

# DATASHEET

## Variable Speed Drives



### Main Features



Reference : CFW701E0142T2NBN1C3  
Product code : 12104757  
Product line : CFW701 HVAC

### Basic data

Power supply : 220-230V  
Input minimum-maximum voltage : 187-253 V  
Number of phases : 3  
Input : 3  
Output : 3

Supply voltage range	220-230V		220-230V	
Overload regime	Normal (ND)	Heavy (HD)	Normal (ND)	Heavy (HD)
Rated current	142A	115		
Overload current at 60 s	156A	156A		
Overload current at 3 s	213A	200		

### Maximum applicable motor

Voltage/Frequency	Power (HP / kW) [1]	
	Normal Overload (ND)	Heavy Overload (HD)
220V / 50Hz	50 / 37	40 / 30
220V / 60Hz	50 / 37	40 / 30
230V / 50Hz	60 / 45	50 / 37
230V / 60Hz	50 / 37	40 / 30

Dynamic braking [2] : Standard without braking  
Electronic supply : Internal  
Safety Stop : No  
RFI internal filter [3] : With filter (C3 category)  
External filter : Not available  
Link Inductor : Yes  
Memory card : Not included in the product  
USB port : Yes, available in HMI  
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) : 142A  
- Overload (HD) : 115A  
Typical input power factor : 0,94  
Displacement factor : 0,98  
Rated efficiency :  $\geq 97\%$   
Maximum connections (power up cycles - on/off) per hour : 60  
DC power supply : Allow  
Standard switching frequency :  
- Overload ND : 2,5 kHz  
- Overload HD : 5 kHz  
Selectable switching frequency : 1,25; 2; 2,5; 5 and 10 kHz  
Real-time clock : Not available  
Copy Function : Yes, by MMF  
Dissipated power:

Mounting type	Overload		Overload (*)	
	ND	HD	ND	HD
Surface	1490 W	1280 W	Not applicable	Not applicable
Flange	210 W	200 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, Sensorless  
Encoder interface : Available in inverter

# DATASHEET

## Variable Speed Drives



### 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	: Not applicable
- Speed variation	: Not applicable

### Analog inputs

Quantity (standard)	: 3
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	: ± 15 Vdc

### Digital inputs

Quantity (standard)	: 8
Activation	: Active low and high
Maximum low level	: 2 V
Minimum high level	: 10 V
Input current	: 7.5 mA
Maximum input current	: 9.5 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)	: 2 NO/NC relay and 3 transistor
Maximum voltage	: 240 Vac and 30 Vdc
Maximum current	: 0.75 A and 80 mA
Function	: Programmable

### Communication

- Modbus-RTU (Standard)
- Modbus/TCP (Not available)
- Profibus DP (with accessory: PROFIBUS DP-01)
- Profibus DPV1 (Not available)
- Profinet (Not available)
- CANopen (with accessory: CAN-01)
- DeviceNet (with accessory: CAN-01)
- EtherNet/IP (Not available)
- EtherCAT (Not available)
- BACnet (Not available for CFW700 series. Available by default on the CFW701 series)

### Protections available

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

### Operation interface (HMI)

Availability	: 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
Standard HMI degree of protection	: IP56

# DATASHEET

## Variable Speed Drives



### Operation interface (HMI)

HMI battery type	: Not applicable
HMI battery life expectancy	: Not applicable
Remote HMI type	: Detachable of the inverter
Remote HMI frame	: Accessory
Remote HMI degree of protection	: IP56

### Ambient conditions

Enclosure	: NEMA1/IP20
Pollution degree	: 2 (EN50178 and UL508C)
Temperature	
- Minimum	: -10 °C / 14 °F
- Nominal [4]	:
Current reduction factor [5]	:
Relative humidity (non-condensing)	
- Minimum	: 5%
- Maximum	: 95%
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	: E
Height	:
Width	:
Depth	:
Weight	:

### Mechanical installation

Mounting position	: Surface or flange
Fixing screw	:
Tightening torque	: 20 N.m / 14.76 lb.ft
Allows side-by-side assembly	:
Minimum spacing around the inverter	
- Top	:
- Bottom	:
- Front	:
- Between inverters (IP20)	:

### Electrical connections

Cable gauges and tightening torque:

	Recommended cable gauge to 75 °C (167 °F)	Recommended tightening torque
Power	50,0 mm <sup>2</sup> (1/0 AWG) HD	15 N.m / 11.07 lb.ft
Braking	Not applicable	15 N.m / 11.07 lb.ft
Grounding	35,0 mm <sup>2</sup> (2 AWG)	10 N.m / 7.38 lb.ft
Control	0,5 to 1,5 mm <sup>2</sup> (20 to 14 AWG)	0,5 N.m / 0.37 lb.ft

### Additional specifications

Maximum breaking current	: Not available
Minimum resistance for the brake resistor	: Not available
Recommended aR fuse [6]	: FNH1-250K-A
Recommended aR fuse [6]	: Not applicable
Recommended circuit breaker [6]	: ACW160H-FMU160-3
Recommended circuit breaker [6]	: Not applicable

### Standards

Safety	<ul style="list-style-type: none"> <li>- UL 508C - Power conversion equipment.</li> <li>- UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment.</li> <li>- EN 61800-5-1 - Safety requirements electrical, thermal and energy.</li> <li>- EN 50178 - Electronic equipment for use in power instalations</li> <li>- 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.</li> <li>- EN 60146 (IEC 146) - Semiconductor converters.</li> <li>- EN 61800-2 - Adjustable speed electrical power drive systems - Part 2: General requirements - Rating especifications for low voltage adjustable frequency AC power drive systems.</li> </ul>
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# DATASHEET

## Variable Speed Drives



Electromagnetic compatibility	<p>EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods.</p> <ul style="list-style-type: none"><li>- EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.</li><li>- CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment</li><li>- Eletromagnetic disturbance characteristics - Limits and methods of measurement.</li><li>- EN 61000-4-2 - Eletromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Eletrostatic discharge immunity test.</li><li>- EN 61000-4-3 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test.</li><li>- EN 61000-4-4 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test.</li><li>- EN 61000-4-5 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 5: Surge immunity test.</li><li>- EN 61000-4-6 - Eletromagnetic compatibility (EMC) - Part4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.</li></ul>
Mechanical construction	<ul style="list-style-type: none"><li>- EN 60529 - Degrees of protection provided by enclosures (IP code).</li><li>- UL 50 - Enclosures for electrical equipment.</li><li>- EN 60529 e UL 50</li></ul>

### Certifications

- 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 CFW700 (size E).