

FIHV

Frequency inverter 400 V



Description

FIHV-E2 are variable frequency drives designed to regulate HVAC fans and pumps equipped with three-phase 400 V motors. They feature application modes that ensure simple commissioning and reliable operation.

The FIHV-E2 drives are suitable for a wide range of applications thanks to their compatibility with various motor types, including induction, BLDC, permanent magnet, synchronous reluctance and PMAREL motors.

Motor performance is optimised through sensorless vector control, eliminating the need for encoder feedback. Communication is supported via Modbus RTU, CANopen and BACnet.

The enclosure has an IP20 rating, protecting the internal components against dust ingress. It is intended for DIN-rail mounting in an electrical cabinet.



Key Features

- Intuitive keypad control
- Built-in motor protection
 - Low load / flow detection
 - Motor connection monitoring
 - Belt break protection
- Three application modes for effortless motor control
 - Pump mode — Energy-efficient control for pump applications.
 - Fan mode — HVAC air handling with flying start, PI control and mains loss ride-through.
 - Industrial mode — Optimised control for industrial applications with sensorless vector control providing high torque and precise speed regulation.
- Advanced braking functions
 - DC injection braking
 - Dynamic braking
 - AC flux braking
- Integrated STO (SIL3) safety function for disabling motor torque generation
- Internal EMC filter (Class 1) to reduce electromagnetic interference

Area of Use

- Fan and pump speed control in HVAC applications

Standards

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Machinery Directive 2006/42/EC
- Ecodesign Directive 2009/125/EC and Commission Regulation (EU) 2019/1781
- Commission Delegated Directive (EU) 2015/863 (RoHS 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances



Article Codes

Article code	Nominal current	Reference codes	Frame size	Supply voltage
FIHV44012E2	1,2 A	ODE-4-140012-3F12	1	3x 400 VAC
FIHV44022E2	2,2 A	ODE-4-140022-3F12		
FIHV44041E2	4,1 A	ODE-4-240041-3F42	2	
FIHV44058E2	5,8 A	ODE-4-240058-3F42		
FIHV44070E2	7,5 A	ODE-4-240075-3F42		
FIHV44095E2	9,5 A	ODE-4-240095-3F42		

Fixing and Dimensions



Frame size	Length [mm]	Width [mm]	Height [mm]	Fixings
1	136	82	176	4x M5
2	168	108	222	4x M5



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Technical Specifications

Input ratings	Supply voltage	3ph 400 Volt
	Supply frequency	48–62 Hz
	Displacement power factor	> 0,98
	Max. allowed phase imbalance	3 %
	Inrush current	< rated current
	Power cycles	max. 120 per hour, evenly spaced
Output ratings	Overload capacity	Heavy duty 150 % for 60 seconds 175 % for 2,5 seconds
	Output frequency	0–500 Hz, 0,1 Hz (high frequency firmware on request)
	Typical efficiency	> 98 %
Operating conditions	Temperature	-40–60 °C (storage)
		-20–50 °C (60 °C with output derating; operating)
	Altitude	Up to 1000 m (Full rated performance)
		Up to 2000 m (UL approved)
		Up to 4000 m (Operation possible, non-UL applications)
	Relative humidity	95 % rH, non-condensing
Enclosure	Vibration	Conforms to EN61800-5-1
	Ingress protection	IP20 (NEMA 1 with optional IP20 kit)
Programming	Keypad	Optional TFT remote keypad
	Display	7 Segment LED
Control specification	Control method	Vector speed control, PM vector control (auto back EMF measurement) Sensorless vector speed control V/Hz speed control synchronous reluctance BLDC control LSPM PMAREL torque control
	PWM frequency	4–16 Hz effective
	Stopping mode	Ramp to stop Coast to stop
	Braking	AC Flux Braking DC injection braking (time, current and speed adjustable at start and stop) Dynamic braking (Size 2 and larger)
	Skip frequency	Single point, user adjustable
	Setpoint control	Analogue signal 0–10 V 10–0 V 0–20 mA 20–0 mA 4–20 mA 20–4 mA
		Digital Motorised potentiometer (keypad) Modbus RTU CANopen
		Optional EtherNet/IP, Modbus-TCP, Profinet, Ethercat frequency input up to 100 kHz
	Frequency range	0–500 Hz (2000 Hz on request for IM)



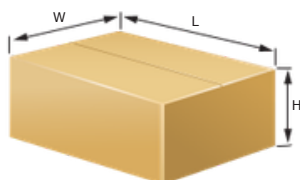
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Technical Specifications

Fieldbus	Built-in	BACnet MS/TP
		CANopen
	Optional	Modbus RTU Odd, even, no parity, 1/2 stop bits Other Modbus-TCP, Ethernet-IP, Profinet
I/O specification	Power supply	24 VDC, 150 mA short circuit and current limit protected 10 VDC, 10 mA short circuit protected for potentiometer
	Programmable inputs	4 total: 2 digital and 2 analogue / digital
	Digital inputs	8–30 VDC, from on-board or external voltage source < 4 ms response time, NPN/PNP logic
	Analogue inputs	Resolution: 12 bits Accuracy: $\pm 2\%$ full scale Response: < 4 ms parameter adjustable scaling and offset
	Programmable outputs	1 analogue (0–10 V, 0–20 mA, 4–20 mA) / digital (24 VDC) 1 changeover relay
Application features	Relay outputs	Max. voltage: 250 VAC, 30 VDC Switching capacity: 6 A AC, 5 A DC
	PI control	Internal PI controller Standby / sleep function
	Fire mode	Bidirectional Selectable speed setpoint (fixed / PI / analogue / fieldbus)
	Common DC bus	DC terminal access (S2 and larger) Phase loss disable
	HVAC features	Spin start Variable torque Belt failure detection
Maintenance and diagnostics	Pump features	Low load detection (dry pump)
	Fault memory	Last 4 trips and time stored. Logging data prior for diagnostics: Output current, drive temperature, DC bus voltage, etc.
	Monitoring	Hours run meter Real units (psi, bar, etc.)
	Input phase loss	Ripple and per phase measurement
	Output phase loss	All 3 phases checked at each enable (can be disabled)
	Brake protection	Brake resistor thermal overload

Packaging



Article code	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight [kg]	Gross weight [kg]
FIHV44012E2	Unit (1 pc.)	136	82	176	0,97	1,22
FIHV44022E2						
FIHV44041E2						
FIHV44058E2		168	108	222	1,95	2,20
FIHV44070E2						
FIHV44095E2						

