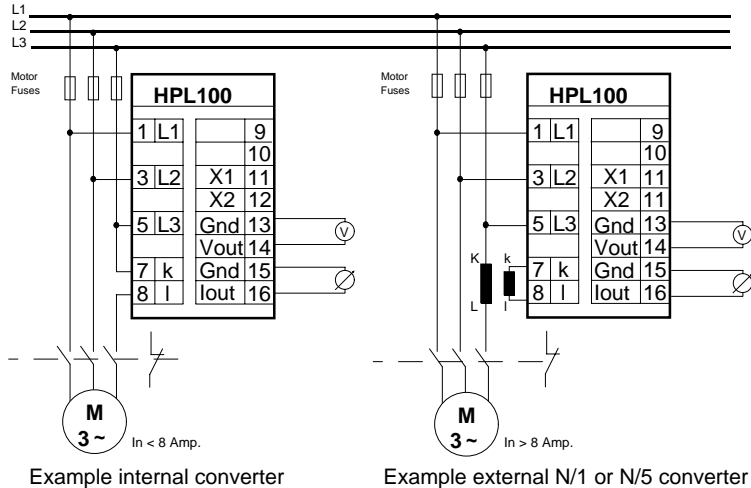


Examples.

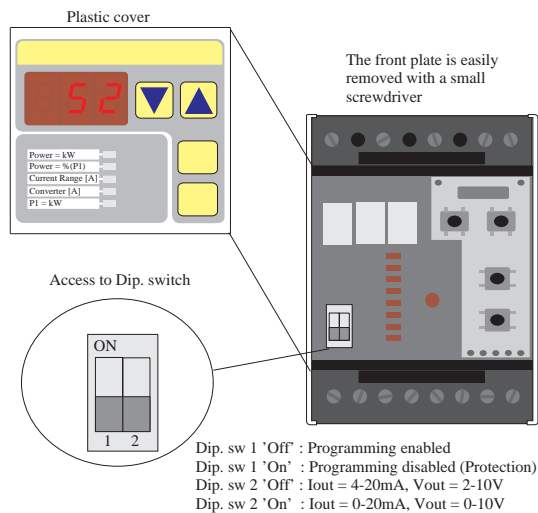
The examples below shows the HPL100 connected to an AC-motor. When the current exceeds 8 Amp. an external N/1 or N/5 converter must be mounted. When a N/1 converter is used then the 1 Amp. range must be chosen and when the N/5 converter is used then the 5 Amp. range must be selected. If the above rule is not obeyed then the

HPL100 does not measure correct power (kilo-Watt). The size of the external current converter must be programmed into the HPL100 in the mode 'Converter [A]'. When the unit is programmed it is possible to protect it against programming by setting the Dip. Sw1, 'On'. The terminals X1 and X2 have no function in this unit. When the motor is powered by a frequency converter then the HPL100 must be mounted before the converter.

Note!!! An external current converter must always be mounted in the L3-phase for correct measurements The converter polarity is not important.



Dip. switch and jumper access.



Unipower

HPL100 Version 2.1
3 x 460 Volt

Technical Information

English Edition

Technical Specification

Electrical

Voltage Range: 400 - 520 VAC.

Current Range

Internal: max. 8 Amp.

External: N/1 or N/5 converter.

Cosφ Range: 0-1.

Frequency Range: 45-65Hz.

Consumption

Supply voltage = measurement voltage,
2 VA.

Analog Output

0-20 mA or 4-20 mA, 0-500 ohm.

0-10 Volt, 2-10V min. load = 1 Kohm.

The outputs are electrically isolated from the measurement system and short-circuit protected.

Mechanical

Housing

Makrolon 8020 (30% GV), UL94V-1 (house).

Makrolon 2800, UL94V-2 (connector + front).

Mounting

Snap-on construction for 35mm DIN rail mounting or panel mounting.

Protection Class

IP40 (house).

IP20 (connector).

Temperature Range: -15 - +50 °C.

Weight: App. 400g.

Dimensions: D 75 x W 56 x H 110 mm.

Terminal tight. torque: 7lbs/in, 0.79Nm
Use 60/75 copper (CU) wire only

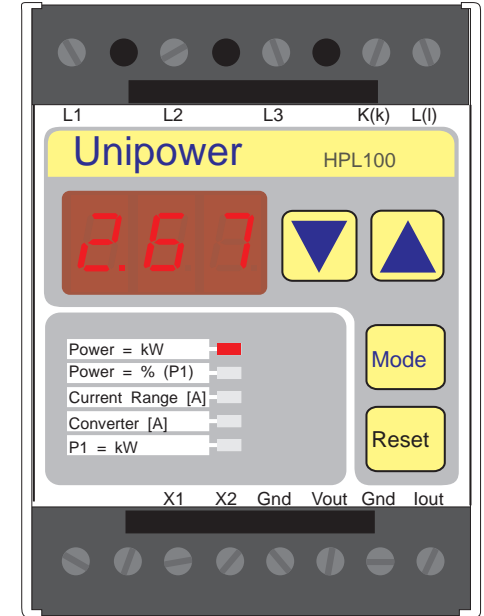
CE mark to:

EN50081-1, EN50082-2, EN61010-1

UL certified:

UL 508 - Industrial Control Equipment

WENTtechnology
Raleigh, NC, USA
(919) 954-1004 www.wentec.com



THE CONCEPT

The Unipower HPL100 is a "low-cost" member of a family of "Intelligent Power Control Units" which is based upon the latest advance in Microcontroller Technology. The unit measures true Power Consumption (kW) given by the formula: $P = \sqrt{3} \times U \times I \times \text{Cos}\phi$. The unit is developed for power measurement on symmetric 3-phase loads like AC-motors etc. The module contains an internal current converter that works up to 8 Amp. Larger currents are covered by using external converters. Two analog outputs, 0(2)-10V and 0(4)-20mA, are available for interface to PLC's etc. The measurement range is continuously scaleable if the proper current range has been chosen. Nineteen current/power ranges are available in the unit. Each range may be scaled continuously from 50-100% of the range. This makes the unit cover a range from 0,40 kW to 797kW.

Measurement Ranges.

The table below shows the correspondance between the current-converter chosen, the current range and the kiloWatt range. When either the converter range or the current is changed then the nominal power P1 is set equal to the full scale. When the current-converter range has been selected then the nominal range (P1 = kW) may get decreased. The analogue outputs, and of course the Power = %P1 display, is always calculated as a percentage of the chosen nominal range. The kiloWatt display is independant of the nominal power P1.

Power = $P = \sqrt{3} \times 460 \times I \times \cos\phi$		
Converter [A]	Current Range [A]	P1 (Range) kiloWatt
Intern	1 Amp.	0.40-0.80 kW
Intern	3 Amp.	1.20-2.39 kW
Intern	5 Amp.	1.99-3.98 kW
Intern	8 Amp.	3.19-6.37 kW
12.5 Amp.	1 or 5 Amp.*	4.98-9.96 kW
15 Amp.	1 or 5 Amp.*	5.98-12.0 kW
25 Amp.	1 or 5 Amp.*	9.96-19.9 kW
30 Amp.	1 or 5 Amp.*	12.0-23.9 kW
50 Amp.	1 or 5 Amp.*	19.9-39.8 kW
75 Amp.	1 or 5 Amp.*	29.9-59.8 kW
100 Amp.	1 or 5 Amp.*	39.8-79.7 kW
150 Amp.	1 or 5 Amp.*	59.8-119 kW
200 Amp.	1 or 5 Amp.*	79.7-159 kW
250 Amp.	1 or 5 Amp.*	100-199 kW
300 Amp.	1 or 5 Amp.*	120-239 kW
400 Amp.	1 or 5 Amp.*	159-319 kW
500 Amp.	1 or 5 Amp.*	199-398 kW
600 Amp.	1 or 5 Amp.*	239-478 kW
700 Amp.	1 or 5 Amp.*	279-558 kW
800 Amp.	1 or 5 Amp.*	319-637 kW
900 Amp.	1 or 5 Amp.*	358-717 kW
1000 Amp.	1 or 5 Amp.*	398-797 kW

* 1 Amp. is chosen with N/1 converter
5 Amp. is chosen with N/5 converter

Vout = 10V & Iout = 20mA when the power (kW) equals P1

Programming & Display.

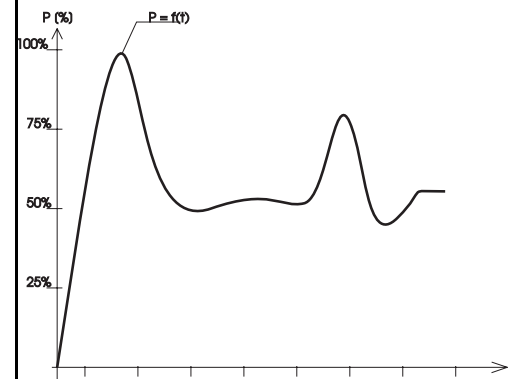
Mode	Function	Variable	Min. Peak	Max. Peak	Display	Default
Power = kW	kW display		Min. Peak	Max. Peak	kW [kiloWatt]	
Power = % (P1)	kW % (P1) display		Min. Peak	Max. Peak	kW [%]	
Current Range [A]	Current Range	1, 3, 5, 8 Amp.	Decrease	Increase	1/3/5/8	5
Converter [A]	Converter Range	Int. / 12.5, 15 **	Decrease	Increase	Int./12.5/15/25 etc.	Int.
P1 = kW	Nominal power (100%)	see table	Decrease	Increase	kW[kiloWatt]	3.98 kW

** See table page 2

The Unipower HPL100 is programmed by the use of only three keys located at the front panel. The "mode" key is used to shift the display from showing kiloWatt or kW [%] to show one of the three programmable variables. All the variables and their programming ranges are shown in the function table above. The red LED's shows which variable that may get altered. When a variable has been chosen, its value may be increased or decreased by the use of the two arrow-keys. Variables are saved into EEPROM. If no key has been activated for about 5 seconds then the display returns to the kiloWatt position. The keys are repeated if continuously activated. The maximum and minimum power consumption is continuously registered and is show by the activation of an arrow-key, when the display shows kW or %P1. The min./max. values are reset to the current power consumption when the reset-key is activated or after power-on of the unit.

Function.

The drawing below shows a possible power consumption curve for an AC-motor just after the voltage has been switched on. Opposite to other



members of the HPL100/400 family the HPL100 does not integrate any control or regulation functions. Such functions must get implemented in an attached PLC etc.

Example.

A machine is for instance driven by a 50 kW motor and should be supervised in a way so that 50 kW measured corresponds to 100% output on the analogue outputs and the display shows 100% in the position: Power = % (P1).

An external current converter of 100 Amp. is chosen and the unit is programmed as follows: The "Current Range" is selected by the use of the "mode" key. The 1 Amp. range is chosen for a 100/1A converter or the 5 Amp. range is chosen for a 100/5A converter. After this the "Converter [A]" is selected and the 100 Amp. range is chosen by the activation of the arrow-keys. The 100 Amp. converter corresponds to a 79.7 kW range at 460 Volt. Finally the variable P1 = kW is selected and the display shows 79.7 kW (full scale). Now the P1 = kW range is decreased to 50kW by the use of the arrow-keys. The 50 kW is now the new nominal power range. The display may show the power consumption as a percentage of P1 or in true kiloWatt.