AC20 Variable Speed Drive

IP20 Compact Drive for General Purpose Applications 1.5 – 180 kW

ENGINEERING YOUR SUCCESS.

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Variable Speed Drive - AC20 Series

Overview

Description

The AC20 Advanced Compact Drive is a highly featured yet economical solution to general purpose motor control applications. AC20 provides speed or torque control in the power range 1.5 kW to 180 kW. Its compact dimensions house many features normally only associated with system drives, including sensorless vector mode for control of Permanent Magnet (PMAC) and AC induction motors, encoder feedback and IO expansion option cards, Safe Torque Off and an onboard Ethernet port that supports major industrial Ethernet protocols. AC20 provides the perfect solution for OEM machine builders looking for a compact, cost-effective drive without compromising on performance.

Features

Simplicity

AC20 is designed to reduce the time and effort required to select, install, set up and commission Two variants of option card are available, and both are user installable/retrofittable. Minimal wiring requirements with two easily accessed terminal rails and removable power cable earthing brackets make AC20 fast and simple to install. All AC20 come with a high quantity of user configurable IO and a user disconnectable C3 EMC filter as standard. Programming and commissioning is made simple through its easy to use integrated keypad and the DSELite programming tool

Reliability

Proven technology and manufacturing techniques ensure AC20 has been engineered and built to deliver consistently outstanding levels of performance day in, day out - ensuring maximum uptime and productivity.
Thanks to its conformally coated PCBs, AC20 is built to withstand C3 environments.

Compatibility

AC20 has been designed with system compatibility in mind. The compact footprint allows installation into existing spaces, while the IO count has been chosen to allow maximum possible flexibility. The internal block diagram is fully featured to enable replacement of legacy Parker inverters, and the onboard Ethernet communications protocols aid integration into wider systems. Retrofittable, plug-in communications cards cover all popular protocols and are simple to configure.

Technical Characteristics

Power Supply	220 ... 240 VAC ±10 % Single Phase 220 ... 240 VAC ±10 % Three Phase 380 ... 480 VAC ±10 % Three Phase
Input Frequency	50/60 Hz ±10 %
Power Range	1.5...180 kW Heavy Duty (HD)
Overload	150% for 60 sec.
Output Frequency	0.5 - 590 Hz
Safe Torque Off (STO)	SIL2, PLd
Operating Temperature	0...40 °C (derate possible up to 45°C)*
Altitude	0-1000m (derate 1% per 100m up to 2000m max.)

* Without communications option fitted

µSD Card Slot

For application cloning and firmware updates in the field

Built-in Display Keypad

Operate the drive and see real time diagnostic feedback through the built-in 2-line alphanumeric display

Standard Ethernet Port

Modbus TCP/IP, ProfinetIO & Ethernet IP as standard. Access the drive webpage or program the drive through the popular and intuitive DSELite configuration tool

User fittable Option Cards

- Encoder Feedback card
- GPIO card

Both are compatible in each option slot & two identical cards can be fitted simultaneously

6901 Keypad Support:

Connect an optional remote 6901 keypad to the RJ11 port.

Safe Torque Off

Independently certified STO to SIL2, PLd as standard. Complies to:

- EN ISO13849-1:2015
- EN 61800-5-2:2017
- EN 61508

Dedicated Motor Thermistor Input

PTC Motor Thermistor feedback connection as standard

Power Cable Shielding Bracket (not shown)

Frames 2-5 fitted with a cable shielding and support bracket as standard

User I/O

Extensive analogue and digital I/O for application flexibility

Additional Communications Options

- CANopen
- EtherCAT
- Ethernet IP
- Profibus DVP-1
- ProfiNet IO
- RS485 Modbus RTU slave

Standards & Compliance

The product is certified to the latest international standards:

Europe:

- Low Voltage Directive: 2014/35/EU
- EMC Directive: 2014/30/EU
- Machinery Directive: 2006/42/EC
- EN61800-5-1:2007+A11;2021
- EN61800-3:2018
- IE 2 Compliant

North America & Canada:

- UL61800-5-1
- CSA22.2#274-17

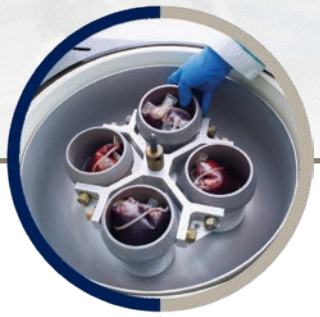
Applications

AC20 provides a no-fuss approach to general purpose industrial motor control applications across a wide range of industries, giving users the benefits of the inherent energy-saving properties of using a variable speed drive, as well as the improved reliability and extended service life benefits associatedwith smoother starting and stopping of regularly cyclingloads.

Typical applications for AC20 include...

- Conveyor
- Centrifuge
- Fans
- Mixers
- Packaging Machines
- Textile Machines
- Strapping Machines
- Labelling Machines
- Industrial Washing Machines
- Machine Tool Spindles
- Roller Doors

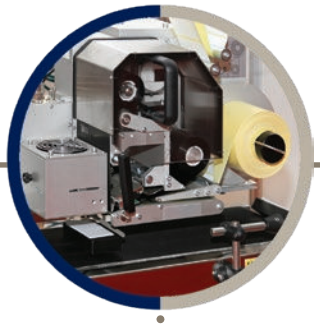
Conveyors



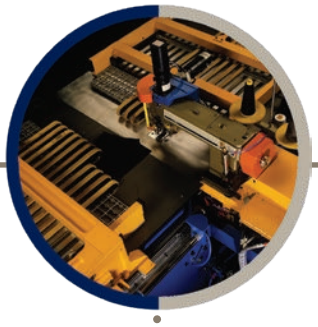
Centrifuges

Fans

Mixers



Packaging Machines



Textile Machines

Technical Characteristics

Power Ratings

220-240 VAC, Single Phase Supply Voltage				
Order Code	**Input Current [A]**	**Output Current [A]**	**HD Power Rating [kW]**	**Frame Size**
20G-12-0070-BF	14	7	1.5	2
20G-12-0100-BF	20	10	2.2	

220-240 VAC, Three Phase Supply Voltage				
Order Code	**Input Current [A]**	**Output Current [A]**	**HD Power Rating [kW]**	**Frame Size**
20G-32-0070-BF	7.8	7	1.5	2
20G-32-0100-BF	11	10	2.2	
20G-33-0170-BF	18.5	17	4	3
20G-34-0210-BF	22	21	5.5	4
20G-35-0300-BF	31	30	7.5	5
20G-35-0400-BF	41	40	11	

380-480 VAC, Three Phase Supply Voltage				
Order Code	**Input Current [A]**	**Output Current [A]**	**HD Power Rating [kW]**	**Frame Size**
20G-42-0040-BF	5	4	1.5	2
20G-42-0065-BF	7.5	6.5	2.2	
20G-42-0090-BF	11	9	4	
20G-43-0120-BF	14	12	5.5	3
20G-43-0170-BF	18.5	17	7.5	
20G-44-0230-BF	24	23	11	4
20G-44-0320-BF	36.5	32	15	
20G-45-0380-BF	44	38	18.5	5
20G-45-0440-BF	51	44	22	
20G-45-0600-BF	70	60	30	
20G-46-0750-BF	80	75	37	6
20G-46-0900-BF	94	90	45	
20G-47-1100-BF	120	110	55	7
20G-47-1500-BF	160	150	75	
20G-48-1800-BF	190	180	90	8
20G-48-2200-BF	225	220	110	
20G-48-2650-BF	275	265	132	
20G-49-3200-BF	330	320	160	9
20G-410-3600-BF	370	360	180	10

Electrical Characteristics

Power Supply	220 - 240 VAC ±10 % Single Phase 220 - 240 VAC ±10 % Three Phase 380 - 480 VAC ±10 % Three Phase
Input Frequency	50/60 Hz ±10 %
Power Range	1.5...180 kW Heavy Duty (HD)
Overload	150% for 60 sec.
Output Frequency	0.5...590 Hz
Max. Switching Frequency	10 kHz
Control Modes	Volts/Hertz, Sensorless Vector (SLV) or Closed-Loop Vector Mode (Induction only)
Supported Motors	Induction & PMAC

Environmental Characteristics

Temperature range	0-40 °C (derate possible up to 45 °C)*
Humidity	Up to 90 % Relative Humidity, non-condensing
Vibration	< 0.5 g
Altitude	0-1000 m (derate 1% per 100m up to max. 2000m)
Protection Degree	IP20
Pollution Degree	Category 2
Chemically Active Substances	Compliance with EN60271-3-3: C3

* De-rating only possible without communications option fitted

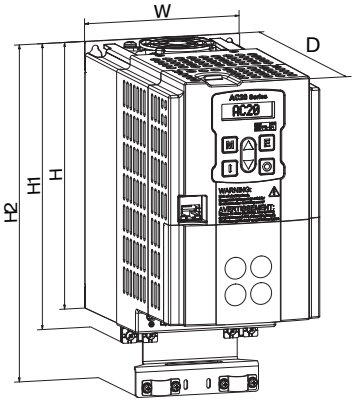
Standards and Conformance

Europe	This product conforms with: - Low Voltage Directive 2014/30/EU - Electro-Magnetic CompatabilityDirective 2006/42/EC - EN61800-5-1:2007+A11:2021 - EN61800-3:2018
North America / Canada	Complies with the requirements of: - UL61800-5-1 - CSA22.2#274-17 as an open-type drive
STO	Independently certified to: - EN ISO13849-1:2015 - EN 61800-5-2:2017 - EN 61508
RoHS	This product complies with the RoHS substance restrictions in accordance with EC Directive 2011/65/EU
REACH	This product complies with the REACH regulations EC1907/2006

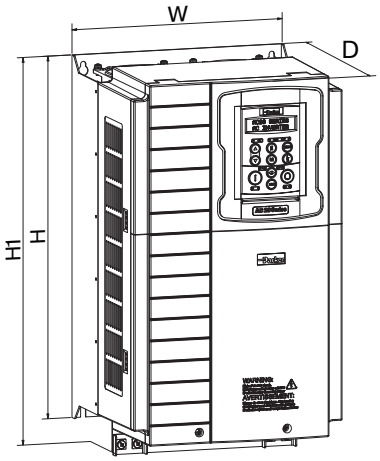
Dimensions [mm]

Frame	Height (H)	Height (H1)	Height (H2)	Width (W)	Depth (D)	Weight [kg]
2	180	193	227,5	108.4	185	2
3	237,5	248	281,9	141.6	184	3.3
4	265	283	321,4	161	196	4.4
5	340	358	401,4	210	220.2	8
6	435	465	n/a	262	240.5	14
7	630	623,5	n/a	355	265	42
8	765	755	n/a	406	300	56.5
9	765	778	n/a	510	326	87
10	910	925	n/a	550	341.5	123

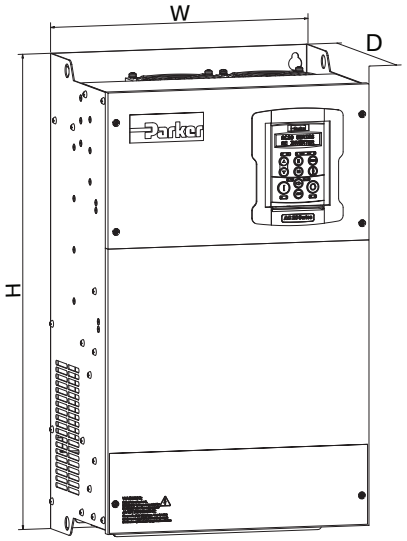
Frame 2-5



Frame 6



Frame 7-10



Power Connections

Frame 2-4

Terminal	Description
PE	Earth
L1 / L	Supply Input phase L1 / Live
L2 / N	Supply Input phase L2 / Neutal
L3	Supply Input phase L3
DC+	DC+ Dynamic Brake Resistor connection (+)
DBR	Dynamic Brake Resistor connection (-)
U	U Motor Output phase U
V	V Motor Output phase V
W	W Motor Output phase W

Frame 5-6

Terminal	Description
PE	Earth
L1	Supply Input phase L1
L2	Supply Input phase L2
L3	Supply Input phase L3
DC+	DC+ Dynamic Brake Resistor connection (+)
DC-	DC-
DBR	Dynamic Brake Resistor connection (-)
U	U Motor Output phase U
V	V Motor Output phase V
W	W Motor Output phase W

Frame 7-10

Terminal	Description
PE	Earth
DC+	DC+ Dynamic Brake Resistor connection (+)
DC-	DC-
DBR	Dynamic Brake Resistor connection (-)
L1	Supply Input phase L1
L2	Supply Input phase L2
L3	Supply Input phase L3
U	U Motor Output phase U
V	V Motor Output phase V
W	W Motor Output phase W

Control Connections

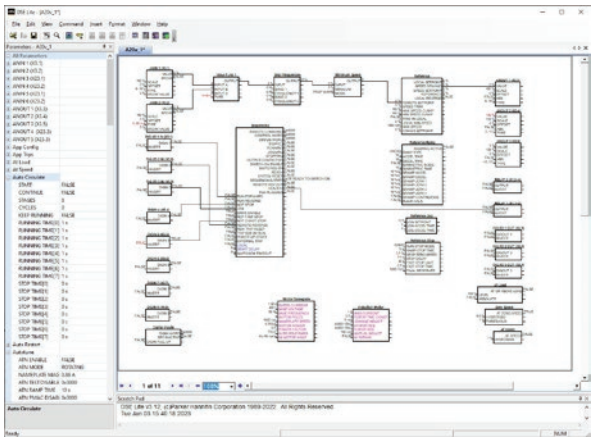
Label	Description
RLY1A	RelayOutput 1 (Contact A)
RLY1B	RelayOutput 1 (Contact B)
RLY2A	RelayOutput 2 (Contact A)
RLY2B	RelayOutput 2 (Contact B)
TH1	Motor Thermistor Input
TH2	Motor Thermistor Input
AIN1	Analogue Input 1 (±10V, 0-10V, 0-20mA, 4-20mA)
AIN2	Analogue Input 2 (±10V, 0-10V, 0-20mA, 4-20mA)
AOUT1	Analogue Output 1 (0-10V, 0-20mA)
AOUT2	Analogue Output 2 (0-10V, 0-20mA)
AOUT3	Analogue Output 3 (±10V, 0-10V)
0V	0V Reference for analogue & digital I/O
0V	0V Reference for analogue & digital I/O
24V	24V user supply
DIO1	Digital Input / Output 1 (24V configurable)
DIO2	Digital Input / Output 2 (24V configurable)
DIN3	Digital Input / Output 3 (24V configurable)
DIN4	Digital Input 4
DIN5	Digital Input 5
DIN6	Digital Input 6
DIN7	Digital Input 7
DIN8	Digital Input 8
DIN9	Digital Input 9*
DIN10	Digital Input 10*
STO1	STO input channel A
STO0V	STO 0V reference
STO2	STO input channel B

* = Frames 6-10 only

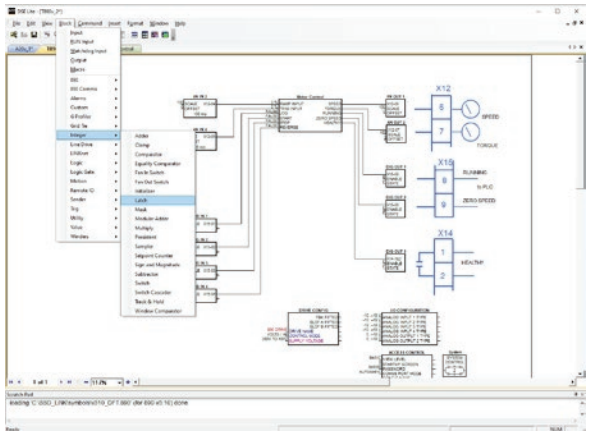
Software

Parker Drive System Explorer (DSELite)

Parker drive configuration software Drive System Explorer (DSE) Lite is an easy to use drive configuration software package, designed tomake programming your application as simple as possible without compromising on functionality.



DSE Lite is based around a straightforward block programming and an intuitive user interface which supports user-defined configurations and offers real- time monitoring and charting. DSE Lite allows the user to create, parameterize and configure user defined applications as well as parameterize and connect fixed Motor Control blocks with 70 user functions and up to 200 ‘links’



Thanks to the on-line help and pre-configured macro templates, users can achieve the optimum drive configuration without the need to navigate through complicated parameter menus.

DSELite for AC20 uses a standard Ethernet connection between PC and inverter, so no special lead is required.

Features new to the AC20 include:
- Ethernet connectivity
- Network scan feature
- Drive LED identification
- Firmware installs over Ethernet
- Ability to save a project to on-board Flash memory
- Compatibility with the AC30 Series PDD scope feature.
- Power 'on the bench' for programming

It is available free of charge to download from www.parker.com.

Accessories and Options

6901 Remote Mounting Keypad

The popular 6901 remote mounting keypad can be mounted away from the drive, such as on the door of an electrical enclosure. This IP20 products allows users to configure, operate and monitor the drive without having to access the drive directly.
The remote keypad provides an alternative to the drive mounted keypad, offering the same functionality, but can be connected to the drive via a 1.5 m cable plugged into a RJ11 port on the drive.

Order Code	Description
6901-00-G	6901 DisplayKeypad
6052-00-G	6901 remote mounting kit

Option Slots

The AC20 features three option slots. All options are user installable and are ordered separately. Two option slots will accept either a speed feedback option or general-purpose IO expansion module, with a third option slot dedicated to communications option modules.

General Purpose I/O (GPIO) Option Card

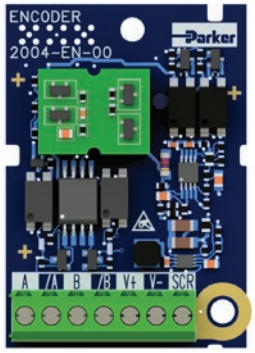
Description:
The general purpose I/O (GPIO) option module offers users the opportunity to expand the drives standard I/O capability, allowing more complex motor control solutions to be implemented.
The option can be fitted in either slot 1 or 2, and two options can be fitted at the same time to maximize the IO compliment. For example, two fitted IO options will give an additional 4 analogue inputs

2004-IO-00	GPIO Option
Analogue inputs	2x Analogue inputs (±10V, 0-10V)
Analogue output	1x Analogue outputs (±10V, 0-10V)
Digital I/O	Digital Input/Output 1 (24V configurable)
Reference voltages	+/- 10V References

Terminal	Label		Description
	Slot 1	Slot 2	
AI3	AIN3	AIN5	Analogue input 3/5 (±10V, 0-10V)
AI4	AIN4	AIN6	Analogue input 4/6 (±10V, 0-10V)
AO4	AOUT4	AOUT5	Analogue output 4/5 (±10V, 0-10V)
DX11	DIO11	DIO12	Digital I/O 11/12 (24V configurable)
+10V	+10V	+10V	+ 10V Reference voltage
-10V	-10V	-10V	- 10V Reference voltage
0V	0V	0V	0V Reference for analogue & digital I/O

Encoder Feedback Card

Description:
The HTTL pulse encoder feedback module allows an incremental encoder to be connected to the AC20, allowing users to take full advantage of closed-loop vector control.
The option can be fitted in either slot 1 or 2, and two identical options can be fitted at the same time, allowing for simple speed following applications.



2004-EN-00	Encoder Feedback Option
Maximum input frequency	250 kHz per channel
Input format	Quadrature
Output supply voltage	5V, 12V, 15V, 20V

Terminal	Label		Description
	Encoder 1	Encoder 2	
A	A	A	Channel A input
/A	/A	/A	Channel /A input
B	B	B	Channel B input
/B	/B	/B	Channel /B input
V+	V+	V+	Encoder supply +
V-	V-	V-	Encoder supply -
SCR	SCR	SCR	Cable screen

Communication Option Cards

The AC20 takes advantage of commonly available third-party communication modules, allowing communication over a range of popular protocols. Also included in the supported range are Ethernet IP and ProfiNet modules, for when two ports are required. Adding an Ethernet based option card is possible in addition to the onboard Modbus TCP/IP, ProfiNet or Ethernet IP port.

2003-CB-00	CANopen communication interface
Supported Protocols	DS301 V4.02
Communication Speed	10 k, 20 k, 50 k, 125 k, 250 k, 500 k, 1 Mbits/s or automatically detected
Max. number of devices	127
Supported Messages	SDO, PDO, NMT, SYNC

2003-EC-00	EtherCAT communication interface
Supported Protocols	CANopen over EtherCAT (CoE) DS301 compliant
Communication Speed	100 Mbits/s
Max. number of devices	65534
Supported Messages	SDO, PDO, NMT, SYNC

2003-IP-00	Ethernet IP communication interface
Supported Protocols	Ethernet IP
Communication Speed	10/100 Mbits/s full/half duplex
Max. number of devices	Virtually unlimited
Supported Messages	Up to 256 bytes of consumed data and 256 bytes of produced data, CIP parameter object support, Explicit messaging

2003-PB-00	PROFIBUS DP-V1 communication interface
Supported Protocols	PROFIBUS-DP; Demand data and Data exchange
Communication Speed	Up to 12 Mbits/s; automatically detected
Max. number of devices	32 per segment, 126 total
Supported Messages	Up to 152 bytes cyclic I/O, 68 bytes class 1 and 2 acyclic data, 152 bytes configuration data. GSD file provided

2003-RS-00	RS485 / Modbus RTU communication interface
Supported Protocols	Modbus RTU
Communication Speed	1200 to 115 200 bits/s
Max. number of devices	247
Supported Messages	Up to 256 bytes of cyclic I/O data in each direction

2003-PN-00	PROFINET I/O communication interface
Supported Protocols	PROFINET I/O generic device
Communication Speed	10/100 Mbits/s full/half duplex
Max. number of devices	Up to 128 submodules in total
Supported Messages	Up to 256 bytes of cyclic I/O in data in each direction

Braking Resistor

During deceleration, or with an over-hauling load, the motor acts as a generator. Energy flows back from the motor into the DC link capacitors within the drive, causing their voltage to rise. If this voltage exceeds a maximum value, the drive will trip to protect the capacitors and internal power devices. The amount of energy that can be absorbed by the capacitors can vary between different applications causing the drive to trip on overvolts.
To increase the drive's dynamic braking capability, high power resistor(s), connected across the DC link, allow the dissipation of this excess energy for short term stoppage or braking.

Brake resistor selection

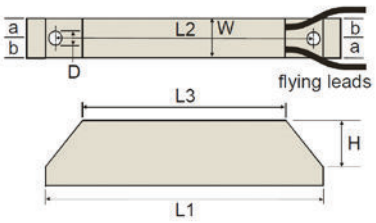
Brake resistor assemblies must be rated to absorb both peak braking power during deceleration and the average power over the complete cycle.

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

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

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

Model	Impedance [Ω]	Nom. Power [W]	Dimensions [mm]							
			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	28 x 2	500	335	316	295	30	60	4.3	13	17



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

EMC Filter

AC20 are supplied as standard with an EMC filter fitted that meets the requirements of a class C3 environment.
For class C2 or C1 environments, an additional external filter may be required.
An internal wire link may be easily removed to disconnect the Y capacitors for those installations where earth currents are undesirable.

Order Code

AC20

	1		2	3		4		5	6
Order example	**20G**	**-**	**1**	**2**	**-**	**0070**	**-**	**B**	**F**

1	**Device Family**	
	20G	AC20 Series, Advanced, General Purpose AC Drive
2	**Voltage**	
	1	230 V Single Phase
	3	230 V Three Phase
	4	400 V Three Phase
3&4	**Frame Size & Current Rating (Heavy Duty)**	
	230Vac, Single Phase Supply Voltage	
	2-0070	Frame 2 - 7A (1.5 kW)
	2-0100	Frame 2 - 10A (2.2 kW)
	230Vac, Three Phase Supply Voltage	
	2-0070	Frame 2 - 7A (1.5 kW)
	2-0100	Frame 2 - 10A (2.2 kW)
	3-0170	Frame 3 - 17A (4.0 kW)
	4-0210	Frame 4 - 21A (5.5 kW)
	5-0300	Frame 5 - 30A (7.5 kW)
	5-0400	Frame 5 - 40A (11 KW)
	400Vac, Three Phase Supply Voltage	
	2-0040	Frame 2 - 4A (1.5 kW)
	2-0065	Frame 2 - 6.5A (2.2 kW)
	2-0090	Frame 2 - 9A (4.0 kW)
	3-0120	Frame 3 - 12A (5.5 kW)
	3-0170	Frame 3 - 17A (7.5 kW)
	4-0230	Frame 4 - 23A (11 kW)
	4-0320	Frame 4 - 32A (15 KW)
	5-0380	Frame 5 - 38A (18.5 kW)
	5-0440	Frame 5 - 44A (22 kW)
	5-0600	Frame 5 - 60A (30 kW)
	6-0750	Frame 6 - 75A (37 kW)
	6-0900	Frame 6 - 90A (45 kW)
	7-1100	Frame 7 - 110A (55 KW)
	7-1500	Frame 7 - 150A (75 kW)
	8-1800	Frame 8 - 180A (90 kW)
	8-2200	Frame 8 - 220A (110 kW)
	8-2650	Frame 8 - 265A (132 kW)
	9-3200	Frame 9 - 320A (160 kW)
	10-3600	Frame 10 - 360A (180 KW)
6	**Brake Switch**	
	B	Brake Switch Fitted
7	**EMC Filter**	
	F	Category C3 Filtered

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
CO_2 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
Electrohydrostatic 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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