

Packaged Drives and Engineered Systems



Packaged Drives and Engineered Systems

Control Techniques known worldwide for packaged drives and engineered systems now offers an even wider variety of enclosure, power, and control options.

From the simple to the complex, we offer six levels of turn-key solutions to meet your requirements.

- AC RapidPaks
- DC StandardPaks
- AC & DC CustomPaks
- Unidrive SP Freestanding Drives
- Large Enclosed Drives
- Engineered Systems

Our engineered solutions are built with the quality and reliability you expect from a leading world-wide supplier and UL Certified shop. Our quick-turn custom engineered packaged products allow us to respond to the most demanding requirements with delivery lead times among the shortest in the industry. Both packaged products and system solutions are backed by formal engineering documentation and drawings. Our refined processes, combined with robust after-sale support

programs, result in a single-source solution, with single source accountability.

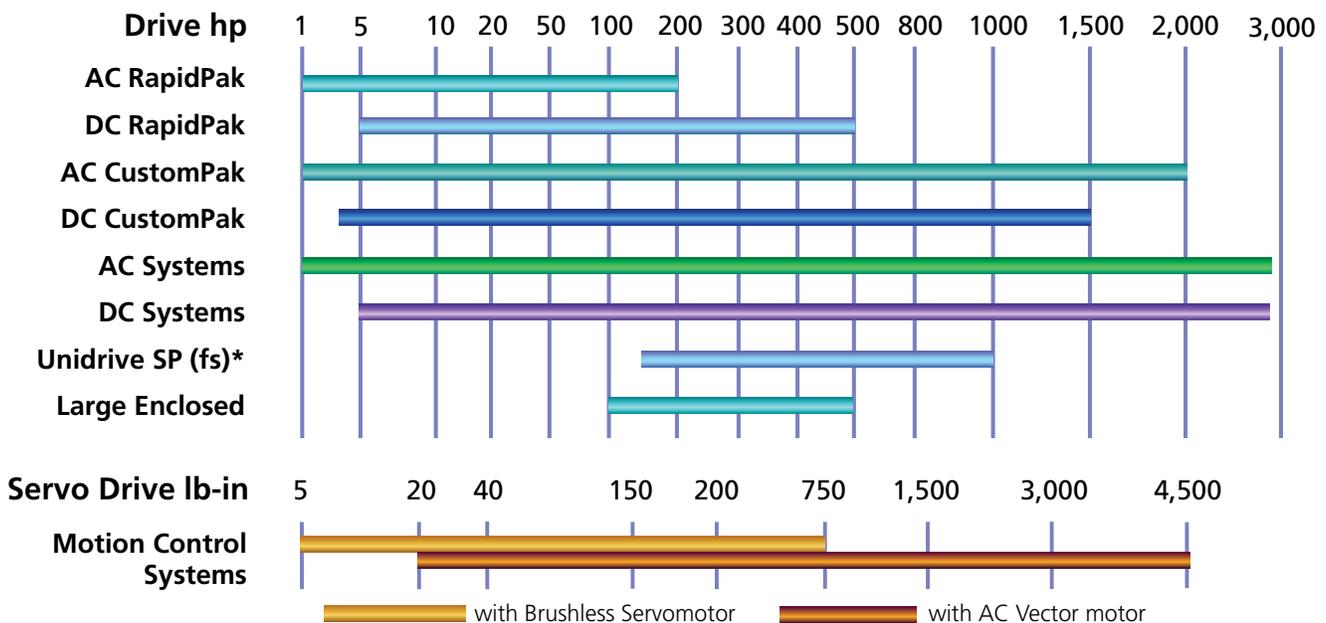
Total Systems Solutions

When the requirement is for a total system solution, our Engineered Systems group is ready to fulfill your needs. Our team consists of industry experts who know what is required for a successful drive application. Our unparalleled technology coupled with the expertise of our engineering, field installation and service teams have made Control Techniques the choice for thousands of engineered drive systems worldwide.



Packaged Drives & Engineered Systems

Packaged Drives and Engineered Systems Power Range (460 VAC)



*(fs) = Freestanding Drives

RapidPaks and CustomPaks

RapidPaks

Think RapidPak, when you need a packaged drive fast.

The AC RapidPak has a one week standard lead time and express lead time in as little as 24 hours. Designed to be easily tailored to a multitude of applications, these pre-engineered AC drive packages feature the most popular choices for operator controls, keypads, fusing, reactors and disconnects. The N12 (PPBF) or N3R RapidPak enclosure will have you up and running fast.

AC RapidPaks are offered with the Commander SK, Commander GP20 and the Unidrive SP. Voltages options are 208V to 460V models. Horsepower extends up to 75 hp, and to 2,000 hp as a **CustomPak**.

Extensive RapidPak Options

With over 40 options available, customers have the opportunity to create a RapidPak or CustomPak that meets most single-drive control system needs.

StandardPaks

DC StandardPaks are offered with the Mentor II and Quantum III digital DC drive. Voltage options are 208V to 480V Models. Horsepower range 5 to 500 hp @ 480V, 5 to 200 hp @ 240V input. Standard lead time is one to three weeks depending on options.

CustomPaks

Think CustomPak when you need custom configured AC or DC drive package. CustomPaks are ideal when higher horse powers and higher voltages are needed, and when there are special needs. CustomPaks include 18 pulse—low harmonic drives, stainless steel enclosures, enclosure heating and air conditioning, lighting and outlets, all built to your requirements, and fully documented.

These engineered packages are be tailored to meet the needs of the most demanding applications. Lead time is typically four to six weeks.

Large Enclosed Drives

Our large enclosed drives are a high-horsepower NEMA12 Positive Pressure Blown and Filtered AC drive system with all the state-of-the-art integration features of the Unidrive SP. The robust Unidrive SPM technology from Control Techniques gives users the power, performance, and the ultimate in flexibility for all AC applications from 100 hp to 500 hp.

This cost competitive, pre-engineered “AC In – AC Out” solution is a perfect match for both high-performance, and standard drive applications, such as fans, pumps and conveyors.

Unidrive SP Free Standing Drives

The Unidrive SP Free Standing AC drives extend the power range of “**the Benchmark**” solution platform to 1000 hp, while providing users with the same integration options as the standard, panel-mount Unidrive SP. Packaged in an IP21 or IP23 enclosure, these Free Standing drives deliver maximum horsepower density for physical size, and include rectifier, inverter and inductor. In addition, an “Incomer” enclosure is available with line power bus bars included to integrate fuse switch/MCCB etc.



See our **Packaged Soft Starters** including Crusher Duty solutions to 1,500 hp in the **Soft Starter** Section.

Packaged Drives & Engineered Systems

AC RapidPak

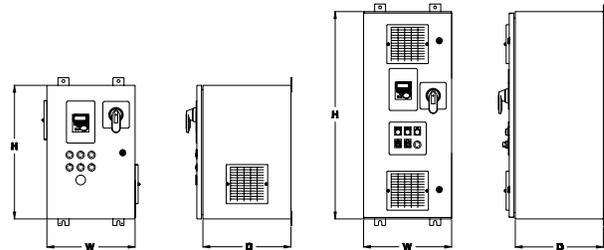
With our RapidPak solutions, and one of the shortest lead times in the industry, you will have an expertly packaged complete drive solution within days of placing your order. One week lead time is standard with a 24 hour option available.

Use the intuitive Order Code Configurator on the following pages to customize the package to your exact requirements. Choose between the simple and flexible Commander SK, the general purpose Commander GP20, and the high performance Unidrive SP. Each of these drives is available in either the space saving "Cube" style or the option abundant "Slimline" enclosure. A main disconnect, door-mounted keypad, input and output reactors, and a variety of door mounted operator's are only the beginning of the long list of options. Combine these with an SM Solutions Module for fieldbus connectivity, additional I/O, or a scalable PLC to solve the most difficult applications. Please see the AC Drives Section for SM Module options and drive compatibility.

These UL508A approved drive packages come standard with a 2 year Drive Warranty.

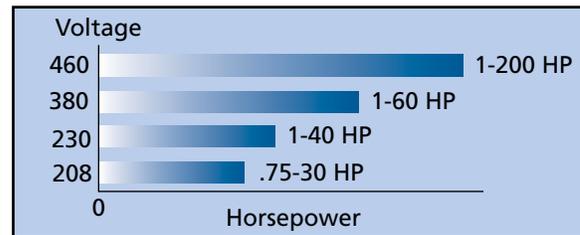


Slimline, 460VAC, 15 HP, OP Stn #5, Keypad, CB, Input reactor, 3 contactor Bypass



Cube Style

Slimline Style



Standard Features

- Open or Closed Loop Vector, V/Hz, Rotor Flux Control (RFC) performance
- Input Voltage 208-460 VAC, 50/60 Hz
- Cube or Slimline Enclosure, Nema -12 (PPBF), fully gasketed, (PPBF) Positive Pressure Blown and Filtered
- AC Line Fusing
- Input Main lugs for customer termination
- Standard lead time in one week
- CT Soft Windows™-based programming tool

Enclosure Design

- Cube: smallest possible package drive and input disconnect option.
- Slimline: compact packaging suitable for side-by-side mounting (only 1/2" spacing required)
- Textured, beige powder coat
- Nema -12 (PPBF), fully gasketed, (PPBF) Positive Pressure Blown and Filtered
- 14 gauge steel

Options

- Normal Duty rating (110% for 1 minute)
- Heavy Duty rating (150% for 1 minute)
- 3%, AC Line Reactor
- 3%, AC Output Reactor
- Auto or Manual 3-Contactor Bypass
- Blower motor starter with adjustable overload
- Nema 3R, Enclosure
- Door mounted operator devices.
- Circuit breaker or Non-fused disconnect switch
- Door mounted LCD (SM – Keypad Plus) with three lines of text.
- SM-Modules not included in the Order Code configurator, please consult with factory.

AC RapidPak



Normal Duty 208 VAC, 3-Phase Input and Output, 50/60 Hz Input

Normal Duty 110% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
1	5.2	RSxxN8001xxx-x	38x16x16	135	RCxxN8001xxx-x	24x16x16	65
1.5	6.8	RSxxN81P5xxx-x	38x16x16	135	RCxxN81P5xxx-x	24x16x16	65
2	9.6	RSxxN8002xxx-x	38x16x16	135	RCxxN8002xxx-x	24x16x16	65
3	15.5	RSxxN8003xxx-x	38x16x16	140	RCxxN8003xxx-x	24x16x16	70
5	22	RSxxN8005xxx-x	38x16x16	140	RCxxN8005xxx-x	24x16x16	70
7.5	28	RSxxN87P5xxx-x	38x16x16	140	RCxxN87P5xxx-x	24x16x16	70
10	42	RSxxN8010xxx-x	56x16x16	210	RCxxN8010xxx-x	30x24x16	180
15	54	RSxxN8015xxx-x	56x16x16	210	RCxxN8015xxx-x	30x24x16	180
20	68	RSxxN8020xxx-x	72x21x16	240	RCxxN8020xxx-x	39x30x16	145
25	80	RSxxN8025xxx-x	72x21x16	300	RCxxN8025xxx-x	39x30x16	200
30	104	RSxxN8030xxx-x	72x21x16	300	RCxxN8030xxx-x	39x30x16	200

Heavy Duty 208 VAC, 3-Phase Input and Output, 50/60 Hz Input

Heavy Duty 110% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
.75	4.3	RSxxH80P7xxx-x	38x16x16	135	RCxxH80P7xxx-x	24x16x16	65
1	5.8	RSxxH8001xxx-x	38x16x16	135	RCxxH8001xxx-x	24x16x16	65
1.5	7.5	RSxxH81P5xxx-x	38x16x16	135	RCxxH81P5xxx-x	24x16x16	65
2	10.6	RSxxH8002xxx-x	38x16x16	140	RCxxH8002xxx-x	24x16x16	70
3	17	RSxxH8003xxx-x	38x16x16	140	RCxxH8003xxx-x	24x16x16	70
5	25	RSxxH8005xxx-x	38x16x16	140	RCxxH8005xxx-x	24x16x16	70
7.5	31	RSxxH87P5xxx-x	56x16x16	140	RCxxH87P5xxx-x	30x24x16	70
10	42	RSxxH8010xxx-x	56x16x16	210	RCxxH8010xxx-x	30x24x16	145
15	56	RSxxH8015xxx-x	72x21x16	210	RCxxH8015xxx-x	39x30x16	145
20	68	RSxxH8020xxx-x	72x21x16	300	RCxxH8020xxx-x	39x30x16	200
25	80	RSxxH8025xxx-x	72x21x16	300	RCxxH8025xxx-x	39x30x16	200

Normal Duty 230 VAC, 3-Phase Input and Output, 50/60 Hz Input

Normal Duty 110% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
1.5	5.2	RSxxN21P5xxx-x	38x16x16	135	RCxxN21P5xxx-x	24x16x16	65
2	6.8	RSxxN2002xxx-x	38x16x16	135	RCxxN2002xxx-x	24x16x16	65
3	9.6	RSxxN2003xxx-x	38x16x16	135	RCxxN2003xxx-x	24x16x16	65
5	15.5	RSxxN2005xxx-x	38x16x16	140	RCxxN2005xxx-x	24x16x16	70
7.5	22	RSxxN27P5xxx-x	38x16x16	140	RCxxN27P5xxx-x	24x16x16	70
10	28	RSxxN2010xxx-x	38x16x16	140	RCxxN2010xxx-x	24x16x16	70
15	42	RSxxN2015xxx-x	56x16x16	210	RCxxN2015xxx-x	30x24x16	180
20	54	RSxxN2020xxx-x	56x16x16	210	RCxxN2020xxx-x	30x24x16	180
25	68	RSxxN2025xxx-x	72x21x16	240	RCxxN2025xxx-x	39x30x16	145
30	80	RSxxN2030xxx-x	72x21x16	300	RCxxN2030xxx-x	39x30x16	200
40	104	RSxxN2040xxx-x	72x21x16	300	RCxxN2040xxx-x	39x30x16	200

Order string: The base Order Code requires a minimum of 12 characters in sequence to create the order string.

Heavy Duty 230 VAC, 3-Phase Input and Output, 50/60 Hz Input							
Heavy Duty 150% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
1	4.3	RSxxH2001xxx-x	38x16x16	135	RCxxH2001xxx-x	24x16x16	65
1.5	5.8	RSxxH21P5xxx-x	38x16x16	135	RCxxH21P5xxx-x	24x16x16	65
2	7.5	RSxxH2002xxx-x	38x16x16	135	RCxxH2002xxx-x	24x16x16	65
3	10.6	RSxxH2003xxx-x	38x16x16	140	RCxxH2003xxx-x	24x16x16	70
5	17	RSxxH2005xxx-x	38x16x16	140	RCxxH2005xxx-x	24x16x16	70
7.5	25	RSxxH27P5xxx-x	38x16x16	140	RCxxH27P5xxx-x	24x16x16	70
10	31	RSxxH2010xxx-x	56x16x16	140	RCxxH2010xxx-x	30x24x16	70
15	42	RSxxH2015xxx-x	56x16x16	210	RCxxH2015xxx-x	30x24x16	145
20	56	RSxxH2020xxx-x	72x21x16	210	RCxxH2020xxx-x	39x30x16	145
25	68	RSxxH2025xxx-x	72x21x16	300	RCxxH2025xxx-x	39x30x16	200
30	80	RSxxH2030xxx-x	72x21x16	300	RCxxH2030xxx-x	39x30x16	200

Normal Duty 460 VAC, 3-Phase Input and Output, 50/60 Hz Input							
Normal Duty 110% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
1.5	2.8	RSxxN41P5xxx-x	38x16x16	135	RCxxN41P5xxx-x	24x16x16	70
2	3.8	RSxxN4002xxx-x	38x16x16	135	RCxxN4002xxx-x	24x16x16	70
3	5	RSxxN4003xxx-x	38x16x16	135	RCxxN4003xxx-x	24x16x16	70
5	8.8	RSxxN4005xxx-x	38x16x16	135	RCxxN4005xxx-x	24x16x16	70
7.5	11	RSxxN47P5xxx-x	38x16x16	135	RCxxN47P5xxx-x	24x16x16	70
10	15.3	RSxxN4010xxx-x	38x16x16	140	RCxxN4010xxx-x	24x16x16	70
15	21	RSxxN4015xxx-x	38x16x16	140	RCxxN4015xxx-x	24x16x16	70
20	29	RSxxN4020xxx-x	38x16x16	140	RCxxN4020xxx-x	24x16x16	70
25	35	RSxxN4025xxx-x	56x16x16	140	RCxxN4025xxx-x	30x24x16	150
30	43	RSxxN4030xxx-x	56x16x16	210	RCxxN4030xxx-x	30x24x16	150
40	56	RSxxN4040xxx-x	56x16x16	210	RCxxN4040xxx-x	30x24x16	250
50	68	RSxxN4050xxx-x	72x21x16	300	RCxxN4050xxx-x	39x30x16	280
60	83	RSxxN4060xxx-x	72x21x16	350	RCxxN4060xxx-x	39x30x16	280
75	104	RSxxN4075xxx-x	72x21x16	350	RCxxN4075xxx-x	39x30x16	280
100	138	RSxxN4100xxx-x	72x36x18	550	n/a		
125	168	RSxxN4125xxx-x	72x36x18	550			
150	202	RSxxN4150xxx-x	90x36x20	700			
200	236	RSxxN4200xxx-x	90x36x20	700			

Note: Weight does not include options.

Order string: The base Order Code requires a minimum of 12 characters in sequence to create the order string.

AC RapidPak

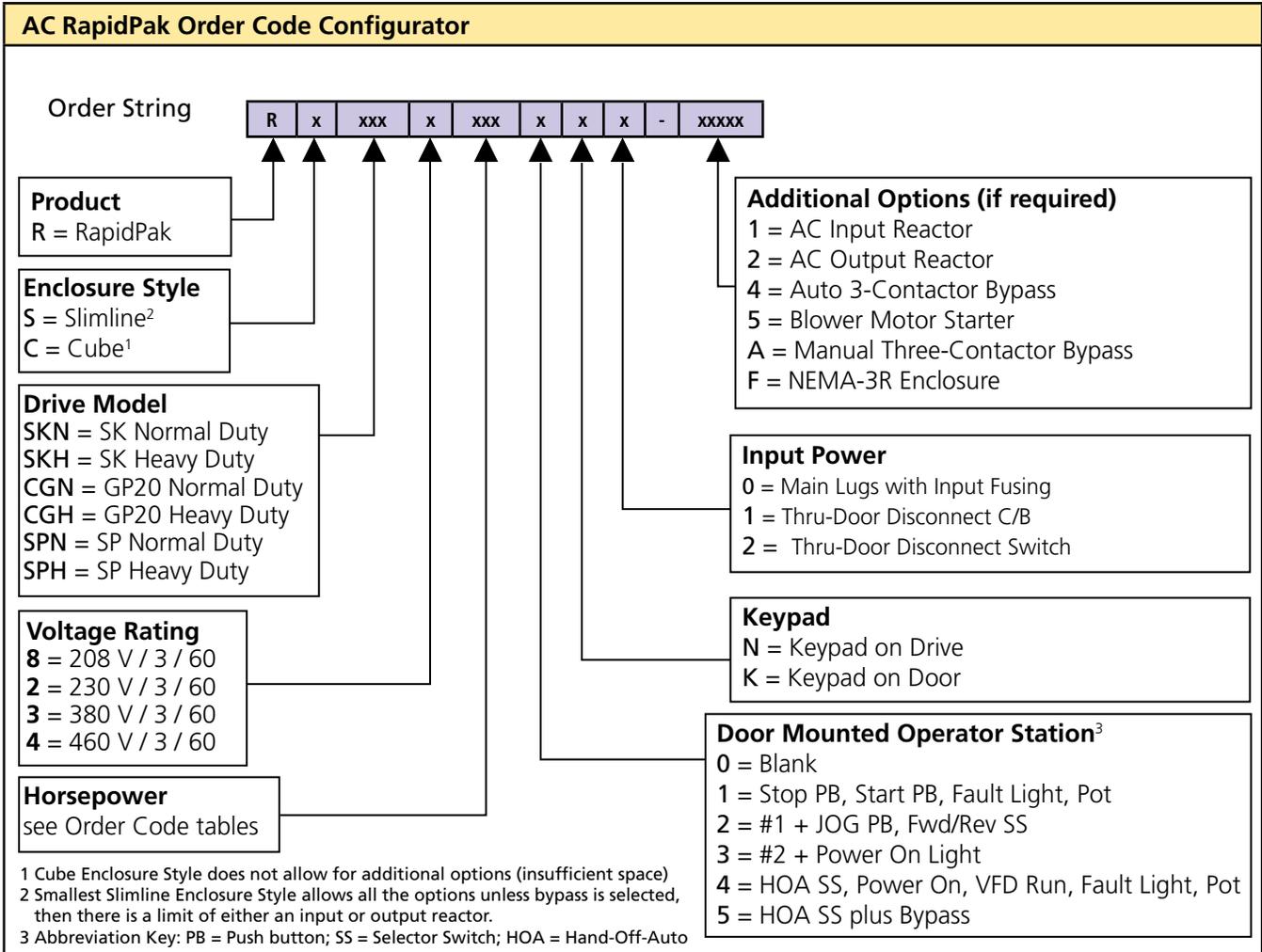
Heavy Duty 460 VAC, 3-Phase Input and Output, 50/60 Hz Input							
Heavy Duty 150% for 1 minute		Slim Enclosure			Cube Enclosure		
HP	Amps	Order Code	Dimensions HxWxD (in)	Weight (lbs)	Order Code	Dimensions HxWxD (in)	Weight (lbs)
1	2.1	RSxxH4001xxx-x	38x16x16	135	RCxxH4001xxx-x	24x16x16	70
1.5	3	RSxxH41P5xxx-x	38x16x16	135	RCxxH41P5xxx-x	24x16x16	70
3	5.8	RSxxH4003xxx-x	38x16x16	135	RCxxH4003xxx-x	24x16x16	70
5	7.6	RSxxH4005xxx-x	38x16x16	135	RCxxH4005xxx-x	24x16x16	70
7.5	13	RSxxH47P5xxx-x	38x16x16	135	RCxxH47P5xxx-x	24x16x16	70
10	16.5	RSxxH4010xxx-x	38x16x16	140	RCxxH4010xxx-x	24x16x16	70
15	25	RSxxH4015xxx-x	38x16x16	140	RCxxH4015xxx-x	24x16x16	70
20	29	RSxxH4020xxx-x	38x16x16	140	RCxxH4020xxx-x	24x16x16	70
25	32	RSxxH4025xxx-x	56x16x16	140	RCxxH4025xxx-x	30x24x16	70
30	40	RSxxH4030xxx-x	56x16x16	210	RCxxH4030xxx-x	30x24x16	150
40	60	RSxxH4040xxx-x	72x21x16	210	RCxxH4040xxx-x	39x30x16	150
50	74	RSxxH4050xxx-x	72x21x16	300	RCxxH4050xxx-x	39x30x16	250
75	96	RSxxH4075xxx-x	72x21x16	300	RCxxH4075xxx-x	39x30x16	280
100	124	RSxxH4100xxx-x	72x36x18	550	n/a		
125	156	RSxxH4125xxx-x	72x36x18	550			
150	180	RSxxH4150xxx-x	90x36x20	700			

Note: Weight does not include options.

AC RapidPaks are available with Commander SK, Commander GP20 and Unidrive SP

Definition - RapidPak AC Order Code Configurator

Item	Description
Enclosure Style C = Cube enclosure S = Slimline enclosure	Cube enclosure option allows only the circuit breaker, non-fused disconnect switch and door operator devices. The Slimline enclosure allows all the options unless bypass is selected, then there is a limit of either an input or output reactor.
Drive Type SKN = SK Normal Duty, SKH = SK Heavy Duty, CGN = GP20 Normal Duty, CGH = GP20 Heavy Duty, SPN = SP Normal Duty, SPH = SP Heavy Duty,	Three drive models: Commander SK, Commander GP20 & Unidrive SP, AC drives with a Normal duty, current overload rating of 110% for 60 seconds. Heavy duty, current overloads rating of 150% for 1 minute.
Voltage Rating 8=208 VAC, 2=230 VAC, 3=380 VAC, 4=460 VAC	AC Input line voltage, 3 hp, 50/60 Hz, equals AC output rating for motor.
HP Rating	Motor hp ratings are based on typical motor current ratings. Actual motor currents and the type of applications should be reviewed before selecting drive size.
Door Mounted Operator Station 0 = Blank 1 = Stop PB, Start PB, Fault Light, Pot. 2 = # 1 & Jog PB, Fwd/Rev SS 3 = # 2 & Power On Light 4 = HOA SS, Pot, Power On, VFD Run, Fault Light 5 = HOA SS, Plus Bypass	The blank option defines that the devices are remote mounted. Selection #1 to #5 defines that the devices are door mounted and wired to the drive terminals.
Input Power 0 = Main Lugs with Input Fusing 1 = Circuit breaker (CB) 2 = Non-fused disconnect (NFD)	0 = Input Main lugs for customer termination with input fusing standard. 1 = CB with through the door operator, Thermal-magnetic overload protection and main circuit disconnect. Includes drive input semiconductor fuses. 2 = NFD with through the door operator, main circuit disconnect. Includes drive fusing.



Order string: The base Order Code requires a minimum of 12 characters in sequence to create the order string.

Additional Order Code

AC Input Reactor	3% impedance input line reactor. Reduces harmonics to line. Slimline only
AC Output Reactor	3% impedance output line reactor. Increases motor insulation life by reducing dV/dt. Slimline only
Auto Three-Contactor Bypass	Used in applications where full speed operation is required if drive becomes inoperable. Automatically switches upon drive fault. Requires Operator Station #5. Slimline only
Blower Motor Starter	Controls separately powered motor blower on TEBC and DPFV motors used for wide speed range applications. Not available with Bypass Options. Slimline only
Manual Three-Contactor Bypass	Used in applications where full speed operation is required if drive becomes inoperable. Manual (operator) activated via Operator Station #5. Slimline only
Nema 3R Enclosure	Enclosure intended for outdoor use. Provides a degree of protection against falling rain, sleet, and external ice.

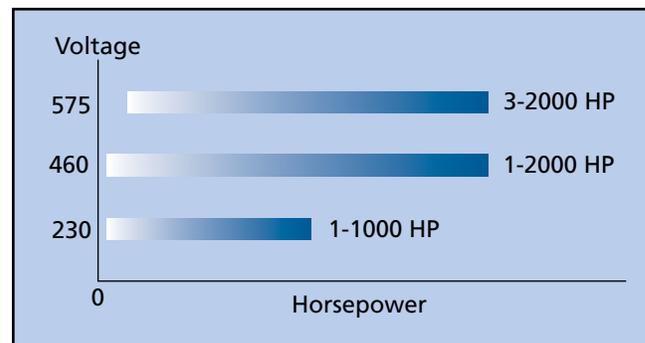
For options not included in the Order Code configurator, please consult factory.

AC CustomPak

In addition to our pre-engineered AC RapidPak solutions, we offer the AC CustomPak solution, when the stand alone module or packaged drives can't answer the need. Available with the full range of Emerson / Control Techniques products, this engineered product can be customized to meet a wide variety of power and control configurations. With power ranges up to 2000 hp and voltages ranging from 208V to 575V. We can deliver a comprehensive and cost-effective design that meets the needs of the most exotic packaged drive configuration. It features Non-Regenerative AC drives, fieldbus communication & coprocessor accessories for the demanding applications. This package solution has several optional features including; AC line contactor, AC line fusing, Input and Output reactors, 12, 18 or 24 pulse operation for harmonic reduction.



UL1, Ventilated Encl., SPM, 600 hp, 460VAC



Standard Features

- Input Voltage 208-460-575 VAC, 50/60 HZ
- Standard Enclosure, NEMA-12 (PPBF), Fully Gasketed, (PPBF) Positive Pressure Blown and Filtered.
- CT Soft Windows™ based Programming Tool

Enclosure Design

- NEMA 3R, Enclosure, Fully Gasketed, (PPBF) Positive Pressure Blown and Filtered
- N4, N4X or N12, (TENV) Enclosure, with or without Air Conditioner Depending on Size of the Drive.
- 14 Gauge Steel

Options

- Normal Duty Rating (110% for 1 minute)
- Heavy Duty Rating (150% for 1 minute)
- 3%, AC Line Reactors
- 3%, AC Output Reactor
- Auto or Manual 3-Contactor Bypass
- Blower Motor Starter with Adjustable Overload
- Door Mounted Operator Devices.
- Circuit Breaker or Non-fused Disconnect Switch
- Input Main Lugs with Input Fusing
- Door Mounted LCD (SM – Keypad Plus) with Three Lines of Text.
- SM-Modules
- Air Conditioner
- Space Heater
- 18 Pulse Operation

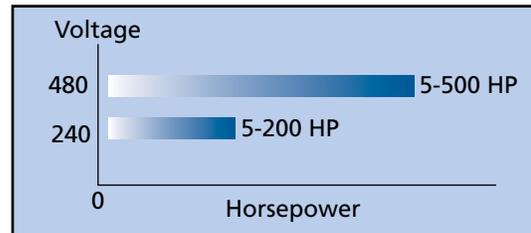
DC StandardPak NEW

The DC StandardPak is a highly reliable, superior performing DC drive package. Featuring the Mentor II and Quantum III DC drive (depending on the options selected), this package is fully equipped with everything you would need to power and precisely control a DC motor. It features non-regenerative or regenerative operation, high speed fusing, field power supply, DC or AC contactor and control power. It also offers optional fieldbus communications & coprocessor accessories for demanding applications. This packaged solution has several optional features including; a circuit breaker, non-fused disconnect switch, fused blower motor starter, door mounted devices and remote mount dynamic braking resistor.



MentorPak PN: DEN4255AN1A0-E
Nema -12 (PPBF), Ventilated Encl., 150 hp, 460 VAC, Non-Regen, Circuit Breaker, AC Contactor, BMS

The DC StandardPak has one of the shortest lead times in the industry and can provide an expertly packaged, DC drive solution within days of placing your order. Standard lead time for the DC StandardPak is 1-3 weeks depending on options.



Standard Features

- Input Voltage 208-480 VAC
- Enclosure or Panel
- 120 VAC Control Logic
- AC Line semiconductor Fuse
- DC Output Fuse for Regenerative Drives.
- Standard field voltage - 240 VAC = 150 VDC
480 VAC = 300 VDC
- CT Soft Windows™-based Programming Tool

QuantumPak

- DC Contactor with DB pole (5-100 hp @ 500 VDC)
- DC/AC or Encoder Feedback
- 55°C Drive Ambient

MentorPak

- AC Contactor (125-500 hp @ 500 VDC)
- DC or Encoder Feedback
- 40°C Drive Ambient

Enclosure Design

- Standard Enclosure N12 (PPBF), Fully Gasketed, (PPBF), Positive Pressure Blown and Filtered
- Painted with ANSI-61 Grey Paint
- Panel Design is with all the Standard Features and Options on a Back Panel
- 14 Gauge Steel

Options

- Door Mounted Operator Devices
- Circuit Breaker or Non-fused Disconnect Switch
- Fused Blower Motor Starter
- Non-Standard 240 VDC Field Supply
- 20 Amp Field Regulator
- Dynamic Braking Resistor (shipped loose)
- Door Mounted Keypad

Approvals

- UL508A

DC RapidPak



Non-Regenerative 208-240-380-480 VAC, 3-Phase Input, 50/60 Hz

QuantumPak: Panel or N12 (PPBF) Enclosure, DC Drive, 120 VAC CPT, DC contactor with DB contact, Input fusing.						
HP 240 VDC	HP 500 VDC	Armature Amps @		Field Amps	Panel Order Code	Enclosure Order Code
		40 ° C	55 ° C			
3-10	5-20	n/a	38	Max 8A Field Current Regulator	DPNx038B0-x	DENx038B0-x
15	25-30		55		DPNx055B0-x	DENx055B0-x
20-30	40-60		106		DPNx106B0-x	DENx106B0-x
40-50	75-100		172		DPNx172B0-x	DENx172B0-x

MentorPak: Panel or N12 (PPBF) Enclosure, DC Drive, 120VAC CPT, AC Input contactor without DB contact, Input fusing.						
HP 240 VDC	HP 500 VDC	Armature Amps @		Field Amps	Panel Order Code	Enclosure Order Code
		40 ° C	55 ° C			
60	125	210	Call Factory	Max 8A Field Current Regulator	DPNx210A0-x	DENx210A0-x
75	150	255		Max 10A Fixed Field Supply	DPNx255A0-x	DENx255A0-x
100	200	350			DPNx350A0-x	DENx350A0-x
125	250	420			DPNx420A0-x	DENx420A0-x
150	300	550			DPNx550A0-x	DENx550A0-x
200	400	700			DPNx700A0-x	DENx700A0-x
	500	825			DPNx825A0-x	DENx825A0-x

Regenerative 208-240-380-480 VAC, 3-Phase Input, 50/60 Hz

QuantumPak: Panel or N12 (PPBF) Enclosure, DC Drive, 120 VAC CPT, DC contactor with DB contact, Input fusing.						
HP 240 VDC	HP 500 VDC	Armature Amps @		Field Amps	Panel Order Code	Enclosure Order Code
		40 ° C	55 ° C			
3-10	15-20	n/a	38	Max 8A Field Current Regulator	DPRx038B0-x	DERx038B0-x
15	25-30		55		DPRx055B0-x	DERx055B0-x
20-30	40-60		106		DPRx106B0-x	DERx106B0-x
40-50	100		172		DPRx172B0-x	DERx172B0-x

MentorPak: Panel or N12 (PPBF) Enclosure, DC Drive, 120 VAC cntrl logic, AC Input contactor without DB contact, Input fusing.						
HP 240 VDC	HP 500 VDC	Armature Amps @		Field Amps	Panel Order Code	Enclosure Order Code
		40 ° C	55 ° C			
60	125	210	Call Factory	Max 8A Field Current Regulator	DPRx210A0-x	DERx210A0-x
75	150	255		Max 10A Fixed Field Supply	DPRx255A0-x	DERx255A0-x
100	200	350			DPRx350A0-x	DERx350A0-x
125	250	420			DPRx420A0-x	DERx420A0-x
150	300	550			DPRx550A0-x	DERx550A0-x
200	400	700			DPRx700A0-x	DERx700A0-x
	500	825			DPRx825A0-x	DERx825A0-x

Notes:

- 1) HP rating is a guide, please verify the motor armature amps at 40° or 55° C, then select the drive amps to be equal or greater than the motor amps.
- 2) The voltage code suffix is the 4th digit in the order string.

Dimensions & Weights

Armature Amps @		Dimensions H x W x D (inches)		Weights (lbs)	
40° C	55° C	Panel	Enclosure	Panel	Enclosure
n/a	38	33x27x13	36x30x16	75	170
	55				
	106				
	172				
210	Call Factory	45x33x12	48x36x16	125	400
255					
350					
420		60x32x14	72x36x18 or 90x36x20 with NFD	210	600
550					
700					
825					

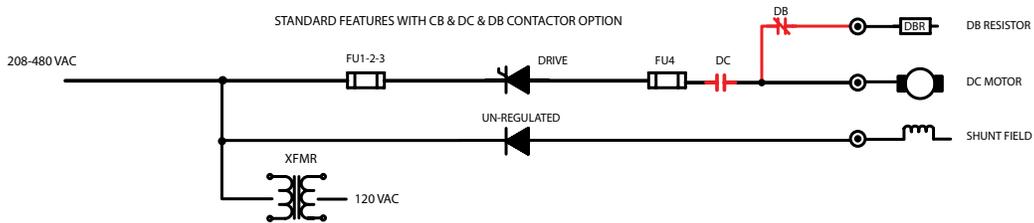
Note: Package Size 2, when adding the FXM5 option to the panel or enclosure the package size changes to Size 3.

DB Braking Resistor ¹			
Motor HP		DB Resistor for 240 VDC Order Code	DB Resistor for 500 VDC Order Code
240 VDC	500 VDC		
5	7.5	005-4301	005-4351
7.5	10	005-4302	005-4352
10	15	005-4303	005-4353
15	20	005-4304	005-4354
20	25	005-4305	005-4355
25	30	005-4306	005-4356
30	40	005-4307	005-4357
40	50	005-4308	005-4358
50	60	005-4309	005-4359
	75		005-4360
	100		005-4361
60	125	005-4310	005-4362
75	150	005-4311	005-4363
100	200	005-4312	005-4364
125	250	call factory	005-4365
150	300	call factory	005-4366
200	400	call factory	005-4367

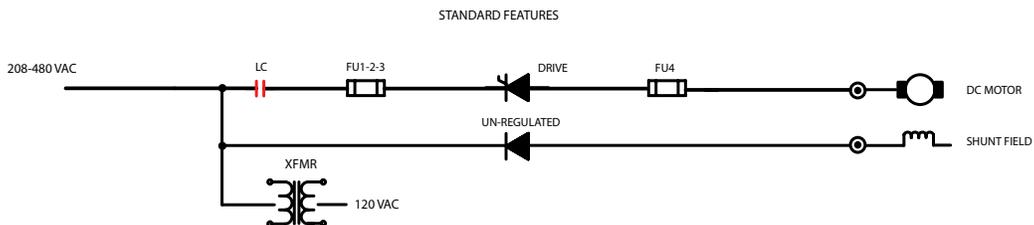
(1) The Nema 1 DB resistor is shipped loose and is to be mounted externally to the StandardPak by the customer to meet UL508A.

Power One Line Diagram

QuantumPak DC Contactor with DB pole



MentorPak AC Input Line Contactor



DC RapidPak

DC StandardPak Order Code Configurator

Order String



Product
D = DC StandardPak

Enclosure Style
P = Panel
E = Enclosure

Drive Model
N = Non-Regenerative
R = Regenerative

Voltage Rating
8 = 208 VAC
2 = 240 VAC
3 = 380 VAC
4 = 480 VAC

Amp Rating
Amps are based on drive size

Dynamic Braking ¹
A = AC Input Contactor
B = DC Contactor with DB pole

Input Power
0 = None (default)
1 = Circuit Breaker (C/B)
2 = Non Fused Disconnect Switch (NFD)

Additional Options (if required)

Fused Blower Motor Starter

- 1 = Range 0.4-0.65A
- 2 = Range 0.6 - 1.1A
- 3 = Range 1.0 - 1.5A
- 4 = Range 1.3-1.9A
- 5 = Range 1.8-2.7A
- 6 = Range 2.5-4.1A
- 7 = Range 4.0-6.3A

Field Supply Options

- A = 20A FXM-5 Field Current Regulator ²
- B = 240 VDC @ 2A ³
- C = 240 VDC @ 8A ³
- D = 240 VDC @ 20A ³

Door Mounted Devices ⁴

- E = E-Stop, Start PB, Stop PB, Speed Pot
- F = Fwd/Rev Switch ⁵
- H = HOA Selector Switch
- J = Jog PB
- K = Keypad (CTVue-303)
- P = Drive Power "ON" PL
- R = Reset PB
- V = Analog Armature Ammeter & Voltmeter
- W = Analog Field Ammeter & Voltmeter

Encoder Cable ⁶

- Y = DB9 Encoder Cable to Terminal Block

(1) E-Stop Braking option requires a DB contactor and an external DB resistor. Consult factory for DC contactor for DC drives rated 210 Amps and up.
 (2) Drives 255A and greater have fixed voltage field supply. A field current regulator is required to operate above base motor speed.
 (3) For 240 VAC application requiring 240 VDC armature and 240VDC Field Voltage.
 (4) To meet UL508A for industrial applications the E-Stop PB is required when door mounted devices are selected.
 (5) The Fwd/Rev Selector Switch applies to regenerative drives only.
 (6) Encoder feedback requires DB9 connector at drive. This option includes cable from DB9 connector to a terminal block.

Standard Enclosure is UL1 rated (NEMA 12 - PPBF (Positive Pressure Blown and Filtered))

DC RapidPak

Order String requires a minimum of 9 characters.

Examples:

Standard Order Code for Non-Regen: 200 hp @ 480 VAC, N12-(PPBF) enclosure, at 40° C
 PN = DEN4350A0

Standard Order Code as above with the following options: Circuit Breaker, Fused Blower Motor Starter, Field Regulator, Start/Stop PB, Reset PB, Armature Ammeter, Field Ammeter, Encoder Cable.
 PN = DEN4350A1-4ARVWY

Definition - DC StandardPak Order Code Configurator

Item	Description
Enclosure Style P = Panel E = Enclosure	P = Panel allows additional options to be added to the Quantum III module. E = The enclosure option is a UL1 rated, ventilated Nema -12 (PPBF), positive pressure blown and filtered. 14 gauge steel enclosure.
Drive Type N = Non-regenerative R = Regenerative	N for Non-regenerative DC drive or R for Regenerative DC drive. Regenerative provides FWD and REV direction with a controlled braking action. Non-Regenerative is unidirectional and will have a coast to a stop action, unless dynamic braking is used.
Voltage Rating 8 = 208 VAC 2 = 240 VAC 3 = 380 VAC 4 = 480 VAC	240 VAC for 240 VDC motor armature. 480 VAC for 500 VDC motor armature.
Drive Amp Rating - Armature	Motor hp ratings are based on typical motor current ratings. Actual motor currents and the type of applications should be reviewed before selecting drive size.
Dynamic Braking (DB) A = AC Input Contactor B = DC Contactor with DB pole	QuantumPak supplied with DC contactor (B), MentorPak supplied with AC contactor (A) as standard. Consult Factory for drives 210A or above with DC contactor. A = AC Input Contactor (210-825A) B = DC Contactor with DB pole (38-172A)
Input Power Disconnect 0 = None 1 = Circuit breaker (CB) 2 = Non-fused disconnect (NFD)	1 – CB with through the door operator, Thermal-magnetic overload protection and main circuit disconnect. Includes drive input semiconductor fuses. 2 – NFD with through the door operator, main circuit disconnect. Includes drive input semiconductor fuses.

ADDITIONAL OPTIONS

Item	Description
Blower Motor Starter 1 to 7	Select the correct blower motor amps. The value must be selected to complete the Order Code for order entry.
Door Mounted Devices E = E-Stop, Start PB, Stop PB, Speed Pot F = Fwd/Rev Switch ⁵ H = HOA Selector Switch J = Jog PB K = Keypad (CTVue-303) P = Drive Power "ON" PL R = Reset PB V = Analog Armature Ammeter & Voltmeter W = Analog Field Ammeter & Voltmeter	To meet UL508A for industrial locations the E-Stop push button is required with door mounted devices. E = E-Stop, Start, & Stop Push buttons, Speed Potentiometer F = Forward / Reverse Switch - FWD/REV Selector Switch applies to regenerative drives only. H = Hand (Manual) - Off - Automatic Switch J = Jog Push button K = Keypad (CTVUE-303 with standard program, mounted and wired on the door) P = Drive Power "ON" pilot light indicates drive running. R = Drive can be reset by means of the door mounted push button (PB), Remote (PB) or (PB) on the cover of the drive. V = Analog Armature Ammeter (150%) & Voltmeter (100%). W = Analog Field Ammeter (100%) & Voltmeter (100%)
Encoder Cable Y = Encoder cable	The drive has a DB9 connector for encoder feedback. The encoder cable is supplied with the DB9 connector wired to a terminal block.

DC MentorPak

For options not included in the Order Code configurator, please consult factory.

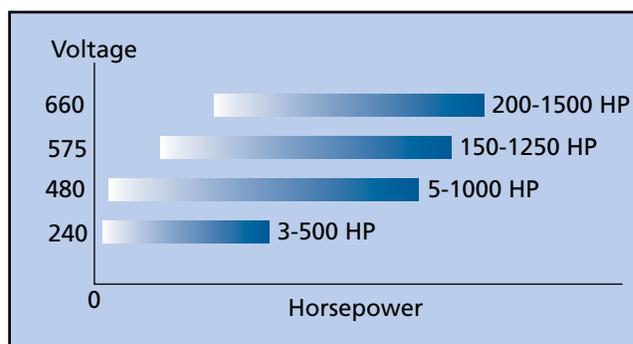
DC CustomPak

In addition to our pre-engineered DC StanardPak solutions, we offer a DC CustomPak solution. Featuring the Mentor II or the Quantum III DC drive, this engineered product can be customized to meet a wide variety of power and control configurations. With power ranges up to 1500 hp and voltages ranging from 240V to 660V, our custom engineered DC packaged solution can meet the needs of the most demanding packaged drive configuration. It features non-regenerative or regenerative operation, high speed fusing, field power supply regulated and unregulated, DC or AC contactor and control power. It also offers optional fieldbus communications & coprocessor accessories for demanding applications.

This packaged solution has several optional features including; a circuit breaker, AC line contactor, DC/DB contactor, fused blower motor starter, door mounted devices, line reactors, 12 pulse operation for harmonic reduction, and higher horsepower range.



Nema -12 (PPBF), Ventilated Encl., 500 hp, 460 VAC, Non-Regen, Circuit Breaker, DC Contactor, Field Regulator



Standard Features

- Input Voltage 208-240-380-480-575-660 VAC
- Enclosure or Panel
- 120 VAC control logic
- AC Line semiconductor fuse
- DC output fuse for regenerative drives
- AC, DC, DB contactor
- 2, 8 amp field regulator
- 10, 20A field supply
- DC, AC Tach or Encoder feedback
- Standard field voltage - 240 VAC = 150 VDC
480 VAC = 300 VDC
- CT Soft Windows™ based programming tool

Approvals

- UL508A up to 150 hp @ 240 VAC, 500 hp @ 480 VAC, 40° C

Options

- Door mounted operator devices and meters
- Circuit Breaker or Non-fused disconnect
- Fused blower motor starter
- Non-Standard field volts
- 20, 50, 90 Amp field regulator
- Line Reactor
- DC Choke
- 12 Pulse
- Dynamic braking resistor
- Air conditioner
- Door mounted keypad

Enclosure Design

- Standard Enclosure is (Nema 12 –PPBF) positive pressure blower and filter
- ANSI-61 grey paint
- 14 gauge steel
- Nema 3R, fully gasketed, (PPBF), Positive Pressure Blown and Filtered

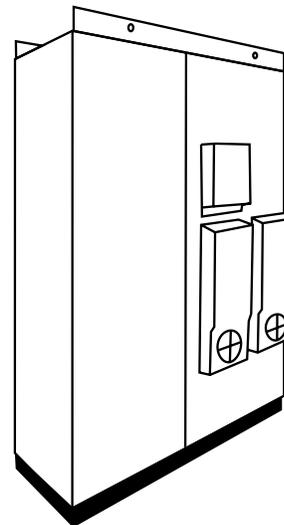
Large Enclosed AC Drives NEW

Users requiring quick delivery of a high-horsepower NEMA 12 Positive Pressure Blown and Filtered AC drive system, now have an Emerson Solution.

Robust Unidrive SPM technology from Control Techniques gives users the power, performance, and the ultimate in flexibility for all AC applications from 100 hp to 500 hp. For custom built higher horsepower configurations please consult your sales representative.

Features

- All the state-of-the-art integration features of the Unidrive SP
- A cost competitive, pre-engineered "AC In – AC Out" solution
- A perfect match for both high-performance, and standard drive applications, such as fans, pumps and conveyors
- Industry standard NEMA 12 filtered and ventilated enclosures
- Simplicity in ordering, installing and configuring
- An extensive array of options, including...
 - Circuit Breaker Disconnect
 - Line / Load Reactors
 - Door Mounted Operator Controls
 - Door Mounted Keypad



Dimensions

Cabinet Dimensions (inches)				
460V Horsepower	Duty	Height	Width	Depth
100–125 hp	Normal	78.75	23.6	23.6
100–125 hp	Heavy			
150–250 hp	Normal	78.75	31.5	27.5
150–250 hp	Heavy			
300–500 hp	Normal	78.75	55.1	27.5
300–450 hp	Heavy			
500 hp	Heavy	78.75	63	27.5

Note: Depth dimensions for the cabinets in the table include through-panel heatsinks and blowers on the back of the cabinet.

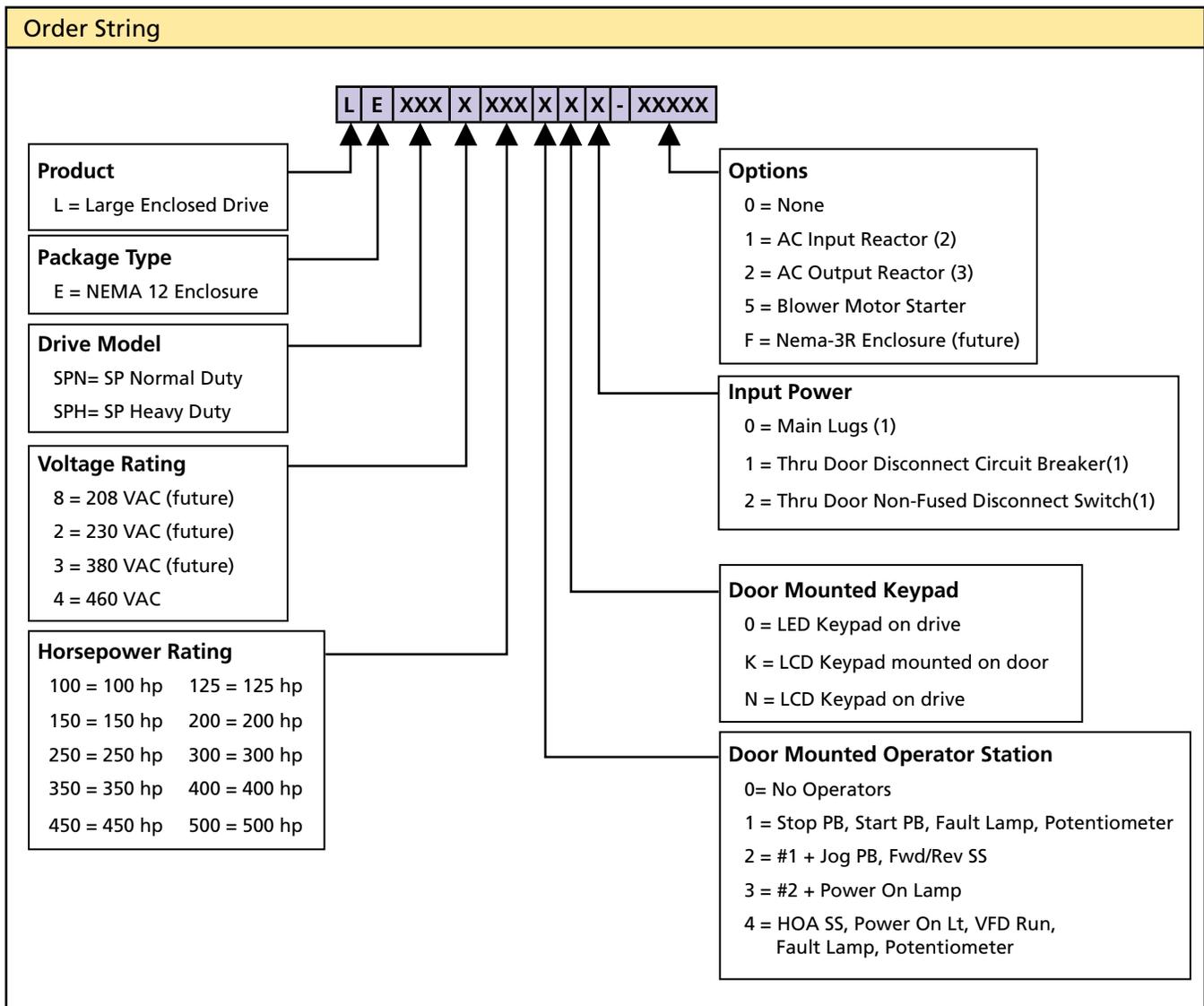
Packaged Drives & Engineered Systems



460 VAC Large Enclosed Drives Horsepower Ratings

Model	Normal Duty Rating (110%)			Heavy Duty Rating (150%)		
	hp 460 VAC	Continuous Amps	Peak Amps	hp 460 VAC	Continuous Amps	Closed Loop Peak Amps
LESPx4100	100	138	151	100	124	217
LESPx4125	125	168	184	125	156	273
LESPx4150	150	205	226	150	210	315
LESPx4200	200	236	260	200	246	369
LESPx4250	250	290	319	250	290	435
LESPx4300	300	335	369	300	342	513
LESPx4350	350	448	492	350	399	599
LESPx4400	400	470	517	400	470	682
LESPx4450	450	551	606	450	551	827
LESPx4500	500	637	701	500	599	898

Maximum permissible current output @ 40°C and 3kHz switching frequency. Consult factory for higher horsepower drives.



Ordering Notes: (1) Drive line fuses are included as standard
 (2) Input reactors are included on 200 hp HD, and all 250 to 500 hp drives
 (3) Output reactors are included on all 300 to 500 hp drives

Packaged Drives & Engineered Systems

Unidrive *SPM* — 60 hp to 2900 hp

Modular drives ideal for system integrators and OEMs

The Unidrive SPM — Solution Platform Modular systems give integrators and OEMs added flexibility to design and build high power AC drives that meet their exact requirements.

The Unidrive SPM platform offers all of the standard and optional features available on the panel mount SP drives and is integrated using the same software tools for commissioning and programming.



The modular nature of the power circuit allows drive systems to be constructed in non-standard enclosures. For example, it is possible to implement a drive system of between 60 and 2900 hp in an enclosure no taller than 36 in.

FEATURES

- Control high current motors by paralleling output inverter modules
- Compact IP20 input and output power modules
- Utilize an existing DC supply
- Return braking energy to AC supply with standard inverter modules
- Recycle energy between simultaneously motoring and regenerating drives
- Enable a single AC power entry
- Minimize harmonics with 12-, 18- and 24-pulse rectifier configurations
- Eliminate harmonics with an active front end
- IP54 heatsink with through panel mounting

BENEFITS

- Build customized high power drives with standard volume produced modules
- Create a comprehensive range of custom power systems
- Economic integration with existing plant
- Reduce running cost
- Ideal for unwinding / winding processes
- Simplify installation and minimize cabling
- Meet more demanding supply regulations
- Comply with supply regulations
- Allows smaller enclosure size, reduces cooling requirements

Unidrive SPMs

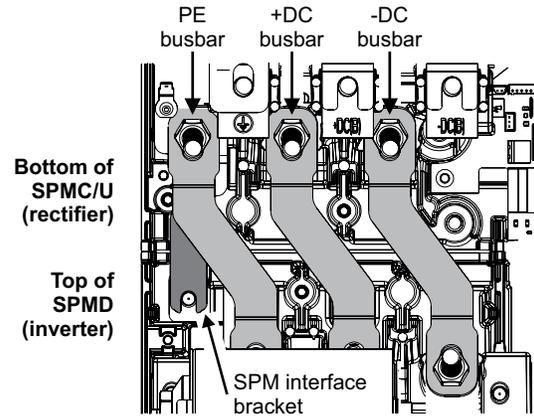
SPM MODULE DESCRIPTIONS

SPMA - Is a complete inverter drive (AC in, AC out) with internal rectifier capable of being parallel connected with SPMA modules of equal rating. DC connections are present for regen and common bus applications.

SPMD - Inverter module (DC in, AC out) that requires a DC power supply from either an SPMC/U or an existing source.

SPMC - **C**ontrolled rectifier bridge module (AC in, DC out) used as a front end power supply to the SPMD inverter module.

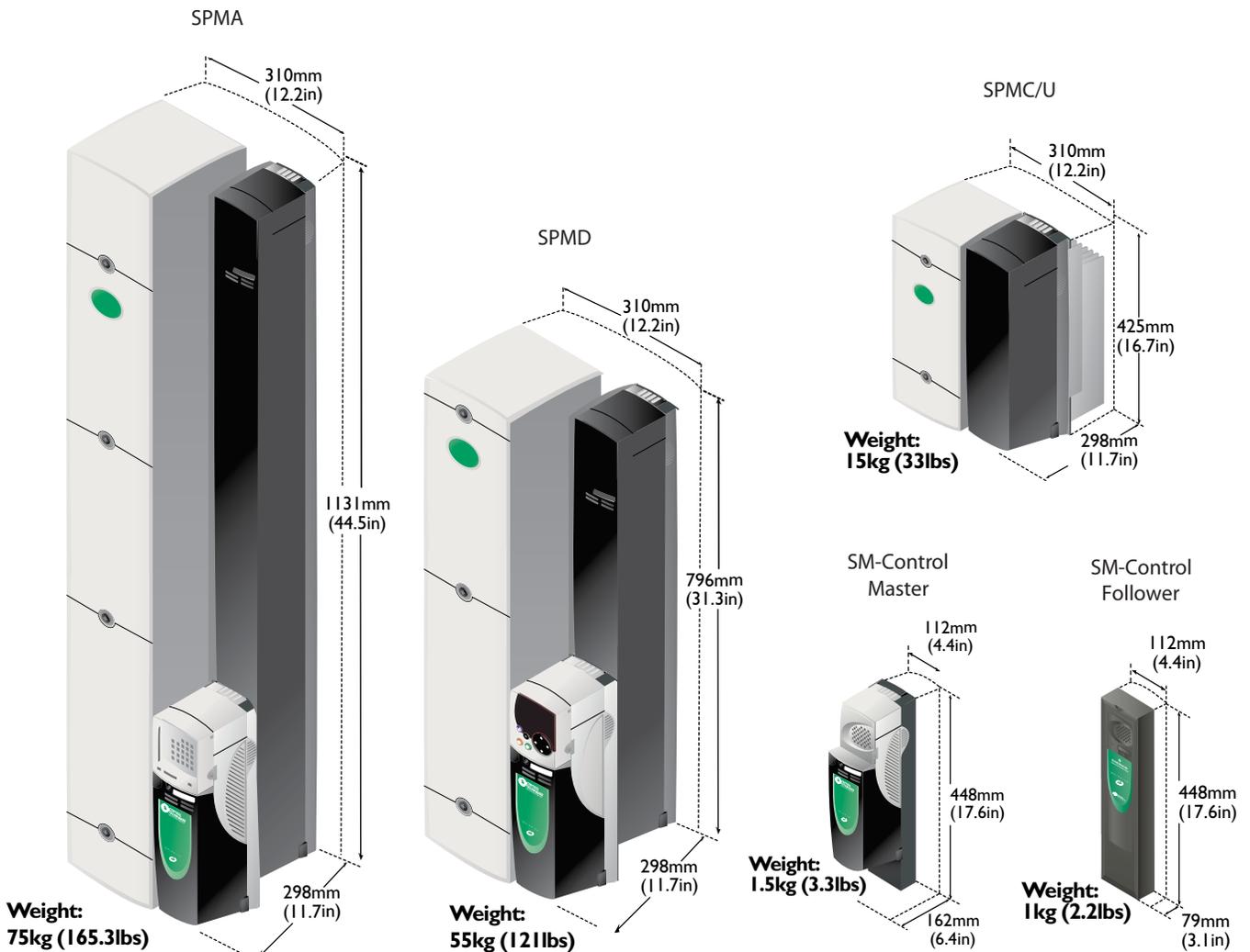
SPMU - **U**ncontrolled rectifier bridge (AC in, DC out) used as a front end power supply to the SPMD inverter module. A separate soft start must be provided.



Docking kits are available that provide the necessary hardware to directly mount the SPMC to an SPMD.

Input line reactors and output sharing chokes are specified and available.

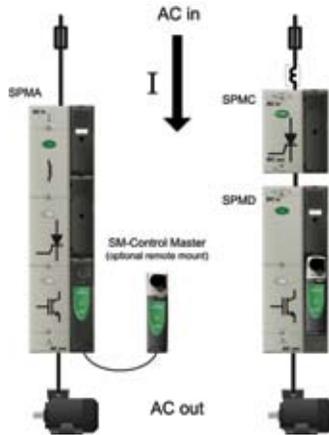
Unidrive SPMs



Basic Configurations

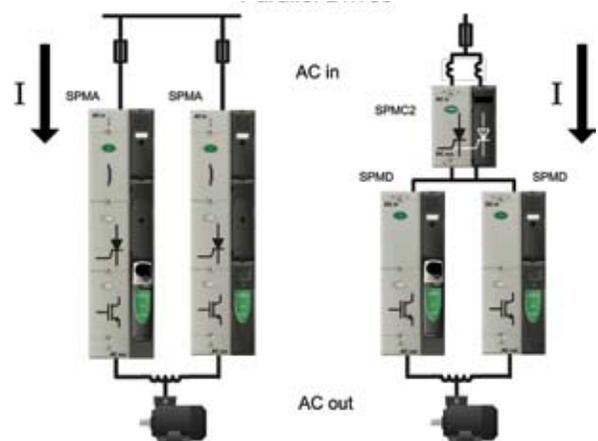
The examples below demonstrate the versatility of the Unidrive SPM in creating a wide range of High Power AC drives.

Single Drives



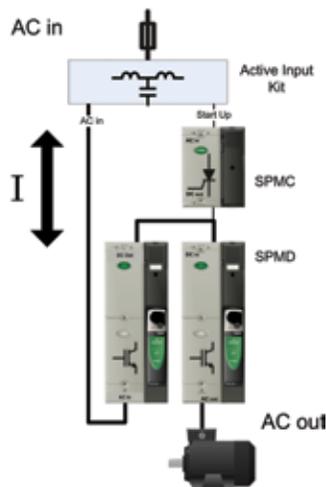
The SPMA solution will be lower cost but the SPMD solution may give site standardization. The master control module on the drive may be replaced by a follower module and the master can be remotely mounted, as the application requires.

Parallel Drives



For higher currents multiple SPMA or SPMDs may be configured in parallel. The SPMA may give shorter installation time with less interconnections but the SPMD may give lower cost. Site standardization may also be a factor.

Active Input and Regeneration



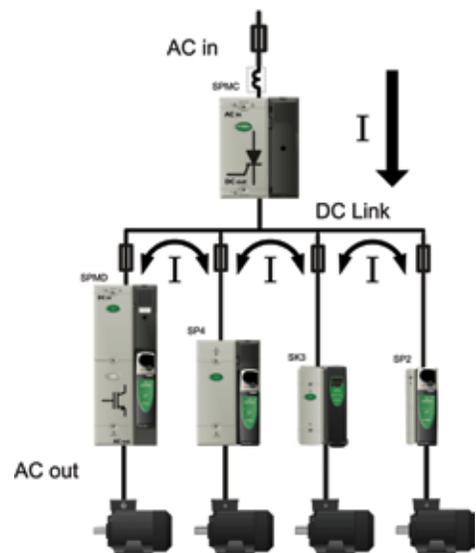
Active inputs for harmonic elimination and regenerating excess energy can be configured with standard drive modules, configured as motoring or regenerating.

12 Pulse Input Current



Multi-pulse rectifiers can be configured (12, 18 and 24 etc.) to minimise input harmonics and help to meet local supply authority regulations.

Common DC bus



Drives from the Unidrive and Commander families can be connected on a common DC bus system, in order to circulate energy between drives with opposing energy flow, supplied from a controlled rectifier input (SPMC), an active input (SPMA or SPMD) or an existing DC source.

Unidrive SPMs



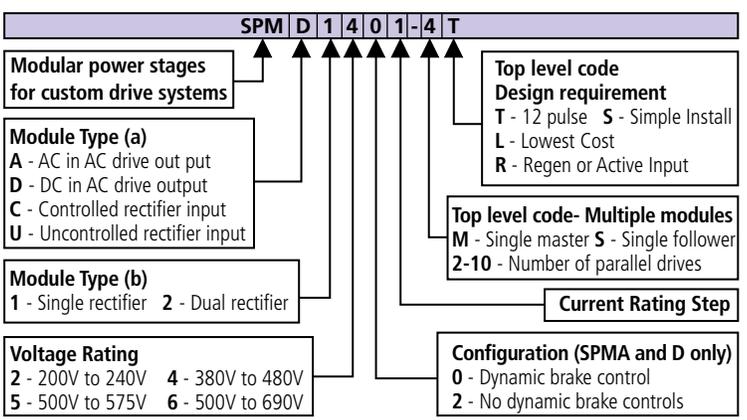
	Output Module Selection								DC Fuse Selection	Input Module Selection				24V DC Input [3]	AC Fuse Selection
	Drive	Normal Duty			Heavy Duty			24 VDC Input [3]		Controlled		Uncontrolled			
		Max Cont. Current	Typical Motor Output		Max Cont. Current	Typical Motor Output				Single	Dual	Single [3]	Dual [3]		
	Order Code	A	220V kW	230V hp	A	220V kW	230V hp	A		A	A	A	A		
200-240 VAC +/- 10%	SPMD1201	192	55	75	156	45	60	3.3	400	na	na	SPMU1402	SPMU2402	3.0	400
	SPMD1202	248	75	100	192	55	75	3.3	550	na	na				
	SPMD1203	312	90	125	250	75	100	5.0	550	na	na				
	SPMD1204	350 ^[1]	110 ^[1]	150 ^[1]	290	90	125	5.0	550	na	na				
		A	400V kW	400V hp	A	400V kW	400V hp								
380-480 VAC +/- 10%	SPMA1401	205	110	150	180	90	150	3.3	na	na	na	na	na	na	315
	SPMA1402	236	132	200	210	110	150	3.3	na	na	na	na	na	na	350
	SPMD1401	205	110	150	180	90	150	3.3	400	SPMC1402	SPMC2402	SPMU1402	SPMU2402	3.0	400
	SPMD1402	246	132	200	210	110	150	3.3	560						
	SPMD1403	290	160	250	246	132	200	5.0	560						
	SPMD1404	350 ^[1]	200 ^[1]	300 ^[1]	290	160	250	5.0	560						
		A	575V kW	575V hp	A	575V kW	575V hp								
500-575 VAC +/- 10%	SPMA1601 ^[2]	125	90	125	100	75	100	3.3	na	na	na	na	na	na	200
	SPMA1602 ^[2]	144	110	150	125	90	125	3.3	na	na	na	na	na	na	200
	SPMD1601 ^[2]	125	90	125	100	75	100	3.3	250	SPMC1601	SPMC2601	SPMU1601	SPMU2601	3.0	250
	SPMD1602 ^[2]	144	110	150	125	90	125	3.3	315						
	SPMD1603 ^[2]	168	110	150	144	110	150	5.0	350						
	SPMD1604 ^[2]	192	150	200	168	110	150	5.0	400						
		A	600V kW	600V hp	A	600V kW	600V hp								
500-690 VAC +/- 10%	SPMA1601	125	110	150	100	90	125	3.3	na	na	na	na	na	na	200
	SPMA1602	144	132	175	125	110	150	3.3	na	na	na	na	na	na	200
	SPMA1601	125	110	150	100	90	125	3.3	250	SPMC1601	SPMC2601	SPMU1601	SPMU2601	3.0	250
	SPMA1602	144	132	175	125	110	150	3.3	315						
	SPMA1603	168	160	200	144	132	175	5.0	350						
	SPMA1604	192	185	250	168	160	200	5.0	400						

Unidrive SPMs

Option Reference	Order Code
SM-Control Master	SM-Control Master
SM-Control Follower	SM-Control Follower ^[4]
24V DC Supply - 10A	8510-0000
SPM Docking Kit	3470-0012

Normal Duty Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive continuous current, higher overloads are achieved.

Heavy Duty (Rotor Flux Control and Closed Loop) Suitable for demanding applications, current overload is set at up to 150% for 60 seconds. Where motor rated current is less than the drive rated continuous current overloads (200% or greater) are achieved.



Notes:
 [1] The full rating is only possible when the SPMD is mounted separately to the SMPC. That is, a single module can deliver 350A with a separate airflow path for each module and Tambient = <35°C. Otherwise the limit is 335A.
 [2] The same model can be used on a 575V or a 690V supply and has two different output ratings. e.g. At Normal Duty, SPMD1601 is suitable for a 90 kW output motor on a 575V but is suitable for a 110 kW output motor on 690V.
 [3] All SPM modules require a 24 VDC power supply for the cooling fans. The total 24 VDC current required can be assessed in the table and a 24 VDC supply chosen.

[4] For paralleling, the necessary interface cable that connects a follower to a master or another follower is delivered with the follower module.
 [5] A separate soft start must be provided for the DC link. Please contact your supplier.
 [6] Input inductance may be incorporated in star-delta transformer.
 [7] Only 400A AC and DC fuses are stocked by Control Techniques, as these are used with other products.
 [8] For more information, contact your supplier.

Engineered Systems

Total Systems Solutions

When your motion application demands more than panel mount, free-standing, or packaged drives, our Drive Centers stand ready to deliver a comprehensive and cost-effective design, build and start up solution. Our more than 50 Drive Centers worldwide, eight in the United States, provide an invaluable, industrial application knowledge base to apply to our customers' needs. Forty years of building electronic-based drive systems has given us the expertise to build solutions for nearly any application.



Control Techniques engineering and systems centers are located around the country and are staffed by engineers providing expertise to a wide variety of industries:

- Automotive Assembly and Testing
- Mining and Aggregates
- Oil and Gas
- Metals Processing
- Glass
- Plastics and Rubber
- Heavy Moveable Structures
- Water/Wastewater Pumping
- Web Handling
- Power Generation
- Converting
- Packaging
- Printing
- Forestry
- Irrigation
- Ski Lifts

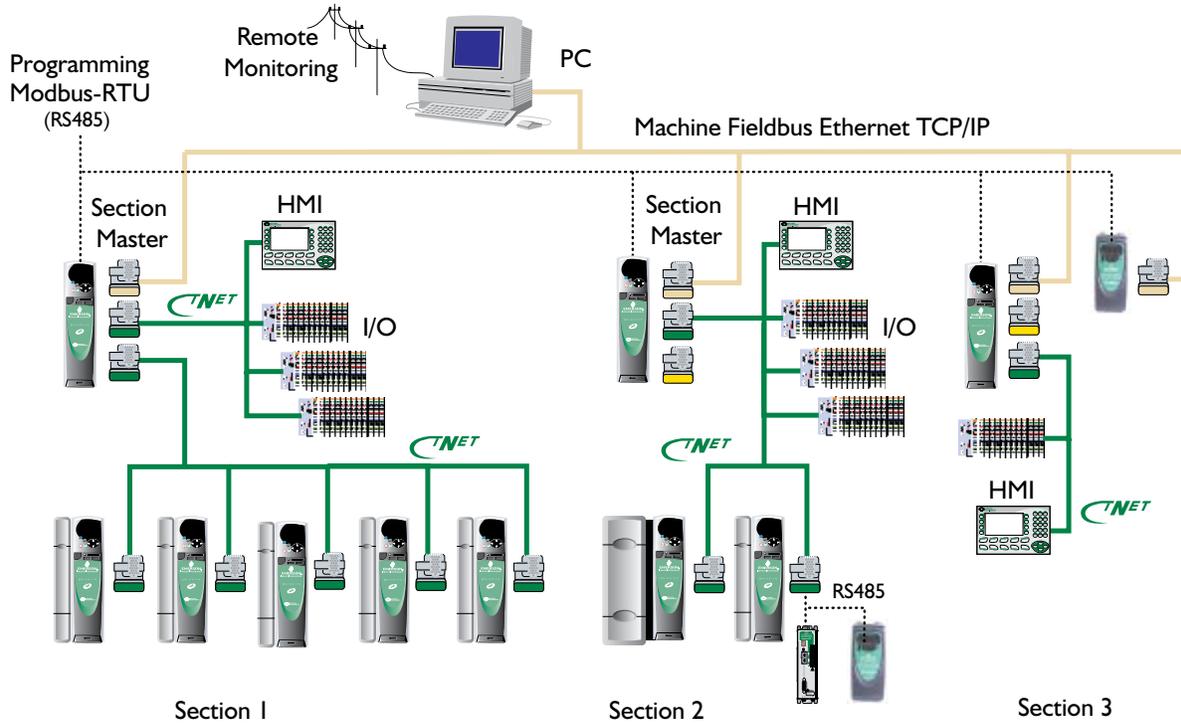
Packaged Drives & Engineered Systems

Flexible control architecture

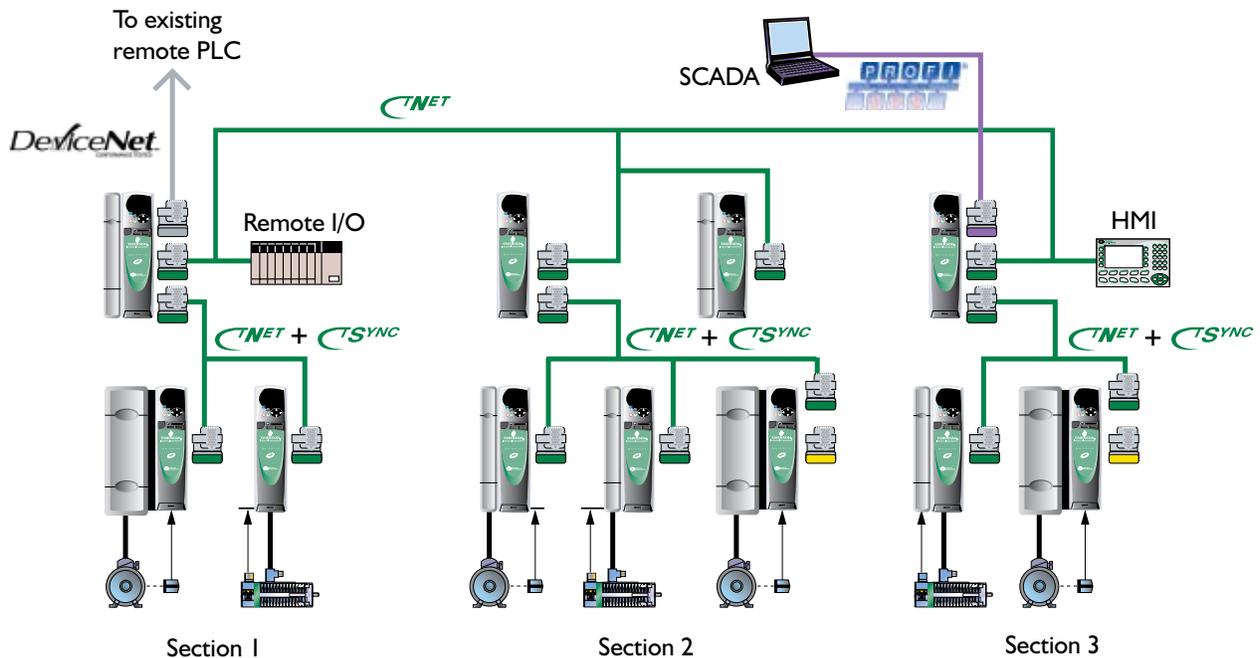
Our drives systems are designed for any control architecture: centralized, distributed, or fully decentralized. The options of scalable PLC functionality within the drive; high speed, peer-to-peer networking; extended I/O capability, and support for all major field-buses, greatly simplifies system integration regardless of the control scheme.

- SM-Applications Plus
- SM-I/O Plus
- SM-PROFIBUS-DP
- SM-DeviceNet
- SM-Ethernet

Distributed Sectional Control — featuring CTNet and Ethernet communications



Decentralized Control — featuring CTSync drive-to-drive synchronization with less than 250µsec jitter



Engineered Systems provides its customers with totally integrated systems, which can include:

- Coordinated Drive/Servo Systems
- Four-quadrant Regenerative Systems
- 18-Pulse and 24-Pulse Drives
- PLC and PC-based Control Systems
- Switch gear, e.g., automatic transfer switches
- Custom Fabrication
- Climate Controlled MCC's and E-Houses
- Electrical Control and Instrumentation
- Power Distribution
- Operator Interfaces (HMI)
- Industrial Communications Platforms
- Custom Enclosures



The typical engineered systems program consists of the following components:

- Initial Applications Review
- Proposal and Review
- Order and Project Scheduling
- Hardware Design and Review
- Software Design and design review
- System Training
- Field Startup Assistance

Systems/Features	AC Systems	Motion Control Systems	DC Systems
Control Technology	High Performance open loop and closed loop vector, regen	Rotary and linear servo, and AC Vector Servo	Digital open loop and closed loop, regen and non-regen
Power	.5 hp to 2900 hp	Servo: To 750 lb-in Vector: To 4,500 lb-in	5 hp to 2000 hp
AC Voltage 50/60Hz ± 10%	200V to 690V 3Ø	90V to 690V 1Ø, 3Ø	208-660V 3Ø
Motor Feedback	All major feedback devices supported.		Voltage Feedback (CEMF) AC or DC Tachometer, Encoder
Communication	All major communication protocols supported.		
Enclosures	NEMA 1, NEMA 3R, NEMA 4, NEMA 4X, NEMA 12, and NEMA 12-Positive Pressure, Custom		
Key Options	Operator control stations, Industrial CRT workstations, HMI programming, PLC's, Switch gear, Power distribution, Common DC bus, Speed reducers		