

# RSi Variable Frequency Drive Products and Systems

*with powerful, **intuitive** user interface*



Complete family of AC drives  
Application / engineering support  
Multi-purpose micro drives  
NEMA 4X washdown drives  
High performance industrial drives  
PREDATOR™ QuickShip program  
IEEE 519 clean power drives  
Integrated communications/systems  
24/7 service and support



# Variable speed drive solutions ...



## From the world leader in **MISSION CRITICAL** motor control

### *Benshaw offers a complete family of variable speed drive solutions:*

- ▶ Multi-purpose micro drives
- ▶ High performance industrial drives
- ▶ IEEE 519 clean power drives
- ▶ NEMA 4X washdown drives
- ▶ Packaged drives
- ▶ Turnkey drive control systems

As a pioneer in the motor control industry, Benshaw has led the effort to expand the market for variable speed drives to include many applications that were once considered unobtainable.

Through extensive research, in-depth testing and real world applications experience, Benshaw now offers a complete range of variable speed drive solutions ... from multi-purpose micro drives and high performance industrial drives to IEEE 519 clean power drives, NEMA 4X washdown duty drives and custom configured packaged drive solutions ... with services and support capabilities available to meet the motor control needs of a broad range of industries and applications.

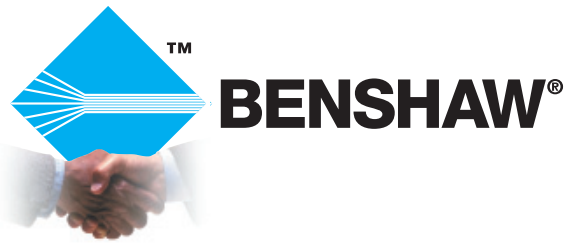
### **Reliable drive products**

A principle factor in Benshaw's rapid expansion in the variable speed marketplace is our focus on quality and the attention we've paid to the issues that are key to our customers ... reliability and ease-of-use.

Benshaw's intuitive operator interface, rugged construction standards, ISO certified quality control systems and an integrated approach to engineering have resulted in a new generation of variable speed drive products that are easier to set up, easier to operate, easier to network and more reliable than ever.

In fact, when the application is demanding and the environment harsh, more customers now turn to Benshaw than any other motor control brand.

*Rugged. Reliable. Ready.*



## and protection.

### High performance, sensorless vector drives

Benshaw's variable speed drive products have earned a solid reputation for rugged, reliable performance in a variety of demanding applications—from pumps, compressors and chillers to fans, blowers, crushers, chippers and conveyors.

All of Benshaw's drive products include an intuitive user interface, integrated control and power electronics, and can be provided with bypass and isolation contactors, and a myriad of user-friendly, user-selectable options.

On-board metering, plain English data displays, ModBus communications capabilities and integrated motor, load and power quality fault protection are standard.

### Engineered drive packages

Benshaw's engineering and design teams draw on extensive real-world drive applications experience. If a standard drive doesn't fit your needs, Benshaw can engineer and build one that does—with the shortest lead time in the industry.

### Custom-engineered drive systems

Benshaw can also design and manufacture a complete custom-engineered drive system or motor control center to meet your industry- or application-specific requirements.

### World-class pre and post-sale service and support

Benshaw's dedicated, knowledgeable technical support staff

is available to answer your questions before, during and after the sale. To help you select the best drive solution available, Benshaw can offer a wide range of engineering and applications support services, including harmonics analysis, application analysis, design consultations, retrofit services and certified ETAP engineering.

Drive repairs, spare parts, field engineering, retrofits and training—whenever and wherever needed—are all part of our commitment.

# World-class drive products ...



## Benschaw offers a variable frequency drive for any industry and any application.

Benschaw offers a wide range of standard drives and engineered drive packages ... from 1 to 700 horsepower. All are rugged, reliable and easy to use, with intuitive, menu driven programming features and robust high quality power sections to support your toughest variable speed applications.

Whether your motor control application is simple or highly complex, Benschaw's flexible I/O functionality and user-selectable control strategies allow the user to optimize the drive to individual application and operating conditions.

### **GX Series** micro drives

Full featured GX Series micro drives combine exceptional performance and ease of use in a compact, economical unit.

### **SG Series** high performance sensorless vector drives

SG Series drives are designed for hard to start applications that require high starting torque. Benschaw's sophisticated auto-tuning algorithm senses internal motor parameters to optimize drive performance and provide precise speed regulation.

### **SG519 Series** clean power 18 pulse drives

Benschaw's clean power drive family meets IEEE519-1992 standards for harmonics. SG519 drives include an 18 pulse transformer and additional diode bridge rectifier to reduce harmonic distortion below 5%.

### **S4 Series** washdown duty drives

Benschaw's S4 drive family is designed to perform in wet, dirty or corrosive environments. The S4's standard NEMA4X polycarbonate enclosure can be mounted in washdown environments and in the harshest operating conditions.

### **SGP** built-to-order drives

Benschaw is the world leader in quick shipment of built-to-order engineered drive packages. SGP packages feature SG Series drives with your choice of disconnect, bypass, line and load reactor and control options.



**standard** drives ...  
**engineered** drives ...  
**integrated** systems ...



### Engineered solutions

Benshaw also provides complete custom engineered drive packages to your specification, with enclosures, bypass configurations and disconnects tailored to meet your application requirements.

In fact, Benshaw is widely recognized as an innovator in the machine control industry. We approach complex control applications with unrivaled engineering and design experience, and work closely with customers to find an optimal drive solution.

Benshaw's intuitive drive interface and expanded communications options simplify remote monitoring and connection of Benshaw controls to your network.

All drives include one integrated ModBus/RS485 communications port as standard. Additional communications protocols are supported through optional communications bridges for simple, plug-and-play networking:

- ◆ Profibus
- ◆ Ethernet
- ◆ Devicenet
- ◆ Lon Works
- ◆ BacNet

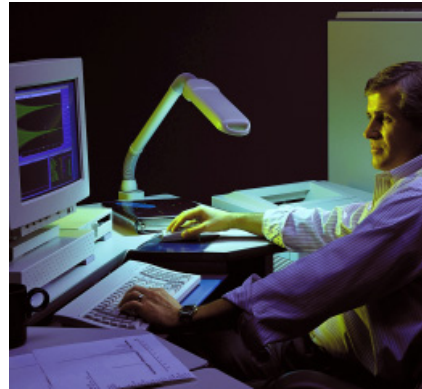
*Intuitive.  
Intelligent.  
Easy.*



*All Benshaw variable speed drives share a common, intuitive interface for quick setup, simplified programming and ease of operation. The powerful Windows-based DriveView software provides complete monitoring, trending, and commissioning support.*



## World-class service and support ...



## Benshaw provides **COMPREHENSIVE SUPPORT** before ...

Benshaw provides world-class, comprehensive service and support—before, during and after the sale—to help you achieve your most demanding motor control objectives.

As the world leader in mission critical motor control and protection, Benshaw's drive engineering expertise and real world applications experience provides precise solutions to your motor control applications.

### **Applications support**

Benshaw's team of well-trained motor control experts is available to review your application and operational requirements. Specific recommendations are provided to help you select the right drive solution for your needs:

- ◆ Application analysis
- ◆ Environmental considerations
- ◆ Motor control parameters
- ◆ Drive quotation

### **Drives engineering**

If a standard drive package doesn't fit your requirements, Benshaw's product engineers will engineer one that does, with all necessary ratings met and compliance to any global standard you specify ... guaranteed.



**Rugged.  
Reliable.  
Ready.**



*The Benshaw Promise ...*

*Every Benshaw variable speed drive is guaranteed for two full years. Other manufacturers limit their warranties to just one year. But at Benshaw, we believe that since we build them better, we can guarantee them longer. That's "the Benshaw Promise."*

## during and after the sale.

### **Technical training**

Benshaw's regional technical support centers provide both classroom and hands-on training for basic drive principles, electrical/electronic maintenance and diagnostics, customized maintenance programs and operations based systems.

### **Commissioning, maintenance and repairs**

Benshaw has developed an extensive network of regional manufacturing and technical support centers across North America ... all linked via centralized engineering and order management systems.

Drive repairs are made by trained, experienced personnel, using the latest diagnostic and testing equipment to service printed circuit boards, power electronic control assemblies and electrical subassemblies.

### **Field engineering**

Benshaw offers 24/7 technical phone support to help you solve your drive problems as quickly as possible. Benshaw can also dispatch experienced field engineering experts on short notice to help with drive commissioning, harmonics analysis, data collection, trending issues, field repairs, onsite training or preventive maintenance.

### **Regional warehousing for standard products, spares and components**

Standard drives, critical drive parts, packaged assemblies and components are stocked and ready to ship from several strategically located warehouses on short notice.



# *GX Series* multipurpose micro drives ...



## **COMPACT**, rugged sensorless vector drives

### **Constant Torque:**

1 to 5HP @ 230VAC  
1 to 5HP @ 460VAC



GX Series micro drives from Benshaw provide a rugged, compact, economical chassis drive solution for low horsepower applications.

Each drive in the GX Series offers an intuitive user interface, quick setup, preconfigured settings for common variable frequency drive applications, and a flexible, programmable I/O for more demanding applications or complex control strategies.

### **Key features:**

- ◆ Compact design
- ◆ Integral PID control
- ◆ Sensorless vector control or V/Hz control
- ◆ Adjustable carrier frequency
- ◆ Programmable I/O
- ◆ Standard dynamic braking resistor

### **Compact design**

GX Series variable frequency drives pack substantial power and flexibility into an economical, space saving package.

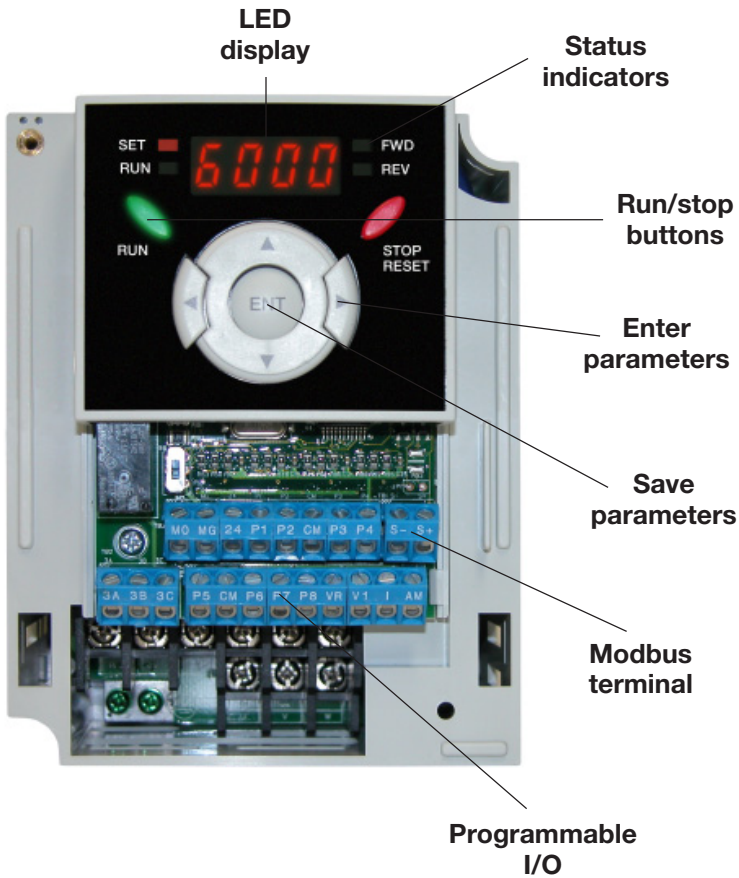
### **Intuitive interface**

GX Series drives provide an intuitive user interface and a four digit LED display with four directional keys for simple, menu-based setup and operation.

### **Heavy duty power rating**

The GX drive family features a rugged power section that can provide up to 150% current for 60 seconds.





**Rugged.  
Reliable.  
Ready.**

### Integrated PID control

The GX Series drive includes standard PID control to regulate pressure, temperature or flow in fan and pump applications.

### Control method

GX Series drives feature user selectable open loop V/Hz control and sensorless vector control.

### Flexible programming

Over 200 programmable parameters are available across four configuration groups.

### Global compliance

Benshaw's GX drive family meets CE and UL (Type 1) compliance standards.

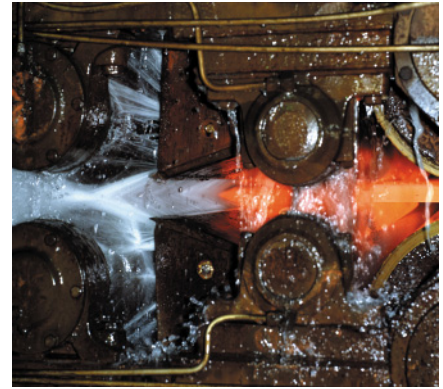
230VAC	CONSTANT TORQUE	
	HP	AMPS
☞ RSI-001-GX-2	1	4.2
☞ RSI-002-GX-2	2	6.8
☞ RSI-003-GX-2	3	9.6
☞ RSI-005-GX-2	5	15.2

460VAC	CONSTANT TORQUE	
	HP	AMPS
☞ RSI-001-GX-4	1	2.1
☞ RSI-002-GX-4	2	3.4
☞ RSI-003-GX-4	3	4.8
☞ RSI-005-GX-4	5	7.6

☞ = Web stocked

# S4 Series NEMA 4X washdown drives ...



## NEMA 4X **WASHDOWN** drives for severe environments

### Constant Torque:

**1HP @ 115V**  
**1 to 20HP @ 230VAC**  
**1 to 50HP @ 460VAC**  
**1 to 50HP @ 600VAC**



Benschaw S4 Series sensorless vector drives are designed for high pressure washdown applications and are built to withstand the harshest industrial environments.

S4 Series drives feature a rugged polycarbonate enclosure that exceeds NEMA 1, 12, 4 and 4X standards, with double labyrinth seals that keep dust, dirt, oil and water from entering the drive at pressures up to 1,000 psi.

230 volt and 460 volt S4 Series drive models are web stocked for immediate shipment. 600 volt models are also available.

### Standard features:

- ◆ NEMA 4X / IP 66 washdown duty enclosure
- ◆ Sensorless vector control
- ◆ Gasketed, double labyrinth seal withstands high pressure washdown to 1,000 psi
- ◆ Arctic Mode - maintains safe operation in cold environments
- ◆ High starting torque
- ◆ Standard sequencer software
- ◆ Standard braking transistor and resistor
- ◆ Infrared programming port
- ◆ Standard and heavy duty ratings
- ◆ LCD plain English display
- ◆ Integrated PID control
- ◆ Standard Modbus communications port

### Standard Duty power rating

The Standard Duty rating provides overload protection at 120% current for 60 seconds.

### Heavy Duty power rating

The Heavy Duty rating provides a more robust power section for loads requiring higher starting torque and higher peak overloads of 150% for 60 seconds.

### Infrared programming port

An infrared programming port is provided as standard equipment on all S4 Series drives for convenient, wireless programming through a handheld, Windows-based PDA.

### Integrated software

Regenerative software is included to eliminate regen energy on overhauling loads. Sequencer software is also included as standard.

### PID control










S4 drives feature an integrated PID control algorithm to regulate pressure, temperature or flow. PID process variables can be set in "real" values, eliminating the need for confusing conversions.

### Dynamic braking transistor and resistor



















S4 drives include as standard a dynamic braking transistor and resistor to decrease deceleration times and eliminate regenerative energy. An optional external resistor can be added for even faster stopping times.

 = Web stocked

\* = Units are NEMA 12 not washdown

230VAC	STANDARD DUTY		HEAVY DUTY	
	HP	AMPS	HP	AMPS
 RSI-001-S4-2W	1	4.2	0.5	2.5
 RSI-002-S4-2W	2	6.8	1	4.8
 RSI-003-S4-2W	3	9.6	2	7.8
 RSI-005-S4-2W	5	15.2	3	11
 RSI-007-S4-2W	7.5	22	5	17.5
 RSI-010-S4-2W	10	28	7.5	25.3
 RSI-015-S4-2W	15	42	10	37.2
 RSI-020-S4-2W	20	54	15	48.3
 RSI-025-S4-2W	25	68	20	62.1

460VAC	STANDARD DUTY		HEAVY DUTY	
	HP	AMPS	HP	AMPS
 RSI-001-S4-4W	1	2.1	0.5	1.1
 RSI-002-S4-4W	2	3.4	1	2.1
 RSI-003-S4-4W	3	4.8	2	3.4
 RSI-005-S4-4W	5	7.6	3	4.8
 RSI-007-S4-4W	7.5	11	5	7.6
 RSI-010-S4-4W	10	14	7.5	11
 RSI-015-S4-4W	15	21	10	14
 RSI-020-S4-4W	20	27	15	21
 RSI-025-S4-4W	25	34	20	27
 RSI-030-S4-4W	30	40	25	34
 RSI-040-S4-4W	40	52	30	40
 RSI-050-S4-4W	50	65	40	52
 RSI-060-S4-4W	60	77	50	65
 RSI-075-S4-4W	75	96	60	77
 RSI-100-S4-4W	100	124	75	96
 RSI-125-S4-4D*	125	156	100	124
 RSI-150-S4-4D*	150	180	125	156
 RSI-200-S4-4D*	200	240	150	180

600VAC	STANDARD DUTY		HEAVY DUTY	
	HP	AMPS	HP	AMPS
RSI-001-S4-6W	1	1.7	0.5	0.9
RSI-002-S4-6W	2	2.7	1	1.7
RSI-003-S4-6W	3	3.9	2	2.7
RSI-005-S4-6W	5	6.1	3	3.9
RSI-007-S4-6W	7.5	9	5	6.1
RSI-010-S4-6W	10	11	7.5	9
RSI-015-S4-6W	15	17	10	11
RSI-020-S4-6W	20	22	15	17
RSI-025-S4-6W	25	27	20	22
RSI-030-S4-6W	30	32	25	27
RSI-040-S4-6W	40	41	30	32
RSI-050-S4-6W	50	52	40	41
RSI-060-S4-6W	60	68	50	52
RSI-075-S4-6W	75	75	60	62
RSI-100-S4-6W	100	107	75	77
RSI-125-S4-6D*	125	125	100	99
RSI-150-S4-6D*	150	144	125	125
RSI-200-S4-6D*	200	192	150	140

# *SG Series* high performance industrial drives ...



## Variable Torque:

7.5 to 40HP @ 230VAC  
7.5 to 700HP @ 460VAC

## Standard Duty:

7.5 to 40HP @ 230VAC  
7.5 to 600HP @ 460VAC

## Heavy Duty:

5 to 30HP @ 230VAC  
5 to 500HP @ 460VAC

Benshaw's rugged, flexible SG Series drives are designed to handle your most demanding variable speed drive applications.

SG Series sensorless vector drives are easy to install and configure. Standard drives are web stocked for immediate shipment. Custom SG Series drive packages are also available on a built-to-order basis, with enclosures, disconnects, bypasses, pilot devices, and magnetics options available to meet your precise motor control requirements.

All SG Series units feature a flexible power stack with three selectable power ratings.

## Key features:

- ◆ Rugged, reliable design
- ◆ Programmable I/O
- ◆ Integral PID control
- ◆ V/Hz or sensorless vector control
- ◆ Selectable variable torque, standard and heavy duty ratings
- ◆ Integral multiple motor control from one drive for pumping applications
- ◆ Uploadable, downloadable keypad
- ◆ Built-in protection features
- ◆ Standard Modbus port
- ◆ Windows-based software
- ◆ Standard coast, decel, flux and DC injection braking



**Rugged.  
Reliable.  
Ready.**

### Variable torque rating

SG drive products deliver maximum energy savings when set to Variable Torque control.

### Standard duty rating

The standard duty rating provides 120% current for 60 seconds. Energy efficiency can be optimized by setting the V/Hz pattern to variable torque, or the V/Hz pattern can be set to constant torque to maintain a precise torque setting throughout the speed range.

### Heavy duty rating

Heavy duty ratings provide a more robust power section for loads requiring higher starting torque and higher peak overloads of 150% for 60 seconds.

Torque can be maintained throughout the speed range by setting the V/Hz pattern to constant torque, or sensorless vector control can be used to provide precise control over both speed and torque.

### Integrated PID control

For fan and pump applications, SG Series drives include an integrated PID control algorithm to regulate pressure, temperature or flow. PID process variables can be set in "real" values, eliminating the confusion of manual conversions.

230VAC	VARIABLE TORQUE		STANDARD DUTY		HEAVY DUTY	
	HP	AMPS	HP	AMPS	HP	AMPS
☞ RSI-007-SG-2-B	7.5	24	7.5	22	5	17
☞ RSI-010-SG-2-B	10	32	10	29	7.5	23
☞ RSI-015-SG-2-B	15	46	15	42	10	33
☞ RSI-020-SG-2-B	20	60	20	55	15	44
☞ RSI-025-SG-2-B	25	74	25	67	20	54
☞ RSI-030-SG-2-B	30	88	30	80	25	68
☞ RSI-040-SG-2-B	40	115	40	105	30	84

460VAC	VARIABLE TORQUE		STANDARD DUTY		HEAVY DUTY	
	HP	AMPS	HP	AMPS	HP	AMPS
☞ RSI-007-SG-4-B	7.5	12	7.5	11	5	8
☞ RSI-010-SG-4-B	10	16	10	14	7.5	11
☞ RSI-015-SG-4-B	15	24	15	22	10	17
☞ RSI-020-SG-4-B	20	30	20	27	15	22
☞ RSI-025-SG-4-B	25	39	25	35	20	28
☞ RSI-030-SG-4-B	30	45	30	41	25	34
☞ RSI-040-SG-4-B	40	61	40	55	30	44
☞ RSI-050-SG-4-B	50	75	50	68	40	55
☞ RSI-060-SG-4-B	60	91	60	83	50	66
☞ RSI-075-SG-4-B	75	110	75	100	60	80
☞ RSI-100-SG-4-B	100	152	100	139	75	111
☞ RSI-125-SG-4-B	125	183	125	167	100	134
☞ RSI-150-SG-4 •	150	223	150	204	125	164
☞ RSI-200-SG-4 •	200	264	200	242	150	194
☞ RSI-250-SG-4 •	250	325	250	302	200	240
☞ RSI-350-SG-4 •	350	432	300	396	250	317
☞ RSI-400-SG-4 •	400	547	400	501	300	401
☞ RSI-500-SG-4 •	500	613	450	562	350	450
☞ RSI-600-SG-4 •	600	731	500	670	400	536
☞ RSI-700-SG-4 •	700	877	600	804	500	643

☞ = Web stocked

# SGP Series built-to-order drive packages ...



## QUICKSHIPPED IN ONE WEEK to your specification

### Variable Torque:

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7.5 to 40HP @ 230VAC  
7.5 to 400HP @ 460VAC

### Standard Duty:

---

7.5 to 40HP @ 230VAC  
7.5 to 400HP @ 460VAC

### Heavy Duty:

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5 to 30HP @ 230VAC  
5 to 300HP @ 460VAC

SGP Series PREDATOR™ QuickShip drive packages combine Benshaw's rugged SG Series sensorless vector drive unit with a NEMA 12 ventilated enclosure and any of the following options:

- ◆ Circuit breaker
- ◆ Fused or non-fused disconnect
- ◆ Input line reactor
- ◆ Output line reactor
- ◆ 3 contactor bypass
- ◆ Door mounted operator station (six configurations are available)

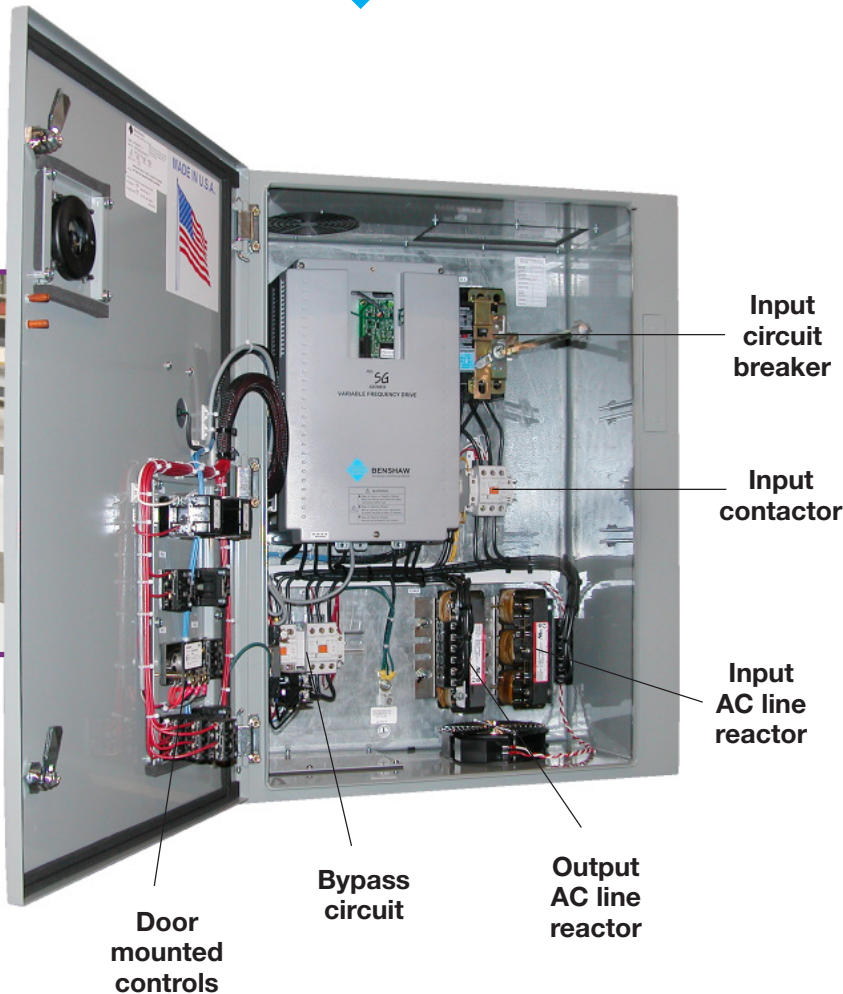
SGP QuickShip built-to-order drive packages meet UL and CE approvals and are available with standard (7.5 to 400 horsepower) and heavy duty (5 to 300 horsepower) ratings to meet your specialized drive requirements.

Benshaw will build and ship your custom-configured SGP Series drive package within one week.

For even faster service, specify 24 Hour Premium Ship and your order will ship next day!

### Standard features:

- ◆ NEMA 12 ventilated enclosure with fans and filters
- ◆ SG Series sensorless vector drive unit
- ◆ User terminal strip
- ◆ Door mounted keypad
- ◆ Control power transformer
- ◆ User input and output power connections



## QuickShip Modular Options:

### Horsepower

- ◆ 5HP, 7.5HP, 10HP, 15HP, 20HP, 25HP, 30HP, 40HP, 50HP, 60HP, 75HP, 125HP, 150HP, 200HP, 250HP, 300HP, 400HP

### Voltage

- ◆ 230V
- ◆ 460V

### Duty Type

- ◆ Standard duty
- ◆ Heavy duty

### Disconnect Options

- ◆ Non-combination
- ◆ Circuit breaker
- ◆ Fusible disconnect
- ◆ Non-fused disconnect
- ◆ Inline fuse

### Door Mounted Devices

- ◆ None
- ◆ Start/stop pushbuttons, reset pushbutton, HOA switch, speed pot
- ◆ Start/stop pushbuttons, reset pushbutton, HOA switch, speed pot, power on, VFD running, VFD fault light
- ◆ Start/stop pushbuttons, fault reset pushbutton, HOA switch, speed pot, jog pushbutton, forward/reverse switch, VFD fault light
- ◆ VFD/off/bypass switch, bypass running light
- ◆ Start/stop pushbuttons, reset pushbutton, HOA switch, speed pot, VFD running light, VFD/off/bypass switch, bypass running light

### Bypass Type

- ◆ None
- ◆ 3 contactor bypass

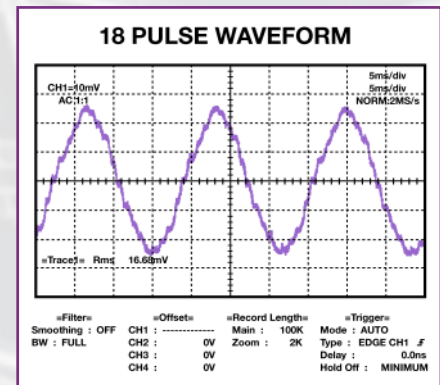
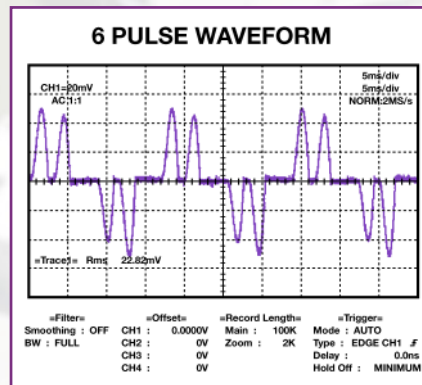
### Reactor Options

- ◆ None
- ◆ Input reactor
- ◆ Output reactor
- ◆ Input and output reactor

## Here's how to order:

- 1** Choose horsepower from the list of available ratings on the right (see the Benshaw catalog for more detail)
- 2** Determine voltage and duty rating required for your application.
- 3** Select a disconnect option, door mounted devices, bypass type and reactor options.
- 4** Contact your Benshaw representative to place your SGP PREDATOR™ QuickShip drive order.

# SG 519 Series clean power drives ...



## IEEE 519-1992 compliant drives built to your specification

### Variable Torque:

7.5 to 40HP @ 230VAC  
7.5 to 700HP @ 460VAC

### Standard Duty:

7.5 to 40HP @ 230VAC  
7.5 to 600HP @ 460VAC

### Heavy Duty:

5 to 30HP @ 230VAC  
5 to 500HP @ 460VAC

Benshaw's SG519 Series drives meet all IEEE 519-1992 voltage and current harmonics specifications, eliminating the need for expensive, time consuming harmonic analysis and avoiding the resonance problems associated with inefficient harmonic filters.

Our municipal projects and engineering team will work with you to configure a clean power package that meets your specific requirements.

All SG519 Series drives are designed to deliver clean power from motor/generator systems without external filters, delivering near zero harmonic distortion regardless of where the drive is placed.

### Standard features:

- ◆ UL listed
- ◆ Meets IEEE 519-1992 voltage and current harmonics specifications
- ◆ Eliminates expensive harmonic analysis
- ◆ Avoids resonance problems associated with inefficient harmonic filters
- ◆ Prevents overloading of circuit breakers, feeders and transformers
- ◆ Eliminates utility penalties for poor power factor and harmonics
- ◆ Run from motor/generator systems with near zero harmonic distortion
- ◆ NEMA 1, 12V, 3R or 4 enclosures available, plus custom configurations with air conditioners and external heat exchangers





**Rugged.  
Reliable.  
Ready.**



### Modular design

The modular design of Benshaw's SG519 Series drives eliminates maintenance problems inherent in older drive designs and improves drive reliability by significantly reducing power module part counts. This design approach also allows each drive unit to be custom-tailored to your specific requirements.

### Optional dual redundancy

An optional dual redundant design configuration is available for SG519 drive packages when mission critical reliability is important and disruptive downtime cannot be tolerated.

460VAC	VARIABLE TORQUE		HEAVY DUTY	
	HP	AMPS	HP	AMPS
RSI519-050-SG-4-A-01	50	65	40	52
RSI519-060-SG-4-A-01	60	77	50	65
RSI519-075-SG-4-A-01	75	96	60	77
RSI519-100-SG-4-A-01	100	125	75	96
RSI519-125-SG-4-A-01	125	156	100	125
RSI519-150-SG-4-A-01	150	180	125	156
RSI519-200-SG-4-A-01	200	240	150	180
RSI519-250-SG-4-A-01	250	302	200	240
RSI519-350-SG-4-A-01	350	414	250	302
RSI519-400-SG-4-A-01	400	477	300	361
RSI519-500-SG-4-A-01	500	590	350	414
RSI519-600-SG-4-A-01	600	731	400	477
RSI519-700-SG-4-A-01	700	877	500	590

☞ = Web stocked

# Custom-engineered drive solutions ...



**Whether you need simple modifications made to one of Benshaw's standard drive packages, a custom engineered, application-specific drive package or a turnkey drive solution, Benshaw can help.**

With more than 1,000,000 man-hours of accumulated engineering experience and complete motor control system production capabilities, Benshaw delivers all of the competence, convenience and value you'd expect from the leader in engineered control systems.

Whatever your motor control needs may be, Benshaw's engineering teams and application specialists can help you find a cost-effective, reliable solution.

### **Quality assurance testing**

Benshaw's assembly teams perform a preliminary quality assurance inspection before delivery is made to functional test cells. Drive assemblies undergo a variety of testing procedures, including motor operation testing, load testing, control circuit testing, wire pull testing, electrical performance checks, mechanical alignment inspection, torque measurement and user interface/pilot device functionality.

All test processes meet or exceed ISO 9001 requirements, and all tests are documented and archived for quality verification..

### **Enclosures**

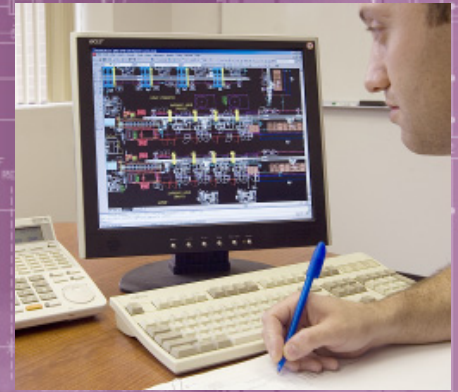
- ◆ Standard NEMA 1, 12 and 3R enclosure designs
- ◆ Custom enclosures
- ◆ NEMA 4, 4X, air conditioned and other special enclosures
- ◆ Motor control centers

### **Combination drive packages**

- ◆ 15 to 2000 amp circuit breakers
- ◆ 40 to 2000 amp non-fused disconnects
- ◆ 30 to 800 amp fusible disconnects
- ◆ Flange or rotary handle mechanisms



For any drive application ...  
In any configuration.



### Control modifications

Over 250 control modifications and accessories are available from Benshaw, including:

- ◆ Pilot devices
- ◆ PLCs
- ◆ Control power transformers
- ◆ Switches
- ◆ Meters
- ◆ Relays
- ◆ Space heaters
- ◆ Protective devices

### Bypass packages

- ◆ Two contactor
- ◆ Three contactor
- ◆ Reduced voltage solid state starters

### Filters

- ◆ Line reactors (3% and 5%)
- ◆ Long lead filters
- ◆ Active and passive harmonic filters
- ◆ 18 pulse systems



## World-class after-market service and support—whenever and wherever needed...

# 7x24

Benshaw provides comprehensive support, with web-based tools and dedicated, knowledgeable staff available 7-days-a-week, 24-hours-a-day to answer your questions, dispatch a field service technician or coordinate an emergency parts request.

Repairs, spares, field engineering, retrofits and training services—whenever and wherever needed—are all part of Benshaw's commitment.



[www.BenshawExpress.com](http://www.BenshawExpress.com) offers a guaranteed two-hour emergency response on many starters and drives from warehouses around the country

- ◆ 7x24 same day shipment.
- ◆ Air or truck delivery.
- ◆ Airport pick-up or door-to-door service.



**7x24 Phone Support** from Benshaw operations centers in Pittsburgh, Listowel (Canada), Detroit and Phoenix provides:

- ◆ Technical assistance.
- ◆ Overnight parts shipment.
- ◆ Service dispatch.



**Training courses** are available in a classroom or a hands-on environment:

- ◆ Basic electrical maintenance.
- ◆ Electronic maintenance and diagnostics.
- ◆ New product orientations.
- ◆ Customized systems (maintenance- or operations-based).



**Regional/International Field Service** by a skilled technician, engineer or complete team, if needed, is available for:

- ◆ Start-up commissioning.
- ◆ Field repairs.
- ◆ Field analysis/data collection.
- ◆ Preventive maintenance.



**Repairs** are made by trained, experienced personnel, using the latest diagnostic and test equipment to service:

- ◆ Printed circuit boards.
- ◆ Power electronic control assemblies.
- ◆ Electrical sub-assemblies.

### United States

Pittsburgh, Pennsylvania  
 Indianapolis, Indiana  
 Syracuse, New York  
 Boston, Massachusetts  
 Charlotte, North Carolina  
 Birmingham, Alabama  
 Los Angeles, California  
 Detroit, Michigan  
 Chicago, Illinois  
 Phoenix, Arizona  
 Seattle, Washington  
 Denver, Colorado  
 Houston, Texas  
 Mobile, Alabama  
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### Canada

Listowel, Ontario  
 Toronto, Ontario  
 Montreal, Quebec  
 Calgary, Alberta

### Brazil

### Ecuador

### Venezuela

### Columbia

### Peru

### Chile

### Argentina

### China

### Australia

### Philippines

### Korea

### Singapore

### Germany

### Mexico

### Russia

### Turkey

### Egypt

### Saudi Arabia

### United Arab Emirates

### Bahrain

### Kuwait

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