EFOY SERIES

EFOY - METHANOL FUEL CELL BATTERY CHARGER

FEATURES
- 45 - 110W
- Fuel Cell Battery Charger
- Direct Methanol Fuel Cell
- Portable & Enclosable
- Long Duration of Maintenance Free Operation
- Quiet & Emission Free
- Remote Monitoring

SPECIFICATIONS

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td>12Vdc, 24Vdc (See selection table)</td>
</tr>
<tr>
<td>Nominal power</td>
<td>EFOY PRO 800: 25W - 45W, EFOY PRO 2400: 80W - 110W (See selection table)</td>
</tr>
<tr>
<td>Charging current</td>
<td>See selection table</td>
</tr>
<tr>
<td>Switching threshold</td>
<td>for automatic: On: &lt;12.3 V / &lt;24.6 V, Off: &gt;14.2 V / &gt;28.4 V</td>
</tr>
<tr>
<td>Battery charging at 12V/24V</td>
<td>Voltage: On: &lt;12.3 V / &lt;24.6 V, Off: &gt;14.2 V / &gt;28.4 V</td>
</tr>
<tr>
<td>Start-up voltage at 12V/24V</td>
<td>&gt;9 V / &gt;18.5 V</td>
</tr>
<tr>
<td>Maximum battery voltage</td>
<td>&lt;16 V / &lt;32 V</td>
</tr>
<tr>
<td>Noise level</td>
<td>42 dB(A) / 25 dB(A) (at 1m / 7m distance)</td>
</tr>
<tr>
<td>Nominal consumption</td>
<td>0.9 l/kWh</td>
</tr>
<tr>
<td>Quiescent current</td>
<td>20mA at 12V</td>
</tr>
<tr>
<td>Dimensions L x W x H</td>
<td>433 x 188 x 278 mm</td>
</tr>
<tr>
<td>Length fuel cartridge connector</td>
<td>70 cm</td>
</tr>
</tbody>
</table>

INTERFACE

User-Interface
- At the unit or via Operating Panel OP2 with text display

Data-Interface
- RJ-45 plug for accessories (e.g. Interface adapter)

Electrical Interface
- MNL-plug 4-pins (e.g. Tyco Electronics Universal Mate-N-Lok ; Nr. 350779)

ENVIRONMENTAL

Operating temperature
-20 °C to +50 °C

Start-up temperature
+3 °C to +50 °C

Storing temperature
+1 °C to +50 °C

Recommended altitude
Standard: ≤1500 (up to 2000m)

International Protection
IP 21

Inclination along the roll axis
Permanent: max. 35°, Temporary (<10 min): max. 45°

Inclination along the lateral axis
Permanent: max. 20°

STANDARD KIT EQUIPMENT

Operating panel OP2 with cable
- Display for view values and settings
- Surface mount frame
- Operating panel with black frame

Mounting plate for EFOY Pro
- For secure mounting of the EFOY Pro

Charge line for battery connection
- Connecting line to fuel cell (1 m)
- Cable with fuse 2A Sense
- Cable with fuse 15A Power

ACCESSORY KIT EQUIPMENT

Fuel Cartridge holder with belet
- For safe transport of the M5 or M10 fuel cartridge in the vehicle these are fastened using a cartridge holder and a belt. For mounting the cartridge holder in the vehicle you will need four screws and, if necessary, appropriate anchors.

Exhaust hose
- During operation the device will produce water vapour and carbon dioxide. These are led to the outside by means of the exhaust hose. The insulation prevents water from freezing. Length: 1.2M.

Off heat duct
- During operation the EFOY Pro generates off heat. The off heat duct is used to conduct this off heat to the outside.
- Off heat flange
- Off heat blow
- Off heat tube
- External face plate
- Lens head screw M4 and 10 (4 screws)

DuoCartSwitch DCS1
- Dimensions 174 x 119 x 96mm
- Weight 0.7 kg
- International Protection (IP-Class) IP 20
- Quiescent current draw 7.5 mA

GSM modem GSM-2-SMS
- Dimensions 72 x 32 x 65mm
- Weight 0.5 kg
- Input Voltage 8-30 V dc
- Max. peak current 3.2A
- Average current draw (Quiescent / SMS / GPRS) 30 / 100 / 100 mA

Fuel cartridge sensor FS1
- Dimensions 50 x 20 x 5mm

Interface adapter IA1
- Dimensions 60 x 33 x 16mm

Cluster controller CC1
- Dimensions 149 x 77 x 270mm
- Weight 0.16 kg

M28 adapter
- Dimensions 70 x 70 x 61mm
## EFOY SERIES

EFOY - METHANOL FUEL CELL BATTERY CHARGER

### SELECTION TABLE

<table>
<thead>
<tr>
<th>FUEL CELLS</th>
<th>EFOY PRO 800</th>
<th>EFOY PRO 800 DUO</th>
<th>EFOY PRO 2400</th>
<th>EFOY PRO 2400 DUO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. nominal power</td>
<td>45 W</td>
<td>45 W</td>
<td>110 W</td>
<td>110 W</td>
</tr>
<tr>
<td>Min. nominal power</td>
<td>25 W</td>
<td>25 W</td>
<td>80 W</td>
<td>80 W</td>
</tr>
<tr>
<td>Nominal volt</td>
<td>12Vdc / 24Vdc</td>
<td>12Vdc / 24Vdc</td>
<td>12Vdc / 24Vdc</td>
<td>12Vdc / 24Vdc</td>
</tr>
<tr>
<td>Charging current</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 12V/24V max.: min</td>
<td>3.75A / 1.88A</td>
<td>3.75A / 1.88A</td>
<td>9.17A / 4.58A</td>
<td>9.17A / 4.58A</td>
</tr>
<tr>
<td></td>
<td>2.1A / 1.05A</td>
<td>2.1A / 1.05A</td>
<td>6.7A / 3.3A</td>
<td>6.7A / 3.3A</td>
</tr>
<tr>
<td>Recommended battery capacity 2 x 12Vdc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lead acid, gel, AGM) at 24Vdc</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 to 160AH</td>
<td>40 to 160AH</td>
<td>60 to 350AH</td>
<td>60 to 350AH</td>
</tr>
<tr>
<td></td>
<td>10 to 100AH</td>
<td>10 to 100AH</td>
<td>30 to 175AH</td>
<td>30 to 175AH</td>
</tr>
<tr>
<td>Weight</td>
<td>8.0 kg</td>
<td>8.3 kg</td>
<td>9.0 kg</td>
<td>9.3 kg</td>
</tr>
<tr>
<td>Connectable Cartridges</td>
<td>(1)(2)</td>
<td>(2)(4)</td>
<td>(1)(2)</td>
<td>(2)(4)</td>
</tr>
</tbody>
</table>

Nominal power varies by ±10%, decreases with the operation hours. Specification valid within warranty period.

<table>
<thead>
<tr>
<th>FUEL CARTRIDGES</th>
<th>M10</th>
<th>M28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>10 L</td>
<td>28 L</td>
</tr>
<tr>
<td>Weight</td>
<td>8.4 kg</td>
<td>22 kg</td>
</tr>
<tr>
<td>Nominal Capacity</td>
<td>11.1kwh</td>
<td>31.1kwh</td>
</tr>
<tr>
<td>Dimensions LxWxH</td>
<td>230 x 193 x 318mm</td>
<td>370 x 285 x 485 with M28 Adapter</td>
</tr>
</tbody>
</table>

### Off-grid power supply

Surveillance, traffic management and on board vehicle power

### Hybrid power supply

Wind industry, SCADA and environmental sensors

### Back-up power supply

Telecommunication industry

### Operating Principal

Diagram of a direct-methanol fuel cell
1. EFOY Pro fuel cell.
2. Connecting line to EFOY Pro fuel cell
3. Extension cable sense line 8m / 26ft (optional accessories)
4. Battery protection in sense line with 2 A fuse
5. Battery
6. Extension cable power line 9m / 26ft (optional accessories)
7. Battery protection in power line with 15 A fuse

Connecting the M28 fuel cartridge

1. Screw the EFOY Pro fuel cartridge connector (1) to the M28 adapter (2).
2. Screw the M28 adapter (2) onto the M28 fuel cartridge (3).