GENERAL INF

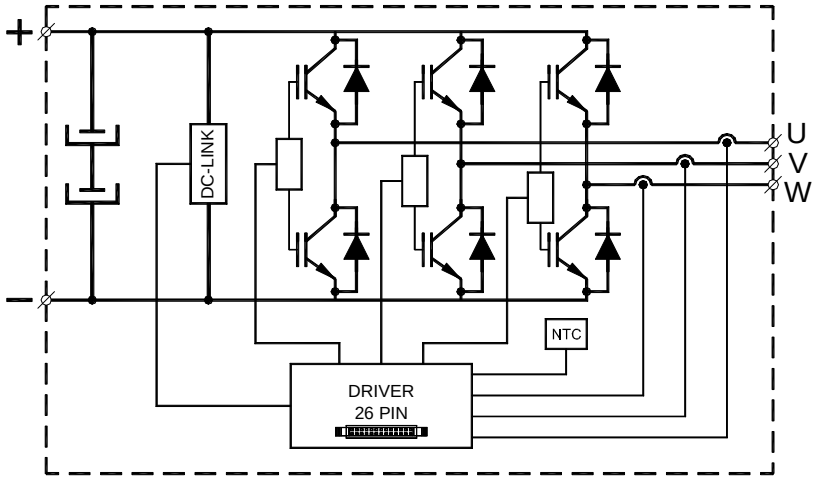
Description

Power equipments for the control of three-phase charges:

- Last generation IGBTs.
- Power protection against overcurrent, Vce-sat. , overtemperature, overvoltage and gate voltage drop.
- Analogical protected outputs; such as heat-sink temperature; DC-link voltage measurement and currents.
- Capacitor bank in DC-link with low inductance.
- Power supply and control signals with flat cable of 26 conductors. It is compatible with other brands.

Applications

- Motor controls
- Solar
- Energy storage
- UPS



Common Data

- ✓ Flat cable with 26 conductors (I/O). It is compatible with other brands.
- ✓ Maximum working DC voltage 800 volts.
- ✓ DC Control voltage supply 24 volts. (Range to 20-30V).
- ✓ Protected inputs against electrostatic charges.
- ✓ Trigger inputs, voltage CMOS 15 V (max 20V). Impedance 3K3 ohms.
- ✓ It has one current sensor per branch.
- ✓ 2 IGBT NTC internal sensors per heat-sink for measuring the temperature. Except model INF 450 with 2 external sensors.
- ✓ DC-link measurement card, with isolated analogical output.
- ✓ 5 protected analogical output against short-circuits.
  - o 3 of current.
  - o 1 of DC-link
  - o 1 of temperature (highest NTC).
- ✓ 4 open collector outputs for alarm indications. It is protected against overcurrent.
  - o 1 output per branch.
  - o 1 overtemperature.

Protections

- ✓ Logic protection against any anomaly. This protection inhibits the gate and switch-off the module to pass 200ms, during this period avoid triggering the gate. This protection introduces an additional advantage against possible failure of external control.
- ✓ Individual alarm of each three branches.
- ✓ Individual alarm of each one of three branches.
- ✓ Overcurrent alarm (See the analogical output table).
- ✓ Overvoltage alarm in DC-link bus (>800V)
- ✓ Power supply fault alarm (<20V)
- ✓ IGBTs protection by Vce sat. and gate voltage drop.

Measurement Ranges

Within each size, there are several models in order to adjust to the needs of the loads. Certain charges need the current measurement as precise as possible, which is the case of the motors controlled by vector control.

Data obtained at 560VDC F. SW = 4KHz TAMB = 40ºC						
INF Code		**IRMS (A)**		**IcPICO (A)**		**TOTAL CAPACITY**
		I.RMS1	**I.RMS2**	**8V**	**10V**	**EQUIPMENT**
					ALARM	(Electrolytic capacitor)
SIZE 1						
50	-10	10	13	24	30	4 (1500) = 1500uF
	-15	20	26	44	56	
	-20	29	38	69	86	
	-25	39	52	89	111	
SIZE 2						
150	-10	45	60	133	167	8(1500) = 3000µF
	-15	64	85	159	198	
SIZE 3						
450	-25	150	200	427	533	8 (3300) = 6600µF
SIZE 4						
1400	-15	348	435	788	985	12 (6800) = 20400µF
	-20	445	550	1000	1250	
SIZE 5						
2801	-10			1376	1720	24(5600) = 33600µF
	-15			1564	1955	
	-20			1690	2112	

Flat Cable

Flat cable with 26 conductors.
The power supply and the control signals are connected through it.
In order to determine the supply consumption of every module to check the pdf file. In equipments with size 4 to 5, if the power supply current exceeds 2 A.;
It is recommendable to supply them with an external connector. In this way, the flat cable is for control signals.
The current relations are according to model. See table below.

Pin	signal		remark
1	free		
2	HB 1	BOT IN	positive 15V CMOS logic; 3k3 impedance
3		ALARM OUT	Alarma HB 1 LOW = NO ERROR; open colector output
4		TOP IN	positive 15V CMOS logic; 3k3 impedance
5	HB 2	BOT IN	positive 15V CMOS logic; 3k3 impedance
6		ALARM OUT	Alarma HB 2 LOW = NO ERROR; open colector output
7		TOP IN	positive 15V CMOS logic; 3k3 impedance
8	HB 3	BOT IN	positive 15V CMOS logic; 3k3 impedance
9		ALARM OUT	Alarma HB 3 LOW = NO ERROR; open colector output
10		TOP IN	positive 15V CMOS logic; 3k3 impedance
11	Overtemperature OUT		LOW = NO ERROR; open colector output
12	free		
13	V DC. LINK		analog OUT; 9V = 800V
14	+24V IN		24V DC (20 - 30V)
15	+24V IN		24V DC (20 - 30V)
16	free		
17	free		
18	GND		GND for power supply and digital signals
19	GND		GND for power supply and digital signals
20	Temp. Alnalog OUT		analog OUT; 8V = 75ºC
21	GND aux.		reference for analog output signals
22	I analog OUT HB 1		analog OUT; 10V = Max current (100% Ic) see table
23	GND aux.		reference for analog output signals
24	I analog OUT HB 2		analog OUT; 10V = Max current (100% Ic) see table
25	GND aux.		reference for analog output signals
26	I analog OUT HB 3		analog OUT; 10V = Max current (100% Ic) see table

Digital Inputs

The trigger input HB-1-2-3 TOP and BOT are CMOS inputs, with an input impedance of 3k3 ohm. They have a small filter and protections against electrostatic charges.
The typical high and low levels are:

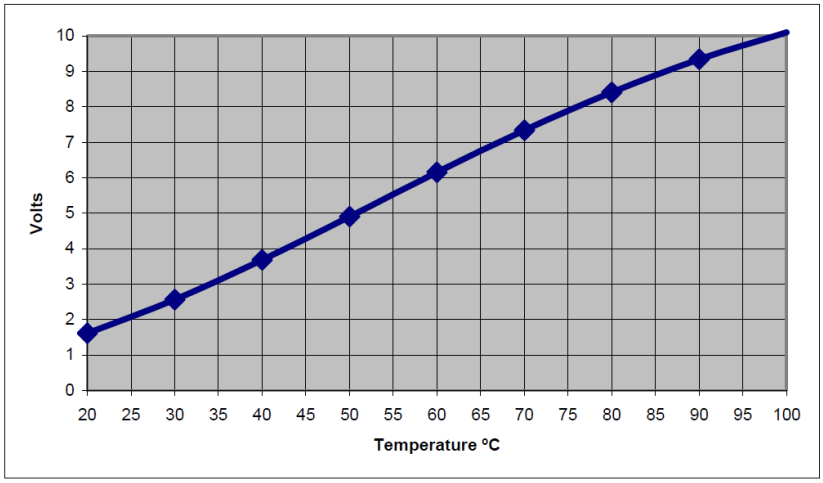
- Low level “0” lower than 7,3 volts.
- High level “1” higher than 9,4 volts

Analogical Outputs

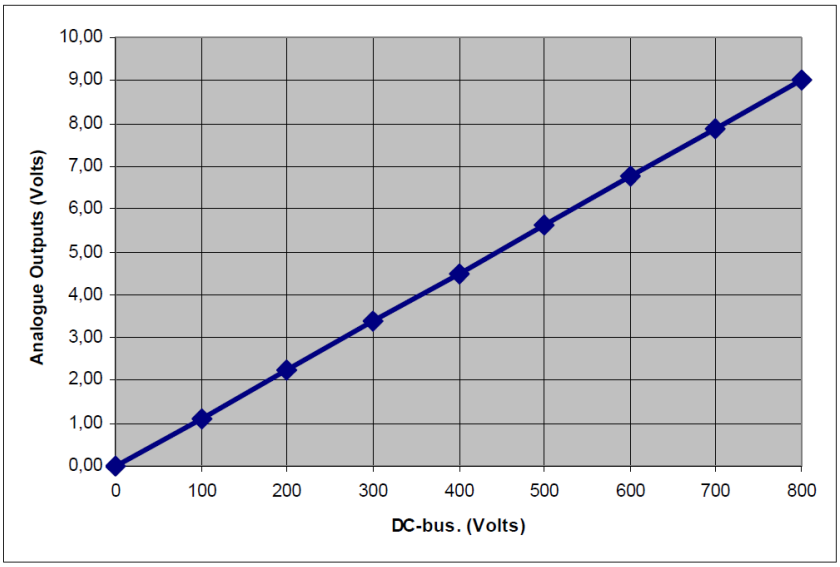
The analogical outputs are protected against overcurrent. Current higher than 30mA.
The measurement ranges according to attached table.

Analogical Outputs	Measurement Range(V)		Equipment protections	
	Min.	Max.		
Outputs according to the current table	-10	+10	+/-10V +/-1%	STOP
Temperature output	0	+10	78ºC +/- 2 ºC	STOP
Temperature output Model INF 450	0	+10	84ºC +/- 2 ºC	STOP
Bus DC output	0	+10	9V(800V) +/-5%	STOP

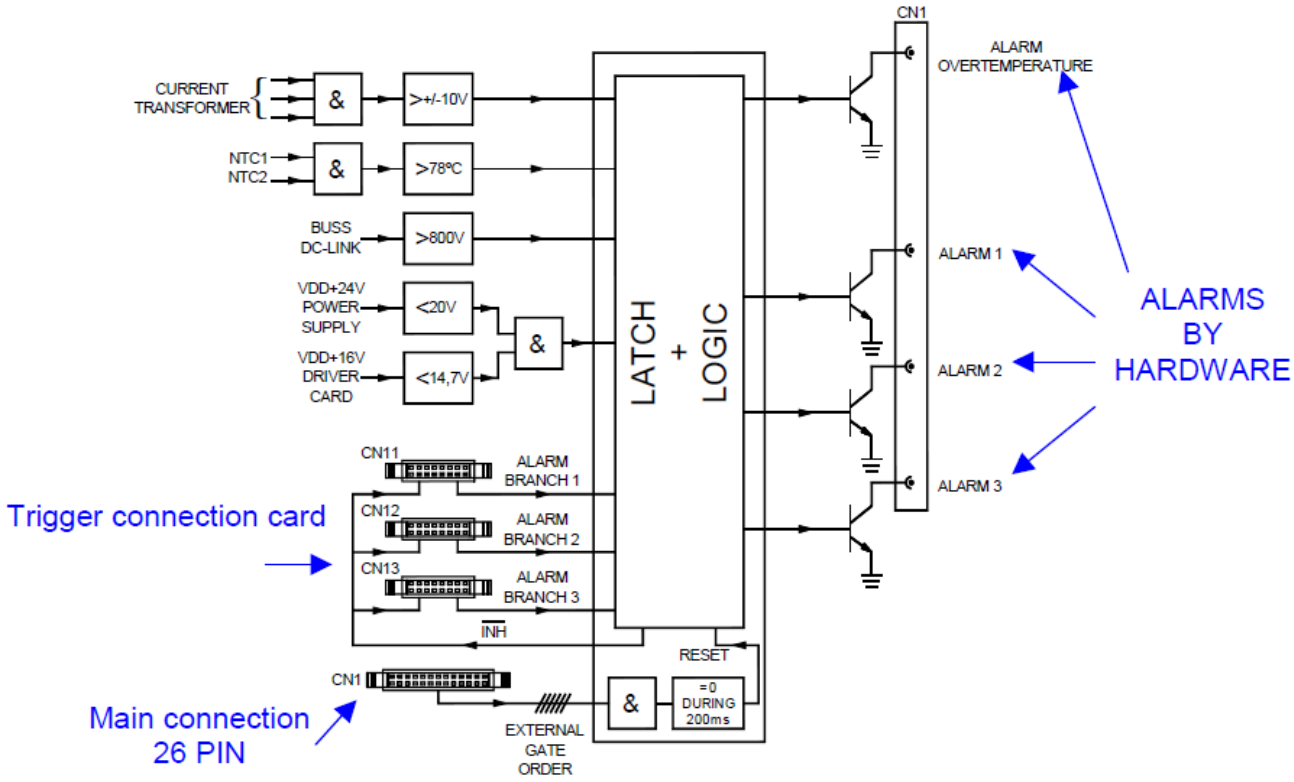
Informative graph of NTC outputs (Tolerance +/- 3ºC). Highest temperature between two NTC of the equipment. It can be considered linear scale between (30ºC = 2,5V y 80ºC = 8,5V). Both NTC are placed in the heat-sink as close as possible to the IGBT,s



Informative Bus graph of DC-link output (MTC-3028) (Tolerance +/- 2%). The total voltage is measured in the Bus through the DC-link. The scale is linear. The maximum voltage on the bus for this series is 800V. (If it exceeds this voltage, it cuts trigger gate).



ALARMS *(hardware)*



The outputs corresponding to the alarms are in open-collector and are protected against short-circuits (max 30 mA.)

Alarm Codes

CONDITIONS	TEMP ALARM	ALARM1	ALARM2	ALARM3
ALARM BRANCH 1	0	1	0	0
ALARM BRANCH 2	0	0	1	0
ALARM BRANCH 3	0	0	0	1
OVERTEMPERATURE	1	0	0	0
OVERCURRENT	0	1	1	1
V_{BUS} HIGH	0	1	1	1
$V_{ALIMENTACIÓN}$ LOW	0	1	1	1

As can be observed, the alarms of overcurrent, overvoltage and low supply voltage are not differences in hardware.