



BENSHAW
Applied Motor Controls



2020 Product Catalog

Low Voltage Variable Frequency Drives

Rapid | Rugged | Global



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S SERIES - MICRO DRIVES

LOW VOLTAGE VARIABLE FREQUENCY DRIVES

FEATURES:

- Normal-duty and heavy-duty rated
- V/Hz control
- SVC control (IM and PM Motors)
- Torque Control
- EMC Filter (460V models)
- Communications: Modbus RTU (standard)
- Optional: Ethernet IP, Modbus TCP, Profibus
- Internal Brake IGBT
- Safe Torque Off (STO)
- Fire Mode
- IP20 enclosure. If NEMA type 1 is required see page 3 for conduit box adder.



OPEN CHASSIS — 230 V

Model Number	Normal Duty		Heavy Duty		Dimensions (H x W x D) (in.)	List Price
	HP	Amps	HP	Amps		
RSI-001-SS-2C	1	3.1	0.5	2.5	5.04 x 2.68 x 4.84	\$428
RSI-002-SS-2C	2	6	1	5	5.04 x 2.68 x 5.04	\$492
RSI-003-SS-2C	3	10	2	8	5.04 x 3.94 x 5.12	\$535
RSI-005-SS-2C	5	12	3	11	5.04 x 3.94 x 5.71	\$655
RSI-007-SS-2C	7.5	18	5.4	17	5.04 x 5.51 x 5.71	\$795
RSI-010-SS-2C	10	30	7.5	24	9.13 x 6.3 x 5.51	\$1,160
RSI-015-SS-2C	15	40	10	32	9.13 x 6.3 x 5.51	\$1,419

OPEN CHASSIS — 460 V

Model Number	Normal Duty		Heavy Duty		Dimensions (H x W x D) (in.)	List Price
	HP	Amps	HP	Amps		
RSI-001-SS-4C	1	2.0	0.5	1.3	7.09 x 2.68 x 5.12	\$624
RSI-002-SS-4C	2	3.1	1	2.5	7.09 x 2.68 x 5.12	\$639
RSI-003-SS-4C	3	5.1	2	4	7.09 x 3.94 x 5.51	\$655
RSI-005-SS-4C	5	6.9	3	5.5	7.09 x 3.94 x 5.51	\$684
RSI-007-SS-4C	7.5	10	5.4	9	7.09 x 5.51 x 5.51	\$843
RSI-010-SS-4C	10	16	7.5	12	9.13 x 6.3 x 5.51	\$1,198
RSI-015-SS-4C	15	23	10	16	9.13 x 6.3 x 5.51	\$1,450

S SERIES - MICRO DRIVE

LOW VOLTAGE VARIABLE FREQUENCY DRIVES

Input Voltage	3 , 200V - 240V, 380V - 480V (-15% to +10%)
Input Frequency	50 - 60 Hz. (+/-5%)
Output Voltage	3 , 200V - 240V, 380V - 480Vac
Output Frequency	0-400 Hz (Sensorless: 0-120 Hz)
Overload	120% Normal Duty / 150% Heavy Duty for 60 sec.
Ambient Temperature	Heavy load: 14-104 ° F (-10-40 ° C) / Normal load: 14-122 ° F (-10-50 ° C) with derating
Motor Control Method	V/Hz., Sensorless Vector (IM and PM motors), Slip Compensation, Torque Control
Keypad	7-Segment LED / Optional LCD
Communications	Modbus_RTU (standard) / Optional: Ethernet IP, Modbus TCP, Profibus DP
Digital Inputs	5 (NPN/PNP)
Analog Inputs	2 (4-20 mA and 0-10 V)
Digital Outputs	2 — (1) Relay (A1, B1, C1), (1) Open Collector Output (Q1)
Analog Outputs	1 (4-20 mA or 0-10 V, switch selectable)

DISPLAY / KEYPAD REMOTE MOUNTING

Part Number	Description	List Price
LCD-100001-00	REMOTE KEYPAD/DISPLAY (LCD)	\$116
RI-100033-00	CABLE, RJ45, 2M	\$75
RI-100033-01	CABLE, RJ45, 3M	\$100
CV-100017-00	COVER, "S" SERIES REMOTE KEYPAD, NEMA 4X	\$189

COMMUNICATION CARDS AND I/O CARDS**

Part Number	Description	List Price
PC-100091-00	PROFIBUS-DP OPTION CARD	\$385
PC-100092-00	ETHERNET IP & MODBUS TCP OPTION CARD	\$214
PC-100090-00	EXTENDED I/O CARD	\$291

** One option card installation per VFD

NEMA 1 CONDUIT KITS

Part Number	Description	List Price
EN-100994-00	Conduit Box, 1 HP~2 HP, 230V	\$39
EN-100994-01	Conduit Box, 3 HP~5 HP, 230V	\$39
EN-100994-02	Conduit Box, 7.5 HP, 230V	\$39
EN-100994-03	Conduit Box, 10 HP~15 HP, 230V/460V	\$39
EN-100994-04	Conduit Box, 1 HP~2 HP, 460V	\$39
EN-100994-05	Conduit Box, 3 HP~5 HP, 460V	\$39
EN-100994-06	Conduit Box, 7.5 HP, 460V	\$39

MOUNTING FLANGES

Part Number	Description	List Price
BRKT-100770-00	Mounting flange, 1 HP~2 HP, 230V	\$61
BRKT-100770-01	Mounting flange, 3 HP~5 HP, 230V	\$61
BRKT-100770-02	Mounting flange, 7.5 HP, 230V	\$61
BRKT-100770-03	Mounting flange, 10 HP~15 HP, 230V/460V	\$61
BRKT-100770-04	Mounting flange, 1 HP~2 HP, 460V	\$61
BRKT-100770-05	Mounting flange, 3 HP~5 HP, 460V	\$61
BRKT-100770-06	Mounting flange, 7.5 HP, 460V	\$61

SG SERIES - MULTI-PURPOSE

SG SERIES

RATINGS

Variable Torque:

7.5–40 HP @ 230 V
 7.5–700 HP @ 460V
 7.5–400 HP @ 600 V

STANDARD DUTY:

7.5–40 HP @ 230 V
 7.5–700 HP @ 460V
 7.5–400 HP @ 600 V

HEAVY DUTY:

5–30 HP @ 230 V
 5–500 HP @ 460 V
 5–300 HP @ 600 V



PRODUCT HIGHLIGHTS:

The SG series is a compact, economical drive designed for the most demanding applications. The flexible power stack allows the user to apply it to heavy-duty loads (150% for 60 secs), standard-duty loads (120% for 60 secs), or variable-torque loads (110% for 60 secs). With over 250 programmable parameters, Benshaw's SG series drives are configurable to meet the needs of almost any industrial application, yet remain simple and easy to use.

KEY ADVANTAGES:

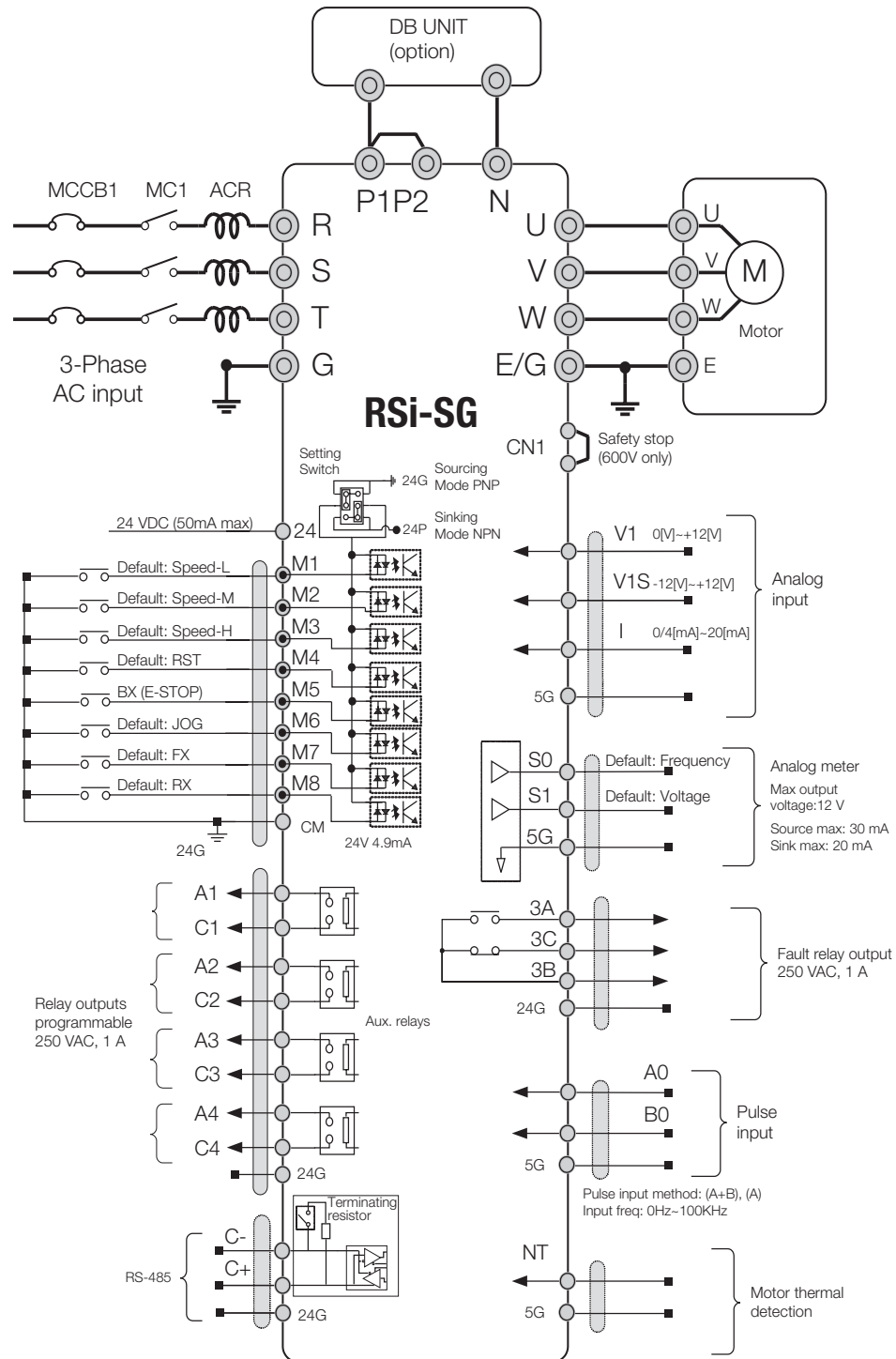
- Standard and heavy-duty ratings
- Sensorless vector control or V/Hz control
- Integral PID Control
- Integral multiple motor control for pumping applications
- Simple, easy-to-use LCD interface
- Uploadable / downloadable keypad
- Flexible, programmable I/O
- Economical, compact design
- Standard Modbus RTU
- Windows-based software

STANDARD FEATURES:

- **User interface:** 2-line LCD display, 16 characters per line
- **Digital metering:** Output currents, ground current, output frequency, DC link voltage, motor RPM, output motor voltage, run time and more
- **Digital inputs:** 8 digital inputs configurable to forward run, reverse run, 3 wire start / stop, reset, jog, preset speeds, motorized pot function, external trip, alternate ramp selections, HOA and more
- **Analog inputs:** 1 at 0/4–20 mA, 1 at 0–10 VDC (or -10 to 10 VDC)
- **Analog outputs:** 2 at 0–10 VDC (standard). Configurable to motor speed, output current, output voltage, DC link voltage, power, PID follower
- **Relay outputs:** 1 Form C fault relay output, 4 Form A relay outputs configurable to running, faulted, ready, at speed, high or low frequency levels, loss of signal, ready and more
- **Optional I/O:** Isolated analog output board (adds 2 additional analog outputs, 0/4–20 mA)
- **Voltage tolerance:** -15%, +10%
- **Control methods:** V/Hz, sensorless vector, slip compensation
- **V/Hz patterns:** Linear, squared, user-programmable V/Hz
- **Protection:** Overcurrent, ground fault, overvoltage, current limit, motor overload, phase loss, overheat, loss of signal and more
- **Stop methods:** Coast, decel, DC injection braking, flux braking and optional dynamic braking

SG SERIES - MULTI-PURPOSE

SG SERIES — BASIC WIRING DIAGRAM



SG SERIES - MULTI-PURPOSE



230 V

Model Number	Variable Torque		Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	HP	Amps	H	W	D		
☒ RSI-007-SG-2B	7.5	24	7.5	22	5	17	11.2	5.9	6.2	11	\$1,500
☒ RSI-010-SG-2B	10	32	10	29	7.5	23	11.2	7.9	7.2	14	\$1,695
☒ RSI-015-SG-2B	15	46	15	42	10	33	11.2	7.9	7.2	14	\$1,850
☒ RSI-020-SG-2B	20	60	20	55	15	44	17.9	9.8	7.9	28	\$2,395
☒ RSI-025-SG-2B	25	74	25	67	20	54	17.9	9.8	7.9	29	\$3,150
☒ RSI-030-SG-2B	30	88	30	80	25	68	23.6	12	9.2	44	\$3,675
☒ RSI-040-SG-2B	40	115	40	105	30	84	23.6	12	9.2	44	\$4,350

460 V

Model Number	Variable Torque		Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	HP	Amps	H	W	D		
☒ RSI-007-SG-4B	7.5	12	7.5	11	5	8	11.2	5.9	6.2	11	\$1,500
☒ RSI-010-SG-4B	10	16	10	14	7.5	11	11.2	7.9	7.2	14	\$1,850
☒ RSI-015-SG-4B	15	24	15	22	10	17	11.2	7.9	7.2	14	\$2,000
☒ RSI-020-SG-4B	20	30	20	27	15	22	17.9	9.8	7.9	28	\$2,595
☒ RSI-025-SG-4B	25	39	25	35	20	28	17.9	9.8	7.9	29	\$2,950
☒ RSI-030-SG-4B	30	45	30	41	25	34	23.6	12	9.2	44	\$3,750
☒ RSI-040-SG-4B	40	61	40	55	30	44	23.6	12	9.2	44	\$4,450
☒ RSI-050-SG-4B	50	75	50	68	40	55	25.3	11.8	10.5	60	\$5,495
☒ RSI-060-SG-4B	60	91	60	83	50	66	25.3	11.8	10.5	60	\$6,850
☒ RSI-075-SG-4B	75	110	75	100	60	80	25.3	11.8	11.2	64	\$7,875
☒ RSI-100-SG-4B	100	152	100	139	75	111	30.2	14.5	12.1	95	\$9,450
☒ RSI-125-SG-4B	125	183	125	167	100	134	30.2	14.5	12.1	95	\$11,550
☒ RSI-150-SG-4 • *	150	223	150	204	125	164	30.9	20.1	16.6	225	\$13,550
☒ RSI-200-SG-4 • *	200	264	200	242	150	194	30.9	20.1	16.6	225	\$16,275
☒ RSI-250-SG-4 • *	250	325	250	302	200	240	33.9	20.1	16.6	255	\$18,950
☒ RSI-350-SG-4 • *	350	432	300	396	250	317	42.5	27.2	17.3	450	\$24,155
☒ RSI-400-SG-4 • *	400	547	400	501	300	401	42.5	27.2	17.3	450	\$33,550
☒ RSI-500-SG-4 •	500	613	450	562	350	450	44.9	30.8	17.4	540	\$42,000
☒ RSI-600-SG-4 •	600	731	500	670	400	536	51.3	36.3	19.5	840	\$50,500
☒ RSI-700-SG-4 •	700	877	600	804	500	643	51.3	36.3	19.5	840	\$60,650

Variable Torque = 110% current for 1 minute / Standard Duty = 120% current for 1 minute / Heavy Duty = 150% current for 1 minute
 Units ending in a "B" designate NEMA 1. Units not ending in a "B" are protected chassis units.

• Protected chassis only (power terminal covers do not meet NEMA 1).

* DC Link Reactor (internal)

☒ Web stocked

Available for same day shipping.

SG SERIES - MULTI-PURPOSE

600 V

Model Number	Variable Torque		Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	HP	Amps	H	W	D		
☒ RSI-007-SG-6B	7.5	9	7.5	8.2	5	6.6	14	7.9	7.2	15	\$1,500
☒ RSI-010-SG-6B	10	12	10	11	7.5	9	14	7.9	7.2	16	\$1,850
☒ RSI-015-SG-6B	15	17	15	15.5	10	12	14	7.9	7.2	16	\$2,000
☒ RSI-020-SG-6B	20	23	20	21	15	17	17.9	9.8	7.9	28	\$2,595
☒ RSI-025-SG-6B	25	27	25	24.7	20	19.8	17.9	9.8	7.9	29	\$2,950
☒ RSI-030-SG-6B	30	34	30	31	25	25	23.6	12	9.2	44	\$3,750
☒ RSI-040-SG-6B	40	43	40	39	30	31.5	23.6	12	9.2	44	\$4,450
☒ RSI-050-SG-6B	50	55	50	50	40	43	25.3	11.8	11.5	71	\$5,495
☒ RSI-060-SG-6B	60	64	60	58.6	50	55	25.3	11.8	11.5	71	\$6,850
☒ RSI-075-SG-6B	75	80	75	73	60	64	25.3	11.8	11.5	71	\$7,875
☒ RSI-100-SG-6B	100	104	100	95	75	80	30.2	14.6	13.3	102	\$9,450
☒ RSI-125-SG-6B	125	128	125	117	100	104	30.2	14.6	13.3	102	\$11,550
☒ RSI-150-SG-6 • *	150	150	150	137	125	128	30.9	20	16.6	225	\$13,550
☒ RSI-200-SG-6 • *	200	200	200	184	150	147	33.9	20	16.6	255	\$16,275
☒ RSI-250-SG-6 • *	250	242	250	222	150	177	33.9	20	16.6	255	\$18,950
☒ RSI-350-SG-6 • *	350	333	300	305	250	244	42.5	27.2	17.7	450	\$24,155
☒ RSI-400-SG-6 • *	400	424	400	389	300	311	42.5	27.2	17.7	450	\$34,500

Variable Torque = 110% current for 1 minute / Standard Duty = 120% current for 1 minute / Heavy Duty = 150% current for 1 minute
 Units ending in a "B" designate NEMA 1. Units not ending in a "B" are protected chassis units.

• Protected chassis only (power terminal covers do not meet NEMA 1).

* DC Link Reactor

☒ Web stocked

SG SERIES - MULTI PURPOSE

SG SERIES — OPTIONS AND ACCESSORIES

FIELDBUS COMMUNICATION CARDS

Model Number	Description	List Price
PC-400002-00	Profibus Communication Board Kit, SG VFD	\$895
PC-400003-00	LonWorks Communication Board Kit, SG VFD	\$1,000
PC-400004-00	BacNet Communication Board Kit, SG VFD	\$1,325
PC-400005-00	Modbus TCP Communication Board Kit, SG VFD	\$1,100

ANALOG OUTPUT CARD

Model Number	Description	List Price
VFD-RSI-SG-4-20-MA	4–20 mA Output Card, Adds (2) 4–20 mA Outputs	\$755

DISPLAY / KEYPAD REMOTE MOUNTING

Model Number	Description	List Price
LCD-100000-00	Replacement Display / Keypad	\$200
VFD-2M-RE-CABLE-SG	2 Meter Keypad Cable	\$100
VFD-3M-RE-CABLE-SG	3 Meter Keypad Cable	\$125
VFD-5M-RE-CABLE-SG	5 Meter Keypad Cable	\$145
VFD-KEYPAD-SG-BEZEL	Bezel, for SG Keypad, Remote Mounting	\$20
VFD-KEYPAD-SG-BLANK	Keypad Blank, Installs in Drive when Keypad Is Remote	\$20

S4 SERIES - NEMA 4X WASHDOWN / NEMA 12 SENSORLESS VECTOR DRIVES

S4 SERIES — STANDARD DUTY / HEAVY DUTY

RATINGS

STANDARD DUTY:

- 1 HP @ 115 V
- 1 to 25 HP @ 230 V
- 1 to 200 HP @ 460 V / 600 V

HEAVY DUTY:

- 0.5 HP @ 115 V
- 0.5 to 20 HP @ 230 V
- 0.5 to 150 HP @ 460 V / 600 V



RSI S4 SERIES PRODUCT HIGHLIGHTS:

The S4 Series is a line of high performance NEMA 4X (washdown) and outdoor rated variable frequency drives. Benshaw's S4 variable frequency drives are built to withstand the harshest environments and hold up under your most demanding pressure washing applications. All S4 Series drives combine a simple user interface with an array of features and are suited to almost any indoor or outdoor environment. S4 variable frequency drives come standard with over 180 configurable parameters to match specific application and interface requirements. A standard dynamic braking transistor and resistor are also included for regenerative applications.

KEY ADVANTAGES:

- NEMA 4X (washdown) and outdoor rated enclosure (≤ 100 HP)
- Sensorless vector control
- Standard braking transistor and resistor
- Standard and heavy duty ratings
- LCD plain English display
- Simple, easy-to-use interface
- Standard Modbus communication port
- Integral PI control

STANDARD FEATURES:

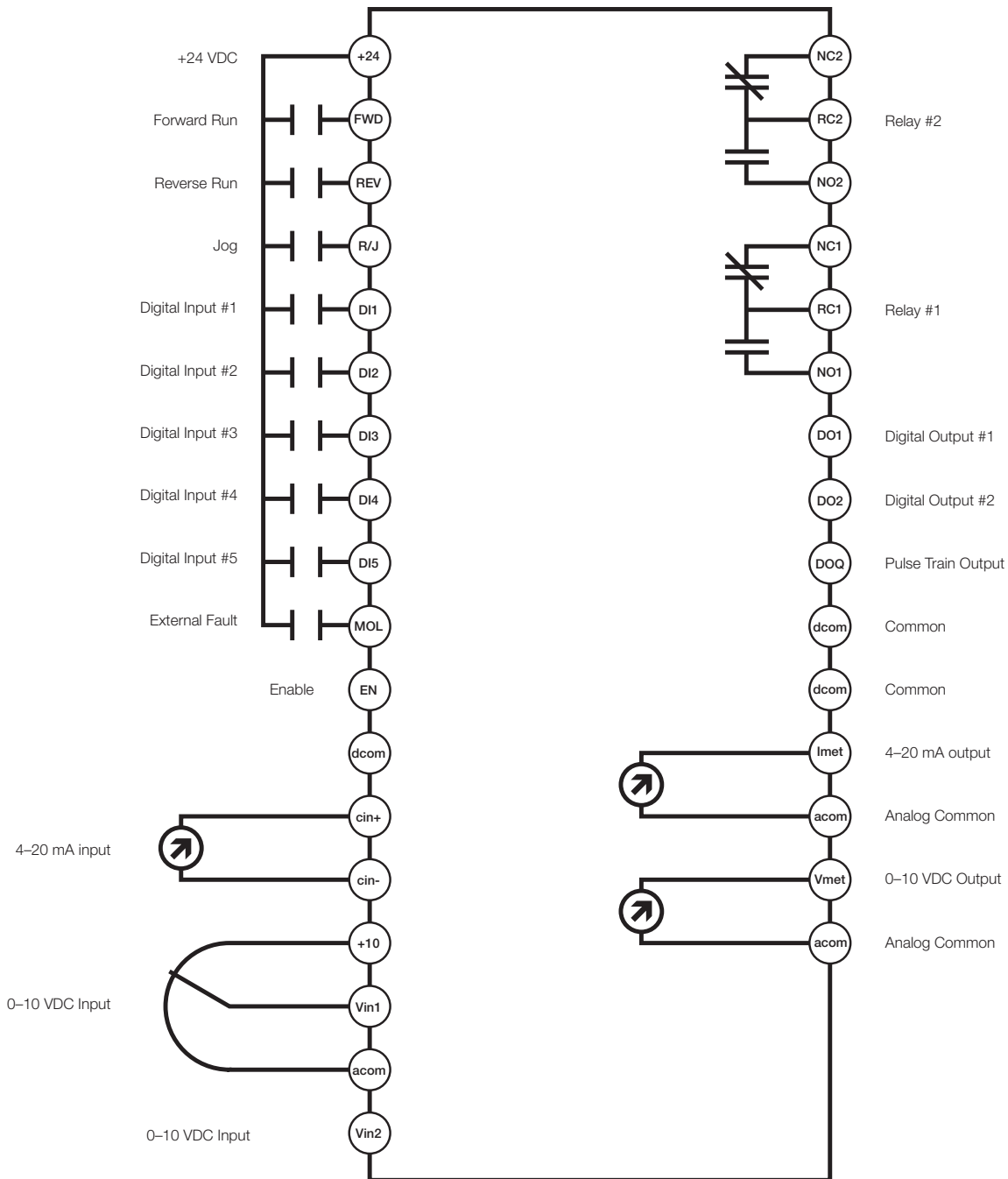
- **NEMA 4X washdown enclosure**
- Units 1–100 HP are NEMA 4X; units 125–200 HP are NEMA 12
- **Standard I/O:** 10 digital inputs, 2 analog inputs, 2 analog outputs, 2 relay outputs
- **User interface:** 20-character LCD display
- **Digital metering:** Output current, output volts, power, MWh meter, run time, power on time, bus voltage, output frequency
- **Communications:** Modbus

standard

- **Voltage tolerance:** $\pm 10\%$
- **Sensorless vector control**
- **V/Hz Pattern:** Linear, quadratic
- **Analog output functions:** Output voltage, output current, drive load, drive temp, stator frequency, output power
- **Analog inputs:** 0–10 VDC, 4–20 mA, -10 VDC to 10 VDC, pulse train input
- **Relay outputs:** Running, forward, reverse, ready, faulted, at speed, keypad control, adjustable torque levels, adjustable current levels, PID limits, loss of reference, timers
- **10 digital inputs configurable:** Run, preset speeds, jogging, PID disable, fault reset, drive enable, timers, motorized pot
- **User interface:** 20-character LCD display.
- **Braking functions:** DECEL, coast, DC injection, dynamic braking

S4 SERIES - NEMA 4X WASHDOWN / NEMA 12 SENSORLESS VECTOR DRIVES

S4 SERIES — BASIC WIRING DIAGRAM



S4 SERIES - NEMA 4X WASHDOWN / NEMA 12 SENSORLESS VECTOR DRIVES

115 V INPUT / 230 V OUTPUT

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	H	W	D		
RSI-001-S4-1SW •	1	4.2	0.5	2.5	9.5	6.5	6.1	9	\$1,925

• Single-phase 115 V input / 3-phase 230 V output

NEMA 4X / 230 V

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	H	W	D		
RSI-001-S4-2W	1	4.2	0.5	2.5	9.5	6.5	6.1	9	\$1,925
RSI-002-S4-2W	2	6.8	1	4.8	9.5	6.5	6.1	9	\$1,975
RSI-003-S4-2W	3	9.6	2	7.8	9.5	6.5	8.5	9	\$2,035
RSI-005-S4-2W	5	15.2	3	11	12	8.7	6.5	14	\$2,415
RSI-007-S4-2W	7.5	22	5	17.5	12	8.7	6.5	14	\$2,475
RSI-010-S4-2W	10	28	7.5	25.3	17.4	10.8	7.9	30	\$3,922
RSI-015-S4-2W	15	42	10	37.2	17.4	10.8	7.9	30	\$4,565
RSI-020-S4-2W	20	54	15	48.3	20.2	11.3	11.7	50	\$6,760
RSI-025-S4-2W	25	68	20	62.1	20.2	11.3	11.7	50	\$7,024

NEMA 4X / NEMA 12 / 460 V

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	H	W	D		
RSI-001-S4-4W	1	2.1	0.5	1.1	9.5	6.5	6.1	9	\$1,854
RSI-002-S4-4W	2	3.4	1	2.1	9.5	6.5	6.1	9	\$1,930
RSI-003-S4-4W	3	4.8	2	3.4	9.5	6.5	8.5	9	\$1,989
RSI-005-S4-4W	5	7.6	3	4.8	12	8.7	6.5	14	\$2,526
RSI-007-S4-4W	7.5	11	5	7.6	12	8.7	6.5	14	\$2,682
RSI-010-S4-4W	10	14	7.5	11	12	8.7	6.5	14	\$2,741
RSI-015-S4-4W	15	21	10	14	17.4	10.8	7.9	30	\$4,273
RSI-020-S4-4W	20	27	15	21	17.4	10.8	7.9	30	\$4,617
RSI-025-S4-4W	25	34	20	27	17.4	10.8	7.9	30	\$4,891
RSI-030-S4-4W	30	40	25	34	17.4	10.8	7.9	30	\$5,133
RSI-040-S4-4W	40	52	30	40	20.2	11.3	11.7	50	\$8,143
RSI-050-S4-4W	50	65	40	52	20.2	11.3	11.7	50	\$8,439
RSI-060-S4-4W	60	77	50	65	29.4	12.9	13.8	110	\$13,975
RSI-075-S4-4W	75	96	60	77	29.4	12.9	13.8	110	\$14,351
RSI-100-S4-4W	100	124	75	96	29.4	12.9	13.8	110	\$17,291
RSI-125-S4-4D *	125	156	100	124	50.5	16.5	18	354	\$24,994
RSI-150-S4-4D *	150	180	125	156	50.5	16.5	18	354	\$27,472
RSI-200-S4-4D *	200	240	150	180	50.5	16.5	18	354	\$28,235

* Units ending in "D" are NEMA 12, not washdown rated.

S4 SERIES - NEMA 4X WASHDOWN / NEMA 12 SENSORLESS VECTOR DRIVES



NEMA 4X / NEMA 12 / 600 V

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)	List Price
	HP	Amps	HP	Amps	H	W	D		
RSI-001-S4-6W	1	1.7	0.5	0.9	12	8.7	6.5	14	\$2,365
RSI-002-S4-6W	2	2.7	1	1.7	12	8.7	6.5	14	\$2,376
RSI-003-S4-6W	3	3.9	2	2.7	12	8.7	6.5	14	\$2,387
RSI-005-S4-6W	5	6.1	3	3.9	12	8.7	6.5	14	\$2,448
RSI-007-S4-6W	7.5	9	5	6.1	12	8.7	6.5	14	\$2,525
RSI-010-S4-6W	10	11	7.5	9	12	8.7	6.5	14	\$3,075
RSI-015-S4-6W	15	17	10	11	17.4	10.8	7.9	30	\$4,840
RSI-020-S4-6W	20	22	15	17	17.4	10.8	7.9	30	\$5,011
RSI-025-S4-6W	25	27	20	22	17.4	10.8	7.9	30	\$5,253
RSI-030-S4-6W	30	32	25	27	17.4	10.8	7.9	30	\$6,050
RSI-040-S4-6W	40	41	30	32	20.2	11.3	11.7	50	\$8,415
RSI-050-S4-6W	50	52	40	41	20.2	11.3	11.7	50	\$8,773
RSI-060-S4-6W	60	68	50	52	29.4	12.9	13.8	110	\$15,400
RSI-075-S4-6W	75	82	60	62	29.4	12.9	13.8	110	\$15,675
RSI-100-S4-6W	100	107	75	77	29.4	12.9	13.8	110	\$18,150
RSI-125-S4-6D *	125	125	100	99	50.5	16.5	18	354	\$26,703
RSI-150-S4-6D *	150	144	125	125	50.5	16.5	18	354	\$27,781
RSI-200-S4-6D *	200	192	150	140	50.5	16.5	18	354	\$30,800

* Units ending in "D" are NEMA 12, not washdown rated.

VARIABLE FREQUENCY DRIVE OPTIONS

LINE REACTORS

480 V — 3% IMPEDANCE

Model Number		Open Dimensions (in.)					Enclosed Dimensions (in.)			Weight (lbs.)	Open List Price	Enclosed List Price
Open	Enclosed (NEMA 1)	HP	A	H	W	D	H	W	D			
KDRMA5L1	KDRMA5L1E01	1	2.1	3.63	4.45	1.78	12.25	12.5	6.75	11.6	\$200	\$445
KDRMA7L1	KDRMA7L1E01	2	3.4	3.63	4.45	1.78	12.25	12.5	6.75	11.8	\$215	\$455
KDRMA8L1	KDRMA8L1E01	3	4.8	3.63	4.45	1.78	12.25	12.5	6.75	11.8	\$235	\$475
KDRAA3L2	KDRAA3L2E01	5	7.6	4.44	4.25	2.64	12.25	12.5	6.75	13.4	\$245	\$495
KDRAA4L2	KDRAA4L2E01	7.5	11	4.44	4.25	2.64	12.25	12.5	6.75	13.6	\$275	\$515
KDRAA5L2	KDRAA5L2E01	10	14	4.44	4.25	2.64	12.25	12.5	6.75	13.7	\$345	\$595
REA-KDRB2L	REA-KDRB2L-E01	15	21	5	6	4	6.5	8	6	12	\$425	\$645
REA-KDRB1L	REA-KDRB1L-E01	20	27	5	6	4	6.5	8	6	12	\$445	\$695
REA-KDRD1L	REA-KDRD1L-E01	25	34	5.75	7.2	4.25	7.5	10	7	16	\$465	\$755
REA-KDRD2L	REA-KDRD2L-E01	30	40	5.75	7.2	4.25	7.5	10	7	16	\$595	\$875
REA-KDRC1L	REA-KDRC1L-E01	40	52	5.75	7.2	5	7.5	10	7	21	\$655	\$945
REA-KDRF2L	REA-KDRF2L-E01	50	65	7	9	6	9	12	8	37	\$750	\$1,145
REA-KDRF4L	REA-KDRF4L-E01	60	77	7	9	6	9	12	8	42	\$775	\$1,295
REA-KDRF3L	REA-KDRF3L-E01	75	96	7	9	6	15.5	15	13	65	\$1,050	\$1,685
REA-KDRH3L	REA-KDRH3L-E01	100	124	7	9	7	15.5	15	13	65	\$1,195	\$1,850
REA-KDRH2L	REA-KDRH2L-E01	125	156	9	11	7	15.5	15	13	75	\$1,675	\$2,125
REA-KDRH1L	REA-KDRH1L-E01	150	180	9	11	7	15.5	15	13	75	\$1,725	\$2,385
REA-KDRG3L	REA-KDRG3L-E01	200	240	9	11	8	15.5	15	13	100	\$2,195	\$2,850
REA-KDRG1L	REA-KDRG1L-E01	250	302	9	11	8	15.5	15	13	100	\$2,425	\$3,095
REA-KDRG2L	REA-KDRG2L-E01	300	361	9	11	8	15.5	15	13	100	\$2,495	\$3,125
REA-KDRJ2L	REA-KDRJ2L-E01	350	414	9	11	9	18.5	20	16	120	\$2,855	\$3,735
REA-KDRJ1L	REA-KDRJ1L-E01	400	477	9	11	9	18.5	20	16	120	\$3,155	\$4,050
REA-KDRL2L	REA-KDRL2L-E01	500	590	11.38	14.5	9.5	18.5	20	16	160	\$5,425	\$6,285
REA-KDRL3L	REA-KDRL3L-E01	600	720	11.38	14.5	9.5	18.5	20	16	205	\$6,875	\$7,735
REA-KDRS1L	REA-KDRS1L-E01	700	840	11.38	15	12.5	36	28.5	30.3	318	\$8,050	\$10,275

Line reactors reduce harmonics and protect the variable frequency drive from input power quality problems. They are also required on applications where the transformer kVA exceeds 10 times the kVA rating of the drive.

VARIABLE FREQUENCY DRIVE OPTIONS

LONG LEAD FILTERS (DV/DT)

480 V

Model Number		Open Dimensions (in.)					Enclosed Dimensions (in.)			Weight (lbs.)	Open List Price	Enclosed List Price
Open	Enclosed (NEMA 1)	HP	A	H	W	D	H	W	D			
FLTR-V1K2A00	FLTR-V1K2A01	0.75	2	9	5.5	7.25	9	5.5	10	11	\$900	\$1,450
FLTR-V1K3A00	FLTR-V1K3A01	1~1.5	3	9	5.5	7.25	9	5.5	10	11	\$925	\$1,475
FLTR-V1K4A00	FLTR-V1K4A01	2	4	9	5.5	7.25	9	5.5	10	11	\$955	\$1,485
FLTR-V1K6A00	FLTR-V1K6A01	3	6	9	5.5	7.25	9	5.5	10	11	\$975	\$1,495
FLTR-V1K8A00	FLTR-V1K8A01	5	8	9	5.5	8.25	9	5.5	10	11	\$995	\$1,525
FLTR-V1K12A00	FLTR-V1K12A01	7.5	12	9	5.5	8.25	9	5.5	10	11	\$1,025	\$1,595
FLTR-V1K16A00	FLTR-V1K16A01	10	16	9	5.5	8.25	9	5.5	10	15	\$1,045	\$1,625
FLTR-V1K18A00	FLTR-V1K18A01	10	18	9	5.5	8.25	9	5.5	10	15	\$1,155	\$1,695
FLTR-V1K21A00	FLTR-V1K21A01	15	21	9	5.5	8.25	9	5.5	10	15	\$1,300	\$1,765
FLTR-V1K25A00	FLTR-V1K25A01	15	25	9	5.5	8.25	9	5.5	10	15	\$1,395	\$1,800
FLTR-V1K27A00	FLTR-V1K27A01	20	27	9	5.5	8.25	9	5.5	10	15	\$1,450	\$1,875
FLTR-V1K35A00	FLTR-V1K35A01	25	35	12	8	9	12	8	11.5	23	\$1,500	\$1,925
FLTR-V1K45A00	FLTR-V1K45A01	30	45	12	8	9	12	8	11.5	23	\$1,595	\$2,000
FLTR-V1K55A00	FLTR-V1K55A01	40	55	12	8	9	12	8	11.5	23	\$1,625	\$2,185
FLTR-V1K80A00	FLTR-V1K80A01	50~60	80	12	8	9	12	8	11.5	29	\$2,295	\$2,840
FLTR-V1K110A00	FLTR-V1K110A01	75	110	12	8	10.25	16.5	18	15	68	\$2,685	\$3,895
FLTR-V1K130A00	FLTR-V1K130A01	100	130	8.5	11.75	9.5	16.5	18	15	83	\$3,150	\$4,395
FLTR-V1K160A00	FLTR-V1K160A01	125	160	8.5	11.75	10.5	16.5	18	15	83	\$3,450	\$4,725
FLTR-V1K200A00	FLTR-V1K200A01	150	200	8.5	11.75	9.25	16.5	18	15	93	\$3,795	\$4,925
FLTR-V1K250A00	FLTR-V1K250A01	200	250	8.5	11.75	9.25	16.5	18	15	93	\$3,875	\$5,000
FLTR-V1K305A00	FLTR-V1K305A01	250	305	8.75	11.75	12.25	16.5	18	30	117	\$4,225	\$5,050
FLTR-V1K362A00	FLTR-V1K362A01	300	362	8.75	11.75	12	16.5	18	30	117	\$4,825	\$5,695
FLTR-V1K420A00	FLTR-V1K420A01	350	420	10	11.75	13.75	16.5	18	30	132	\$5,595	\$6,075
FLTR-V1K480A00	FLTR-V1K480A01	400	480	10	11.75	13.75	16.5	18	30	138	\$5,955	\$6,800
FLTR-V1K600A00	FLTR-V1K600A01	500	600	12.75	15	13.75	16.5	18	30	168	\$6,250	\$7,445
FLTR-V1K750A00	FLTR-V1K750A01	600	750	12.75	15	14.5	16.5	18	30	180	\$10,195	\$13,335

Long lead filters should be considered on applications where the cable distance between the motor and the variable frequency drive exceeds 300 feet.

Long lead filters protect the motor from high dV/dt.

Consult motor manufacturer on selection of output filter.

VARIABLE FREQUENCY DRIVE OPTIONS

DYNAMIC BRAKE RESISTORS AND BRAKE MODULES



Dynamic brake resistors and modules are used to address overvoltage conditions with drives. Overvoltage trips occur when the DC bus in the drive increases to the overvoltage trip level. This increase in voltage occurs when the mechanical energy in the motor is converted into regenerative electrical energy, which is transferred back into the drive (the motor acts like a generator).

Regeneration can occur on an occasional basis or periodically (cyclical) depending on the type of load. A dynamic brake module and resistor are required to be added to the drive to dissipate this excess power. The module and resistor must be sized correctly depending on the application.

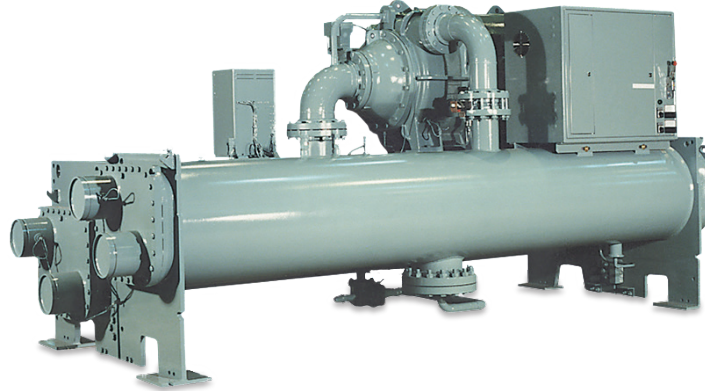
Regeneration occurs when:

- The deceleration time is too quick
- The load has high inertia and keeps rotating after the drive output power has decreased below that of the load (Ex: fly wheels, large fans)
- The load is an overhauling load, cyclical or periodic (Ex: pump jack, punch press)
- When the motor suddenly becomes unloaded (Ex: lumber mill saw applications)

Contact **Benshaw** for assistance with sizing brake resistors and brake modules.



INTEGRATED CONTROL SOLUTIONS USING BOTH BENSHAW AND ADDITIONAL BRANDS.



Benshaw builds customized engineered solutions to meet your most demanding applications.

Benshaw's success in the OEM and industrial marketplace is a direct result of our willingness as a company to think "beyond the box." We've made systems integration a central focus of our business, and we make learning your business a top priority.

By focusing on the bigger picture, we gain a better understanding of your process, your control requirements and your market objectives.

We then apply that knowledge toward the development and production of complete, cost-effective, fully integrated control solutions.

CUSTOMIZED ENCLOSURES:

Benshaw takes great pride in our ability to design and deliver custom control enclosures that truly complement the form and function of your machine.

NEMA 1, 12, 3R, 4 and 4X enclosures in unit mount, console mount, free-standing and wall-mount configurations are available to suit your needs.

Every enclosure we design is carefully crafted to meet your dimensional requirements, prototyped and tested for fit and compliance with relevant safety standards, fabricated to exacting tolerances and finished to your paint specification.

INTELLIGENT MOTOR CONTROLS:

Benshaw offers a full range of intelligent, programmable, low and medium voltage starters and drives—from fractional to 20,000 HP—to meet a variety of motor control needs.

Motor control products include full voltage starters, solid state reduced voltage starters and variable frequency drives.

Starter configurations include reversing, two-speed, DC braking, wye-delta, synchronous and wound rotor control.

ENGINEERED LOW VOLTAGE DRIVE PACKAGES

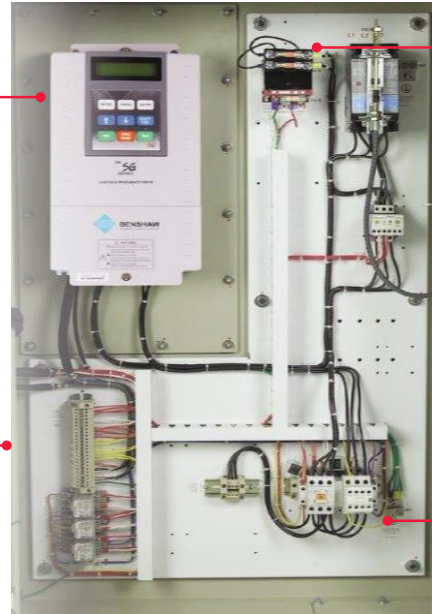
OVERVIEW

Benshaw is a recognized industry leader in the shipment of engineered drives from our state-of-the-art factory, with dedicated engineering teams and a complete inventory of components necessary to build engineered solutions for you. Select the enclosure, disconnect, bypass, pilot devices, control strategy and filters required to meet your most demanding applications.

Benshaw builds customized engineered solutions to meet your most demanding applications.

SG Series
Single AC Drive

User
terminal
strip



Control
power
transformer

Input circuit
breaker and
disconnect

Bypass
Contactor

CONTROL MODIFICATIONS — WHATEVER YOU SPECIFY

- Pilot devices, control power transformers, switches, meters, relays, space heaters, protective devices and more

COMBINATION DRIVE PACKAGES — TO MEET YOUR REQUIREMENTS

- Circuit breaker protection
- Non-fused disconnect protection
- Fusible disconnect protection
- Flange or rotary handle mechanism

BYPASS PACKAGES — TO FIT YOUR APPLICATION

- Three contactor
- Reduced voltage solid state starters

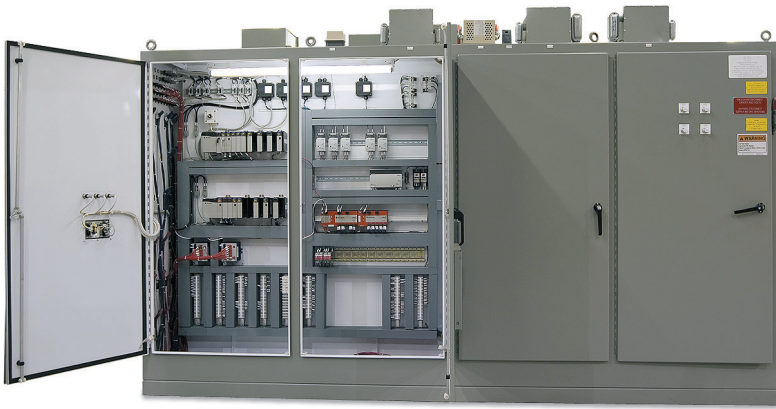
ENCLOSURES — TO MATCH YOUR ENVIRONMENT

- Standard designs — NEMA 1, 12, 3R
- Custom enclosures
- Special enclosures — 4, 4X, air conditioned
- Motor control packages (MCP), multiple VFD's, one package

FILTERS — FOR YOUR UNIQUE APPLICATION

- Line reactors 3% and 5%
- Long lead filters
- Load reactors
- Harmonic filters
- 18-pulse systems

LET OUR KNOWLEDGE BECOME YOUR COMPETITIVE EDGE.



INTEGRATED MACHINE LOGIC:

Benshaw can supply standard or PC-based programmable logic controllers, and will custom design hardware or software to meet process requirements.

INTEGRATED CONTROL SENSORS:

Benshaw can integrate any number of sensors, transducers, relays, switches, meters and protective devices, as required, to precisely monitor and respond to all critical process, machine or environmental variables.

INTEGRATED POWER PACKAGES:

Benshaw can also incorporate all of the power distribution components needed for your machine in one simple, plug-and-play package.

Turnkey power distribution packages typically include all internal and external motor control wiring harnesses, power wiring harnesses, motor/machine sensor connections and, if needed, a fully integrated power factor correction unit.

All power systems are factory tested at Benshaw to guarantee reliable performance.

TYPICAL OEM / INDUSTRIAL APPLICATIONS

- Air and process compressors
- Blowers and air handling equipment
- Chillers
- Conveyors
- Food / liquid processing equipment
- Industrial refrigeration equipment
- Municipal waste / water handling machines
- Pumps
- Pipelines
- Shredders / grinders
- Specialty machinery
- Transfer lines

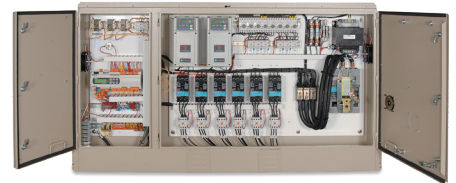
CUSTOM-ENGINEERED DRIVE SOLUTIONS.

FOR ANY DRIVE APPLICATION. IN ANY CONFIGURATION.

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 engineering experience and complete motor control system production capabilities, Benshaw delivers all of the competence, convenience and value you'd expect from a 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. 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
- 15-2,000A circuit breakers
- 40-2,000A non-fused disconnects
- 30-800A fusible disconnects
- Flange or rotary handle mechanisms

CONTROL MODIFICATIONS:

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

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

BYPASS PACKAGES:

- Three contactor
- Reduced voltage solid state starters

FILTERS:

- Line reactors (3% and 5%)
- Long lead filters
- Passive harmonic filters
- 18-pulse systems (IEEE-519)





ENGINEERED PACKAGE OPTIONS

CLEAN POWER DRIVES

SG 519 SERIES

RATINGS

STANDARD DUTY:

50–700 HP @ 460 V

HEAVY DUTY:

40–500 HP @ 460 V

IEEE-519 Compliant

PRODUCT HIGHLIGHTS:

Benshaw's SG 519 Series drives are designed and manufactured to limit voltage and current distortion levels to within the levels defined by IEEE-519*. This eliminates the need for expensive, time-consuming harmonic analysis and avoids the resonance problems associated with inefficient harmonic filters.

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

MODULAR DESIGN:

The modular design of Benshaw's SG 519 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.

*IEEE-519-2014, TABLES 1 AND 2



OPTIONAL BYPASS:

An optional bypass design configuration (ATL or RVSS) is available for SG 519 drive packages when mission-critical reliability is important and disruptive downtime cannot be tolerated.

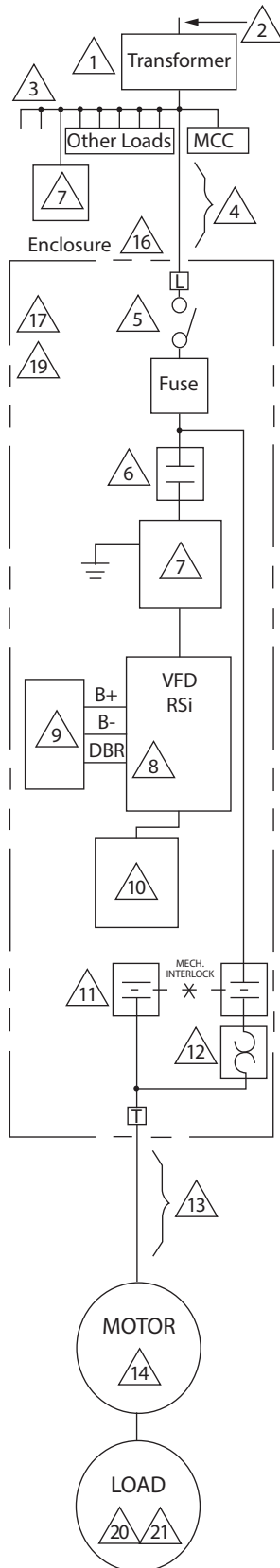
STANDARD FEATURES:

- SG Series drive
- NEMA 1 ventilated enclosure
- 65 kAIC circuit breaker with lockable disconnect
- Phase-shifting transformer and line reactor
- 12-pulse rectifier unit
- Control transformer with extra 120 V capacity
- Door-mounted control
- Keypad / display
- Start / stop buttons
- Reset button
- Hand-off-auto switch
- Speed potentiometer

OPTIONS

- Bypass (ATL or RVSS)
- Line fusing
- Output filter (reactor, long lead or sine wave)
- Enclosures — NEMA 12, 3R, 4 or 4X (with AC unit)
- RTD monitor
- Communications
- Control options to customer specification

VFD PRE-ORDER CHECK LIST



PURCHASER INFORMATION

Company Name _____

Contact Person _____

Email _____

Address _____

Phone Number _____

Supply — Incoming	1	Primary (Input) Volts ____ VAC ____ KVA ____ % Impedance Short Circuit Capability ____ ISC (Amps) Secondary (Output) Volts ____ WYE-Delta Connection: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Grounded <input type="checkbox"/> Ungrounded
PCC (Point of Common Coupling)	2	Harmonic Restrictions at PCC: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> IEEE 519-1992
Other Connected Loads	3	Other Connected Loads Present? Please list in detail in comments. Ex. PFCC, VFD, etc. <input type="checkbox"/> Yes <input type="checkbox"/> No
Feeder Cable	4	Cable Length ____ <input type="checkbox"/> Conduit <input type="checkbox"/> Teck <input type="checkbox"/> Non-Shielded <input type="checkbox"/> Shielded
Main Disconnect	5	<input type="checkbox"/> Breaker <input type="checkbox"/> Fusible Disc. <input type="checkbox"/> Line Fuses KAIC Rating ____
Input Isolation Contactor	6	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> HP Rated <input type="checkbox"/> NEMA Rated
Harmonic Suppression	7	Input Line Reactor <input type="checkbox"/> Transformer <input type="checkbox"/> Passive Filter <input type="checkbox"/> Active Filter 3 <input type="checkbox"/> or 5 <input type="checkbox"/> % Imp. <input type="checkbox"/> 18 Pulse <input type="checkbox"/> RFI/EMI Filter
VFD Ratings	8	VFD - HP ____ KVA ____ KW ____ CT <input type="checkbox"/> VT <input type="checkbox"/> Volts ____ V ____ Amps ____ Model - RSi - ____ HP - ____ V - ____ Encl.
Dynamic Braking	9	Load Type: <input type="checkbox"/> Decel Only <input type="checkbox"/> Overhauling Duty Cycle <input type="checkbox"/> 5% <input type="checkbox"/> 10% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 100%
Output Filter	10	<input type="checkbox"/> Reactor <input type="checkbox"/> Long Lead <input type="checkbox"/> Sine Wave 50 ft. ~ 300 ft. 300 ft. ~ 1500 ft. > 1500 ft.
Bypass	11	<input type="checkbox"/> 2 Contactor <input type="checkbox"/> 3 Contactor <input type="checkbox"/> RVSS <input type="checkbox"/> HP Rated <input type="checkbox"/> NEMA Rated <input type="checkbox"/> IEC Rated
Overload	12	For ATL Bypass only: Class 1-40 ____



VFD PRE-ORDER CHECK LIST

Cable Length	See	Manufacturer _____ Length ____ Ft ____ m ____ Cable Specification: <input type="checkbox"/> Non-Shielded <input type="checkbox"/> Shielded <input type="checkbox"/> Conduit
Motor Name Plate Data		Manufacturer _____ HP _____ Volts _____ RPM ____ FLA ____ S.F. _____ Amps _____ KVA/Code _____ Design _____ Frame _____ Breakdown torque ____% ____ lb-ft Temperature Rise _____ °C Critical speed _____ RPM Insulation VFD Grade NEMA MG 1 -1998, Part 3 1.4.4.2 <input type="checkbox"/> Yes <input type="checkbox"/> No; See Over temperature protection: Thermostat Thermistor RTD and type <input type="checkbox"/> 100 Pt <input type="checkbox"/> 10 Cu <input type="checkbox"/> 100Ni <input type="checkbox"/> 120Ni Does the motor require a blower for low speed operation? <input type="checkbox"/> Yes <input type="checkbox"/> No Insulated Bearing(s) <input type="checkbox"/> Yes <input type="checkbox"/> No
Options		<input type="checkbox"/> Start P/B <input type="checkbox"/> Local/Remote Sw. <input type="checkbox"/> Stop P/B <input type="checkbox"/> Pilot Lights <input type="checkbox"/> Emergency Stop P/B <input type="checkbox"/> - Run/Stop <input type="checkbox"/> HOA Switch <input type="checkbox"/> - Forward/Reverse <input type="checkbox"/> Forward P/B <input type="checkbox"/> - Jog <input type="checkbox"/> Reverse P/B <input type="checkbox"/> - Power <input type="checkbox"/> Jog Forward P/B <input type="checkbox"/> - Fault <input type="checkbox"/> Jog Reverse P/B <input type="checkbox"/> Potentiometer <input type="checkbox"/> Fault Reset P/B <input type="checkbox"/> Other _____
Enclosure		UL Type _____ (1, 12, 3R, 4, 4X) Ambient temperature range ____ °C to ____ °C Altitude 0 to 3,300 ft. (1,000m) <input type="checkbox"/> Other _____ Cable Entry/Exit Locations _____ Enclosure Size Restrictions H _____ W _____ D _____ Description _____
Control		<input type="checkbox"/> Keypad <input type="checkbox"/> Multi-Motor <input type="checkbox"/> Terminal <input type="checkbox"/> Master <input type="checkbox"/> Follower <input type="checkbox"/> 0 to 5VDC <input type="checkbox"/> Analog Outputs <input type="checkbox"/> 0 to 10VDC <input type="checkbox"/> Analog Inputs <input type="checkbox"/> ± 10VDC <input type="checkbox"/> Digital Inputs <input type="checkbox"/> 0/4 to 20mA <input type="checkbox"/> Relay Outputs

VFD PRE-ORDER CHECK LIST

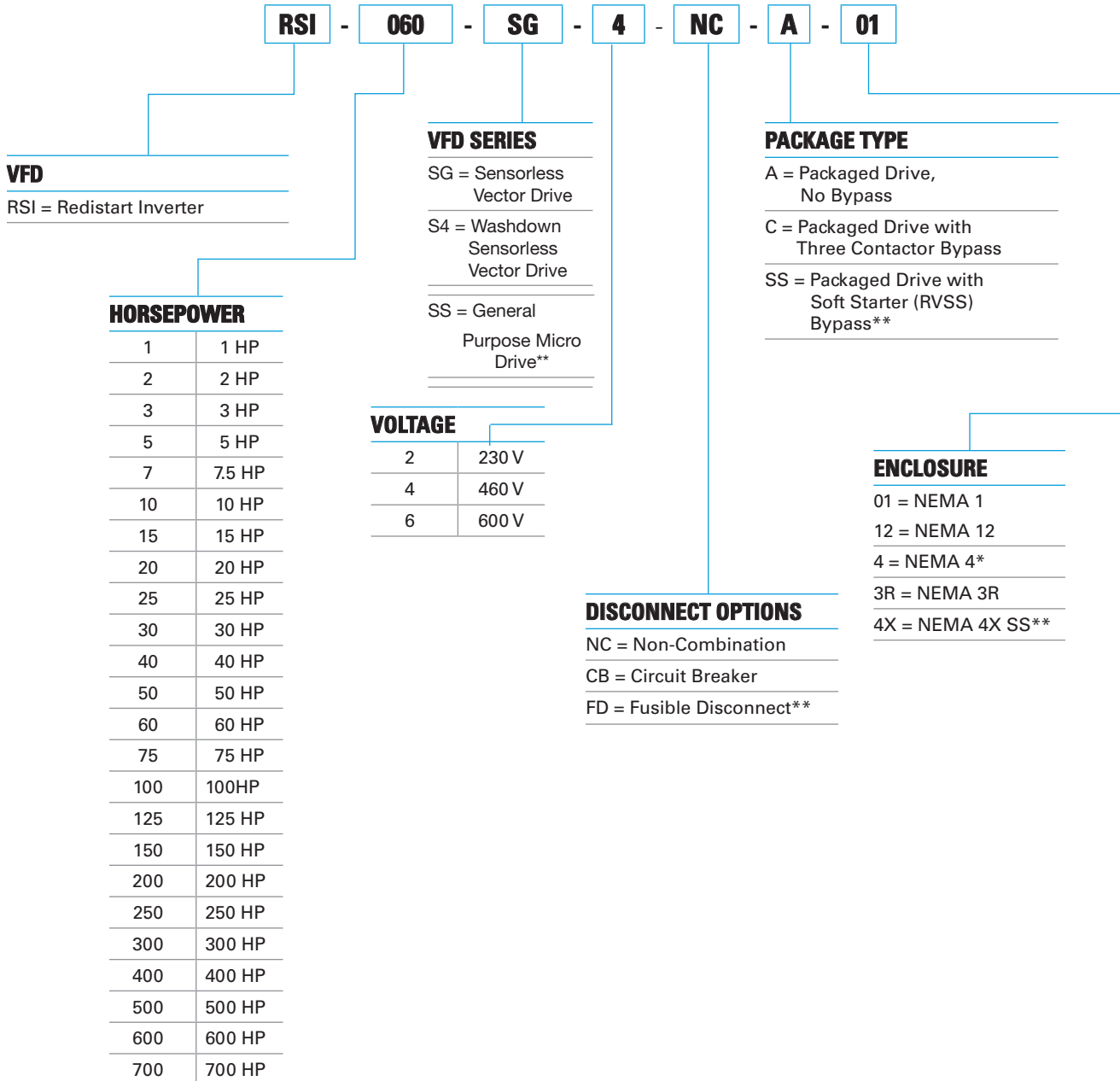
Communications	<input type="checkbox"/> 18 DeviceNet <input type="checkbox"/> Profibus	<input type="checkbox"/> Modbus RTU <input type="checkbox"/> Other _____
Motors	<input type="checkbox"/> 19 Motor Amps _____ Motor Volts _____ Frequency _____ RPM _____ Other (Please Specify) _____	
Application Details	<input type="checkbox"/> 20 <input type="checkbox"/> Constant Torque (150% for 60s) <input type="checkbox"/> Standard-Duty Torque (120% for 60s) <input type="checkbox"/> Variable Torque (110% for 60s) <input type="checkbox"/> Load-Steady <input type="checkbox"/> Pulsing <input type="checkbox"/> Regenerative Speed Range _____ to _____ RPM <input type="checkbox"/> Load Flywheel Inertia (WK ²) <input type="checkbox"/> Load Torque Profile <input type="checkbox"/> Breakaway Torque lb.-ft. Breakaway Torque Duration _____ sec. Max. Peak Torque _____ lb.-ft. Accel. Time _____ Decel. Time _____ <input type="checkbox"/> Torque vs. Speed Curve Deceleration: <input type="checkbox"/> Coast <input type="checkbox"/> Ramp <input type="checkbox"/> DC Injection Pump/Fan Speed _____ Min. Speed _____ Starting and stopping cycle (details) _____ Holding Brake required? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Load Details	<input type="checkbox"/> 21 Fan <input type="checkbox"/> Fin Fan Cooler <input type="checkbox"/> Cooling Tower Fan Pump <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Centrifugal Compressor <input type="checkbox"/> Electrical Submersible Pump (ESP) <input type="checkbox"/> PD Pump <input type="checkbox"/> Slurry Pump Oil Pump <input type="checkbox"/> Pumpjack (PG) <input type="checkbox"/> Progressive Cavity Screw Pump (PCP) Conveyor <input type="checkbox"/> Screw Conveyor <input type="checkbox"/> Belt Conveyor <input type="checkbox"/> Flat Conveyor <input type="checkbox"/> Bucket Conveyor <input type="checkbox"/> Air Conveyor Extruder <input type="checkbox"/> Single Extruder <input type="checkbox"/> Dual Extruder <input type="checkbox"/> Piston Extruder Other <input type="checkbox"/> Number Throws <input type="checkbox"/> Centrifuge <input type="checkbox"/> Canter Line <input type="checkbox"/> Step-up Transformer: <input type="checkbox"/> KVA <input type="checkbox"/> Vprim <input type="checkbox"/> Vsec <input type="checkbox"/> V Z Gear ratio/Sheave ratio (Motor RPM/Load RPM) _____:_____ <input type="checkbox"/> Single-phase input	

Additional Comments: _____



ENGINEERED PACKAGE PART NUMBER ASSEMBLER

SENSORLESS VECTOR DRIVES



* Air conditioning required.

** Consult factory.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — SG SERIES

ENCLOSED DRIVES — NON-COMBINATION SENSORLESS VECTOR DRIVE - 230 V

7.5 - 40 HP / NEMA 1 AND 3R

Model Number	Variable Torque		Standard Duty		Heavy Duty		List Price			
	HP	Amps	HP	Amps	HP	Amps	A-01	C-01	A-3R*	C-3R*
RSI-007-SG2-NC-XX	7.5	22	7.5	22	5	15.2	\$6,525	\$6,875	\$6,565	\$6,865
RSI-010-SG2-NC-XX	10	29	10	29	7.5	22	\$6,650	\$6,985	\$7,095	\$7,455
RSI-015-SG2-NC-XX	15	42	15	42	10	28	\$6,925	\$7,350	\$7,765	\$8,225
RSI-020-SG2-NC-XX	20	54	20	54	15	42	\$7,425	\$7,950	\$8,255	\$8,775
RSI-025-SG2-NC-XX	25	68	25	68	20	54	\$7,955	\$8,695	\$8,795	\$9,525
RSI-030-SG2-NC-XX	30	80	30	80	25	68	\$8,325	\$9,235	\$9,165	\$10,000
RSI-040-SG2-NC-XX	40	104	40	104	30	80	\$8,725	\$9,855	\$9,555	\$10,695

A-01 = VFD in fan and filtered enclosure.

C-01 = VFD in fan and filtered enclosure with three contactor bypass circuit.

A-3R = VFD in fan and filtered 3R enclosure.

C-3R = VFD in fan and filtered 3R enclosure with three contactor bypass circuit.

For dimensions refer to page 29.

For options refer to pages 30 thru 32.

Variable Torque = 110% current for 1 minute.

Standard Duty = 120% current for 1 minute.

Heavy Duty = 150% current for 1 minute.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — SG SERIES

ENCLOSED DRIVES — NON-COMBINATION SENSORLESS VECTOR DRIVE - 460 V

7.5 - 700 HP / NEMA 1 AND 3R

Model Number	Variable Torque		Standard Duty		Heavy Duty		List Price			
	HP	Amps	HP	Amps	HP	Amps	A-01	C-01	A-3R*	C-3R*
RSI-007-SG4-NC-XX	75	11	75	11	5	8	\$6,550	\$6,825	\$7,025	\$7,295
RSI-010-SG4-NC-XX	10	14	10	14	7.5	11	\$6,625	\$6,900	\$7,095	\$7,425
RSI-015-SG4-NC-XX	15	21	15	21	10	14	\$6,885	\$7,295	\$7,795	\$8,150
RSI-020-SG4-NC-XX	20	27	20	27	15	21	\$7,350	\$7,775	\$8,255	\$8,625
RSI-025-SG4-NC-XX	25	34	25	34	20	27	\$7,825	\$8,625	\$8,675	\$9,500
RSI-030-SG4-NC-XX	30	40	30	40	25	34	\$8,325	\$8,775	\$9,195	\$9,625
RSI-040-SG4-NC-XX	40	52	40	52	30	40	\$8,715	\$9,250	\$9,555	\$10,075
RSI-050-SG4-NC-XX	50	65	50	65	40	52	\$10,350	\$11,055	\$11,175	\$11,925
RSI-060-SG4-NC-XX	60	77	60	77	50	65	\$12,000	\$13,000	\$13,175	\$14,155
RSI-075-SG4-NC-XX	75	96	75	96	60	77	\$12,755	\$13,935	\$13,885	\$15,125
RSI-100-SG4-NC-XX	100	125	100	125	75	96	\$14,095	\$15,855	\$15,195	\$16,995
RSI-125-SG4-NC-XX	125	156	125	156	100	125	\$15,595	\$20,355	\$16,425	\$18,995
RSI-150-SG4-NC-XX	150	180	150	180	125	156	\$25,000	\$28,655	\$25,665	\$25,625
RSI-200-SG4-NC-XX	200	240	200	240	150	180	\$26,775	\$30,995	\$27,375	\$33,395
RSI-250-SG4-NC-XX	250	302	250	302	200	240	\$29,275	\$30,985	\$30,355	\$35,825
RSI-350-SG4-NC-XX	350	414	350	361	250	302	\$40,850	\$40,855	\$41,955	\$47,000
RSI-400-SG4-NC-XX	400	477	400	477	300	361	\$48,000	\$56,575	\$49,155	\$57,655
RSI-500-SG4-NC-XX	500	590	500	515	350	414	\$59,885	\$71,765	\$61,455	\$64,000
RSI-600-SG4-NC-XX	600	731	600	590	400	477	\$67,795	\$79,955	\$71,795	\$81,525
RSI-700-SG4-NC-XX	700	877	700	804	500	590	\$77,395	\$122,385	\$78,955	\$124,575

A-01 = VFD in fan and filtered enclosure.

C-01 = VFD in fan and filtered enclosure with three contactor bypass circuit.

A-3R = VFD in fan and filtered 3R enclosure.

C-3R = VFD in fan and filtered 3R enclosure with three contactor bypass circuit.

For dimensions refer to page [29](#).

For options refer to pages [30 thru 32](#).

Variable Torque = 110% current for 1 minute.

Standard Duty = 120% current for 1 minute.

Heavy Duty = 150% current for 1 minute.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — SG SERIES

ENCLOSED DRIVES — COMBINATION CIRCUIT BREAKER SENSORLESS VECTOR DRIVES - 230 V

7.5 - 40 HP / NEMA 1 AND 3R

Model Number	Variable Torque		Standard Duty		Heavy Duty		List Price			
	HP	Amps	HP	Amps	HP	Amps	A-01	C-01	A-3R*	C-3R*
RSI-007-SG2-CB-XX	7.5	22	7.5	22	5	15.2	\$6,885	\$7,185	\$7,350	\$7,695
RSI-010-SG2-CB-XX	10	28	10	28	7.5	22	\$6,955	\$7,500	\$7,435	\$7,825
RSI-015-SG2-CB-XX	15	42	15	42	10	28	\$7,295	\$7,755	\$8,125	\$8,575
RSI-020-SG2-CB-XX	20	54	20	54	15	42	\$7,835	\$8,350	\$8,675	\$9,195
RSI-025-SG2-CB-XX	25	68	25	68	20	54	\$8,365	\$9,095	\$9,225	\$9,940
RSI-030-SG2-CB-XX	30	80	30	80	25	68	\$8,925	\$9,845	\$9,765	\$10,685
RSI-040-SG2-CB-XX	40	104	40	104	30	80	\$9,555	\$10,695	\$10,395	\$11,535

A-01 = VFD in fan and filtered enclosure.

C-01 = VFD in fan and filtered enclosure with three contactor bypass circuit.

A-3R = VFD in fan and filtered 3R enclosure.

C-3R = VFD in fan and filtered 3R enclosure with three contactor bypass circuit.

*Units should be mounted out of direct sunlight.

For dimensions refer to page 29.

For options refer to pages 30 thru 32.

Variable Torque = 110% current for 1 minute.

Standard Duty = 120% current for 1 minute.

Heavy Duty = 150% current for 1 minute.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — SG SERIES

ENCLOSED DRIVES — COMBINATION CIRCUIT BREAKER SENSORLESS VECTOR DRIVES - 460 V

7.5 - 700 HP / NEMA 1 AND 3R

Model Number	Variable Torque		Standard Duty		Heavy Duty		List Price			
	HP	Amps	HP	Amps	HP	Amps	A-01	C-01	A-3R*	C-3R*
RSI-007-SG4-CB-XX	7.5	11	7.5	11	5	8	\$6,865	\$7,150	\$7,335	\$7,625
RSI-010-SG4-CB-XX	10	14	10	14	7.5	11	\$6,925	\$7,250	\$7,395	\$7,750
RSI-015-SG4-CB-XX	15	21	15	21	10	14	\$7,250	\$7,625	\$8,095	\$8,550
RSI-020-SG4-CB-XX	20	27	20	27	15	21	\$7,725	\$8,150	\$8,600	\$8,975
RSI-025-SG4-CB-XX	25	34	25	34	20	27	\$8,185	\$8,595	\$9,050	\$9,400
RSI-030-SG4-CB-XX	30	40	30	40	25	34	\$8,695	\$9,125	\$9,525	\$9,975
RSI-040-SG4-CB-XX	40	52	40	52	30	40	\$9,150	\$9,655	\$9,695	\$10,485
RSI-050-SG4-CB-XX	50	65	50	65	40	52	\$10,765	\$11,495	\$11,600	\$12,325
RSI-060-SG4-CB-XX	60	77	60	77	50	65	\$12,685	\$13,650	\$13,555	\$14,825
RSI-075-SG4-CB-XX	75	96	75	96	60	77	\$14,095	\$15,295	\$14,985	\$16,175
RSI-100-SG4-CB-XX	100	125	100	125	75	96	\$15,425	\$17,225	\$16,250	\$18,000
RSI-125-SG4-CB-XX	125	156	125	156	100	125	\$16,955	\$19,425	\$17,775	\$20,250
RSI-150-SG4-CB-XX	150	180	150	180	125	156	\$26,675	\$30,295	\$24,000	\$28,895
RSI-200-SG4-CB-XX	200	240	200	240	150	180	\$28,385	\$32,550	\$28,985	\$35,000
RSI-250-SG4-CB-XX	250	302	250	302	200	240	\$31,655	\$35,750	\$32,735	\$38,195
RSI-350-SG4-CB-XX	350	414	350	361	250	302	\$43,625	\$50,950	\$44,695	\$52,000
RSI-400-SG4-CB-XX	400	477	400	477	300	361	\$51,955	\$62,650	\$53,000	\$63,750
RSI-500-SG4-CB-XX	500	590	450	515	350	414	\$63,345	\$76,625	\$64,945	\$78,175
RSI-600-SG4-CB-XX	600	731	600	590	400	477	\$74,775	\$85,750	\$76,350	\$87,275
RSI-700-SG4-CB-XX	700	877	600	804	500	590	\$84,395	\$128,950	\$90,000	\$130,000

A-01 = VFD in fan and filtered enclosure.

C-01 = VFD in fan and filtered enclosure with three contactor bypass circuit.

A-3R = VFD in fan and filtered 3R enclosure.

C-3R = VFD in fan and filtered 3R enclosure with three contactor bypass circuit.

*Units should be mounted out of direct sunlight.

For dimensions refer to page 29.

For options refer to pages 30 thru 32.

Variable Torque = 110% current for 1 minute.

Standard Duty = 120% current for 1 minute.

Heavy Duty = 150% current for 1 minute.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — SG SERIES

SG SERIES DIMENSIONS - 230 V

HP	Enclosure Dimensions			
	No Options	With Circuit Breaker or Line Reactor	3-Contactor Bypass	3-Contactor Bypass & Circuit Breaker
7.5	30x24x16	30x24x16	30x24x16	30x24x16
10	30x24x16	30x24x16	30x24x16	30x24x16
15	30x24x16	30x24x16	30x24x16	30x24x16
20	30x24x16	30x24x16	30x24x16	30x24x16
25	30x24x16	30x24x16	30x24x16	30x24x16
30	30x24x16	30x24x16	30x24x16	30x24x16
40	36x30x16	36x30x16	36x30x16	36x30x16

SG SERIES DIMENSIONS - 460 V

HP	Enclosure Dimensions			
	No Options	With Circuit Breaker or Line Reactor	3-Contactor Bypass	3-Contactor Bypass & Circuit Breaker
7.5	30x24x16	30x24x16	30x24x16	30x24x16
10	30x24x16	30x24x16	30x24x16	30x24x16
15	30x24x16	30x24x16	30x24x16	30x24x16
20	30x24x16	30x24x16	30x24x16	30x24x16
25	30x24x16	30x24x16	30x24x16	30x24x16
30	30x24x16	30x24x16	30x24x16	30x24x16
40	36x30x16	36x30x16	36x30x16	36x30x16
50	36x30x16	36x30x16	36x30x16	36x30x16
60	36x30x16	36x30x16	36x30x16	36x30x16
75	36x30x16	36x30x16	36x30x16	36x30x16
100	46x30x16	46x30x16	70x30x24	70x30x24
125	46x30x16	46x30x16	70x30x24	70x30x24
150	87x31x24	87x31x24	87x48x24	87x48x24
200	87x31x24	87x31x24	87x48x24	87x48x24
250	87x31x24	87x37x24	87x48x24	87x48x24
350	87x37x24	87x48x24	87x48x24	87x72x24
400	87x37x24	87x48x24	87x48x24	87x72x24
500	87x48x24	87x48x24	87x72x24	87x96x24
600	87x48x24	87x72x24	87x72x24	87x96x24
700	87x48x24	87x72x24	Consult Factory	Consult Factory

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — PILOT DEVICES

PUSH-BUTTONS

Model Number	Description	List Price
QB	Raised Stop Push-Button — Red	\$100
QC	Flush Start Push-Button — Green	\$100
QD	Jog Push-Button - Yellow	\$100
QE	OI Reset Push-Button — (For External OI Relay) — Black	\$100
QF	Reset Push-Button — Black	\$100
QG	Raised Push-Button — Specify Color and Function	\$100
QH	Flush Push-Button — Specify Color and Function	\$100
QJ	Mushroom Head Stop Push-Button — Red	\$125
QK	Illuminated Push-Button — Specify Color and Function	\$200
QL	On/Off Push-Button	\$100
QM	O/L trip Reset Button	\$100

PILOT LIGHTS

Model Number	Description	List Price
QN	Red Run Light	\$125
RJ	Green Stop Light	\$125
RK	Amber Fault Light	\$125
RL	Green Ready Light	\$125
RM	Amber Bypass Light	\$125
RN	Red Light — Specify Function	\$125
RP	Green Light — Specify Function	\$125
RQ	Amber Light — Specify Function	\$125
RR	White Light — Specify Function	\$125
RS	Blue Light — Specify Function	\$125
RT	Push to Test Contact Assembly (Addition to Above)	\$200
QP	Power On Light — White	\$200

SELECTOR SWITCHES

Model Number	Description	List Price
QV	Hand-Off-Auto Selector Switch	\$200
QW	Local-Off-Remote Selector Switch	\$200
TV	Key-Operated Hand-Off-Auto Selector Switch	\$250
TW	Dual Ramps Selector Switch	\$200
TX	Two-Position Selector Switch — Specify Function	\$200
TY	Three-Position Selector Switch — Specify Function	\$200
TZ	Other Selector Switch — Specify Function and Type	CF

For additional options, contact factory.

CF - Contact Factory

METERS

Model Number	Description	List Price
KT	Analog Ammeter	\$300
KU	Analog Ammeter (3-phase with selector)	\$300
KV	Analog Voltmeter	\$300
KW	Analog Voltmeter (3-phase with selector)	\$300
KX	Elapsed Timer Meter (analog, non-resettable)	\$300
KY	Operations Counter	
KZ	AC Wattmeter	
L2	AC Watt Hour Meter	
L3	Other Power Metering - Specify Function	
L4	Analog Ammeter (utilizes VFDs analog output)	
L5	Analog Voltmeter (utilizes VFDs analog output)	

POTENTIOMETERS

Model Number	Description	List Price
S7	1 Turn Potentiometer - NEMA 1	\$225
S8	10 Turn Potentiometer - NEMA 1	\$250

SPACE HEATERS

Model Number	Description	List Price
A171	Space Heater with Thermostat	\$450

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — LINE REACTORS (INSTALLED)

230 V — INPUT 3% AC LINE REACTORS

Model Number	HP	Volts	List Price
GA	1	230	\$345
GB	2	230	\$355
GC	3	230	\$395
GD	5	230	\$465
GE	7.5	230	\$525
GF	10	230	\$545
GG	15	230	\$565
GH	20	230	\$595
GJ	25	230	\$755

460 V — INPUT 3% AC LINE REACTORS

Model Number	HP	Volts	List Price
GL	2	460	\$215
GM	3	460	\$235
GN	5	460	\$245
GP	7.5	460	\$275
GQ	10	460	\$345
GR	15	460	\$425
GS	20	460	\$445
GT	25	460	\$465
GU	30	460	\$595
GV	40	460	\$655
GW	50	460	\$750
GX	60	460	\$775
GY	75	460	\$1,050
GZ	100	460	\$1,195
H2	125	460	\$1,675
H3	150	460	\$1,725
H4	200	460	\$2,195
H5	250	460	\$2,425
H6	300	460	\$2,495
H7	350	460	\$2,855
H8	400	460	\$3,155
H9	500	460	\$5,425
HA	600	460	\$6,875
HB	700	460	\$8,050

460 V — INPUT 5% AC LINE REACTORS

Model Number	HP	Volts	List Price
HN	2	460	\$265
HP	3	460	\$295
HQ	5	460	\$315
HR	7.5	460	\$355
HS	10	460	\$425
HT	15	460	\$515
HU	20	460	\$535
HV	25	460	\$565
HW	30	460	\$725
HX	40	460	\$785
HY	50	460	\$900
HZ	60	460	\$935
J2	75	460	\$1,265
J3	100	460	\$1,450
J4	125	460	\$2,000
J5	150	460	\$2,095
J6	200	460	\$2,650
J7	250	460	\$2,925
J8	300	460	\$2,995
J9	350	460	\$3,425
JA	400	460	\$3,785
JB	500	460	\$6,500
JC	600	460	\$8,250
JD	700	460	\$9,665

Line reactors reduce harmonics and protect the variable frequency drive from input power quality problems. They are also recommended on applications where the transformer kVA exceeds 10 times the KVA rating of the drive. For additional options, contact factory.

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — LONG LEAD FILTERS (INSTALLED)

460 V — LONG LEAD FILTERS

Model Number	HP	Volts	List Price
JW	1	460	\$1,050
JX	2	460	\$1,095
JY	3	460	\$1,125
JZ	5	460	\$1,200
K2	7.5	460	\$1,295
K3	10	460	\$1,350
K4	15	460	\$1,395
K5	20	460	\$1,455
K6	25	460	\$1,495
K7	30	460	\$1,550
K8	40	460	\$1,695
K9	50–60	460	\$2,095
KA	75	460	\$2,625
KB	100	460	\$2,965
KC	125	460	\$3,150
KD	150	460	\$3,365
KE	200	460	\$3,450
KF	250	460	\$3,595
KG	300	460	\$3,850
KH	350	460	\$4,125
KJ	400	460	\$4,625
KK	500	460	\$9,450
KL	600	460	CF
KM	700	460	CF

Long lead filters should be considered on applications where the cable distance between the motor and the variable frequency drive exceeds 300 feet.

Long lead filters protect the motor from high dV/dt.

Consult motor manufacturer on selection of output filter.

CF - Contact Factory



Benshaw's standard products are stocked in warehouses in the USA and Canada. . . ready for shipment to support your critical needs:

Benshaw.com

In the USA, call or fax

Phone: 412.968.0100

Fax: 412.968.5415

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Phone: 519.291.5112

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- Field analysis/data collection
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- Retrofits

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A wide range of motor controls and drives is available.

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- LV AC drives to 2,000HP, MV AC drives to 10,000HP
- Electromechanical controls to 800A

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Pittsburgh, PA 15238
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Specifications are subject to change without notice.

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