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AC650

Variable Speed AC Drives



ENGINEERING YOUR SUCCESS.

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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.
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AC650 Variable Speed AC Drives

General Purpose AC Drives

Description

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.



Features

- 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

International Standards

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

| | |
|-------------------------------------|--|
| Power Supply | Single Phase Units : 220-240 VAC $\pm 10\%$, 50-60 Hz $\pm 5\%$ Three Phase Units : 380-460 VAC $\pm 10\%$, 50-60 Hz $\pm 5\%$ |
| AC650 Series 0.25-7.5 kW | The AC650 is a simple, compact, cost effective solution to basic Volts/Hertz open-loop motor speed control applications to 7.5 kW, such as: <ul style="list-style-type: none"> • Conveyors • Automatic barriers • Machine spindles |
| AC650V Series 0.25-110 kW | The AC650V expands upon the AC650 and benefits from the addition of sensorless flux vector control. This makes it ideally suited for applications up to 110 kW where improved speed regulation of variable loads and higher starting torques for high inertia systems is required. <ul style="list-style-type: none"> • Centrifugal pumps • Industrial blower fans • Mixers |



Diagnostic and control through the operator keypad

Easy-to-use Operator/Programming Controls



Simplified operation through the use of pre-programmed macros

The diagrams illustrate various macro control applications:

- Speed control:** A drive controls a motor that processes material in a hopper.
- Manual / Automatic control:** A drive controls a motor that fills bottles on a production line.
- Preset speed control:** A drive controls a motor that moves blocks on a conveyor belt, with digital inputs for speed selection.
- Increase / Decrease:** A drive controls a motor that pumps liquid into a tank, with digital inputs for speed adjustment.
- PID Control:** A drive controls a motor that processes material, with a transducer providing feedback (Pressure or Volume Feedback) to maintain a Speed Setpoint.

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

AC650V - High Performance AC Drives

0.25 kW - 110 kW

Description

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.

Features

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



Technical Specification

AC650 and AC650V Series

| | |
|---------------------------------|---|
| Power Supply | Single Phase Units : 220-240 VAC $\pm 10\%$, 50-60 Hz $\pm 5\%$ Three Phase Units : 380-460 VAC $\pm 10\%$, 50-60 Hz $\pm 5\%$ |
| Environment | 0-40 °C (derate to 50 °C) Up to 1000 m ASL (derate >1000 m) |
| Protection | IP20 |
| Overload | Constant torque rating : 150 % for 60 s Variable torque rating (pumps and fans) : 110 % for 60 s |
| Output Frequency | 0-240 Hz |
| Analogue Inputs | 2; Speed Control 0-10 V, 0-10 V/4-20 mA |
| Analogue Outputs | 1; User configurable output frequency / load 0-10 V |
| Digital Inputs | AC650 - 3, AC650V - 5; User configurable Start / Stop / Direction / pre-set speeds (8) |
| Digital Inputs / Outputs | AC650 - 1, AC650V - 2; User configurable as inputs or outputs |
| Digital Relay Outputs | 1; Relay output 4 A @240 V All digital outputs configurable for; at (not at) speed / at (above) minimum speed / running (stopped) / health (tripped) / above (below) pre-set load |
| Motor Thermistor Input | 1 |
| Power Supply Outputs | 24 VDC (50 mA) - Digital I/O Supply 10 VDC (10 mA) - Analogue reference supply |
| Communications Options | AC650V and AC650 : RS485 / RS232 AC650V : PROFIBUS |

Electrical Characteristics

AC650 and AC650V Series

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

| Old Order Reference** | New Order Reference | Nominal Power [kW] | Output Current [A] | Frame |
|-----------------------|---------------------|--------------------|--------------------|-------|
| 650(V)-002-230-... | 650(V)-21115010-... | 0.25 | 1.5 | 1 |
| 650(V)-003-230-... | 650(V)-21122010-... | 0.37 | 2.2 | 1 |
| 650(V)-005-230-... | 650(V)-21130010-... | 0.55 | 3.0 | 1 |
| 650(V)-007-230-... | 650(V)-21140010-... | 0.75 | 4.0 | 1 |
| 650(V)-011-230-... | 650(V)-21155020-... | 1.1 | 5.5 | 2 |
| 650(V)-015-230-... | 650(V)-21170020-... | 1.5 | 7.0 | 2 |

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

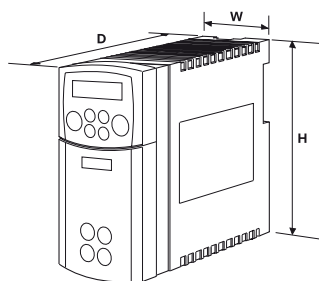
| Old Order Reference** | New Order Reference | Nominal Power [kW] | Output Current [A] | Frame |
|-----------------------|---------------------|--------------------|--------------------|-------|
| | 650(V)-22196030-... | 2.2 | 9.6 | 3 |

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

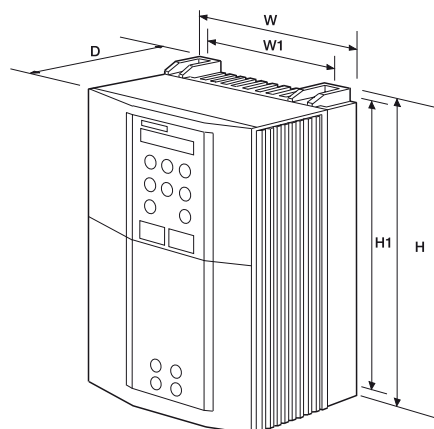
| Old Order Reference** | New Order Reference | Constant Torque | | Variable Torque | | Frame |
|-----------------------|---------------------|--------------------|--------------------|--------------------|--------------------|-------|
| | | Nominal Power [kW] | Output current [A] | Nominal Power [kW] | Output Current [A] | |
| 650(V)-003-400-... | 650(V)-43115020-... | 0.37 | 1.5 | - | - | 2 |
| 650(V)-005-400-... | 650(V)-43120020-... | 0.55 | 2.0 | - | - | 2 |
| 650(V)-007-400-... | 650(V)-43125020-... | 0.75 | 2.5 | - | - | 2 |
| 650(V)-011-400-... | 650(V)-43135020-... | 1.1 | 3.5 | - | - | 2 |
| 650(V)-015-400-... | 650(V)-43145020-... | 1.5 | 4.5 | - | - | 2 |
| 650(V)-022-400-... | 650(V)-43155020-... | 2.2 | 5.5 | - | - | 2 |
| 650(V)-030-400-... | 650(V)-43168030-... | 3.0 | 6.8 | - | - | 3 |
| 650(V)-040-400-... | 650(V)-43190030-... | 4.0 | 9.0 | - | - | 3 |
| 650(V)-055-400-... | 650(V)-43212030-... | 5.5 | 12 | - | - | 3 |
| 650(V)-075-400-... | 650(V)-43216030-... | 7.5 | 16 | - | - | 3 |
| 650VC-0075-4-... | 650V-432160C0-... | 7.5 | 16 | 11 | 23 | C |
| 650VC-0110-4-... | 650V-432230C0-... | 11 | 23 | 15 | 30 | C |
| 650VC-0150-4-... | 650V-432300C0-... | 15 | 30 | 18 | 38 | C |
| 650VD-0180-4-... | 650V-432380D0-... | 18 | 38 | 22 | 45 | D |
| 650VD-0220-4-... | 650V-432450D0-... | 22 | 45 | 30 | 59 | D |
| 650VD-0300-4-... | 650V-432590D0-... | 30 | 59 | 37 | 73 | D |
| 650VE-0370-4-... | 650V-432730E0-... | 37 | 73 | 45 | 87 | E |
| 650VF-0450-4-... | 650V-432870E0-... | 45 | 87 | 55 | 105 | E |
| 650VF-0550-4-... | 650V-433105F1-... | 55 | 105 | 75 | 145 | F |
| 650VF-0750-4-... | 650V-433145F1-... | 75 | 145 | 90 | 165 | F |
| 650VF-0900-4-... | 650V-433180F1-... | 90 | 180 | 110 | 205 | F |

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.

Dimensions



Frame 1,2,3



Frame C, D, E, F

Dimensions and Weights

| Frame | Overall Dimensions | | | Fixing Centres | | Weight [kg] |
|-------|--------------------|----------------|----------------|------------------|-----------------|-------------|
| | Height (H) [mm] | Width (W) [mm] | Depth (D) [mm] | Height (H1) [mm] | Width (W1) [mm] | |
| 1 | 132 | 73 | 142 | - | - | - |
| 2 | 188 | 73 | 173 | - | - | - |
| 3 | 242 | 96 | 200 | - | - | - |
| C | 348 | 201 | 208 | 335 | 150 | 9.3 |
| D | 453 | 252 | 245 | 440 | 150 | 17.4 |
| E | 669 | 257 | 312 | 630 | 150 | 32.5 |
| F | 720 | 257 | 355 | 700 | 150 | 41.0 |



Selection and Order Code

AC650 Series

| Example | | | | | | Block 1 | Block 2 | | | | Block 3 | | | | Block 4 | | | | | |
|--|-------------------------|-----|---------------------|------|-------|---------|---------|----|------|---|---------|---|---|---|---------|---|----|---|---|---|
| | | | | | | 650 | - | 21 | 1150 | 1 | 0 | - | 0 | 0 | 0 | P | 00 | - | A | 0 |
| Product family | | | | | | | | | | | | | | | | | | | | |
| AC650 AC Drive - V/F | | | | | | 650 | | | | | | | | | | | | | | |
| Rating data | | | | | | | | | | | | | | | | | | | | |
| | Supply voltage | kW | Output current A | HP | Frame | | | | | | | | | | | | | | | |
| Power/ Current Rating | 230 V 1phase | | | | | 21 | | | | | | | | | | | | | | |
| | 0.25 | | 1.5 | 0.3 | 1 | | 1150 | 1 | | | | | | | | | | | | |
| | 0.37 | | 2.2 | 0.5 | 1 | | 1220 | 1 | | | | | | | | | | | | |
| | 0.55 | | 3 | 0.75 | 1 | | 1300 | 1 | | | | | | | | | | | | |
| | 0.75 | | 4 | 1 | 1 | | 1400 | 1 | | | | | | | | | | | | |
| | 1.1 | | 5.5 | 1.5 | 2 | | 1550 | 2 | | | | | | | | | | | | |
| | 1.5 | | 7 | 2 | 2 | | 1700 | 2 | | | | | | | | | | | | |
| | 230 V 1/3phase | | | | | 22 | | | | | | | | | | | | | | |
| | 2.2 | | 9.6 | 3 | 3 | | 1960 | 3 | | | | | | | | | | | | |
| | 230 V 3phase | | | | | 23 | | | | | | | | | | | | | | |
| | 3 | | 12.3 | 4 | 3 | | 2123 | 3 | | | | | | | | | | | | |
| | 4 | | 16.4 | 5 | 3 | | 2164 | 3 | | | | | | | | | | | | |
| | 400/460 V 3phase | | | | | 43 | | | | | | | | | | | | | | |
| | 0.37 | | 1.5 | 0.5 | 2 | | 1150 | 2 | | | | | | | | | | | | |
| | 0.55 | | 2 | 0.75 | 2 | | 1200 | 2 | | | | | | | | | | | | |
| | 0.75 | | 2.5 | 1 | 2 | | 1250 | 2 | | | | | | | | | | | | |
| 1.1 | | 3.5 | 1.5 | 2 | | 1350 | 2 | | | | | | | | | | | | | |
| 1.5 | | 4.5 | 2 | 2 | | 1450 | 2 | | | | | | | | | | | | | |
| 2.2 | | 5.5 | 3 | 2 | | 1550 | 2 | | | | | | | | | | | | | |
| 3 | | 6.8 | 4 | 3 | | 1680 | 3 | | | | | | | | | | | | | |
| 4 | | 9 | 5 | 3 | | 1900 | 3 | | | | | | | | | | | | | |
| 5.5 | | 12 | 7.5 | 3 | | 2120 | 3 | | | | | | | | | | | | | |
| 7.5 | | 16 | 10 | 3 | | 2160 | 3 | | | | | | | | | | | | | |
| Auxiliary supply | | | | | | | | | | | | | | | | | | | | |
| Not required | | | | | | 0 | | | | | | | | | | | | | | |
| Brake switch | | | | | | | | | | | | | | | | | | | | |
| Not fitted (not available on frames 1-2 230 V products) | | | | | | 0 | | | | | | | | | | | | | | |
| Brake switch fitted (must be fitted on frame 2 400/460 V, and all frame 3 products) | | | | | | B | | | | | | | | | | | | | | |
| Filter | | | | | | | | | | | | | | | | | | | | |
| Not fitted | | | | | | 0 | | | | | | | | | | | | | | |
| Filter fitted | | | | | | F | | | | | | | | | | | | | | |
| Communications | | | | | | | | | | | | | | | | | | | | |
| No communications port | | | | | | 0 | | | | | | | | | | | | | | |
| RS232 port fitted (must be selected if remote mounting of keypad required) | | | | | | 1 | | | | | | | | | | | | | | |
| Mounting | | | | | | | | | | | | | | | | | | | | |
| Panel mounting | | | | | | P | | | | | | | | | | | | | | |
| Special option | | | | | | | | | | | | | | | | | | | | |
| None | | | | | | 00 | | | | | | | | | | | | | | |
| Documented special options (01-99) (Refer to local sales office) | | | | | | | | | | | | | | | | | | | | |
| Language | | | | | | | | | | | | | | | | | | | | |
| English (50 Hz) | | | | | | A | | | | | | | | | | | | | | |
| English (60 Hz) | | | | | | B | | | | | | | | | | | | | | |
| German | | | | | | D | | | | | | | | | | | | | | |
| Spanish | | | | | | E | | | | | | | | | | | | | | |
| French | | | | | | F | | | | | | | | | | | | | | |
| Italian | | | | | | I | | | | | | | | | | | | | | |
| Swedish | | | | | | S | | | | | | | | | | | | | | |
| Keypad | | | | | | | | | | | | | | | | | | | | |
| None | | | | | | 0 | | | | | | | | | | | | | | |
| 6511 TTL fitted (local mounting only) | | | | | | 1 | | | | | | | | | | | | | | |
| 6511 RS232 fitted (local or remote mounting - RS232 port must be selected for remote mounting) | | | | | | 2 | | | | | | | | | | | | | | |

AC650V Series High Performance AC Drive - 230 V



| | | | | | | | Example | Block 1 | Block 2 | | | | Block 3 | | | | Block 4 | | | | |
|---|----------|-----------------|----------|-----------------|------|--------|-----------|---------|---------|--------|---|---|---------|---|---|---|---------|----|---|---|---|
| | | | | | | | 650V | - | 21 | 1150 | 1 | 0 | - | 0 | 0 | 0 | P | 00 | - | A | 0 |
| Product family | | | | | | | | | | | | | | | | | | | | | |
| AC650V AC Drive - Sensorless Flux Vector Control | | | | | | | 650V | | | | | | | | | | | | | | |
| Rating data | | | | | | | | | | | | | | | | | | | | | |
| | | Constant Torque | | Variable Torque | | | | | | | | | | | | | | | | | |
| Supply voltage | | kW/A | HP/A | kW/A | HP/A | Frame | | | | | | | | | | | | | | | |
| 230 V 1phase | | | | | | | 21 | | | | | | | | | | | | | | |
| Power/ Current Rating | 0.25/1.5 | | 0.3/1.5 | | 1 | | 1150 1 | | | | | | | | | | | | | | |
| | 0.37/2.2 | | 0.5/2.2 | | 1 | | 1220 1 | | | | | | | | | | | | | | |
| | 0.55/3.0 | | 0.75/3.0 | | 1 | | 1300 1 | | | | | | | | | | | | | | |
| | 0.75/4.0 | | 1.0/4.0 | | 1 | | 1400 1 | | | | | | | | | | | | | | |
| | 1.1/5.5 | | 1.5/5.5 | | 2 | | 1550 2 | | | | | | | | | | | | | | |
| | 1.5/7.0 | | 2.0/7.0 | | 2 | | 1700 2 | | | | | | | | | | | | | | |
| 230 V 1/3phase | | | | | | | 22 | | | | | | | | | | | | | | |
| 2.2/9.6 | | 3.0/9.6 | | 3 | | 1960 3 | | | | | | | | | | | | | | | |
| 230 V 3phase | | | | | | | 23 | | | | | | | | | | | | | | |
| 3.0/12.3 | | 4/12.3 | | 3 | | 2123 3 | | | | | | | | | | | | | | | |
| 4.0/16.4 | | 5/16.4 | | 3 | | 2164 3 | | | | | | | | | | | | | | | |
| 5.5/22 | | 7.5/22 | | 7.5/28 | | 10/28 | | C | | 2220 C | | | | | | | | | | | |
| 7.5/28 | | 10/28 | | 11/42 | | 15/42 | | C | | 2280 C | | | | | | | | | | | |
| 11/42 | | 15/42 | | 15/54 | | 20/54 | | D | | 2420 D | | | | | | | | | | | |
| 15/54 | | 20/54 | | 18.5/68 | | 25/68 | | D | | 2540 D | | | | | | | | | | | |
| 18.5/68 | | 25/68 | | 18.5/68 | | 25/68 | | D | | 2680 D | | | | | | | | | | | |
| 22/80 | | 30/80 | | 30/104 | | 40/104 | | E | | 2800 E | | | | | | | | | | | |
| 30/104 | | 40/104 | | 37/130 | | 50/130 | | F | | 3104 F | | | | | | | | | | | |
| 37/130 | | 50/130 | | 45/154 | | 60/154 | | F | | 3130 F | | | | | | | | | | | |
| 45/154 | | 60/154 | | 55/192 | | 75/192 | | F | | 3154 F | | | | | | | | | | | |
| Auxiliary supply | | | | | | | | | | | | | | | | | | | | | |
| Not required (not available on frames 1-3 & frames C-E) | | | | | | | 0 | | | | | | | | | | | | | | |
| 115 V 1ph (frame F only) | | | | | | | 1 | | | | | | | | | | | | | | |
| 230 V 1ph (frame F only) | | | | | | | 2 | | | | | | | | | | | | | | |
| Brake switch | | | | | | | | | | | | | | | | | | | | | |
| Not fitted (not available on frames 1-2 230 V products) | | | | | | | 0 | | | | | | | | | | | | | | |
| Brake switch fitted (must be fitted on frame 2 400/460 V, and all frame 3 products) | | | | | | | B | | | | | | | | | | | | | | |
| Filter | | | | | | | | | | | | | | | | | | | | | |
| Not fitted | | | | | | | 0 | | | | | | | | | | | | | | |
| Filter fitted | | | | | | | F | | | | | | | | | | | | | | |
| Communications | | | | | | | | | | | | | | | | | | | | | |
| RS232 port fitted | | | | | | | 1 | | | | | | | | | | | | | | |
| RS232 & RS485 port fitted (frame C-F only) | | | | | | | 2 | | | | | | | | | | | | | | |
| Mounting | | | | | | | | | | | | | | | | | | | | | |
| Panel mounting (standard fitting) | | | | | | | P | | | | | | | | | | | | | | |
| Wall mount (option on frames C-F only) | | | | | | | W | | | | | | | | | | | | | | |
| Through panel mount (option on frames C-E only) | | | | | | | T | | | | | | | | | | | | | | |
| Special option | | | | | | | | | | | | | | | | | | | | | |
| None | | | | | | | 00 | | | | | | | | | | | | | | |
| Documented special options (01-99) (Refer to local sales office) | | | | | | | | | | | | | | | | | | | | | |
| Language | | | | | | | | | | | | | | | | | | | | | |
| English (50 Hz) | | | | | | | A | | | | | | | | | | | | | | |
| English (60 Hz) | | | | | | | B | | | | | | | | | | | | | | |
| German | | | | | | | D | | | | | | | | | | | | | | |
| Spanish | | | | | | | E | | | | | | | | | | | | | | |
| French | | | | | | | F | | | | | | | | | | | | | | |
| Italian | | | | | | | I | | | | | | | | | | | | | | |
| Swedish | | | | | | | S | | | | | | | | | | | | | | |
| Keypad | | | | | | | | | | | | | | | | | | | | | |
| None | | | | | | | 0 | | | | | | | | | | | | | | |
| 6511 TTL fitted (option on frames 1-3 only, local mounting only) | | | | | | | 1 | | | | | | | | | | | | | | |
| 6511 RS232 fitted (option on frames 1-3 only, local or remote mounting) | | | | | | | 2 | | | | | | | | | | | | | | |
| 6521 RS232 fitted (option on frames C-F only, local or remote mounting) | | | | | | | 3 | | | | | | | | | | | | | | |



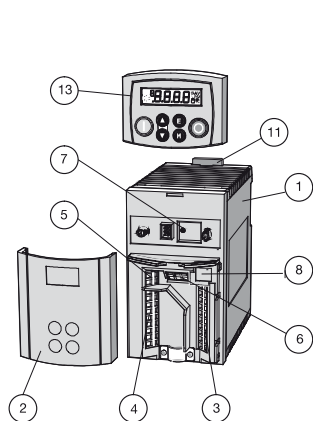
AC650V Series High Performance AC Drive - 400 V

| | Example | Block 1 | Block 2 | | | | Block 3 | | | | Block 4 | | | | | |
|---|------------------|----------|----------|-----------------|-----------------|----------|---------|-------|---|---|---------|---|----|---|---|----|
| | | 650V | - | 21 | 1150 | 1 | 0 | - | B | 0 | 0 | P | 00 | - | A | 0 |
| Product family | | | | | | | | | | | | | | | | |
| AC650V AC Drive - Sensorless Flux Vector Control | | 650V | | | | | | | | | | | | | | |
| Rating data | | | | | | | | | | | | | | | | |
| | | | | Constant Torque | Variable Torque | | | | | | | | | | | |
| | | | | kW/A | HP/A | kW/A | HP/A | Frame | | | | | | | | |
| | Supply voltage | | @400 VAC | @460 VAC | @400 VAC | @460 VAC | | | | | | | | | | |
| | 400/460 V 3phase | | | | | | | | | | | | 43 | | | |
| Power/ | | 0.37/1.5 | 0.5/1.5 | | | | | 2 | | | | | | | | |
| Current | | 0.55/2.0 | 0.75/2.0 | | | | | 2 | | | | | | | | |
| Rating | | 0.75/2.5 | 1.0/2.5 | | | | | 2 | | | | | | | | |
| | | 1.1/3.5 | 1.5/3.5 | | | | | 2 | | | | | | | | |
| | | 1.5/4.5 | 2.0/4.5 | | | | | 2 | | | | | | | | |
| | | 2.2/5.5 | 3.0/5.5 | | | | | 2 | | | | | | | | |
| | | 3.0/6.8 | 4.0/6.8 | | | | | 3 | | | | | | | | |
| | | 4.0/9.0 | 5.0/9.0 | | | | | 3 | | | | | | | | |
| | | 5.5/12 | 7.5/12 | | | | | 3 | | | | | | | | |
| | | 7.5/16 | 10/16 | | | | | 3 | | | | | | | | |
| | 400/460 V 3phase | | | | | | | | | | | | 43 | | | |
| | | 7.5/16 | 10/14 | 11/23 | 15/21 | C | | | | | | | | | | |
| | | 11/23 | 15/21 | 15/30 | 20/27 | C | | | | | | | | | | |
| | | 15/30 | 20/27 | 18.5/37 | 25/34 | C | | | | | | | | | | |
| | | 15/31 | 20/31 | 18.5/38 | 25/38 | D | | | | | | | | | | |
| | | 18.5/38 | 25/38 | 22/45 | 30/45 | D | | | | | | | | | | |
| | | 22/45 | 30/45 | 30/59 | 40/52 | D | | | | | | | | | | |
| | | 30/59 | 40/52 | 37/73 | 50/65 | D | | | | | | | | | | |
| | | 30/59 | 40/59 | 37/73 | 50/73 | E | | | | | | | | | | |
| | | 37/73 | 50/73 | 45/87 | 60/87 | E | | | | | | | | | | |
| | | 45/87 | 60/87 | 55/105 | 75/105 | E | | | | | | | | | | |
| | | 55/105 | 75/100 | 75/145 | 100/125 | F | | | | | | | | | | |
| | | 75/145 | 100/130 | 90/165 | 125/156 | F | | | | | | | | | | |
| | | 90/180 | 150/180 | 110/205 | 150/205 | F | | | | | | | | | | |
| Auxiliary supply | | | | | | | | | | | | | | | | |
| Not required (not available on frames 1-3 & frames C-E) | | | | | | | | | | | | | | | | 0 |
| 115 V 1ph (frame F only) | | | | | | | | | | | | | | | | 1 |
| 230 V 1ph (frame F only) | | | | | | | | | | | | | | | | 2 |
| Brake switch | | | | | | | | | | | | | | | | |
| Not fitted | | | | | | | | | | | | | | | | 0 |
| Brake switch fitted (must be fitted on frame 2 400/460 V, and all frame 3 products) | | | | | | | | | | | | | | | | B |
| Filter | | | | | | | | | | | | | | | | |
| Not fitted (option on frames 1-3 and must be selected for frames C-F) | | | | | | | | | | | | | | | | 0 |
| Filter fitted (option on frame 1-3 only) | | | | | | | | | | | | | | | | F |
| Communications | | | | | | | | | | | | | | | | |
| RS232 port fitted | | | | | | | | | | | | | | | | 1 |
| RS232 & RS485 port fitted (frame C-F only) | | | | | | | | | | | | | | | | 2 |
| Mounting | | | | | | | | | | | | | | | | |
| Panel mounting (standard fitting) | | | | | | | | | | | | | | | | P |
| Wall mount (option on frames C-E only) | | | | | | | | | | | | | | | | W |
| Through panel mount (option on frames C-E only) | | | | | | | | | | | | | | | | T |
| Special option | | | | | | | | | | | | | | | | |
| None | | | | | | | | | | | | | | | | 00 |
| Documented special options (01-99) (Refer to local sales office) | | | | | | | | | | | | | | | | |
| Language | | | | | | | | | | | | | | | | |
| English (50 Hz) | | | | | | | | | | | | | | | | A |
| English (60 Hz) | | | | | | | | | | | | | | | | B |
| German | | | | | | | | | | | | | | | | D |
| Spanish | | | | | | | | | | | | | | | | E |
| French | | | | | | | | | | | | | | | | F |
| Italian | | | | | | | | | | | | | | | | I |
| Swedish | | | | | | | | | | | | | | | | S |
| Keypad | | | | | | | | | | | | | | | | |
| None | | | | | | | | | | | | | | | | 0 |
| 6511 TTL fitted (option on frames 1-3 only, local mounting only) | | | | | | | | | | | | | | | | 1 |
| 6511 RS232 fitted (option on frames 1-3 only, local or remote mounting) | | | | | | | | | | | | | | | | 2 |
| 6521 RS232 fitted (option on frames C-F only, local or remote mounting) | | | | | | | | | | | | | | | | 3 |

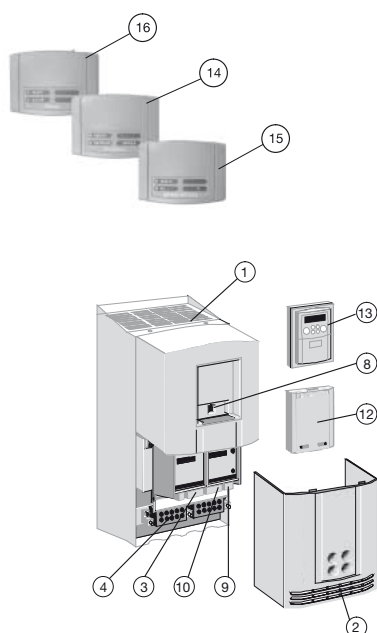
Accessories and Options

AC650/AC650V/AC650S Series AC Drive

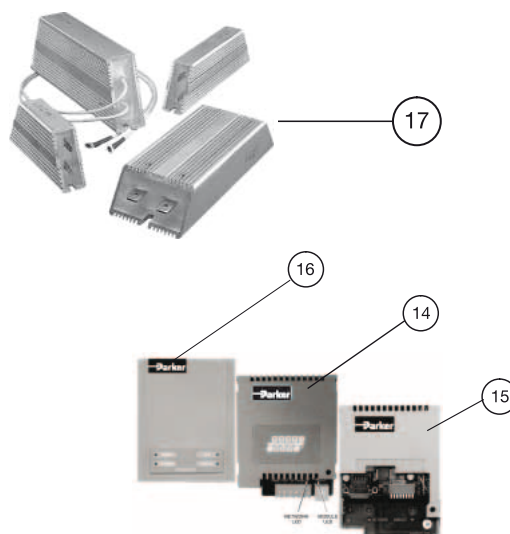
| Options | | Frame | AC650V only | Fitting | Reference | |
|------------------------|--|----------|-------------|---------------------------|-----------------|---|
| AC Inverters | | | | | | |
| 1 | Inverter housing | 1-F | | Standard | See order code | |
| 2 | Terminal Cover (simplified wiring diagram) | | | | | |
| 3 | Control wiring terminals | | | | | |
| 4 | Power wiring terminals | | | | | |
| 5 | Volt-free relay contact | | | | | |
| 6 | Encoder / Digital Inputs | | √ | | | |
| 7 | Power On LED | | | | | |
| 8 | RS232 P3 port for remote mounting of operator keypad | | √ | | | |
| 9 | RS232 P3 port for programming | | C-F | | | √ |
| 10 | RS485 port | | C-F | | | |
| 11 | DIN Rail mounting clip | | 1-3 | | | |
| 12 | Front cover | | C-F | | | |
| Operator keypad | | | | | | |
| 13 | TTL keypad (local mounting only) | 1-3 | | Standard | 6511-TTL-00 | |
| | RS232 keypad (remote mountable) | 1-3 | √ | Option | 6511-RS232-00 | |
| | | C-F | √ | Standard | 6521/00/G | |
| Communication | | | | | | |
| 14 | Profibus communications card | 1-3 | √ | Factory Option | 6513-PROF-00 | |
| | | C-F | √ | Factory Option | 6523/PROF/00 | |
| 15 | RS232/RS485 communication card (Modbus RTU, EI Bisync F1/3) | 1-3 | √ | Factory Option | 6513-EI00-00 | |
| | | C-F | √ | Factory Option | See order codes | |
| Other options | | | | | | |
| 16 | Cloning module for the storage and transfer of up to 10 drive configurations | 1-3, C-F | | Option | 6514-00 | |
| Accessories | | | | | | |
| 17 | Brake resistor | | | See corresponding section | | |



Frames 1 - 3 up to 7.5 kW



Frames C - F up to 110 kW



Options

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

| Order Code | Description | Suitable for |
|------------|----------------|--------------|
| 6514-00 | Cloning Module | AC650/AC650V |

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

| Order Code | Description | Suitable for |
|--------------|--------------------------------------|-------------------|
| 6513-E100-00 | RS485/RS232 Communications Interface | AC650V Frames 1-3 |

Operator Keypads



6511-xxxx-00



6521-00-G

Product Codes

| Order Code | Description | Suitable for |
|---------------|---------------------------------|--------------------------|
| 6511-TTL-00 | TTL keypad (local mounting) | AC650, AC650V Frames 1-3 |
| 6511-RS232-00 | RS232 keypad (remote mountable) | AC650, AC650V Frames 1-3 |
| 6521-00-G | RS232 keypad (remote mountable) | AC650V Frames C-F |

Options

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)



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

Product Codes

| Order Code | Description | Suitable for |
|--------------|--------------------------------------|---------------------------|
| 6513-PROF-00 | PROFIBUS-DP communications interface | AC650, AC650V Frames 1-3 |
| 6523-PROF-00 | PROFIBUS-DP communications interface | AC650V Frames C, D, E & F |

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

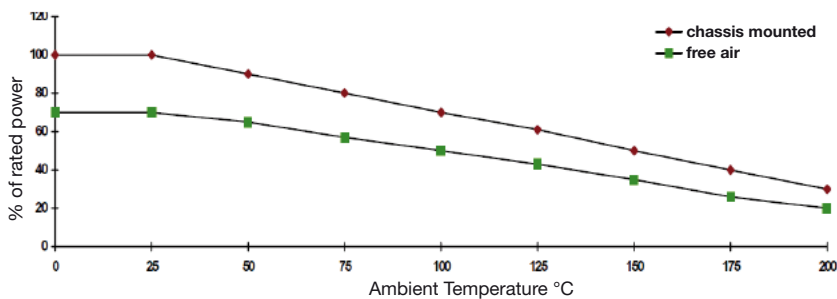
Resistors above 500 W are available upon request :

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

$$\text{Peak braking power} = \frac{0.0055J \times (n1^2 - n2^2) \text{ (W)}}{tb}$$

$$\text{Average braking power } P_{av} = \frac{P_{pk} \times tb}{tc}$$

J - total inertia in kgm²
n1 - initial speed in min⁻¹
n2 - final speed min⁻¹
tb - braking time in s
tc - cycle time in s

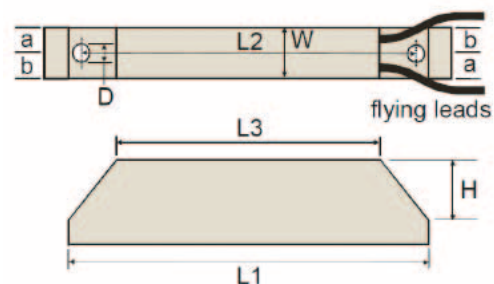


Dimensions

| 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 %



EMC Filters

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

| AC Drives | 2nd Environment (Industrial) | 1st Environment (Domestic) |
|-------------|---|---|
| 650 / 650V | | |
| Frame 1-3 | Indicated by an F in the product code | Indicated by an F in the product code |
| 650V / 690P | | |
| Frame B | Indicated by an F in the product code | Indicated by an F in the product code |
| Frame C | Standard | TN/IT AC Supply Ext. Filter FP C0467842U044 |
| Frame D | Standard | TN/IT AC Supply Ext. Filter FP C0467842U084 |
| Frame E | Standard | TN/IT AC Supply Ext. Filter FP C0467842U105 |
| Frame F | Standard | TN/IT AC Supply Ext. Filter FP C0467842U215 |
| Frame G/H/J | (690PG-1100 and 690PG-1320) | TN and IT AC Supply Ext. Filter FP C0467842U340 |
| | (690PG-1600 and 690PG-1800 and frame H and J) | TN and IT Ext. Filter 2 x FP C0467842U340 |

EMC Filters

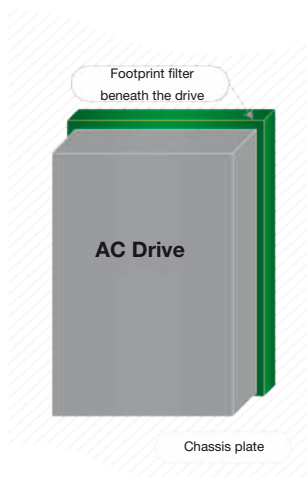
for AC Drives

IP40 mounted: use mounting kits below

| Filter | Mounting Kit |
|--------------|--------------|
| CO467842U020 | BA467840U020 |
| CO467842U044 | BA467840U044 |
| CO467842U084 | BA467840U084 |
| CO467842U105 | BA467840U105 |

Dimensions

| Filter Reference | Terminal size [mm ²] | Earth terminal [mm] | Gland mountings [mm] | Filter dimensions [mm] | Fixing centres [mm] | Weight [kg] |
|------------------|----------------------------------|---------------------|----------------------|------------------------|---------------------|-------------|
| CO467842U044 | 10 | 5 | 4 x 4 | 400 x 178x 55 | 384 x 150 | 2.1 |
| CO467842U084 | 25 | 6 | 4 x 4 | 513 x 233 x 70 | 495 x 208 | 4.2 |
| CO467842U105 | 50 | 8 | 4 x 4 | 698 x 250 x 80 | 680 x 216 | 6.2 |
| CO467842U215 | 95 | 8 | N/A | 825 x 250 x 115 | 795 x 216 | N/A |



Drive mounted on an external footprint filter

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.

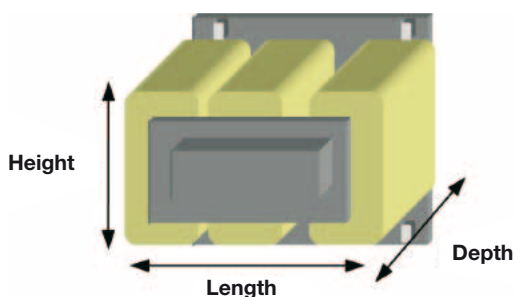
As well as helping with compliance with IEEE 519 there are other benefits to using line/load reactors including:

- 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 µH | 315 | 215 | 330 | 320 | 175 x 225 | 70 |
| CO389936U402 | 50 µH | 480 | 215 | 330 | 320 | 175 x 225 | 95 |
| CO466448U040 | 50 µH | 36 | 70 | 155 | 127 | 48 x 140 | 2.5 |
| CO466448U165 | 50 µH | 148.5 | 115 | 190 | 155 | 93 x 170 | 12 |
| CO466709U038 | 30 µH | 342 | 370 | 350 | 226 | 240 x 320 | 38 |
| CO466709U050 | 25 µH | 450 | 431 | 420 | 226 | 290 x 381 | 53 |
| CO466709U073 | 20 µH | 653 | 431 | 420 | 226 | 290 x 381 | 60 |
| CO466709U083 | 15 µH | 747 | 431 | 420 | 226 | 290 x 381 | 69 |
| CO468314U650 | 5 µH | 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 µH | 13.5 | 60 | 80 | 67 | 64 x 40 | 1 |
| CO466448U110 | 50 µH | 100 | 100 | 190 | 155 | 170 x 75 | 7.5 |
| CO468326U006 | 2.917 mH | 12.8 | 170 | 240 | 260 | 80 x 140 | 17 |
| CO466448U070 | 50 µH | 63 | 85 | 155 | 127 | 140 x 63 | 4.5 |
| CO466250U012 | 15 µH | 1080 | 400 | 420 | 450 | 300 x 140 | 170 |

* Include Earth Stud



Accessories For All AC Drives

Drive System Explorer Lite (DSE Lite) Software

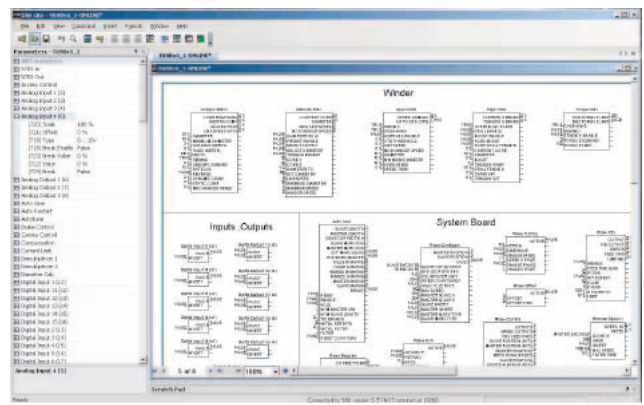
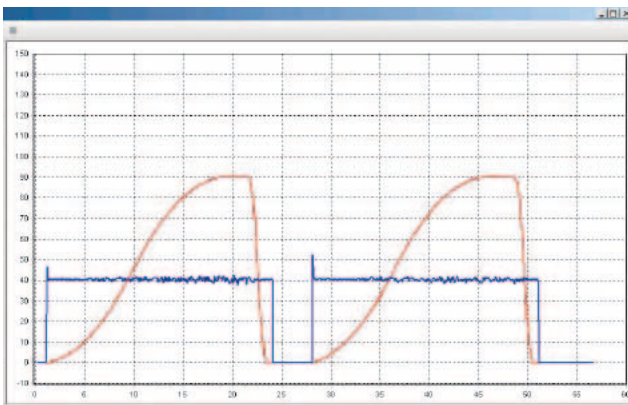
Description

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



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