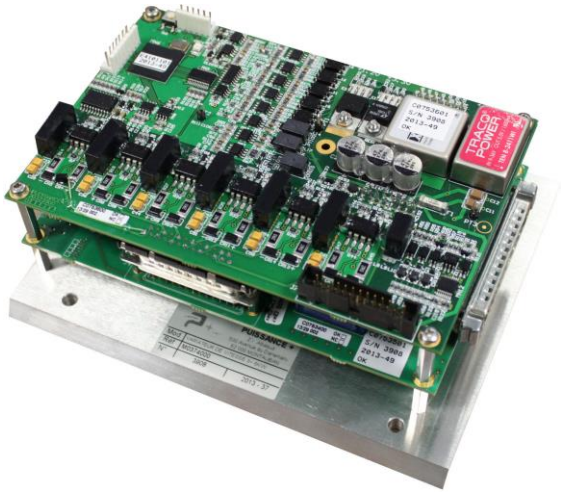
THREE PHASES CONVERTER DC-3xAC



PERFORMANCE

- Wide input voltage range
- Wide output voltage range
- Rated power: 6kW
- Programmable output frequency
- Configurable control law

CE RS232

APPLICATIONS

- Three-phase inverter
- Asynchronous motor control

DESCRIPTION

- The converter ref. M03740 creates, from a DC power voltage and an auxiliary power supply, a three-phase AC network.
- Two operating modes are implemented (see page 3): digital and analog mode.
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- It has various configurable protections, including for severe conditions of use: high environment temperature, output short-circuit...
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- A specific software is provided to communicate with the converter via a RS232 link. It allows the configuration of the protections, visualization of States parameters (voltage, current, temperature), control of the configuration of the outputs: variations of voltage or frequency, phases order…
- The converter can be supplied with two variants:
- o without Firmware,
- o with a simplified Firmware access to the different bricks of the module (IGBT commands, ADC converters) and can be completed.
  In both cases, a description document is supplied for implementation of its own Firmware.

TRADE REFERENCES

- **M03740** DC-3xAC converter
- **P00054** control software by computer

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FEATURES

OUTPUT ALTERNATIVE	Output	
	Type	3-phase without neutral
	Power	6 kW max
	Voltage	240 VRMS between phases (1) (2).
	Rate regulation	< 5% from 0 to rated power
	Continuous current per phase	30 ARMS max
	Frequency	Programmable from 5 to 70 Hz
	Isolation	
	Output power versus mechanical mass	> 100 M Ω under 1000 VDC
	Output power versus auxiliary DC input	> 100 M Ω under 1000 VDC

INPUT DC VOLTAGES	DC power input	
	Operating range	100 to 350 VDC max (2)
	Ripple rate	5% max
	Max current (output power of 6kW and 270VDC power)	24 ADC
	DC auxiliary input	
	Operating range	18 to 72 VDC
	Ripple rate	3% max
	Absorbed current	< 500 mA under 28VDC
	Isolation	
	Power input versus mechanical mass	> 100 M Ω under 1000 VDC
	Power input versus DC auxiliary input	> 100 M Ω under 1000 VDC
	DC auxiliary input versus mechanical mass	> 100 M Ω under 1000 VDC

ENVIRONMENT	Temperature	
	Operation	-5 to + 50 ° C
	Storage	-20 to + 70 ° C
	Moisture	
	Operation	85% max
	Storage	93% max
	Dimensions and weight	
	Width	148 mm
	Length	180 mm
	Height	64 mm
	Weight	2 kg

(1) The value of the nominal output voltage follows the law of U/f order depending on the voltage of the DC input power.

(2) The converter can be modified to obtain a composed voltage of 400 VRMS between phases. The limits of the DC bus would be adapted accordingly.

OPERATION MODES

Analog mode

By default, the operating mode of the converter is the analog mode.

In this mode, the configuration parameters of the converter are read in the EEPROM memory of its control card. No software is needed to allow the operating of the converter, but its configuration will be previously performed by the software.

The frequency setting is read on the analog input 0-10VDC "FREQ".
The direction of rotation of the phases is selected by the “Tout-Ou-Rien” entry dedicated "SENS".

It is possible to communicate with the converter via RS232 link, and therefore to change its settings or read back its state settings.

Digital mode

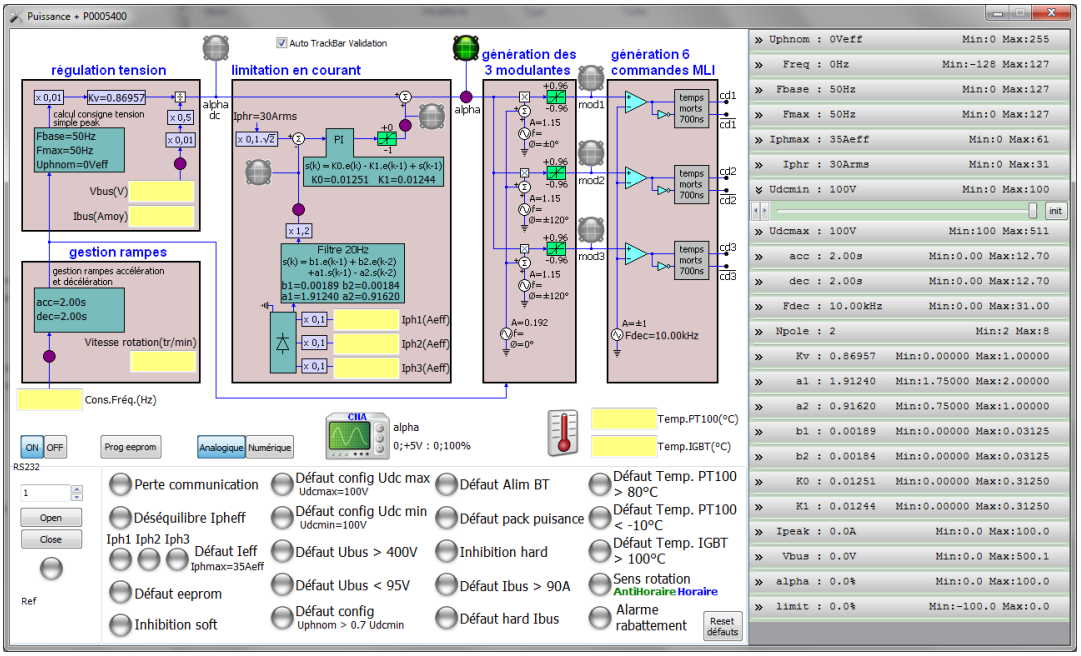
In digital mode, the converter works with the P0068xx executable software.
The converter communicates with a PC through its serial RS232 link.
In this mode:

- The user access to all configuration and status of the converter settings
- The analog input 0-10 VDC of frequency setpoint is inactive,
- TOR of the choice of the direction of rotation of the phases is inactive.

The software setting

This software, supplied with the converter allows to:

- Program parameters of regulation,
- Read the parameters of operation,
- View defects,
- Carry out defects,
- Save the configuration in the converter.



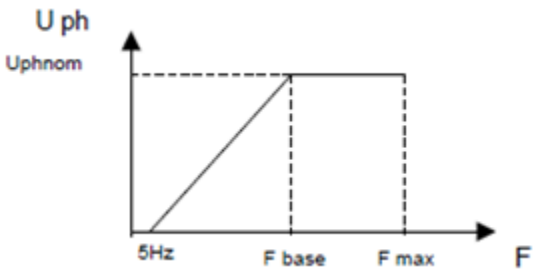
PROGAMMABLE PARAMETERS

Via RS232, without using the software, the user can change the converter control parameters:

- MODE: control of the frequency setting, analog or digital mode
- CEDF: PWM, from 10 to 20 kHz pulse frequency in steps of 1 kHz. This directly affects the harmonic content of the 3 PWM voltages generated. This setting also an influence on the sound level of the system. CEDF editing must be done at a frequency setting zero.
- FBASE: base frequency of the Act of 30 to 70 Hz V/F control in steps of 1 Hz
- FMAX: maximum frequency of the Act U/F, from 30 to 70 Hz in steps of 1 Hz
- VAC: duration of the positive ramp of the frequency from 0 to FMAX setting from 0 to 10.0 s in steps of 0.1 s
- DEC: duration of the negative ramp to set frequency FMAX to 0, 0 to 10.0 s in steps of 0.1 s
- UDCMIN: minimum continuous power bus voltage, of minimum 100V to UDCMAX in steps of 1V
- UDCMAX: maximum continuous power bus voltage, of UDCMIN at 350VDC, no 1V
- IPHMAX: maximum effective current authorized by phase, from 1 to 35 ARMS in increments of 1 has
- UPHNOM: composed of configurable according to UDCMIN output, voltage from 0 to 350 VRMS in steps of 1V
- IPHR: maximum current allowed by phase before drawdown in frequency, from 1 to 30 ARMS in increments of 1A

The form of the law of order is given below:

The setting range [0, 5 Hz] is defined as beach died, that is to say that no voltage is generated in this beach.



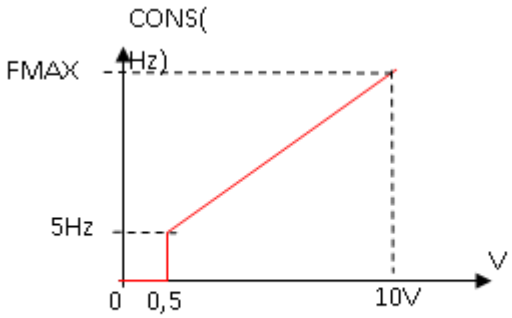
Voltage composed out of the converter in the range [5 Hz-FBASE] is calculated as follows:

UPH = UPHNOM x (FREQ-5) / (FBASE-5)

The voltage composed out of the converter in the range [FBASE - FMAX] is:

UPH = UPHNOM

In analog mode, the control frequency of the converter is directed by entry 0 - 10V FREQ.



The permissible maximum voltage of 10V is the value of the FMAX (Hz) parameter.

We define a deadband in tension in which the frequency setting is frozen in 0Hz.

The frequency setting is calculated by the converter in the useful Beach [(0.5V-10V)] is:
CONS (Hz) = 5 Hz + (FMAX-5) x (V - 0.5) / 9.5

SEARCHABLE PARAMETERS

Via RS232, without using the software, the user can query parameters of the converter:

- UDC: measured voltage from the continuous bus, 0 to 500.0 VDC with a resolution of 0.1V
- IDC: average current consumption on the continuous bus, 0 at 30.0 A with a resolution of 0.1 A
- IPH1: phase current U, of 0 to 35.0 ARMS, with a resolution of 0.1 A
- IPH2: phase current V, of 0 to 35.0 ARMS, with a resolution of 0.1 A
- IPH3: phase current W, of 0 to 35.0 ARMS, with a resolution of 0.1 A
- STATUS: status of the alarms (1) Word, from 0 to 255 (Word of 8bits)
- ALR: alarm flag (2), set to 0 if no new alarm, alarm 1 on new
- PT100 TEMP: temperature value calculated from the PT100 external sensor, from 0 to 110 ° C with a resolution of 1 ° C
- TEMP IGBT: module IGBT temperature value, from 0 to 110 ° C with a resolution of 1 ° C
- Direction: direction of rotation of the phases U, V, W, 0 for the schedule, 1 for the counterclockwise sense

(1) status word coded on 8 bits, which the decimal value is transferred by the link series. A bit to 0 corresponds to an inactive alarm, to an active alarm 1.
(2) a fleeting alarm remains active as long as the State "ALR" has not been read. A reading of this variable takes the place of an acquittal of alarm.

INTERNAL ALARMS

The variable "STATUS" is coded as follows:

- Bit 0: alarm 'over-current'
- IPH1 or IPH2 or IPH3 is greater than the configuration setting IPHMAX on longer than 0,2 s

- Bit 1: alarm 'switch' on the continuous power bus
- UDC is less than the configuration setting UDCMIN on longer than 1 s

- Bit 2: alarm 'surge' of continuous power bus
- UDC greater than the configuration setting UDCMAX on longer than 1 s

- Bit 3: alarm "IGBT high temperature"
- Triggered if TEMP is greater than 100 ° C on a period longer than 1 s

- Bit 4: Indication of imbalance of the currents of phases
- Triggered if a gap differs from ±10% on one of the RMS currents from the average of the 3

- Bit 5: Indication of the action of limiting implementation running

- Bit 6: default power Pack

- Bit 7: unused

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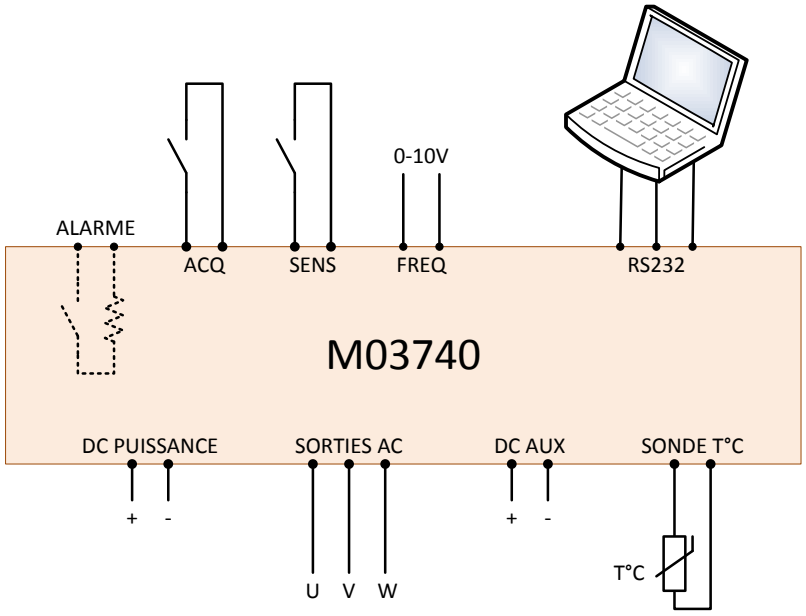
CONNECTIONS



ALARM: output fault reporting

- Type: all or nothing "Open / Close"
- Impedance in absence of default: Open Circuit
- Default impedance: 1 kΩ
- Maximum tension: 20 VDC
- Maximum current: 20 mADC
- Isolation: isolated supply the power and electronics of the converter

CQI: acquittal of defects

- Type: dry Contact
- Operation: close contact temporarily to pay a default

When the converter has memorised an alarm, restarting is only possible if the 3 following conditions are fulfilled:

- Disappearance of the defect detected
- Payment of default: by the software or by the CQI entry
- Discount to 0 of the setpoint: setpoint frequency will have to go through 0 to allow a restart. This avoids unwanted reboots after acquittal.

MEANING: programming of the direction of rotation of the phases

- Dry Contact type
- Contact open / closed U-V-W / U-W-V

FREQ: frequency programming

- Type: 0 - 10V
- Voltage: 0 to + 10VDC
- Impedance: 10 kΩ

SENSOR T ° C: entry measurement (2)

- Type of sensor: PT100 temperature

This measure entry allows to connect a PT100 temperature probe and display the position on the screen of the control software. This measure of temperature is not involved in the decision to switch to default: it is made for information purposes.

Specification may change without notice.