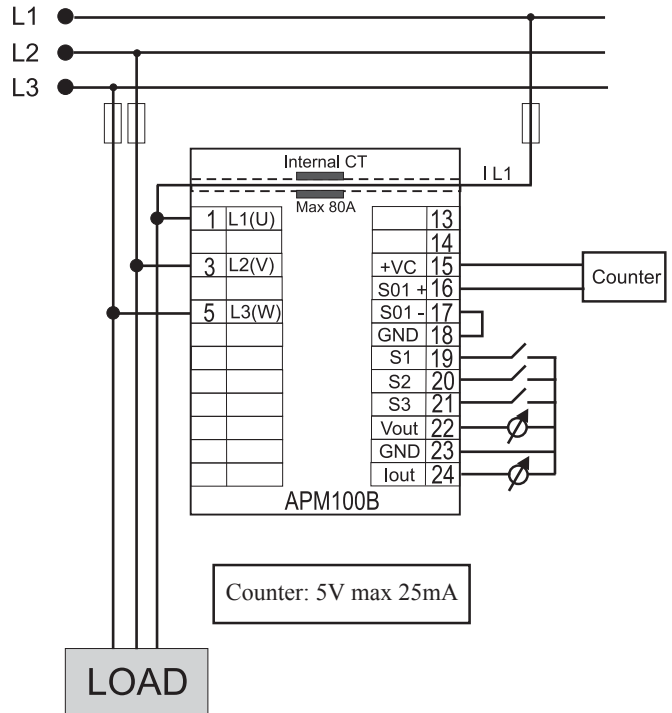
Housing:	Lexan UL94V-0 (top) Noryl UL94V-0 (bottom)
Mounting:	M36 for 35 mm DIN rail
CT dia.:	Max. 10mm
IP class:	Housing IP40. Terminals IP20
Terminals:	Max 16A. Max 2,5 mm <sup>2</sup> Max torque 0,6 Nm
Temp.:	-15 to +50 grad C
Weight:	300 g
Dimens.:	D 58 x W 70 x H 86 mm
CE mrk:	EN61326-1, EN61010-1

#### Electrical

Supply:	3x400-3x460Vac ± 10%
Measurement voltage:	Same as supply voltage
Current input	80A (130A)
Frequency:	45-65 Hz
Accuracy:	Class 2%
Analogue output 1:	0(4)-20 mA max 300Ω
Analogue output 2:	0(2)-10V min load 10kΩ
kWh output:	100/300 imp/time/fs
SO1 output:	Passive optocoupler, current limited to 25 mA
SO1 pulse width:	200ms



Typical connection between APM100B and PLC



Typical connection between APM100B and counter

### Measurement range

APM100B may be connected to mains voltages from 3x360Vac min. to 3x500Vac max. and currents up to 80A. Example:

Nominal voltage : 3x460Vac  
 kW range set : 30kW  
 Max current (cosφ=1) : 37.6A

20mA (10V) on the analog output is reached at nominal power (Pmax). In the example above 20mA (10V) is reached at 30 kW. If measurement is done on a lower voltage - e.g. 3x400Vac - 20mA (10V) is still reached at 30 kW but at a higher current (43.3A). If the voltage is e.g. 3x400Vac and cosφ=0.5, 20mA (10V) is reached at a current of 86.6A.

If a measurement range larger than 70kW is needed, an external CT N/5A must be used for current measurement - N being the CT's primary current.

### Measurement range ext. CT

To set up the measurement range when using an ext. CT, a simple calculation is necessary:

Ex: A measurement range of 100kW is wanted with a supply voltage of 3x400V. Choose a CT of 200A. The winding ratio of a 200/5A CT is 40. The unit must be set to 100kW/40 = 2.5kW for a measurement range of 100kW, i.e:

$$[\text{Range}] = \text{Meas'ment range}/\text{CT winding ratio}$$

### kWh pulse rate

	Range kW	3	10	30	100
S1 Off	pulses/kWh		10		1
S1 On	pulses/kWh	100		10	

Fig.1

The table above shows measurement ranges which result in kWh pulse rates consistent with counters without scaling. For other measurement ranges the pulses must be scaled in a PLC or counter.

### Digital Inputs

S1	100 pulses/hour@FS	Off
	300 pulses/hour@FS	On
S2	Filter x 1	Off
	Filter x 16	On
S3	4-20mA (2-10V)	Off
	0-20mA(0-10V)	On

Fig.2