DCS 500 Thyristor Power Converters

for DC drive systems
25...5150 A

Technical Data

Update 3 to Rev E

DCS 500B
DCS 600

Update(s) for Supplement to Rev E

No.	Date	Page(s) concerned	Remark(s)
3	23.03.01	some	new converter types DCS501B0680-41/51-0000000 / DCS601-0680-41/51-0000000 DCS501B0820-41/51-0000000 / DCS601-0820-41/51-0000000 DCS501B1000-41/51-0000000 / DCS601-1000-41/51-0000000 DCS502B0680-41/51-0000000 / DCS602-0680-41/51-0000000 DCS502B0820-41/51-0000000 / DCS602-0820-41/51-0000000 DCS502B1000-41/51-0000000 / DCS602-1000-41/51-0000000

DCS 500 Overload Capability

DCS 500 valid for DCS 500B / DCS 600

To match a drive system's components as efficiently as possible to the driven machine's load profile, the power converters can be dimensioned by means of the load cycle. Load cycles for driven machines have been defined in the IEC 146 or IEEE specifications, for example.

The currents for the DC I to DC IV types of load (see diagram on the following page) for the power converter modules are listed in the table below.

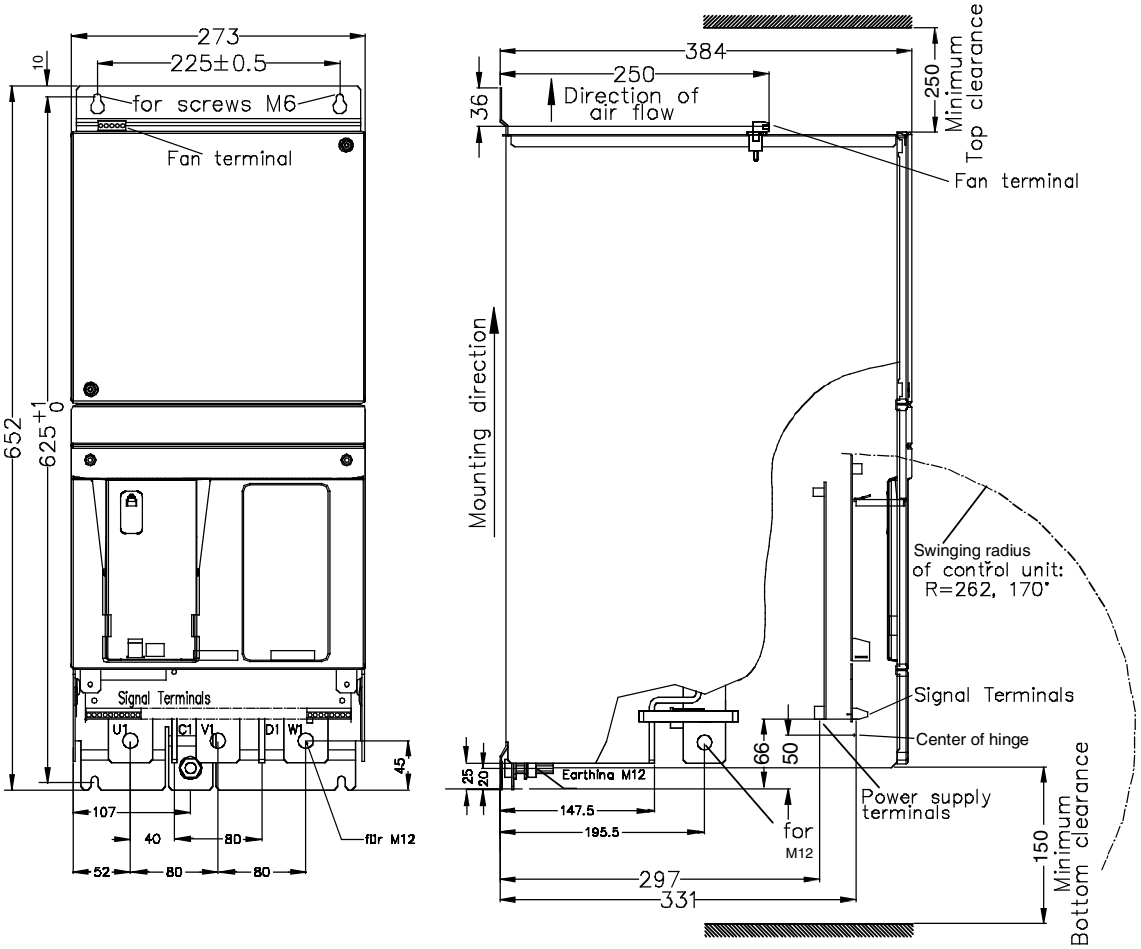
Unit type **500 V**	$I_{DC\,I}$ continuous [A]	$I_{DC\,II}$ 100 % 15 min [A]	$I_{DC\,II}$ 150 % 60 s [A]	$I_{DC\,III}$ 100 % 15 min [A]	$I_{DC\,III}$ 150 % 120 s [A]	$I_{DC\,IV}$ 100 % 15 min [A]	$I_{DC\,IV}$ 200 % 10 s [A]	Size
2-Q								
DCS 501B0680-41/51	610	490	735	482	732	454	908	C2
DCS 501B0820-41/51	740	596	894	578	867	538	1076	
DCS 501B1000-41/51	900	700	1050	670	1005	620	1240	
4-Q								
DCS 502B0680-41/51	680	544	816	538	807	492	984	C2
DCS 502B0820-41/51	820	664	996	648	972	598	1196	
DCS 502B1000-41/51	1000	766	1149	736	1104	675	1350	

Table: The power converter modules' currents with the corresponding load cycles.
The characteristics are based on an ambient temperature of max. 40°C and an elevation of max. 1000 meters.

Dimensions

Module C2
DCS 50xB0680
DCS 50xB0820
DCS 50xB1000

Dimensions in mm
Weight appr. 42 kg



Cross-sectional areas - Tightening torques

DCS 500 valid for DCS 500B / DCS 600

Recommended cross-sectional area **to DIN VDE 0276-1000** and **DIN VDE 0100-540** (PE), trefoil arrangement, up to 40°C ambient temperature and a 90°C operating temperature of the conductor.

Unit type	C1, D1				U1, V1, W1				PE ❶				
	IDC [A-]	HO7V [mm²]	NSGA FÖU [mm²]	N2XY [mm²]	Iv [A~]	HO7V [mm²]	NSGA FÖU [mm²]	N2XY [mm²]	HO7V [mm²]	NSGA FÖU [mm²]	N2XY [mm²]	1 x M..	[Nm]
DCS 501B0680 *	610	2 x 150	2 x 95	2 x 95	498	2 x 150	2 x 95	2 x 70	1 x 150	1 x 95	1 x 70	M12	50
DCS 501B0820 *	740	2 x 240	2 x 150	2 x 150	604	2 x 185	2 x 120	2 x 95	1 x 185	1 x 120	1 x 95	M12	50
DCS 501B1000 *	900	2 x 240	2 x 185	2 x 185	735	2 x 240	2 x 150	2 x 150	1 x 240	1 x 150	1 x 150	M12	50
DCS 502B0680 *	680	2 x 185	2 x 120	2 x 120	555	2 x 150	2 x 120	2 x 95	1 x 150	1 x 120	1 x 95	M12	50
DCS 502B0820 *	820	2 x 240	2 x 150	2 x 150	669	2 x 240	2 x 150	2 x 120	1 x 240	1 x 150	1 x 120	M12	50
DCS 502B1000 *	1000	2 x 300	2 x 185	2 x 185	816	2 x 240	2 x 150	2 x 150	1 x 240	1 x 150	1 x 150	M12	50

* Busbar connection 5 x 40 mm is recommended

❶ You will find instructions on how to calculate the PE conductor's cross-sectional area in VDE 0100 or in equivalent national standards. We would remind you that power converters may have a current-limiting effect. This can lead to other values than recommended.

Definition of the recommended cables above:
H07V: DIN-VDE 0281-1; Polyvinyl chloride insulated cables
NSGAFÖU: DIN-VDE 0250-602; Special rubber-insulated single-core cables
N2XY: DIN-VDE 0276-604; Power cable with special fire performance

Power losses

Converter type		I_{DC} [A]	Power losses P_L [W] Load 25%	50%	75%	100%
DCS 501B0680	2-Q	610	312	653	1025	1427
DCS 501B0820	2-Q	740	380	799	1259	1758
DCS 501B1000	2-Q	900	467	993	1578	2222
DCS 502B0680	4-Q	680	349	736	1160	1622
DCS 502B0820	4-Q	820	423	895	1416	1986
DCS 502B1000	4-Q	1000	522	1116	1786	2527

Table: Power losses

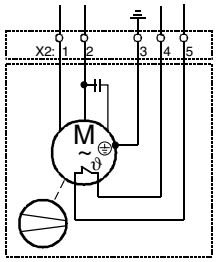
Remarks on the table
- The values stated are are maximum values obtained under the most unfavourable conditions.

Power section cooling

DCS 500 valid for DCS 500B / DCS 600

Fan assignment

Converter type	Size	Fan type	Configuration
DCS 50xB0680...DCS 50x.0820	C2	1x W2E200 (230 V)	3
DCS 50xB1000	C2	1x W2E250 (230 V)	3



Configuration 3

Fan data

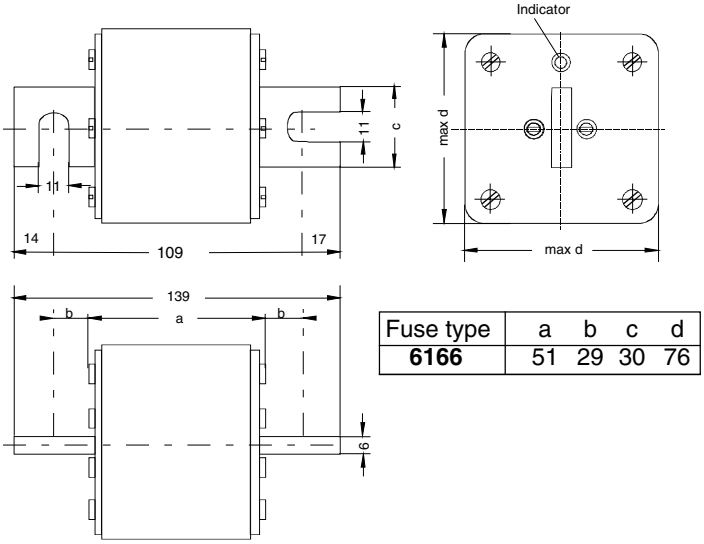
Fan type	W2E200		W2E250	
Rated voltage [V]	230; 1~		230; 1~	
Tolerance [%]	+6/-10		+6/-10	
Frequency [Hz]	50	60	50	60
Power consuption [W]	64	80	135	185
Current consumption [A]	0.29	0.35	0.59	0.82
Stall current [A]	< 0.7	< 0.8	<0.9	<0.9
Air volume, freely blowing [m³/h]	925	1030	1860	1975
Noise levelt [dBA]	59	61	68	70
Max. ambient temperature [° C]	< 75		60	
Useful lifetime of fan	appr. 45000 h/60°		appr. 40000 h	
Protection	Temperature detector $U_N \leq 230V$ AC; $I_N \leq 2.4$ A AC			

Fuses and fuse holders for armature-circuit supply

The semiconductor fuses used are blade fuses. The relevant data are listed in the table below. The fuses' construction requires special fuse holders. Fuse holder of the OFAX and OFAS type series are available for this purpose.

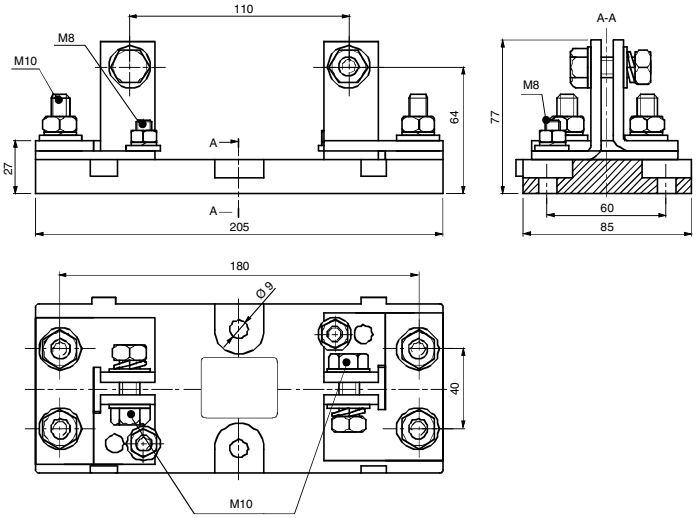
Converter type	Manufacturer/ Type	Fuse holder
2-quadrant converter		
DCS 501B0680	Bussman 170M 6813	OFAS B 3
DCS 501B0820	Bussman 170M 6813	OFAS B 3
DCS 501B1000	Bussman 170M 6166	170H 3006
4-quadrant converter		
DCS 502B0680	Bussman 170M 6813	OFAS B 3
DCS 502B0820	Bussman 170M 6813	OFAS B 3
DCS 502B1000	Bussman 170M 6166	170H 3006

Remark:
Given dimensions may be exeeded in some cases. Please take them only for information.



Fuse type	a	b	c	d
6166	51	29	30	76

Dimensions Fuse 170M 6166



Dimensions Fuse holder 170H 3006

Line chokes L1

DCS type 500V	Type of reactor	Fig.
2-quadrant converter		
DCS 501B0680	ND12	2
DCS 501B0820	ND12	2
DCS 501B1000	ND13	3
4-quadrant converter		
DCS 502B0680	ND12	2
DCS 502B0820	ND13	3
DCS 502B1000	ND13	3

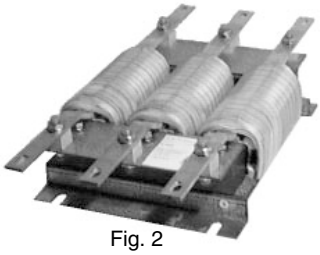


Fig. 2

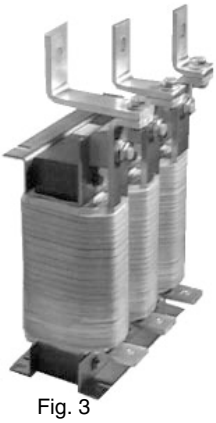


Fig. 3

EMC Filters

Converter type	Rat. direct current [A]	Filter type ❶	Weight appr. [kg]	Dimensions L x W x H [mm]
2-quadr. convert.				
DCS 501B0680	610	NF3-500-600	22	450x260x115
DCS 501B0820	740	NF3-500-600	22	450x260x115
DCS 501B1000	900	NF3-690-1000	❷	❷
4-quadr. convert.				
DCS 502B0680	680	NF3-500-600	22	450x260x115
DCS 502B0820	820	NF3-690-1000	❷	❷
DCS 502B1000	1000	NF3-690-1000	❷	❷

The filters 25 ... 600 A are available for 440 V and for 500 V.

❶ The filters can be optimized to suit the actual motor currents encountered: $I_{Filter} = 0,8 \bullet I_{MOT\ max}$; the factor 0.8 takes into account the current ripple.

❷ Weight and dimensions on request

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