

BOC Hymera DC Hydrogen Fuel Cell Generator. 150W hydrogen fuel cell power generator.



Description The Hymera DC is a hydrogen powered fuel cell system capable of delivering 150 W of DC power in off grid and remote locations. This makes it ideal for supplying power for applications such as remote monitoring, control and telemetry stations which can be powered from 12 volt rechargeable batteries.

When used in conjunction with the companion BOC 54 ZH portable hydrogen fuel cylinder (mass of 10kg) , the Hymera DC can provide almost 3 kWh of electrical energy. This is equivalent to almost 75kg of lead-acid battery and a single cylinder will keep a 3W average load powered for almost one month, or a 20W security camera powered for approximately 5 days. The Hymera DC can also be used with standard hydrogen cylinders, such as the K, which would keep a 20W security camera powered for approximately 20 days.

The 54 ZH is a user friendly integrated 'energy source' removing the need for pressure regulators and safe hand operation connections. The 54 ZH, as well as standard hydrogen cylinders, are available throughout BOC distribution centres.

Advantages

- Clean, silent and highly portable
- Minimal service requirement
- Ideally suited to today's high efficiency electrical applications such as LED lights
- Ideally suited to low power, long duration loads such as remote monitoring, control and surveillance
- For loads less than 50W, substantially lower cost of ownership compared to diesel or petrol generators

Sample Applications

- 2 x 40W LED task lights (equivalent to 2 x 400W halogen) for nearly 40 hours (with 54-ZH hydrogen cylinder)
- 3W noise monitoring system for approximately one month (with 54-ZH hydrogen cylinder)
- 10W average load traffic sign for more than one week (with 54-ZH hydrogen cylinder)
- Capable of fully recharging a 200Ah / 12V lead acid battery bank (with 54-ZH hydrogen cylinder)
- 20km electric fence for 2 months (with 54-ZH hydrogen cylinder)
- Battery extender in UPS system
- Security lights
- Intruder alarms
- Traffic signs and control

Sample Applications (continued)

The Hymera DC has three distinct modes of operation:

Manual output mode

typically used to run 12 volt appliances, either directly or by placing a 12 Volt lead acid battery between the Hymera DC and the appliance. Manual mode can be used to charge any 12 Volt lead acid battery but requires an operator to start and stop the charging process.

Automatic mode - Float

Hymera DC can be connected to an external battery which has little or no load as a long term charge maintainer. E.g. maintaining boat or caravan house batteries over winter or for periods of non use. Hymera will allow the batteries to discharge to around 20% of their capacity before commencing recharge. Users should therefore never return to find less than an 80% charged battery. Typical Applications long term battery maintenance

Automatic mode - Normal

Hymera DC is connected to an external battery which is constantly or periodically placed under load. The Hymera DC then monitors the charge state of the external battery and when the battery reaches approximately 70% discharge it will automatically start and re-charge the battery and return to sleep.

Power drain

In Automatic mode, the energy used by the Hymera DC from the external battery is minimal and kept low by a sampling procedure which puts the processor to sleep other than for short sampling periods. Algorithms are applied to ensure that spurious events do not trigger a false start to charging.

Battery condition

An external battery condition indicator is provided to display the approximate state of charge of the external battery. Use of this feature is restricted to Automatic mode.

For the system integrator

Many features are available for the system integrator. These include:

- Frost stat to protect the system in low temperature environments
- Inhibit switch to prevent Hymera DC starting to charge, when combined with other technologies such as PV or Wind
- Closing contact for out of gas alarm
- Built in diagnostic features
- Automatic shutdown and fault log in the event of a failure, e.g ran out of Hydrogen
- One switch setting for automatic mode
- Re-set able overload cut outs

Specifications

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| Rated output power (W) continuous | 150W |
| Peak output power (W) short term | 200W |
| DC output voltage | 13.3 -14.2 V |
| Maximum DC output current (A) | 12 A |
| Required inlet hydrogen pressure range | 4-10 bar |
| Purity rating of fuel gas | High purity |
| Start up time (typical) | 35 secs |
| Typical gas consumption rate @ 100W | 1 litre/min |
| Efficiency (based on lower heating value of H ₂) | ~ 50% @ 100W DC |
| Minimum sustaining duration w/o hydrogen with fully charged Internal battery | 2 mins |
| Operating temperature range (degrees C)* | 0-35°C |
| Humidity range (%) RH | 0 – 95 (%) RH |
| IP rating (ingress protection) | IP43 |

BOC

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