

Vorläufige Daten
preliminary data

Key data

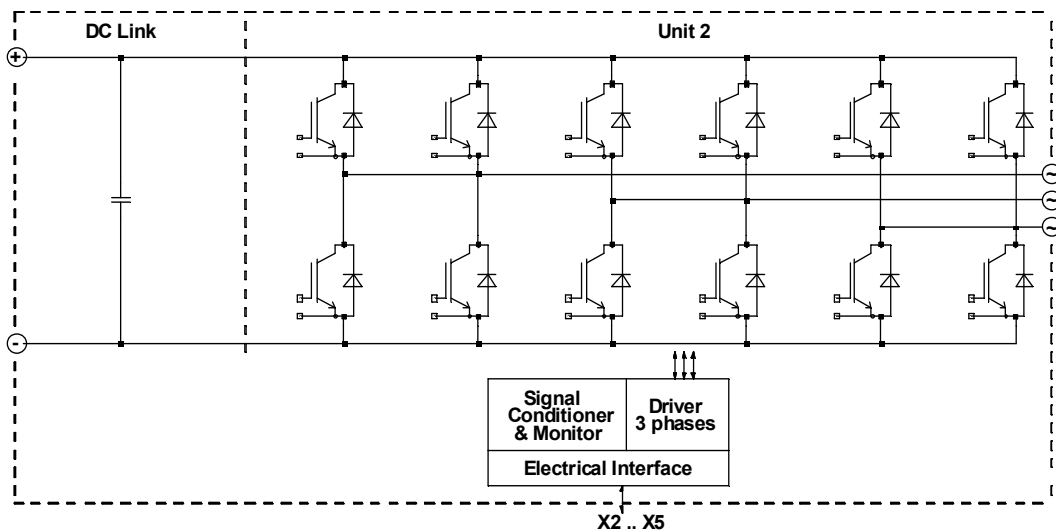
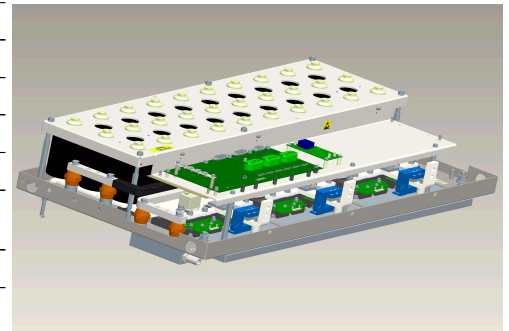
3x 726A rms at 707V rms, water cooled

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		18.8mF
Semicond. (Unit 2)	IGBT	6x FF1200R17KE3_B2
Driver signals IGBT		electrical CMOS 0 .. 15V
Standards		EN50178
Sales - name		6MS24017E33W31361
Internal ID		31361
Mechanical drawing number		31361_MB_Rev02
Electrical drawing number		57000008
Dimensions (width x depth x height)		1090 mm x 596 mm x 273 mm
Weight		83 kg



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Note

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

Electrical data

DC Link			min	typ	max	units
Voltage		V_{DC}		1150	1250	V
Overtoltage shutdown				1250		V

Unit 2 AC			min	typ	max	units
Voltage	depending on controller	V_{Unit2}		707		V_{RMS}
Continuous current	$V_{Unit2} = 707V_{RMS}$, $V_{DC} = 1150V$, $T_{inlet} = 40^{\circ}C$, $T_J \leq 125^{\circ}C$, $f_{Unit2} = 50Hz$, $f_{sw2} = 3000Hz$, $\cos(\phi) = 0,95$	I_{Unit2}			726	A_{RMS}
Continuous current overload cap.	$T_{inlet} = 40^{\circ}C$, for overload capability 150% for 60s			553		A_{RMS}
Short time current	$T_{inlet} = 40^{\circ}C$, 10s, every 180s, initial load = 701 A_{RMS}	I_{Unit2}			876	A_{RMS}
DC current	no rotating field, $T_{inlet} = 40^{\circ}C$	$I_{Unit2 DC}$			290,0	A_{av}
Overcurrent shutdown	within 15 μ s			1500		A_{peak}
Switching frequency		f_{sw2}			3000	Hz
Power losses	$V_{Unit2} = 707V$, $V_{DC} = 1150V$, $T_{inlet} = 40^{\circ}C$, $T_J \leq 125^{\circ}C$, $f_{Unit2} = 50Hz$, $f_{sw2} = 3000Hz$, $\cos(\phi) = 0,95$, $I_{Unit2} = 726A_{RMS}$	P_{loss2}		12200		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}		18,80		mF
		type	Electrolytic Capacitor			
wiring system	series, parallel		3s, 10p			
Balance or discharge resistors	per DC Link unit	R_b		6,0		k Ω

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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 1,8k Ω , 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 726A	$V_{ana\ out}$	4,78	4,88	4,98	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 $T_{NTC} = 69^{\circ}C$ correspond to $T_j = 125^{\circ}C$	$V_{T\ out}$	9,80	10,00	10,20	V
Overtemperature shutdown	at $T_{NTC} = 69^{\circ}C$ correspond to $T_j = 125^{\circ}C$	$V_{T\ out\ OT}$		10		V
Overvoltage shutdown reaction time	after overvoltage message by ModSTACK™ interface				50	μs
Overcurrent shutdown reaction time	after overcurrent message by ModSTACK™ interface				10	μs

Heat sink water cooled / Thermal data

			min	typ	max	units
Water flow	according cooling water specification from infineon	$\Delta V/\Delta t_{Water}$	12			dm ³ /min
Water pressure drop		Δp_{Water}		550		mbar
Water pressure					8	bar
Cooling water inlet temperature		T_{inlet}	-25		40	$^{\circ}C$
Water connection				3/4		in

IGBT data unit 2

			min	typ	max	units
Type	assumed					
collector-emitter saturation voltage	$I_c = 1200A; V_{ge} = 15V; T_{vj} = 125^{\circ}C$	$V_{CE\ sat}$		2,4		V
parameter for linear model	$T_{vj} = 25^{\circ}C$	V_{ce1}		1,1		V
parameter for linear model	$T_{vj} = 25^{\circ}C$	r_{ce1}		0,75		m Ω
parameter for linear model	$T_{vj} = 125^{\circ}C$	V_{ce2}		1		V
parameter for linear model	$T_{vj} = 125^{\circ}C$	r_{ce2}		1,167		m Ω
turn-on / turn-off energy loss per pulse	$T_{vj} = 25^{\circ}C$	E_1		240 / 305		mJ
turn-on / turn-off energy loss per pulse	$T_{vj} = 125^{\circ}C$	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	$I_F = 1200A; V_{ge} = 0V; T_{vj} = 125^\circ C$	V_F		1,9		V
parameter for linear model	$T_{vj} = 25^\circ C$	V_{F1}		1,15		V
parameter for linear model	$T_{vj} = 25^\circ C$	r_{F1}		0,542		mΩ
parameter for linear model	$T_{vj} = 125^\circ C$	V_{F2}		1		V
parameter for linear model	$T_{vj} = 125^\circ C$	r_{F2}		0,75		mΩ
reverse recovery energy	$T_{vj} = 25^\circ C$	E_{rec1}		190		mJ
reverse recovery energy	$T_{vj} = 125^\circ C$	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

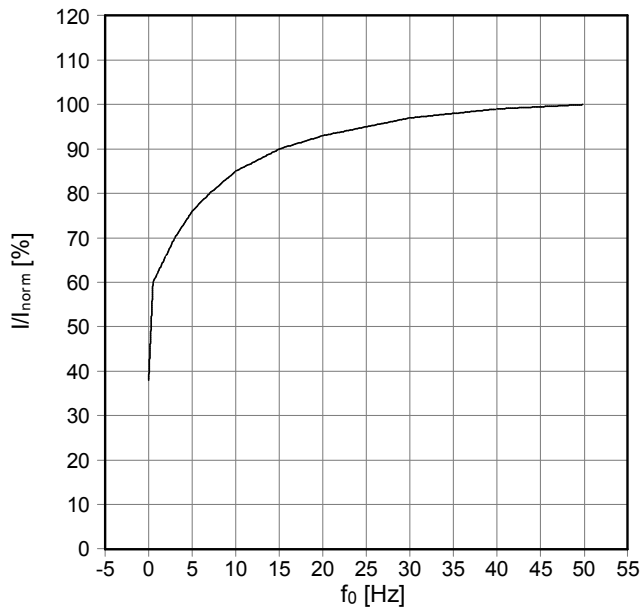
Environmental conditions

			min	typ	max	units
Storage temperature		T_{stor}	-40		65	°C
Ambient temperature		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/s ²
Continuous vibration	according to EN60068				20	m/s ²
Shock	according to EN60068				100	m/s ²
Protection degree				IP00		
Pollution degree				2		
Dimensions	width × depth × height		1090	596	273	mm
Weight with heat sink	approximation			83,0		kg
Weight without heat sink	approximation			65,0		kg

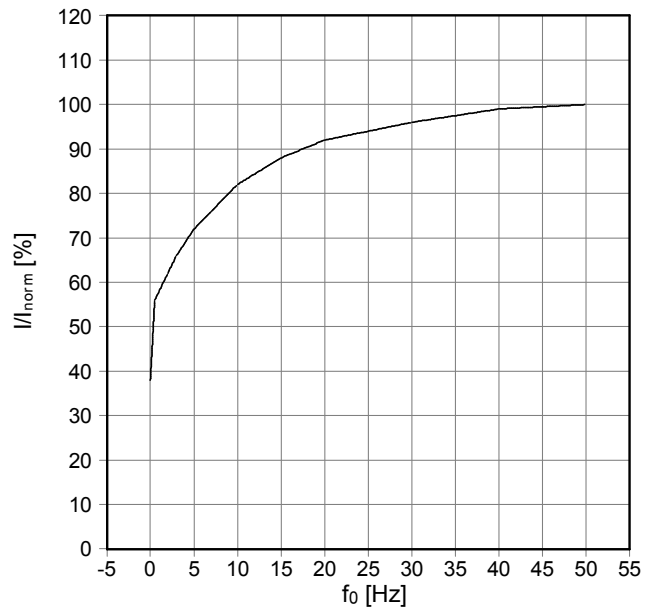
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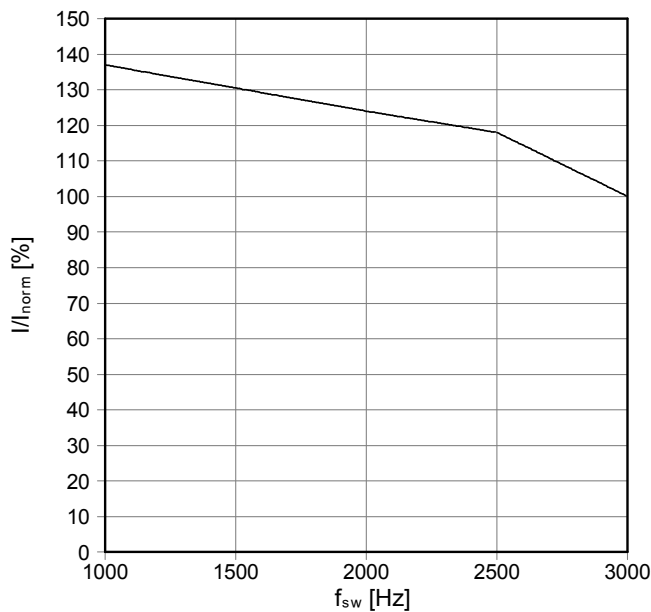
fo - derating curve IGBT (motor)
 $\cos(\phi) = 0,95$
 $T_{cool\ medium} = 40^{\circ}C$; 100% = 726 A rms



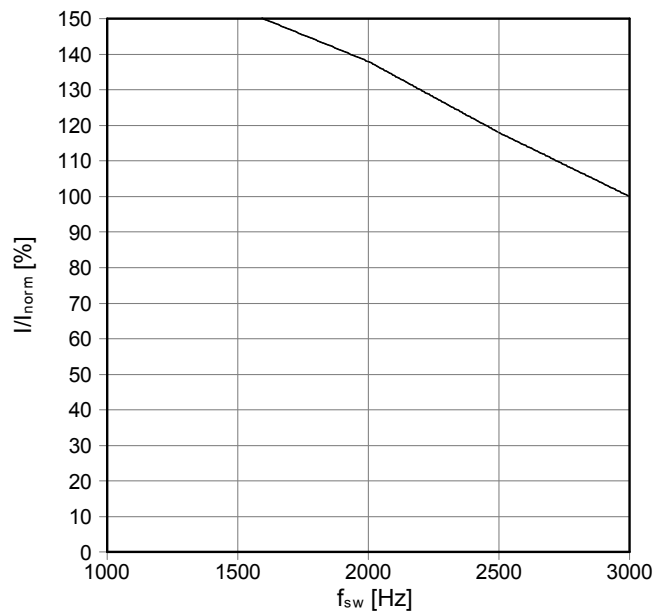
fo - derating curve Diode (generator)
 $\cos(\phi) = -0,95$
 $T_{cool\ medium} = 40^{\circ}C$; 100% = 632 A rms



fsw - derating curve IGBT (motor)
 $\cos(\phi) = 0,95$
 $T_{cool\ medium} = 40^{\circ}C$; 100% = 726 A rms



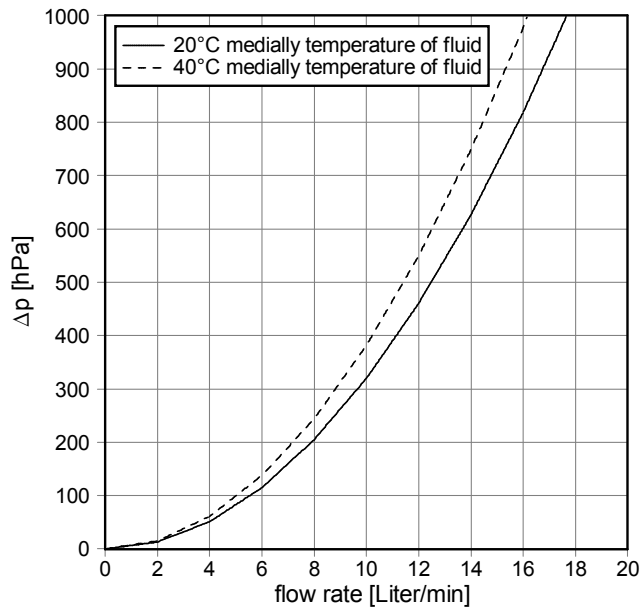
fsw - derating curve Diode (generator)
 $\cos(\phi) = 0,95$
 $T_{cool\ medium} = 40^{\circ}C$; 100% = 632 A rms



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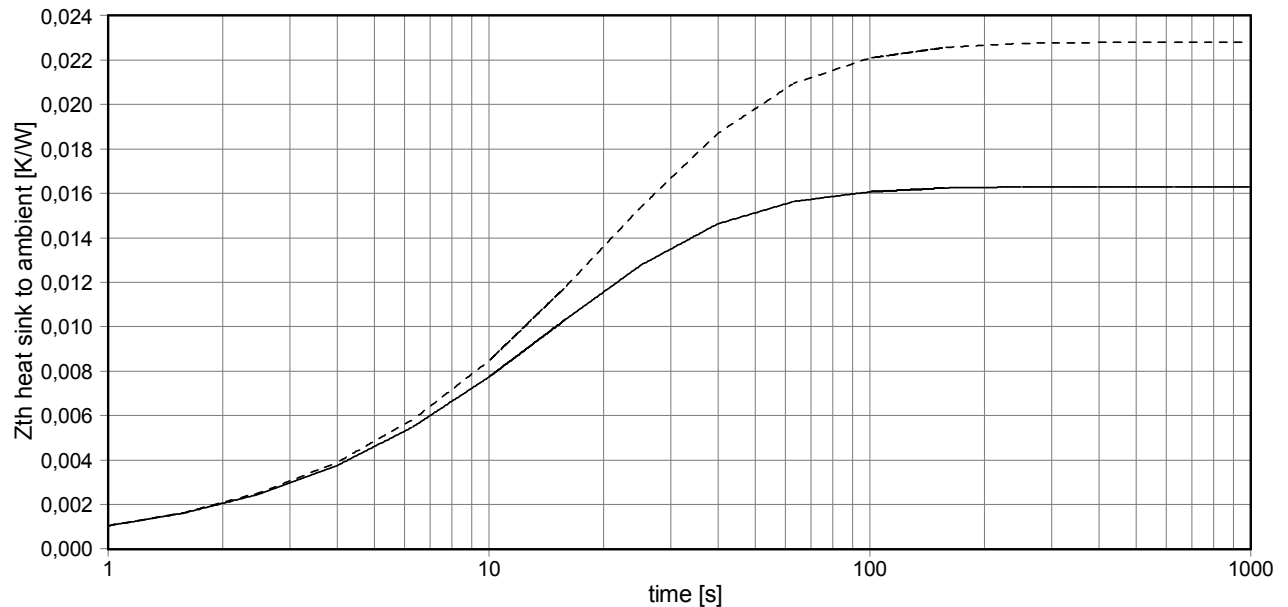
Pressure drop as a function of flow rate



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



— Water

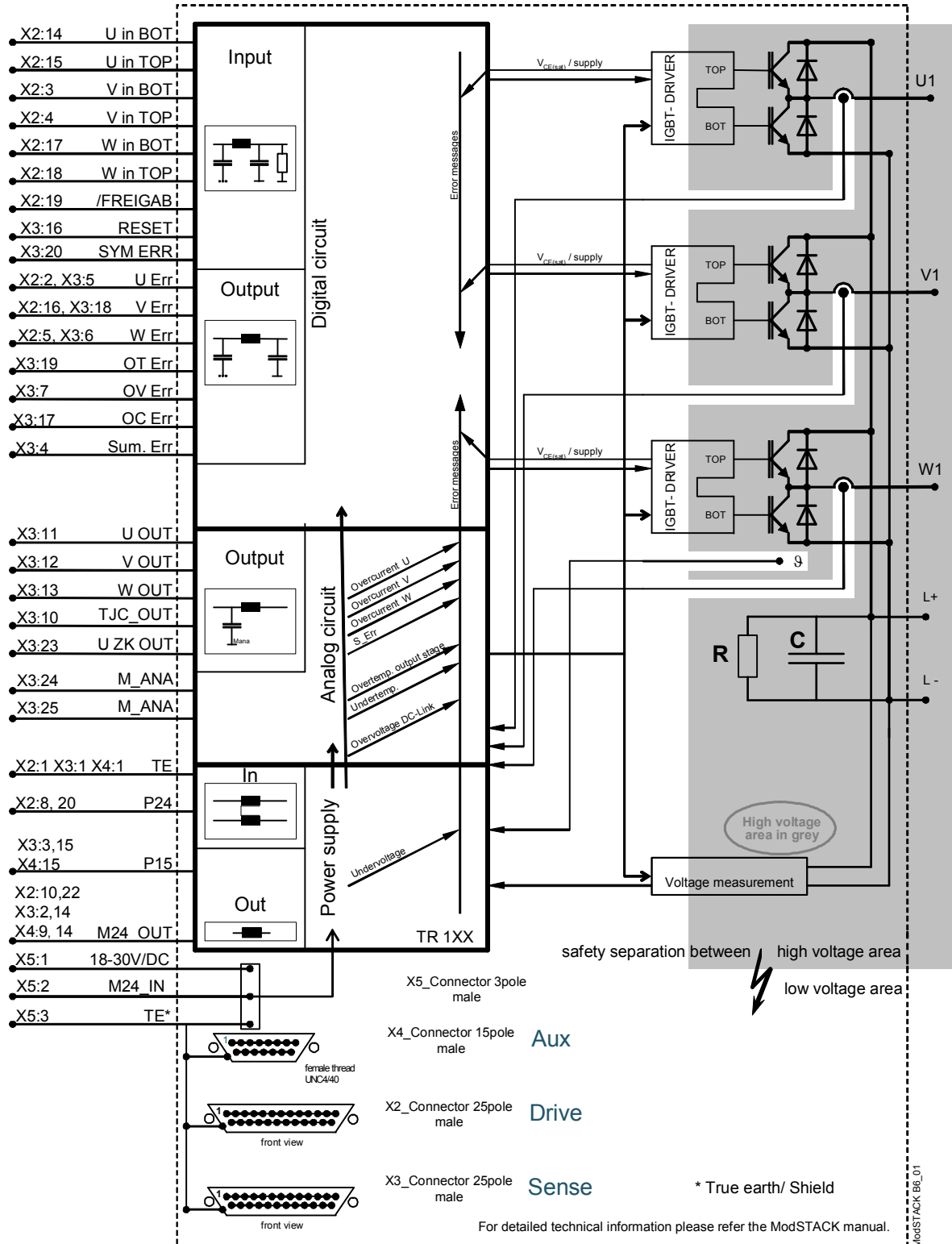
i:	1	2	3	4
r_i [K/W]:	0,00001	0,01387	0,00231	0,00011
τ_i [s]:	7,556	13,62	41,1	50,89

--- Water + Antifrogen N (52%)

i:	1	2	3	4
r_i [K/W]:	0,00001	0,01941	0,00323	0,00015
τ_i [s]:	10,58	19,06	57,55	71,24

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Circuit diagram



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- the conclusion of Quality Agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery depended on the realization of any such measures.

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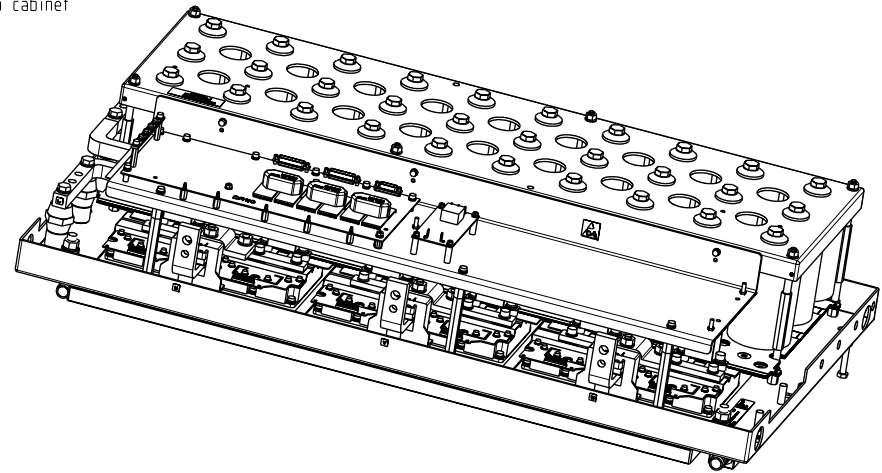
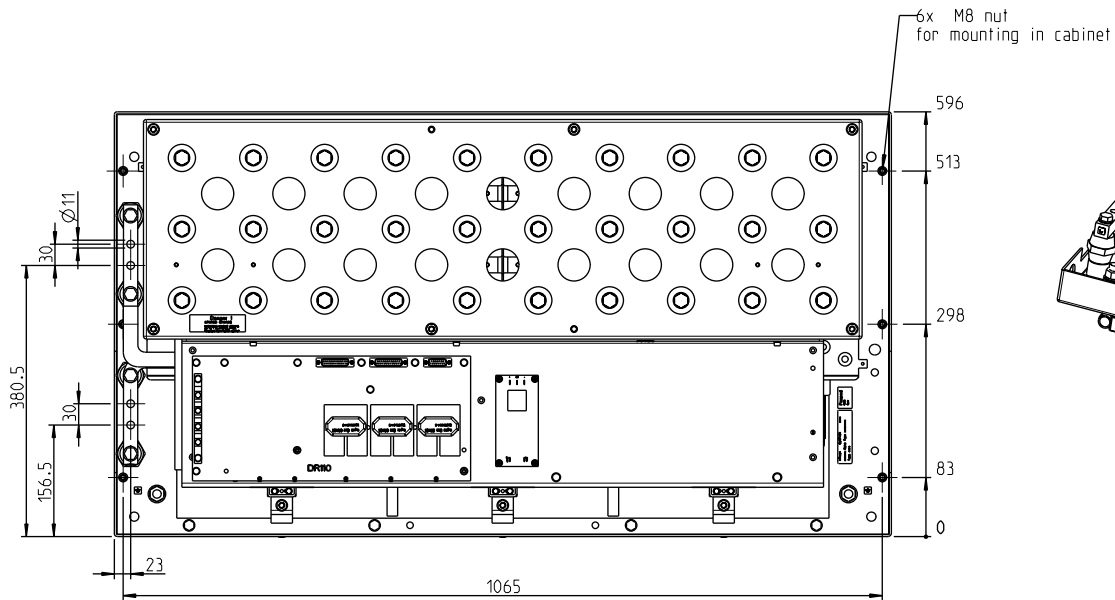
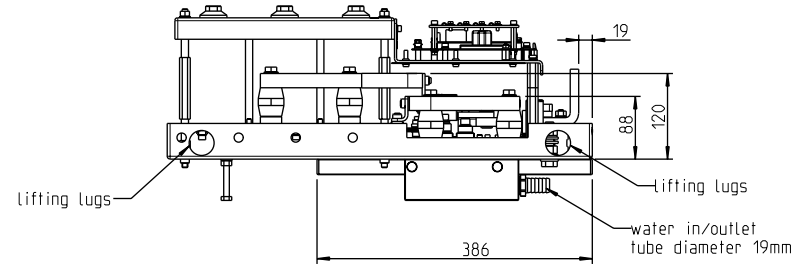
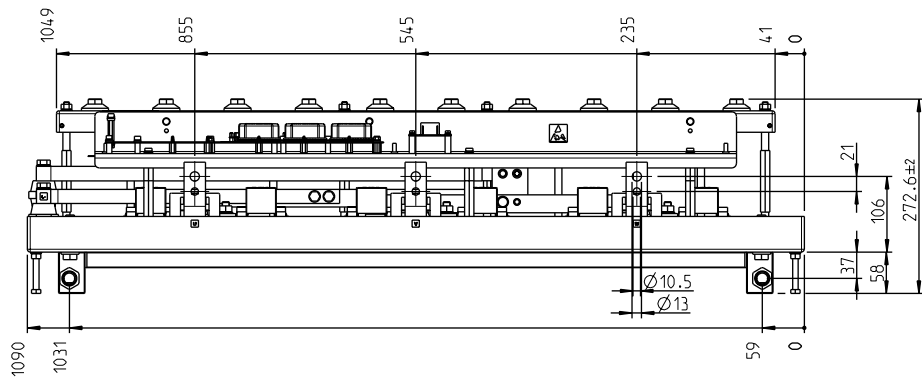
Sicherheitshinweise

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.	general Tolerance	Surface	Scale	1:5	
Assembly-No.			Material		
			Material-No.		
		Date	Name	Description	
	Agent	04.04.2008	Pelmer	Outline MS3 6MSxx00Rxx xxx-3W AH-Vx	
	Checked	04.04.2008	gez.Bohl/änder		
	Norm				
02	Reihenlemme entf.	25.06.09	Pe	Graph-No.	Version
01	Reihenlemme	12.08.08	Pe	31361	0
Vers.	Revision	Date	Name	Origin	Sheet
				Constructed for	A2



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