

### Variable Speed Drives

The Advantage variable speed AC drives presents the most advanced and user-friendly solutions in the marketplace. Featuring optimal reactions times and complete scalability to match your application requirements for speed, size and protection, the complete line of products provide the flexibility and performance to meet the needs of a broad range of pumping applications. Reduce your energy costs and improve your up-time by simplifying installation, configuring and maintenance by providing advanced diagnostics, industry-leading voltage ride thru capability and seismic qualified products.



### Advantage 12 AC Nano-drives

The Advantage 12 variable speed AC drive is the only compact drive that combines best-in-class motor performance, a ten-year service life and an intuitive user interface in an attractive design suitable for smaller single and 3 phase pump motors. It features an integrated communications port, user-friendly navigation wheel on the faceplate and an optional multiloader that streamlines set-up by making programming quick and easy. All of this comes with the energy efficient advantages of a variable speed drive with the versatility to handle applications from simple to complex, across a wide variety of industries, even in harsh environments.



### Advantage 312 Mini-drives

The Advantage 312 mini-drive provides a 575 volt option for smaller motors while at the same time, simplifying its integration into a single control system architecture. With the highest overtorque and the only drive with a remote graphic keypad in its class, the Advantage 312 mini-drive is suited to the needs of pump applications. It also comes standard with integrated communications port for Modbus and CANopen networks, as well as optional cards for CANopen Daisy Chain, DeviceNet and Profibus DP.

The Advantage 312 mini-drive is extremely robust. It comes with coated cards (IEC 60721-3-3 Classes 3C2 and 3S2) and can withstand temperatures ranging from -10° C to 50° C without derating, even when installed side-by-side. What's more, it offers excellent resistance to disturbed power supplies and motor interference.



### Advantage 21 Mid-featured AC Drives

Offering unmatched value in installed cost and functionality for centrifugal pumps, the Advantage 21 AC drive offers just the right solution for contractors and control panel builders. The Advantage 21 AC drive can communicate through its native Modbus® port or be fitted with an option card for connectivity to Lonworks, BACnet, Johnson Controls N2 or Apogee P1 networks.



### Advantage 61 Full-featured AC Drives

The Advantage 61 AC drive defines ease of use for variable speed drives used in centrifugal pumps offering the highest level of features, functions and flexibility. Its evolutionary design will reduce installation and start-up time while providing reliable operation. It is designed for OEMs, end-users and system integrators requiring an easy-to-use product with a high level of functionality and customization that is also easy to maintain. It provides connection options to the major building automation networks, including Lonworks, BACnet, Johnson Controls N2 and Apogee P1, as well as other industrial networks. The Advantage 61 AC drive can be internally fitted with an option card to manage multiple pump installations and can also be fitted with the "Controller Inside" option board, which allows custom programming via the IEC 1131 programming methods.



# single provider of AC drives

## S-Flex™ Enclosed Drives

The S-Flex™ enclosed drive features the Advantage 2I drive on the inside and provides 100 kAIC rating for commercial pump applications. Designed as an off-the-shelf product, the S-Flex™ enclosed drive is an economical, yet feature-rich package that includes a circuit breaker disconnect and optional bypass contactors, drive input disconnect switch and line contactor. In addition, the S-Flex™ enclosed drive is rated as a NEMA Type I general purpose enclosure and is ideal for use in residential high rise and mixed-use buildings, commercial office buildings, schools and campus environments.



## E-Flex™ Enclosed Drives

The E-Flex™ enclosed AC drive controller is a robust, industrial-grade enclosed solution for healthcare and industrial plant floor; HVAC, pump and fan applications. The E-Flex™ enclosed drive features the Advantage 6I AC drive on the inside and provides 100 kAIC rating with a circuit breaker and with an option for bypass contactors. Built to conform to international building code (IBC) and ASCE seismic standards for ground and roof-level installations, the E-Flex™ enclosed drive meets both indoor and outdoor application requirements with Type I, Type 12/12K and Type 3R enclosures.



## M-Flex™ Enclosed Drives

The M-Flex™ enclosed drive controllers provide a robust, adjustable-speed solution for government, hospitals, universities, pharmaceutical, industrial facilities and municipal pumping applications. These enclosed packages feature the Advantage 6I AC drives and are available in Type I general purpose or Type 12/12K drip/dustproof environmental enclosures in integrated or barriered designs.




## PowerGard™ Series C Enclosed Drives

Combining adjustable speed drives and power quality solutions for municipal and industrial pumping applications, the PowerGard™ Series C, 18-Pulse enclosed drive controller features the Advantage 6I AC drives. They are ideal for installations specifying “clean power” low harmonic content in compliance with IEEE 519 guidelines for harmonic mitigation. PowerGard™ Series C, 18-Pulse enclosed drives are UL 508 listed and are available in Type I general purpose or with fan filter options.



# Advantage VARIABLE SPEED DRIVES Panel mounted/open products solutions

Starters/drives		<b>Advantage 12</b> 	<b>Advantage 312</b> 
Distribution voltage ranges for 50/60 Hz line supply		Single-phase 100 V to 120 V Single-phase 200 V to 240 V Three-phase 200 V to 230 V	Three-phase 525 V to 600 V
Horsepower ratings for three-phase motors		<ul style="list-style-type: none"> <li>• 1/4 hp to 1 hp, 115 V/230 V single-phase input</li> <li>• 1/4 hp to 3 hp, 208 V/230 V single-phase input</li> <li>• 1/4 hp to 5 hp, 208 V/230 V</li> </ul>	<ul style="list-style-type: none"> <li>• 1/4 hp to 3 hp, 208 V/230 V single-phase input</li> <li>• 1/4 hp to 20 hp, 208 V/230 V</li> <li>• 1/2 hp to 20 hp, 400 V/480 V</li> <li>• 1 hp to 20 hp, 575 V/600 V</li> </ul>
Drive	Output frequency –	0.5 Hz to 400 Hz	0.5 Hz to 500 Hz
	Type of control: Asynchronous motor	Sensorless flux vector control Kn2 quadratic ratio for pump and fan	Sensorless flux vector control, voltz per hertz, Energy saving ratio
	Synchronous motor	—	—
	Transient overtorque	150% to 170% of the nominal motor torque	170% to 200% of the nominal motor torque
Functions			
Number of functions		40	50
Number of I/O	Analog inputs	1	2
	Logic inputs	4	3
	Relay outputs	1	2
Communication	Integrated	Modbus	Modbus and CANOpen
	Available as an option	—	Option cards: <ul style="list-style-type: none"> <li>• DeviceNet</li> <li>• Profibus DP</li> <li>• CANOpen Daisy Chain</li> </ul> Gateway options for: <ul style="list-style-type: none"> <li>• Ethernet TCP/IP</li> <li>• Fipio</li> </ul>
Cards (available as an option)		—	—
Enclosure rating		IP20	IP20, Type I with optional kit,
Standards and certifications		IEC/EN 61800-5-1, IEC/EN 61800-3 (Environments 1 and 2, categories C1 and C3) CE, UL, CSA, C-Tick, NOM, Gost	EN 50178, EN 61800-3, EN 55011 – EN 55002: class A, class B with option, C-TICK, UL, N998, CE, CSA

## Advantage 2 I





## Advantage 6 I



Three-phase 200 V to 240 V Three-phase 380 V to 480 V	Single-phase 200 V to 240 V Three-phase 200 V to 240 V Three-phase 380 V to 480 V Three-phase 525 V to 690 V
<ul style="list-style-type: none"> <li>• 1 hp to 40 hp, 208 V/230 V</li> <li>• 1 hp to 100 hp, 400 V/480 V</li> </ul>	<ul style="list-style-type: none"> <li>• 1 hp to 30 hp, 208 V/230 V single-phase input</li> <li>• 1 hp to 125 hp, 208 V/230 V</li> <li>• 1 hp to 2000 hp, 400 V/480 V</li> <li>• 2 hp to 2500 hp, 575 V/690 V</li> </ul>
0 Hz to 200 Hz	0.5 Hz to 1000 Hz up to 50 hp 0.5 Hz to 500 Hz from 50 hp to 900 hp
Volts per hertz or sensorless flux vector control	Volts per hertz ratio (2 or 5 points) or sensorless flux vector control, energy saving ratio
—	—
Transient overload: 110% of the nominal drive current for 60 seconds	Transient overload: 110% of the nominal drive current for 60 seconds
50	> 100
2	2-4
3	6-20
1	2-4
Modbus	Modbus and CANOpen
<ul style="list-style-type: none"> <li>• APOGEE FLN (PI)</li> <li>• BACnet</li> <li>• LonWorks</li> <li>• Metasys N2</li> </ul>	<ul style="list-style-type: none"> <li>• APOGEE FLN (PI)</li> <li>• BACnet</li> <li>• Modbus/Uni-Telway</li> <li>• LonWorks</li> <li>• Modbus TCP/IP</li> <li>• Ethernet IP</li> <li>• Modbus Plus</li> <li>• Interbus S</li> <li>• DeviceNet</li> <li>• Profibus DP [V1]</li> <li>• Metasys N2</li> <li>• Fipio</li> </ul>
—	I/O extension cards "Controller Inside" programmable card, multi-pump cards
IP20, Type I with optional kit	IP20, Type I with optional kit, Type I2
EN 50178, IEC/EN 61800-3, EN 55011, 55022: class A, class B with option, CE, UL, C-TICK, N998, UL 1995 Plenum-rated	IEC/EN 61800-5-1, IEC/EN 61800-3 (environments 1 and 2, C1 to C3), EN 55011, EN 55022, UL 1995 Plenum-rated, IEC/EN 61000-4-2/4-3/4-4/4-5/4-6/4-11, CE, UL, CSA, DNV, C-TICK, NOM 117, GOST, ABS

# Advantage Enclosed Packaged Products

VARIABLE SPEED DRIVES

<p>Packaged products</p> <p>Integrated controls protected within enclosures, optimized with disconnect means, circuit breakers, push buttons, selector switches, control logic, communication and miscellaneous options designed to meet application requirements.</p> <p>Product platform</p>	<p><b>S-Flex™</b></p>  <p>Advantage 21</p>	<p><b>E-Flex™</b></p>  <p>Advantage 61</p>
<p>Distribution voltage ranges for 50/60 Hz line supply</p>	<p>208 VAC, 240 VAC, 480 VAC</p>	<p>208 VAC, 240 VAC, 480 VAC</p>
<p>Horsepower ratings</p>	<p>Variable torque:</p> <ul style="list-style-type: none"> <li>• 1 hp to 40 hp, 200 V/230 V</li> <li>• 1 hp to 100 hp, 460 V</li> </ul>	<p>Variable torque:</p> <ul style="list-style-type: none"> <li>• 1 hp to 100 hp, 460 V</li> <li>• 1 hp to 50 hp, 208 V/230 V</li> </ul>
<p>Configurable options</p>	<p>Configurable product</p> <ul style="list-style-type: none"> <li>• Drive with isolation/bypass</li> <li>• Non-bypass</li> <li>• Drive input disconnect switch</li> <li>• Line contactor</li> </ul> <p>Communication options</p>	<p>Configurable product</p> <ul style="list-style-type: none"> <li>• Drive with disconnect means</li> <li>• Drive with isolation/bypass</li> <li>• Optional 3% line reactor</li> </ul> <p>Limited options</p>
<p>Enclosure ratings</p>	<p>Type I general purpose</p>	<p>Type I general purpose Type 12/12K dust/drip proof Type 3R outdoor</p>
<p>Communication</p>	<ul style="list-style-type: none"> <li>• Modbus RJ45 (included as standard)</li> <li>• BACnet</li> <li>• LonWorks</li> <li>• Metasys N2</li> <li>• APOGEE FLN (PI)</li> </ul>	<ul style="list-style-type: none"> <li>• APOGEE FLN (PI) *</li> <li>• BACnet *</li> <li>• Ethernet TCP/IP</li> <li>• LonWorks</li> <li>• Metasys N2 *</li> <li>• Modbus Plus *</li> <li>• Profibus DP</li> </ul>
<p>Standards and certifications</p>	<p>UL 508A, Seismic qualification ICC ES AC156 acceptance test protocol</p>	<p>UL 508C, cUL, Seismic qualification ICC, ES AC156 acceptance test protocol, ABS</p>

▼ Heating Ventilation Air Conditioning, \* Available with Advantage 61 based product

## M-Flex™



Advantage 61 (variable torque)

## PowerGard™ Series C



Advantage 61 (variable torque)

208 VAC, 240 VAC, 480 VAC

Variable torque:

- 1 hp to 500 hp, 460 V
- 1 hp to 50 hp, 208 V/230 V

Constant torque:

- 1 hp to 450 hp, 460 V
- 1 hp to 40 hp, 208 V/230 V

480 VAC

Variable torque:

- 50 hp to 500 hp, 460 V

Constant torque:

- 40 hp to 450 hp, 460 V

Customizable product

- Drive with disconnect means
- Drive with integrated bypass
- Drive with barriered bypass
- Drive with reduced voltage bypass
- Drive with soft start bypass

Extensive options

Type I general purpose  
Type IG general purpose with gasketing  
Type I2/I2K dust/drip proof

Customizable product

- Drive with disconnect means
- Drive with integrated bypass
- Drive with barriered bypass
- Drive with reduced voltage bypass
- Drive with soft start bypass
- Soft start with options

Extensive options

Type I general purpose  
Type IB general purpose with fan filters

- APOGEE FLN (PI) \*
- BACnet \*
- DeviceNet
- EtherNet TCP/IP
- FIPIO
- Interbus S
- LonWorks \*
- Metasys N2 \*
- Modbus/Unitelway
- Modbus Plus
- Profibus DP

UL 508A, UL 508C, cUL, Seismic qualification ICC ES  
AC156 acceptance test protocol, ABS

- APOGEE FLN (PI) \*
- BACnet \*
- DeviceNet
- Ethernet TCP/IP
- FIPIO
- Interbus S
- LonWorks \*
- Metasys N2 \*
- Modbus/Uni-Telway
- Modbus Plus
- Profibus DP

UL 508A, UL 508C, cUL, Seismic qualification ICC ES  
AC156 acceptance test protocol



*In order to provide the most efficient pump solution to our customers, Taco is now working with Schneider Electric.*

*This collaboration brings together Taco's pump technology with Schneider Electric Variable Frequency Drives and the drive packaging of Square D enclosures to offer the best overall pumping solution for our customers.*



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