

POWER CONTROL CARD (MTC-3001)

Description

Board with excellent dynamic features designed to control motors, obtaining high precision on low speed torque loop and speed. Its frontal part is made up of:

- Connexion with power stage through flat cable.
- Alphanumeric display to indicate the different stages of the equipment (power system alarms, control systems alarms, board configuration...)
- Direct entry with supply for differential encoder.
- Configurable outputs of optical fiber for the connexion of the board to a fast meter module.



Application

Net regeneration from a bus D/C for the realization of UPS, brakes...

High precision electric drives for motor controlling...

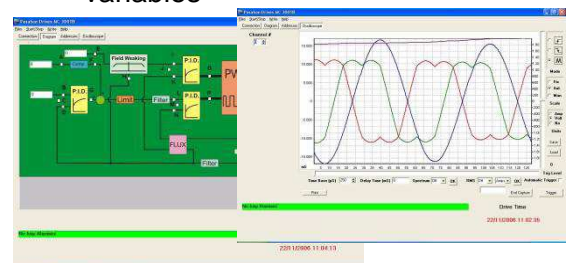
- ...D/C, controlled with torque loop and speed.
- ...Induction motor in vector control, with encoder and sensorless.
- ...servo brushless in torque loop and speed.

Additional Data

Tools

- ✓ Europe board format
- ✓ Alarms and warnings by jumps in the configurable references.
- ✓ Integrates software scopemeter which allows the visualization online of variables and parameters of the system with different shoots.
- ✓ Alarm historic management for an easy way of problem detection, with graphic storage of the parameters and variables of the equipment.
- ✓ Flat cable 26PIN (connexion with power stage)
- ✓ Alphanumeric display 35LED
- ✓ Do exist FBs (under codesys) for an easy use of the control.

- ✓ TPC/IP connexion through CPU MTC-3000.
- ✓ Fast meter board for high complexity tools.
- ✓ Graphic interface program for an easy configuration of the equipment and for a graphic visualization of the systems variables



ALARMS (NFS & CMS)

The alarms for the new MTC-3001 line are latched, must pass 6 seconds until the alarm could be reset.

The fault alarms in the branches can acquire two different codes in the Pasaban Drives, having better information about the cause that produces the failure. If in the alphanumeric display of the MTC-3001 appears the text E1, the cause of the alarm can be due to an extern cause or breakdown in the equipment, which will correspond with code "1" in the Pasaban Drives. On the other hand, if instead the mentioned code, we have "101", means that the equipment is breakdown.

The codes from 1 to 15 (in bold), appear when the frequency converter has been previously working. The codes from 101 to 115, appear after giving the starting order and before producing it.(in case of an existing defect in the equipment)

PASABAN DRIVES CODE		ALARM(s) HW BRANCH(s)				MTC-3001 DISPLAY
		1	2	3	4	
1	(101)	•				Eu
2	(102)		•			Ev
4	(104)			•		Ew
8	(108)				•	Et
7	(107)	•	•	•		Ey
15	(115)	•	•	•	•	Ez
3	(103)	•	•			Ex
5	(105)	•		•		
9	(109)	•			•	
11	(111)	•	•		•	
13	(113)	•		•	•	
6	(106)		•	•		
10	(110)		•		•	
14	(114)		•	•	•	
12	(112)			•	•	

Alarm 8 (STOP)

This alarm is configured when a 10V is obtained in the hall effect transformer. Depending on the frequency converter model, the meaning of the alarm for the power stage differs

- NFS Model => Over temperature
- CMS Model => Over temperature
Supply>19V
Over current

PASABAN DRIVES CODE	SW ALARM		MTC-3001 DISPLAY
20	RMS Current	Branch R	Eb
21		Branch S	
22		Branch T	
30	Over current PEAK	Branch R	Ea
31		Branch S	
32		Branch T	

Alarm 20...22 (STOP)

By SW it's observed the area of the current that overcomes the RMS value of it. In case of overcoming the users prearranged value, the alarm appears.

Alarm 30...32(STOP)

By SW is observed when the current overcomes the motors peak value.

If the values of the alarms Ea and Eb are really close, for a big motor is more possible an Eb, but if the motor is smaller is more possible an Ea. Depends on the motor.

PASABAN DRIVES CODE	SW ALARMS	MTC-3001 DISPLAY
40	WD / CPU	Ec
41	Faulty encoder	Ed
42	Inverted turn	Ee
43	Max speed reached	Ef
45	Loss	dot

Alarm 40 (STOP)

The WD CPU alarm, appears if the frequency converter is started in local mode without disconnecting the WD (Starting process in local mode.....)

Alarm 41 (STOP)

While the encoder is turning the impulses are read, and if the tolerance (adjustable by the user) differs from the characteristical pulses/turns of the pulses generator, it's considered that the encoder is faulty, giving the Ed alarm.

Alarm 42 (STOP)

Despite that by software has been annulled the inversion of the cutting-motor turn, if during a braking the master loses control, the slave is left with negative torque, therefore the cut would turn in the opposite direction. To that purpose the encoder movement direction is analysed and in case of being negative it stops the machine showing the Ee message.

Alarm 43 (STOP)

This alarm appears when the motor/frequency converter reaches a 200KHz frequency. The measurements in this frequency are not guaranteed.

Alarm 45 (STOP)

The frequency converter starts working wrong (PWM outputs of the frequency converter start switching off, in the display appears a dot...)It's necessary to reset the controlling board to reco0ver the frequency converters configuration.

PASABAN DRIVES CODE	V _{BUS} ALARM	MTC-3001 DISPLAY	MC-2001 DISPLAY
50	High	Eh	UH
51	Low	Eg	UL

Alarm 50...51 (STOP)

They correspond to measurements done in the BUS DC and they are compared with superior and inferior limits prefixed by the user.

PASABAN DRIVES CODE	ALARM JUMP IN THE REFERENCE...	MC-2001 DISPLAY
120	Tension in mode	Aa
121	Speed	Ab
122	Acceleration compensation	Ac
123	Torque	Ad
124	Frequency	Ae
125	Magnetizing current	Af

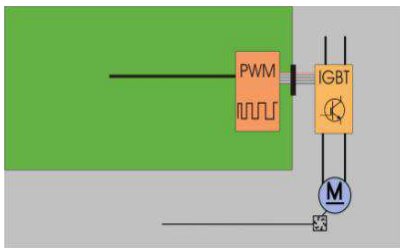
Alarm 120...125 (WARNING)

The jumps produced in the speed, pair references... don't produce the stopping alarm. If there is a sudden change in the reference, the alphanumeric display will inform about ir, and the jump will be integrated until the motor reaches the reference. During all the integration time, this alarms will be seen in the display. THEY DO NOT STOP THE FREQUENCY CONVERTER, THEY JUST INFORM ABOUT THE EVENT.

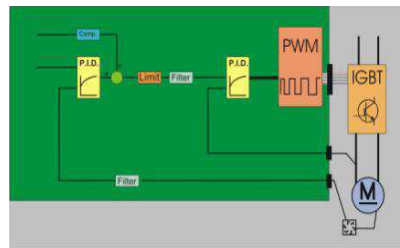
OPERATION WAYS

The following table gathers the 11 operation ways in which the frequency converter control board can operate. Each working way has its alarms (120...125). Not all the alarms are operative in every way.

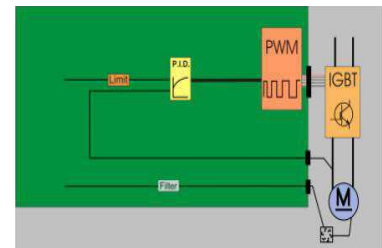
WAY	DENOMINATION	MTC-3001 DISPLAY
1	DC Motor in...	Opened loop
2		Speed loop
3		Torque loop
4	AC scalar motor in...	Opened
5		closed
6	Test mode F/V independent	AC-3
7	AC vector motor in...	Speed loop
8		Torque loop
9	Without use	
10	Permanent magnet in...	Speed loop
11		Torque loop



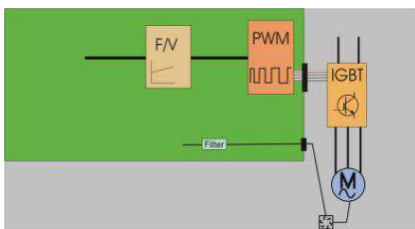
DC-1



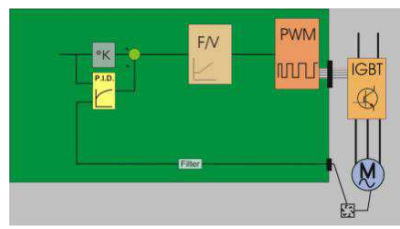
DC-2



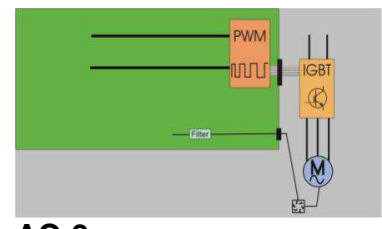
DC-3



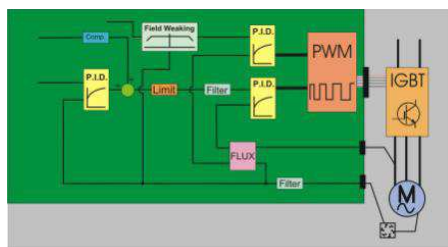
AC-1



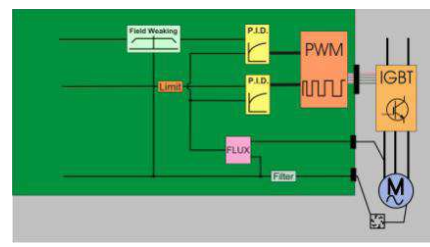
AC-2



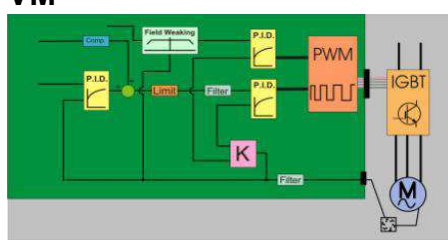
AC-3



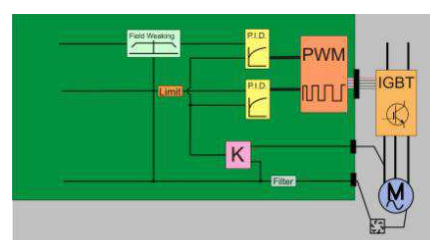
VM



VS



TM



TS

PASABAN DRIVES CODE		COMENTARY	DISPLAY MTC3001	
1	(101)	ALARM xxx DRIVER FAULT: ERROR IN TRANSISTOR BRANCH 1	Eu	
2	(102)	ALARM xxx DRIVER FAULT: ERROR IN TRANSISTOR BRANCH 2	Ev	
4	(103)	ALARM xxx DRIVER FAULT: ERROR IN TRANSISTOR BRANCH 3	Ew	
8	(108)	ALARM xxx DRIVER FAULT: OVERTEMPERATURE IN TRANSISTORS	Et	
7	(107)	ALARM xxx DRIVER FAULT: OVERCURRENT (HARDWARE)	Ey	
50		ALARM xxx DRIVER FAULT: OVERVOLTAGE IN CAPACITORS	Eh	
51		ALARM xxx DRIVER FAULT: LOW VOLTAGE IN CAPACITORS	Eg	
20		ALARM xxx DRIVER FAULT: OVERCURRENT (NOMINAL)	Eb	
21				Branch R
22				Branch S
30		ALARM xxx DRIVER FAULT: OVERCURRENT (PEAK)	Ea	
31				Branch R
32				Branch S
41		ALARM xxx DRIVER FAULT: NO SIGNALS FROM ENCODER	Ed	
42		ALARM xxx DRIVER FAULT: REVERSED ENCODER SIGNALS	Ee	
40		ALARM xxx DRIVER FAULT: WATCH DOG ERROR, NO REFERENCE FROM CPU	Ec	
15	(115)	ALARM xxx DRIVER FAULT: NO 24V SUPPLY OR FLAT CABLE ERROR	Ez	
3	(103)	ALARM xxx DRIVER FAULT: ERROR IN TWO OR MORE TRANSISTOR BRANCHES	Ex	
5	(105)			
9	(109)			
11	(111)			
13	(113)			
6	(106)			
10	(110)			
14	(114)			
12	(112)			
43		ALARM xxx DRIVER FAULT: OVERSPEED	Ef	
44		ALARM xxx DRIVER FAULT: FATAL ERROR, CONTROL FRECUENCY TOO MUCH FAST	Ei	
45		ALARM xxx DRIVER FAULT: FATAL ERROR, CONTROL LOST	Dot	
		UNIDENTIFIED (this is programed in the codesys bloc)		

XXX: Power suppliers name

Alarms in Yellow: new alarms

Alarms in Green: Programmed in the function bloc (codesys) for the power supplier alarms. Has an alarm but is not any of the programmed