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AC 890 Modular Systems Drive

AC Drives 0.55 – 1200kW (0.75 – 1500 HP)



ENGINEERING YOUR SUCCESS.

AC 890 Modular Systems Drives

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Product Overview

The AC890 is a compact, modular systems drive engineered to control speed and position of open-loop and closed-loop AC motors or servo motors.

The AC890 meets the requirements of all variable speed applications, from simple motor speed control to the most sophisticated integrated multi-drive systems.

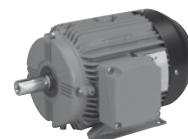


One Drive Fits All

The AC890 is compatible with any AC motor and virtually any speed/position feedback option. With this flexibility you may not even need to replace your existing AC motor to achieve high performance, saving you time and money.

Feedback Options

- **Incremental encoder**
- **EnDat 21 (SinCos) encoder**
- **Resolver**



Induction motors



Brushless motors



Torque motors

Modular Design

Available in two styles

Stand Alone Version



The Complete Drive

The AC890 Series Stand Alone Drive provides a complete AC input to AC motor output, with power input and output terminals. Other features of the Stand Alone Drive include:

- Power output to 900 kW (1200 HP) in 9 frame sizes
- access to all feedback and networking options
- built-in dynamic brake switch – provisions to add external braking resistor
- 24 VDC control board supply for programming without power
- USB programming port
- torque and speed analogue outputs
- 208-500 VAC input supply

Common Bus Version



Common Bus Drive

The AC890 is also available in a common bus platform, where individual motor output drives are easily connected to a common bus supply.

Common Bus Drive (CD)

Features:

- Power output to 900 kW (1200 HP) in 9 frame sizes
- access to all feedback and networking options
- 24 VDC control board supply for programming without power
- USB programming port
- torque and speed analogue outputs

Common Bus Supply Module (CS) Features:

- built-in dynamic braking unit
- diagnostic operator panel
- 208-500 VAC power supply
- up to 162A output per module

The AC890 can be user configured for 5 different operating modes

Open-Loop (volts/frequency) Control

This mode is ideal for basic motor speed control.

Sensorless Vector Control

With its ultra high performance sensorless vector algorithm, it delivers a combination of both high torque and close speed regulation without the need for any speed measuring transducer.

Closed-Loop Vector Control

Full closed-loop flux vector performance can be achieved with the AC890 by simply adding an encoder feedback 'technology box'. This provides 100% continuous full load standstill torque, plus a highly dynamic speed loop more than sufficient for the most demanding applications.

Servo Control

Designed for the most demanding servo systems. The ultra fast control loops and process bus make the AC890 ideal for single or multi axis applications.

4 Quadrant Active front-end power supply module

With this configuration, the energy is fed back into the mains supply with sinusoidal currents and unity power factor; a very low current harmonic content is achieved.

Performance Level Options

Advanced Performance

Motion control firmware with added position loop, motion control function blocks, move incremental, move absolute, move home, line drive master ramp and section control, winder blocks (speed winder, current winder), full function PID, machine state, and others.

High Performance

All Advanced features plus: Library of pre-engineered application specific LINK VM function blocks such as: Shaftless Printing, cut-to-length, advanced winding, advanced traversing and others.

A High Performance Design

*Stand alone version shown

Features

High Speed feedback

- Incremental encoder
- EnDat® 2.1 (SinCos) encoder
- Resolver

Open FireWire IEEE 1394

Process Port

- 125µs cycle time
- Real-time synchronization between drives



Open Communications

EtherNet/IP
conformance tested

ControlNet
certification tested

PROFIBUS

DeviceNet
certification tested

CANopen

Fast 150Mhz micro processor



Benefits

Minimal delay between the fieldbus setpoints and the control loops

Designed to integrate in existing automation systems, the AC890 features high performance ports linked directly to the fast control loops of the drive.

Minimum delay exists between your digital setpoint sent through a fieldbus and the control loops.

Replacement of analogue solutions

Your existing analogue setpoint-based solutions can be replaced by a digital fieldbus-based solution with minimal bandwidth loss.

Flexible feedback

The AC890 offers system designers complete flexibility in their choice of feedback technology.

Open standards for protection of investment

The AC890 has been deliberately designed to integrate seamlessly into your automation network.

To connect to your PLC or fieldbus network you can simply choose from the wide range of communication technology boxes.

Serves the most demanding applications

Taking advantage of leading edge control algorithms running on a fast 150Mhz microprocessor, the AC890 drive can achieve very high-bandwidth control loops.

This allows you to use the drive for the most demanding industrial applications e.g. printing, cut-to-length, rotary shear, converting and slitting.

Common Bus Version

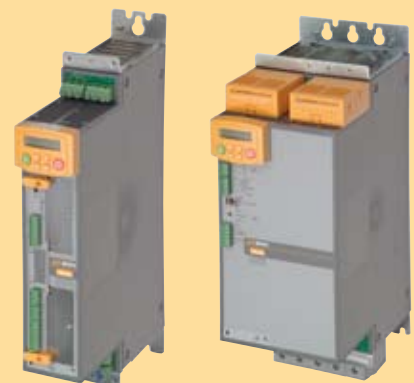
Compact space saving

We have designed the AC890 with your panel space in mind:

The AC890 benefits from the latest advances in semiconductor cooling technology which make it extremely compact.

The control terminal connectors are removable for easy servicing.

Common bus configuration can help you achieve a smaller systems design footprint.



Drive System Explorer

Configuration and Programming Software

Modular function blocks for fast and easy project creation

DSE, the development environment for AC890 drives, has been designed to assist you in the creation and management of your project.

At the project creation stage, the project tree contains all the sections or axis of the machine.

Function blocks reusability

DSE offers user-defined macros that can be reused. The LINK programming environment, with PLC-like function blocks, makes application programming simple and reduces the training needs of the technical staff.

Built-in library of function blocks for advanced applications

DSE comes with a library of built-in function blocks for advanced applications at no extra cost:

- Shaftless printing
- Winder
- Registration

Section control

The configuration of the most complex machines is fast and error-free.

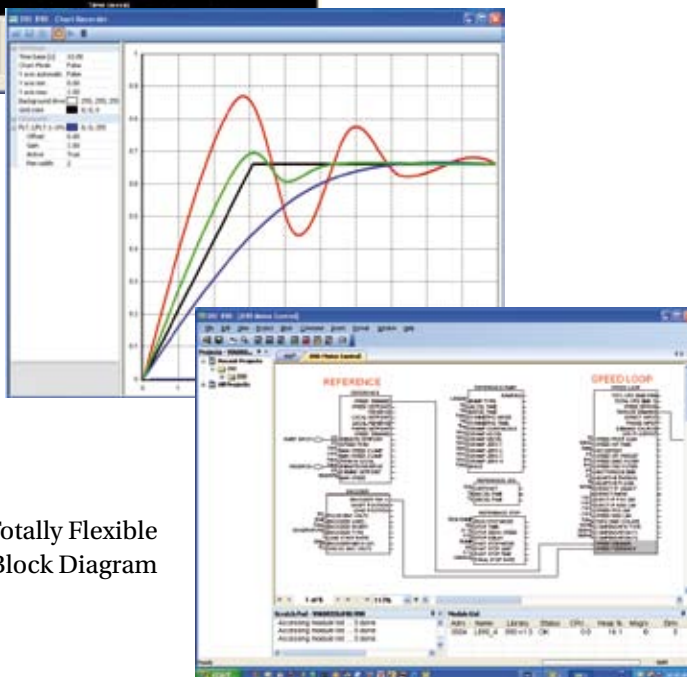
- Parameters setting and project creation
- High bandwidth digital oscilloscope
- Monitoring and online tuning



Chart Variables on line

Monitoring and on line tuning

Totally Flexible LINK Block Diagram



Options



Keypad Options

The AC890 features three user keypad options, which allow the user to read drive parameters on three screen sizes. Remote mounting is also available and is required on some drive frame sizes.

Option	Model
4 digit LCD	6511
2 line LCD	6901
55x40mm Graphical	6911



TS8000 Operator Interface

The TS8000 operator interface is a web-enabled graphical interface available in 4 sizes. Pre-engineered templates assist system design.

Bus Bars

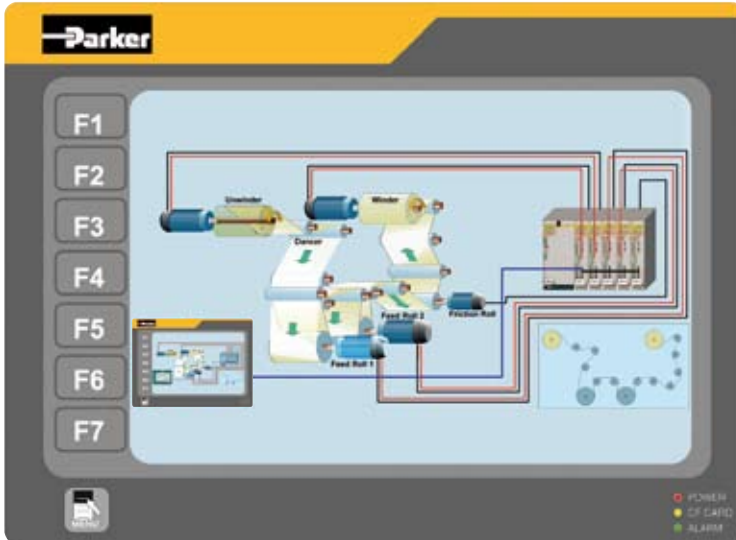
Allow you to join common drives, common supplies and common adapter modules together. 140A max current rating and load sharing between units.

Duct Components

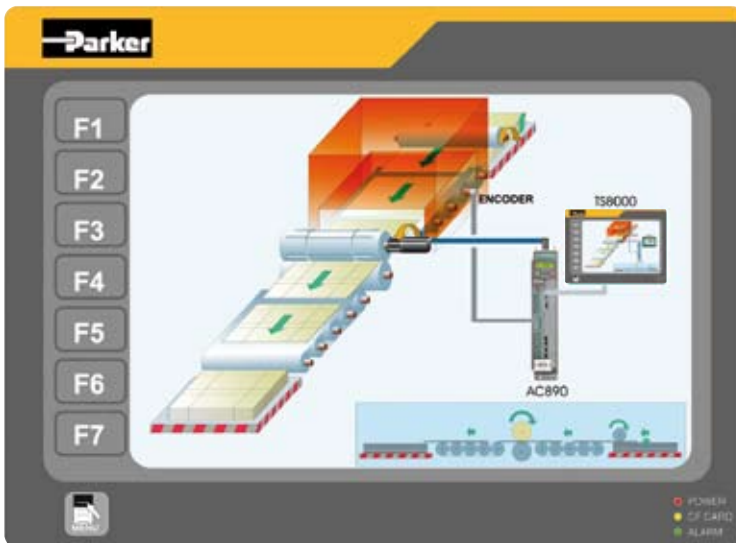
Provides a means of ventilating air directly through the heat sinks and out of the cabinet.

AC890 Application Examples

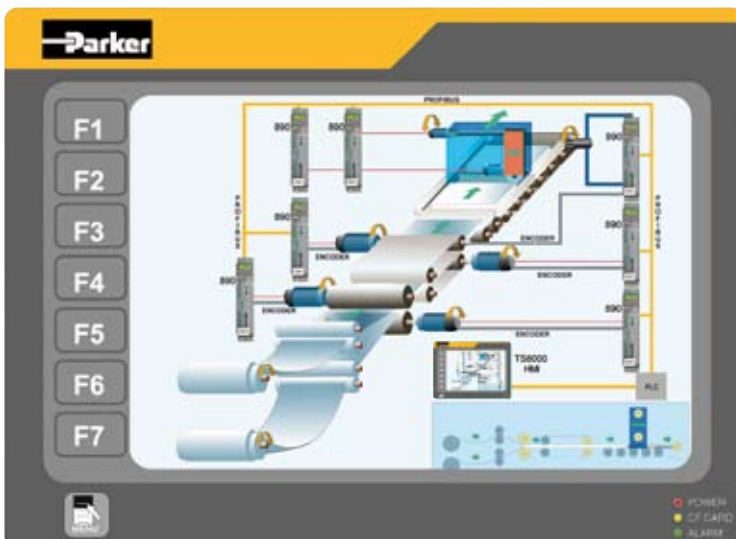
Paper or Metal Finishing



Corrugated Cutting



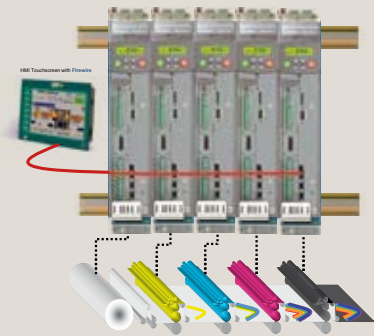
Laminating



Shaftless Registration Control Solutions for Printing

Mechanical line shafts are easily replaced with individual AC890 drives, capable of precise synchronization and printing registration adjustment to each section, guaranteeing perfect alignment of each colour.

AC890 High Performance Level features a library of pre-engineered application specific LINK VM function blocks, including shaftless printing, cut-to-length, precision winding, traversing and others.



The Complete Drive for converting and energy saving:

The AC890 provides precise speed control in a variety of **material converting environments**, including cutting, coating and printing processes.

Additionally, the AC890 provides the technology to **reduce energy consumption** in many traditionally fixed speed applications, such as fans, pumps and compressors.

Specifications (all ratings shown @ 400Vac)

Ratings Common Bus Supply Modules

208 - 500 Vac (+/- 10%) 3 phase

kW	(HP)	Amperes	Frame
15	(20)	32	B
30	(40)	54	B
60	(80)	108	D
90	(120)	162	D

Ratings Common Bus Drive Modules

used with 208 - 230 Vac (+/- 10%) Supplies

kW	(HP)	Amperes		Frame
		Vector / Servo		
0.55	(0.75)	3 / 2.2		B
1.1	(1)	5.5 / 4		B
1.5	(2)	7 / 6		B
2.2	(3)	11 / 8		B
4	(5)	16.5 / 12		B
5.5	(7.5)	24 / 24		C
7.5	(10)	30 / 30		C

Ratings Stand-alone Drive Modules

208 - 240 Vac (+/- 10%) Input - 3 phase

kW	(HP)	Amperes		Frame
		Vector/Servo		
0.55	(0.75)	3 / 2.2		B
1.1	(1)	5.5 / 4		B
1.5	(2)	7 / 6		B
2.2	(3)	11 / 8		B
4	(5)	16.5 / 12		B
5.5	(7.5)	24 / 24		C
7.5	(10)	30 / 30		C

Ratings Stand-alone Drives

380 - 500 Vac (+/- 10%) Input - 3 phase : Frames B to F
 380 - 460 Vac (+/- 10%) Input - 3 phase : G and above

kW	(HP)	Amperes		Frame	kW	(HP)	Amperes		Frame
		Vector/Servo					Vector/Servo		
0.55	(0.75)	2 / 1.5		B	110	(150)	216 / 153		G
1.1	(1)	3.5 / 2.5		B	132	(175)	250 / 171		G
1.5	(2)	4.5 / 3.5		B	160	(200)	316 / 224		G
2.2	(3)	6 / 4		B	180	(250)	361 / 253		G
4.0	(5)	10 / 6		B	200	(300)	375 / 268		H
5.5	(7.5)	12 / 9		B	220	(300)	420 / 300		H
7.5	(10)	16 / 12		B	250	(350)	480 / 336		H
11.0	(15)	24 / 20		C	280	(400)	520 / 368		H
15.0	(20)	30 / 25		C	315	(450)	590 / 411		J
18.5	(25)	39 / 35		D	355	(500)	685 / -		K
22.0	(30)	45 / 38		D	400	(600)	798 / -		K
30.0	(40)	59 / 50		D	500	(700)	988 / -		K
37.0	(50)	73 / 67		E	550	(800)	1028 / -		K
45.0	(60)	87 / 79		E	600	(900)	1120 / -		K
55.0	(75)	105 / 78		F ⁽¹⁾	630	(1000)	1197 / -		K
75.0	(100)	145 / 110		F ⁽¹⁾	800	(1300)	1482 / -		K
90.0	(125)	180 / 135		F ⁽¹⁾	900	(1500)	1681 / -		K

Dimensions

Frame Size	Overall Dimensions					
	H		W		D	
	mm	(in)	mm	(in)	mm	(in)
B	434	(17.1)	72	(2.8)	258.5	(10.2)
C	434	(17.1)	116	(4.6)	258.5	(10.2)
D	434	(17.1)	160	(6.3)	258.5	(10.2)
E	668	(26.3)	257	(10.1)	312	(12.3)
F	720	(28.3)	257	(10.1)	349	(13.7)
G	1042	(41.0)	456	(18.0)	465	(18.3)
H	1177	(46.3)	572	(22.5)	465	(18.3)
J	1288	(50.7)	677	(26.7)	465	(18.3)
K*	2007	(79.0)	3251	(128.0)	610	(24.0)
K**	2007	(79.0)	3658	(144.0)	610	(24.0)

Dimensions are in millimeters (inches)

Horsepower ratings correspond to appropriate motor ratings.

K-frame dimensions include NEMA 12 ventilated enclosures with flange disconnect option

*6-pulse input [12-pulse optional]

**6-pulse input [18-pulse optional]

Please refer to your local regional office for dimensional drawings for each Frame.

Overload Ratings

Vector: 150% for 60 secs / 180% for 0.5 secs

Servo: 200% for 4 secs

Output Frequency

0 - 1000 Hz; V/Hz mode

0 - 350 Hz; closed loop vector mode

0 - 120 Hz; sensorless vector mode

0 - 350 Hz; Servo

Switching Frequency

Frame size B - D: 3,6 or 9 KHz (Vector), 4 KHz (Servo)

Frame size E: 3 or 6 KHz (Vector) 4KHz (Servo)

Frame size F - K: 3 KHz (Vector) 4KHz (Servo)

Frame size G - H: 2.5KHz (Vector) 4KHz (Servo)

Frame size J: 2KHz (Vector) 4KHz (Servo)

Some exceptions apply. All with audibly silent switching frequency

Dynamic Braking

All drive modules have either regenerative braking or dynamic resistor options

Operating Temperature

0°C to 45°C (32°F to 113°F) for frames B-F

0°C to 40°C (32°F to 104°F) for frames G-K

Product Enclosure Rating - IP21

Frame size B-E Open or Enclosed (Type1), frame size F-K Open type suitable for cubicle mount only.

Cubicle Rating

Cubicle to provide 10dB attenuation to radiated emissions between 30-100MHz. Cubicle may also require tool for opening or removing any door or panel.

Humidity

Maximum 85% relative humidity at 40°C non-condensing

Atmosphere

Non flammable, non corrosive and dust free

Climatic Conditions

Class 3k3, as defined by EN50178 (1998)

Vibration

Test Fc of EN60068-2-6

Standards

Pollution Degree

Pollution Degree II (non-conductive pollution, except for temporary condensation)

Europe

When installed in accordance with the manual, this product conforms to the Low Voltage Directive 2006/95/EC.

North America

Complies with US requirements (UL508C) and Canadian requirements (C22.2 No. 14).

⁽¹⁾ Not tested.

Globally Certified

EMC Directive 2004/108/EC

Low Voltage Directive 2006/95/EC

Globally certified and compliant with the most stringent international regulations, the AC890 can be used anywhere in the world.

