



**CORPORATE
& PRODUCTS**

COMPANY PRESENTATION

**DRIVES & MOTORS
OVERVIEW**

Distributed by





Diversified Business

System & Automation Products



Low & Medium Voltage Motors



Power Business



Gas Insulated Switchgear



Diesel Engine Generator

Household and Air Conditioning Appliances



TECO glass refrigerator



Inverter drum washing machine



TECO 4K-smart light emitting diode television

ECO Energy Business



Electric vehicle



Wind turbine



Solar panel project Engineering Procurement Construction service (EPC)

IoT Applications



Management for all the electromechanical equipment in the factory



smart air-quality monitoring services

B2C businesses: Real Estates Delivery Service Catering



About

Founded in 1956 as a manufacturer of industrial motors, TECO has diversified, in parallel with Taiwan's economic miracle, to heavy electric equipment, home appliances, information technology, communications, electronics, key components and parts, civil engineering, real estate, logistics, and catering and restaurant.

As a global player, TECO is present in over 50 countries in 5 continents, with more than 100 affiliates.



TECO Headquarter - Nankang Software Park, Taipei, Taiwan

Established: 1956
 Headquarter: Taipei, Taiwan
 Employees: 23.000
 Revenues: NT\$ 49,9B (1,5 B EUR)
 Milestones:
 • Acquired Westinghouse Motor (US) in 1995
 • Acquired Motovario SpA (Italy) in 2015

Global Network

AMERICA

- Canada
- U.S.
- Mexico
- Guatemala
- Nicaragua
- Venezuela
- Columbia
- Ecuador
- Peru
- Uruguay
- Chile

EMEA

- Italy
- France
- Germany
- Spain
- U.K.
- South Africa
- Turkey
- Israel
- Saudi Arabia

ASIA

- China
- India
- Japan
- Taiwan
- Hong Kong
- Vietnam
- Thailand
- Singapore
- Malaysia
- Indonesia
- Philippines

OCEANIA

- Australia
- New Caledonia
- Papua New Guinea
- Fiji
- New Zealand
- Papua New Guinea

Look forward

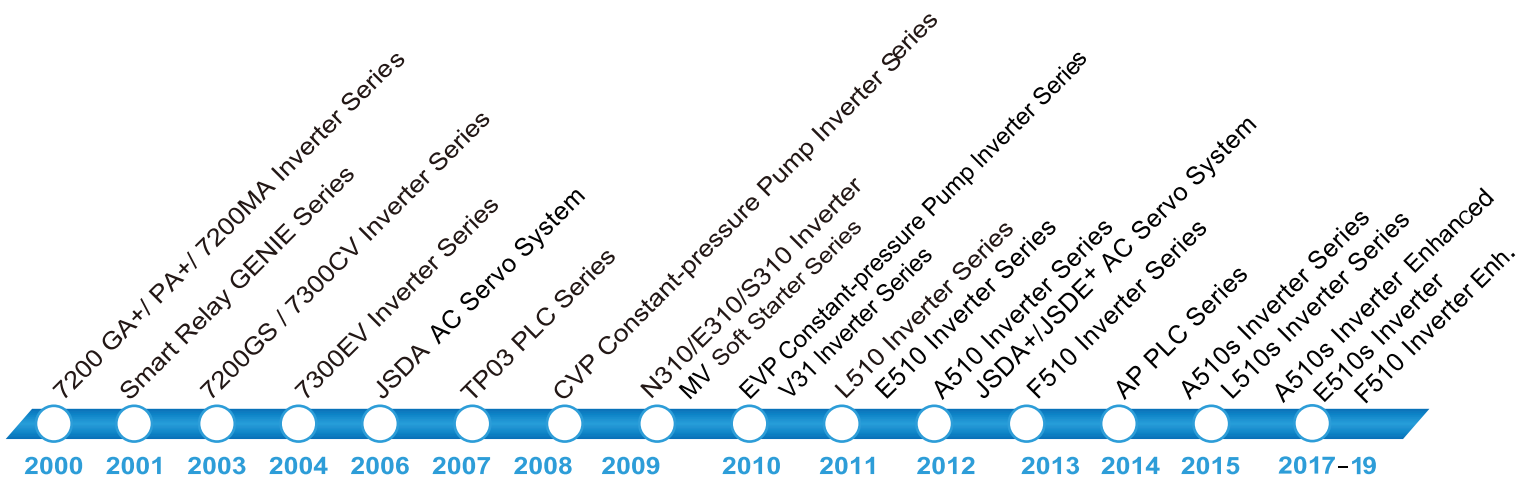
Think global

TECO Electric & Machinery System Automation

Since its foundation in June 1956, TECO Electric and Machinery Co., Ltd. has never rested on the laurels of its own success. TECO started out as an industrial motor manufacturer 45 years ago. Over the years, it has successfully diversified into a conglomerate with worldwide business operations. TECO is not only renowned as a leading heavy electrical industrial brand, but also as a leading manufacturer of home appliances, telecommunications equipment, IT systems, electromechanical components, and commercial electronics. Not satisfied with producing motors or limited by home appliances, the TECO Group is also committed to medical information systems, e-commerce, semiconductor, optronics, network, software, infrastructure, financial investment, food services, and distribution industries, becoming a globalize, high-tech enterprise group. TECO group has about 30 subsidiaries and affiliations across Asia, America and Europe, employee total over ten thousand. TECO is forever dedicated to long-term development, creating new competitive advantages, enhancing service quality, developing top-flight personnel, and creating outstanding products.

System Automation Division is funded in the spirit of creation and development. The division initially expanded from basic power distribution components to planning, designing and construction. Based on our inverter expertise, SA Division has also put a lot of effort into industrial control technology to further integrate automatic systems, such as machine factories, iron and steel factories, semi-conductor factories, TFT factories and mechanical & electrical project contracts. With the trend of intelligent buildings and home automation, we are looking forward to developing 3A (FA-Factory Automation, BA-Building Automation, HA-Home Automation) products and services in the near future.

R&D History



A510s Series

Advanced Current Vector Control Drive

A510^{Super} Enhanced

Super technology
Super excellence
Super evolution



Features

Many control modes integrated in one drive include V/F, V/F+PG, SLV, SV, PMSV **PMSLV and SLV2**.

Dual core processor with 32bit MCU and ASIC enhances performance and reliability.

Dual rating design for normal and heavy duty applications.

Four quadrant control with speed, torque and position control modes.

Advanced current vector control technology provides impressive torque performance.

Unique static and rotating auto-tuning methods provide faster commissioning time.

Intelligent over voltage suppression function for some regenerative loads without braking resistor.

Built-in standard Modbus RTU via RJ45 port for one to one and one to many control.

Integrated PLC function and PID function for many applications.

Conformity to CE, UL standards and RoHS directive.

SPS low voltage activated function (EPS)

Complete PG card solution, suitable for Line Driver, Open Collector, SinCos and Endat encoder.

Ultra low motor noise from noise detection technology.

STO (Safety Torque Off) function with SIL2 safety level as defined in IEC61508:2000 and Cat.3 as in EN95-1

Power Rating	kW HP	0.75 1	1.5 2	2.2 3	3.7 5	5.5 7.5	7.5 10	11 15	15 20	18.5 25	22 30	30 40	37 50	45 60	55 75	75 100	90 125	110 150	132 175	160 215	185 270	220 300	280 375	425 575							
A510s	200V 3 phase	[Blue bar indicating power range]																													
	400V 3 phase	[Green bar indicating power range]																													

Drive

High Efficiency PM Motor Driving

- Simple parameter settings for easy switching between induction and permanent magnet motors.
- High performance current vector control for induction and permanent magnet motors.



- | | | |
|--|--|---|
| <p>Induction Motor (IM)</p> <ul style="list-style-type: none"> -Cost Effective -Mechanical Robustness | <p>Surface Permanent Magnet Motor (SPM)</p> <ul style="list-style-type: none"> -Highly Efficient -Compact Size -Low Cogging Torque | <p>Interior Permanent Magnet Motor (IPM)</p> <ul style="list-style-type: none"> -Highly Efficient -Compact Size -With Reluctance Torque |
|--|--|---|

More powerful in core computing



- New core processors and better computing ability.

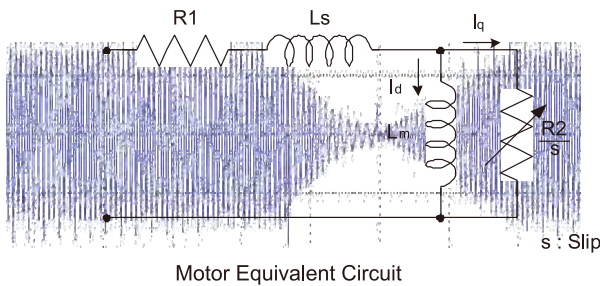
Core computing	Raise 60%	RAM	Raise 530%
Raise 100%	ROM		

*Compared with A510

Advanced Motor Auto-tune Function

Integrated Multiple Auto-tune Modes

Rotational auto-tune mode	Rotary-type auto-tune for higher performance for precise control.
Static auto-tune mode	The motor shaft will be locked in static auto-tune mode.
Stator resistance measurement	Auto measure the resistor within cable and compensate accordingly.



FAN CONTROL AND QUICK RELEASE



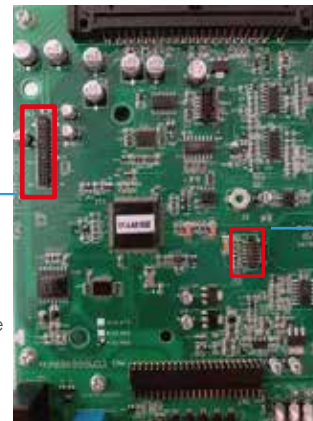
- Lower noise and extend the life of fan.
- Quick replaceable fan makes customers be easy to change it.

Supports Communication Card/ IO Expansion Card/ DC24V Power Card

Expansion Slot 1 (CN3)

For encoder feedback card installation. Please refer to accessories page for detail specification. If the motor with encode or resolver installed, by closed loop control, can provide better motor performance.

For DC24V power card installation. Catalog No.: JN5-PS-DC24V, to communicate with inverter, and setup or copy the parameter without using the main power.



Expansion Slot 1 (CN2)

For communication card installation. Please refer to accessories page for detail specification. It can improve the support of the upper controller communication protocol.

For IO expansion card installation. Catalog No. JN5-IO-2DO1AI, to add one relay, one transistor and one analog output with -10V ~ 10V/ 4~20mA.

Applications

Gravitational Handling Equipment

- Crane, Elevator

Plastics/Rubber Processing Machine

- Extruder, Injection Molding Machine

Textile Machine

- Dyeing and Finishing Machine

Metal Processing Machine

- Press, Lathes

Tension Control Equipment

- Printing Machine, Reeling Machine

Wire/Cable Making Machine

- Wire Drawing Machine

E510/E510s Series

General Vector Control Drive



Features

E510S with Filter includes Safe Torque Off (STO) function, E510 up to 18,5 kW 400V is without STO & cards

32bit RISC processor and latest generation of sensorless vector control technology provide outstanding torque response at low speed.

Internal EMC filter in compliance with IEC/EN 61800-3 and IEC/EN 61800-5-1 standard.

Built-in braking transistor for whole series.

Support Soft-PWM modulation method to create an even more quiet industrial environment.

Keypad support remote control with potentiometer.

Integrated Safety Stop and Fire Mode functions.

Built-in Modbus RTU/ASCII communication with standard RJ45 connector for one-to-one or one-to-many control.

Optional fieldbus gateways support Profibus-DP, DeviceNet, Ethernet (TCP/IP) and CANopen.

Built-in PID function and sleeping mode for fan or pump applications.

Support parameter lock function prevents unauthorized access.

Built-in PLC function for simple sequence or process control applications.

Auto carrier frequency switching to protect inverter being over temperature.

Providing different protection level types include IP20 and IP66. Waterproof type (IP66/NEMA4X) can withstand harsh environments.

STO (Safety Torque Off) function with SIL2 safety level as defined in IEC61508:2000 and Cat.3 as in EN95-1

Power Rating	0.4kW 0.5HP	0.75kW 1HP	1.5kW 2HP	2.2kW 3HP	3.7kW 5HP	5.5kW 7.5HP	7.5kW 10HP	---	37kW 40HP	75kW 100HP
E510s	200V 1/3 phase									
	200V 1 phase									
		400V	3-phase 200V		200V 3 phase					

Drive

Heat sink structure

External design of Heat sink enhance the reliability of product. By this, efficiently preventing inverter from dust get into it, which will cause short circuit.



Various communication module

Provide customer with convenient way for communication.



▲ Ethernet (TCP/IP) ▲ DeviceNet ▲ Profibus ▲ CANopen



JN5-CMI-PDP **JN5-CMI-CAN** **JN5-CMI-TCPIP**
JN5-CMI-DNET

Applications



Soft PWM

Efficiently reducing the noise when motor is in the low carrier frequency.

Smart fan control

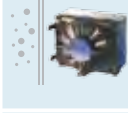
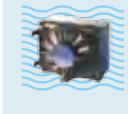
Providing four kinds of fan control mode by temperature detection. Automatic fan control can depend on operation temperature of inverter.

Auto-derating function

Built-in temperature sensor let inverter automatically adjust frequency to prevent inverter from stop running for over temperature,

Ensuring type of high protection level IP66/NEMA 4X

E510 can be chosen for IP66 model, which provide the customer with best energy saving solution for high pollution and high humidity environment.

First number: 6		dust proof
Second number: 6		water gun, let limited water get in



L510s series

Compact V/F & SLV Control Drive



Features

Output frequency up to 599Hz

Built-in Modbus RS485 communication for one to one and one to many control

Built-in digital display and keypad including speed adjustment potentiometer

RJ45 interface for PC and Copy unit

Compact space saving design for side by side installation. Plus optional Din rail mounting kit(Frame1/2)

Built-in PID feedback control

Rapid stop function built-in complying with global standard

Earthing terminals built-in into heat sink to effectively provide grounding protection

Flip form communication interface for easy link and dust-proof feature, with operational and protective functions

Auto Carrier frequency change to limit inverter over temperature

Frame1 with fanless design can effectively objects entry to extends product life

Higher reliability and environment immunity with coated PCB

32 bit 100M Hz CPU design provides high performance, faster A/D conversion and torque compensation

Control mode include V/F and SLV

Communication interface modules for Profibus/ DeviceNet/ Ethernet(TCP/IP)/ CANopen

New Built-in BACnet communication function(Built-in multi-pump function model without BACnet function)

Built-in EMI filter. For interference suppression in compliance with (IEC) EN61800-3 and (IEC)EN 61800-5-1 standard.

L510s connects grounding kit (option) to enhance the EMC effect (Frame1/2)

Motor over-temperature protective function to protect motor (fulfilled by PTC)

Add multi-pump function, four pumps parallel connection

Constant pressure Pump Control Built-in

Drive

Power Rating	0.2kW 0.25HP	0.4kW 0.5HP	0.75kW 1HP	1.5kW 2HP	2.2kW 3HP	3.7kW 5HP	5.5kW 8HP	7.5kW 10HP	11kW 15HP
L510s	100V 1/3 phase								
	200V 1 phase								
	200V 3 phase								
				400V 3 phase					

Adjacent Installation

Highly efficient heat dissipation for space-efficient feature



Strong Communication Ability



Applications



Computerized Flat Knitting Machine



Packaging Machine



Conveyor



Reflow



Filling Machine



Recoiler

F510 series

Enhanced Fan & Pump Drive



Features

- Dual core processor with 32 bits MCU & CPLD improved kernel algorithm computing and protection function.
- IP55 enclosure is available for harsh environment, IP21 is also available.
- Advanced sensorless current vector control technology provides brilliant performance.
- Unique auto-tuning method has build up exact motor equivalent model.
- Built-in Modbus, BACnet, Metasys N2 communication protocol.
- Intelligent over-voltage prevention function for some regenerative loads without braking resistor.
- Dedicated parameter supported Water Supply Pump, Exhaust fan, HVAC application.
- Integrated PLC and RTC function for simple sequence control.
- Built-in 2 sets PID function with sleeping mode for fan or pump applications.
- LCD Operator displayed engineering unit and supported copy unit.
- Supports Fire mode to reduce smoke damage to human as possible.
- Integrated EMC Filter, and compliant with IEC/EN 61800-3 standard.

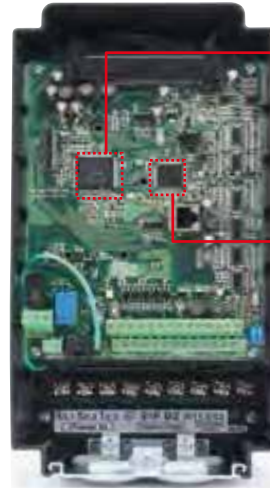
Power Rating	kW HP	3.7 5	5.5 7.5	7.5 10	11 15	15 20	18.5 25	22 30	30 40	37 50	45 60	55 75	75 100	90 125	110 150	132 175	160 215	185 270	220 300	280 375	315 425	400 535	500 670	600 800	
F510	IP20 200V 3 phase	Available														Not Available									
	IP21 400V 3 phase	Available																							
F510 IP55	400V 3 phase	Available												Not Available											

Built-in HVAC Communication

Advanced network functions for building automation inclusive of BACnet, Metasys N2 and Modbus. F510 can reduce the cost of installing automatic central air conditioning system.



DUAL CORE PROCESSORS



ASIC *Above frame2 models
Prevents inrush current damage to IGBT module. Enhances the reliability and life expectancy of motor drive.

32Bit MCU
Mass computing capability for advanced current vector control technology. Minimizes the internal loop time for higher control response.

Enhanced Performance & Reliability!

Excellent Pump Control

Built-in multi-pump control mode. According to the load of system, use intelligent control to coordinate pumps. It distributes running hours evenly across master and slave pumps to increase system efficiency and extend the life of drive.



IP55 for Harsh Environment

F510 provide IP55-protection enclosure for harsh environment to against the water and dust.



Modular Design



Features

PCB coating for all series meets IEC 60721-3-3 Class3C2 standard.

Regulation of output frequency 0.01Hz~599.0Hz

Filters on the full range in compliance with EN61800-3 2nd ed. about RFI emission limits

Fire mode

Built-in multi-pump control mode.

PID Function/ Second PID Function / 2-zone PID for different applications

Records of Power On and Operation Time, 4 Fault History Records and Latest Fault Record State, Energy-Saving Function, Phase Loss protection, Smart Braking, DC Braking, Dwell, S Curve Acceleration and Deceleration, Up / Down Operation, Modbus, BACNet MS/TP, and Metasys N2 Communication Protocol, Display of Multi- Engineering Unit, Local / Remote Switch, SINK / SOURCE Input Selection, User Parameter Settings, RS-485 Communication Standard, Simple PLC Function, 2 Sets of Analog Output, Safety Switch Auto Tuning, Soft-PWM, Over-Voltage Protection, Dynamic Braking, Speed Search, Momentary Power Loss Restart, 2 Sets of PID Control, Slide Difference Compensation

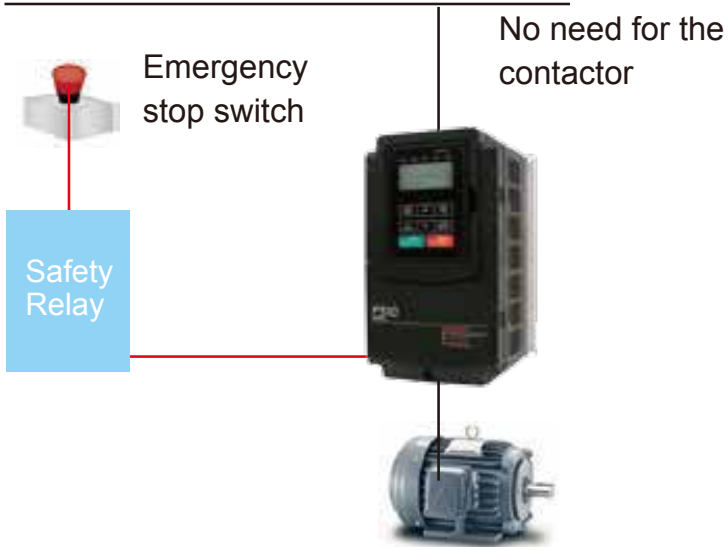
Enclosure IP00, IP20, IP55, Metal case

Built-in STO function

integrated Safe Torque Off (STO) function, complies with:

- EN ISO 13849-1 Cat/PLd
- EN60204-1 Category 0
- EN61508 SIL2
- EN62061 SIL CL2

Power



Applications

- Compressor
- Agitator
- Fans & Pumps
- HVAC



SG2 Series

Programmable Logic Relay



Features

Expandable I/O points up to 44.

Digital I/O, analog input, temperature input, analog output and optional communication modules.

A/O expandable to 8 points with voltage/current/temperature input.

Multi-communication linkage: Profibus, Devicenet, Modbus, Ethernet.

Dual Editing Format: Ladder format with a maximum of 300 lines; FBD format with a maximum of 260 blocks.

Advanced module (V series) with Modbus, I/O link and Remote I/O built-in.

RTC built-in (operational up to 240 hours after power off).

16-bit password protection function.

2 PWM output points, one of them could be used for 1KHz max.

Multi-language built-in (including English, French, Spanish, Italian, German, Portuguese, Simple Chinese, Polish, Russian and Turkish).

SG2 Series

Applications

Woodworking Machinery, Welding Machinery, Food Processing Machinery, Low Voltage and Factory Control



8 expansion points,
analog input and modbus expansion



Ethernet



Profibus



Devicenet

Look forward

Think global

TECO Electric & Machinery : Motors driving the world

Brief introduction of electrification products

As the company's core business from the start, TECO's electromechanical unit has own R&D center, global production bases and marketing/service networks, and complete and extensive global coverage. In line with the trend of IoT integration, innovative application, and energy conservation, the unit has integrated motor, reducer, inverter, and electronic protective relay, offering power transmission system products, marketing services and optimal custom solutions, thereby helping customers achieve the goal of "safety/stability, cost reduction, performance enhancement."

TECO's electrification products conform to multiple international standards, including CNS, IEC, NEMA, GB, JIS, CE, and UL, on top of passing various international certifications. The company is capable of manufacturing complete lineup of motors, covering low-, medium- and high-voltage motors, ranging 1/4HP to 100,000HP, and 14.5kV ultra high-voltage motors.

At the same time, actively push the development of "green products," engaging in, one step ahead of peers, the R&D of high-performance motors, boasting substantial power saving and energy consumption, which testifies to the company's active role for "the protection of the Earth's environment".

Low-voltage motor

TECO produces low-voltage motors, including permanent-magnet motors (3-120HP) and inductive motors (1/4-300HP), covering 1E1-1E4, with features of high performance, low temperature increase and long product life, thanks to strictly selected materials and high precision process, which cuts motors' losses.

Options for various protection grades (including IP22/23/54/55/56/66) are available, in addition to approvals of various international energy-performance or blast-proof certifications, such as IEC, CNS, GB, UL and CSA.





CAST IRON MOTORS IEC

Main Features

- IE3 - IP 55 Cast Iron motors
- Available voltages ratings:

All motors suitable for Delta/Star configurations

≤ 2.2	220/240 Δ 50	$3.0 \leq$	380/415 Δ 50
	250/280 Δ 60		Δ 60
	380/415 Y 50		440/480
	440/480 Y 60		660/690 Y 60

- PTC 150° standard
- Color RAL 7032 - C3 CLASS
- R23 Double lip oil seal on DE and NDE

- Oversized 4 X 90° rotatable terminal box
- Inverter duty
frame 280 and above, insulated bearings recommended
Casing: AESV= feet / feet + flange; AESU = flange)
B3, IM1001
B5, IM3001
B35, IM2001
B14, IM3601
B34, IM2101
NDF = non detachable feet
SDF = standard detachable feet (please see catalog)

Available Ratings

CONTINUOUS DUTY 50HZ 400V

IE3 CI, TEFC, CLASS F, 40°C AMBIENT TEMP. IEC, CONTINUOUS DUTY 50HZ 400V				
please see catalog for exceptions marked (*)				
POLES	From [kW]	to [kW]	CLASS	V / FREQ.
2	0,75	400	IE3 (*)	400 / 50
4	0,55	400	IE3 (*)	400 / 50
6	0,37	375	IE3 (*)	400 / 50
8	0,18	315	IE3 (*)	400 / 50

CONTINUOUS DUTY 60HZ 460V

IE3 CI, TEFC, CLASS F, 40°C AMBIENT TEMP. IEC,				
please see catalog for exceptions marked (*)				
POLES			CLASS	V / FREQ.
2	0,86	460	IE3 (*)	460 / 60
4	0,63	400	IE3 (*)	460 / 60
6	0,43	431	IE3 (*)	460 / 60
8	0,21	362	IE3 (*)	460 / 60

NEMA PREMIUM

IE3 CI, TEFC, CLASS F, 40°C AMBIENT TEMP. IEC, CONTINUOUS DUTY 60HZ 460V				
please see catalog for exceptions marked (*)				
POLES	From [kW]	to [kW]	CLASS	V / FREQ.
2	0,75	315	IE3 (*)	460 / 60
4	0,55	315	IE3 (*)	460 / 60
6	0,37	250	IE3 (*)	460 / 60

Options on request

- IP 56, IP65, IP66
- PTC additional
- Encoder
- Forced ventilation
- Insulated bearings
- Brakes
- ATEX Zone 1 / 2 / 21 / 22
- Rain cover

Certifications

- CE Conformity
- UL Certification for US and Canada
- Russian CU-TR (on demand)

ALUMINUM MOTORS IEC

Main Features

- IE3 Aluminum IP55 motors
- Casing: AERV= foot / foot + flange; AEQV = flange)
B3, IM1001
B5, IM3001
B35, IM2001
B14, IM3601
B34, IM2101
- Inverter duty
- 3 x PTC standard
- Double lip oil seal on DE and NDE



Available Ratings

IE3 CI, TEFC, CLASS F, 40°C AMBIENT TEMP. IEC, CONTINUOUS DUTY 50HZ 400V				
please see catalog for exceptions marked (*)				
POLES	From [kW]	to [kW]	CLASS	V / FREQ.
2	0,75	18,5	IE3 (*)	400 / 50
4	0,75	15	IE3 (*)	400 / 50
6	0,75	11	IE3 (*)	400 / 50



ELECTRIC MOTORS NEMA

NEMA

The TECO-Westinghouse MAX-E1® product line offers a broad range of NEMA Premium Efficiency motors from 3/4 hp to 800 hp that are suitable for any general purpose application and can meet most specific industrial requirements.

MAX-E1® motors are designed, manufactured and tested to meet or exceed the latest NEMA, IEEE, and other international standards. All motors are CSA certified for Class I, Division II, Groups B, C, and D; temperature code T3C and have a non-sparking, non-static fan.

MAX-E2® motors meet IEEE-841 standard, to be suitable for Petroleum and Chemical Industry use. Premium Efficiency Severe-Duty TEFC design up to 500HP



Main Features

- NEMA MG-1 design
- Efficiency NEMA Premium
- CSA certified Class 1 Division 2 Group B C D
- Voltage 230/460V or 575V in 60HZ
190/380V in 50HZ
- Output 1HP to 800HP
- Frame size 143T to 6808
- Insulation class F/B
- Inverter Duty per NEMA MG 1, Part 31, 4.4.2
- SKF, NSK or NTN bearing
- MAX-E2 meets IEEE841 std
- Stock availability
- NEMA explosion proof motor on request

SMOKESPILL MOTORS

Smokespill

TECO's smokespill motors are designed to operate at extremes of temperature in the event of fire (up to 400°C for 2 hours). These motors are installed in ventilation set which is to extract smoke & heat from buildings or tunnels giving sufficient time for people evacuation and rescue.

The design meets EN12101-3, providing F400, F300 and F200 with efficiency level IE3 and IE2. Output KW from 0,75KW to 400KW with frame size 80 to 355

Main Features

- Design std EN12103-3; IEC60034
- Available for F400, F300, F200
- Efficiency IE3 ; IE2
- Frame size H80 – H315
- Insulation class H
- Foot mounted ; Pad mounted
- Cooling IC411 ; IC418
- Double lip seals on both sides
- 3 off PTC with clamping type connection
- Metal cable gland on request
- Metal conduit cable upon request
- Ceramic terminal block upon request
- Metal fan for IC411High temperature grease



MOTOVARIO S.P.A.

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42, Rue de l'Avenir
69740 Genas
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MOTOVARIO GMBH

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MOTOVARIO S.A.U.

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MOTOVARIO LTD

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Worcestershire
United Kingdom

MOTOVARIO CORPORATION

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USA

**MOTOVARIO GEAR SOLUTIONS
PRIVATE LIMITED**

C.S. Plot No.512,
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700104 - Thakurpukur, Joka (Kolkata)
India

**MOTOVARIO INTERNATIONAL
TRADING (Shanghai) Co. Ltd**

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200060 - (Putuo Shanghai)
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