

Variable Speed AC Drives

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WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Whether you need to control a conveyor belt, automatic barrier, machine spindle or other general purpose application, the AC650 delivers reliable, cost-effective voltage/frequency speed control of your motor.

Designed with simplicity in mind, the AC650 comes in a compact format with DIN rail mounting as standard allowing easy integration into any electrical control panel. The operator/programming keypad can be removed after setup to prevent unauthorised changes to inverter configuration.

For simple motor speed control up to 7.5 kW, the AC650 is an easy to use, out of the box solution that will have your system up and running in no time.

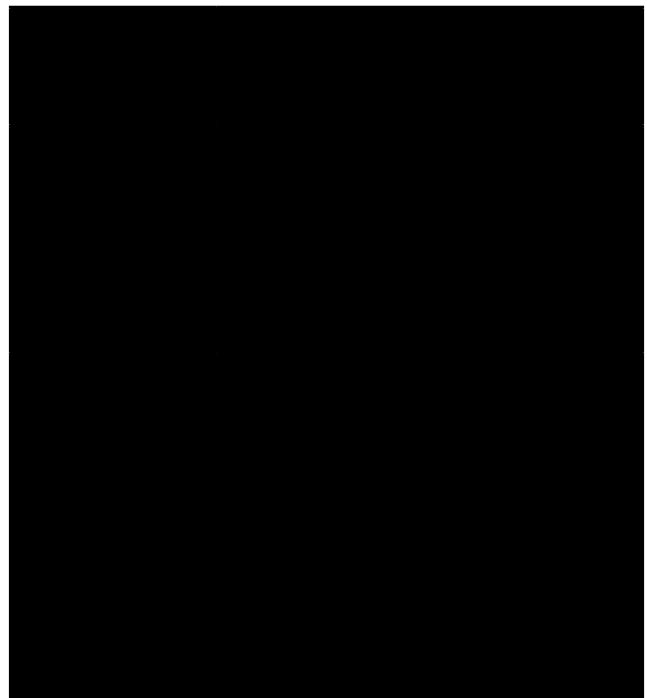
- Integrated operator keypad with option for remote mounting
- Integrated EMC filter ensures compliance while maintaining a compact footprint
- Pre-programmed macros allowing quick and simple drive setup
- DIN rail mounting for easy integration into any electrical cabinet
- Flexible I/O including analogue and relay output and motor thermister input allowing greater control options
- 6514 cloning module (option) allows easy back-up and transfer of parameters between different drives

The AC650 and AC650V series AC drives meets the following standards when installed in accordance with the relevant product manual.

- CE marked to EN 50178 (Safety, Low Voltage Directive)
- CE marked to EN 61800-3 (EMC Directive)
- UL listed to US Standard UL508C
- cUL listed to Canadian Standard C22.2 #14



Characteristics



Easy-to-use Operator/Programming Controls

Bright Backlit LCD Display

Diagnostic or Parameter Indicator

Motor Rotating and Direction Indicator

Local Start

Raise/Lower Speed

4 Digit Readout

Units

Local/Remote Indicator

Local Stop

Menu

Speed

- Simple speed control
set speed and voltage or current
with start / stop direction control

- Manual / Automatic control
set to run with local speed setting
or external reference

- Preset speed control
select up to 8 pre-programmed
speeds using digital inputs

- Increase / Decrease
Increase or reduce speed using
digital inputs

Transducer

- PID Control
Control the pressure, flow, tempe-
rature or any process variable

Pressure or Volume Feedback
Speed
Setpoint

0.25 kW - 110 kW

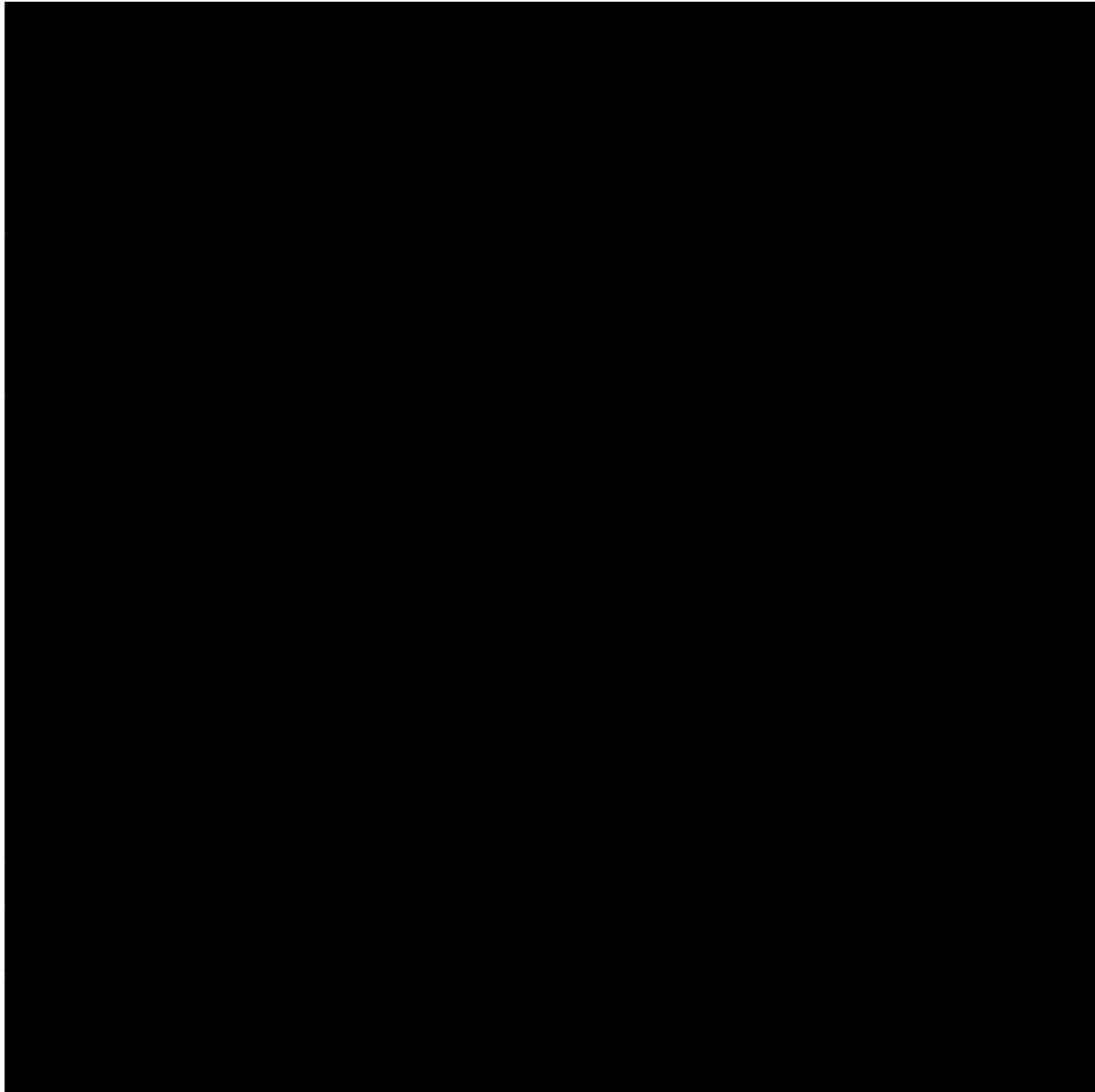
The AC650V expands upon the simple, no-fuss philosophy of the AC650 and provides reliable, robust motor control from 0.25 kW through to 110 kW.

With the addition of sensorless flux vector technology, the AC650V allows improved motor control at lower speeds, better speed regulation of variable loads and higher starting torques for high inertia systems. The variable torque configuration option above 5.5 kW makes the AC650V ideally suited to energy saving in pump and fan applications.

The AC650V offers the same high level of specification as the AC650 and also includes :

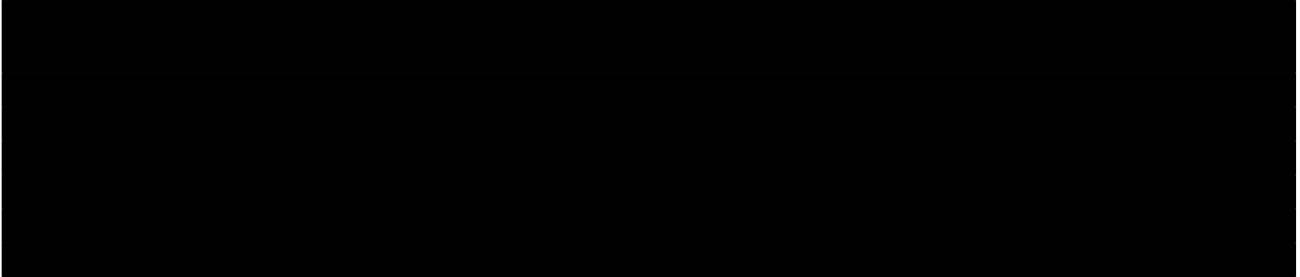
- High torque sensorless vector control mode for advanced motor control
- Selectable constant torque or (higher) variable torque rating for centrifugal pump and fan applications allowing optimum inverter sizing to suit the application
- Fully configurable with graphical software tools such as DSE Lite provided at no additional charge.
- Additional user configurable I/O points offering increased control capabilities
- Additional PROFIBUS communications options for integration into PLC systems
- Wall and panel mounting options above 7.5 kW
- Extended power range to 110 kW makes the AC650V suited to a wide of uses

AC650 and AC650V Series



AC650 and AC650V Series

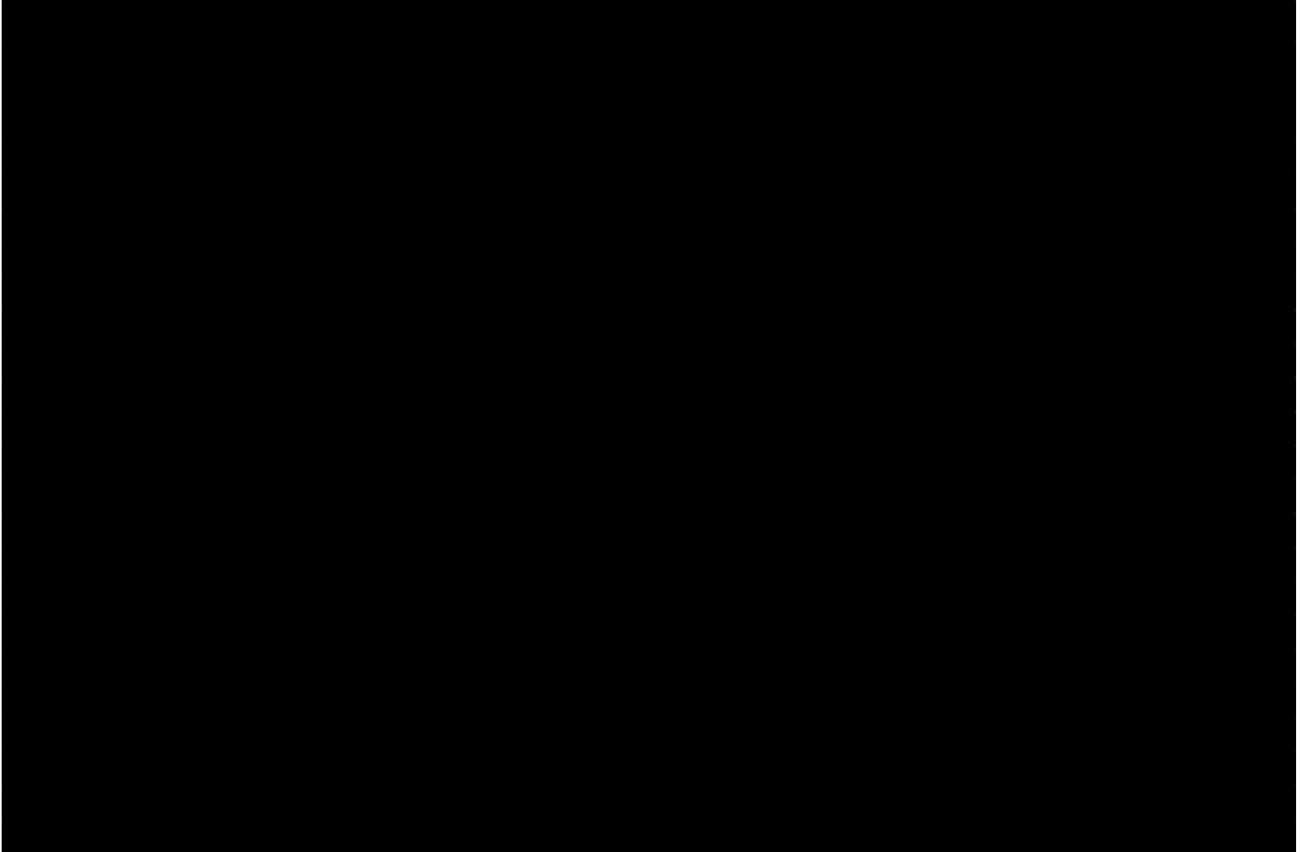
220-240 VAC (+10 %) 50 Hz (+5 %) 1phase



220-240 VAC (+10 %) 50 Hz (+5 %) 1/3 phase



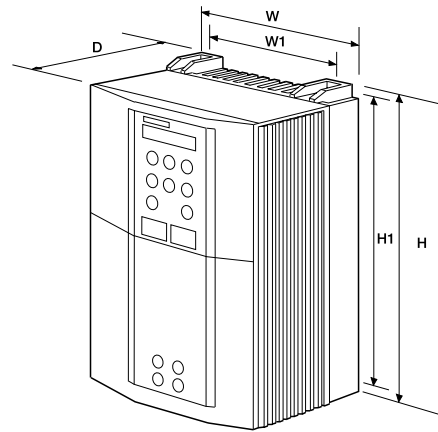
380-460 VAC (+10 %) 50 Hz (+5 %) 3phase



Note: **Old reference refers to legacy part references prior to 2009.
See "Selection and Order Code" to complete product reference.
230 VAC 3phase supply also available as an option.

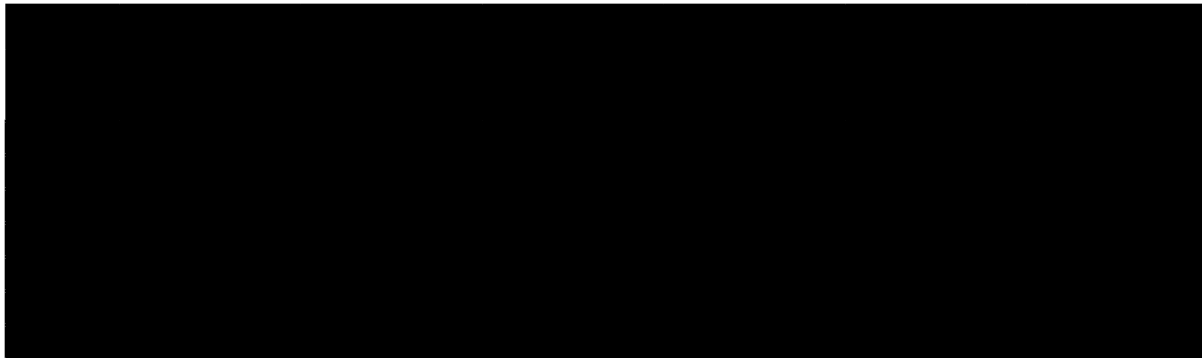
AC650 - Variable Speed AC Drives
Dimensions

Frame 1,2,3



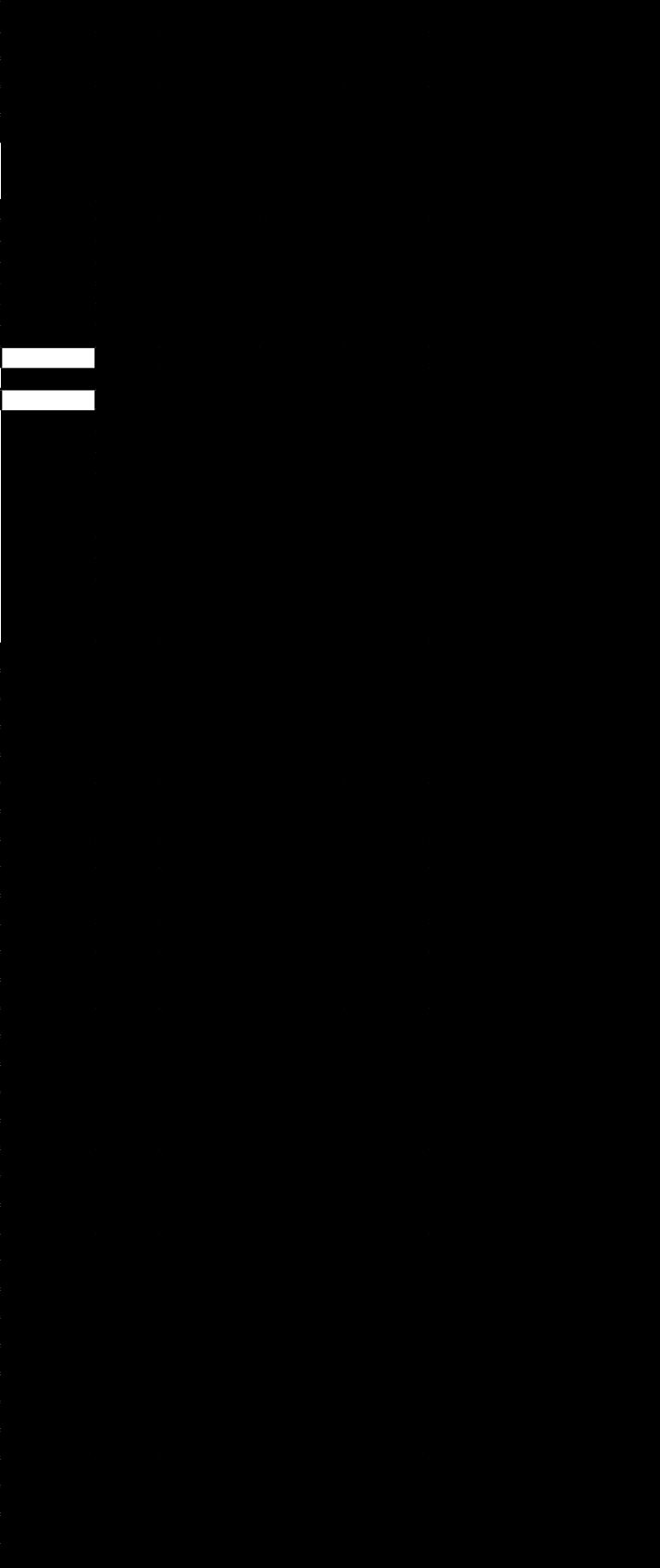
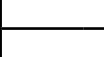
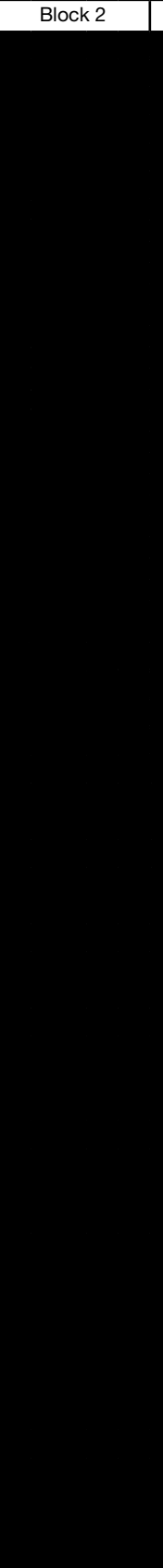



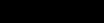
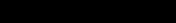
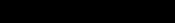
Frame C, D, E, F

Dimensions and Weights



Block 1	Block 2	Block 3	Block 4
[Redacted content]			

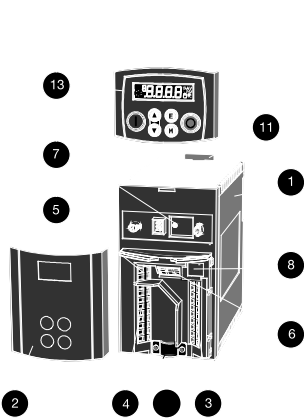
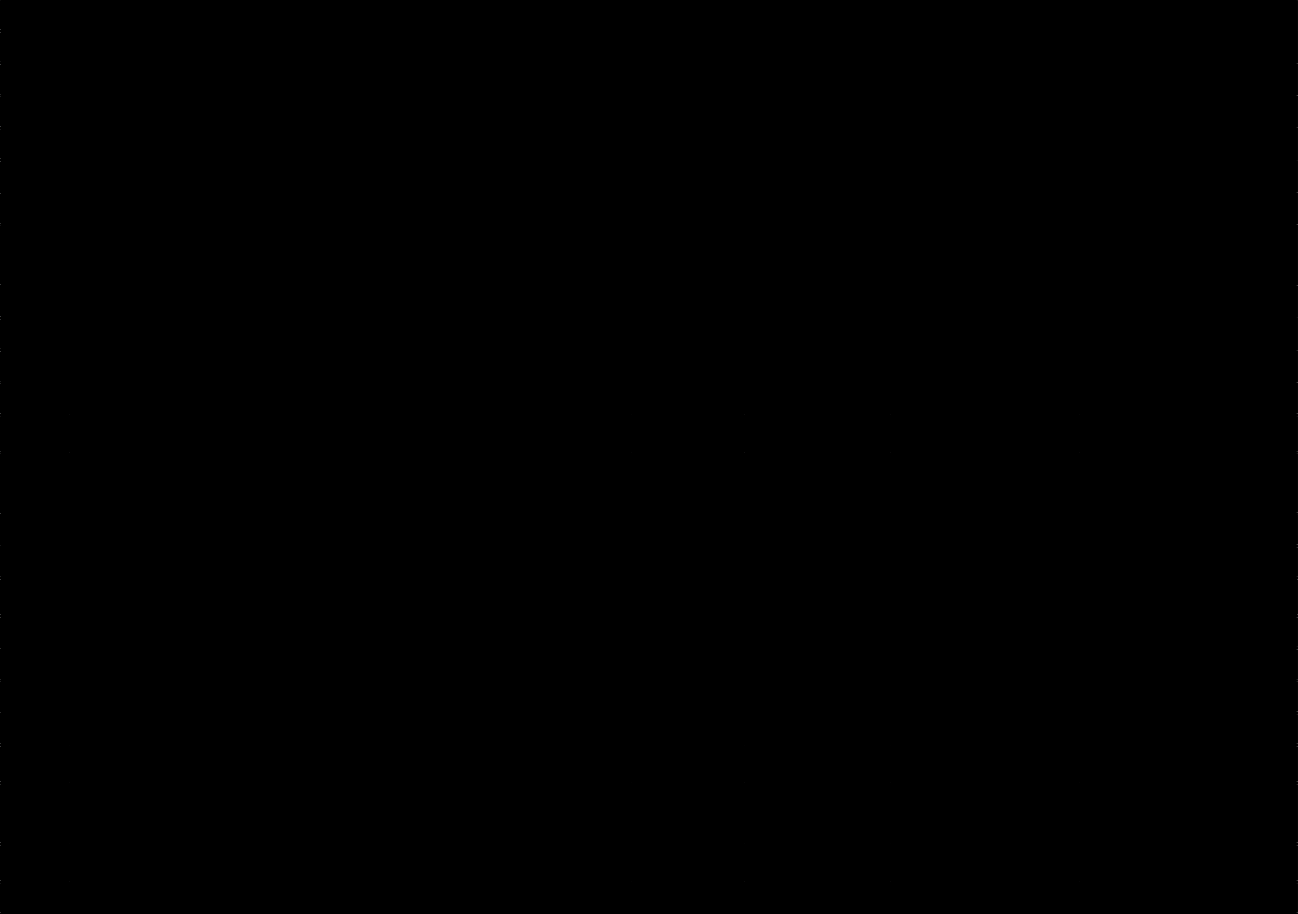
AC650 - Variable Speed AC Drives
Selection and Order Code

Block 1	Block 2	Block 3	Block 4
			
			
			

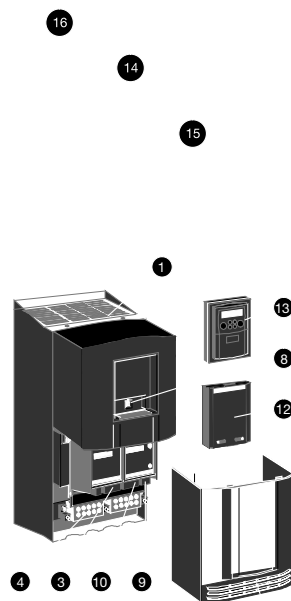
Block 1	Block 2	Block 3	Block 4

AC650/AC650V/AC650S Series AC Drive

AC Inverters



Frames 1 - 3 up to 7.5 kW



2 Frames C - F up to 110 kW

Cloning Module

Description

The cloning module can be used with the complete range of the AC650 / AC650V series of AC drives.

It allows the user to store up to 10 separate drive configurations which can then be transferred between different drives. The configurations can be mapped between different drive sizes. This is an invaluable tool for commissioning or plant maintenance personnel allowing drives to be backed up and reconfigured simply and easily.

Product Codes



RS485 Modbus Interface

Description

The RS485/RS232 communications interface provides serial data communication, allowing an AC650V drive to connect to a Modbus RTU network as a slave station.

Features

- Protocols : ModBus RTU or EI-6ASCII
- Compatible with AC650/650V version 4.x and above
- Connection by shielded twisted pair cable (RS485)
- Connection by shielded 3 core cable (RS232)
- Configuration of input function blocks
- Baud rate configurable by software
- Slave address configurable by software
- Direct access to all drive parameters

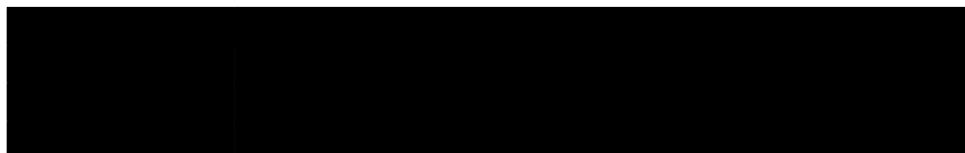
Product Codes



Operator Keypads

6511-xxxx-00

Product Codes



6521-00-G

PROFIBUS-DP Interface

Description

The PROFIBUS option supports the PROFIBUS-DP PROFIBUS protocol, designed specifically for communication between a PLC system and remote I/O. The PROFIBUS interface enables the drive to connect to a PROFIBUS-DP as a slave station.

Features

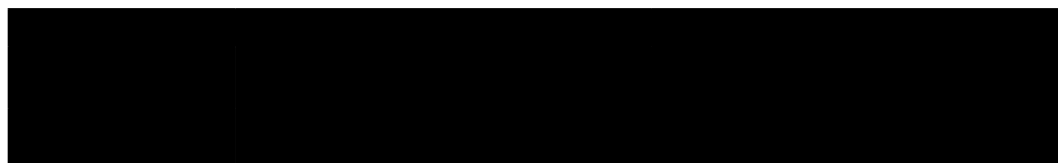
- PROFIBUS-DP network
- Connection by shielded twisted pair
- Baud rate configurable by software up to 12M Baud
- LED indication of card and communication status
- Compatible with AC inverters AC650V vers 4.9+

PROFIBUS Module 6513-PROF-00
(AC650V Frames 1, 2, 3)

1 2 3 4 5 6 p3

PROFIBUS Module 6523-PROF-00
(AC650V Frames C-F)

Product Codes



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

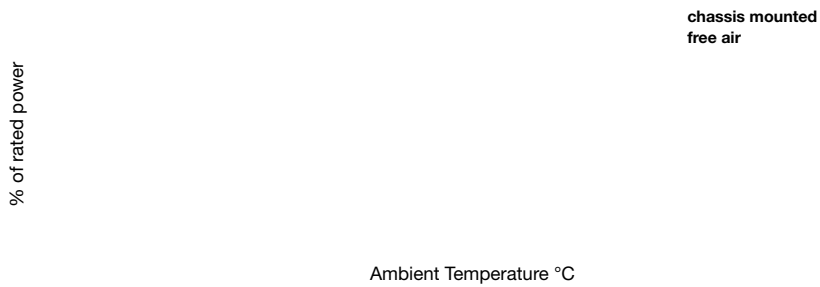
Brake resistor assemblies must be rated to absorb both peak braking power during deceleration and the average power over the complete cycle.

Resistors above 500 W

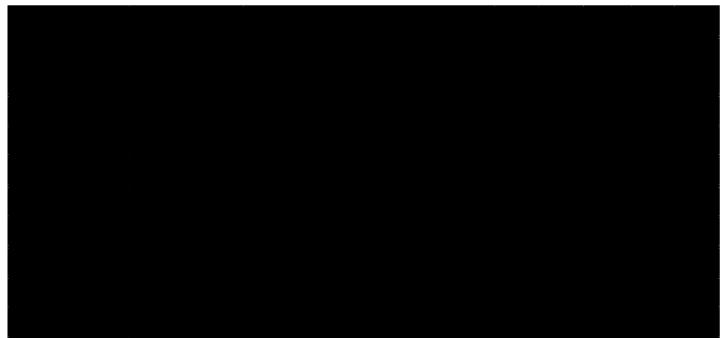
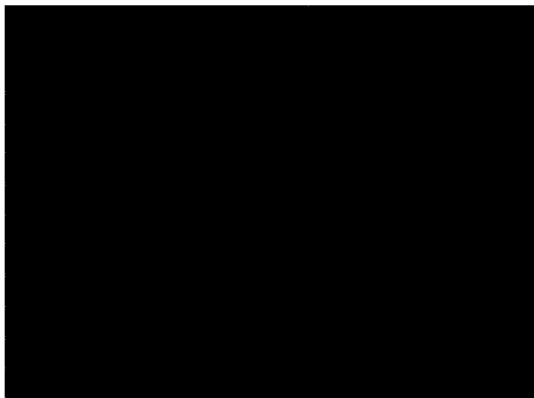
Resistors above 500 W are available upon request :

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

Peak braking power	=	$\frac{0.0055J \times (n12-n22) (W)}{tb}$	J - total inertia in kgm ² n1 - initial speed in min ⁻¹ n2 - final speed min ⁻¹ tb - braking time in s
Average braking power Pav	=	$\frac{Ppk \times tb}{tc}$	tc - cycle time in s



Dimensions



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

for AC Drives

Description

A range of custom designed optional EMC (Electromagnetic Compatibility) filters are available for use with Parker SSD Drives product range.

They are used to help achieve conformance with the EMC directive BS EN 61800-3:2004 - "Adjustable speed electrical power drive systems - Part 3".

Installation of the drive must be in accordance with the installation guidelines in the product manual. The filters comply with the relevant standards as outlined in the following table.

1st Environment : Drives directly connected without intermediate transformers to a low voltage (<100 Vrms) supply network that is part of a network that also supplies buildings used for domestic purposes.

2nd Environment : Establishments where there is no direct connection to a low voltage supply network that also supplies buildings used for domestic purpose.

TN Earthing = Grounded neutral AC supply <460 VAC

IT Earthing = Ungrounded neutral AC supply <500 VAC

Ext. Filter = External filter

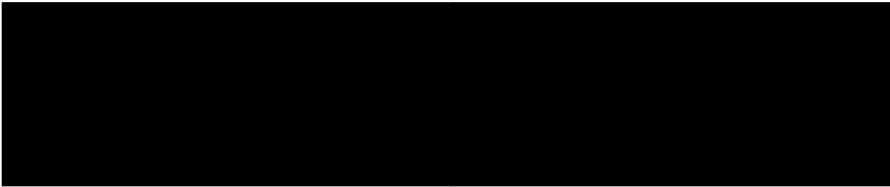
Ext. Filter FP = Footprint external filter

EMC Filters

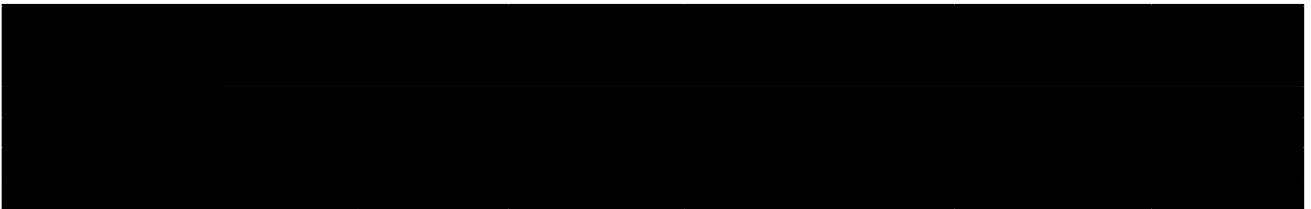
650 / 650V		
650V / 690P		

for AC Drives

IP40 mounted: use mounting kits below



Dimensions



Footprint filter
beneath the drive

AC Drive

Chassis plate

Drive mounted on an external footprint lter

for AC Drives

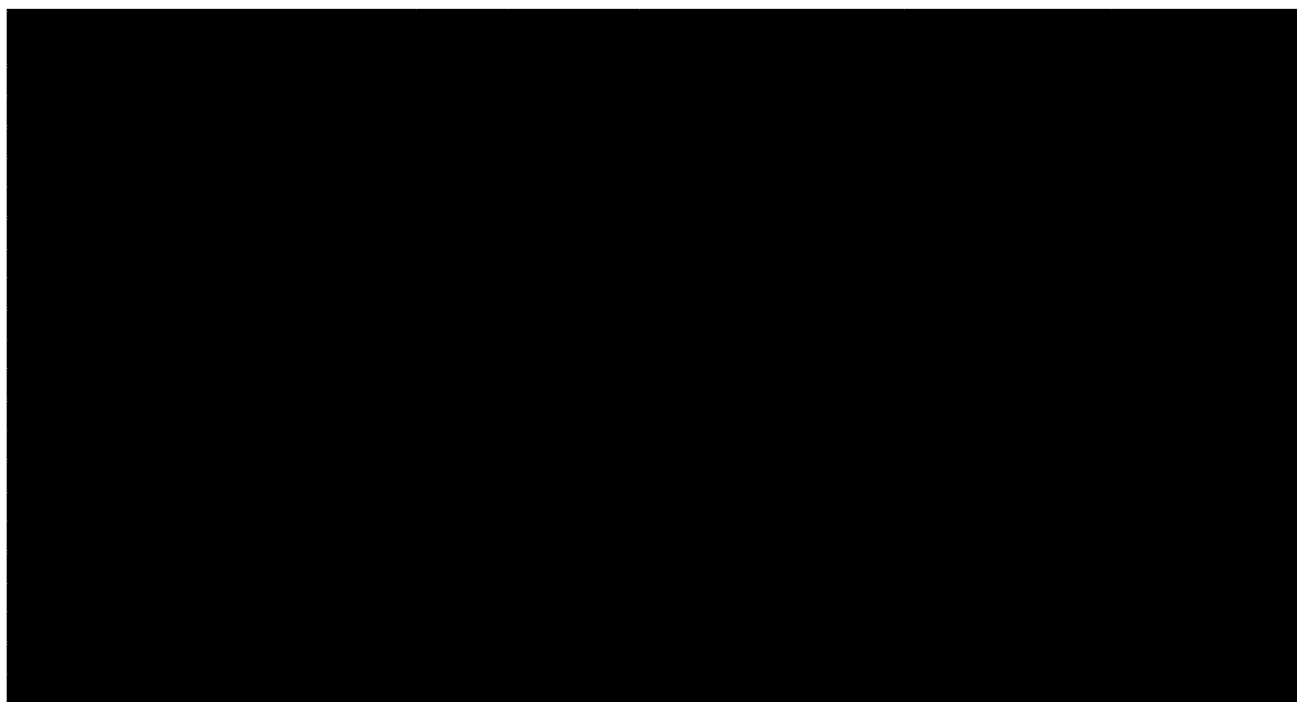
Description

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



* Include Earth Stud

Height

Depth

Length

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

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budapest
Tel: +36 1 220 4155
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7272 505 800
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel: +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland
Tel: +1 216 896 3000

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

IN – India, Mumbai
Tel: +91 22 6513 7081-85

JP – Japan, Tokyo
Tel: +81 (0)3 6408 3901

KR – South Korea, Seoul
Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 717 8140

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Apodaca
Tel: +52 81 8156 6000

VE – Venezuela, Caracas
Tel: +58 212 238 5422

European Product Information Centre
Free phone: 00 800 27 27 5374

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Parker Hannifin Ltd.

Tachbrook Park Drive / Tachbrook Park
Warwick, CV34 6TU
United Kingdom
Tel.: +44 (0) 1926 317 878
Fax: +44 (0) 1926 317 855
parker.uk@parker.com
www.parker.com

Your local authorized Parker distributor