Unidrive SP - *Incorporating "Benchmark" Technologies*

Safe Torque Off

The Unidrive SP Safe Torque Off function meets the requirements of EN954-I : category 3 for machine safety, and can serve as a part of a category 4 application. Control Techniques' Safe Torque Off safety solution has been independently verified by the European Safety organizations, BGIA and TÜV. This exclusive feature of the Unidrive SP saves money and space. Under many conditions, this standard feature eliminates the need for safety contactors by utilizing secure circuitry to prevent the motor from being powered by the drive.

Multiple Fieldbus Capability

The Unidrive SP provides unrivaled fieldbus flexibility. In addition to the standard Modbus RTU port, up to three fieldbus option modules can be installed in the Unidrive SP's option slots. This provides the capability to control and monitor a Unidrive SP on multiple fieldbus networks. For example, a single Unidrive SP can be configured to communicate on both DeviceNet and Profibus networks simultaneously.

In the example shown, CTNet is used to provide real-time coordination between two Unidrive SP modules. The DeviceNet and Profibus connections allow data to be passed to/from the controllers in a machine line.

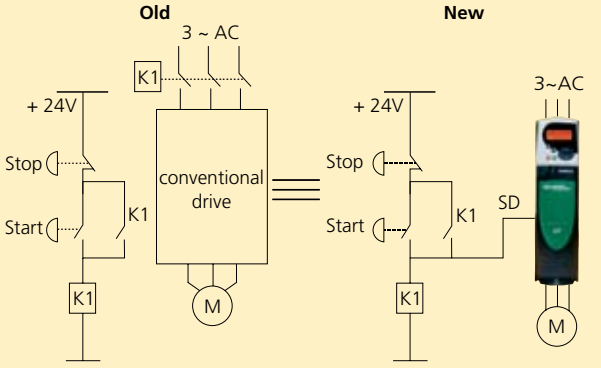
Scalable PLC Functionality

In addition to the extensive drive configuration capabilities of the Unidrive SP, scalable programming is available to solve virtually any application requirement. Simple logic function programming is achieved using SyPTLite software and the drive's built in PLC. More complex systems can be solved by adding SM-Applications Lite V2 (with SyPTLite or SyPTPro), or SM-Applications Plus (SyPTPro only) option modules.

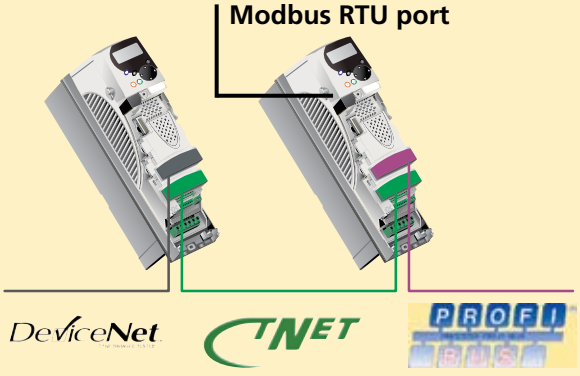
SM-Applications Plus

SM-Applications Lite V2

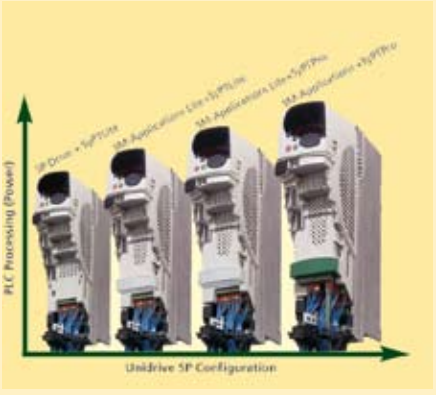
Safe Torque Off



Multiple Fieldbus



Scalable PLC Functionality



N1652

2 YEAR Digital Drive Warranty
5 YEAR Extended Warranty

FEATURE
Performance Advantage

THE BENCHMARK

Dual Duty Ratings–Normal and Heavy
Provides cost effective sizing choices for all applications.

48 VDC Main Power Supply Input
Ideally suited for elevator rescue and machine tool set up.

24 VDC Auxiliary Power Supply Input
Provides an additional means of maintaining control, fieldbus and position loop on mains loss

Comprehensive Auto-tune
Inertia monitoring and static auto-tune reduce startup time.

Universal Feedback Interface
Supports 14 different feedback configurations, including several absolute encoders. No need for additional components.

High Resolution Analog Input
16-bit, 250 µsec interface for high performance applications. Two additional 10-bit analog inputs for low level controls.

Extensive Fieldbus Connectivity
ModbusRTU (Standard), Profibus-DP (12Mbit), Ethernet, DeviceNet, CAN, CANOpen, EtherCAT, Interbus-S and CTNet optional via Zero-space SM modules. Up to four fieldbuses can connect to a single drive, eliminating the need for expensive gateways.

Universal Option Slots
Unidrive SP size Zero has 2 slots, sizes one and up have 3 option module slots. SM-Fieldbus, I/O & Application modules fit in any of the open option slots.

Safe Torque Off Function
Conforms to IEC954-1 Category 3 for machine safety with system cost reduction.

SmartCard for Simple Setup and Cloning
Easy-to-use card stores drive configuration for simple startup and parameter cloning. Supplied free with Unidrive SP.

Keypad Options
Choose no keypad, LED keypad or LCD keypad based on the system design and operating environment.

Drive Mounted Brake Resistor
Unidrive SP sizes 0, 1 and 2 feature a drive mounted brake resistor option to reduce panel space requirements.

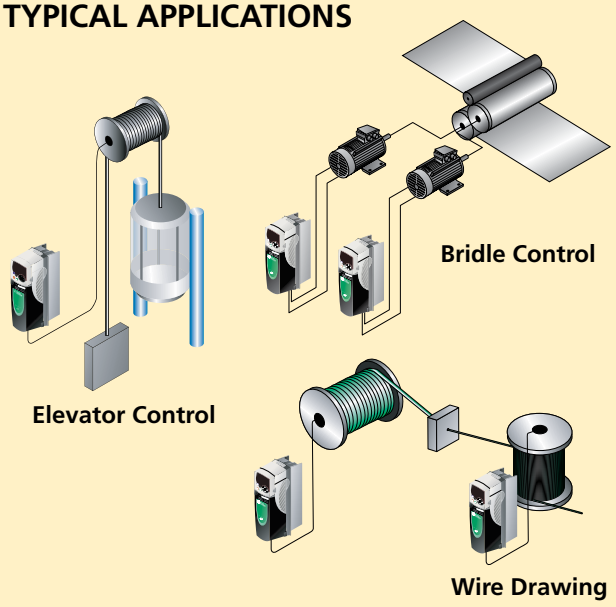
Standard Features of the Unidrive SP

- *7 Operating modes: V/Hz, open loop vector, rotor flux control, closed loop vector, servo, regen, and torque*
- *Encoder feedback as standard (select from 14 types)*
- *Built-in shaft orientation mode*
- *Digital lock with adjustable ratio (frequency slaving)*
- *Programmable boolean logic (AND, NAND, OR, NOR) gates with delay outputs*
- *Programmable threshold comparators*
- *Built-in PID controller*
- *S-ramp accel/decel profiling*
- *Built-in MOP (motorized potentiometer)*
- *8 Preset speeds and independent accel/decel rates*
- *3 Skip frequencies with adjustable bandwidths*
- *Run time chronometers*
- *Configurable analog and digital I/O*
- *Selectable Stopping modes including Coast, Ramp, and DC injection*
- *Dynamic Braking capability, transistor built in*
- *Removable control terminals common to all sizes*

Feature Enhancements to Unidrive SP

- *Output frequencies up to 3000 Hz for very high motor speed operations*
- *Intelligent Thermal Management (ITM) technology with switching frequencies up to 16 kHz*

TYPICAL APPLICATIONS



Unidrive SP Size Zero - ½ hp to 2 hp 230 VAC 1Ø or 3Ø, or 460 VAC 3Ø

The new Unidrive SP size Zero has the same advanced feature set, universal motor control and easy user interface as the rest of the Unidrive SP range. Unidrive SP is quick and easy to set-up. The drive may be configured using the removable keypad or using CTSoft, the free commissioning software which guides the user through the configuration process.

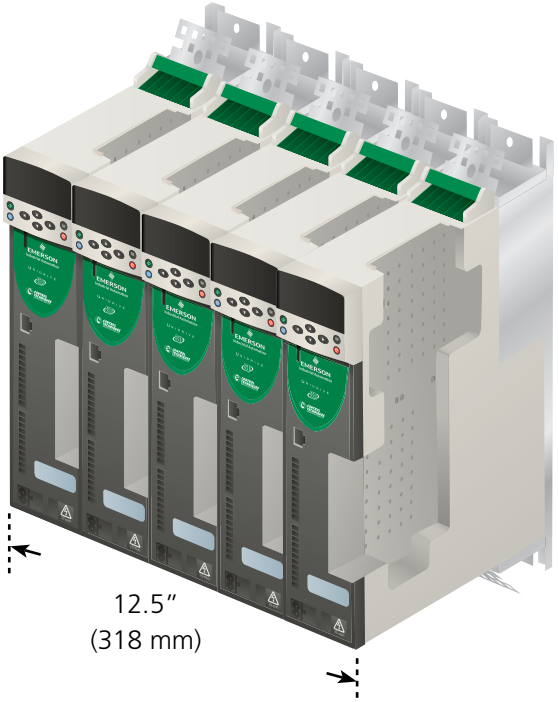
Unidrive SP Size Zero may be mounted side-by-side with other drives or components saving you valuable panel space. The Unidrive SP Zero also uses our SmartCard technology which allows you to safely store and copy parameters quickly from one drive to another.

The drives auto-tune features enable you to get the best drive performance by measuring the application dynamics and automatically optimizing the control loop gains.

Safe Torque Off input disables the output stage of the drive with a high degree of security. This reduces the cost of complying with machine safety standards such as EN954 Cat 3 and enables the drive to integrate easily with the machine safety circuit.

- Universal motor control of Induction, Servo and Linear Motors
- 2 Solution Module Slots (3 in Unidrive SP size 1 & up)
- Side-by-side mounting
- Removable LED Keypad
- SmartCard
- Internal EMC Filter
- Safe Torque Off Input
- 24V Backup Supply
- Universal Encoder Input
- High Resolution Analog and Digital I/O
- PC Port for Programming
- 48 VDC Drive Supply
- Quick and Easy Mounting Arrangement
- Optional Internal Braking Resistor
- Reduced commissioning time

Comparison photograph above and illustration below show the size difference between a Unidrive SP size 1 and the new size Zero.



With the Digitax ST's ultra compact mounting (only 2 mm between drives) you can fit 5 drives in a 12.5" width.

RATINGS: *SELECT MODEL BASED ON ACTUAL MOTOR FULL LOAD CURRENT*

The Unidrive SP is available in panel mount, free standing and modular platforms.

Panel Mount Drives - Drives from 0.5 to 200 hp used for any AC Drive application. Shipped as drive only, and to be mounted into customer machine enclosure with other power/control components.

Free Standing Drives - Pre-Engineered drive packages from 150 to 1000 hp in IP21 enclosure (standard), perfect for many standard applications (i.e. fans, pumps, conveyors, etc.).

SPM Drives - Modular drives for OEMs and system integrators. Range from 60 to 2900 hp. See the Engineered Systems section for complete details.

Panel Mount Drives are available in seven frame sizes

PANEL MOUNT RATINGS

Unidrive SP		Motor HP	Continuos Output Current	Peak Output Current	Motor HP	Continuos Output Current	Peak Output Current	
208/240 VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 230V	I_N (A)	(A)	HP @ 230V	I_H (A)	Open loop (A)	Closed loop (A)
SP0201-XXX	0	0.5	2.2	3.3	0.5	2.2	3.3	3.9*
SP0202-XXX		0.75	3.1	4.7	0.75	3.1	4.7	5.4*
SP0203-XXX		1	4	6	1	4	6	7*
SP0204-XXX		1.5	5.7	8.6	1.5	5.7	8.6	10.2*
SP0205-XXX		2	7.5	11.3	2	7.5	11.3	13.1*
SP1201-XXX	1	1.5	5.2	5.7	1	4.3	6.4	7.5
SP1202-XXX		2	6.8	7.5	1.5	5.8	8.7	10.1
SP1203-XXX		3	9.6	10.6	2	7.5	11.3	13.1
SP1204-XXX		3	11	12.1	4	10.6	15.9	18.5
SP2201-XXX	2	5	15.5	17.0	4	12.6	18.9	22.0
SP2202-XXX		7.5	22	24.2	5	17	25.5	29.7
SP2203-XXX		10	28	30.8	7.5	25	37.5	43.7
SP3201-XXX	3	15	42	46.2	10	31	46.5	54.2
SP3202-XXX		20	54	59.4	15	42	63	73.5
SP4201-XXX	4	25	68	74.8	20	56	84	98
SP4202-XXX		30	80	88	25	68	102	119
SP4203-XXX		40	104	114.4	30	80	120	140
SP5201-XXX	5	50	130	143	40	105	157.5	183.8
SP5202-XXX		60	154	169.4	50	130	195	227.5

Note: Motor horsepower ratings are based on typical motor current ratings. Actual motor currents should be checked before selecting a particular drive. For some high efficiency motors, the required full load motor current may allow the selection of a smaller drive than is indicated in the chart. The same consideration would also apply for motors with less common power or voltage ratings.

* Unidrive SP Zero 230 VAC models can operate on single or three phase input power. 175% peak currents are valid only when 3 phase input power is supplied. When supplying single phase input power the maximum peak current is 150%.

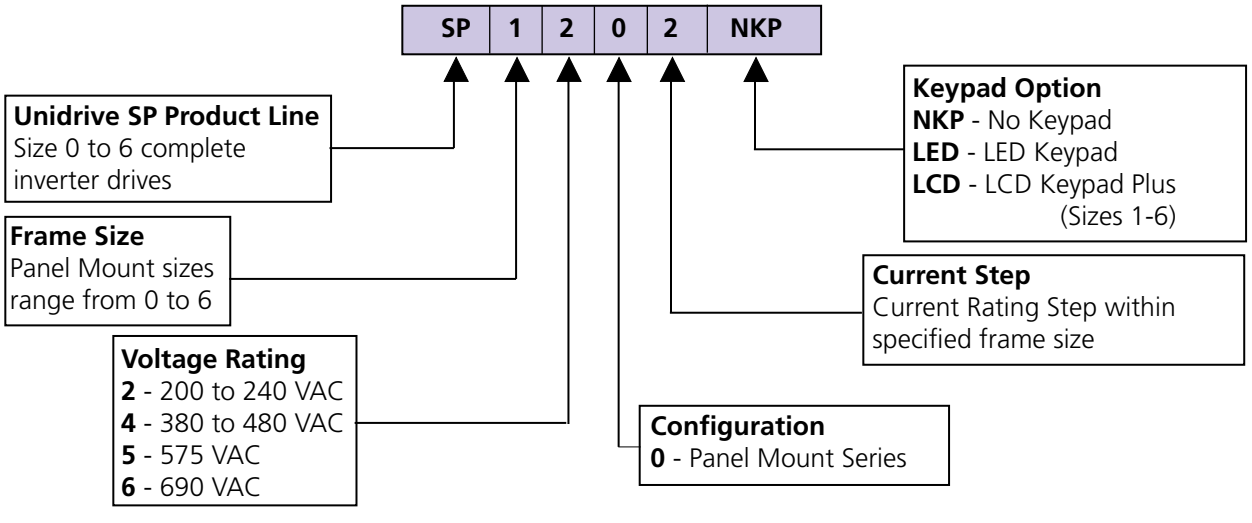
Normal Duty	Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.	**Heavy Duty**	Suitable for demanding applications, current overload is set at up to 175% for 40 seconds. Where motor rated current is less than the drive rated continuous current, higher overloads (200% or greater) are achieved.

PANEL MOUNT RATINGS *(continued)*

Unidrive SP		Motor HP	Continuous Output Current	Peak Output Current	Motor HP	Continuous Output Current	Peak Output Current	
380/480 VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 460V	I_N (A)	(A)	HP @ 460V	I_N (A)	Open loop (A)	Closed loop (A)
SP0401-XXX	0	0.5	1.3	2.0	0.5	1.3	2.0	2.3
SP0402-XXX		0.75	1.7	2.6	0.75	1.7	2.6	3.0
SP0403-XXX		1	2.1	3.1	1	2.1	3.1	3.6
SP0404-XXX		1.5	3	4.5	1.5	3	4.5	5.2
SP0405-XXX		2	4.2	6.3	2	4.2	6.3	7.3
SP1401-XXX	1	1.5	2.8	3.0	1	2.1	3.1	3.6
SP1402-XXX		2	3.8	4.1	2	3	4.5	5.2
SP1403-XXX		3	5	5.5	3	4.2	6.3	7.3
SP1404-XXX		5	6.9	7.5	4	5.8	8.7	10.1
SP1405-XXX		5	8.8	9.6	5	7.6	11.4	13.3
SP1406-XXX		7.5	11	12.1	5	9.5	14.2	16.6
SP2401-XXX	2	10	15.3	16.8	10	13	19.5	22.7
SP2402-XXX		15	21	23.1	10	16.5	24.7	28.8
SP2403-XXX		20	29	31.9	15	25	34.5	40.2
SP2404-XXX		20	29	31.9	20	29	43.5	50.7
SP3401-XXX	3	25	35	38.5	25	32	48	56
SP3402-XXX		30	43	47.3	30	40	60	70
SP3403-XXX		40	56	61.6	30	46	69	80.5
SP4401-XXX	4	50	68	74.8	50	60	90	105
SP4402-XXX		60	83	91.3	60	74	111	129.5
SP4403-XXX		75	104	114.4	75	96	144	168
SP5401-XXX	5	100	138	151.8	100	124	186	217
SP5402-XXX		150	168	184.8	125	156	234	273
SP6401-XXX [1]	6	150	202	222.2	150	180	231	269
SP6402-XXX [1]		200	236	259.6	150	210	270	315

1) Size 6 drives require a +24 VDC - 3.5A power supply for the heat sink fans not provided with unit. See the Options & Accessories section for available power supplies.

Order String



PANEL MOUNT RATINGS *(continued)*

Unidrive SP		Motor HP	Continuous Output Current	Peak Output Current	Motor HP	Continuous Output Current	Peak Output Current	
575 VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 575V	I_N (A)	(A)	HP @ 575V	I_H (A)	Open loop (A)	Closed loop (A)
SP3501-XXX	3	5	5.4	5.9	3	4.1	6.1	7.1
SP3502-XXX		5	6.1	6.7	5	5.4	8.1	9.4
SP3503-XXX		7.5	8.4	9.2	5	6.1	9.1	10.6
SP3504-XXX		10	11	12.1	7.5	9.5	14.2	16.6
SP3505-XXX		15	16	17.6	10	12	18	21
SP3506-XXX		20	22	24.2	15	18	27	31.5
SP3507-XXX		25	27	29.7	20	22	33	38.5
SP4603-XXX	4	30	36	39.6	25	27	40.5	47.3
SP4604-XXX		40	43	47.3	30	36	54	63
SP4605-XXX		50	52	57.2	40	43	64.5	75.3
SP4606-XXX		60	62	68.2	50	52	78	91
SP5601-XXX	5	75	84	92.4	60	62	93	108.5
SP5602-XXX		100	99	108.9	75	84	126	147
SP6601-XXX [1]	6	125	125	137.5	100	100	130	150
SP6602-XXX [1]		150	144	158.4	125	125	162.5	187.5

Unidrive SP		Motor HP	Continuous Output Current	Peak Output Current	Motor HP	Continuous Output Current	Peak Output Current	
690 VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 690V	I_N (A)	(A)	HP @ 690V	I_H (A)	Open loop (A)	Closed loop (A)
SP4601-XXX	4	25	22	24.2	20	19	28.5	33.3
SP4602-XXX		30	27	29.7	25	22	33	38.5
SP4603-XXX		40	36	39.6	30	27	40.5	47.3
SP4604-XXX		50	43	47.3	40	36	54	63
SP4605-XXX		60	52	57.2	50	43	55.7	75.2
SP4606-XXX		75	62	68.2	60	52	67.6	91
SP5601-XXX	5	100	84	92.4	75	62	93	108.5
SP5602-XXX		125	99	108.9	100	84	126	147
SP6601-XXX [1]	6	150	125	137.5	125	100	128	149
SP6602-XXX [1]		175	144	158.4	150	125	160	187

1) Size 6 drives require a +24 VDC - 3.5A power supply for the heat sink fans not provided with unit. See the Options & Accessories section for available power supplies.

Note: Motor horsepower ratings are based on typical motor current ratings. Actual motor currents should be checked before selecting a particular drive. For some high efficiency motors, the required full load motor current may allow the selection of a smaller drive than is indicated in the chart. The same consideration would also apply for motors with less common power or voltage ratings.

Normal Duty	Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.	**Heavy Duty**	Suitable for demanding applications, current overload is set at up to 175% for 40 seconds (150% on Size 6). Where motor rated current is less than the drive rated continuous current, higher overloads (200% or greater) are achieved.