

AUTOMATIONDIRECT.com

High Performance AC Variable Frequency Drives (VFDs)



DURA
PULSE

WEQ

TOSHIBA

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High Performance Variable Frequency AC Drives.

When precision is required.



AutomationDirect.com is a trusted source for high-performance AC drives. High-performance AC drives are the top-of-the-line drive that is selected when a high degree of precision in speed control is required, full torque is needed through the speed range of the motor (full torque available at very

low or zero speeds), or if torque control mode is required (controlling and maintaining torque as opposed to speed).

High-performance AC drives also have many features not found on lower-cost drives.

What are the benefits of high-performance AC variable frequency drives and why would I need one?

- High-precision speed control – high-performance drives support very tight speed control tolerances for applications with or without encoder feedback.
- Full torque throughout the motor's speed range – high-performance VFDs always support vector speed control. Sometimes this is sensorless vector which is an open-loop system that still allows for full torque from base speed down to very low speeds; many support closed-loop flux vector speed control which will support 100% of the drive's available torque from base speed down to zero speed.
- Torque control – applications such as winders and tensioners, where the motor's torque needs to be varied and controlled in lieu of motor speed, require a torque control mode. High-performance AC drives offer this control methodology. GS30 includes a dedicated tension control parameter set.
- High tech features – high-performance VFDs offer features not found on other classes of drives. Most modern AC drives offer features such as dynamic braking and an integrated PLC as well as some communications capabilities. High-performance VFDs take this to a new level with more powerful PLCs, advanced functionality, advanced networking capabilities and safety features such as STO and SS1.
- Modularity – high-performance drives are offered in an extensive range of horsepower sizes ranging from ¼ or ½ hp up to 300 hp. Choosing a high-performance drive on all your applications lets you know you can cover any horsepower application needed and won't need to relearn drive configuration.

Not sure that this is the right AC Drive series you need?

Click for a complete selection guide

What type of applications use high-performance AC variable frequency drives (VFDs)?

Applications where a high-performance VFD might be used, are ones that require tighter precision. Such as: a brake-meter conveyor belt used for high-speed gapping of products



Winders and tensioner applications that will control torque during the machine cycle and sometimes switch between speed control and torque control



High-performance VFDs are also commonly used where several drives are networked to one controller and operate as a large finely tuned machine. Some examples are: paper mills, steel mills, and textile mills



Why buy drives from us?

There are several distinct advantages to purchasing a high-performance AC variable frequency drive from AutomationDirect:



Price

As with all of our product lines, our prices are often well below the list prices of traditional automation suppliers. Our direct business model allows us to operate more efficiently than other suppliers and pass the savings on to you.



Quality



All of the high-performance AC variable frequency drives we sell have a 1- or 2-year warranty and a 45-day moneyback guarantee. If for any reason you are not satisfied with your purchase, send it back and we will refund your money. Pair with Toshiba motors for a 3 year warranty.



Service

We give you options for self-service but at the same time, we are there when you need us. You can place your order online or call our customer service. Have a technical question about one of our products or need help gathering up a bill of materials for one of your projects? You can call our Free Technical Support.

Select the Best High-Performance AC Drive for Your Application

HIGH-PERFORMANCE AC DRIVES			
 	 	 	 
High-performance VFD loaded with all of the features you need. Available in horsepower ratings up to 300 hp	Compact high-performance VFD supporting Flux Vector Control and Tension Control	The most feature rich VFD that we offer that supports closed-loop flux vector control for 100% torque output at 0 speed	High-performance VFD with integrated features that are optional on other drives in sizes up to 300 hp
Input/Output Voltages hp Range	Input/Output Voltages hp Range	Input/Output Voltages hp Range	Input/Output Voltages hp Range
230VAC 1-phase/230VAC 1 - 25 hp	230VAC 1-phase/230VAC 0.5 - 3 hp	230VAC 1-phase/230VAC 0.25 - 3 hp	-
230VAC/230VAC 1 - 100 hp	230VAC/230VAC 0.5 - 50 hp	230VAC/230VAC 0.25 - 30 hp	-
460VAC/460VAC 1 - 300 hp	460VAC/460VAC 0.5 - 100 hp	460VAC/460VAC 0.33 - 150 hp	460VAC/460VAC 0.5 - 300 hp
Supported Control Modes	Support Control Modes	Supported Control Modes	Supported Control Modes
V/F (1:12)	V/F (1:50)	V/F (1:20)	V/F (1:10)
Sensorless Vector (1:12)	Sensorless Vector (1:50)	VVW (1:30)	Auto Torque Boost (1:50)
-	Field Oriented Control (1:100)	Sensorless (1:100)	Vector Control (1:200)
-	Flux Vector control with encoder (Speed 1:1000)	Flux Vector control with encoder (Speed 1:1000)	Flux Vector control with encoder (Speed 1:1000)
-	Flux Vector control with encoder (Torque 1:1000)	Flux Vector control with encoder (Torque 1:1000)	Flux Vector control with encoder (Torque 1:1000)
Built-in I/O	Built-In I/O	Built-in I/O	Built-in I/O
8 digital inputs	7 digital inputs	4 digital inputs	8 digital inputs
2 digital outputs	2 digital outputs	1 digital output	-
2 relay outputs	1 relay output	1 relay output	3 relay outputs
3 analog input channels	2 analog inputs	1 isolated analog input	3 analog inputs
2 analog output channels	1 analog output	1 isolated analog output	2 analog outputs
Optional I/O	Optional I/O	Optional I/O	Optional I/O
Expandable to 6 additional digital inputs with	4 different I/O expansion option cards to expand analog I/O, digital inputs, and relay outputs	Expandable to 4 additional relay outputs or digital outputs with optional expansion card	120VAC Option card replaces 8 24VDC digital inputs with 6 120VAC digital inputs.
Expandable to 8 additional digital inputs with optional expansion card	2 line driver or open collector encoder card	3 additional analog inputs possible with optional expansion card	Encoder Option card
Expandable to 6 additional relay outputs or 2 digital outputs with optional expansion card	Backup power supply card	2 additional analog outputs possible with optional expansion card	-
-	-	Incremental encoder module	-
-	-	Optional flash memory module	-
Keypad	Keypad	Keypad	Keypad
Removable and remote mountable keypad.	Removable and remote mountable keypad	Built-in keypad and optional remote keypads. Basic and advanced remote keypad options	Highly advanced, with intuitive menus and a capacitive wheel. Removable and remote mountable.
Communication Supported	Communication Supported	Communication Supported	Communication Supported
Modbus RTU and BACnet	Modbus RTU over RS485	Modbus RTU over RS485	2 EtherNet/IP ports and Modbus RTU
Optional Communications	Optional Communications	Optional Communications	Optional Communications
EtherNet/IP and Modbus TCP with option card	EtherNet/IP, Modbus TCP, with 1 or 2 ports	EtherNet/IP and Modbus TCP with option card	-
-	EtherCAT with 2 ports	-	EtherCAT
Safety Ratings	Safety Ratings	Safety Ratings	Safety Ratings
Safe Torque Off (STO) SIL2	Safe Torque Off (STO) SIL2	Safe Torque Off (STO) and Safe Stop 1 (SS1) SIL2 with optional CFW500-SFY2	Safe Torque Off (STO) SIL2
Environmental Ratings	Environmental Ratings	Environmental Ratings	Environmental Ratings
Open and IP20 models available	IP20 rating, optional conduit box to rate assembly for NEMA 1	IP20 optional NEMA 1 conduit boxes available	NEMA 1/IP 20 with optional conduit box
Additional Features	Additional Features	Additional Features	Additional Features
Built-in dynamic braking up to 40 hp. Higher hp uses external units.	Built-in dynamic braking up to 40 hp. Higher hp uses external units.	Built-in dynamic braking on most models	Built-in dynamic brake up to 100 hp
Built-in PLC 10k rungs	Built-in PLC 5k steps	Built-in PLC	Built-in function block sequencer
PID Control	PID Control	PID control with sleep and wake	Multiple PID loop support
-	-	-	Integrated EMF filter
-	Tension Control mode	-	-
-	-	-	Built-in webserver, QR code fault display, real-time clock
Free GSoft2 for configuration and GSLogic for PLC programming	Free GSoft2 for configuration and GSLogic for PLC programming and monitoring as well as PLC programming	Free WPS programming software for drive configuration	ASD Pro configuration software

DURAPULSE® GS30 AC Drives

**DURA
IMPULSE
GS30**

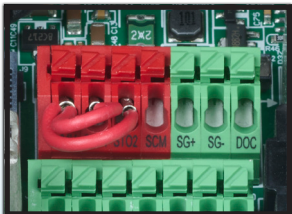
DURAPULSE GS30 AC Flux Vector Drives

DURApulse GS30 series flux vector AC drives provide unparalleled advanced features at an industry-best price. These drives include the features available on the GS20, plus many more such as closed-loop flux vector control, EtherCAT® communication, and a dedicated tension control parameter set.

EtherNet/IP™
EtherCAT®



Advanced Removable Keypad with RJ45 connection can be remotely mounted. 5-digit, 16 segment LCD display with quick setting digital dial. Keypad displays parameter descriptions and the digital dial is used to scroll through parameters.



Safe Torque Off (STO) provides an additional level of safety
EN 61508 SIL2
EN 62061 SIL CL2
ISO 13849-1:2015 Cat3

Removable RFI jumper (depends on application needs)



Built-in USB port for fast & easy programming



QR Code for remote access to product details (online)

Removable fan, fast & easy to replace



Communication and BPS card cable connector

Option card mount

Spring clamp terminal blocks

Zero-Stack Installation

Zero-stack installation saves time, money, and panel space by allowing the GS30 drives to be mounted right next to each other.



Built-in RS-485 w/ Modbus RTU

Not sure that this is the right AC Drive series you need?
Click for a complete selection guide

HP	230V 1-ph	230V 3-ph	460V 3-ph
Frame A	1/2	1/2, 1	1/2, 1
Frame B	1	2	2
Frame C	2, 3	3, 5	3, 5
Frame D		7.5	7.5, 10
Frame E		10, 15	15, 20
Frame F		20	25, 30
Frame G		25, 30	40
Frame H			50, 60
Frame I		40, 50	75, 100
Part #'s	GS31-2xxx	GS33-2xxx	GS33-4xxx

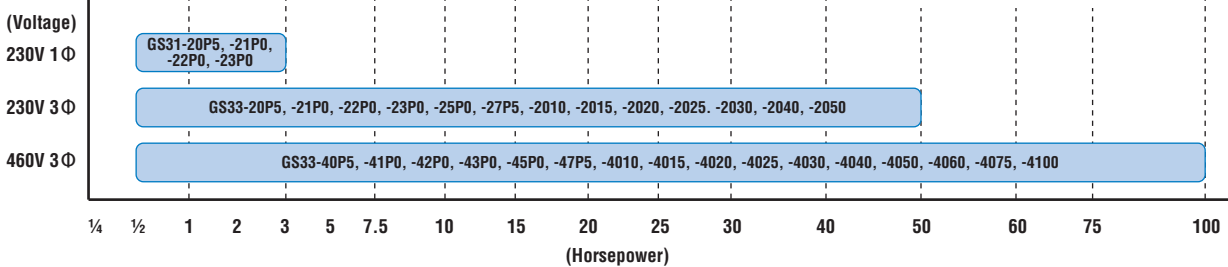
GS33-47P5

Motor HP: 0P2: 0.25hp, 0P5: 0.5hp, 1P0: 1.0hp, 2P0: 2.0hp, 3P0: 3.0hp, 5P0: 5.0hp, 7P5: 7.5hp, 010: 10hp, etc...

Input Volts: 2: 230VAC, 4: 460VAC

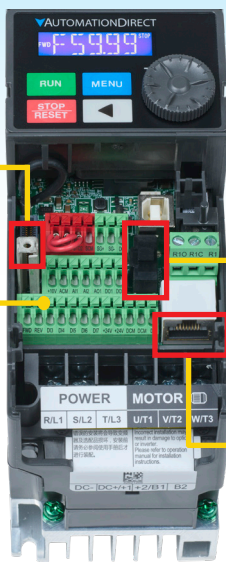
Input Phase: 1: single phase, 3: three phase

Series Name: GS3_-GS30



Spring Clamp Wiring Terminals

Plenty of space for ease of wiring and spring clamp terminals cut down the time it takes to wire up the drive.





GS4 Keypad Compatibility

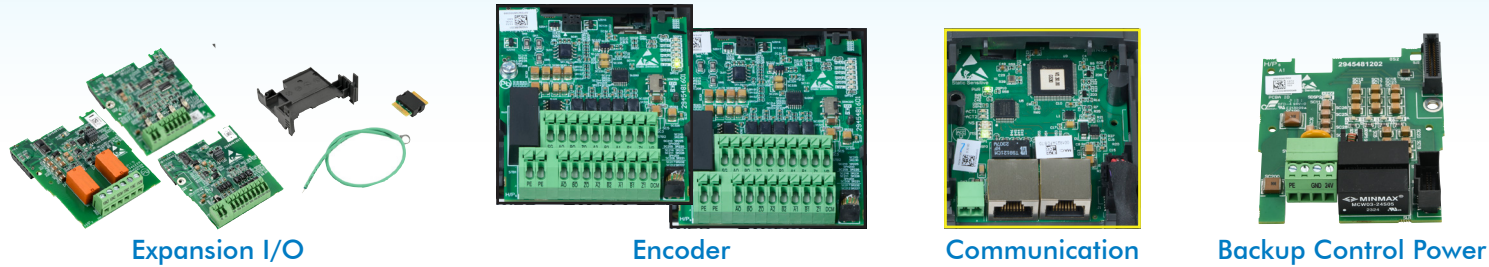
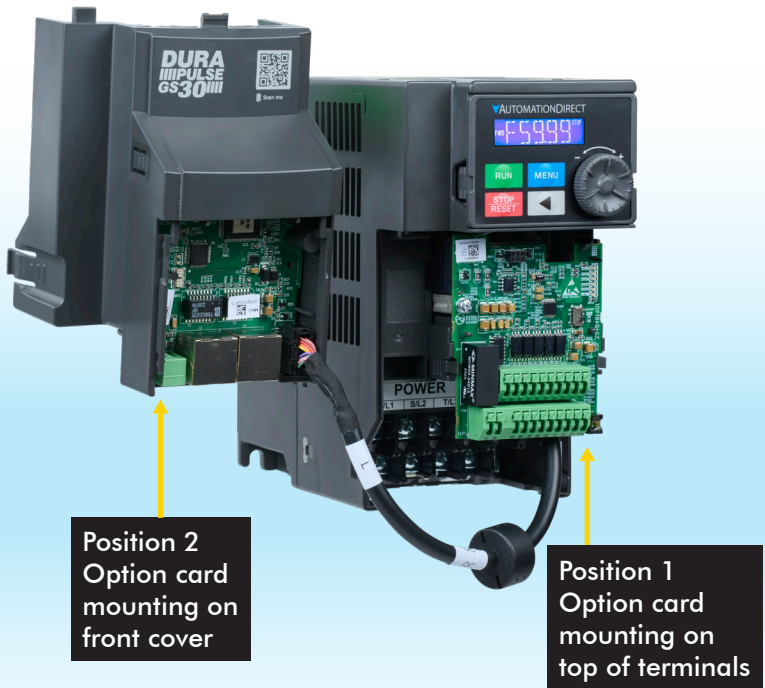
Using the GS4 keypad connected to the GS30 allows the user to monitor several parameters values at once, transfer configuration to/from the keypad to/from the GS30 drive, and select parameters by name without referencing the user manual.

Option Cards

Option cards are available for the GS30 to add features such as Ethernet communications over EtherNet/IP, Modbus TCP, and EtherCAT, an additional encoder, or a backup to the built-in 24VDC power supply. The GS30 supports up to two option cards with two mounting positions.

Position 1 mounting is mandatory for encoder cards and I/O expansion cards and optional for communications cards or backup power supply cards.

Position 2 mounting can be used for communication cards (required position for EtherCAT card) and backup power supply cards.



GS30 Programming

The GS30 VFDs support parameter configuration, setup and troubleshooting via the updated GSoft2 software now featuring Ethernet connectivity, parameter wizards and an improved scope feature. In addition to this, the GS30 has a built-in PLC that is programmed with GSLOGIC software.



GS30 Control Modes

The GS30 supports five different control modes offering various levels of torque output control at different speed ranges. Torque control modes allow the drive to control the level of torque as opposed to speed; this includes a tension control mode and is a feature usually only found on higher cost drives.

		V/F & SVC	FOC Mode	FOC + Encoder	TQC	TQC + PG
Induction Motor (IM)	Start Torque	150% @ 3Hz	200% @ .5Hz	200% @ 0Hz	200% @ .5Hz	200% @ 0Hz
	Accuracy	1:50	1:100	1:1000	+/- 15%	+/- 5%
Permanent Magnet (IPM, SPM)	Start Torque	100% @ 1/20th Motor Frequency	150% @ 0Hz	200% @ 0Hz	150% @ 0Hz	200% @ 0Hz
	Accuracy	1:20	1:100	1:1000	+/- 15%	+/- 5%

GS30 Additional Features

You will be hard-pressed to find a drive for the same price with all of the features the GS30 provides. In addition to the features already described, the GS30 supports:

- V/Hz Control, Sensorless Vector Control, Field Oriented Control, Field Oriented Control Plus Encoder (Flux Vector),
- Torque Control Mode and Tension Control Mode
- Maximum frequency 599Hz
- Multiple motor support, supports up to 4 induction motor switching control from a single VFD
- Built-in braking chopper up to 40hp
- DEB, deceleration energy backup, controls motor deceleration during power loss
- 100kA short circuit current rating up to 30hp
- STO – Safe Torque Off
- 100% conformal coating (IEC 60721-3-3 class 3C2) on PCBs provides moisture, corrosion & dustproof in critical environments
- Built-in PLC (up to 5,000 steps)
- USB programming
- Built-in RS485 communications (Modbus RTU)
- Optional Ethernet communications Modbus TCP, EtherNet/IP, and EtherCAT
- Optional encoder option card for support of Flux Vector Control mode
- Expansion I/O option cards
- Backup power supply option card
- Generous built-in I/O, pulse in/out 33KHz pulse input & output
- Analog inputs +/- 10VDC, 0-10VDC, 0-20mA/4-20mA
- Digital I/O: 7 inputs, 3 outputs
- 2 option card mounting positions
- High-Speed Pulse Input and Output up to 33KHz
- Mounting, NEMA1 conduit box; DIN rail adapter (up to Frame C); EMC shield plate; top-wire mounting plate (all optional)
- Compact size
- Two-year warranty
- UL, CE listed

GS Drive Accessories

- Line reactors
- VTF output filters
- High speed Class J fuses and fuse holders
- Dynamic braking resistors and DBUs
- EMI and RFI filters
- Replacement cooling fans



DURAPULSE GS4 AC drives available up to 300hp!



**DURA
PULSE
GS4**

Starting at
\$525.00

1-7.5HP, 10-20HP, 25-40HP, 50-60HP, 75-100HP, 125-150HP, 175-200HP, 250-300HP

Starting at only \$525.00, GS4 AC drives are loaded with features!

- V/Hz Control or Sensorless Vector in all 8 frames sizes
- All 230V drives have single-phase input capability
- Dual rating design – CT/VT ratings (light & heavy duty)
- Flexible carrier frequency to 15kHz and output frequency to 600Hz
- STO – Safe Torque Off (TUV Certified)
- Built-in PLC to support up to 10k steps
- 100kA short circuit current rating
- Free downloadable software for configuration and programming (\$10.50 for USB Card)
- Field-upgradable firmware via USB port
- Hot-pluggable LCD text-based keypad can be remotely mounted
- Embedded quick-start menus
- Control mode selection from keypad, communication input, or digital I/O
- Display units of measure of your choice (GPM, FPM, etc.)

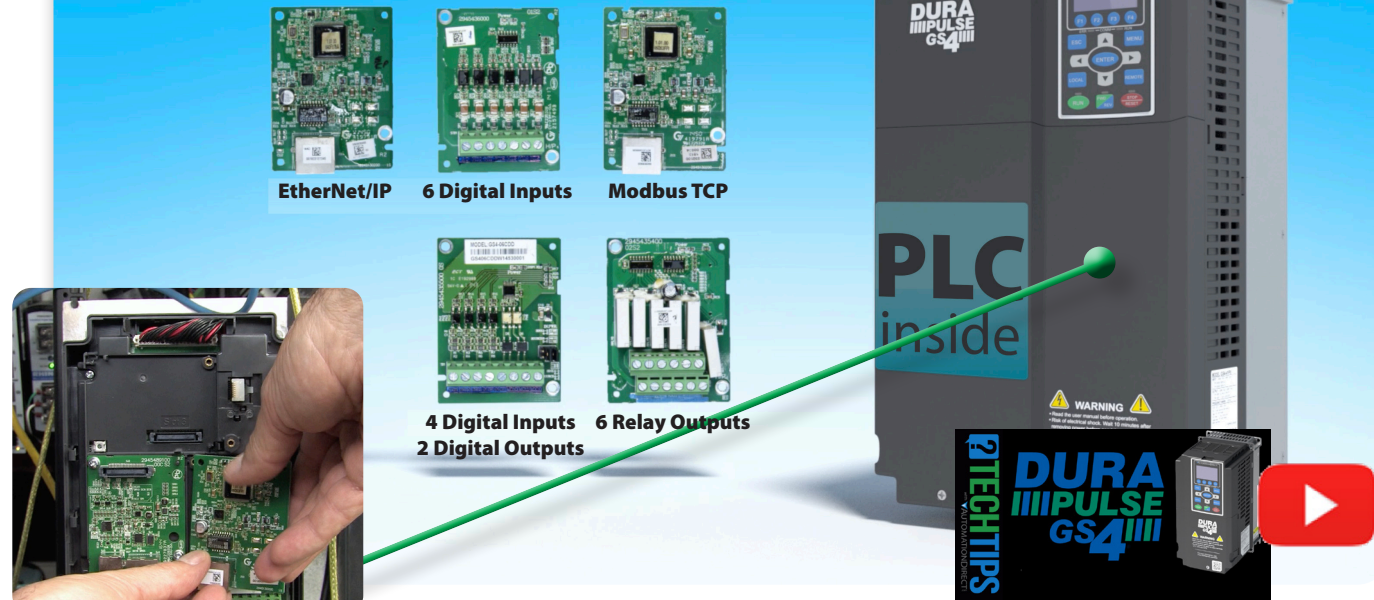
- Momentary power loss restarts
- Built-In DC choke (some models)
- Flange-mount capability for frame sizes A to F (1 to 215hp)
- Conduit boxes for NEMA 1 installations
- Expanded I/O capability – 110V inputs, relay outputs, combo DC I/O card
- Analog I/O – configurable 3 inputs and 2 outputs
- Auto speed search capability
- Multi-motor control
- Dynamic braking
- PID controller –including sleep and wake
- Password protection
- RTD and/or PTC Input Motor Protection
- Circulative motor control for control of multiple motors
- Calendar function allows chronological program control (daylight savings time, etc.)
- Modbus RTU and BACnet communication protocols built in

- Optional communication cards for Modbus TCP and EtherNet/IP
- Modularized design eases maintenance and expansion
- Conformal coating on PCBs for improved environmental tolerance
- Excellent heat-sink design; operate at 50°C without derating
- Fire Mode – emergency smoke removal and HVAC system pressure
- Multi-motor control: control up to 8 pumps at the same time
- Two-year warranty
- CE, TUV, UL, cUL



A built-in PLC and expanded I/O capabilities

Upgrade to Modbus/TCP or EtherNet/IP with optional comm cards



EtherNet/IP **6 Digital Inputs** **Modbus TCP**

4 Digital Inputs 2 Digital Outputs **6 Relay Outputs**

PLC inside

DURA PULSE GS4

PLC inside

A fully functional PLC is built in to the GS4 drive. Capable of up to 10k steps, it's perfect for drive-related logic requirements. Control the drive and I/O with standard ladder logic (and our FREE downloadable PLC software, GSLOGIC). Advanced PLC features include 32-bit math, Gray Code, drive frequency control, read/write drive parameters, real-time clock/calendar with support for daylight savings time and full drive PID control. And it's all on-board!

You have I/O choices

Perfect for drive related and PLC operations, the built-in I/O includes eight DC digital inputs, two DC digital outputs (up to 48V), 2 form-C relay outputs, as well as five analog channels (3 inputs and 2 outputs) configurable for either voltage, current or potentiometer (input). The expansion I/O slot will accept any one of three I/O option cards: the combo DC discrete card with four 24VDC input (sinking or sourcing) and two 24VDC outputs, the six-point 110VAC input card, or the six-relay output (250VAC/30VDC) card.

High-speed communication interfaces

GS4 drives support both Modbus RTU/ASCII and BACnet (serial) protocols out-of-the-box. Modbus RTU is ubiquitous on the factory floor – all PLCs and most other equipment are compatible. Similarly, BACnet is the de facto standard for the HVAC and building automation worlds. The GS4 drives also accept an optional Ethernet card; choose from the Modbus TCP option or the EtherNet/IP version. These economically priced option cards put your GS4 drive on a fast network at a low cost. You'll be amazed at how easily you can set up the drive to communicate with any of our PLCs (especially the newer Do-more and Productivity Series models).




DURA PULSE GS4

Safe Torque Off (STO)

Free downloadable configuration software

GSoft2 is the configuration software for the DURApulse family of drives. It allows you to connect a personal computer to any GS4, GS10, GS20(X), or GS30 series drive, and perform a variety of functions:

- Create new drive configurations
- Upload/download drive configurations
- Edit drive configurations
- Archive/store multiple drive configurations on your PC
- Trend drive operation parameters
- Tune the PID loop in the drive
- View key operating parameters in real-time
- View drive faults
- Start/Stop drive and switch directions, provided drive is set up for remote operation
- Upgrade firmware in the drive, keypad, or Ethernet communication cards.

GSoft2 includes a comprehensive help file and can be downloaded for free or purchased on a USB drive from AutomationDirect.com. Connection via Ethernet, USB or RS-485 (depending on drive series).

GS202_3.0.0.8

Disconnect Parameters Key Pad Scope Tools About

Exit Disconnect Parameters Key Pad Scope Monitor Screen IP Config VFD FW Comm Card FW FW Ethernet Card Help

Parameters

Exit Save New Rating Open Read Write All Compare Wizard Help

Drive

All Parameters

0-SYSTEM PARAMETER00

1-BASIC PARAMETER 01

2-DIGITAL IN/OUT 02

3-ANALOG IN/OUT 03

4-MULTI-SPEED 04

5-MOTOR PARAMETER 05

6-PROTECTION 06

7-SPECIAL 07

8-PID CONTROL 08

9-COMMUNICATION 09

10-SPEED FEEDBACK 10

11-ADVANCE SET 11

12-TENSION 12

13-MACRO 13

14-EXT IO PROTECT 14

Selected Parameters

File

Parameters

Selected Pr. NO Modbus Description Unit Data Default Min Max

00.00 0000h Identity Code 303 0 0 65535

00.01 0001h Rated Current 2.80 0.00 0.00 655.35

00.02 0002h Parameter Reset 0 0 0 13

00.03 0003h Start up Display 0:Freq Setpoint 0 0 3

00.04 0004h User Display 7:Actual RPM 3 0 57

00.05 0005h Gain Coeff Rslt 0.00 0.00 0.00 160.00

00.06 0006h Firmware Version 91.00 91.00 0.00 655.35

00.07 0007h Password Decoder 0 0 0 65535

00.08 0008h Password Input 0 0 0 65535

00.09 0009h Reserved 0 0 0 65535

00.10 000Ah Ctrl Method Sel 0:Velocity Mode 0 0 2

00.11 000Bh Veloc Mode Sel 0:V/F Open Ctrl 0 0 7

00.12 000Ch Document 0 0 0 1

00.13

00.14

00.15

00.16

00.17

00.18

00.19

00.20

Scope

Exit Record Parameters Save File Load File JPG Screen Zoom All Zoom In Zoom Out Recovery Key Pad Help

12000

10800

9600

8400

7200

6000

4800

3600

2400

1200

0

-1200

-2400

-3600

-4800

-6000

-7200

-8400

-9600

-10800

-12000

0

10000

20000

30000

40000

50000

60000

70000

80000

90000

100000

110000

120000

130000

140000

150000

160000

170000

180000

190000

200000

Drive Information

Type: GS30

Version: 1.00

kW(hp): 0.5HP

Rate Voltage: 230V

Rate Current: 2.8A

Status of Drive

RUN STOP JOG FWD REV

0

0

0

0

Error Code: 0

No errors occurred

Variable Address Data Type Value Δ Y

1 Frequency Command (Hz) U16 0 0 0

2 Output frequency (Hz) U16 0 0 0

3 Output current (A rms) U16 0 0 0

4 DC_bus (Vdc) U16 0 0 0

Time Sec 20

Δ Time Sec 0

1/Δ Time Sec INF

DI/DO Channel 1 Channel 2 Channel 3 Channel 4

DI Addr: 2210

DO Addr: 2211

Channel 1 Channel 2 Channel 3 Channel 4

Channel 1 Channel 2 Channel 3 Channel 4

Download GSOFT2 NOW!

Download

GSOFT2

NOW!

Download

GSOFT2

NOW!

Check out the three part Quick-Start Video

GSoft2

DRIVE configuration software

QUICK START

PART 1: PARAMETERS

Play

Free downloadable ladder logic software

Take your VFD applications to new heights with the built in PLCs included in any GS30, GS20(X) or GS4 DURApulse drive. GSLOGIC is the powerful PLC programming software used to create and monitor the ladder logic for your AC drive. Program capacity varies by drive type. GS4 allows 10,000 steps, GS30 5,000 steps and GS20(X) 2,000 steps. The PLC can read from or write to any parameter in the drive, and control the ample on-board and optional I/O. Access the real-time clock calendar to program date-specific, or daily, weekly, or monthly routines, with full support for daylight savings time built in. Use the serial interfaces to communicate with other DURApulse drives, or other equipment in your factory. There's even a special instruction that allows the PLC to monitor and adjust the drive PID loop.

GSLOGIC can be used on all GS20(X), GS30, and GS4 drives. The software supports all the standard Windows editing functions like cut, copy, paste, multiple windows, etc. Standard PLC software functionality includes the following:

- Online ladder monitor
- View/Edit Register values in real time.
- Create and edit drive-specific ladder programs
- Upload/download PLC program files to the onboard PLC
- Archive/store multiple PLC programs on your PC or GS4-KPD keypad
- Control the Drive PID loop (FPID instruction)
- Print Drive PLC program files

GSLOGIC includes an integral help file with explanations of all software instructions.

GSLOGIC

Drive-based Logic Control

AutomationDirect

X001

X002

Y001 (OUT)

Y001

Y201

C1

AutomationDirect

Run to L5 then Reverse back to Home - GSLogic - [Ladder Diagram]

File Edit Compiler Comments Search View Communication Options Window Help

Relay Type

0

4

13

20

33

9999

X0

X0

M1025

X2

M1

X1

RST

M1026

M0

M0

X2

M1

X3

M1025

M1040

M1

X0

M1025

X2

X3

X1

SET

M1026

Override: Row: 1, Col: 1

34010000 Steps

3Wire Control(3Wire Control) - GSLogic - [Ladder Diagram]

File Edit Compiler Comments Search View Communication Options Window Help

Relay Type

0

43

9999

X1

X0

M1025

X2

M1025

M1040

M1026

DMUL

D1028

K5

D20

DIV

D20

K10

D30

FREQ

D30

K100

K10

END

Override: Row: 0, Col: 1

44010000 Steps

GS4 (PLC Station Address: 2)

mHPD-12 High-Performance Drives

AUTOMATIONDIRECT.com

1 - 8 0 0 - 6 3 3 - 0 4 0 5

www.automationdirect.com/drives

High-Performance Drives

mHPD-13

Toshiba AS3™ High-Performance drives

A proven name-brand drive packed with features

Toshiba is a trusted name in power electronics with a proven track record in the industry. They are built with high-quality construction for long-lasting service life. Toshiba is a name that stands above some of the most prominent brands in the VFD industry, now available from AutomationDirect and supported by our world-class technical support team. The Toshiba AS3 VFD is an adjustable speed drive packed with features that, on competing products, require buying optional modules. The AS3 drives are designed to emphasize built-in communications and access to real-time data.

TOSHIBA

Removable keypad with display and capacitive selection wheel. Advanced with full remote keypad (mounting kits available).

Built-in dynamic braking chopper up to 100 hp. No need for an external braking unit.

Standard 2 port ethernet comms.

Built-in DC choke eliminates the need for an external line reactor.

Cable strain reliefs come standard on frame sizes A1 through A5. Frames A6 through A8 have optional NEMA1 enclosures.

EtherNet/IP™
EtherCAT®

AS3 VFD Applications

- Pumps
- Fans
- Compressors
- Centrifuges
- Conveyors
- Mixers
- Pumpjacks
- Crushers

Frame Size	460 VAC
Frame A1 - HP	0.5, 1, 2, 3, 5
Frame A2- HP	7.5, 10
Frame A3 - HP	15, 20, 25
Frame A4 - HP	30, 40, 50
Frame A5 - HP	60, 75, 100
Frame A6 - HP	125, 150, 200
Frame A7 - HP	250
Frame A8 - HP	300

Practical AS3 VFD Features

- Sizes from ½ to 300hp, 460 VAC
- NEMA 1 enclosure standard on frames A1 through A5. Optional for frames A6 through A8.
- Heavy-duty overload rating of 150%
- Eight programmable digital inputs
- Three programmable relay outputs: one form-C relay output, two form-A relay outputs
- Three programmable analog inputs: one 4-20mA, one 0-10 VDC, and one -/+ 10 VDC
- Embedded STO Safety Terminal Compliant with IEC 61800-5-2 and SIL3 level in IEC 61508
- 2- or 4-wire RS-485
- Built-in dual port Ethernet supporting EtherNet/IP and Modbus TCP
- Embedded web server featuring real-time monitoring and configuration.
- Real-time clock for past trip monitoring or calendar functionality
- QR code display for additional parameter information or fault code troubleshooting
- UL Type 1 up to 100hp
- Ambient temperature 14° to 122° F (-10° to 50°C) or 140°F (60°C) with derating
- Altitude up to 1000 meters without derating
- 95% non-condensing humidity rating
- Advanced LCD keypad with capacitive touch wheel
- Save, restore, and clone multiple drive systems
- Built-in dynamic braking circuit up to 100hp
- DC link reactor built-in
- Free ASD Pro software for configuration
- Built-in function block program sequencer
- Multiple-loop PID control
- Pump control
- Permanent magnet AC motor control supported
- Industry 4.0/IoT supported
- Optional EtherCAT communications supported
- Supports 2 embedded option modules
- Three-year warranty when paired with Toshiba motors



VFAS3-4370PC

Suffix: PC
Rated Horsepower:

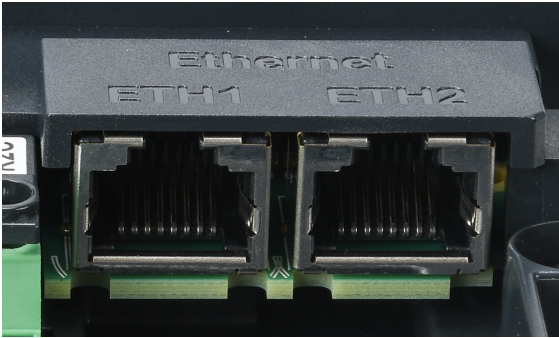
004	= 0.5 hp
007	= 1 hp
015	= 2 hp
022	= 3 hp
037	= 5 hp
055	= 7.5 hp
075	= 10 hp
110	= 15 hp
150	= 20 hp
185	= 25 hp
220	= 30 hp
300	= 40 hp
370	= 50 hp
450	= 60 hp
550	= 75 hp
750	= 100 hp
900	= 125 hp
110K	= 150 hp
132K	= 200 hp
160K	= 250 hp
200K	= 300 hp

Voltage: 4=460 VAC
Series Name: VFAS3 = Toshiba AS3

Not sure that this is the right AC Drive series you need?
Click for a complete selection guide

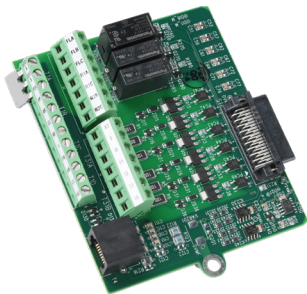
Toshiba AS3 Dual Port Ethernet Adpater

The Toshiba AS3 drive has a dual-port Ethernet adapter to support many networking topologies such as ring, linear bus, or star. The AS3 drive supports EtherNet/IP, Modbus TCP, and EtherCAT protocols.



Toshiba AS3 Optional Features

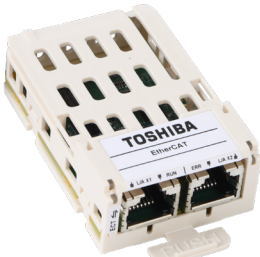
The Toshiba AS3 drive offers additional options such as NEMA 1 conduit boxes for frame sizes A6 and up, a 120VAC control module, and an encoder module which allows for full vector control. Additional communication support is provided via the EtherCAT option module. This drive supports the use of 2 option slots (120 VAC option replaces the standard 24 VDC card)..



AC I/O option module



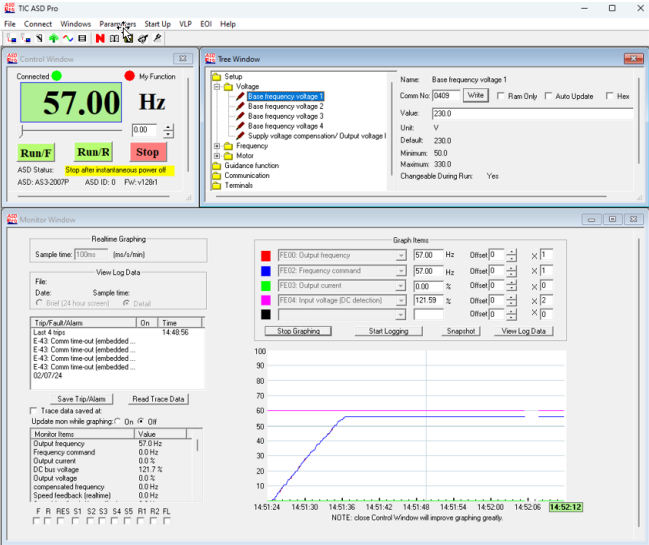
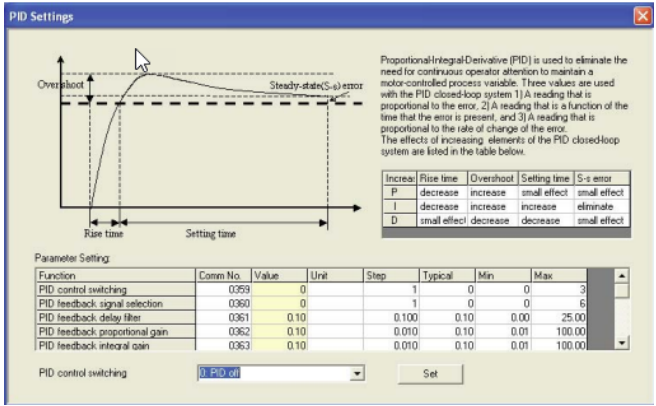
Encoder option module



EtherCAT option module

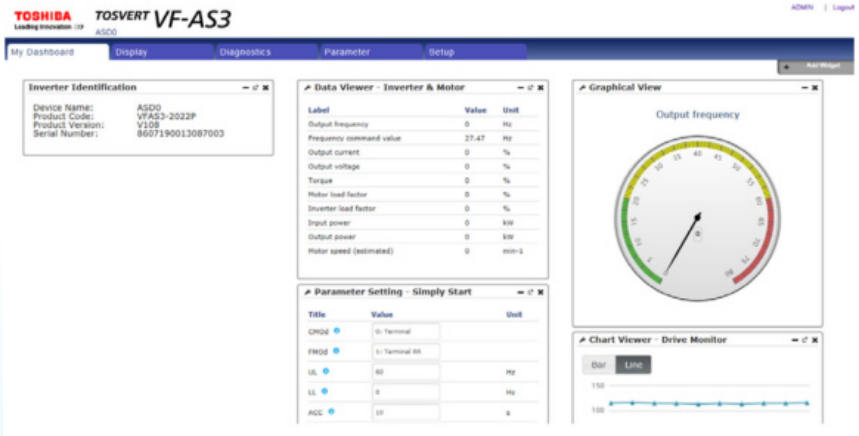
ASD PRO Software

ASD Pro is a free drive configuration and programming software. This powerful software is used for parameter configuration, tuning, monitoring, PID setup, and function block programming.



Built-in Web Server

The AS3 drives support a built-in web server for real-time drive monitoring.

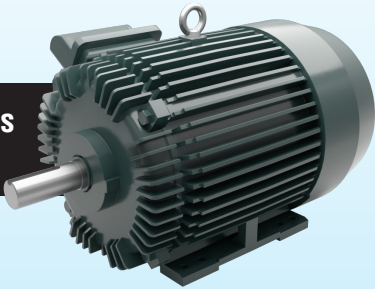


AS3 Advanced Keypad

The Toshiba AS3 drive features easy-to-read status LEDs and an advanced keypad. Parameter lists provide more detail than most drives. Intuitive menus make setup a breeze. Navigating the menu is easy with the capacitive touch wheel. When a drive fault does occur, the keypad turns red and displays a QR code for quick troubleshooting. Keypad is remote mountable with a mounting kit.



AS3 Warranty is Extended to Three-Years when Paired with Toshiba Motors



Not sure that this is the right AC Drive series you need? Click for a complete selection guide

WEG CFW500 High-Performance AC Drives

A closed-loop flux vector VFD you can buy direct

The WEG CFW500 series is a high-performance AC variable frequency drive that supports closed-loop flux vector speed control as well as torque control modes. Typically you have to wait up to several months when ordering drives with high-performance features such as these. Here at AutomationDirect, you can get them shipped from stock straight to you with 2-day delivery.

Built-in keypad with display. Standard and advanced with full text remote keypads are optionally available.

Built-in dynamic braking chopper. No need for an external braking unit.

Control terminals located safely away from power terminals provide room for a clean installation.

Power terminals at bottom of unit with ample room for wiring safety and routing away from low voltage signals.

QR Code for remote access to product details (online)

Cooling fans on all models.



High-Performance VFD Applications

- Centrifugal pumps
- Roller tables
- Winders
- Conveyors (excellent for high-speed metering and gapping belts)
- Tensioners
- Fans and blowers
- Mixers
- Extruders
- Granulators
- Cutting and welding machines
- Commercial dryers
- Rotary filters



	230V 1-ph	230V 3-ph	460V 3-ph
Frame A - HP	1/4, 1/2, 1	2, 3	1/3, 3/4, 1, 2, 3
Frame B - HP	2, 3	5	1, 2, 3, 5
Frame C - HP		7.5	10
Frame D - HP		10, 15	15, 20
Frame E - HP		20	25, 30
Frame F - HP		20, 25, 30	40, 50, 60
Frame G - HP			75, 100, 150

Additional CFW500 Features

The CFW500 line of VFDs have the following features:

- Broad offering from 1/4 to 60 hp
- 200-240V (single-phase/3-phase and 3-phase only models) and 380-480V input voltage
- 230VAC: three-phase up to 30 hp, single-phase input up to 3 hp
- 460VAC: three-phase up to 150 hp
- IP20 with NEMA 1 conduit box options
- Speed and torque control down to 0 (zero) rpm
- Precision of 0.01% for speed control
- DIN rail (35mm), A, B, and C frame, or surface mounting with screws on all frame sizes
- G-Frame and F-Frame models can be flange mounted
- Same programming as other WEG VFDs including CFW300 and CFW100
- Built-in SoftPLC
- Scalar, Vector Control (Sensorless and closed-loop with encoder feedback) and VVW PM (suitable for fan, pump and compressor)
- 0 to 500 Hz output frequency
- 2.5 to 15 kHz adjustable switching frequency (5 kHz standard)
- PID with sleep mode
- Flying start / ride-through
- Built-in 24VDC power supply (max. 150 mA)

- Built-in RS-485 (Modbus RTU) communication
- Four isolated programmable digital inputs
- One programmable relay output (1NO, 1NC, 240VAC 0.5A)
- One programmable transistor output
- One isolated programmable analog input (0-10V, 0/4-20mA)
- One isolated programmable analog output (0-10V, 0/4-20mA)
- Protective features: Overcurrent (phase-phase short circuit in the output or phase-ground short circuit in the output), under/overvoltage, overtemperature in heatsink, motor overload, IGBT overload and external fault
- Control features: Linear and "S" ramp acceleration and deceleration, local/remote control, DC braking, torque boost, motor slip compensation, electronic pot, preset speeds, adjustable V/Hz profile, maximum and minimum adjustable frequency limits, two skip frequencies, adjustable output current limit, JOG, ride-thru, flying start and PID regulator
- Keypad with backlight with main display line, secondary display line and bar graph display
- Ambient: 14°F (-10°C) to 104°F (40°C), 3300ft (1000m) altitude, 5-95% humidity, non-condensing
- WPS compatible

CFW500A02P6T2DB20G2

- Options: NB = No Brake, DB = Dynamic Brake, 20 = IP20 Enclosure, G2 = Generation 2
- Supply Voltage: 2 = 200-240 Vac, 4 = 380-480 Vac
- Supply Phases: S = 1 Phase, B = 1 or 3 Phase, T = 3 Phase
- Rated Current: 01P0 = 1.0 Amps, 01P6 = 1.6 Amps, 02P6 = 2.6 Amps, 04P3 = 4.3 Amps, 06P1 = 6.1 Amps, 06P5 = 6.5 Amps, 07P3 = 7.3 Amps, 09P6 = 9.6 Amps, 10P0 = 10 Amps, 14P0 = 14.0 Amps, 16P0 = 16.0 Amps, 24P0 = 24.0 Amps, 28P0 = 28.0 Amps, 31P0 = 31.0 Amps, 33P0 = 33.0 Amps, 39P0 = 39.0 Amps, 47P0 = 47.0 Amps, 49P0 = 49 Amps, 56P0 = 56.0 Amps, 77P0 = 64 Amps (240 Vac), 61 Amps (48 Vac), 88P0 = 75 Amps (240 Vac), 73 Amps (480 Vac), 0105 = 105 Amps, 0142 = 142 Amps, 0180 = 180 Amps, 0211 = 211 Amps
- Frame: A, B, C, D, E, F, G
- Series Name: CFW500 = WEG CFW500

Not sure that this is the right AC Drive series you need?

Click for a complete selection guide

Flexibility and Performance

The CFW500 VFD gives the user the possibility to choose the plug-in module that best fits their application, or to use the standard version, that comes with the CFW500-IOS plug-in module. All plug-in modules include one RS-485 port as standard.

The installation of the CFW500 is simple and its configuration and operation is intuitive with the navigation menus of the operator interface (HMI) with built-in LCD display. By using the flash memory module, it is possible to download the existing setting from one CFW500 to other units without powering them up.

Conformal Coating

Improved 3C2 class of coating on the internal circuits of all versions and extra 3C3 Class coating (optional) according to IEC 60721-3-3 ensures improved protection in environments with corrosive chemicals.

Flash Memory Module (CFW500-MMF Accessory)

Download/Upload the settings to other CFW500 units without the need to power them up.

Plug-In Modules

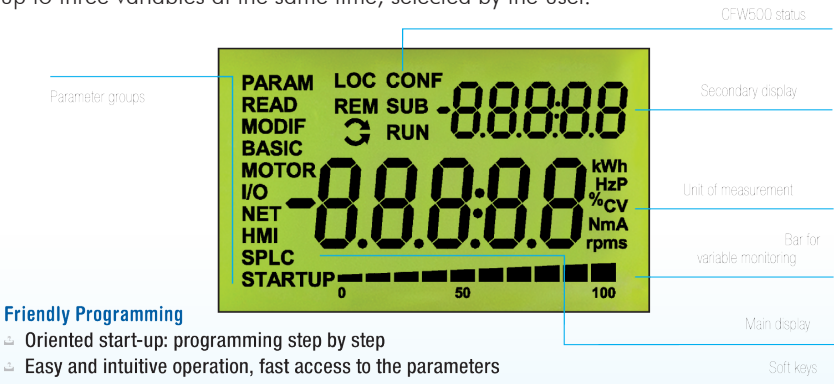
Selectable according to the application.

Easily Removable Fan

The quick change system ensures simple and fast fan maintenance.

Human-Machine Interface (keypad)

Display up to three variables at the same time, selected by the user.



Friendly Programming

- ▢ Oriented start-up: programming step by step
- ▢ Easy and intuitive operation, fast access to the parameters
- ▢ Parameter group: shortcut to the parameters of interest

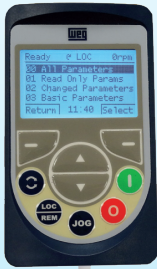
Remote HMI (keypad)

Suitable for enclosure door or machine console, two options available.

CFW500-HMIR
Non-Text Remote Keypad



HMI-01
Advanced Text Remote Keypad



CFW500-CCHMIRXM
X = up to 10 m



Safety Functions

safety functions are used to reduce risk and to guarantee the safety of personnel and environment if there is a hazardous event due to a fault in operating machines. The embedded safety functions STO and SS1 provide machine builders a cost-effective solution to design protective measures and reduce the risk from unexpected and hazardous movement in industrial machines and processes.

Advantages

- Safety functions integrated in the CFW500 drive make it easier to comply with the machine and application safety requirements
- Less components means less wiring, saving space and installation costs
- Easier installation, commissioning and maintenance
- No electromechanical components, meaning faster responses and higher degree of productivity
- Due to the high safety performance level SIL3, the CFW500 with safety module may avoid the use of external safety relays for cables and emergency pushbuttons monitoring

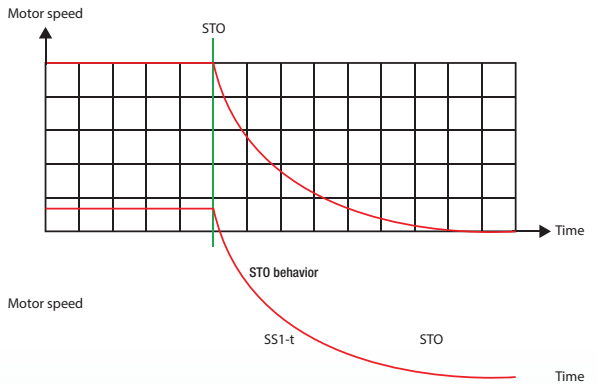


Safety Function Operation

STO (Safe Torque Off)

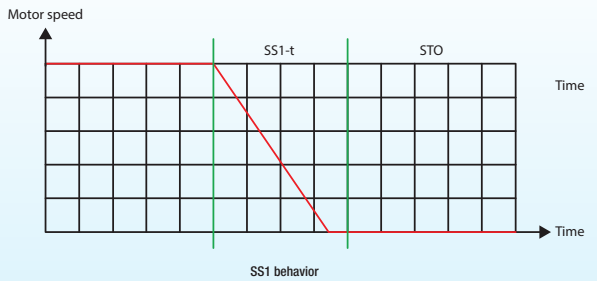
This function immediately switches off the drive output to the motor, disabling the supply of torque-generating energy. STO is also used to prevent an unexpected startup of machinery or for an emergency stop, fulfilling stop category 0 (IEC 60204-1).

It is applicable if the motor can be brought to a standstill in a sufficiently short time by the load torque or friction or where motor coast to a stop is not relevant to safety.



SS1 (Safe Stop 1)

This function enables motor deceleration and then, after a delay time, activates the STO function. SS1 can be used to implement a controlled stop and then removal of power, fulfilling stop category 1 according to IEC 60204-1. This function is used when, in the event of a safety related fault, the drive must stop as quickly as possible and then enter the STO state. The stopping of a drive by means of SS1 function reduces the risk of danger, eliminates the need of external safety timers, increases the productivity of a machine and allows safety clearances in a machine to be reduced. The reason is the active stopping of the drive as compared with the use of the STO function only.



Not sure that this is the right AC Drive series you need?
Click for a complete selection guide



Remote operating interface (HMI) (CFW500-HMIR accessory)

The CFW500 can be connected to the main industrial Fieldbus communication networks, with protocols used worldwide such as EtherNet/IP and Modbus-TCP, according to the plug-in module selected.

In addition, all plug-in modules come with serial interface RS-485 Modbus-RTU built-in.

I/O expansion:
IOS (standard, included in the version with plug-in), IOD, IOAD, IOR

Functionality expansion:
Incremental encoder
USB

Fieldbus communication protocols:
RS-232
RS-485
EtherNet/IP
Modbus-TCP

Selectable
plug-in
modules

Free WPS Programming Suite Software

That's right! The WPS software is a free download. This is a fully featured software suite for drive configuration, monitoring AND for programming the built-in PLC – it's all in one easy-to-use package.



Filter and download parameters by group, or use the powerful search function to create your own parameter groups

WPS WEG PROGRAMMING SUITE

Quick Start

Changed parameters (awaiting download) are highlighted

Welcome screen takes new users right to the most common activities

Other great Quick Start features include:

- Monitoring Wizards
- Configuration Wizards
- Custom Monitoring Windows
- Trending
- Diagnostics
- And MORE!

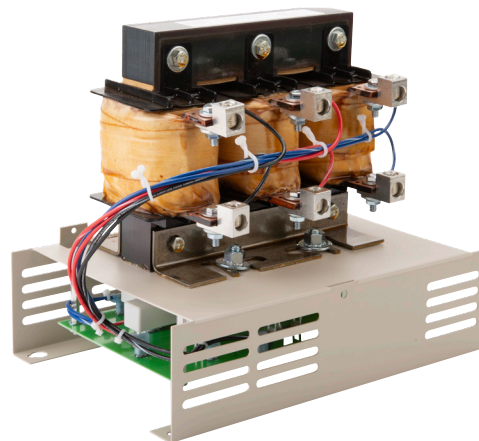
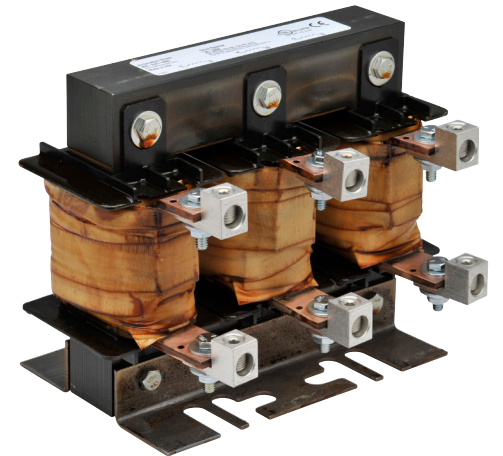
AC Drive Accessories

AC Line Reactors

Line reactors are an option to protect and optimize any AC drive and motor installation. Input line reactors provide many benefits to AC drives, including less nuisance tripping, reduced drive downtime, improved power factor, increased drive life, and sensitive equipment protection.

When used on the load side between the AC drive and the motor, reactors decrease voltage spikes between the motor and drive, increasing the reliability and longevity of both. Recommended for load-side applications with wiring lengths of 100 feet or less.

- Voltage support of 120 VAC and 230 VAC single-phase; 230, 460, and 575 VAC three-phase
- Sizes up to 361 Amps



VFD Output Filters

VTF series output (dv/dt) filters provide protection against harmful reflected waves between the VFD output and AC motor. These are recommended for any application when motor protection is critical or for any motor wiring distance from 100-1,000 feet. The filters ensure voltage spikes are limited to below 1,000 V.

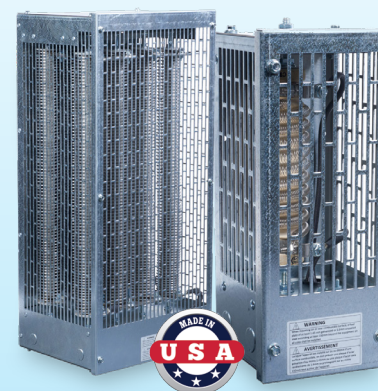
Output filters also provide other benefits, such as reduced motor heating, increased motor bearing life, and reduced common mode current.

- Voltage support of 208-600 VAC
- Sizes up to 362 Amps
- NEMA1 versions available for mounting outside of the panel

GS Brake Resistors

Brake resistors are used to increase the braking torque of the AC drive, for frequently repeated ON-OFF cycles of the AC drive, or for decelerating a load with large inertia. Brake resistors are compatible with various AC drives (check specifications for selection).

- Available power ratings from 80 W to 9.6 kW
- Resistance ratings from 3.3 to 750 Ohms
- Available in encapsulated, panel mount, and in a NEMA 1 enclosure with temperature switch



CROHM Brake resistors

CROHM brake resistors are designed and manufactured in the USA with ISO 9001 certification. They can be used with any AC drive up to 600 V (check specifications for selection). These resistors come enclosed in a NEMA 1 enclosure and include a built-in temperature switch.

- Available power ratings from 240 W to 18 kW
- Resistance ratings from 3.7 to 400 Ohms
- Stainless steel bus bars
- Pre-wired terminal blocks
- CSA compliance to CSA 22.2 and UL 508 standard
- CE compliant

