PowerSTACK

Datasheet: 1B6I 690/1100-400W S Preliminary Data

Key Data

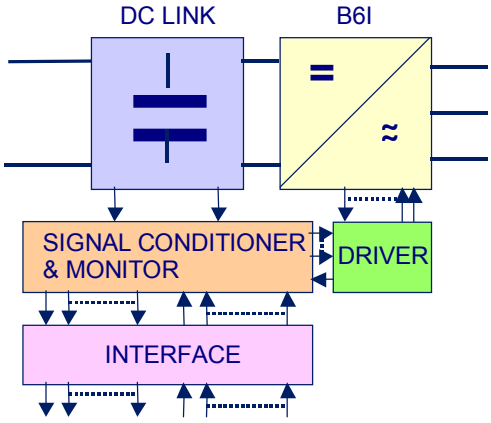
3 x 400A AC at 690V AC, watercooled

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		DC Link + B6I
Load Type		Resistive, inductive load
Cooling		By Water
Targed Application		Industrial Drive
Extra		Slave [S] to build the 3B6I690/1100-400W with 2B6I690/1100-400W
Drivercore		Scale Driver
Monitors		Current-, Voltage-, Temperature-Monitoring
Module (Unit1)		n.a.
Module (Unit2)	IGBT	3x FF800R17KF6C
Interface		Electrical, opt. optical
Standards		EN50178, UL94, prepared for UL508C
Product ID (eupec)		Slave 24359
Drawing No.		380000016_B_MB
Circuit Diagram No.		57000002

Unit 1 Unit 2



Electrical Data

	Parameter		Min	Typ	Max	
Assumed Linevoltage	For Isolation-Management	VLine		690		VRMS
DC Link Voltage		VDC		975	1219	Vav
DC Link Overvoltage Shutdown	Within 100µs			VDCmax		V
DC Link Current	At IUnit2, VUnit2, cos_φUnit2	IDCLink Input		445		Aav
Voltage Unit1		VUnit1		-		VRMS
Continious Current Unit1	ϑ=ϑair_inlet	IUnit1			-	ARMS
Shorttime Current Unit1	10s, every 180s, initial load = IUnit1	IUnit1_10			-	ARMS
Pulse Current Unit1	Sinehalfwave 20ms				-	Apeak

DC Current at Unit1	No rotating field, ϑ=ϑair_inlet,	IUnit1_DC			-	Aav
Overcurrent Shutdown Unit1	Percentage of IUnit1. Within 15µs			-		%
Switching Freq. Unit1		fsw1			-	Hz
Power Losses Unit1	V=Vunit1_min, I=IUnit1, fsw=fsw1	Ploss1		-		W
Voltage Unit2	Depending on Controller	VUnit2		690		VRMS
Displacement factor		cos_φUnit2	-0,9		+0,9	
Continious Current Unit2	ϑ=ϑwater_inlet, ϑchip <= 125°C fUnit2>5Hz Both B6I connected in parallel (1U1 ->2U1..)	IUnit2			400	ARMS
Shorttime Current Unit2	ϑwater_inlet<=40°C, 10s, every 180s, initial load = IUnit2	IUnit2_10			480	ARMS
Pulse Current Unit2	Sinehalfwave 20ms, starting from IUnit2.	IUnit2peak			-	Apeak
DC Current at Unit2	No rotating field, ϑ=ϑair_inlet,	IUnit2_DC			0,4* IUnit2	ADC
Overcurrent Shutdown Unit2	Percentage of IUnit2. Within 15µs			125		%
Switching Freq. Unit2		fsw2			2250	Hz
Power Losses Unit2	I=IUnit2, fsw=fsw2	Ploss2		5000		W
Power Losses (PCB and Capacitor)		Ploss_aux			200	W
Filterresistors at Output Unit2	Applicable for Sinewavefilters (damping, optionally)	RFilter		-		Ohm
		PRFilter		-		Watt
Auxiliary Voltage		Vaux	18	24	30	Vav
Auxiliary Power Demand	Vaux=24 Vav, to feed with B6U	Paux		40		W
EMC Test	According EN61800-3 at named interfaces — Power	VBurst		2		kV
	Control	VBurst		1		
	Aux (24V)	VSurge		1		kV
Insulation Test Voltage	According EN50178 f=50Hz, t=1min	Visol		1,8		kVRMS

Important Component Data

DC Link Capacitor		CDC		7,83		mF
DC Link Capacitor		Type		Elcap		
Capacitor Design Lifetime	Loadcycle for: Wind	LTD		-		Year
	Loadcycle for: Solar	LTD		-		Year

(eupec approximation)	Loadcycle for: Industrial Drive (ϑair=35°C, I=0,8, Duration=24h/Day)	LTD		11		Year

Requirements to the Powersource

Assumed Inductance Of Feeding Powersource	(Necessary inductance not included, feeded by B6U)	LFeed		220		µH

Fan Data (assumed when excluded)

Fan Type	Assumed		-			
Fan Voltage		VFan		-		VRMS
Fan Frequency		fFan		-		Hz
Fan Current		IFan		-		ARMS
Fan Air Pressure	Assumed	ΔpAirFan		-		Pa

Controller Interface Data

Driver	See Datasheet	PCB	TR100			
Paralleling Interface		PCB	-			
Optical Interface		PCB	-			
Digital Input Level	Resistor to Gnd (1,8k) High = on min 15mA	Vin	0		15	V
Digital Output Level	Open collector Low = ok max 15mA	Vout	0		15	V
Analog Current Outputs Unit1	Load max 1mA at IUnit1			-		V
Analog Current Outputs Unit2	Load max 1mA at IUnit2			4		V
Analog DC Link Voltage Output	Load max 1 mA At VDCmax	VDCout		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 PowerSTACK Interface				50	µs
Overcurrent Shut Down Reaction Time	After overcurrent message by PowerSTACK Interface				10	µs

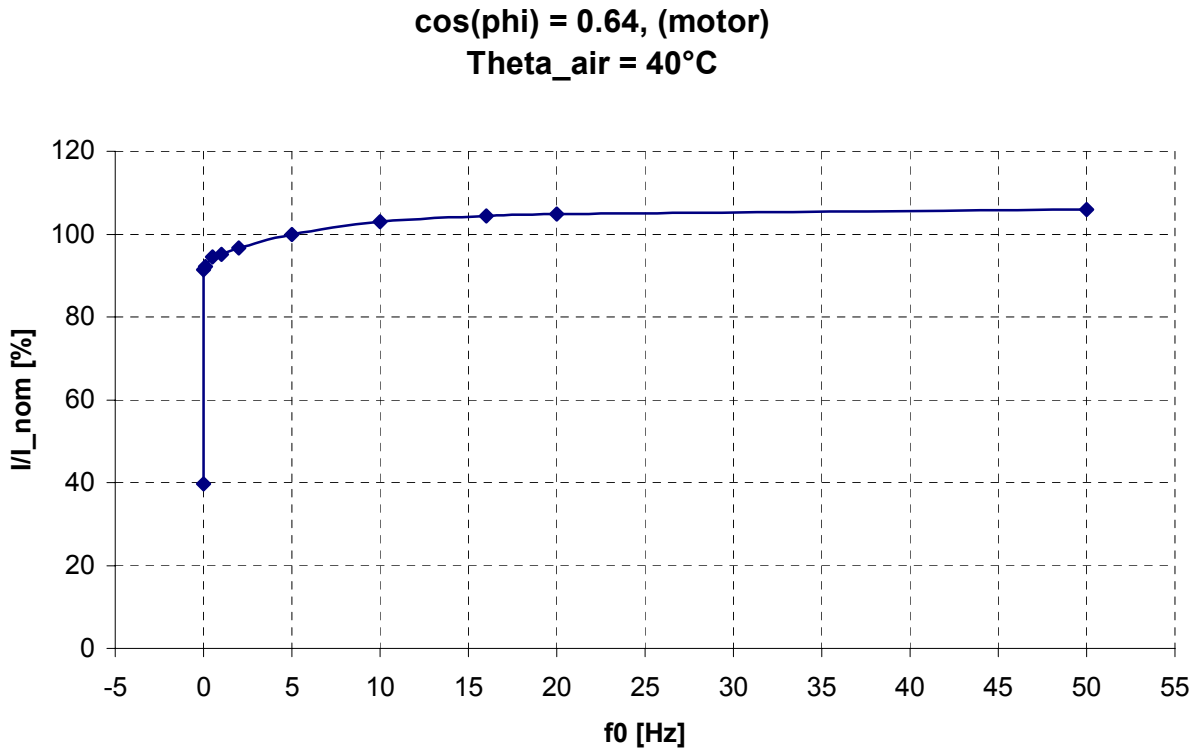
Mechanical Data

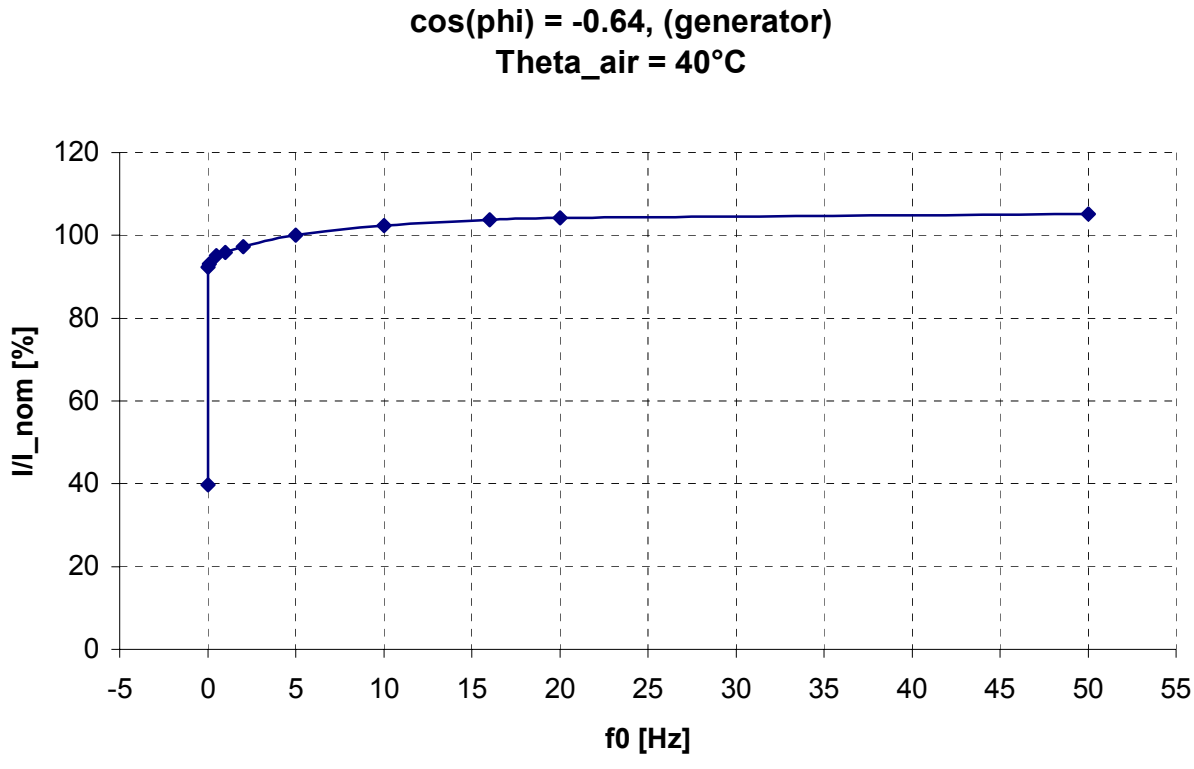
Airvelocity	ϑAir=20°C	vAir	-			m/s
Airflow heatsink	Pair=1013 hPa	dV/dtAir	-			m³/h
Air Pressure Drop heatsink	Dry- and dustfree, measured outside of heatsink. According DIN 41882	ΔpAir		-		Pa
Waterflow heatsink	According Coolingwater Specification from eupec for copper tubes	dV/dt Water	12			l/min
Water Pressure Drop heatsink Max. Water Pressure		ΔpWater		200 8		mbar bar
Water connection (Tube diameter)				¾”		Inch
Dimensions	Width x Depth x Hight		1090	600	250	mm
Mass	Approximation			70		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	-		-	°C
	Heatsink temperature > -25°C		-			
Cooling Water Inlet Temperature (Heatsink)		ϑwater_ inlet	-25		+40	°C
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)*

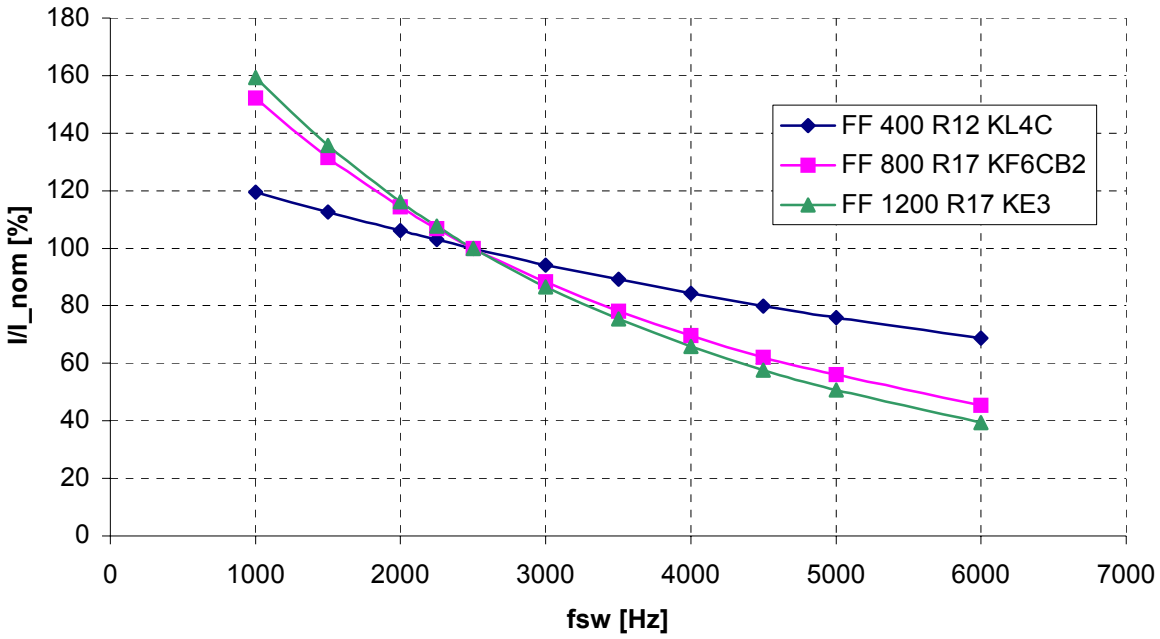
Current derating at low rotating field frequency (f0). **Maximal 100% current is allowed.**



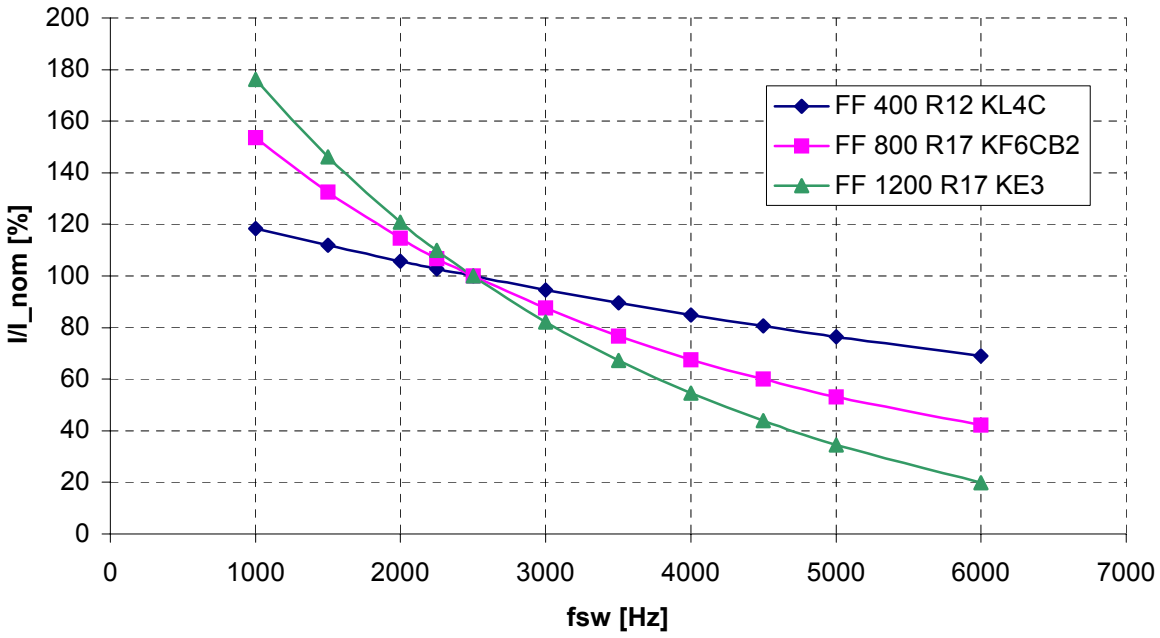


Current derating at different switching frequencies. See datatable for nominal switching frequency. In this drawing 2500Hz ist assumed. **Maximal 100% current is allowed.**

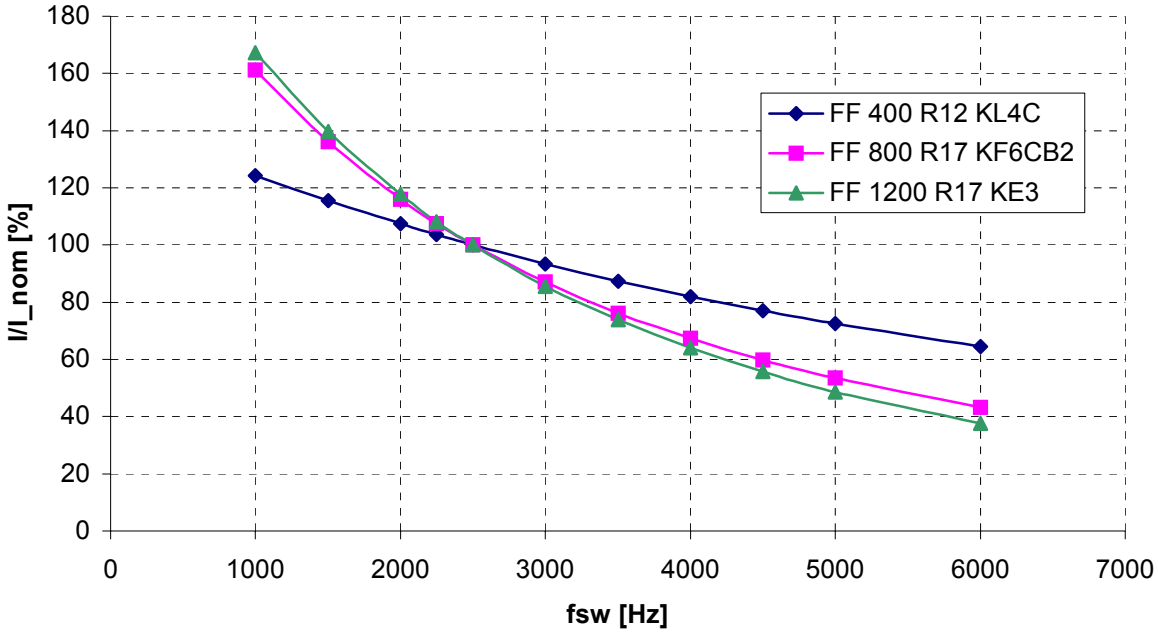
IGBT, cos(phi) = 0.64
Theta_air = 40°C



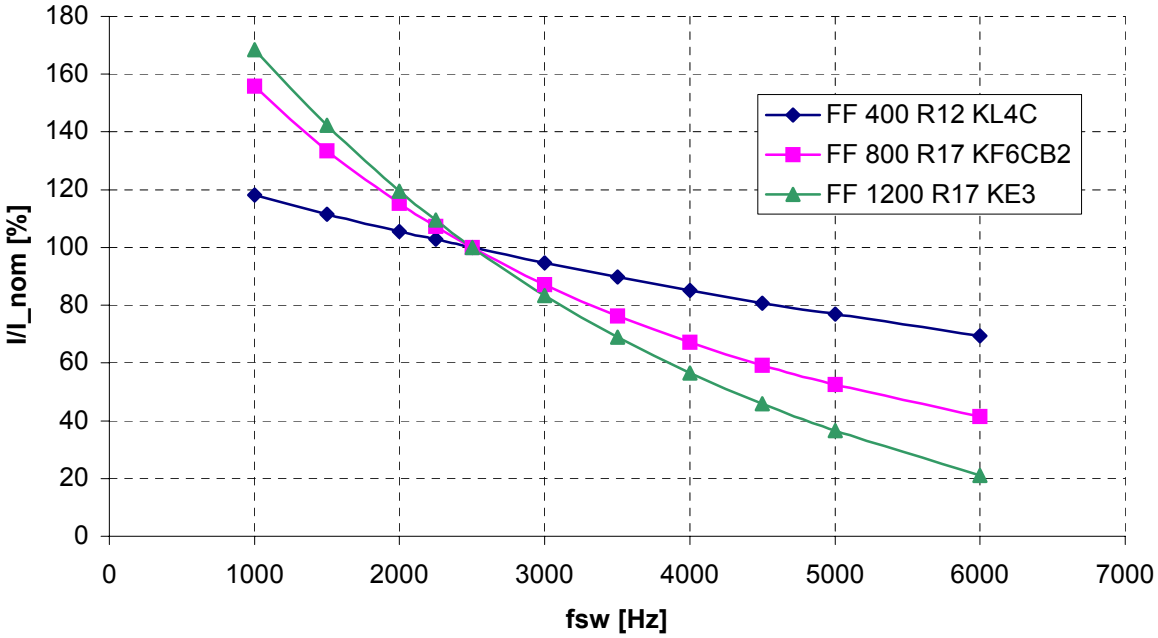
Diode, cos(phi) = 0.64
Theta_air = 40°C



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 PowerSTACK. For further details regarding publications of the eupec PowerSTACK and information on other publications in the area of PowerSTACKs please contact your nearest eupec branch or visit our website: http://www.eupec.com.

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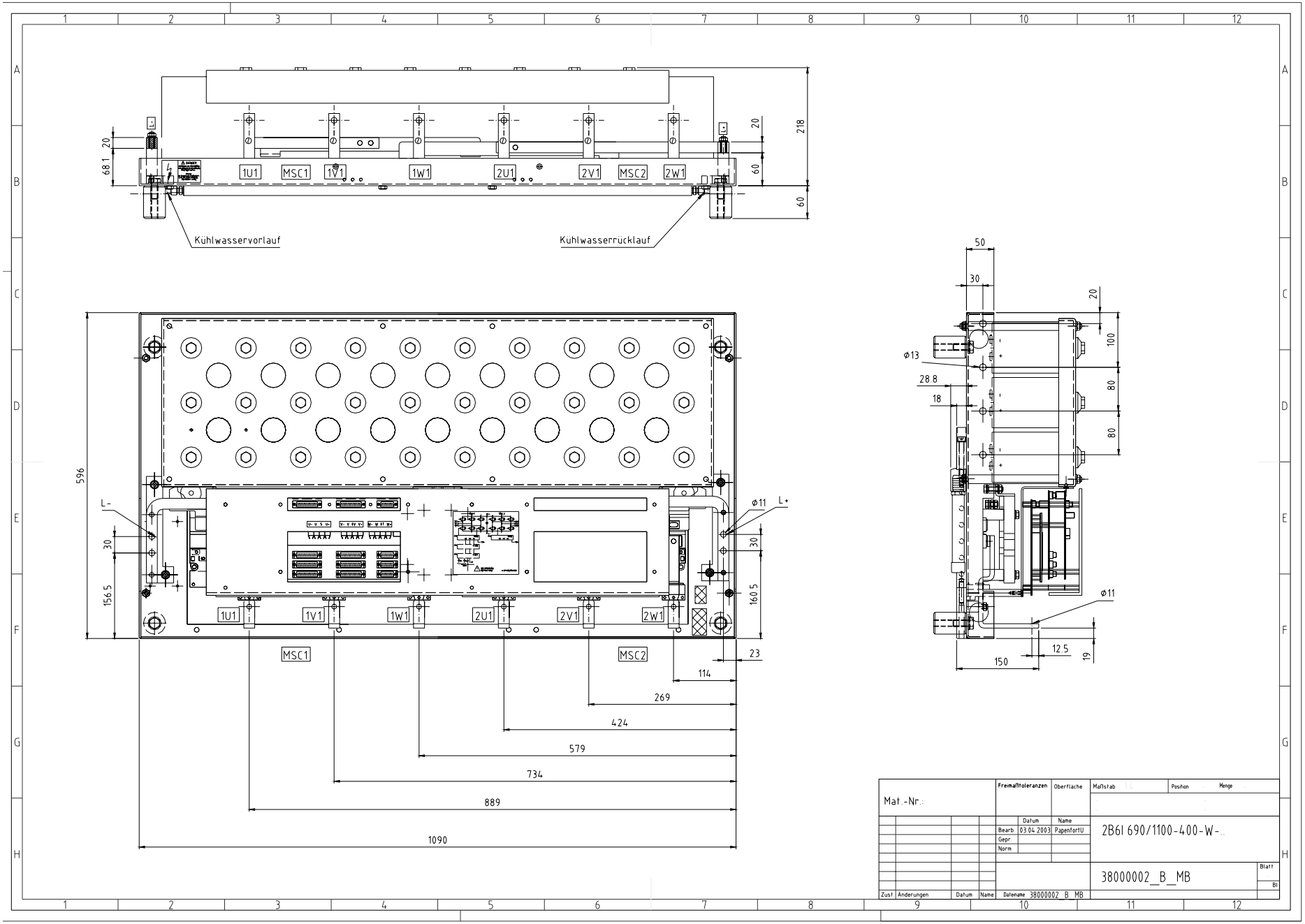
1U1
MSC1
1V1
1W1
2U1
2V1
MSC2
2W1
Kühlwasservorlauf
Kühlwasserrücklauf
68.1
20
218
60
596
156.5
160.5
30
L-
L+
Ø11
MSC1
MSC2
23
114
269
424
579
734
889
1090
50
30
100
80
Ø13
28.8
18
12.5
19
150
Mat.-Nr.:
Freimaßtoleranzen
Oberfläche
Maßstab
Position
Menge
Datum
Name
Bearb. 03.04.2003 PapenfortU
Gepr.
Norm
2B6I 690/1100-400-W-..
38000002_B_MB
Blatt
Zust. Änderungen
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Name
Datename 38000002_B_MB