

# ODE-3-240058-3F4B

## Optidrive E3 VFD Datasheet



**2.2 kW (3 HP), 5.8 A, 380-480 V, 3PH**

**IP66 Outdoor Switched Variable Frequency Drive with EMC Filter**

### Input Ratings

|                             |           |
|-----------------------------|-----------|
| Supply Voltage              | 380-480 V |
| Input Phases                | 3         |
| Supply Current Continuous   | 7.5 A     |
| Supply Fuse or MCB (Type B) | 16 A      |

### Output Ratings

|                     |                    |
|---------------------|--------------------|
| Motor Output Rating | 2.2 kW (3 HP)      |
| Output Voltage      | 0 – Supply Voltage |
| Output Current      | 5.8 A              |

### Cable Information

|                        |                                |
|------------------------|--------------------------------|
| Max Supply Cable Size  | 8 mm <sup>2</sup> (0.01 sq in) |
| Max Motor Cable Size   | 8 mm <sup>2</sup> (0.01 sq in) |
| Max Motor Cable Length | 100 m (328 ft)                 |

### Factory Build Options

|                  |                           |
|------------------|---------------------------|
| EMC Filter       | Internal EMC Filter       |
| Brake Transistor | Internal Brake Transistor |
| Enclosure        | IP66 Outdoor Switched     |
| Display          | LED                       |
| PCB Coating      | -                         |

### Dimensions

|         |                   |
|---------|-------------------|
| Size    | 2                 |
| Height  | 257 mm (10.12 in) |
| Width   | 188 mm (7.4 in)   |
| Depth   | 182 mm (7.17 in)  |
| Weight  | 3.5 kg (7.72 lbs) |
| Fixings | 4 x M4            |

### Packaged Dimensions

|        |                   |
|--------|-------------------|
| Height | 215 mm (8.46 in)  |
| Width  | 235 mm (9.25 in)  |
| Depth  | 375 mm (14.76 in) |
| Weight | 4.2 kg (9.26 lbs) |



 **Buy this drive or get more information**  
Find your local sales partner on  
[invertekdrives.com](https://www.invertekdrives.com)



# OPTIDRIVE™

AC Variable Speed Drive

**General Purpose Drive**  
Easy control for all motor types

Easy to Use



0.37kW–37kW / 0.5HP–50HP  
**110–480V** Single & 3 Phase Input

**IP20**

**IP66**

## Easy to Use

### General Purpose Drive

Focused on ease of use, **Optidrive E3** provides unrivalled simplicity of installation, connection and commissioning, allowing the user to benefit from precise motor control and energy savings within minutes.



#### Simple Commissioning

With just 14 basic parameters and application macro functions providing rapid set up, Optidrive E3 minimises start-up time.



#### Intuitive Keypad Control

Precise digital control at the touch of a button.



#### Application Macros

Switch between **Industrial, Pump & Fan** modes to optimise Optidrive E3 for your application.

Industrial | Pump | Fan

See [Page 6](#)

## IP20

### Up to 37kW

- ✓ Easy to use
- ✓ Compact & robust

See [Page 4](#)



### Take a closer look at the stunning Optidrive E3



[www.invertekdrives.com/optidrive-e3](http://www.invertekdrives.com/optidrive-e3)

### Sensorless Vector Control for all Motor Types

#### IM

IE2 & IE3  
Induction  
Motors

#### PM

AC Permanent  
Magnet Motors

#### BLDC

Brushless DC  
Motors

#### SynRM

Synchronous  
Reluctance  
Motors

Precise and reliable control for  
**IE2, IE3 & IE4 motors**

**IP66**

**Up to 22kW**

- ✓ Outdoor rated
- ✓ Dust-tight
- ✓ Washdown ready

See **Page 5**



## Key Features

- ✓ Internal Category C1 EMC filter
- ✓ Internal PI control
- ✓ Internal brake chopper
- ✓ Dual analogue inputs
- ✓ Operates up to 50°C
- ✓ Bluetooth® connectivity
- ✓ Option for control of single phase motors (see **Page 8**)

**Modbus RTU**  
**CAN**

on-board as standard

## Internal Category C1 EMC Filter

An internal filter in every Optidrive E3 saves cost and time for installation.

Cat C1 according to EN61800-3:2004



**IP20**

**Up to 37kW**

Compact, robust  
and reliable general  
purpose drive for  
panel mounting

## Simple Installation

DIN rail and keyhole  
mounting options

## Fast Connection

5mm rising clamp terminals  
with captive screws

## Quick Reference

Integrated help card

Operates up to 50°C

## Modbus RTU CAN

on-board as standard

## Incredibly Easy to Use

- ✓ Built in PI control, EMC filter (C1) & brake chopper
- ✓ Application macros for industrial, fan and pump operation
- ✓  Bluetooth® connectivity

## Optistick Smart

Rapid commissioning tool

See **Page 10**

Dual analogue inputs

Motor supply  
connects at base

## Controls Multiple Motor Types

- ✓ IE2, 3 & 4
- ✓ IM, PM, BLDC and SynRM

5 sizes cover global  
supply ratings

## Simply Power Up

Optidrive E3 provides precise motor control and energy savings using the factory settings. Simply power up and the drive can immediately deliver energy savings.

14 basic parameters allow simple adjustment for your application if required, with up to 50 parameters available in total for a highly flexible performance.



# OPTIDRIVE™ E<sup>3</sup>

**IP66 Outdoor**

**Up to 22kW**

**Coated Heatsink as Standard**

Ideal for hygiene based operations requiring washdown — such as food and beverage

Outdoor rated enclosed drives for direct machine mounting, dust tight and ready for washdown duty



## Locally customisable

Flat front to terminal cover with mounting points for switches and an internal PCB.

Switched or non-switched

Conformal coating as standard



- 1 2 x RJ45 ports**  
eliminate the need for a splitter.
- 2 Easily accessible EMC disconnect**
- 3 Easy to wire**  
due to the large, accessible chamber and removeable gland plate.

## IP66/Nema 4X outdoor rated

Built with tough polycarbonate plastics specifically chosen to withstand degradation by ultra violet (UV), greases, oils and acids. Also robust enough not to be brittle at -20°C.

## Dust-Tight Design

Install directly on your processing equipment and be sure of protection from dust and contaminants.

## Washdown Ready

With a sealed ABS enclosure and corrosion resistant heatsink, the Optidrive E3 IP66 is ideal for high-pressure washdown applications.

## Switched models

Simply wire up the drive, turn the inbuilt potentiometer and the motor will start running – allowing immediate energy savings.

Saving energy cannot be easier than this!

For ultimate ease of use

Local Speed Potentiometer

Run Reverse / Off / Run Forward Switch

Lockable Mains Disconnect / Isolator



# Application Macros

Switch modes at the touch of a button to optimise Optidrive E3 for your application

Single parameter application macro selection



## Industrial Mode

**Industrial Mode** optimises Optidrive E3 for load characteristics of typical industrial applications.

### Applications include:

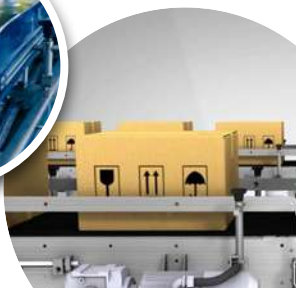
- ✓ Conveyors
- ✓ Mixers
- ✓ Treadmills

**Sensorless Vector** provides high starting torque and excellent speed regulation

**IP20** panel mount units or **IP66** for direct machine mounting



Rapid parameter cloning using **OPTISTICK Smart**



## Pump Mode

**Pump Mode** makes energy efficient pump control easier than ever.

### Applications include:

- ✓ Dosing Pumps
- ✓ Borehole Pumps
- ✓ Transfer Pumps
- ✓ Swimming Pools
- ✓ Spas
- ✓ Fountains

- Constant or variable torque
- Internal PI control



## Fan Mode

**Fan Mode** (inc. fire operation) makes air handling a breeze, ideal for simple HVAC systems.

### Applications include:

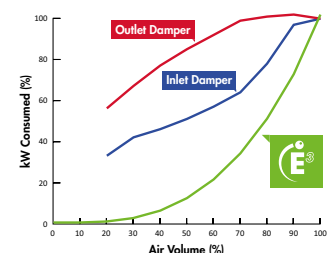
- ✓ Air Handling Units
- ✓ Ventilation Fans
- ✓ Circulating Fans
- ✓ Air Curtains
- ✓ Kitchen Extract



- High efficiency **variable torque** motor control
- Flying start capability
- Mains loss ride through
- PI control

## Instant Power Savings

The graph below shows the incredible efficiency of Optidrive E3 for controlling airflow compared to traditional damper control methods.



## Modbus RTU CAN

on-board as standard

## How much energy could you save?

Estimate potential energy savings, CO<sub>2</sub> emissions and financial savings for your application with the Invertek Drives **Energy Savings Calculator** app.



[www.invertekdrives.com/calculator](http://www.invertekdrives.com/calculator)

|                                 | kW   | HP  | Amps | Frame | Model Code             | Product Family | Generation | Frame Size | Voltage Code | Output Current x 10 | Supply Phases | EMC Filter | Brake Transistor | Enclosure Option |
|---------------------------------|------|-----|------|-------|------------------------|----------------|------------|------------|--------------|---------------------|---------------|------------|------------------|------------------|
| 110–115V ± 10%<br>1 Phase Input | 0.37 | 0.5 | 2.3  | 1     | ODE - 3 - 1 1 0023 - 1 | 0              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 0.75 | 1   | 4.3  | 1     | ODE - 3 - 1 1 0043 - 1 | 0              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.1  | 1.5 | 5.8  | 2     | ODE - 3 - 2 1 0058 - 1 | 0              | 4          | #          |              |                     |               |            |                  |                  |
| 200–240V ± 10%<br>1 Phase Input | 0.37 | 0.5 | 2.3  | 1     | ODE - 3 - 1 2 0023 - 1 | #              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 0.75 | 1   | 4.3  | 1     | ODE - 3 - 1 2 0043 - 1 | #              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 7    | 1     | ODE - 3 - 1 2 0070 - 1 | #              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 7    | 2     | ODE - 3 - 2 2 0070 - 1 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 2.2  | 3   | 10.5 | 2     | ODE - 3 - 2 2 0105 - 1 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 4    | 5   | 15.3 | 3     | ODE - 3 - 3 2 0153 - 1 | 0              | 4          | #          |              |                     |               |            |                  |                  |
| 200–240V ± 10%<br>3 Phase Input | 0.37 | 0.5 | 2.3  | 1     | ODE - 3 - 1 2 0023 - 3 | 0              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 0.75 | 1   | 4.3  | 1     | ODE - 3 - 1 2 0043 - 3 | 0              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 7    | 1     | ODE - 3 - 1 2 0070 - 3 | 0              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 7    | 2     | ODE - 3 - 2 2 0070 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 2.2  | 3   | 10.5 | 2     | ODE - 3 - 2 2 0105 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 4    | 5   | 18   | 3     | ODE - 3 - 3 2 0180 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 5.5  | 7.5 | 24   | 3     | ODE - 3 - 3 2 0240 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 7.5  | 10  | 30   | 4     | ODE - 3 - 4 2 0300 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 11   | 15  | 46   | 4     | ODE - 3 - 4 2 0460 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 15   | 20  | 61   | 5     | ODE - 3 - 5 2 0610 - 3 | F              | 4          | 2          |              |                     |               |            |                  |                  |
|                                 | 18.5 | 25  | 72   | 5     | ODE - 3 - 5 2 0720 - 3 | F              | 4          | 2          |              |                     |               |            |                  |                  |
|                                 |      |     |      |       |                        |                |            |            |              |                     |               |            |                  |                  |
| 380–480V ± 10%<br>3 Phase Input | 0.75 | 1   | 2.2  | 1     | ODE - 3 - 1 4 0022 - 3 | #              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 4.1  | 1     | ODE - 3 - 1 4 0041 - 3 | #              | 1          | #          |              |                     |               |            |                  |                  |
|                                 | 1.5  | 2   | 4.1  | 2     | ODE - 3 - 2 4 0041 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 2.2  | 3   | 5.8  | 2     | ODE - 3 - 2 4 0058 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 4    | 5   | 9.5  | 2     | ODE - 3 - 2 4 0095 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 5.5  | 7.5 | 14   | 3     | ODE - 3 - 3 4 0140 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 7.5  | 10  | 18   | 3     | ODE - 3 - 3 4 0180 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 11   | 15  | 24   | 3     | ODE - 3 - 3 4 0240 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 15   | 20  | 30   | 4     | ODE - 3 - 4 4 0300 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 18.5 | 25  | 39   | 4     | ODE - 3 - 4 4 0390 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 22   | 30  | 46   | 4     | ODE - 3 - 4 4 0460 - 3 | #              | 4          | #          |              |                     |               |            |                  |                  |
|                                 | 30   | 40  | 61   | 5     | ODE - 3 - 5 4 0610 - 3 | F              | 4          | 2          |              |                     |               |            |                  |                  |
|                                 | 37   | 50  | 72   | 5     | ODE - 3 - 5 4 0720 - 3 | F              | 4          | 2          |              |                     |               |            |                  |                  |
|                                 |      |     |      |       |                        |                |            |            |              |                     |               |            |                  |                  |
|                                 |      |     |      |       |                        |                |            |            |              |                     |               |            |                  |                  |

Replace # in model code with colour-coded option

## Enclosure Types

A



**IP66**  
Outdoor Use  
Non-switched

B



**IP66**  
Outdoor Use  
Switched

2



**IP20**

## EMC Filter

F

Internal EMC Filter

0

No Internal EMC Filter

## IP20



| Size      | 1    | 2    | 3    | 4    | 5    |
|-----------|------|------|------|------|------|
| mm Height | 173  | 221  | 261  | 420  | 486  |
| mm Width  | 83   | 110  | 131  | 171  | 222  |
| mm Depth  | 123  | 150  | 175  | 212  | 226  |
| kg Weight | 1.0  | 1.7  | 3.2  | 9.1  | 18.1 |
| Fixings   | 4xM5 | 4xM5 | 4xM5 | 4xM8 | 4xM8 |

## IP66



| Size      | 1    | 2    | 3    | 4    |
|-----------|------|------|------|------|
| mm Height | 232  | 257  | 310  | 360  |
| mm Width  | 161  | 188  | 211  | 240  |
| mm Depth  | 162  | 182  | 235  | 271  |
| kg Weight | 2.3  | 3.5  | 6.6  | 9.5  |
| Fixings   | 4xM4 | 4xM4 | 4xM4 | 4xM4 |

## Drive Specification

|                |                           |                                                                                                                                                                                          |                         |                                                                                                            |                                                                                                                 |                                                                                                |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
|----------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Input Ratings  | Supply Voltage            | 110 – 115V ± 10%<br>200 – 240V ± 10%<br>380 – 480V ± 10%                                                                                                                                 | Programming             | Keypad                                                                                                     | Built-in keypad as standard<br>Optional remote mountable keypad                                                 |                                                                                                | I/O Specification                                | Power Supply                                                                       | 24 Volt DC, 100mA, Short Circuit Protected<br>10 Volt DC, 10mA for Potentiometer                                    |                      |                                                                      |                                                                          |                                                                         |
|                | Supply Frequency          | 48 – 62Hz                                                                                                                                                                                |                         | Display                                                                                                    | 7 Segment LED                                                                                                   |                                                                                                |                                                  | Programmable Inputs                                                                | 4 Total<br>2 Digital<br>2 Analog / Digital selectable                                                               |                      |                                                                      |                                                                          |                                                                         |
|                | Displacement Power Factor | > 0.98                                                                                                                                                                                   |                         | PC                                                                                                         | OptiTools Studio                                                                                                |                                                                                                |                                                  | Digital Inputs                                                                     | 8 – 30 Volt DC, internal or external supply<br>Response time < 4ms                                                  |                      |                                                                      |                                                                          |                                                                         |
|                | Phase Imbalance           | 3% Maximum allowed                                                                                                                                                                       |                         | Control Specification                                                                                      | Control Method                                                                                                  | Sensorless Vector Speed Control<br>PM Vector Control<br>BLDC Control<br>Synchronous Reluctance |                                                  | Analog Inputs                                                                      | Resolution: 12 bits<br>Response time: < 4ms<br>Accuracy: ± 2% full scale<br>Parameter adjustable scaling and offset |                      |                                                                      |                                                                          |                                                                         |
|                | Inrush Current            | < rated current                                                                                                                                                                          |                         |                                                                                                            | PWM Frequency                                                                                                   | 4–32kHz Effective                                                                              |                                                  | Programmable Outputs                                                               | 2 Total<br>1 Analog / Digital<br>1 Relay                                                                            |                      |                                                                      |                                                                          |                                                                         |
|                | Power Cycles              | 120 per hour maximum, evenly spaced                                                                                                                                                      |                         |                                                                                                            | Stopping Mode                                                                                                   | Ramp to stop: User Adjustable 0.1–600 secs<br>Coast to stop                                    |                                                  | Relay Outputs                                                                      | Maximum Voltage: 250 VAC, 30 VDC<br>Switching Current Capacity: 6A AC, 5A DC                                        |                      |                                                                      |                                                                          |                                                                         |
| Output Ratings | Output Power              | 110V 1 Ph Input: 0.5–1.5HP (230V 3 Ph Output)<br>230V 1 Ph Input: 0.37–4kW (0.5–5HP)<br>230V 3 Ph Input: 0.37–18.5kW (0.5–25HP)<br>400V 3 Ph Input: 0.75–37kW<br>460V 3 Ph Input: 1–50HP | Braking                 |                                                                                                            | Motor Flux Braking<br>Built-in braking transistor (not frame size 1)                                            | Skip Frequency                                                                                 | Single point, user adjustable                    |                                                                                    | Analog Outputs                                                                                                      | 0 to 10 Volt         |                                                                      |                                                                          |                                                                         |
|                | Overload Capacity         | 150% for 60 Seconds<br>175% for 2.5 seconds                                                                                                                                              |                         | Setpoint Control                                                                                           |                                                                                                                 |                                                                                                | Analog Signal                                    | 0 to 10 Volts<br>10 to 0 Volts<br>0 to 20mA<br>20 to 0mA<br>4 to 20mA<br>20 to 4mA |                                                                                                                     | Application Features | PI Control                                                           | Internal PI Controller<br>Standby / Sleep Function                       |                                                                         |
|                | Output Frequency          | 0 – 500Hz, 0.1Hz resolution                                                                                                                                                              |                         |                                                                                                            |                                                                                                                 |                                                                                                |                                                  |                                                                                    |                                                                                                                     |                      | Digital                                                              | Motorised Potentiometer (Keypad)<br>Modbus RTU<br>CANopen<br>EtherNet/IP | Fire Mode                                                               |
|                | Acceleration Time         | 0.01 – 600 seconds                                                                                                                                                                       |                         |                                                                                                            |                                                                                                                 |                                                                                                | Fieldbus                                         | Built-in                                                                           |                                                                                                                     |                      |                                                                      |                                                                          | CANopen<br>125–1000 kbps<br><br>Modbus RTU<br>9.6–115.2 kbps selectable |
|                | Deceleration Time         | 0.01 – 600 seconds                                                                                                                                                                       | Data Logging            |                                                                                                            | Logging of data prior to trip for diagnostic purposes:<br>Output Current<br>Drive Temperature<br>DC Bus Voltage |                                                                                                |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
|                | Typical Efficiency        | > 98%                                                                                                                                                                                    |                         |                                                                                                            | Monitoring                                                                                                      | Hours Run Meter                                                                                |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
|                | Ambient Conditions        | Temperature                                                                                                                                                                              |                         |                                                                                                            |                                                                                                                 | Storage: –40 to 60°C<br>Operating: –20 to 50°C                                                 |                                                  | Standards Compliance                                                               | Low Voltage Directive                                                                                               |                      | Adjustable speed electrical power drive systems.<br>EMC requirements |                                                                          |                                                                         |
|                |                           | Altitude                                                                                                                                                                                 |                         | Up to 1000m ASL without derating<br>Up to 2000m maximum UL approved<br>Up to 4000m maximum (non UL)        |                                                                                                                 | EMC Directive                                                                                  | 2014/30/EU<br>Cat C1 according to EN61800-3:2004 |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
|                |                           | Humidity                                                                                                                                                                                 | 95% Max, non condensing | Machinery Directive                                                                                        |                                                                                                                 | 2006/42/EC                                                                                     |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
|                |                           | Vibration                                                                                                                                                                                | Conforms to EN61800-5-1 | Conformance                                                                                                | CE, UL, RCM                                                                                                     |                                                                                                |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |
| Enclosure      | Ingress Protection        | IP20, IP66                                                                                                                                                                               | Environmental Class     | Conformal Coated PCBs. Suitable for use in the following environments:<br>IP20: 3C2, 3S2<br>IP66: 3C3, 3S3 |                                                                                                                 |                                                                                                |                                                  |                                                                                    |                                                                                                                     |                      |                                                                      |                                                                          |                                                                         |

# OPTIDRIVE™

For Single Phase Motors

**IP20**

**IP66**

**Up to 1.1kW**

Single Phase Motor  
Control for PSC &  
Shaded-Pole Motors

## Key Features

- ✓ 110–115V and 200–240V models
- ✓ Small mechanical envelope
- ✓ Rugged industrial operation
- ✓ Fast setup, and simple operation with 14 basic parameters
- ✓ Unique motor control strategy optimised for single phase motors
- ✓ Motor current and rpm indication
- ✓ Built in PI control, EMC filter (C1) & brake chopper
- ✓ Application macros for industrial, fan and pump operation
- ✓  Bluetooth® connectivity

**Modbus RTU**  
**CAN**

on-board as standard

150% overload for 60 secs  
(175% for 2 secs)



Pump control in  
swimming pools & spas



Simple airflow control

## Dedicated to Single Phase Motor Control

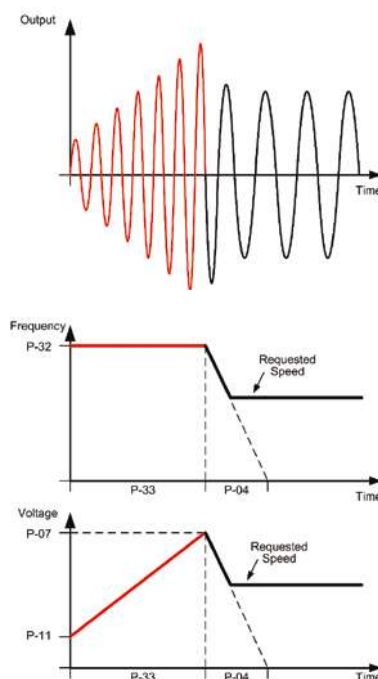
Designed to be cost effective and easy to use, the Optidrive E3 for Single Phase Motors is for use with PSC (Permanent Split Capacitor) or Shaded-Pole Single Phase induction motors.

Optidrive E3 for Single Phase Motors uses a revolutionary motor control strategy to achieve reliable intelligent starting of single phase motors.

- Removes the need for 3 phase supply wiring
- Provides the same performance features as the 3 phase Optidrive E3
- The ideal energy saving solution where high starting torque is not required — typically including fans, blowers, centrifugal pumps, fume extractors and air flow controllers

## Special Boost Phase

To ensure reliable starting of single phase motors, the drive initially ramps the motor voltage up to rated voltage whilst maintaining a fixed starting frequency, before reducing the frequency and voltage to the desired operating point.



# OPTIDRIVE™ E<sup>3</sup>

## For Single Phase Motors

|                                 | kW   | HP   | Amps | Size | Model Code  | Product Family | Generation | Frame Size | Voltage Code | Capacity | Supply Phases | EMC Filter | Brake Transistor | Enclosure Type | Single Phase Output |
|---------------------------------|------|------|------|------|-------------|----------------|------------|------------|--------------|----------|---------------|------------|------------------|----------------|---------------------|
| 110–115V ± 10%<br>1 Phase Input | 0.37 | 0.5  | 7    | 1    | ODE - 3 - 1 | 1              | 0070       | - 1        | # 1          | # - 01   |               |            |                  |                |                     |
|                                 | 0.55 | 0.75 | 10.5 | 2    | ODE - 3 - 2 | 1              | 0105       | - 1        | # 4          | # - 01   |               |            |                  |                |                     |
| 200–240V ± 10%<br>1 Phase Input | 0.37 | 0.5  | 4.3  | 1    | ODE - 3 - 1 | 2              | 0043       | - 1        | # 1          | # - 01   |               |            |                  |                |                     |
|                                 | 0.75 | 1    | 7    | 1    | ODE - 3 - 1 | 2              | 0070       | - 1        | # 1          | # - 01   |               |            |                  |                |                     |
|                                 | 1.1  | 1.5  | 10.5 | 2    | ODE - 3 - 2 | 2              | 0105       | - 1        | # 4          | # - 01   |               |            |                  |                |                     |

Replace # in model code with colour-coded option

### Enclosure Types

|          |  |                                      |
|----------|--|--------------------------------------|
| <b>A</b> |  | <b>IP66 Outdoor Use Non-switched</b> |
| <b>B</b> |  | <b>IP66 Outdoor Use Switched</b>     |
| <b>2</b> |  | <b>IP20</b>                          |

### EMC Filter

|          |                        |
|----------|------------------------|
| <b>F</b> | Internal EMC Filter    |
| <b>0</b> | No Internal EMC Filter |

### Model Code Guide:

|                                                                                |
|--------------------------------------------------------------------------------|
| <b>ODE-3-120043-3F12-01</b>                                                    |
| Product Family                                                                 |
| Generation                                                                     |
| Frame Size                                                                     |
| Voltage Code                                                                   |
| Capacity                                                                       |
| Single Phase = 1<br>3 Phase = 3                                                |
| Supply Phases                                                                  |
| Internal EMC Filter = F<br>No Internal EMC Filter = 0                          |
| EMC Filter                                                                     |
| No Internal Brake Transistor = 1<br>Internal Brake Transistor = 4              |
| Brake Transistor                                                               |
| IP20 = 2<br>IP66 Outdoor use Non-switched = A<br>IP66 Outdoor use Switched = B |
| Enclosure Type                                                                 |
| Single Phase Output                                                            |

### IP20

| Size      | 1      | 2      |
|-----------|--------|--------|
| mm Height | 173    | 221    |
| mm Width  | 83     | 110    |
| mm Depth  | 123    | 150    |
| kg Weight | 1.0    | 1.7    |
| Fixings   | 4 x M5 | 4 x M5 |

### IP66

| Size      | 1      | 2      |
|-----------|--------|--------|
| mm Height | 232    | 257    |
| mm Width  | 161    | 188    |
| mm Depth  | 162    | 182    |
| kg Weight | 2.3    | 3.5    |
| Fixings   | 4 x M4 | 4 x M4 |

## Drive Specification

|                    |                           |                                                                                                     |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|--------------------|---------------------------|-----------------------------------------------------------------------------------------------------|-----------------------|----------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------|-------------------------------------------------------|---------------|
| Input Ratings      | Supply Voltage            | 110 – 115V ± 10%<br>200 – 240V ± 10%                                                                | Control Specification | Control Method       | V/F Voltage<br>Energy Optimised V/F                              |                                                                                    | Application Features                                                         | PI Control           | Internal PI Controller<br>Standby / Sleep Function                                                              |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Supply Frequency          | 48 – 62Hz                                                                                           |                       | PWM Frequency        | 4–32kHz Effective                                                |                                                                                    |                                                                              | Fire Mode            | Selectable Speed Setpoint (Fixed / PI / Analog / Fieldbus)                                                      |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Displacement Power Factor | > 0.98                                                                                              |                       | Stopping Mode        | Ramp to stop: User Adjustable 0.1 – 600 secs<br>Coast to stop    |                                                                                    | Maintenance & Diagnostics                                                    | Fault Memory         | Last 4 Trips stored with time stamp                                                                             |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Phase Imbalance           | 3% Maximum allowed                                                                                  |                       | Braking              | Motor Flux Braking<br>Built-in braking transistor (frame size 2) |                                                                                    |                                                                              | Data Logging         | Logging of data prior to trip for diagnostic purposes:<br>Output Current<br>Drive Temperature<br>DC Bus Voltage |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Inrush Current            | < rated current                                                                                     |                       | Skip Frequency       | Single point, user adjustable                                    |                                                                                    |                                                                              | Monitoring           | Hours Run Meter                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Power Cycles              | 120 per hour maximum, evenly spaced                                                                 |                       | Setpoint Control     | Analog Signal                                                    | 0 to 10 Volts<br>10 to 0 Volts<br>0 to 20mA<br>20 to 0mA<br>4 to 20mA<br>20 to 4mA |                                                                              | Standards Compliance | Low Voltage Directive                                                                                           | Adjustable speed electrical power drive systems.<br>EMC requirements        |                                                                                  |                     |                                                       |               |
| Output Ratings     | Output Power              | 110V 1 Ph Input: 0.5–0.75HP<br>230V 1 Ph Input: 0.37–1.1kW (0.5–1.5HP)                              |                       |                      |                                                                  | Digital                                                                            | Motorised Potentiometer (Keypad)<br>Modbus RTU<br>CANopen<br>EtherNet/IP     |                      | EMC Directive                                                                                                   | 2014/30/EU<br>230V 1Ph. Filtered Units : Cat C1 according to EN61800-3:2004 |                                                                                  |                     |                                                       |               |
|                    | Overload Capacity         | 150% for 60 Seconds<br>175% for 2.5 seconds                                                         |                       |                      |                                                                  |                                                                                    | Fieldbus                                                                     |                      | Built-in                                                                                                        | CANopen<br>125–1000 kbps<br><br>Modbus RTU<br>9.6–115.2 kbps selectable     | Machinery Directive                                                              | 2006/42/EC          |                                                       |               |
|                    | Output Frequency          | 0 – 500Hz, 0.1Hz resolution                                                                         |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             | Conformance                                                                      | CE, UL, RCM         |                                                       |               |
|                    | Acceleration Time         | 0.01 – 600 seconds                                                                                  |                       |                      |                                                                  |                                                                                    |                                                                              |                      | I/O Specification                                                                                               | Power Supply                                                                | 24 Volt DC, 100mA, Short Circuit Protected<br>10 Volt DC, 10mA for Potentiometer | Programmable Inputs | 4 Total<br>2 Digital<br>2 Analog / Digital selectable |               |
|                    | Deceleration Time         | 0.01 – 600 seconds                                                                                  |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       | Analog Inputs |
|                    | Typical Efficiency        | > 98%                                                                                               |                       | Programmable Outputs | 2 Total<br>1 Analog / Digital<br>1 Relay                         |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
| Ambient Conditions | Temperature               | Storage: –40 to 60°C<br>Operating: –20 to 50°C                                                      |                       |                      |                                                                  | Relay Outputs                                                                      | Maximum Voltage: 250 VAC, 30 VDC<br>Switching Current Capacity: 6A AC, 5A DC |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Altitude                  | Up to 1000m ASL without derating<br>Up to 2000m maximum UL approved<br>Up to 4000m maximum (non UL) |                       |                      |                                                                  |                                                                                    |                                                                              | Analog Outputs       |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Humidity                  | 95% Max, non condensing                                                                             |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Vibration                 | Conforms to EN61800-5-1                                                                             |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
| Enclosure          | Ingress Protection        | IP20, IP66                                                                                          |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
| Programming        | Keypad                    | Built-in keypad as standard<br>Optional remote mountable keypad                                     |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | Display                   | 7 Segment LED                                                                                       |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |
|                    | PC                        | OptiTools Studio                                                                                    |                       |                      |                                                                  |                                                                                    |                                                                              |                      |                                                                                                                 |                                                                             |                                                                                  |                     |                                                       |               |

# Options & Accessories

## Optistick Smart



**Optistick Smart** **OPT-3-STICK-IN**  
Rapid Commissioning Tool

- Allows copying, backup and restore of drive parameters
- Provides Bluetooth interface to a PC running OptiTools Studio or the OptiTools Mobile app on a smartphone
- Onboard NFC (Near Field Communication) for rapid data transfer

## Remote Keypads



**Optipad** **OPT-3-OPPAD-IN**  
Remote Keypad & TFT Display

**Optiport 2** **OPT-2-OPORT-IN**  
Remote Keypad & LED Display

## RJ45 Accessories



Ideal for simple and fast connection of Modbus RTU/CAN networks

- |                     |                                      |
|---------------------|--------------------------------------|
| <b>OPT-J4505-IN</b> | RJ45 Cable 0.5m                      |
| <b>OPT-J4510-IN</b> | RJ45 Cable 1.0m                      |
| <b>OPT-J4530-IN</b> | RJ45 Cable 3.0m                      |
| <b>OPT-J45SP-IN</b> | RS485 3 Way Data Cable Splitter RJ45 |

## EtherNet Module



**EtherNet Module** **OPT-2-ETHEG-IN**

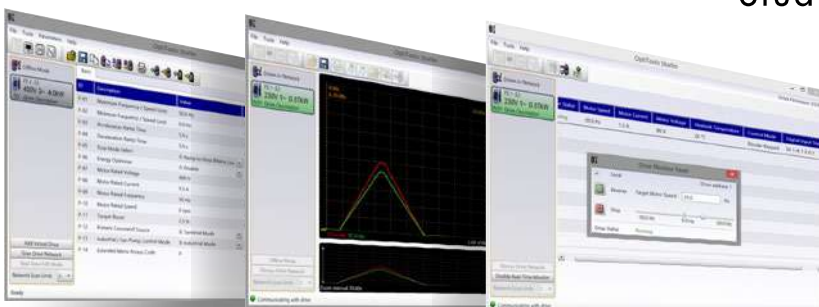
- ODVA compliant EtherNet/IP Modbus Translator Device
- Compatible with all drive platforms: P2, E3 & Eco
- Integrated network switch: simplifying network architecture
- Compatible with RSLogix and CoDeSys PLCs

## External EMC Filters, Input Chokes & Output Filters are available

See [www.invertekdrives.com](http://www.invertekdrives.com) for details



## OptiTools Studio



Drive commissioning and parameter backup

- Real-time parameter editing
- Drive network communication
- Parameter upload, download and storage
- Simple PLC function programming
- Real-time scope function and data logging
- Real-time data monitoring

**Compatible with:**  
Windows Vista & Windows 7, Windows 8, Windows 8.1 & Windows 10

# Proven Worldwide in Low Power Applications

Cooling loop for solar  
energy research

**Solar Tech Lab, Italy**



Chain wax development  
for Team Sky cycling team

**Muc-Off, UK**



Business-critical climate control  
for commercial horticulturist

**Hatziminas Flowers, Greece**



Chilled water pump  
control predicted to save  
AED 12385 per year

**Al Jahili Fort, UAE**



Efficient water circulation  
gives energy savings of  
60% per annum

**Leisure World, Australia**

Pallet handling in **UK**

Olive oil decanting in **Greece**

Seed processing in **Netherlands**

Pizza making in **Belgium**

Chamfering machines in **Italy**

Machine tool OEM in **UK**

Chemical fume removal in **Singapore**

Sawmill optimisation in **UK**

Precision polishing in **Switzerland**

See [www.inverterdrives.com/solutions](http://www.inverterdrives.com/solutions) for full case studies



## Optidrive E3

### ✓ Low Power Applications

Dedicated to low power applications, Optidrive E3 combines innovative technology, reliability, robustness and ease of use in a range of compact IP20 & IP66 enclosures.

### ✓ Simple Commissioning

14 parameter basic setup. Default settings suitable for most applications. Contactor style connection for simple wiring.

### ✓ Optidrive E3 IP66

Environmentally protected, IP66 rated models can be mounted directly on your processing equipment.



### ✓ Washdown Ready

With a sealed ABS enclosure and corrosion resistant heatsink, Optidrive E3 IP66 models are ideal for high-pressure washdown applications.

### ✓ On-drive Control

IP66 models feature optional, convenient controls for speed control, REV/OFF/FWD and Power ON/OFF, complete with safety lock.

### ✓ Single Phase Motor Control

Optidrive E3 for Single Phase Motors provides accurate speed control of single phase PSC or shaded pole motors. Special boost phase ensures reliable starting, initially ramping the motor voltage up to rated voltage whilst maintaining a fixed starting frequency, before reducing the frequency and voltage to the desired operating point.



## About Inverter Drives

- ✓ Sales, service & application support in over 80 countries
- ✓ World-class production, innovation & training facilities at UK headquarters
- ✓ Global assembly cells controlled by cloud-based manufacturing database
- ✓ ISO 14001 environmental & ISO 9001 quality management systems



[www.inverterdrives.com/optidrive-e3](http://www.inverterdrives.com/optidrive-e3)

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