1 Unidrive SPMC/U (rectifier)

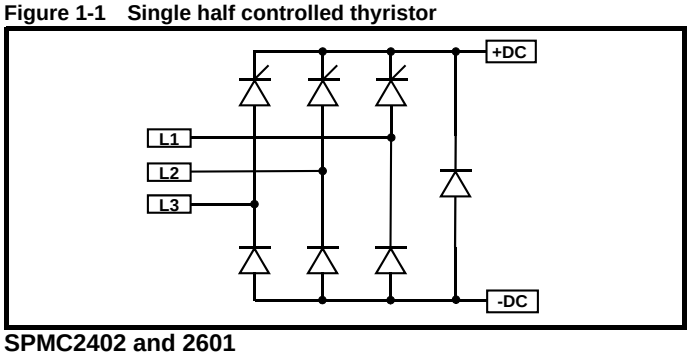
Please refer to the *Unidrive SPM User Guide* for full details of the Unidrive SPMC/U (rectifier) product.

1.1 Introduction

The Unidrive SPMC is a controlled thyristor rectifier and the SPMU is an uncontrolled rectifier.

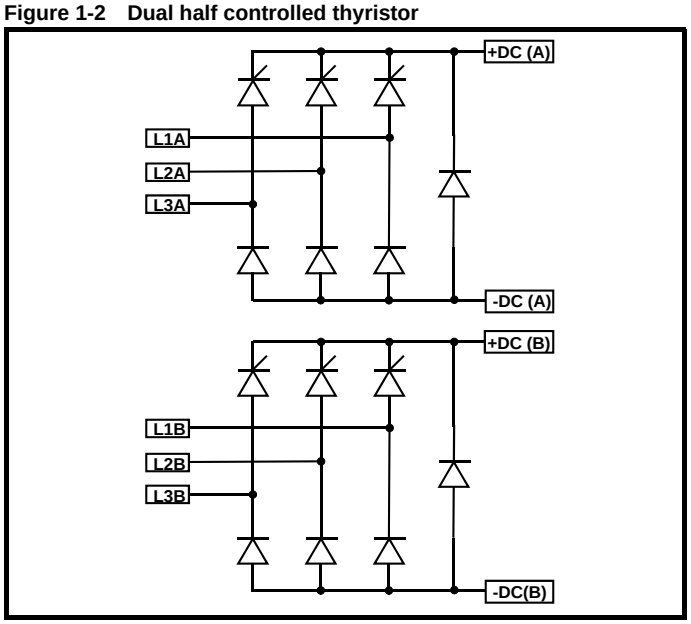
SPMC1402 and 1601

Figure 1-1 Single half controlled thyristor



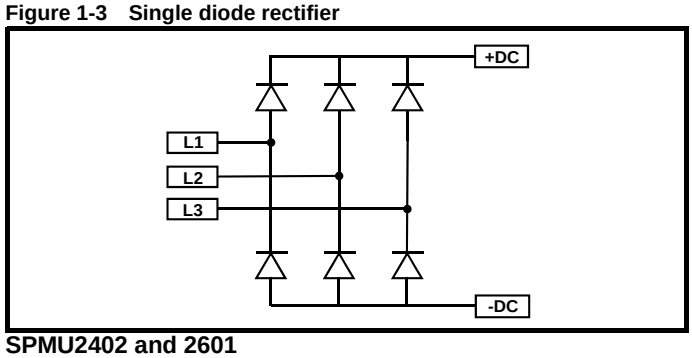
SPMC2402 and 2601

Figure 1-2 Dual half controlled thyristor



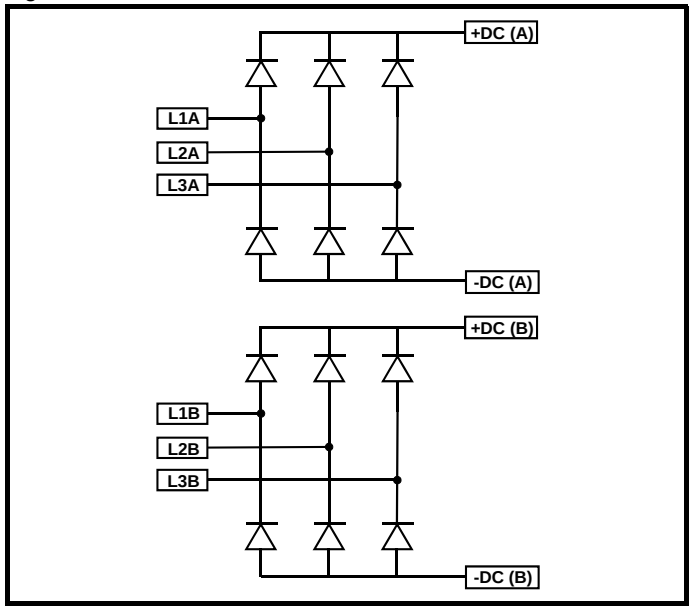
SPMU1402 and 1601

Figure 1-3 Single diode rectifier



SPMU2402 and 2601

Figure 1-4 Dual diode rectifier



The Unidrive SPMC is a half controlled thyristor bridge is used as a front end to the SPMD inverter module or as a stand alone rectifier for several smaller drives. Soft-start is built in.

The Unidrive SPMU is used as a front end to the SPMD inverter module or as a stand alone rectifier for several smaller drives. **Softstart must be supplied externally using a resistor and contactor or SPMC**.

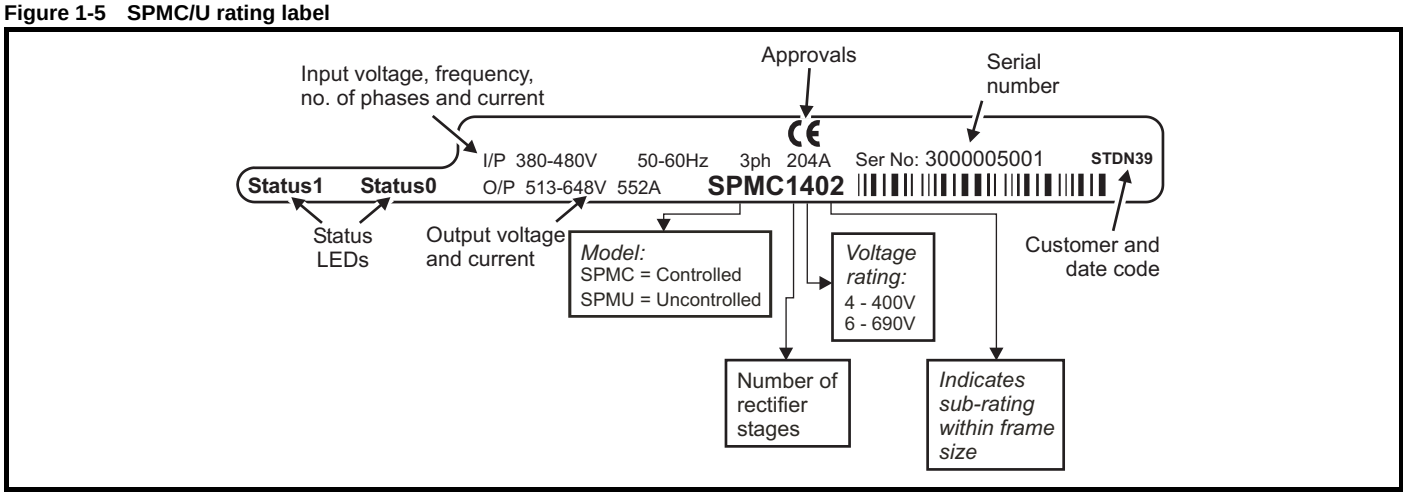
An external 24V, 3A power supply is required in addition to the AC supply to allow the rectifier to operate. See section *Unidrive SPMC/U external 24V supply requirements* and section *Unidrive SPM power supply* on page 4. Control wiring is required between the rectifier and motoring drive(s) so that if the rectifier indicates a fault the motoring drive(s) will be disabled.

The 24V supply must be protected using a 4A slow-blow fuse, one for each supply pole.

Control connections to the Unidrive SPMC/U should be made with 0.5mm^2 cable.

The status relay contacts are rated for switching non-inductive loads at 250Vac 6A non-inductive, up to 4Adc if the voltage is limited to 40V or up to 400mA dc if the voltage is limited to 250Vdc. Protection from overcurrent must be provided.

Figure 1-5 SPMC/U rating label



1.2 Unidrive SPMC/U technical data

Table 1-1 Unidrive SPMC/U 400V input current, fuse and cable size ratings

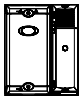
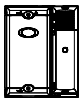
Model		Typical input current	Maximum AC input current	Typical DC output current	Semiconductor fuse in series with HRC fuse		Cable sizes				
					HRC IEC Class gG UL class J	Semi-conductor IEC class aR	AC input		DC output cable		Cable installation method
		A	A	A	A	A	mm^2	AWG	mm^2	AWG	
	SPMC/U1402	339	344	379	450	400	2 x 120	2 x 4/0	2 x 120	2 x 4/0	B1 or C
	SPMC/U2402	2 x 308	2 x 312	2 x 345	450	400	2 x 120	2 x 4/0	2 x 120	2 x 4/0	B1 or C

Table 1-2 Unidrive SPMC/U 690V input current, fuse and cable size ratings

Model		Typical input current	Maximum AC input current	Typical DC output current	Semiconductor fuse in series with HRC fuse		Cable sizes				
					HRC IEC Class gG UL class J	Semi-conductor IEC class aR	AC input		DC output cable		Cable installation method
		A	A	A	A	A	mm^2	AWG	mm^2	AWG	
	SPMC/U1601	192	195	209	250	250	2 x 70	2 x 2/0	2 x 120	2 x 4/0	B2
	SPMC/U2601	2 x 170	2 x 173	2 x 185	250	250	2 x 70	2 x 2/0	2 x 120	2 x 4/0	B2

Installation class (ref: IEC60364-5-52:2001)

B1 - separate cables in conduit
B2 - multicore cable in conduit
C - multicore cable in free air.

WARNING: The user must provide a means of preventing live parts from being touched. A cover around the electrical connections at the top of the inverter and the bottom of the rectifier where the cables enter is required.
WARNING: Input fuses as specified must be provided.
WARNING: The Unidrive SPMC/U depends on the drive for protection. Status outputs must be linked to the drive enable circuit to ensure that when the rectifier indicates a fault the motoring drive(s) is disabled.
CAUTION: A separate input line reactor of at least the value shown in Table 1-3 must be used with the rectifiers. Failure to provide sufficient reactance could damage or reduce the service life of the rectifier or inverter.

Table 1-3 Matching line reactor to SPMC/U

SPM modules	Model	Current A	Width (W) mm	Depth (D) mm	Height (H) mm	Weight kg	Part number
SPMC/U1402 with SPMD1401/1402	INL401	245	240	190	225	32	4401-0181-00
SPMC/U1402 with SPMD1403/1404	INL402	339	276	200	225	36	4401-0182-00
SPMC/U1601 with SPMD1601/1602	INL601	145	240	190	225	33	4401-0183-00
SPMU1601 with SPMD1603/1604	INL602	192	276	200	225	36	4401-0184-00
SPMC/U2402 with 2 x SPMD1401/1402	INL411	2x 245	320	220	360	55	4401-0206-01
SPMC/U2402 with 2 x SPMC/U1403/1404	INL412	2x 339	320	220	360	55	4401-0207-01
SPMC/U2601 with 2 x SPMC/U1601/1602	INL611	2x 145	220	220	360	40	4401-0190-03
SPMC/U2601 with 2 x SPMC/U1603/1604	INL612	2x 192	220	220	360	55	4401-0191-03

Figure 1-6 Accessories supplied with SPMC/U

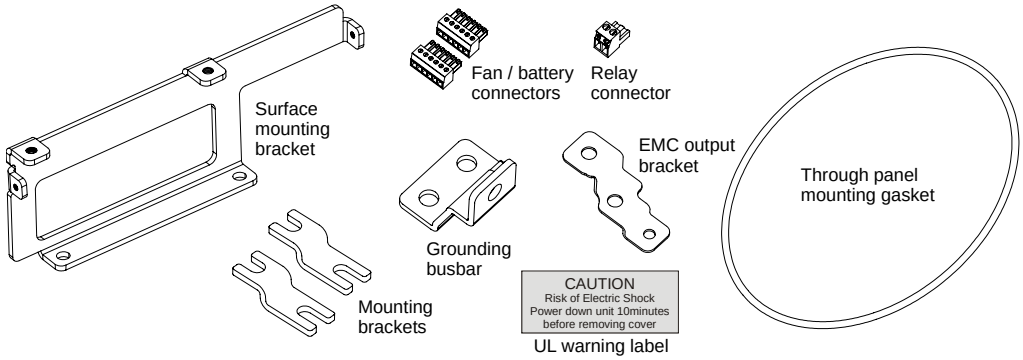


Table 1-4 Key to SPMC (rectifier) LEDs

Status Output		Meaning
1: Left LED	0: Right LED	
OFF	OFF	Mains loss, or 24V supply to the rectifier has been lost
OFF	ON	Phase loss
ON	OFF	Any of the following: • Snubber overheating due to excessive cable charging current or supply notching • Rectifier heatsink over temperature • Rectifier PCB over temperature • Status input wire break
ON	ON	System healthy

Table 1-5 Key to SPMU (rectifier) LEDs

Status Output		Meaning
1: Left LED	0: Right LED	
OFF	OFF	24V supply to the rectifier has been lost
OFF	ON	Any of the following: • Internal fault • Check that rectifier is an SPMU. This could indicate that unit is an SPMC
ON	OFF	Any of the following: • Rectifier heatsink over temperature • Rectifier PCB over temperature • Status input wire break
ON	ON	System healthy

Figure 1-7 Surface mounting the Unidrive SPMC/U (rectifier)

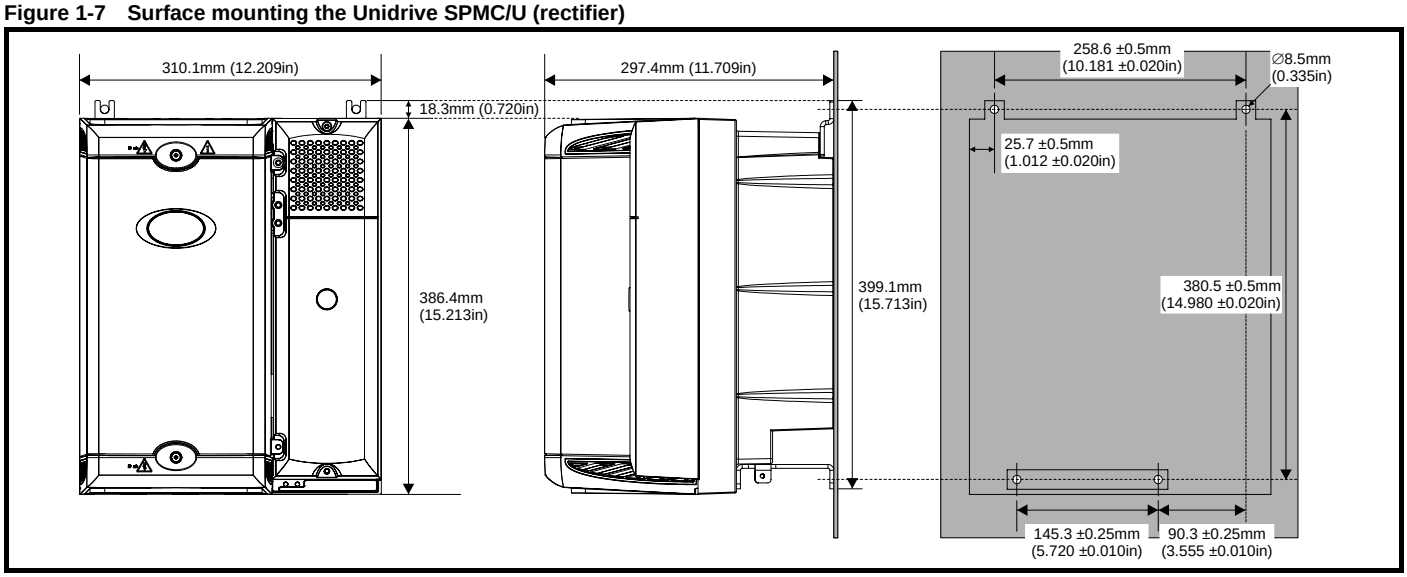


Figure 1-8 Through-panel mounting the Unidrive SPMC/U (rectifier)

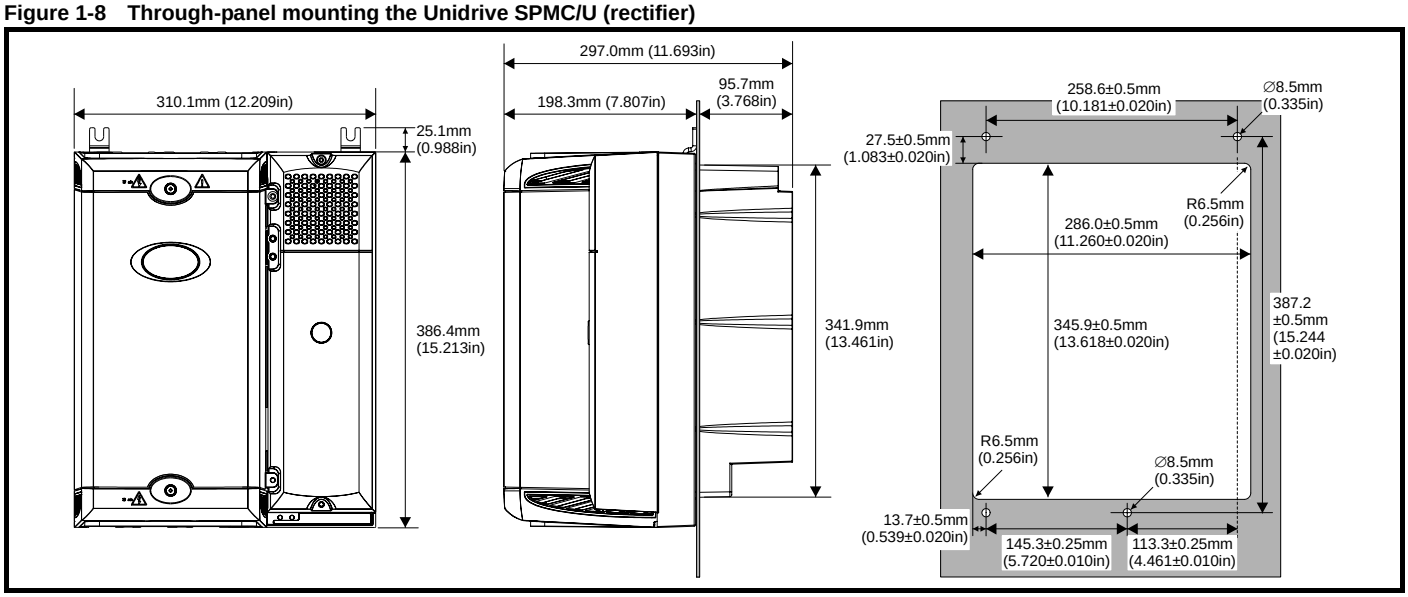


Figure 1-9 Location of control terminals

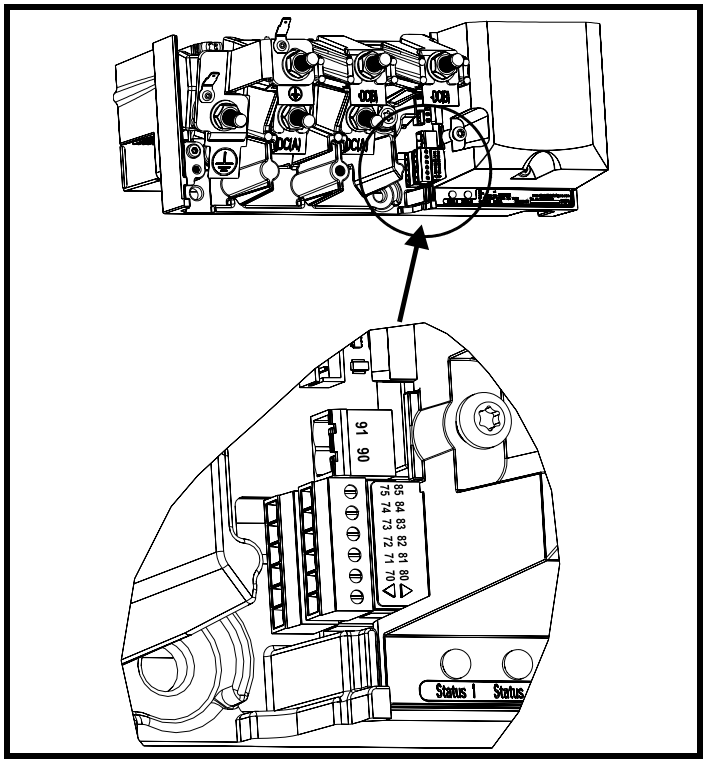


Figure 1-10 Single rectifier control terminals and descriptions

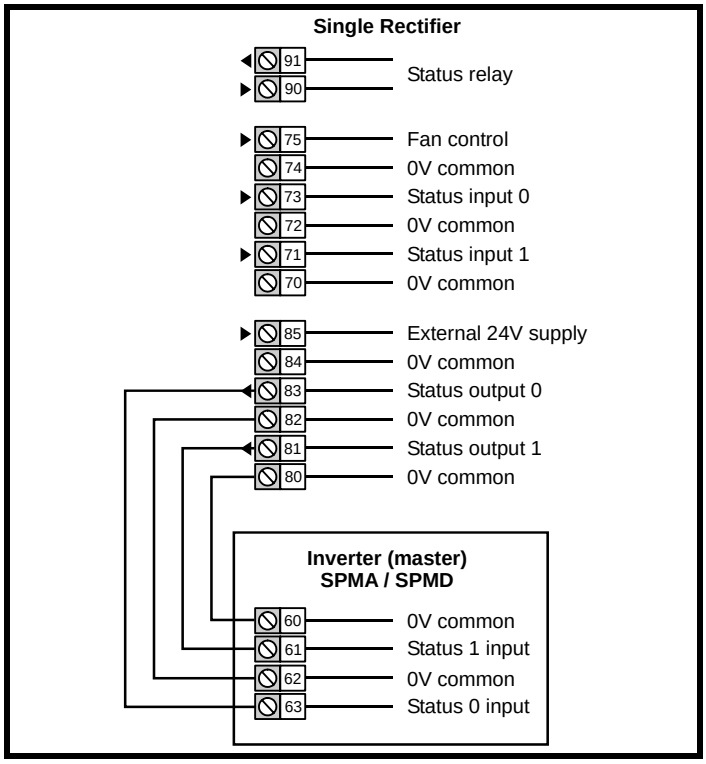
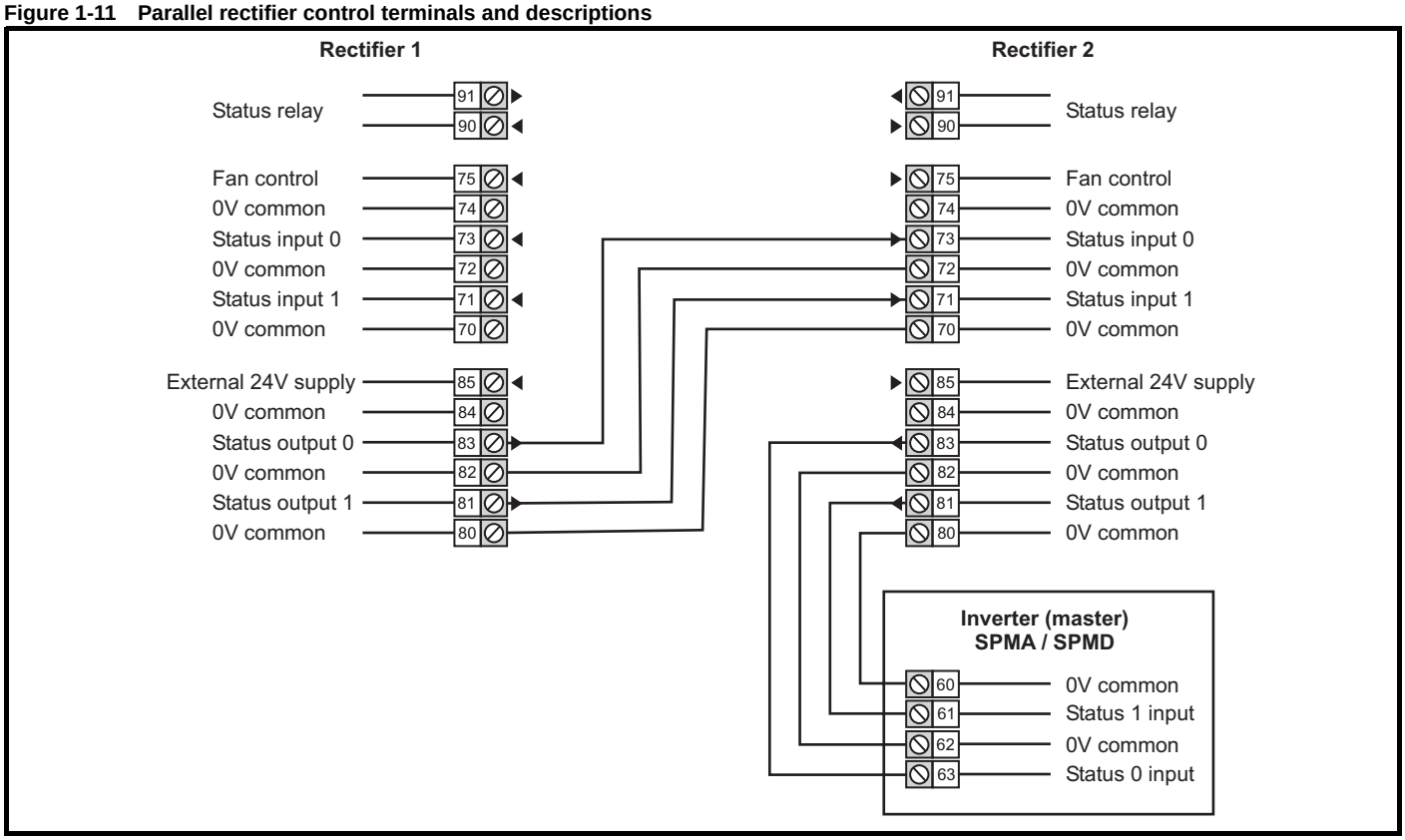


Figure 1-11 Parallel rectifier control terminals and descriptions



Unidrive SPMC/U external 24V supply requirements

Nominal voltage:	24V
Minimum voltage:	23V
Maximum voltage:	28V
Current drawn:	3A
Minimum start-up voltage:	18V
Recommended power supply:	24V, 100W, 4.5A
Recommended fuse:	4A fast blow (I^2t <$20A^2s$)

NOTE

If the Unidrive SPM power supply (CT part number 8510-0000) is used to supply the Unidrive SPMA/D or SPMC/U, a fuse on the 24V supply to the SPMC/U is not required.

Unidrive SPM power supply

CT part number:	8510-0000
Current rating:	10A
Input voltage:	85 to 123 / 176 to 264Vac auto switching
Cable size:	$0.5mm^2$ (20AWG)
Fuse:	5A slow-blow from supply

SPMC/U docking kit

The docking kit is used to mount the SPMC/U and SPMD together. The part number of the docking kit is 3470-0012. Consult the *Unidrive SPM User Guide* for more information