

# Fronius CL

## PV central inverter with the Fronius MIX™ Concept

The Fronius CL combines high-yield power electronics with a unique, modular system design of up to 15 identical power stage sets using the Fronius MIX™ concept. Maximum yield and the highest reliability are the advantages of this well-designed interactive system. This makes the Fronius CL the optimal central inverter for PV systems of up to several hundred kilowatts. Other advantages include the precise MPP tracking of the Module Manager, the automatic transformer switching function, and much more. The Fronius CL is thus a first-class, versatile device that guarantees continuous high performance.



## Technical Data Fronius CL 36.0 / 48.0 / 60.0

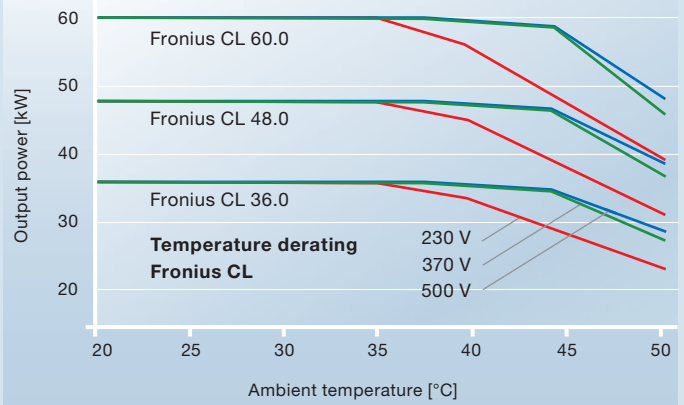
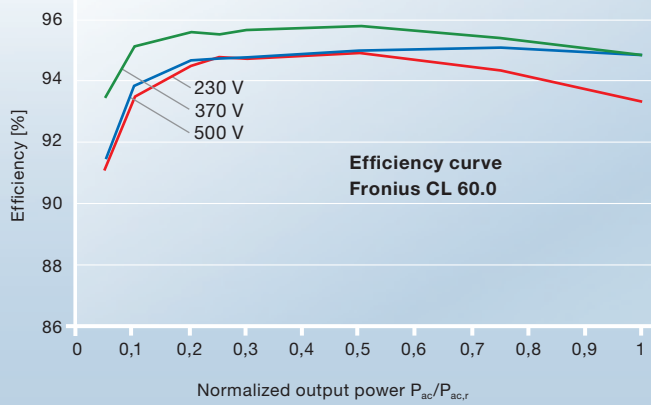
Naturally, all Fronius CL devices have the **CE** mark and meet all required country-specific guidelines and standards. For more information and certificates as well as details regarding system analysis and control using the Fronius DATCOM system, please go to [www.fronius.com](http://www.fronius.com).

Data as per EN 50524:2008

INPUT DATA	Fronius CL 36.0	Fronius CL 48.0	Fronius 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
Min. input voltage ( $U_{dc \min}$ )		230 V	
Feed-in starting voltage ( $U_{dc \text{ start}}$ )		260 V	
Nominal input voltage ( $U_{dc \text{ n}}$ )		370 V	
Max. input voltage ( $U_{dc \max}$ )		600 V	
MPP voltage range ( $U_{mpp \min} - U_{mpp \max}$ )		230 - 500 V	
OUTPUT DATA			
AC nominal output ( $P_{ac \text{ n}}$ ) at $\cos \varphi=1$	36 kW	48 kW	60 kW
Maximum 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		3~NPE 400 V / 230 V	
Min. output voltage ( $U_{ac \min}$ )		180 V	
Max. output voltage ( $U_{ac \max}$ )		270 V	
Frequency ( $f_i$ )		50 Hz / 60 Hz	
Frequency range ( $f_{\min} - f_{\max}$ )		45 Hz - 65 Hz	
Harmonic distortion		< 3 %	
Power factor ( $\cos \varphi_{ac \text{ n}}$ )		0.85 - 1 ind. / cap.	
Night consumption	11.4 W	11.6 W	12.2 W
Feed-in starting at	80 W	95 W	120 W



POWERING YOUR FUTURE



EFFICIENCY	Fronius CL 36.0	Fronius CL 48.0	Fronius CL 60.0
Max. efficiency	95.9 %	95.9 %	95.9 %
Euro. efficiency ( $\eta_{EU}$ )	95.3 %	95.4 %	95.5 %
$\eta$ at 5 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	89.6 / 90.8 / 91.4 %	90.5 / 90.9 / 91.7 %	91.1 / 93.7 / 91.4 %
$\eta$ at 10 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	93.3 / 94.4 / 94.1 %	93.9 / 94.7 / 94.1 %	93.5 / 95.2 / 93.9 %
$\eta$ at 20 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	94.4 / 95.3 / 95.0 %	94.7 / 95.5 / 94.8 %	94.6 / 95.7 / 94.8 %
$\eta$ at 25 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	94.8 / 95.5 / 95.1 %	95.0 / 95.7 / 95.2 %	94.9 / 95.7 / 94.9 %
$\eta$ at 30 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	95.0 / 95.7 / 95.1 %	95.1 / 95.7 / 95.3 %	94.9 / 95.8 / 95.0 %
$\eta$ at 50 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	95.1 / 95.9 / 95.3 %	95.2 / 95.9 / 95.4 %	95.1 / 95.9 / 95.2 %
$\eta$ at 75 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	94.4 / 95.4 / 95.3 %	94.4 / 95.5 / 95.3 %	94.5 / 95.5 / 95.3 %
$\eta$ at 100 % $P_{ac,r}$ and at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$	93.3 / 94.8 / 94.9 %	93.4 / 94.8 / 94.8 %	93.4 / 94.8 / 94.8 %
MPP adaptation efficiency	> 99.9 %		

#### GENERAL DATA

Dimensions (height x width x depth) including base (100 mm)	1830 x 1105 x 722 mm		
Weight	248 kg	276 kg	303 kg
Degree of protection	IP 20		
Protection class	1		
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	3x DC+ and 3x DC- with M10 bolts at DC filter		
AC connection technology	5 pole AC with M10 bolts at AC filter		
Standards for grid interface (country-specific)	VDE V 0126-1-1, ÖVE/ÖNORM E 8001-4-712, UTE C15-712, G 59, CER 06-190, Guida per le connessioni alla rete elettrica di ENEL Distribuzione		

#### SAFETY EQUIPMENT

DC insulation measurement	Warning when $R_{iso} < 500$ kohms
Overload behavior	Operating point shift, power limiter
DC disconnect	integrated

#### INTERFACES

2x RJ45 sockets (RS485)	Solar Net interface, interface protocol
-------------------------	---

#### SPECIAL FEATURES

Fronius CL devices for Germany are delivered exclusively with a manual AC circuit breaker.



**FRONIUS UK LTD.**  
Maidstone Road, Kingston  
Milton Keynes, MK10 0BD  
E-Mail: pv-sales-uk@fronius.com

**FRONIUS INTERNATIONAL GMBH**  
Buxbaumstraße 2, 4600 Wels, Austria  
E-Mail: PV@fronius.com

[www.fronius.com](http://www.fronius.com)