

improve electric motor

# efficiency

by 50%

# reduce

CO2 emissions



# SinuMEC

**Sinusoidal Motor Efficiency Controller for Constant Speed, Variable Load AC Motors. This multifunctional controller improves energy efficiency, reliability, and reduces operating expenses by controlling the voltage supplied to the motor.**

**Voltage Control Technology that Benefits More than Frequency Control and Goes Beyond Soft Starters.**

## BENEFITS

- **Motor Start** - startup current at typically 2x the nominal
- **Energy Efficiency** - reduces energy consumption (kWh) and facility losses
- **Power Quality** - harmonics filtration and power factor correction
- **Maintenance** - extends motor lifetime, reduces downtime/maintenance costs

## FEATURES

**Harmonics-free motor startup** - Provides reduced motor startup at typical 2x nominal current. The RIGHTVoltage technology starts the motor harmonics-free for less failures and fewer mishaps, which are typical in SCR-based starters.

**Reduced maintenance and downtime** - The SinuMEC reduces the motor's operating temperature by up to 10° Celsius and reduces operating stress (voltages, mechanical). This improves motor lifetime and reduces downtime and maintenance costs by up to 50%.

**Reducing energy consumption** - Reduces the motor's internal losses, optimizes the motor's efficiency and saves up to 20% of the energy consumption (kWh).

**Reducing conduction losses** - Losses on electrical wires and transformers are, on average, 12% of electricity consumption. The 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** - The SinuMEC 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.

**Motor protection** - Protects the motor from operating under network failure or internal failure conditions.

## SIMPLE INSTALLATION

- No affect on motor and load operation such as speed or torque
- Simple installation using three standard cables – no 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

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## ALL-IN-ONE SOLUTION

Improve all aspects of the electric network: motor protection, motor startup, energy savings

## MOTOR SYSTEMS:

AC induction motors with partial or variable loads running at constant speeds

## APPLICATIONS:

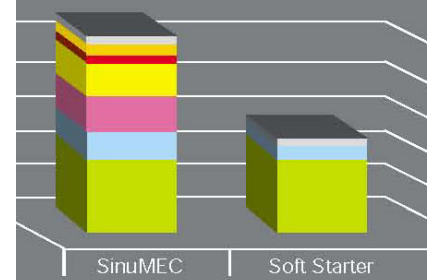
**Industrial:** Granulators, grinders, shredders, mills, vacuum pumps, hydraulic pumps, mud and sludge pumps, conveyors, bucket elevators, mixers, presses, fans and more

**Commercial:** Escalators, moving walkways, fans and more

## RANGE:

15A - 142A,  
400v/50Hz or 480v/60Hz

- Motor Protection
- Power Factor Correction
- Harmonics Filtration
- Conduction Losses Saving
- Energy Saving
- Reduced Maintenance
- Motor Start





## VOLTAGE CONTROL

The SinuMEC is built around patented RIGHT Voltage 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 the left). In-line connection provides the maximum performance while inside delta connection provides great economical value.

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. For this connection, the SinuMEC should be rated at 58% 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 at one of the following conditions:

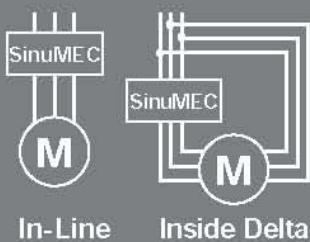
- The motor is loaded by more than 55% and startup is completed - no voltage control is required
- Signal provided on digital input to force bypass
- The unit is in test mode (in this mode, it changes periodically from operation mode to bypass mode)
- The SinuMEC internal temperature is too high (and the motor continues to work).

## MODELS

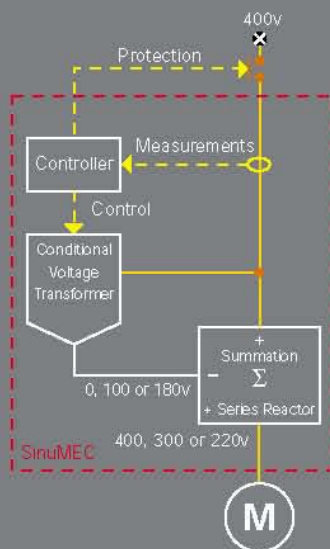
Model [A]	Max. Motor Power* at 400v/50Hz				Max. Motor Power* at 480v/60Hz			
	In-line		Inside Delta		In-line		Inside Delta	
	[kW]	[HP]	[kW]	[HP]	[kW]	[HP]	[kW]	[HP]
15	7.5	10	12	15	7.5	10	15	20
30	15	20	25	35	18	25	22	40
43	22	30	37	50	22	30	37	50
57	30	40	50	65	30	40	55	75
75	37	50	60	80	45	60	75	100
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

\* 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.

### CONNECTION MODES



### BLOCK DIAGRAM



The technology is protected by patents and patent pending.  
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Specifications are subject to change without notice.  
PowerSines Ltd. is ISO 9000:2000 and IQNet approved

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