



# FI-E13

## variable frequency inverter

The FI-E13 is a variable frequency inverter for controlling low power three-phase motors. It is reliable, flexible to apply, easy to commission, and meets the highest standards of quality.

The FI-E13 provides solutions to fulfill nearly any inverter requirement in the power range between 0.37 and 4.0 kW. It has only fourteen standard parameters to adjust in its basic form. For the more advanced user the extended parameter set gives access to powerful additional functionality. The FI-E13 can be supplied with or without an internal EMC filter.

### SPECIFICATIONS

- Single phase input/ three phase output
- Small mechanical IP20 and IP66 housing
- Rugged industrial operation 50 °C ambient rating
- High pressure washdown duty IP66/ NEMA4X for indoor use \*
- Specially coated heatsinks to protect against corrosion \*
- Dust tight seals to prevent water, oil and dust entering the enclosure \*
- No external fans to replace
- Simple mechanical and electrical installation
- Simple operation, powerful features and easy to use
- Fast setup, factory default settings OK for most applications, only fourteen basic parameters
- Variable or constant torque
- Unique programmable boost feature to achieve intelligent starting
- Motor current and rpm indication
- 150 % overload for 60 sec (175 % for 2 sec)
- Keypad control
- Integral RFI filter option
- Integral brake chopper (S2 only)
- Modbus RTU serial communications
- PI control for feedback applications

\*IP66 version

|      | Article code |             | Motor power | Output current |
|------|--------------|-------------|-------------|----------------|
|      | With EMC     | Without EMC |             |                |
| IP20 | FI-E13023E2  | FI-E13023-2 | 0.37 kW     | 2.3 A          |
|      | FI-E13043E2  | FI-E13043-2 | 0.75 kW     | 4.3 A          |
|      | FI-E13070E2  | FI-E13070-2 | 1.5 kW      | 7.0 A          |
|      | FI-E13105E2  | FI-E13105-2 | 2.2 kW      | 10.5 A         |
| IP66 |              | FI-E13150-2 | 4.0 kW      | 15.0 A         |
|      | FI-E13023E6  | FI-E13023-6 | 0.37 kW     | 2.3 A          |
|      | FI-E13043E6  | FI-E13043-6 | 0.75 kW     | 4.3 A          |
|      | FI-E13070E6  | FI-E13070-6 | 1.5 kW      | 7.0 A          |
|      | FI-E13105E6  | FI-E13105-6 | 2.2 kW      | 10.5 A         |
|      |              | FI-E13150-6 | 4.0 kW      | 15.0 A         |

#### Article code structure

FI-E13aaaBc (ex. FI-E13043-2)

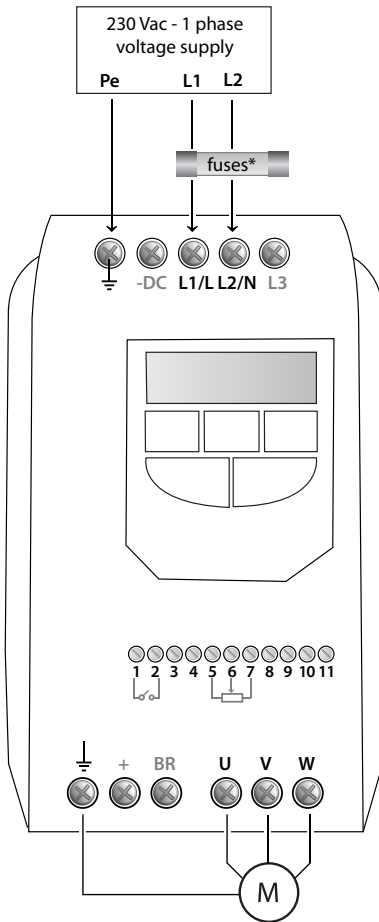
FI-E basic range HVAC frequency inverter E2  
 1 230 VAC input (single phase)  
 3 3x230 VAC output  
 aaa output current  
 043 = 4.3 A  
 070 = 7.0 A  
 105 = 10.5 A  
 150 = 15.0 A  
 B - = without EMC filter  
 E = with EMC filter  
 c 2 = IP20  
 6 = IP66

|                       |                            |  |
|-----------------------|----------------------------|--|
| Output ratings        | Overload capacity          | 150 % for 60 sec<br>175 % for 2 sec                                      |
|                       | Frequency                  | 0 - 500 Hz   |
| Input ratings         | Frequency                  | 48 - 62 Hz   |
|                       | Voltage                    | 200 - 240 ± 10 % 1 phase (0.37 - 4 kW)                                   |
| Ambient conditions    | Temperature                | Operating: 0 to 50 °C, max. storage: -40...+60 °C                        |
|                       | Altitude                   | 0 - 2000 m, derate 1 % per 100 m above 1000 m                            |
|                       | Ingress protection         | IP20 & IP66/NEMA 4X  |
| Programming           | Keypad                     | yes  |
|                       | PC                         | yes  |
|                       | PDA                        | yes  |
|                       | Smartphone                 | yes  |
| Control specification | Control method             | Voltage vector   |
|                       | PWM frequency              | 4 - 32 kHz (effective)   |
|                       | V/Hz ratio                 | linear   |
|                       | Boost                      | yes  |
|                       | Stop mode                  | Coast / Ramp / DC brake  |
|                       | Internal brake transistor  | yes (size 2 and 3), external resistor required                           |
|                       | Capacity                   | 100 % drive rated power continuously                                     |
|                       | Skip frequency             | one point, adjustable frequency band                                     |
|                       | Frequency setpoint control | 0 - 10 VDC / 20 - 4 mA / 4 - 20 mA / 0 - 20 mA digital - keypad / Modbus |
|                       | Preset speeds              | 4  |
|                       | PI control                 | yes  |
|                       | Spin start                 | yes  |
|                       | Acceleration               | 0 - 600 sec  |
|                       | Deceleration               | (2 ramps) 0 - 600 sec  |
| Programmable I/O      | Input 1                    | programmable digital input   |
|                       | Input 2                    | programmable digital input   |
|                       | Input 3                    | user selectable analog / digital Input                                   |

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|                      |                   |   |
|----------------------|-------------------|---|
|                      | Input 4           | user selectable analog / digital Input  |
|                      | Output 1          | programmable analog / digital output  |
|                      | Relay 1           | relay output (30 VDC 5A, 250 VAC, 6 A)  |
| Keypad display       | Operating display | output frequency, current, rpm, power and user scalable values  |
|                      | Remote mount      | optional optiport E2 remote mounting keypad   |
| Protective functions | Inverter trip     | over voltage / over current / under voltage / external trip / motor overload / over temperature / short circuited / earth fault / under voltage |
|                      | Memory            | last 4 trips stored   |
| Bus communication    | Modbus RTU        | standard  |
|                      | Profibus DP       | via gateway   |
|                      | DeviceNet         | via gateway   |
|                      | RS485 (Optibus)   | standard  |
| Standards compliance | EN 61800-3:2004   | adjustable speed electrical power drive systems / EMC requirements  |

## WIRING DIAGRAM



### INPUTS

|       |   |
|-------|---|
| ± Pe  | earth connections                                     |
| L1 L  | single phase power supply 230 VAC– 50/60 Hz - line    |
| L2 N  | single phase power supply 230 VAC– 50/60 Hz - neutral |
| L3    | not used  |
| fuses | *fuses dependent from drive rating                    |

### OUTPUTS

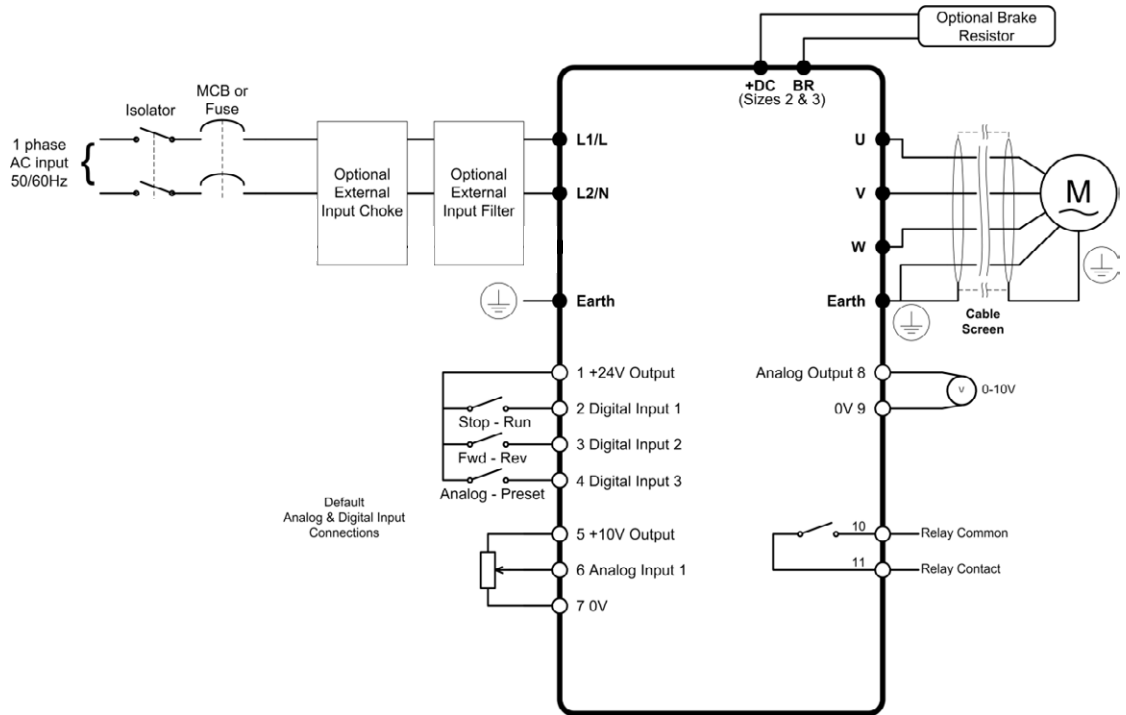
|   |                              |
|---|------------------------------|
| U | three phase motor connection |
| V | three phase motor connection |
| W | three phase motor connection |

### CONTROL TERMINALS

- 1-11 (based on default setting out of box)
1. Connect a start/stop switch from terminal 1 to 2  
close the contact START (enable) the drive  
open the contact STOP the drive
  2. Connect a 10 kOhm potentiometer on terminals 5, 6 and 7  
to vary the speed from 35 to 50 Hz (60 Hz for HP drives)



## OPERATION EXAMPLE



## DIMENSIONS & WEIGHT

|      | Article code |             | width | height | depth  | weight |
|------|--------------|-------------|-------|--------|--------|--------|
|      | With EMC     | Without EMC |       |        |        |        |
| IP20 | FI-E13023E2  | FI-E13023-2 | 82    | 173    | 123    | 1.1 kg |
|      | FI-E13043E2  | FI-E13043-2 | 82    | 173    | 123    | 1.1 kg |
|      |              | FI-E13070-2 | 82    | 173    | 123    | 1.1 kg |
|      | FI-E13070E2  |             | 221   | 104    | 150    | 2.6 kg |
|      | FI-E13105E2  | FI-E13105-2 | 221   | 104    | 150    | 2.6 kg |
| IP66 |              | FI-E13150-2 | 131   | 261    | 175    | 4.0 kg |
|      | FI-E13023E6  | FI-E13023-6 | 232   | 161    | 175    | 2.8 kg |
|      | FI-E13043E6  | FI-E13043-6 | 232   | 161    | 175    | 2.8 kg |
|      |              | FI-E13070-6 | 232   | 161    | 175    | 2.8 kg |
|      | FI-E13070E6  |             | 257   | 188    | 187    | 4.6 kg |
|      | FI-E13105E6  | FI-E13105-6 | 257   | 188    | 187    | 4.6 kg |
|      | FI-E13150-6  | 210.5       | 310   | 243    | 7.4 kg |        |