

FRONIUS CL

/ The central inverter for long-term peak performance.



/ Fronius MIX™ technology



/ HF transformer switchover



/ PC board replacement process



/ WLAN interface



/ Transport technology



/ Smart Grid Ready

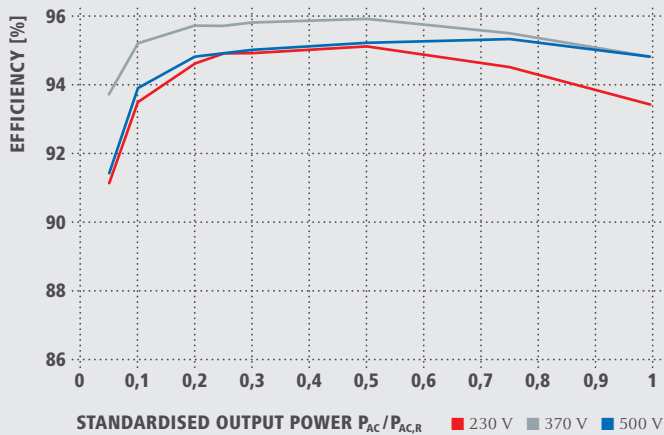
/ The Fronius CL combines efficient power electronics with a unique modular system design of up to 15 identical power stage sets in the Fronius MIX™ technology. This makes the Fronius CL the perfect central inverter for PV systems of up to several hundred kilowatts. Other advantages: precise maximum power point tracking of the Fronius Module Manager, automatic transformer switchover, and much more. The Fronius CL is available in the 36, 48 and 60 kW power categories.

TECHNICAL DATA: FRONIUS CL

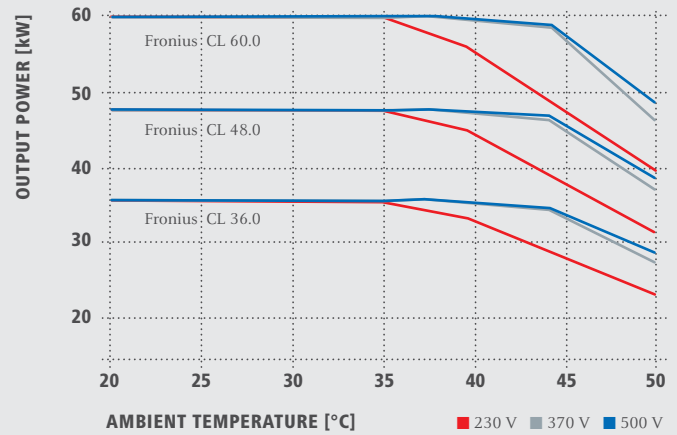
| INPUT DATA | CL 36.0 | CL 48.0 | CL 60.0 |
|---|---|------------------------|---------|
| DC maximum power at $\cos \varphi = 1$ | 38.6 kW | 51.4 kW | 64.4 kW |
| Max. input current ($I_{dc \max}$) | 167.8 A | 223.4 A | 280.2 A |
| Max. array short circuit current | 251.7 A | 335.2 A | 420.3 A |
| Min. input voltage ($U_{dc \min}$) | | 230 V | |
| Feed-in start voltage ($U_{dc \text{ start}}$) | | 260 V | |
| Nominal input voltage ($U_{dc,r}$) | | 370 V | |
| Max. input voltage ($U_{dc \max}$) | | 600 V | |
| MPP voltage range ($U_{mpp \min} - U_{mpp \max}$) | | 230 V – 500 V | |
| Number of DC inputs | | 3 | |
| OUTPUT DATA | CL 36.0 | CL 48.0 | CL 60.0 |
| AC nominal output ($P_{ac,r}$) | 36 kW | 48 kW | 60 kW |
| Max. output power | 36 kVA | 48 kVA | 60 kVA |
| Max. output current ($I_{ac \max}$) | 52.2 A | 69.6 A | 87.0 A |
| Grid connection ($U_{ac,r}$) | | 3-NPE 400 V / 230 V | |
| Min. output voltage ($U_{ac \min}$) | | 180 V | |
| Max. output voltage ($U_{ac \max}$) | | 270 V | |
| Frequency (f_r) | | 50 Hz / 60 Hz | |
| Frequency range ($f_{\min} - f_{\max}$) | | 46 Hz – 65 Hz | |
| Distortion factor | | < 3% | |
| Power factor ($\cos \varphi_{ac,r}$) | | 0.85 – 1 ind. / cap. | |
| GENERAL DATA | CL 36.0 | CL 48.0 | CL 60.0 |
| Dimensions (height x width x depth) | | 1,730 x 1,105 x 722 mm | |
| Weight | 248 kg | 276 kg | 303 kg |
| Degree of protection | | IP 20 | |
| Protection class | | 1 | |
| Overvoltage category (DC / AC) | | 2 / 3 | |
| Night-time consumption | 11.4 W | 11.6 W | 12.2 W |
| Inverter concept | | HF transformer | |
| Cooling | | Regulated air cooling | |
| Installation | | Indoor installation | |
| Ambient temperature range | | from -20°C to +50°C | |
| Permitted humidity | | 0% to 95% | |
| DC connection technology | | Bolt M10 | |
| AC connection technology | | Bolt M10 | |
| Certificates and compliance with standards | VDE V 0126-1-1, ÖVE/ÖNORM E 8001-4-712, UTE C15-712-1, G 59, CER 06-190, CEI 0-21 | | |

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS CL 60.0 EFFICIENCY CURVE



FRONIUS CL TEMPERATURE DERATING



TECHNICAL DATA: FRONIUS CL

| EFFICIENCY | CL 36.0 | CL 48.0 | CL 60.0 |
|-------------------------------------|----------------------|----------------------|----------------------|
| Max. efficiency | 95.9 % | 95.9 % | 95.9 % |
| European efficiency (η_{EU}) | 95.3 % | 95.4 % | 95.5 % |
| η at 5% $P_{AC,R}^{(1)}$ | 89.6 / 90.8 / 91.4 % | 90.5 / 90.9 / 91.7 % | 91.1 / 93.7 / 91.4 % |
| η at 10% $P_{AC,R}^{(1)}$ | 93.3 / 94.4 / 94.1 % | 93.9 / 94.7 / 94.1 % | 93.5 / 95.2 / 93.9 % |
| η at 20% $P_{AC,R}^{(1)}$ | 94.4 / 95.3 / 95.0 % | 94.7 / 95.5 / 94.8 % | 94.6 / 95.7 / 94.8 % |
| η at 25% $P_{AC,R}^{(1)}$ | 94.8 / 95.5 / 95.1 % | 95.0 / 95.7 / 95.2 % | 94.9 / 95.7 / 94.9 % |
| η at 30% $P_{AC,R}^{(1)}$ | 95.0 / 95.7 / 95.1 % | 95.1 / 95.7 / 95.3 % | 94.9 / 95.8 / 95.0 % |
| η at 50% $P_{AC,R}^{(1)}$ | 95.1 / 95.9 / 95.3 % | 95.2 / 95.9 / 95.4 % | 95.1 / 95.9 / 95.2 % |
| η at 75% $P_{AC,R}^{(1)}$ | 94.4 / 95.4 / 95.3 % | 94.4 / 95.5 / 95.3 % | 94.5 / 95.5 / 95.3 % |
| η at 100% $P_{AC,R}^{(1)}$ | 93.3 / 94.8 / 94.9 % | 93.4 / 94.8 / 94.8 % | 93.4 / 94.8 / 94.8 % |
| MPP adaptation efficiency | | > 99.9 % | |

¹⁾ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$

| PROTECTIVE EQUIPMENT | CL 36.0 | CL 48.0 | CL 60.0 |
|---------------------------|---|---------|---------|
| DC insulation measurement | Warning/shutdown (depending on country setup) at $R_{ISO} < 500\ k\Omega$ | | |
| Overload behaviour | Operating point shift, power limitation | | |
| DC circuit breaker | Integrated | | |

| INTERFACES | CL 36.0 | CL 48.0 | CL 60.0 |
|-----------------------------------|---|---------|---------|
| 2x RS422 (RJ45 socket) | Fronius Solar Net, interface protocol | | |
| 2 signalling outputs | Max. current per output: AC max. 277 V / 10 A, DC max. 24 V / 10 A | | |
| Optional with Fronius Datamanager | WLAN, Ethernet, Modbus TCP, 6 digital inputs, 4 digital inputs/outputs, Datalogger, Webserver | | |

| SPECIAL FEATURES | CL 36.0 | CL 48.0 | CL 60.0 |
|---|---------|---------|---------|
| Feed-in from | 80 W | 95 W | 120 W |
| Fronius CL devices for Germany are only supplied with a manual AC disconnecter. | | | |

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

/ Battery Charging Systems / Welding Technology / Solar Electronics

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS.

/ Whether Battery Charging Systems, Welding Technology or Solar Electronics - our goal is clearly defined: to be the technology and quality leader. With around 3,000 employees worldwide, we shift the limits of what's possible - our more than 850 active patents are testimony to this. While others progress step by step, we innovate in leaps and bounds. Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com



v02 2012 EN

Fronius Australia Pty Ltd.
90-92 Lambeck Drive
Tullamarine VIC 3043
Australia
pv-sales-australia@fronius.com
www.fronius.com.au

Fronius UK Limited
Maidstone Road, Kingston
Milton Keynes, MK10 0BD
United Kingdom
pv-sales-uk@fronius.com
www.fronius.co.uk

Fronius International GmbH
Froniusplatz 1
4600 Wels
Austria
pv@fronius.com
www.fronius.com

Text and images correspond to the current state of technology at the time of printing. Subject to modifications. All information is without guarantee in spite of careful editing. - liability excluded. Copyright © 2011 Fronius™. All rights reserved. M.06.0011.EN v01 Jun 2013 as13