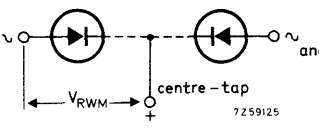
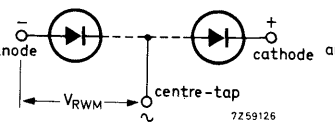
HIGH VOLTAGE RECTIFIER STACKS

The OSB9210, OSM9210 and OSS9210series are ranges of high voltage rectifier assemblies, incorporating controlled avalanche diodes mounted on fire proof triangular formers. The OSB9210series is intended for application in two phase half wave rectifier circuits. The OSM9210series is intended for application in single phase or three phase bridges or in voltage doubler circuits.
The OSS9210series is intended for all kinds of high voltage rectification. The assemblies are supplied with M6 studs or with standard valve bases. The OSB9210-series and OSM9210series are supplied with a centre tap (8-32UNC). The maximum crest working voltages of the OSB9210 and OSM9210series cover the range from 2 kV to 15 kV, and of the OSS9210series the range from 3 kV to 30 kV, in 1 kV steps.

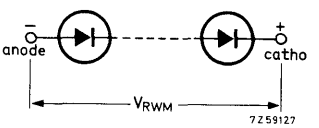
CIRCUIT OSB9210



CIRCUIT OSM9210



CIRCUIT OSS9210



QUICK REFERENCE DATA

		OSB9210	−4	−6	...	−28	−30	
		OSM9210	−4	−6	...	−28	−30	
Crest working reverse voltage from centre tap to end	V_{RWM}	max.	2	3	...	14	15	kV
		OSS9210	−3	−4	...	−29	−30	
Crest working reverse voltage	V_{RWM}	max.	3	4	...	29	30	kV
Average forward current with R and L load (averaged over any 20 ms period)								
in free air up to T_{amb} = 35 °C	$I_{F(AV)}$	max.				5		A
in oil up to T_{oil} = 30 °C	$I_{F(AV)}$	max.				20		A
Non-repetitive peak forward current t = 10 ms; half sine wave; T_j = 175 °C prior to surge	I_{FSM}	max.				360		A

MECHANICAL DATA see page 4 and 5

All information applies to frequencies up to 400 Hz

RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Voltages

			OSB9210	-4	-6	...	-28	-30		
			OSM9210	-4	-6	...	-28	-30		
Crest working reverse voltage	V_{RWM}	max.		2	3	...	14	15	kV	
			OSS9210	-3	-4	...	-29	-30		
Crest working reverse voltage	V_{RWM}	max.		3	4	...	29	30	kV	

Currents

Average forward current (averaged over any 20 ms period)					
in free air up to T_{amb} = 35 °C	$I_{F(AV)}$	max.	5	A	
in oil up to T_{oil} = 30 °C	$I_{F(AV)}$	max.	20	A	
Repetitive peak forward current	I_{FRM}	max.	440	A	
Non-repetitive peak forward current t = 10 ms; half sine wave; T_j = 175 °C prior to surge	I_{FSM}	max.	360	A	

Reverse power dissipation

			OSB9210	-4	-6	...	-28	-30		
			OSM9210	-4	-6	...	-28	-30		
Repetitive peak reverse power t = 10 µs (square wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.		4	6	...	28	30	kW	
Non-repetitive peak reverse power t = 10 µs (square wave)										
T_j = 25 °C prior to surge	P_{RSM}	max.		26	39	...	182	195	kW	
T_j = 175 °C prior to surge	P_{RSM}	max.		4	6	...	28	30	kW	
			OSS9210	-3	-4	...	-29	-30	kW	
Repetitive peak reverse power dissipation t = 10 µs (square wave; f = 50 Hz) T_j = 175 °C	P_{RRM}	max.		6	8	...	58	60	kW	
Non-repetitive peak reverse power dissipation t = 10 µs (square wave)										
T_j = 25 °C prior to surge	P_{RSM}	max.		39	52	...	377	390	kW	
T_j = 175 °C prior to surge	P_{RSM}	max.		6	8		58	60	kW	

Temperatures

Storage temperature	T_{stg}		-55 to +175	°C
Junction temperature	T_j	max.	175	°C

CHARACTERISTICS (See note 1)

			OSB9210 -4	-6	...	-28	-30	
			OSM9210-4	-6	...	-28	-30	
Forward voltage								
I_F = 50 A; T_j = 25 °C	V_F	<	3.6	5.4	...	25.2	27	V
Reverse breakdown voltage [1]								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	2.5	3.75	...	17.5	18.75	kV
		<	3.76	5.64	...	26.32	28.2	kV

			OSS9210 -3	-4	...	-29	-30	
Forward voltage								
I_F = 50 A; T_j = 25 °C	V_F	<	5.4	7.2	...	52.2	54	V
Reverse breakdown voltage [1]								
I_R = 5 mA; T_j = 25 °C	$V_{(BR)R}$	>	3.75	5.0	...	36.25	37.5	kV
		<	5.64	7.52	...	54.52	56.4	kV

Reverse current				
$V_{RM} = V_{RWM\,max}$; T_j = 125 °C	I_{RM}	<	0.6	mA

NOTES

1. The Ratings and Characteristics given apply from centre tap to end. (Not for OSS9210series).

2. Type number suffix

   The suffix sonsists of a figure indicating the total number of diodes, followed by a letter indicating the base.
   A = M6 studs at the ends
   B = 4 pin Super Jumbo (B4D)
   C = Goliath
   E = 4 pin Jumbo (B4F)
   F = A3-20

3. Operating position

   The rectifier units can be operated at their maximum ratings when mounted in any position.

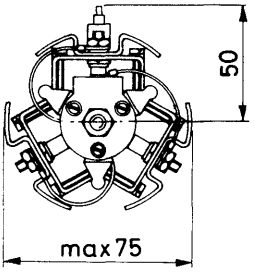
[1]) The breakdown voltage increases by approximately 0.1 % per °C with increasing junction temperature.

MECHANICAL DATA

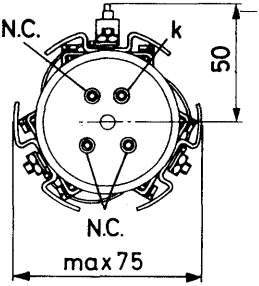
Dimensions in mm

n = total number of diodes

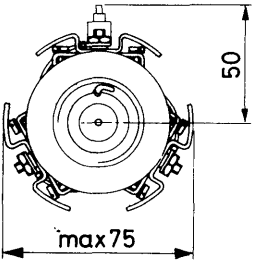
OSM9210-nA

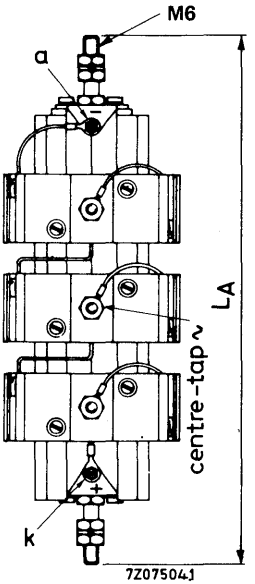


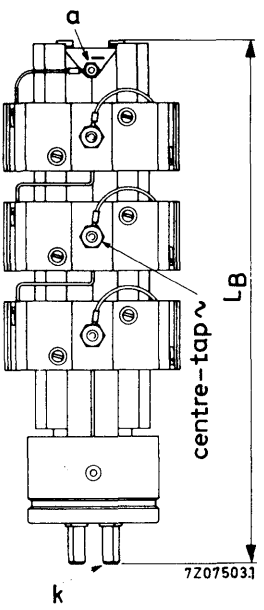
OSM9210-nB

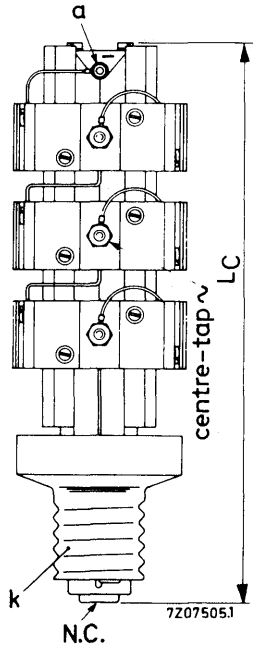


OSM9210-nC









The drawings show the OSM9210series; the OSB9210 and OSS9210series differ in the following respects:

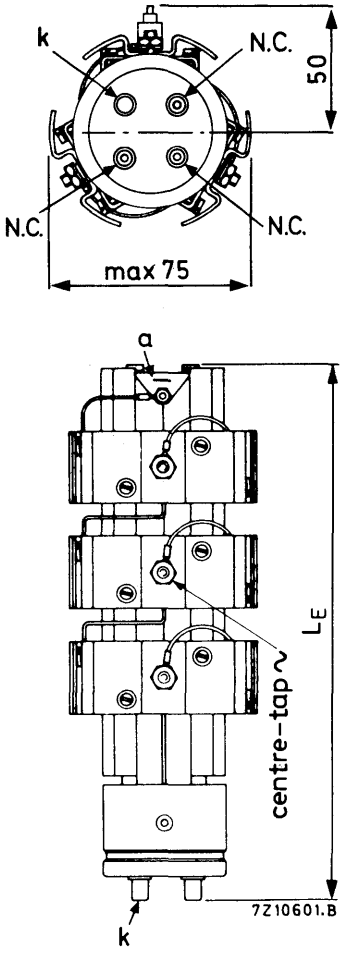
OSB9210series – terminals marked a(-) and k(+) in the drawings are both marked ~; the centre-tap is marked + (instead of ~ as in the drawings).

OSS9210series – has no centre-tap.

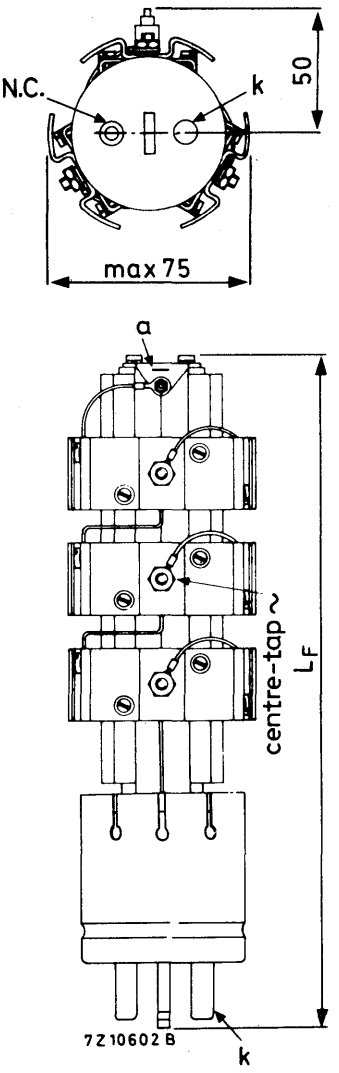
MECHANICAL DATA

n = total number of diodes.

OSM9210-nE



OSM9210-nF

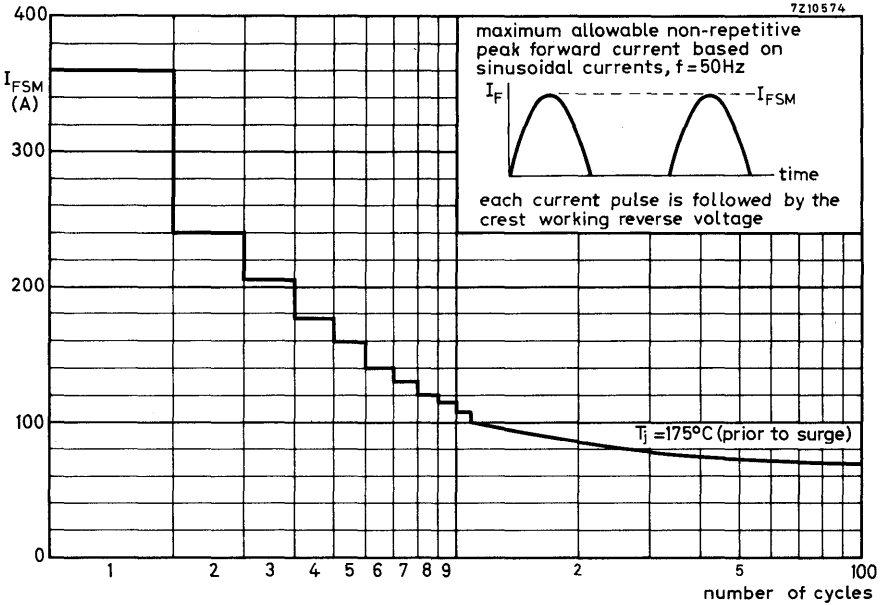


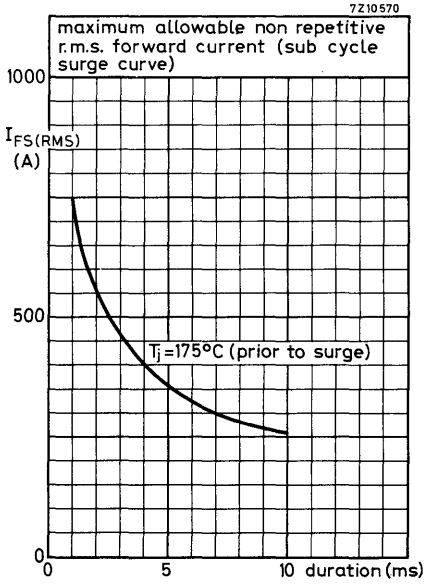
For lengths and weights see table on page 6.

Table of lengths and weights (mm and g)

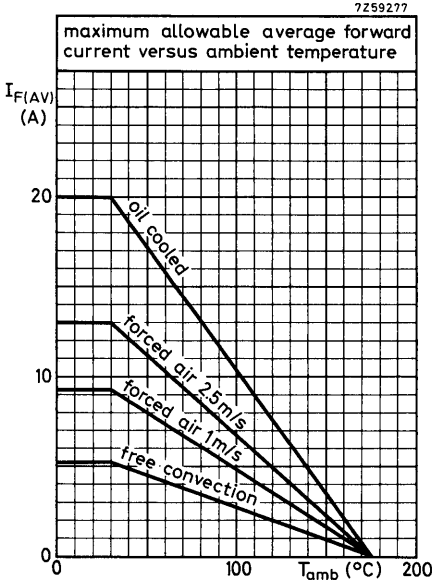
number of diodes	n	3	4 to 6	7 to 9	10 to 12	13 to 15
maximum lengths	L_A	143	184	224	264	305
	L_B	147	188	228	268	309
	L_C	159	199	239	279	320
	L_E	132	173	213	253	294
	L_F	184	225	265	305	346
weight	W_A	153	286	419	552	685
$W_B = W_C =$	W_E	218	351	484	617	750
	W_F	379	512	645	778	911

number of diodes	n	16 to 18	19 to 21	22 to 24	25 to 27	28 to 30
maximum lengths	L_A	345	385	426	466	506
	L_B	349	389	430	470	510
	L_C	360	400	441	481	521
	L_E	334	374	415	455	495
	L_F	386	426	467	507	547
weights	W_A	818	951	1084	1217	1350
$W_B = W_C =$	W_E	883	1016	1149	1282	1415
	W_F	1044	1177	1310	1443	1576

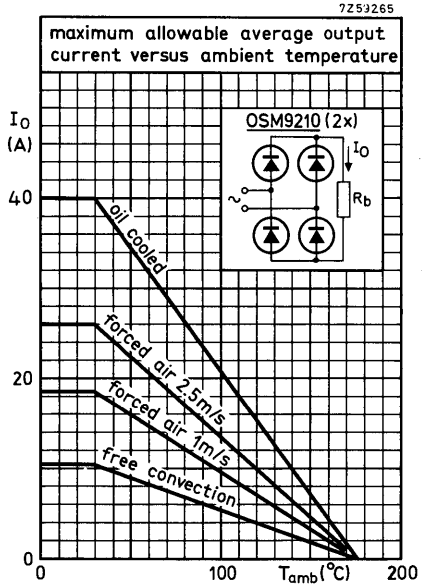

7Z10574
maximum allowable non-repetitive peak forward current based on sinusoidal currents, f=50Hz
I_F
I_{FSM}
time
each current pulse is followed by the crest working reverse voltage
I_{FSM} (A)
400
300
200
100
0
1
2
3
4
5
6
7
8
9
2
5
100
number of cycles
T_j =175°C (prior to surge)


7Z10570
maximum allowable non repetitive r.m.s. forward current (sub cycle surge curve)
1000
$I_{FS(RMS)}$ (A)
500
0
0
5
10 duration (ms)
T_j =175°C (prior to surge)

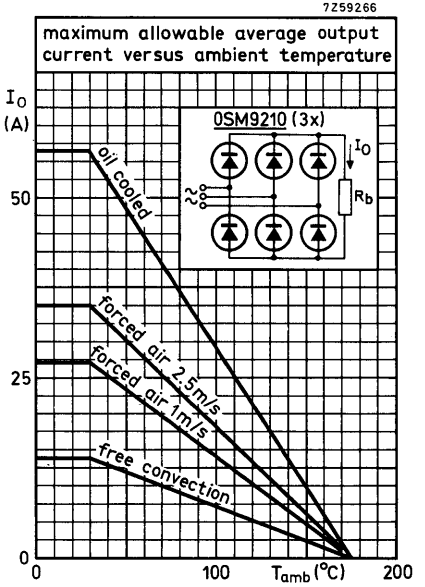
7Z59277



7Z59265

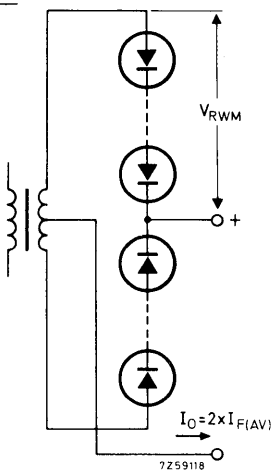


7Z59266

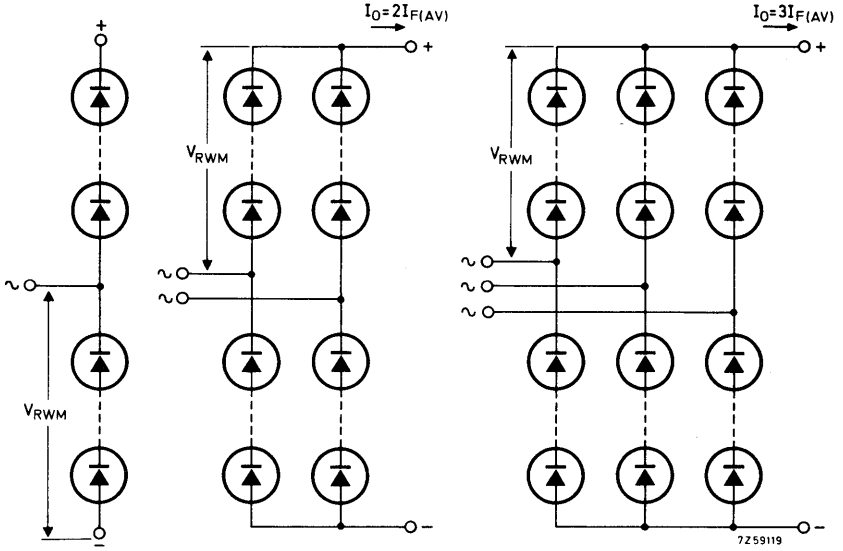


APPLICATION INFORMATION

OSB9210-4



OSM9210series



voltage doubler
1x OSM9210

rectifier circuits with respectively
2x OSM9210 and 3x OSM9210