ModSTACK

Datasheet: B6I+B6I 690/1100-300G M, S Preliminary Data

Key Data

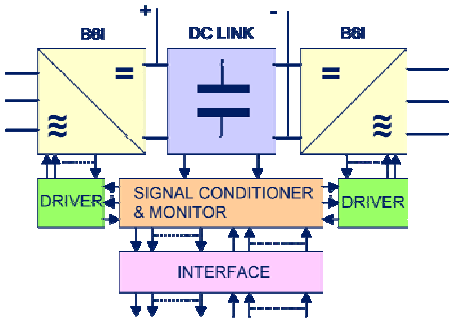
3 x 277A AC at 690V AC, aircooled

General Information

Stack with IGBT, heatsinks, capacitors, drivers and sensors for several inverter applications. These are only technical data! Please read heedful the complete documentation and attend the adopted design environment! Especially the EMC environment and the controller functionality.

Topology		B6I + DC Link + B6I
Load Type		Resistive, inductive load
Cooling		Forced air, fan excluded
Targed Application		Wind
Extra		Available in Master [M] or Slave [S] Configuration. Also available with 20ms Shorttime Overload at Unit 2 [TSSa] Opt. Resistors for Sinewavefilters
Drivercore		Scale Driver
Monitors		Current-, Voltage-, Temperature-Monitoring
Module (Unit1)	IGBT	3x FF600R17KF6C
Module (Unit2)	IGBT	3x FF800R17KF6C
Interface		Electrical, opt. optical
Standards		EN50178, UL94, prepared for UL508C
Product ID (eupec)		Master 22902 Slave 22903 Master [TSSa] 24255 Slave [TSSa] 24256
Drawing No.		37001450MB [mit TSSa] 37001637MB
Circuit Diagram No.		57000001

Unit1 (LSC) Unit2 (MSC)



Electrical Data

	Parameter		Min	Typ	Max	
Assumed Linevoltage	For Isolation-Management	VLine		690		VRMS
DC Link Voltage		VDC		1100	1219	Vav
DC Link Overvoltage Shutdown	Within 100µs			VDCmax		V
DC Link Current		IDCLink		-		ADC

Voltage Unit1			V_{Unit1}		690		V_{RMS}
Continious Current Unit1	$\vartheta=\vartheta_{air\_inlet}$		I_{Unit1}			170	A_{RMS}
Shorttime Current Unit1	10s, every 180s, initial load = I_{Unit1}		I_{Unit1_10}			210	A_{RMS}
Pulse Current Unit1	Sinehalfwave 20ms					-	Apeak
DC Current at Unit1	No rotating field, $\vartheta=\vartheta_{air\_inlet}$,		I_{Unit1_DC}			0,4* I_{Unit1}	Aav
Overcurrent Shutdown Unit1	Percentage of I_{Unit1}. Within 15µs				150		%
Switching Freq. Unit1			f_{sw1}			2250	Hz
Power Losses Unit1	V=V_{unit1_min}, I=I_{Unit1}, fsw=f_{sw1}		P_{loss1}		2319		W
Voltage Unit2	Depending on Controller		V_{Unit2}		690		V_{RMS}
Continious Current Unit2	$\vartheta=\vartheta_{air\_inlet}$, ϑ_{chip} <= 125°C f_{Unit2}>5Hz		I_{Unit2}			277	A_{RMS}
Shorttime Current Unit2	ϑ_{air_inlet}<=40°C, 10s, every 180s, initial load = I_{Unit2}		I_{Unit2_10}			327	A_{RMS}
Pulse Current Unit2	Sinehalfwave 20ms, starting from I_{Unit2}. Only [TSS] Version		$I_{Unit2peak}$			1250	Apeak
DC Current at Unit2	No rotating field, $\vartheta=\vartheta_{air\_inlet}$,		I_{Unit2_DC}			0,4* I_{Unit2}	A_{DC}
Overcurrent Shutdown Unit2	Percentage of I_{Unit2}. Within 15µs Basic Version				150		%
	Only [TSS] Version				320		%
Switching Freq. Unit2			f_{sw2}			2250	Hz
Power Losses Unit2	I=I_{Unit2}, fsw=f_{sw2}		P_{loss2}		3544		W
Power Losses (PCB and Capacitor)			P_{loss_aux}			400	W
Filterresistors at Output Unit2	Applicable for Sinewavefilters (damping) only in Produkt ID 24255 and 24256		R_{Filter}		22		Ohm
			$P_{RFilter}$		100		Watt
Auxiliary Voltage			V_{aux}	18	24	30	Vav
Auxiliary Power Demand	Vaux=24 Vav, to feed with B6U		P_{aux}		80		W
EMC Test	According EN61800-3 at named interfaces	Power	V_{Burst}		2		kV
		Control	V_{Burst}		1		
		Aux (24V)	V_{Surge}		1		kV

Insulation Test Voltage	According EN50178 f=50Hz, t=1min	V_{isol}		1,8		kV_{RMS}

Important Component Data

DC Link Capacitor		C_{DC}		12,53		mF
DC Link Capacitor		Type		Elcap		
Capacitor Design Lifetime (eupec approximation)	Loadcycle: Wind	L_{TD}		17		Year
	Loadcycle: Solar	L_{TD}		-		Year
	Loadcycle: Industrial	L_{TD}		-		Year

Requirements to the Powersource

Assumed Inductance Of Feeding Powersource	(Necessary inductance not included, feeded by B6U)	L_{Feed}		292		µH

Fan Data (assumed when excluded)

Fan Type	Assumed			QK10A-2DM.68.FK		
Fan Voltage		V_{Fan}		400		V_{RMS}
Fan Frequency		f_{Fan}		50		Hz
Fan Current		I_{Fan}		1,42		A_{RMS}
Fan Air Pressure	Assumed	Δp_{AirFan}		170		Pa

Controller Interface Data

Driver	Master Basic Version	PCB		TR100		
	Master [TSS] Version			TR101		
	Slave			TR100		
	See Datasheets					
Paralleling Interface	Master	PCB		SAD101		
	Slave			-		
	See Datasheet					
Optical Interface	Master	PCB		OEA101		
	Slave			-		
	See Datasheet					
Digital Input Level	Resistor to Gnd (1,8k) High = on min 15mA	V_{in}	0		15	V
Digital Output Level	Open collector Low = ok max 15mA	V_{out}	0		15	V
Analog Current Outputs Unit1	Load max 1mA at I_{Unit1}			2,27		V
Analog Current Outputs Unit2	Load max 1mA at I_{Unit2} Basic Version			4		V
	[TSS] Version			2		V
Analog DC Link Voltage Output	Load max 1 mA At V_{DCmax}	V_{DCout}		9		V

Analog Temperature Out	Load max 1mA At ϑj=125°C	Vϑout		9		V
Optical Input Level	optionally		12			µW
Optical Output Level	optionally				60	µW

Requirements to the Controller

EMC Protection	According EN61800-3 at auxiliary power and controlinterface		1			kV
EMC Environment			Shieldconcept with TE (True Earth) separated from PE, HF conform installation			
Drive Pulse Time		ton_min	10			µs
Blockout Time		tpause	10			µs
Overvoltage Shut Down Reaction Time	After overvoltage message by ModSTACK Interface				50	µs
Overcurrent Shut Down Reaction Time	After overcurrent message by ModSTACK Interface				10	µs

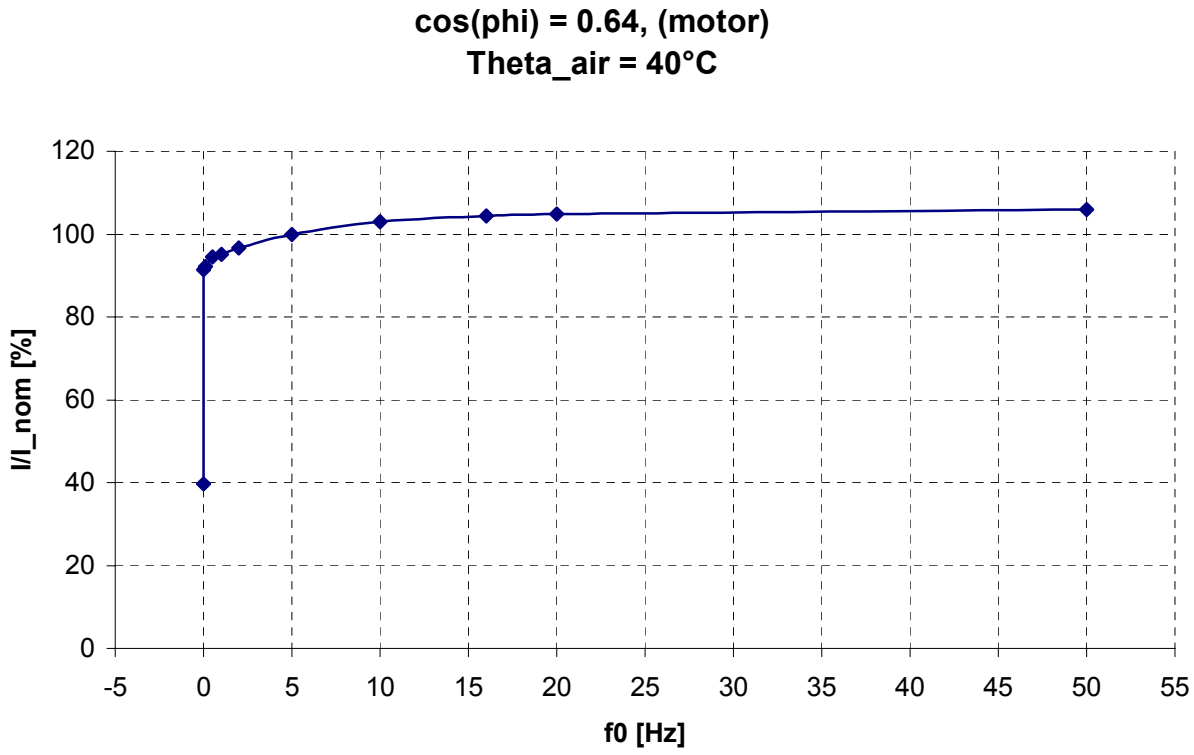
Mechanical Data

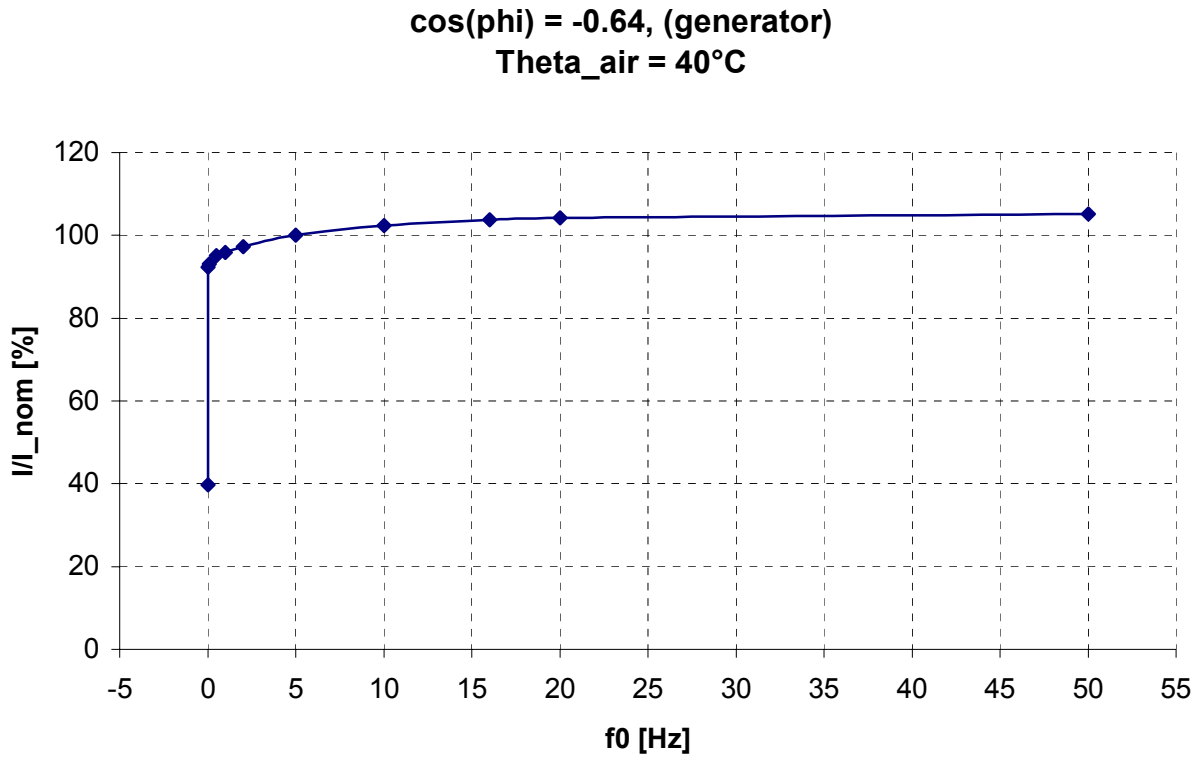
Airvelocity	ϑAir=20°C Pair=1013 hPa Dry- and dustfree, measured outside of heatsink. According DIN 41882	vAir	6			m/s
Airflow heatsink		dV/dtAir	1600			m³/h
Air Pressure Drop heatsink		ΔpAir		170		Pa
Watervelocity	According Coolingwater Specification from eupec	vWater				m/s
Waterflow heatsink		dV/dt Water	-			m³/h
Water Pressure Drop heatsink		ΔpWater		-		Pa
Dimensions	Width x Depth x Hight		1090	596	345	mm
Mass	Approximation			101		kg
Storage Temperature Range		ϑstor	-40		+65	°C
Operating Temperature range (PCB and Capacitor)	Minimal 0 °C for optional optical interface	ϑop	-25 (0)		+55	°C
Cooling Air Inlet Temperature (Heatsink)		ϑair_inlet	-25		+40	°C
	Heatsink temperature > -25°C		-40			
Cooling Airvelocity (PCB and Capacitor)		vAir_PCB	2			m/s
Air Pressure	Standard atmosphere	pAir	900		1100	hPa
Humidity	No Condensation	Rel. F	0		95	%

Installation Height			0		1000	m
Vibration	EN60068-2-6, Fc 10..59Hz 0,075mm				10	m/s²
Permanence Vibration	EN60068-2-6, Fc 10-150Hz, 20 Cycles				20	m/s²
Shock	EN60068-2-27, Ea Halfsine 11ms, 3 pulses				100	m/s²
Protection Degree			IP00			
Pollution Degree			2			
Overvoltage Category			III			

Derating Curves *(IGBT Part)*

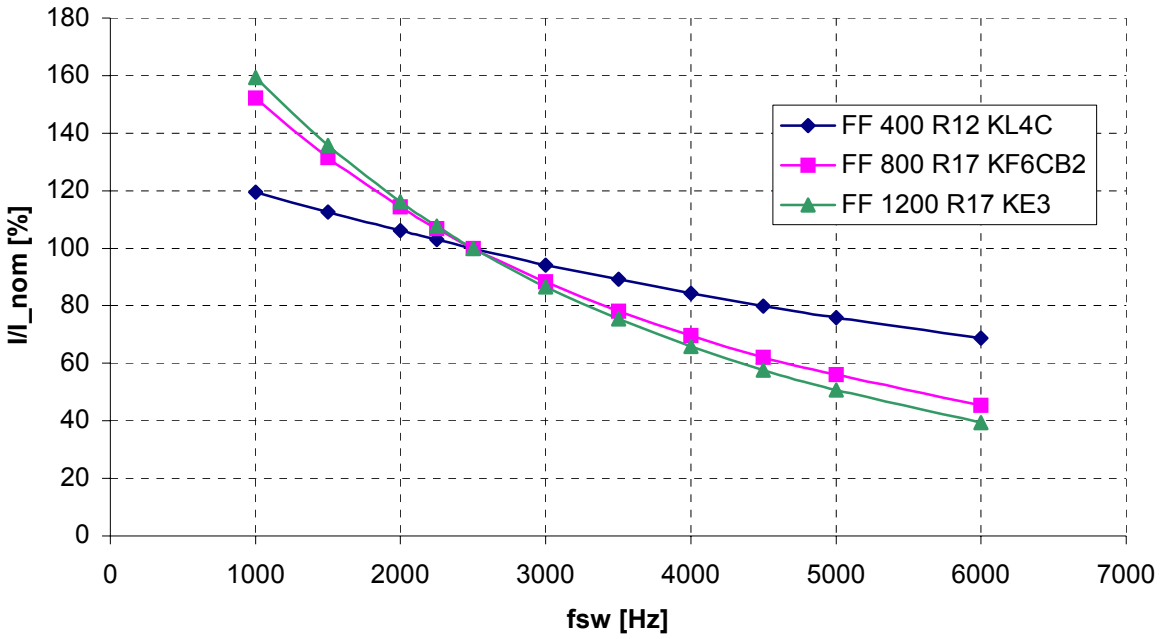
Current derating at low rotating field frequency (f0). **Maximal 100% current is allowed.**



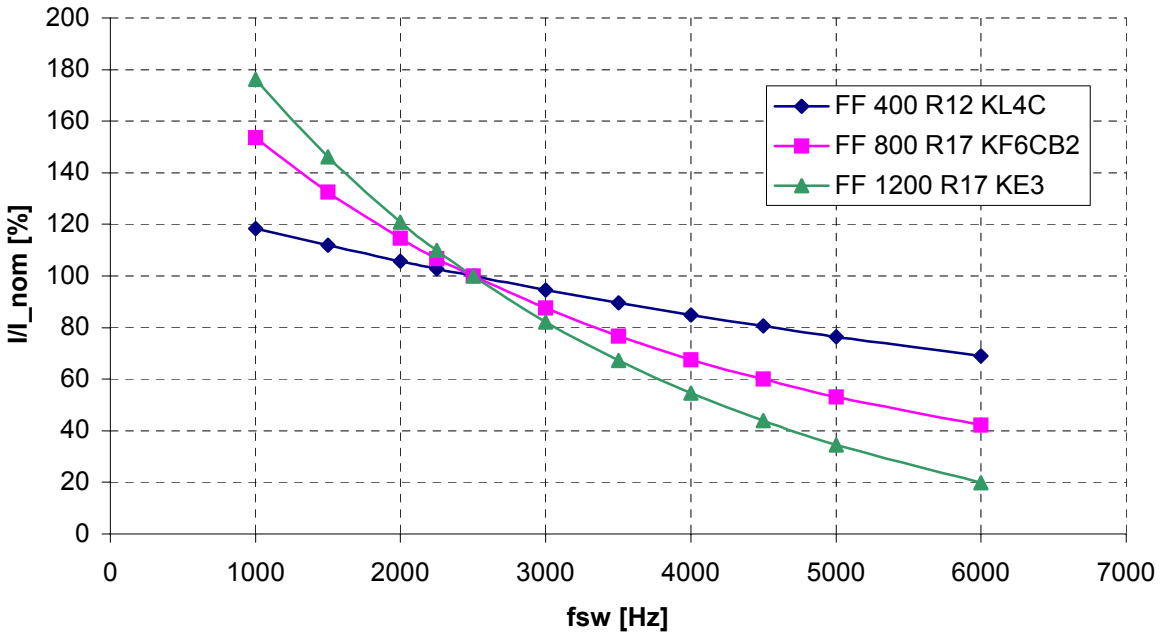


Current derating at different switching frequencies. See datatable for nominal switching frequency. In this drawing 2500Hz ist assumed. **Maximal 100% current is allowed.**

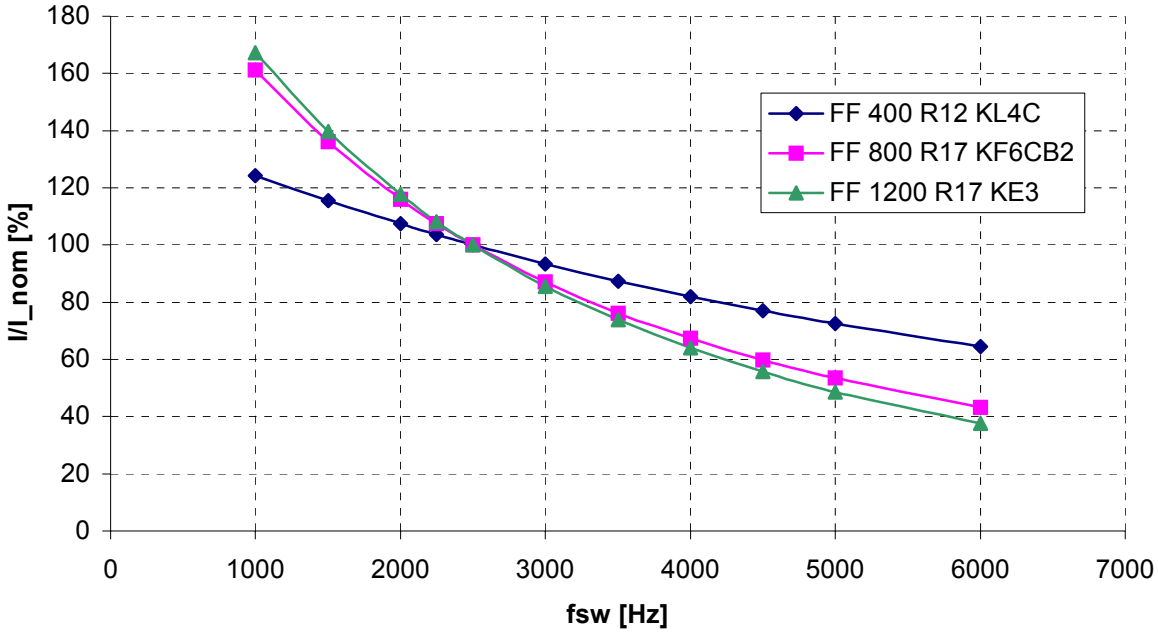
IGBT, cos(phi) = 0.64
Theta_air = 40°C



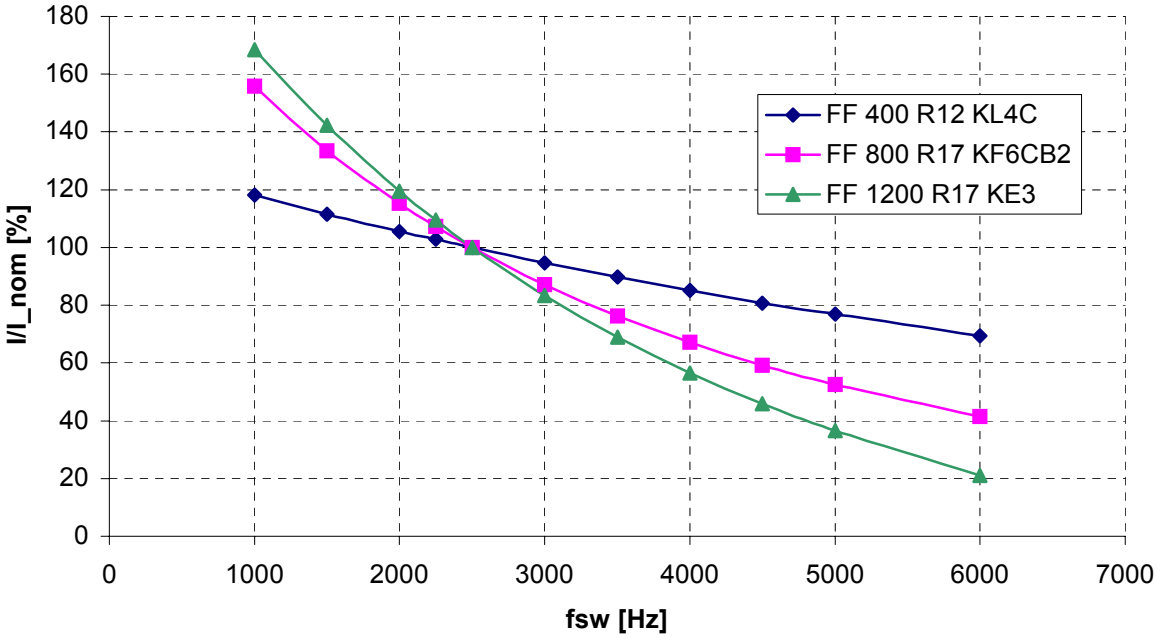
Diode, cos(phi) = 0.64
Theta_air = 40°C



IGBT, cos(phi) = - 0.64
Theta_air = 40°C



Diode, cos(phi) = -0.64
Theta_air = 40°C



Miscellaneous

This technical information specifies semiconductor stacks but promises no characteristics. It is valid in combination with the belonging technical notes.
This document may be changed without prior notice.

Warning!

Prior to installation and commissioning 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 missing or damaged signs are replaced.

The safety instructions have to be strictly adhered to.
The manual contains detailed information on all technical topics with regard to the eupec ModSTACK. For further details regarding publications of the eupec ModSTACK and information on other publications in the area of ModSTACKs please contact your nearest eupec branch or visit our website: http://www.eupec.com.

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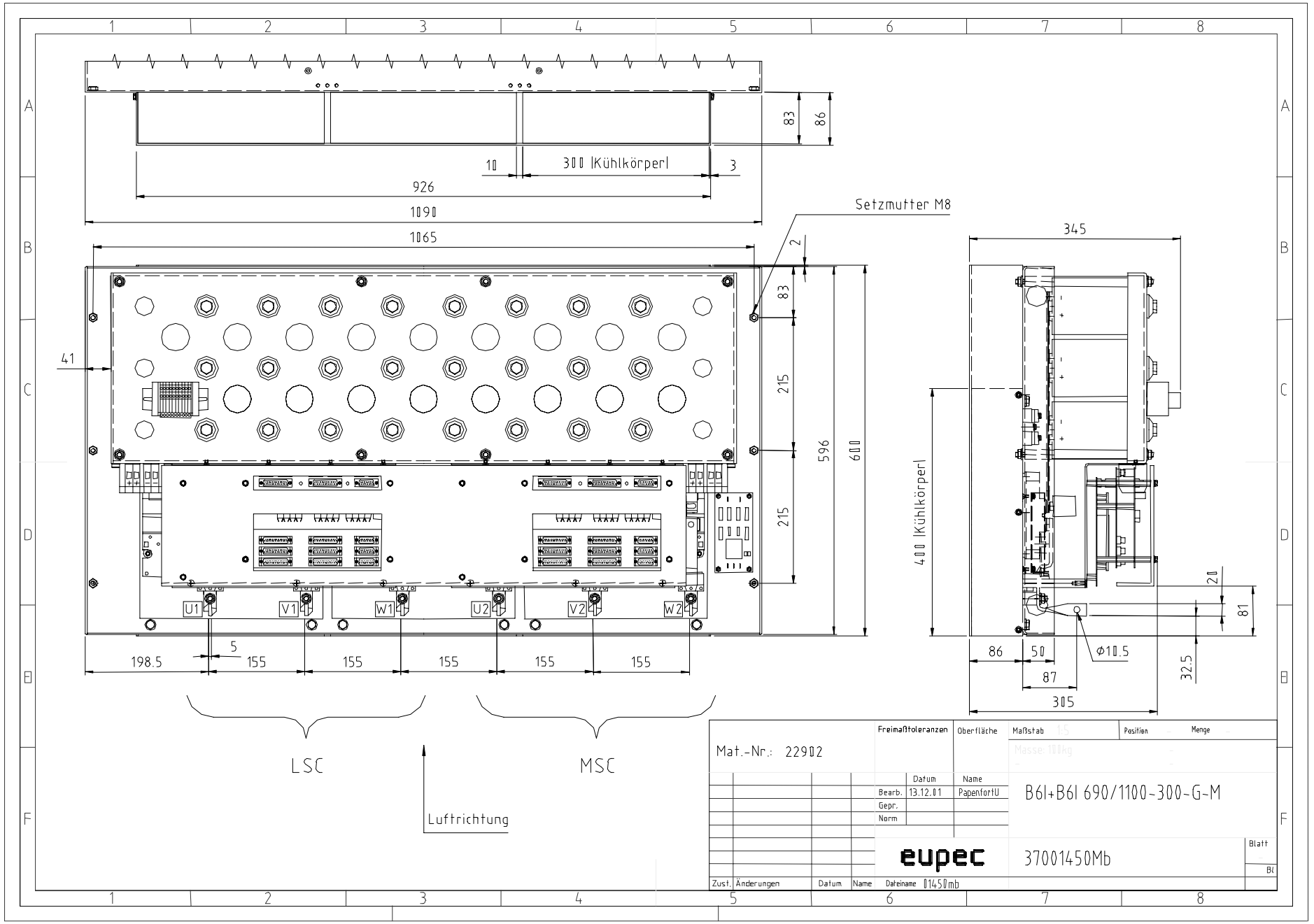
83
86
10
300 (Kühlkörper)
3
926
1090
1065
Setzmutter M8
2
345
41
83
215
596
600
215
400 (Kühlkörper)
U1
V1
W1
U2
V2
W2
198.5
5
155
155
155
155
155
20
81
86
50
Ø10.5
87
32.5
305
LSC
MSC
Luftrichtung
Mat.-Nr.: 22902
Freimaßtoleranzen
Oberfläche
Maßstab
Position
Menge
Masse: 100kg
Datum
Name
Bearb.
13.12.01
PapenfortU
Gepr.
Norm
B6I+B6I 690/1100-300-G-M
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