Invertek Drives.com

OPTIDRIVE™ E²

AC Variable Speed Drive

General Purpose Drives

Dedicated to low power applications

0.37kW – 11kW / 0.5HP – 15HP

110–480V Single & 3 Phase Input

OPTIDRIVE™ E2

AC Variable Speed Drive

0.37kW – 11kW / 0.5HP – 15HP
110 – 480V Single & 3 Phase Input

General Purpose

Dedicated to low power applications, Optidrive E2 combines innovative technology, reliability, robustness and ease of use in a range of compact IP20 & IP66 enclosures

Key Features

Intuitive Keypad Control
Precise digital control at the touch of a button.

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

Integral RFI Filter
Options for built-in and external filters for full EMC compliance.

Modbus RTU
Easy integration with your control & monitoring systems.

Compact Enclosures
Small mechanical envelopes to help minimise your space requirements.

Brake Chopper (Sizes 2 & 3)
Dynamic & compact options with heatsink mounted resistor.

High Overload Capability
150% overload for 60 seconds.
175% overload for 2 seconds.

Industrial Ambient Ratings
Up to 50°C operation

Processing Plants Chemical Conveyer Systems
Bottling HVAC Woodworking
Pumping Baggage Handling Agricultural Mining

IP20

- Available up to 11KW
- Easy to use
- Compact & robust

IP66

- Available up to 7.5KW
- Dust-tight
- Washdown ready

More details on page 4

Single Phase

- Available up to 1.1KW
- Single-phase motor control
- Special boost phase

More details on pages 6 & 7

Convenient Help Card

Optistick Programming

DIN Rail Mount

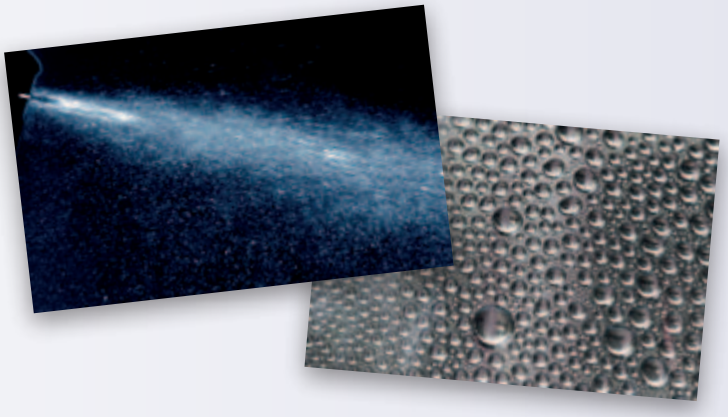
EMC & Varistor Disconnect

Optional Braking Resistor

OPTIDRIVE™ E2 IP66

Ready to wash down

Switched and Non-switched IP66 models available.



Optidrive E2 IP66

Environmentally protected, the Optidrive E2 IP66 can be mounted directly on your processing equipment.

Dust-tight Design

Install in-situ and be sure of protection from dust and contaminants.

Washdown Ready

With a sealed ABS enclosure and corrosion resistant heatsink, the Optidrive E2 IP66 is 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.

IP66
Recommended for:

- Paper
- Petroleum
- Food Processing
- Aggregate / Cement
- Mining
- Textile
- Horticultural
- Chemical
- Agricultural

IP66 / NEMA 4X

Dimensions IP20 & IP66

NOT TO SCALE

	Size	IP20 1	IP20 2	IP20 3	IP66 1	IP66 2	IP66 3
mm	Height	173	221	261	232	257	310
mm	Width	83	110	131	161	188	210.5
mm	Depth	123	150	175	179	187	245
kg	Weight	1.0	1.7	3.2	3.1	4.1	7.6
	Fixings	4 x M4	4 x M4	4 x M4	4 x M4	4 x M4	4 x M4

	kW	HP	Amps	Size	kW Model Code	HP Model Code	EMC Filter	Brake Transistor	Enclosure
110–115V ± 10% (230V 3 Phase Output) 1 Phase Input	–	0.5	2.3	1	N/A	ODE - 2 - 1 1 005 - 1 H 0 1 #	0	1	2 X Y
	–	1	4.3	1	N/A	ODE - 2 - 1 1 010 - 1 H 0 1 #	0	1	2 X Y
	–	1.5	5.8	2	N/A	ODE - 2 - 2 1 015 - 1 H 0 4 #	0	4	2 X Y
200–240V ± 10% 1 Phase Input	0.37	0.5	2.3	1	ODE - 2 - 1 2 037 - 1 K # 1 #	ODE - 2 - 1 2 005 - 1 H # 1 #	B 0	1	2 X Y
	0.75	1	4.3	1	ODE - 2 - 1 2 075 - 1 K # 1 #	ODE - 2 - 1 2 010 - 1 H # 1 #	B 0	1	2 X Y
	1.5	2	7	1	ODE - 2 - 1 2 075 - 1 K # 1 #	ODE - 2 - 1 2 011 - 1 H # 1 #	B 0	1	2 X Y
	1.5	2	7	2	ODE - 2 - 2 2 150 - 1 K # 4 #	ODE - 2 - 2 2 020 - 1 H # 4 #	B 0	4	2 X Y
	2.2	3	10.5	2	ODE - 2 - 2 2 220 - 1 K # 4 #	ODE - 2 - 2 2 030 - 1 H # 4 #	B 0	4	2 X Y
	4	5	15	3	ODE - 2 - 3 2 040 - 1 K 0 4 #	ODE - 2 - 3 2 050 - 1 H 0 4 #	0	4	2 X Y
200–240V ± 10% 3 Phase Input	0.37	0.5	2.3	1	ODE - 2 - 1 2 037 - 3 K # 1 #	ODE - 2 - 1 2 005 - 3 H # 1 #	B 0	1	2 X Y
	0.75	1	4.3	1	ODE - 2 - 1 2 075 - 3 K # 1 #	ODE - 2 - 1 2 010 - 3 H # 1 #	B 0	1	2 X Y
	1.5	2	7	1	ODE - 2 - 1 2 150 - 3 K # 1 #	ODE - 2 - 1 2 020 - 3 H # 1 #	B 0	1	2 X Y
	1.5	2	7	2	ODE - 2 - 2 2 150 - 3 K # 4 #	ODE - 2 - 2 2 020 - 3 H # 4 #	B 0	4	2 X Y
	2.2	3	10.5	2	ODE - 2 - 2 2 220 - 3 K # 4 #	ODE - 2 - 2 2 030 - 3 H # 4 #	B 0	4	2 X Y
	4	5	18	3	ODE - 2 - 3 2 040 - 3 K # 4 #	ODE - 2 - 3 2 050 - 3 H # 4 #	B 0	4	2 X Y
380–480V ± 10% 3 Phase Input	0.75	1	2.2	1	ODE - 2 - 1 4 075 - 3 K # 1 #	ODE - 2 - 1 4 010 - 3 H # 1 #	A 0	1	2 X Y
	1.5	2	4.1	1	ODE - 2 - 1 4 150 - 3 K # 1 #	ODE - 2 - 1 4 020 - 3 H # 1 #	A 0	1	2 X Y
	1.5	2	4.1	2	ODE - 2 - 2 4 150 - 3 K # 4 #	ODE - 2 - 2 4 020 - 3 H # 4 #	A 0	4	2 X Y
	2.2	3	5.8	2	ODE - 2 - 2 4 220 - 3 K # 4 #	ODE - 2 - 2 4 030 - 3 H # 4 #	A 0	4	2 X Y
	4	5	9.5	2	ODE - 2 - 2 4 400 - 3 K # 4 #	ODE - 2 - 2 4 050 - 3 H # 4 #	A 0	4	2 X Y
	5.5	7.5	14	3	ODE - 2 - 3 4 055 - 3 K # 4 #	ODE - 2 - 3 4 075 - 3 H # 4 #	A 0	4	2 X Y
	7.5	10	18	3	ODE - 2 - 3 4 075 - 3 K # 4 #	ODE - 2 - 3 4 100 - 3 H # 4 #	A 0	4	2 X Y
	11	15	24	3	ODE - 2 - 3 4 110 - 3 K # 4 2	ODE - 2 - 3 4 150 - 3 H # 4 2	A 0	4	2

kW Models: Factory Settings
Motor Rated Frequency: 50Hz
Motor Rated Voltage: 400V

HP Models: Factory Settings
Motor Rated Frequency: 60Hz
Motor Rated Voltage: 460V

Replace # in model code with colour-coded option

Factory Build Options

EMC Filter: 0 = No EMC Filter; A = High Voltage Filter; B = Low Voltage Filter

Brake Transistor: 1 = No Internal Brake Transistor; 4 = Internal Brake Transistor

Enclosure: 2 = IP20; X = IP66 Non-switched; Y = IP66 Switched

Model Code Guide

ODE-2-12037-3K###

- Product Family
- Generation
- Frame Size
- Supply Voltage: 110–115V = 1; 200–240V = 2; 380–480V = 4
- Power Rating Code
- Input Phases: Single Phase = 1; 3 Phase = 3
- Power Type: kW = K; HP = H
- EMC Filter: 400 Volt EMC Filter = A; 200 Volt EMC Filter = B; No Internal EMC Filter = 0
- Brake Transistor: No Internal Brake Transistor = 1; Internal Brake Transistor = 4
- Enclosure: IP20 = 2; IP66 Non-switched = X; IP66 Switched = Y

Drive Specification

Input Ratings	Supply Voltage	110 – 115V ± 10% 200 – 240V ± 10% 380 – 480V ± 10%
	Supply Frequency	48 – 62Hz
	Phase Imbalance	3% Maximum allowed
	Inrush Current	< rated current
	Power Cycles	120 per hour maximum, evenly spaced
Output Ratings	Output Power	110V 1 Phase: 0.5–1.5HP (230V 3 Phase Output) 230V 1 Phase: 0.75–4kW / 1–5HP 230V 3 Phase: 0.75–4kW / 1–5HP 400V 3 Phase: 0.75–11kW 460V 3 Phase: 1–15HP
	Overload Capacity	150% for 60 seconds 175% for 2 seconds
	Output Frequency	0 – 500Hz, 0.1Hz resolution
Ambient Conditions	Temperature	Storage: –40 to 60°C Operating: –10 to 50°C
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL Approved Up to 4000m maximum (non UL) Above 1000m: Derate by 1% per 100m
	Humidity	95% Max, non-condensing
Programming	Keypad	Built-in Keypad as standard Optional remote mountable keypad
	Display	Built-in LED display
	Programming	OptiTools Studio / Optistick
Control Specification	Control Method	V/F Voltage Vector Energy Optimised V/F
	PWM Frequency	4 – 32kHz Effective
	Stopping Mode	Ramp to Stop: User Adjustable 0.01–600 secs Coast to Stop
	Braking	Motor Flux Braking Built-in Braking Transistor (Frames 2 & 3)
	Skip Frequency	Single point, user adjustable
	Setpoint Control	Analog Signal: 0 to 10 Volts; 0 to 20mA; 20 to 0mA; 4 to 20mA; 20 to 4mA
		Digital: Motorised Potentiometer (Keypad) Modbus RTU
		Optional Gateway: PROFIBUS DP, DeviceNet, EtherNet/IP

I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 5mA for Potentiometer
	Programmable Inputs	4 Total as standard 2 Digital 2 Analog / Digital Selectable
	Digital Inputs	10 – 30 Volt DC, internal or external supply, Response time: < 4ms
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < ± 2% of full scale Parameter adjustable scaling and offset
	Programmable Outputs	2 Total 1 Analog / Digital 1 Relay
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 6A AC
	Analog Outputs	0 to 10 Volt
Control Features	PI Control	Internal PI control with feedback display
Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp
	Data Logging	Logging of data prior to trip for diagnostic purposes : Output Current, Drive Temperature, DC Bus Voltage
	Monitoring	Hours Run Meter
Standards Compliance	Low Voltage Directive	2006/95/EC
	EMC Directive	2004/108/EC 230V 1 Phase Filtered Units category C1 according to EN61800-3:2004 400V 3 Phase filtered units category C2 according to EN61800-3:2004
	Machinery Directive	98/37/EC
	Conformance	CE, UL, cUL, C-Tick, GOST
	Ingress Protection	IP20 IP66 (Excluding 11kW / 15HP)

OPTIDRIVE™ E2 Single Phase

AC Variable Speed Drive

0.37kW – 1.1kW / 0.5HP – 1.5HP
110 – 240V

Single Phase Motor Control

The Optidrive E2 Single Phase is the world's first fully digital, fully packaged variable speed drive for controlling low power single phase motors

Designed to be cost effective and easy to use, the Optidrive E2 Single Phase is for use with PSC (Permanent Split Capacitor) or Shaded-Pole Single Phase induction motors.

Optidrive E2 Single Phase uses a revolutionary motor control strategy to achieve reliable intelligent starting of single phase motors.

Optidrive E2 Single Phase has only 14 standard parameters to adjust in its basic form. The Optidrive's legendary ease of use ensures quick and easy drive commissioning. For the more advanced user the extended parameter set gives access to powerful additional functionality.

Typical Applications

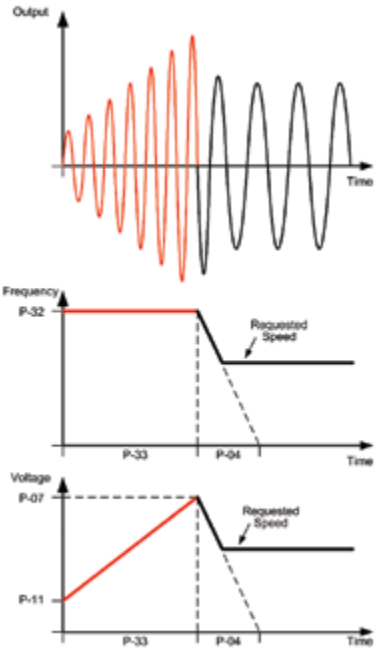
Optidrive E2 single phase output can be used to provide energy efficient, accurate speed control of single phase motors in a variety of applications, especially fans and pumps which typically do not require high starting torque. The control method used provides significant energy savings compared to alternative methods.

Key Features

- 110 – 115V and 200 – 240V models available
- Single phase input/single phase output
- Small mechanical envelope
- Rugged industrial operation: Up to 50°C ambient rating
- Simple mechanical & electrical installation
- Fast setup, and simple operation. Factory default settings okay for most applications, only 14 basic parameters
- Unique motor control strategy optimised for Single Phase Motors
- Motor current and rpm indication
- Debugging using troubleshooting & P-00
- 150% overload for 60 secs (175% for 2 secs)
- Keypad control
- Integral RFI filter option
- Integral brake chopper (S2 only)
- Modbus RTU serial communications

Special Boost Phase

To ensure reliable starting, the Optidrive E2 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™ E2

Single Phase

	kW	HP	Amps	Size	kW Model Code	HP Model Code
110–115V ± 10% 1 Phase Input	–	0.5	7	1	N/A	ODE - 2 - 1 1 005 - 1 H 0 1 # -01
	–	0.75	10.5	2	N/A	ODE - 2 - 2 1 007 - 1 H 0 4 # -01
200–240V ± 10% 1 Phase Input	0.37	0.5	4.3	1	ODE - 2 - 1 2 037 - 1 K # 1 # -01	ODE - 2 - 1 2 005 - 1 H # 1 # -01
	0.75	1	7	1	ODE - 2 - 1 2 075 - 1 K # 1 # -01	ODE - 2 - 1 2 010 - 1 H # 1 # -01
	1.1	1.5	10.5	2	ODE - 2 - 2 2 110 - 1 K # 4 # -01	ODE - 2 - 2 2 015 - 1 H # 4 # -01

Model code positions: Product Range | Generation | Frame Size | Supply Voltage | Power Rating | Input Phases | Power Type | Factory Build Options | Single Phase Output

Factory Build Options

EMC Filter	Brake Transistor	Enclosure
0 = Low Voltage Filter	0 = No Internal Brake Transistor	2 = IP20
0 = No EMC Filter	1 = Internal Brake Transistor	X = IP66 Non Switched
	4 = Internal Brake Transistor	Y = IP66 Switched

kW Models: Factory Settings
Motor Rated Frequency: 50Hz

HP Models: Factory Settings
Motor Rated Frequency: 60Hz

Replace # in model code with colour-coded option

Drive Specification

Input Ratings	Supply Voltage	110 – 115V ± 10% 200 – 240V ± 10%
	Supply Frequency	48 – 62Hz
	Phase Imbalance	3% Maximum allowed
	Inrush Current	< rated current
	Power Cycles	120 per hour maximum, evenly spaced
Output Ratings	Output Power	110V 1 Phase Input: 0.5–0.75HP 230V 1 Phase Input: 0.75–1.1kW (1–1.5HP)
	Overload Capacity	150% for 60 seconds 175% for 2 seconds
	Output Frequency	0 – 120Hz, 0.1Hz resolution
Ambient Conditions	Temperature	Storage: –40 to 60°C Operating: – 10 to 50°C
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL Approved Up to 4000m maximum (non UL) Above 1000m: Derate by 1% per 100m
	Humidity	95% Max, non-condensing
Programming	Keypad	Built-in Keypad as standard Optional remote mountable keypad
	Display	Built-in LED display
	Programming	OptiTools Studio / Optistick
Control Specification	Control Method	Single Phase V/F with Starting Boost
	PWM Frequency	4 – 32kHz Effective
	Stopping Mode	Ramp to Stop: User Adjustable 0.1 – 600 seconds Coast to Stop
	Braking	Motor Flux Braking Built-in Braking Transistor (Size 2 only)
	Skip Frequency	Single point, user adjustable
	Setpoint Control	Analog Signal: 0 to 10 Volts, 0 to 20mA, 20 to 0mA, 4 to 20mA, 20 to 4mA
		Digital: Motorised Potentiometer (Keypad) Modbus RTU
		Optional Gateway: PROFIBUS DP, DeviceNet, EtherNet/IP

I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 5mA for Potentiometer
	Programmable Inputs	4 Total as standard 2 Digital 2 Analog / Digital Selectable
	Digital Inputs	10 – 30 Volt DC, internal or external supply, Response time: < 4ms
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < ± 2% of full scale Parameter adjustable scaling and offset
	Programmable Outputs	2 Total 1 Analog / Digital 1 Relay
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 6A AC, 5A DC
	Analog Outputs	0 to 10 Volt
Control Features	PI Control	Internal PI control with feedback display
Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp
	Data Logging	Logging of data prior to trip for diagnostic purposes : Output Current, Drive Temperature, DC Bus Voltage
	Monitoring	Hours Run Meter
Design Standards	Low Voltage Directive	2006/42/EC
	EMC Directive	2004/108/EC 230 Volt 1 Phase unit category C1 according to EN61800-3
	Machinery Directive	98/37/EC
	Conformance	CE, UL, cUL, C-Tick, GOST
	Ingress Protection	IP20, IP66

Model Code Guide

ODE-2-12037-1K#1#-01

- Product Family
- Generation
- Frame Size
- Supply Voltage: 110–115V = 1, 200–240V = 2, 380–480V = 4
- Power Rating Code
- Input Phases: Single Phase = 1, 3 Phase = 3
- Power Type: kW = K, HP = H
- EMC Filter: 200 Volt EMC Filter = B, No Internal EMC Filter = 0
- Brake Transistor: No Internal Brake Transistor = 1, Internal Brake Transistor = 4
- Enclosure: IP20 = 2, IP66 Non-switched = X, IP66 Switched = Y
- Single Phase Output

NOT TO SCALE

	Size	IP20 1	IP20 2	IP66 1	IP66 2
mm	Height	173	221	232	257
mm	Width	83	110	161	188
mm	Depth	123	150	179	187
kg	Weight	1.1	1.7	3.1	4.1
	Fixings	4 x M4	4 x M4	4 x M4	4 x M4

OPTIDRIVE™ E2

Invertek Drives.com

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Optidrive E2

✓ Low Power Applications

Dedicated to low power applications, Optidrive E2 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 E2 IP66

Environmentally protected, the Optidrive E2 IP66 can be mounted directly on your processing equipment.

✓ Washdown Ready

With a sealed ABS enclosure and corrosion resistant heatsink, the Optidrive E2 IP66 is 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

The Optidrive E2 Single Phase is the world's first fully digital, fully packaged variable speed drive for controlling low power single phase Special Boost Phase To ensure reliable starting, the Optidrive E2 Single Phase 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

UK Headquarters, Welshpool

Invertek Drives Ltd is dedicated to the design, manufacture and marketing of electronic variable speed drives. The state of the art UK headquarters houses specialist facilities for research & development, manufacturing and global marketing. The company pledges to implement and operate the ISO 14001 Environmental Management System to enhance environmental performance.

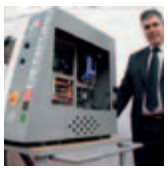
All company operations are accredited to the exacting customer focused ISO 9001:2008 quality standard. The company's products are sold globally in over 80 different countries. Invertek Drives' unique and innovative drives are designed for ease of use and meet with recognised international design standards.

Global Drive Solutions

Optidrive E2 combines innovative technology, reliability & robustness.

BELGIUM
Ready meal production line automation.

ITALY
Precision control of portable chamfering.



UK
Realiable control of machine tools.

GREECE
Control of decanters in olive oil production.

Optidrive E2 User Guide

Scan to download or visit the Invertek Drives website

www.invertekdrives.com/optidrive-e2

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