Invertek Drives.com

OPTIDRIVE™ coolvert

High Performance Drive
specifically for BLDC Compressors, Heat Pumps & CDUs

1.5kW – 11kW / 2HP – 15HP
200–480V Single & 3 Phase Input

OPTIDRIVE™ coolvert

High Performance Drive

Invertek's high-performance OPTIDRIVE™ CoolVert; designed specifically for machine builders to optimise the performance of BLDC compressors used in Heat Pumps and Condensing Units (CDUs), improving overall system performance and lowering energy costs.

EASY TO USE

Experience You Can Trust

Invertek Drives has been manufacturing AC variable speed drives since 1998. During this time, our brushless permanent magnet motor control technology has been successfully used on 100's of different AC motor designs.

State of the art UK headquarters house specialist facilities for innovation, manufacturing and global marketing.

The company has achieved the ISO 14001 Environmental Management System to enhance environmental performance.

All operations, including innovation, are accredited to the exacting customer focused ISO 9001 quality standard.

The company's products are sold globally by a network of specialist distributors in over 80 different countries. Invertek Drives' unique and innovative Optidrive range is designed for ease of use and meets recognised international design standards for CE (Europe) and cUL (USA and Canada).

Key Product Features

Open Connectivity & Easy Commissioning

- Seamless connectivity with any application controller
- Built in RS485 Modbus RTU
- Bluetooth connectivity available via Optistick Smart
- External TFT keypad available
- Drive status LEDs

Environmental

- Compact design with through panel mounting
- Wide operating temperature: –20°C to 60°C
- IP20 rated front enclosure, IP55 at the rear
- Coldplate version available
- Coated PCBs meet class 3C2 in accordance with EN60713-303
- Built-in EMC filter class C2 in accordance with EN61800-3-2004
- Low harmonic design compliant with; EN61000-3-2, (1 phase 200-230V input), and EN61000-3-12, (3 phase 380-480V input).

Supply voltages and output current range

- 1 x 200–240V (± 10%):
  7.0A, 12A
  All single phase drives with active PFC
- 3 x 380–480V (± 10%):
  14A, 18A, 24A

Selectable motor types

- AC Induction (IM)
- AC Permanent Magnet (PM)
- Brushless DC (BLDC),
- Synchronous Reluctance (SynRM)
- Line Start Permanent Magnet (LSPM)

Control Terminals

- Pluggable control and communication terminals
- STO SIL3 Safe Torque Off for system protection, TUV approved
- Programmable, predefined input and output functions:
  - Start / Stop (Enable / Disable)
  - PTC motor thermal protection (0-10V, 4-20mA)
  - Relay (drive healthy / trip)

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

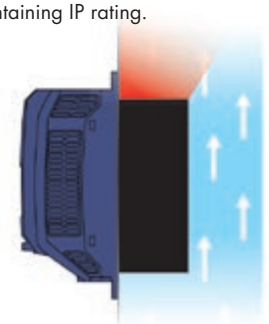
LSPM Line Start PM Motors

Precise and reliable control for
IE2, IE3, IE4 & IE5 motors

Practical Thermal Management

Through panel mounting allows the drive power electronics to be cooled by the chilled air.

Allowing OEM's to select the smallest electrical panel size, for the control electronics, while safely removing the heat generated by the drive, and maintaining IP rating.

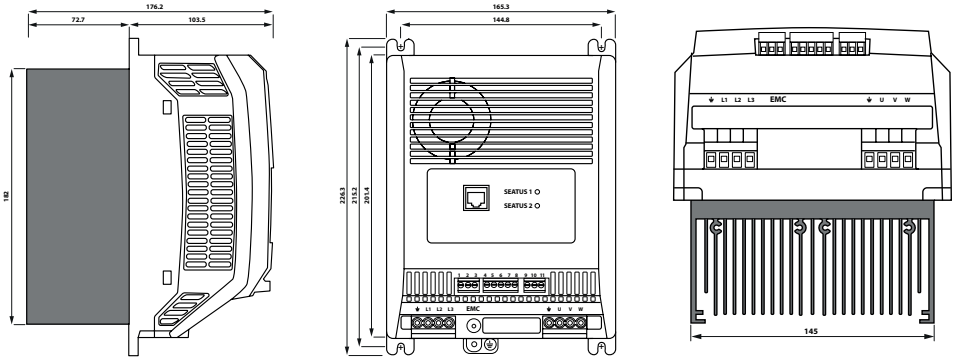


IP20 **Front** **IP55** **Rear**

Coldplate Version

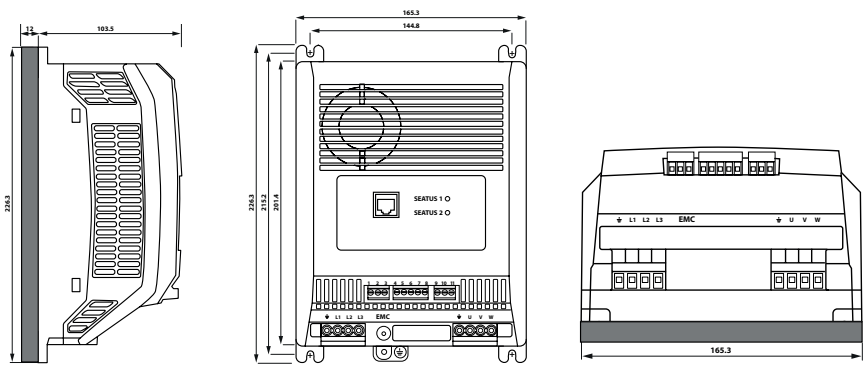
Specifications are identical to the standard Coolvert except the heatsink is replaced with a flat aluminium coldplate. This allows the Coolvert to be fixed to a device containing its own heat exchanger which then dissipates the heat from the drive.

Heatsink Version (dimensions in mm)



NOTE: The Heatsink Version can be conventionally mounted on the backplate of a panel using the optional panel mounting kit (sold separately)

Coldplate Version (dimensions in mm)



OPTIDRIVE™ coolvert

	kW	HP	Amps	Size	Model Code
200–240V ± 10% 1 Phase Input	1.5	2	7.0	2	CV - 2 2 0070 - 1 F # P
	2.2	3	12	2	CV - 2 2 0012 - 1 F # P
380–480V ± 10% 3 Phase Input	5.5	7.5	14	2	CV - 2 4 0140 - 3 F # E
	7.5	10	18	2	CV - 2 4 0180 - 3 F # E
	11	15	24	2	CV - 2 4 0240 - 3 F # E

Model Code: Product Family | Frame Size | Voltage Code | Power Rating Code | Number of Inputs Phases | EMC Filter | Heatsink/Coldplate | Power Technology

See model code guide opposite

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 evenly spaced
Output Ratings	Output Power	200V: 1.5 – 4.0kW 400V: 5.5 – 11kW
	Overload Capacity	130% rated current for 10s
	Output Frequency	0 – 500Hz
	Acceleration Time	0.01 – 600 seconds
	Deceleration Time	0.01 – 600 seconds
	Typical Efficiency	> 98%
Ambient Conditions	Temperature	Storage: –40 to 70°C Operating: –20 to 60°C
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL Approved Up to 4000m maximum (non UL)
	Humidity	95% Max, non condensing
	Vibration	Conforms to EN61800-5-1
Enclosure	Ingress Protection (IP)	Front IP20 Rear (Through Panel Mounting) IP55
	Coated PCBs	Designed for operation in 3S2/3C2 environments according to IEC 60721-3-3
Programming	Modbus RTU (RS485)	Modbus RTU on Pluggable terminals and through RJ45 port
	PC Tools	PC Tools software for Diagnostics and parameter configuration (RJ45 port only)
	Keypad	Optional Remote Keypad with TFT display for diagnostic and programming
	Smartphone app	Optitools Mobile
Control Specification	Control Method	200 – 240V ± 10% 380 – 480V ± 10%
	PWM Frequency	4–32kHz
	Stopping Mode	Ramp to stop, Coast to stop
	Skip frequency	2 skip frequencies, user adjustable
	Control Modes	Modbus RTU (RS485) Terminal Control Digital / Analogue Terminal Control PI mode Master / Slave Mode

Safe Torque Off (STO)	IEC 61800-5-2:2016	SIL 3
	EN ISO 13849-1:2015	PL "e"
	EN 61508 (Part 1 to 7): 2010	SIL 3
	EN 60204-1: 2006 & A1: 2009	Cat 0
	EN 62061: 2005 & A2: 2015	SIL CL 3
	Independent Approval	TUV Rheinland

Application Features	PI Control	Internal PI Controller
	Intelligent Drive Thermal Management	Reduced-load operation of the system can be configured under high drive temperatures to prevent nuisance tripping
	Intelligent Motor Thermal Management	Reduced-load operation of the system can be configured under continued motor overload to prevent nuisance tripping
	Serial Communications-Loss Fall-Back Speed	The ability to configure the drive to run at a 'safe' speed in the even of a loss of serial communication. Can prevent total loss of operation whilst maintaining minimum process demands.
	Master Follower Configuration	The ability to run a cascade of machines with one Master regulating the operating point in PI Control
Maintenance & Diagnostics	Fault Memory	Last 3 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 kWH

Conformance	The Coolvert product range conforms to the relevant safety provisions of the following council directives: 2014/30/EU (EMC), 2014/35/EU (LVD), 2006/42/EC (Machinery Directive), 2011/65/EU (RoHS 2) and 2009/125/EC (Eco-design)	
	Design and manufacture is in accordance with the following harmonised European standards:	
	BSEN 61800-5-1: 2007 & A1: 2017	Adjustable speed electrical power drive systems. Safety requirements. Electrical, thermal and energy.
	BSEN 61800-3:2018	Adjustable speed electrical power drive systems. Part 3: EMC requirements and specific test methods (IEC 61800-3:2017).
	BSEN 61800-9-2:2017	Adjustable speed electrical power drive systems. Part 9-2: Ecodesign for power drive systems, motor starters, power electronics and their driven applications – Energy efficiency indicators for power drive systems and motor starters (IEC 61800-9-2:2017).
	BSEN 60529: 1992 & A2: 2013	Specifications for degrees of protection provided by enclosures
	BSEN 61800-5-2:2017	Adjustable speed electrical power drive systems.[as relevant] Part 5-2: Safety requirements – Functional (IEC 61800-5-2:2016).
	UL 61800-5-1	cUL Listed * cUR Recognised for the coldplate variants *
	BSEN 61000-3-12: 2011	Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low voltage systems with input current >16 A and ≤ 75 A per phase
	BSEN 61000-3-2:2019 (single phase input variants only)	Electromagnetic compatibility (EMC). Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)

* Pending

Options for commissioning & diagnostics

Optistick Smart

OPT-3-STICK-IN

Rapid Commissioning Tool

- Copying, backup and restore of drive parameters
- 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

Optipad

OPT-3-OPPAD-IN

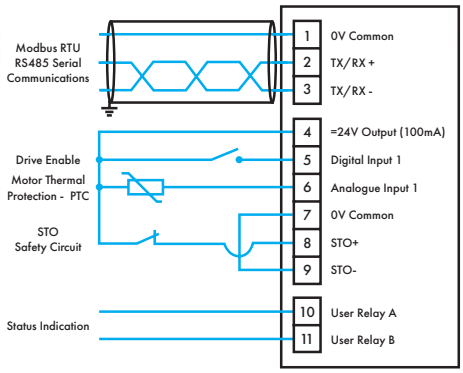
Remote Keypad with TFT Display

Model Code Guide

CV-220070-1FHP

- Product Family: CV = Coolvert
- Frame Size
- Supply Voltage: 200V = 2 | 400V = 4
- Output Rating
- Number of Input Phases
- F = Internal EMC Filter
- H = Heatsink, C = Coldplate
- E = Eco Film Capacitor, P = Active PFC

Connection Diagram



ISO 9001 SYSTEM CERTIFICATION SGS ISO 14001 SYSTEM CERTIFICATION SGS

www.invertekdrives.com

INVERTEK DRIVES LIMITED UK Headquarters
Offa's Dyke Business Park
Welshpool, Powys, UK
SY21 8JF

Tel: +44 (0)1938 556868
Fax: +44 (0)1938 556869
Email: sales@invertekdrives.com