

*The NFO Sinus frequency inverter is based on a patented Swedish technology that allows you to control the speed of electric motors without generating electromagnetic interference, which in turn offers a range of unique benefits. Thanks to the sine-wave voltage, the inverter is intrinsic EMC, i.e., it is interference-free in itself.*

# NFO Sinus

## **SIMPLE**

Installation is easy and cost-efficient due to there is no need of shielded cables, EMC filters or other EMC-classed installation accessories. When undertaking energy efficiency projects, it's also possible to use the existing non-shielded cables, this makes the installation work quick, easy and cost-efficient. There is no cable length limitation between the motor and the NFO Sinus except for the resistance of the cable. The NFO Sinus can be installed where it's suitable depending on the application, even if the distance to the motor is several hundred meters thanks to the Sinus technique which gives cost-efficient flexible solutions in all environments.

## **SILENT**

NFO Sinus is interference free and therefore does not create any electromagnetic interference which can disturb surrounding equipment. The NFO Sinus satisfies the most stringent demands set out in the EMC directive 2014/30/ EU without filters and without shielded cables and can be

used in every kind of environment from industrial, medical to residential. With NFO Sinus you also avoid all the disturbing switching noise in the motor, which results in a quieter environment.

## **SAFE**

NFO Sinus does not generate any bearing currents. The motor therefore has a longer lifespan. No earth leakage currents are generated, which means that residual current devices for both personal safety and fire prevention can be used. This provides a high level of electrical safety.

## **HIGH PRECISION**

The motor speed is very precisely controlled and with full torque right from stand-still as well as at a low speed regardless of chosen control mode Speed, frequency, torque or process-control. The inverter furthermore has an energy-save function that allows you to conserve even more energy when running with a low load on the motor, e.g., fans, which at times run at a low speed.



## **Simple installation**

- No shielded cables
- No complicated installation requirements
- No limitations of distance



## **Silent operation**

- No electromagnetic interference
- No irritating switching noise



## **Safe technology**

- No bearing currents
- No earth currents

NFO Sinus is available in size 0,37 kW up to 22 kW

Power rating (kW)	7.5	11.0	15.0
Continuous Rating (A)	14.8	21.5	28.5
Maximum Rating (A)	17.7	25.8	32.0
Protection Class	IP20	IP20	IP20
Measurements HxDxW (mm)	413x280x203	413x280x203	413x280x203
Weight (kg)	14.0	14.0	14.0
Part number	NFO 2CIA3151D	NFO 2CIA3221D	NFO 2CIA3281D

	Voltage (V)	Frequency (Hz)
<b>Input:</b>	3x380-440V ±10%	50/60 Hz ± 10 %
<b>Output:</b>	0-440V + 10 %	0-150Hz
<b>Output voltage wave form:</b>	Sinus	
<b>Operating mode:</b>	4-kvadrant	
<b>Control inputs configurable:</b>	<b>Setpoint</b>	<b>Actual value</b>
2 pcs of voltage(V)	0-10V, 2-10V, ± 10V	0-10V, 2-10V, ± 10V
1 pc of current (mA)	0-20 mA, 4-20 mA ± 20 mA	0-20 mA, 4-20 mA ± 20 mA
1 pc of potentiometer input	Potentiometer 10 kΩ	
Selectable from terminal + or- logic	7 fixed setpoints	

<b>Acceleration time:</b>	0,2-500 s
<b>Retardation time:</b>	0,2-500 s
<b>Relay outputs:</b>	Common alarm (Potential free contact max 1A 50VDC) Run signal (Potential free contact max 1A 50VDC)
<b>Voltage output:</b>	24V supply to external sensor
<b>Control modes:</b>	Frequency control 0-150 Hz Speed control 0-9000 rpm Torque control 1-400% of nominal motor torque, depending on inverter capacity
	Process control PI- controller with feedback
<b>Local mode keyboard:</b>	Forward, Reverse, Stop
<b>Motor protection:</b>	Thermistor input PTC or Klixon Power guard Overload protection
<b>Communication:</b>	Modbus RTU/ASCII
<b>Software:</b>	Sinus Manager free download from <a href="http://www.nfodrives.se">www.nfodrives.se</a>
<b>Energysave function:</b>	Optimized motors magnetizing current at low load.
<b>Environment:</b>	Ambient temp -10-> +40°C Storage temp -20->+60°C RH 0->90% non-condensing.
<b>Earth current:</b>	< 2 mA. RCD's for both person -and fireprotection can be used.
<b>EMC:</b>	Certified to be used without shielded cables and filters EMC Directive 2014/30/EU <b>Standards:</b> EMC Emission EN 61000-6-3:2007/A1:2011 EMC Immunity EN 61000-6-2:2005, EN 61000-4-2, -3, -4, -5, -6, -11 LVD EN 61800-5-1

## Option

<b>Expansion card I/O:</b>	Input PT1000 Output 0-10V, Frequency 0-32 kHz open collector Function relay Potential free contact max 2A 50VDC 50W, 24V to external sensor
<b>Brake resistors/chopper:</b>	Dimensioning of braking resistors; see the user and installation manual Chap. 6
<b>Communication card:</b>	Can-open, Profi-Bus DP

For more information: See NFO Drives Operating and installation manual