

PROJECT 100+ LOW VOLTAGE STARTERS

**NOW WITH NEW TD SERIES DIGITAL SOLID STATE STARTERS
FULL VOLTAGE NON-REVERSING STARTERS (FVNR)
REDUCED VOLTAGE AUTOTRANSFORMER STARTERS (RVAT)
WYE-DELTA OPEN TRANSITION STARTERS (YDOT)**

TOUGH QUARRY DUTY

Introducing Toshiba's New TD Series Solid State Starters

The Project 100+ Series Starters Offers the Latest Technology and Best Protection Available in a Standard Low Voltage Starter. This Series Combines Quick Delivery at a Price Level Comparable with Standard Air Magnetic Starters.

STANDARD FEATURES INCLUDE:

- UL/CUL
- TYPE 3R ENCLOSURE (INDOOR/OUTDOOR)
- MAIN CIRCUIT BREAKER
- VACUUM CONTACTOR(S)
- SOLID STATE MOTOR PROTECTION W/ADJUSTABLE TRIP CURVES
- CONTROL POWER TRANSFORMER (120VAC)

Many models are carried in stock (Houston, Texas).



TOSHIBA PROJECT 100+ STARTERS

FULL VOLTAGE NON-REVERSING & REDUCED VOLTAGE AUTOTRANSFORMER

STARTER SIZE (Max. FLA)	MAXIMUM 3 PHASE HORSEPOWER MOTOR VOLTAGE			
	208V	230V	460V	575V
4V (160A)	50	60	125	150
5V (320A)	100	125	250	300
6V (600A)	200	250	500	600
7V (720A)	---	300	600	700

FVNR starters are the most economic form of motor control available. They are used where full motor starting torque is acceptable and where the associated inrush current is not detrimental to the power system.

RVAT starters provide the highest starting torque per line ampere and are closed transition. They are used to reduce the starting power requirements when reduced starting torque is allowable. An incomplete sequence timer is standard to provide maximum protection against extended starting times. These starters include a medium duty autotransformer with voltage taps of 50%, 65%, and 80%.



Size 5V RVAT Starter

WYE-DELTA OPEN TRANSITION

STARTER SIZE (Max. FLA)	MAXIMUM 3 PHASE HORSEPOWER MOTOR VOLTAGE			
	208V	230V	460V	575V
4V (275A)	100	100	200	250
5V (550A)	200	200	450	500
6V (960A)	350	400	700	1000
7V (1240A)	---	500	1000	1250

YDOT starters are used with delta-wound motors the appropriate leads brought out to facilitate a wye connection for starting. They are suitable for high inertia loads or long acceleration time applications where low starting torque is acceptable. Although not a true reduced voltage, the starting line current is reduced to 33% of full voltage starting. An incomplete sequence timer is standard to provide maximum protection against extended starting times. Both mechanical and electrical interlocks are provided.

Notes: 4V -- Size 4 Vacuum Contactor
 5V -- Size 5 Vacuum Contactor
 6V -- Size 6 Vacuum Contactor
 7V -- Size 7 Vacuum Contactor



Size 4V Wye-Delta Open Transition Starter

TOSHIBA PROJECT 100+ STARTERS

SOLID STATE

STARTER SIZE MODEL	MAXIMUM 3 PHASE HORSEPOWER MOTOR VOLTAGE			
	208V	230V	460V	575V
TD108	50	60	125	150
TD109	60	75	150	200
TD110	75	100	200	250
TD111	100	125	250	300
TD111	125	150	300	350
TD012	-	-	350	400
TD113	150	200	400	500
TD114	200	250	500	600
TD115*	250	300	600	700
TD115*	300	350	700	800

* - These units use air contactors for the bypass contactor. Consult Factory for higher rated units.



TD111 Solid State Starter

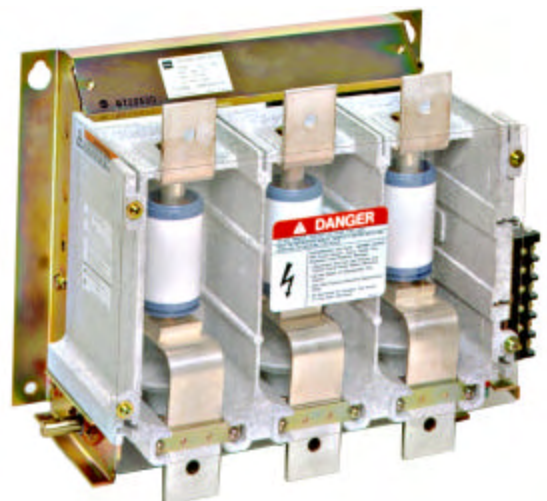
Toshiba's series of solid state starters incorporates the latest design technology to provide a custom starting condition for a variety of applications. The Project 100+ solid state starters include a vacuum contactor except for SSS above 720A motor FLA, as well as a main circuit breaker, control power transformer, in an indoor/outdoor enclosure.

- **Soft Start:** Provides smooth and stepless starting.
- **Soft Stop and other Stopping Methods:** A soft stop allows the user to control deceleration and reduces mechanical stress on the motor and its load. Optional DC injection braking allows for faster stops.
- **Voltage Rating:** Starters are also available in 380V and 415V models.
- **Protection:** Phase imbalance, phase loss, electronic overload, shorted SCR, shorted load, short circuit, undercurrent (loss of load), overcurrent (jammed load), repetitive starting, and starter overtemperature.
- **Conformity to Standards:** Conforms to the applicable NEMA, UL, and cUL standards.

FVNR, RVAT & WDOT Project 100+ starters include Toshiba vacuum contactors and the Toshiba 2E electronic overload relay, main circuit breaker, control power transformer, in an indoor/outdoor enclosure.

Toshiba vacuum contactors offer superior performance over standard air magnetic contactors.

- **Environment Resistant:** Ideal for use in high dust areas. Switching arc is contained within the vacuum bottle, shielding the main contacts.
- **Reduced Maintenance:** Vacuum bottle contacts have long life with virtually no maintenance required.
- **No External Surge Protection Required:** Special contact materials minimize chopping current.
- **Designed for Safety:** High voltage and low voltage parts are totally separated by an insulated barrier (non-flammable molded frame). The CV-1GAU (160A) and CV-1HAU (320A) are rated to 2.5kV, and the CV-1JBU (600A) and CV-1KAU (720A) are rated to 1.5kV maximum system voltage.
- **Conformity to International Standards:** Conforming to international industrial standards.
- **High Interrupting Performance:** Provides a wide margin of protective coordination with any type of power fuse resulting in increased electrical safety and reliability.



CV-1JBU (600A) Vacuum Contactor

TOSHIBA PROJECT 100+ STARTERS

Toshiba's 2E relay, model RC820, prevents many motor failures. This solid state relay features precise motor protection. The 2E provides overload and single phase protection and has an adjustable setting for very wide range from 3 to 40 seconds (starting characteristic, at 600% current) to accommodate reduced voltage start-ups and high inertia loads.

- **Overload & Single Phase Protection:** Two protective functions are incorporated.
- **Solid State:** Provides high reliability and precise operation.
- **Manual Test Feature:** Manual test switch offers convenience for sequence testing.
- **Manual/Remote Reset:** Selection of reset mode gives application flexibility. Automatic reset is optional.
- **Flexibility:** The relay allows for a high degree of flexibility for coordinating with a wide range of current and trip time settings.
- **Visible Trip Indicator:** LED indicator shows relay trip status clearly until reset.
- **Internationally Recognized:** The relay complies with international standards as well as UL and CSA.
- **Ground Fault & Phase Reversal Option:** The 2E relay can be provided with an optional Ground Fault module, Phase Reversal module, or a module that combines both functions.
- **Available in Solid State Starter:** The 2E is offered when "Manual Bypass" (emergency full voltage starting) is ordered.



RC820 (2E) Motor Protection Relay

Standard Features

Main Circuit Breaker: The Project 100+ starters include a main circuit breaker for an incoming disconnect and short circuit protection. The breaker is door interlocked and has padlock provisions.

Control Power Transformer: A control power transformer is provided as standard with a 120VAC secondary. Included are one secondary and two primary fuses.

Type 12/3R Enclosure: Starters are suitable for both indoor and outdoor applications. Type 12/3R enclosure meets the requirements for Type 1, 1A, 12 and 3R (dust tight, rain tight, sleet and ice resistant).

Auxiliary Contacts: At least two normally open and two normally closed (2NO/2NC) contacts are provided on each contactor. Additional contacts are provided on the interposing relay. Some contacts are used in the control circuit. For exact number of contacts available for customer use, contact the local Toshiba dealer or sales office.

Solid State Timing Relays: On Reduced Voltage Autotransformer and Wye-delta starters, solid state timing relays (starting and incomplete sequence) are provided.

TOSHIBA

TOSHIBA INTERNATIONAL CORPORATION
INDUSTRIAL DIVISION

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