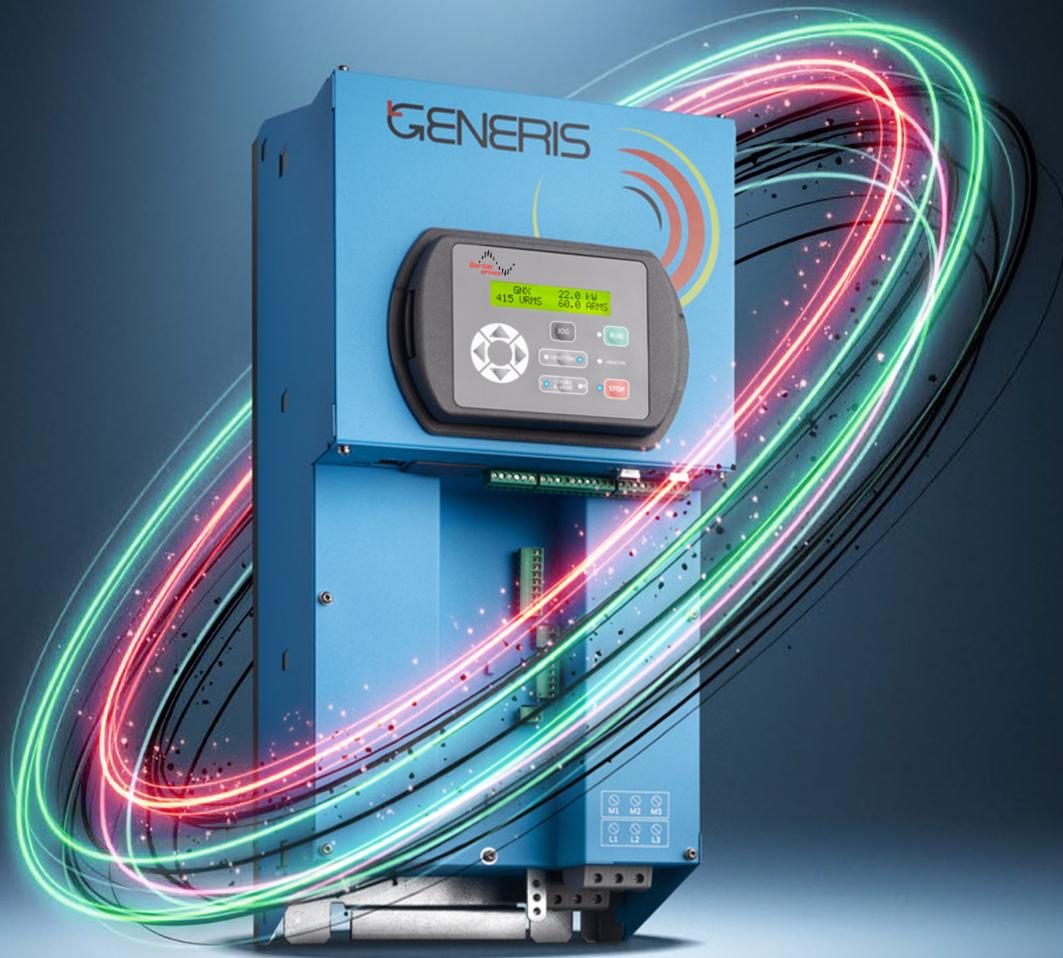


Bardac
drives

GENERIS



4-Quadrant Regenerative AC Drive

***drive.web* distributed control**

Ultra-low harmonics

~ The Ultimate Systems Drive ~

AC Drive Energy Regeneration

THE NEW BENCHMARK FOR AC MOTOR CONTROL

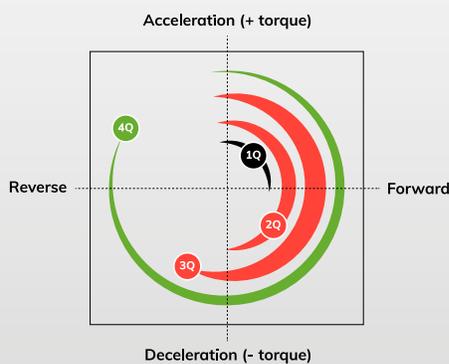
High performance motor control and energy regeneration using single stage power conversion

Advanced motor control and energy regeneration

4 quadrant control as standard

Generis delivers high performance AC electric motor control with the ability to return energy generated by the electric motor back to the supply.

It reliably delivers dynamic energy savings, avoiding the need to waste energy through dissipation in brake resistors.



Line switched, 4-Q Regen with *drive.web* automation technology

~ The Ultimate Systems Drive ~

Efficiency

Unique patented switching technology

- No DC link circuit & No electrolytic capacitors
- High efficiency
- Maximum energy saving
- Full torque at zero speed

Reliability

No electrolytic capacitors

- Long lifetime
- Less maintenance
- Reduced cost of ownership

Power quality

Converts AC input direct to variable AC output

- Unity power factor of 0.99
- Ultra-low THD (Total Harmonic Distortion) on input current <4%
- No DC link circuit & No electrolytic capacitors

Single stage power conversion

Generis provides a single power conversion stage, delivering AC power input direct to the motor as variable AC power supply, with no intermediate DC link. This maximizes energy savings and minimizes losses. *The Generis difference explained – see page 7*

Ultra-low THD (Total Harmonic Distortion) on input current

Reduces heating in cables, switchgear and transformers.

Near unity power factor operation

Input current stays in-phase with input voltage. This minimizes current drawn from supply for a given output power, allowing smaller supply cables to be used and reducing the cost of ownership.

Continuous operation at zero speed

No need to de-rate converter for continuous operation at zero speed and full torque.

Low speed performance maximized

Due to balanced loading of the devices at low speed (down to zero speed) there is no unbalanced load on any of the switching circuit.

Three-level voltage output waveform

At any instant, the output voltage is equal to one of the three input voltages. In an indirect converter it is one of two levels. Lower dv/dt gives reduced EMI (smaller filter) and allows for longer cable runs to the motor.

No electrolytic capacitors

Generis has no intermediate DC link or electrolytic smoothing capacitors. This means high reliability and long lifetime as there are no components that wear out over time.

drive.web connectivity

On-board *speedy dw281* facilitates seamless integration with the *drive.web* ecosystem



Advanced control of all motor types



Continuous operation at 0 speed

No derating required and no mechanical brake



Fast payback

On constant and variable torque profiles



Compact design

50% less volume than equivalent competitors



Safe torque off (STO)

PRODUCT SPECIFICATION



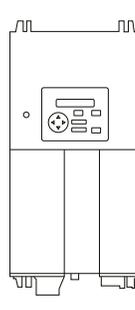
Dimensions		
Size	Frame 1	Frame 2
Motor Power Rating	30 HP (22 kW)	75 HP (55kW)
Width (W)	10.4" (264 mm)	10.4" (264 mm)
Height (H)	22.7" (576 mm)	22.8" (578 mm)
Depth (D)	9.2" (234 mm)	11.4" (289 mm)
Weight	48.5 lbs (22 kg)	55.1 lbs (25 kg)



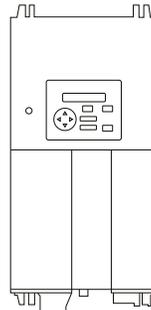
Size 1 - 30HP



Size 2 - 75HP

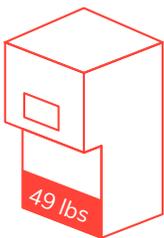


Size 3 - 120HP

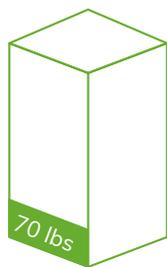


Size 4 - 270HP

Market leading power density

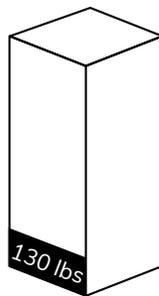


GENERIS 30 HP



Competitor A

Generis is half the volume and 40% lighter.



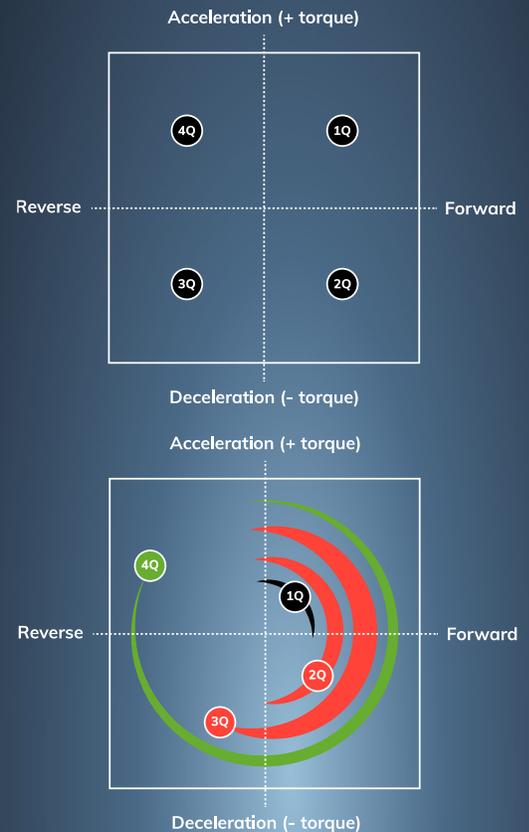
Competitor B

Generis is half the volume and 64% lighter.

Generis features include:

- Auxiliary power input
- Single or dual encoder
- Fieldbus support
- Removable operator station
- 40 character two line text display
- Multiple motor types supported
- Configurable application blocks
- Comprehensive set of user I/O
- Safe Torque Off
- *drive.web* distributed control

4 quadrant control with AC regeneration drive



What are the four quadrants?

If a motor is connected to a load then it can be driven (or accelerated) in a forward direction. This is quadrant 1. If the load is then slowed down or braked in this direction (decelerated) then this is quadrant 2. If the motor is decelerated or braked past zero speed and into reverse then this is quadrant 3. Finally, if the motor is accelerated in reverse then this is quadrant 4.

Generis achieves high performance 4 quadrant control with simplified mechanics and a unique, patented switching technology. This eliminates the need for the advanced electronics, DC links and electrolytic capacitors previously required to create an AC drive that could control all 4 quadrants, often called Active Front End drives.

Generis is the advanced motor control that delivers a more reliable, efficient and compact solution to 4 quadrant control of an AC motor. It does this while delivering unity power factor, minimal harmonic distortion to input current and full torque at any speed.

Ratings

Power configuration

- Four quadrant regenerative
- 380 – 500Vac, three-phase, 50/60Hz
- Auxiliary 24VDC input (optional)
- Internal EMC filter

Environment

- Ambient 0–50°C (derate above 40°C)
- Storage -25 to +55°C

Power rating

- 10, 15, 20, 25, 30 HP (7.5, 11, 15, 18.5, 22kW)

Current rating

- Normal duty: 18, 26, 35, 44, 52A; 110% overload for 30 seconds
- Heavy duty: 15, 22, 30, 37, 44A; 150% overload for 30 seconds

Output voltage/frequency

- $V_{out} = \leq 0.86 V_{in}$
- $f_{max} = 200\text{Hz}$

Speed / Accuracy

- 2% in Open-loop V/f
- 0.02% in closed-loop vector

Enclosure

- IP20
- Air-cooled with temperature controlled fans
- Keyhole slot mounting
- Two-part control connections

Operator station

- Chassis or panel-mounting
- 2 x 20-character backlit LCD
- Four key menu navigation
- Local/remote modes
- Dedicated Run/Jog/Stop keys
- Direction and health indications

Standards

- EN 61800-5-1:2007 (CE - Low Voltage Directive)
- EN 61800-3:2017 (CE- EMC)
- EN61800-5-2:2017 (STO Pending)
- UL 61800-5-1 (UL Pending)

Protection

- Thermal fold-back
- Instantaneous over-current
- Motor over-temperature
- Heatsink over-temperature
- AC power loss
- AC line sync loss
- Stall protection
- Standstill logic
- Fan fail
- Digital/analog output short-circuit
- Digital/analog input over-voltage (to 30VDC)

Analog inputs

- 3 x $\pm 10\text{V}$ configurable reference supplies (10mA maximum)
- 1 x 4/20mA or $\pm 10\text{V}$ configurable reference

Analog outputs

- $\pm 10\text{V}$ range
- Two configurable

Digital inputs

- 24V logic
- Current sinking
- Four dedicated: Run, Stop, Jog, Coast Stop
- Four configurable
- Seven configurable
- One configurable Coast Stop
- Dedicated coast stop

Digital outputs

- 24V logic
- Current sourcing (400mA maximum)
- Five configurable

Relay outputs

- 240VAC volt-free contacts
- Two configurable

Encoder inputs

- Single or dual incremental encoder inputs
- A, B and Marker
- Differential or single-ended
- 5, 12 or 24V (software selectable)
- Single / dual incremental encoder inputs

Motor temperature

- 1x PT100 input
- External sensor required

Software functions

Motor control

- Open-loop V/f and closed-loop vector modes
- Controls Induction motors
- Speed control
- Open-loop constant torque or quadratic torque power modes
- Current loop autotune

Application functions

Full featured programmable control

- Analog Logic
- PID's
- Advanced Math
- Winder Control
- Motion Control
- Position Control
- and more!

Diagnostics

- Motor current/voltage/speed/power
- AC supply voltage/frequency
- Heatsink temperature
- Motor temperature (external sensor required)
- User input voltages
- Run and powered hours

Interfaces

Communications

- **drive.web** smart Ethernet
- Modbus TCP/IP
- Ethernet/IP
- USB-C
- **Optional:** PROFIBUS, PROFINET, DeviceNet, EtherCAT, Modbus, CAN/CANopen & all major industrial networks

Programming

- Graphical Function Block programming
- **drive.web** distributed control

drive.web AUTOMATION

On-board *drive.web dw281* facilitates seamless integration with the *drive.web* ecosystem enabling full *savvy* support.

- Fast, deterministic, peer-to-peer control over Ethernet
- No system bandwidth degradation with systems of any size
- One completely homogeneous environment for drives, controls, operator stations, I/O – everything!
- Complete data consistency throughout a system
- The ability to store the entire system configuration in the controllers for easy field total access
- The ability to manage total system program thread and hierarchy
- Consistent multi-level password protection

drive.web dw281



Generis Configuration

Only requires *savvy* software for quick setup and operation.

<https://driveweb.com/get-savvy/>

Explore GENERIS in the *drive.web* world

Data Collection

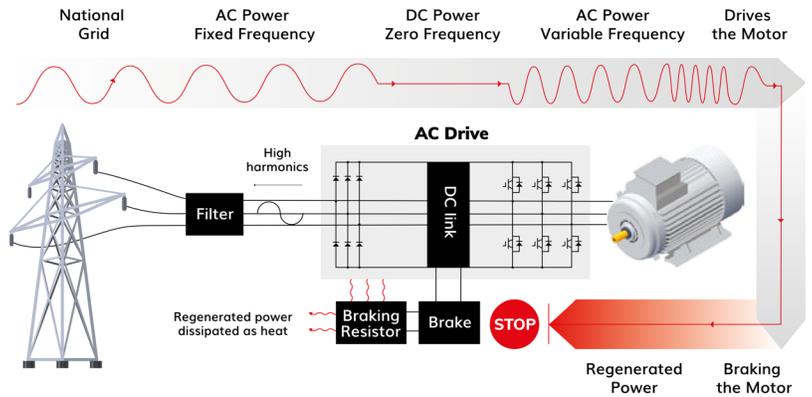
Drive/motor temperature
Supply frequency
Motor speed
Supply voltage
Feedback optics



GENERIS AC DRIVES VS TRADITIONAL AC DRIVES

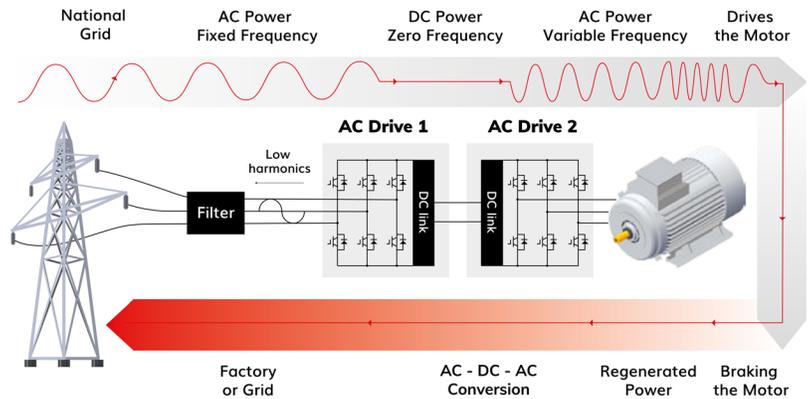
How a standard AC drive works

AC current input supply has to be converted to DC in order to output a variable AC supply to the motor (the load). When the motor is braked, the energy generated by the motor has to be dissipated through braking resistors as heat. This wastes the energy created by the motor; requires extra hardware costs to handle energy from the motor; and requires design and installation measures to protect electronics from the heat created.



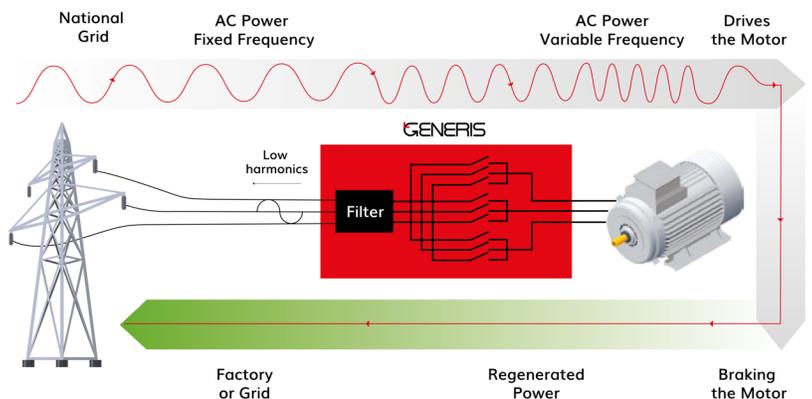
To regenerate energy, two standard AC drives are required

Often referred to as Active Front End (AFE) drives, this requires two AC drives to be placed back-to-back. Energy can then flow both ways – from the input supply to the motor and regenerated energy from the motor back to the supply grid. This solution is not only costly. It uses electrolytic capacitors where lifetime is halved for every 10°C rise in temperature.



Generis regenerates energy as standard

Generis uses a unique, patented switching technology to deliver a single power stage, with no DC link required. This means AC supply input goes direct to AC variable supply output to the motor and regenerated energy from the motor can be passed direct back to the supply. This direct energy conversion delivers unity power factor and low total harmonic distortion. The simplified mechanics of Generis with solid state electronics also means improved reliability and longer operating lifetimes.



WORLD CLASS AC & DC DRIVES

Bardac provides a wide range of AC & DC drives covering single phase and three phase, regenerative and non-regenerative applications.

Our US manufacturing facility is supported by a global network of distributors.

APPLICATIONS FOR GENERIS

Artificial lifts
Centrifuges
Converting Lines
Energy generation / transfer & recovery
Extrusion & Molding
Flywheels
Hydrokinetic (tidal / bi-directional) river flow
Low harmonic or regen fans
Low harmonic or regen pumps
Material handling equipment
Packaging
Printing & Coating
Process control
Pumped hydro
Textiles
Wind turbines
Winding / Unwinding

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