

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



## AC30 Variable Speed Drive

For Open and Closed Loop Control of Pump,  
Fan, and General Purpose Applications  
1 - 100 HP (0.75 - 75 kW)



ENGINEERING YOUR SUCCESS.

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# AC30 - For Open and Closed Loop Control of Pump, Fan, and General Purpose Applications

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# Parker Hannifin

The global leader in motion and control technologies and systems

## Global Partnerships Global Support

Parker is committed to helping make our customers more productive and more profitable through our global offering of motion and control products and systems. In an increasingly competitive global economy, we seek to develop customer relationships as technology partnerships. Working closely with our customers, we can ensure the best selection of technologies to suit the needs of our customers' applications.



## Electromechanical Technologies for High Dynamic Performance and Precision Motion

Parker electromechanical technologies form an important part of Parker's global motion and control offering. Electromechanical systems combine high performance speed and position control with the flexibility to adapt the systems to the rapidly changing needs of the industries we serve.



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Parker SSD drive products are manufactured globally to provide our customers with quality products at a competitive price point. In addition to factory-direct support, Parker provides sales assistance and local technical support through a group of dedicated sales teams and a network of authorized systems integrators, field service engineers, and technical distributors across the globe. For contact information, please refer to the Sales Offices listed on the back cover of this document or visit [www.parker.com/ssdusa](http://www.parker.com/ssdusa)



Charlotte, NC



Littlehampton, UK



Wuxi, China



Chennai, India

# AC30 Pump, Fan and General Purpose AC Drive

## Overview

### Description

AC30 drive has been designed to provide users with exceptional levels of control, from simple open-loop pumps and fans through to closed-loop process line applications. Its flexible and highly modular construction enables a wide range of communications and I/O modules to be easily added as required.

The AC30 has been designed with simplicity in mind, but this doesn't compromise its functionality. Integrated macros for a range of applications and PLC functionality enable more capable users to create sophisticated control that would previously have required a separate PLC.

Designed for operation in environment class 3C3 and 3C4 for Hydrogen Sulphide (H<sub>2</sub>S) as standard (tested at 25 ppm for 1200 hours), temperatures up to 50 °C with optional integrated EMC filter to C2 1<sup>st</sup> environment and DC link choke to reduce line harmonics. AC30 also complies with RoHS substance restrictions in accordance with EC Directive 2011/65/EU



### Features

#### Flexibility

- Open-loop or optional closed-loop operation with pulse encoder feedback module
- Suitable for operation with AC induction and Permanent Magnet AC (PMAC) servo motors
- Ethernet TCP/IP as standard
- I/O expansion options
- Support for popular industrial fieldbuses
- Chassis or through-panel mount as standard

#### Simplicity

- Parker Drive Quicktool (PDQ) drive management software tool
- Multi-language graphical keypad
- Quick start wizards
- Terminal covers removable with drive in place

#### Reliability

- Conformally coated for harsh environment protection as standard
- Isolated power stack cooling with removable fan

### Technical Specifications - Overview

Ratings									
380-480 VAC Supply (±10%) Three Phase									
Normal Duty (Variable Torque)				Heavy Duty (Constant Torque)					
HP	kW	Output Current [A <sub>rms</sub> ]		HP	kW	Output Current [A <sub>rms</sub> ]		Frame	
		400 V	480 V			400 V	480 V		
1.5	1.1	3.5	3.0	1	0.75	2.5	2.1	D	
2	1.5	4.5	3.4	1.5	1.1	3.5	3.0	D	
3	2.2	5.5	4.8	2	1.5	4.5	3.4	D	
4	3	7.5	5.8	3	2.2	5.5	4.8	D	
5	4	10	7.6	4	3	7.5	5.8	D	
7.5	5.5	12	11	5	4	10	7.6	D	
10	7.5	16	14	7.5	5.5	12	11	E	
15	11	23	21	10	7.5	16	14	E	
20	15	32	27	15	11	23	21	F	
25	18.5	38	36	20	15	32	27	F	
30	22	45	40	25	18.5	38	36	G	
40	30	60	52	30	22	45	40	G	
50	37	73	65	40	30	60	52	G	
60	45	87	77	50	37	73	65	H	
75	55	105	96	60	45	87	77	H	
100	75	145	124	75	55	105	96	H	

### Designed with you in mind

Throughout every stage of the design process, our engineering teams worked to equip the AC30 with a wealth of features that benefit both OEMs and End-users alike.

Working with the three principles of Flexibility, Simplicity and Reliability in mind, our engineers have created a product that not only delivers class-leading performance but also offers excellent usability in a host of motor control applications.

#### Flexibility (F)

A fully featured list of standard functionality along with the use of common control and option modules allows users to put the drive to work in many different open or closed-loop applications without having to invest significant time and effort in re-engineering motor control systems.

#### Simplicity (S)

From the clear and concise backlit LCD display to the power terminal covers that can be removed with the drive in the cabinet, AC30 has been engineered to make the process of operating and maintaining the drive as easy as possible.

#### Reliability (R)

Although no one can guarantee problems will never happen, our engineers have taken every possible step to reduce their likelihood of occurring. We have included a number of features in the AC30 that will ensure any loss of productivity is minimized and production restarted as safely and as soon as possible.



#### Engineered cooling improves reliability

- Intelligent design minimizes force ventilation requirements (R)
- Removable fan improves maintainability (R)
- Isolated power stack cooling path reduces contamination of control electronics (R)



#### Unobstructed access to power and dynamic brake terminals

- Terminal covers removable with drive in place (S)
- Dynamic brake switch fitted as standard (F)
- Easy access to DC Bus connections (S)



#### Suitable for harsh environments

- AC30 is conformally coated as standard and meets the requirements of environment classes 3C1, 3C2 (all defined substances) plus 3C3 and 3C4 for Hydrogen Sulphide (H<sub>2</sub>S) (F)(R)



#### Suited to all environments

- Internal EMC filter options up to C2 1<sup>st</sup> environment for use in commercial buildings (F)
- CE marked to EN61800-5-1 and NRTL listed to UL508C and C22.2#14
- DC chokes above 3 HP reduce harmonics to below IEC/EN61000-3-12 limits (F)(R)



#### Compact footprint, chassis or through-panel mounting

- Multi-position feet with keyhole slots for ease of mounting (F)(S)
- Reduced heat radiation allows side-by-side mounting (F)



#### Expandable I/O capabilities

- A range of option modules expand AC30 to accommodate application specific I/O (F)
- High-performance, closed-loop control with pulse encoder feedback module (F)
- Spring clamp terminals reduce installation time and risk of loose connections (S)(R)



### Ethernet connectivity and built in diagnostic web pages

- Built in web pages allow AC30 to be interrogated over the onboard Ethernet and Modbus TCP/IP connection **(S)**



### Simplified configuration and data storage with SD cards

- SD card simplifies firmware updates and allows drive configuration and data to be stored **(S)**



### Intuitive and easy to use, multi-function graphical keypad

- Remote mountable and easy to use tactile keypad makes drive setup and operation simple **(S)**

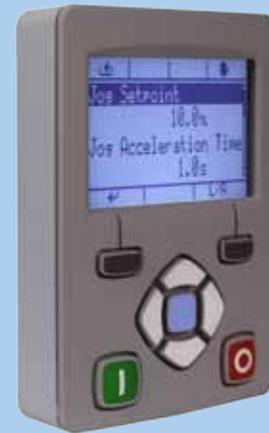


### Safe-Torque-Off (STO) for safety critical applications

- Protecting users and machinery against unexpected motor start-up in accordance with EN13849-1 at PLe Cat3 or SIL 3 to EN61800-5-2 **(F)(R)**

### Field-installable communications

- Seamless integration into automation systems **(F)**



### Graphical Keypad

The tactile IP55 keypad can be mounted either on the drive itself or remotely and provides access to all drive functions.

The backlit LCD display can be configured to present information in any one of a number of different languages, or even in your own custom language with your own user-defined units.

### Simple Setup Wizard and Macros

- Integrated quick start wizards means you don't have to be an expert to configure the drive within minutes
- Dedicated macros and integrated function blocks simplify the creation of specific motor control applications

### Keypad Remote Mounting

The graphical keypad can be mounted remotely to the drive with the use of a connecting cable. When remote mounting, a blanking cover can be fitted to the drive in place of the keypad.

## Simple and effective pump and fan control



### Saving energy through speed control

Pumps and fans are widely used throughout industry. Some estimates suggest that a large proportion of these can be as much as 20% oversized for the application they are used in. When these are operated at a constant speed, a significant amount of the power consumed by the motor is wasted, costing your company considerable amounts of money and creating additional CO<sub>2</sub> emissions.

Matching the speed of pumps and fans to process demands with the AC30 ensures that the motor will always operate at the optimal speed to deliver just the right amount of air or fluid. This can result in significant energy savings. A 20% reduction in speed will actually reduce energy consumption by almost 50% and payback can be achieved in **less than 18 months in many cases.**

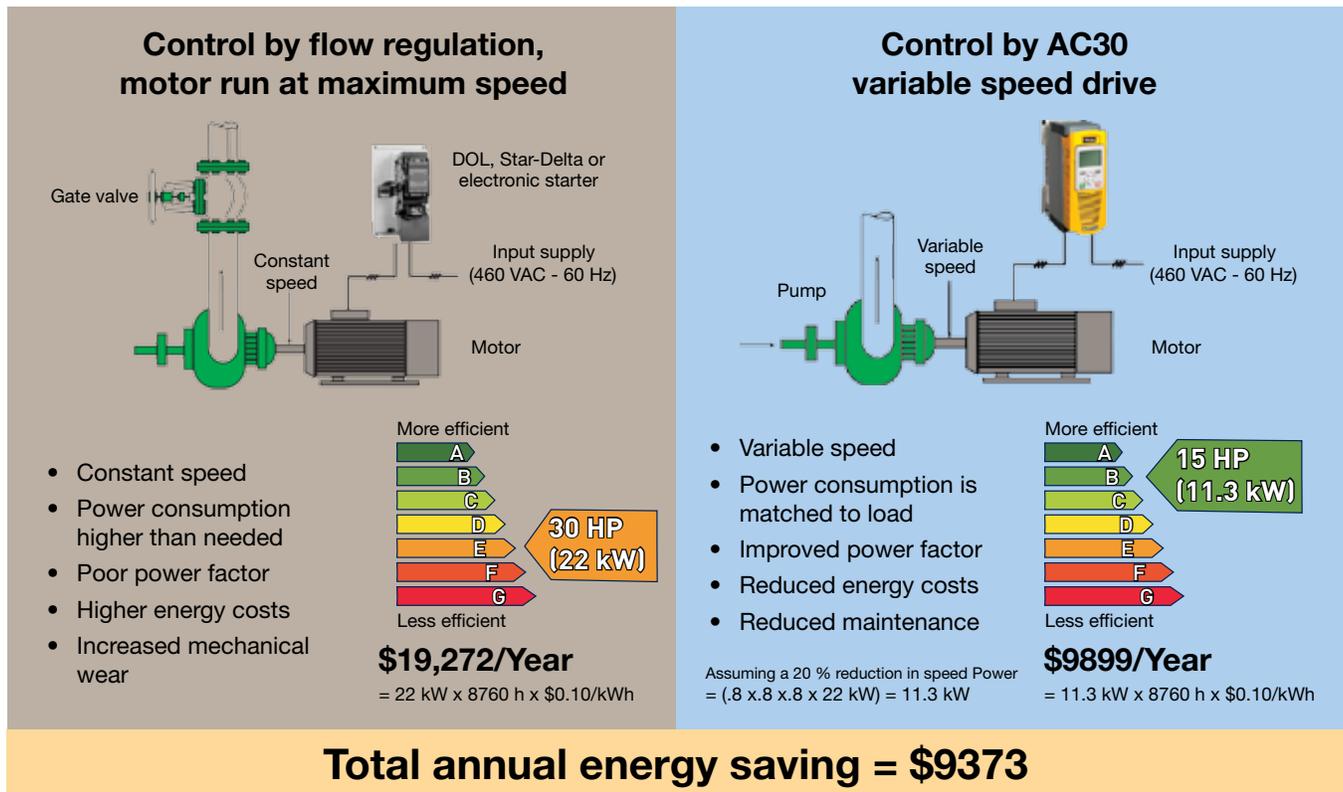
### Speed control = Savings

- Up to 50% energy savings
- Improved power factor
- Reduced maintenance
- Quieter operation
- Increased service life
- Reduced carbon footprint

### Improved power factor and service life

Pumps and fans that continuously operate at maximum speed inevitably have shorter life spans and are subject to unnecessary wear and tear. Variable speed drives can help improve service life while also reducing energy consumption and improving the power factor of your installations.

In addition to the cut in energy costs, you'll also see significant savings with maintenance and repair bills and a noticeable reduction in noise pollution as well.



## Designed to put you in control of your energy savings

AC30 is supplied complete with a number of features designed to simplify pump and fan control. In addition to quick setup, dedicated pump and fan macros, there are a number of other features dedicated to energy-saving pump and fan control such as:

### Automatic belt breakage detection

Interactive monitoring of the running conditions of a fan allows AC30 to detect a breakage in the drive belt between the fan and motor, stop the motor and indicate an alarm condition.

### Catching a spinning load - "fly-catching"

The fan control algorithms enable the AC30 to detect when a fan is free-wheeling and to regain control of it before running it at the commanded speed.

### PID Control

Multiple PID control loops can be programmed to monitor process variables and adjust the speed of the motor accordingly to achieve the required variable setpoint.

### Intelligent pump profiles

Our advanced intelligent pump control algorithms monitor motor loads and provides users with a number of features designed specifically for pump control applications, such as:

- Pump dry running protection
- Flow detection (low and no-flow)
- Blocked pump detection

### Essential services (Fire mode)

Selected via digital input, Fire mode will cause the drive to run continuously at the maximum programmed speed ignoring all other control signals and alarm conditions.

### Energy optimization

Under constant speed conditions, the motor power waveforms from the drive are optimized to reduce motor energy consumption without compromising performance.

### Skip frequencies

Up to 4 speed and frequency bands can be programmed in the AC30, to enable resonant points on the fan to be avoided, reducing vibration, wear and noise.

### Timed run function

With the optional Real Time Clock (RTC) module, 10 daily start/stop events can be programmed with different running speeds across a 7 day period. This function is ideally suited to applications where regular operating patterns or periods of activity need to be accommodated, such as in a production environment.

### Process Timers

Multiple hours-run timers can be programmed to generate text alerts on the drive keypad to coincide with process maintenance intervals.



### Engineered for any motor

In addition to the energy-saving associated with VSD control of pumps and fans. Additional energy saving can be achieved by using permanent magnet (PMAC) servo motors. AC30 offers effective and affordable control of either AC induction motors or PMAC motors.

PMAC motors are up to 10% more efficient and 75% smaller than standard AC induction motors



### Closed-loop operation

An optional pulse encoder feedback module can be added to the AC30 for applications requiring more accurate speed or torque control of AC induction motors



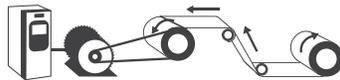
## Application Macros

Making use of pre-defined control logic, application macros enable users to quickly configure the AC30 for control of one of a number of pre-defined functions. Information is presented to the user in a template format which can then be simply and easily populated with the specific details of the application. This removes the complexity of designing the application logic from scratch.



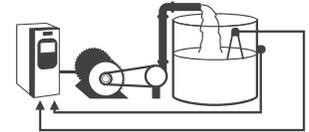
### BASIC SPEED CONTROL

Set speed and voltage or current with start/stop direction control



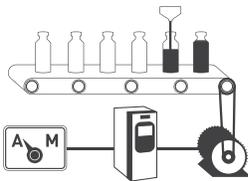
### TORQUE CONTROL

Control the motor torque limit using an analog input



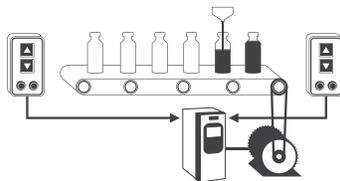
### PUMP CONTROL

Dedicated pump control with specific pump functionality



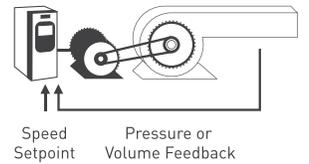
### AUTOMATIC/MANUAL CONTROL

Set to run with local speed setting or external reference



### RAISE/LOWER

Increase or reduce speed using digital inputs



### PID CONTROL

Control the pressure, flow, temperature or any process variable



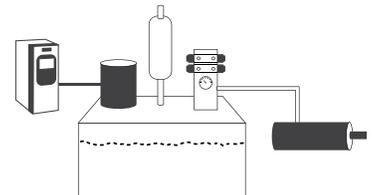
### PRESET SPEED CONTROL

Select up to 8 pre-programmed speeds using digital inputs



### FAN CONTROL

Dedicated fan control with specific fan functionality



### HYDRAULIC PUMP CONTROL

Efficient control of hydraulic pump applications, including accumulator charging, pressure control, flow control



## Parker Drive Quicktool (PDQ) Software

To enable communication between the AC30 drive and a PC, this programming, monitoring, and diagnostic software package is provided with every drive. PDQ includes setup and tuning wizards to get your newly installed drive up and running in no time!

## Applications

With over 30 years experience of designing and building AC and DC drives and systems, Parker has a wealth of expertise in many different industries. The AC30 has been built on this experience and incorporates many flexible and innovative features, making it ideally suited for use in many industrial and commercial applications. Additional communications, expanded I/O and pulse encoder feedback option modules extend the capabilities of the AC30 still further, making it an extremely flexible and capable solution for all types of open- and closed-loop motor control requirements.



**Industrial Pump Control**



**Industrial Fan Control**



**Conveyor Control**



**Air Compressor Control**



**Machine Spindle**



**Hydraulic Pump Control**

# Technical Specifications

## Power Ratings

Order Code	Normal Duty Ratings			Heavy Duty Ratings			Frame
	kW/HP	Output Current A <sub>rms</sub>		kW/HP	Output Current A <sub>rms</sub>		
		400 VAC	480 VAC		400 VAC	480 VAC	
380-480 (± 10 %) VAC Supplies Three Phase							
31V-4D0004-B...	1.1/1.5	3.5	3.0	0.75/1	2.5	2.1	D
31V-4D0005-B...	1.5/2	4.5	3.4	1.1/1.5	3.5	3.0	D
31V-4D0006-B...	2.2/3	5.5	4.8	1.5/2	4.5	3.4	D
31V-4D0008-B...	3/4	7.5	5.8	2.2/3	5.5	4.8	D
31V-4D0010-B...	4/5	10	7.6	3/4	7.5	5.8	D
31V-4D0012-B...	5.5/7.5	12	11	4/5	10	7.6	D
31V-4E0016-B...	7.5/10	16	14	5.5/7.5	12	11	E
31V-4E0023-B...	11/15	23	21	7.5/10	16	14	E
31V-4F0032-B...	15/20	32	27	11/15	23	21	F
31V-4F0038-B...	18/25	38	36	15/20	32	27	F
31V-4G0045-B...	22/30	45	40	18/25	38	36	G
31V-4G0060-B...	30/40	60	52	22/30	45	40	G
31V-4G0073-B...	37/50	73	65	30/40	60	52	G
31V-4H0087-B...	45/60	87	77	37/50	73	65	H
31V-4H0105-B...	55/75	105	96	45/60	87	77	H
31V-4H0145-B...	75/100	145	124	55/75	105	96	H

See Ordering Information for full order codes and description

## Electrical Characteristics

Power Supply	480 V Nominal
Rated Input Voltage	3 Ø 380-480 VAC ±10%
Input Frequency	45-65 Hz
Maximum Switching Frequency	Frame D, E: 4 kHz up to maximum of 16 kHz - de-rating may apply Frame F: 4 kHz up to maximum of 12 kHz - de-rating may apply Frame G: 3 kHz up to maximum of 12 kHz - de-rating may apply Frame H: 3 kHz up to maximum of 8 kHz - de-rating may apply
Overload: Heavy Duty	150% for 60 seconds - 180% for 3 seconds
Overload: Normal Duty	110% for 60 seconds - 180% of HD full load current for 3 seconds
Output Frequencies	0-500 Hz at 4 kHz switching frequency 0-590 Hz at 8 kHz switching frequency 0-590 Hz at 12 kHz switching frequency
Earth Leakage Current	>10 mA (all models)

# Technical Specifications

## Environmental Characteristics

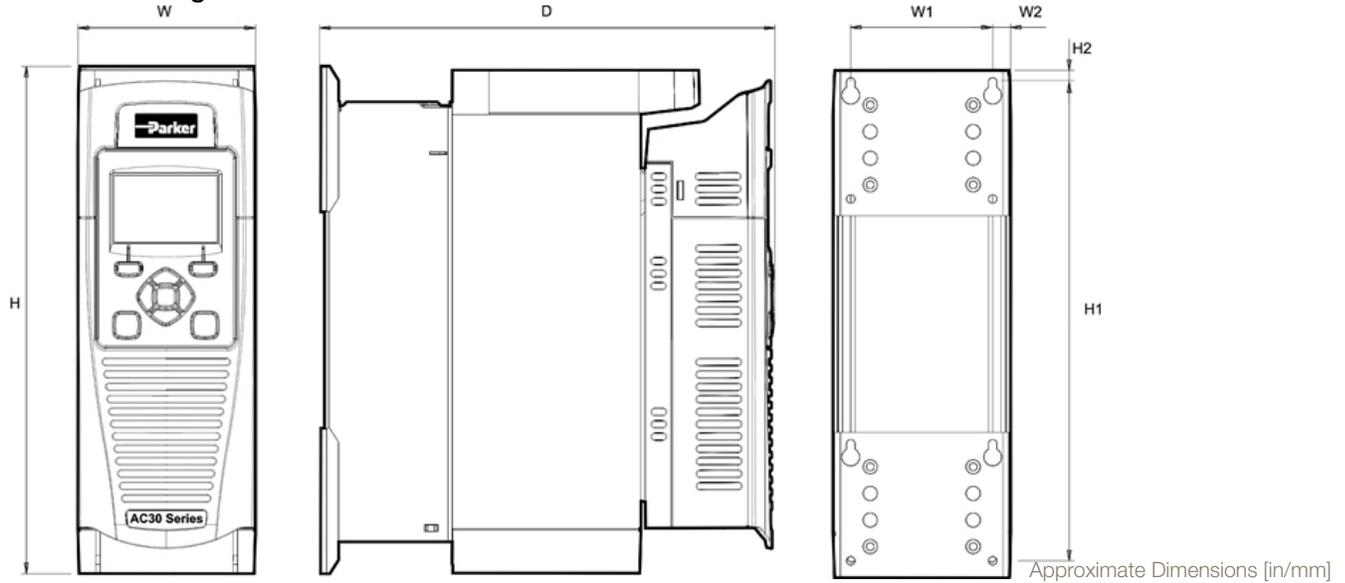
<b>Operating Temperature</b>	0 to +40°C (32°F to 104°F) Normal Duty, 0 to +45°C (32°F to 113°F) Heavy Duty, derate up to a maximum of +50°C (122°F) (Refer to manual for derating specifics)
<b>Storage Temperature</b>	-25°C to +55°C (-13°F to 131°F)
<b>Shipping Temperature</b>	-25°C to +70°C (-13°F to 158°F)
<b>Product Enclosure Rating</b>	IP20 - remainder of surfaces (Europe) UL (c-UL) Open Type (North America)
<b>(Cubicle mounted)</b>	IP20 UL (c-UL) Open Type (North America)
<b>(Through-panel mounted)</b>	IP20 UL (c-UL) Open Type (North America)
<b>Altitude</b>	1000 m ASL. Derate output by 1% per 100 m to a maximum of 2000 m
<b>Operating Humidity</b>	Maximum 85% relative humidity at 40°C (104°F) non-condensing
<b>Atmosphere</b>	Non-flammable, non-corrosive and dust free
<b>Climatic Conditions</b>	Class 3k3, as defined by EN60721-3-3
<b>Chemically Active Substances</b>	For the standard product, compliance with EN60271-3-3 is: <ul style="list-style-type: none"> <li>• Both classes 3C3 and 3C4 for Hydrogen Sulphide gas (H<sub>2</sub>S) at a concentration of 25 ppm for 1200 hours</li> <li>• Both classes 3C1 (rural) and 3C2 (urban) for all 9 defined substances as defined in table 4</li> </ul>
<b>Operating Vibration</b>	Test Fc of EN60068-2-6 10 Hz<=f<=57 Hz sinusoidal 0.075 mm amplitude 57 Hz<=f<=150 Hz sinusoidal 1 g 10 sweep cycles per axis on each of three mutually perpendicular axes

## Standards and Conformance

<b>Overvoltage Category</b>	Overvoltage category III (numeral defining an impulse withstand level)
<b>Pollution Degree</b>	Pollution degree II (non-conductive pollution, except for temporary condensation) for control electronics Pollution Degree III (dirty air rating) for through-panel mounted parts
<b>North America/Canada</b>	Complies with the requirements of UL508C and CSA22.2 #14 as an open-type drive
<b>Europe</b>	This product conforms with the Low Voltage Directive 2006/95/EC
<b>EMC Compatibility</b>	CE Marked in accordance with 2004/108/EC (EMC Directive)
<b>RoHS Compliance</b>	This product complies with RoHS substance restrictions in accordance with EC Directive 2011/65/EU

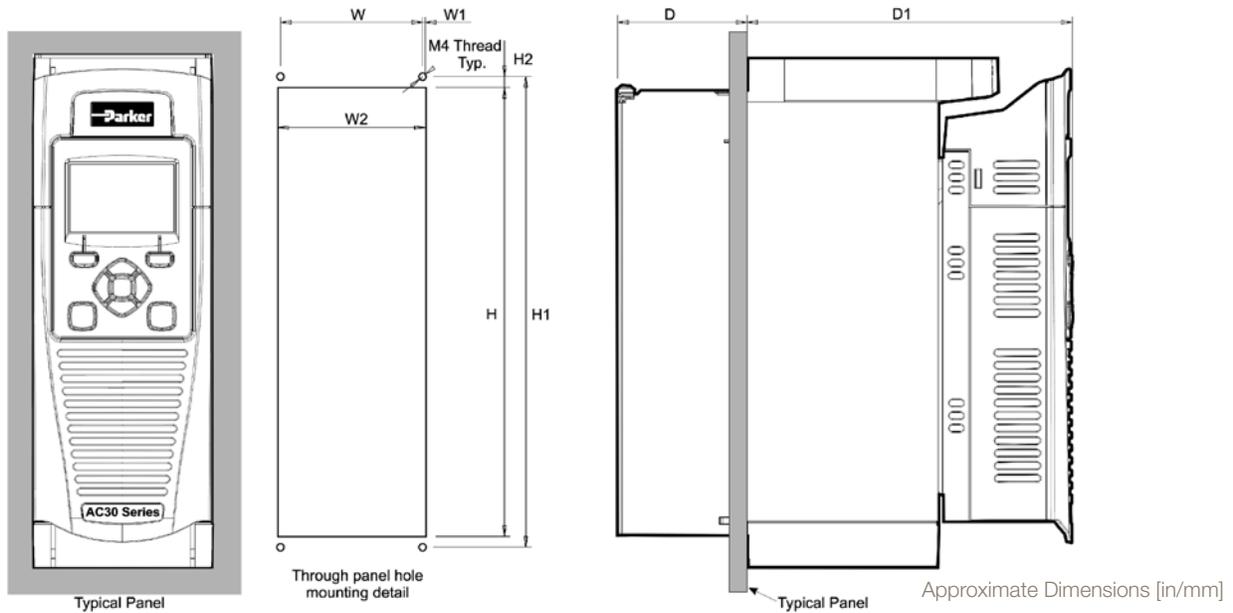
# Dimensions

## Panel Mounting



Size	Max. Weight [lb/kg]	H	H1	H2	W	W1	W2	D	Mounting
Frame D	10.0/4.5	11.26/286.0	10.6/270.0	0.25/6.5	3.93/100.0	3.15/80.0	0.39/10.0	10.0/255.0	4.5mm slot, M4 mountings
Frame E	15.0/6.8	13.11/333.0	12.6/320.0	0.25/6.5	4.92/125.0	3.93/100.0	0.49/12.5	10.0/255.0	
Frame F	22.0/10.0	15.07/383.0	14.5/370.0	0.25/6.5	5.90/150.0	4.92/125.0	0.49/12.5	10.0/255.0	
Frame G	49.2/22.3	18.90/480.0	18.31/465.0	0.29/7.25	8.66/220.0	7.48/190	0.51/13.0	11.30/287	5.5mm slot, M5
Frame H	94.6/42.8	26.38/670.0	25.59/650.0	0.39/10.0	10.24/260.0	8.66/220	0.79/20	12.44/316	6.8mm slot, M6

## Through-Panel Mounting

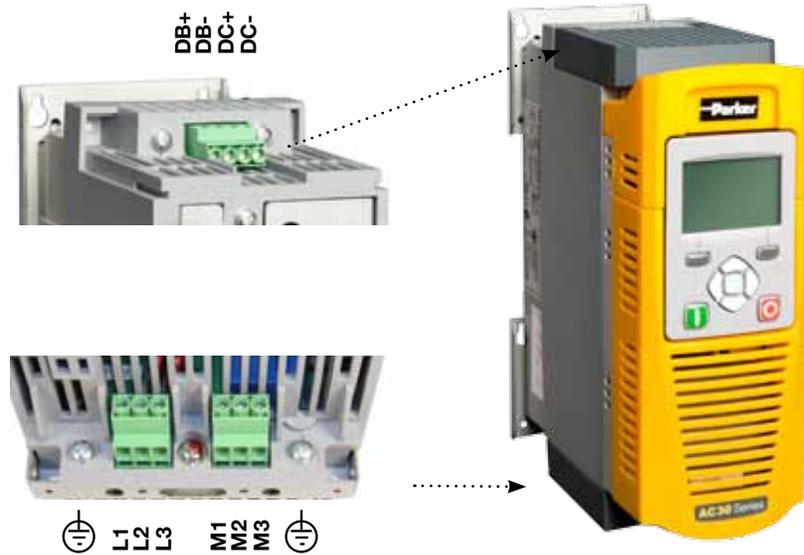


Size	H	H1	H2	W	W1	W2	D	D1	Mounting
Frame D	9.8/250	10.3/262	0.24/6	3.1/79	0.06/1.5	3.2/82	2.8/72	7.1/181	Use M4 mountings
Frame E	11.7/297	12.2/309	0.24/6	4.1/104	0.04/1	4.0/102	2.8/72	7.1/181	
Frame F	13.7/347	14.1/359	0.24/6	5.1/129	0.04/1	5.0/127	2.8/72	7.1/181	
Frame G	Refer to kit part number LA502471								
Frame H	Refer to kit part number LA502472								

# Connections

## Power connections

Term.	Description
DB+	Dynamic Brake Resistor
DB-	Dynamic Brake Resistor
DC+	DC Link Bus +
DC-	DC Link Bus -
L1	L1 AC Input Supply
L2	L2 AC Input Supply
L3	L3 AC input Supply
M1	Motor Output 1/U
M2	Motor Output 2/V
M3	Motor Output 3/W



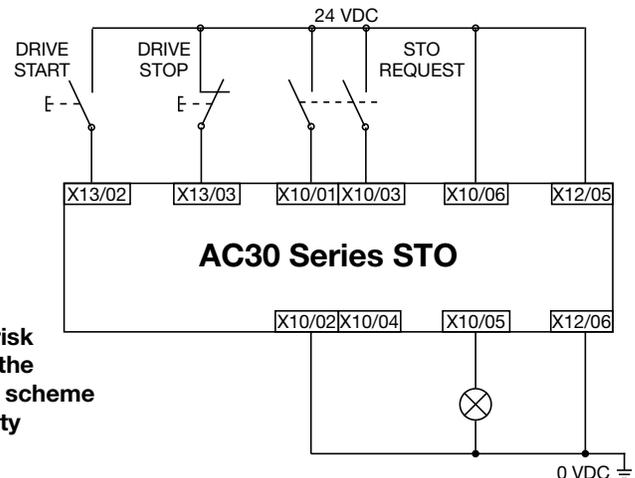
## Safe Torque Off (STO)

The AC30 series features Safe Torque Off functionality as standard, offering users protection against unexpected motor start-up in accordance with EN13849-1 at PLe Cat 3 or SIL 3 to EN61800-5-2.

The STO functionality helps protect personnel and machinery by preventing the drive from restarting automatically. It disables the drive pulses and inhibits the power supply to the motor, so that the drive cannot generate any potentially hazardous movement. The state is monitored internally within the drive.

The example wiring diagram shows the minimum connections required to implement STO with the AC30 series AC drives.

Term.	Label	Description
X10/01	STO A Input	STO Channel A input signal
X10/02	STO Common	Return signals for STO A and STO B
X10/03	STO B Input	STO Channel B input signal
X10/04	STO Common	Return signals for STO A and STO B
X10/05	STATUS A	STO Status Indication
X10/06	STATUS B	STO Status Indication

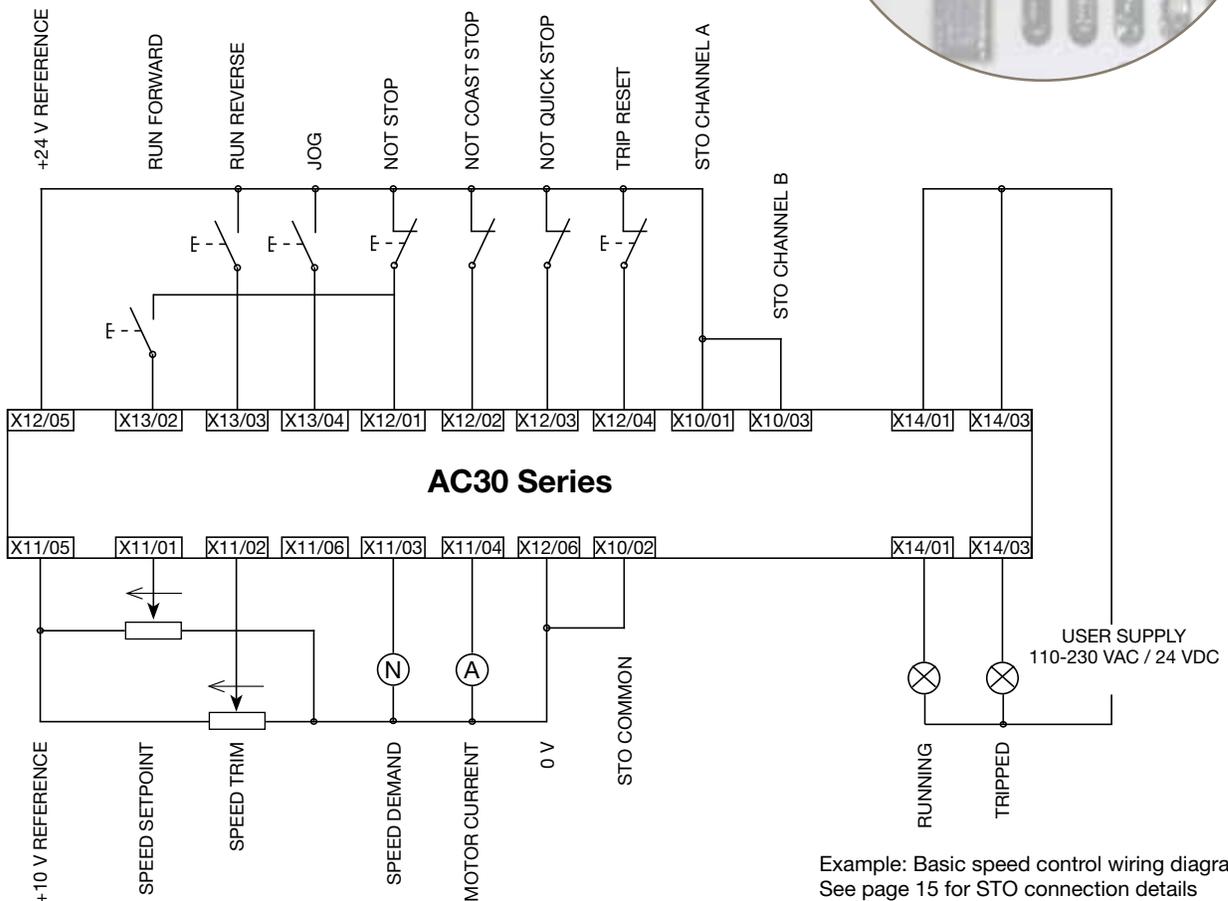
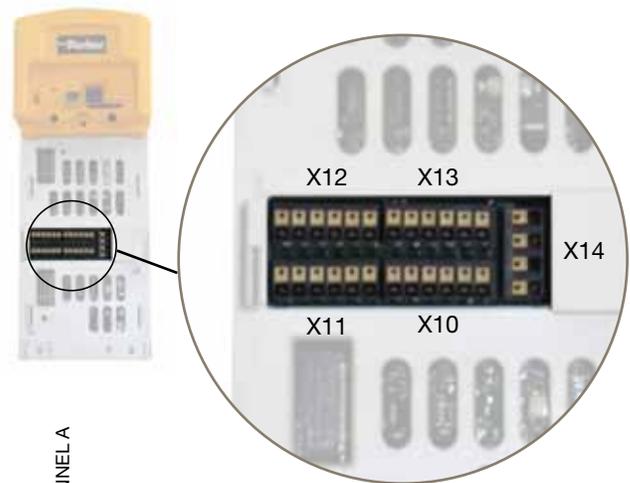


 It is the user's responsibility to ensure the safe and correct use of the STO function of the AC30 Series. Users should read and fully understand chapter 6 (Safe Torque Off) of the product user manual. Manual No. HA501718U001

## Control wiring connections

Term.	Label
X10/01	STO A Input
X10/02	STO Common Return
X10/03	STO B Input
X10/04	STO Common Return
X10/05	STO Status A
X10/06	STO Status B
X11/01	ANIN 01 Analog Input ( $\pm 10$ V, 0-10 V, 0-20 mA, 4-20 mA)
X11/02	ANIN 02 Analog Input ( $\pm 10$ V, 0-10 V)
X11/03	ANOUT 01 Analog output ( $\pm 10$ V, 0-10 V)
X11/04	ANOUT 02 Analog output (0-10 V, 0-20 mA, 4-20 mA)
X11/05	+10 V Reference
X11/06	-10 V Reference
X12/01	DIGIN04 / DIGOUT 01 Digital In/Out
X12/02	DIGIN05 / DIGOUT 02 Digital In/Out
X12/03	DIGIN06 / DIGOUT 03 Digital In/Out
X12/04	DIGIN07 / DIGOUT 04 Digital In/Out
X12/05	User +24 V Output
X12/06	0 V Common

Term.	Label
X13/01	0V Common
X13/02	DIGIN 1 Digital Input
X13/03	DIGIN 2 Digital Input
X13/04	DIGIN 3 Digital Input
X13/05	+24 V Auxiliary Input
X13/06	0 V Auxiliary Input
X14/01	Relay Output 01 (Contact A)
X14/02	Relay Output 01 (Contact B)
X14/03	Relay Output 02 (Contact A)
X14/04	Relay Output 02 (Contact B)



Example: Basic speed control wiring diagram  
 See page 15 for STO connection details

## Accessories and Options

### Operator Keypad

Order Code	Description
7001-00-00	IP54 Graphical keypad
7001-01-00	Keypad blanking cover
LA501991U300	Keypad remote mounting kit (3 m cable and screws)

#### Description:

The backlit LCD graphical keypad can be either mounted locally on the drive or remotely with the use of a remote mounting kit. The keypad has three passcode protected user access levels which allows operators, technicians, or engineers to gain access to the relevant level of drive information.

The keypad makes use of a softkey menu system and can be used to set up and commission the drive, change parameter settings, monitor running status, or diagnose warning or alarm conditions.

The keypad can display information in one of the following languages. The display is also capable of displaying a user defined language set as well as a customized set of units.

- English
- German
- Spanish
- French
- Italian
- Customized



7001-00-00



7001-01-00

### Data Storage and Cables

Order Code	Description
IF501990	SD card 2GB
CM501989U010	Ethernet cable 1 m
CM501989U011	Ethernet cable 3 m
CM501989U012	Ethernet cable 5 m



IF501990

### Mounting and Filter Kits

Order Code	Description
BO501911U001	Frame D through panel mounting gasket
BO501911U002	Frame E through panel mounting gasket
BO501911U003	Frame F through panel mounting gasket
BO501911U004	Frame G through panel mounting gasket
BO501911U005	Frame H through panel mounting gasket
LA501935U001	Frame D C2 environment filter kit
LA501935U002	Frame E C2 environment filter kit
LA501935U003	Frame F C2 environment filter kit
LA501935U004	Frame G C2 environment filter kit
LA501935U005	Frame H C2 environment filter kit



LA501935UU001

The environment filter kit consists of a motor cable ferrite core and screening brackets and is required to comply with the requirements of the EMC directive for a C2 environment.

## Communication Interfaces

<b>7003-PB-00</b>	<b>PROFIBUS DP-V1 communication interface</b>
<b>Supported Protocols</b>	PROFIBUS-DP; Demand data and Data exchange
<b>Communication Speed</b>	Up to 12 Mbits/s; automatically detected
<b>Max. number of devices</b>	32 per segment, 126 total
<b>Supported Messages</b>	Up to 152 bytes cyclic I/O, 68 bytes class 1 and 2 acyclic data, 152 bytes configuration data. GSD file provided



<b>7003-DN-00</b>	<b>DeviceNet communication interface</b>
<b>Supported Protocols</b>	DeviceNet protocol (slave)
<b>Communication Speed</b>	125, 250, 500 kbits/s or automatically detected
<b>Max. number of devices</b>	64
<b>Supported Messages</b>	Bit strobed I/O, Polled I/O, Cyclic I/O, Change of state, Explicit messaging



<b>7003-CB-00</b>	<b>CANopen communication interface</b>
<b>Profile</b>	DS301 V4.02
<b>Communication Speed</b>	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 1 Mbits/s or automatically detected
<b>Max. number of devices</b>	127
<b>Supported Messages</b>	SDO, PDO, NMT, SYNC



<b>7003-PN-00</b>	<b>PROFINET I/O communication interface</b>
<b>Supported Protocols</b>	PROFINET I/O Real-Time (RT) Protocol
<b>Communication Speed</b>	100 Mbits/s full duplex
<b>Max. number of devices</b>	Virtually unlimited
<b>Supported Messages</b>	Up to 256 bytes of cyclic I/O in data in each direction



<b>7003-IP-00</b>	<b>Ethernet IP communication interface</b>
<b>Supported Protocols</b>	Ethernet IP
<b>Communication Speed</b>	10/100 Mbits/s full/half duplex
<b>Max. number of devices</b>	Virtually unlimited
<b>Supported Messages</b>	Up to 256 bytes of consumed data and 256 bytes of produced data, CIP parameter object support, Explicit messaging



<b>7003-RS-00</b>	<b>RS485 / Modbus RTU communication interface</b>
<b>Supported Protocols</b>	Modbus RTU
<b>Communication Speed</b>	1200 to 115200 bits/s
<b>Max. number of devices</b>	247
<b>Supported Messages</b>	Up to 256 bytes of cyclic I/O data in each direction



## Communication Interfaces

<b>7003-BN-00</b>	<b>BACnet MSTP communication interface</b>
<b>Supported Protocols</b>	BACnet/MSTP
<b>Communication Speed</b>	up to 76.8 kbits/s
<b>Max. number of devices</b>	255
<b>Supported Messages</b>	Real time synchronization according to DM-T S-B, COV notifications and Alarm/Event functionality



<b>7003-BI-00</b>	<b>BACnet/IP communication interface</b>
<b>Supported Protocols</b>	BACnet/IP
<b>Communication Speed</b>	100 Mbits/s
<b>Max. number of devices</b>	255
<b>Supported Messages</b>	Real time synchronization according to DM-T S-B, COV notifications and Alarm/Event functionality



<b>7003-CN-00</b>	<b>ControlNet communication interface</b>
<b>Supported Protocols</b>	ControlNet
<b>Communication Speed</b>	5 Mbits/s
<b>Max. number of devices</b>	99
<b>Supported Messages</b>	Polled I/O



<b>7003-EC-00</b>	<b>EtherCAT communication interface</b>
<b>Supported Protocols</b>	CANopen over EtherCAT (CoE) DS301 compliant
<b>Communication Speed</b>	100 Mbits/s
<b>Max. number of devices</b>	65534
<b>Supported Messages</b>	SDO, PDO, NMT, SYNC



<b>7003-IM-00</b>	<b>Ethernet TCP communication interface</b>
<b>Supported Protocols</b>	Modbus/TCP
<b>Communication Speed</b>	10/100 Mbits/s
<b>Max. number of devices</b>	Virtually unlimited
<b>Supported Messages</b>	CIP parameter object support, explicit messaging



## Input and Output Cards

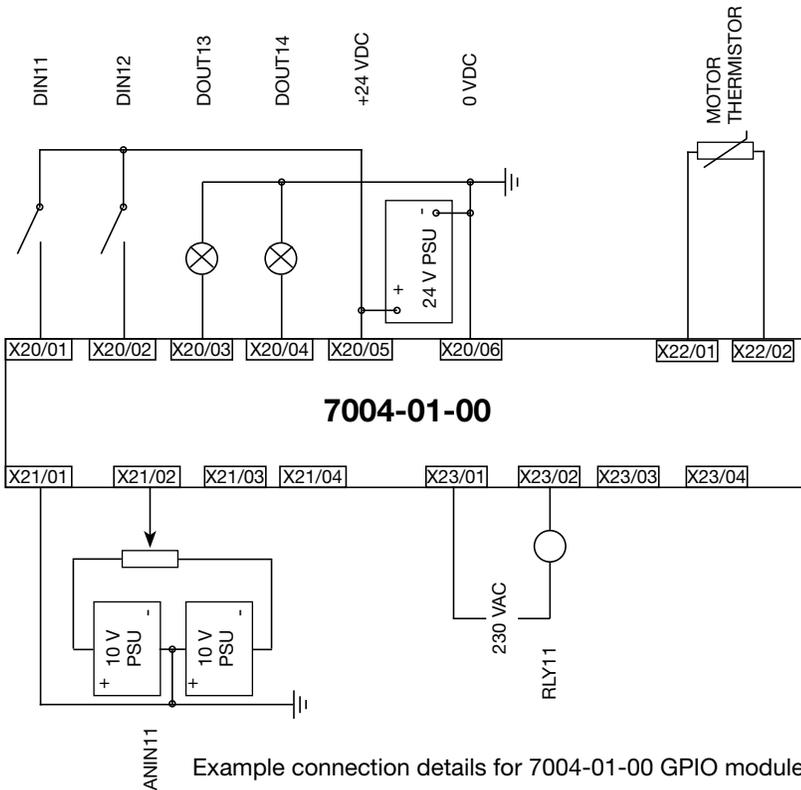
### 7004-01-00 - General Purpose I/O Module

Digital Inputs & Outputs	4x Digital inputs or outputs
Analog Inputs/Outputs	3x Analog inputs ( $\pm 10$ V)
Relay Outputs	2x Volt-free relay outputs (230 VAC)
Motor Temperature Sensing	1 motor thermistor input
Real time Clock	Included

#### Description:

The general purpose I/O (GPIO) option module can be fitted to all AC30 series drives in the upper I/O option module slot. The modules are field installable and offer users the opportunity to expand the drive's standard I/O capability, allowing more complex motor control solutions to be implemented.

#### Connection Details:



Terminal	Label
X20/01	DIN11/DOUT11
X20/02	DIN12/DOUT12
X20/03	DIN13/DOUT13
X20/04	DIN14/DOUT14
X20/05	+24 VDC
X20/06	0 VDC COMMON
X21/01	REFERENCE
X21/02	ANIN11
X21/03	REFERENCE
X21/04	ANIN12
X22/01	MOTOR THERMISTOR
X22/02	MOTOR THERMISTOR
X23/01	RLY11
X23/02	RLY11
X23/04	RLY12
X23/04	RLY12

### 7004-02-00 - Motor Thermistor Input Module

Motor Thermistor Inputs	1 motor thermistor input
Thermistor Compatibility	PTC, NTC, KTY
Thermistor Resistance Range	0-4.5 k $\Omega$

#### Description:

The isolated motor thermistor input module provides a means of monitoring motor temperature in order to protect the motor from a potentially damaging high temperature. By default the drive will trip if the motor exceeds a user-defined temperature threshold thereby preventing motor temperature from rising further.



## Input and Output Cards

### 7004-03-00 - Real Time Clock and Motor Thermistor Input Module

Motor Temperature Sensing	1 motor thermistor input
Thermistor Compatibility	PTC, NTC, KTY
Thermistor Resistance Range	0 - 4.5 kΩ
Time Format	Seconds
Accuracy (drive powered)	±1 minute / month (RTC trim=0)
Accuracy (drive unpowered)	±5 minutes / month (RTC trim=0)
Battery Backup Duration	6 Months

#### Description:

A real-time clock (RTC) is provided for the user to program the drive to perform functions at specified times. The RTC has battery backup, so it continues to run when the drive is unpowered. The battery recharges when the drive is powered.

An isolated motor thermistor input is also included in the 7004-03-00 module.

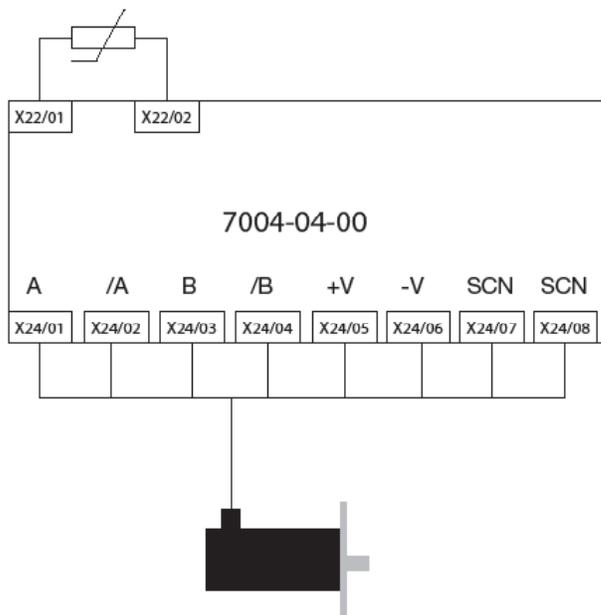


### 7004-04-00 - Pulse Encoder Feedback Module

Maximum Input Frequency	250 Hz per channel
Supply Voltage Output	5 V, 12 V, 15 V, 24 V
Input Format	Quadrature, or Clock (inputs A & /A) and Direction (input B & /B)
Motor Thermistor Details	Same as 7004-02-00

#### Description:

The pulse encoder feedback module provides the provision for an incremental encoder to be connected to the AC30, allowing users to take full advantage of the enhanced torque control and speed regulation functionality of the drive. In addition, the 7004-04-00 option module is equipped with a single motor thermistor input.



Terminal	Description
X24/01	Channel A
X24/02	Channel /A
X24/03	Channel B
X24/04	Channel /B
X24/05	Supply positive
X24/06	Supply negative
X24/07	Cable screen
X24/08	Cable screen
X22/01	Motor thermistor
X22/02	Motor thermistor

## Ancillary Parts

### Three Phase Reactors

Line reactors have been selected for the AC30 series to add inductance to reduce the harmonic content of the supply current.

Order Code	Motor Power Normal Duty [HP/kW]	Inductance [mH]	Current [A <sub>rms</sub> ]
CO470651	1.5/1.1	6.5	4
	2.0/1.5		
CO352782	3.0/2.2	5	8
	4.0/3.0		
CO470652	5.0/4.0	3	8
CO352783	7.5/5.5	2.5	12
CO352785	10/7.5	1.5	18
CO352786	15/11	1.2	25
CO352901	20/15	0.8	35
	25/18		
CO352902	30/22	0.7	45
CO352903	40/30	0.5	55
CO352904	50/37	0.4	80
	60/45		
CO352905	75/55	0.3	100
CO352906	100/75	0.2	130



### EMC Filters

A range of custom designed optional EMC (Electromagnetic Compatibility) filters are available for use with the Parker SSD Drives product range. They are used to help achieve conformance with the EMC directive BS EN 61800-3:2004 - "Adjustable speed electrical power drive systems Part 3".

Order Code	Motor Power Normal Duty [HP/kW]	Frame Size
CO501894	1.5/1.1	D
	2.0/1.5	D
	3.0/2.2	D
	4.0/3.0	D
	5.0/4.0	D
	7.5/5.5	D
	10/7.5	E
	15/11	E
CO501895	20/15	F
	25/18	F
	30/22	G
Consult Factory	40/30	G
	50/37	G
Consult Factory	60/45	H
	75/55	H
	100/75	H



## Ancillary Parts

### Braking Resistors

These resistor sets are designed for stopping the system at rated power. They are rated for 10 seconds in a 100 second duty cycle. They should be mounted on a heatsink (back panel) in a protected area and covered to prevent injury from burning.



Resistor Order Code	Drive Part Number	Motor Power Normal Duty [HP/kW]	Motor Power Heavy Duty [HP/kW]	Resistance [Ω]	Power [W]	Current [A]	Type	Dimensions [in] (LxWxH)
LA471353	31V-4D0005	2.0/1.5	1.5/1.1	500	60	0.347	Metal clad	4x1x1.6
	31V-4D0006	3.0/2.0	2.2/1.5	500	60	0.347	Metal clad	4x1x1.6
LA471355	31V-4D0008	4.0/3.0	3.0/2.2	200	100	0.71	Metal clad	6.5x1x1.6
	31V-4D0010	5.0/4.0	4.0/3.0	200	100	0.71	Metal clad	6.5x1x1.6
LA471356	31V-4D0012	7.5/5.0	5.5/4.0	100	100	1.0	Metal clad	6.5x1x1.6
LA471357	31V-4E0016	10/7.5	7.5/5.5	100	200	1.4	Metal clad	6.5x1.2x2.4
LA471358	31V-4E0023	15/10	11/7.5	56	200	1.9	Metal clad	6.5x1.2x2.4
LA471359	31V-4F0032	20/15	15/11	56	500	3.0	Metal clad	13.2x1.2x2.4
LA471361	31V-4F0038	25/20	18.5/15	30	750	5.0	Cage	13.5x7x5
LA471362	31V-4G0045	30/25	22/18.5	25	756	5.5	Cage	13.5x7x5
LA471350	31V-4G0060	40/30	30/22	22.5	1134	7.1	Cage	13.5x10x5
LA471364	31V-4G0073	50/40	37/30	18	1123	7.9	Cage	13.5x10x5
LA471365	31V-4H0087	60/50	45/37	15	1135	8.7	Cage	13.5x10x5
LA471352	31V-4H0105	75/60	55/45	9	2247	15.8	Cage	13.5x10x7.5
LA471367	31V-4H0145	100/75	75/55	8	1502	13.7	Cage	13.5x13x5

### Line Fuses

These fuses, when used with the specified drive, are recommended to provide protection under short circuit conditions.

Fuse Order Code	Drive Part Number	Fuse Type	Current (Amps)
CS470754U006	31V-4D0004	AJT6	6
CS470754U010	31V-4D0005	AJT10	10
	31V-4D0006		
CS470754U012	31V-4D0008	AJT12	12
	31V-4D0010		
CS470754U020	31V-4D0012	AJT20	20
CS470754U025	31V-4E0016	AJT25	25
CS470754U030	31V-4E0023	AJT30	30
CS470754U040	31V-4F0032	AJT40	40
CS470754U050	31V-4F0038	AJT50	50
CS470754U060	31V-4G0045	AJT60	60
CS470754U080	31V-4G0060	AJT80	80
CS470754U100	31V-4G0073	AJT100	100
CS470408U125	31V-4H0087	AJT125	125
CS470408U150	31V-4H0105	AJT150	150
CS470408U200	31V-4H0145	AJT200	200

## Order Code/Part Numbers

	1	2	3	4	5	6	7	8	
Order example	<b>31V</b>	<b>4</b>	<b>D</b>	<b>0004</b>	<b>B</b>	<b>E</b>	<b>2</b>	<b>S</b>	<b>0000</b>

1	Device Family	
<b>31V</b>	AC30 Series complete drive	
<b>710</b>	Power stack only (no control module)	
2	Voltage	
<b>4</b>	400V nominal (400/460)	
3	Frame Size and Rating	
	HP (normal/heavy duty)	kW (normal/heavy duty)
<b>D0004</b>	1.5/1.0	1.1/0.75
<b>D0005</b>	2.0/1.5	1.5/1.1
<b>D0006</b>	3.0/2.0	2.2/1.5
<b>D0008</b>	4.0/3.0	3.0/2.2
<b>D0010</b>	5.0/4.0	4.0/3.0
<b>D0012</b>	7.5/5.0	5.5/4.0
<b>E0016</b>	10/7.5	7.5/5.5
<b>E0023</b>	15/10	11/7.5
<b>F0032</b>	20/15	15/11
<b>F0038</b>	25/20	18.5/15
<b>G0045</b>	30/25	22/18.5
<b>G0060</b>	40/30	30/22
<b>G0073</b>	50/40	37/30
<b>H0087</b>	60/50	45/37
<b>H0105</b>	75/60	55/45
<b>H0145</b>	100/75	75/55

4	Brake Switch	
<b>B</b>	Brake switch fitted	
5	EMC Filter <sup>(1)</sup>	
<b>N</b>	No filter fitted	
<b>E</b>	Category C3 filter fitted	
6	Graphical Keypad	
<b>0</b>	No keypad fitted	
<b>1</b>	Blanking cover fitted	
<b>2</b>	Graphical keypad fitted	
7	Environmental Coating <sup>(2)</sup>	
<b>S</b>	Standard 3C3 coating	
<b>E</b>	Enhanced coating	
8	Special Options	
<b>0000</b>	No special options	

<sup>(1)</sup> Filter should be chosen by the environment in which the drive will be installed as defined in IEC/EN61800-3. C2 = domestic & commercial, C3 = industrial

<sup>(2)</sup> AC30 is conformally coated as standard for use in environments class 3C3 and 3C4 for Hydrogen Sulphide gas. It is also compliant to both classes 3C1 (rural) and 3C2 (urban) for all nine substances defined in table 4 in EN60271-3-3. Enhanced coating is available for areas subject to high moisture.

## Accessories

### Graphical Keypad

Order Code	Description
7001-00-00	Graphical keypad for local or remote mounting
7001-01-00	Keypad blanking cover
LA501991U300	Keypad remote mounting kit (3 m cable and screws)

### I/O Options

Order Code	Description
7004-01-00	General purpose I/O module
7004-02-00	Motor thermistor input module
7004-03-00	Real time clock and motor thermistor input module
7004-04-00	Pulse encoder feedback module

### Communication Interfaces

Order Code	Description
7003-PB-00	Profibus DPV1
7003-PN-00	Profinet IO
7003-DN-00	DeviceNet
7003-CN-00	ControlNet
7003-CB-00	CANopen
7003-IP-00	Ethernet IP
7003-IM-00	Ethernet TCP
7003-EC-00	EtherCAT
7003-BI-00	BACnet IP
7003-BN-00	BACnet MSTP
7003-RS-00	RS485/Modbus RTU

### Versatile Control Module

It is possible to order the AC30 Series as a separate power stack and versatile control module. This is useful for distributor or MRO spare part stocking.



Order Code 30V-0S-0000



## Related Products

### Inverter and Vector Duty Induction Motors

#### Description

Parker SSD can provide Inverter Duty and Vector Duty motors that let you get the most out of your drive. With your choice of a wide variety of frame styles, every rating includes specific features demanded by high performance drive applications.

Cast iron frames with totally enclosed non-ventilated construction are available for harsh environments, while compact laminated frame designs with forced ventilation can fit into the tightest spaces while providing 1000:1 constant torque speed range and excellent dynamic performance.

Not all motors are created equal. Don't settle for a re-rated constant speed motor for variable speed applications. All Parker SSD Inverter and Vector Duty motors are provided with insulation that is suitable for use with IGBT based PWM drives, and with 200% torque overload capability. Ask for a performance-matched package every time.



The RPM AC™ series of AC motors was designed specifically for inverter duty performance, and offers high performance over a wide speed range. The compact, square cross-section, laminated steel frame includes cast iron brackets with feet for maximum ruggedness and stability. The low inertia design allows fast acceleration and high dynamic response. And to assure long and reliable motor life, Corona-Free insulation is used on all ratings.



For applications in tougher environments, we offer V\*S Master™, featuring cast iron frame and end shields. Overload is no problem, with 200% capability for 60 seconds. Corona-Free insulation and an insulated CE bearing extend lifetime.

### NX Series PMAC Sensorless Motors

0.2 - 7.5 kW, 0.45 - 41 Nm

#### Description

The sensorless version of NX Series motors has been designed to offer a cost effective brushless motor solution when used in conjunction with AC30 drives. Controlled without feedback sensor, NX Series servomotors are a compact, high performance, and extremely efficient alternative to traditional induction motors.

#### Features and Benefits

- Cost effective brushless solution
- Sensorless control with AC30 drives
- More compact and efficient than induction motors
- More robust design due to the lack of feedback sensor
- No need for cooling fan



At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call (800) C-PARKER



#### AEROSPACE

##### Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

##### Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



#### CLIMATE CONTROL

##### Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

##### Key Products

- CO<sup>2</sup> controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves



#### ELECTROMECHANICAL

##### Key Markets

- Aerospace
- Factory automation
- Food & beverage
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

##### Key Products

- AC/DC drives & systems
- Electric actuators
- Controllers
- Gantry robots
- Gearheads
- Human machine interfaces
- Industrial PCs
- Inverters
- Linear motors, slides and stages
- Precision stages
- Stepper motors
- Servo motors, drives & controls
- Structural extrusions



#### FILTRATION

##### Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

##### Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators



#### FLUID & GAS HANDLING

##### Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food & beverage
- Fuel & gas delivery
- Industrial machinery
- Mobile
- Oil & gas
- Transportation
- Welding

##### Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hose
- PTFE & PFA hose, tubing & plastic fittings
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



#### HYDRAULICS

##### Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

##### Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



#### PNEUMATICS

##### Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Food & beverage
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

##### Key Products

- Air preparation
- Compact cylinders
- Field bus valve systems
- Grippers
- Guided cylinders
- Manifolds
- Miniature fluidics
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves and controls
- Rodless cylinders
- Rotary actuators
- Tie rod cylinders
- Vacuum generators, cups & sensors



#### PROCESS CONTROL

##### Key Markets

- Chemical & refining
- Food, beverage & dairy
- Medical & dental
- Microelectronics
- Oil & gas
- Power generation

##### Key Products

- Analytical sample conditioning products & systems
- Fluoropolymer chemical delivery fittings, valves & pumps
- High purity gas delivery fittings, valves & regulators
- Instrumentation fittings, valves & regulators
- Medium pressure fittings & valves
- Process control manifolds



#### SEALING & SHIELDING

##### Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

##### Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

ENGINEERING YOUR SUCCESS.

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