

ODE-3-540720-3F42

Optidrive E3 VFD Datasheet

37 kW (50 HP), 72 A, 380-480 V, 3PH
IP20 Variable Frequency Drive with EMC Filter



Input Ratings

Supply Voltage	380-480 V
Input Phases	3
Supply Current Continuous	67.6 A
Supply Fuse or MCB (Type B)	100 A

Output Ratings

Motor Output Rating	37 kW (50 HP)
Output Voltage	0 – Supply Voltage
Output Current	72 A

Cable Information

Max Supply Cable Size	35 mm ² (0.05 sq in)
Max Motor Cable Size	35 mm ² (0.05 sq in)
Max Motor Cable Length	100 m (328 ft)

Factory Build Options

EMC Filter	Internal EMC Filter
Brake Transistor	Internal Brake Transistor
Enclosure	IP20
Display	LED
PCB Coating	-


Dimensions

Size	5
Height	486 mm (19.13 in)
Width	222 mm (8.74 in)
Depth	226 mm (8.9 in)
Weight	18.1 kg (39.9 lbs)
Fixings	4 x M8

Packaged Dimensions

Height	356 mm (14.02 in)
Width	336 mm (13.23 in)
Depth	658 mm (25.91 in)
Weight	19 kg (41.89 lbs)



 **Buy this drive or get more information**
Find your local sales partner on 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

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



OPTIDRIVE™

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

Simply Power Up

Optidrive E3 provides precise motor control and energy savings using the factory default 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.

5 sizes cover global supply ratings



OPTIDRIVE™ E³

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.



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:

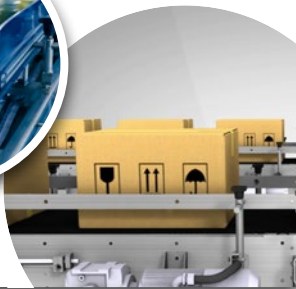
- ✓ Conveyors
- ✓ Mixers
- ✓ Treadmills

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:

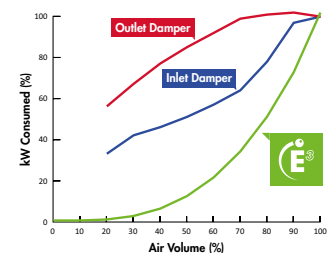
- ✓ Air Handling Units
- ✓ Ventilation Fans
- ✓ Circulating Fans
- ✓ Air Curtains
- ✓ Kitchen Extract



- 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, CO₂ emissions and financial savings for your application with the Inverter Drives **Energy Savings Calculator** app.



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

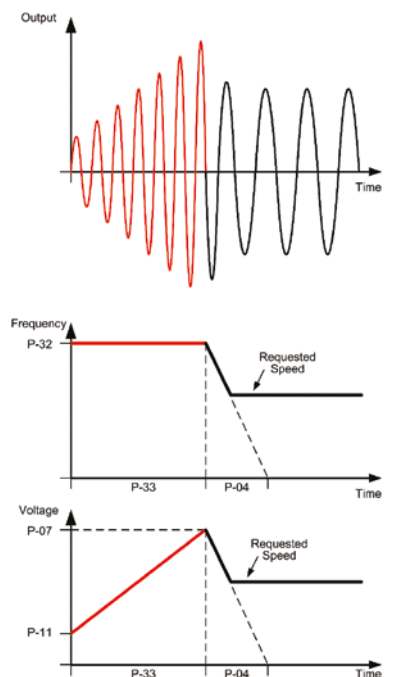
Designed to be cost effective and easy to use, the Optidrive E3 for Single Phase Motors is for use with PSC (Permanent Split Capacitor) or Shaded-Pole Single Phase induction motors.

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™ E³

For Single Phase Motors

Model Code	Product Family	Generation	Frame Size	Voltage Code	Capacity	Supply Phases	EMC Filter	Brake Transistor	Enclosure Type	Single Phase Output
110-115V ± 10% 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% 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



IP20

Size	1	2
mm Height	173	221
mm Width	83	110
mm Depth	123	150
kg Weight	1.0	1.7
Fixings	4xM5	4xM5

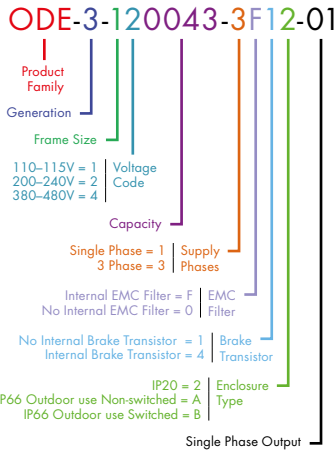
IP66

Size	1	2
mm Height	232	257
mm Width	161	188
mm Depth	162	182
kg Weight	2.3	3.5
Fixings	4xM4	4xM4

EMC Filter

F	Internal EMC Filter
0	No Internal EMC Filter

Model Code Guide:



Drive Specification

Input Ratings	Supply Voltage	110 – 115V ± 10% 200 – 240V ± 10%	Control Specification	Control Method	V/F Voltage Energy Optimised V/F	Application Features	PI Control	Internal PI Controller 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 Coast to stop		Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp
	Phase Imbalance	3% Maximum allowed		Braking	Motor Flux Braking Built-in braking transistor (frame size 2)			Data Logging	Logging of data prior to trip for diagnostic purposes: Output Current Drive Temperature 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		Output Ratings	Setpoint Control		Analog Signal	0 to 10 Volts 10 to 0 Volts 0 to 20mA 20 to 0mA 4 to 20mA 20 to 4mA	Standards Compliance
Overload Capacity	150% for 60 Seconds 175% for 2.5 seconds	Digital	Motorised Potentiometer (Keypad) Modbus RTU CANopen EtherNet/IP			EMC Directive	2014/30/EU 230V 1Ph. Filtered Units : Cat C1 according to EN61800-3:2004		
Output Frequency	0 – 500Hz, 0.1Hz resolution	Fieldbus	Built-in			CANopen	125–1000 kbps	Machinery Directive	
Acceleration Time	0.01 – 600 seconds				Modbus RTU	9.6–115.2 kbps selectable	Conformance	CE, UL, RCM	
Deceleration Time	0.01 – 600 seconds		I/O Specification		Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer	Environmental Class	Environmental Class	
Typical Efficiency	> 98%	Programmable Inputs			4 Total 2 Digital 2 Analog / Digital selectable	Ambient Conditions		Temperature	
Enclosure	Ingress Protection			IP20, IP66	Digital Inputs			8 – 30 Volt DC, internal or external supply Response time < 4ms	Altitude
	Programming	Keypad		Built-in keypad as standard Optional remote mountable keypad				Analog Inputs	Humidity
		Display		7 Segment LED	Programmable Outputs				2 Total 1 Analog / Digital 1 Relay
PC	OptiTools Studio	Relay Outputs		Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 6A AC, 5A DC				Analog Outputs	0 to 10 Volt

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

- OPT-J4505-IN** RJ45 Cable 0.5m
- OPT-J4510-IN** RJ45 Cable 1.0m
- OPT-J4530-IN** RJ45 Cable 3.0m
- OPT-J455P-IN** RS485 3 Way Data Cable Splitter RJ45

EtherNet Module



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

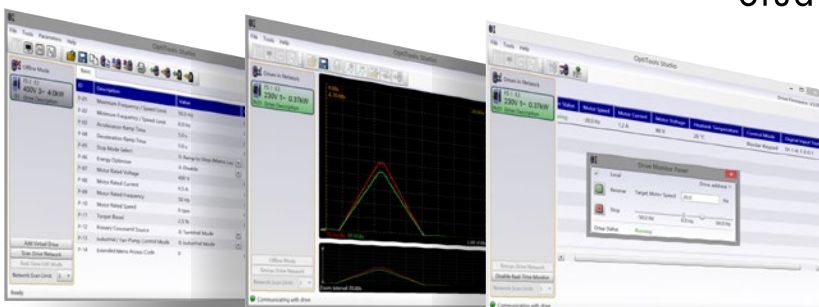
- ODVA compliant EtherNet/IP Modbus Translator Device
- Compatible with all drive platforms: P2, E3 & Eco
- Integrated network switch: simplifying network architecture
- Compatible with RSLogix and CoDeSys PLCs

External EMC Filters, Input Chokes & Output Filters are available

See www.invertekdrives.com 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 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 Invertek 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



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