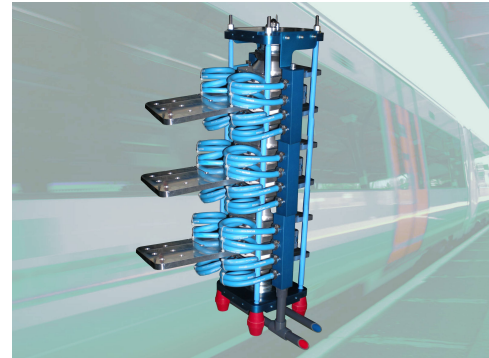


PRELIMINARY TECHNICAL INFORMATION

HIGHLIGHTS

- strong reliability
- ruggedness
- good short circuit behaviour
- high voltage ratings
- water cooled
- driver system included
- fuse less design

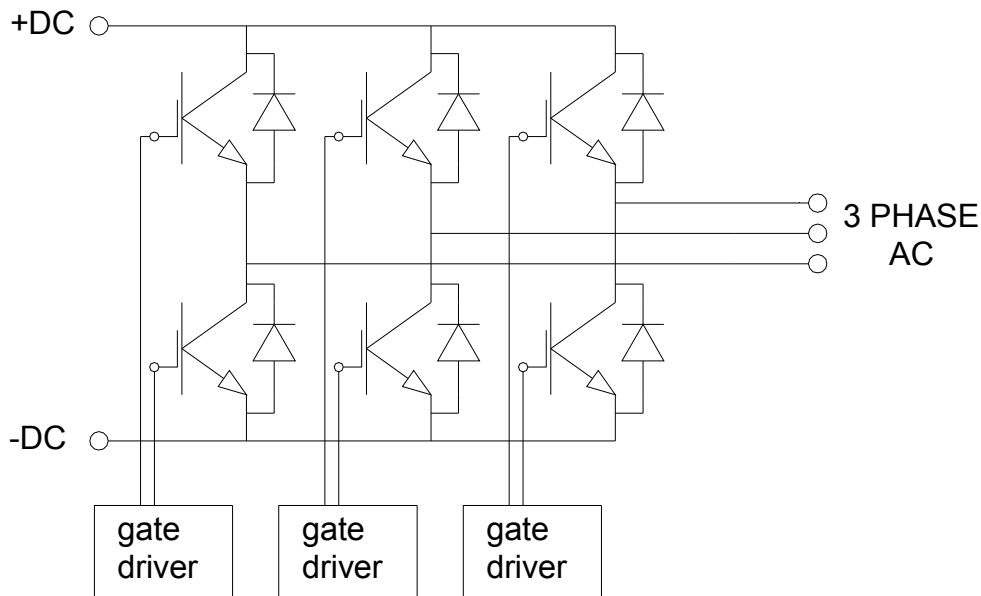


Non-contractual photo

ABOUT SP SERIES

RECTIFICADORES GUASCH S.A. offers the IGBT assemblies in press pack format. Press pack IGBTs reduce the explosion risk, improve power cycling performance as well as provide better short circuit behaviour compared with modules. Also the stray inductance in both gate and emitter connections is reduced. SP stacks are built with 2500V & 4500V IGBTs, suitable for wide range of high power IGBT assemblies.

The modular system allows different topologies, covering a wide range of applications like induction heating, traction applications, high power inverters, HVDC transmission, active VAr controllers, medium and high voltage drives. The assemblies are totally stackable, maintaining in this way a single input/output water flux, with low pressure drop.



POWER STACK GENERAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
IGBT maximum junction temperature	T_{Jmax}				125	°C
IGBT switching conditions temp.	$T_{J(sw)}$		-40		125	°C
storage temperature	T_{stg}		-40		85	°C
operating temperature	T_{op}		-25		85	°C
voltage applied to DC-link	V_{DClink}				2800	V_{DC}
power-to-control isolation voltage	$V_{ISO-p-c}$	50 Hz @1min/ note 1	10500			V_{AC}
power-to-housing isolation voltage	$V_{ISO-p-g}$	50 Hz @1min/ note 2	10000			V_{AC}
weight (aprox)				85		kg

COOLING SYSTEM CHARACTERISTICS

Description	Typical	Units
type	Liquid cooled heatsink	
refrigeration fluid	Ethylene glycol 30%	
total flow rate	45-50	l/min

IGBT MODULE ELECTRICAL CHARACTERISTICS

Description	symbol	notes/test conditions	Min	Typ	Max	Units
collector-emitter Voltage	V_{CE}				4500	V
DC collector current	I_{Cnom}	$T_{HK}=55^{\circ}C$			1800	A
repetitive peak collector current	I_{CRM}	$t_p=1ms, T_J=125^{\circ}C$			3000	A
power dissipation (per device)	P_{DISS}	$T_{HK}=25^{\circ}C$			20	kW
collector-emitter saturation voltage	V_{CEsat}	$I_c=1800 A, T_J=125^{\circ}C$		4,7		V

ENVIRONMENT 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 recommended 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.

note 1: 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 2: This isolation voltage is referred to the minimum electrical isolation between any power connection (DC input, AC output) and any point that could be used to fix the assembly inside a cabinet or in a support structure.

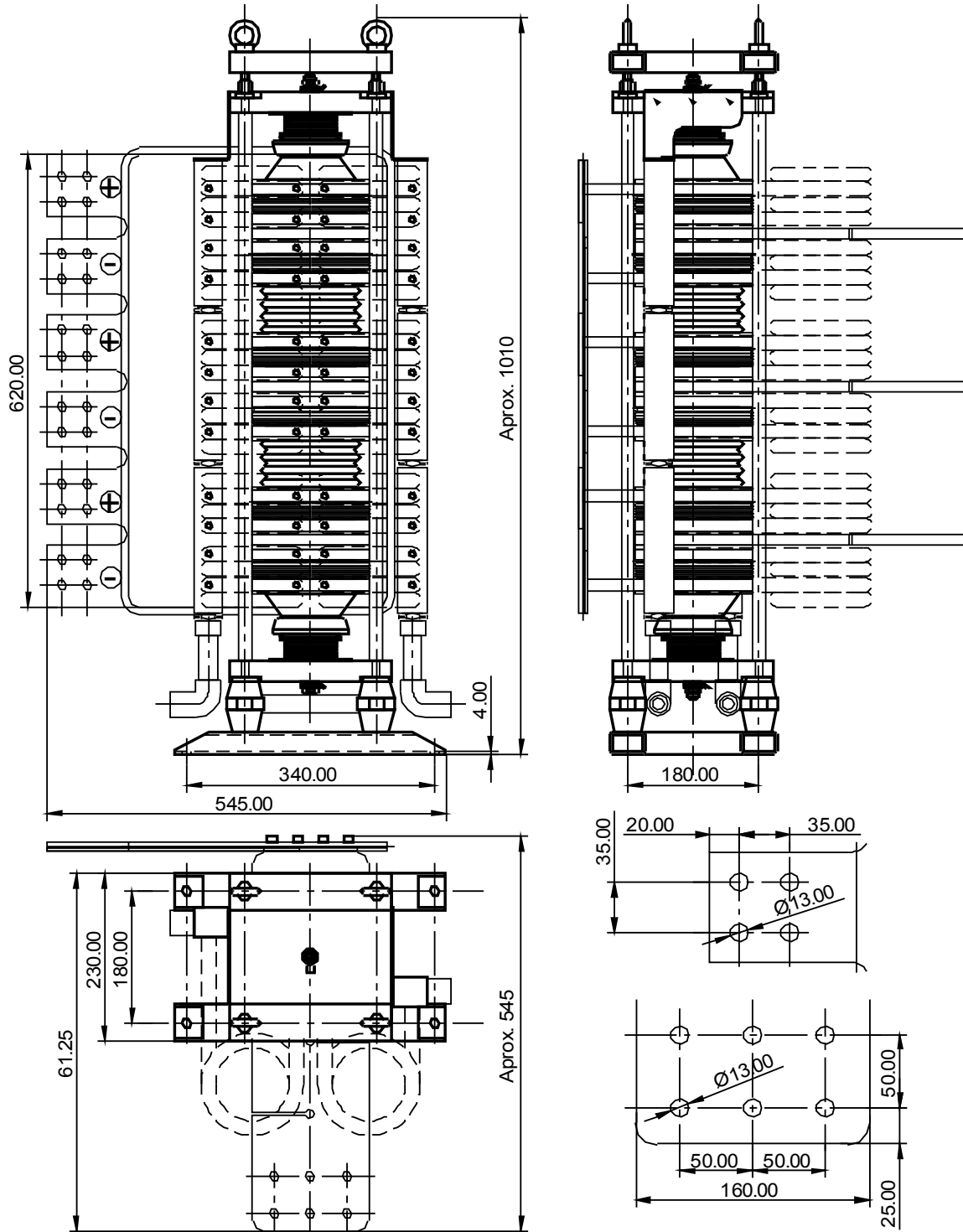
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MECHANICAL DIMENSIONS



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DRIVER BOARD CHARACTERISTICS

driver system used: Inpower 1PSE1A45-105

BRIEFING

- Smart switching with variable gate resistors
- Tuned according to the application
- Reliable protection against
 - over-current in all short circuit conditions
 - over-voltage during turn-off
- Advanced control and protection functions
 - four level desaturation monitoring
 - two level di/dt monitoring
 - feedback clamping with active function
 - multiple soft shut down
 - supply voltage monitoring
 - digital input filter for switching signals
- DC/DC converter included

ELECTRICAL CHARACTERISTICS

Description	symbol	notes	Min	Typ	Max	Units
supply voltage	V_{CC}		14		30	V
input PWM driving signal		optical		660		nm
output fault signal		optical		660		nm
maximum switching frequency	f_{sw}				833	Hz
turn-on delay time	t_{pdON}			400		ns
turn-off delay time	t_{pdOFF}			400		ns
typical time of soft shut down	t_{SSD}			1-2		μ s
max. system time between fault detection and error notification	t_{SYS}				100	ns
time between detection of desaturation and gate voltage falling edge	t_{pDES}			300		ns

CONNECTORS

optical receiver	HFBR-2531Z (Avago)
optical transmitter	HFBR-1531Z (Avago)
DC supply on PCB	FKC 2,5/2-STF-5,08 (Phoenix)

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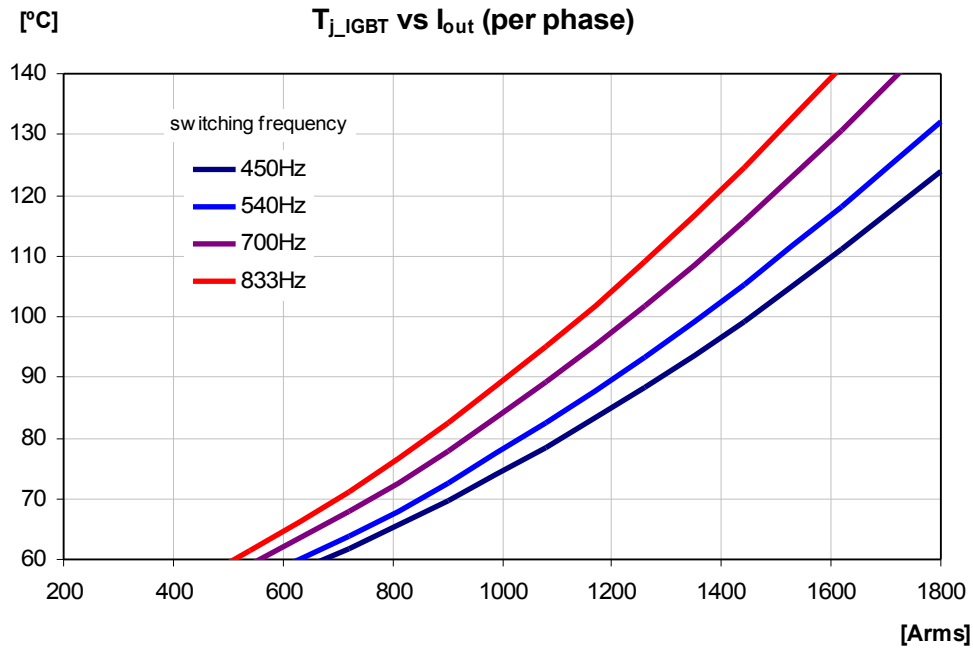
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PERFORMANCE CURVES

The following curves shows the inner chip temperature of the IGBT as a function of the output current, (when the stack works as an three phase inverter) with the switching frequency as a parameter



Condition	Symbol	Value	Units
ambient temperature	T_A	40	°C
DC-link Voltage	V_{DClink}	2700	V
total flow rate	Q	48	l/min
load power factor	PF	0,85	
modulation index	m	1	
output frequency	f_{OUT}	50	Hz

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