LAYER ELECTRONICS®

Since 1967
Quality and Reliability
made in Italy

Member of CISQ Federation
RINA IQNET
CERTIFIED MANAGEMENT SYSTEM
ISO 9001
ISO QSCert 14001
ISO QSCert 45001

# Professional **CF** frequency converters

# between 1.5 and 1600 kVA

- ON-LINE double conversion technology
- IGBT Technology with a high commutation frequency
- Insulation transformer in output (on request transformer in input)
- Very high crest factor (3 : 1 and more on request)
- High overload capability and short-circuit proof
- Well able to supply power to devices which produce significant distortion
- Small amount of harmonic distortion for mains (12-pulse or PFC rectifier upon request)
- Very low harmonic distortion (THD < 2%)
- Inrush current lower than nominal current
- Mimic flow diagram
- Event history with time stamp up to 4000 events
- Provision of optional computer interfaces (RS232-RS485-SNMP-CAN) and voltage-free contacts
- High MTBF (> 150000 h)
- Low MTTR (< 0.5 h)
- High efficiency starting from 25% of the load with consequent reduction of the operating cost
- Easy installation and maintenance with full front accessibility
- Compact size (customized cabinets on request)
- Higher protection degrees on request

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The CF series of frequency converters offers the **ultimate in** terms of **quality and reliability**. LAYER ELECTRONICS recommends the CF series of frequency converters to all those driven by professional needs who therefore need very **high performance** products.

Since its introduction on the market on 2005, the CF series of frequency converters has shown great reliability and robustness, becoming the top product and finding application in the most different situations, **both civil and military** (CAGE/NCAGE/NATO code: AD484).

The **high reliability** is due to the high professional level of components used and to its simplicity.

The management through Digital Signal Processor (DSP) allows so many controls to also **protect** the frequency converter and the connected load **under the harshest electric conditions**, environmental and in overload. Particular attention is given in safeguarding the connected load through an **insulation transformer in output**.

The CF series of frequency converters is a high technology product. The CF series is available for 50-60-75-200-400 Hz in 1-Ph version from 1.5 kVA to 200 kVA (available also with 3-Ph input) and in 3-Ph version from 5 kVA to 1600 kVA.

# Technical Data CF series 1-Ph

| MODEL | CF-1/1 | CF-3/1 | CF-5/1 | CF-7/1 | CF-10/1 | CF-15/1 | CF-20/1 | CF-30/1 |
|---|---|---|---|---|---|---|---|---|
| Power - kVA | 1.5 | 3 | 5 | 7.5 | 10 | 15 | 20 | 30 |
| ***Input*** | | | | | | | | |
| Phases | 1-Ph / 3-Ph + N | | | | | | | |
| Voltage | 220 / 230 / 240 V // 380 / 400 / 415 V ± 20%<br>(100 / 110 / 115 / 120 / 127 V // 200 / 208 / 220 / 440 / 480 V on request) | | | | | | | |
| Frequency | 50 / 60 Hz ± 5% | | | | | | | |
| ***Output*** | | | | | | | | |
| Wave-form | SINE WAVE | | | | | | | |
| Harmonic distortion | < 2% | | | | | | | |
| Crest factor (non-linear load 75%) | 3 : 1 | | | | | | | |
| Phases | 1-Ph | | | | | | | |
| Voltage | 220 / 230 / 240 V ± 1%<br>(100 / 110 / 115 / 120 / 127 V on request) | | | | | | | |
| Frequency | 50 / 60 / 75 / 200 / 400 Hz ± 0.1% | | | | | | | |
| Overload | 125% for 10 min, 150% for 1 min, 200% for 0.1 sec. | | | | | | | |
| Efficiency (AC-AC) | > 92% | | | | | | | |
| ***Protections*** | Overload, overtemperature, min/max input voltage, min/max inverter voltage | | | | | | | |
| Short-circuit | With electronic protection | | | | | | | |
| EMI Suppression | EMI/RFI Filter | | | | | | | |
| ***Signals*** | | | | | | | | |
| LED | Mains, rectifier, inverter, output | | | | | | | |
| Display | Standard | | | | | | | |
| Acoustic | Overload, overtemperature, fault | | | | | | | |
| Computer interface | RS232 - RS485 - SNMP - CAN (optional) | | | | | | | |
| ***Environmental*** | | | | | | | | |
| Temperature | 0°C ÷ 50°C | | | | | | | |
| Non-condensing humidity | 0% ÷ 95% | | | | | | | |
| Noise (at 1 m) | < 60 dBA | | | | | | | |
| Protection rating | IP20 | | | | | | | |
| ***Dimensions*** | | | | | | | | |
| W x D x H - mm | 270 x 630 x 730 | | 800 x 500 x 1100 | | 800 x 600 x 1300 | | | 800 x 800 x 1300 |
| ***Weight - kg*** | 45 | 60 | 110 | 130 | 150 | 200 | 250 | 320 |

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| ***UPS Classification according EN 62040-3*** | Class VFI |
| ***CE Marking*** | 2014/30/EU; 2014/35/EU |
| ***Compliance with the standards*** | UPS: EN 60146-1-1, EN 62040-1-1, EN 62040-1-2, EN 62040-2, EN 62040-3, EN 60742; EMC: 2014/30/EU; Low voltage: 2014/35/EU |

# Technical Data CF series 3-Ph

| MODEL | CF-5 | CF-7 | CF-10 | CF-15 | CF-20 | CF-30 | CF-40 | CF-50 | CF-60 | CF-80 |
|---|---|---|---|---|---|---|---|---|---|---|
| Power - kVA | 5 | 7.5 | 10 | 15 | 20 | 30 | 40 | 50 | 60 | 80 |
| ***Input*** | | | | | | | | | | |
| Phases | 3-Ph + N | | | | | | | | | |
| Voltage | 380 / 400 / 415 V ± 20%<br>(200 / 208 / 220 / 440 / 480 V on request) | | | | | | | | | |
| Frequency | 50 / 60 Hz ± 5% | | | | | | | | | |
| ***Output*** | | | | | | | | | | |
| Wave-form | SINE WAVE | | | | | | | | | |
| Harmonic distortion | < 2% | | | | | | | | | |
| Crest factor (non-linear load 75%) | 3 : 1 | | | | | | | | | |
| Phases | 3-Ph + N | | | | | | | | | |
| Voltage | 380 / 400 / 415 V ± 1%<br>(200 / 208 / 220 / 440 / 480 V on request) | | | | | | | | | |
| Frequency | 50 / 60 / 75 / 200 / 400 Hz ± 0.1% | | | | | | | | | |
| Overload | 125% for 10 min, 150% for 1 min, 200% for 0.1 sec. | | | | | | | | | |
| Efficiency (AC-AC) | > 92% | | | | | | | | | |
| ***Protections*** | Overload, overtemperature, min/max input voltage, min/max inverter voltage | | | | | | | | | |
| Short-circuit | With electronic protection | | | | | | | | | |
| EMI Suppression | EMI/RFI Filter | | | | | | | | | |
| ***Signals*** | | | | | | | | | | |
| LED | Mains, rectifier, inverter, output | | | | | | | | | |
| Display | Standard | | | | | | | | | |
| Acoustic | Overload, overtemperature, fault | | | | | | | | | |
| Computer interface | RS232 - RS485 - SNMP - CAN (optional) | | | | | | | | | |
| ***Environmental*** | | | | | | | | | | |
| Temperature | 0°C ÷ 50°C | | | | | | | | | |
| Non-condensing humidity | 0% ÷ 95% | | | | | | | | | |
| Noise (at 1 m) | < 60 dBA | | | | | | | | | |
| Protection rating | IP20 | | | | | | | | | |
| ***Dimensions*** | | | | | | | | | | |
| W x D x H - mm | 800 x 500 x 1100 | | 800 x 600 x 1300 | | | 800 x 800 x 1300 | | | 800 x 800 x 1500 | 800 x 800 x 1700 |
| ***Weight - kg*** | 150 | 160 | 170 | 200 | 250 | 270 | 290 | 310 | 580 | 650 |

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|---|---|
| ***UPS Classification according EN 62040-3*** | Class VFI |
| ***CE Marking*** | 2014/30/EU; 2014/35/EU |
| ***Compliance with the standards*** | UPS: EN 60146-1-1, EN 62040-1-1, EN 62040-1-2, EN 62040-2, EN 62040-3, EN 60742; EMC: 2014/30/EU; Low voltage: 2014/35/EU |

| **MODEL** | **CF-100** | **CF-120** | **CF-150** | **CF-200** | **CF-250** | **CF-300** | **CF-400** | **CF-500** | **CF-600** | **CF-800** |
|---|---|---|---|---|---|---|---|---|---|---|
| Power - kVA | 100 | 120 | 150 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| ***Input*** | | | | | | | | | | |
| Phases | 3-Ph + N | | | | | | | | | |
| Voltage | 380 / 400 / 415 V ± 20%<br>(200 / 208 / 220 / 440 / 480 V on request) | | | | | | | | | |
| Frequency | 50 / 60 Hz ± 5% | | | | | | | | | |
| ***Output*** | | | | | | | | | | |
| Wave-form | SINE WAVE | | | | | | | | | |
| Harmonic distortion | < 2% | | | | | | | | | |
| Crest factor (non-linear load 75%) | 3 : 1 | | | | | | | | | |
| Phases | 3-Ph + N | | | | | | | | | |
| Voltage | 380 / 400 / 415 V ± 1%<br>(200 / 208 / 220 / 440 / 480 V on request) | | | | | | | | | |
| Frequency | 50 / 60 / 75 / 200 / 400 Hz ± 0.1% | | | | | | | | | |
| Overload | 125% for 10 min, 150% for 1 min, 200% for 0.1 sec. | | | | | | | | | |
| Efficiency (AC-AC) | > 92% | | | | | | | | | |
| ***Protections*** | Overload, overtemperature, min/max input voltage, min/max inverter voltage | | | | | | | | | |
| Short-circuit | With electronic protection | | | | | | | | | |
| EMI Suppression | EMI/RFI Filter | | | | | | | | | |
| ***Signals*** | | | | | | | | | | |
| LED | Mains, rectifier, inverter, output | | | | | | | | | |
| Display | Standard | | | | | | | | | |
| Acoustic | Overload, overtemperature, fault | | | | | | | | | |
| Computer interface | RS232 - RS485 - SNMP - CAN (optional) | | | | | | | | | |
| ***Environmental*** | | | | | | | | | | |
| Temperature | 0°C ÷ 50°C | | | | | | | | | |
| Non-condensing humidity | 0% ÷ 95% | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| Noise (at 1 m) | < 60 dBA | | | | | | | | | |
| Protection rating | IP20 | | | | | | | | | |
| ***Dimensions*** | | | | | | | | | | |
| W x D x H - mm | 1200 x 1100 x 1900 | | | 1400 x 1100 x 1900 | 1700 x 1300 x 1900 | | 2180 x 1500 x 2160 | | 3400 x 1300 x 1900 | 4360 x 1500 x 2160 |
| ***Weight - kg*** | 900 | 1000 | 1100 | 1700 | 2000 | 2400 | 2700 | 3200 | 4800 | 5400 |
| ***UPS Classification according EN 62040-3*** | Class VFI | | | | | | | | | |
| ***CE Marking*** | 2014/30/EU; 2014/35/EU | | | | | | | | | |
| ***Compliance with the standards*** | UPS: EN 60146-1-1, EN 62040-1-1, EN 62040-1-2, EN 62040-2, EN 62040-3, EN 60742; EMC: 2014/30/EU; Low voltage: 2014/35/EU | | | | | | | | | |