TOSHIBA

SOLID STATE STARTERS

TE3 Series

LOW VOLTAGE

AN ADVANCED DIGITAL SOFT STARTER FOR A WIDE VARIETY OF APPLICATIONS

Toshiba International Corporation's TE3 low voltage motor starter series is an advanced premium digitally-programmable solid state starter. This starter's heavy duty ratings, built-in bypass and advanced motor protection make the TE3 soft starter suitable for extremely demanding motor applications. The TE3 features:

- All TE3 Units Rated 500% Current for 60 Seconds
- Removable 3.5" Color Touch Screen Rated IP66/N4X
- 42 Smart Application Profiles – Easy Setup in One (1) Minute
- Auto Pedestal to Control Spinning Motors
- Built-in iERS (intelligent Energy Recovery System)
- 65 kA Rating with Breakers
- Advanced Motor Protection with Memory
- Life Time Event Logging Diagnostics
- Metering for Power, Voltage and Current

CONNECTION AND PROGRAMMING FEATURES

- 120VAC Control Voltage
- Easy User Terminal Access
- Four (4) Programmable Digital Inputs
- Five (5) Programmable Relay Outputs
- Analog Output 0-10V / 4-20mA
- Analog Input 0-10V / 4-20mA
- RS485 – Modbus® RTU; Other Industrial Protocols Available as Option

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EASY SETUP & TUNING

Ease of Use

The TE3 display will show all messages in full, and users also have the option to choose from a variety of languages what language their messages will display in. The TE3's display also uses graphics and other schematic images and real-time mimic diagrams to provide a visual representation of what is happening mechanically with the TE3. Detailed life logging will aid programming of the device, and onboard USB allows configurations to be uploaded, downloaded and/or emailed.

Auto Configuration

The starter's automatic functionality now allows for more features to be configured without needing to refer to parameter lists.

Built-In Applications

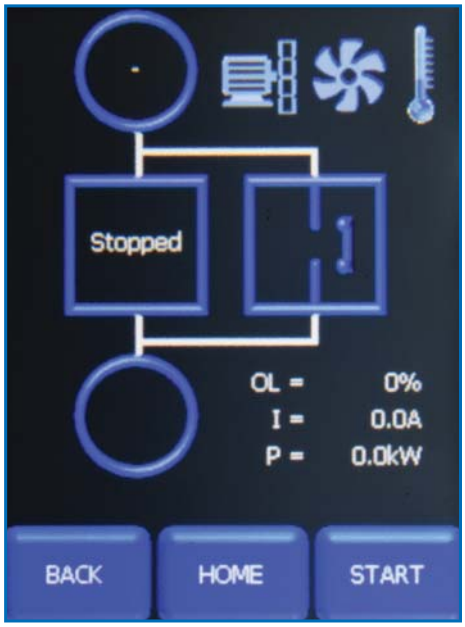
With many different applications profiles, the TE3 offers a quick and comprehensive commissioning process. Setup takes less than one (1) minute.

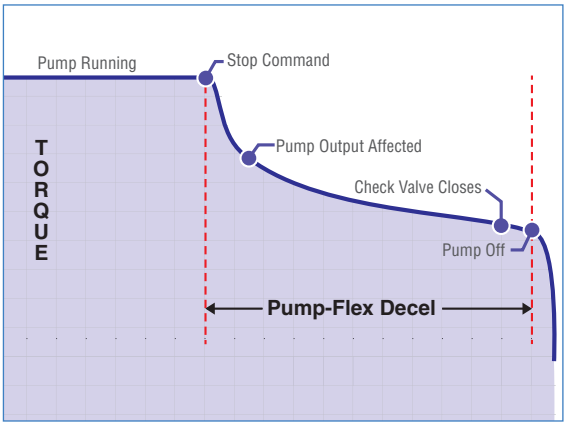
Automatic Load Tuning

The TE3 will dynamically tune to a changing load.

TE3 Configuration Software

The TE3's software can be used to commission, start-up, diagnose and troubleshoot the TE3. This software has an easy-to-use interface with built-in trend recorder, monitor and status panel.





Pump-Flex Decel Feature

DEDICATED APPLICATION FEATURES & FUNCTIONS

Pumps, Fans Blowers & Conveyors

Closed Loop Torque/Current Ramping provides a linear increase in output torque during motor acceleration and maximizes the available torque using an internal PID feedback loop to help ensure a smooth linear ramp. This smooth constant acceleration smooths out the various loads associated with these types of applications.

Compressors & Chillers

For large horsepower applications, Voltage Ramp with Current Limit provides the smoothness of voltage ramping while maintaining the ability to start in limited power environments.

Pump-Flex Decel Control - Auto Adjust 3 Points

Users are able to eliminate water hammer with the TE3's automatic advanced Soft Stop Controls. A gradual reduction in the output torque of your pump motor results when a stop signal is initiated. Check valves close gently, and other fluid system components are no longer subjected to the shock and destructive potential of water hammer.

Auto Pedestal

The Auto Pedestal feature offers a simple economical way to deal with dynamic situations in which fans spin backward with no user input required. Auto Pedestal automatically corrects the start voltage and senses when the motor is turning in the correct direction. For dynamic situations such as roof cooling fans, which may sometimes spin backwards, resulting in belt failures, the Auto Pedestal feature will control the ramp while the motor spins down to a stop and accelerates in the correct direction. Once the soft starter senses the motor is turning in the right direction, the soft start will accelerate the motor normally.

MOTOR PROTECTION, MEASUREMENT AND ANALYSIS FUNCTIONS

Motor Overload Protection

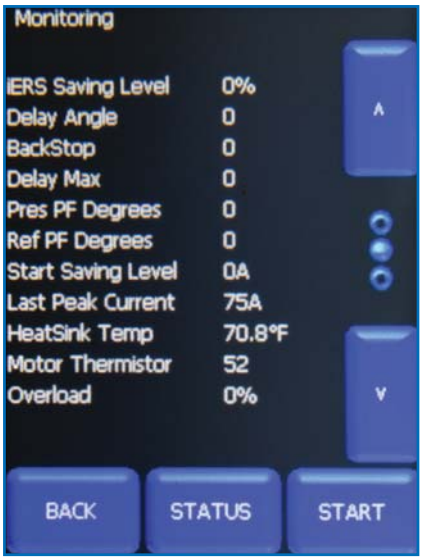
The TE3 protects the motor in the event of an overload condition at full I2t motor overload with the soft starter's intelligent thermal memory retention feature, which continually monitors overloads to determine reductions in motor heating levels even when the TE3 is in the "off" state.

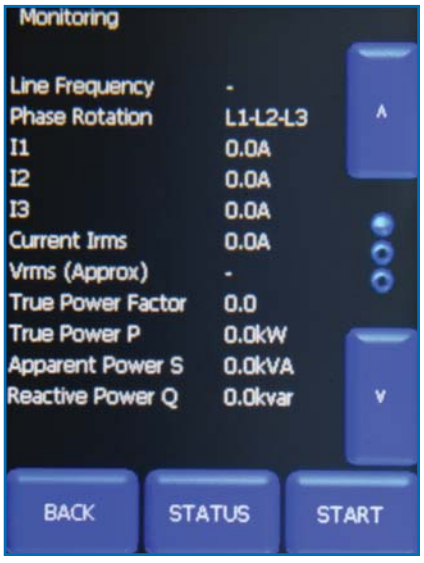
Event Logging

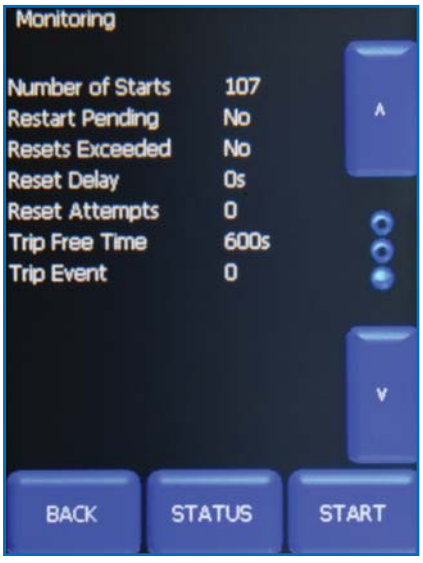
The TE3's data logger can record up to three million events to help enable users to conduct fast accurate fault analysis and their resolution. It allows for recording of multiple activities, including start, stop, top of ramp, faults, as well as application parameters (time, overload level, currents, frequency) and device information. Event logs can be downloaded via USB port or via the TE3 Tool (see page 6).

Soft Starter and Motor Monitoring

The TE3 continuously monitors and analyzes soft starter and motor data such as: Line Frequency, Phase Rotation, Changes to Current & Voltage (RMS), V rms, Real Power Factor, True Power P, Apparent Power S, Reactive Power Q, iERS Saving Level, SCR Overload, Delay Angle, Backstop, Delay Max, Pres PF Degrees, Ref PF Degrees, Start Saving Level, Last Peak Start Current, Last Peak Stop Current, Last Temperature, Last Overload, Heatsink Temp, Motor Thermistor Overload, Trip Free Time, Number of Starts.







SPECIFICATIONS

- Ranges from 18 - 1250A or 10 - 1000 HP
- 3-Phase SCR
- Full Motor Overload with Memory
- Standard Trip Class 10, Class 20 & Class 30
- 200, 208, 230, 380, 400, 460, 480, 575, or 600 Volts
- Operates on Varying Frequency (45 Hz - 65 Hz)
- Internal Bypass Contactor
- Auto Pedestal Function for Spinning Motor Direction Control
- User-Friendly, Full Color Touchscreen / Full Automatic Setup
- 120VAC Control Voltage
- iERS - (intelligent Energy Recovery System) as Standard
- Multiple Languages
- Modbus RTU as Standard, Other Protocols Available
- Inputs / Outputs:
  - 5 x Programmable Outputs Relays
  - 4 x Programmable Digital Inputs
  - 1 x Analog Input
  - 1 x Analog Output
  - USB for Data Logging and Parameter Setting / Saving
  - Full Meter Functions
- Comprehensive Data Logging
- Fully Field Upgradeable via USB Port
- Fully Field Serviceable Fans
- Two (2)-Year Warranty

ENERGY SAVINGS & EFFICIENCY

In the industrial sector, it is becoming increasingly important to offer technology that meets the corporate social responsibilities of companies, which includes a reduction in their carbon footprint, as well as reduces the overall running costs of equipment and minimizes downtime and maintenance.

Intelligent Energy Recovery System (iERS) is an advanced motor control technology for use in fixed-speed lightly loaded applications. It is proven to reduce the energy consumed in a variety of industrial and commercial applications and has been implemented in many markets, including HVAC and Oil and Gas.

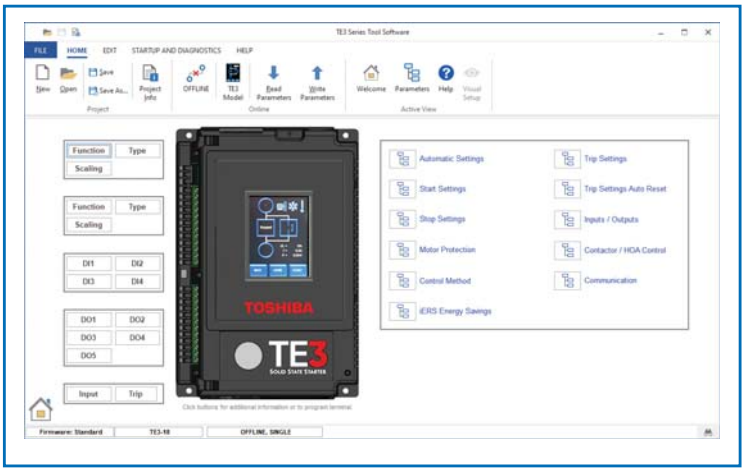
iERS is a technology that matches the power consumption to the load required. It intelligently monitors and regulates energy consumption on fixed speed motors. It also monitors the voltage, current and power factor during the start to calculate the full load figures. During the running stage, the power factor continues to be monitored.

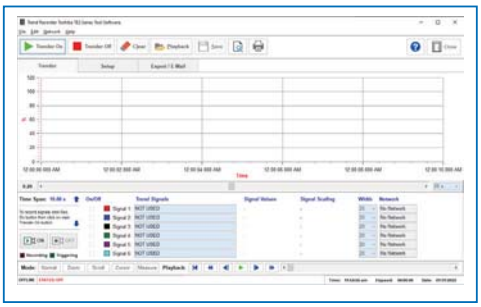
When the power factor drops, the motor is lightly loaded with excitation losses inherent in motor design that cause excess energy to be wasted. iERS's continual monitoring automatically recognizes these costly losses and reduces the voltage and current, not only to increase the load power factor but also to reduce the energy consumption, which allows the motor to run cooler. When the power factor increases, the motor is more loaded. iERS then automatically bypasses the SCRs to remove those excitation losses within the equipment.

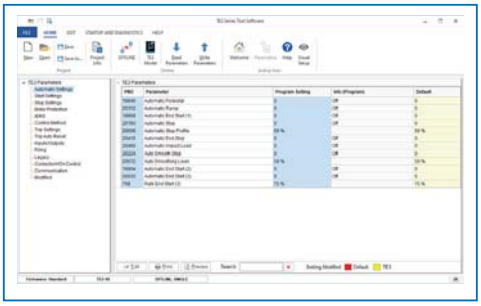
RUGGED, HEAVY DUTY PREMIUM SOFT STARTER

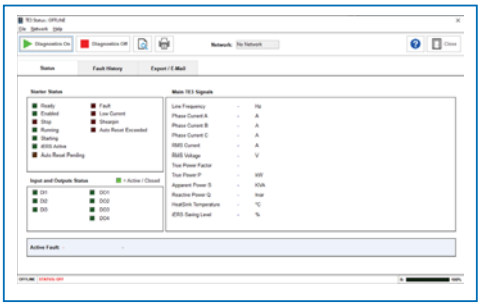
TE3 TOOL SOFTWARE

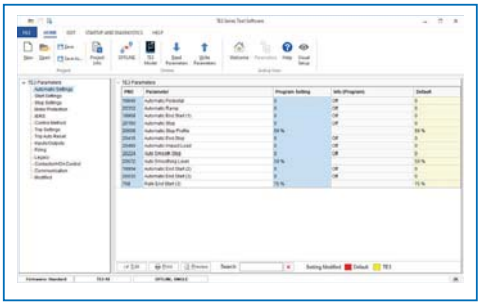
The TE3 can store up to three million events and provides a free link to a suite of advanced software to help track trends, commission motors, find problems, or record information. This TE3 Tool software also has a built-in user manual for the customer who wants to get into the details. Should a critical motor need special attention, TE3 Tool can also be connected to the TE3 to access the signal traces. A six-channel trend-recorder can be used to troubleshoot problems. The trends can be shared via email to help find issues with critical motors. A log that can store up to three million events offers detailed information about the motor's life. A predictive maintenance program can monitor trends to look for times to change or service motor, drive or drive components. TE3 Tool helps to commission the system, record events and troubleshoot any problems.











Software Features

- Parameter Editing and Commissioning
- Parameter Compare Functions
- Modified Parameter Overview
- Parameter Report Export to Popular File Format (PDF, XLSX, RTF, etc.)
- Visual Programming, Point and Click on TE3 I/O Terminals
- Monitor Panel with Four (4) Programmable Signals and Customizable Gauges
- Trend-Recorder with Six (6) Programmable Channels, Storage, Triggering, Playback
- Trend-Recorder Signal Measuring Mode (Avg, Min, Max, Peak)
- Status and Diagnostics Panel
- Fault History Overview
- Communication Connection for Serial, USB and Ethernet (Modbus/TCP)
- Built-In Comprehensive Help and Product Documentation
- Multi-Drop Network Support for Multiple TE3 Starters

TE3 Solid State Starter — Open Chassis Type

Model Number	Max. Amps	Nominal Motor Rating 50/60 Hz							
		208 V/HP		230 V/HP		460 V/HP		575 V/HP	
		Shunt Bypass	Start Bypass	Shunt Bypass	Start Bypass	Shunt Bypass	Start Bypass	Shunt Bypass	Start Bypass
TE3-18-BP	18	5	3	5	5	10	10	15	10
TE3-28-BP	28	7.5	7.5	7.5	7.5	20	15	25	20
TE3-39-BP	39	10	10	10	10	25	25	30	30
TE3-48-BP	48	15	10	15	15	30	30	40	30
TE3-62-BP	62	20	15	20	20	40	40	60	50
TE3-78-BP	78	25	20	25	25	60	50	75	60
TE3-92-BP	92	30	25	30	30	60	60	75	75
TE3-112-BP	112	30	30	40	30	75	75	100	75
TE3-150-BP	150	40	40	50	50	100	100	125	-
TE3-160-BP	160	50	40	60	50	125	100	150	-
TE3-210-BP	210	60	60	75	60	150	150	200	150
TE3-275-BP	275	75	60	100	75	200	150	200	150
TE3-361-BP	361	125	75	125	125	300	250	350	300
TE3-450-BP	450	150	125	150	150	350	300	450	300
TE3-550-BP	550	150	150	200	200	450	400	500	500
TE3-600-BP	600	200	200	200	200	500	500	600	600
TE3-862-BP	862	250	250	300	300	600	500	700	600
TE3-900-BP	900	300	250	350	300	700	600	900	600
TE3-1006-BP	1006	350	300	400	400	800	800	1000	900
TE3-1250-BP	1250	450	350	500	450	1000	900	1200	1000

INDUSTRIES SERVED

- Oil & Gas
- Mining & Minerals
- Chemical
- Water & Wastewater

APPLICATIONS

- Compressors
- Conveyors
- Crushers
- Fans
- Pumps

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