AC890

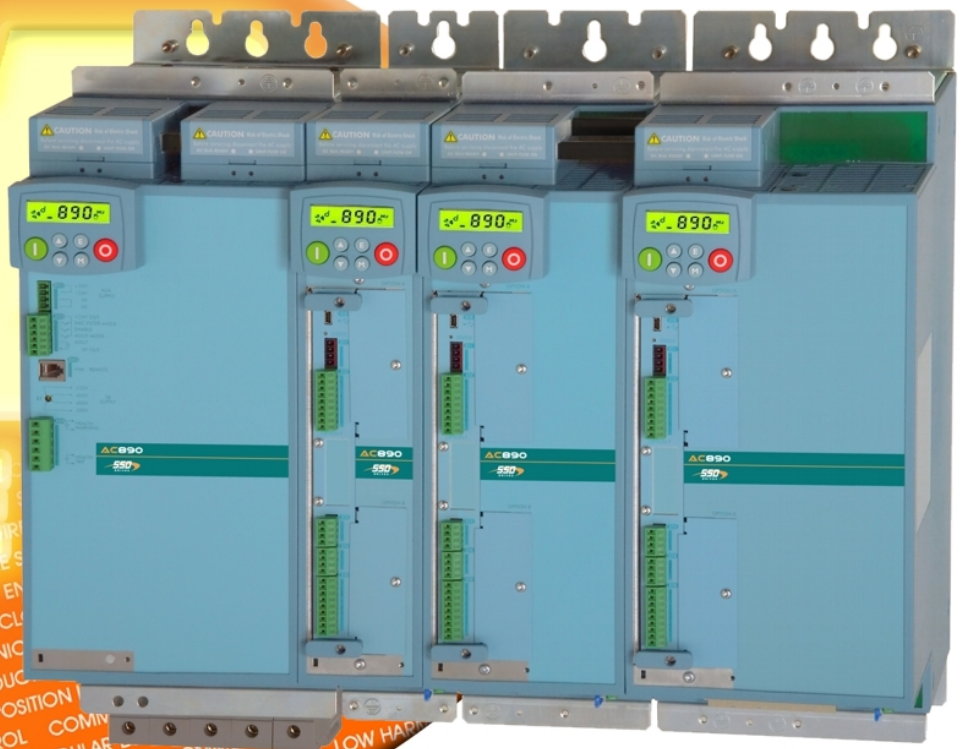
Modular AC Drives for Systems

1 - 1600 HP
1 - 1200 kW

AC V/F, VECTOR AND SERVO MOTOR CONTROL

COMMON BUS SUPPLIES AND INVERTERS

COORDINATED SYSTEM CONTROL



Firewire
Communications
IEEE1394

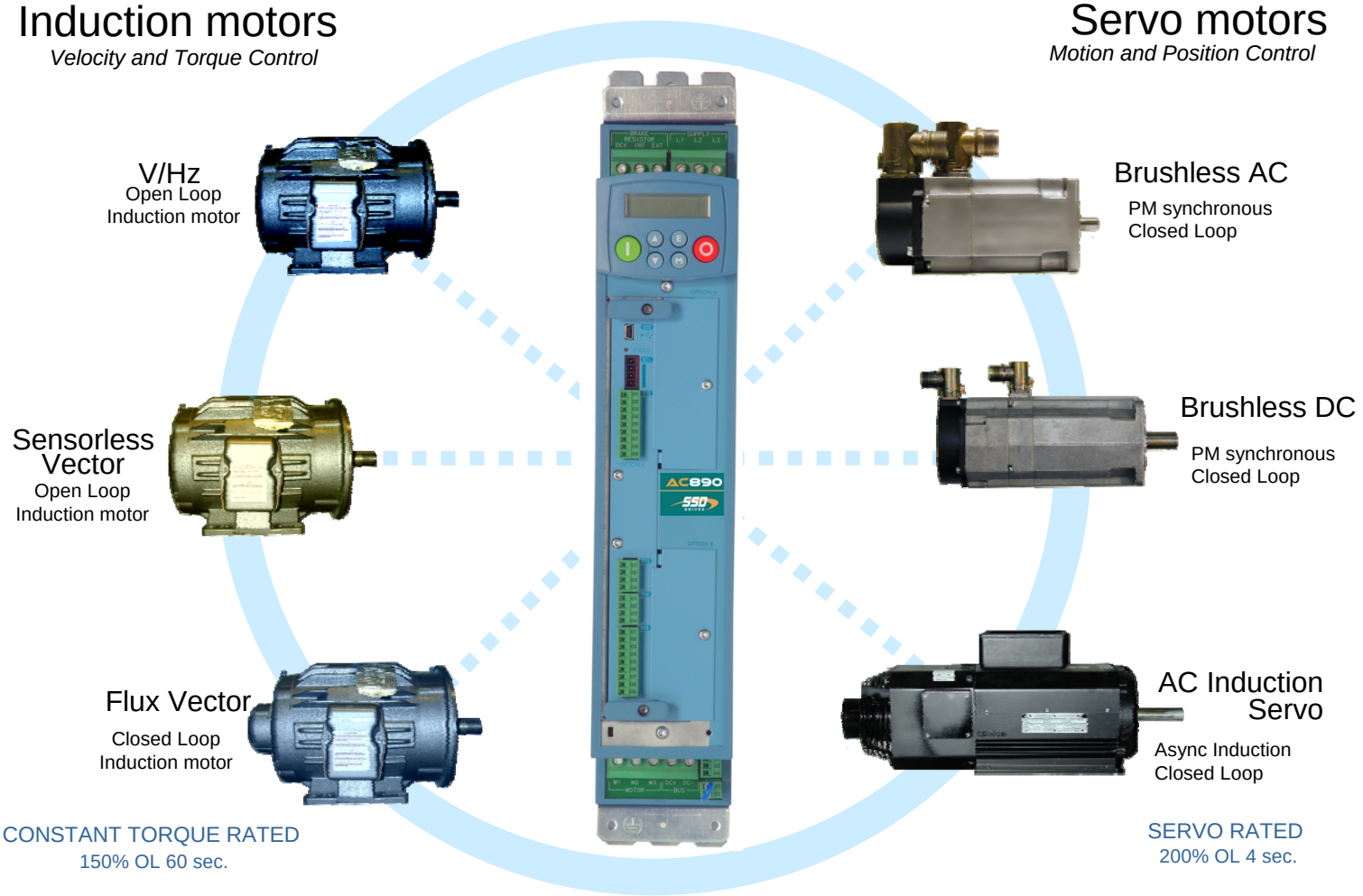
formerly EUROTHERM DRIVES

SSD DRIVES

One Drive Fits All

Induction motors
Velocity and Torque Control

Servo motors
Motion and Position Control



CONSTANT TORQUE RATED
150% OL 60 sec.

SERVO RATED
200% OL 4 sec.

890 is the drive for a wide range of motor types and sizes, through easy to use, pre-defined parameter set-up macros

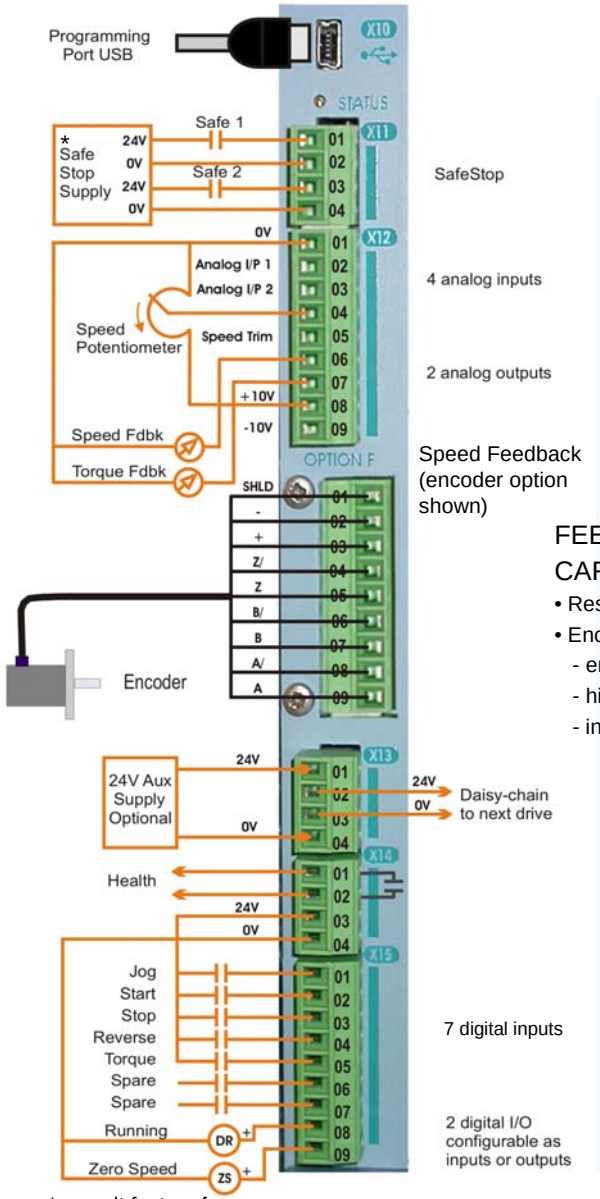
No Matter What Your Application…..

AC890 Drive is The Right Solution!

Control and Option Boards

LOWEST COST
PER NODE!

ONE MAIN CONTROL BOARD

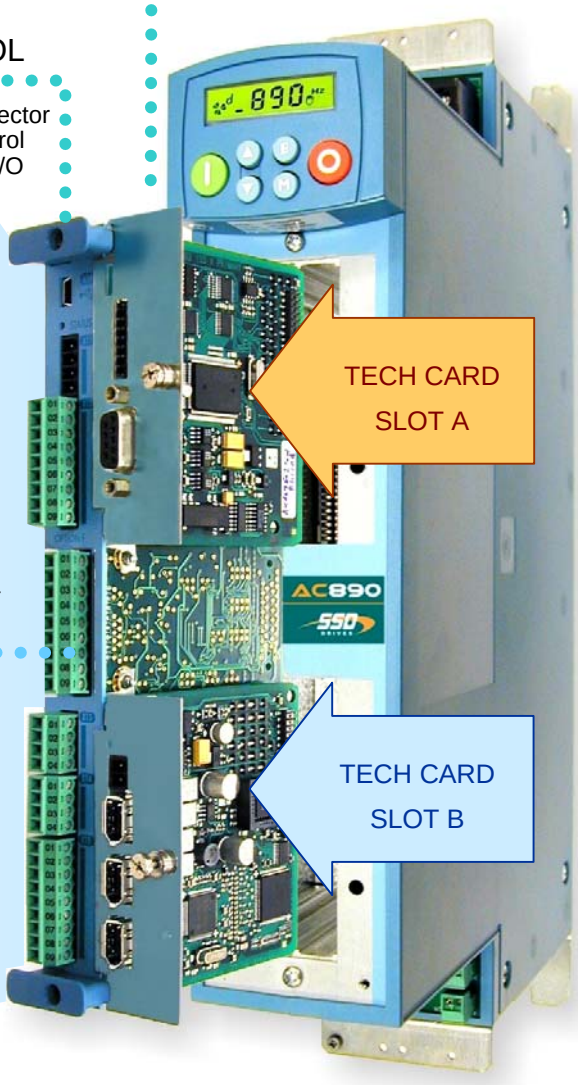


*consult factory for proper usage

Option slot for:
- Expansion I/O card
- Follower board
  (encoder and resolver types)

DIRECT PROCESSING
COMMUNICATIONS
HIGH SPEED
LOW COST

CONTROL BOARD
- V/Hz,SV,Vector
- Servo control
- On-board I/O



FEEDBACK CARD TYPES
- Resolver card
- Encoder card types:
  - enDat (sin/cos)
  - hiperface (sin/cos)
  - incremental encoder

FIELDBUS COMMS
(2 locations)

- DeviceNet
- Profibus
- ControlNet
- Ethernet *(future)*
- ModBus
- CAN
- Firewire*

Why Firewire?

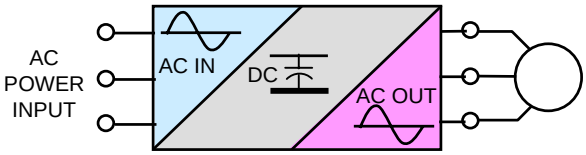
As defined by IEEE 1394, FireWire delivers 400 Mbps performance, 3 orders of magnitude faster than most industrial serial buses and almost 1,000 times faster than other fieldbus networks.

FireWire supports full communications directly from node to node. By bypassing varying delays due to central processing loads, 1394 is fast and deterministic in node-to-node communications, enabling high-performance LINK VM embedded applications without any PC presence.

IEEE1394
Firewire
comms!

Available in 2 Styles

STAND ALONE



a complete AC-input-to-AC motor output controller complete with power input and output terminals, and access to all feedback and networking options

Stand Alone (Complete Drive)

1 - 10 HP
.75 – 7.5 KW

15 - 20 HP
11 - 15 KW

25 - 40 HP
18 - 30 KW

Stand Alone Drives come complete with a built-in Dynamic Brake switch with provisions to add an external resistor.

COMMON BUS

Supply Section

up to 45 HP
up to 30 KW

50 - 135 HP
37 - 90 KW

Drive Section

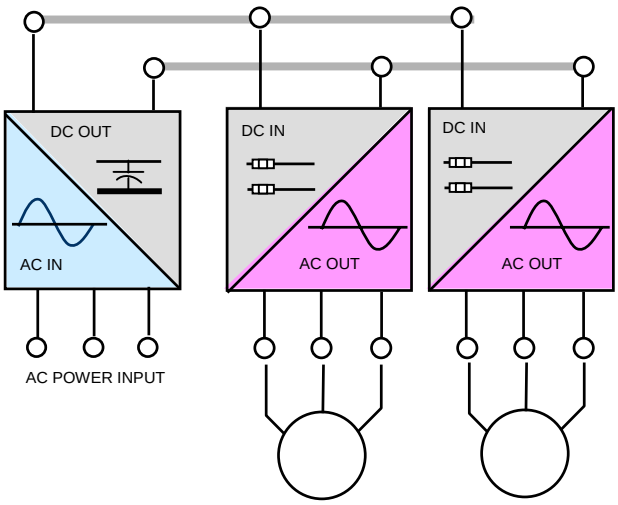
1 - 10 HP
.75 – 7.5 KW

15 - 20 HP
11 - 15 KW

25 - 40 HP
18 - 30 KW

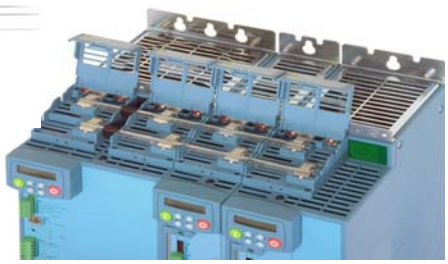
Common Bus Drives (CD) are individual motor output sections that easily connect to a Common Bus Supply (CS) with a unique, easy-to-install DC busbar system

- Integral fusing provides branch protection
- No power interlocks or input reactors required
- Each CD provides access to all feedback and networking options



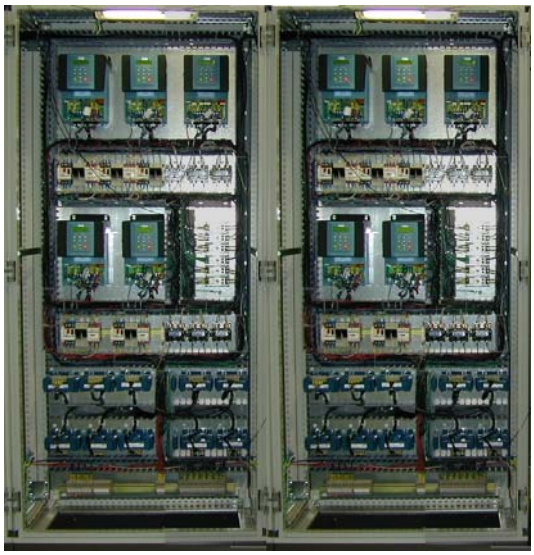
example of Common Bus setup

Simple common bus connection for quick and easy installation



Space and Cost Savings

CONVENTIONAL DRIVE SYSTEM



10-Drive System

- Circuit Breakers
- Fusing
- Line Reactors
- Contactors

Component Reduction

- Enclosure Size
- Engineering
- Wiring
- Other Components
- Switchgear

50% Space Reduction

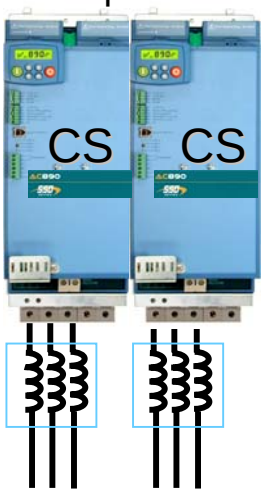
AC890 MODULAR DRIVE SYSTEM

10-Drive System

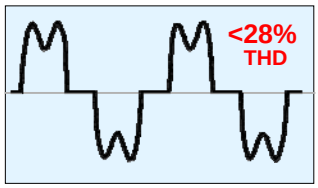
Input Power Configurations

Parallel Input Modules and multi-pulse configurations*

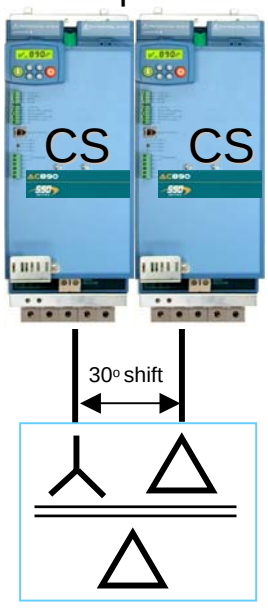
6 pulse



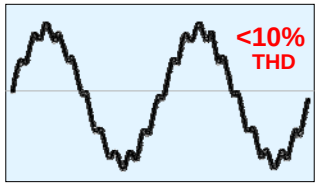
20% de-rate
2 x 60kW x .8 = 96kW



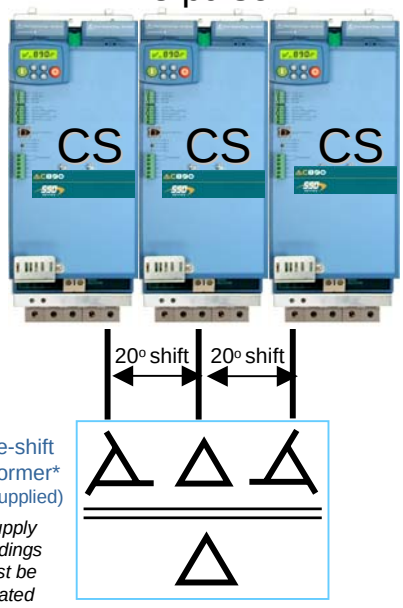
12 pulse



reduced harmonics



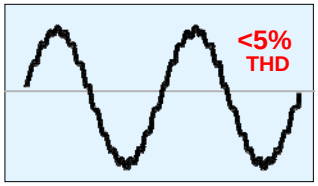
18 pulse



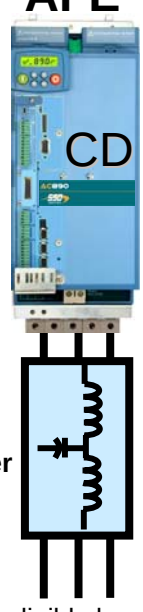
phase-shift transformer* (user supplied)

** supply windings must be isolated*

minimal harmonics



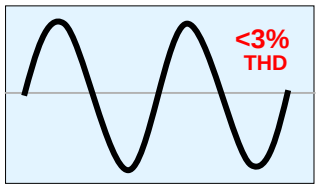
AFE



Line Regenerative Active-Front-End (AFE) types are also available

LCL Filter

negligible harmonics



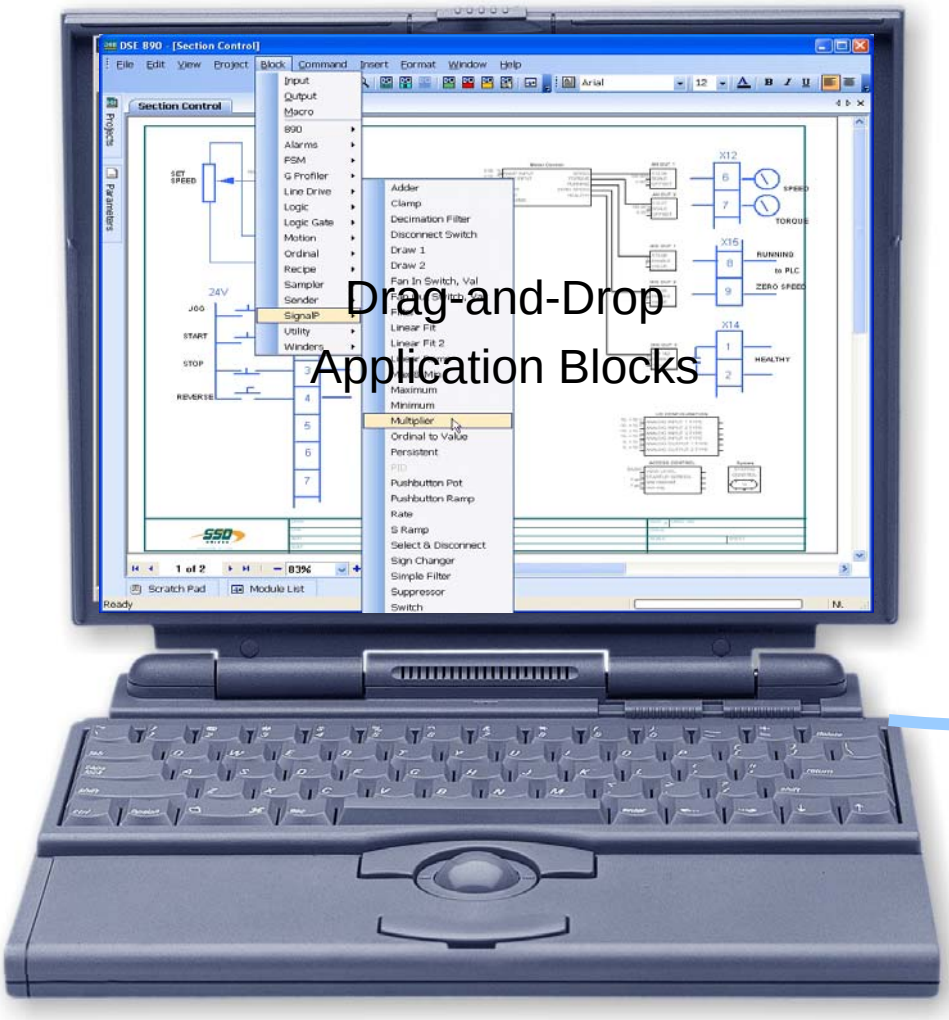
INPUT CURRENT WAVEFORMS

DSE890

Drive System Explorer

Configuration and Monitoring

Fast-and-easy project creation and online monitoring tool

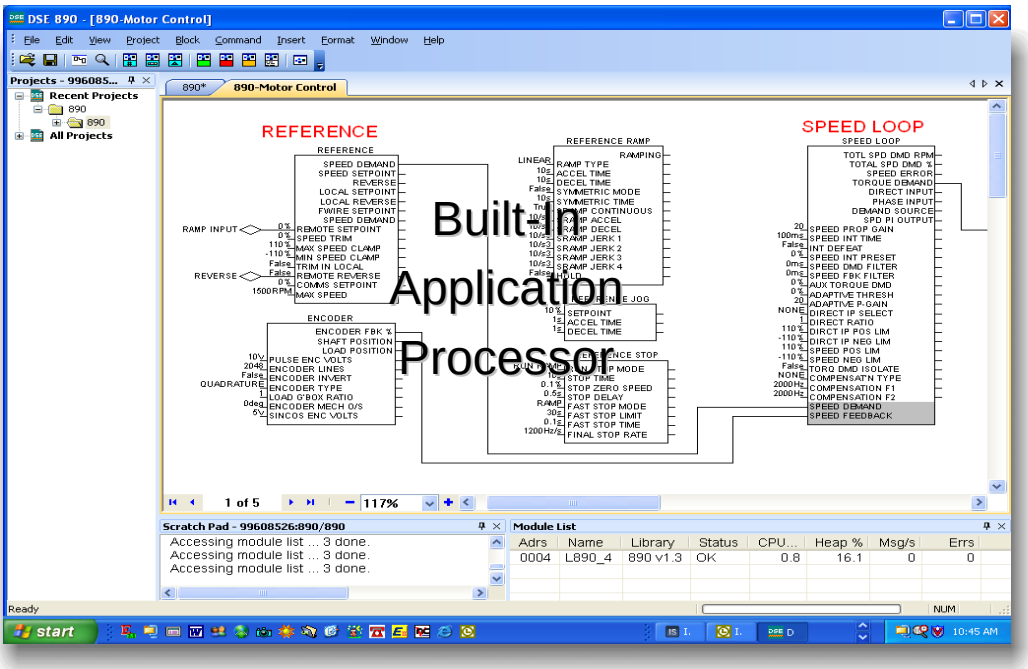


- Build a custom drive system in minutes!

- No costly special firmware builds

AC890

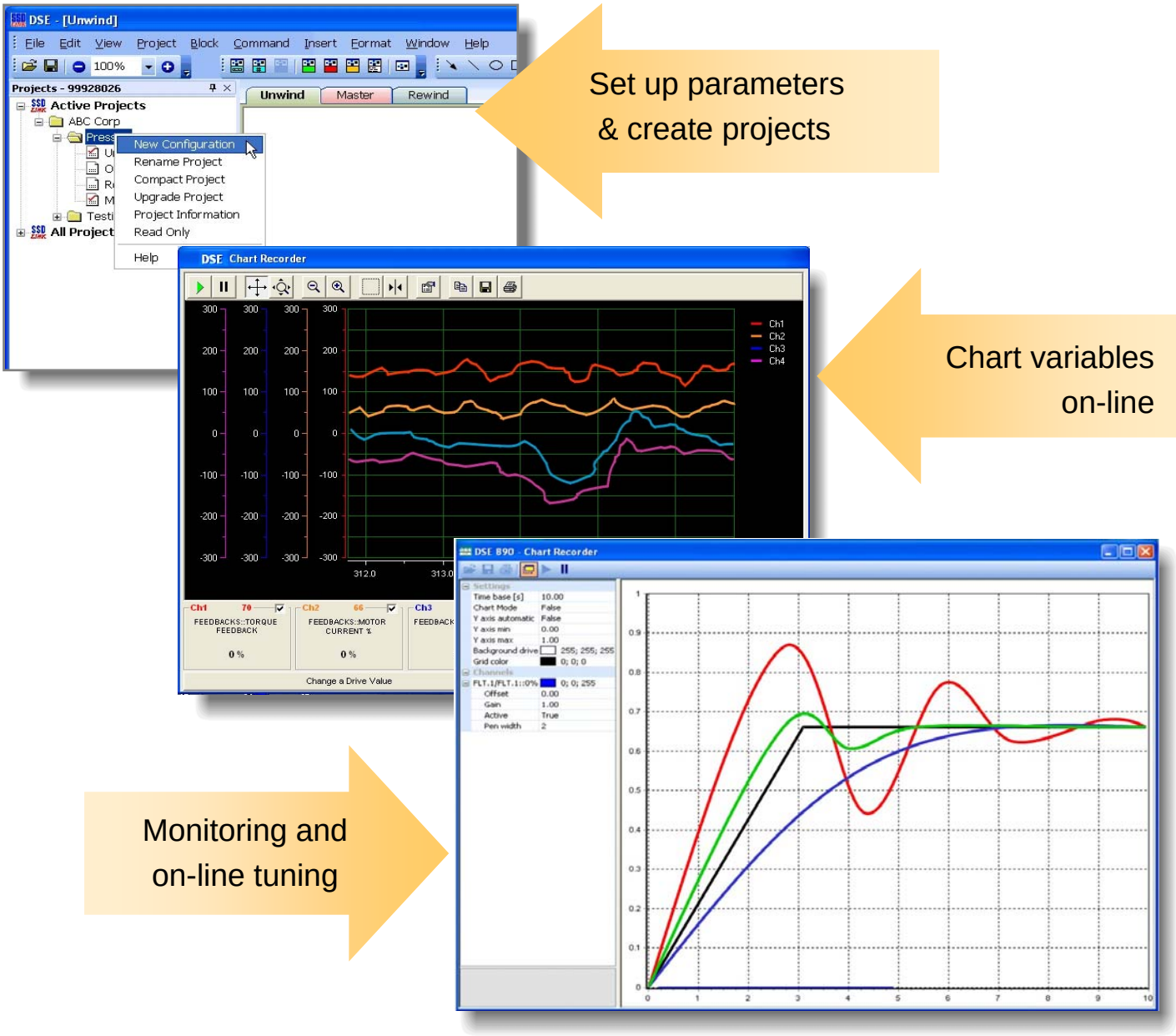
Architecture

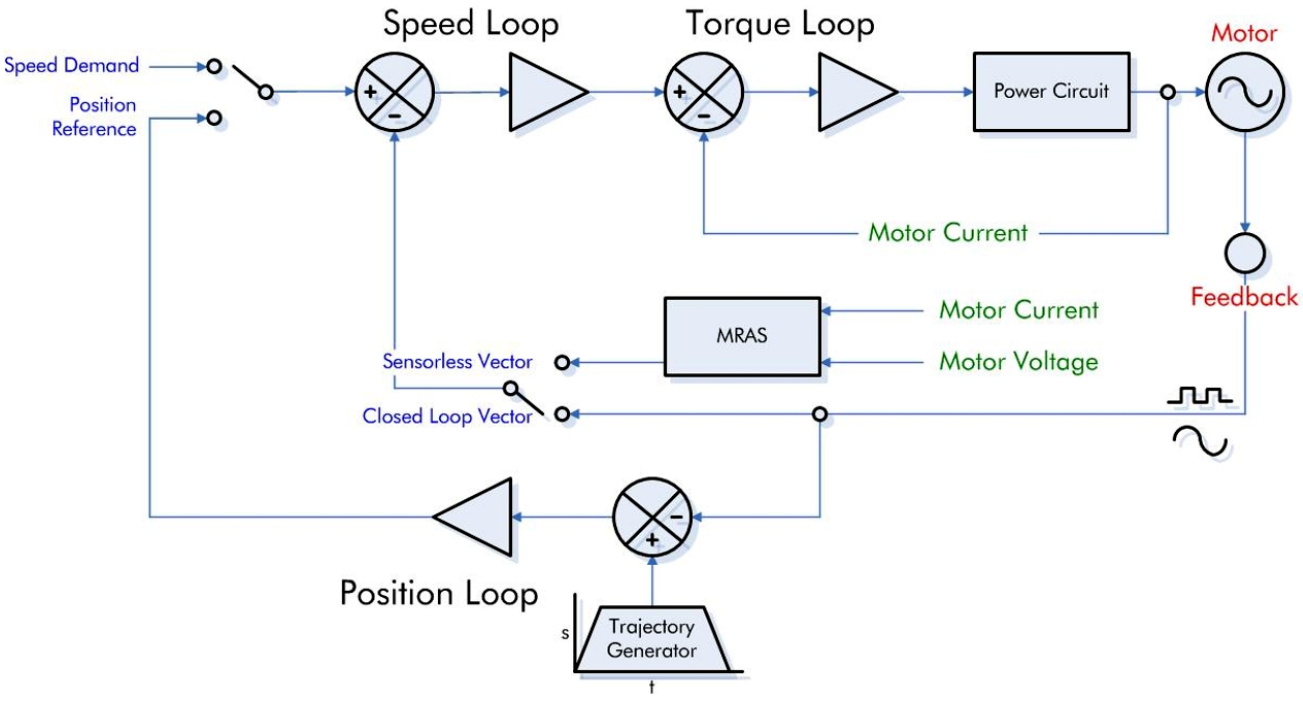


Totally Flexible *LINK* Block Diagram

- 32 bit architecture
- Multiple Configuration Interface
- Graphical Programmability
- Object Oriented Software
- Fully Deterministic

Infinite Possibilities!


DSE - [Unwind]
File Edit View Project Block Command Insert Format Window Help
Projects - 99928026
Active Projects
ABC Corp
New Configuration
Rename Project
Compact Project
Upgrade Project
Project Information
Read Only
Help
Unwind
Master
Rewind
DSE Chart Recorder
Ch1
Ch2
Ch3
Ch4
FEEDBACKS::TORQUE FEEDBACK
FEEDBACKS::MOTOR CURRENT %
Change a Drive Value
DSE B90 - Chart Recorder
Set up parameters & create projects
Chart variables on-line
Monitoring and on-line tuning


Speed Loop
Torque Loop
Motor
Speed Demand
Position Reference
Power Circuit
Motor Current
Feedback
MRAS
Motor Current
Motor Voltage
Sensorless Vector
Closed Loop Vector
Position Loop
Trajectory Generator
s
t

Performance Levels

AC890 can deliver the right level of performance to precisely match your application needs. By offering 3 different performance level packages, your AC890 system has the flexibility to meet all of your demands.

LEVEL

1 STANDARD PERFORMANCE

Basic LINK VM function blocks: Math functions, Boolean Logic, Timers, Counters, One Shots, Threshold Comparators, Latches, and others.

2 ADVANCED PERFORMANCE

Standard Features, plus: 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 (SPW, CPW), full function PID, state machine, and others.

3 HIGH PERFORMANCE

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

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 color.

AC890 HIGH PERFORMANCE LEVEL features a library of pre-engineered application specific LINK VM function blocks, including shaftless printing, precision camming, cut-to-length, precision winding, traversing and others.

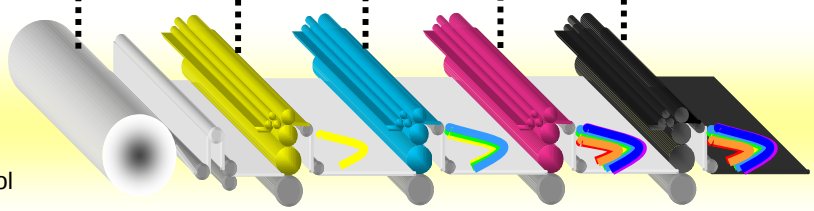
FireWire

(IEEE1394)

HMI Touchscreen with **Firewire**

- HIGH SPEED: 125uS cycle time
- Time synchronization
- 400MB network speed
- 10 - 40x more performance than SERCOS
- Already the choice for 3-4 major servo motion control suppliers

Firewire provides *synchronized data transfer* for Print Registration Control

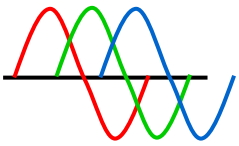


Line Regenerative Solutions

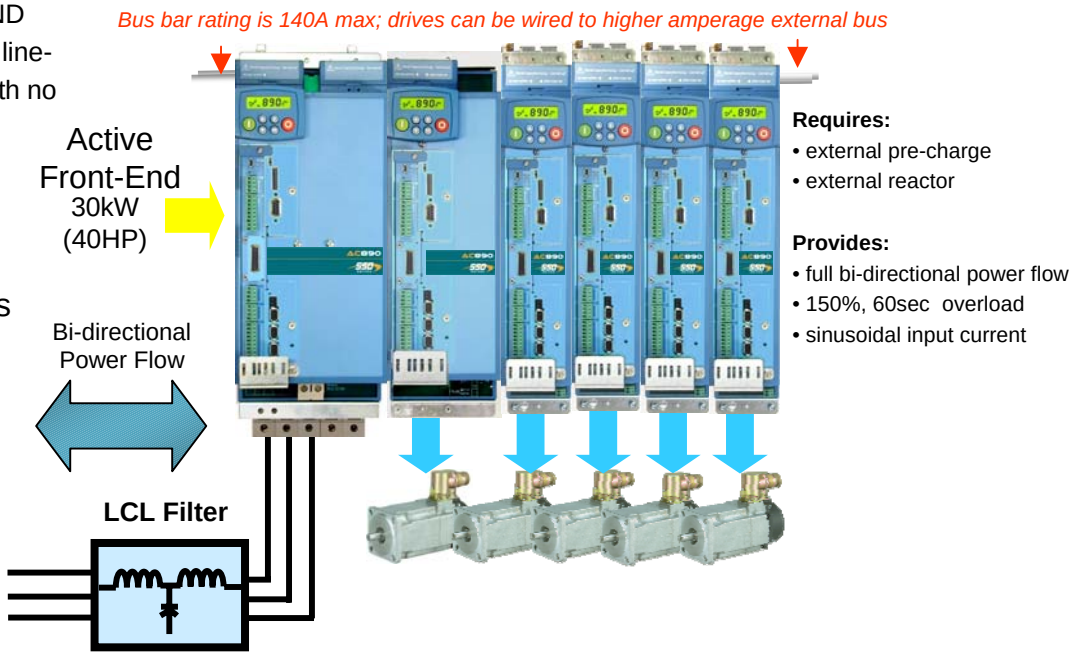
ACTIVE FRONT ENDS for CLEAN POWER

Common Bus Drive sections can also be configured as ACTIVE-FRONT-END INPUT SECTIONS, providing true line-regenerative 4-quadrant control with no harmonics

- Fully Line Regenerative
- Low Power Line Harmonics
- UNITY POWER FACTOR

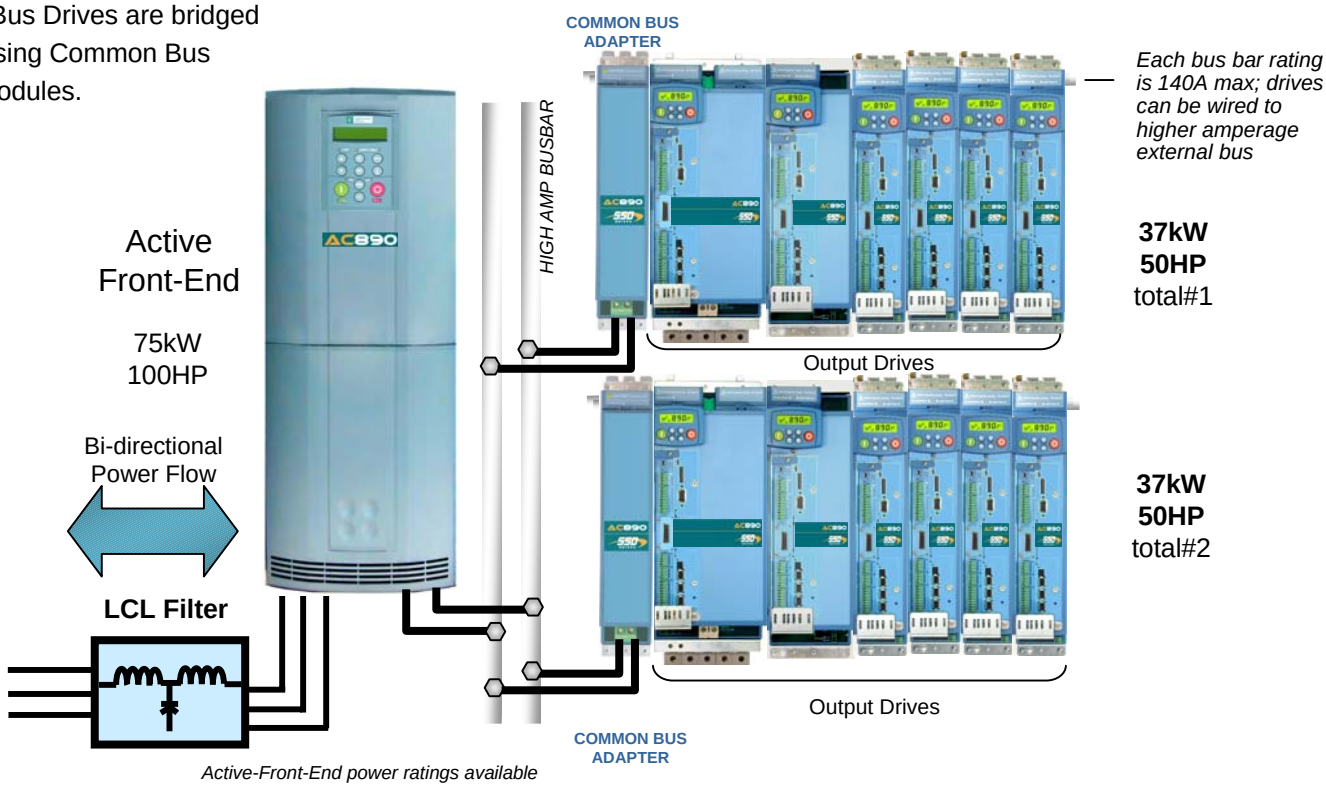


Typical 30kW (40HP) Line Regenerative System



Larger AC890 systems can be matched with separate higher-power Active Front End units. Multiple rows of AC890 Common Bus Drives are bridged together using Common Bus Adapter modules.

Typical 75kW (100HP) Line Regenerative System



Active-Front-End power ratings available through 1200KW (1600HP)

AC890 FRAME SIZES and SPECIFICATIONS

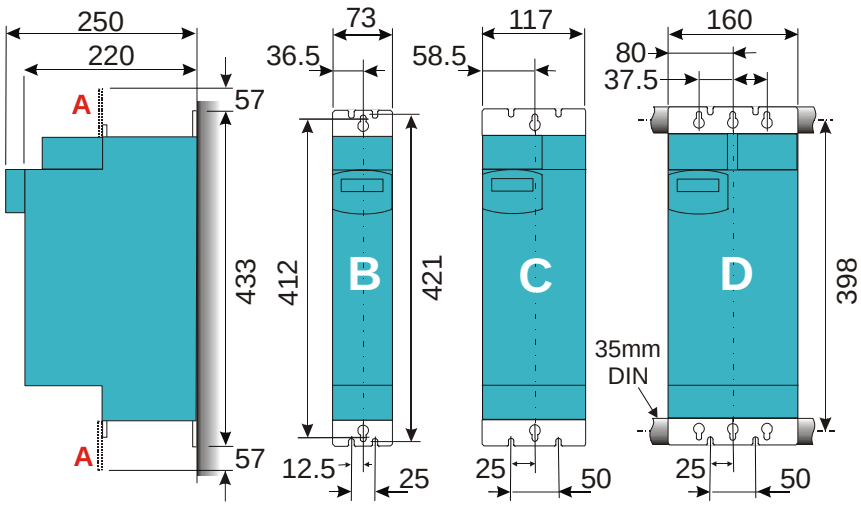
B

C

D

E

Bookshelf Frames



AC890 Frame Dimensions

Frame Size	Overall Dimensions			Mounting Centers		
	H	W	D	H1	H2	W2
B	434 (17.1)	72 (2.9)	258.5 (10.2)	414 (16.3)	-	-
C	434 (17.1)	116 (4.6)	258.5 (10.2)	414 (16.3)	-	-
D	434 (17.1)	160 (6.3)	258.5 (10.2)	414 (16.3)	-	-
E	668 (26.3)	257 (10.1)	312 (12.3)	630 (24.8)	-	150 (5.90)
F	720 (28.3)	257 (10.1)	349 (13.74)	700 (27.5)	-	150 (5.90)
G	1042 (41.0)	456 (17.9)	465 (18.3)	300 (11.8)	16 (0.6)	420 (16.5)
H	1177 (46.3)	572 (22.5)	465 (18.3)	300 (11.8)	16 (0.6)	536 (21.1)
J	1288 (50.7)	677 (26.6)	465 (18.3)	300 (11.8)	16 (0.6)	641 (25.2)
K*	2007 (79)	3251 (128)	610 (24)	-	-	-
K**	2007 (79)	3658 (144)	610 (24)	-	-	-

Dimensions are in millimeters (inches)

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

* 6-pulse input (12-pulse optional)

** 6-pulse input (18-pulse optional)

Part# Decoder:

Voltage Rating:
2 = 230 Vac, **4** = 400 -460 Vac,
5 = 500 Vac

Cont. Current Rating: Frame Size
XXXXx = Output RMS Amps @ 400Vac for CD and SD Units
: Input RMS Amps for CS Units
xxxx**X** : Letter suffix is the frame size designation (B thru K)

890SD/ 5 / 0010B / B / 00 / A / xx

Destination:
xx = Country Code

Product Type:
CS = Common Bus Supply
CD = Common Bus Drive
CA = Common Bus Adaptor
SD = Standalone Drive

Braking Control:
N = No Braking or N/A
B = Braking Switch incl.

Build Options:
00 = None
1F = 110VFan
2F = 230V Fan

Performance Level:
S = Standard
A = Advanced
H = High Performance

AC890 Common Bus Supplies
230 - 500 VAC (+/- 10%) 3-phase

Part Number	HP @460Vac	HP @230Vac	Input Amps	Frame
890CS/5/0032B/B/00/N/EN	25	10	32	B
890CS/5/0054B/B/00/N/EN	45	20	54	B
890CS/5/0108D/B/00/N/EN	75	40	108	D
890CS/5/0162D/B/00/N/EN	135	60	162	D

AC890 Common Bus Drives
used with 208 - 230 VAC (+/-10%) Supplies - 3 phase (890CS)

Part Number	HP@230Vac	Output Amps @230Vac	Frame
890CD/2/0003B/N/00/S/US	0.75	3.0	B
890CD/2/0005B/N/00/S/US	1.5	5.5	B
890CD/2/0007B/N/00/S/US	2	7.0	B
890CD/2/0011B/N/00/S/US	3	11	B
890CD/2/0016B/N/00/S/US	5	16.5	B
890CD/2/0024C/N/00/S/US	7.5	24	C
890CD/2/0030C/N/00/S/US	10	30	C

AC890 Common Bus Drives
used with 380 - 500 (+/- 10%) VAC Supplies - 3 phase (890CS)

Part Number	HP@460Vac	Output Amps @460Vac	Frame
890CD/5/0002B/N/00/S/US	1	2.0	B
890CD/5/0003B/N/00/S/US	1.5	3.5	B
890CD/5/0004B/N/00/S/US	2	4.5	B
890CD/5/0006B/N/00/S/US	3	5	B
890CD/5/0010B/N/00/S/US	5	8	B
890CD/5/0012B/N/00/S/US	7.5	12	B
890CD/5/0016B/N/00/S/US	10	14	B
890CD/5/0024C/N/00/S/US	15	24	C
890CD/5/0030C/N/00/S/US	20	27	C
890CD/5/0039D/N/00/S/US	25	35	D
890CD/5/0045D/N/00/S/US	30	40	D
890CD/5/0059D/N/00/S/US	40	52	D
890CD/4/0073E/N/00/S/US	50	73	E
890CD/4/0087E/N/00/S/US	60	87	E
890CD/4/0105F/N/1F/S/US	75	100	F
890CD/4/0145F/N/1F/S/US	100	130	F
890CD/4/0156F/N/1F/S/US	125	156	F
890CD/4/0180F/N/1F/S/US	150	180	F

Note 1: The braking switch is optional on these models, please refer to figure one (Dynamic Braking Field) for guidance.

Note 2: The 890 comes in three performance level configurations, Standard, Advanced and High. The part#'s shown above 890SD/x/xxxxx/x/xx/**S**/xx are for **S**tandard Performance models, for **A**dvanced models replace the Performance Level field designator with an **A**, and for **H**igh Performance models use an **H.**

F

G, H, J

K

AC890 Stand-alone Drives

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

Part Number	HP@230Vac	Output Amps @230Vac	Frame
890SD/2/0003B/B/00/S/US	0.75	3.0	B
890SD/2/0005B/B/00/S/US	1.5	5.5	B
890SD/2/0007B/B/00/S/US	2	7.0	B
890SD/2/0011B/B/00/S/US	3	11	B
890SD/2/0016B/B/00/S/US	5	16.5	B
890SD/2/0024C/B/00/S/US	7.5	24	C
890SD/2/0030C/B/00/S/US	10	30	C

AC890 Stand-alone Drives

380 - 500 VAC (+/- 10%) Input - 3 Phase: Frames B thru D
380 - 460 VAC (+/- 10%) Input - 3 Phase: Frames E and Higher

Part Number	HP@460Vac	Output Amps @460Vac	Frame
890SD/5/0002B/B/00/S/US	1	2.0	B
890SD/5/0003B/B/00/S/US	1.5	3.5	B
890SD/5/0004B/B/00/S/US	2	4.5	B
890SD/5/0006B/B/00/S/US	3	5	B
890SD/5/0010B/B/00/S/US	5	8	B
890SD/5/0012B/B/00/S/US	7.5	12	B
890SD/5/0016B/B/00/S/US	10	14	B
890SD/5/0024C/B/00/S/US	15	24	C
890SD/5/0030C/B/00/S/US	20	27	C
890SD/5/0039D/B/00/S/US	25	35	D
890SD/5/0045D/B/00/S/US	30	40	D
890SD/5/0059D/B/00/S/US	40	52	D
890SD/4/0073E/B/00/S/US	50	73	E
890SD/4/0087E/B/00/S/US	60	87	E
890SD/4/0105F/B/1F/S/US	75	100	F
890SD/4/0145F/B/1F/S/US	100	130	F
890SD/4/0156F/B/1F/S/US	125	156	F
890SD/4/0180F/B/1F/S/US	150	180	F
890SD/4/0216G/(note1)/1F/S/US	175	216	G
890SD/4/0250G/(note1)/1F/S/US	200	250	G
890SD/4/0316G/(note1)/1F/S/US	250	316	G
890SD/4/0361G/(note1)/1F/S/US	300	361	G
890SD/4/0420H/(note1)/1F/S/US	350	420	H
890SD/4/0480H/(note1)/1F/S/US	400	480	H
890SD/4/0520H/(note1)/1F/S/US	450	520	H
890SD/5/0590J/(note1)/1F/S/US	500	590	J
890SD/5/0685K/(note1)/1F/S/US	600	685	K (2xG)
890SD/5/0798K/(note1)/1F/S/US	700	798	K (2xH)
890SD/5/0988K/(note1)/1F/S/US	800	988	K (2xH)
890SD/5/1028K/(note1)/1F/S/US	900	1028	K (3xG)
890SD/5/1120K/(note1)/1F/S/US	1000	1120	K (2xJ)
890SD/5/1197K/(note1)/1F/S/US	1000	1197	K (3xH)
890SD/5/1482K/(note1)/1F/S/US	1300	1482	K (3xH)
890SD/5/1681K/(note1)/1F/S/US	1500	1681	K (3xJ)

AC890 Specifications and Operating Conditions

Overload
Constant Torque Ratings: 150% for 60 seconds,180% for 1 second
Servo Torque Ratings: Consult Factory

Output Frequency
0 -1000 Hz; V/Hz mode
0 - 350 Hz; closed loop vector mode
0 - 120 Hz; sensorless vector mode

Switching Frequency
Frame size B - D: 3 KHz (standard), 4 or 8 KHz (servo)
Frame size E: 3 or 6 KHz
Frame size F: 3 KHz
Frame size G - H: 2.5 KHz
Frame size J: 2 KHz
- some exceptions apply; all with audibly silent switching frequency

Dynamic Braking
Frame size B - F Stand Alone types have built-in switch with option for external resistor
Frame size B & D CS modules have built-in switch with option for external resistor
Frame size G - K have option for external brake switch and external resistor

Operating Temperature
0°C to 45°C (32°F to 113°F) through frame F
0°C to 40°C (32°F to 104°F) frames G and above

Product Enclosure Rating
IP20 - UL (c-UL) Open Type (North America/Canada)
Suitable for cubicle mount only

Enclosure Rating
Enclosure to provide 15dB attenuation to radiated emissions between 30-100MHz. It must also need a security tool for opening

Humidity
Maximum 90% relative humidity at 40°C non-condensing

Atmosphere
Non flammable, non corrosive and dust free

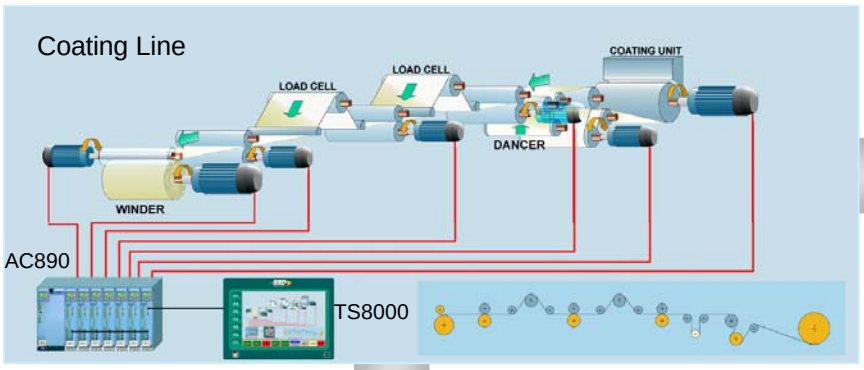
Climatic Conditions
Class 3k3, as defined by EN50178 (1998)

Vibration
Test Fc of EN60068-2-6

STANDARDS
Pollution Degree
Pollution Degree II (non-conductive pollution, except for temporary condensation)
Europe
When fitted inside an enclosure, this product conforms with the Low Voltage Directive 73/23/EEC with amendment 93/68/EEC, Article 13 and Annex III using EN50178 (1998) to show compliance.
North America/ Canada
Complies with the requirements of UL508C as an open-type drive.

AC890 Application Examples

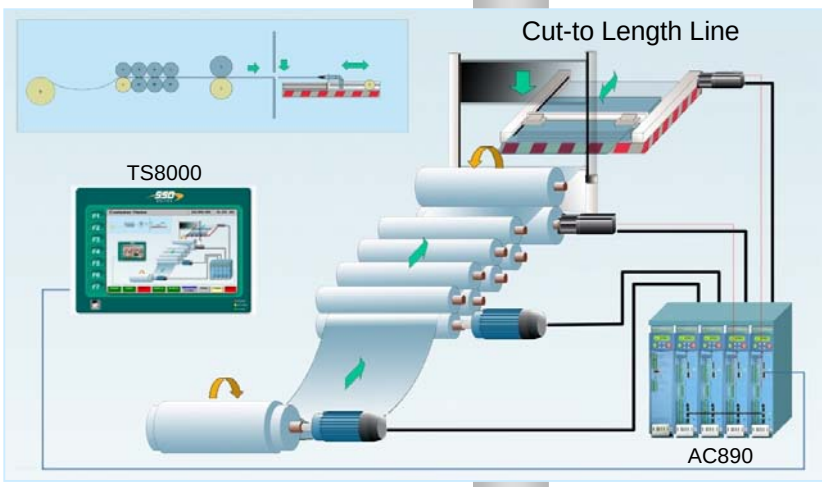
COATING



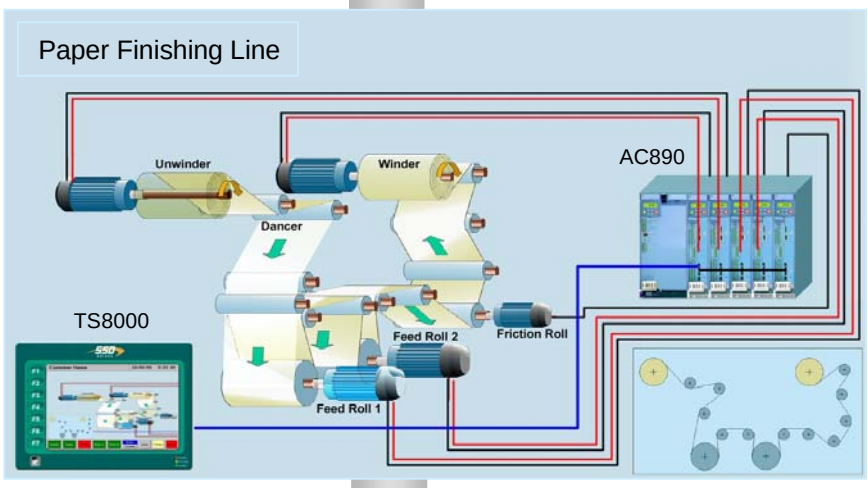
FireWire

(IEEE1394)

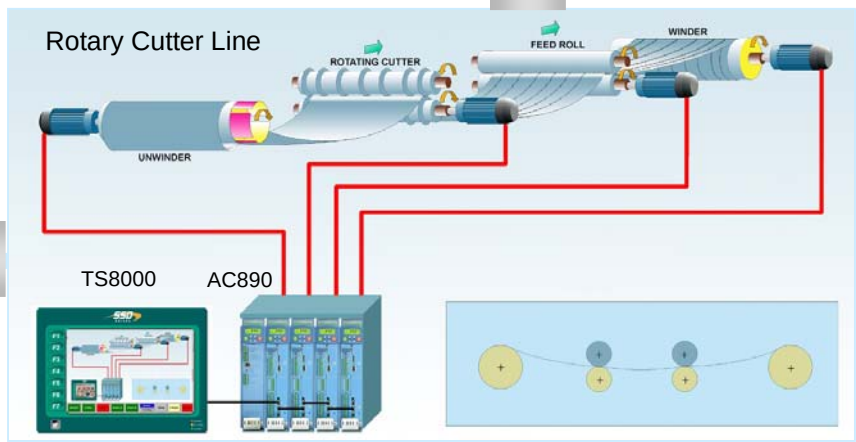
CUT TO LENGTH



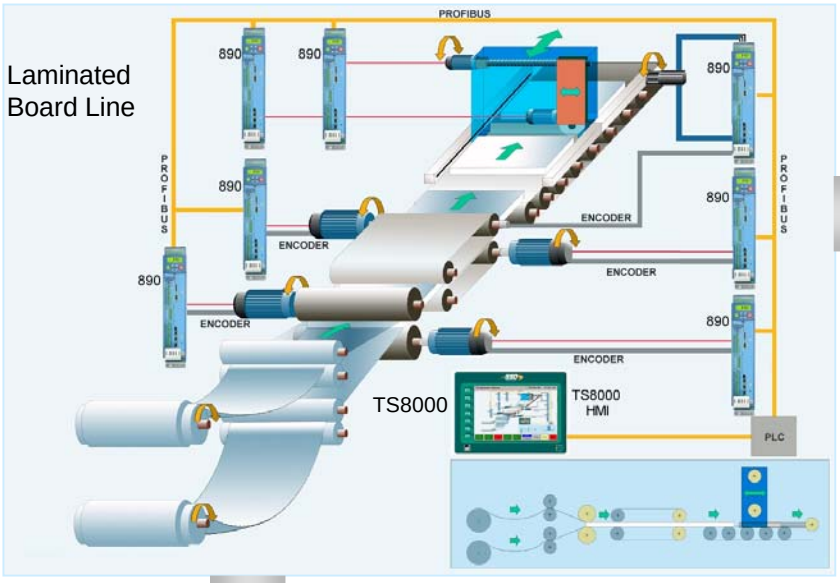
PAPER FINISHING



ROTARY CUTTING



Laminated
Board Line



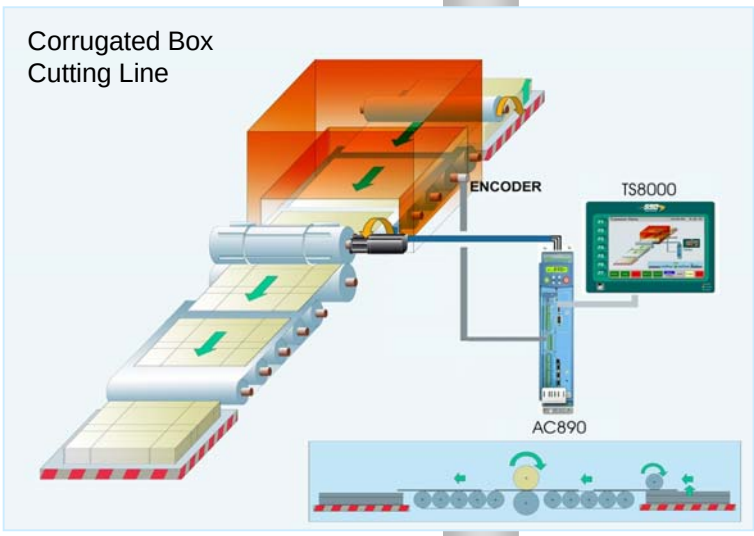
LAMINATING

FireWire

(IEEE1394)

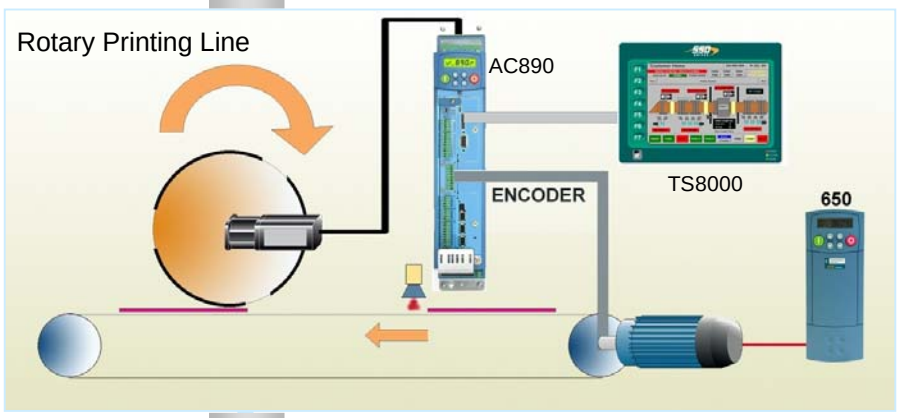
CORRUGATING AND CUTTING

Corrugated Box
Cutting Line



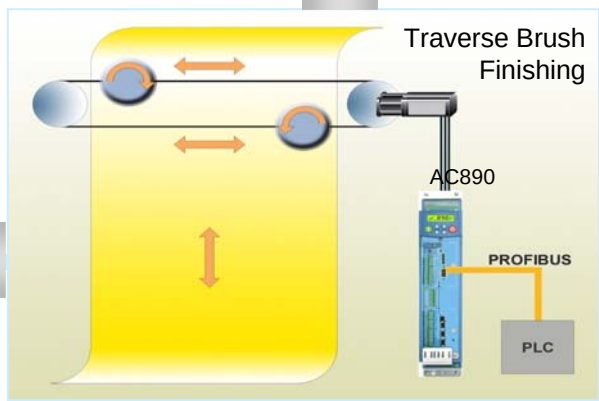
PRINTING

Rotary Printing Line

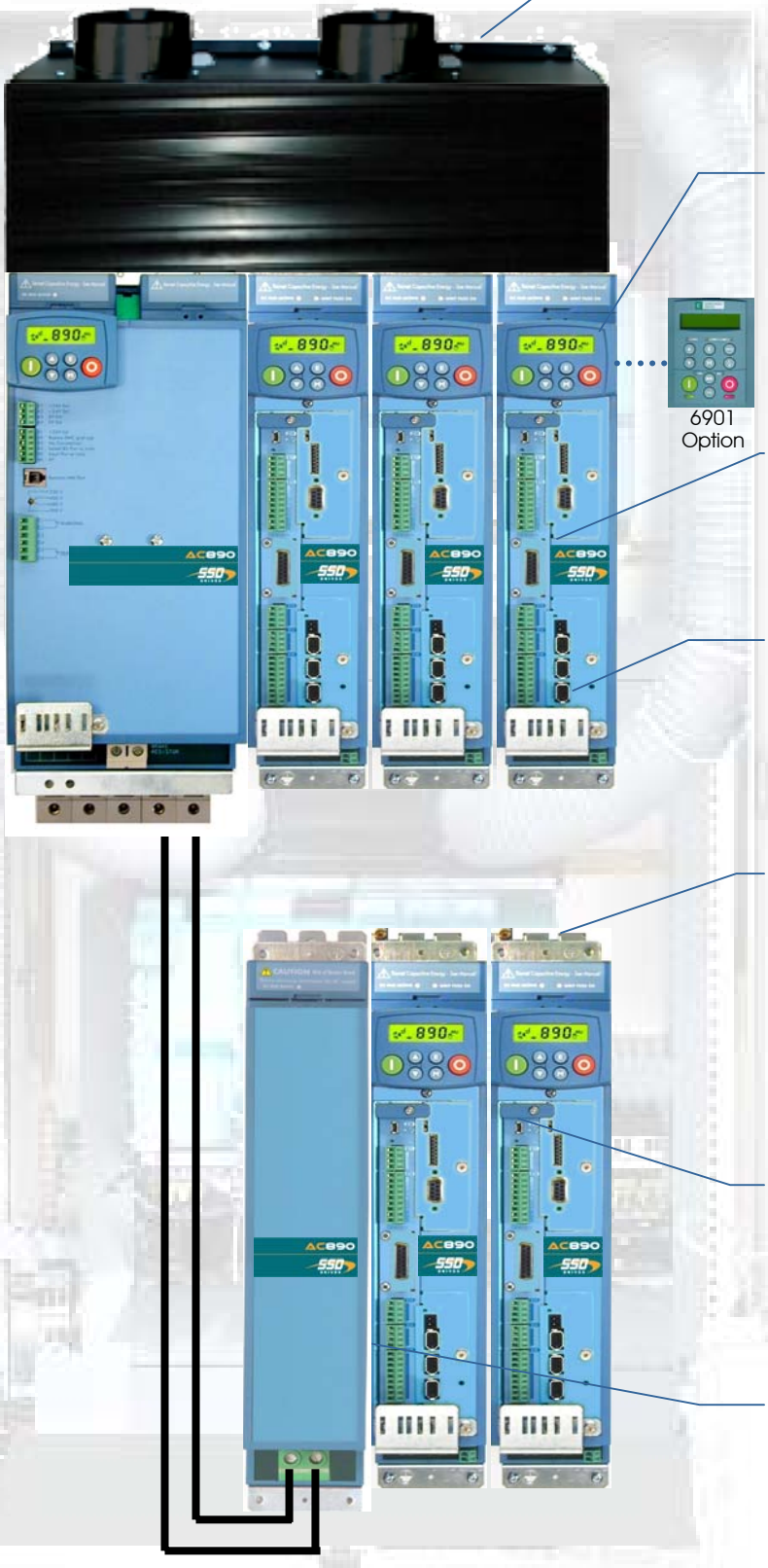


FINISHING

Traverse Brush
Finishing



Options and Accessories



1 Duct Components

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

2 Keypad Options

Allow you to view your drive parameters on an alpha numeric keypad. Remote mount your existing keypad or an alpha numeric keypad.

3 Feedback Options

Increase your drive's performance by adding speed/position feedback options.

4 Communications

Send and receive data from a wide variety of PLC's and operator stations.

5 Bus Bars

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

6 Software

Program and configure, chart, monitor, save and clone your drives.

7 Common Adapter

Effortlessly join rows of drives together. The RT version also allows you to add additional capacitance to a system, providing greater ride through capability.

AC 890 Options and Accessories

1

190 CFM Fan Kit

1 Meter Exhaust Duct

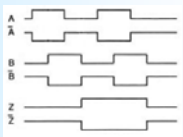
2

6511

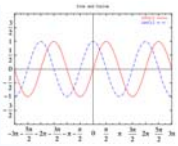
6901

3m Cable

3



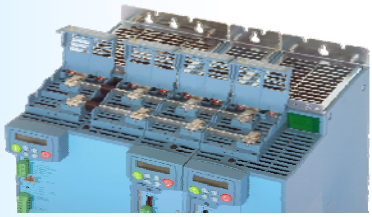
Quadrature Encoder



Sin/Cos

4

5

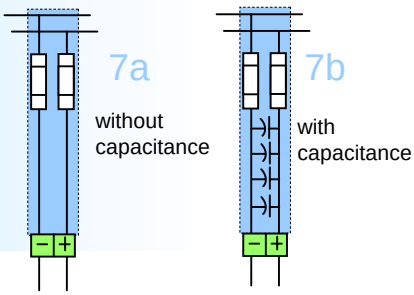


1m Lengths - 140 Amps Max

6

DSE Software

7



8

FireWire/1394 cables

Reference Number	Description	Catalog Number
1	**Duct Kit**	
1a	Duct Kit (1 Meter Exhaust Duct + 1 Fan Kit)	8905/DUCTKIT/190
1b	Fan Kit	8905/DUCTFAN/190
1c	Frame E & F Duct Kits	LA466717U004 (E) 003 (F)
2	**Keypad Options**	
2a	Alphanumeric Keypad	6901
2b	Remote Mounting Kit for 6901	6052/00
2c	Spare LCD Keypad	6511
3	**Feedback Cards**	
3a	Encoder Quadrature	8902/EQ/00/FF
3b	EnDat 2.1 Encoder (Sin/Cos, Heidenhain)	8902/E1/00/FF
3c	Hiperface Encoder Ref (Sin/Cos, Stegmann)	8902/HR/00/FF
3d	Resolver (Standard for Servo)	8902/RE/00/FF
4	**Communication Expansion Boards**	
4a	CanOpen Fieldbus	8903/CB/00/FF
4b	Controlnet Fieldbus	8903/CN/00/FF
4c	DeviceNet Fieldbus	8903/DN/00/FF
4d	EtherNet Fieldbus (IP)	8903/EN/00/FF
4e	Firewire 1394a, 890 LAN Comm's	8903/FA/00/FF
4f	ProfiBus DP Fieldbus	8903/PB/00/FF
5	**Bus Bars**	
5a	1 M Length, SSD Rail/ Bus Bar, 140 Amps	BH465850
6	**Software**	
6a	DSE 890 Lite CD w/Cable Kit	8906/DSELITE/00
6b	DSE 890 Run Time CD w/Cable Kit	8906/DSERUN/00
6c	DSE 890 Development w/ Cable Kit	8906/DSEDEV/00
7	**Common Bus Adapter**	
7a	50HP, 80A DC, without Capacitance	890CA/5/0080B/N/00/N/EN
7b	40HP, 50A DC, with Capacitance	890CA/5/0050B/N/RT/N/EN
8	**Firewire Cables**	
8a	200 mm FireWire Cable	8905/FWCBL200/00
8b	280 mm FireWire Cable	8905/FWCBL280/00
8c	1000 mm FireWire Cable	8905/FWCBL1000/00
8d	4500 mm FireWire Cable	8905/FWCBL4500/00

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