We make it easy for you to flex your application's muscle

PowerFlex® 750-Series AC Drives

Allen-Bradley

by ROCKWELL AUTOMATION

PowerFlex® 750-Series AC Drives Power and Control Made Just for You

PowerFlex 750-Series of AC drives are designed with your needs in mind—your need for flexibility, productivity and ease of use. The result is a family of AC drives that provides an exceptional user experience, from initial programming through operation.

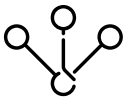
This robust family of AC drives offers high performance for a wide variety of industrial applications.

The PowerFlex 753 provides general purpose control for applications ranging up to 350 Hp/250 kW while the PowerFlex 755 provides maximum flexibility and performance up to 2000 Hp/1500 kW.

With a complete power range of 0.75 to 1500 kW (1 to 2000 Hp) and 400/480 and 600/690 volt availability, the PowerFlex 750-Series is a comprehensive drive family providing productivity-enhancing benefits to a wide range of global applications.

The PowerFlex 753, 755 AC and 755T drives offer more selection for control, communications, safety and supporting hardware options than any other drives in their class.

Key Drive Features



Simplified Integration with Logix

The PowerFlex 753 and 755 drives offer easy integration into the Logix environment. It offers simplified and enhanced configuration, programming, commissioning, diagnostics and maintenance. Using either Add-on Profiles or embedded instructions*, you'll be able to reduce engineering time and related costs.

Communications

The PowerFlex 750-Series of drives supports a wide array of network protocols to ease integration. The PowerFlex 755 drive features an embedded EtherNet/IP™ port, which allows you to easily manage drive data over EtherNet/IP networks. In addition, a dual-port EtherNet/IP option module for the PowerFlex 750-Series drives provides flexible and cost-effective ways to apply EtherNet/IP, including Device Level Ring functionality.

Safety Solutions that Help Improve Productivity

In the past, implementing safety solutions often meant sacrificing productivity. PowerFlex 750 Series drives address productivity concerns by offering safety options that help protect your people and equipment while also reducing planned and unplanned downtime.

DeviceLogix™

Controls outputs and manages status information locally within the drive, allowing you to operate the drive independently or complementary to supervisory control.

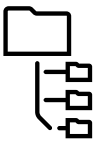
** PowerFlex 755 uses embedded instructions*

Configure for Your Application

Each drive has a slot-based hardware architecture that reduces unnecessary add-ons. This gives you the flexibility to select option cards to suit your application and expand your drive for future needs. Supported hardware control options are common for the series to help reduce your inventory and spare parts requirements.

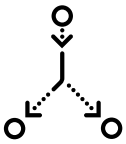
Predictive Diagnostics

Prevent unplanned downtime with predictive diagnostics and built-in protection features to help protect your investment. These settings allow the PowerFlex 750-Series drives to keep track of information that affects the life of the drive components. PowerFlex 755 drives 250 kW/350 Hp and larger have additional diagnostic features including built-in protection devices. PowerFlex 755T drives continuously monitor operation and then calculate expected life of components based on actual operating conditions. This information is provided in real time back to your control system.



Application-matched Packaging

Gain additional flexibility with packaging options that address a range of application and environmental protection requirements.



Feedback

Options include Universal, Encoder and Dual Encoder feedback options. The Universal Feedback option includes multiple feedback interfaces to support a wide range of applications. Interfaces supported are Incremental, EnDat and Hiperface for Stegmann and Heidenhain high resolution feedback, SSI and BiSS for rotary and linear applications. The drives also provide automatic feedback loss switchover.

PowerFlex 755T Drive Solutions

Allen-Bradley® PowerFlex® 755T AC drives help you make the most of your assets and production time. They offer the benefits of harmonic mitigation, regeneration and common bus solutions. These benefits, along with TotalFORCE® Technology provide excellent motor control through precise, adaptive control of positioning, velocity and torque.

PowerFlex 755TL drives provide harmonic mitigation and power factor correction through the use of active front end technology.

PowerFlex 755TR drives provide an energy-efficient solution that uses regenerative active front end technology to deliver energy back to the incoming supply. Drives also provide harmonic mitigation and power factor correction.

PowerFlex 755TM drive systems allow you to select from a series of predesigned configurations for regenerative common bus supplies and common bus inverters to optimize your system design and power consumption.

You're smart, dependable and brimming with useful insights. Shouldn't your variable frequency drive have those same traits? **Ours do.**

PowerFlex 753 AC Drive

The PowerFlex 753 drive is ideal for general purpose applications requiring speed or torque control up to 250 kW/350 Hp. Embedded I/O along with three option slots for safety, feedback, communications, 24V power or additional I/O make the drive a flexible, cost-effective solution.

PowerFlex 755 AC Drive

PowerFlex 755 drive is ideal for applications requiring positioning, speed or torque control up to 1500 kW/2000 Hp. The PowerFlex 755 drive is easily integrated with the embedded Ethernet port and has five option slots. This supports additional options for feedback, I/O, safety, communications and auxiliary 24V DC control power.

The PowerFlex 755 AC drive can be integrated with a ControlLogix® or CompactLogix™ Programmable Automation Controller (PAC) via embedded drive instructions. This level of integration is specific to PowerFlex 755 drives on EtherNet/IP.

TotalFORCE Technology

PowerFlex 755T drives offer TotalFORCE Technology to help your application achieve increased throughput, improved quality and reduced downtime.

Increase the Throughput of Your Application

With excellent tracking, the drives follow speed or torque commands very closely. They also effectively reject disturbances when loads change suddenly to help keep the application running smoothly.

Improve the Quality of End-products

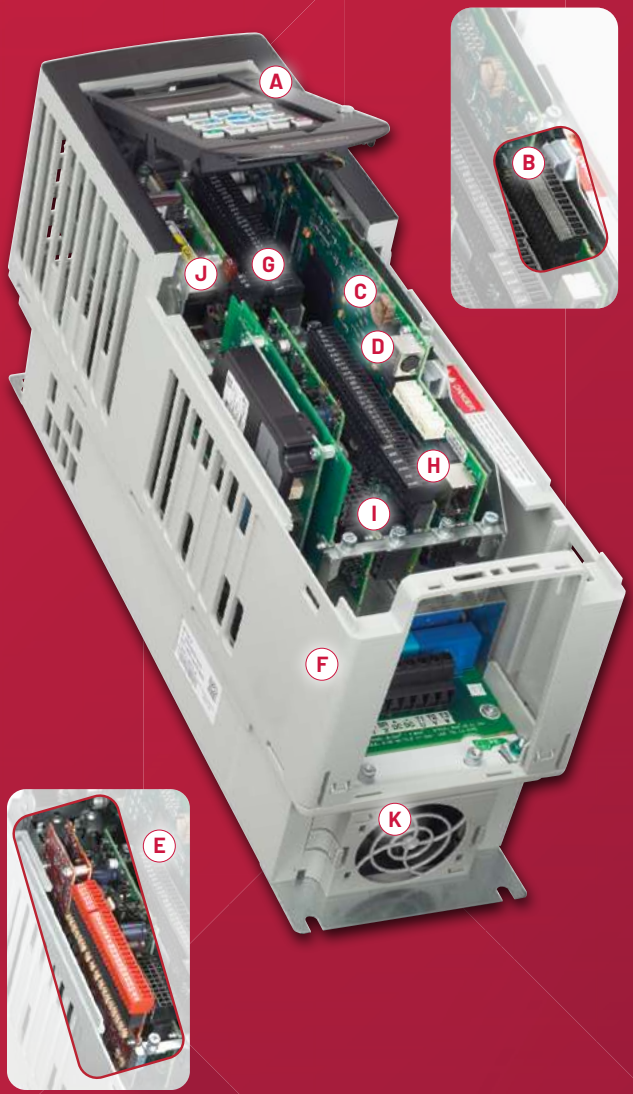
As a result of rapid processing speed, the drives are able to provide precise position, velocity and torque control to help improve the uniformity of end products. In addition, high torque accuracy helps maintain speed regulation in demanding tension control applications.

Reduce Equipment Downtime

PowerFlex 755T drives continuously monitor operation, tracking the health of electrical components in the drive and motor to provide real-time diagnostics. With this information, you can predict equipment failures and take action to prevent unplanned downtime. In addition, adaptive control features within the drives help isolate potentially harmful vibration and automatically compensate for variances.

PowerFlex 750-Series AC Drive

- **A** High-definition LCD display allows for six lines of text for more meaningful explanations of parameters and events.
- **B** Standard I/O on the PowerFlex 753 provides a cost-effective solution.
- **C** Real-time clock provides time-stamped events vs. run-time data.
- **D** Additional DPI for expanded programming capability.
- **E** Increase safety performance levels with the Safe Speed Monitor option card which includes an embedded safety relay.
- **F** Packaging options to meet application requirements.
- **G** DeviceLogix embedded control technology provides function block programming for stand-alone control of basic applications.
- **H** Easily configure, control and collect drive data with standard embedded Ethernet port on the PowerFlex 755.
- **I** Slot-based mechanical architecture to support additional options for I/O, feedback, safety, communications and auxiliary power supply.
- **J** Optional Auxiliary Power Supply maintains control and communications in event that main power is not present.
- **K** Easily assessable heat sink and internal fans.



PowerFlex 755T AC Drives

1. AC pre-charge module regulates the input AC current from the incoming power source, greatly reducing stress on the power components during power up.
2. LCL Filter is a 230 mm wide module that provides low harmonic capability and minimizes the current distortion into the utility grid.
3. Line side converter is a 230 mm wide module that draws energy from the AC line without harmonic distortion and converts it to DC power. It also provides a means of regeneration back to the AC line.
4. Motor side inverter is a 230 mm wide module that controls the voltage and current of the motor.
5. IP21/IP54 enclosures provide a choice of packaging options to meet the environmental requirements of your application.
6. Control pod contains the control platform that is responsible for motor control, system control and communications. Five option slots allow you to add I/O, safety and feedback. There is one control pod for each common bus inverter and one for the regenerative bus supply.
7. DC pre-charge regulates the input DC current from the incoming power source, greatly reducing stress on the power components during power up. It also provides a means of isolating the inverter from the DC bus for service or maintenance.
8. Roll in/out design makes the drive easy to install and service by allowing complete removal of a module from cabinet, providing generous room for wiring behind the drive. Power wiring can stay connected while unit is rolled out.

Regenerative Bus Supplies:

400/480V: 87 kW...4358 kW / 90 kW...4818 kW

600/690V: 69 kW...4432 kW / 84 kW...4714 kW

Common Bus Inverters:

400/480V: 160 kW...3600 kW / 250 Hp...6000 Hp

600/690V: 200 Hp...4500 Hp / 250 kW...5100 kW

Safety Solutions that Help Improve Productivity

In the past, implementing safety solutions often meant sacrificing productivity. PowerFlex 750 series drives address productivity concerns by offering safety options that help protect your people and equipment while also reducing planned and unplanned downtime.

PowerFlex 750 series drives offer a choice of four safety option modules:

Hardwired Safe Torque Off is designed for safety-related applications that benefit from removal of rotational power from the drive. This functionality offers the benefit of quick start-up after a demand on the safety system. SIL3, PLe, CAT 3

Networked Safe Torque Off on EtherNet/IP provides the same benefits as hardwired Safe Torque Off – plus the ability to simplify your machine design and minimize required equipment. SIL3, PLe, CAT 3

Safe Speed Monitor provides a hardwired solution for applications that can benefit from access to a safety zone while there is limited motion. It allows operators to perform some process or maintenance work without stopping the machine. SIL3, PLe, CAT 4

Integrated safety functions provide the PowerFlex 750 series drives with advanced safety on an EtherNet/IP network. The option module uses safety instructions based on IEC 61800-5-2.

Drive-based safety instructions include:

- STO – Safe Torque Off
- SSI – Safe Stop 1

Controller-based safety functions include:

- SFX – Safety Feedback Interface
- SS1 – Safe Stop 1
- SS2 – Safe Stop 2
- SOS – Safe Operational Stop
- SLS – Safely-limited Speed
- SLP – Safely-limited Position
- SDI – Safe Direction
- SBC – Safe Brake Control

When used as part of an integrated safety system that includes a GuardLogix® 5580ES controller or Compact GuardLogix 5380ES controller, the integrated safety functions option module provides safety ratings up to and including SIL3 and PLe Cat 4. Studio 5000 Logix Designer application version 31 or later is also required.

The Right Packaging for Your Application

PowerFlex 750-Series drives are available with various packaging options. Highly flexible IP00 open styles, MCC-style cabinets and other features help provide additional protection. PowerFlex 750-Series drives, with the right packaging, help you meet productivity your goals.

PowerFlex 755 Floor Mount Drives with IP00, NEMA/UL Open Type Ratings

The PowerFlex 755 IP00, NEMA/UL Open Type drives are designed to provide packaging flexibility, including the option for either vertical or horizontal mounting orientations. This option is available in PowerFlex 755 floor mount drives with ratings up to 1500 kW/2000 Hp.

PowerFlex 750-Series Drives with IP54/UL Type 12 Ratings

For applications requiring additional protection from harsh environments, PowerFlex 753 and 755 drives are available with IP54/UL Type 12 enclosures. These enclosures help protect the drive from dust and splashing water and are appropriate for moderately harsh indoor environments.

PowerFlex 750-Series drives are available with a variety of enclosure options and ratings including IP00, IP20, IP54 (above left) and an extra protection flange mount (above right).

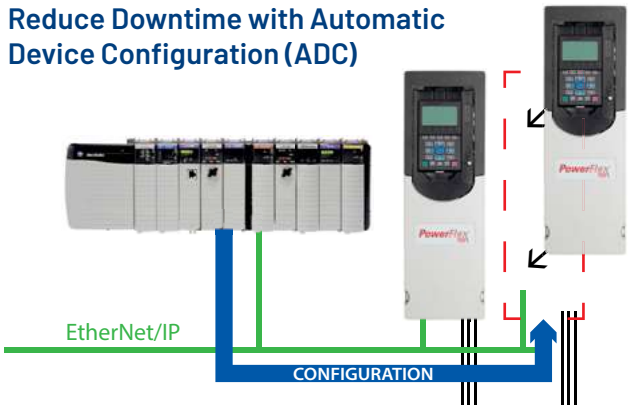
Keep it Simple with Premier Integration

Dealing with the complexity of today's manufacturing operations can be exhausting. The work required to configure and connect controllers and smart devices can cause a plant manager to go running for the hills. To make programming less cumbersome, time-consuming and costly, look to the Premier Integration experience.

Enabled by the Logix control platform, Premier Integration experience consolidates controller programming, device configuration, and machine operation/maintenance into one environment. This single software experience helps reduce integration and configuration.

PowerFlex drives use add-on profiles in Studio 5000™ Logix Designer software to streamline drive installation. The result is simplified programming, which reduces to the need to refer back to user manuals for specific parameter and tag information.

Reduce Downtime with Automatic Device Configuration (ADC)



Easy-to-use tools help reduce development time and require no specialized knowledge – Wizards with advanced graphical interfaces walk you through drive parameter configuration.

Eliminate errors associated with using multiple software tools – Single development environment to configure and program your entire Logix drive system.

Access, edit and save drive information to the control system project with ease – Drive configuration is saved as part of the RSLogix project file (*.acd) and is also stored in the Logix controller, so there's no need to store and maintain multiple files – you only need one file.

Easily download global objects and faceplates – You can use the same tag names generated by the drive add-on profiles to utilize global objects and faceplates for a FactoryTalk® View HMI display

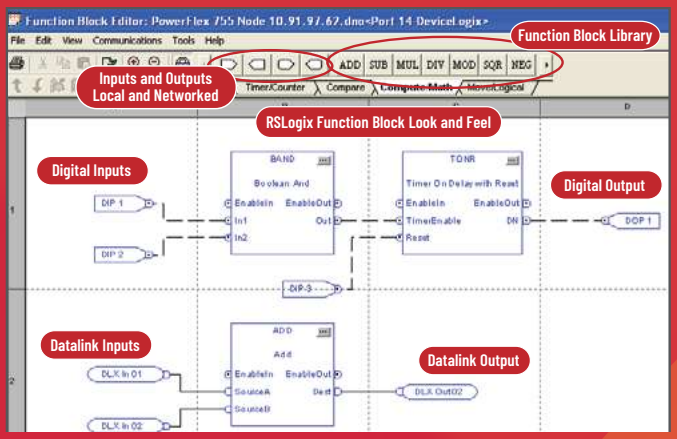
Easy to Maintain – Diagnostic, fault, alarm, and event information are integral to Studio 5000.

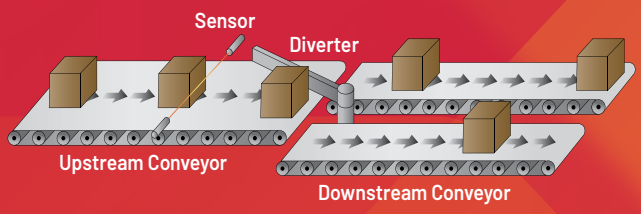
Customize your Solution with **DeviceLogix™ Control Technology**

DeviceLogix control technology provides you with the flexibility to customize a drive to more closely match your application needs.

You can use the PowerFlex 750-Series DeviceLogix to:

- Speed reaction time by processing in the drive, which reduces dependency on network throughput
- Provide scaling, selector switches, or other data manipulations not already built into the drive
- Read inputs/write outputs and exclusively control the drive
- Provide an option for decision-making if communication is lost with main controller
- Control other PowerFlex drives via a Peer-to-Peer EtherNet/IP network





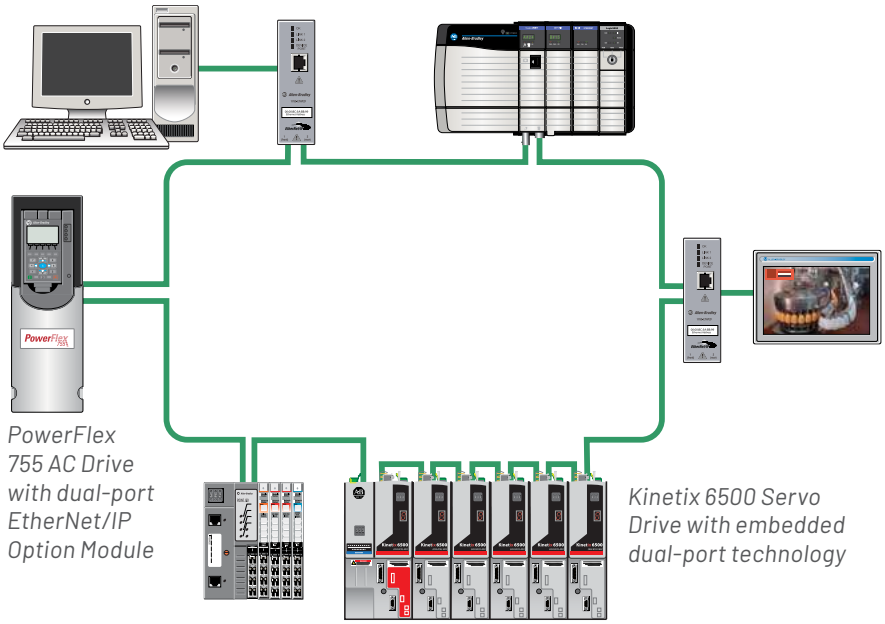
DeviceLogix is easily programmed via: RSLogix 5000 and DriveTools SP v 5.01.

EtherNet/IP – A Single Network for Complete Machine Control

Connect Your Entire Enterprise

Benefit from the EtherNet/IP network for complete machine control that simplifies and enhances machine design.

- Low cost, high performance and easy to use
- Easily integrate any PowerFlex drive, I/O, smart actuators and any other EtherNet/IP connected device
- EtherNet/IP is an established, broadly-adopted network
- PowerFlex 755 AC drives and Kinetix 6500 servo drives can reside on the same EtherNet/IP network.



PowerFlex 755 AC Drive with dual-port EtherNet/IP Option Module

Kinetix 6500 Servo Drive with embedded dual-port technology

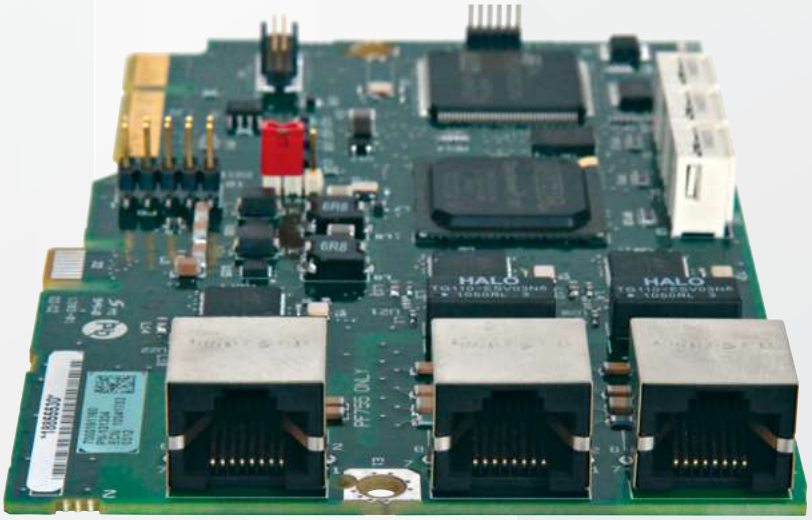
Device Level Ring (DLR) is an ODVA standard and provides fault tolerant connectivity for high drive availability. If one device on the EtherNet/IP network fails, the other devices are able to continue operation.

Dual-port EtherNet/IP Option Module Enhances Flexibility

The PowerFlex 750-Series drives dual-port EtherNet/IP option module provides flexible and cost-effective ways to apply EtherNet/IP. It supports ring, linear and star topologies as well as DLR functionality. DLR-based networks reduce configuration time and costs by minimizing the number of managed switches and reducing cabling needs.

Information is received in real time to various levels of an organization, without adding complexity. Getting real-time information helps you enhance the agility of your business.

This solution supports optimal integration on a DLR level for the PowerFlex 755 and 755T drives. This further integration into the Rockwell Automation Integrated Architecture. Allen-Bradley drives are able to offer optimal integration into the Integrated Architecture. This provides simplified configuration, programming, commissioning, diagnostics and maintenance.



All PowerFlex 755 AC drives have a single embedded Ethernet port. This 750-Series option module provides the benefits of dual-port EtherNet/IP functionality for both the PowerFlex 753 and 755.

Technical Specifications

	PowerFlex 753 AC Drive	PowerFlex 755 AC Drive	PowerFlex 755 TL, TR, TM
Ratings: 280-240V	0.5...200 Hp 2.2...477 A	0.5...200 Hp 2.2...477 A	N/A
Ratings 400-480V	• 0.5...300 Hp 1.7...289A	• 0.5...1500 Hp 1.7...1530 A	• 10...5100 Hp 11...4960 A
Ratings 600V	• 5.5...250 kW 12...263A	• 5.5...1500 kW 12...1485 A	• 11...4550 kW 15...4596 A
Ratings 690V	• 5.5...250 kW 12...263A	• 5.5...1500 kW 12...1485 A	• 11...4550 kW 15...4596 A
Communications	Optional • EtherNet/IP • ControlNet (Coax or Fiber) • DeviceNet • RS485 DFI • PROFIBUS DP • Modbus/TCP • HVAC (Modbus RTU, FLN P1, N2) • CANopen • LonWorks	• Embedded EtherNet/IP Optional • CIP Motion • ControlNet (Coax or Fiber) • DeviceNet • RS485 DFI • PROFIBUS DP • Modbus/TCP • HVAC (Modbus RTU, FLN P1, Metasys N2) • Bluetooth • CANopen • LonWorks	• Embedded Dual-Port EtherNet/IP Optional • ControlNet • DeviceNet • PROFIBUS DP* • PROFINET*
Safety Options	• Hardwired Safe Torque-Off • Hardwired Safe Speed Monitor	• Hardwired Safe Torque Off • Networked Safe Torque Off • Hardwired Safe Speed Monitor • Networked Integrated Safety Functions – 8 safety instructions based on IEC 61800-5-2	• Hardwired Safe Torque Off • Networked Safe Torque Off • Hardwired Safe Speed Monitor • Networked Integrated Safety Functions – 8 safety instructions based on IEC 61800-5-2
Ambient Temperature Ratings	IP00/IP10/IP20, NEMA/UL Open Type = 0-50 °C (32-122 °F) • Flange Mount Front: IP00/IP20, NEMA/UL Open Type = 0-50 °C (32-122 °F) • Flange Mount Back: IP66, NEMA/UL Type 4X = 0-40 °C (32-104 °F) • IP54, NEMA/UL Type 12 = 0-40 °C (32-104 °F)	IP00/IP10/IP20, NEMA/UL Open Type = 0-50 °C (32-122 °F) • Flange Mount Front: IP00/IP20, NEMA/UL Open Type = 0-50 °C (32-122 °F) • Flange Mount Back: IP66, NEMA/UL Type 4X = 0-40 °C (32-104 °F) • IP54, NEMA/UL Type 12 = 0-40 °C (32-104 °F)	• -20 °C...40 °C • -20...60°C with derate
TotalFORCE Technology	No	No	Yes
Motor Control	• Vector Control w/FORCE™ Technology with and without an encoder • Sensorless Vector Control • Volts per Hertz • PM but only interior	• Vector Control w/FORCE Technology with and without an encoder • Sensorless Vector Control • Volts per Hertz • Permanent Magnet Motor Control (Surface and Interior) • Open Loop Speed Regulation • Closed Loop Speed Regulation	• Vector Control w/TotalFORCE Technology with and without an encoder • Sensorless Vector Control • Volts per Hertz • Permanent Magnet Motor Control (Surface and Interior) • Open Loop Speed Regulation • Closed Loop Speed Regulation
Standards and Certifications	ABS (Frames 2...7, 400/480V AC) ATEX Certified with appropriate options • CE • C-Tick • cUL • UL • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option	ABS (Frames 2...8, 400/480V AC) ATEX Certified with appropriate options • CE • C-Tick • cUL • UL • TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option	ABS (Frames 5...8, 400/480/600/690V AC) • CE • C-Tick • EAC • ICC • RCM • RoHS • UL• WEEE; TÜV FS ISO/EN13849-1 (EN954-1) with Safe Torque-Off option
Output Frequency Range	• 0...325 Hz @ 2 kHz PWM • 0...590 Hz @ 4 kHz PWM	• 0...325 Hz @ 2 kHz PWM • 0...590 Hz @ 4 kHz PWM	• 0...325 Hz @ 1.33 kHz carrier • 0...325 Hz @ 2 kHz carrier • 0...590 Hz @ 4 kHz carrier
EMC Category	See 750-TD001	See 750-TD001	See T55T-100

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AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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Publication 750-BR001B-EN-P - November 2020 | Supersedes Publication 750-BR001A-EN-P - January 2013
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