

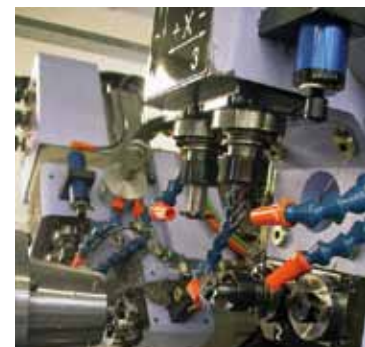


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Compact drive for sensorless servo control

AC650S series 0.25 – 7.5kW



ENGINEERING YOUR SUCCESS.

Compact drive for sensorless servo control

AC650S series 0.25 – 7.5kW

Description

The AC650S series is designed to save energy in general purpose applications by replacing induction motors by more efficient permanent-magnet motors.

Easy to commission and maintain, it runs the motor without speed sensor.

It is available up to 1.5 kW for 230V supply and up to 7.5kW for 400V three-phase supply.



Features and benefits

Side-by-side mounting

reduces the space used in a cubicle.

Energy savings

achieved when using a permanent-magnet motor instead of an induction motor can amount to up to 12%, thanks to the higher efficiency of permanent magnet motors.

The AC650S comes with one **PID controller**. It can be set to control process parameters like pressure or flow rate.



A **cloning module** is available as option for **easy maintenance**. It allows to save up to 10 drive configurations without a PC.

Sensorless motor control

removes the need for a speed sensor, which improves the system reliability.

Easy commissioning

thanks to built-in application macros for the most common applications and free setup wizard.

Built-in filter for EMC compliance to EN61800-3.

Typical applications

Used in combination with AC650S drives, Parker permanent magnet motors are specially recommended as alternatives to induction motors in the following applications:

- When **energy savings** are important : conveyers, fans, pumps, hydraulic systems, extruders...

- In **compact machines**, when compact drive solutions are

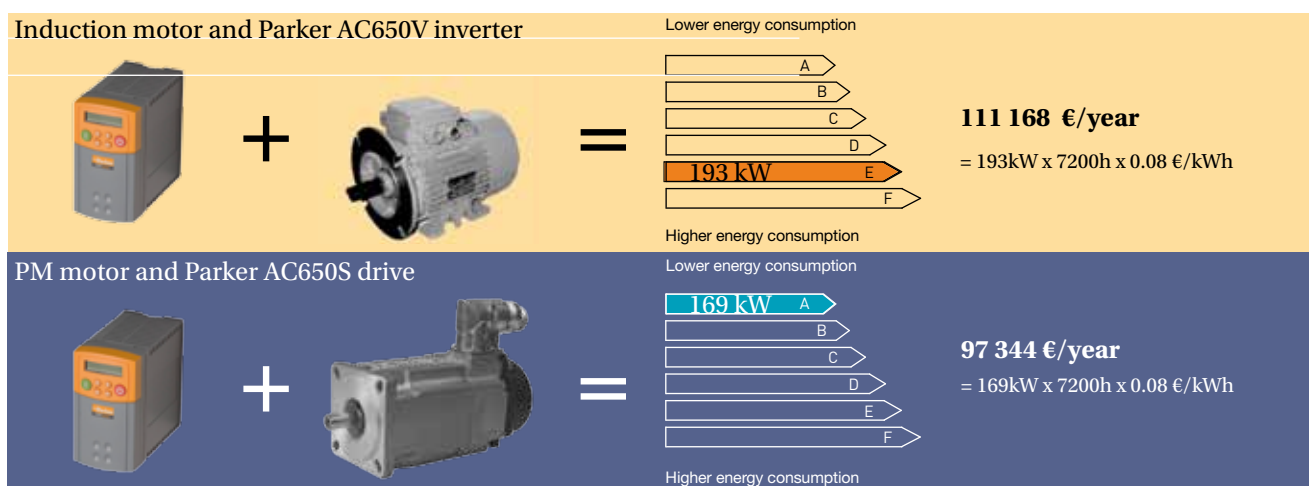
mandatory or when room in cubicle is limited : machine-tools, packaging machines, conveyers, winders/unwinders, special-purpose machines ...

Energy savings, maximum compactness

Energy savings

The AC650S drive features an advanced sensorless control algorithm for permanent-magnet motors.

Coupled with the high efficiency of Parker permanent-magnet motors, huge electricity costs savings can be achieved.



Typical annual savings
assuming 100 x 1.5kW motors

13 824 €/year

Maximum compactness for smaller machines, no need to have a forced ventilation.

The Parker PM motors are up to 75% smaller than same-power induction motors, which enables you make ultra-compact machines.

Furthermore, the motors are available with a very economical brake option.



Minimum cubicle space

The AC650S is among the smallest drive of the market. Side-by-side mounting is

possible, which minimizes even more the space required in cubicles for multi-drives systems.

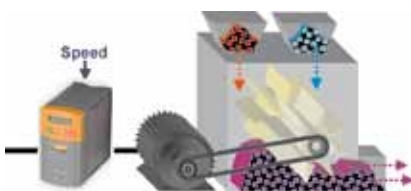
Easy commissioning

Built-in macros

Built-in macros for the most common applications allow easy commissioning.

- Basic speed control

Voltage and current source speed demand with digital start/stop and direction.



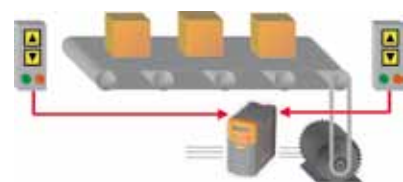
- Manual/Auto control

Switch between a local or remote speed setpoint.



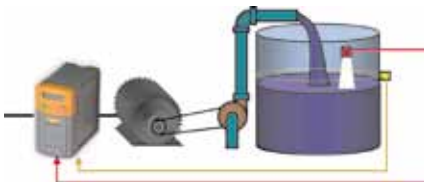
- Preset speeds

Up to 8 preprogrammed speed setpoints, selected by digital inputs



- Raise / Lower

Increase and decrease speed setpoint from raise/lower digital inputs



- PID Control

Control pressure, flow, temperature or other variables by monitoring transduced feedback with the built-in PID function.

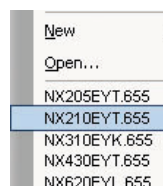


Easy commissioning, optimal performances

On top of macros built in the drive, a setup wizard is available for free to optimally tune the drive according to the load characteristics for any PM motor. A library of Parker motors further eases the commissioning workload.

Just select the motor, specify the load inertia and you are done in minutes !

Motor library
Load inertia estimate

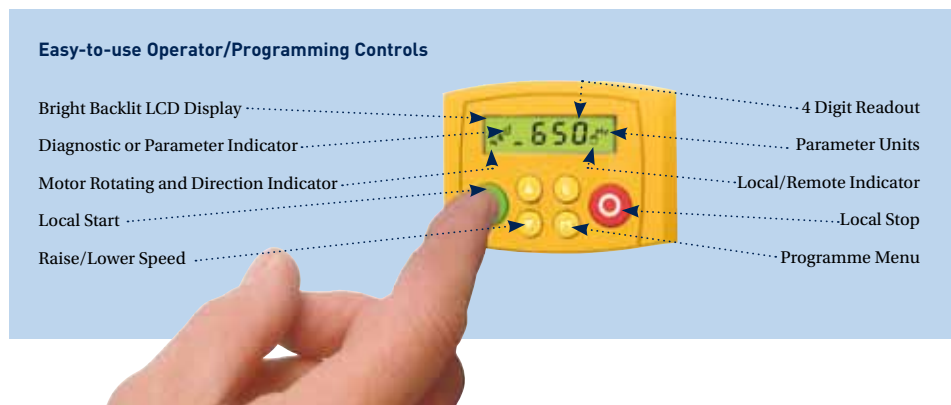


Library of Parker PM motors



Diagnostics and maintenance

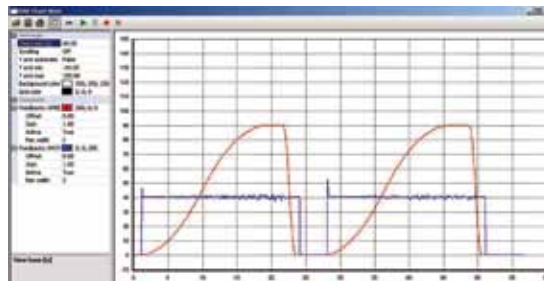
Easy diagnostics and maintenance
can be achieved through the friendly operator station



Monitoring

The “on line” programming, monitoring and diagnostic software platform DSE lite is available for free.

During drive operation, it is possible to monitor every parameter in the “chart recorder”.



Cloning module

A cloning module (option) allows to save, archive and clone up to 10 drive configurations without using a PC.

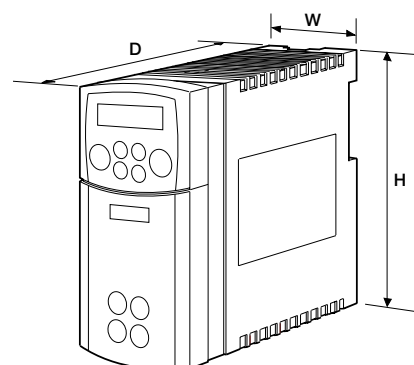
No need to be an expert to maintain the machine !



Specifications

Specifications		
Power Supply 0.25 to 1.5kW : 220-240Vac $\pm 10\%$, 50-60Hz $\pm 5\%$ 0.37 to 7.5kW, three-phase units : 380-460Vac $\pm 10\%$, 50-60Hz $\pm 5\%$	Inputs / Outputs 2 Analogue Inputs 0-10V, 0-10V/4-20mA 2 Analogue Outputs 0-10V, load $<10\text{mA}$ 5 Digital Inputs User configurable ; 15V to 24V DC 2 Digital Inputs / Outputs User configurable as inputs or outputs	User Selectable pre-programmed Applications Macros • Basic Speed Control – voltage or current source speed demand with digital start/stop and direction. • Manual/Auto Control – switch between a local or remote speed demand signal. • Preset Speeds – select up to 8 preprogrammed speeds selected by digital inputs. • Raise / Lower – increase and decrease speed from raise/lower digital inputs. • PID Control – control pressure, flow, temperature or other variable by monitoring transducer feedback.
Ambient 0-40°C (derate to 50°C) Up to 1000m ASL (derate $> 1000\text{m}$) IP20 protected	1 Digital Relay Output Relay output 4A @ 240V	
Overload 150% heavy duty ratings	1 Motor Thermistor Input	
Output Frequency 0-500Hz	Power Supply Outputs 24V dc (50mA) – Digital I/O supply 10V dc (10mA) – Analogue reference supply	
Standards The AC650S series meets the following standards when installed in accordance with the relevant product manual. • CE Marked to EN50178 (Safety, Low Voltage Directive). • CE Marked to EN61800-3 (EMC Directive). • UL listed to US standard UL508C. • cUL listed to Canadian standard C22.2 #14.	Communication Options Profibus-DP, Modbus RTU Cloning option Up to 10 drive configurations saved without a PC	

Dimensions			
Frame Size	H	W	D
1	137	73	142
2	192	73	173
3	257	96	200



Electrical ratings

Drive ratings

Product code	Supply voltage	Nominal power (KW / HP)	Output current (A)	Frame	Overload
650S-21140010-0■1P00-A1	230V 1ph	0.75 / 1.0	4	1	150 % x 30 sec
650S-21170020-0■1P00-A1		1.5 / 2.0	7	2	
650S-43125020-B■1P00-A1	400V 3ph	0.75 / 1.0	2,5	2	
650S-43155020-B■1P00-A1		2.2 / 3.0	5,5	2	
650S-43190030-B■1P00-A1		4.0 / 5.0	9	3	
650S-43216030-B■1P00-A1		7.5 / 10	16	3	
The models listed below are available for special order only (minimum quantities apply) - Please consult your nearest Parker contact					
650S-21115010-0■1P00-A1	230V 1ph	0.25 / 0.3	1,5	1	150 % x 30 sec
650S-21122010-0■1P00-A1		0.37 / 0.5	2,2	1	
650S-21130010-0■1P00-A1		0.55 / 0.75	3	1	
650S-21155020-0■1P00-A1		1.1 / 1.5	5,5	2	
650S-43115020-B■1P00-A1	400V 3ph	0.37 / 0.5	1,5	2	
650S-43120020-B■1P00-A1		0.55 / 0.75	2	2	
650S-43135020-B■1P00-A1		1.1 / 1.5	3,5	2	
650S-43145020-B■1P00-A1		1.5 / 2.0	4,5	2	
650S-43168030-B■1P00-A1		3.0 / 4.0	6,8	3	
650S-43212030-B■1P00-A1		5.5 / 7.5	12	3	
■ = 0, drives with no EMC filter ; ■ = F, for drives with built-in EMC filter					

Associations with Parker NX servo motors

230 Vac power supply									
At rated speed		@ 1500 rpm @ 3000 rpm		At low speed		Inertia	Motor code	Drive Code	
Nn (rpm)	Pn (kW)	P (kW)	P (kW)	M0 (Nm)	I0 (Amps)	(kg.m².10 ⁻⁵)			
6000	0,21	0,07	0,13	0,45	1,14	2,1	NX205EYUR6000	650S-21140010-001P00-A1	
5000	0,37	0,15	0,27	1	1,99	3,8	NX210EYPR6000	650S-21140010-001P00-A1	
2000	0,38	0,29	—	2	1,39	7,9	NX310EYPR6000	650S-21140010-001P00-A1	
3500	0,62	0,29	0,55	2	2,43	7,9	NX310EYKR6000	650S-21140010-001P00-A1	
1900	0,72	0,58	—	4	2,71	29	NX420EYPR6000	650S-21140010-001P00-A1	
3350	1,09	0,58	1,06	4	4,43	29	NX420EYKR6000	650S-21170020-001P00-A1	
1750	0,95	0,83	—	5,5	3,43	42,6	NX430EYMR6000	650S-21140010-001P00-A1	
2700	1,38	0,83	—	5,5	5,24	42,6	NX430EYJR6000	650S-21170020-001P00-A1	
3500	1,67	0,83	1,5	5,5	6,64	42,6	NX430EYFR6000	650S-21170020-001P00-A1	
1850	1,47	1,21	—	8	5,31	98	NX620EYRR6000	650S-21170020-001P00-A1	
1650	1,82	1,8	—	12	6,74	147	NX630EYWR6000	650S-21170020-001P00-A1	
850	1,38	—	—	16	5,16	320	NX820EYXR6000	650S-21170020-001P00-A1	
400 Vac power supply									
6000	0,21	0,07	0,13	0,45	1,14	2,1	NX205EYUR6000	650S-43125020-B01P00-A1	
6000	0,39	0,15	0,27	1	1,99	3,8	NX210EYPR6000	650S-43125020-B01P00-A1	
3700	0,65	0,29	0,55	2	1,39	7,9	NX310EYPR6000	650S-43125020-B01P00-A1	
6000	0,88	0,29	0,55	2	2,43	7,9	NX310EYKR6000	650S-43125020-B01P00-A1	
1750	0,67	0,58	—	4	1,36	29	NX420EYVR6000	650S-43125020-B01P00-A1	
3500	1,19	0,58	1,06	4	2,71	29	NX420EYPR6000	650S-43155020-B01P00-A1	
6000	1,65	0,58	1,06	4	4,43	29	NX420EYKR6000	650S-43155020-B01P00-A1	
2250	1,19	0,83	—	5,5	2,45	42,6	NX430EYQR6000	650S-43125020-B01P00-A1	
3150	1,55	0,83	1,5	5,5	3,43	42,6	NX430EYMR6000	650S-43155020-B01P00-A1	
3500	1,67	0,83	1,5	5,5	3,78	42,6	NX430EYLR6000	650S-43155020-B01P00-A1	
1500	1,21	1,21	—	8	2,42	98	NX620EYIR6000	650S-43125020-B01P00-A1	
3350	2,33	1,21	2,17	8	5,31	98	NX620EYRR6000	650S-43155020-B01P00-A1	
5800	2,41	1,21	2,17	8	8,88	98	NX620EYKR6000	650S-43190030-B01P00-A1	
2350	2,4	1,8	—	12	5,25	147	NX630EYRR6000	650S-43155020-B01P00-A1	
3000	3,12	1,8	3,12	12	6,74	147	NX630EYWR6000	650S-43190030-B01P00-A1	
4000	3,48	1,8	3,12	12	8,98	147	NX630EYLR6000	650S-43190030-B01P00-A1	
1620	2,53	2,36	—	16	5,16	320	NX820EYXR6000	650S-43155020-B01P00-A1	
3500	4,89	2,36	4,33	16	11	320	NX820EYRR6000	650S-43216030-B01P00-A1	
5150	6,26	2,36	4,33	16	16	320	NX820EYMR6000	650S-43216030-B01P00-A1	
1650	4,22	3,9	—	28	8,9	620	NX840EYRR6000	650S-43290030-B01P00-A1	
3000	6,39	3,9	6,39	28	15,9	620	NX840EYWR6000	650S-43216030-B01P00-A1	
1400	5,26	—	—	41	15,6	920	NX860EYWR6000	650S-43216030-B01P00-A1	



Parker NX motors are the ideal complement to AC650S drives in applications where compactness and energy savings are needed. Their main features are as follows :

- Excellent motion quality
- Compact dimensions and robustness
- Large set of options and customization possibilities
- **EX variant for explosive atmospheres**
- High-speed variant up to 17000rpm
- CE and UL variants

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