Technical Information

ModSTACK™ 6MS2400R17KE3-3WAH-B9C18VTIOIN

Vorläufige Daten
preliminary data

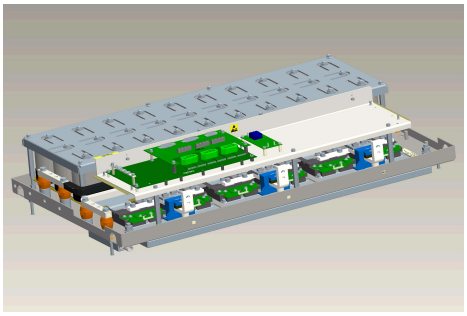
Key data

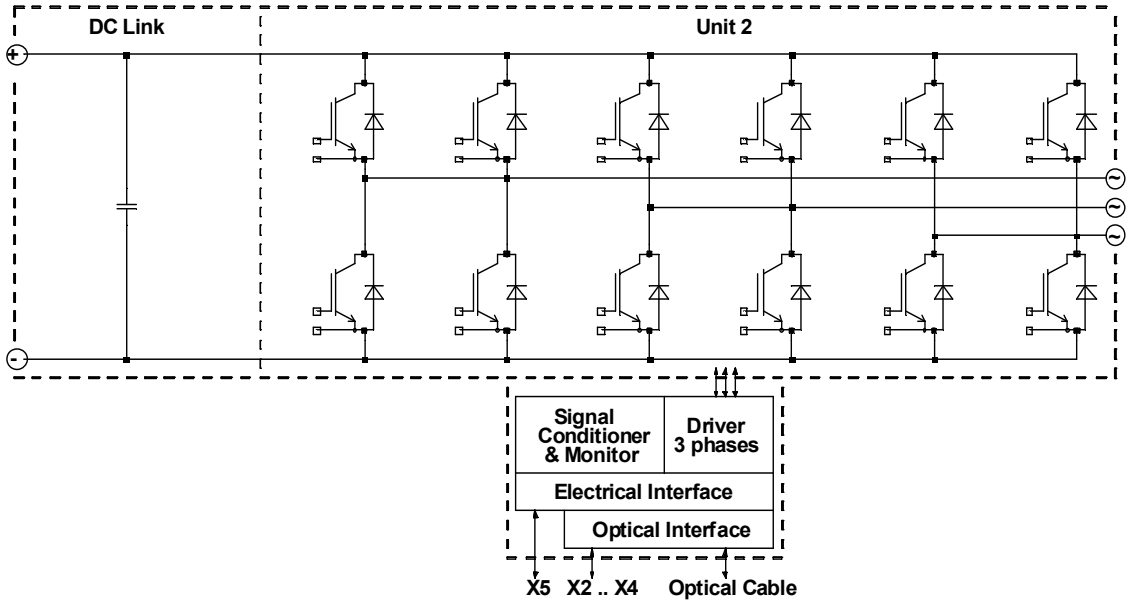
3x 1082A rms at 690V rms, water cooled

General information

Stacks for various inverter application. Semiconductors, heat sinks, capacitors, drivers and sensors included. These are only technical data!
Please read carefully the complete documentation and maintain the proper design environment!
Especially note the EMC environment and the controller's functionality.

Topology		DC Link + B6I
Application / Modulation		Inverter / Sine
Load type		resistive, inductive
Cooling		water cooled
Implemented sensors		current, voltage, temperature
Semicond. (Unit 1)		none
DC Link		12mF
Semicond. (Unit 2)	IGBT	6x FF1200R17KE3_B2
Driver signals IGBT		optical HFBR-15X1 / HFBR-25X1
Standards		EN50178
Sales - name		6MS24017E33W34402
Internal ID		34402
Mechanical drawing number		34402_MB
Electrical drawing number		57000008





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Note

Heat sink with aluminum cooling channel.
Composites of fluid: Water and 52 vol. % Antifrogen N.

Electrical data

DC Link				min	typ	max	units
Voltage		V_{DC}			1100	1250	V
Overvoltage shutdown	within 150µs				1250		V

Unit 2 AC				min	typ	max	units
Voltage	depending on controller	V_{Unit2}			690		V_{RMS}
Continuous current	V_{Unit2} = 690V_{RMS}, V_{DC} = 1100V, T_{inlet} = 40°C, $T_J \leq$ 125°C, f_{Unit2} = 50Hz, f_{sw2} = 2000Hz, cos(phi) = 0,90	I_{Unit2}				1082	A_{RMS}
Continuous current overload cap.	T_{inlet} = 40°C, for overload capability 150% for 60s				733		A_{RMS}
Short time current	T_{inlet} = 40°C, 10s, every 180s, initial load = 930A_{RMS}	I_{Unit2}				1162	A_{RMS}
DC current	no rotating field, T_{inlet} = 40°C	$I_{Unit2\ DC}$				509,0	A_{av}
Overcurrent shutdown	within 15µs				1700		A_{peak}
Switching frequency		f_{sw2}				3000	Hz
Power losses	V_{Unit2} = 690V, V_{DC} = 1100V, T_{inlet} = 40°C, $T_J \leq$ 125°C, f_{Unit2} = 50Hz, f_{sw2} = 2000Hz, cos(phi) = 0,90, I_{Unit2} = 1082A_{RMS}	P_{loss2}			13300		W
Power factor		$cos(phi)_{Unit2}$		-1,00		1,00	

General data				min	typ	max	units
Power losses (PCB and capacitor)		$P_{loss\ aux}$				400	W
EMC test	according to IEC61800-3 at named interfaces	power	V_{Burst}		2		kV
		control	V_{Burst}		1		kV
		aux (24V)	V_{Surge}		1		kV
Insulation management is designed for			V_{Line}		690		V_{RMS}
Insulation test voltage	according to EN50178, f = 50Hz, t = 60s		V_{isol}		2,5		kV_{RMS}

Important component data				min	typ	max	units
DC Link capacitor			C_{DC}		12,00		mF
			type		Foil		
Temperature range				-40		+85	°C
Rated voltage	per device		U_R		1100		V_{DC}
Surge voltage	per device		U_{Surge}			1650	V
Rated capacitance	per device		C_R		400		µF
Capacitance tolerance	per device		Tol	-10		+10	%
Maximum ripple current	per device, T_{amb} = 60°C		I_{Rmax}			45	A_{RMS}
wiring system	**s**eries, **p**arallel				1s, 30p		
Balance or discharge resistors	per DC Link unit		R_b		6,0		kΩ

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Controller interface data

			min	typ	max	units
Auxiliary voltage		V_{aux}	18	24	30	V_{av}
Auxiliary power requirement	V_{aux} = 24V_{av}	P_{aux}		40		W
Driver and interface board	see separate technical information			TR110 / DR110		
Driver core				EiceDRIVER 2ED300C17-S		
Digital input level	resistor to GND 1,8kΩ, capacitor to GND 4nF, high = on, min 15mA	V_{in}	0,0		15,0	V
Digital output level	open collector, low = ok, max 15mA	V_{out}	0,0		15,0	V
Analog current outputs Unit 2	load max 1mA; at 1000A	$V_{ana\ out}$	5,01	5,11	5,21	V
Analog DC Link voltage output	load max 1mA; at 1250V	$V_{DC\ out}$	8,79	8,97	9,15	V
Analog temperature output	load max 1mA; at T_{NTC} = 68°C correspond to T_j = 125°C	$V_{T\ out}$	9,11	9,30	9,49	V
Overtemperature shutdown	at T_{NTC} = 72°C correspond to T_j = 133°C	$V_{T\ out\ OT}$		10		V
Optical interface board	see separate technical information			OEA101		
Optical input power				12		µW
Optical output power					60	µW

Heat sink water cooled / Thermal data

			min	typ	max	units
Water flow	according cooling water specification from infineon	$\Delta V/\Delta t_{Water}$	12			dm³/min
Water pressure drop		Δp_{Water}		400		mbar
Water pressure					8	bar
Cooling water inlet temperature		T_{inlet}	-25		40	°C
Water connection				3/4		in

IGBT data unit 2

			min	typ	max	units
Type	assumed					
collector-emitter saturation voltage	I_c = 1200A; V_{ge} = 15V; T_{vj} = 125°C	$V_{CE\ sat}$		2,4		V
parameter for linear model	T_{vj} = 25°C	V_{ce1}		1,1		V
parameter for linear model	T_{vj} = 25°C	r_{ce1}		0,75		mΩ
parameter for linear model	T_{vj} = 125°C	V_{ce2}		1		V
parameter for linear model	T_{vj} = 125°C	r_{ce2}		1,167		mΩ
turn-on / turn-off energy loss per pulse	T_{vj} = 25°C	E_1		240 / 305		mJ
turn-on / turn-off energy loss per pulse	T_{vj} = 125°C	E_2		350 / 445		mJ
thermal resistance, junction to case	per IGBT	R_{thjc}		0,019		K/W
thermal resistance, case to heatsink	per IGBT	R_{thch}		0,023		K/W

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Diode data unit 2

			min	typ	max	units
Type	assumed					
forward voltage	I_F = 1200A; V_{ge} = 0V; T_{vj} = 125°C	V_F		1,9		V
parameter for linear model	T_{vj} = 25°C	V_{F1}		1,15		V
parameter for linear model	T_{vj} = 25°C	r_{F1}		0,542		mΩ
parameter for linear model	T_{vj} = 125°C	V_{F2}		1		V
parameter for linear model	T_{vj} = 125°C	r_{F2}		0,75		mΩ
reverse recovery energy	T_{vj} = 25°C	E_{rec1}		190		mJ
reverse recovery energy	T_{vj} = 125°C	E_{rec2}		340		mJ
thermal resistance, junction to case	per Diode	R_{thjc}		0,042		K/W
thermal resistance, case to heatsink	per Diode	R_{thch}		0,052		K/W

Environmental conditions

			min	typ	max	units
Storage temperature		T_{stor}	-40		65	°C
Ambient temperature	minimum 0°C for optional optical interface	T_{amb}	-25		55	°C
Operating temperature	see chapter Heat sink water cooled / Thermal data					
Cooling air velocity (PCB and capacitor)		$V_{Air\ PCB}$	2,0			m/s
Air pressure	standard atmosphere	p_{Air}	900		1100	hPa
Humidity	no condensation	Rel. F	0		95	%
Installation height			0		1000	m
Vibration	according to EN60068				10	m/s²
Continuous vibration	according to EN60068				20	m/s²
Shock	according to EN60068				100	m/s²
Protection degree				IP00		
Pollution degree				2		
Dimensions	width × depth × height		1090	596	257	mm
Weight with heat sink	approximation			83,0		kg
Weight without heat sink	approximation			65,0		kg

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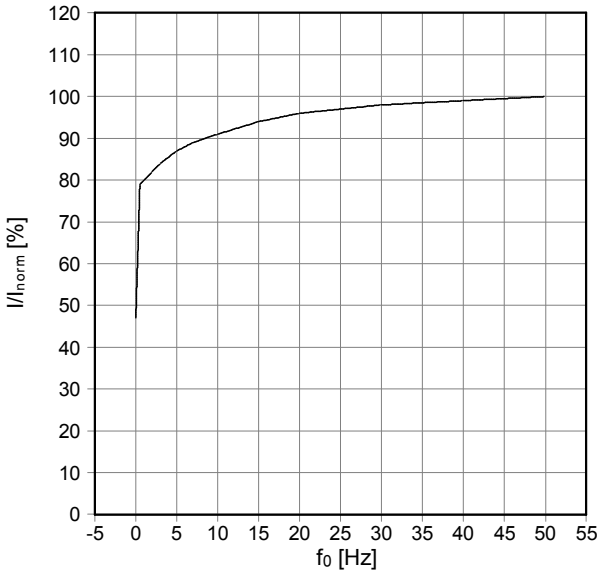
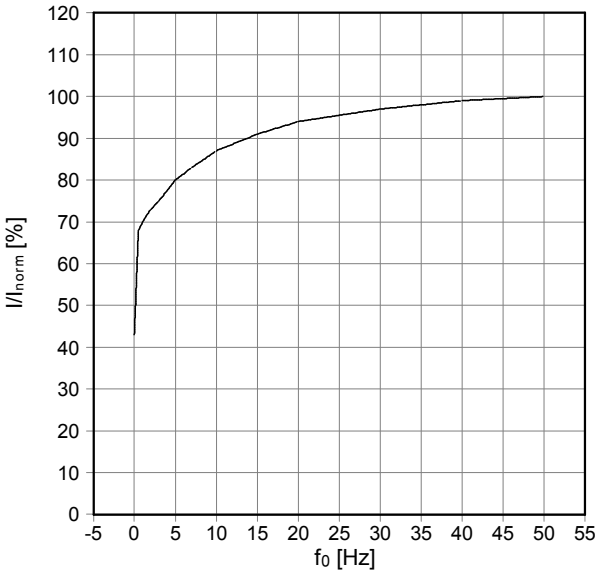
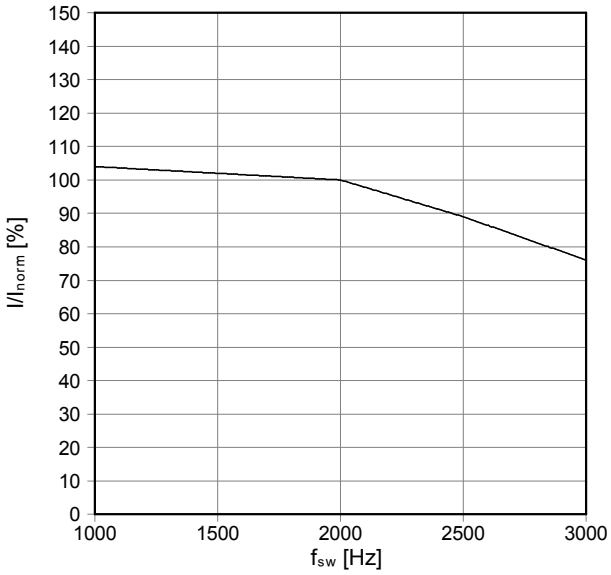
fo - derating curve IGBT (motor)
cos(phi) = 0,90
$T_{cool\ medium}$ = 40°C ; 100% = 1082 A rms



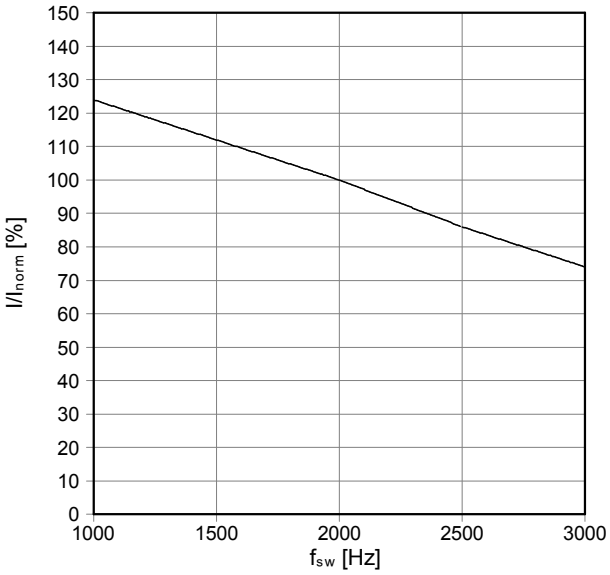
fo - derating curve Diode (generator)
cos(phi) = -0,90
$T_{cool\ medium}$ = 40°C ; 100% = 904 A rms



fsw - derating curve IGBT (motor)
cos(phi) = 0,90
$T_{cool\ medium}$ = 40°C ; 100% = 1082 A rms



fsw - derating curve Diode (generator)
cos(phi) = -0,90
$T_{cool\ medium}$ = 40°C ; 100% = 904 A rms



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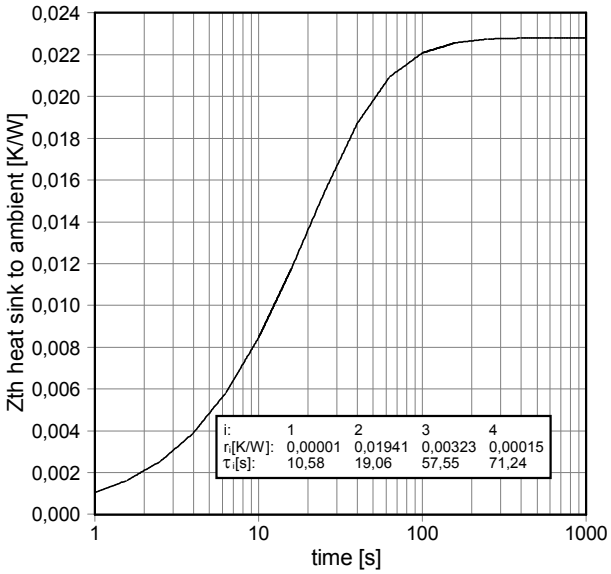
Transient thermal impedance per module
$T_{cool\ medium}$ = 40°C



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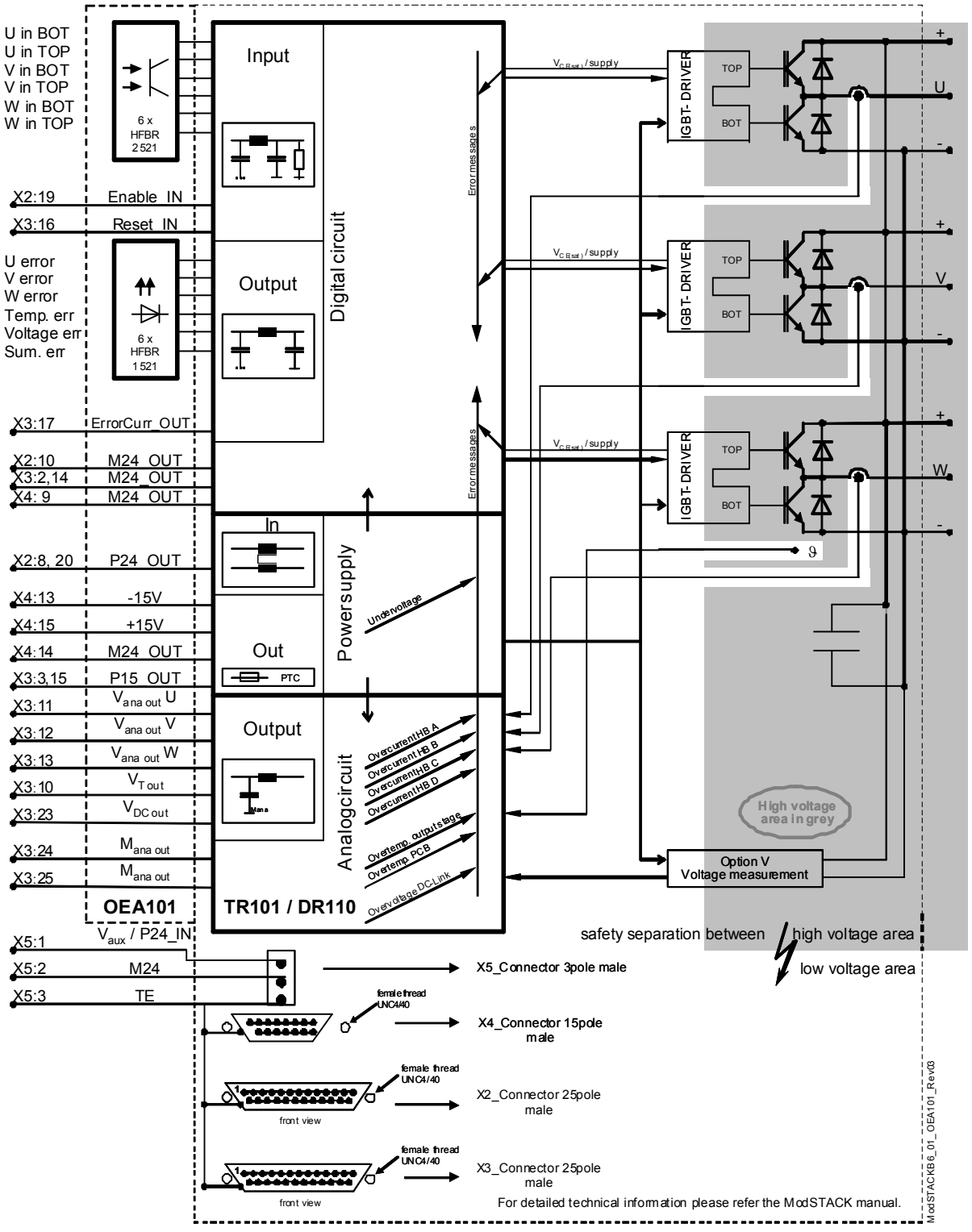
Circuit diagram



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Sicherheitshinweise

Bevor Sie mit der Installation und dem Betrieb der Baugruppe beginnen, lesen Sie bitte sorgfältig alle Sicherheitshinweise, Warnungen und beachten Sie die angebrachten Warnschilder. Vergewissern Sie sich, dass alle Warnschilder in leserlichem Zustand verbleiben und fehlende oder beschädigte Schilder ersetzt werden.

Safety Instructions

Prior to installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced. To installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced.

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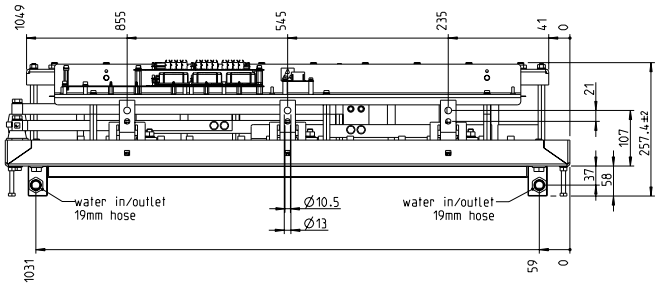

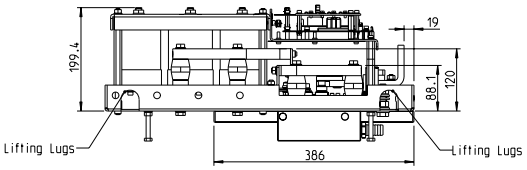

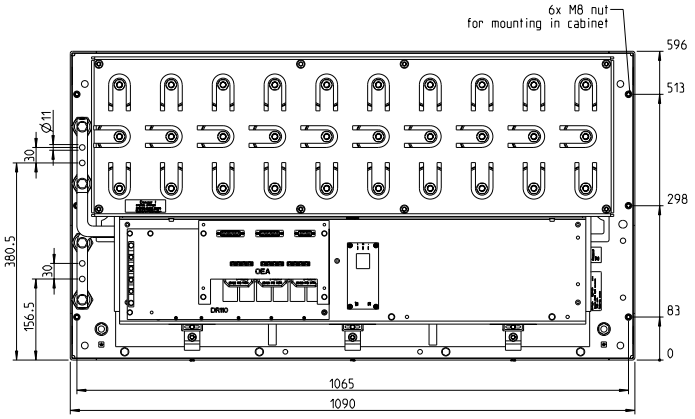

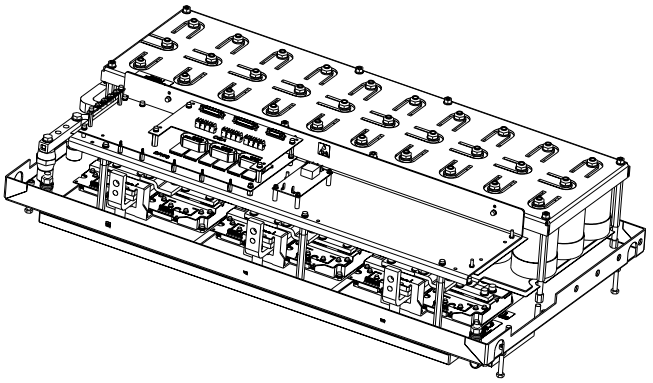

Part-No. 34402			general Tolerance	Surface	Scale 1:5		
Assembly-No.					Material		
					Material-No.		
			Date	Name	Description		
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			Checked 19.09.2008	gez.Bohl Binder	6MSxx00Rxx xxx-3WCH-Cxx		
			Norm				
					Graph-No. 34402	Version 0	Sheet 1/2
Vers.	Revision	Date	Name	Origin	Constructed for		A2

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