



Fronius **CL**

PV central inverter with
Fronius MIX™ concept





Modular system design. Maximum energy earnings.

The Fronius CL combines high-yield power electronics with the unique, modular system design of up to 15 identical power stages in the MIX™ concept. Maximum yield and the highest stability are the advantages of this sophisticated system. This makes the Fronius CL the optimal central inverter for PV systems of up to several hundred kilowatts. Other features include the exact MPP tracking of the module manager, the automatic transformer switching function and much more. This makes the Fronius CL a distinctive multi-featured device that guarantees continual high performance.

Unique system design with the Fronius MIX™ concept

Up to 15 power stages operate in the Fronius CL accomplishing something great together. This combination of several power stages has many advantages: maximum earnings in partial load ranges, high system stability, long service life, and easy servicing.

Higher partial load efficiency. 9, 12 or 15 identical power stages divide up the work in the MIX™ concept. The individual power stages are turned off and on automatically depending on the irradiance. This ensures that the load is optimized and yield is always at maximum – even while raining, when cloudy, or at dusk.

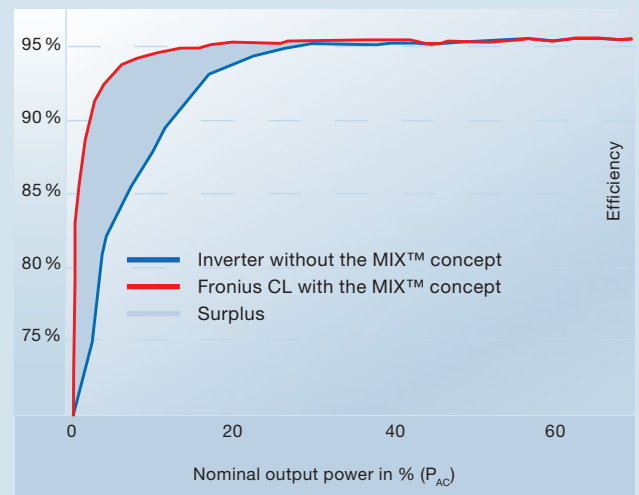
Proven reliability. The Fronius CL creates a compartmentalized system by integrating several smaller power stages. If one power stage should fail, all others operate normally and loss is mitigated due to strict isolation of the problem. In comparison: when the power stage fails in PV systems with a single stage inverter, the entire system stops operating and this leads to considerable loss of earnings. The Fronius MIX™ concept ensures that the inverter remains in operation even when there is a defect in a power stages and this helps to lock in your earnings.

Long service life. The control unit automatically calculates which power stages and how many will be turned on and off in partial load operation based upon the respective operating hours of the power stages. This helps to equalize the work load on the electronics. This also decreases the operating hours of the individual power stages thus increasing the service life of the inverter.

Fast service option. When service is required, power stages can be easily removed and replaced via the plug & play principle and drawer design. This ensures the highest serviceability and the fastest reaction times on the market.



Up to 15 identical power stages in the Fronius CL create a compartmentalized system. A well thought out concept developed to ensure the highest stability.



The Fronius MIX™ concept: Maximum efficiency even during rain, cloudiness or at dusk. The power stages turn on or off depending on the irradiance, ensuring maximum earnings.

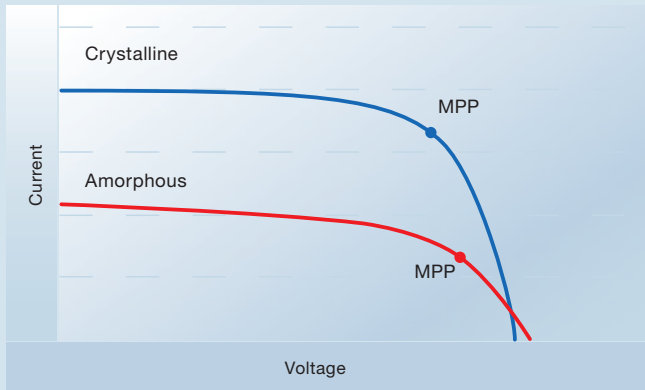


High-yield power electronics

The Fronius CL was designed for continual high performance. The clever combination of automatic transformer switching, the precise Fronius Module Manager, the innovative ventilation concept and the advantages of the high frequency transformer technology make it one of the highest yield inverters of its class.

Automatic transformer switching. The Fronius CL provides constant, high efficiency over the entire input voltage range. This is because Fronius inverters have three efficiency peaks due to automatic transformer switching. In comparison: Devices without transformer switching only have one efficiency peak. The efficiency then decreases steadily with an increasing input voltage.

Exact MPP tracking. The Fronius Module Manager always finds the exact maximum power point (MPP). This is true even with the more demanding thin film modules. Overall, the Fronius Module Manager is able to achieve an outstanding MPP adaptation efficiency of 99.9 %. This ensures that the maximum yield is obtained from every ray of light.

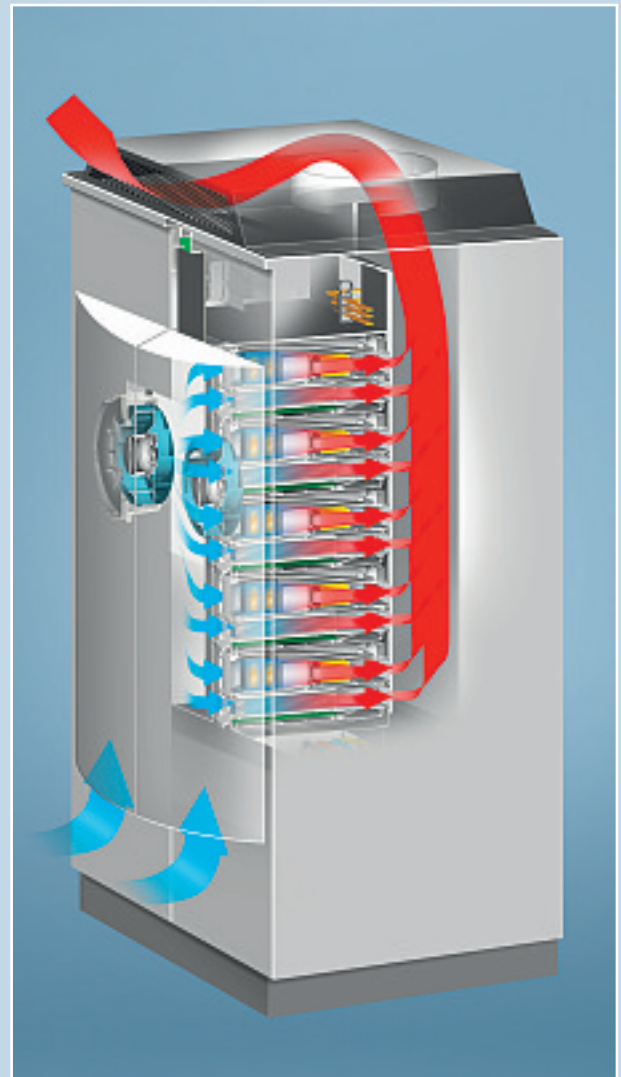


Amorphous (thin film) modules have efficiency characteristics that are more even. That's why other inverters have a difficult time reaching the maximum power point (MPP). The intelligent Module Manager from Fronius always finds the exact MPP.

High-frequency transformer technology. High performance with low weight and a compact design: The use of proven high-frequency transformer technology produces excellent performance results. The Fronius CL uses galvanic isolation, which meets the strictest safety standards worldwide.



High performance power stages with uniform high efficiency using automatic transformer switching, precise MPP tracking and an intelligent cooling concept.



Intelligent cooling. An innovative ventilation design eliminates dust and moisture from getting into the power stage area. The air required for cooling is drawn in by two fans on the front of the device and passed through a closed channel through the individual power stages. The electronic components never come into contact with the outside air. Inside the airtight power stage, a smaller fan ensures uniform cooling. This sophisticated system increases the operational reliability and the service life of the inverter.

Simple planning, easy installation

The Fronius CL was designed with practicality in mind. It can be used for many different configurations due to its planning flexibility. It is also easy to set up due to numerous design details that make installation and connection as simple as possible. Available in 36, 48 or 60 kW output configurations.

Wide input voltage range. Different module configurations are possible: The wide input voltage range ensures high flexibility for system configuration.

Integrated grounding option. The Fronius CL is compatible with either positive or negative grounded modules. Simply change two wires and a software parameter to change from negative to positive grounding.

Optional exhaust air guide. If the Fronius CL is set up in a closed area, the exhaust air can be channeled out of the space using a connected pipe to prevent extreme heating of the ambient air. An integrated relay contact can also be used to control an external fan that draws the air to the outside.

Low installation height. The Fronius CL can also fit into confined spaces due to its low 72 inch height (with base). This compact design is achieved by its three-column arrangement of power stages in the inverter.

Low installation weight. The power stages can simply be removed for installation. This reduces the weight of the Fronius CL and makes the housing easier to move. The power stages can then be re-inserted and the inverter can begin operation immediately.



Installation made easy: The power stages can be easily removed for transport. Cables with large cross sections can be easily connected in the spacious connection area.

Generous connection area. Sufficient space is available for connections and cabling with large cable cross sections, making installation much easier.

Extensive system monitoring

System monitoring is vital for inverters of this size. Using the comprehensive Fronius DATCOM system, you can set up a complete monitoring system including extensive data recording, analysis, visualization as well as remote monitoring.

100 % DATCOM-compatible. The Fronius CL can utilize all options for professional system monitoring within the comprehensive Fronius DATCOM system. The Fronius Com Card is already integrated. Other components such as the Datalogger, sensors and much more can be added at any time. Therefore, it can be equipped for any situation.

Fronius String Control 250/25. The customized solution for string monitoring. The Fronius String Control 250/25 continually compares the string currents of connected strings with each other. This enables the early detection and localization of problems in the entire system (e.g. gnawing damage to cables from small animals, module failure, etc.). This can prevent an incremental loss of earnings. Up to 25 module strings can be fused and bundled using the Fronius String Control 250/25.



The Fronius String Control 250/25 continually compares the string currents of up to 25 module strings. This enables you to quickly detect and localize problems within the entire system.

Integrated Com Card. The Fronius CL has two DATCOM option slots. One of which comes standard with a Fronius Com Card. Therefore, a professional monitoring system can be installed right away.

Integrated Interface Card function. An open data protocol is used to read system data enabling you to easily use third-party components for system monitoring.

Fronius CL Technical Data

INPUT DATA	Fronius CL	33.3 _{Delta}	36.0 _{WYE277}	44.4 _{Delta}	48.0 _{WYE277}	55.5 _{Delta}	60.0 _{WYE277}
Recommended PV-power		28.3 - 39.0 kWp	30.6 - 42.1 kWp	37.8 - 52.0 kWp	40.8 - 56.2 kWp	47.2 - 65.0 kWp	51.0 - 70.2 kWp
MPPT-voltage range		230 ... 500 V					
Max. input voltage (at 1000 W/m ² 14°F in open circuit operation)		600 V					
Nominal input voltage		390 V					
Nominal input current		90.8 A	98.2 A	121.1 A	130.9 A	151.4 A	163.7 A
Max. usable input current		154.0 A	166.5 A	205.4 A	222.0 A	256.7 A	277.5 A
DC startup voltage		245 V					
Admissible conductor size (DC)		350 MCM					
No. of DC input terminals		2x M12 (1/2") lug per pole					
No. of MPP trackers		1					

OUTPUT DATA	Fronius CL	33.3 _{Delta}	36.0 _{WYE277}	44.4 _{Delta}	48.0 _{WYE277}	55.5 _{Delta}	60.0 _{WYE277}
Nominal output power (P _{AC,nom})		33300 W	36000 W	44400 W	48000 W	55500 W	60000 W
Max. continuous output power (40°C)	208 V	33300 W	n.a	44400 W	n.a	55500 W	n.a
	240 V	33300 W	n.a	44400 W	n.a	55500 W	n.a
	277 V	n.a	36000 W	n.a	48000 W	n.a	60000 W
Nominal AC output voltage		208/240 V	277 V	208/240 V	277 V	208/240 V	277 V
Operating AC voltage range default	208 V	183 - 229 V	n.a	183 - 229 V	n.a	183 - 229 V	n.a
	240 V	211 - 264 V	n.a	211 - 264 V	n.a	211 - 264 V	n.a
	277 V	n.a	244 - 305 V	n.a	244 - 305 V	n.a	244 - 305 V
Nominal output current	208 V	92.4 A	n.a	123.2 A	n.a	154.0 A	n.a
	240 V	80.1 A	n.a	106.8 A	n.a	133.5 A	n.a
	277 V	n.a	43.3 A	n.a	57.8 A	n.a	72.2 A
Number of phases		3					
Admissible conductor size (AC)		350 MCM					
No. of AC terminals		2x M10 (7/16") lug per pole					
Max. continuous utility backfeed current		0 A					
Nominal output frequency		60 Hz					
Operating frequency range		59.3 - 60.5 Hz					
Total harmonic distortion		< 3 %					
Power factor		1					

GENERAL DATA	Fronius CL	33.3 _{Delta}	36.0 _{WYE277}	44.4 _{Delta}	48.0 _{WYE277}	55.5 _{Delta}	60.0 _{WYE277}
Max. efficiency		95.9 %					
CEC efficiency	208 V	94.5 %	n.a	94.5 %	n.a	94.5 %	n.a
	240 V	95.0 %	n.a	95.0 %	n.a	95.0 %	n.a
	277 V	n.a	95.5 %	n.a	95.5 %	n.a	95.5 %
Consumption in standby (night)		< 15 W		< 15 W		< 15 W	
Consumption during operation		65 W		95 W		110 W	
Cooling		Controlled forced ventilation, variable speed fan					
Enclosure type		NEMA 3R, Powder Coated Aluminum Enclosure (standard)					
Unit dimensions (w/socket) (W x H x D)		43.5 x 76.6 x 31.4 inch (1105 x 1945 x 797 mm)					
Inverter weight (w/socket)		661 lbs (300 kg)		721 lbs (327 kg)		783 lbs (355 kg)	
Admissible ambient temperature		-13°F ... +122°F (-25°C ... +50°C)					
Rel. humidity		0 ... 95 % (non condensing)					
AC- & DC-disconnects		integrated					
Compliance		UL 1741-2005, IEEE 1547-2003, IEEE 1547.1, ANSI/IEEE C62.41, FCC Part 15 B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001), California Solar Initiative - Program Handbook - Appendix C: Inverter Integral 5 % Meter Performance Specification					

PROTECTION DEVICES	Fronius CL	33.3 _{Delta}	36.0 _{WYE277}	44.4 _{Delta}	48.0 _{WYE277}	55.5 _{Delta}	60.0 _{WYE277}
Ground fault protection		internal GFDI (Ground Fault Detector/Interruptor); in accordance with UL 1741-2005 and NEC Art. 690					
DC reverse polarity protection		internal diode					
Islanding protection		internal; in accordance with UL 1741-2005, IEEE 1547-2003 and NEC					
Over temperature		output power derating/active cooling					



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