



EMERSON[™]
Industrial Automation

Unidrive SPM

High Power AC Drives
Unidrive Connectivity
with Modular Flexibility

45 to 1900kW (60 to 2900 HP)
200V / 400V / 575V / 690V



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TECHNIQUES**

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Unidrive SPM - Flexible Power from 45 to 1900kW

Whatever the design priorities for the system engineer, the flexibility of the SPM range enables the optimum solution to be chosen.

This brochure will help you to select the optimum configuration for your application.

The SPM range consists of the following drive products:

- **SPMA** - **AC** in AC out drive.
- **SPMD** - **DC** in AC out drive.
- **SPMC** - **C**ontrolled rectifier.
- **SPMU** - **U**ncontrolled rectifier.

Design Requirement	Solution
Optimise initial cost	Lowest total material cost
Simplest installation	Select configuration with minimum interconnections
Optimise spares inventory	Select configuration for site standardisation
Optimise energy costs	Select multi pulse, active input or common DC bus configuration

SPM Benefits

Build custom high power systems using volume produced power modules, with proven reliability and short lead time. The compact, innovative, IP20 modules are physically easy to handle and install.

Cleaner power by minimising input harmonics with 12, 18 or 24 pulse rectifiers or eliminate harmonics with an active input configuration. Control dynamic loads with the inbuilt brake controller or full regenerative energy control with an active input. Reduce running costs by circulating energy between braking and motoring drives on a common DC bus system and by returning excess energy to mains supply with an active input.

High performance motor control with simple set up and no position feedback using Rotor Flux Control (RFC).

Familiarisation and integration is simple with the common control and option set used throughout the Unidrive SP family.

Unidrive SPM is a part of the Unidrive SP family of high performance drives.

Unidrive SP Solutions Platform Overview & SP Panel Mount 0.37kW - 132kW

Unidrive SP main brochure. Featuring SP Panel Mount, flexible drive modules for integration into cabinets



Unidrive SP Free Standing 90kW to 675kW

Fully engineered compact cabinet drives brochure for high powered motors.



SPMA



SPMD



SPMC or SPMU



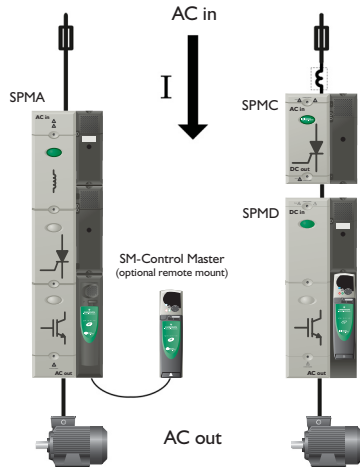
All popular high power system configurations can be implemented with compact, flexible modules:

System Requirement	Configuration
High power motors	Parallel drives
Harmonic minimisation	Multi-pulse rectifier (12, 18, 24 etc.)
Harmonic elimination	Active Input
Four Quadrant motor control	Regenerative configuration
Energy transfer - braking to motoring	DC Bus connected drives

Basic Configurations

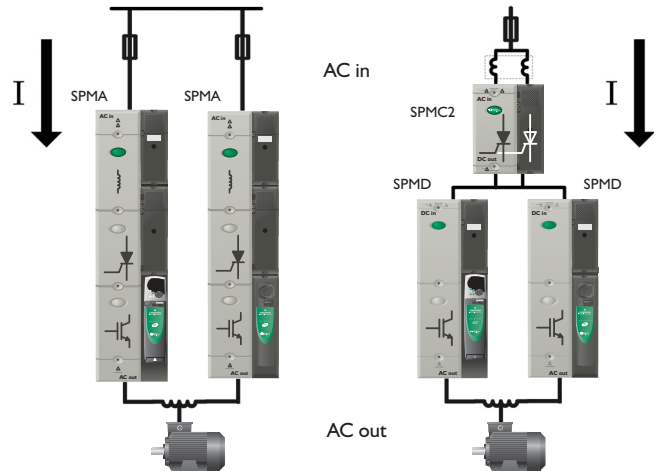
The examples below demonstrate the versatility of the Unidrive SPM in creating a wide range of High Power AC drives.

Single Drives



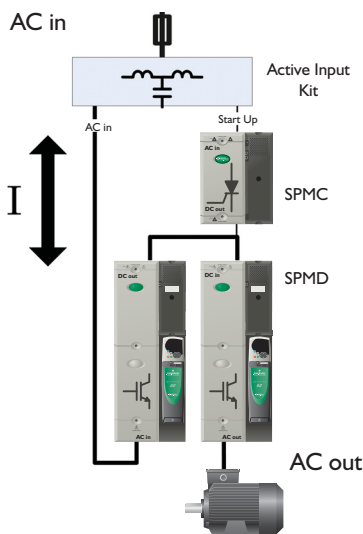
The SPMA solution will be lower cost but the SPMD solution may give site standardisation. The master control module on the drive may be replaced by a slave module and the master can be remotely mounted, as the application requires.

Parallel Drives



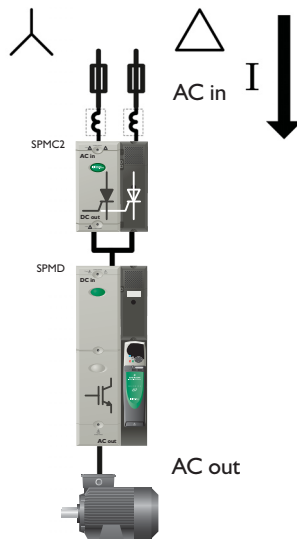
For higher currents multiple SPMA's or SPMD's may be configured in parallel. The SPMA may give shorter installation time with less interconnections but the SPMD may give lower cost. Site standardisation may also be a factor.

Active Input and Regeneration



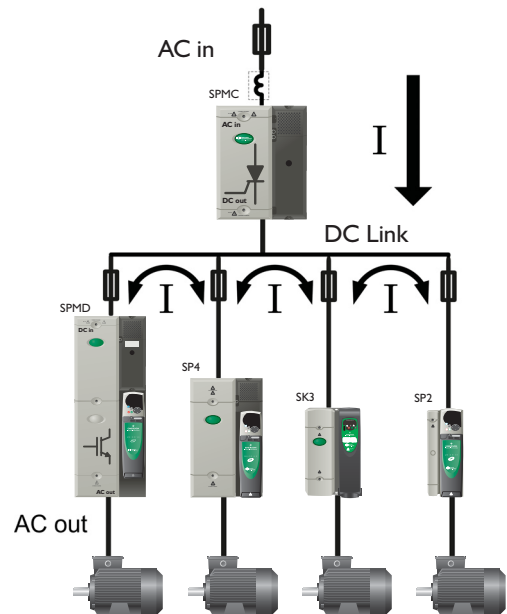
Active inputs for harmonic elimination and regenerating excess energy can be configured with standard drive modules, configured as motoring or regenerating.

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.

Unique benefits of Unidrive SPM

Electrical Design



The units that make up the SPM range can be used to implement most types of system. The separation of the power circuit into rectifier and drive stages enables elegant and compact active input configurations to be implemented. For example this 550kW four quadrant test rig system consists of 6 identical drive modules in a 2.4m cubicle suite.

Mechanical Design



In this example, from the power generation sector, the requirement was to find a 132kW drive that would fit inside an industry standard motor control cubicle, to increase reliability and maximise generating efficiency. The SPMA was a unique solution.

Installation Flexibility



All SPM modules have an IP54 rated heatsink and may be installed with their heat sinks "through panel" mounted. This allows the main cooling to be outside the electronic enclosure, simplifying the design and reducing the thermal stress on the rest of the control system.

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 45 and 1900kW in an enclosure no taller than 1m. This would be achieved by mounting the drives, rectifiers and inductors side by side. This is of great interest for crane hoists, deep mine conveyors and all compact machine designs.

Maintenance



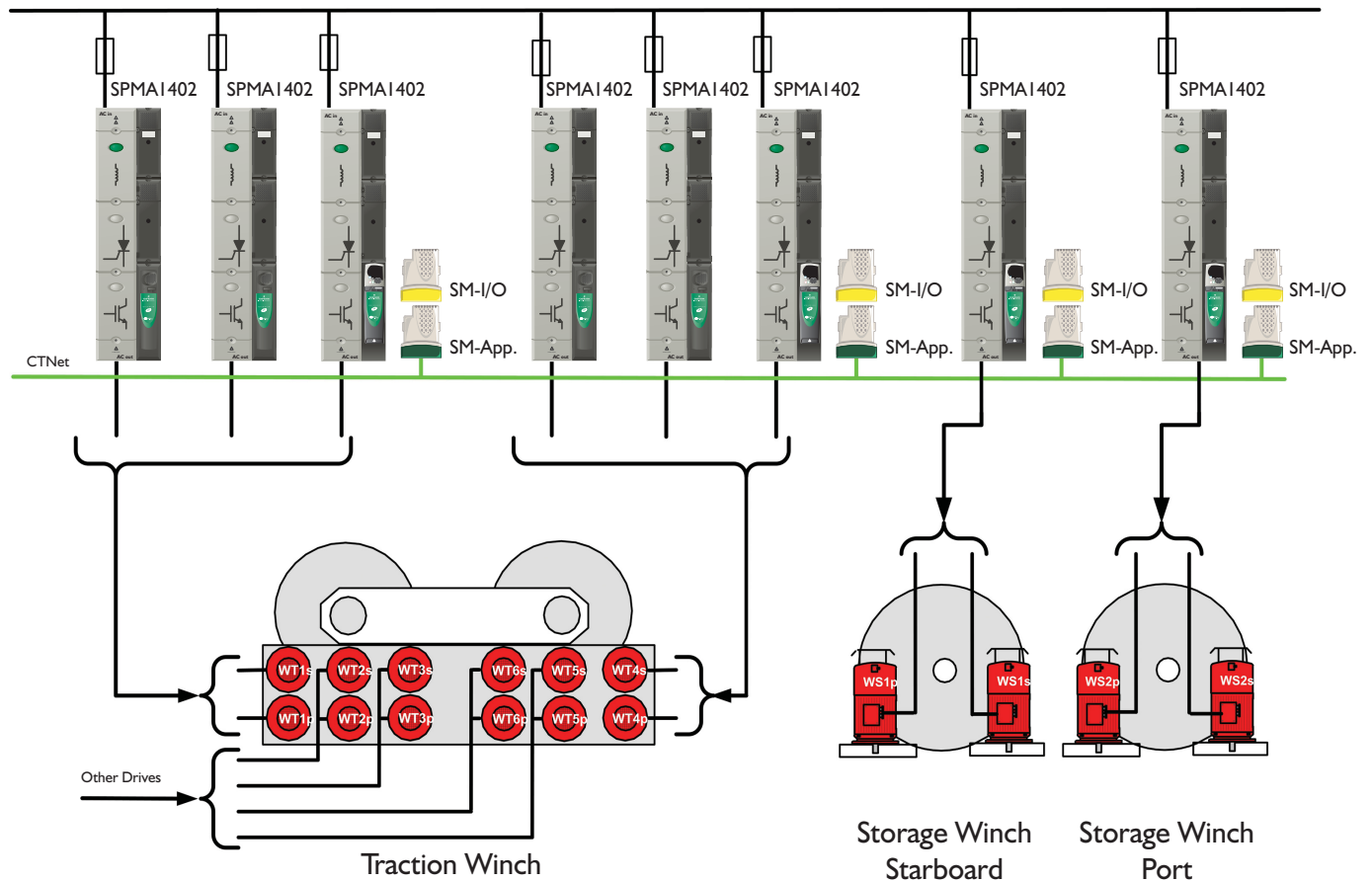
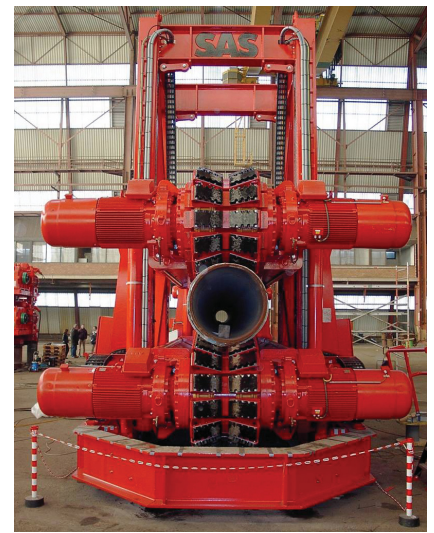
The SPMD drive in this picture is capable of controlling 350A (200kW induction motor, typical) and yet is extremely manageable. The picture shows it being installed in a 400mm wide cubicle.

Any system designed with SPM is constructed with compact drive modules, that are manufactured in high volume. This means that in the event of the system being damaged, normal service is rapidly resumed simply by exchanging the damaged module with a factory built and tested one. The scenario of rebuilding power circuits down to semiconductor level is easily avoided.



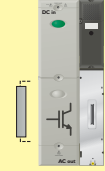

Optimise Spares Inventory

The possibility of standardising on a single, compact drive module is highlighted by the following schematic. It is based on an actual marine project that incorporated a wide range of applications and motor ratings, but with each one implemented by various combinations of SPMA1402.

In addition to minimising spares inventory, this approach also standardises the system build, with many of the cubicles being identical.



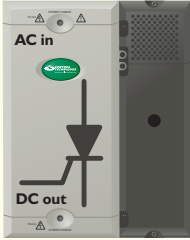
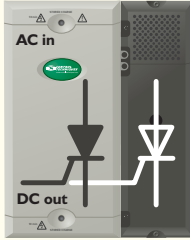
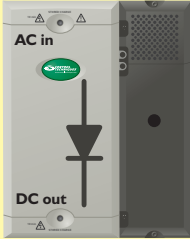
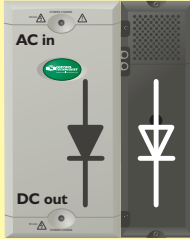
Drive Product Range

Model Reference		SPMA						SPMD						
Operating Mode	Motoring		AC in AC out						DC in AC out					
	Regenerating		AC in AC out and DC link soft start						AC in and DC out					
Voltage, Current and Power Range	Supply (V)	Duty	From			To			From			To		
			(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(kW)	(HP)
	200	Normal	-	-	-	-	-	-	192	55		3333	950	
		Heavy	-	-	-	-	-	-	156	45		2761	750	
	230	Normal	-	-	-	-	-	-	192		75	3333		1450
		Heavy	-	-	-	-	-	-	156		60	2761		1200
	400	Normal	205	110		2247	1250		205	110		3333	1900	
		Heavy	180	90		2000	1100		180	90		2761	1500	
	460	Normal	205		150	2247		1950	205		150	3333		2900
		Heavy	180		150	2000		1750	180		150	2761		2400
575	Normal	125		125	1371		1500	125		125	1828		2000	
	Heavy	100		100	1190		1300	100		100	1600		1750	
690	Normal	125	110		1371	1350		125	110		1828	1800		
	Heavy	100	90		1190	1150		100	90		1600	1550		
Power Modules			 <p>SPMA 1x0x Brake Transistor Included</p>			 <p>SPMA 1x2x No Brake Transistor</p>			 <p>SPMD 1x0x Brake Transistor Included</p>			 <p>SPMD 1x2x No Brake Transistor</p>		

Drive Control Modules

Model Reference	SM-Control Master	SM-Control Slave
Control Modules For assembly to Power Module	 <p>Illustrated with optional SM-Keypad fitted</p>	

Rectifier Product Range

Rectifier Type	Single Rectifier AC in / DC out	Dual Rectifier 2 x AC in / DC out
Controlled DC link soft start for drive system	 SPMC1x0x	 SPMC2x0x
Uncontrolled DC link supply for conditions where a controlled rectifier is impractical A separate soft start must be provided for the DC link	 SPMUIx0x	 SPMU2x0x

Rectifier ratings

Supply (V)	Model References	Max AC Input Current (A)	Max DC Input Current (A)	Max AC Input Current (A)	Max DC Input Current (A)
400	SPMC and SPMU	344	379	2x312	2x345
690		195	209	2x173	2x185

Equivalent SPMD AC Output

Supply (V)	Model References	From (1 x SPMC1)			To (10 x SPMC1)			From (1 x SPMC2)			To (10 x SPMC1)		
		(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(kW)	(HP)
200	SPMU	192	55		3333	950		384	110		3333	950	
230		192		75	3333		1450	384		150	3333		1450
400	SPMC and SPMU	205	110		3333	1900		410	220		3333	1900	
460		205		150	3333		2900	410		300	3333		2900
575		125		125	1828		2000	250		250	1828		2000
690		125	110		1828	1550		250	250		1828	1800	

SPMA Simplest Installation - minimum interconnections

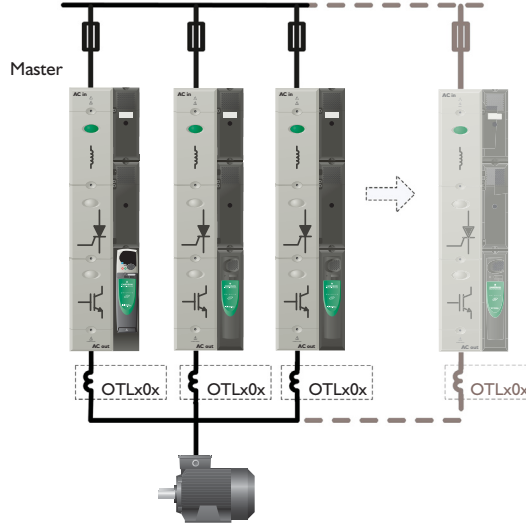
Fig 1 - SPMA x 1



Fig 2 - SPMA x 2



Fig 3 - SPMA x 3 to x 10



	Normal Duty			Heavy Duty			L _{dB}	Top Level Drive Order Code	Drive Order Code Items			
	Max Continuous Current (A)	Typical Motor Output		Max Continuous Current (A)	Typical Motor Output				Modules		Inductors	
		@ 400V (kW)	@ 460V (HP)		@ 400V (kW)	@ 460V (HP)			Drive	Master		Slave
	(A)	(kW)	(HP)	(A)	(kW)	(HP)						Output
400V	205	110	150	180	90	150	1	SPMA1401-1S	1 x SPMA1401	1		
	236	132	200	210	110	150	1	SPMA1402-1S	1 x SPMA1402	1		
	390	225	300	342	185	300	2	SPMA1401-2S	2 x SPMA1401	1	1	1 x OTL411
	449	250	400	400	225	350	2	SPMA1402-2S	2 x SPMA1402	1	1	1 x OTL412
	585	315	500	514	280	450	3	SPMA1401-3S	3 x SPMA1401	1	2	3 x OTL401
	674	355	550	600	315	500	3	SPMA1402-3S	3 x SPMA1402	1	2	3 x OTL402
	780	400	650	685	355	600	3	SPMA1401-4S	4 x SPMA1401	1	3	4 x OTL401
	899	500	750	800	400	700	3	SPMA1402-4S	4 x SPMA1402	1	3	4 x OTL402
	976	550	850	857	450	750	3	SPMA1401-5S	5 x SPMA1401	1	4	5 x OTL401
	1123	600	950	1000	550	850	3	SPMA1402-5S	5 x SPMA1402	1	4	5 x OTL402
	1171	650	1000	1028	550	900	3	SPMA1401-6S	6 x SPMA1401	1	5	6 x OTL401
	1348	750	1150	1200	650	1050	3	SPMA1402-6S	6 x SPMA1402	1	5	6 x OTL402
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:												
2247	1250	1950	2000	1100	1750	3	SPMA1402-10S	10 x SPMA1402	1	9	10 x OTL402	

	@ 690V (kW)		@ 575V (HP)		@ 690V (kW)		@ 575V (HP)		L _{dB}	Top Level Drive Order Code	Drive Order Code Items		
	Max Continuous Current (A)	Typical Motor Output		Max Continuous Current (A)	Typical Motor Output						Modules		Inductors
		@ 690V (kW)	@ 575V (HP)		@ 690V (kW)	@ 575V (HP)	Drive	Master			Slave		
	(A)	(kW)	(HP)	(A)	(kW)	(HP)						Output	
575V / 690V	125	110	125	100	90	100	1	SPMA1601-1S	1 x SPMA1601	1			
	144	132	150	125	110	125	1	SPMA1602-1S	1 x SPMA1602	1			
	238	200	250	190	185	200	2	SPMA1601-2S	2 x SPMA1601	1	1	1 x OTL611	
	274	250	300	238	200	250	2	SPMA1602-2S	2 x SPMA1602	1	1	1 x OTL612	
	357	350	350	285	250	300	3	SPMA1601-3S	3 x SPMA1601	1	2	3 x OTL601	
	411	400	450	357	300	350	3	SPMA1602-3S	3 x SPMA1602	1	2	3 x OTL602	
	476	450	500	380	350	400	3	SPMA1601-4S	4 x SPMA1601	1	3	4 x OTL601	
	548	500	600	476	450	500	3	SPMA1602-4S	4 x SPMA1602	1	3	4 x OTL602	
	595	550	650	476	450	500	3	SPMA1601-5S	5 x SPMA1601	1	4	5 x OTL601	
	685	650	700	595	550	650	3	SPMA1602-5S	5 x SPMA1602	1	4	5 x OTL602	
	714	700	750	571	550	600	3	SPMA1601-6S	6 x SPMA1601	1	5	6 x OTL601	
	822	800	900	714	700	750	3	SPMA1602-6S	6 x SPMA1602	1	5	6 x OTL602	
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:													
1371	1350	1500	1190	1150	1300	3	SPMA1602-10S	10 x SPMA1602	1	9	10 x OTL602		

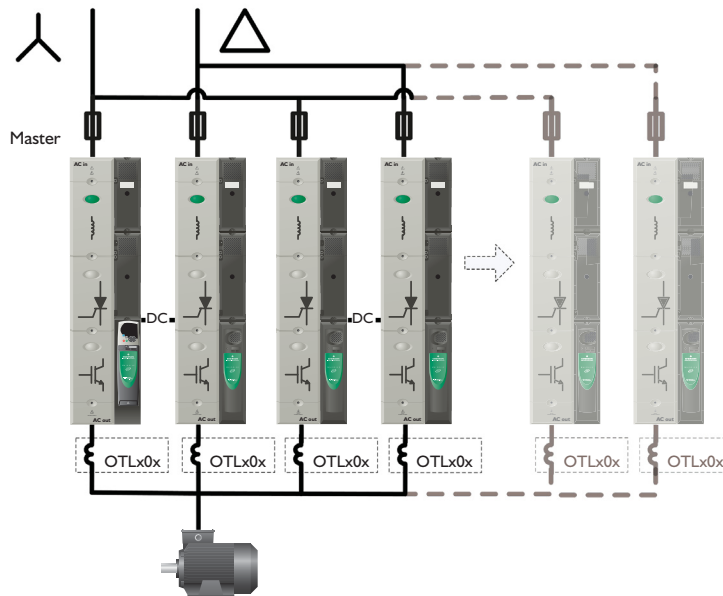
SPMA 12 Pulse - reduced harmonics

This principle may be extrapolated to 18 and 24 pulse configurations

Fig 4 - SPMA x 2



Fig 5 - SPMA x 4 to 10 (Pairs only)



	Normal Duty			Heavy Duty			L _{eq}	Top Level Drive Order Code	Drive Order Code Items			
	Max Continuous Current (A)	Typical Motor Output		Max Continuous Current (A)	Typical Motor Output				Modules		Inductors Output	
		@ 400V (kW)	@ 460V (HP)		@ 400V (kW)	@ 460V (HP)			Drive	Master Slave		
	(A)	@ 400V (kW)	@ 460V (HP)	(A)	@ 400V (kW)	@ 460V (HP)						
400V	390	225	300	342	185	300	4	SPMA1401-2T	2 x SPMA1401	1	1	1 x OTL411
	449	250	400	400	225	350	4	SPMA1402-2T	2 x SPMA1402	1	1	1 x OTL412
	780	400	650	685	355	600	5	SPMA1401-4T	4 x SPMA1401	1	3	4 x OTL401
	899	500	750	800	400	700	5	SPMA1402-4T	4 x SPMA1402	1	3	4 x OTL402
	1171	650	1000	1028	550	900	5	SPMA1401-6T	6 x SPMA1401	1	5	6 x OTL401
	1348	750	1150	1200	650	1050	5	SPMA1402-6T	6 x SPMA1402	1	5	6 x OTL402
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:												
	2247	1250	1950	2000	1100	1750	5	SPMA1402-10T	10 x SPMA1402	1	9	10 x OTL402

	@ 690V (kW)		@ 575V (HP)		@ 690V (kW)		@ 575V (HP)		L _{eq}	Top Level Drive Order Code	Drive Order Code Items		
	Max Continuous Current (A)	Typical Motor Output		Max Continuous Current (A)	Typical Motor Output						Modules		Inductors Output
		@ 690V (kW)	@ 575V (HP)		@ 690V (kW)	@ 575V (HP)	Drive	Master Slave					
	(A)	@ 690V (kW)	@ 575V (HP)	(A)	@ 690V (kW)	@ 575V (HP)							
575V / 690V	238	200	250	190	185	200	4	SPMA1601-2T	2 x SPMA1601	1	1	1 x OTL611	
	274	250	300	238	200	250	4	SPMA1602-2T	2 x SPMA1602	1	1	1 x OTL612	
	476	450	500	380	350	400	5	SPMA1601-4T	4 x SPMA1601	1	3	4 x OTL601	
	548	500	600	476	450	500	5	SPMA1602-4T	4 x SPMA1602	1	3	4 x OTL602	
	714	700	750	571	550	600	5	SPMA1601-6T	6 x SPMA1601	1	5	6 x OTL601	
	822	800	900	714	700	750	5	SPMA1602-6T	6 x SPMA1602	1	5	6 x OTL602	
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:													
	1371	1350	1500	1190	1150	1300	5	SPMA1602-10T	10 x SPMA1602	1	9	10 x OTL602	

SPMD Simplest Installation - minimum interconnections

Fig 6 - SPMD x 1

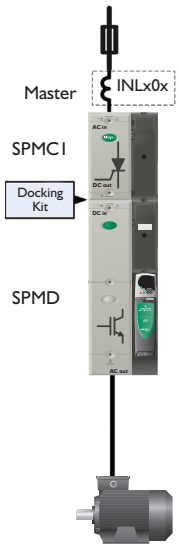


Fig 7 - SPMD x 2

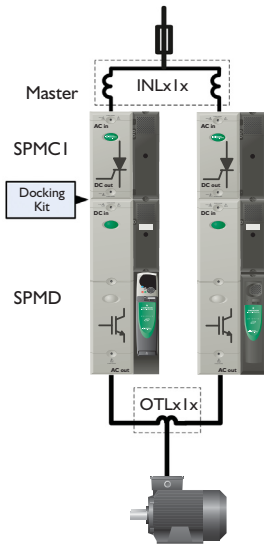
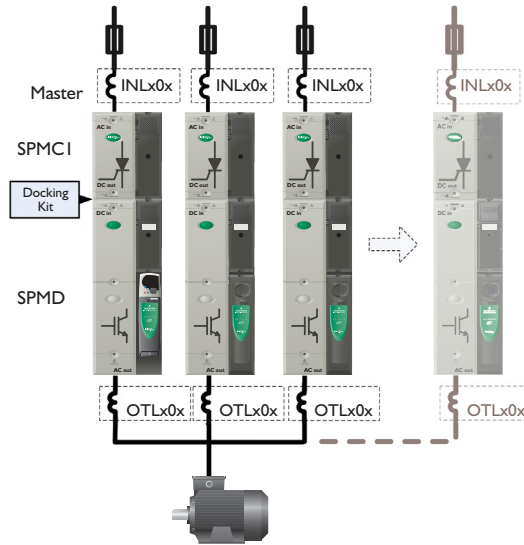


Fig 8 - SPMD x 3 to x 10



	Normal Duty			Heavy Duty			Fig.	Top Level Drive Order Code	Drive Order Code Items						
	Max Cont. Current	Typical Motor Output		Max Cont. Current	Typical Motor Output				Modules			Inductors		Docking Kit	
		(A)	@ 400V (kW)		@ 460V (HP)	(A)			@ 400V (kW)	@ 460V (HP)	Drive	Master	Slave		Rectifier
400V	205	110	150	180	90	150	6	SPMD1401-1S	1 x SPMD1401	1		1 x SPMC1402		1 x INL401	1
	246	132	200	210	110	150	6	SPMD1402-1S	1 x SPMD1402	1		1 x SPMC1402		1 x INL401	1
	290	160	250	246	132	200	6	SPMD1403-1S	1 x SPMD1403	1		1 x SPMC1402		1 x INL402	1
	335 ^[1]	185 ^[1]	300 ^[1]	290	160	250	6	SPMD1404-1S	1 x SPMD1404	1		1 x SPMC1402		1 x INL402	1
	390	225	300	342	185	300	7	SPMD1401-2S	2 x SPMD1401	1	1	2 x SPMC1402	1 x OTL411	1 x INL411	2
	468	280	400	400	225	300	7	SPMD1402-2S	2 x SPMD1402	1	1	2 x SPMC1402	1 x OTL412	1 x INL411	2
	552	315	450	468	280	400	7	SPMD1403-2S	2 x SPMD1403	1	1	2 x SPMC1402	1 x OTL413	1 x INL412	2
	638	355	500	552	315	450	7	SPMD1404-2S	2 x SPMD1404	1	1	2 x SPMC1402	1 x OTL414	1 x INL412	2
	702	400	600	600	315	500	8	SPMD1402-3S	3 x SPMD1402	1	2	3 x SPMC1402	3 x OTL402	3 x INL401	3
	828	450	700	702	400	650	8	SPMD1403-3S	3 x SPMD1403	1	2	3 x SPMC1402	3 x OTL403	3 x INL402	3
957	560	800	828	450	750	8	SPMD1404-3S	3 x SPMD1404	1	2	3 x SPMC1402	3 x OTL404	3 x INL402	3	
1104	630	900	937	550	800	8	SPMD1403-4S	4 x SPMD1403	1	3	4 x SPMC1402	4 x OTL403	4 x INL402	4	
1276	710	1000	1104	630	900	8	SPMD1404-4S	4 x SPMD1404	1	3	4 x SPMC1402	4 x OTL404	4 x INL402	4	
3190	1800	2800	2761	1500	2400	8	SPMD1404-10S	10 x SPMD1404	1	9	10 x SPMC1402	10 x OTL404	10 x INL402	10	

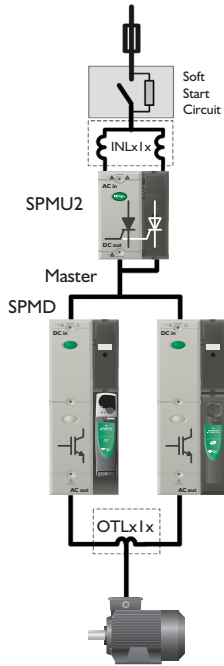
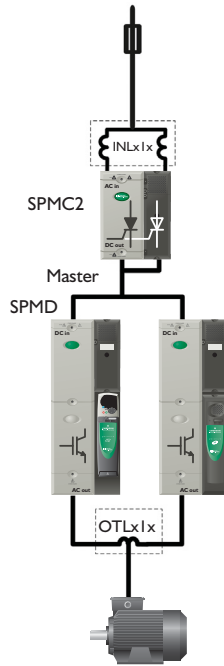
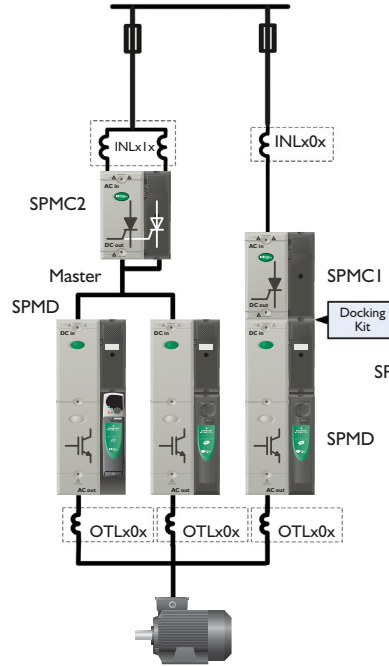
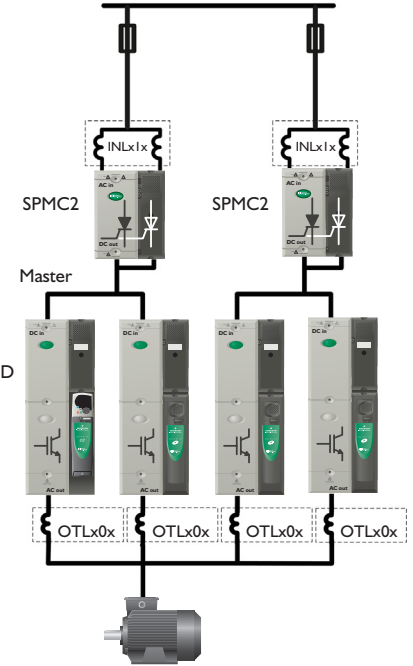
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:

	@ 690V (kW)		@ 575V (HP)		Fig.	Top Level Drive Order Code	Drive Order Code Items								
	Max Cont. Current	Typical Motor Output		Max Cont. Current			Typical Motor Output		Modules			Inductors		Docking Kit	
		(A)	@ 690V (kW)				@ 575V (HP)	(A)	@ 690V (kW)	@ 575V (HP)	Drive	Master	Slave		Rectifier
575V / 690V	125	110	125	100	90	100	6	SPMD1601-1S	1 x SPMD1601	1		1 x SPMC1601		1 x INL601	1
	140	132	150	125	110	125	6	SPMD1602-1S	1 x SPMD1602	1		1 x SPMC1601		1 x INL601	1
	158	155	175	142	132	150	6	SPMD1603-1S	1 x SPMD1603	1		1 x SPMC1601		1 x INL602	1
	165	160	180	160	160	175	6	SPMD1604-1S	1 x SPMD1604	1		1 x SPMC1601		1 x INL602	1
	238	200	260	190	185	200	7	SPMD1601-2S	2 x SPMD1601	1	1	2 x SPMC1601	1 x OTL611	1 x INL611	2
	266	250	290	238	225	250	7	SPMD1602-2S	2 x SPMD1602	1	1	2 x SPMC1601	1 x OTL612	1 x INL611	2
	300	295	330	269	250	290	7	SPMD1603-2S	2 x SPMD1603	1	1	2 x SPMC1601	1 x OTL613	1 x INL612	2
	313	310	345	304	300	330	7	SPMD1604-2S	2 x SPMD1604	1	1	2 x SPMC1601	1 x OTL614	1 x INL612	2
	399	390	440	357	350	390	8	SPMD1602-3S	3 x SPMD1602	1	2	3 x SPMC1601	3 x OTL602	3 x INL601	3
	450	440	495	404	400	445	8	SPMD1603-3S	3 x SPMD1603	1	2	3 x SPMC1601	3 x OTL603	3 x INL602	3
	470	460	520	456	450	500	8	SPMD1604-3S	3 x SPMD1604	1	2	3 x SPMC1601	3 x OTL604	3 x INL602	3
	600	590	660	539	530	590	8	SPMD1603-4S	4 x SPMD1603	1	3	4 x SPMC1601	4 x OTL603	4 x INL602	4
	627	615	690	608	600	670	8	SPMD1604-4S	4 x SPMD1604	1	3	4 x SPMC1601	4 x OTL604	4 x INL602	4
	1567	1540	1725	1520	1500	1675	8	SPMD1604-10S	10 x SPMD1604	1	9	10 x SPMC1601	10 x OTL604	10 x INL602	10

For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:

See notes on page 18*

SPMD Lowest Cost - minimum total cost of modules

Fig 9 - SPMD x 2

Fig 10 - SPMD x 2

Fig 11 - SPMD x 3, 5, 7, 9

Fig 12 - SPMD x 4, 6, 8, 10


	Normal Duty			Heavy Duty			Fig.	Top Level Drive Order Code	Drive Order Code Items					Docking Kit	
	Max Cont. Current	Typical Motor Output		Max Cont. Current	Typical Motor Output				Modules			Inductors			
		(A)	@ 220V (kW)		@ 230V (HP)	(A)			@ 220V (kW)	@ 230V (HP)	Rectifier	Output	Input		
									Master	Slave					
200V	364	110	150	296	90	125	9	SPMD1201-2L	2 x SPMD1201	1	1	1 x SPMU2402 ^[5]	1 x OTL411	1 x INL411	
	471	132	200	364	110	150	9	SPMD1202-2L	2 x SPMD1202	1	1	1 x SPMU2402 ^[5]	1 x OTL412	1 x INL411	
	592	160	250	475	150	200	9	SPMD1203-2L	2 x SPMD1203	1	1	1 x SPMU2402 ^[5]	1 x OTL413	1 x INL412	
	665	200	250	551	160	200	9	SPMD1204-2L	2 x SPMD1204	1	1	1 x SPMU2402 ^[5]	1 x OTL414	1 x INL412	
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10.															
400V	@ 400V @ 460V (kW) (HP)			@ 400V @ 460V (kW) (HP)											
	390	225	300	342	185	300	10	SPMD1401-2L	2 x SPMD1401	1	1	1 x SPMC2402	1 x OTL411	1 x INL411	
	468	280	400	400	225	300	10	SPMD1402-2L	2 x SPMD1402	1	1	1 x SPMC2402	1 x OTL412	1 x INL411	
	552	315	450	468	280	400	10	SPMD1403-2L	2 x SPMD1403	1	1	1 x SPMC2402	1 x OTL413	1 x INL412	
	666^[1]	350 ^[1]	550 ^[1]	552	315	450	10	SPMD1404-2L	2 x SPMD1404	1	1	1 x SPMC2402	1 x OTL414	1 x INL412	
	702	400	600	600	315	500	11	SPMD1402-3L	3 x SPMD1402	1	2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL402	1 x INL411 + 1 x INL401	1
	828	450	700	702	400	650	11	SPMD1403-3L	3 x SPMD1403	1	2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL403	1 x INL412 + 1 x INL402	1
	1000^[1]	550 ^[1]	850 ^[1]	828	450	750	11	SPMD1404-3L	3 x SPMD1404	1	2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL404	1 x INL412 + 1 x INL402	1
	1104	630	900	937	550	800	12	SPMD1403-4L	4 x SPMD1403	1	3	2 x SPMC2402	4 x OTL403	2 x INL412	
	1333^[1]	750 ^[1]	1100 ^[1]	1104	630	950	12	SPMD1404-4L	4 x SPMD1404	1	3	2 x SPMC2402	4 x OTL404	2 x INL412	
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:															
3333^[1]	1900 ^[1]	2900 ^[1]	2761	1500	2400	12	SPMD1404-10L	10 x SPMD1404	1	9	5 x SPMC2402	10 x OTL404	5 x INL412		
575V / 690V	@ 690V @ 575V (kW) (HP)			@ 690V @ 575V (kW) (HP)											
	238	200	250	190	185	200	10	SPMD1601-2L	2 x SPMD1601	1	1	1 x SPMC2601	1 x OTL611	1 x INL611	
	274	250	300	238	200	250	10	SPMD1602-2L	2 x SPMD1602	1	1	1 x SPMC2601	1 x OTL612	1 x INL611	
	320	300	350	274	250	300	10	SPMD1603-2L	2 x SPMD1603	1	1	1 x SPMC2601	1 x OTL613	1 x INL612	
	411	400	450	357	350	350	11	SPMD1602-3L	3 x SPMD1602	1	2	1 x SPMC2601 + 1 x SPMCI601	3 x OTL602	1 x INL611 + 1 x INL601	1
	480	450	500	411	400	450	11	SPMD1603-3L	3 x SPMD1603	1	2	1 x SPMC2601 + 1 x SPMCI601	3 x OTL603	1 x INL612 + 1 x INL602	1
	640	630	700	548	500	600	12	SPMD1603-4L	4 x SPMD1603	1	3	2 x SPMC2601	4 x OTL603	2 x INL612	
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:															
1596	1435	1925	1368	1230	1650	12	SPMD1603-10L	10 x SPMD1603	1	9	5 x SPMC2601	10 x OTL603	5 x INL612		

See notes on page 18

SPMD 12 Pulse - reduced harmonics

This principle may be extrapolated to 18 and 24 pulse configurations

Fig 13 - SPMD x 1

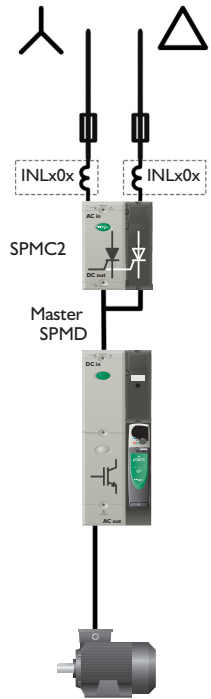


Fig 14 - SPMD x 2

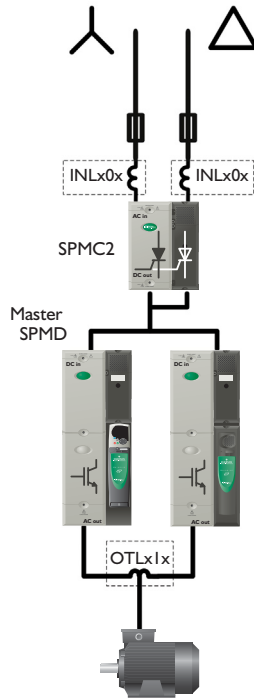
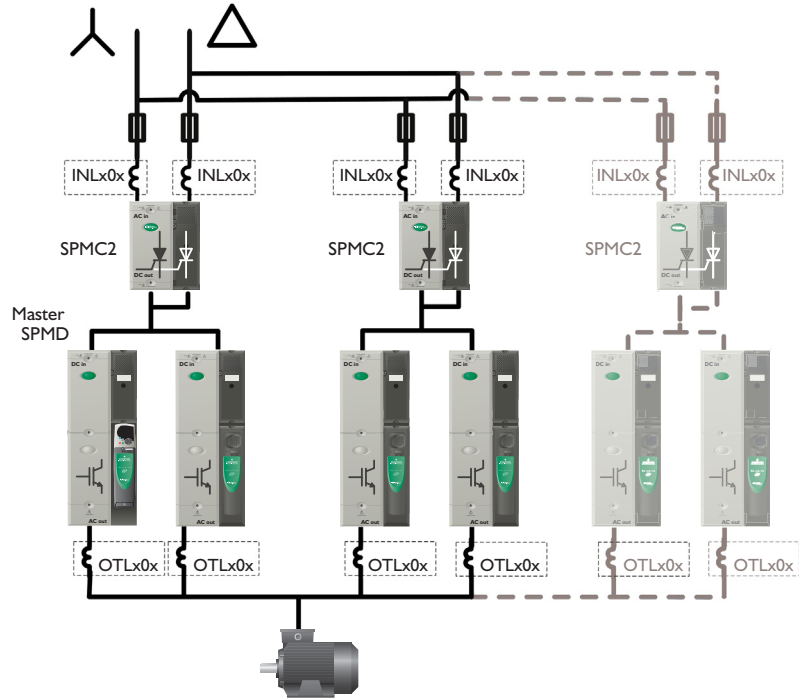


Fig 15 - SPMD x 4, 6, 8, 10



	Normal Duty			Heavy Duty			Fig.	Top Level Drive Order Code	Drive Order Code Items					
	Max Cont. Current (A)	Typical Motor Output		Max Cont. Current (A)	Typical Motor Output				Modules			Inductors		
		@ 400V (kW)	@ 460V (HP)		@ 400V (kW)	@ 460V (HP)			Drive	Master	Slave	Rectifier	Output	Input
	(A)	(kW)	(HP)	(A)	(kW)	(HP)								
400V	205	110	150	180	90	150	13	SPMD1401-1T	1 x SPMD1401	1	1	1 x SPMC2402		2 x INL401 ^[6]
	246	132	200	210	110	150	13	SPMD1402-1T	1 x SPMD1402	1	1	1 x SPMC2402		2 x INL401 ^[6]
	290	160	250	246	132	200	13	SPMD1403-1T	1 x SPMD1403	1	1	1 x SPMC2402		2 x INL402 ^[6]
	350 ^[1]	200 ^[1]	300 ^[1]	290	160	250	13	SPMD1404-1T	1 x SPMD1404	1	1	1 x SPMC2402		2 x INL402 ^[6]
	390	225	300	342	185	300	14	SPMD1401-2T	2 x SPMD1401	1	1	1 x SPMC2402	1 x OTL411	2 x INL401 ^[6]
	468	280	400	400	225	300	14	SPMD1402-2T	2 x SPMD1402	1	1	1 x SPMC2402	1 x OTL412	2 x INL401 ^[6]
	552	315	450	468	280	400	14	SPMD1403-2T	2 x SPMD1403	1	1	1 x SPMC2402	1 x OTL413	2 x INL402 ^[6]
	666 ^[1]	350 ^[1]	550 ^[1]	552	315	450	14	SPMD1404-2T	2 x SPMD1404	1	1	1 x SPMC2402	1 x OTL414	2 x INL402 ^[6]
	780	450	650	685	355	600	15	SPMD1401-4T	4 x SPMD1401	1	3	2 x SPMC2402	4 x OTL401	4 x INL401 ^[6]
	937	500	800	800	450	700	15	SPMD1402-4T	4 x SPMD1402	1	3	2 x SPMC2402	4 x OTL402	4 x INL401 ^[6]
1104	630	900	937	550	800	15	SPMD1403-4T	4 x SPMD1403	1	3	2 x SPMC2402	4 x OTL403	4 x INL402 ^[6]	
1333 ^[1]	750 ^[1]	1100 ^[1]	1104	630	950	15	SPMD1404-4T	4 x SPMD1404	1	3	2 x SPMC2402	4 x OTL404	4 x INL402 ^[6]	
3333 ^[1]	1900 ^[1]	2900 ^[1]	2761	1500	2400	15	SPMD1404-10T	10 x SPMD1404	1	9	5 x SPMC2402	10 x OTL404	10 x INL402 ^[6]	

For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:

	@ 690V (kW)		@ 575V (HP)		Fig.	Top Level Drive Order Code	Drive Order Code Items							
	@ 690V (kW)	@ 575V (HP)	@ 690V (kW)	@ 575V (HP)			Modules			Inductors				
							Drive	Master	Slave	Rectifier	Output	Input		
	(kW)	(HP)	(kW)	(HP)										
575V / 690V	125	110	125	100	90	100	13	SPMD1601-1T	1 x SPMD1601	1	1	1 x SPMC2601		2 x INL601 ^[6]
	144	132	150	125	110	125	13	SPMD1602-1T	1 x SPMD1602	1	1	1 x SPMC2601		2 x INL601 ^[6]
	168	160	150	144	132	150	13	SPMD1603-1T	1 x SPMD1603	1	1	1 x SPMC2601		2 x INL602 ^[6]
	192	185	200	168	160	150	13	SPMD1604-1T	1 x SPMD1604	1	1	1 x SPMC2601		2 x INL602 ^[6]
	238	200	250	190	185	200	14	SPMD1601-2T	2 x SPMD1601	1	1	1 x SPMC2601	1 x OTL611	2 x INL601 ^[6]
	274	250	300	238	200	250	14	SPMD1602-2T	2 x SPMD1602	1	1	1 x SPMC2601	1 x OTL612	2 x INL601 ^[6]
	320	300	350	274	250	300	14	SPMD1603-2T	2 x SPMD1603	1	1	1 x SPMC2601	1 x OTL613	2 x INL602 ^[6]
	365	350	400	320	300	350	14	SPMD1604-2T	2 x SPMD1604	1	1	2 x SPMC1601	1 x OTL614	2 x INL602 ^[6]
	476	470	500	380	350	400	15	SPMD1601-4T	4 x SPMD1601	1	3	2 x SPMC2601	4 x OTL601	4 x INL601 ^[6]
	548	500	600	476	450	500	15	SPMD1602-4T	4 x SPMD1602	1	3	2 x SPMC2601	4 x OTL602	4 x INL601 ^[6]
	640	630	700	548	500	600	15	SPMD1603-4T	4 x SPMD1603	1	3	2 x SPMC2601	4 x OTL603	4 x INL602 ^[6]
	731	700	800	640	630	700	15	SPMD1604-4T	4 x SPMD1604	1	3	4 x SPMC1601	4 x OTL604	4 x INL602 ^[6]
1828	1800	2000	1600	1550	1750	15	SPMD1604-10T	10 x SPMD1604	1	9	10 x SPMC1601	10 x OTL604	10 x INL602 ^[6]	

For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:

See notes on page 18

Active Input Single Drives - regeneration and harmonic elimination

Fig I6 - SPMA

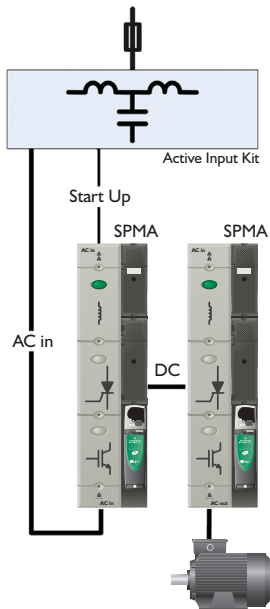


Fig I7 - SPMA + SPMD

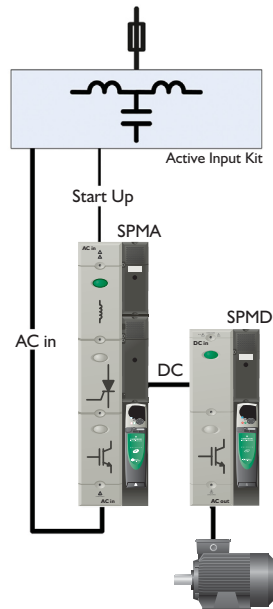
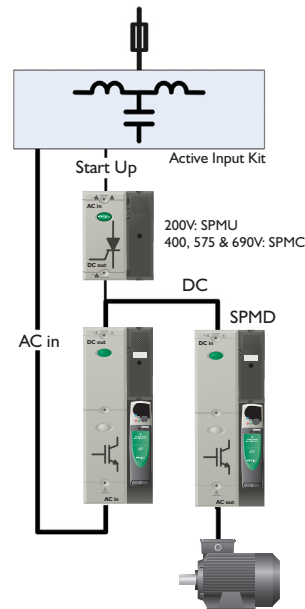


Fig I8 - SPMD + SPMC

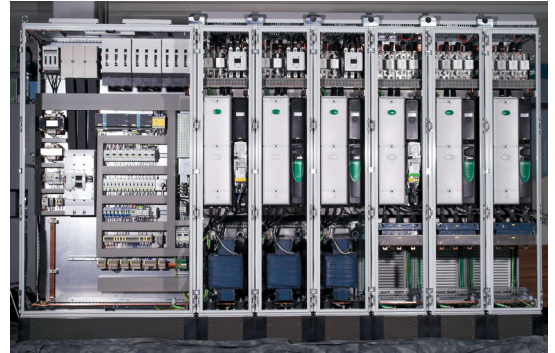
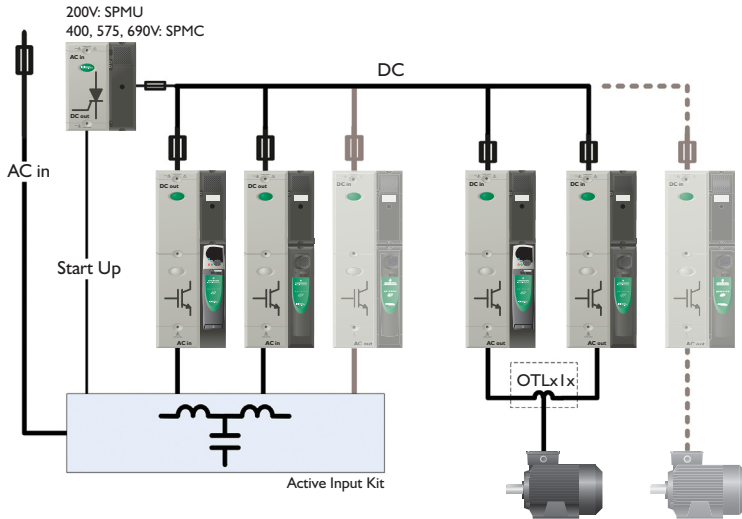


	Normal Duty			Heavy Duty			Fig.	Top Level Drive Order Code	Drive Order Code Items			Active Input Kits ^[7]			
	Max Cont. Current	Typical Motor Output		Max Cont. Current	Typical Motor Output				Modules			Order Kit based on required voltage and duty			
		@ 220V (A)	@ 230V (kW) (HP)		@ 220V (A)	@ 230V (kW) (HP)			Drive	Master	Rectifier	Normal Duty	Heavy Duty	Normal Duty	Heavy Duty
200V	192	55	75	156	45	60	18	SPMDI221-1R	2 x SPMDI221	2	1 x SPMU1402 ^[5]	200-2	200-1		
	248	75	100	192	55	75	18	SPMDI222-1R	2 x SPMDI222	2	1 x SPMU1402 ^[5]	200-3	200-2		
	312	90	125	250	75	100	18	SPMDI223-1R	2 x SPMDI223	2	1 x SPMU1402 ^[5]	200-4	200-3		
	350^[1]	110 ^[1]	150 ^[1]	290	90	125	18	SPMDI224-1R	2 x SPMDI224	2	1 x SPMU1402 ^[5]	200-5	200-4		
400V		@ 400V (kW)	@ 460V (HP)		@ 400V (kW)	@ 460V (HP)									
	205	110	150	180	90	150	16	SPMAI421-1R	2 x SPMAI421	2		400-2	400-1		
							17	SPMA/DI421-1R	1 x SPMAI421 + 1 x SPMDI421	2					
							18	SPMDI421-1R	2 x SPMDI421	2	1 x SPMC1402				
	236	132	200	210	110	150	16	SPMAI422-1R	2 x SPMAI422	2		400-3	400-2		
							17	SPMA/DI422-1R	1 x SPMAI422 + 1 x SPMDI422	2					
	246	132	200	210	110	150	18	SPMDI422-1R	2 x SPMDI422	2	1 x SPMC1402				
290	160	250	246	132	200	18	SPMDI423-1R	2 x SPMDI423	2	1 x SPMC1402	400-3	400-3			
350^[1]	200 ^[1]	300 ^[1]	290	160	250	18	SPMDI424-1R	2 x SPMDI424	2	1 x SPMC1402	400-4	400-3			
575V / 690V		@ 690V (kW)	@ 575V (HP)		@ 690V (kW)	@ 575V (HP)									
	125	110	125	100	90	100	16	SPMAI621-1R	2 x SPMAI621	2		690-2	690-1	575-2	575-1
							17	SPMA/DI621-1R	1 x SPMAI621 + 1 x SPMDI621	2					
							18	SPMDI621-1R	2 x SPMDI621	2	1 x SPMC1601				
	144	132	150	125	110	125	16	SPMAI622-1R	2 x SPMAI622	2		690-3	690-2	575-3	575-2
							17	SPMA/DI622-1R	1 x SPMAI622 + 1 x SPMDI622	2					
							18	SPMDI622-1R	2 x SPMDI622	2	1 x SPMC1601				
	168	160	150	144	132	150	18	SPMDI623-1R	2 x SPMDI623	2	1 x SPMC1601	690-4	690-3	575-4	575-3
192	185	200	168	160	150	18	SPMDI624-1R	2 x SPMDI624	2	1 x SPMC1601	690-6	690-4	575-6	575-4	

See notes on page 18

Active Input Multiple Drives - regeneration and harmonic elimination

Fig 19 - SPMD x 4 to x 20 + SPMC



	Normal Duty						Heavy Duty						L _{iso}	Top Level Drive Order Code	Drive						Active Input Kits ^[7]			
	Max Cont. Current (A)	Typical Motor Output		Max Cont. Current (A)	Typical Motor Output		L _{iso}	Top Level Drive Order Code	Modules			Inductors			Order Kit based on required voltage and duty									
		@ 220V (kW)	@ 230V (HP)		@ 220V (kW)	@ 230V (HP)			Drive	Master	Slave	Rectifier			Output	Normal Duty	Heavy Duty	Normal Duty	Heavy Duty					
																				Normal Duty	Heavy Duty	Normal Duty	Heavy Duty	
200V	364	110	150	296	90	125	19	SPMD1221-2R	4 x SPMD1221	2	2	1 x SPMU1402 ^[5]	1 x OTL411	200-7	200-6									
	471	132	200	364	110	150	19	SPMD1222-2R	4 x SPMD1222	2	2	1 x SPMU1402 ^[5]	1 x OTL412	200-8	200-7									
	592	160	250	475	150	200	19	SPMD1223-2R	4 x SPMD1223	2	2	1 x SPMU1402 ^[5]	1 x OTL413	200-9	200-8									
	665	200	250	551	160	200	19	SPMD1224-2R	4 x SPMD1224	2	2	1 x SPMU1402 ^[5]	1 x OTL414	200-11	200-9									
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10.																								
400V	@ 400V @ 460V (kW) (HP)		@ 400V @ 460V (kW) (HP)																					
	390	225	300	342	185	300	19	SPMD1421-2R	4 x SPMD1421	2	2	1 x SPMC1402	1 x OTL411	400-6	400-5									
	468	280	400	400	225	350	19	SPMD1422-2R	4 x SPMD1422	2	2	1 x SPMC1402	1 x OTL412	400-7	400-6									
	552	315	450	468	280	400	19	SPMD1423-2R	4 x SPMD1423	2	2	1 x SPMC1402	1 x OTL413	400-7	400-7									
	666^[1]	350 ^[1]	550 ^[1]	552	315	450	19	SPMD1424-2R	4 x SPMD1424	2	2	1 x SPMC1402	1 x OTL414	400-9	400-7									
	702	400	600	600	315	500	19	SPMD1422-3R	6 x SPMD1422	2	4	1 x SPMC1402	3 x OTL402	400-10	400-8									
	828	450	700	702	400	650	19	SPMD1423-3R	6 x SPMD1423	2	4	1 x SPMC1402	3 x OTL403	400-10	400-10									
	1000^[1]	550 ^[1]	850 ^[1]	828	450	750	19	SPMD1424-3R	6 x SPMD1424	2	4	1 x SPMC1402	3 x OTL404	400-11	400-10									
1104	630	900	937	550	800	19	SPMD1423-4R	8 x SPMD1423	2	6	1 x SPMC1402	4 x OTL403	400-12	400-12										
1333^[1]	750 ^[1]	1100 ^[1]	1104	630	950	19	SPMD1424-4R	8 x SPMD1424	2	6	1 x SPMC1402	4 x OTL404	400-14	400-12										
3333^[1]	1900 ^[1]	2900 ^[1]	2761	1500	2400	19	SPMD1424-10R	20 x SPMD1424	2	18	1 x SPMC2402	10 x OTL404	400-26	400-24										
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:																								
575V / 690V	@ 690V @ 575V (kW) (HP)		@ 690V @ 575V (kW) (HP)																					
	238	200	250	190	185	200	19	SPMD1621-2R	4 x SPMD1621	2	2	1 x SPMC1601	1 x OTL611	690-7	690-5	575-7	575-5							
	274	250	300	238	200	250	19	SPMD1622-2R	4 x SPMD1622	2	2	1 x SPMC1601	1 x OTL612	690-8	690-7	575-8	575-7							
	320	300	350	274	250	300	19	SPMD1623-2R	4 x SPMD1623	2	2	1 x SPMC1601	1 x OTL613	690-9	690-8	575-9	575-8							
	365	350	400	320	300	350	19	SPMD1624-2R	4 x SPMD1624	2	2	1 x SPMC1601	1 x OTL614	690-11	690-9	575-11	575-9							
	411	400	450	357	350	350	19	SPMD1622-3R	6 x SPMD1622	2	4	1 x SPMC1601	3 x OTL602	690-12	690-10	575-12	575-10							
	480	450	500	411	400	450	19	SPMD1623-3R	6 x SPMD1623	2	4	1 x SPMC1601	3 x OTL603	690-13	690-12	575-13	575-12							
	548	500	600	480	450	500	19	SPMD1624-3R	6 x SPMD1624	2	4	1 x SPMC1601	3 x OTL604	690-14	690-13	575-14	575-13							
	640	630	700	548	500	600	19	SPMD1623-4R	8 x SPMD1623	2	6	1 x SPMC1601	4 x OTL603	690-16	690-15	575-16	575-15							
	731	700	800	640	630	700	19	SPMD1624-4R	8 x SPMD1624	2	6	1 x SPMC1601	4 x OTL604	690-18	690-16	575-18	575-16							
1828	1800	2000	1600	1550	1750	19	SPMD1624-10R	20 x SPMD1624	2	18	1 x SPMC2601	10 x OTL604	690-30	690-28	575-30	575-28								
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:																								

See notes on page 18

SPM Power Selector Module



The SPM Power Selector offers enhanced flexibility in drive systems implemented with Unidrive SPM drives. The SPM Power Selector enables automatic connection and disconnection of Unidrive SPM modules in a parallel drive system.

The SPM Power Selector serves as a multi-way switch for the parallel

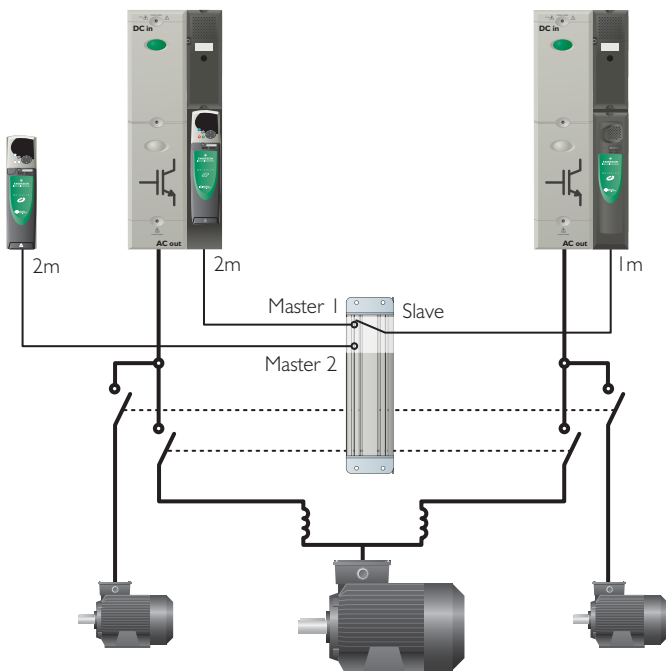
control cables and provides relay outputs to control the power contactors.

Notes:

- 1 SPM power and control modules along with the SPM Power Selector Module must be powered down, when changing between the operating modes. That is, "on-the-fly" switching between modes is not allowed.
- 2 The combined length of all paralleling cables between power modules and SPM Power Selector modules must be no more than 20m. The standard paralleling control cables are supplied with the products in the following lengths:
 - SPM Power Selector - 1m
 - SM-Control Slave - 2m
- 3 The number of SPM Power Selector modules required = $N - 1$, where N = number of SPM power modules.

The configurations made possible are illustrated below:

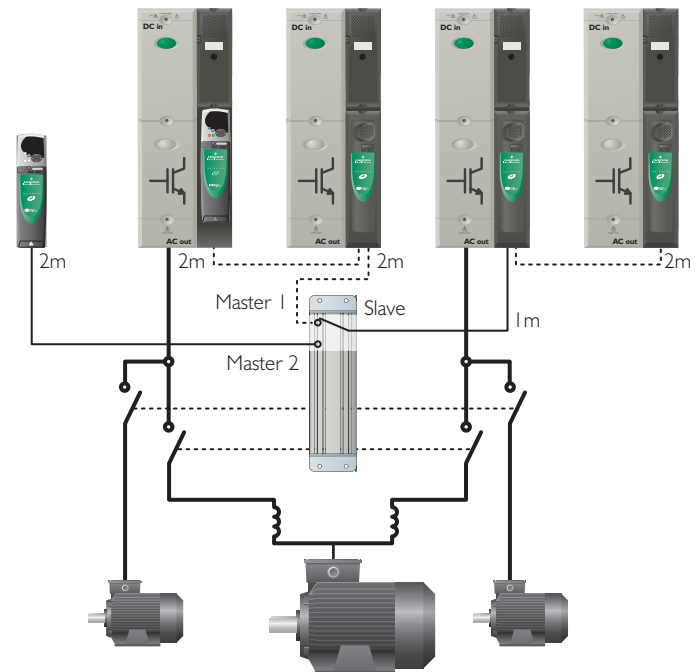
Configuration I(a)



Function: For two Unidrive SPM drives, it enables automatic selection between the control of two separate motors or one larger motor.

Example application: Gantry crane with exclusive operation of dual long travel motors and main hoist. In this case two drives could be used instead of three, eliminating the larger one and delivering a cost saving.

Configuration I(b)



Function: Each of the drives on the Master 1 and Slave connections of the SPM Power Selector can be paralleled in the standard way. No further SPM Power Selectors are required.

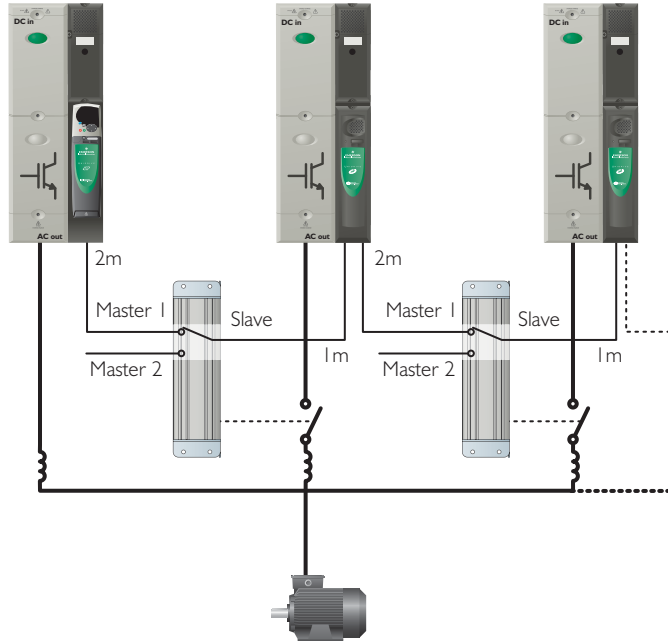
Example application: Higher power gantry crane.

Note:

The total number of drives that can be connected in this way is 10, summing both sides of the SPM Power Selector.

SPM Power Selector Module

Configuration 2



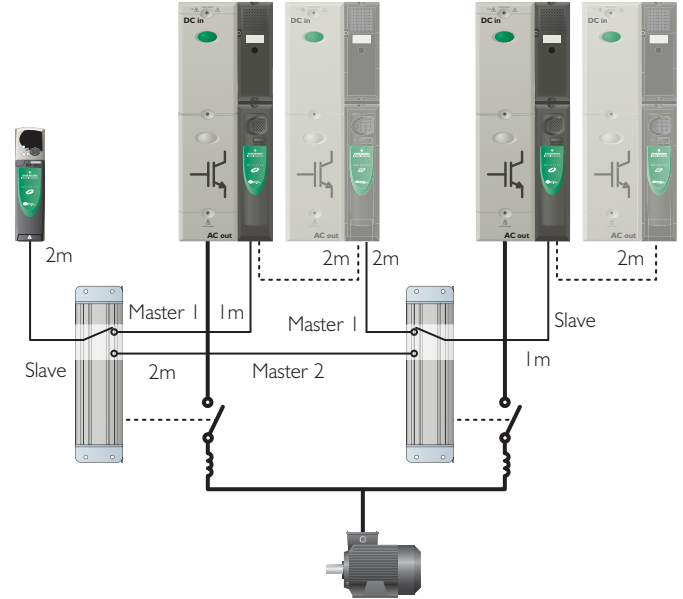
Function: This configuration allows the SPM power modules to be switched out of circuit when the output power demand is reduced, and conversely for the modules to be re-connected when output power demand increases. Modules must be switched in and out of operation from the non Master drive end, as this configuration has no control signal feed-through.

Example application: Test rigs that are required to operate over a wide torque / power range, maintaining current control and measurement accuracy throughout the range.

Notes:

- 1 Maximum number of parallel power modules:
 - a. With standard paralleling control cables = 7
 - b. With 2m SPM Power Selector "Slave" connection cables (for extra distance between power modules - optional order) = 6
 - c. With 1m paralleling control cables throughout (optional order) = 10
- 2 If more than two motors are to be used with this configuration, an SM-Applications module will be required to store the motor map parameters.

Configuration 3



Function: This configuration enables continuous operation with a faulty or de-energised module. This is achieved by automatically taking the faulty module out of circuit and operating at a lower current.

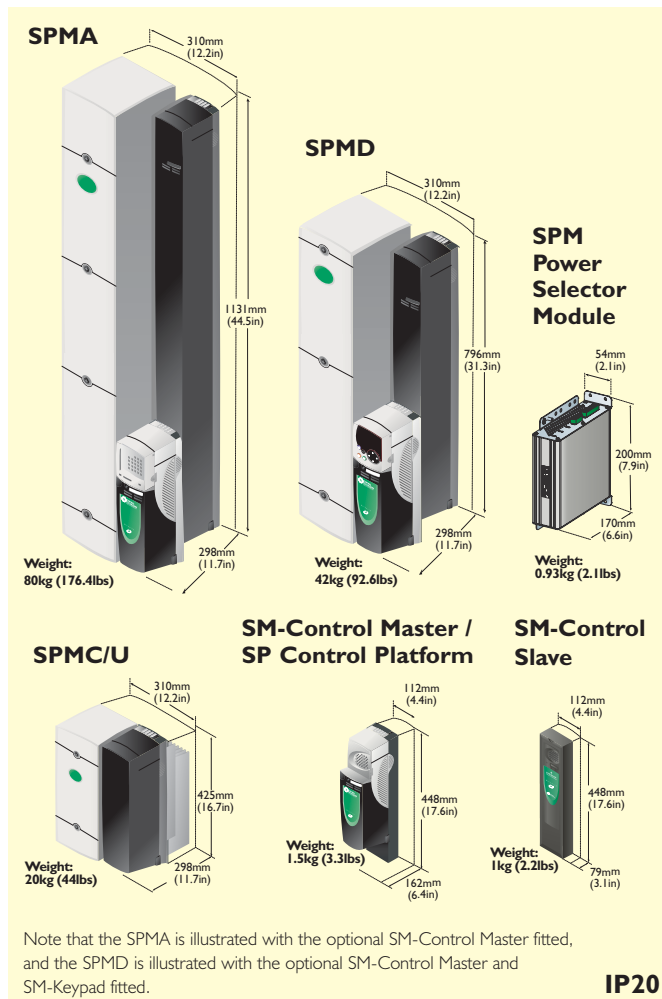
This configuration feeds the control signal through the right hand SPM Power Selector, allowing the left hand drive to be de-energised. Each drive may be paralleled but the control signal feed-through may only be implemented once. This means that the range of redundancy/reduced current operation is limited to using the left drive, the right drive or both.

Notes:

- 1 Maximum number of parallel power modules:
 - a. With standard paralleling control cables = 8
 - b. With 1m paralleling control cables throughout (optional order) = 10

Example application: Main drive on a production line that is critical to operation. The drive installation will be oversized to include redundant power modules.

Module dimensions



SPECIFICATIONS

Environmental Safety and Electrical Conformance

- IP20/Nema I rating, IP54 (NEMA 12) through panel mount
- Ambient temperature -15 to +40°C, 50°C with derating
- Humidity 95% maximum (non condensing) at 40°C
- Altitude: 0 to 3000m, derate 1% per 100m between 1000m and 3000m
- Vibration: Tested in accordance with IEC 60068-2-34
- Mechanical Shock Tested: In accordance with IEC 60068-2-27
- Storage temperature -40°C to 50°C
- Electromagnetic Immunity complies with EN 61800-3 and EN 61000-6-2
- Electromagnetic Emissions complies with EN 61800-3 (2nd environment)
- With on board EMC filter; complies with EN 61800-3 (2nd environment)
- EN 61000-6-3 and EN 61000-6-4 with optional external EMC filter
- IEC 61000-3-4 Supply conditions
- IEC 60146-1-1 Supply conditions
- IEC 61800-5-1 (Power Drive Systems)
- IEC 61131-2 I/O
- EN 60529 Ingress protection
- EN 50178 Electrical safety (future IEC 62103)
- Independently assessed by BIA (machine safety authority) to EN 954-1 cat 3 (secure disable)
- EN 81-1 assessed by TÜV
- EN 61000-6-2, EN 61000-6-4 EMC
- UL508C, UL840

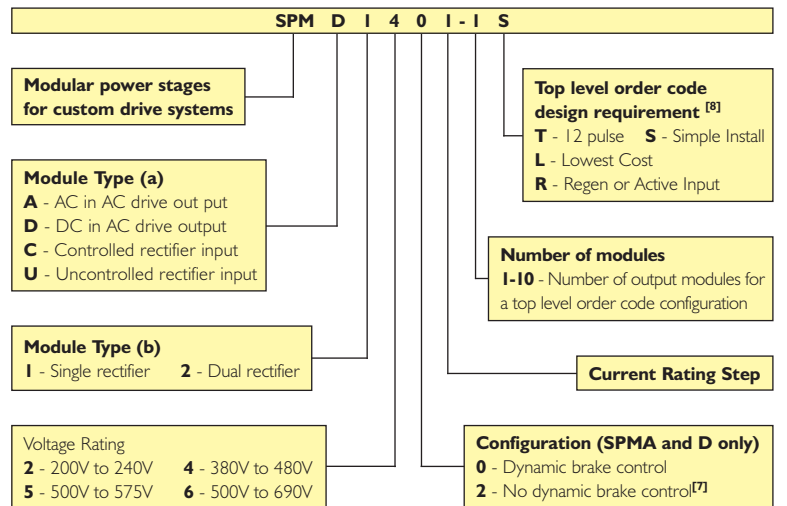
Order Codes for the Unidrive SPM and Configurations

Select model on actual motor full load current.

	Output Module Selection								DC Fuse Selection (A)	Input Module Selection					AC Fuse Selection (A)
	Normal Duty			Heavy Duty			Drive Order Code	24V DC Input [3] (A)		Controlled		Uncontrolled		24V DC Input [3] (A)	
	Max Cont. Current (A)	Typical Motor Output		Max Cont. Current (A)	Typical Motor Output					Single	Dual	Single [5]	Dual [5]		
	(A)	@220V (kW)	@230V (HP)	(A)	@220V (kW)	@230V (HP)						(A)	(A)		
200-240VAC +/- 10%	192	55	75	156	45	60	SPMD1201	3.3	400						
	248	75	100	192	55	75	SPMD1202	3.3	550						
	312	90	125	250	75	100	SPMD1203	5.0	550			SPMU1402	SPMU2402	3.0	400
	350 ^[1]	110 ^[1]	150 ^[1]	290	90	125	SPMD1204	5.0	550						
380-480VAC +/- 10%	(A)	@400V (kW)	@460V (HP)	(A)	@400V (kW)	@460V (HP)									
	205	110	150	180	90	150	SPMA1401	3.3						315	
	236	132	200	210	110	150	SPMA1402	3.3						350	
	205	110	150	180	90	150	SPMD1401	3.3	400						
	246	132	200	210	110	150	SPMD1402	3.3	560	SPMC1402	SPMC2402	SPMU1402	SPMU2402	3.0	400
	290	160	250	246	132	200	SPMD1403	5.0	560						
350 ^[1]	200 ^[1]	300 ^[1]	290	160	250	SPMD1404	5.0	560							
500-575VAC +/- 10%	(A)	@575V (kW)	@575V (HP)	(A)	@575V (kW)	@575V (HP)									
	125	90	125	100	75	100	SPMA1601 ^[2]	3.3						200	
	144	110	150	125	90	125	SPMA1602 ^[2]	3.3						200	
	125	90	125	100	75	100	SPMD1601 ^[2]	3.3	250						
	144	110	150	125	90	125	SPMD1602 ^[2]	3.3	315	SPMC1601	SPMC2601	SPMU1601	SPMU2601	3.0	250
	168	110	150	144	110	150	SPMD1603 ^[2]	5.0	350						
192	150	200	168	110	150	SPMD1604 ^[2]	5.0	400							
500-690VAC +/- 10%	(A)	@690V (kW)	@690V (HP)	(A)	@690V (kW)	@690V (HP)									
	125	110	150	100	90	125	SPMA1601	3.3						200	
	144	132	175	125	110	150	SPMA1602	3.3						200	
	125	110	150	100	90	125	SPMD1601	3.3	250						
	144	132	175	125	110	150	SPMD1602	3.3	315	SPMC1601	SPMC2601	SPMU1601	SPMU2601	3.0	250
	168	160	200	144	132	175	SPMD1603	5.0	350						
192	185	250	168	160	200	SPMD1604	5.0	400							

Option Reference	Order Code
SM-Control Master	SM-Control Master
SM-Control Slave	SM-Control Slave ^[4]
24V DC Supply - 10A	8510-0000
SPM Docking Kit	3470-0012
SM-Keypad	SM-Keypad
SM-Keypad Plus	SM-Keypad Plus
SPM Power Selector Module	SPM Power Selector Module
SP Control Platform	SP Control Platform
2m Paralleling cable	3471-0013
1m Paralleling cable	3471-9842

Normal Duty	Heavy Duty (Rotor Flux Control and Closed Loop)
Suitable for most applications, current overload is set at 110% for 165 seconds. Where motor rated current is less than the drive continuous current, higher overloads are achieved.	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 SPMC. That is, a single module can deliver 350A with a separate airflow path for each module and T_{ambient} = <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 90kW output motor on a 575V but is suitable for a 110kW output motor on 690V.
- [3] All SPM modules require a 24V DC power supply for the cooling fans. The total 24V DC current required can be assessed in the table and a 24V DC supply chosen.
- [4] For paralleling, the necessary interface cable that connects a slave to a master or another slave is delivered with the slave 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] For more information, contact your supplier.
- [8] Top Level Order Codes are used to order standard output modules and power components for implementation of a complete output configuration. These ordering suffixes will not appear on the rating label. The rating label is applicable only to the power output module.

For Active Input Assembly order codes, see configuration tables

Drive	Input Inductor Selection (Required with each SPMC/U)				Output Inductor Selection (For Parallel Configurations)				External EMC Filter (To meet requirements of EN61800-3)		Suitable Braking Resistors ^[7]		
	Single		Dual		Single		Dual		Schaffner	Epos	Minimum Resistance (Ω)	Instantaneous Power Rating (kW)	Average Power for 60sec (kW)
	Model Number	Order Code	Model Number	Order Code	Model Number	Order Code	Model Number	Order Code	Order Code	Order Code			
	Model Number	Order Code	Model Number	Order Code	Model Number	Order Code	Model Number	Order Code	Order Code	Order Code	Order Code	Order Code	Order Code
SPMD1201 SPMD1202	INL401	4401-0181-00	INL411	4401-0206-01	OTL401	4401-0197-00	OTL411	4401-0188-02	4200-6315	4200-6313	2.5	61	61
OTL402					4401-0198-00	OTL412	4401-0189-02	2.5			61	61	
SPMD1203 SPMD1204	INL402	4401-0182-00	INL412	4401-0207-01	OTL403	4401-0199-00	OTL413	4401-0192-02	4200-6315	4200-6313	1.9	80	80
OTL404					4401-0200-00	OTL414	4401-0186-02	1.9			80	80	

SPMA1401 SPMA1402	INL401	4401-0181-00	INL411	4401-0206-01	OTL401	4401-0197-00	OTL411	4401-0188-02	4200-6603	4200-6601	5	122	122
OTL402					4401-0198-00	OTL412	4401-0189-02	5			122	122	
SPMD1401 SPMD1402	INL401	4401-0181-00	INL411	4401-0206-01	OTL401	4401-0197-00	OTL411	4401-0188-02	4200-6315	4200-6313	5	122	122
OTL402					4401-0198-00	OTL412	4401-0189-02	5			122	122	
SPMD1403 SPMD1404	INL402	4401-0182-00	INL412	4401-0207-01	OTL403	4401-0199-00	OTL413	4401-0192-02	4200-6315	4200-6313	3.8	160	160
OTL404					4401-0200-00	OTL414	4401-0186-02	3.8			160	160	

SPMA1601 ^[2] SPMA1602 ^[2]	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-02	4200-6603	4200-6601	10	125	113
OTL602					4401-0202-00	OTL612	4401-0194-02	10			125	125	
SPMD1601 ^[2] SPMD1602 ^[2]	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-02	4200-6316	4200-6314	10	125	113
OTL602					4401-0202-00	OTL612	4401-0194-02	10			125	125	
SPMD1603 ^[2] SPMD1604 ^[2]	INL602	4401-0184-00	INL612	4401-0191-03	OTL603	4401-0203-00	OTL613	4401-0195-02	4200-6316	4200-6314	6.2	202	165
OTL604					4401-0204-00	OTL614	4401-0196-02	6.2			202	198	

SPMA1601 SPMA1602	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-02	4200-6603	4200-6601	10	125	113
OTL602					4401-0202-00	OTL612	4401-0194-02	10			125	125	
SPMD1601 SPMD1602	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-02	4200-6316	4200-6314	10	125	113
OTL602					4401-0202-00	OTL612	4401-0194-02	10			125	125	
SPMD1603 SPMD1604	INL602	4401-0184-00	INL612	4401-0191-03	OTL603	4401-0203-00	OTL613	4401-0195-02	4200-6316	4200-6314	6.2	202	165
OTL604					4401-0204-00	OTL614	4401-0196-02	6.2			202	198	

AC Fuse Selection (Semiconductor IEC class aR)				
(A)	Bussman		Ferraz	
	Order Code	Manufacturer Part No.	Order Code	Manufacturer Part No.
200	[7]	170M3015	[7]	6,9URD31D08A0200
250	[7]	170M3016	[7]	6,9URD31D08A0250
315	[7]	170M3017	[7]	6,9URD31D08A0315
350	[7]	170M3018	[7]	6,9URD31D08A0350
400	3533-4069	170M3019	4300-0400	6,9URD32D08A0400

External EMC Filter (To meet requirements of EN61800-3) For multiple drive configurations					
(V)	(A)	Epos		Schaffner	
		Order Code	Manufacturer Part No.	Order Code	Manufacturer Part No.
500V	600	4200-6801	B84143-B600-S20	4200-6808	FN3359-600-99
	1000	4200-6802	B84143-B1000-S20	4200-6809	FN3359-1000-99
	1600	4200-6803	B84143-B1600-S20	4200-6810	FN3359-1600-99
690V	320	4200-6804	B84143-B320-S24	4200-6811	FN3359HV-320-99
	400	4200-6805	B84143-B400-S24	4200-6812	FN3359HV-400-99
	600	4200-6806	B84143-B600-S24	4200-6813	FN3359HV-600-99
	1000	4200-6807	B84143-B1000-S24	4200-6814	FN3359HV-1000-99

DC Fuse Selection (Semiconductor IEC class aR)				
(A)	Bussman		Ferraz	
	Order Code	Manufacturer Part No.	Order Code	Manufacturer Part No.
250	[7]	170M3016	[7]	6,9URD31D08A0250
315	[7]	170M3017	[7]	6,9URD31D08A0315
350	[7]	170M3018	[7]	6,9URD31D08A0350
400	3533-4069	170M3019	4300-0400	6,9URD32D08A0400
560	[7]	170M3022	[7]	6,9URD31D08A0550

Related Brochures		Order Code
Unidrive SP Comprehensive brochure		0771-0013
Unidrive SP Free Standing brochure		0771-0007
Safe Torque Off Guide		0704-0000

For a complementary range of matching motors, please refer to the FLS range from Leroy Somer.



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