

**PRELIMINARY TECHNICAL INFORMATION**

**HIGHLIGHTS**

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

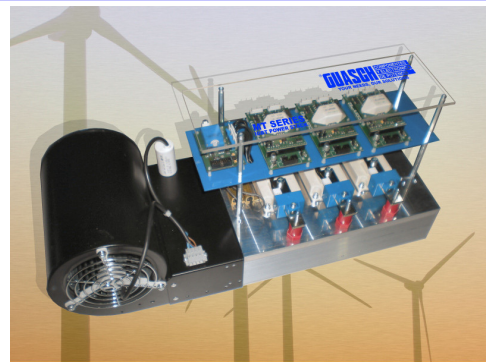


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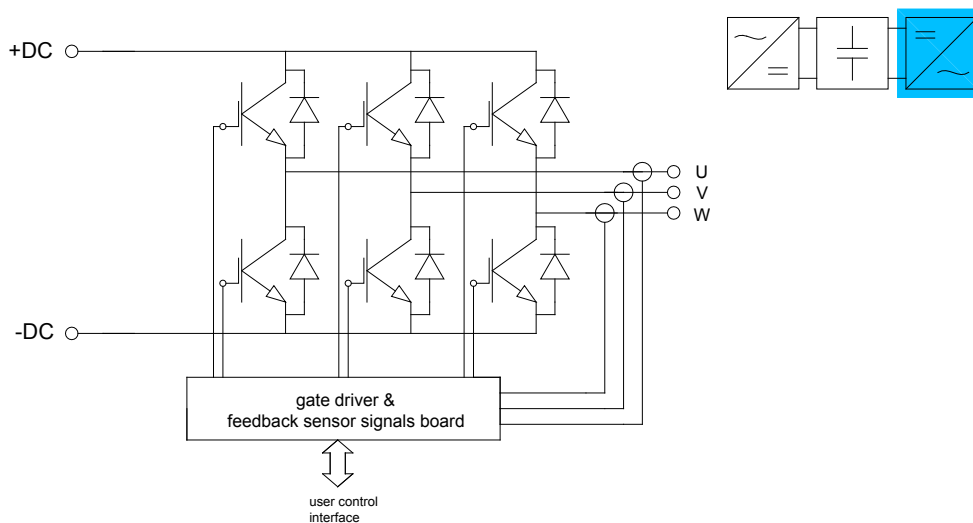
**ABOUT MT SERIES**

RECTIFICADORES GUASCH S.A. offers the most modifiable 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	B6I	
Market	industrial	
Cooling system	centrifugal fan	
Driver system	SCiCoreLink62	
Parameters monitored	DC voltage, Output current (each phase) temperature on heatsink	
Max Voltage applied to DClink	800 V	
Output current per phase	fsw=5kHz, T <sub>J</sub> <125°C Tamb=40°C fo=50Hz P.F.=0,85 m=1 VDClink=600V 339 A	



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## POWER STACK GENERAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
Voltage applied to DClink	$V_{DClink}$	<b>note 1</b>		600	800	$V_{DC}$
Output current per phase	$I_{U,V,W}$	fsw=5kHz, $T_J < 125^\circ C$ Tamb=40°C fo=50Hz P.F.=0,85 m=1 VDClink=600V			339	$A_{RMS}$
IGBT maximum junction temperature	$T_{Jmax}$				150	°C
IGBT temp. under switching conditions	$T_{J(sw)}$		-40		125	°C
Storage temperature	$T_{stg}$		-40		85	°C
Operating temperature	$T_{op}$		-25		85	°C
Power-to-control isolation voltage	$V_{ISOp-c}$	50 Hz @1min/ <b>note 2</b>	3			$kV_{AC}$
Module isolation voltage	$V_{ISOmod}$	50 HZ @1min/ <b>note 3</b>	4			kV
Mounting Torque AC terminals		M6	4.5		5.5	N·m
Mounting Torque DC terminals		M6	4.5		5.5	N·m
Mounting Torque Capacitor Bank		M6	4.5		5.5	N·m
Weight (aprox)				13.7		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	0,92/0,89	A

## IGBT MODULE ELECTRICAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
Collector-Emitter Voltage	$V_{CES}$	$T_J = 25^\circ C$			1200	V
DC Collector current	$I_{Cnom}$	$T_C = 80^\circ C, T_J = 150^\circ C$			450	A
Repetitive peak collector current	$I_{CRM}$	$t_p = 1ms$			900	A
Power dissipation (per module)	$P_{DISS}$	$T_C = 25^\circ C, T_J = 150^\circ C$			2400	W
Collector-emitter saturation voltage	$V_{CEsat}$	Ic=450 A, $T_J = 125^\circ C$		2,05		V

**note 1:** This voltage is limited by IGBT module restricted by DC Link capacitors voltage.

**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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## ENVIRONMENTAL SPECIFICATIONS

### Description

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

## MOUNTING CONSIDERATIONS

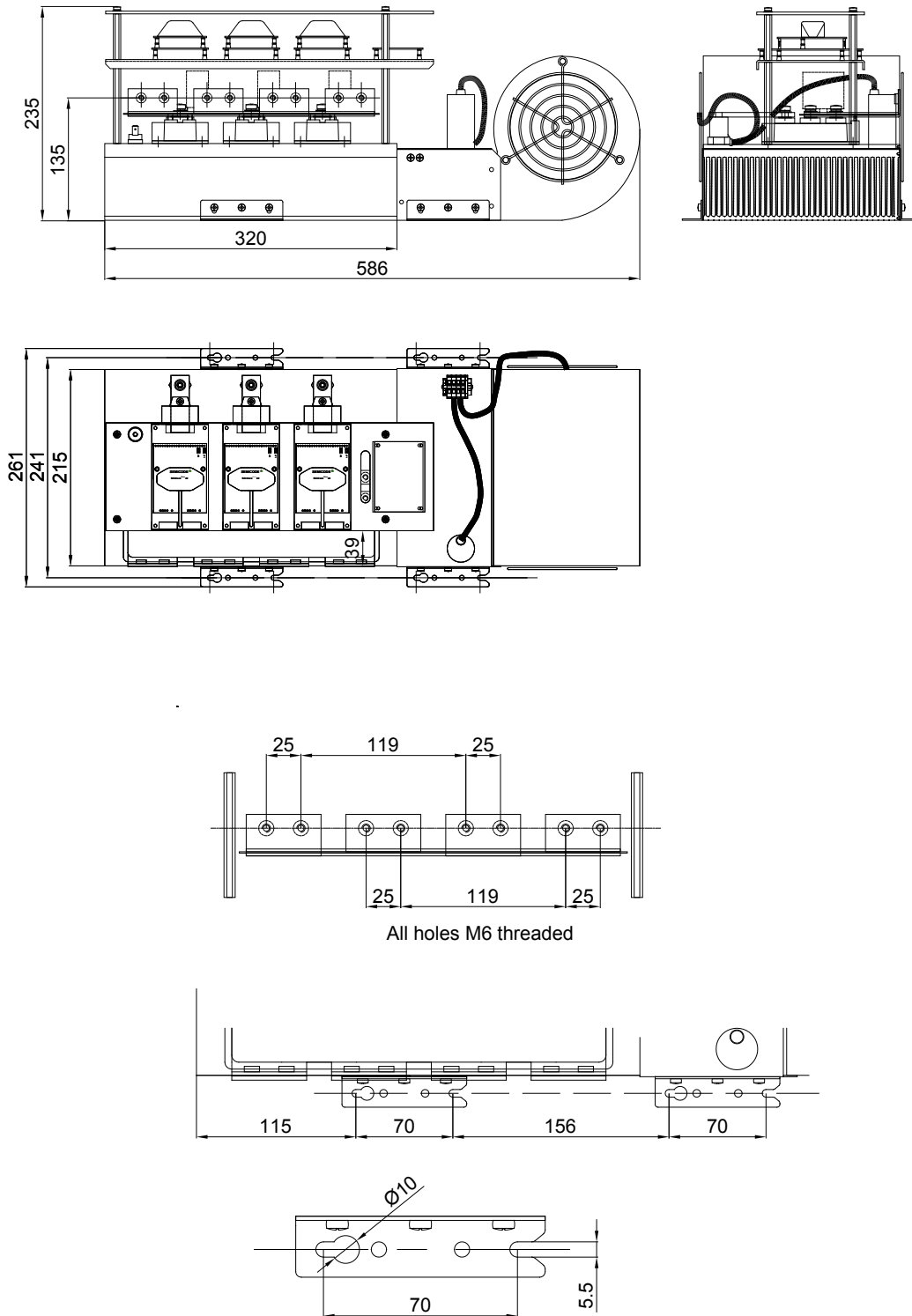
It's necessary a minimum distance of 100 mm with regard to the envelope. The free air circulation should be guaranteed. Avoiding the heat sources of nearby to assembly.

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.

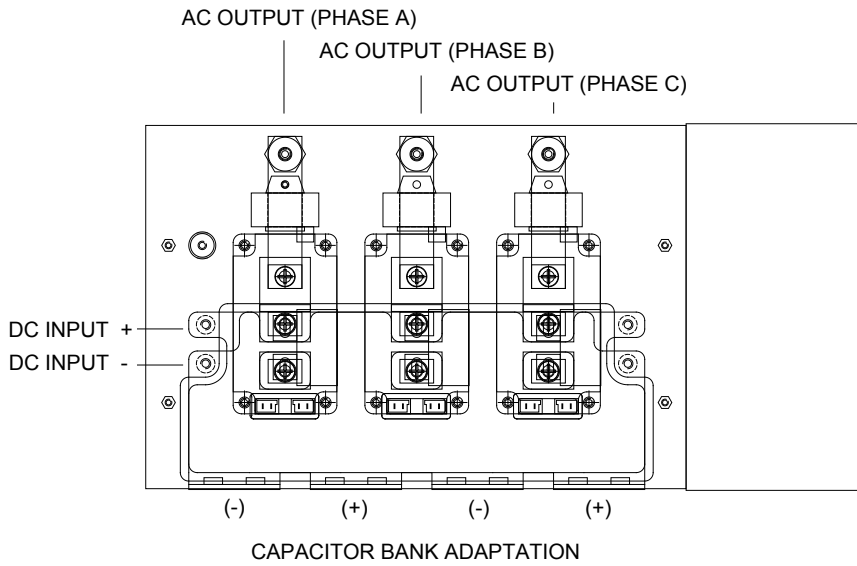
## MECHANICAL DIMENSIONS

All dimensions in mm.

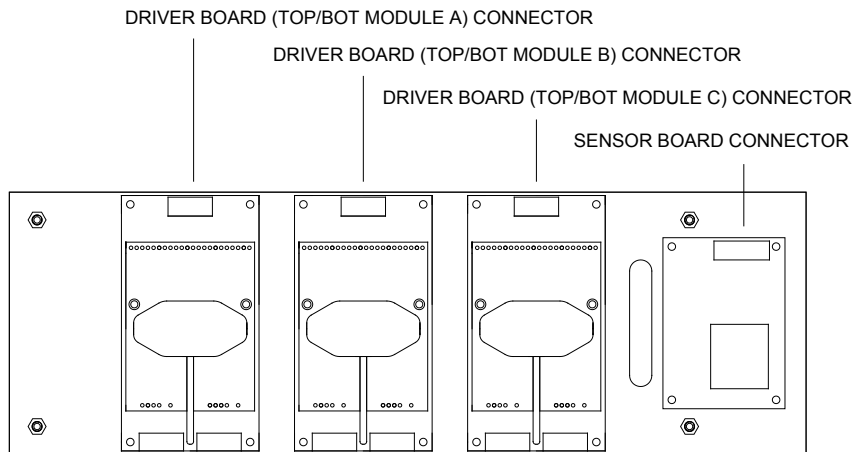


All holes M6 threaded

**POWER CONNECTION**



**CONTROL CONNECTION**



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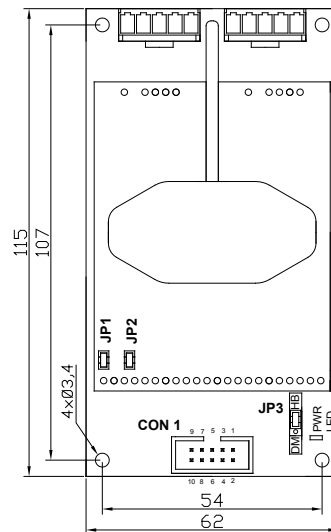
### GATE DRIVER BOARD ELECTRICAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
Supply voltage	$V_{CC}$		14	15	16	V
Current consumption	$I_{CC}$	$f_{sw} = 10\text{kHz}; Q_{G/pulse} = 6\mu\text{C}$		390		mA
PWM High state Input voltage	$V_{PWM\ H}$	JP1&JP2 connected	3,5		5	V
PWM Low state Input voltage	$V_{PWM\ L}$		0		1,5	V
PWM High state Input voltage	$V_{PWM\ H}$	JP1&JP2 unconnected	11		15	V
PWM Low state Input voltage	$V_{PWM\ L}$		0		4	V
Reset High state Input Voltage	$V_{RESET\ H}$		2		5	V
Reset Low state Input Voltage	$V_{RESET\ L}$		0		0,8	V
Fault (working as open collector) current	$I_{FAULT}$	working as open collector			8	mA
Fault High state Output Voltage	$V_{FAULT\ H}$	working in logic level			5	V

### GATE DRIVER BOARD PINOUT

CON 1	designation	function
1	PWM <sub>TOP</sub>	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 <sub>BOT</sub>	Input logic signal for switching BOT IGBT

JUMPERS	
JP1	both connected: 5V logic level
JP2	both unconnected: 15V logic level
JP3	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 logic levels (0-15V optional)
- 0-5V logic fault output (low level-open collector fault output optional)

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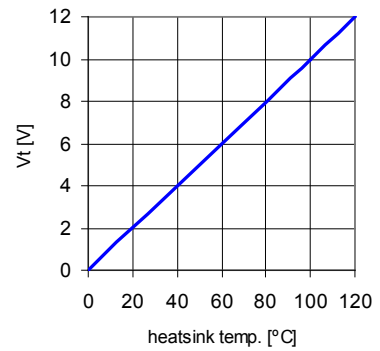
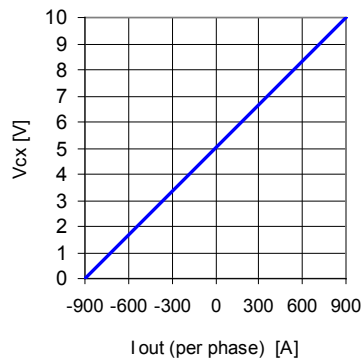
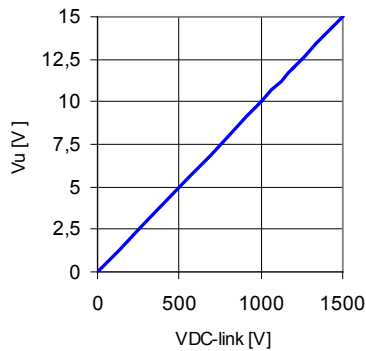
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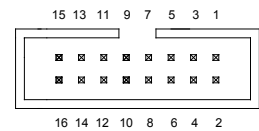
## SENSOR BOARD ELECTRICAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
Supply voltage	$V_{CC}$			$\pm 15$		V
Feedback signal of heatsink temp.	$V_T$	relative error <2,5%	0		12	V
Heatsink temp. measurable range			0		120	°C
Feedback signal of output current	$V_{CX}$	relative error <3%	0		10	V
Current measurable range			-900		900	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		
NTC rated resistance	$R_{NTC 25}$					kΩ
NTC B value	$B_{25/50}$					K



## SENSOR BOARD PINOUT

CON 2	designation	function
1	+15Vcc	+15VDC for supply voltage
2	N.C.	
3	N.C.	
4	N.C.	
5	N.C.	
6	N.C.	
7	N.C.	
8	TH <sub>2</sub>	Thermostat terminal 2
9	$V_T$	Output voltage representation of heatsink temperature
10	TH <sub>1</sub>	Thermostat terminal 1
11	$V_{C V}$	Output voltage representation of phase V output current
12	$V_U$	Output voltage representation of VDC-link voltage
13	$V_{C W}$	Output voltage representation of phase W output current
14	$V_{C U}$	Output voltage representation of phase U output current
15	-15Vcc	-15VDC for supply voltage



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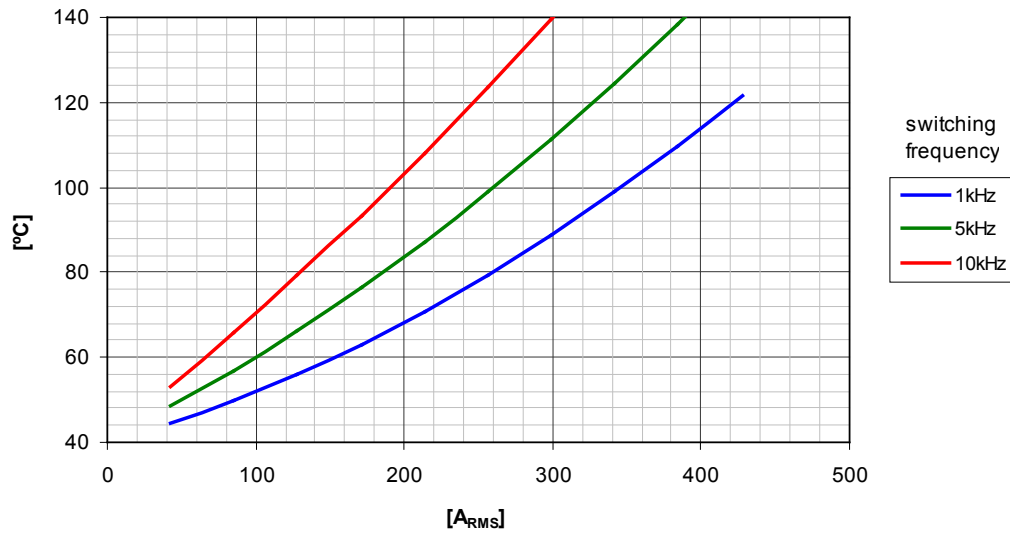
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**PERFORMANCE CURVES**

Stack working as an inverter

**T<sub>J\_IGBT</sub> vs I<sub>OUT</sub> (per phase, AC output)**



Condition	Symbol	Value	Units
Ambient temperature	T <sub>A</sub>	40	°C
DCLink Voltage	V <sub>DCLink</sub>	600	V
Load Power Factor	PF	0,85	
Modulation index	m	1	
Output frequency	f <sub>OUT</sub>	50	Hz



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