INVERTEK DRIVES
www.invertek.co.uk

OPTIDRIVE™ HVAC

AC Variable Speed Drives

Energy Efficient

Fan & Pump Control

0.75kW – 160kW / 1HP – 250HP

200 – 480V Single & 3 Phase Input

IP55 / NEMA 12

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Optimised for HVAC

Dedicated to centrifugal fan & pump applications, Optidrive HVAC gives powerful and flexible control in HVAC systems.

Energy Efficient Flow Control

Optidrive HVAC sets a new standard for dedicated fan & pump control.

Whilst retaining the ease of use traditionally associated with Invertek Drives, Optidrive HVAC has an innovative design, combined with robust performance to provide powerful flow control and reliability in a compact drive.

Save Energy

- Highly efficient operation
- Automatic optimisation when load decreases
- In-built sleep mode prevents lost energy when flow is low or zero

Save Time

- Simple parameter set allows fast installation and commissioning
- OptiTools Studio & Optistick make programming a breeze
- Customisable OLED Display
- Pluggable terminals

Save Money

- Advanced features as standard
- Options for additional flexibility

Take control of your environment

OPTIDRIVE™ HVAC

Energy efficient fan & pump control

Simple Commissioning

PID Control

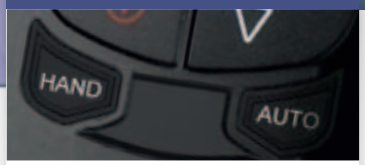
The Optidrive HVAC has a PID controller built in that is fully integrated with both HVAC and energy efficient features and is packaged in a user friendly way to ensure ease of use and fast commissioning. Now in the majority of applications it has become possible to eliminate the need for external controllers.

EN 61000-3-12 Harmonics

COMPLIANT

Optidrive HVAC can meet the demanding standards of EN 6100-3-12 (the international standards for supply harmonics) with readily available options (New in 2011, Harmonics compliance without additional components).

Hand / Auto



Allows manual control (of fan or pump) to easily be selected in the event of an automatic control system failure or for simplified commissioning/system checks, or when a fast temporary override of the control system is required. Built-in 'Auto Control Selection' allows return to automatic system control just as easily.

Noise Reduction

Quiet Motor Operation

High switching frequency selection (up to 32kHz) ensures motor noise is minimised.

Quiet System Mechanics

Simple skip frequency selection avoids stresses and nuisance noise caused by mechanical resonance.

Quiet Drive Operation

Temperature-controlled cooling fans ensure quiet operation in periods of reduced load.

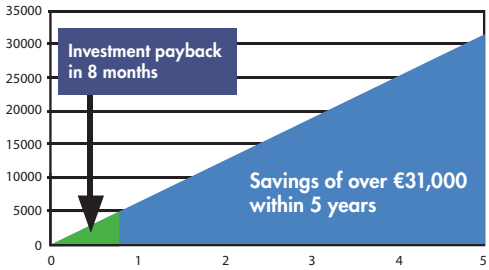
Noise Reduction through Speed Control

Optimising motor speed gives significant energy savings and reduces motor noise.

Energy Savings Calculator

Visit www.invertek.co.uk to estimate your potential energy savings, CO_2 emissions and financial savings using our free software.

Example savings based on a 45kW load



Using Optidrive HVAC compared to direct on-line control, an estimated 20% reduction in speed results in potential energy savings of 50%.

Calculation based on a typical estimated factory working week and energy costs, including estimated component and installation costs.

RoHS

ACT ON CO_2

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Energy Efficient Fan Control

Putting you in control of your energy costs.

Improved Fan Efficiency

Energy Optimisation and Monitoring

The advanced optimisation function intelligently matches energy usage to the driven load to ensure your fan operates at maximum efficiency. The in-built energy consumption meters allow energy consumption to be clearly displayed and savings to be calculated.

Intelligent Standby

To reduce energy used by slow-running fans, Optidrive HVAC has an intelligent standby/sleep function to shut off output from the drive until demand for air flow increases.

Broken Belt Detection

Optidrive HVAC intelligently monitors current/speed to provide immediate warning of broken belts between motors and ventilation fans.

Resonance Avoidance

Optidrive HVAC can be easily configured to avoid frequencies that cause resonance in ventilation systems, preventing unnecessary noise and mechanical damage to motors and fans.

Take control of your environment

OPTIDRIVE™ HVAC

Energy efficient fan & pump control

In Case of Emergency

Optidrive HVAC can step in to control air flow and pressure along essential escape/access routes

Fire Override Mode

Fire override mode ignores signals and alarms, keeping the Optidrive HVAC operating for as long as possible.

This feature is crucial for ensuring smoke extraction from buildings in the event of a fire.

Selectable logic means that the Optidrive HVAC can be easily configured to the signal produced by your fire management system.

With an independently set speed for fire mode operation, selectable as either forward or reverse direction, the Optidrive HVAC has the flexibility to match the needs of your fire control system.

Stairwell Pressurisation

In the event of a fire, stairwells are often essential escape routes.

Optidrive HVAC can be used to control air flow and pressure to help keep stairwells clear of smoke to allow safe evacuation and give firefighters safe access to buildings.

IP55 / NEMA 12

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Energy Efficient Pump Control

Reducing energy and maintenance costs.

Drive Controlled Bypass

Intelligent features within the Optidrive HVAC allow a bypass circuit to be implemented. Activation of Bypass mode can be determined intelligently by the Optidrive HVAC drive based on a command from the building management system. The drive can be set to automatically select bypass mode when entering into a trip condition ensuring minimal disruption to service.

Prevent Pump Downtime

Blockage Detect/Clear

Optidrive HVAC can detect pump blockages and trigger a programmed cleaning cycle to automatically clear them, preventing downtime.

Pump Clean/Stir Cycle

Triggered by a settable period of inactivity, a configurable cleaning cycle can be run to clear sediment, ensuring the pump is ready to run when needed.

Dry Run Protection

Optidrive HVAC can evaluate a pump's speed/power and shut it off or warn when the pump starts to run dry, protecting it from heat/friction damage.

Motor Preheat Function

Optidrive HVAC features a motor preheat function to help ensure moisture is not permitted to collect on the motor in periods of inactivity and prior to motor start up. In addition, the motor preheat function can be used to keep condensation from developing on the motor as the motor cools down immediately following a stop. The feature is fully configurable, meaning the pump can be always available the instant it is required.

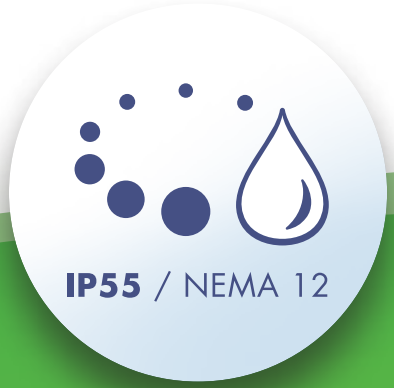
OPTIDRIVE™ HVAC

Energy efficient fan & pump control

Pump Efficiency

In-built Sleep Mode with Auto-boost

Sleep mode saves energy by detecting when a pump is running inefficiently and producing little useful work. Optidrive HVAC can be programmed to enter into a sleep/ disabled mode until the demand increases. To help prevent sleep mode oscillation, Optidrive HVAC can automatically initiate a boost cycle to increase pressure on starting or stopping.

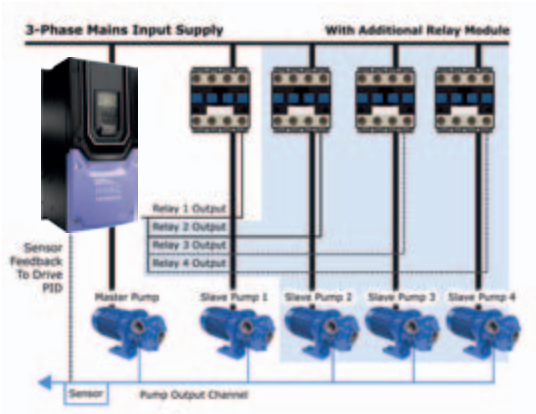


Multiple Pump Cascade / Staging

Variable speed duty pump with up to 4 assist pumps

(requires optional cascade module)

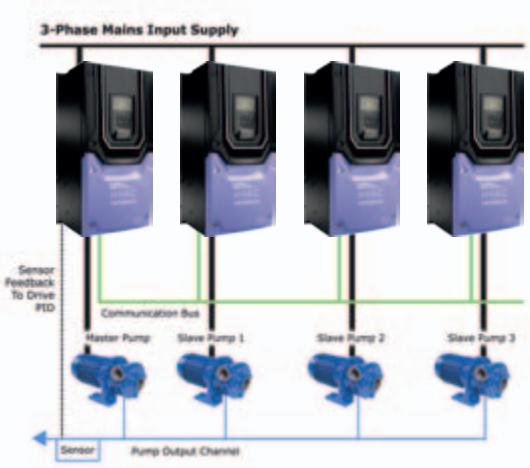
Optidrive HVAC can provide automatic operating time monitoring and balancing for assist pumps to share duty cycle. Run time clocks for all fixed speed assist pumps are maintained and visible within the Optidrive HVAC for integration into the pump system maintenance schedules.



All drives operate in variable speed

One 'master' drive monitors the running time for all Optidrive HVAC drives and balances run time between them.

The Optidrive HVAC provides adjustable Switch On / Off duty points to allow system and efficiency optimisation.



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Features & Specification

AC variable speed drives (0.75kW – 160kW, 200 – 480V Single & 3 phase) with integrated cable management, long-life fans & innovative OLED graphic display.

Pluggable Terminals

High Quality Long-life Fans

Integrated Cable Management

Option Modules

Dimensions (mm)

One of the smallest drives in its class

Size	2	3	4	5	6	7
Height	257	310	440	540	865	1280
Width	188	210.5	173	235	330	330
Depth	238	256	230	270	340	370

Model Code Guide

ODV-2-32040-3KFI#-##

- Model Range
- Generation
- Frame Size
- 200-240V = 2 | 380-480V = 4 | Voltage
- Power Rating
- Single Phase = 1 | 3 Phase = 3 | Phase
- kW = K | HP = H | Power Type
- With Internal EMC Filter = F | No Internal EMC Filter = 0 | Filter
- Single Quadrant = 1 | 4 Quadrant with Internal Braking Transistor = 4 | Quadrants
- IP55 Non-switched Enclosure = N | IP55 Switched Enclosure = S | Enclosure
- OLED Text = T | Standard 7-Segment LED = S | Display
- Coated PCB = C | Non-coated PCB = N | PCB

Drive Specification

Input Ratings	Supply Voltage	200 – 240V ± 10% 380 – 480V ± 10%
	Supply Frequency	48 – 62Hz
	Displacement Power Factor	> 0.98
	Phase Imbalance	3% Maximum allowed
	Inrush Current	< rated current
	Power Cycles	120 per hour maximum, evenly spaced
Output Ratings	Output Power	230 Volt 1 Phase Input : 0.75 – 2.2kW (1 – 3HP) 230 Volt 3 Phase Input : 0.75 – 90kW (1 – 120HP) 400 Volt 3 Phase Input : 0.75 – 160kW 460 Volt 3 Phase Input : 1 – 250HP
	Overload Capacity	110% for 60 seconds, 125% for 2 seconds
	Output Frequency	0 – 120Hz, 0.1Hz resolution
Ambient Conditions	Temperature	Storage : –40 to 60°C Operating : –10 to 40°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
Enclosure	Ingress Protection	IP55
Programming	Keypad	Built-in Keypad as standard Optional remote mountable keypad
	Display	Built-in Multi Language OLED Display
	PC	OptiTools Studio
Control Specification	Control Method	Variable Torque V/F Variable Torque Energy Optimised V/F
	PWM Frequency	4–32kHz Effective
	Stopping Mode	Ramp to Stop : User Adjustable 1–600 seconds Coast to Stop
	Braking	Motor Flux Braking
	Skip Frequency	Single point, user adjustable
	Setpoint Control	Analog Signal: 0 to 10 Volts 10 to 0 Volts – 10 to 10 Volts 0 to 20mA 20 to 0mA 4 to 20mA 20 to 4 mA
		Digital: Motorised Potentiometer (Keypad) Modbus RTU BACnet
		Optional: BACnet/IP, Profibus DP, DeviceNet
I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 5mA for Potentiometer
	Programmable Inputs	5 Total as standard (Optional additional 3) 3 Digital (Optional additional 3) 2 Analog / Digital Selectable
	Digital Inputs	10 – 30 Volt DC, internal or external supply, NPN Response time : < 4ms
	Analog Inputs	Resolution : 12 bits Response time : < 4ms Accuracy : < 1% full scale Parameter adjustable scaling and offset
	Programmable Outputs	4 Total (Optional additional 3) 2 Analog / Digital 2 Relays (Optional additional 3)
	Relay Outputs	Maximum Voltage : 250 VAC, 30 VDC Switching Current Capacity : 6A AC, 5A DC
	Analog Outputs	0 to 10 Volt 0 to 20mA 4 to 20mA
Control Features	Fire Mode	Selectable direction Selectable speed reference
	Broken Belt Detection	Under load monitoring with autotune configuration
	PID Control	Internal PID control with feedback display
Pump Control Features	Pump Blockage Detection	Pump load monitoring with autotune function, user configurable
	Pump Cleaning	Adjustable Pump Cleaning Cycle operation
	Multi-pump Control	Control of fixed speed assist pumps via optional cascade control module Control of Duty, Assist and Standby variable speed pumps via internal Master – Slave network
	Pump Stir	Automatic pump stir function
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
	Maintenance Indicator	Maintenance Indicator with user adjustable maintenance interval Onboard service life monitoring
	Monitoring	Hours Run Meter Resettable & Non Resettable kWh meters
Standards Compliance	EN 61800-3:2004	Adjustable speed electrical power drive systems. EMC requirements.

Model Reference

200–240V ± 10% 1 Phase Input

kW Models		HP Models			
With Filter	kW	With Filter	HP	Output Current (A)	Size
ODV-2-22075-1KFIN	0.75	ODV-2-22010-1HFIN	1	4.3	2
ODV-2-22150-1KFIN	1.5	ODV-2-22020-1HFIN	2	7	2
ODV-2-22220-1KFIN	2.2	ODV-2-22030-1HFIN	3	10.5	2

200–240V ± 10% 3 Phase Input

kW Models		HP Models			
With Filter	kW	With Filter	HP	Output Current (A)	Size
ODV-2-22075-3KFIN	0.75	ODV-2-22010-3HFIN	1	4.3	2
ODV-2-22150-3KFIN	1.5	ODV-2-22020-3HFIN	2	7	2
ODV-2-22220-3KFIN	2.2	ODV-2-22030-3HFIN	3	10.5	2
ODV-2-32040-3KFIN	4	ODV-2-32050-3HFIN	5	18	3
ODV-2-32055-3KFIN	5.5	ODV-2-32075-3HFIN	7.5	25	3
ODV-2-42075-3KFIN	7.5	ODV-2-42100-3HFIN	10	39	4
ODV-2-42110-3KFIN	11	ODV-2-42150-3HFIN	15	46	4
ODV-2-52150-3KFIN	15	ODV-2-52020-3HFIN	20	61	5
ODV-2-52185-3KFIN	18.5	ODV-2-52025-3HFIN	25	72	5
ODV-2-52220-3KFIN	22	ODV-2-52030-3HFIN	30	90	5
ODV-2-62030-3KFIN	30	ODV-2-62040-3HFIN	40	110	6
ODV-2-62037-3KFIN	37	ODV-2-62050-3HFIN	50	150	6
ODV-2-62045-3KFIN	45	ODV-2-62060-3HFIN	60	180	6
ODV-2-62055-3KFIN	55	ODV-2-62075-3HFIN	75	202	6
ODV-2-72075-3KFIN	75	ODV-2-72100-3HFIN	100	248	7
ODV-2-72090-3KFIN	90	ODV-2-72120-3HFIN	120	312	7

380–480V ± 10% 3 Phase Input

kW Models		HP Models			
With Filter	kW	With Filter	HP	Output Current (A)	Size
ODV-2-24075-3KFIN	0.75	ODV-2-24010-3HFIN	1	2.2	2
ODV-2-24150-3KFIN	1.5	ODV-2-24020-3HFIN	2	4.1	2
ODV-2-24220-3KFIN	2.2	ODV-2-24030-3HFIN	3	5.8	2
ODV-2-24400-3KFIN	4	ODV-2-24050-3HFIN	5	9.5	2
ODV-2-34055-3KFIN	5.5	ODV-2-34075-3HFIN	7.5	14	3
ODV-2-34075-3KFIN	7.5	ODV-2-34100-3HFIN	10	18	3
ODV-2-44110-3KFIN	11	ODV-2-44150-3HFIN	15	24	4
ODV-2-44150-3KFIN	15	ODV-2-44200-3HFIN	20	30	4
ODV-2-44185-3KFIN	18.5	ODV-2-44250-3HFIN	25	39	4
ODV-2-44220-3KFIN	22	ODV-2-44300-3HFIN	30	46	4
ODV-2-54300-3KFIN	30	ODV-2-54040-3HFIN	40	61	5
ODV-2-54370-3KFIN	37	ODV-2-54050-3HFIN	50	72	5
ODV-2-54450-3KFIN	45	ODV-2-54060-3HFIN	60	90	5
ODV-2-64055-3KFIN	55	ODV-2-64075-3HFIN	75	110	6
ODV-2-64075-3KFIN	75	ODV-2-64100-3HFIN	100	150	6
ODV-2-64090-3KFIN	90	ODV-2-64150-3HFIN	150	180	6
ODV-2-64110-3KFIN	110	ODV-2-64160-3HFIN	160	202	6
ODV-2-74132-3KFIN	132	ODV-2-74200-3HFIN	200	240	7
ODV-2-74160-3KFIN	160	ODV-2-74250-3HFIN	250	300	7

Connections & Options

Total flexibility with plug-in modules for a wide range of communication protocols. Remote keypad, rapid commissioning tool and multi-function software available.

BACnet & Modbus RTU compatability built-in as standard

Connection Diagram

+24 Volt Control Circuit Supply or external 24 Volt Power Supply

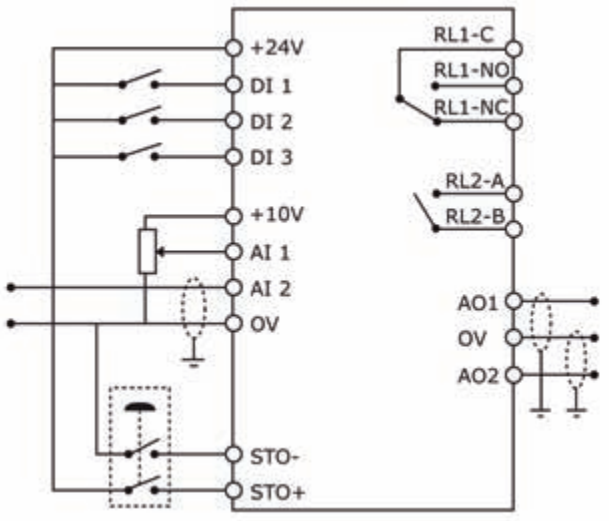
Stop / Run (Enable)

Analog Ref / Preset Speed 1

Remote Control / Local Control

Programable Analogue Inputs

External Safety Circuit for Safe Torque Off Function



Programmable Relay Output
Drive Healthy

Programmable Relay Output
Drive Running

Programmable Analog Output
Output Speed

Output Current

Flexible, easy to use & designed for HVAC

OPTIDRIVE™ HVAC

Energy efficient fan & pump control

OLED Display

Clear Graphical Display

- Operates to −10°C
- Wide viewing angle, effective in dark and light conditions
- Customisable display
- Multi-language selection

OPTIPAD

Remote Keypad & OLED Display

IP55 panel mount touch sensitive operator interface with Intuitive sliding bar parameter adjustment.

OPTISTICK

Rapid Commissioning

Plug-in or wirelessly copy parameter sets between drives.

Option Modules

Extend Functionality with easy to use plug-in modules.

Expansion Modules

- Extended I/O
  (3 x Digital In, 1 x Relay Out)
- Cascade Control (extended Relay)
  (3 x Relay Outputs)

Fieldbus Interfaces

- BACnet/IP

BACnet

OptiTools Studio

Powerful PC Software

Drive commissioning and parameter backup

- Real Time Parameter Editing
- Parameter Upload, Download and Compare Functions
- Function Block Commissioning Diagrams
- Multi Channel Scope and Datalogger functions
- Simple PLC function programming (additional patch required)

Compatible with Windows XP, Windows Vista & Windows 7

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Global HVAC Solutions

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UK
Safety critical ventilation in underground car parks

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Hot water pumping across district network

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IRELAND
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