



# SinuMEC CSD

## Sinusoidal Energy Saving & Efficiency Controller for Constant Speed AC Motors

PowerSines SinuMEC CSD is a Sinusoidal Motor Efficiency Controller for constant speed, variable load, AC motors. With up to **40% energy-saving**, this multifunctional controller reduces energy consumption and improves efficiency, lowering operating expenses by controlling the voltage supplied to the motor according to its instantaneous load.

SinuMEC is the optimal solution for AC motors operating in constant speed applications. Its patented VVC technology provides both significant energy saving along with power-quality advantages that improve reliability and cut machine's downtime. SinuMEC CSD has a definite edge over frequency controls (VFD) when it comes to fixed speed AC motors.

### Benefits

- **Energy Saving & Efficiency** – up to 40% reduction in energy consumption and over 50% reduction of line losses
- **Power Quality** - harmonics filtration and power factor correction
- **Motor Start** - startup current at typically 2x the nominal
- **Pure-sine** - using PowerSines patented VVC technology
- **Maintenance** - reduces operating temperature, downtime and maintenance costs

### Features

- **Reduced energy consumption** - Reduces motor's internal losses, optimizes its efficiency and saves up to 40% of the energy consumption (kWh).
- **Decreased maintenance and downtime** - Reduces motor's operating temperature by up to 10°C and decreases operating stress. This improves motor lifetime and reduces downtime and maintenance costs by up to 50%.
- **Lowered conduction losses** - Losses on electrical wires and transformers are, on average, 12% of electricity consumption. SinuMEC reduces the current by up to 50%, thus reducing up to 75% of the losses. This brings additional kWh savings of up to 9%.
- **Harmonics filtration** - Filters out up to 60% of the existing harmonics both to the motor and to the whole network. Harmonics are one of the most common causes for energy losses, electrical network failures and fires.
- **Power factor correction** - Improves the Power Factor (PF) on the motor itself and reduces the amount of capacitors required by central PFC systems. Unlike PFC systems that improve the PF for the utility company, the SinuMEC improves PF also for the facility itself. It can improve as high as 60% of the power factor, which provides saving in investment of equipment and energy losses.
- **Harmonics-free motor startup** - Provides reduced motor startup at typical 2x nominal current. PowerSines technology starts the motor harmonics-free for less failures and fewer mishaps, which are typical in SCR-based starters.
- **Motor protection** - Protects the motor from operating under network failure or internal failure conditions.

### ATTRACTIVE ENERGY SAVING

Up to **40% energy savings**, improved power-quality, motor protection and motor startup

### APPLICATIONS

#### Industrial Applications:

Injection mold machines, granulators, compressors, grinders, shredders, mills, vacuum pumps, hydraulic pumps, mud and sludge pumps, conveyors, mixers, bucket elevators, presses, fans and more

#### Commercial Applications:

HVAC, cooling refrigeration systems, escalators & moving walkways, fans, compressors, pumps and more

### MOTOR SYSTEMS

For AC induction motors operating at constant speeds with variable loads

### RANGE

15A - 170A  
400v/50Hz or 480v/60Hz

## Voltage Control

The SinuMEC is built using the patented **PowerSines VVC** technology which enables control of the voltage supplied to the AC motor. By utilizing proprietary methods for combining three-phase voltage vectors (VVC - Voltage Vector Combination), the SinuMEC controls voltage amplitude while keeping pure sinusoidal waveform, without generating harmonics and is EMI/RFI free. **The SinuMEC automatically controls the voltage supplied to the motor, according to its load.** In this way, the operation is optimized while keeping the same operating conditions. By reducing the voltage, the SinuMEC dynamically adjusts the full motor power to 100%, 50% or 25% of its original power rating.



## Connection Modes

The SinuMEC can be connected both in-line to the motor and inside the motor delta (see diagram on right). The options of In-line and Inside Delta connections provide the maximum performance and great economical value for multiple application scenarios.

When connected in-line to the motor, the motor receives one of three voltages (L-L): 400v/300v/220v in 400v/50Hz network or 480v/360v/265v in 480v/60Hz network. For this connection, the SinuMEC should be rated at 100% of the motor rated current. When connected inside the delta, the motor receives one of three voltages (L-L): 400v/310v/290v in 400v/50Hz network or 480v/370v/350v in 480v/60Hz network. In this connection, the SinuMEC should be rated at 56% of the motor rated current. For example, a 75A motor can be operated using a 43A SinuMEC.

## Integral Bypass Contactor

The SinuMEC has an integral bypass contactor that can be operated in various situations depending on the application and the settings made to the device. Bypass can also be activated using digital signal input to force bypass, when unit is in 'test mode' (in this mode, it changes periodically from operation mode to bypass mode), or in case operating temperature is too high.

## Simple Installation

- Simple installation without infrastructure change
- Heavy duty; works also in low power quality conditions and with any phase rotation order
- Plug & Save: supplied ready to use – no setup is required for most installations

## Models

Model (A)	Max. Motor Power* at 400v/50Hz				Max. Motor Power* at 480v/60Hz			
	In-line		Inside Delta		In-line		Inside Delta	
	[kW]	[HP]	[kW]	[HP]	[kW]	[HP]	[kW]	[HP]
15	7.5	10	12	15	7.5	10	15	20
30	15	20	25	35	18	25	22	40
43	22	30	37	50	22	30	37	50
57	30	40	50	65	30	40	55	75
75	37	50	60	80	45	60	75	100
85	40	60	75	100	50	65	90	110
104	55	75	95	125	55	75	95	125
142	75	100	132	175	75	100	132	175
170	90	120	155	205	90	120	155	205

\* The SinuMEC rating is defined in Amperes. The power ratings are for indication only and based on standard motors. Please check the motor nominal current and the SinuMEC's spec sheet for the most suitable SinuMEC model.

