

# General Purpose AC Drives

AC650 Series AC Drive

0.25kW - 7.5kW



## 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 7.5kW, 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

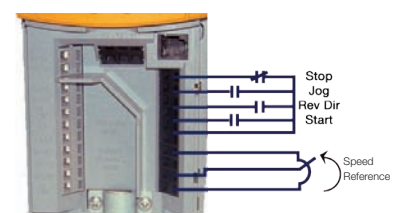
**Integrated EMC filter** ensures compliance while maintaining a compact footprint

**Pre-programmed Macros** allowing quick and simple drive setup

**DIN rail mounting** for easy integration into any electrical cabinet

**6514 cloning module** (option) allows easy back-up and transfer of parameters between different drives

**Flexible I/O** including analogue and relay output and motor thermister input allowing greater control options

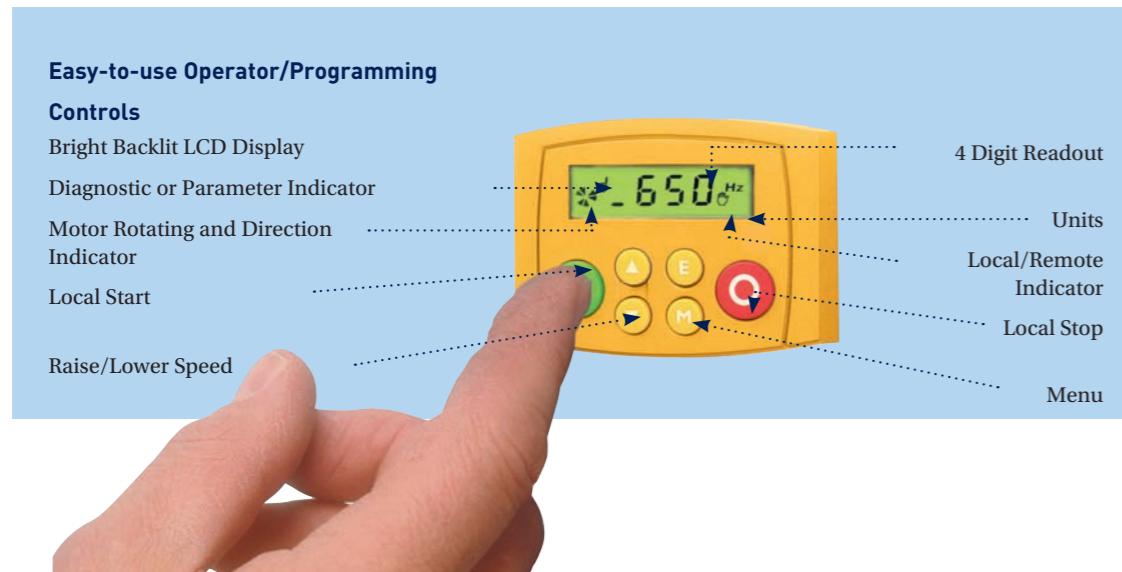


## General Purpose AC Drive

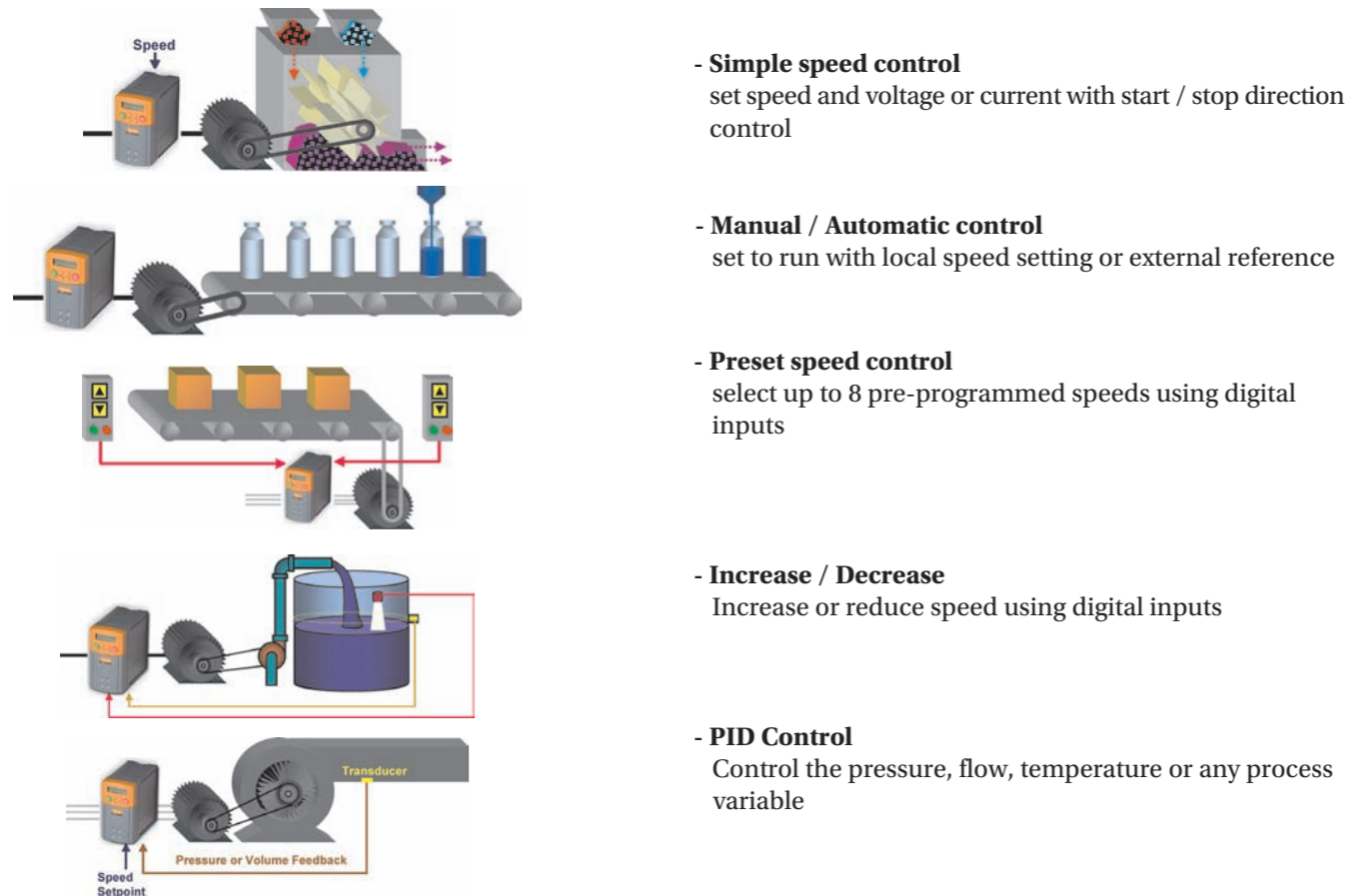
AC650 Series AC Drive  
0.25kW - 7.5kW

### Features

#### Diagnostic and control through the operator keypad



#### Simplified operation through the use of pre-programmed macros



## General Purpose High Performance AC Drives

AC650V Series AC Drive  
0.25kW - 110kW

### Description

The AC650V expands upon the simple, no-fuss philosophy of the AC650 and provides reliable, robust motor control from 0.25kW through to 110kW. 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 5.5kW 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 7.5kW
  - Extended power range to 110kW makes the AC650V suited to a wide of uses

# Technical Specification

## AC650-AC650V Series AC Drive



Power Supply	Single Phase Units 220-240 Vac +/- 10 %, 50-60 Hz +/- 5% Three Phase Units 380-460 Vac +/- 10 %, 50-60 Hz +/- 5%
Environment	0-40°C (derate to 50°C) Up to 1000m ASL (derate > 1000m)
Protection	IP20
Overload	Constant torque rating : 150% for 60s Variable torque rating (pumps and fans) : 110% for 60s
Output Frequency	0-240 Hz
Inputs/Outputs	2; Speed Control
Analogue Inputs	0-10V, 0-10V/4-20mA
Analogue Outputs	1; User configurable output frequency / load 0-10V
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 4A @ 240V 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	
Power Supply Outputs	24V dc (50mA) - Digital I/O Supply 10V dc (10mA) - Analogue reference supply
Communications Options	RS485 / RS232 - AC650V and AC650 Profibus - AC650V only

## Standards

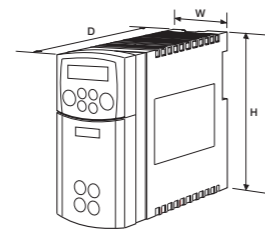
The AC650 and AC650V Series AC drives meets the following standards when installed in accordance with the relevant product manual

- CE Marked to EN50178 (Safety, Low Voltage Directive)
- CE Marked to EN61800-3 (EMC Directive)
- UL listed to US Standard UL508C
- cUL Listed to Canadian Standard C22.2 #14



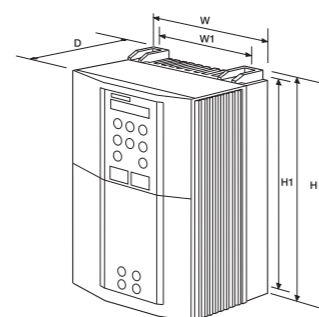
## Dimensions

Frame	H	W	D
1	137	73	142
2	192	73	173
3	257	96	195



Frame 1,2,3

Frame	Overall Dimensions			Fixing Centres		Weight (kg)
	H	W	D	H1	W1	
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	349	700	150	41.0



Frame C, D, E, F

# Electrical Characteristics

## AC650-AC650V Series AC Drive

### 220 – 240Vac (+10%) 50Hz (+5%) 1 ph

Old 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 – 240Vac (+10%) 50Hz (+5%) 1/3 ph

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

### 380 – 460Vac (+10%) 50Hz (+5%) 3 ph

Old 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				2
650(V)-005-400-...	650(V)-43120020-...	0.55				2
650(V)-007-400-...	650(V)-43125020-...	0.75				2
650(V)-011-400-...	650(V)-43135020-...	1.1				2
650(V)-015-400-...	650(V)-43145020-...	1.5				2
650(V)-022-400-...	650(V)-43155020-...	2.2				2
650(V)-030-400-...	650(V)-43168030-...	3.0				3
650(V)-040-400-...	650(V)-43190030-...	4.0				3
650(V)-055-400-...	650(V)-43212030-...	5.5				3
650(V)-075-400-...	650(V)-43216030-...	7.5				3
650VC-110-4-...	650V-432160C0-...	7.5	16	11	23	C
650VC-150-4-...	650V-432230C0-...	11	23	15	30	C
650VD-180-4-...	650V-432200C0-...	15	30	18	38	C
650VD-220-4-...	650V-432380D0-...	18	38	22	45	D
650VD-300-4-...	650V-432450D0-...	22	45	30	59	D
650VE-370-4-...	650V-432590D0-...	30	59	37	73	D
650VE-450-4-...	650V-432730E0-...	37	73	45	87	E
650VF-550-4-...	650V-432870E0-...	45	87	55	105	E
650VF-750-4-...	650V-433105F1-...	55	105	75	145	F
650VF-900-4-...	650V-433145F1-...	75	145	90	165	F
	650V-433180F1-...	90	180	110	205	F

\*\* Old reference refers to legacy part references prior to 2009  
... See following product configuration pages to complete product reference

# Selection and Order Codes

## AC650 Series General Purpose AC Drive



	Block 1	Block 2	Block 3	Block 4	
Example ▶	650	- 21 1150 1 0	- 0 0 0 P 00	- A 0	
Product Family	AC650 AC Drive - V/F 650				
Supply Voltage	230V 1 phase 21				
Current / Power Rating	kW	Output Current (A)	HP	Frame Size	
	0.25	1.5	0.3	1	
	0.37	2.2	0.5	1	
	0.55	3	0.75	1	
	0.75	4	1	1	
	1.1	5.5	1.5	2	
	1.5	7	2	2	
	230V 1/3 phase	22			
	230V 3 phase	23			
	400/460V 3 phase	43			
Auxiliary Supply	Not Required 0				
Brake Switch	Not fitted - (not available on frame 1 and frame 2 230V products)			0	
	Brake switch fitted - (must be fitted on frame 2 400/460V, and all frame 3 products)			B	
Filter	Not fitted			0	
	Filter fitted			F	
Communications	No communications port			0	
	RS 232 port fitted - (must be selected if remote mounting of keypad required)			1	
Mounting	Panel mount			P	
Special Options	None			00	
	Documented special options (01-99) (refer to local sales office)				
Language	English (50Hz)			A	
	English (60Hz)			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	

# Selection and Order Codes

## AC650V Series General Purpose High Performance AC Drive 230V Power Supplies



	Block 1	Block 2	Block 3	Block 4	
Example ▶	650V	- 21 1150 1 0	- 0 0 0 P 00	- A 0	
Product Family	AC650V AC Drive -Sensorless Flux Vector Control 650V				
Supply Voltage	230V 1 phase 21				
Current / Power Rating	Constant Torque kW/A @Vac	HP/A @Vac	Variable Torque kW/A @Vac	HP/A @Vac	
	0.25/1.5	0.3/1.5			
	0.37/2.2	0.5/2.2			
	0.55/3.0	0.75/3.0			
	0.75/4.0	1.0/4.0			
	1.1/5.5	1.5/5.5			
	1.5/7.0	2.0/7.0			
	230V 1/3 phase	22			
	230V 3 phase	23			
	Auxiliary Supply	Not required (not available on frames 1-3 & frames C-E) 0			
	115V 1ph (frame F only) 1				
	230V 1ph (frame F only) 2				
Brake Switch	Not fitted - (not available on frame 1 and frame 2 230V products)			0	
	Brake switch fitted - (must be fitted on frame 2 400/460V and all frame 3 products)			B	
Filter	Not fitted			0	
	Filter fitted			F	
Communications	RS 232 port fitted			1	
	RS232 & RS485 port fitted (frame C-F only)			2	
Mounting	Panel mount - (standard fitting)			P	
	Wall mount (option on frames C-F only)			W	
	Through panel mount (option on frames C-E only)			T	
Special Options	None			00	
	Documented special options (01-99) (refer to local sales office)				
Language	English (50Hz)			A	
	English (60Hz)			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	



# Selection and Order Codes

## AC650V Series General Purpose High Performance AC Drive 400V Power Supplies



						Block 1	Block 2	Block 3	Block 4												
Example ▶						650V	-	43	1150	2	0	-	B	0	0	P	00	-	A	0	
Product Family	AC650V AC Drive -Sensorless Flux Vector Control					650V															
	Supply Voltage	Constant Torque		Variable Torque		Frame Size															
		kW/A @Vac	HP/A @Vac	kW/A @Vac	HP/A @Vac																
Power / Current Rating	400/460V 3 phase					43															
		0.37/1.5	0.5/1.5			2	1150	2													
		0.55/2.0	0.75/2.0			2	1200	2													
		0.75/2.5	1.0/2.5			2	1250	2													
		1.1/3.5	1.5/3.5			2	1350	2													
		1.5/4.5	2.0/4.5			2	1450	2													
		2.2/5.5	3.0/5.5			2	1550	2													
		3.0/6.8	4.0/6.8			3	1680	3													
		4.0/9.0	5.0/9.0			3	1900	3													
		5.5/12	7.5/12			3	2120	3													
		7.5/16	10/16			3	2160	3													
		400/460V 3 phase					43														
			7.5/16	10/14	11/23	15/21	C	2160	C												
			11/23	15/21	15/30	20/27	C	2230	C												
			15/30	20/27	18.5/37	25/34	C	2300	C												
			15/31	20/31	18.5/38	25/38	D	2310	D												
			18.5/38	25/38	22/45	30/45	D	2380	D												
			22/45	30/45	30/59	40/52	D	2450	D												
			30/59	40/52	37/73	50/65	D	2590	D												
		30/59	40/59	37/73	50/73	E	2590	E													
		37/73	50/73	45/87	60/87	E	2730	E													
		45/87	60/87	55/105	75/105	E	2870	E													
		55/105	75/100	75/145	100/125	F	3105	F													
		75/145	100/130	90/165	125/156	F	3145	F													
		90/180	125/156	110/205	150/180	F	3156	F													
		90/180	150/180	110/205	150/180	F	3180	F													
Auxiliary Supply	Not required (frames 1-3 & frames C-E)									0											
	115V 1ph (frame F only)									1											
	230V 1ph (frame F only)									2											
Brake Switch	Not fitted - (not available on frame 1 and frame 2 230V products)									0											
	Brake switch fitted -(must be fitted on frame 2 400/460V products and all frame 3 products)									B											
Filter	Not fitted (option on frame 1-3 and must be selected for frames C-F)									0											
	Filter fitted (option on frame 1-3 only)									F											
Communications	RS 232 port fitted									1											
	RS232 + RS485 port fitted (frame C-F only)									2											
Mounting	Panel mount - (standard fitting)									P											
	Wall mount (option on Frames C-E only)									W											
	Through panel mount (option on frames C-E only)									T											
Special Options	None									00											
	Documented special options (01-99) (refer to local sales office)																				
Language	English (50Hz)										A										
	English (60Hz)										B										
	German										D										
	Spanish										E										
	French										F										
	Italian										I										
	Swedish										S										
Keypad	None										0										
	6511 TTL fitted (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										