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



AC690+ Integrator Series

From 0.75 kW to 1000 kW



ENGINEERING YOUR SUCCESS.



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Parker Hannifin

The global leader in motion and control technologies

A world class player on a local stage

Global Product Design

Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

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Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

Electromechanical Worldwide Manufacturing Locations

Europe

Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia

Wuxi, China
Chennai, India

North America

Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota



Offenburg, Germany

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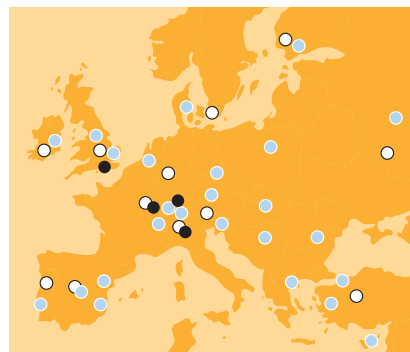
For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com



Milan, Italy



Littlehampton, UK



- Electromechanical Manufacturing
- Parker Sales Offices
- Distributors



Dijon, France

Integrator Series AC Drive - AC690+

Overview

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 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 380-500 V 3-phase 0.75 to 1000 kW and 220-240 V 0.75 to 55 kW.



Features

Modes of Operation

The AC690+ can be user configured for 3 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.

Benefits

- Vector control with / without encoder feedback
- Power ratings 0.37 to 1000 kW
- Supplied in enclosure above 355 kW
- Pre-programmed application Macros
- Programmable over communications
- Programming identical to DC 590+ DC drive
- Variable torque ratings
- Class B EMC filters

Technical Characteristics - Overview

AC690+	Integrator Series AC Drive
Power supply	380...460 V ($\pm 10\%$) 3-phase 0.75...1000 kW 380...500 V ($\pm 10\%$) 3-phase 2.2...110 kW 220...240 V ($\pm 10\%$) 1-phase 0.37...2.2 kW 220...240 V ($\pm 10\%$) 3-phase 0.37...37 kW
Environment	Constant torque: 0...45 °C (40 °C with IP40 cover) derating possible up to 50 °C max Max altitude: 1000 m, derate by 1% for every 100 m above 1000 m
Overload	Constant torque: 150 % for 60 s, 180 % for 1 s Variable torque: 115 % for 10 s
Output frequency	0...480 Hz
Dynamic braking	Each drive can be fitted with an internal dynamic brake switch Frame B and C: standard Frame D, E and F: optional

Demanding Environments

For environments that have dusty, humid or corrosive atmospheres, the AC690+ can optionally be supplied with conformally coated circuit boards that improve the drives resistance to corrosion, thereby increasing reliability and service life.

Industries that would typically benefit from conformal coating could include:

- Water and wastewater
- Paper and pulp processing
- Steel
- Marine and offshore
- Outdoor cranes
- Wind & wave power generation
- Food processing

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 analogue inputs to high resolution (12 bit plus sign)
- 2 encoder inputs
- 2 high speed register mark inputs



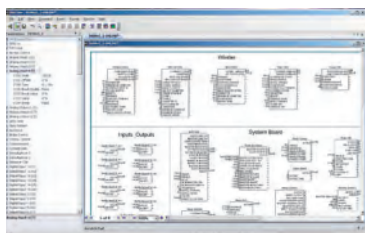
Mechanical protection options to suit all environments

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 optional top cover, with cable gland plate enables the drive to be directly wall or machine mounted. (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 FASTPACK option.
- **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).

Integrated function blocks

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



Open standard fieldbus communications

The AC690+ has a whole 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
- DeviceNet
- Modbus RTU
- CANopen
- ControlNet
- Link (Parker SSD proprietary bus)

Programming / Operator controls

- The AC690+ HMI 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 HMI 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.



Enclosure specifications

(above 355 kW for constant torque)

- Energy Saving
- Fast return on investment in pump and fan applications
- Improved power factor
Flux vector control with / without encoder and V/F control
- Reduced harmonics through 12 or 18 pulse coupling
- Improved HVAC control

Standards

The AC690+ series meets the following standards when installed in accordance with the relevant product manual.

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.

6 pulse Model	Power Rating	Constant torque: 355...900 kW Variable torque: 400...1000 kW
	Supply Voltage	380...460 VAC ($\pm 10\%$) 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 (optional)	Harmonics	Reduced harmonic current
	Power Rating	Constant torque: 355...600 kW Variable torque: 400...650 kW
	Supply Voltage	380...460 VAC ($\pm 10\%$) 3-phase
	Disconnect Switch	Standard
	Input Transformer	(not included in the enclosure) optional 2 secondaires U/D
	Output Choke	Standard
18 pulse model (option)	Harmonics	Total harmonic distortion (current) in accordance with limits of IEEE 519 (1992)
	Power Rating	Constant torque: 630...900 kW Variable torque: 750...1000 kW
	Supply Voltage	380...460 VAC ($\pm 10\%$) 3-phase
	Disconnect Switch	Standard
	Input Transformer	(not included in the enclosure) optional 3 secondaires phase shifted by 20°
	Output Choke	Standard
	Operator Panel	6901 operator keypad mounted on enclosure door



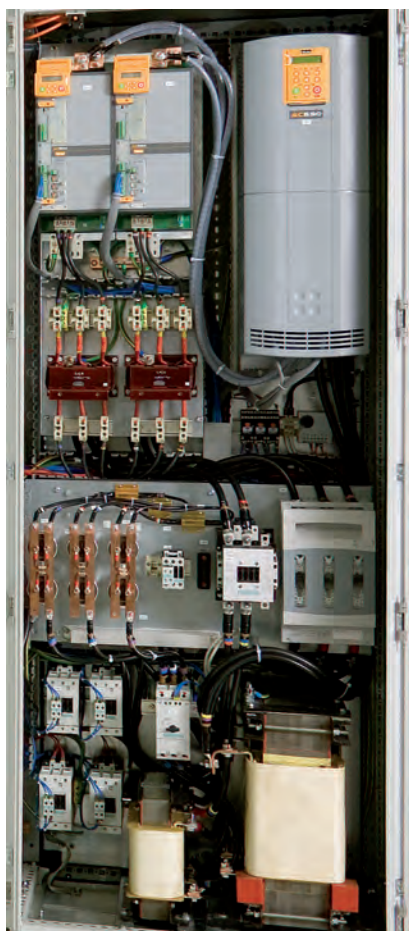


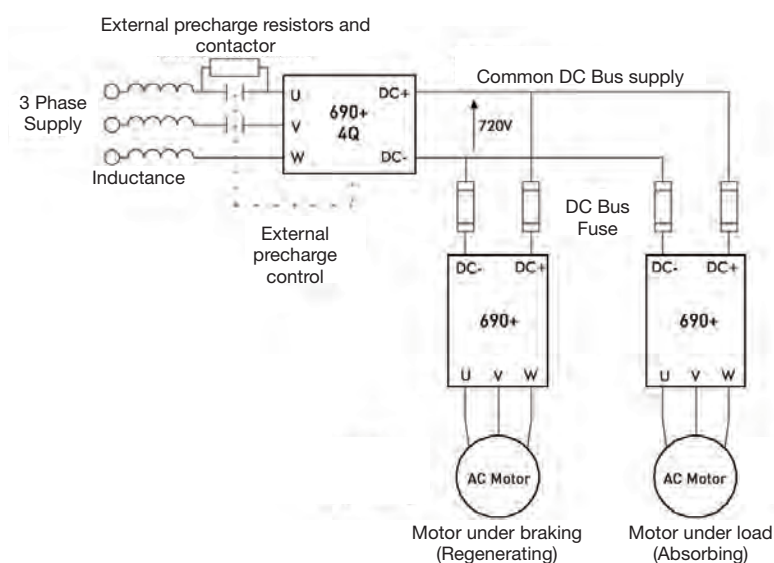
Image shows a typical 4 Quadrant system implemented using AC890 Modular Systems Drives

Description

In many applications the overall power consumed by the system is less than the sum of power of the installed motors. Indeed, all sections of a machine do not consume energy at the same time. Typically, some motors will be driven electrically while others are being driven by the momentum of the machine.

For such applications, it is economically advantageous to connect the drives of all sections of the machine to a common DC bus: the energy-generating sections are then fed into the energy-consuming sections, which reduces the overall energy consumption of the system.

The drive AC690+ configured in 4 quadrant mode is the ideal solution to power such systems. Thanks to the 4Q functionality of the AC690+, the excess energy in the system is returned to the network and not dissipated in the form of heat through braking resistors. The current waveforms are almost sinusoidal, which minimizes network harmonics.



Benefits

- Energy saving
- No maintenance (No braking resistor)
- Reducing the size of the supply required by distributing energy through the DC bus system
- Reduced harmonics meeting the limits of IEEE 519
- High power factor ($\cos \phi \sim 1$)

Technical Characteristics

General Characteristics

Power Supply	380...460 V ($\pm 10\%$) 3-phase 0.75...1000 kW; 380...500 V ($\pm 10\%$) 3-phase 2.2...110 kW; 220...240 V ($\pm 10\%$) 1-phase 0.37...2.2 kW; 220...240 V ($\pm 10\%$) 3-phase 0.37...37 kW
Environment	Constant torque: 0...45 °C (40 °C with IP40 cover) derating possible up to 50 °C max Max altitude: 1000 m, derate by 1 % for every 100 m above 1000 m
Overload	Constant torque: 150 % for 60 s, 180 % for 1 s; Variable torque: 115 % for 10 s
Output Frequency	0...480 Hz
Switching Frequency	Frame B 3,6 or 9 kHz; Frame C, D, E and F 3 or 6 kHz - All with audibly silent switching frequency
Dynamic Braking	Each drive can be fitted with an internal dynamic brake switch Frame B and C: standard; Frame D, E and F: optional
Analogue Inputs	4 Configurable, 10 bits (13 bits with optional system card). 0...10 V, 0... ± 10 V, 0...20 mA, 4...20 mA
Analogue Outputs	3 Configurable, 10 bits. 0...10 V, 0... ± 10 V, 0...20 mA, 4...20 mA
Digital Inputs	7 Configurable, nominal 24 VDC (30 VDC max)
Digital Outputs	3 Configurable, relay contacts 3 A/230 VAC
Reference Supplies	+10 VDC, -10 VDC, +24 VDC
Motor Thermistor input	PTC

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 realised 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.
Analogue 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: • 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: • 5 Additional user configurable Inputs / Outputs • 4 High resolution analogue inputs (12 bits plus sign) • 2 Additional encoder inputs • 2 High speed register mark inputs

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

Order Reference	Frame	Constant Torque		Variable Torque		Inductance	Braking Module	
		Nominal Power [kW]	Output Current [A]	Nominal Power [kW]	Output Current [A]			
690-431250B0-B...	B	0.75	2.5	-	-	N/A	Standard	
690-431450B0-B...	B	1.5	4.5	-	-			
690-431550B0-B...	B	2.2	5.5	-	-			
690-431950B0-B...	B	4.0	9.5	-	-			
690-432120B0-B...	B	5.5	12	-	-			
690-432120C0-B...	C	5.5	12			Standard - Internal Inductance DC Bus		
690-432140B0-B...	B	6.0	14					
690-432160C0-B...	C	7.5	16	11	23			
690-432230C0-B...	C	11	23	15	31 (UL=27)*			
690-432300C0-B...	C	15	31	18.5	38			
690-432310D0-...	D	15	31	18.5	38			
690-432380D0-...	D	18.5	38	22	45			
690-432450D0-...	D	22	45	30	59 (UL=52)*			
690-432590D0-...	D	30	59	37	73			
690-432590E0-...	E	30	59	37	73		Standard - Inductance Internal 3-phase	
690-432730E0-...	E	37	73	45	87			
690-432870E0-...	E	45	87	55	105			
690-433105F2-...	F	55	105	75	145			
690-433145F2-...	F	75	145	90	165			
690-433180F2-...	F	90	180	110	205			
690-433216G2-...	G	110	216	132	260			
690-433250G2-...	G	132	250	150	302			
690-433316G2-...	G	160	316	180	361			
690-433361G2-...	G	180	361	220	420			
690-433375H2-...	H	200	375	250	480		Option	
690-433420H2-...	H	220	420	250	480			
690-433480H2-...	H	250	480	300	545			
690-433520H2-...	H	280	520	315	590			
690-433590J2-...	J	315	590	355	650			
690GM1800-43-xx + 690GS1800-43-xx	K	355	685	400	798			
690HM2200-43-xx + 690HS2200-43-xx	K	400	798	475	912			
690HM2800-43-xx + 690HS2800-43-xx	K	500	988	600	1120			
690JM3150-43-xx + 690JS3150-43-xx	K	600	1120	650	1235			
690GM1800-43-xx + 2 x 690GS1800-43-xx	K	550	1028	630	1197			
690HM2200-43-xx + 2 x 690HS2200-43-xx	K	630	1197	750	1368			
690HM2800-43-xx + 2 x 690HS2800-43-xx	K	800	1482	900	1681			
690JM3150-43-xx + 2 x 690JS3150-43-xx	K	900	1681	1000	1852			

Power Supply 380-500 V (±10 %) 50/60 Hz 3-phase

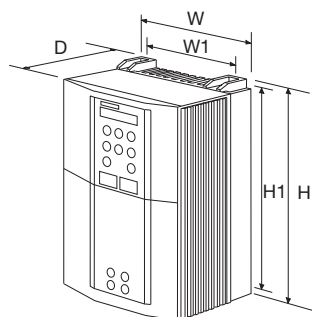
Order Reference	Frame	Constant Torque		Variable Torque	
		Nominal Power [kW]	Output Current [A]	Nominal Power [kW]	Output Current [A]
690-531500B0-B...	B	2.2	5.0	-	-
690-531800B0-B...	B	4.0	8.0	-	-
690-532110B0-B...	B	5.5	11	-	-
690-532110C0-B...	C	5.5	11	7.5	14
690-532140C0-B...	C	7.5	14	11	21
690-532210C0-B...	C	11	21	15	27
690-532270C0-B...	C	15	27	18.5	34
690-532280D0-...	D	15	28	18.5	36
690-532360D0-...	D	18.5	36	22	42
690-532420D0-...	D	22	42	30	52
690-532520D0-...	D	30	52	37	65
690-532540E0-...	E	30	54	37	67
690-532670E0-...	E	37	67	45	79
690-532790E0-...	E	45	79	55	98
690-533100F2-...	F	55	100	75	125
690-533125F2-...	F	75	125	90	156
690-533156F2-...	F	90	156	110	180

Power Supply 220-240 V (±10 %) 50/60 Hz

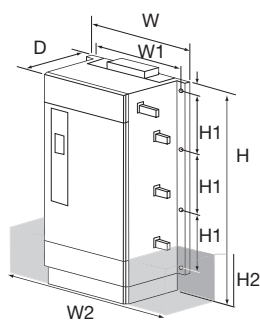
Order Reference	Number of phases	Frame	Constant Torque		Variable Torque		Inductance	Braking Module
			Nominal Power [kW]	Output Current [A]	Nominal Power [kW]	Output Current [A]		
690-211400B0-B...	1	B	0.75	4.0	-	-	No	Standard
690-211700B0-B...	1	B	1.5	7.0	-	-		
690-212105B0-B...	1	B	2.2	10.5	-	-		
690-231400B0-B...	3	B	0.75	4.0	-	-		
690-231700B0-B...	3	B	1.5	7.0	-	-		
690-232105B0-B...	3	C	2.2	10.5	-	-		
690-232165B0-B...	3	C	4.0	16.5	-	-		
690-232220C0-B...	3	C	5.5	22	7.5	28		
690-232280C0-B...	3	C	7.5	28	11	42	Standard - Internal inductance DC Bus	Option
690-232420D0-...	3	D	11	42	15	54		
690-232540D0-...	3	D	15	54	18.5	68		
690-232680D0-...	3	D	18.5	68	n.a.	n.a.		
690-232800E0-...	3	E	22	80	30	104		
690-233104F2-...	3	F	30	104	37	130		
690-233130F2-...	3	F	37	130	45	154		
690-233154F2-...	3	F	45	154	55	192		

Power ratings stated based on a supply voltage of 230 VAC

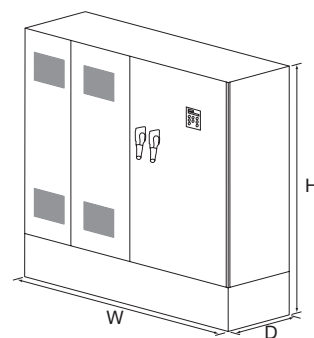
Dimensions



Frame B, C, D, E, F



Frame G, H, J



Frame K

Model	Dimensions [mm]				Mounting Centres [mm]					Weight [kg]
	H without brake	H with brake	W	D	W2	H2	H1	W1	G	
Frame B	233	233	177	181	-	-	223	130	-	4.3
Frame C	348	348	201	208	-	-	335	150	-	9.3
Frame D	453	453	252	245	-	-	440	150	-	17.4
Frame E	669	669	257	312	-	-	630	150	-	32.5
Frame F	720	720	257	349	-	-	700	150	-	41.0
Frame G	1042	1490	455	465	675	225	300	420	16	100
Frame H	1177	1750	570	465	805	360	300	536	16	125
Frame J	1288	1825	1177	465	825	333	300	641	16	170
Frame K 355/400 kW*	2000	2000	1600	600	-	-	-	-	-	-
Frame K 400/475 kW*	2000	2000	1600	600	-	-	-	-	-	-
Frame K 500/600 kW*	2000	2000	1600	600	-	-	-	-	-	-
Frame K 600/650 kW*	2000	2000	2000	600	-	-	-	-	-	-
Frame K 550/630 kW*	2000	2000	2400	600	-	-	-	-	-	-
Frame K 630/750 kW*	2000	2000	2400	600	-	-	-	-	-	-
Frame K 800/900 kW*	2000	2000	2400	600	-	-	-	-	-	-
Frame K 900/1000 kW*	2000	2000	3000	600	-	-	-	-	-	-

Accessories and Options

Communication Cards

The AC690+ Communication cards allow the AC690+ to be connected to the most common industry standard fieldbuses



Features

- Communications cards can be factory fitted as part of the drive, or purchased separately for fitting on-site
- Dimensions HxWxD: 127 mm x 76.2 mm x 25.4 mm
- LED indication of network and card status

Ethernet Communications Interface	
*Order Code: 6053-ETH-00 and 6055-ETH-00	
Supported Protocols	Modbus/TCP and Ethernet IP
Communication Speed	10/100 M bits/s
Station Address	Selectable via switch or Internet Explorer
Suitable for	AC690+ version 4.7+ DC590+ version 7.1+

DeviceNet Communications Interface	
*Order Code: 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+ DC590+ version 5.x+

CANopen Communications Interface	
*Order Code: 6053-CAN-00 and 6055-CAN-00	
Profile	DS402
Supported Messages	SDO, PDO, NMT, SYNC
Communication Speed	20 K, 50 K, 125 K, 250 K, 500 K, 1M bits/s selectable
Station Address	Selectable via Switch
Suitable for	AC690+ DC590+ version 5.x+

RS485/Modbus Communications Interface	
*Order Code: 6053-EI-00 and 6055-EI-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+ DC590+ version 5.17+

ControlNet Communications Interface	
*Order Code: 6053-CNET-00 and 6055-CNET-00	
Supported Messages	Polled I/O
Station Address	Selectable via Software
Suitable for	AC690+ version 4.7+ DC590+ version 5.17+

Modbus Plus Communications Interface	
*Order Code: 6053-MBP-00 and 6055-MBP-00	
Supported Protocols	Modbus Plus
Cabling	RS485 2 or 4 wire
Communication Speed	1 M bits/s
Station Address	Selectable via Software
Suitable for	AC690+ version 4.7+ DC590+ version 7.1+

Profibus-DP Communications Interface	
*Profibus-DP (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+ DC590+ version 5.x+

LonWorks	
*Order Code: 6053-LON-00 and 6055-LON-00	
Supported Protocols	LonWorks
Delivered	with a resource file compatible with LonMaker software (or equivalent)
Suitable for	AC690+ version 5.1+

Johnson Controls	
*Order Code: 6053-JMET-00 and 6055-JMET-00	
Supported Protocols	Johnson Controls N2

* Refer to previous page for details of drive frame compatibility

HTTL Encoder Feedback Card

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:

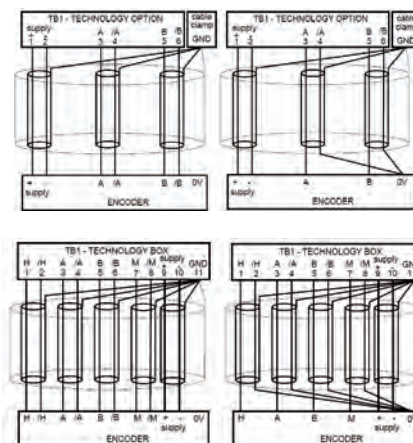
- 4 Optically isolated differential inputs A, B, M and H
- Adjustable isolated 10...20 V encoder power output

Specifications

Maximum input frequency	250 kHz
Receiver current consumption	≤10 mA per channel
Input format	2-channels in quadrature, clock / direction, or clock only
De-phasing	>1 μs
Differential input voltage	10...30 V max
Encoder power	Maximum Load: Card AH467407U001: 200 mA or 2 W Housing 6054/HTTL/00: 250 mA or 2.5 W Voltage 10...20 V software adjustable



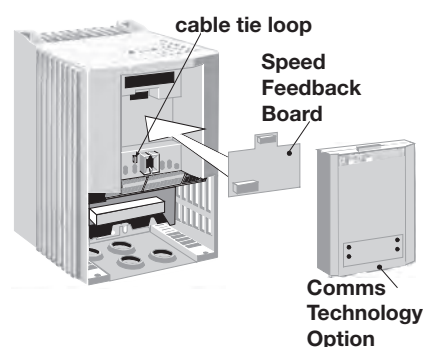
Installation and Cabling



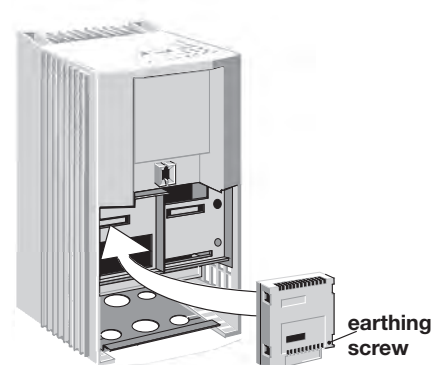
Product Codes

Order Code	Drives
AH467407U001	AC690+ Frame B (690-xxxxxxB...) drives
6054/HTTL/00	AC690+ Frames C - K drives

AC690+ Frame B AC Drives



AC690+ Frames C-K Drives



System Expansion Module

Description

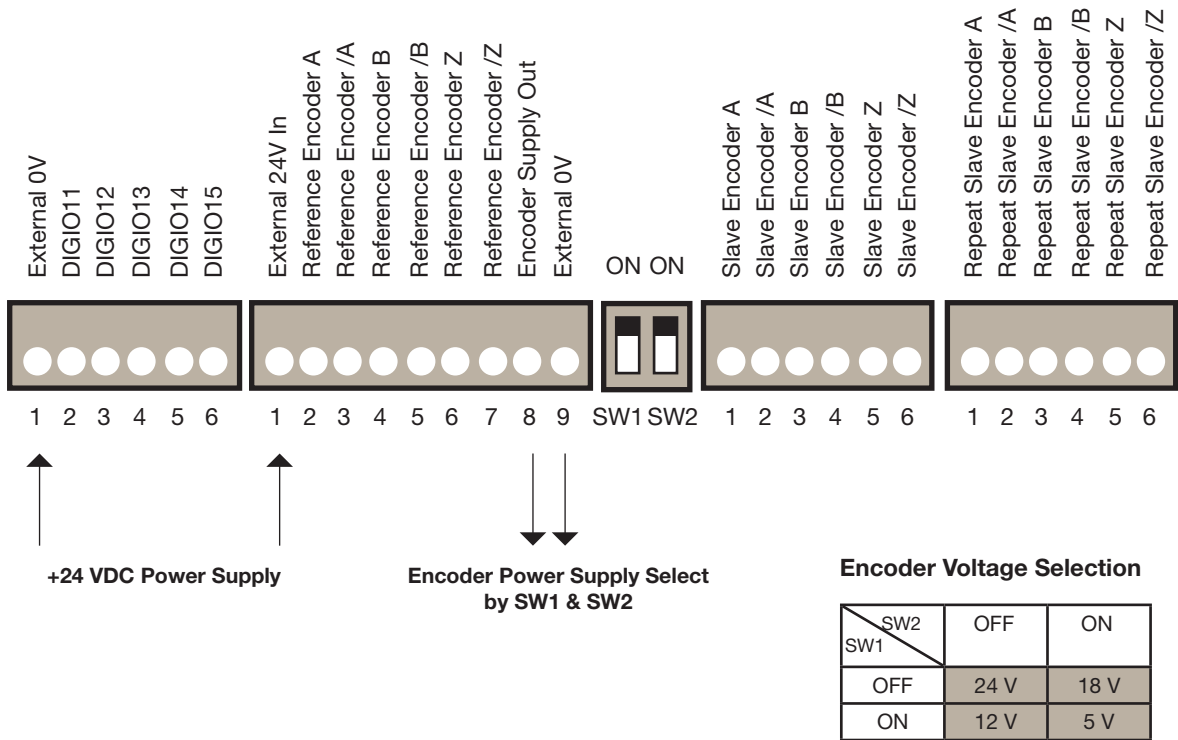
With the System expansion module, the AC690+ can be used in sophisticated applications, or where a small amount of automation is required to be used in conjunction with the drive.

The following features are available:

- Analogue Inputs AIN1-4 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 1A / 24 VDC ($\pm 10\%$) must be connected to the card.

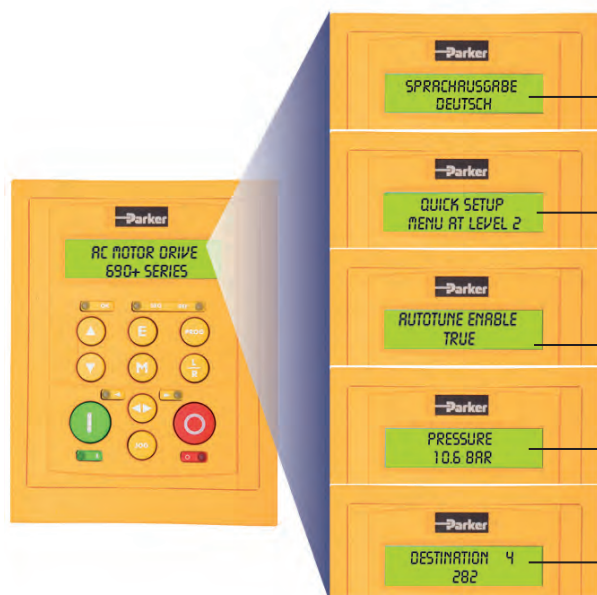


Operator Keypads

Standard operator keypad 6901-00-G

Features

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



Multilingual

English · 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

Advanced operator keypad 6911-01-00-G

Features

- 128x64 pixels semi-graphical resolution
- RS232 and RS485 ports
- Recording of parameters to keypad and restore to drive (Memory card 256 MB to 2 GB)



Braking Resistors

for AC Drives

Description

Brake resistors are used with AC650, AC650V, or AC690 drives equipped with a braking option modules. They are designed to allow the drive to stop a motor at full load during deceleration or an overhauling load.



Brake resistor selection

Brake resistor assemblies must be rated to absorb both peak braking power during deceleration and the average power over the complete cycle.

Resistors above 500 W

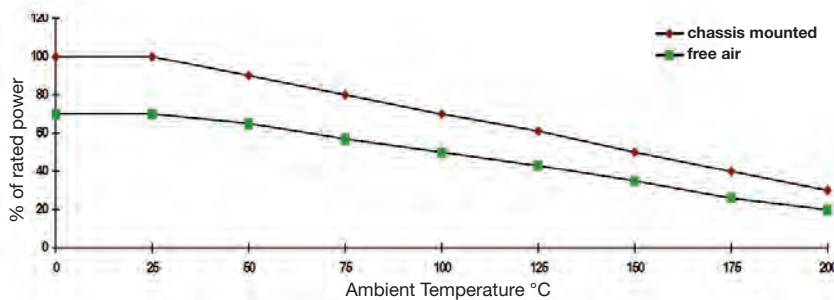
Resistors above 500 W are available upon request :

- IP20 protection up to 3 kW
- IP13 protection between 4.2 and 9.8 kW

$$\text{Peak braking power} = \frac{0.0055J \times (n_1^2 - n_2^2) \text{ (W)}}{t_b}$$

$$\text{Average braking power } P_{av} = \frac{P_{pk} \times t_b}{t_c}$$

J - total inertia in kgm^2
 n_1 - initial speed in min^{-1}
 n_2 - final speed min^{-1}
 t_b - braking time in s
 t_c - cycle time in s

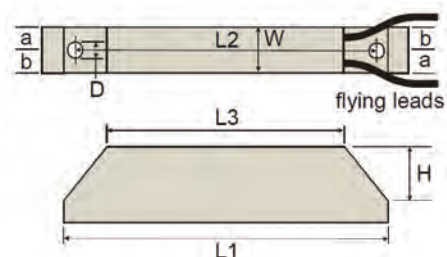


Dimensions

Nominal Power [kW]	Dimensions		
	L [mm]	H [mm]	P [mm]
1.0	137	450	140
1.6	182	450	140
2.0	182	450	140
2.5	227	450	140
3.0	227	450	140
4.2	450	440	540
5.6	530	440	540
7.0	530	440	540
8.4	610	440	540
9.8	610	440	540

Model	Impedance [Ω]	Nom. Power [W]	Dimensions							
			L1	L2	L3	W	H	D	a	b
CZ467715	500	60	100	87	60	22	41	4.3	10	12
CZ467714	200	100	165	152	125	22	41	4.3	10	12
CZ389853	100	100	165	152	125	22	41	4.3	10	12
CZ467717	100	200	165	146	125	30	60	4.3	13	17
CZ463068	56	200	165	146	125	30	60	4.3	13	17
CZ388397	56	200	165	146	125	30	60	4.3	13	17
CZ388396	36	500	335	316	295	30	60	4.3	13	17
CZ467716	28x2	500	335	316	295	30	60	4.3	13	17

Overload 5 s : 500 %
 Overload 3 s : 833 %
 Overload 1 s : 2500 %



Three Phase Line Reactors

for AC Drives

Description

Parker's range of line reactors have been especially selected to match the requirements of the Parker AC drive range and can be used on both the input and output sides of the drive. They are used to reduce the harmonic content of the supply current. A choke fitted in the drive output limits the capacitive current when motor cable runs in excess of 50 m are used. It prevents overcurrent trips and temperature rise of the motor.

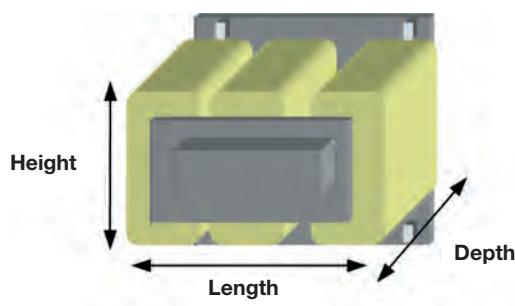
As well as helping with compliance with IEEE 519 there are other benefits to using line/load reactors including:

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

Dimensions

Order Reference	Inductance	In [A]	Height [mm]	Length [mm]	Depth [mm]	Fixing Centres [mm]	Weight (approx.) [kg]
CO389936U401	75 μ H	315	215	330	320	175 x 225	70
CO389936U402	50 μ H	480	215	330	320	175 x 225	95
CO466448U040	50 μ H	36	70	155	127	48 x 140	2.5
CO466448U165	50 μ H	148.5	115	190	155	93 x 170	12
CO466709U038	30 μ H	342	370	350	226	240 x 320	38
CO466709U050	25 μ H	450	431	420	226	290 x 381	53
CO466709U073	20 μ H	653	431	420	226	290 x 381	60
CO466709U083	15 μ H	747	431	420	226	290 x 381	69
CO468314U650	5 μ H	650	30	300	325*	100 x 250	35
CO468325U006	1.749 mH	12.7	83	157	160*	60 x 80	6
CO468325U037	0.416 mH	54	110	240	250*	80 x 200	13
CO468325U110	0.137 mH	165	140	300	310*	110 x 240	30
CO468326U006	2.917 mH	12.8	170	240	260*	80 x 140	17
CO468326U037	0.693 mH	54	240	360	380*	120 x 200	50
CO468326U110	0.227 mH	165	320	390	490*	280 x 260	130
CO468325U055	0.282 mH	79	130	240	250*	100 x 200	19
CO466448U015	50 μ H	13.5	60	80	67	64 x 40	1
CO466448U110	50 μ H	100	100	190	155	170 x 75	7.5
CO468326U006	2.917 mH	12.8	170	240	260	80 x 140	17
CO466448U070	50 μ H	63	85	155	127	140 x 63	4.5
CO466250U012	15 μ H	1080	400	420	450	300 x 140	170

* Include Earth Stud



Software

Drive System Explorer Lite (DSE Lite) Software

Description

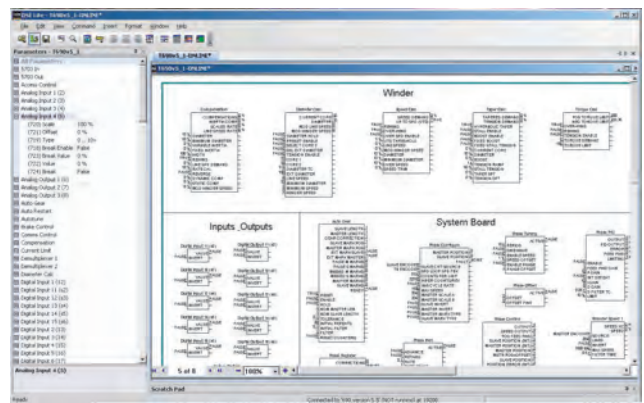
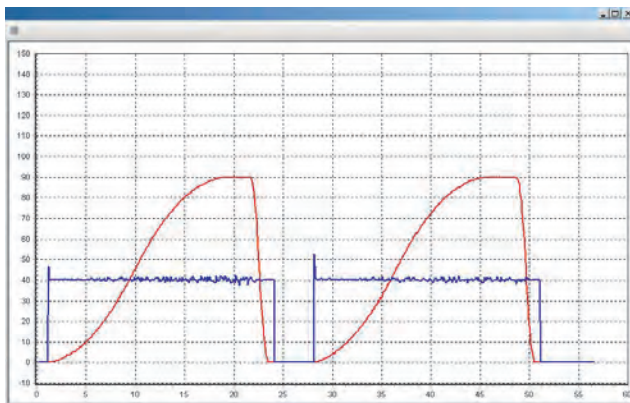
DSE Lite software is an easy to use configuration, commissioning and monitoring tool with graphical interface for the Parker SSD Drives range of AC and DC drives.

While the drive is in running mode the oscilloscope function allows "on-line" monitoring of selected parameters and the recording of trends.

DSE Lite, allows the user to create, parameterize and configure user defined applications thanks to function blocks dedicated to speed control, Winder, PID, Diameter calculator, Shaftless...

DSE Lite is downloadable from our website.

www.parker.com



Order Code

AC690+ Integrator Series

	1		2	3	4		5	6	7	8	9		10	11	12	13
Order example	690	-	21	1400B	0	-	B	0	0	P	00	-	A	0	0	0

1	Product Family					
690	AC690+ Integrator Series AC Drive					
C690	AC690+ Integrator Series AC Drive (Conformal Coating)					
2	Supply Voltage					
21	230 V 1-phase					
23	230 V 3-phase					
43	400/460 V 3-phase					
53	400/500 V 3-phase					
3	Power / Current Rating @230 V 1-phase					
	@230 V 1-phase	Constant Torque kW/A	HP/A	Variable Torque kW/A	HP/A	Frame
1400B	0.75/4.0	1.0/4.0	-	-	-	B
1700B	1.5/7.0	2.0/7.0	-	-	-	B
2105B	2.2/10.5	3.0/10.5	-	-	-	B
	@230 V 3-phase	Constant Torque kW/A	HP/A	Variable Torque kW/A	HP/A	Frame
1400B	0.75/4.0	1.0/4.0	-	-	-	B
1700B	1.5/7.0	2.0/7.0	-	-	-	B
2105B	2.2/10.5	3.0/10.5	-	-	-	B
2165B	4.0/16.5	5.0/16.5	-	-	-	B
2220C	5.5/22	7.5/22	7.5/28	10/28	-	C
2280C	7.5/28	10/28	11/42	15/42	-	C
2420D	11/42	15/42	15/54	20/54	-	D
2540D	15/54	20/54	18.5/68	25/68	-	D
2680D	18.5/68	25/68	-	-	-	D
2800E	22/80	30/80	30/104	40/104	-	E
3104F	30/104	40/104	37/130	50/130	-	F
3130F	37/130	50/130	45/154	60/154	-	F
3154F	45/154	60/154	55/192	84/192	-	F
	@400/ 460 V 3-phase	Constant Torque kW/A	HP/A	Variable Torque kW/A	HP/A	Frame
1250B	0.75/2.5	1.0/2.5	-	-	-	B
1450B	1.5/4.5	2.0/4.5	-	-	-	B
1550B	2.2/5.5	3.0/5.5	-	-	-	B
1950B	4.0/9.5	5.0/9.5	-	-	-	B
2120B	5.5/12	7.5/11	-	-	-	B
2140B	6.0/14	10/14	-	-	-	B
2120C	5.5/12	7.5/12	7.5/16	10/16	-	C
2160C	7.5/16	10/14	11/23	15/21	-	C
2230C	11/23	15/21	15/30	20/27	-	C
2300C	15/30	20/27	18.5/37	25/34	-	C
2310D	15/31	20/31	18.5/38	25/38	-	D
2380D	18.5/38	25/38	22/45	30/45	-	D
2450D	22/45	30/45	30/59	40/52	-	D
2590D	30/59	40/52	37/73	50/65	-	D
2590E	30/59	40/59	37/73	50/73	-	E
2730E	37/73	50/73	45/87	60/87	-	E
2870E	45/87	60/87	55/105	75/105	-	E

	@400/ 460 V 3-phase	Constant Torque kW/A	HP/A	Variable Torque kW/A	HP/A	Frame
3105F	55/105	75/100	75/145	100/125	-	F
3145F	75/145	100/130	90/165	125/156	-	F
3156F	90/180	125/156	110/205	150/180	-	F
3180F	90/180	150/180	110/205	150/180	-	F
3216G	110/216	175/216	132/260	200/260	-	G
3250G	132/250	200/250	150/302	250/302	-	G
3316G	160/316	250/316	180/361	300/361	-	G
3361G	180/361	300/361	220/420	350/420	-	G
3375H	200/375	-	250/480	-	-	H
3420H	220/420	350/420	250/480	400/480	-	H
3480H	250/480	400/480	300/545	450/545	-	H
3520H	280/520	450/520	315/590	505/590	-	H
3590J	315/590	500/590	355/650	550/650	-	J
	@ 500 V 3-phase	Constant Torque kW/A	HP/A	Variable Torque kW/A	HP/A	Frame
1500B	2.2/ 5.0	-	-	-	-	B
1800B	4.0 /8.0	-	-	-	-	B
2110B	5.5/11	-	-	-	-	B
2110C	5.5/11	-	7.5/14	-	-	C
2140C	7.5/14	-	11/21	-	-	C
2210C	11/21	-	15/27	-	-	C
2270C	15/27	-	18.5/34	-	-	C
2280D	15/28	-	18.5/36	-	-	D
2360D	18.5/36	-	22/42	-	-	D
2420D	22/42	-	30/52	-	-	D
2520D	30/52	-	37/65	-	-	D
2540E	30/54	-	37/67	-	-	E
2730E	37/67	-	45/79	-	-	E
2870E	45/79	-	55/98	-	-	E
3105F	55/100	-	75/125	-	-	F
3145F	75/125	-	90/156	-	-	F
3156F	90/156	-	110/180	-	-	F

4	Auxiliary Supply	
0	Not Required (frames B - E)	
1	115V 1-ph (frame F - J only)	
2	230V 1-ph (frame F - J only)	

5	Brake Switch
0	Not fitted (option for frames D - J)
B	Brake switch fitted (optional on frames D – J) (must be fitted on frames B & C)
6	Filter
0	Not fitted (option for frame B) (fitted filter not available for frames C – F)
F	Filter fitted (option on frame B only)
7	System Board
0	Not fitted
S	System Board fitted
8	Mounting
P	Panel mount (option on frames B - E, must be selected on frame C - J)
W	Wall mount (option on frames B - E only)
T	Through panel mount (option for frames C - E only)
9	Special Options
00	None
	Documented special options (01 - 99) (refer to local sales office)
10	Language
A	English (50 Hz)
B	English (60 Hz)
D	German
E	Spanish
F	French
G	Portuguese
I	Italian
L	Polish
S	Swedish
11	Keypad
0	None (option on frames B – F)
4	6901 keypad fitted (option on frames B – F) (must be specified for frames G – J)
12	Speed Feedback
0	None
3	HTTL Encoder
13	Communication
0	None
C	ControlNet
D	DeviceNet
E	Ethernet
J	Johnson Metasys
L	Link
M	Modbus+
N	CANopen
P	Profibus
R	RS485 (EI Bisynch)
S	Siemens Apogee
W	LonWorks

Accessories and Options

Options	Frame	Fitting	Order Reference
Operator Keypad			
AC690+ (removable)	B - J	Option	6901-00-G
Advanced operator keypad (removable)	B - J	Option	6911-01-00-G
Remote mounting kit	B - J	Option	6052/00
Communication Cards			
Ethernet Modbus/TCP and Ethernet IP	B	Option	6053-ETH-00
	C - J	Option	6055-ETH-00
ControlNet	B	Option	6053-CNET-00
	C - J	Option	6055-CNET-00
Modbus Plus	B	Option	6053-MBP-00
	C - J	Option	6055-MBP-00
DeviceNet	B	Option	6053-DNET-00
	C - J	Option	6055-DNET-00
RS485 / Modbus	B	Option	6053-EI00-00
	C - J	Option	6055-EI00-00
Profibus-DP	B	Option	6053-PROF-00
	C - J	Option	6055-PROF-00
CANopen DS402	B	Option	6053-CAN-00
	C - J	Option	6055-CAN-00
LonWorks	B	Option	6053-LON-00
	C - J	Option	6055-LON-00
Link	B	Option	6053-LINK-00
	C - J	Option	6055-LINK-00
Speed Feedback / Systems Module			
HTTL Encoder Card	B	Option	LA467461
	C - J	Option	6054/HTTL/00
Systems Expansion Module	B	Option	LA467471U002
	C - J	Option	AH463889U001
Accessories			
Brake Resistor			
Chokes			
IP40 Cover for Wall Mounting	B	Option	LA467452
	C	Option	LA465034U002
	D	Option	LA465084U002
	E	Option	LA465058U002
DSE Lite Programming Software			
HMI Operator interace 3 to 15"			
Motors			
Asynchronous Motors			



Parker's Motion & Control Technologies

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 00800 27 27 5374



Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Climate Control

Key Markets

Agriculture
Air conditioning
Construction machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves



Electromechanical

Key Markets

Aerospace
Factory automation
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, gantry robots & slides
Electrohydraulic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions



Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings



Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors



Pneumatics

Key Markets

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

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors



Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves



Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General Industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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