Frequently Ask Questions

EN40 – EN40P – EN’clic
# TABLE OF CONTENTS

1. DOCUMENT HISTORY .......................................................... 3
2. REFERENCES ................................................................. 4
   2.1 Reference documents .................................................. 4
   2.2 Glossary ............................................................... 4
3. INTRODUCTION ............................................................. 5
4. GENERAL QUESTIONS .................................................... 6
5. QUESTIONS ABOUT INSTALLATION AND DISPLAY .................... 7
6. QUESTIONS ABOUT PRODUCT’S CHARACTERISTICS .................. 9
7. QUESTIONS ABOUT THE PULSE-OUTPUT (ONLY FOR EN40P) ....... 10
1 DOCUMENT HISTORY

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Author(s)</th>
<th>Modifications List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft version</td>
<td>Sep 9th, 2008</td>
<td>Alvin ZHANG</td>
<td>Initial version</td>
</tr>
<tr>
<td>First Release</td>
<td>Sep 11th, 2008</td>
<td>Marc Chachereau</td>
<td>First Release</td>
</tr>
</tbody>
</table>
2 REFERENCES

2.1 Reference documents

<table>
<thead>
<tr>
<th>Index</th>
<th>Name</th>
<th>Document ID</th>
<th>Author / Entity</th>
<th>Archive Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DES04—Product &amp; system specification</td>
<td>AAV4998104</td>
<td>Marc Chachereau</td>
<td>Symphony</td>
</tr>
<tr>
<td>2</td>
<td>DES06—Product design</td>
<td>AAV4998106</td>
<td>Alvin ZHANG</td>
<td>Symphony</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Andy WU</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marc Chachereau</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>User manual for EN40P &amp; EN40 series</td>
<td>AAV74173</td>
<td></td>
<td>Symphony</td>
</tr>
<tr>
<td>4</td>
<td>User manual for EN’clic series</td>
<td>AAV75672</td>
<td></td>
<td>Symphony</td>
</tr>
</tbody>
</table>

2.2 Glossary

<table>
<thead>
<tr>
<th>Wording</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELN</td>
<td>Electronic</td>
</tr>
<tr>
<td>ME</td>
<td>Mechanical</td>
</tr>
<tr>
<td>EM</td>
<td>Electromechanical</td>
</tr>
<tr>
<td>IP</td>
<td>International Protection</td>
</tr>
<tr>
<td>OVC</td>
<td>Over-Voltage Category</td>
</tr>
<tr>
<td>PO</td>
<td>Pulse-Output</td>
</tr>
</tbody>
</table>
3 **INTRODUCTION**

This document gathers the FAQ for the products EN40P, EN40 and EN’clic. It gives the answers of the frequently asked questions related to the products.
4 GENERAL QUESTIONS

Question 4-1: What does this product measure?
Answer: This product is an AC static watt-hour meter for active energy. It directly measures the active energy on an AC single-phase network.

Question 4-2: How many references does this product have? What's their main difference?
Answer: There are 3 references: EN40P, EN40 and EN‘clic.
   - EN40P: Grey color, with pulse-output for remote transfer.
   - EN40: Grey color, without pulse-output for remote transfer.
   - EN‘clic: White color, without pulse-output for remote transfer.

Question 4-3: What standards and accuracy class does this product conform to?
Answer: Class 1 conforming to IEC62053-21, IEC61557-12 (PMD DD) and GB/T17215-2002:
   - Imax: 40A, Ib: 5A, Ist: 0.02A
Class B conforming to EN50470-3:
   - Imax: 40A, Iref: 5A, Imin: 0.25A, Ist: 0.02A
5 QUESTIONS ABOUT INSTALLATION AND DISPLAY

Question 5-1: Where can this meter be mounted?
Answer: This meter can be mounted on a standard DIN-rail.

Question 5-2: What is the correct way to connect this meter to the AC network?
Answer: Connection diagram:

When this meter is associated with a contactor, connect it upstream of the contactor.

Question 5-3: What does each part of the meter display or be used for?
Answer: Front view of the meter:
Question 5-4: What does the different status of two LEDs indicate?

Answer:

<table>
<thead>
<tr>
<th>Power ON</th>
<th>Power OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Power</td>
<td>Negative Power</td>
</tr>
<tr>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>Power LED (Green)</td>
<td>Indicator LED (Yellow)</td>
</tr>
</tbody>
</table>

Status table:

- Power LED (Green):
  - On: Power ON
  - Off: Power OFF

- Indicator LED (Yellow):
  - Stays on for around 1s after power on, then blinks @ 3200 flashes/KWh

Status diagram:

- LED(G): Off
- LED(Y): Off

Power ON

After about 1 second

- LED(G): On
- LED(Y): On

Power OFF

- LED(G): Blink @ 3200 flashes/KWh

Positive power

Power OFF

- LED(G): Off
- LED(Y): Off

Negative power
6 QUESTIONS ABOUT PRODUCT’S CHARACTERISTICS

Question 6-1: What is this product’s working voltage range and its frequency range?
Answer: 230V±20%, 45~65Hz.

Question 6-2: What is the rated current (maximum current) of this product?
Answer: 40A

Question 6-3: What is the start-up current that this meter is able to measure?
Answer: 0.02A

Question 6-4: What is the operating temperature range of this product?
Answer: I<32A: -25°C~+65°C  
I>32A: -25°C~+55°C

Question 6-5: What is the IP level of this product?
Answer: IP40 for the front panel, IP20 for the casing. Please select the corresponding cabinet if you require a higher IP level.

Question 6-6: What is the over-voltage and measurement category of this product?
Answer: Over-voltage and measurement category III.

Question 6-7: What is the forecast pollution of the micro-environment of this product?
Answer: Degree of pollution 2: Normally non-conductive pollution. Occasional condensation causing temporary conductive pollution when the device stops.

Question 6-8: What is the power consumption of this product itself?
Answer: <10VA.

Question 6-9: What is the maximum cable size that the terminals of this product can contain?
Answer: Power terminals (L&N): 10mm²  
Remote transfer terminals (pulse-output): 4mm² (only for EN40P)

Question 6-10: What is the maximum tightening torque of the terminals of this product?
Answer: Power terminals (L&N): 1.2±0.2 N.m  
Remote transfer terminals (pulse-output): 0.8±0.1 N.m (only for EN40P)

Question 6-11: What is the capacity of this meter’s display?
Answer: 6+1 digits with the unit of kWh (999999.9kWh in maximum).

Question 6-12: What is the flashing frequency of the yellow indicator LED?
Answer: 3200 flashes/kWh
7 QUESTIONS ABOUT THE PULSE-OUTPUT (ONLY FOR EN40P)

Question 7-1: What is the pulse-output typically used for in EN40P series products?
Answer: To remote transfer the energy consumption. Every pulse corresponds to 10Wh active energy consumption.

Question 7-2: What is the pulse frequency of the pulse-output?
Answer: 100 impulses/kWh

Question 7-3: What is the pulse-ON state duration of the pulse-output?
Answer: 120ms

Question 7-4: What is the maximal frequency of the pulse-output?
Answer: Correspond to a 40A load and a PF=1, so one pulse every 3.9s.

\[ F_{\text{max}} = \frac{1}{(3.9+0.12)} \approx \frac{1}{4} \approx 0.25 \text{ Hz} \]

Question 7-5: What are maximum voltage and current that the pulse-output can withstand and support?
Answer: 35V, 20mA.

Question 7-6: What is the right polarity of the two pulse-output terminals?
Answer: Terminal 1 should be positive and Terminal 2 should be negative if connected to the peripheral circuit.

Question 7-6: What is the accuracy of the pulse output?
Answer: The accuracy is consistent with the product accuracy class 1 or class index B; refer to 4.3
Question 7-7: What is the typical peripheral circuit of the pulse-output?
Answer: There are many kinds of peripheral circuits that can be connected to the pulse-output. Below are detailed two typical ones:

Positive Logic topology: high state is active
- Vcc is linked to S0+
- S0- is linked to GND through a polarization resistor
- Pulses are emitted between S0- and GND
- When the product is emitting a pulse the S0- output is bring down to 0V during 120ms

\[
\begin{align*}
R_{\text{min}} &\geq \frac{V_{cc}}{I_{\text{max}}} \iff R \geq \frac{V_{cc}}{20mA}.
\end{align*}
\]
We recommend selecting \( R_{\text{typ}} = 2 \times R_{\text{min}} \)

<table>
<thead>
<tr>
<th>U (Volt)</th>
<th>35</th>
<th>24</th>
<th>12</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{\text{max}} (A)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>R_{\text{min}} (Ohm)</td>
<td>1750</td>
<td>1200</td>
<td>600</td>
<td>250</td>
</tr>
<tr>
<td>R_{\text{typ}} (Ohm)</td>
<td>3500</td>
<td>2400</td>
<td>1200</td>
<td>500</td>
</tr>
</tbody>
</table>

Negative Logic topology: low state is active
- Vcc is linked to S0+ through a polarization resistor
- S0- is linked to GND
- Pulses are emitted between S0+ and Vcc
- When the product is emitting a pulse the S0+ output is bring down to 0V during 120ms

\[
\begin{align*}
R_{\text{min}} &\geq \frac{V_{cc}}{I_{\text{max}}} \iff R \geq \frac{V_{cc}}{20mA}.
\end{align*}
\]
We recommend selecting \( R_{\text{typ}} = 2 \times R_{\text{min}} \)

<table>
<thead>
<tr>
<th>U (Volt)</th>
<th>35</th>
<th>24</th>
<th>12</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{\text{max}} (A)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>R_{\text{min}} (Ohm)</td>
<td>1750</td>
<td>1200</td>
<td>600</td>
<td>250</td>
</tr>
<tr>
<td>R_{\text{typ}} (Ohm)</td>
<td>3500</td>
<td>2400</td>
<td>1200</td>
<td>500</td>
</tr>
</tbody>
</table>