



GT 3000

**VOLTAGE SOURCE
FREQUENCY CONVERTER**



An Ansaldo Sistemi Industriali S.p.A. Company 

GT3000

VOLTAGE SOURCE FREQUENCY CONVERTER



The **GT3000** family of inverters, developed to meet customer's every need is, thanks to its versatile and high performance features, the most suitable answer to satisfy market demands.

The adaptability and efficiency of the **GT3000** can be found in a vast range of applications where maximum harmonic control and user friendliness must be guaranteed at all times.

The flexible range of options available and efficient technical assistance, make **GT3000** the ideal product for any application.

AVANT-GARDE ELECTRONICS TO PROTECT THE ENVIRONMENT.



WE STRIVE TO DEVELOP TECHNOLOGY BY OFFERING AVANT-GARDE SOLUTIONS. WE ARE DYNAMIC IN OUR QUEST TO ACHIEVE EXCELLENCE. RESPECTING THE ENVIRONMENT IS IN OUR NATURE.

MISSION

ANS like **ANSALDO**. Experience and structural competence.

The vast experience and versatility of an organised structure guarantee top quality performance. We strive to create customised avant-garde technological solutions to satisfy our customers' every need and expectation thanks to the EN ISO 9001:2000 Global Quality Management System.

W like **WORLDWIDE**. Ambitions beyond all boundaries.

The company aims at achieving the quality required by the international industrial automation market: our distribution network is worldwide. Our Just-in-time policy makes sure that each product reaches the right destination at the right time.

E like **ENERGY**. By nature, we protect nature.

Energy-saving products and the use of alternative energy: implementation of an Environment Management System in compliance with ISO 14001 makes it possible to operate in complete harmony with the environment and respect for nature.

R like **RENEWAL**. Tailored innovative solutions.

The company as a source of ideas to create and market new products, aims at stimulating, absorbing and sustaining innovation, thanks to a team of professionals in the R&D division.

These are the targets of a dynamic company that has always been customer and global quality-oriented, at the same time respecting the ecosystem.



PROCESS RELIABILITY, PERFORMANCE AND CONTROL

The **GT3000**, based on IGBT (Insulated Gate Bipolar Transistor) technology, offers matchless reliability and versatility, to meet the requirements of numerous markets and applications.

The easy start-up and running of the inverter, together with its ability to satisfy the most exacting demands in terms of torque performance are the direct result of a sophisticated control algorithm that is common to all the **GT3000** series.

There are two control boards: the basic microprocessor board, which is suitable for pumps, fans and applications in variable torque systems in numerous industries, including building automation, water treatment, conditioning and material handling.

The microprocessor-plus board is particularly suitable for iron and steel production plants, rolling mills for long and flat products, hot rolling mills, process lines, non-ferrous rolling mills, glass, rubber and plastic, lifting systems, rope transportation and naval systems.

The GT3000 is certified and accepted at international level



SUPERIOR PERFORMANCE TO SATISFY EACH AND EVERY NEED

- open-loop vector control (sensorless) guarantees the right torque at the right time
- scalar control (V/Hz)
- closed-loop vector control (FOC) for complex applications
- tin plated bars and coated boards
- energy saving
- 4 pre-selectable programmable pre-set speeds
- 3 set of acceleration / deceleration ramps
- S-shaped acceleration / deceleration ramp
- auto reset and restart
- flying start for powering into a spinning motor in both directions
- single, two, and three wire logic starting
- torque boost
- Mains Dip Ride Through
- current and frequency limits
- critical frequency/speed avoidance
- keypad with graphical display to facilitate use and configuration
- quick-start-up
- auto-tuning of motor data
- applicative macros for easy programming
- optional communication and I/O expansion boards
- Windows-based tool that allows configuring, monitoring and troubleshooting directly from your PC
- Fault/Alarm Log (list of last 30 protections/alerts)



MARKETS AND APPLICATIONS

PERFORMANCE AND CONTROL FOR A WIDE VARIETY OF APPLICATIONS

The **GT3000** offers an endless array of possibilities. The advanced control strategy and proven IGBT technology provide process improvement and energy savings with each application. The **GT3000** software handles main applications, such as pump, ventilation and lifting systems, steel and paper production lines and naval systems (shaft alternator, etc.) through the use of the **GT3000** "macros".



WATER

The **GT3000** is ideal for industry and city-owned companies, making water and drain water treatment plants more efficient, reducing the need for chemical treatment and offering a significant reduction in the need for water supplies and treatment costs. The **GT3000** helps to achieve the utmost performance in key processes, such as pumping, osmosis, wastewater treatment, desalination, and elimination of hazardous wastes and generation of ozone.

APPLICATIONS

- PUMPS
- COMPRESSORS
- CENTRIFUGES
- OZONISERS
- DESALINATION PLANTS



MATERIAL HANDLING

The **GT3000** meets the characteristics of load variability that are typical of applications linked to material handling and lifting.

The sophisticated control characteristics fully meet the most complex demands and guarantee the maximum precision in speed control. Moreover, the **GT3000** allows a high degree of control and safety during handling operations in lifting systems.

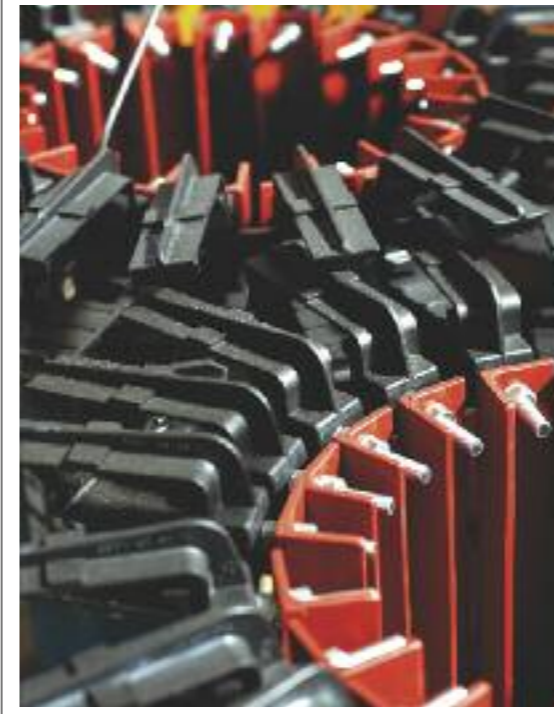
The load sharing function, synchronisation function and high torque at low speeds make **GT3000** the tailored product for applications relating to material handling and lifting.

The "crane" macros make the **GT3000** easy for the operator to use in lifting applications and allow:

- soft and controlled manoeuvres that reduce the need for maintenance
- mechanical brake control with verification of the torque during brake opening, such as to guarantee a sufficient torque
- maximum speed according to the load, thanks to the weight-load function
- suspended load control
- regenerative braking (AFE control)

APPLICATIONS

- CONVEYOR BELTS
- PACKAGING LINES
- LIFTING SYSTEMS
- DRAWBRIDGES



RUBBER AND PLASTIC

A considerable number of applications require a high starting torque.

The **GT3000**, in open-loop vector control, guarantees a constant torque throughout the full speed regulation field and accurate speed/torque control. The options and communication characteristics make it possible to monitor critical processes and keep them under constant control.

APPLICATIONS

- MIXERS
- EXTRUDERS
- CALANDERS
- INJECTION MACHINES

CEMENT

The inverter has replaced the old electrical motor speed and start-up control techniques used in cement production processes: the **GT3000** is the ideal solution. It optimises the production process, improves quality, increases production and keeps down costs. Moreover, the **GT3000** reduces the wear of mechanical parts extending the life of the plant and contributing to reduced energy consumption and harmonic distortion in the network. The **GT3000** overload capacity and accurate speed/torque control allow an accurate control of the furnace, which is the core of the production process, optimising fuel consumption and the production flow.

APPLICATIONS

- FURNACES
- SEPARATORS
- MILLS
- PRIMARY AND SECONDARY FANS
- EXHAUST SYSTEMS



RENEWABLE ENERGY

Conventional energy producing systems tend to use fossil fuel such as coal, oil and gas that pollute both environment and climate.

Aeolic energy is the result of kinetic energy produced by the wind transformed into other forms of energy. Nowadays, it is mostly transformed into electrical energy by means of an aeolic or wind-driven power station.

Wind-driven energy has not only been the leading source of renewable energy used by man, but it takes the cutting edge in terms of cost/production benefits.

Exploitation of solar energy using photovoltaic technologies also contributes actively in reducing atmospheric pollution.

Answer Drives has developed an inverter to direct the energy produced from renewable sources (photovoltaic cells, wind-driven generators, etc.) into the power mains. The inverter is the link between the energy source and the public network.

APPLICATIONS

- AEOLIC OR WIND-DRIVEN SYSTEMS
- PHOTOVOLTAIC SYSTEMS
- MINI-HYDRO SYSTEMS



METALLURGY

The **GT3000** makes it possible to manage the process in real time, therefore, with no defects and observing the tightest tolerance parameters.

Accurate speed/torque control makes **GT3000** the ideal converter in the steel mill.

Answer Drives has been supplying the steel sector for over forty years and has drives installed in more than 700 systems throughout the world.

APPLICATIONS

- HOT ROLLING MILLS FOR FLAT AND LONG PRODUCTS
- COLD ROLLING MILLS
- PROCESS LINES
- ROLLING MILLS FOR NON-FERROUS MATERIALS
- FUME DEDUSTING PLANTS
- STIRRERS



NAVAL APPLICATIONS

Naval applications require extremely reliable products that are suitable for saline environments and are easy to program and maintain.

Answer Drives has developed the **GT3000** version with painted boards, sealed buses, supports in treated steel and the possibility of water-cooling specifically for naval applications.

The **GT3000** with AFE control is the ideal inverter for many naval applications and offers regenerative braking, power factor control and low harmonic content in the network.

Moreover, an IP54 high protection version is available for decentralised installation; it can be wall-mounted near the motor.

This version makes it possible to do away with control boards, which take up a lot of space; consequently long shielded cables are no longer required.

APPLICATIONS

- PROPULSION
- SHAFT GENERATOR
- WINCHES/PULLEYS
- LIFTING
- AUXILIARY PUMPS
- CONDITIONING



PROGRAMMING INSTRUMENTS

PROGRAMMED FLEXIBILITY

The **GT3000** can be configured for all applications from the most simple to the most complex. Its advanced range of options and user interface modules provides the utmost versatility and simplicity.

PC PROGRAMMING INTERFACE

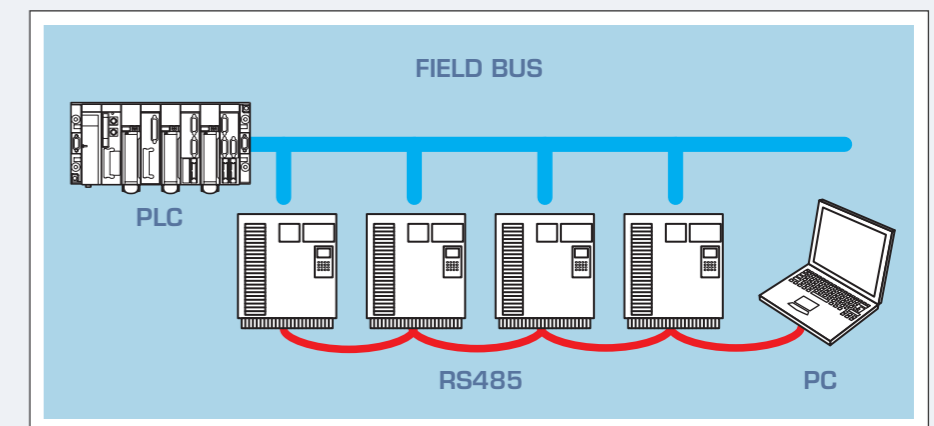
The **GT3000** programming interface operates in the Windows environment, thereby making configuration and modification of the parameters simple through a virtual keypad.

The graphic software provides real-time operating data in oscilloscope form. The numerical values are then selected from the menu and can be displayed and modified according to specific requirements. The **Answer Drives** PC software runs in Windows 95, 98, ME, NT, 2000 and XP.

GT3000 GUIDED MENU

ALLOWS THE USER TO:

- program the drive directly from the PC
- process and save parameters
- load and download parameters
- activate and monitor the VFD
- display and print the operating reports
- display and print the list of parameters
- prevent use by unauthorised personnel



COMMUNICATION OPTIONS

To monitor and control the process the user of an inverter needs to interface it with industrial protocols.

Answer Drives provides serial communication boards that are compatible with the most important protocols and, given the demand for increasingly new protocols and platforms has designed a rapid process for the development of new boards. The **GT3000** provides optional serial communication boards for the following systems: Modbus™, Profibus™, DeviceNet™.

PERFORMANCE

OPERATOR INTERFACE

The **GT3000** keypad has been developed to provide numerous functions and is available in the basic and advanced versions. To program the inverter, the advance keypad makes use of a simple and intuitive menu. The display shows a considerable amount of information clearly and five separate actual values simultaneously. The copy function makes it possible to store data and download it into another inverter, thereby simplifying start-up.



BASIC KEYPAD

- Led: "ON", VFD "FAULT", and "RUN"
- 7 Led segment display to monitor status
- 5 function keys: start/stop/automatic/manual/reset
- 4 arrow scroll keys

ADVANCED KEYPAD

- Led: "ON", VFD "FAULT", and "RUN"
- Multiple meter functions
- High level graphic LCD display
- 20 multifunction keys
- 4 arrow scroll keys
- English readout
- Independent memory for parameter storage
- Uploading and downloading of parameters to other VFD's
- Diagnostic data and fault file storage
- Date and time display (Microprocessor Plus)
- User-friendly menu

CUSTOMER SUPPORT AND SERVICE

TRAINING: Answer Drives, has always paid attention to its customers' needs by providing a series of courses based on the most modern teaching techniques to help the customer manage and maintain their systems at the maximum performance levels at all times.

EDUCATION: Specific product features and problems will be thoroughly dealt with during the tailored Education hours based on each customer's needs. The courses will be held at the offices in Montebello Vicentino (VI), but can also be held at the customer's premises or directly in the plant, upon request.

SERVICE: Customer satisfaction is our primary goal. To access our service network, a simple phone call is enough to get prompt support.

Service can involve each step of the job, from start-up, routine or major maintenance up to fault-finding. Our team is at the customer's disposal to provide assistance throughout the product's life-cycle and advisory services on:

- preventive maintenance
- product reviews
- training
- spare parts
- updates
- repairs and replacements



AUTO-TUNING

To start-up the **GT3000** requires seven (7) simple parameters to be configured. Thanks to sensorless control, auto-tuning makes it possible for the motor data to be automatically retrieved, thereby simplifying and drastically reducing start-up times.

Auto Tuning envisages:

- Auto-tuning with motor at a halt: used when the motor is connected to the load and disconnection is difficult. In this case, the motor is supplied with power but remains at a halt.
- Auto-tuning with no-load motor: used when the motor is not connected to the load. The motor rotates at 90% of its rated speed.

The motor data can also be entered manually, but this should be done before starting the inverter.

MOTOR CABLE LENGTH

In many applications where variable frequency drives with motor are used, the installation requirements often lead to a physical separation between the drive and the motor. Depending on the distance between the drive and the motor, the voltage pulses deriving from the PWM (Pulse Width Modulation) may interfere with the distributed inductance and the capacity of the motor cable to produce voltage peaks exceeding 1600 V.

This so-called "long-lead", which is typical of installations with a drive coupled to the motor using a 15 m long cable can negatively affect motor insulation and consequently lead to faulty operation.

Answer Drives special IGBT ignition algorithm helps to reduce the effect within safety limits in most applications with up to 100 m long cables for systems starting from 400 V and more and up to 15 metres for 575 V systems and more.

HELPER - LOAD SHARING (FOC)

To control load sharing between two drives with mechanically coupled motors. The function keeps the speed regulator of the "slave" drive active, therefore, in no circumstance is there any dangerous overspeed.

DROOPING

The function is applied with drives where the mechanical coupling, through the material, is not as rigid as to be able to control the torque.

The function prevents conflicts between the master and slave drives, allowing small speed differences between the two.

Internal displacement: The motor speed reference is reduced by its control when the load increases.

Cross-displacement: The slave motor speed reference is reduced according to the torque produced by the master and slave motors.

BACK-LASH COMPENSATION

The function is used to remove the effect of mechanical gaps during torque inversion.



FLYING RESTART

By continuously monitoring motor speed and direction, the **GT3000** can instantaneously start or restart into a spinning motor. In the event of power interruption, the **GT3000**'s open-loop vector control tracks the motor. When power is restored, it immediately powers the motor without delay.

OVERLOAD PROTECTION

With the use of a I2t curve that is simulated in the drive software, the **GT3000** guarantees full protection of both self-ventilated as well as servo-ventilated motors.

Moreover, the thermal protection of a motor can be managed through PTC/NTC mounted on the motor.

SAFETY OVERRIDE

This function can be used if a drive has to ignore all the software safety protections at any given time. A typical application of this function is in fume emission plants.

ENERGY SAVING

The **GT3000** Energy Saver adjusts the motor to offer the best flow and considerably improves the efficiency of the system at low loads (from 5 to 25Hz), reducing losses and optimising the motor power factor.

TYPICAL EFFICIENCIES		
OUTPUT FREQUENCY	MOTOR EFFICIENCY WITHOUT ENERGY SAVER	MOTOR EFFICIENCY WITH ENERGY SAVER
30	95%	95%
25	93%	95%
20	90%	94%
15	85%	92%
10	65%	90%
5	28%	80%

PID REGULATOR FOR PROCESS CONTROL

The PID regulator allows to control a variable in the application selected by the user (e.g. pressure, temperature, flowrate, etc.) in closed loop.

For the "Pump" application in particular, a motor pause function is provided, which automatically stops the motor if the pump pressure falls below a certain value to then restart it automatically when the plant conditions require. This type of management system offers energy saving by keeping the pump running only when required.

INPUT PHASE FAILURE

This function offers the possibility of dealing with a phase failure as an alarm or protection, or continuing operations with reduced torque.

FAULT AND ALARM LOG

Up to 30 fault or alarm events can be stored in a cyclic buffer (historical log).

With installation of the microprocessor plus board the log is displayed in real time (year, month, day, hour, minutes) thanks to the RTC (Real Time Clock).

Up to five (5) protections and alarms can be excluded from the log display.

TRACE

This function is particular useful to find what may have caused the drive to stop.

Trace consists of a cyclic memory used to record events related to stoppages. During normal operation, the memory is continuously updated. If a protection comes into operation, the memory is blocked and the data are frozen according to a given value that can be set by the user.

Trace contains data relating to 10 variables (analog and digital) up to a maximum of 260 samples per variable. Data sampling times can also be selected.



POWER

Answer Drives has been the leading Italian group in the field of power electronics for over forty years, as well as leader in product development, capability and expertise on the quality of energy.

Answer Drives has the ability to supply the best solution for your applications.

HARMONICS

Inverters offer many benefits on the process control at reduced operating costs. For this reason they are fully recognised as the most advantageous speed control system.

Inverters are non-linear loads that produce harmonic distortion in the power supply network, if they are used incorrectly, could cause serious problems in the quality of the network.

Uncontrolled harmonic distortion can cause damage and/or interference to sensitive devices such as telephone systems, networks, data, computers, automation systems and even irregular heating of other users.

IEEE 519-1992

The IEEE 519-1992 standard has been developed to control harmonic distortion and has been issued to give a certain guideline on the increase of non-linear loads in many industries. Finally, the value of the harmonics relates to the short circuit power of the network. The 5th, 7th, 11th and 13th harmonics are the cause of most distortion and must be compensated in order to meet the requirements of the IEEE 519-1992 standard.

GT3000 18-pulse Clean Power series

The **Answer Drives** 18-pulse Clean Power series meets the most exacting IEEE 519-1992 requirements in terms of current as well as input voltage harmonic distortion.

The GT3000 18 pulse Clean Power inverter

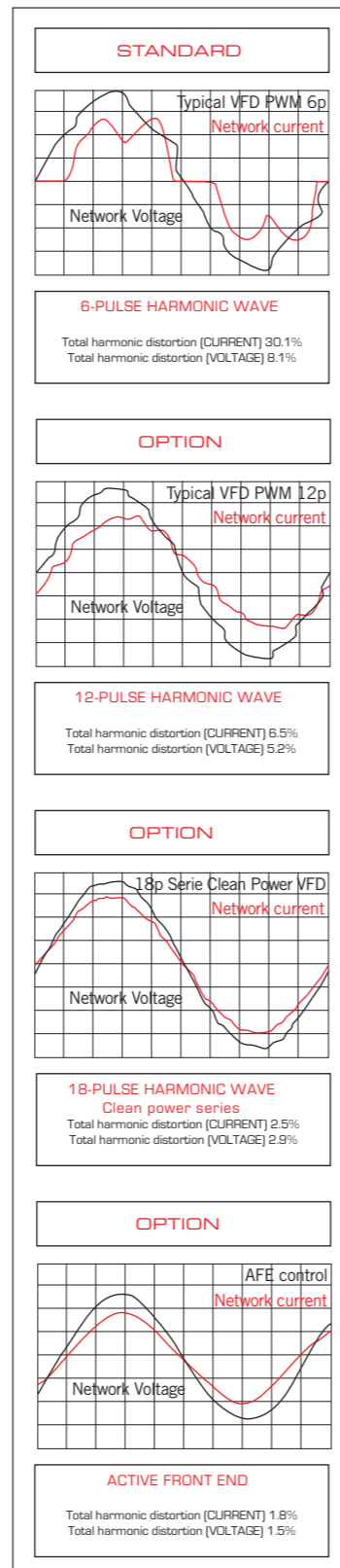
- Covers the entire speed range with almost unitary power factors.
- Prevents harmonic disturbances to the network.
- Offers an almost zero harmonic level on weak networks or power generators.
- Eliminates the need for expensive harmonic analysis studies.
- Avoids the use of passive harmonic filters that are expensive and difficult to apply.

GT3000 12-pulse option

For applications in which the short circuit network current is quite high compared to the power of the **GT3000**, **Answer Drives** can also offer the 12 pulse solution.

HARMONIC COMPARISON

Typical 220 KVA network, 5.75% impedance and 132 kW converter. The 6-pulse inverter does not meet the IEEE 519-1992 limits whereas the 12-pulse inverter is closer, but again does not meet the IEEE 519-1992 requirements in this type of network. The **GT3000** 18-pulse Clean series meets the IEEE 519-1992 standard also at switchboard input (a more conservative measurement compared to the IEEE 519-1992 requirements).



ACTIVE FRONT END

The **GT3000** with AFE eliminates harmonic currents and protects devices supplied from the same network from possible damage caused by harmonic distortion.

The AFE dynamically controls the non-linear current required by the load and generates a form of adaptive current wave that compensates the form of the non-linear current portion of the load.

By injecting this compensation current in the bus, it blocks out the damaging current at the connection point and corrects the power factor to guarantee improved operating continuity and savings.

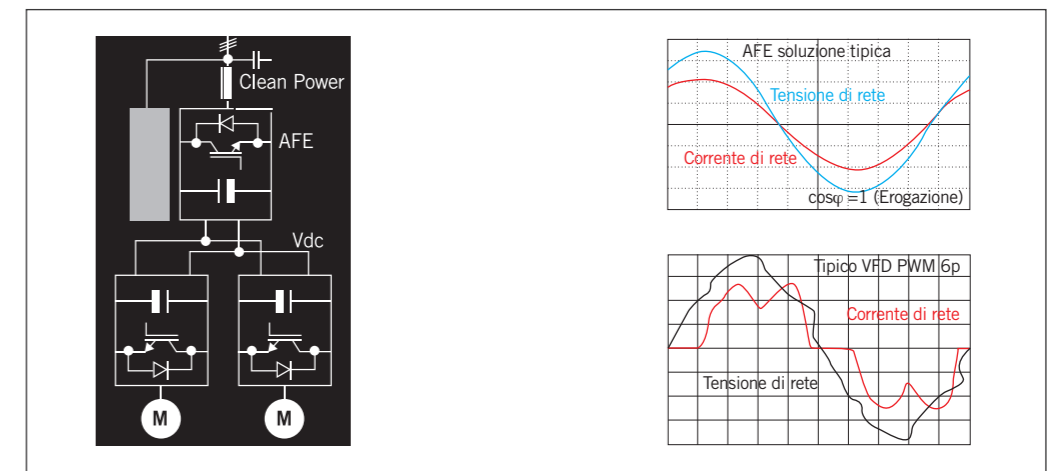
The AFE does not require serial components; it is simple to install, even in parallel for high power applications and complies with IEEE 519-1992 standard.

It can be sized for a single inverter or a DC bus with several inverters and is also available in the redundant version.

AFE control is particularly suitable for applications that require high inertia load braking and regenerative braking, such as centrifuges, lifting systems, mine conveyors, etc. As applications of this kind require rapid acceleration and deceleration, the AFE control allows high braking power to be regenerated in the network.

Inverters without AFE control for high inertia load braking use dynamic braking, which means that the braking energy is dissipated as heat in the braking resistor and consequently lost or wasted.

Answer Drives AFE is also applied to aeolic or wind-driven plants to issue energy in the network without harmonic distortion and to optimise plant yield.



CABINET CONVERTERS: CUBE

The **GT3000** is a versatile product par excellence, whose design is both uniform and modular. In fact, its modularity lies behind the standard solution in the **CUBE** cabinet that, thanks thanks to an excellent and qualified engineering activity, guarantees a perfect dialogue between drive and electromechanical control and protection devices. The **CUBE** is an AC/AC converter in a standard electrical cabinet with forced ventilation through built-in fans, ready to be connected.

An ample choice of options makes it possible to adapt it to the application requirements. **CUBE** is the result of many years of experience in the industrial automation field and is the ideal "Plug & Play" solution when protection degrees in the range of IP23 and IP54 are required. Moreover, given its intrinsic design and management characteristics, **CUBE** guarantees a considerable reduction in delivery times and simplifies the application process on site.

CUBE has a vast range of options and accessories to offer the best solution in terms of performance and cost for OEMs and system integrators.

CUBE conforms to the international standards for electrical equipment and is distributed throughout the European and Asian markets.

CE Mark, EN 61800-3 (Directive 89/336 EEC modified by 93/68/EEC -EMC-) and directive 2006/95 EC -low voltage- EN 60204-1; EN 60146.1.

CUBE has been designed and built in compliance with ISO 9001 and ISO 14001 standards.

BASIC VERSION INCLUDES

- **GT3000** LV AC drive
- **Answer Drives** cabinet with IP23 protection and RAL7035 orange peel grey finish
- Automatic input circuit breaker
- Three-phase line reactor
- LCD graphics keypad mounted on the door
- Emergency pushbutton mounted on the door

OPTIONS:

- Protection degree according to EN 60529: IP33, IP43, IP54
- STO (Safe Torque Off) function to prevent the inverter from generating torques when the motor is in stand-by or at a halt. This board meets the EN954-1 cat. 3 requirements.
- Main contactor
- RFI filter
- Output reactor
- Sinusoidal output filter
- dv/dt output filter
- Chopper and braking resistor
- Serial boards for main field buses: Modbus, DeviceNet, Profibus DP. Others available upon request
- Converter with galvanic isolation: 0-10V/0(4)-20 mA

ACCESSORIES:

- cabinet illumination with service socket
- anti-condensation heaters with thermostat
- PT100 and PTC, for motor protection, evaluation devices
- Automatic breaker for motor fan
- Emergency control device
- Additional instrumentation mounted on door (voltmeter, ammeter, tachometer, etc.)



Switch-board protection degree	1st figure: protection against contact with external solid particles and access to hazardous parts	2nd figure: protection against water penetration
IP20	Protection against solid particles exceeding 12 mm. Protection against access with hands	No protection
IP23	Protection against solid particles exceeding 12 mm. Protection against access with hands	Protection against rain
IP33	Protection against solid particles exceeding 2.5 mm. Protection against access with tools	Protection against rain
IP43	Protection against solid particles exceeding 1 mm. Protection against access with hands	Protection against rain
IP54	Protection against dust and access with wire. Not completely dust-proof, but sufficiently protected so that plant operation or safety is not jeopardised	Protection against water sprays. Any water sprayed from a hose towards the switchboard must not have any damaging effects

GT3000 . GENERAL TECHNICAL DATA

OUTPUT DATA		GT3000 Chassis /Cube	400 V	0.75 - 1000 kW
			460 V	2 - 1000 HP
			500 V	1 - 1250 kW
			525 V	37 - 600 kW
			575 V	60 - 700 HP
			600 V	45 - 700 kW
			690 V	75 - 800 kW
	Output voltage	From 0 to input voltage		
	Output current	Class 1: 110% of rated current per 1 min every 10 min. Class 2: 150% of rated current per 1 min every 10 min.		
		Usually, higher overloads are possible as the motor current is generally lower than the rated current of the GT3000		
	Starting torque	Class 1: 110% - Class 2: 150%		
	Output frequency	0 - 200 Hz		
	Frequency resolution	0.1 Hz		
INPUT DATA		Frequency	From 48 to 63 Hz	
	Voltage	"F" 400 - 460 V, +/-10%		
		"G" 500 V, +/-10%		
		"K" 525 - 690 V, +10% -15%		
CONTROL CHARACTERISTICS		Control method	V/Hz, open-loop vector (sensorless) closed-loop vector (FOC)	
	Switching frequency	Programmable: from 2 to 12 kHz		
	Speed/Frequency reference	From analog input: resolution 0,1 Hz From keypad: 0.01 Hz resolution		
	Acceleration/deceleration time	from 0,1 to 262 seconds		
	Braking torque	DC injection: from 0 to 100% of rated voltage		
Standard functions		<ul style="list-style-type: none"> • Selection of speed reference source • Pre-set speeds • Speed reference loss (4-20 mA) • Self-adaptive acceleration • Motor overload protection • Automatic reset and restart • HOA/pulsed start/stop • Input phase failure • Flying Restart in both directions 	<ul style="list-style-type: none"> • Ramps • Digital motopotentiometer • Critical Speed Avoidance • Self-adaptive deceleration • Stoppage by inertia • Automatic restart after network failure • Auto On/Off • Mains Dip Ride Through • Energy saving 	
Applicative macros		<ul style="list-style-type: none"> • Current oscillation compensation • Jog speed • Minimum load • Helper - load sharing between two motor mechanically coupled (FOC) • PTC/NTC motor management • Torque control • Motor stalling • Safety override • Back-lash compensation • AND/OR function for /O digital expansion board • Fault/alarm log (list of last 30 faults/alarms in real time) • Tracelog (cyclic memory of data up to 10 variables, used to record events related to a trip) 	<ul style="list-style-type: none"> • External speed limits • Output phase failure • PID regulator for process control • Internal or cross drooping • Torque limit control • Speed deviation • Crane control • Programmable password 	

GT3000 . GENERAL TECHNICAL DATA

Protections and Alarms		<ul style="list-style-type: none"> • Overcurrent • Overspeed • DSP failure (control fault) • Desaturation (IGTB fault) • Drive overtemperature • Speed reference loss (4-20 mA) • Ground fault (output) • Motor overload 	<ul style="list-style-type: none"> • Failed precharge • Communication loss • Input phase failure • Output phase failure • Over/under voltage (DC bus) • Speed deviation (stall trip) • Minimum load • External protection
CONTROL CONNECTIONS		Microprocessor Plus	Microprocessor Base
Digital Outputs		1 NO/NC fault relay 2 programmable relay outputs (1 NO/NC, 1 NO) 1 programmable open collector output	1 NO/NC fault relay 1 programmable relay output (1 NO/NC, 1 NO) 1 programmable open collector output
Analog Inputs		2 isolated analog inputs (12 bit) 0-10 V 40 kohm 4 - 20 mA, 475 ohm	2 isolated analog inputs (12 bit) 0-10 V 40 kohm 4 - 20 mA, 475 ohm
Analog Outputs		2 isolated analog outputs (10 bit) 0-10 V 2 isolated analog outputs (10 bit) 0-10 V, 4-20 A	2 isolated analog outputs (10 bit) 0-10 V
Digital Inputs		5 isolated programmable digital inputs 2 isolated digital inputs (start/stop, enable) 2 terminal programmable as digital I/O (24 VDC) 2 outputs: +10V, -10 V 5mA (protected against short circuit)	4 isolated programmable digital inputs 2 isolated digital inputs (start/stop, enable) 2 terminal programmable as digital I/O (24 VDC) 2 outputs: +10V, -10 V 5mA (protected against short circuit)
		3 encoder inputs (3 channels) outputs: +5V 150 mA (encoder supply) RS232/RS485 HD serial output Auxiliary power supply: +24VDC, 100 mA RTC to records date and time of the event in real time	3 encoder inputs (3 channels) outputs: +5V 150 mA (encoder supply) RS232 serial output Auxiliary power supply: +24VDC, 100 mA
ENVIRONMENTAL CONDITIONS		Operating temperature 0°C-40°C (32°F – 104°F) 1% output current de-rating for each °C in excess up to a maximum of +55°C (104°F) Storage temperature: from -25°C to +70°C (from 40°F to +158°F) Relative humidity: 95% without condensation Altitude: up to 1000 m (3280 ft.) a.s.l. Over 1000 m (3280 ft.) a.s.l. rated output current is reduced by 1% for each additional 100 m (382 ft.). maximum height 3000 m (9840 ft.) Vibrations during operation: max. 0.3 mm (from 2 to 9 Hz), max. 1 m/s ² (from 9 to 200 Hz) sinusoidal (Class 3 M1) Protection degree: IP20 for frames I-VIN, IP00 for frames VII-VIII (optional IP20) Frames IIN-IVN are prepared for installation of heatsink in separate duct so as to easily structure cabinets with IP54 protection degree Contamination level (painted boards) Chemical gases: IEC 721-3-3, Class 3C2 Solid particles: IEC 721-3. Class 3S2 Cooling: forced air with built-in fan (water cooling for VII and VIII upon request) Housing: cover in plastic material, frame in galvanised steel sheet	
DIRECTIVES AND CERTIFICATIONS		EN 60146-1 UL Listed at 690 V CUL Listed at 690 V	EN 61800-3 (EMC) CE Marked (directive 2006/95/EC low voltage) ISO 9001

OPTIONS AND ACCESSORIES

- EMC filters (standard for SVGT030-166F)
- Input reactors (standard for SVGT030-166F)
- Output reactors
- Sinusoidal output filters and dv/dt filters
- STO* Safe Torque Off kit
- Power supply for external control supply
- Basic LED keypad or LCD advanced graphics keypad
- Remote mounting keypad kit (2m)
- I/O digital expansion boards
- Dynamic braking switch and resistors
- 2 channel 0-10 V/4 (0) – 20 mA converter
- Serial board: Profibus DP, Modbus RTU Device Net and others upon request
- Diode bridges for Bus DC (6, 12 and 18 pulses)
- AFE (DC bus supply and regenerating braking energy to the AC Mains Supply)
- SPDMR (DC bus supply and regenerating braking energy to the AC Mains Supply)
- IP20 protection degree for frames VII-VIII

The technical data of this publication may change. Please contact Answer Drives for confirmation.

GT3000 BASIC - 6P VERSION - 380/480VAC +10%																			
		CL. 1 110% OVERLOAD PER 1' EVERY 10'					CL. 2 150% OVERLOAD PER 1' EVERY 10'												
MODEL	FRAME	OUTPUT CURRENT	MOTOR POWER (4 POLES)				OUTPUT CURRENT	MOTOR POWER (4 POLES)				DIMENSIONS						WEIGHT	
			@400 V		@460 V			@400 V		@460 V		WIDTH		HEIGHT		DEPTH			
			A	KW	A	HP		A	KW	A	HP	mm	inches	mm	inches	mm	inches		
SVGT03FDB	I	3,8	1,5	3,6	2	3,4	2,1	0,75	2,0	1,50	2	131	5,16	271	10,67	171	6,73	3,5	8
SVGT04FDB	I	5,6	2,2	5	3	4,8	3,8	1,5	3,6	2	3,4	131	5,16	271	10,67	171	6,73	3,5	8
SVGT06FDB	I	9,5	4	8,6	5	7,6	5,6	2,2	5,00	3	4,8	131	5,16	271	10,67	171	6,73	3,5	8
SVGT08FDB	II	12	5,5	11,5	7,50	11	9,5	4,00	8,6	5	7,6	138	5,43	341,5	13,44	219	8,60	5,0	11
SVGT011FDB	III	16	7,5	15,5	10	14	12	5,5	11,5	7,5	11	138	5,43	441,5	17,38	219	8,60	7,5	17
SVGT015FDB	III	21,0	9	18,4	15	19,7	16	7,5	15,5	10	14	138	5,43	441,5	17,38	219	8,60	7,5	17
SVGT018FDB	IIIX	27	11	22,5	20	25	21	9	18,4	15	19,7	138	5,43	466,5	18,36	241	9,46	7,5	17
SVGT022FDB	IIIX	34	15	30,2	25	30,5	27	11	22,5	20	25	138	5,43	466,5	18,36	241	9,46	7,5	17
SVGT028FDB	IIIL	40	18,5	37	30	36	34	15	30,2	25	30,5	138	5,43	466,5	18,36	255	10,04	10	22
SVGT030FDB	IIIN	40	18,5	37	30	36	34	15	30,2	25	30,5	200	7,88	454	17,89	279	10,99	33	73
SVGT036FDB	IIIN	52	22	43	40	49	40	18,5	37	30	36	200	7,88	454	17,89	279	10,99	33	73
SVGT045FDN	IVN	65	30	58	50	62	52	22	43	50	49	250	9,84	675	26,57	274	10,80	36	79
SVGT053FDN	IVN	77	37	69	60	71	65	30	58	50	62	250	9,84	675	26,57	274	10,80	36	79
SVGT066FDN	IVN	96	45	84	75	86	77	37	69	60	71	250	9,84	755	26,57	274	10,80	40	88
SVGT086FDN	VN	124	55	100	100	109	96	45	84	75	86	250	9,84	755	29,72	289,5	11,41	52	115
SVGT108FDN	VN	156	75	135	125	139	124	55	100	109	250	9,84	1000	29,72	289,5	11,41	52	115	
SVGT125FDN	VN	180	90	160	150	173	156	75	135	125	139	260	10,24	1000	39,37	319,5	12,59	88	194
SVGT150FDN	VN	217	110	195			180	90	160	150	173	260	10,24	1000	39,37	319,5	12,59	96	212
SVGT166FDN	VN	240	132	239	200	226	200	110	195			260	10,24	1000	39,37	319,5	12,59	96	212
SVGT200FDN	VII	302	160	288	250	290	240	132	239	200	230	540	21,25	1160	45,67	398	15,68	103	227
SVGT250FDN	VII	361	200	355	300	350	302	160	288	250	290	540	21,25	1160	45,67	398	15,68	103	227
SVGT292FDN	VIII	420	225	395	350	400	370	200	355	300	350	577	22,72	1160	45,67	398	15,68	133	293
SVGT340FDN	VIII	510	250	430	400	460	420	240	420	350	400	577	22,72	1160	45,67	398	15,68	150	330
SVGT420FDN	VIII	610	315	554	500	560	480	250	430	400	460	577	22,72	1160	45,67	398	15,68	183	403
SVGT470FDN	VIII	680	355	610	500	560	520	250	430	400	460	577	22,72	1160	45,67	398	15,68	183	403

GT3000 PLUS - 6P VERSION - 380/480VAC +10%																			
		CL. 1 110% OVERLOAD PER 1' EVERY 10'					CL. 2 150% OVERLOAD PER 1' EVERY 10'												
MODEL	FRAME	OUTPUT CURRENT	MOTOR POWER				OUTPUT CURRENT	MOTOR POWER				DIMENSIONS						WEIGHT	
			@400 V		@460 V			@400 V		@460 V		WIDTH		HEIGHT		DEPTH			
			A	KW	A	HP		A	KW	A	HP	mm	inches	mm	inches	mm	inches		
SVGT030FEB	IIIN	40	18,5	37	30	36	34	15	30,2	25	30,5	200	7,88	454	17,89	279	10,99	33	73
SVGT036FEB	IIIN	52	22	43	40	49	40	18,5	37	30	36	200	7,88	454	17,89	279	10,99	33	73
SVGT045FEN	IVN	65	30	58	50	62	52	22	43	50	49	250	9,84	675	26,57	274	10,80	36	79
SVGT053FEN	IVN	77	37	69	60	71	65	30	58	50	62	250	9,84	675	26,57	274	10,80	36	79
SVGT066FEN	IVN	96	45	84	75	86	77	37	69	60	71	250	9,84	675	29,72	274	10,80	40	88
SVGT086FEN	VN	124	55	100	100	109	96	45	84	75	86	250	9,84	755	29,72	289,5	11,41	52	115
SVGT108FEN	VN	156	75	135	125	139	124	55	100	109	250	9,84	755	29,72	289,5	11,41	52	115	
SVGT125FEN	VIN	180	90	160	150	173	156	75	135	125	139	260	10,24	1000	39,37	319,5	12,59	88	194
SVGT150FEN	VIN	217	110	195			180	90	160	150	173	260	10,24	1000	39,37	319,5	12,59	96	212
SVGT166FEN	VIN	240	132	239	200	226	200	110	195			260	10,24	1160	45,67	319,5	12,59	96	212
SVGT200FEN	VII	302	160	288	250	290	240	132	239	200	230	540	21,25	1160	45,67	398	15,68	103	227
SVGT250FEN	VII	361	200	355	300	350	302	160	288	250	290	540	21,25	1160	45,67	398	15,68	103	227
SVGT292FEN	VIII	420	225	395	350	400	370	200	355	300	350	577	22,72	1160	45,67	398	15,68	133	293
SVGT340FEN	VIII	510	250	430	400	460	420	240	420	350	400	577	22,72	1160	45,67	398	15,68	150	330
SVGT420FEN	VIII	610	315	554	500	560	480	250	430	400	460	577	22,72	1160	45,67	398	15,68	183	403
SVGT470FEN	VIII	680	355	610	500	560	520	250	430	400	460	577	22,72	1160	45,67	398	15,68	183	403
SVGT520FEN	2xVIII	800	450	784	700	770	620	355	610	550	616	2x540	2x21,25	1160	45,67	398	15,68	2x103	2x227
SVGT580FEN	2xVIII	840	500	840	700	770	740	400	690	650	725	2x577	2x22,72	1160	45,67	398	15,68	2x133	2x293
SVGT680FEN	2xVIII	1020	550	950	800	900	840	500	840	700	770	2x577	2x22,72	1160	45,67	398	15,68	2x150	2x330
SVGT780FEN	2xVIII	1220	710	1200	1000	1128	960	550	950	800	900	2x577	2x22,72	1160	45,67	398	15,68	2x183	2x403
SVGT940FEN	2xVIII	1360	710	1200	1200	1350	1040	630	1040	800	900	2x577	2x22,72	1160	45,67	398	15,68	2x150	2x403

GT3000 PLUS - 6P VERSION - 525/690VAC +15%																			
		CL. 1 110% OVERLOAD PER 1' EVERY 10'					CL. 2 150% OVERLOAD PER 1' EVERY 10'												
MODEL	FRAME	OUTPUT CURRENT	MOTOR POWER				OUTPUT CURRENT	MOTOR POWER				DIMENSIONS						WEIGHT	
			@690 V		@575 V			@690 V		@575 V		WIDTH		HEIGHT		DEPTH			
			A	KW	A	HP		A	KW	A	HP	mm	inches	mm	inches	mm	inches		
SVGT105KE	VIL	88	75	79	75	67	68	55	58	60	54	295	11,61	954	37,56	396,5	15,61	65	143
SVGT130KE	VIL	105	90	93	100	89	78	75	78	75	67	295	11,61	954	37,56	396,5	15,61	65	143
SVGT170KE	VIL	143	132	139	150	135	110	90	93	100	89	295	11,61	954	37,56	396,5	15,61	65	143
SVGT200KE	VII	170	160	166	150	135	135	132	139	150	135	577	22,72	1160	45,67	398	15,68	103	227
SVGT260KE	VII	220	200	206	200	184	180	160	166	150	135	577	22,72	1160	45,67	398	15,68	103	227
SVGT320KE	VII	270	250	243	300	264	210	200	206	200	184	577	22,72	1160	45,67	398	15,68	103	227
SVGT390KE	VIII	330	315	320	350	320	260	250	243	250	230	577	22,72	1160	45,67	398	15,68	150	330
SVGT480KE	VIII	400	355	357	450	405	320	315	320	300	264	577	22,72	1160	45,67	398	15,68	183	403
SVGT521KE	VIII	440	400	404	450	405	360	355	357	400	360	577	22,72	1160	45,67	398	15,68	183	403
SVGT640KE	2xVII	540	500	505	600	540	420	400	404	450	405	2x577	2x22,72	1160	45,67	398	15,68	2x103	2x227
SVGT780KE	2xVIII	660	630	620	650	575	520	500	505	550	505	2x577	2x22,72	1160	45,67	398	15,68	2x150	2x330
SVGT960KE	2xVIII	800	800	800	605	605	620	630	620	650	575	2x577	2x22,72	1160	45,67	398	15,68	2x183	2x403

CORPORATE

Answer Drives S.r.l.
Viale Sarca 336
I - 20126 Milano
Phone +39 02 6445 1
Fax +39 02 6445 4401

MANUFACTURING FACILITY

S.S. 11 - Via Cà Sordis, 4
I-36054 Montebello Vicentino (VI)
Phone +39 0444 449 268
Fax +39 0444 449 276
www.answerdrives.com

CUSTOMER SERVICE AND SUPPORT

S.S. 11 - Via Cà Sordis, 4
I-36054 Montebello Vicentino (VI)
Phone +39 0444 449 226
Fax +39 0444 449 276
www.answerdrives.com

REPRESENTATIVE OFFICE CHINA

Silver Tower Rm. 3208 No. 2
Dongsanhuan Beilu Chao Yang District
Beijing 100027
Phone +86 10 6410 6601
+86 10 6410 6602
Fax +86 10 6554 4493

THAILAND
Ansaldo Sistemi Industriali SpA Thailand Branch
Muang Thai-Phatra Office Tower II 24th Fl
252/119 Rachadaphisek Rd, Huaywang
Bangkok 10310 Thailand
Phone +66 2 6932930
Fax +66 2 6932934

CHINA

ASI Industrial Systems Beijing Co. Ltd.
(subsidiary of Ansaldo Sistemi Industriali S.p.A.)
Room 3206 - 3208 / Beijing Silver Tower
No. 2 Dong San Huan Bei Road-Chaoyang District
Beijing People's Republic of China
Phone +86 10 6554 4490/91/92
Fax +86 10 6554 4493

FRANCE



www.answerdrives.com