# DATASHEET
## Variable Speed Drives

## Main Features

| | |
|---|---|
| Reference | : NACFW110016T2ON1Z |
| Product code | : 10574726 |
| Product line | : CFW11 |

**Basic data**

| | |
|---|---|
| Power supply | : 200-240 V |
| Input minimum-maximum voltage | : 170-264 V |
| Number of phases | |
| Input | : 3 |
| Output | : 3 |

| Supply voltage range | 200-240 V | |
|---|---|---|
| Overload regime | Normal (ND) | Heavy (HD) |
| Rated current | 16 A | 13 A |
| Overload current at 60 s | 17,6A | 19,5A |
| Overload current at 3 s | 24A | 26A |

**Maximum applicable motor**

| Voltage/Frequency | Power (HP / kW) [1] | |
|---|---|---|
| | Normal Overload (ND) | Heavy Overload (HD) |
| 220V / 50Hz | 5,5 / 4 | 4 / 3 |
| 220V / 60Hz | 5 / 3,7 | 4 / 3 |
| 230V / 50Hz | 5,5 / 4 | 4 / 3 |
| 230V / 60Hz | 5 / 3,7 | 4 / 3 |

| | |
|---|---|
| Dynamic braking [2] | : Standard with braking |
| Electronic supply | : Internal |
| Safety Stop | : No |
| RFI internal filter [3] | : Without filter |
| External filter | : Not available |
| Link Inductor | : Yes |
| Memory card | : Included in the product |
| USB port | : Standard in the product |
| Line frequency | : 50/60Hz |
| Line frequency range (minimum - maximum) | : 48-62 Hz |
| Phase unbalance | : Less or equal to 3% of input rated line voltage |
| Transient voltage and overvoltage | : Category III |
| Rated current of single-phase input | |
| - Overload (ND) | : |
| - Overload (HD) | : |
| Rated current of three-phase input | |
| - Overload (ND) | : 16A |
| - Overload (HD) | : 13A |
| Typical input power factor | : 0,94 |
| Displacement factor | : 0,98 |
| Rated efficiency | : ≥ 97% |
| Maximum connections (power up cycles - on/off) per hour | : 60 |
| DC power supply | : Allow |
| Standard switching frequency | |
| - Overload ND | : 5 kHz |
| - Overload HD | : 5 kHz |
| Selectable switching frequency | : 1,25; 2; 2,5; 5 and 10 kHz |
| Real-time clock | : Yes, in the HMI |
| Copy Function | : Yes, by HMI/MMF |
| Dissipated power: | |

| Mounting type | Overload | | Overload (*) | |
|---|---|---|---|---|
| | ND | HD | ND | HD |
| Surface | 230 W | 190 W | Not applicable | Not applicable |
| Flange | 30 W | 30 W | Not applicable | Not applicable |

**Source available to the user**

| | |
|---|---|
| Output voltage | : 24 Vcc |
| Maximum capacity | : 500 mA |

**Control/performance data**

| | |
|---|---|
| Power supply | : Switched-mode power supply |
| Control method - induction motor | : V/f, VVW, Vector and PM motor |
| Encoder interface | : Only with 'Slot 2' accessory |

**Control/performance data**

| | |
|---|---|
| Control output frequency [5] | : 0 to 300 Hz |
| Frequency resolution | : Equivalent to 1 rpm |
| V/F Control | |
| - Speed regulation | : 1% of rated speed |
| - Speed variation | : 1:20 |
| VVW Control | |
| - Speed regulation | : 1% of rated speed |
| - Speed variation | : 1:30 |
| Sensorless vector control | |
| - Speed regulation | : 0,5% of rated speed |
| - Speed variation | : 1:100 |
| Vector control with encoder | |
| - Speed regulation | : 0,05% of rated speed |
| - Speed variation | : Up to 0 rpm |

**Analog inputs**

| | |
|---|---|
| Quantity (standard) | : 2 |
| Levels | : 0-10V, 0/4-20mA and -10-+10V |
| Impedance | |
| - Impedance for voltage input | : 400 kΩ |
| - Impedance for current input | : 500 Ω |
| Function | : Programmable |
| Maximum allowed voltage | : ± 30 Vcc |

**Digital inputs**

| | |
|---|---|
| Quantity (standard) | : 6 |
| Activation | : Active low and high |
| Maximum low level | : 3 V |
| Minimum high level | : 18 V |
| Input current | : 11 mA |
| Maximum input current | : 13,5 mA |
| Function | : Programmable |
| Maximum allowed voltage | : 30 Vcc |

**Analog outputs**

| | |
|---|---|
| Quantity (standard) | : 2 |
| Levels | : 0 to 10V, 0 to 20mA and 4 to 20mA |
| RL for voltage output | : 10 kΩ |
| RL for current output | : 500 Ω |
| Function | : Programmable |

**Digital outputs**

| | |
|---|---|
| Quantity (standard) | : 3 NO/NC relays |
| Maximum voltage | : 240 Vca |
| Maximum current | : 1 A |
| Function | : Programmable |

**Communication**

- Modbus-RTU (with accessory: RS485-01; RS485-05; CAN/RS485-01; RS232-01 or RS232-05)
- Modbus/TCP (with accessory: MODBUSTCP-05)
- Profibus DP (with accessory: PROFDP-05)
- Profibus DPV1 (with accessory: PROFIBUS DP-01)
- Profinet (with accessory: PROFINETIO-05)
- CANopen (with accessory: CAN/RS485-01 or CAN-01)
- DeviceNet (with accessory: DEVICENET-05; CAN/RS485-01 or CAN-01)
- EtherNet/IP (with accessory: ETHERNET/IP-05 or ETHERNETIP-2P-05)
- EtherCAT (with accessory: ETHERCAT-01)
- BACnet (with accessory: RS485-01 or CAN/RS485-01)

**Protections available**

- Output overcurrent/short circuit
- Power supply phase loss
- Under/Overvoltage in power
- Overtemperature
- Motor overload
- IGBT's modules overload
- Fault/External alarm
- Breaking resistor overload
- CPU or memory failure
- Output phase-ground short circuit

**Operation interface (HMI)**

| | |
|---|---|
| Avaliability | : Included in the product |
| HMI installation | : Local |
| Number of HMI buttons | : 9 |
| Display | : Graphic LCD |
| Indication accuracy | : 5% of rated current |
| Speed resolution | : 1 rpm |

**Operation interface (HMI)**

| | |
|---|---|
| Standard HMI degree of protection | : IP56 |
| HMI battery type | : CR2032 |
| HMI battery life expectancy | : 10 years |
| Remote HMI type | : Detachable of the inverter |
| Remote HMI frame | : Accessory |
| Remote HMI degree of protection | : IP56 |

**Ambient conditions**

| | |
|---|---|
| Enclosure | : NEMA1 |
| Pollution degree | : 2 (EN50178 and UL508C) |
| Temperature | |
| - Minimum | : -10 °C / 14 °F |
| - Nominal [4] | : 50 °C / 122 °F |
| Current reduction factor [5] | : 2 % per °C of 50 (122) o 60 °C (140 °F) |
| Relative humidity (non-condensing) | |
| - Minimum | : 5% |
| - Maximum | : 90% |
| Altitude | |
| - Rated conditions | : 1000 m (3281 ft) |
| - Maximum allowed for operation (with derating factor) | : 4000 m (13123 ft) |
| Current Reduction factor[6] | |
| - Current derating factor (for altitudes above rated) | : 1% for each 100 m above (0,3% for each 100 ft above) |
| - Voltage derating factor (for altitudes above 2000 m / 6562 ft) | : 1,1% for each 100 m above (0,33% for each 100 ft above) |

**Sustainability policies**

| | |
|---|---|
| RoHS | : Yes |
| Conformal Coating | : 3C2 (IEC 60721-3-3:2002) |

**Dimensions**

| | |
|---|---|
| Size | : A |
| Height | : 330 mm / 13.0 in |
| Width | : 145 mm / 5.71 in |
| Depth | : 227 mm / 8.94 in |
| Weight | : 7.2 kg / 15.9 lb |

**Mechanical installation**

| | |
|---|---|
| Mounting position | : Surface or flange |
| Fixing screw | : M5 |
| Tightening torque | : 5 N.m / 3.69 lb.ft |
| Allows side-by-side assembly | : Yes, without top cap |
| Minimum spacing around the inverter | |
| - Top | : 25 mm / 0.98 in |
| - Bottom | : 25 mm / 0.98 in |
| - Front | : 10 mm / 0.39 in |
| - Between inverters (IP20) | : 30 mm / 1.18 in |

**Electrical connections**

Cable gauges and tightening torque:

| | Recommended cable gauge to 75 °C (167 °F) | Recommended tightening torque |
|---|---|---|
| Power | 4,0 mm² (12 AWG) | 1,8 N.m / 1.33 lb.ft |
| Braking | 4,0 mm² (12 AWG) | 1,8 N.m / 1.33 lb.ft |
| Grounding | 4,0 mm² (12 AWG) | 1.8 N.m / 1.33 lb.ft |
| Control | 0,5 to 1,5 mm² (20 to 14 AWG) | 0,5 N.m / 0.37 lb.ft |

**Additional especifications**

| | |
|---|---|
| Maximum breaking current | : 14,8 A |
| Minimum resistance for the brake resistor | : 27 Ω |
| Recommended aR fuse [6] | : FNH00-35K-A |
| Recommended aR fuse [6] | : Not applicable |
| Recommended circuit breaker [6] | : ACW100H-FMU20-3 |
| Recommended circuit breaker [6] | : Not applicable |

**Standards**

| | |
|---|---|
| Safety | - UL 508C - Power conversion equipment.<br>- UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment.<br>- EN 61800-5-1 - Safety requirements electrical, thermal and energy.<br>- EN 50178 - Electronic equipment for use in power instalations<br>- EN 60204-1 - Safety of machinery. Electrical equipment of machines. Part 1: General requirements. Note: To have a machine in accordance with this standard, the machine manufacturer is responsible for installing an emergency stop device and supply disconnecting device.<br>- EN 60146 (IEC 146) - Semiconductor converters.<br>- EN 61800-2 - Adjustable speed electrical power drive systems - Part 2: General requirements - Rating especifications for low voltage adjustable frequency AC power drive systems. |

| | |
|---|---|
| Electromagnetic compatibility | EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods.<br>- EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.<br>- CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment - Eletromagnetic disturbance characteristics - Limits and methods of measurement.<br>- EN 61000-4-2 - Eletromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Eletrostatic discharge immunity test.<br>- EN 61000-4-3 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test.<br>- EN 61000-4-4 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test.<br>- EN 61000-4-5 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 5: Surge immunity test.<br>- EN 61000-4-6 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields. |
| Mechanical construction | - EN 60529 - Degrees of protection provided by enclosures (IP code).<br>- UL 50 - Enclosures for electrical equipment.<br>- EN 60529 e UL 50 |

**Certifications**
UL, CE, C-Tick, CS and IRAM

**Notes**
1) Orientative motor power, valid for WEG Motors standard of IV poles. The correct sizing must be done according to the nominal current of the motor used, which must be less than or equal to the rated output current of the inverter;
2) Braking resistor is not included;
3) With category for emission level conducted;
4) Without derating and with minimum spaces;
5) For temperatures above the nominal and maximum temperature (with derating of current and minimum spaces);
6) For altitude over of specified;
7) All images are merely illustrative;
8) For more information, see the users manual of the CFW-11 (size A).