



AC690+ Integrator Series Drives

Product Catalog



ENGINEERING YOUR SUCCESS.



Parker Electromechanical and Drives Division Headquarters - Charlotte, NC

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AC690+ Integrator Series AC Drive

1 HP - 1500 HP

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The global leader in motion and control technologies and systems

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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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With annual sales of approximately \$13 billion in fiscal year 2015, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 55,000 people in 50 countries around

the world. Parker has increased its annual dividends paid to shareholders for 59 consecutive fiscal years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's website at www.parker.com, or its investor information website at www.phstock.com.

AC690+ Integrator Series AC Drives

1 HP - 1500 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 1500 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.

Line Regenerative

Some applications require full four quadrant operation or extensive braking capabilities. The AC690+ series offers an energy efficient alternative to dynamic braking resistors in its Active Front End (AFE) unit. The AFE allows regenerative power to be returned to the grid safely and efficiently, and at unity power factor. The AC690+ AFE can also be used for situations that require ultra-low harmonics. An AFE package is offered, complete with LCL filter and other required components. See page 11 for details.

AC690+ Integrator Series AC Drive

1 HP - 1500 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 and register control. It fits 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



Mechanical protection options to suit all environments

A choice of mechanical protection options allows the drive to be mounted in a variety of different operating environments.

- **IP20** - for mounting inside an electrical enclosure.
- **IP40/NEMA 1** - The top cover, with cable gland plate enables the drive to be directly wall or machine mounted. (Sold as an accessory for Frames B to E)
- **IP54** - Ideal for mounting in aggressive environments. Higher levels of protection are available as a special build option on request. A multitude of control options can be added to the drive using our Packaged Drive service.
- **Through-panel mounting** - This option allows the drive to be mounted with the major heat producing components and heatsink outside the enclosure, keeping the electronics clean and cool. (Frames C,D, and E)

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

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.

AC690+ Integrator Series AC Drive

1 HP - 1500 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 1500 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) Derate 1.5% per degree C to 50°C max (Frame K)
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: 0-1000 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 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 and register control. 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 slave repeater

AC690+ Integrator Series AC Drive

K-Frame 600 HP - 1500 HP



Energy Savings

Fast return on investment in pump and fan applications

Improved power factor

Flux vector control with or without encoder and V/F control

Reduced harmonics through 12 or 18 pulse coupling

Improved HVAC control

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.



Specifications (K-Frame)

6 pulse Model	Power Rating	Constant torque : 600 - 1500 HP Variable torque : 700 - 1600 HP
	Supply Voltage	380-460Vac (±10%) 3-phase
	Disconnect Switch	Standard
	Input inductance	Standard for limiting harmonic current
	Output Choke	Standard
	Operator Panel	6901 operator keypad mounted on enclosure door
12 pulse Model (option)	Harmonics	Reduced harmonic current
	Power Rating	Constant torque : 600 - 1000 HP Variable torque : 700 - 1500 HP
	Supply Voltage	380-460Vac (±10%) 3-phase
	Disconnect Switch	Standard
	Input Transformer	(not included in the enclosure) optional 2 secondaries U/D
	Operator Panel	6901 operator keypad mounted on enclosure door
18 pulse Model (option)	Harmonics	Total harmonic distortion (current) in accordance with limits of IEEE 519 (1992)
	Power Rating	Constant torque : 900 - 1500 HP Variable torque : 1000 - 1600 HP
	Supply Voltage	380-460Vac (±10%) 3-phase
	Disconnect Switch	Standard
	Input Transformer	(not included in the enclosure) optional 3 secondaries phase shifted by 20°
	Operator Panel	6901 operator keypad mounted on enclosure door



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	1/1.75	4.0	-	-	No	Yes
690+0003/230/CBN1	1	B	3/2.2	10.5	-	-	No	
690+0001/230/CBN	3	B	1/1.75	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	1/1.75	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 (page 16) 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	
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	Yes
690+0100/460/CBN	3	F	100/75	145	130	125/90	165	156	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		
690+K0600/460/2G/N	3*	K	600	-	685	700	-	798	AC	No
690+K0600/460/2G/B	3*	K	600	-	685	700	-	798	AC	Yes
690+K0700/460/2H/N	3*	K	700	-	798	800	-	912	AC	No
690+K0700/460/2H/B	3*	K	700	-	798	800	-	912	AC	Yes
690+K0800/460/2H/N	3*	K	800	-	988	900	-	1120	AC	No
690+K0800/460/2H/B	3*	K	800	-	988	900	-	1120	AC	Yes
690+K0900/460/3G/N	3**	K	900	-	1028	1000	-	1197	AC	No
690+K0900/460/3G/B	3**	K	900	-	1028	1000	-	1197	AC	Yes
690+K1000/460/2J/N	3*	K	1000	-	1120	1100	-	1235	AC	No
690+K1000/460/2J/B	3*	K	1000	-	1120	1100	-	1235	AC	Yes
690+K1000/460/3H/N	3**	K	1000	-	1197	1200	-	1368	AC	No
690+K1000/460/3H/B	3**	K	1000	-	1197	1200	-	1368	AC	Yes
690+K1300/460/3H/N	3**	K	1300	-	1482	1500	-	1681	AC	No
690+K1300/460/3H/B	3**	K	1300	-	1482	1500	-	1681	AC	Yes
690+K1500/460/3J/N	3**	K	1500	-	1681	1600	-	1852	AC	No
690+K1500/460/3J/B	3**	K	1500	-	1681	1600	-	1852	AC	Yes

Constant Torque ratings provide 150% overload for 60 seconds. Variable Torque ratings provide 110% overload for 60 seconds
To add System Expansion Module (page 44) change last character in part number from "N" to "S"

*12-Pulse Input Optional

**18-Pulse Input Optional

For frame "K" drives, please specify whether constant torque or variable torque when ordering

4 Quadrant Power Module

AC690+ Integrator Series AC Drive
Active Front End Units 10 HP - 500 HP



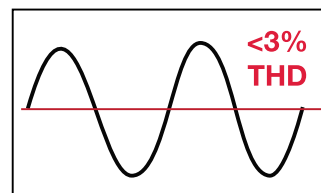
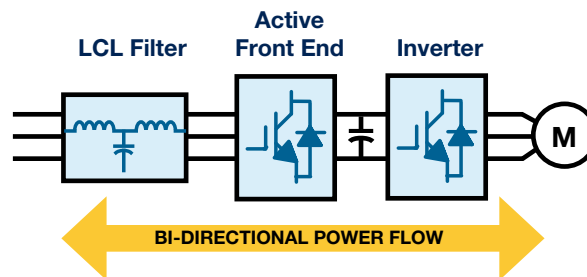
Illustration shows typical panel including AC690+ with AFE and additional system components.

Description

Many applications depend on the drive for braking torque as well as motoring torque. While dynamic braking with a resistor can be effective for lighter or lower duty cycle braking, some applications demand more braking performance than traditional D/B can provide. In addition, traditional dynamic braking using a resistor is wasteful of energy, as the potential energy in the load is dissipated as heat. By using an Active Front End (AFE) configuration, energy from the load is returned back to the power grid at unity power factor, providing extremely effective and controllable braking, as well as energy efficiency.

Applications that can benefit from line regeneration include hoists and lifts, centrifuges, continuous web processes, and dynamometer test stands. An AFE may also be used in applications that require ultra-low harmonics.

This cost effective AFE package includes pre-charge circuit and LCL filter.



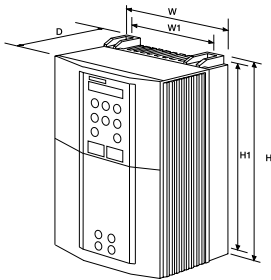
- Recovers wasted energy
- No braking resistor/No maintenance
- Ultra-low harmonics, meeting the requirements of IEEE 519
- High power factor ($\cos \phi \sim 1$)

Part Number	Phases	Frame	Nominal Power (HP)	Dimensions (in)
AFE-13-LCL	3	B	13	22 x 18
AFE-26-LCL	3	C	26	28 x 22
AFE-45-LCL	3	D	45	33 x 27
AFE-85-LCL	3	E	85	46 x 34
AFE-125-LCL	3	F	125	46 x 34
AFE-167-LCL	3	F	167	46 x 34
AFE-350-LCL*	3	G	350	79 x 47 x 24
AFE-400-LCL*	3	H	400	79 x 47 x 24
AFE-500-LCL*	3	H	500	79 x 47 x 24

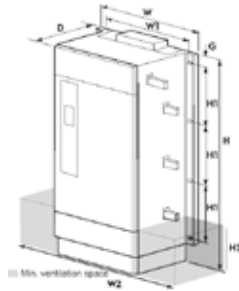
* Provided in NEMA 12 force ventilated cabinet with fans and filters

Dimensions

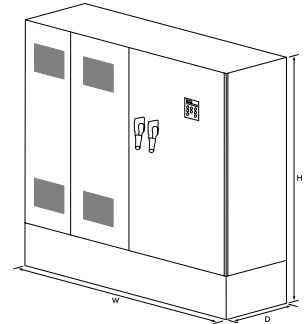
AC690+ Integrator Series AC Drive



Frame B,C,D,E,F



Frame G,H,J



Frame K

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
Frame K - 685A, 798A, 988A, and 1120A ratings	79/2000	128/3251	24/610	-	-	-	-	-	-
Frame K - 1028A, 1197A, 1482A, and 1681A ratings	79/2000	176/4470	24/610	-	-	-	-	-	-



Accessories and Options

AC690+ Integrator Series AC Drive



Option Description	Frame	Part Number	Page
Operator Keypad			
AC690+ (removable)	B - K	6901/00/G	17
Remote mounting kit	B - K	6052/00	
Keypad Blanking Cover	B - K	LA500326U001	18
Communication Cards			
Ethernet Modbus/TCP and Ethernet/IP	B	6053/ENET/00	14
	C - K	6055/ENET/00	
DeviceNet	B	6053/DNET/00	
	C - K	6055/DNET/00	
RS485 / Modbus	B	6053/EI00/00	
	C - K	6055/EI00/00	
Profibus-DP	B	6053/PROF/00	
	C - K	6055/PROF/00	
CANopen DS402	B	6053/CAN/00	
	C - K	6055/CAN/00	
Apogee P1 (HVAC Series)	B	6053/APOG/00	
	C - K	6055/APOG/00	
Metasys N2 (HVAC Series)	B	6053/JMET/00	
	C - K	6055/JMET/00	
LINKnet	B	6053/LNET/00	
	C - K	6055/LNET/00	
Speed Feedback / Systems Module			
HTTL Encoder Card	B	LA467461	15
	C - K	6054-00	
Systems Expansion Module	B - K	Specified in drive part number (S)	16
Other Options and Accessories			
Dynamic Braking Resistors	All	See table	18
Filters and Reactors	All	See table	21
IP40 Cover for Wall Mounting	B	LA467452	
	C	LA465034U002	
	D	LA465048U002	
	E	LA465058U002	
DSE Lite Programming Software	All	DSE-Lite	19
HMI Operator interface 3 to 15"	All	See TS8000 section	20
Vent Kit	F	LA466717U003	18

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.

Features

- Communications cards can be factory installed into the drive, or purchased 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+

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+

RS485/Modbus Communications Interface

*Part Number: 6053/EI00/00 and 6055/EI00/00	
Supported Protocols	Modbus RTU, EI Bisynch ASCII
Cabling	RS485 2 or 4 wire
Communication Speed	300 to 115200 bits/s
Station Address	Selectable via Software
Suitable for	AC690+ version 4.7+

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+

* Refer to page 13 for details of drive frame compatibility

Apogee P1 (HVAC Series only)

*Part Number: 6053/APOG/00 and 6055/APOG/00)	
Supported Protocols	Apogee P1
Suitable for	AC690+ HVAC Series

Metasys N2 (HVAC Series only)

*Part Number: 6053/JMET/00 and 6055/JMET/00)	
Supported Protocols	Johnson Controls N2
Suitable for	AC690+ HVAC Series version 4.6+

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



LINKnet is an Ethernet based version of the SSD LINK system. It is a peer-to-peer network designed to integrate AC and DC drives with remote I/O at high speed, with or without a supervisory PLC, allowing precise and repeatable control for complex machines and process lines. LINKnet nodes communicate using Modbus TCP over Ethernet.

LINKnet components are plugin compatible with many older Parker drives as well. An existing LINK system using AC690+ and/or DC590+ units can potentially be updated to LINKnet without requiring the replacement of functional drives. The system will connect to any Ethernet enabled PLC and with remote I/O. LINK2 touchscreens can be replaced by the Parker TS8000.

LINKnet tech boxes are connected by commercially available CAT-6 Ethernet cable, and require no external source of power when installed on a DC590+ drive. Parker has qualified third party remote fieldbus I/O modules for use in LINKnet systems. This provides users with an assortment of standard modules to choose from. Digital, analog and specialty modules may be combined, up to 64 per node, and will be recognized and supported by Parker DSE software.



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

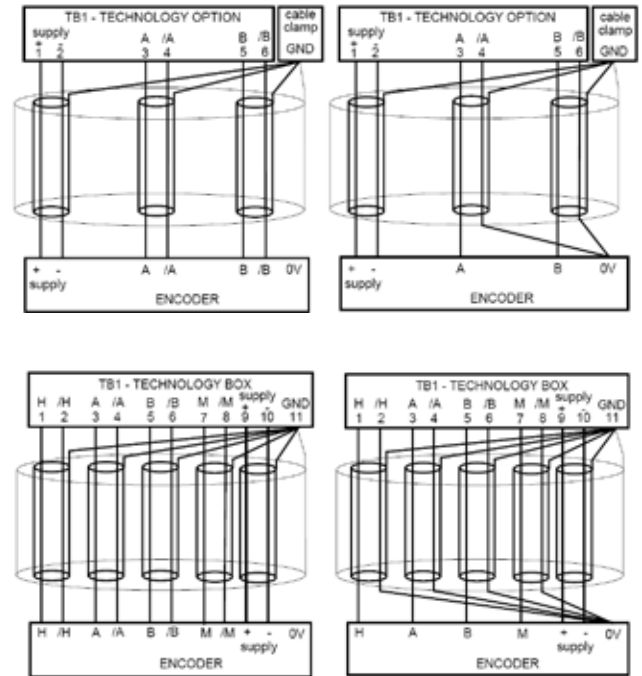
Specifications

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.

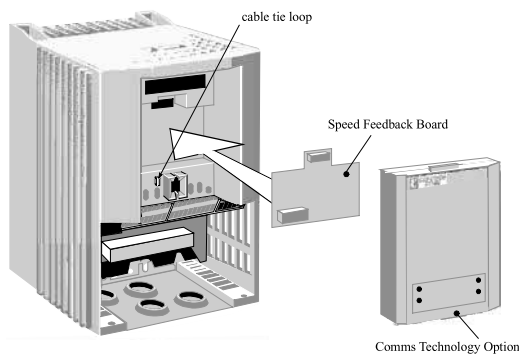
Part Numbers

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

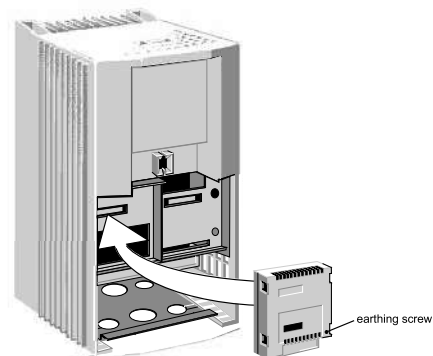
Installation and cabling



AC690+ Frame B Drives



AC690+ Frames C-K 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 a small amount of 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)

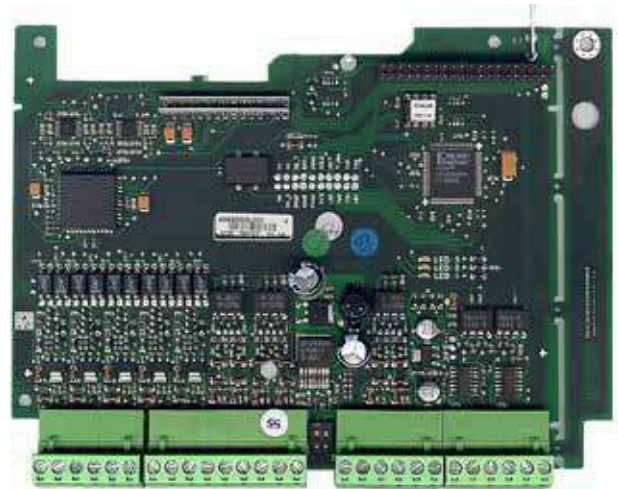
5 isolated I/O points, configurable as either inputs or outputs

Variable isolated output power for encoders

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

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

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

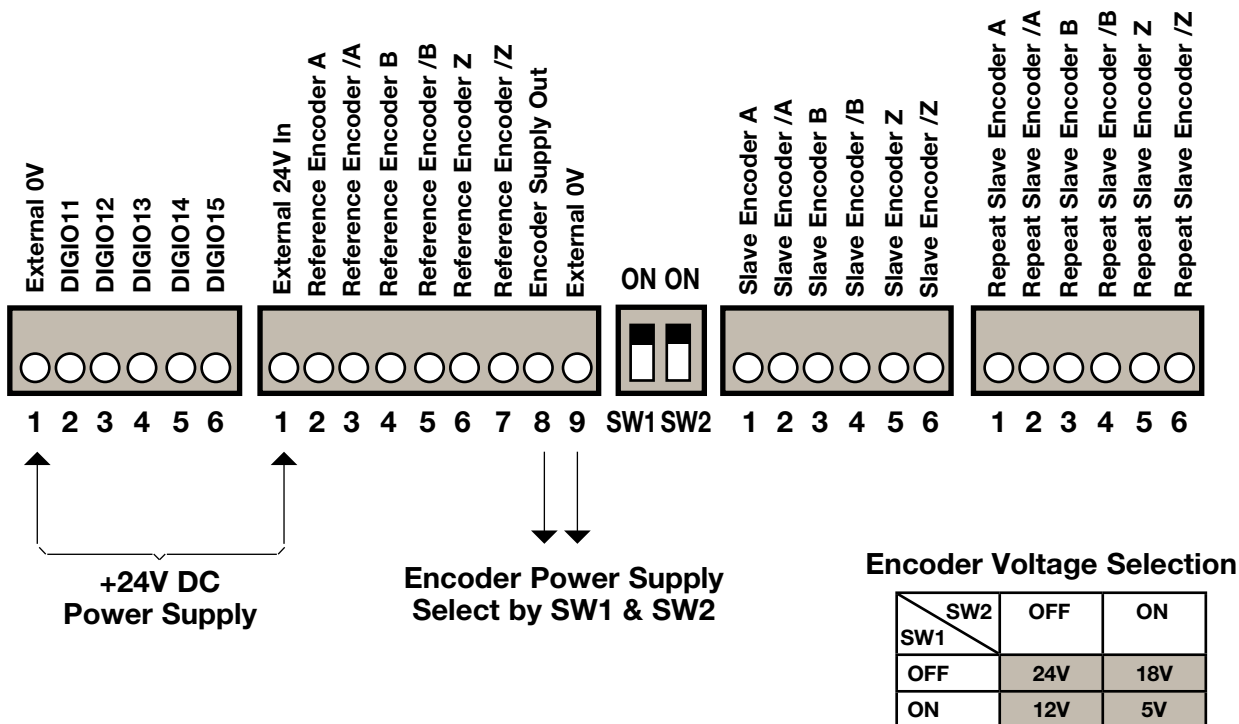


External Power Supply

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".



Operator Keypads

AC690+ Integrator Series AC Drive

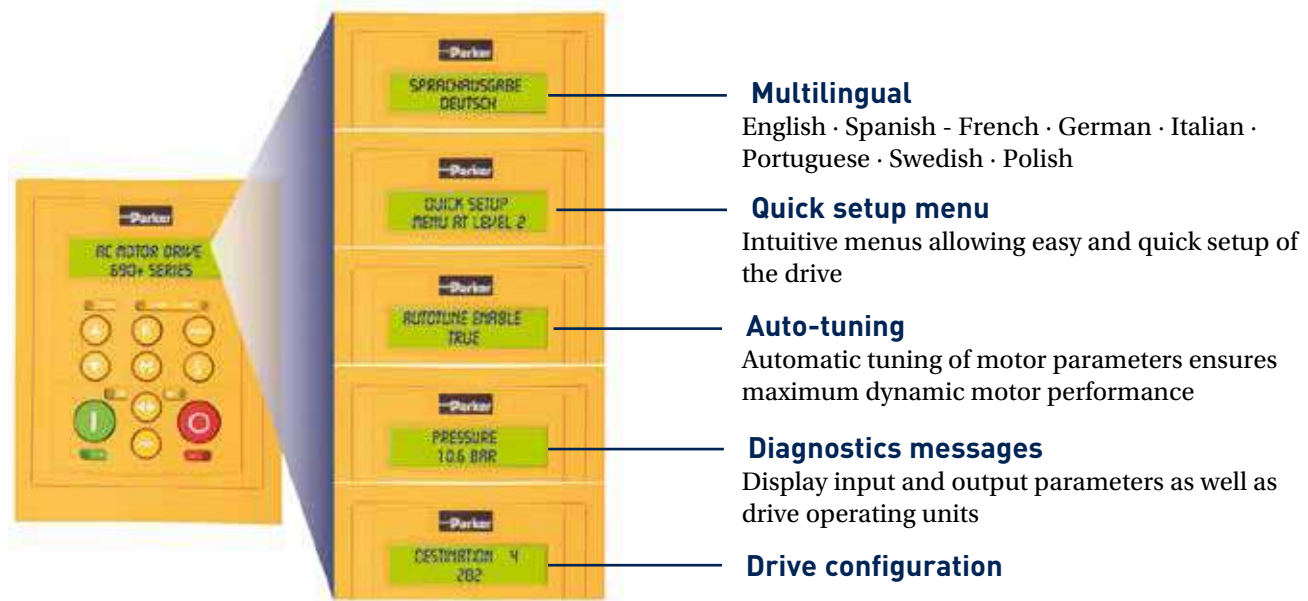


Standard operator keypad 6901/00/G

Provided standard with all AC690+ drives

Features

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

Dynamic Braking Kit/Vent Kit

AC690+ Integrator Series AC Drive

D/B Kit includes resistor, overload, protective cage, and enclosure top or panel mounting							
Part Number	Voltage	Nominal Power - CT (HP)	Nominal Power - VT (HP)	Ohms	Amps	Watts	Dimensions (in) LxWxH
LA471358	208/230	1, 2, 3, 5	-	56	1.9	202	6.5 x 1.2 x 2.4
LA471406	208/230	7.5, 10	10, 15	30	3.5	368	13.5x4x5
LA471386	208/230	15	20	15	5	375	13.5x4x5
LA471378	208/230	20, 25	25	10	8.7	757	13.5x7x5
LA471407	208/230	30	40	7	10.4	757	13.5x7x5
LA471379	208/230	40	50	6	13.7	1126	13.5x10x5
LA471380	208/230	50, 60	60, 75	4	19.4	1505	13.5x13x5
LA471356	460	1, 2, 3	1, 2, 3	100	1	100	6.5 x 1 x 1.6
LA471404	460	5, 7.5, 10	5, 7.5, 10	100	1.9	361	13.5x4x5
LA471359	460	15	20	56	3	500	13.2x1.2x2.4
LA471405	460	20	25	60	3.5	735	13.5x7x5
LA471361	460	25, 30	30, 40	30	5	750	13.5x7x5
LA471350	460	40	50	22.5	7.1	1134	13.5x10x5
LA471364	460	50	60	18	7.9	1123	13.5x10x5
LA471365	460	60	75	15	8.7	1135	13.5x10x5
LA471367	460	75, 100	100, 125	8	13.7	1502	13.5x13x5
LA471369	460	125, 150	150	6	19.4	2258	13.5x10x5
LA471370	460	200	250	3	39	4563	20x18x10
LA471372	460	250, 300	300, 350	2.25	45	4556	20x18x10
LA471375	460	350, 400, 450	400, 450, 500	1.5	55	4538	20x18x10
LA471376	460	500	550	1.2	61	4465	20x18x10

*NEMA ICS 3-301.62 Dynamic braking stop option. Minimum 100% full load torque from base speed with 6x motor inertia, and 4 stops per hour.

Keypad Blanking Cover

Description

The keypad blanking cover kit may be used when local keypad is not installed. Kit includes light pipes for LED's.

Part Number	Description	Suitable for
LA500326U001	Blank Cover	AC690+ Frame B-J

Vent Kit

Description

For the two largest frame sizes, 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



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.

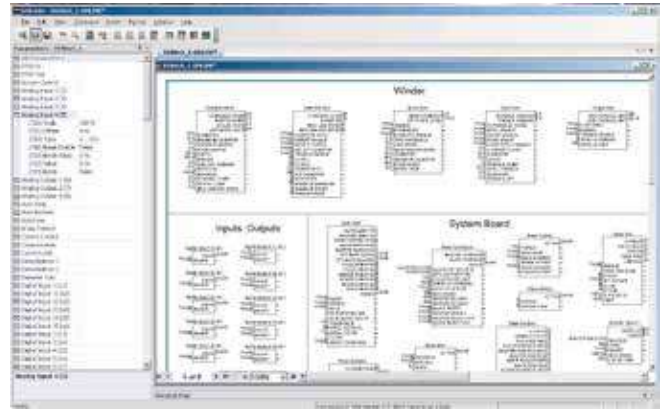
There are three levels of DSE software available.

- 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

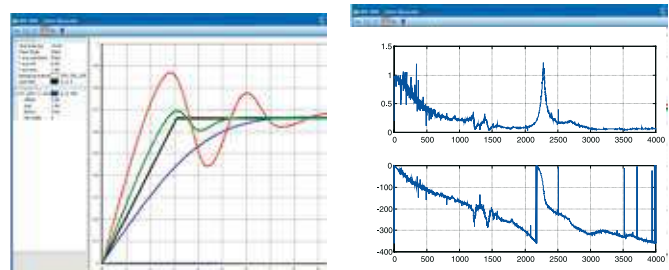
- Windows Vista® or Windows® XP, Home or Professional Edition operating system
- 100Mb of free hard disk space
- USB port for connecting to an AC890 or AC890PX drive
- Serial port for connecting to AC650V, AC690+, DC590+, or legacy drives.



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

HMI Touchscreen

TS8000 Series



Description

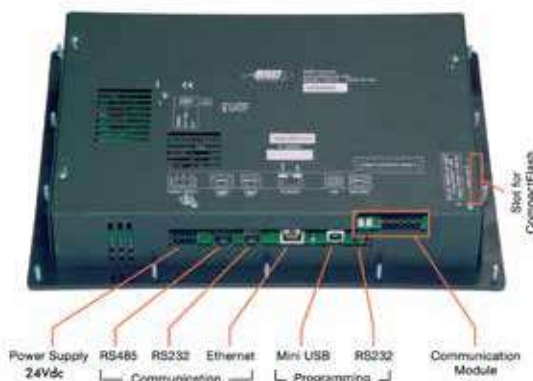
TS8000 is a high performance web-enabled HMI touchscreen range with powerful features that would normally only be found in PC-based displays.

The TS8000 is able to communicate with many different pieces of hardware through its 10/100Base-T Ethernet port.

Furthermore a USB programming port allows programs to be downloaded, or access to trending and data logging, while data can be collected and stored on a standard CompactFlash card, freeing up internal memory.

Unlike similar competitive units, programming software for the TS8000 is a free download!

- Multi-lingual graphical interface**
- Built-in symbol library of common objects**
- Built-in web server/Virtual Panel**
- CompactFlash support**
- Integrated automatic multiple protocol conversion**
- Free DSI8000 programming software**



Technical specifications

Power Supply	24Vdc ±20%
Operating Temperature	0-50°C
Relative Humidity	80% non-condensing
Altitude	2000 m
Enclosure	IP66/Nema 4X
Keypads	<p>TS8003 :</p> <ul style="list-style-type: none"> . 8 user assignable keys . 5 navigation keys . 12 numeric keys . 7 dedicated keys <p>TS8006 : 5 programmable keys for on screen menus</p> <p>TS8008 : 7 programmable keys for on screen menus</p> <p>TS8010 : 8 programmable keys for on screen menus</p> <p>TS8015 : 10 programmable keys for on screen menus</p>
Memory	CompactFlash slot
Communication Ports	<p>Programming :</p> <ul style="list-style-type: none"> USB 1.1 - connector type B RS232 - via RJ12 <p>Communication :</p> <ul style="list-style-type: none"> . RS232 - via RJ12 . RS485 - via RJ45 . Ethernet 10/100 Base T - connector RJ45

HMI Specifications

Part Number	Screen	Colors	Pixels
TS8003/00/00	3.2"/FSTN	2	128 x 64
TS8006/00/00	5.7"/TFT	256 QVGA	320 x 240
TS8008/00/02	7.7"/TFT	256 VGA	640 x 480
TS8010/00/02	10.4"/TFT		
TS8015/00/00	15"/TFT	32,000 XGA	1024 x 768

EMC Filters

for AC690+ Drives

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

Ordering

Part Number	Rating	Type	Description
Add “F” in Part Number	Per drive rating	Internal	Filter for Frame B AC690+ Drive
CO467842U020	20A	Footprint	Filter for Frame B AC690+ Drive
CO467842U044	40A	Footprint	Filter for Frame C AC690+ Drive
CO467842U084	84A	Footprint	Filter for Frame D AC690+ Drive
CO467842U105	105A	Footprint	Filter for Frame E AC690+ Drive
CO467842U215	215A	Footprint	Filter for Frame F AC690+ Drive
CO467843U340	340A	External	Filter for Frame G, H or J AC690+ Drive

Three Phase Reactors

For AC690+ Drives

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 are used to 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

Ordering

Part Number	Line Voltage	Current	Drive HP (CT)	Impedance
CO470653	230	4A	1	3mH
CO353011		8A	1.5 / 2	1.5mH
CO470638		12A	3	1.25mH
CO353012		18A	5	0.8mH
CO353013		25A	7.5	0.5mH
CO353014		35A	10	0.4mH
CO353015		45A	15	0.3mH
CO353016		55A	20	0.25mH
CO353017		80A	25 / 30	0.20mH
CO470654		100A	40	0.15mH
CO353018		130A	50	0.1mH
CO471264		160A	60	0.075mH
CO470650		460	2A	1
CO470651	4A		2	6.5mH
CO352782	8A		3	5mH
CO470652	8A		5	3mH
CO352783	12A		7.5	2.5mH
CO352785	18A		10	1.5mH
CO352786	25A		15	1.2mH
CO352901	35A		20 / 25	0.8mH
CO352902	45A		30	0.7mH
CO352903	55A		40	0.5mH
CO352904	80A		50 / 60	0.4mH
CO352905	100A		75	0.3mH
CO352906	130A		100	0.3mH
CO470057	160A		125	0.15mH
CO470045	200A		150	0.11mH
CO470046	250A		200	0.09mH
CO470047	320A		250	0.075mH
CO470048	400A	300	0.06mH	
CO470049	500A	350 / 400	0.05mH	
CO470050	600A	500	0.04mH	



Parker Drive Systems Capabilities

Engineered Solutions

For customers preferring the convenience of more support in the design and implementation of their control systems, Parker and our network of integrators offer a complete in-house design and build service, enabling you to focus on your core competencies.

Based on the fundamental principles of application expertise, quality, reliability and safety, Parker's systems team is able to undertake all aspects of an electrical control system project, from pre-design specification to on-site commissioning and training.

By allowing Parker or one of our integrators to undertake the design, build, programming and commissioning of your motor control system, you can be assured that every aspect

of the design, from environmental considerations through component selection to mounting of products has been carefully considered and allowed for.

Fully documenting a complete control system can be a daunting task for many equipment manufacturers, again Parker is on hand to help by providing complete electrical schematic and single line drawings as well as installation, maintenance and operating instructions.

As an accredited systems builder, Parker is also able to undertake the certification process required to enable systems to be put into service in any number of industrial markets.



Total Project Support

From concept to installation and beyond, Parker and our integrator network have a full range of complimentary capabilities to provide as much or as little support to your own team's expertise as you need. With a team of dedicated project engineers, we take the risk out of any capital project by ensuring that all stages are managed and executed precisely to your requirements.

Holding certification to the latest quality standards (ISO 9001 - 2008) means that as a customer, you can be assured of reliable, repeatable quality of design, build and documentation.

Integrators

Parker is backed by an extensive array of trained and experienced systems integrators. Our integrators offer a means for you to work with local engineering, service and support companies who pride themselves on catering to your facilities needs by improving system processes, eliminating downtime or simply helping you bring new products to market.



AC Motors

Inverter and Vector Duty - Compatible with AC690+

1 - 500 HP

Description

Parker 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 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.

RPM AC™ Product Features



The RPM AC™ series of AC motors was designed specifically for optimum 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 unique 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 RPM ACTM ratings.

- Unique square laminated steel frames (FL210 - L440)
- Most compact, lightest weight
- Cast iron feet and end brackets
- Wide constant HP range - 4:1 to 12:1 available
- Low inertia design for faster dynamic response
- Replace DC motors with minimal mechanical issues
- Corona free insulation system
- Force ventilated open and enclosed blower cooled frames

Available enclosures:

DPG-FV (Drip-Proof Guarded Force Ventilated) - IEC IP23/IC06. Motor cooling is provided by motor-mounted blower driven by an integrally mounted three-phase blower motor.

TEBC (Totally Enclosed Air-Over Blower-Cooled) - IEC IP44/IC416. In-line blower cooled motors incorporate unique integral air ducts in the frame, external to the windings. The integrally mounted, independently powered three phase blowers result in low noise levels over wide speed ranges.

TEFC (Totally Enclosed Fan-Cooled) - IEC IP44/IC411. Exterior surface cooled by external fan mounted on motor shaft.

Encoders: Motors above are available with an encoder suitable for use with Parker drives. On some ratings, the encoder is an option, while on others it is provided as standard equipment. The standard encoder is a 1024 PPR quadrature style with mating connector. Please inquire if you have any special encoder requirements.

V*S Master™ Product Features



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.

- Cast iron frames and end brackets
- Corona free insulation system
- 200% overload torque for 1 minute
- Three thermostats
- Constant HP to 1.5 times base speed
- Class F insulation
- Stainless steel nameplate
- Re-greaseable bearings
- TEFC ratings provide continuous full load torque from 0 to base speed
- CSA certified and UL recognized

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