



AC690+ Integrator Series Drives

Product Catalog



ENGINEERING YOUR SUCCESS.



Parker Electromechanical & Drives Division - Rohnert Park, CA

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AC690+ Integrator Series AC Drive

1 HP - 500 HP

Table of Contents

		Page
General Information	Introduction to Parker Hannifin	4
AC690+	Description and Operating Modes	5
	Features	6
	Specifications	7
	Electrical Characteristics	8
	Dimensions	10
	Software Tools	11
	Accessories and options AC690+	13

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.



About Parker Hannifin Corporation

Parker Hannifin is a Fortune 250 global leader in motion and control technologies. For more than a century the company has been enabling engineering breakthroughs that lead to a better tomorrow. Learn more at www.parker.com or [@parkerhannifin](https://twitter.com/parkerhannifin).



AC690+ Integrator Series AC Drives

1 HP - 500 HP



Description

The AC690+ Series is a single range of AC drives designed to meet the requirements of all variable speed applications from simple single motor speed control systems through to the most sophisticated integrated multi-drive systems.

The heart of the AC690+ is a highly advanced 32-bit microprocessor based motor control model. This provides an exceptional dynamic performance platform to which can be added a host of communications and control options, enabling you to tailor the drives to meet your exact requirements.

The AC690+ is available in 380-500V 3-phase 1 to 500 HP and 220V-240V 1 to 60 HP, including single phase input for 1 to 3 HP.

Modes of Operation

The AC690+ can be user configured for different modes of operation:

Open-loop (volts/frequency) control

This mode is ideal for basic motor speed control, or multiple motors driven in parallel. The quick set-up menu and plain language display ensures the quickest and easiest, trouble free start up.

Sensorless vector control

High starting torque and tight speed regulation is provided by a sophisticated MRAS (Model Reference Adaptive System) motor control strategy. MRAS provides accurate speed simulation (without the need for any speed measuring transducer) by continually modelling the motor.

Closed-loop vector control

Full closed-loop flux vector performance can be achieved with the AC690+ by simply adding an encoder feedback 'technology box'. This provides 100% continuous full load standstill torque plus a highly dynamic speed loop (up to 45 Hz bandwidth); more than sufficient for the most demanding of applications.

AC690+ Integrator Series AC Drive

1 HP - 500 HP

Features

Encoder feedback option with encoder technology box

The AC 690+ is converted from open-loop control to high performance closed-loop control by simply adding the plug-in encoder feedback technology box.

High performance systems expansion module

The optional add-on “systems” expansion module is available for more advanced applications and includes phase locking between drives. It is factory installed behind the main control board and provides the following functionality:

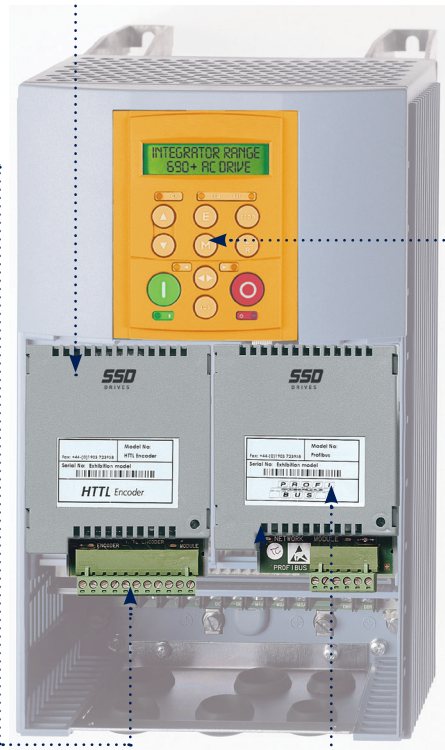
- 5 configurable digital Inputs/ outputs
- Converts existing 4 analog inputs to high resolution (12 bit plus sign)
- 2 encoder inputs
- 2 high speed register mark inputs

Integrated function blocks

- Winder Control
- Process PID
- Raise/Lower
- Spinning Load Start

Programming/Operator controls

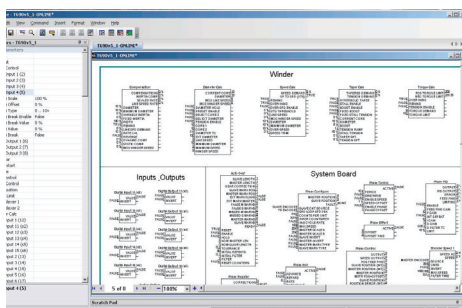
The AC690+ keypad comes standard with the drive, and provides access to all of the drive’s functions in a logical and intuitive manner. The readout is backlit and displays all functions in plain language and engineering units. The keypad can be mounted on the drive itself, or alternatively it can be supplied loose, with a mounting kit, for mounting remotely on a panel door, for example.



Open standard fieldbus communications

The AC690+ has a host of communication technology box options allowing seamless multi-vendor integration into networked systems using the most common industrial fieldbus communications protocols :

- Profibus-DP
- Ethernet/IP
- DeviceNet
- Modbus RTU
- CANbus
- **LINKnet**



AC690+ Integrator Series AC Drive

1 HP - 500 HP

Vector control with / without encoder feedback

Power ratings 1 HP - 1500 HP

Pre-programmed application Macros

Programmable over communications

Programming identical to DC590+ DC drive

Variable torque ratings

Class B EMC filters



Technical Specification

Power Supply	380-460V (±10%) 3-phase 1 to 500 HP 380-500V (±10%) 3-phase 2.2 to 110kW 220-240V (±10%) 1-phase 1 to 3 HP 220-240V (±10%) 3-phase 1 to 60 HP
Operating Temperature	Constant torque - 0-45°C (40°C with IP40 cover) Derate 2% per degree C to 50°C max (Frame B-F) Derate 1% per degree C to 50°C max (Frame G-J)
Altitude	Maximum altitude: 1000m (Derate by 1% for every 100m above 1000m to 2000m maximum)
Overload	Constant torque: 150% for 60 seconds, 180% for 1 second Variable torque: 110% for 60 seconds
Output Frequency	Volts/Hertz mode: 0-590 Hz Sensorless Vector mode: 0-120 Hz Closed Loop Vector mode: 0-300 Hz
Switching Frequency	Frame B: 3,6 or 9kHz Frame C, D, E and F: 3 or 6kHz All with audibly silent switching frequency
Dynamic Braking	Each frame B-F drive includes an internal dynamic brake switch as standard.
Analog Inputs	4 Configurable, 10 bits (13 bits with optional system card). 0-10V, 0-±10V, 0-20mA, 4-20mA
Analog Outputs	3 Configurable, 10 bits. 0-10V, 0-±10V, 0-20mA, 4-20mA
Digital Inputs	7 Configurable, nominal 24VDC (30VDC max)
Digital Outputs	3 Configurable, relay contacts 3A/230 VAC
Reference Supplies	+10VDC, -10VDC, +24VDC
Motor Thermistor Input	Yes

Function Block Programming	Function block programming allows a tremendously flexible control structure to be created with ease. An almost infinite combination of user functions can be realized often alleviating the need for an external PLC. However, the drive is pre-configured so it can be used straight from the box as a standard AC drive without further adjustment.
Analog Functions	If So, summing, subtractor, multiplier, divider, if higher then lower then If, Counter, Timer
Boolean Functions	Not, And, Nand, Or, Nor, Xor, Trigger, Flip-Flop
Application Macros	Simple speed control, Forward/Reverse, Raise/Lower, Process PID, Preset speeds, Winder control.
6901 Operator Keypad	The 6901 keypad is designed for setting-up, configuring and operating the AC690+ drive. The intuitive menu navigation and parameter display is simple and easy to use. Main features: <ul style="list-style-type: none"> • Remote mounting capability on front of enclosure • Backlit display • Multilingual 2x16 alphanumeric display • Customizable display • Local Control: Speed setpoint, Start/Stop, Jog and Direction • Password protection • Quick set-up mode
Systems Expansion Module	The optional systems expansion module allows for advanced applications such as phase locking between drives. Key features include: <ul style="list-style-type: none"> • 5 Additional user configurable Inputs / Outputs • 4 High resolution analog inputs (12 bits plus sign) • 2 Additional encoder inputs • 2 High speed register mark inputs • Encoder repeater

Standards

Most standard products in the AC690+ series meet the following standards when installed in accordance with the relevant product manual. Consult factory for verification of standards for specific part numbers.

CE Marked to EN50178 (Safety, Low Voltage Directive)

CE Marked to EN61800-3 (EMC Directive)

UL Listed to US safety standard UL508C.

cUL Listed to Canadian standard C22.2 #14.



Electrical Characteristics

AC690+ Integrator Series AC Drive



Power Supply 220-240V (±10%) 50/60 Hz

Part Number	Phases	Frame	Constant Torque		Variable Torque		Inductance	Braking Module
			Power (HP/kW)	Output Current (A)	Power (HP/kW)	Output Current (A)		
690+0001/230/CBN1	1	B	1/7.5	4.0	-	-	No	Yes
690+0003/230/CBN1	1	B	3/2.2	10.5	-	-	No	
690+0001/230/CBN	3	B	1/7.5	4.3	-	-	No	
690+0003/230/CBN	3	B	3/2.2	10.5	-	-	DC	
690+0005/230/CBN	3	B	5/4	16	-	-	DC	
690+0015/230/CBN	3	D	15/11	42	20/15	54	DC	
690+0030/230/CBN	3	E	30/22	80	40/30	104	DC	
690+0040/230/CBN	3	F	40/30	104	50/37	130	AC	
690+0050/230/CBN	3	F	50/37	130	60/45	154	AC	
690+0060/230/CBN	3	F	60/45	154	75/55	192	AC	

Power Supply 380-460V (±10%) 50/60 Hz 3-phase

Part Number	Phases	Frame	Constant Torque			Variable Torque			Inductance	Braking Module
			Power (HP/kW)	Output Current (A)		Power (HP/kW)	Output Current (A)			
				400V	460V		400V	460V		
690+0001/460/CBN	3	B	1/7.5	2.5	2.5	-	-	-	-	Yes
690+0002/460/CBN	3	B	2/1.5	4.5	4.5	-	-	-	-	
690+0003/460/CBN	3	B	3/2.2	5.5	5.5	-	-	-	-	
690+0005/460/CBN	3	B	5/4	9	9	-	-	-	-	
690+0010B/460/CBN	3	B	10/6	14	14	-	-	-	-	
690+0015/460/CBN	3	C	15/11	23	21	20/15	30	27	DC	
690+0020C/460/CBN	3	C	20/15	30	27	25/18.5	37	34	DC	
690+0030/460/CBN	3	D	30/22	45	45	40/30	59	52	DC	
690+0040D/460/CBN	3	D	40/30	59	52	50/37.5	73	65	DC	

Constant Torque ratings provide 150% overload for 60 seconds. Variable Torque ratings provide 110% overload for 60 seconds
To add System Expansion Module, change last character in part number from "N" to "S"

Electrical Characteristics

AC690+ Integrator Series AC Drive



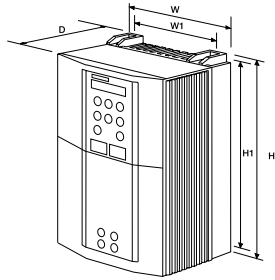
Power Supply 380-460V (±10%) 50/60 Hz 3-phase

Part Number	Phases	Frame	Constant Torque			Variable Torque			Inductance	Braking Module
			Power (HP/kW)	Output Current (A)		Power (HP/kW)	Output Current (A)			
				400V	460V		400V	460V		
690+0050/460/CBN	3	E	50/37	73	73	60/45	87	87	AC	Yes
690+0060/460/CBN	3	E	60/45	87	87	75/55	105	100	AC	
690+0075/460/CBN	3	F	75/55	105	100	100/75	145	125	AC	
690+0100/460/CBN	3	F	100/75	145	130	125/90	165	156	AC	
690+0125/460/CBN	3	F	125/90	165	156	150/110	180	180	AC	
690+0150/460/CBN	3	F	150/90	180	180	150/110	205	180	AC	
690+0200/460/CBN	3	G	200/132	250	250	250/150	302	302	External	Yes
690+0200/460/CNN	3	G	200/132	250	250	250/150	302	302	External	No
690+0300/460/CBN	3	G	300/180	361	361	350/220	420	420	External	Yes
690+0300/460/CNN	3	G	300/180	361	361	350/220	420	420	External	No
690+0350/460/CBN	3	H	350/220	420	420	400/250	480	480	External	Yes
690+0350/460/CNN	3	H	350/220	420	420	400/250	480	480	External	No
690+0450/460/CBN	3	H	450/280	520	520	500/315	590	590	External	Yes
690+0450/460/CNN	3	H	450/280	520	520	500/315	590	590	External	No
690+0500/460/CBN	3	J	500/315	590	590	550/355	650	650	External	Yes
690+0500/460/CNN	3	J	500/315	590	590	550/355	650	650	External	No

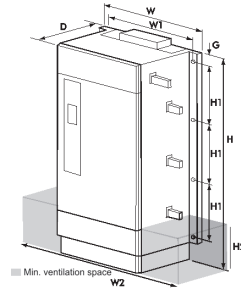
Constant Torque ratings provide 150% overload for 60 seconds. Variable Torque ratings provide 110% overload for 60 seconds
To add System Expansion Module, change last character in part number from "N" to "S"

Dimensions

AC690+ Integrator Series AC Drive



Frame B,C,D,E,F



Frame G,H,J

Dimensions

Model	Dimensions (in/mm)			Mounting Centers (in/mm)					Weight (lb/kg)
	H	W	D	W2	H2	H1	W1	G	
Frame B	9.17/233	6.95/177	7.13/181	-	-	8.78/223	5.12/130	-	9.5/4.3
Frame C	13.7/348	7.91/201	8.19/208	-	-	13.19/335	5.91/150	-	20.5/9.3
Frame D	17.8/453	9.92/252	9.65/245	-	-	17.32/440	5.91/150	-	40.6/18.4
Frame E	26.3/669	10.1/257	12.28/312	-	-	24.80/630	5.91/150	-	72.0/32.5
Frame F	28.3/720	10.1/257	13.74/349	-	-	27.56/700	5.91/150	-	90.4/41.0
Frame G	41/1042	17.9/455	18.31/465	26.57/675	8.86/225	11.81/300	16.54/420	0.63/16	202/100
Frame H	46.3/1177	22.5/570	18.31/465	31.69/805	14.17/360	11.81/300	21.10/536	0.63/16	276/125
Frame J	50.7/1288	26.6/1177	18.31/465	32.48/825	13.11/333	11.81/300	25.24/641	0.63/16	388/176



Software Tools

AC690+ Integrator Series AC Drive

Drive System Explorer Software

DSE is a programming, monitoring and diagnostic software platform for drives. Thanks to the on-line help, users can achieve the optimum drive configuration without the need to navigate through complicated parameter menus. Advanced programming is carried out through a set of pre-engineered templates in order to create the required configuration. It is possible to monitor every parameter of the drive either as a digital value or as a function in the “chart recorder” during normal operation.

While the drive is in running mode the oscilloscope function allows “on-line” monitoring of selected parameters and the recording of trends. Using straightforward block programming, DSE allows the user to create, parameterize and configure user defined applications thanks to function blocks dedicated to speed control, inputs, outputs, ramps, winder functions, PID, diameter calculator, and more. Groups of function blocks can be combined into macros for more complex programs.

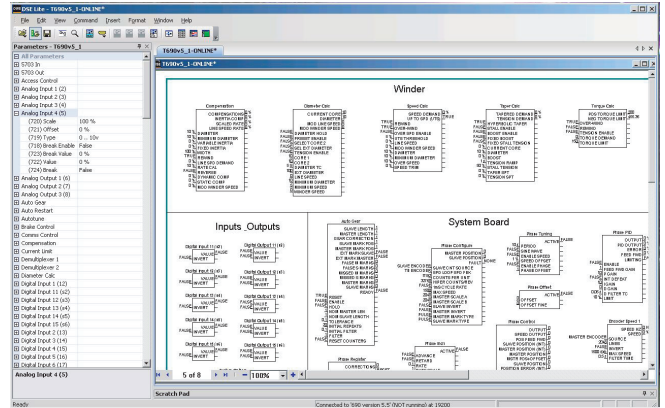
There are three levels of DSE software available.

- DSE Lite is provided as a free download, and is a fully functional package for drive programming, configuration, status monitoring, and diagnosis.
- DSE Development software adds the capability to create and edit projects using AC890 with Firewire communications.
- DSE Runtime allows the user to edit projects using AC890 with Firewire communications, but not create new ones.

For users of DSD software who wish to migrate to the DSE platform, we offer upgrade packages for both development and runtime versions of that product.

System Requirements

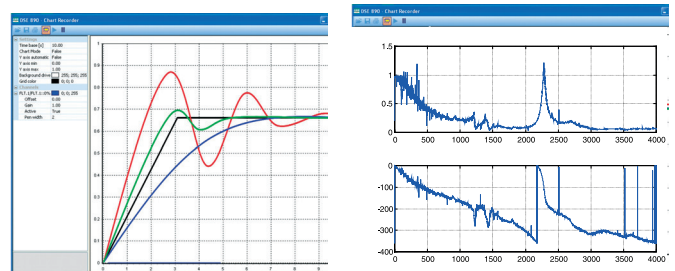
- Windows® 7 through Windows® 10; 32 or 64 bit
- 100Mb of free hard disk space
- USB port for connecting to an AC890 or AC890PX drive
- Serial port for connecting to AC650V, AC690+, DC590+, or legacy drives.



Function block configuration



Chart recorder function



Real-time data acquisition and oscilloscope functions

Part Number	Description
DSE-Lite	DSE Lite software (single axis) + USB cable*
8906-DSEDEV-00	DSE Development software + USB cable
8906-DSERUN-00	DSE Runtime/Maintenance + USB cable
8906-DSEDEVUPG-00	DSD Development to DSE Development Upgrade + USB cable
8906-DSERUNUPG-00	DSD Runtime to DSE Runtime Upgrade + USB cable

* DSE Lite may also be downloaded free of charge

Communication Cards

AC690+ Integrator Series AC Drive



Description

The selection of available AC690+ communication “technology boxes” allow the flexibility to be connected to the most common industry standard fieldbuses. Part numbers beginning 6053 fit Frame B, part numbers beginning 6055 fit all other AC690+ frames.

Features

- Communications cards are provided separately for installation on-site
- Dimensions H x W x D : 127mm x 76.2mm x 25.4mm
- LED indication of network and card status

Ethernet Communications Interface

Part Number: 6053/ENET/00 and 6055/ENET/00	
Supported Protocols	Modbus/TCP and Ethernet IP
Communication Speed	10/100M bits/s
Station Address	Selectable via switch or Internet Explorer
Suitable for	AC690+ version 4.7+

LINKnet Communications Interface

Part Number: 6053/LNET/00 and 6055/LNET/00	
Supported Protocols	Ethernet Modbus UDP/IP
Cabling	CAT-6 shielded
Communication Speed	100 Mbps
Suitable for	AC690+ version 5.X

Devicenet Communications Interface

Part Number: 6053/DNET/00 and 6055/DNET/00	
Supported Protocols	DeviceNet Drive Profile Drive – Group 2 slave only
Station Address	DeviceNet Drive Profile Drive – Group 2 slave only
Suitable for Drives	AC690+

Profibus-DP Communications Interface

Part Number: 6053/PROF/00 and 6055/PROF/00	
Supported Protocols	Profibus-DP
Communication Speed	Automatically Detected
Station Address	Selectable via Software
Suitable for	AC690+ version 1.x+

CANopen Communications Interface

Part Number: 6053/CAN/00 and 6055/CAN/00	
Profile	DS402
Supported Messages	SDO, PDO, NMT, SYNC
Communication Speed	20K, 50K, 125K, 250K, 500K, 1M bits/s selectable
Station Address	Selectable via switch
Suitable for	AC690+

LINKnet



LINKNet provides an advanced platform to network all Parker system drives on a high speed peer to peer network. Configured using DSE and based on the time-proven 890DSE function blocks, LINKNet brings the power of the AC890 to all Parker system drives.

LINKNet uses readily available CAT6 cable and supports both Modbus TCP or Ethernet IP, making integration with third party devices easy.

Legacy LINK fiber optic systems may be upgraded to LINKNet, often without having to replace the existing drives.

HTTL Encoder Feedback Card

AC690+ Integrator Series AC Drive



Description

The HTTL Encoder Feedback Card allows an incremental encoder to be connected to the AC690+ AC drive, allowing users to take full advantage of the integrated torque control and speed regulation functionality.

The HTTL Encoder Feedback card has the following features:

- 4 Optically isolated differential inputs A, B, M and H
- Adjustable isolated 10 - 20V encoder power output

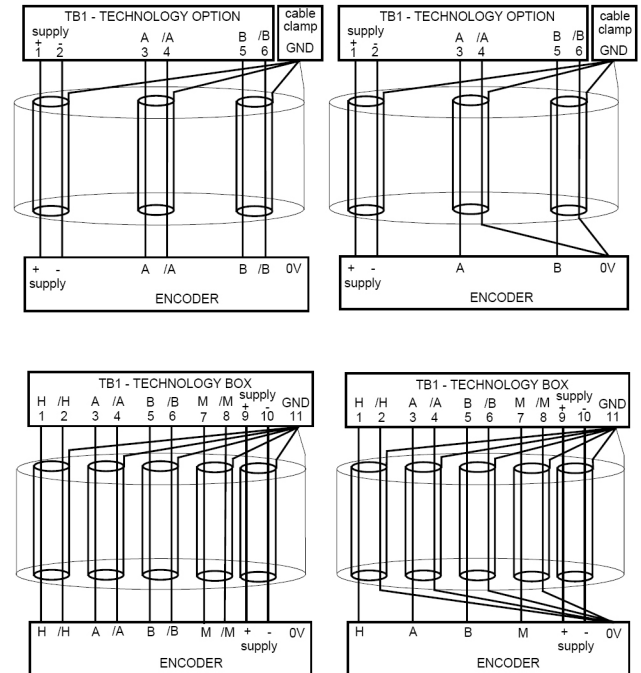
Specifications

Maximum Input Frequency	250kHz
Receiver current consumption	≤10mA per channel
Input Format	2-channels in quadrature, clock / direction, or clock only
De-phasing	>1μs
Differential Input Voltage	10 - 30V Maximum
Encoder Power	Maximum Load: Card LA467461: 200mA or 2W Housing 6054-00: 250mA or 2.5W Voltage 10-20V software adjustable.

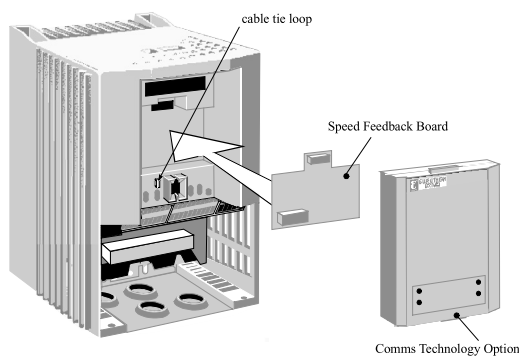
Part Numbers

Part Number	Compatible Drives
LA467461	AC690+ Frame B (690-xxxxxB...) drives
6054-00	AC690+ Frames C - J drives

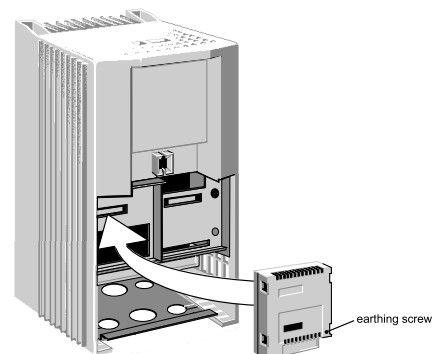
Installation and cabling



AC690+ Frame B Drives



AC690+ Frames C-J Drives



System Expansion Module

AC690+ Integrator Series AC Drive

Description

With the System Expansion Module, the AC690+ can be used in more sophisticated applications, or where additional automation is required to be used in conjunction with the drive.

The following features are available:

Analog Inputs AIN1-4 are become high resolution (12 bit plus sign)

5 isolated I/O points, configurable as either inputs or outputs

Variable isolated output power for encoders

Master encoder inputs (Isolated HTTL): A, A/, B, B/, Z and Z/

Follower encoder inputs (Isolated HTTL): A, A/, B, B/, Z and Z/

Follower encoder output retransmission (Isolated HTTL): A, A/, B, B/, Z and Z/.

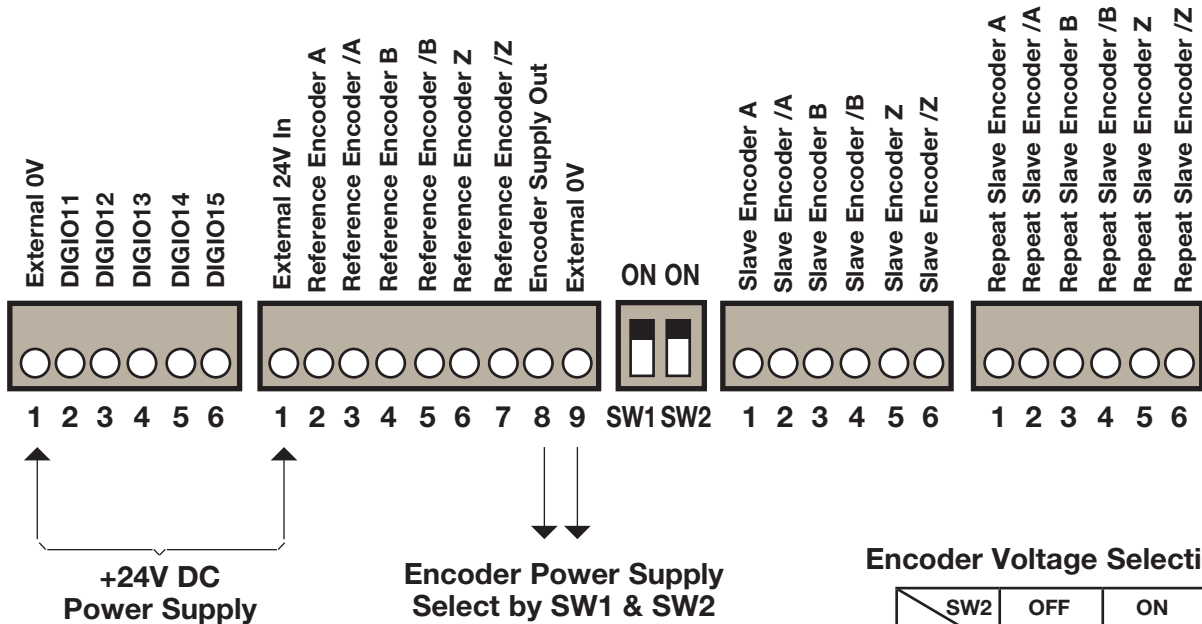
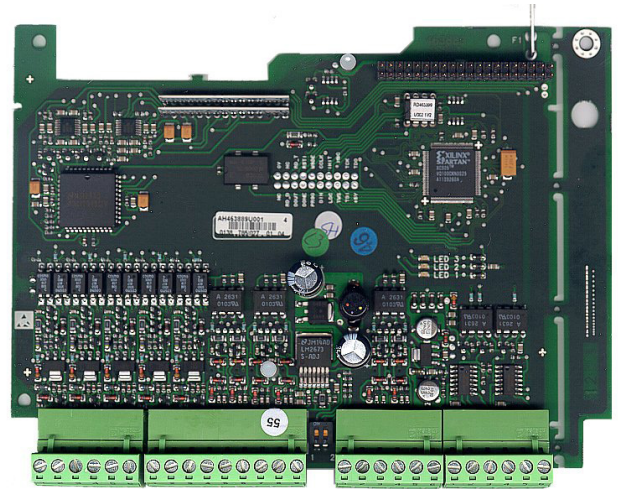
External Power Supply

An external 1 Amp 24VDC ($\pm 10\%$) supply must be connected to the card.

How to Order

Change last character of drive part number from "N" to "S".

The System Expansion Module is not available as a field-installed option.



Encoder Voltage Selection

	SW2	OFF	ON
SW1	OFF	24V	18V
ON	ON	12V	5V

Operator Keypads

AC690+ Integrator Series AC Drive

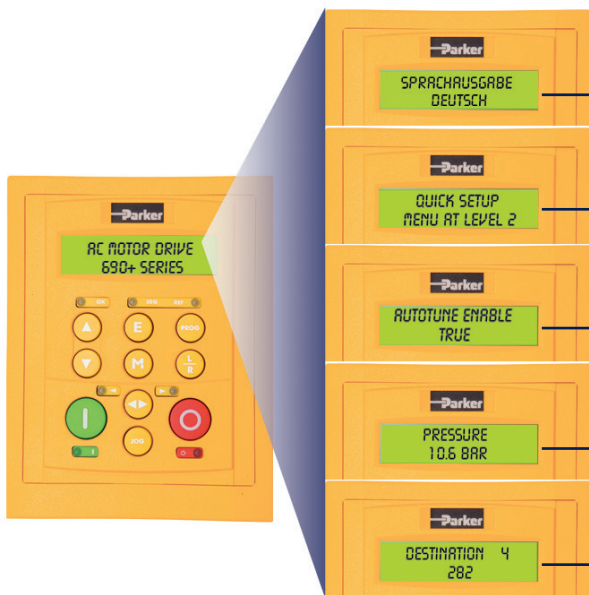


Standard operator keypad 6901/00/G

Provided standard with all AC690+ drives

Features

- Local motor control : start, speed, direction, diagnostics
- Operator menus and parameter configuration
- Cloning capability
- Quick setup menu
- Password protection for parameter configuration
- Configuration storage capability



Multilingual

English · Spanish · French · German · Italian · Portuguese · Swedish · Polish

Quick setup menu

Intuitive menus allowing easy and quick setup of the drive

Auto-tuning

Automatic tuning of motor parameters ensures maximum dynamic motor performance

Diagnostics messages

Display input and output parameters as well as drive operating units

Drive configuration

Through-panel Mounting Kit

Description

This option allows the heat sink of the drive to protrude through the back panel of an enclosure or cabinet, allowing the heat to be dissipated outside of the enclosure. This mounting configuration can generally permit the use of a smaller enclosure, or elimination of the need for air conditioning inside the enclosure. Please consult the installation manual for complete information regarding thermal management requirements for the drive or drives to be used.

Keypad Blanking Cover

Description

The keypad blanking cover kit may be used when local keypad is not installed. Kit includes light pipes for the LEDs.

Part Number	Description	Suitable for
LA500326U001	Blank Cover	AC690+ Frame B-J
6052/00/G	Remote mounting kit	AC690+ (All)

Accessories

AC690+ Integrator Series AC Drive

Braking Resistor Kits

Description

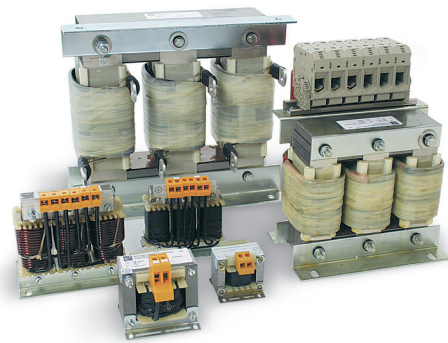
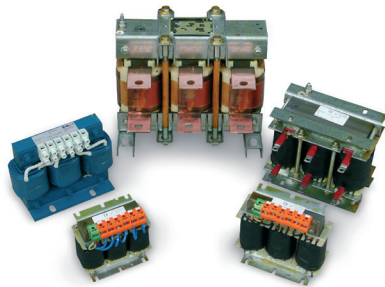
A range of braking resistor kits are available to compliment the 690+ that have brake modules installed. Braking resistor kits include the resistor with expanded sheet metal cage and overload.

Line Reactors

Description

Parker's range of reactors have been especially selected to match the requirements of the Parker AC drive range and can be used on either the input or output sides of the drive. They add inductance to reduce the harmonic content of the supply current. A reactor installed in the drive output limits the capacitive current when motor cable runs in excess of 50m are used. It prevents overcurrent trips and temperature rise of the motor. In addition to helping with compliance with IEEE 519 there are other benefits to using line/load reactors including:

- Increased drive system reliability
- Reduced harmonics / surge currents
- Reduced motor noise and temperature
- Improved true power factor



Vent Kits

Description

For frames E and F, optional vent ducting kits is available. These kits provide a convenient means of venting hot exhaust air from the panel-mounted AC690+ drive. The kit includes a duct, attached to the top of the drive and the roof of your enclosure, and an air exhaust hood for mounting on the top of the enclosure. Mounting hardware and gasket are provided in the kit. Installation will require a rectangular hole and six mounting bolt holes to be cut through the top of your enclosure.

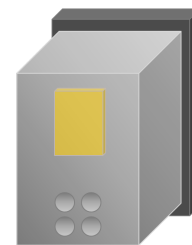
Part Number	Description	Suitable for
LA466717U004	Vent Kit	AC690+ Frame E
LA466717U003	Vent Kit	AC690+ Frame F

Vent kits are standard with frames G, H, and J.

EMC Filters

Description

A range of pre-selected EMC (Electromagnetic Compatibility)/RFI (Radio Frequency Interference) Filters are available, suitable for all drives. These filters are a cost effective and easily implemented solution for the abatement of EMC in order to meet certain directives. Installation of the drive must be in accordance with the installation guidelines in the product manual. Filters described as "footprint" type are designed to save panel space by mounting behind the drive.



Drive mounted on a "footprint" filter

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