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**EMERSON**<sup>TM</sup>  
Industrial Automation



**Unidrive SP**  
Free Standing  
Fully Engineered AC Drives

125 - 2,450hp (90kW - 1.6MW)  
380 - 480V / 575V - 690V



# Unidrive SP Free Standing, Ready to Run Large Drives

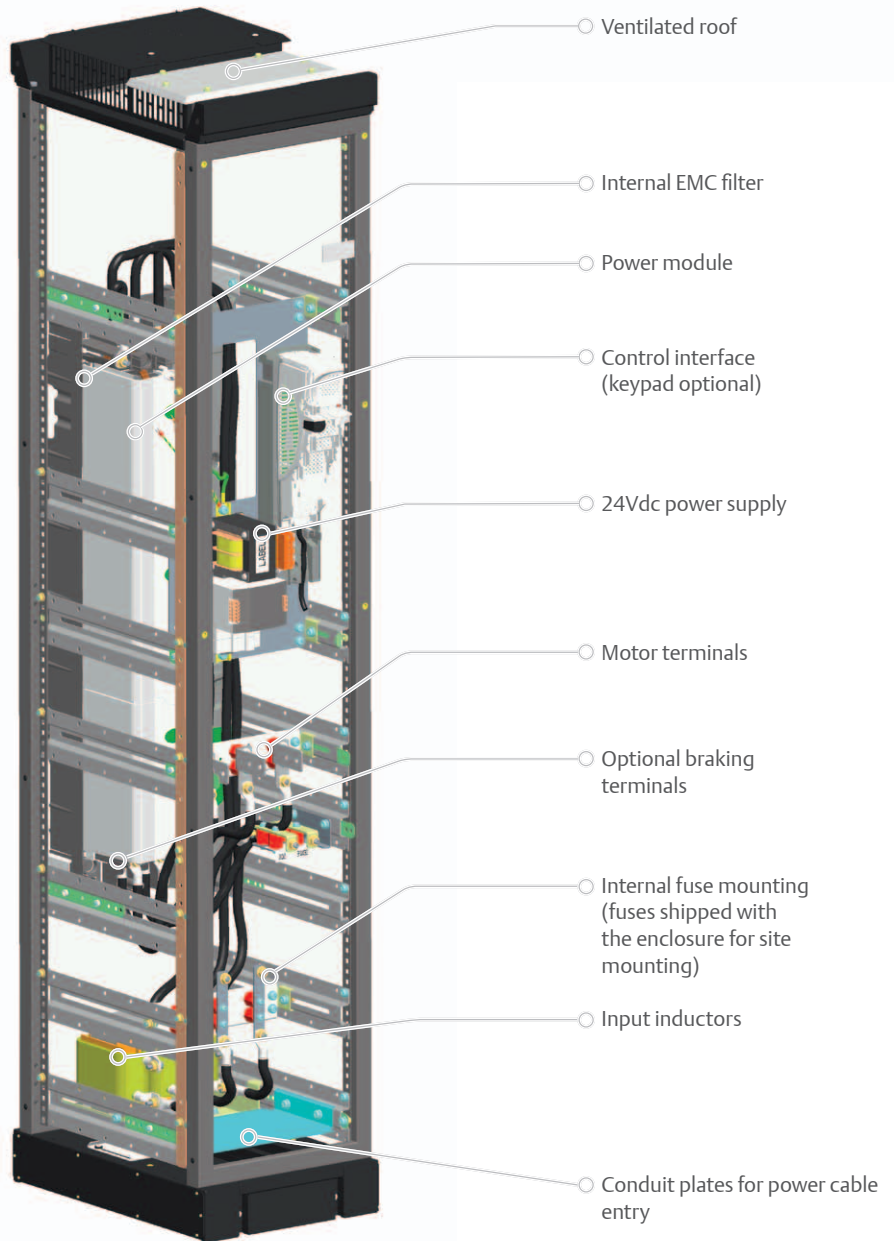
Unidrive SP Free Standing is a range of AC drives for high-power motors in the 125 to 2,450hp range. They inherit their easy commissioning, reliability, performance and flexibility from the Unidrive SPM family.

## Compact Size

Unidrive SP Free Standing drives are up to 50% smaller and are significantly lighter than other 'compact' drive enclosures. For example, a 500hp drive is only 15.8in (400mm) wide and a 1,000hp drive is only 31.5in (800mm) wide. This makes Unidrive SP Free Standing an excellent choice where space is at a premium such as new or retrofit energy saving applications. All drives are shipped in 15.8in (400mm) wide sections that can be connected quickly. This makes Unidrive SP Free Standing drives easy to handle and locate on site.


## The Hard Work Has Been Done

Unidrive SP Free Standing drives are fully engineered and tested drive enclosures. The entire enclosure is certified to comply with international standards including CE and UL. This proven design and third-party approval allows engineering resources to focus on applications, not the hardware.



**Panel Mount - Standard Drive Modules**  
0.5 - 200hp (0.37 - 132kW)

*For more information please refer to the Unidrive SP Panel Mount brochure.*  
(BRO-USP-1107)




# Extended Power Range and Incoming Power Options

## Extended Power Range

Unidrive SP size 9 Free Standing configurations can be extended to give higher output power by adding extension enclosures to the standard enclosures. Up to three extension enclosures can be added to a standard Unidrive SP size 9 Free Standing drive, providing an ideal solution for creating higher power systems. All configurations consist of existing SP9xx5 (master and follower enclosures) together with one or more additional size 9 extension enclosures.



*The resulting configuration will require modifications to the standard Free Standing enclosures supplied from the factory. This must be undertaken in accordance with the technical conditions outlined in the supplied Installation Guide by a Control Techniques Drive Center with in-house systems capability.*

## Factory Engineered Incoming (Incomer) Enclosure

Free Standing drives can be ordered from the factory with a built-in circuit breaker for supply isolation. This means the drive is delivered to your site ready to be connected reducing engineering effort and installation time. The circuit breaker is installed in an 15.8in enclosure which can be added to Free Standing units sizes 6 to 9.

## User Engineered Incoming Enclosure Option

For users wishing to design and build their own incoming power section, a range of accessories is available (including empty 15.8in enclosures) allowing you to install your own line-side equipment along with any application specific equipment you have. Standard enclosure color and dimensions mean that Free Standing drives can be combined with other manufacturers' enclosures.

Users requiring this design for size 8 and 9 Free Standing drives should order empty enclosure SP Incomer Shell 40. This shell is supplied along with busbars to make the interconnection between the drive and incomer enclosures. Users requiring this design for size 6 and 7 Free Standing drives should order empty enclosure SP Systems Shell 40. This enclosure is supplied without interconnection busbars as cables are used to make the connection.

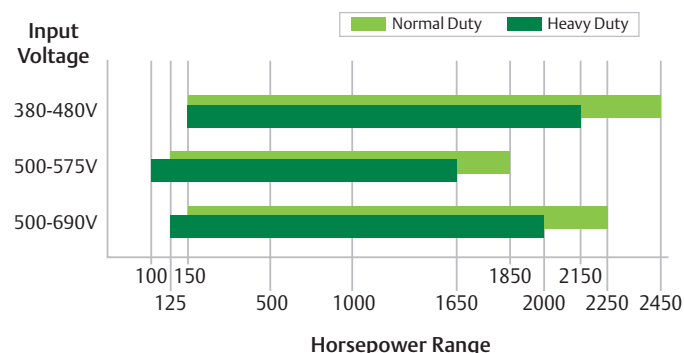
Order Code	Description
SP-INCOMER-SHELL-40	Empty enclosure with 6-pulse interconnection busbar
SP-INCOMER-SHELL-40-P12	Empty enclosure with 12-pulse interconnection busbar
SP-SYSTEMS-SHELL-40	Empty enclosure
CB-KIT-SPxxxx	Enclosure with circuit breaker

## Power Quality

For applications requiring harmonic attenuation beyond that achieved by the internal filter choke, 12-pulse input versions of the size 8 and 9 Free Standing drives are available. The 12-pulse input option is specified as part of the drive order code. For 12-pulse drives the power connections can be made through existing busbars in the drive enclosure or, if required, made within a separate enclosure (SP Incomer Shell 40 P12).

Engineered solutions to further reduce supply harmonics (such as passive in-line filters and active input modules) are available through your Control Techniques drives supplier. These aid in complying with harmonics standards IEEE 519-1992, IEC 61000-2-2 and IEC 61000-2-12.

## Ratings




# Unidrive SP, Fast and Easy Integration Flexibility


**External Control**




SM-APPS-LITE-V2




SM-APPS-PLUS




SM-REGISTER




SM-EZMOTION




Windows 98, NT  
4.0, 2000, XP, Vista  
32 or a Windows  
7-compatible PC




PLC




Multi-Axis Controller  
MC464




USB Port-to-Drive Serial Interface Cable  
CT-USB-CABLE



SyPT Lite



SyPT Pro




PowerTools Pro

See the Software brochure for relevance to each SM Option Module and order codes



## Operator Interface Options


**SmartCard**




Memory device to store and copy drive parameters  
SMARTCARD

**Software**

CTSoft  
CTScope  
CTOPServer




**HMI Operator Interface**



CTVue 303L, 303M, 306A, 306C, 308A, 310C


See the Options & Accessories brochure for order codes

**LCD Keypad**




Remote panel or drive mount LCD multilingual text keypad display to IP54 (NEMA 12)

SM-KEYPAD-PLUS



Interconnect Cable  
See page 6 for order codes

**LED Keypad**




Drive mount LED display to IP54 (NEMA 12)  
Size 1 and up


SM-KEYPAD

## Communications

**Modbus RTU**



**Options**





SM-CAN  
SM-CANOPEN  
SM-DEVICENET  
SM-ETHERCAT



SM-ETHERNET:

EtherNet/IP, Modbus TCP/IP, email, web server, simple network time Protocol

SM-INTERBUS  
SM-PROFIBUS-DP  
SM-PROFINET  
SM-SERCOS


**Standard**


## Input / Output

**Standard**



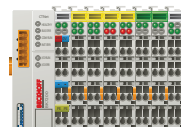
5 Analog input/outputs  
7 Digital input/outputs  
1 Safe Torque Off

**Options**



**SM Option Modules**

SM-I/O-32 (32 digital I/O)  
SM-I/O-24V (Protected)  
SM-I/O-LITE  
SM-I/O-PLUS  
SM-I/O-TIMER (Real-Time Clock)  
SM-I/O-120V (120V AC I/O)  
SM-PELV



**Remote I/O**

See the Options & Accessories brochure for order codes

### Additional Enclosure Options



**SP-INCOMER-SHELL-40**  
Includes 6-pulse interconnect busbar



**SP-INCOMER-SHELL-40-P12**  
Includes 12-pulse interconnect busbar



**SP-SYSTEM-SHELL-40**  
Empty enclosure



**CB-KIT-SPxxx**  
Includes circuit breaker

### Dynamic Braking Options

#### Filters

Standard Options

**Internal EMC Filter**

**External EMC Filter**

See the Options & Accessories brochure for order codes

#### External Dynamic Braking Resistor

See the Options & Accessories brochure for order codes

### Feedback

Standard Options

Sin/Cos  
Quadrature  
Frequency/Direction  
Clockwise/Counter Clockwise

**DC Back-up Power Supply**

**24Vdc Control**

**EnDat** **HIPERFACE®** **SSI**

**SM Option Modules**

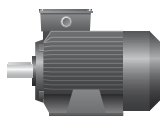
- SM-UNI-ENCODER\*
- SM-ENCODER-OUT\*\*
- SM-ENCODER-PLUS\*\*
- SM-RESOLVER

\* Accepts and replicates incremental and absolute feedback types; recommended for Servo and positioning applications

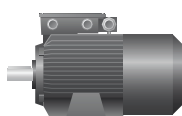
\*\* For use with Induction motors and incremental feedback devices

### Motor Control Modes

**Open-loop Induction Motor**



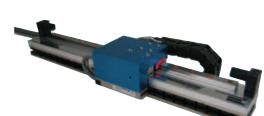
**Closed-loop Induction Motor**



**Servo Motor**



**Linear Motor**



# Specifications and Dimensions

## Specifications

### Environment

Ambient temperature	32 to 104 °F (0 to 40 °C)
Cooling method	Forced ventilation
Humidity	95% maximum (non-condensing) at 104 °F (40 °C)
Storage temperature	-40 to 122 °F (-40 to 50 °C)
Altitude	0 to 9,900ft (3000m), derate 1% per 328ft (100m) between 3,280ft (1000m) and 9,842ft (3000m)
Vibration	Tested in accordance with IEC 60068-2-34
Mechanical shock	Tested in accordance with IEC 60068-2-27
Enclosure	NEMA 1 (IP21) enclosure design, optional IP23 (max. IP23 ambient is 91°F (33°C))
Electromagnetic immunity	In compliance with IEC 61000-4-2, 3,4,5,11, IEC61000-6-1,2 and IEC 61800-3
Electromagnetic emissions	IEC 61800-3 with built-in filter, compliance category depends on installation conditions, external filters are available

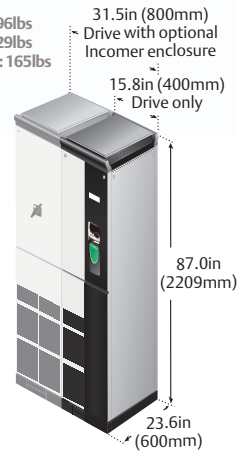
### Approvals and Listings

UL, cUL	UL508C file # E171230
IEC	IEC 60146-1-1 general requirements IEC 61800-5-1 safety of power drive systems IEC 61131-2 I/O
EN	EN 60529 ingress protection Safe Torque Off (secure disable) meets EN 954-1-cat3
ISO	ISO 9001 quality management system ISO 14001 environment management

## Dimensions

### Size 6/7

Weight  
Size 6: 496lbs  
Size 7: 529lbs  
Incomer: 165lbs



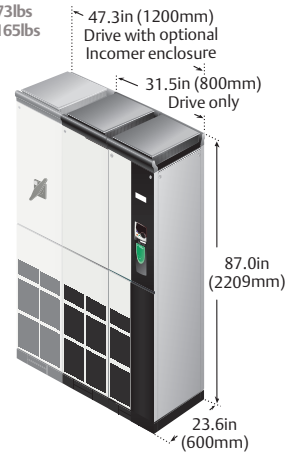
### Size 8

Weight  
Drive: 586lbs  
Incomer: 165lbs



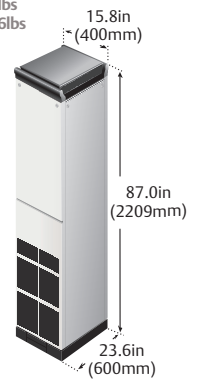
### Size 9

Weight  
Drive: 1,173lbs  
Incomer: 165lbs



### SP Incomer Shell 40\* / SP System Shell 40\* / SP9xx5 Extension\*\*

Weight  
\*121lbs  
\*\*586lbs



## Order Code

SP 6 4 1 1

### Power Range

6 - Size 6  
7 - Size 7  
8 - Size 8  
9 - Size 9

### Voltage Range

4 - 380 - 480V  
6 - 500 - 690V

### Free Standing Configuration

1 - Dynamic brake control\*  
3 - No dynamic brake control

### Current Rating Step

## Interconnect Cable Order Codes

Description	Order Code
USB 485 communications cable	CT-USB-CABLE
Keypad to drive cable, 5ft	SP-LCD-485-005
Keypad to drive cable, 10ft	SP-LCD-485-010
Keypad to drive cable, 15ft	SP-LCD-485-015
Keypad to drive cable, 25ft	SP-LCD-485-025
Keypad to drive cable, 50ft	SP-LCD-485-050
Keypad to drive cable, xxx is cable length in 5ft increments (max length 100ft)	SP-LCD-485-xxx

\* Does not include braking resistor or associated components.

# Ratings

Width Drive Only	Width with Switch Disconnector	380-480Vac +/- 10% (kW@400V, hp@460V)	Normal Duty			Heavy Duty		
			Max Continuous Current (A)	Motor Power (hp)	Typical Output (kW)	Max Continuous Current (A)	Motor Power (hp)	Typical Output (kW)
		Order Code						
15.8in	31.5in	SP64x1	205	150	110	180	150	90
		SP64x2	236	200	132	210	150	110
		SP74x1	290	250	160	238	200	132
		SP74x2	335	250	185	290	250	160
		SP84x1	389	300	225	335	250	185
		SP84x2	450	400	250	389	300	225
		SP84x3	545	450	315	450	400	250
31.5in	47.5in	SP84x4	620	500	355	545	450	315
		SP94x1	690	600	400	620	500	355
		SP94x3	900	800	500	790	700	450
		SP94x4	1010	900	560	900	800	500
47.5in	N/A	SP94x5	1164	1000	675	1010	900	560
63in		SP94x5 +1x SP94x5 Extension	1746	1500	960	1515	1250	830
79in		SP94x5 +2x SP94x5 Extension	2328	2000	1280	2020	1750	1110
		SP94x5 +3x SP94x5 Extension	2910	2450	1600	2525	2150	1380

Width Drive Only	Width with Switch Disconnector	500-690Vac +/- 10% (kW@690V, hp@575V)	Normal Duty			Heavy Duty		
			Max Continuous Current (A)	Motor Power (hp)	Typical Output (kW)	Max Continuous Current (A)	Motor Power (hp)	Typical Output (kW)
		Order Code						
15.8in	31.5in	SP66x1	125	125	110	100	100	90
		SP66x2	144	150	132	125	125	110
		SP76x1	168	150	160	144	150	132
		SP76x2	192	200	185	168	150	160
		SP86x1	231	250	200	186	200	185
		SP86x2	266	300	225	231	250	200
		SP86x3	311	350	315	266	250	150
31.5in	47.5in	SP86x4	355	400	355	311	350	315
		SP96x1	400	450	400	347	350	355
		SP96x3	533	500	500	466	450	450
		SP96x4	616	600	560	533	500	500
47.5in	N/A	SP96x5	711	700	630	622	600	560
63in		SP96x5 +1x SP96x5 Extension	1067	1000	960	933	900	830
79in		SP96x5 +2x SP96x5 Extension	1422	1500	1280	1244	1250	1120
		SP96x5 +3x SP96x5 Extension	1778	1850	1600	1555	1500	1380

Ratings shown are for NEMA 1 IP21 at 40°C ambient or IP23 at 30°C ambient, 3kHz switching frequency and 1000m altitude. Select model based on motor full load current. hp and kW ratings are for general guide only.

## Normal Duty

Suitable for most applications; current overload of 110% for 165 seconds available. Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.

## Heavy Duty

Suitable for demanding applications; current overload of up to 150% for 60 seconds.

# Driving Technology...



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