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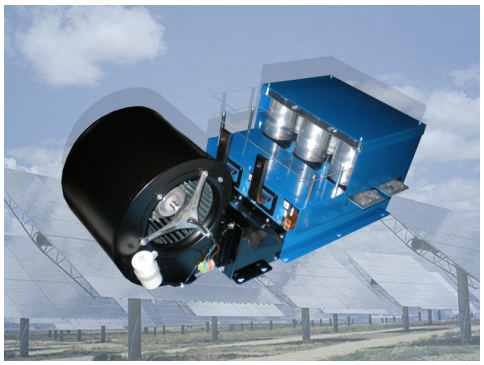


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HIGHLIGHTS

-Wide range.
-Reliability.
-Short delivery time
-Modular system.
-Cooling system included.
-Current, voltage and temperature sensors.
-IGBT drivers included.
-Ready to use.

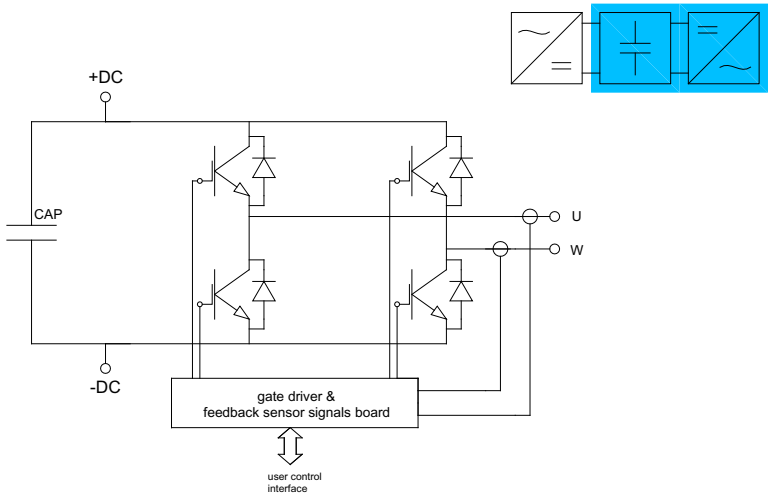
ABOUT MT SERIES

RECTIFICADORES GUASCH S.A. offers the most modulable way for designing power stages AC-AC or DC-AC by connecting rectifier block, DC-link block and IGBT power stack. This way, the customer (and not the builder) decides which the block that limits the power of the entire system. The customer can obtain in a short delivery time a wide range of power assemblies in a compact size.

Each block is designed for obtaining the maximum efficiency by itself in the minimum dimensions. MT series is suitable to realize converters, choppers, half, full or three phases bridge inverters for motor control, welding, renewable energies, UPS...

BRIEFING

Topology	B2I + capacitor bank	
Market	industrial	
Cooling system	centrifugal fan	
Driver system	SCiCoreLink67	
Parameters monitorized	DC voltage, Output current (each phase) temperature on heatsink, internal module NTC	
Max Voltage applied to DClink		1100 V
Output current per phase	fsw=2kHz, TJ<125ºC Tamb=40ºC *fo=50Hz P.F.=0.85 m=1 VDClink=900V*	377 A



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POWER STACK GENERAL CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Min*	*Typ*	*Max*	*Units*
Voltage applied to DClink	V_{DClink}	**note 1**		900	1200	V_{DC}
Output current per phase	$I_{U,V,W}$	fsw=2kHz, TJ<125ºC Tamb=40ºC fo=50Hz P.F.=0.85 m=1 VDClink=900V			377	A_{RMS}
IGBT maximum junction temperature	T_{Jmax}				150	ºC
IGBT temp. under switching conditions	$T_{J\ (sw)}$		-40		125	ºC
Storage temperature	T_{stg}		-40		85	ºC
Operating temperature	T_{op}		-25		85	ºC
Power-to-control isolation voltage	V_{ISOp-c}	50 Hz @1min/ **note 2**	3			kV_{AC}
Module isolation voltage	V_{ISOmod}	50 HZ @1min/ **note 3**	4			kV
Mounting Torque DC terminals		M8	8		10	N·m
Weight (aprox)				38.5		kg

COOLING SYSTEM CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Typical*	*Units*
Type		centrifugal fan		
Fan system supply voltage	V_{FAN}		230	V_{RMS}
Fan system consumption	I_{FAN}	50Hz/60Hz	1,11/1,36	A

IGBT MODULE ELECTRICAL CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Min*	*Typ*	*Max*	*Units*
Collector-Emitter Voltage	V_{CES}	T_J=25ºC			1700	V
DC Collector current	I_{Cnom}	T_C=80ºC, T_J=150ºC			450	A
Repetitive peak collector current	I_{CRM}	t_p=1ms			900	A
Power dissipation (per module)	P_{DISS}	T_C=25ºC, T_J=150ºC			2800	W
Collector-emitter saturation voltage	V_{CEsat}	Ic=450 A, TJ=125ºC		2,35		V

***note 1**: This voltage is limited by IGBT module. Restriction by DC Link capacitors voltage must be considered.*
***note 2**: This isolation voltage is referred to the minimum isolation voltage between any control/feedback signal (PWM, reset fault, feedback sensor signals and supply of boards) and any power voltage (DC input, AC output).*
***note 3**: This is an inner property of the IGBT module. It refers to the isolation between the internal chip and the external case.*

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CAPACITOR BANK CHARACTERISTICS

Description	*symbol*	*Typical*	*Units*
Single capacitor	C	MKP type 420uF -15%..0% 1100V	
Total equivalent capacitance	C_{equiv}	3780	µF
max capacitor bank DC voltage	V_{DClink}	1100 **note 4**	V

ENVIRONMENTAL SPECIFICATIONS

Description	
Protection grade (EN-60529 / CEI529 / UNE-20324)	IP-00
Humidity max.	50% RH @ 35ºC / 90% RH @ 20ºC
Pollution degree	III

MOUNTING CONSIDERATIONS

It's necessary a minimum distance of 100 mm with regard to the envelope. The free air circulation should be guaranteed. Avoiding the heat sources of nearby to assembly.

In the real applications it is important to consider a safety margin with regarding the working current, we recommend a margin of the 20%.

For critical cases (24 hours work, repetitive overloads...), margins of the 30% to 50% are used.

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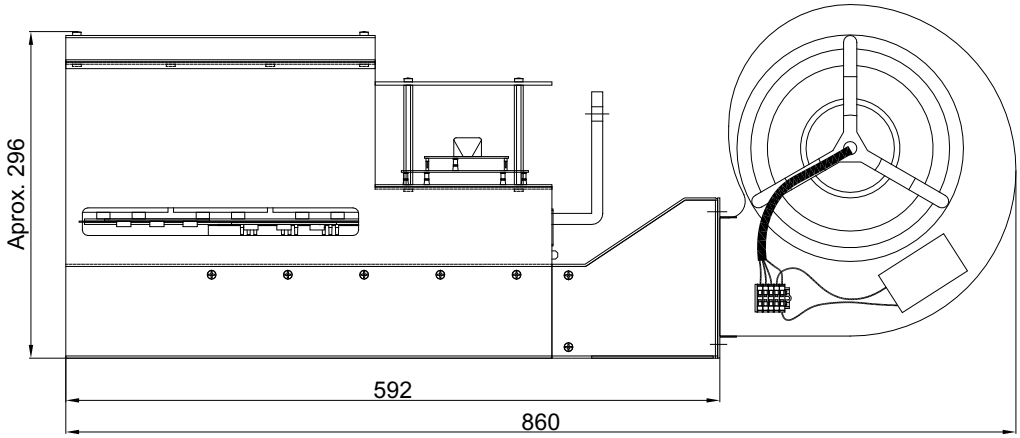
***note 4**: This voltage is limited by DC Link capacitors. Restriction by IGBT maximum voltage must be considered.*

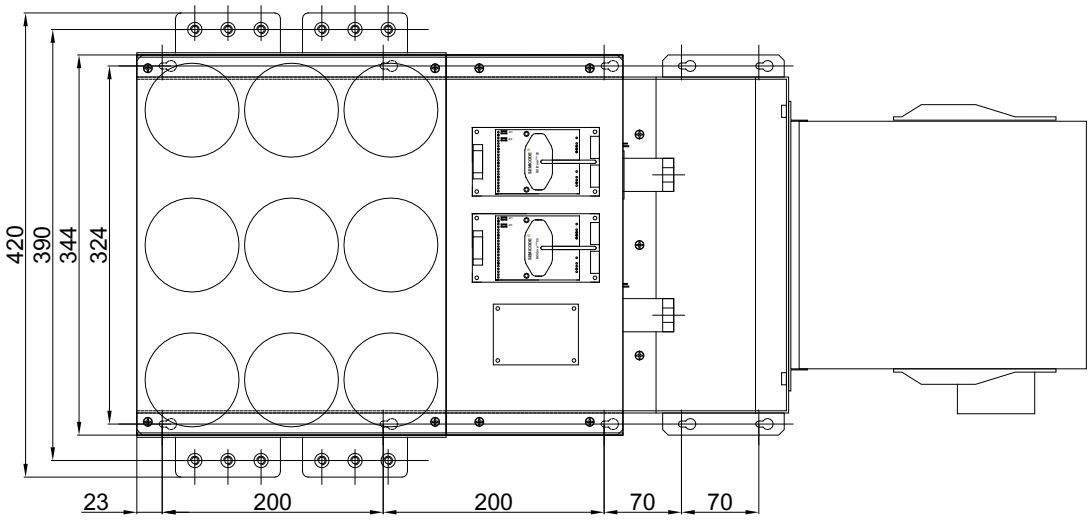
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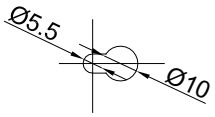
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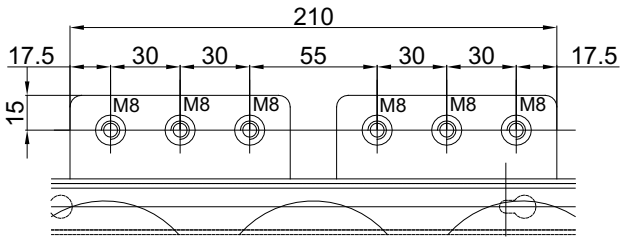
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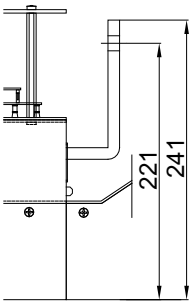
MECHANICAL DIMENSIONS

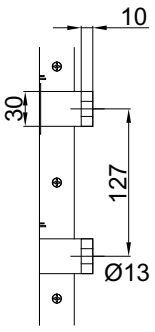












All dimensions in milimeters

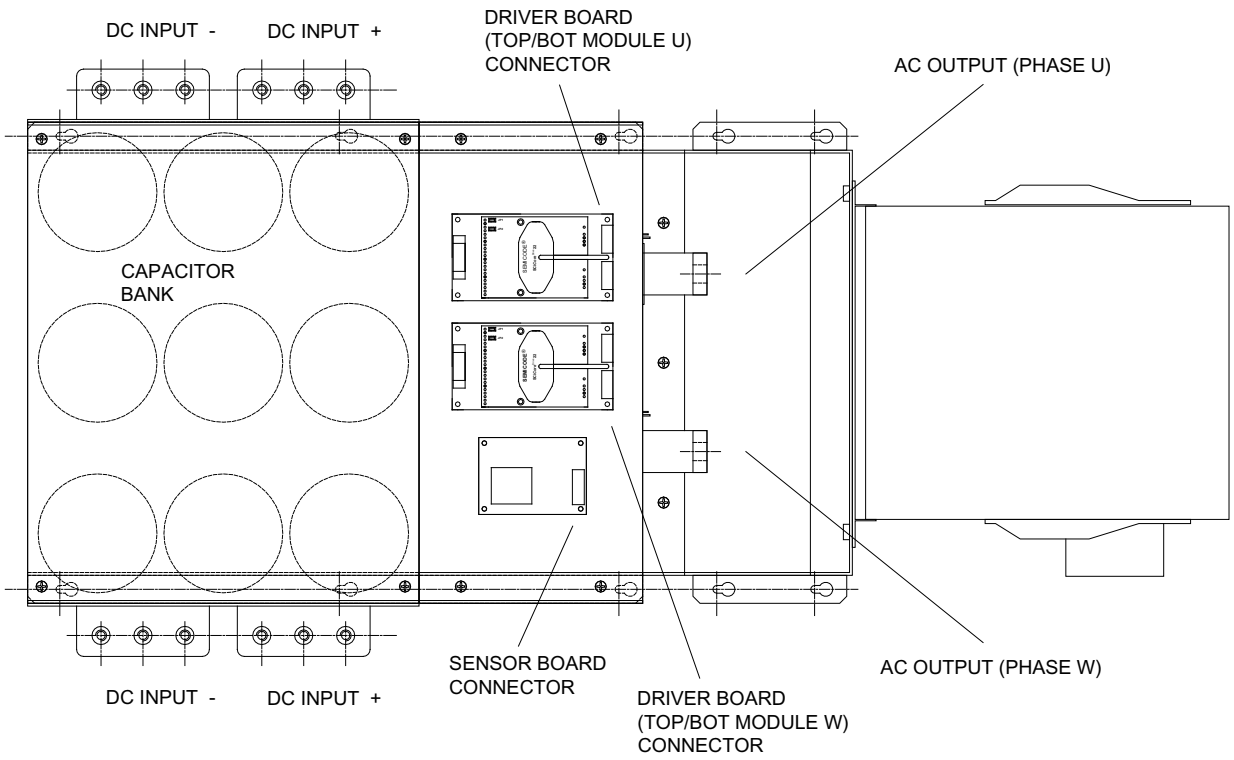
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POWER AND CONTROL CONNECTION



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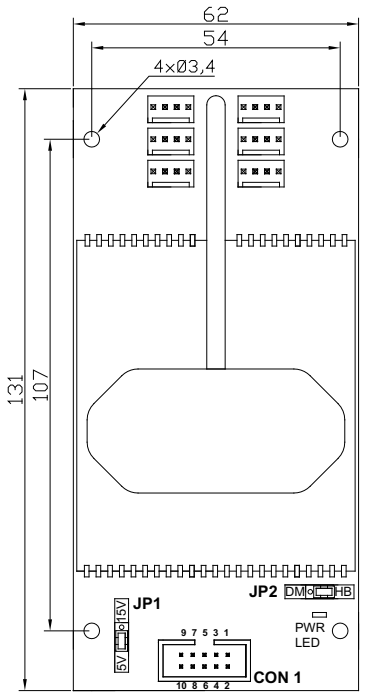
GATE DRIVER BOARD ELECTRICAL CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Min*	*Typ*	*Max*	*Units*
Supply voltage	V_{CC}			15		V
Current consumption	Icc	f_{sw}=10kHz; $Q_{G/pulse}$=6μC		370		mA
PWM & reset High state Input voltage	V_{IN_H}	JP1 to 5V connected	3,5		5	V
PWM & reset Low state Input voltage	V_{IN_L}	JP1 to 5V connected	0		1,5	V
PWM & reset High state Input voltage	V_{IN_H}	JP1 to 15V connected	11		15	V
PWM & reset Low state Input voltage	V_{IN_L}	JP1 to 15V connected	0		4	V
Fault High state Output Voltage	V_{FAULT_H}	working in logic lev; JP1 to 15V			15	V
Fault High state Output Voltage	V_{FAULT_H}	working in logic lev; JP1 to 5V			5	V
Fault (working as open collector) current	I_{FAULT}	working as open collector			20	mA

GATE DRIVER BOARD PINOUT

CON 1	*designation*	*function*
1	PWM_{TOP}	Input logic signal for switching TOP IGBT
2	GND	Ground terminal for supply and logic signals
3	GND	Ground terminal for supply and logic signals
4	RESET	reset input signal (low state
5	GND	Ground terminal for supply and logic signals
6	VCC	+15VDC for supply voltage
7	FAULT	fault output signal
8	VCC	+15VDC for supply voltage
9	VCC	+15VDC for supply voltage
10	PWM_{BOT}	Input logic signal for switching BOT IGBT

JUMPERS	
JP1	right connected: 15V logic level left connected: 5V logicc level
JP2	right connected: half bridge mode left connected: direct mode



All dimensions in mm.

DEFAULT VALUES

· half bridge mode (direct mode optional)
· 4μs dead time between channels generated
· Gate resistor depending of the IGBT module used
· 0-5V input PWM and reset logic levels (0-15V optional)
· 0-5V logic fault output (0-15V or low level-open collector fault output optional)

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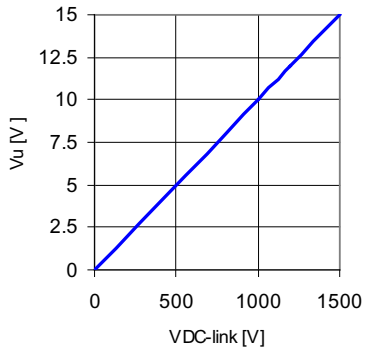
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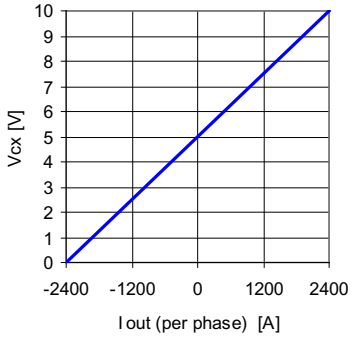
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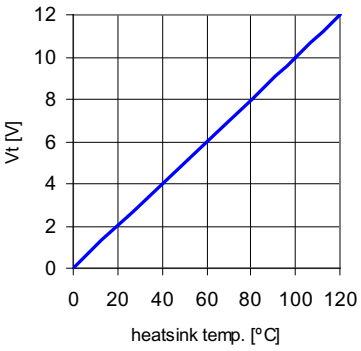
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SENSOR BOARD ELECTRICAL CHARACTERISTICS

Description	*symbol*	*notes/test conditions*	*Min*	*Typ*	*Max*	*Units*
Supply voltage	V_{CC}			±15		V
Feedback signal of heatsink temp.	V_T	relative error <2,5%	0		12	V
Heatsink temp. measurable range			0		120	ºC
Feedback signal of output current	V_{CX}	relative error <3%	0		10	V
Current measurable range			-2400		2400	A
Feedback signal of VDC-link voltage	V_U	relative error <2,8%	0		15	V
DC-link measurable voltage range			0		1500	V_{DC}
Thermostat		Normally connected		90		ºC
NTC rated resistance	$R_{NTC\ 25}$	internal module NTC TC=25ºC		5		kΩ
NTC B value	$B_{25/50}$	**note 1**		3375		K

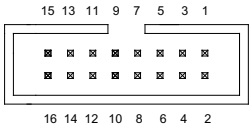






SENSOR BOARD PINOUT

CON 2	*designation*	*function*
1	+15Vcc	+15VDC for supply voltage
2	NTCA1	NTC terminal 1 of IGBT module A
3	N.C.	NTC terminal 2 of IGBT module B
4	N.C.	NTC terminal 1 of IGBT module B
5	NTCC1	NTC terminal 1 of IGBT module C
6	NTCA2	NTC terminal 2 of IGBT module A
7	NTCC2	NTC terminal 2 of IGBT module C
8	TH_2	Thermostat terminal 2
9	V_T	Output voltage representation of heatsink temperature
10	TH_1	Thermostat terminal 1
11	V_{C_B}	Output voltage representation of heatsink temperature
12	V_U	Output voltage representation of VDC-link voltage
13	V_{C_C}	Output voltage representation of phase C output current
14	V_{C_A}	Output voltage representation of phase A output current
15	-15Vcc	-15VDC for supply voltage



note 1: $$R_T = R_{25} \cdot e^{B\left(\frac{1}{T[K]} - \frac{1}{298,15K}\right)}$$

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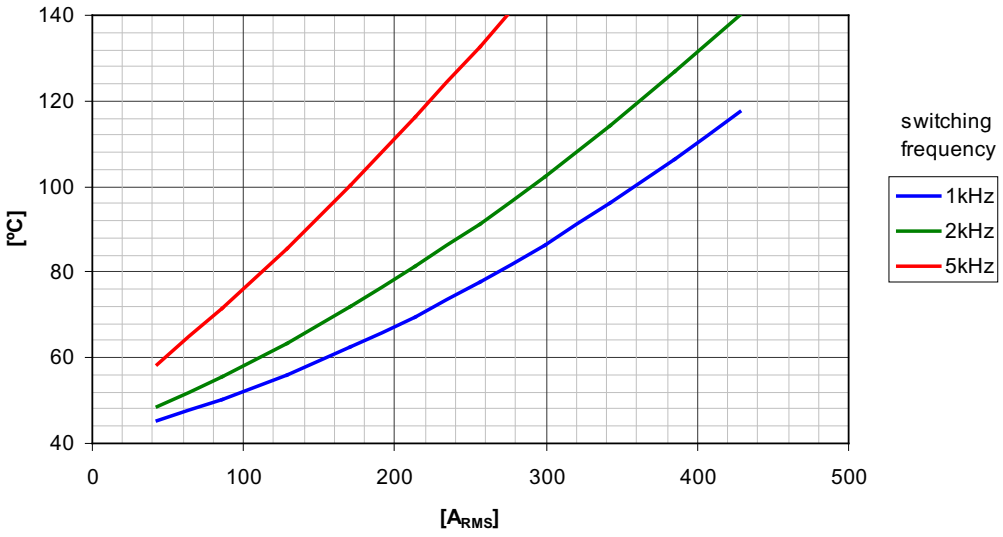
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PERFORMANCE CURVES

Stack working as an inverter

T_{J_IGBT} **vs** I_{OUT} (per phase, AC output)



Condition	*Symbol*	*Value*	*Units*
Ambient temperature	T_A	40	ºC
DClink Voltage	V_{DClink}	900	V
Load Power Factor	PF	0,85	
Modulation index	m	1	
Output frequency	f_{OUT}	50	Hz

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