



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

## Unidrive SPM

High Power AC Drives  
Unidrive Connectivity  
with Modular Flexibility

45 to 1900kW (150 to 2900 HP)  
200V / 400V / 575V / 690V



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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.**

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

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**n-controlled rectifier.

## 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.

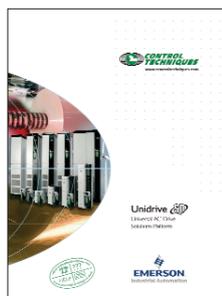
Reduce running costs by circulating energy between braking and motoring drives on a common DC bus system and by returning excess energy to mains supply with an active input.

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.

The SPM range complements the existing Unidrive ranges, described in a separate brochure. SP Panel Mounted - 0.75 to 132kW  
Complete drive modules to integrate into your own cubicles.  
SP Free Standing - 90 to 675kW  
Pre-engineered cubicle drives for standard solutions.

(Ask for brochure: Unidrive SP 0175-0339)



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

# 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 90 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.

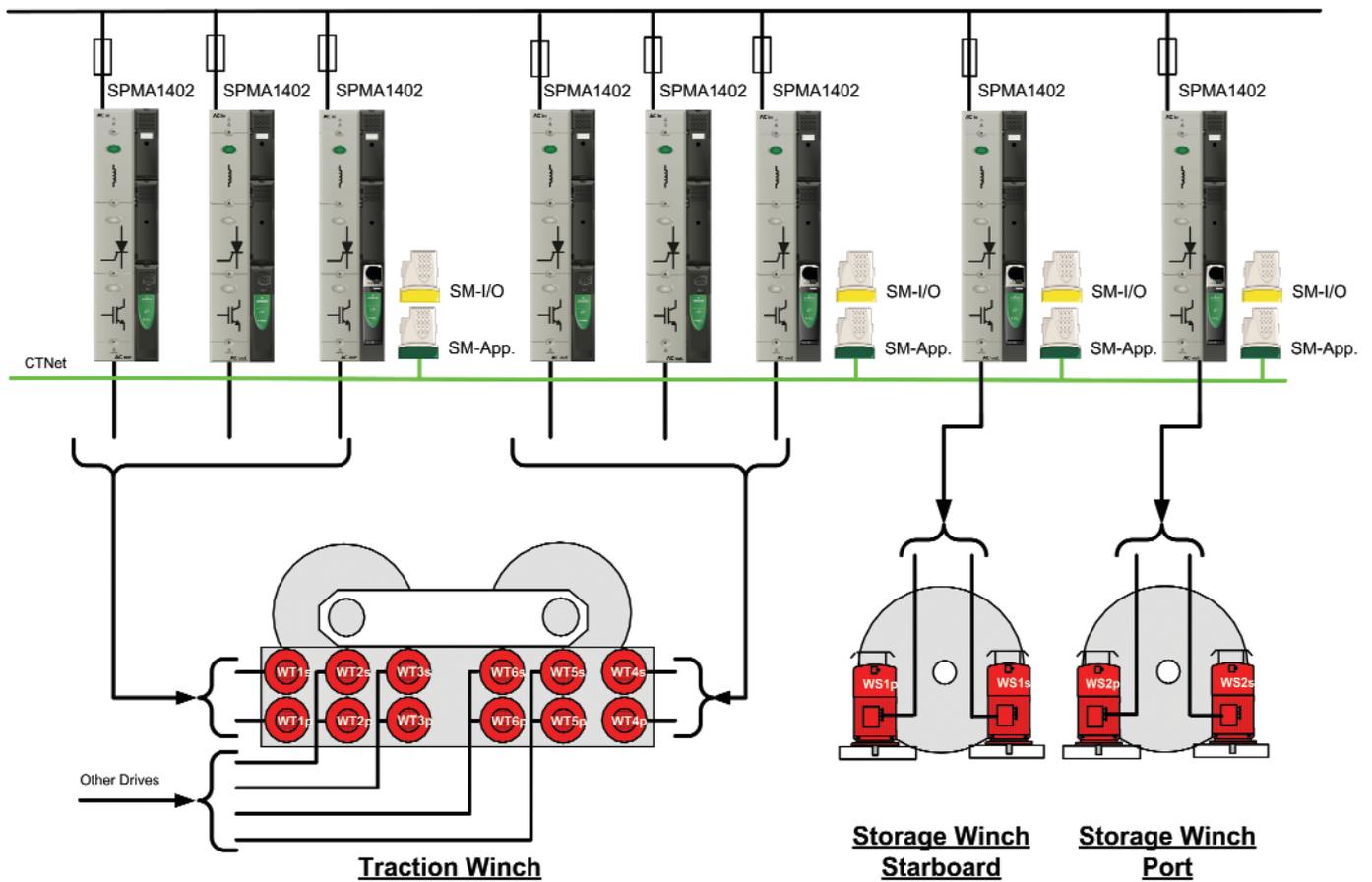
Any system designed with SPM is constructed with compact drive modules, that are manufactured in high volume. This means that in the event of the system being damaged, normal service is rapidly resumed simply by exchanging the damaged module with a factory built and tested one. The scenario of rebuilding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

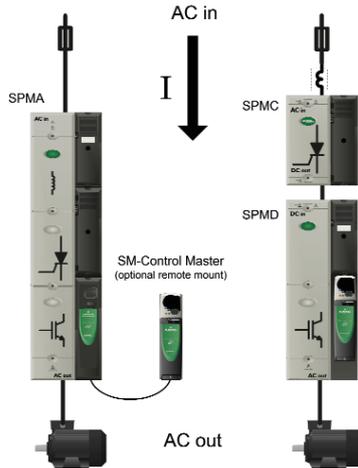
In addition to minimising spares inventory, this approach also standardises the system build, with many of the cubicles being identical.



# Basic Configurations

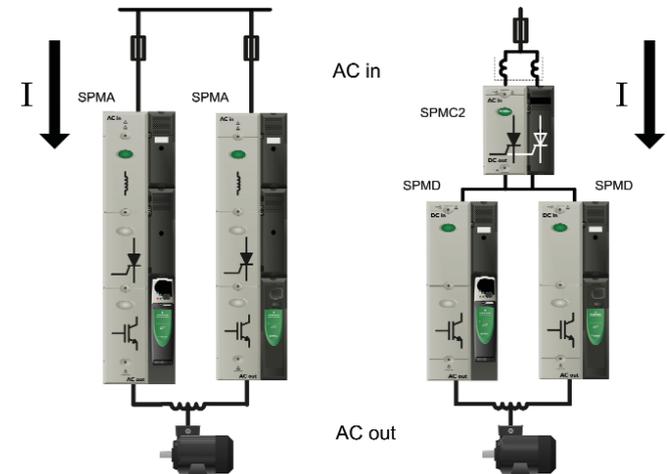
The examples below demonstrate the versatility of the Unidrive SPM in creating a wide range of High Power AC drives.

## Single Drives



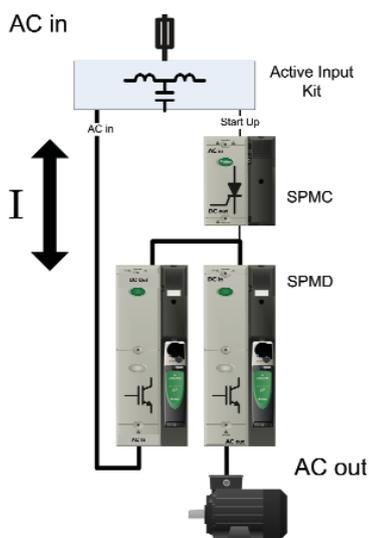
The SPMA solution will be lower cost but the SPMD solution may give site standardisation. The master control module on the drive may be replaced by a slave module and the master can be remotely mounted, as the application requires.

## 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



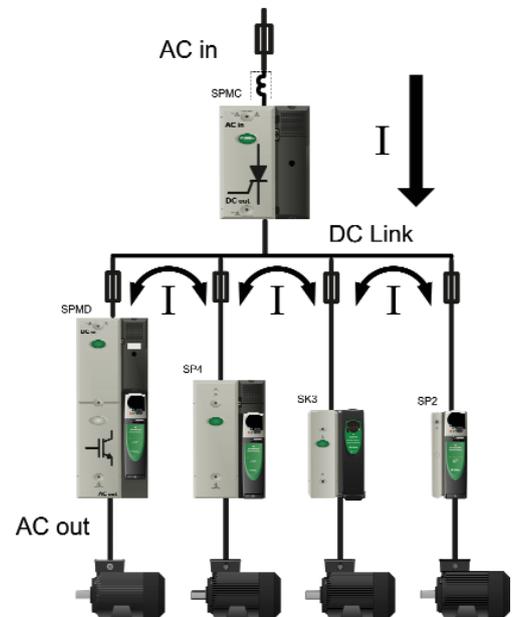
Active inputs for harmonic elimination and regenerating excess energy can be configured with standard drive modules, configured as motoring or regenerating.

## 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.

# Drive Product Range

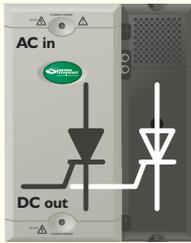
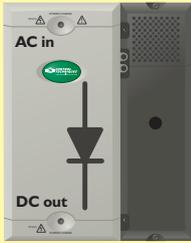
Model Reference		SPMA						SPMD							
Operating Mode	Motoring		AC in AC out						DC in AC out						
	Regenerating		AC in AC out and DC link soft start						AC in and DC out						
Voltage, Current and Power Range	Supply (V)	Duty	From			To			From			To			
			(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(kW)	(HP)	(A)	(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	-		
<b>Master</b> SM-Control Master module included, ready for installation			 SPMA I x0x-M Brake Transistor Included			 SPMA I x2x-M No Brake Transistor			 SPMD I x0x-M Brake Transistor Included			 SPMD I x2x-M No Brake Transistor			
<b>Slave</b> SM-Control Slave module included, ready for installation			 SPMA I x0x-S Brake Transistor Included			 SPMA I x2x-S No Brake Transistor			 SPMD I x0x-S Brake Transistor Included			 SPMD I x2x-S No Brake Transistor			
<b>Power Only</b> No SM-Control module included, for stock flexibility			 SPMA I x0x Brake Transistor Included			 SPMA I x2x No Brake Transistor			 SPMD I x0x Brake Transistor Included			 SPMD I x2x No Brake Transistor			

# Drive Control Modules

Model Reference	SM-Control Master	SM-Control Slave
Separately available for: 1. Flexibility of stock 2. Remote mounting of Master for user interface application flexibility		

# Rectifier Product Range

Equivalent Drive Ratings			Single Rectifier AC in / DC out						Dual Rectifier 2 x AC in / DC out					
			From (1 x SPMCI)			To (10 x SPMCI)			From (1 x SPMC2)			To (10 x SPMC2)		
Voltage, Current and Power Range	Supply (V)	Model Ref.	(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		

<b>Controlled</b> DC link soft start for drive system	 SPMCIx0x	 SPMC2x0x
	<b>Uncontrolled</b> DC link supply for conditions where a controlled rectifier is impractical A separate soft start must be provided for the DC link	 SPMUIx0x

# SPMA Simplest Installation - minimum interconnections

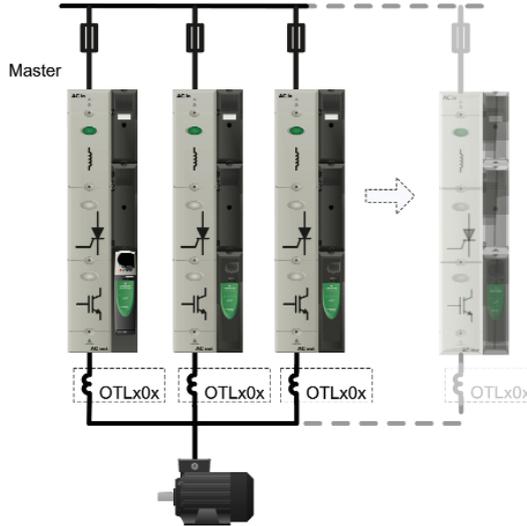
Fig 1 - SPMA x 1



Fig 2 - SPMA x 2



Fig 3 - SPMA x 3 to x 10



	Normal Duty			Heavy Duty			L <sub>BO</sub>	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)					
<b>400V</b>	205	110	150	180	90	150	1	SPMA1401-M	1 x SPMA1401	1	
	236	132	200	210	110	150	1	SPMA1402-M	1 x SPMA1402	1	
	390	225	300	342	185	300	2	SPMA1401-2	2 x SPMA1401	1	1 x OTL411
	449	250	400	400	225	350	2	SPMA1402-2	2 x SPMA1402	1	1 x OTL412
	585	315	500	514	280	450	3	SPMA1401-3	3 x SPMA1401	1	2 x 3 x OTL401
	674	355	550	600	315	500	3	SPMA1402-3	3 x SPMA1402	1	2 x 3 x OTL402
	780	400	650	685	355	600	3	SPMA1401-4	4 x SPMA1401	1	3 x 4 x OTL401
	899	500	750	800	400	700	3	SPMA1402-4	4 x SPMA1402	1	3 x 4 x OTL402
	976	550	850	857	450	750	3	SPMA1401-5	5 x SPMA1401	1	4 x 5 x OTL401
	1123	600	950	1000	550	850	3	SPMA1402-5	5 x SPMA1402	1	4 x 5 x OTL402
	1171	650	1000	1028	550	900	3	SPMA1401-6	6 x SPMA1401	1	5 x 6 x OTL401
	1348	750	1150	1200	650	1050	3	SPMA1402-6	6 x SPMA1402	1	5 x 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	SPMA1402-10	10 x SPMA1402	1	9	10 x OTL402

	@ 690V (kW)		@ 575V (HP)		@ 690V (kW)		@ 575V (HP)		L <sub>BO</sub>	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)							
<b>575 / 690V</b>	125	110	125	100	90	100	1	SPMA1601-M	1 x SPMA1601	1			
	144	132	150	125	110	125	1	SPMA1602-M	1 x SPMA1602	1			
	238	200	250	190	185	200	2	SPMA1601-2	2 x SPMA1601	1	1 x OTL611		
	274	250	300	238	200	250	2	SPMA1602-2	2 x SPMA1602	1	1 x OTL612		
	357	350	350	285	250	300	3	SPMA1601-3	3 x SPMA1601	1	2 x 3 x OTL601		
	411	400	450	357	300	350	3	SPMA1602-3	3 x SPMA1602	1	2 x 3 x OTL602		
	476	450	500	380	350	400	3	SPMA1601-4	4 x SPMA1601	1	3 x 4 x OTL601		
	548	500	600	476	450	500	3	SPMA1602-4	4 x SPMA1602	1	3 x 4 x OTL602		
	595	550	650	476	450	500	3	SPMA1601-5	5 x SPMA1601	1	4 x 5 x OTL601		
	685	650	700	595	550	650	3	SPMA1602-5	5 x SPMA1602	1	4 x 5 x OTL602		
	714	700	750	571	550	600	3	SPMA1601-6	6 x SPMA1601	1	5 x 6 x OTL601		
	822	800	900	714	700	750	3	SPMA1602-6	6 x SPMA1602	1	5 x 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	SPMA1602-10	10 x SPMA1602	1	9	10 x OTL602		

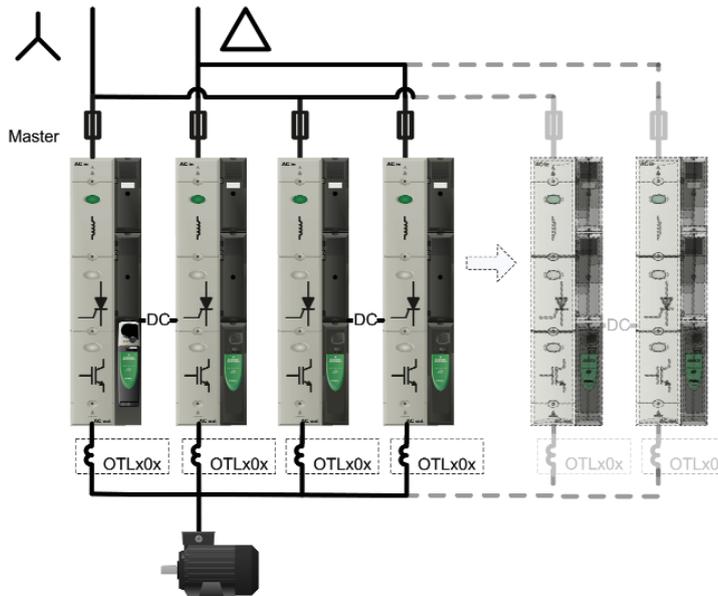
# SPMA 12 Pulse - reduced harmonics

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 <sub>eq</sub>	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)						
<b>400V</b>	<b>390</b>	225	300	<b>342</b>	185	300	4	SPMA1401-2T	2 x SPMA1401	1	1	1 x OTL411
	<b>449</b>	250	400	<b>400</b>	225	350	4	SPMA1402-2T	2 x SPMA1402	1	1	1 x OTL412
	<b>780</b>	400	650	<b>685</b>	355	600	5	SPMA1401-4T	4 x SPMA1401	1	3	4 x OTL401
	<b>899</b>	500	750	<b>800</b>	400	700	5	SPMA1402-4T	4 x SPMA1402	1	3	4 x OTL402
	<b>1171</b>	650	1000	<b>1028</b>	550	900	5	SPMA1401-6T	6 x SPMA1401	1	5	6 x OTL401
	<b>1348</b>	750	1150	<b>1200</b>	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:												
	<b>2247</b>	1250	1950	<b>2000</b>	1100	1750	5	SPMA1402-10T	10 x SPMA1402	1	9	10 x OTL402

	@ 690V (kW)		@ 575V (HP)		@ 690V (kW)		@ 575V (HP)		L <sub>eq</sub>	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)							
<b>575V / 690V</b>	<b>238</b>	200	250	<b>190</b>	185	200	4	SPMA1601-2T	2 x SPMA1601	1	1	1 x OTL611	
	<b>274</b>	250	300	<b>238</b>	200	250	4	SPMA1602-2T	2 x SPMA1602	1	1	1 x OTL612	
	<b>476</b>	450	500	<b>380</b>	350	400	5	SPMA1601-4T	4 x SPMA1601	1	3	4 x OTL601	
	<b>548</b>	500	600	<b>476</b>	450	500	5	SPMA1602-4T	4 x SPMA1602	1	3	4 x OTL602	
	<b>714</b>	700	750	<b>571</b>	550	600	5	SPMA1601-6T	6 x SPMA1601	1	5	6 x OTL601	
	<b>822</b>	800	900	<b>714</b>	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:													
	<b>1371</b>	1350	1500	<b>1190</b>	1150	1300	5	SPMA1602-10T	10 x SPMA1602	1	9	10 x OTL602	

# SPMD Simplest Installation - minimum interconnections

Fig 6 - SPMD x 1

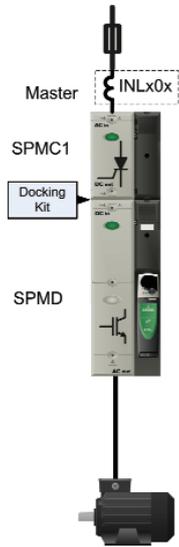


Fig 7 - SPMD x 2

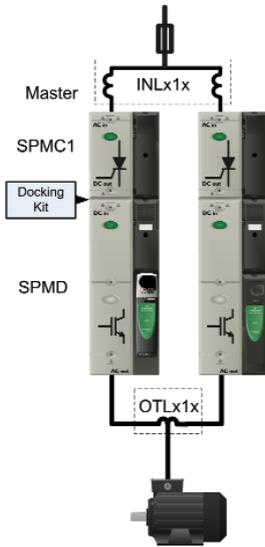
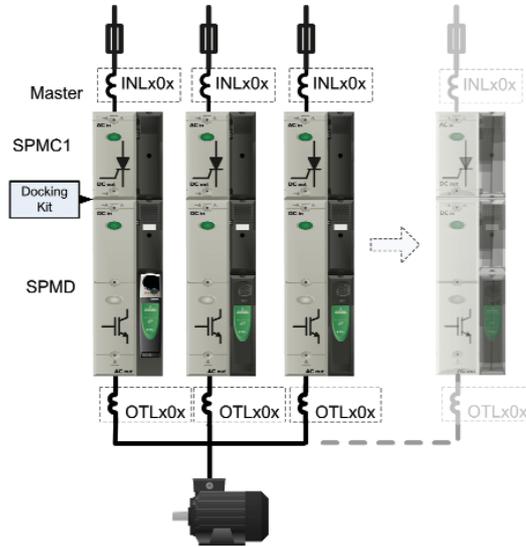


Fig 8 - SPMD x 3 to x 10



	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 <sup>[1]</sup>	185 <sup>[1]</sup>	300 <sup>[1]</sup>	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	

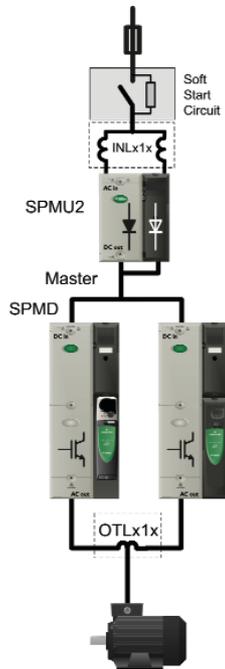
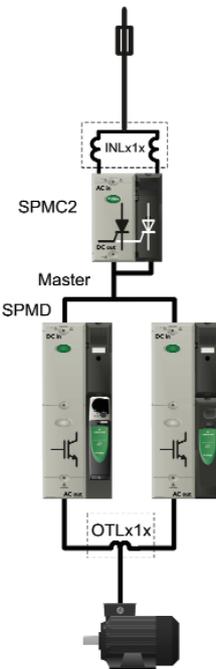
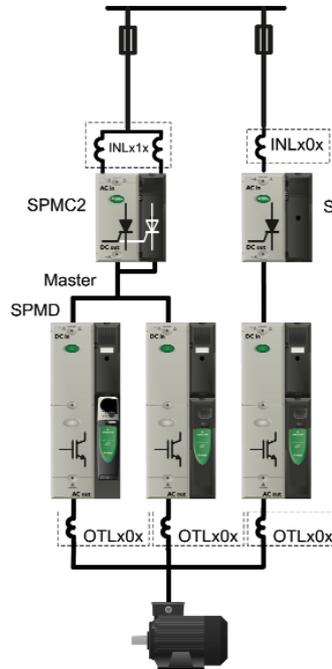
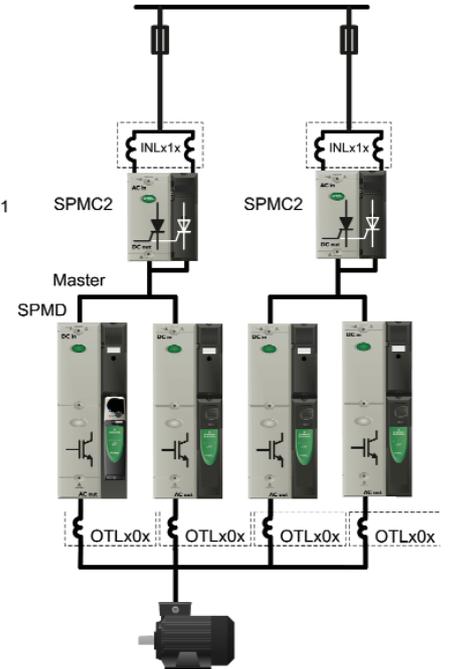
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:

	@ 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	75	6	SPMD1601-1S	1 x SPMD1601	1		1 x SPMC1601		1 x INL601	1
	144	132	150	125	110	90	6	SPMD1602-1S	1 x SPMD1602	1		1 x SPMC1601		1 x INL601	1
	168	160	150	144	132	110	6	SPMD1603-1S	1 x SPMD1603	1		1 x SPMC1601		1 x INL602	1
	192	185	200	168	160	110	6	SPMD1604-1S	1 x SPMD1604	1		1 x SPMC1601		1 x INL602	1
	238	200	250	190	185	200	7	SPMD1601-2S	2 x SPMD1601	1	1	2 x SPMC1601	1 x OTL611	1 x INL611	2
	274	250	300	238	200	250	7	SPMD1602-2S	2 x SPMD1602	1	1	2 x SPMC1601	1 x OTL612	1 x INL611	2
	320	300	350	274	250	300	7	SPMD1603-2S	2 x SPMD1603	1	1	2 x SPMC1601	1 x OTL613	1 x INL612	2
	365	350	400	320	300	350	7	SPMD1604-2S	2 x SPMD1604	1	1	2 x SPMC1601	1 x OTL614	1 x INL612	2
	411	400	450	357	350	350	8	SPMD1602-3S	3 x SPMD1602	1	2	3 x SPMC1601	3 x OTL602	3 x INL601	3
	480	450	500	411	400	450	8	SPMD1603-3S	3 x SPMD1603	1	2	3 x SPMC1601	3 x OTL603	3 x INL602	3
	548	500	600	480	450	500	8	SPMD1604-3S	3 x SPMD1604	1	2	3 x SPMC1601	3 x OTL604	3 x INL602	3
	640	630	700	548	500	600	8	SPMD1603-4S	4 x SPMD1603	1	3	4 x SPMC1601	4 x OTL603	4 x INL602	4
	731	700	800	640	630	700	8	SPMD1604-4S	4 x SPMD1604	1	3	4 x SPMC1601	4 x OTL604	4 x INL602	4
	1828	1800	2000	1600	1550	1750	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 16

# 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			F <sub>50</sub>	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			
		@ 220V	@ 230V		@ 220V	@ 230V			Drive	Master	Slave	Rectifier	Output	Input	
	(A)	(kW)	(HP)	(A)	(kW)	(HP)									
<b>200V</b>	<b>364</b>	110	150	<b>296</b>	90	125	9	SPMD1201-2L	2 x SPMD1201			1 x SPMU2402 <sup>[5]</sup>	1 x OTL411	1 x INL411	
	<b>471</b>	132	200	<b>364</b>	110	150	9	SPMD1202-2L	2 x SPMD1202			1 x SPMU2402 <sup>[5]</sup>	1 x OTL412	1 x INL411	
	<b>592</b>	160	250	<b>475</b>	150	200	9	SPMD1203-2L	2 x SPMD1203			1 x SPMU2402 <sup>[5]</sup>	1 x OTL413	1 x INL412	
	<b>665</b>	200	250	<b>551</b>	160	200	9	SPMD1204-2L	2 x SPMD1204			1 x SPMU2402 <sup>[5]</sup>	1 x OTL414	1 x INL412	

For higher currents, please contact your supplier. The maximum number of parallel output stages is 10.

	@ 400V @ 460V			@ 400V @ 460V			F <sub>50</sub>	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			
		@ 220V	@ 230V		@ 220V	@ 230V			Drive	Master	Slave	Rectifier	Output	Input	
	(A)	(kW)	(HP)	(A)	(kW)	(HP)									
<b>400V</b>	<b>390</b>	225	300	<b>342</b>	185	300	10	SPMD1401-2L	2 x SPMD1401			1 x SPMC2402	1 x OTL411	1 x INL411	
	<b>468</b>	280	400	<b>400</b>	225	300	10	SPMD1402-2L	2 x SPMD1402			1 x SPMC2402	1 x OTL412	1 x INL411	
	<b>552</b>	315	450	<b>468</b>	280	400	10	SPMD1403-2L	2 x SPMD1403			1 x SPMC2402	1 x OTL413	1 x INL412	
	<b>666<sup>[1]</sup></b>	350 <sup>[1]</sup>	550 <sup>[1]</sup>	<b>552</b>	315	450	10	SPMD1404-2L	2 x SPMD1404			1 x SPMC2402	1 x OTL414	1 x INL412	
	<b>702</b>	400	600	<b>600</b>	315	500	11	SPMD1402-3L	3 x SPMD1402		2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL402	1 x INL402 + 1 x INL412	
	<b>828</b>	450	700	<b>702</b>	400	650	11	SPMD1403-3L	3 x SPMD1403		2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL403	1 x INL402 + 1 x INL412	
	<b>1000<sup>[1]</sup></b>	550 <sup>[1]</sup>	850 <sup>[1]</sup>	<b>828</b>	450	750	11	SPMD1404-3L	3 x SPMD1404		2	1 x SPMC2402 + 1 x SPMCI402	3 x OTL404	1 x INL402 + 1 x INL412	
	<b>1104</b>	630	900	<b>937</b>	550	800	12	SPMD1403-4L	4 x SPMD1403		3	2 x SPMC2402	4 x OTL403	2 x INL412	
	<b>1333<sup>[1]</sup></b>	750 <sup>[1]</sup>	1100 <sup>[1]</sup>	<b>1104</b>	630	950	12	SPMD1404-4L	4 x SPMD1404		3	2 x SPMC2402	4 x OTL404	2 x INL412	
	<b>3333<sup>[1]</sup></b>	1900 <sup>[1]</sup>	2900 <sup>[1]</sup>	<b>2761</b>	1500	2400	12	SPMD1404-10L	10 x SPMD1404		9	5 x SPMC2402	10 x OTL404	5 x INL412	

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

	@ 690V @ 575V			@ 690V @ 575V			F <sub>50</sub>	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			
		@ 220V	@ 230V		@ 220V	@ 230V			Drive	Master	Slave	Rectifier	Output	Input	
	(A)	(kW)	(HP)	(A)	(kW)	(HP)									
<b>575V / 690V</b>	<b>238</b>	200	250	<b>190</b>	185	200	10	SPMD1601-2L	2 x SPMD1601			1 x SPMC2601	1 x OTL611	1 x INL611	
	<b>274</b>	250	300	<b>238</b>	200	250	10	SPMD1602-2L	2 x SPMD1602			1 x SPMC2601	1 x OTL612	1 x INL611	
	<b>320</b>	300	350	<b>274</b>	250	300	10	SPMD1603-2L	2 x SPMD1603			1 x SPMC2601	1 x OTL613	1 x INL612	
	<b>365</b>	350	400	<b>320</b>	300	350	10	SPMD1604-2L	2 x SPMD1604			1 x SPMC2601	1 x OTL614	1 x INL612	
	<b>411</b>	400	450	<b>357</b>	350	350	11	SPMD1602-3L	3 x SPMD1602		2	1 x SPMC2601 + 1 x SPMCI601	3 x OTL602	1 x INL602 + 1 x INL612	
	<b>480</b>	450	500	<b>411</b>	400	450	11	SPMD1603-3L	3 x SPMD1603		2	1 x SPMC2601 + 1 x SPMCI601	3 x OTL603	1 x INL602 + 1 x INL612	
	<b>548</b>	500	600	<b>480</b>	450	500	11	SPMD1604-3L	3 x SPMD1604		2	1 x SPMC2601 + 1 x SPMCI601	3 x OTL604	1 x INL602 + 1 x INL612	
	<b>640</b>	630	700	<b>548</b>	500	600	12	SPMD1603-4L	4 x SPMD1603		3	2 x SPMC2601	4 x OTL603	2 x INL612	
	<b>731</b>	700	800	<b>640</b>	630	700	12	SPMD1604-4L	4 x SPMD1604		3	2 x SPMC2601	4 x OTL604	2 x INL612	
	<b>1828</b>	1800	2000	<b>1600</b>	1550	1750	12	SPMD1604-10L	10 x SPMD1604		9	5 x SPMC2601	10 x OTL604	5 x INL612	

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

See notes on page 16

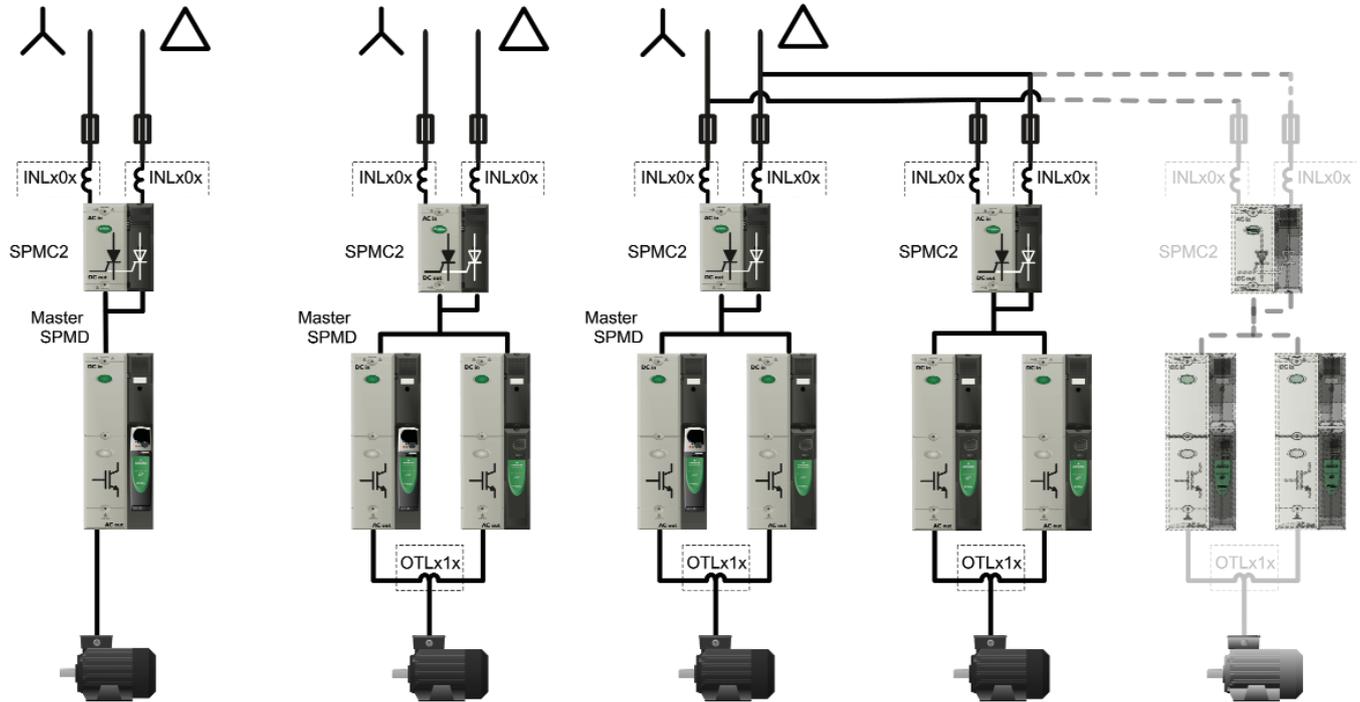
# SPMD 12 Pulse - reduced harmonics

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)								
<b>400V</b>	205	110	150	180	90	150	13	SPMD1401-1T	1 x SPMD1401	1		1 x SPMC2402		2 x INL401 <sup>[6]</sup>
	246	132	200	210	110	150	13	SPMD1402-1T	1 x SPMD1402	1		1 x SPMC2402		2 x INL401 <sup>[6]</sup>
	290	160	250	246	132	200	13	SPMD1403-1T	1 x SPMD1403	1		1 x SPMC2402		2 x INL402 <sup>[6]</sup>
	350 <sup>[1]</sup>	200 <sup>[1]</sup>	300 <sup>[1]</sup>	290	160	250	13	SPMD1404-1T	1 x SPMD1404	1		1 x SPMC2402		2 x INL402 <sup>[6]</sup>
	390	225	300	342	185	300	14	SPMD1401-2T	2 x SPMD1401	1	1	1 x SPMC2402	1 x OTL411	2 x INL401 <sup>[6]</sup>
	468	280	400	400	225	300	14	SPMD1402-2T	2 x SPMD1402	1	1	1 x SPMC2402	1 x OTL412	2 x INL401 <sup>[6]</sup>
	552	315	450	468	280	400	14	SPMD1403-2T	2 x SPMD1403	1	1	1 x SPMC2402	1 x OTL413	2 x INL402 <sup>[6]</sup>
	666 <sup>[1]</sup>	350 <sup>[1]</sup>	550 <sup>[1]</sup>	552	315	450	14	SPMD1404-2T	2 x SPMD1404	1	1	1 x SPMC2402	1 x OTL414	2 x INL402 <sup>[6]</sup>
	780	450	650	685	355	600	15	SPMD1401-4T	4 x SPMD1401	1	3	2 x SPMC2402	4 x OTL401	4 x INL401 <sup>[6]</sup>
	937	500	800	800	450	700	15	SPMD1402-4T	4 x SPMD1402	1	3	2 x SPMC2402	4 x OTL402	4 x INL401 <sup>[6]</sup>
1104	630	900	937	550	800	15	SPMD1403-4T	4 x SPMD1403	1	3	2 x SPMC2402	4 x OTL403	4 x INL402 <sup>[6]</sup>	
1333 <sup>[1]</sup>	750 <sup>[1]</sup>	1100 <sup>[1]</sup>	1104	630	950	15	SPMD1404-4T	4 x SPMD1404	1	3	2 x SPMC2402	4 x OTL404	4 x INL402 <sup>[6]</sup>	
3333 <sup>[1]</sup>	1900 <sup>[1]</sup>	2900 <sup>[1]</sup>	2761	1500	2400	15	SPMD1404-10T	10 x SPMD1404	1	9	5 x SPMC2402	10 x OTL404	10 x INL402 <sup>[6]</sup>	

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

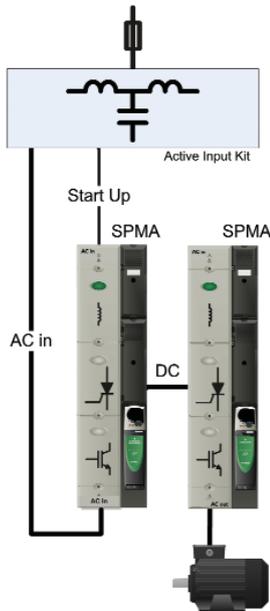
	@ 690V (kW)		@ 575V (HP)		Fig.	Top Level Drive Order Code	Drive Order Code Items							
	@ 690V (kW)	@ 575V (HP)	@ 690V (kW)	@ 575V (HP)			Modules			Inductors				
							Drive	Master	Slave	Rectifier	Output	Input		
	(kW)	(HP)	(kW)	(HP)										
<b>575V / 690V</b>	125	110	125	100	90	75	7	SPMD1601-1T	1 x SPMD1601	1		1 x SPMC2601		2 x INL601 <sup>[6]</sup>
	144	132	150	125	110	90	7	SPMD1602-1T	1 x SPMD1602	1		1 x SPMC2601		2 x INL601 <sup>[6]</sup>
	168	160	150	144	132	110	7	SPMD1603-1T	1 x SPMD1603	1		1 x SPMC2601		2 x INL602 <sup>[6]</sup>
	192	185	200	168	160	110	7	SPMD1604-1T	1 x SPMD1604	1		1 x SPMC2601		2 x INL602 <sup>[6]</sup>
	238	200	250	190	185	200	10	SPMD1601-2T	2 x SPMD1601	1	1	1 x SPMC2601	1 x OTL611	2 x INL601 <sup>[6]</sup>
	274	250	300	238	200	250	10	SPMD1602-2T	2 x SPMD1602	1	1	1 x SPMC2601	1 x OTL612	2 x INL601 <sup>[6]</sup>
	320	300	350	274	250	300	10	SPMD1603-2T	2 x SPMD1603	1	1	1 x SPMC2601	1 x OTL613	2 x INL602 <sup>[6]</sup>
	365	350	400	320	300	350	10	SPMD1604-2T	2 x SPMD1604	1	1	1 x SPMC2601	1 x OTL614	2 x INL602 <sup>[6]</sup>
	476	470	500	380	350	400	9	SPMD1601-4T	4 x SPMD1601	1	3	2 x SPMC2601	4 x OTL601	4 x INL601 <sup>[6]</sup>
	548	500	600	476	450	500	9	SPMD1602-4T	4 x SPMD1602	1	3	2 x SPMC2601	4 x OTL602	4 x INL601 <sup>[6]</sup>
	640	630	700	548	500	600	12	SPMD1603-4T	4 x SPMD1603	1	3	2 x SPMC2601	4 x OTL603	4 x INL602 <sup>[6]</sup>
	731	700	800	640	630	700	12	SPMD1604-4T	4 x SPMD1604	1	3	2 x SPMC2601	4 x OTL604	4 x INL602 <sup>[6]</sup>
1828	1800	2000	1600	1550	1750	12	SPMD1604-10T	10 x SPMD1604	1	9	5 x SPMC2601	10 x OTL604	10 x INL602 <sup>[6]</sup>	

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

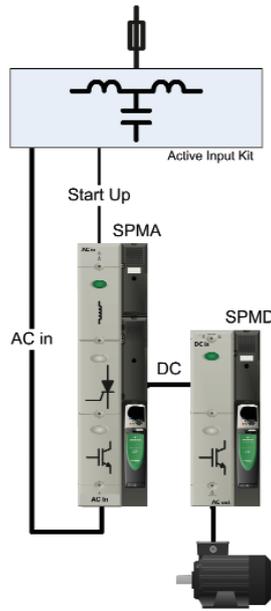
See notes on page 16

# Active Input Single Drives - regeneration and harmonic elimination

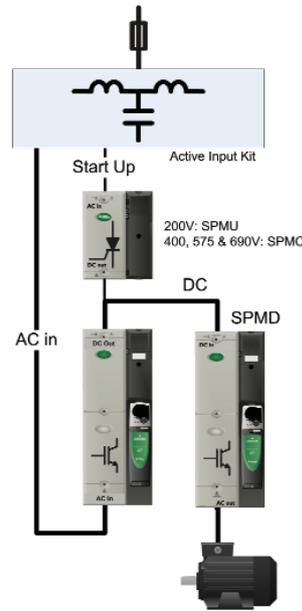
**Fig 16 - SPMA**



**Fig 17 - SPMA + SPMD**



**Fig 18 - SPMD + SPMC**

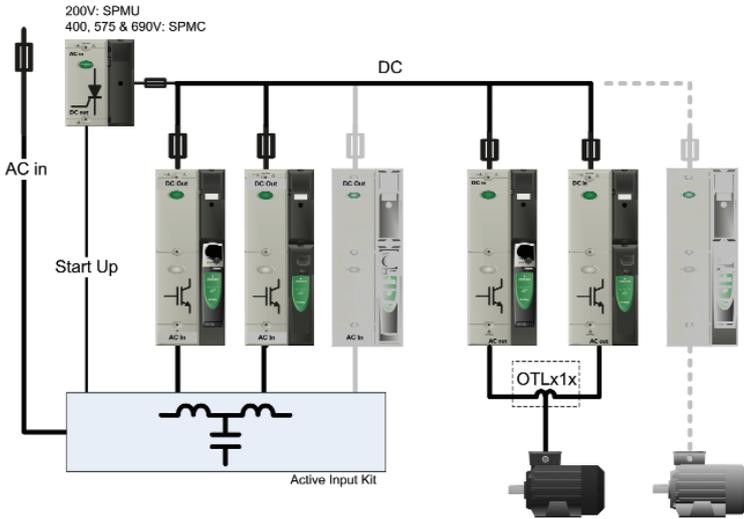


	Normal Duty						Heavy Duty						F.L.O.	Top Level Drive Order Code	Drive Order Code Items							
	Max Cont. Current (A)	Typical Motor Output		Max Cont. Current (A)	Typical Motor Output		Drive	Modules		Active Input Kits <sup>[8]</sup>												
								Master	Rectifier	Normal Duty	Heavy Duty	Normal Duty			Heavy Duty							
		@ 220V (kW)	@ 230V (HP)		@ 220V (kW)	@ 230V (HP)																
<b>200V</b>	<b>192</b>	55	75	<b>156</b>	45	60	18	SPMD1221-2R	2	2	2	1 x SPMU1402 <sup>[5]</sup>	200-2	200-1								
	<b>248</b>	75	100	<b>192</b>	55	75	18	SPMD1222-2R	2	2	2	1 x SPMU1402 <sup>[5]</sup>	200-3	200-2								
	<b>312</b>	90	125	<b>250</b>	75	100	18	SPMD1223-2R	2	2	2	1 x SPMU1402 <sup>[5]</sup>	200-4	200-3								
	<b>350<sup>[1]</sup></b>	110 <sup>[1]</sup>	150 <sup>[1]</sup>	<b>290</b>	90	125	18	SPMD1224-2R	2	2	2	1 x SPMU1402 <sup>[5]</sup>	200-5	200-4								
<b>400V</b>		@ 400V (kW)	@ 460V (HP)		@ 400V (kW)	@ 460V (HP)																
	<b>205</b>	110	150	<b>180</b>	90	150	16	SPMA1421-2R	2	2												
							17	SPMA/D1421-2R	1	2	1	1 x SPMU1402 + 1 x SPMD1421	400-2	400-1								
							18	SPMD1421-2R	2	2	1	1 x SPMC1402										
	<b>236</b>	132	200	<b>210</b>	110	150	16	SPMD1422-2R	2	2												
							17	SPMA/D1422-2R	1	2	1	1 x SPMU1402 + 1 x SPMD1422	400-3	400-2								
	<b>246</b>	132	200	<b>210</b>	110	150	18	SPMD1422-2R	2	2	2	1 x SPMC1402										
<b>290</b>	160	250	<b>246</b>	132	200	18	SPMD1423-2R	2	2	2	1 x SPMC1402	400-3	400-3									
<b>350<sup>[1]</sup></b>	200 <sup>[1]</sup>	300 <sup>[1]</sup>	<b>290</b>	160	250	18	SPMD1424-2R	2	2	2	1 x SPMC1402	400-4	400-3									
<b>575V / 690V</b>		@ 690V (kW)	@ 575V (HP)		@ 690V (kW)	@ 575V (HP)																
	<b>125</b>	110	125	<b>100</b>	90	100	16	SPMA1621-2R	2	2												
							17	SPMA/D1621-2R	1	2	1	1 x SPMU1601 + 1 x SPMD1621	690-2	690-1								
							18	SPMD1621-2R	2	2	1	1 x SPMC1601										
	<b>144</b>	132	150	<b>125</b>	110	125	16	SPMA1622-2R	2	2												
							17	SPMA/D1622-2R	1	2	1	1 x SPMU1601 + 1 x SPMD1622	690-3	690-2								
							18	SPMD1622-2R	2	2	2	1 x SPMC1601										
<b>168</b>	160	150	<b>144</b>	132	150	18	SPMD1623-2R	2	2	2	1 x SPMC1601	690-4	690-3									
<b>192</b>	185	200	<b>168</b>	160	150	18	SPMD1624-2R	2	2	2	1 x SPMC1601	690-6	690-4									

See notes on page 16

# Active Input Multiple Drives - regeneration and harmonic elimination

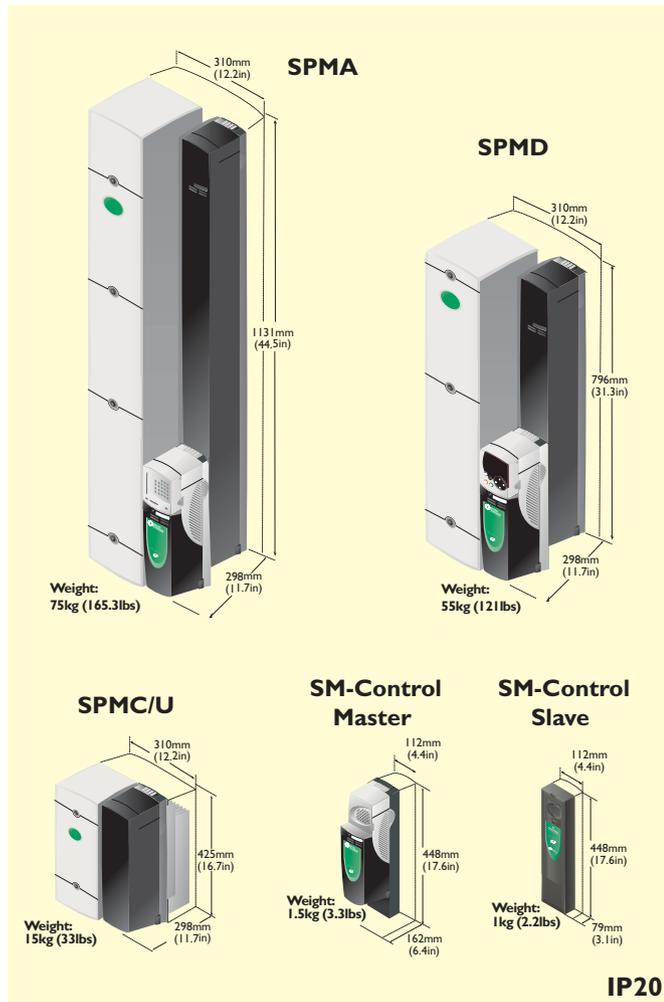
**Fig 19 - SPMD x 4 to x 20 + SPMC**



	Normal Duty						Heavy Duty						F. No.	Top Level Drive Order Code	Drive									
	Max Cont. Current		Typical Motor Output		Max Cont. Current		Typical Motor Output		Drive	Modules		Rectifier			Chokes Output	Active Input Kits <sup>[8]</sup>								
	(A)	@ 220V @ 230V (kW) (HP)		(A)	@ 220V @ 230V (kW) (HP)		Master	Slave		Normal Duty	Heavy Duty					Normal Duty	Heavy Duty							
<b>200V</b>	<b>364</b>	110	150	<b>296</b>	90	125	19	SPMD1221-2R	4 x SPMD1221	2	2	1 x SPMU1402 <sup>[5]</sup>	1 x OTL411	200-7	200-6									
	<b>471</b>	132	200	<b>364</b>	110	150	19	SPMD1222-2R	4 x SPMD1222	2	2	1 x SPMU1402 <sup>[5]</sup>	1 x OTL412	200-8	200-7									
	<b>592</b>	160	250	<b>475</b>	150	200	19	SPMD1223-2R	4 x SPMD1223	2	2	1 x SPMU1402 <sup>[5]</sup>	1 x OTL413	200-9	200-8									
	<b>665</b>	200	250	<b>551</b>	160	200	19	SPMD1224-2R	4 x SPMD1224	2	2	1 x SPMU1402 <sup>[5]</sup>	1 x OTL414	200-11	200-9									
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10.																								
<b>400V</b>	@ 400V @ 460V (kW) (HP)		@ 400V @ 460V (kW) (HP)																					
	<b>390</b>	225	300	<b>342</b>	185	300	19	SPMD1421-2R	4 x SPMD1421	2	2	1 x SPMC1402	1 x OTL411	400-6	400-5									
	<b>468</b>	280	400	<b>400</b>	225	350	19	SPMD1422-2R	4 x SPMD1422	2	2	1 x SPMC1402	1 x OTL412	400-7	400-6									
	<b>552</b>	315	450	<b>468</b>	280	400	19	SPMD1423-2R	4 x SPMD1423	2	2	1 x SPMC1402	1 x OTL413	400-7	400-7									
	<b>666<sup>[1]</sup></b>	350 <sup>[1]</sup>	550 <sup>[1]</sup>	<b>552</b>	315	450	19	SPMD1424-2R	4 x SPMD1424	2	2	1 x SPMC1402	1 x OTL414	400-9	400-7									
	<b>702</b>	400	600	<b>600</b>	315	500	19	SPMD1422-3R	6 x SPMD1422	2	4	1 x SPMC1402	3 x OTL402	400-10	400-8									
	<b>828</b>	450	700	<b>702</b>	400	650	19	SPMD1423-3R	6 x SPMD1423	2	4	1 x SPMC1402	3 x OTL403	400-10	400-10									
	<b>1000<sup>[1]</sup></b>	550 <sup>[1]</sup>	850 <sup>[1]</sup>	<b>828</b>	450	750	19	SPMD1424-3R	6 x SPMD1424	2	4	1 x SPMC1402	3 x OTL404	400-11	400-10									
	<b>1104</b>	630	900	<b>937</b>	550	800	19	SPMD1423-4R	8 x SPMD1423	2	6	1 x SPMC1402	4 x OTL403	400-12	400-12									
	<b>1333<sup>[1]</sup></b>	750 <sup>[1]</sup>	1100 <sup>[1]</sup>	<b>1104</b>	630	950	19	SPMD1424-4R	8 x SPMD1424	2	6	1 x SPMC1402	4 x OTL404	400-14	400-12									
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:																								
<b>3333<sup>[1]</sup></b>	1900 <sup>[1]</sup>	2900 <sup>[1]</sup>	<b>2761</b>	1500	2400	19	SPMD1424-10R	20 x SPMD1424	2	18	1 x SPMC2402	10 x OTL404	400-26	400-24										
<b>575V / 690V</b>	@ 690V @ 575V (kW) (HP)		@ 690V @ 575V (kW) (HP)																					
	<b>238</b>	200	250	<b>190</b>	185	200	19	SPMD1621-2R	4 x SPMD1621	2	2	1 x SPMC1601	1 x OTL611	690-7	690-5									
	<b>274</b>	250	300	<b>238</b>	200	250	19	SPMD1622-2R	4 x SPMD1622	2	2	1 x SPMC1601	1 x OTL612	690-8	690-7									
	<b>320</b>	300	350	<b>274</b>	250	300	19	SPMD1623-2R	4 x SPMD1623	2	2	1 x SPMC1601	1 x OTL613	690-9	690-8									
	<b>365</b>	350	400	<b>320</b>	300	350	19	SPMD1624-2R	4 x SPMD1624	2	2	1 x SPMC1601	1 x OTL614	690-11	690-9									
	<b>411</b>	400	450	<b>357</b>	350	350	19	SPMD1622-3R	6 x SPMD1622	2	4	1 x SPMC1601	3 x OTL602	690-12	690-10									
	<b>480</b>	450	500	<b>411</b>	400	450	19	SPMD1623-3R	6 x SPMD1623	2	4	1 x SPMC1601	3 x OTL603	690-13	690-12									
	<b>548</b>	500	600	<b>480</b>	450	500	19	SPMD1624-3R	6 x SPMD1624	2	4	1 x SPMC1601	3 x OTL604	690-14	690-13									
	<b>640</b>	630	700	<b>548</b>	500	600	19	SPMD1623-4R	8 x SPMD1623	2	6	1 x SPMC1601	4 x OTL603	690-16	690-15									
	<b>731</b>	700	800	<b>640</b>	630	700	19	SPMD1624-4R	8 x SPMD1624	2	6	1 x SPMC1601	4 x OTL604	690-18	690-16									
For higher currents, please contact your supplier. The maximum number of parallel output stages is 10, as on next line:																								
<b>1828</b>	1800	2000	<b>1600</b>	1550	1750	19	SPMD1624-10R	20 x SPMD1624	2	18	1 x SPMC2601	10 x OTL604	690-30	690-28										

See notes on page 16

# 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 (2<sup>nd</sup> environment)
- With on board EMC filter; complies with EN 61800-3 (2<sup>nd</sup> 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

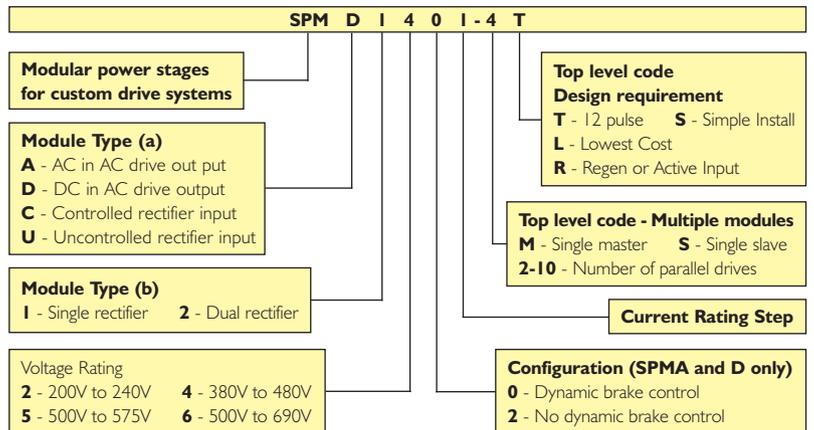
# Order Codes for the Unidrive SPM and Configurations

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	Typical Motor Output		Max Cont. Current	Typical Motor Output					Single	Dual	Single [5]			Dual [5]
	(A)	@220V (kW)	@230V (HP)	(A)	@220V (kW)	@230V (HP)						(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 <sup>[1]</sup>	110 <sup>[1]</sup>	150 <sup>[1]</sup>	290	90	125	SPMD1204	5.0	550						
380-480VAC +/- 10%		@400V (kW)	@460V (HP)	(A)	@400V (kW)	@460V (HP)									
	205	110	150	180	90	150	SPMA1401	3.3	400						315
	236	132	200	210	110	150	SPMA1402	3.3	560						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 <sup>[1]</sup>	200 <sup>[1]</sup>	300 <sup>[1]</sup>	290	160	250	SPMD1404	5.0	560							
500-575VAC +/- 10%		@575V (kW)	@575V (HP)	(A)	@575V (kW)	@575V (HP)									
	125	90	125	100	75	100	SPMA1601 <sup>[2]</sup>	3.3	250						200
	144	110	150	125	90	125	SPMA1602 <sup>[2]</sup>	3.3	315						200
	125	90	125	100	75	100	SPMD1601 <sup>[2]</sup>	3.3	250						
	144	110	150	125	90	125	SPMD1602 <sup>[2]</sup>	3.3	315	SPMC1601	SPMC2601	SPMU1601	SPMU2601	3.0	250
	168	110	150	144	110	150	SPMD1603 <sup>[2]</sup>	5.0	350						
192	150	200	168	110	150	SPMD1604 <sup>[2]</sup>	5.0	400							
500-690VAC +/- 10%		@690V (kW)	@690V (HP)	(A)	@690V (kW)	@690V (HP)									
	125	110	150	100	90	125	SPMA1601	3.3	250						200
	144	132	175	125	110	150	SPMA1602	3.3	315						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 <sup>[4]</sup>
24V DC Supply - 10A	8510-0000
SPM Docking Kit	3470-0012

<b>Normal Duty</b>	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.
<b>Heavy Duty (Rotor Flux Control and Closed Loop)</b>	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 T<sub>ambient</sub> = <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] Only 400A AC and DC fuses are stocked by Control Techniques in Newtown, as these are used with other products.
- [8] For more information, contact your supplier.

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 <sup>[8]</sup>		
	Single		Dual		Single		Dual		Schaffner	Epcos	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	INL401	4401-0181-00	INL411	4401-0206-01	OTL401	4401-0197-00	OTL411	4401-0188-01	4200-6315	4200-6313	2.5	61	55
SPMD1202				OTL402	4401-0198-00	OTL412	4401-0189-01					2.5	61
SPMD1203	INL402	4401-0182-00	INL412	4401-0207-01	OTL403	4401-0199-00	OTL413	4401-0192-01			1.9	80	80
SPMD1204					OTL404	4401-0200-00	OTL414	4401-0186-01			1.9	80	80

SPMA1401					OTL401	4401-0197-00	OTL411	4401-0188-01	4200-6603	4200-6601	5	122	90
SPMA1402					OTL402	4401-0198-00	OTL412	4401-0189-01			5	122	110
SPMD1401	INL401	4401-0181-00	INL411	4401-0206-01	OTL401	4401-0197-00	OTL411	4401-0188-01	4200-6315	4200-6313	5	122	90
SPMD1402					OTL402	4401-0198-00	OTL412	4401-0189-01					5
SPMD1403	INL402	4401-0182-00	INL412	4401-0207-01	OTL403	4401-0199-00	OTL413	4401-0192-01			3.8	160	132
SPMD1404					OTL404	4401-0200-00	OTL414	4401-0186-01			3.8	160	160

SPMA1601 <sup>[2]</sup>					OTL601	4401-0201-00	OTL611	4401-0193-00	4200-6603	4200-6601	10	126	113
SPMA1602 <sup>[2]</sup>					OTL602	4401-0202-00	OTL612	4401-0194-00			10	126	113
SPMD1601 <sup>[2]</sup>	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-00	4200-6316	4200-6314	10	126	75
SPMD1602 <sup>[2]</sup>					OTL602	4401-0202-00	OTL612	4401-0194-00					10
SPMD1603 <sup>[2]</sup>	INL602	4401-0184-00	INL612	4401-0191-03	OTL603	4401-0203-00	OTL613	4401-0195-00			6.2	202	110
SPMD1604 <sup>[2]</sup>					OTL604	4401-0204-00	OTL614	4401-0196-00			6.2	202	132

SPMA1601					OTL601	4401-0201-00	OTL611	4401-0193-00	4200-6603	4200-6601	10	126	113
SPMA1602					OTL602	4401-0202-00	OTL612	4401-0194-00			10	126	113
SPMD1601	INL601	4401-0183-00	INL611	4401-0190-03	OTL601	4401-0201-00	OTL611	4401-0193-00	4200-6316	4200-6314	10	126	75
SPMD1602					OTL602	4401-0202-00	OTL612	4401-0194-00					10
SPMD1603	INL602	4401-0184-00	INL612	4401-0191-03	OTL603	4401-0203-00	OTL613	4401-0195-00			6.2	202	110
SPMD1604					OTL604	4401-0204-00	OTL614	4401-0196-00			6.2	202	132

AC Fuse Selection (Semiconductor IEC class aR)				
(A)	Bussman		Ferraz	
	Order Code	Manufacturer Part No.	Order Code	Manufacturer Part No.
200	[7]	170M3015	[7]	6,9URD3ID08A0200
250	[7]	170M3016	[7]	6,9URD3ID08A0250
315	[7]	170M3017	[7]	6,9URD3ID08A0315
350	[7]	170M3018	[7]	6,9URD3ID08A0350
400	3533-4069	170M3019	4300-0400	6,9URD32D08A0400

External EMC Filter (To meet requirements of EN61800-3) For multiple drive configurations					
(V)	(A)	Epcos		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]	6,9URD3ID08A0250
315	[7]	170M3017	[7]	6,9URD3ID08A0315
350	[7]	170M3018	[7]	6,9URD3ID08A0350
400	3533-4069	170M3019	4300-0400	6,9URD32D08A0400
560	[7]	170M3022	[7]	6,9URD3ID08A0550

Related Brochures		Order Code
Unidrive SP - Overview		0175-0336
Unidrive SP - Comprehensive Brochure		0175-0339
PLC Functionality with Uni SP		0175-0328
Flexible integration with Uni SP		0175-0330
Unidrive SP Secure Disable Booklet		0175-0317

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



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