



Product Catalog



SG/S4 Series

2022 EDITION

Low Voltage Variable Frequency Drives

Rapid | Rugged | Global

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Introduction

Benshaw SG Series and S4 Series variable frequency drives provide a rugged, compact solution for your most demanding applications.

Benshaw SG Series Low Voltage Variable Frequency Drives are compact, economical drives designed for a wide range of demanding applications. The SG Series' flexible power stack allows a 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.

Our S4 Series drives are a line of high performance NEMA 4X (washdown) and outdoor rated variable frequency drives. Benshaw's S4 Series variable frequency drives are built to withstand the harshest environments and hold up under your most demanding pressure washing applications. All drives in the series combine a simple user interface with an array of features suited to almost any indoor or outdoor environment.

Benshaw S4 Series 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.



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, Benschaw's SG series drives are configurable to meet the needs of almost any industrial application, yet remain simple and easy to use.

KEY ADVANTAGES:

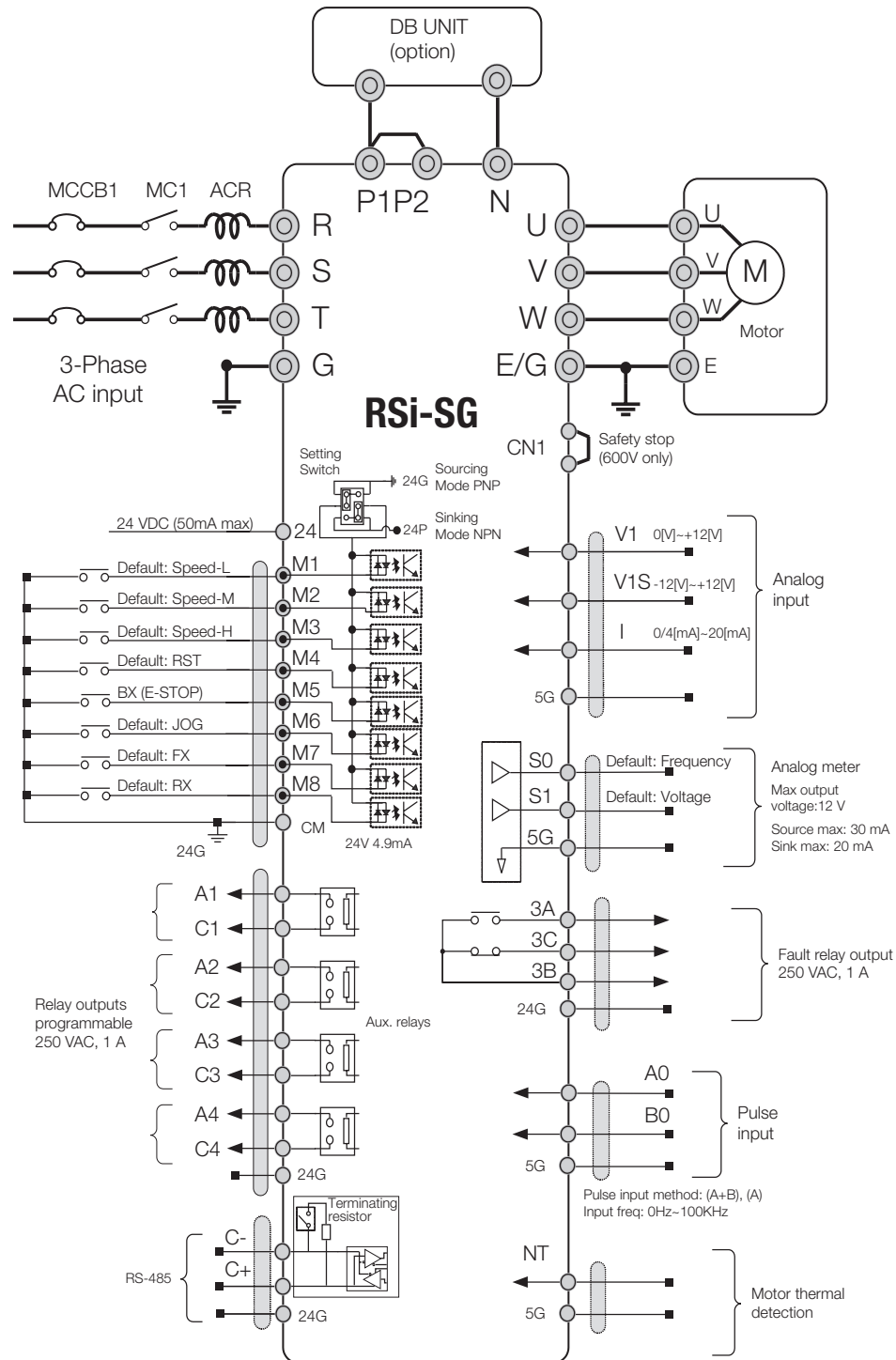
- Standard and heavy-duty ratings
- Sensorless vector control or V/Hz control
- Integral PID Control
- Integral multiple motor control for pumping applications
- Simple, easy-to-use LCD interface
- Uploadable / downloadable keypad
- Flexible, programmable I/O
- Economical, compact design
- Standard Modbus 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.)
	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
☞ RSI-010-SG-2B	10	32	10	29	7.5	23	11.2	7.9	7.2	14
☞ RSI-015-SG-2B	15	46	15	42	10	33	11.2	7.9	7.2	14
☞ RSI-020-SG-2B	20	60	20	55	15	44	17.9	9.8	7.9	28
☞ RSI-025-SG-2B	25	74	25	67	20	54	17.9	9.8	7.9	29
☞ RSI-030-SG-2B	30	88	30	80	25	68	23.6	12	9.2	44
☞ RSI-040-SG-2B	40	115	40	105	30	84	23.6	12	9.2	44

460 V

Model Number	Variable Torque		Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)
	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
☞ RSI-010-SG-4B	10	16	10	14	7.5	11	11.2	7.9	7.2	14
☞ RSI-015-SG-4B	15	24	15	22	10	17	11.2	7.9	7.2	14
☞ RSI-020-SG-4B	20	30	20	27	15	22	17.9	9.8	7.9	28
☞ RSI-025-SG-4B	25	39	25	35	20	28	17.9	9.8	7.9	29
☞ RSI-030-SG-4B	30	45	30	41	25	34	23.6	12	9.2	44
☞ RSI-040-SG-4B	40	61	40	55	30	44	23.6	12	9.2	44
☞ RSI-050-SG-4B	50	75	50	68	40	55	25.3	11.8	10.5	60
☞ RSI-060-SG-4B	60	91	60	83	50	66	25.3	11.8	10.5	60
☞ RSI-075-SG-4B	75	110	75	100	60	80	25.3	11.8	11.2	64
☞ RSI-100-SG-4B	100	152	100	139	75	111	30.2	14.5	12.1	95
☞ RSI-125-SG-4B	125	183	125	167	100	134	30.2	14.5	12.1	95
☞ RSI-150-SG-4 • *	150	223	150	204	125	164	30.9	20.1	16.6	225
☞ RSI-200-SG-4 • *	200	264	200	242	150	194	30.9	20.1	16.6	225
☞ RSI-250-SG-4 • *	250	325	250	302	200	240	33.9	20.1	16.6	255
☞ RSI-350-SG-4 • *	350	432	300	396	250	317	42.5	27.2	17.3	450
☞ RSI-400-SG-4 • *	400	547	400	501	300	401	42.5	27.2	17.3	450
☞ RSI-500-SG-4 •	500	613	450	562	350	450	44.9	30.8	17.4	540
☞ RSI-600-SG-4 •	600	731	500	670	400	536	51.3	36.3	19.5	840
☞ RSI-700-SG-4 •	700	877	600	804	500	643	51.3	36.3	19.5	840

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.)
	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
☞ RSI-010-SG-6B	10	12	10	11	7.5	9	14	7.9	7.2	16
☞ RSI-015-SG-6B	15	17	15	15.5	10	12	14	7.9	7.2	16
☞ RSI-020-SG-6B	20	23	20	21	15	17	17.9	9.8	7.9	28
☞ RSI-025-SG-6B	25	27	25	24.7	20	19.8	17.9	9.8	7.9	29
☞ RSI-030-SG-6B	30	34	30	31	25	25	23.6	12	9.2	44
☞ RSI-040-SG-6B	40	43	40	39	30	31.5	23.6	12	9.2	44
☞ RSI-050-SG-6B	50	55	50	50	40	43	25.3	11.8	11.5	71
☞ RSI-060-SG-6B	60	64	60	58.6	50	55	25.3	11.8	11.5	71
☞ RSI-075-SG-6B	75	80	75	73	60	64	25.3	11.8	11.5	71
☞ RSI-100-SG-6B	100	104	100	95	75	80	30.2	14.6	13.3	102
☞ RSI-125-SG-6B	125	128	125	117	100	104	30.2	14.6	13.3	102
☞ RSI-150-SG-6 • *	150	150	150	137	125	128	30.9	20	16.6	225
☞ RSI-200-SG-6 • *	200	200	200	184	150	147	33.9	20	16.6	255
☞ RSI-250-SG-6 • *	250	242	250	222	150	177	33.9	20	16.6	255
☞ RSI-350-SG-6 • *	350	333	300	305	250	244	42.5	27.2	17.7	450
☞ RSI-400-SG-6 • *	400	424	400	389	300	311	42.5	27.2	17.7	450

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

FIELD BUS COMMUNICATION CARDS

Model Number	Description
PC-400002-00	Profibus Communication Board Kit, SG VFD
PC-400003-00	LonWorks Communication Board Kit, SG VFD
PC-400004-00	BacNet Communication Board Kit, SG VFD
PC-400005-00	Modbus TCP Communication Board Kit, SG VFD

ANALOG OUTPUT CARD

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

DISPLAY / KEYPAD REMOTE MOUNTING

Model Number	Description
LCD-100000-00	Replacement Display / Keypad
VFD-2M-RE-CABLE-SG	2 Meter Keypad Cable
VFD-3M-RE-CABLE-SG	3 Meter Keypad Cable
VFD-5M-RE-CABLE-SG	5 Meter Keypad Cable
VFD-KEYPAD-SG-BEZEL	Bezel, for SG Keypad, Remote Mounting
VFD-KEYPAD-SG-BLANK	Keypad Blank, Installs in Drive when Keypad Is Remote

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:

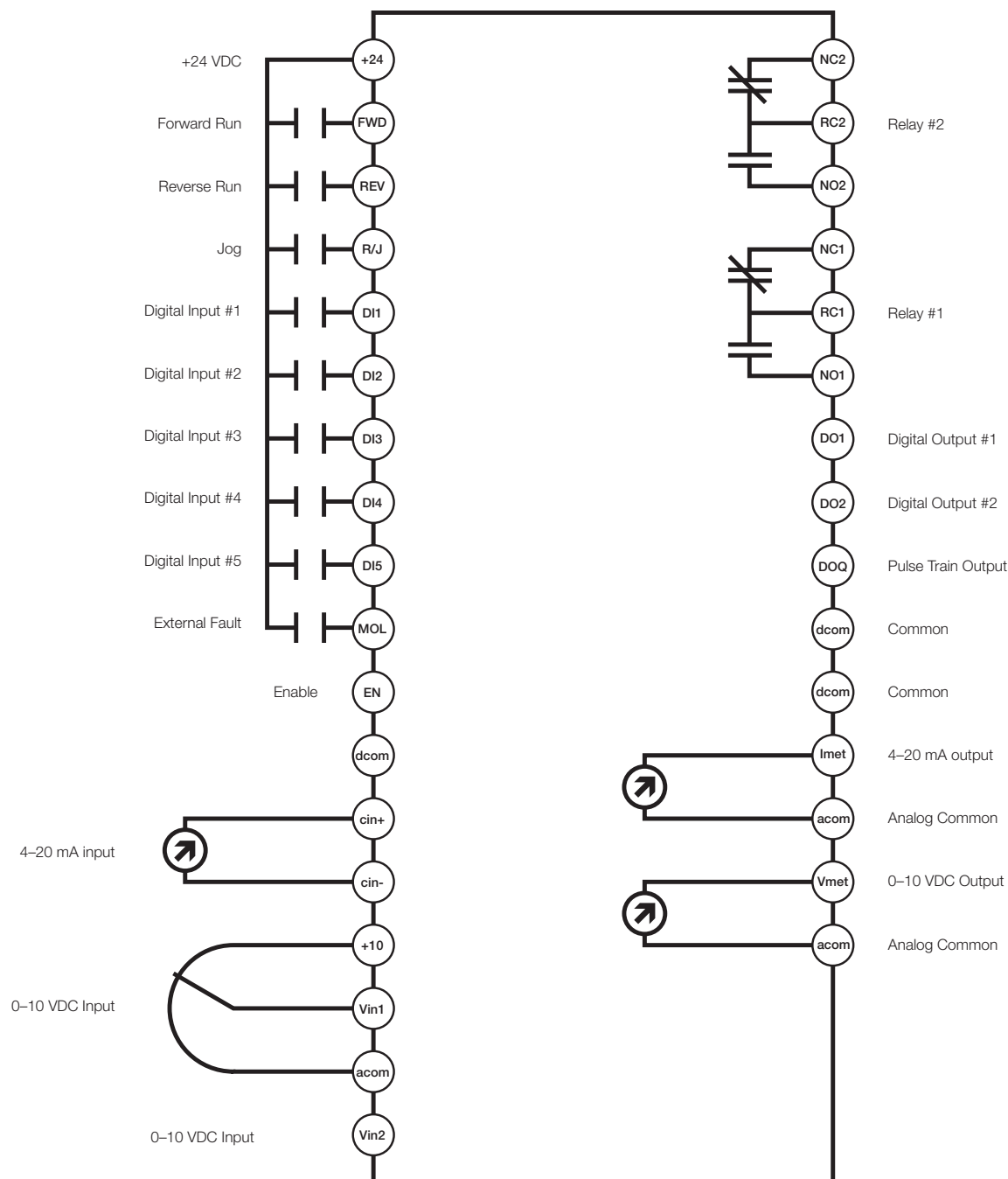
- **NEMA 4X washdown enclosure**
- Units 1–100 HP are NEMA 4X; units 125–200 HP are NEMA 12
- **Standard I/O:** 10 digital inputs, 2 analog inputs, 2 analog outputs, 2 relay outputs
- **User interface:** 20-character LCD display
- **Digital metering:** Output current, output volts, power, MWh meter,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

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

NEMA 4X / 230 V

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)
	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
RSI-002-S4-2W	2	6.8	1	4.8	9.5	6.5	6.1	9
RSI-003-S4-2W	3	9.6	2	7.8	9.5	6.5	8.5	9
RSI-005-S4-2W	5	15.2	3	11	12	8.7	6.5	14
RSI-007-S4-2W	7.5	22	5	17.5	12	8.7	6.5	14
RSI-010-S4-2W	10	28	7.5	25.3	17.4	10.8	7.9	30
RSI-015-S4-2W	15	42	10	37.2	17.4	10.8	7.9	30
RSI-020-S4-2W	20	54	15	48.3	20.2	11.3	11.7	50
RSI-025-S4-2W	25	68	20	62.1	20.2	11.3	11.7	50

NEMA 4X / NEMA 12 / 460 V

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)			Weight (lbs.)
	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
RSI-002-S4-4W	2	3.4	1	2.1	9.5	6.5	6.1	9
RSI-003-S4-4W	3	4.8	2	3.4	9.5	6.5	8.5	9
RSI-005-S4-4W	5	7.6	3	4.8	12	8.7	6.5	14
RSI-007-S4-4W	7.5	11	5	7.6	12	8.7	6.5	14
RSI-010-S4-4W	10	14	7.5	11	12	8.7	6.5	14
RSI-015-S4-4W	15	21	10	14	17.4	10.8	7.9	30
RSI-020-S4-4W	20	27	15	21	17.4	10.8	7.9	30
RSI-025-S4-4W	25	34	20	27	17.4	10.8	7.9	30
RSI-030-S4-4W	30	40	25	34	17.4	10.8	7.9	30
RSI-040-S4-4W	40	52	30	40	20.2	11.3	11.7	50
RSI-050-S4-4W	50	65	40	52	20.2	11.3	11.7	50
RSI-060-S4-4W	60	77	50	65	29.4	12.9	13.8	110
RSI-075-S4-4W	75	96	60	77	29.4	12.9	13.8	110
RSI-100-S4-4W	100	124	75	96	29.4	12.9	13.8	110
RSI-125-S4-4D *	125	156	100	124	50.5	16.5	18	354
RSI-150-S4-4D *	150	180	125	156	50.5	16.5	18	354
RSI-200-S4-4D *	200	240	150	180	50.5	16.5	18	354

* 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.)
	HP	Amps	HP	Amps	H	W	D	
RSI-001-S4-6W	1	1.7	0.5	0.9	12	8.7	6.5	14
RSI-002-S4-6W	2	2.7	1	1.7	12	8.7	6.5	14
RSI-003-S4-6W	3	3.9	2	2.7	12	8.7	6.5	14
RSI-005-S4-6W	5	6.1	3	3.9	12	8.7	6.5	14
RSI-007-S4-6W	7.5	9	5	6.1	12	8.7	6.5	14
RSI-010-S4-6W	10	11	7.5	9	12	8.7	6.5	14
RSI-015-S4-6W	15	17	10	11	17.4	10.8	7.9	30
RSI-020-S4-6W	20	22	15	17	17.4	10.8	7.9	30
RSI-025-S4-6W	25	27	20	22	17.4	10.8	7.9	30
RSI-030-S4-6W	30	32	25	27	17.4	10.8	7.9	30
RSI-040-S4-6W	40	41	30	32	20.2	11.3	11.7	50
RSI-050-S4-6W	50	52	40	41	20.2	11.3	11.7	50
RSI-060-S4-6W	60	68	50	52	29.4	12.9	13.8	110
RSI-075-S4-6W	75	82	60	62	29.4	12.9	13.8	110
RSI-100-S4-6W	100	107	75	77	29.4	12.9	13.8	110
RSI-125-S4-6D *	125	125	100	99	50.5	16.5	18	354
RSI-150-S4-6D *	150	144	125	125	50.5	16.5	18	354
RSI-200-S4-6D *	200	192	150	140	50.5	16.5	18	354

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

VARIABLE FREQUENCY DRIVE OPTIONS

LINE REACTORS

480 V — 3% IMPEDANCE

Model Number		HP	A	Open Dimensions (in.)			Enclosed Dimensions (in.)			Weight (lbs.)
Open	Enclosed (NEMA 1)			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
KDRMA7L1	KDRMA7L1E01	2	3.4	3.63	4.45	1.78	12.25	12.5	6.75	11.8
KDRMA8L1	KDRMA8L1E01	3	4.8	3.63	4.45	1.78	12.25	12.5	6.75	11.8
KDRAA3L2	KDRAA3L2E01	5	7.6	4.44	4.25	2.64	12.25	12.5	6.75	13.4
KDRAA4L2	KDRAA4L2E01	7.5	11	4.44	4.25	2.64	12.25	12.5	6.75	13.6
KDRAA5L2	KDRAA5L2E01	10	14	4.44	4.25	2.64	12.25	12.5	6.75	13.7
REA-KDRB2L	REA-KDRB2LE01	15	21	5	6	4	6.5	8	6	12
REA-KDRB1L	REA-KDRB1LE01	20	27	5	6	4	6.5	8	6	12
REA-KDRD1L	REA-KDRD1LE01	25	34	5.75	7.2	4.25	7.5	10	7	16
REA-KDRD2L	REA-KDRD2LE01	30	40	5.75	7.2	4.25	7.5	10	7	16
REA-KDRC1L	REA-KDRC1LE01	40	52	5.75	7.2	5	7.5	10	7	21
REA-KDRF2L	REA-KDRF2LE01	50	65	7	9	6	9	12	8	37
REA-KDRF4L	REA-KDRF4LE01	60	77	7	9	6	9	12	8	42
REA-KDRF3L	REA-KDRF3LE01	75	96	7	9	6	15.5	15	13	65
REA-KDRH3L	REA-KDRH3LE01	100	124	7	9	7	15.5	15	13	65
REA-KDRH2L	REA-KDRH2LE01	125	156	9	11	7	15.5	15	13	75
REA-KDRH1L	REA-KDRH1LE01	150	180	9	11	7	15.5	15	13	75
REA-KDRG3L	REA-KDRG3LE01	200	240	9	11	8	15.5	15	13	100
REA-KDRG1L	REA-KDRG1LE01	250	302	9	11	8	15.5	15	13	100
REA-KDRG2L	REA-KDRG2LE01	300	361	9	11	8	15.5	15	13	100
REA-KDRJ2L	REA-KDRJ2LE01	350	414	9	11	9	18.5	20	16	120
REA-KDRJ1L	REA-KDRJ1LE01	400	477	9	11	9	18.5	20	16	120
REA-KDRL2L	REA-KDRL2LE01	500	590	11.38	14.5	9.5	18.5	20	16	160
REA-KDRL3L	REA-KDRL3LE01	600	720	11.38	14.5	9.5	18.5	20	16	205
REA-KDRS1L	REA-KDRS1LE01	700	840	11.38	15	12.5	36	28.5	30.3	318

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		HP	A	Open Dimensions (in.)			Enclosed Dimensions (in.)			Weight (lbs.)
Open	Enclosed (NEMA 1)			H	W	D	H	W	D	
FLTR-V1K2A00	FLTR-V1K2A01	0.75	2	9	5.5	7.25	9	5.5	10	11
FLTR-V1K3A00	FLTR-V1K3A01	1~1.5	3	9	5.5	7.25	9	5.5	10	11
FLTR-V1K4A00	FLTR-V1K4A01	2	4	9	5.5	7.25	9	5.5	10	11
FLTR-V1K6A00	FLTR-V1K6A01	3	6	9	5.5	7.25	9	5.5	10	11
FLTR-V1K8A00	FLTR-V1K8A01	5	8	9	5.5	8.25	9	5.5	10	11
FLTR-V1K12A00	FLTR-V1K12A01	7.5	12	9	5.5	8.25	9	5.5	10	11
FLTR-V1K16A00	FLTR-V1K16A01	10	16	9	5.5	8.25	9	5.5	10	15
FLTR-V1K18A00	FLTR-V1K18A01	10	18	9	5.5	8.25	9	5.5	10	15
FLTR-V1K21A00	FLTR-V1K21A01	15	21	9	5.5	8.25	9	5.5	10	15
FLTR-V1K25A00	FLTR-V1K25A01	15	25	9	5.5	8.25	9	5.5	10	15
FLTR-V1K27A00	FLTR-V1K27A01	20	27	9	5.5	8.25	9	5.5	10	15
FLTR-V1K35A00	FLTR-V1K35A01	25	35	12	8	9	12	8	11.5	23
FLTR-V1K45A00	FLTR-V1K45A01	30	45	12	8	9	12	8	11.5	23
FLTR-V1K55A00	FLTR-V1K55A01	40	55	12	8	9	12	8	11.5	23
FLTR-V1K80A00	FLTR-V1K80A01	50~60	80	12	8	9	12	8	11.5	29
FLTR-V1K110A00	FLTR-V1K110A01	75	110	12	8	10.25	16.5	18	15	68
FLTR-V1K130A00	FLTR-V1K130A01	100	130	8.5	11.75	9.5	16.5	18	15	83
FLTR-V1K160A00	FLTR-V1K160A01	125	160	8.5	11.75	10.5	16.5	18	15	83
FLTR-V1K200A00	FLTR-V1K200A01	150	200	8.5	11.75	9.25	16.5	18	15	93
FLTR-V1K250A00	FLTR-V1K250A01	200	250	8.5	11.75	9.25	16.5	18	15	93
FLTR-V1K305A00	FLTR-V1K305A01	250	305	8.75	11.75	12.25	16.5	18	30	117
FLTR-V1K362A00	FLTR-V1K362A01	300	362	8.75	11.75	12	16.5	18	30	117
FLTR-V1K420A00	FLTR-V1K420A01	350	420	10	11.75	13.75	16.5	18	30	132
FLTR-V1K480A00	FLTR-V1K480A01	400	480	10	11.75	13.75	16.5	18	30	138
FLTR-V1K600A00	FLTR-V1K600A01	500	600	12.75	15	13.75	16.5	18	30	168
FLTR-V1K750A00	FLTR-V1K750A01	600	750	12.75	15	14.5	16.5	18	30	180

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).

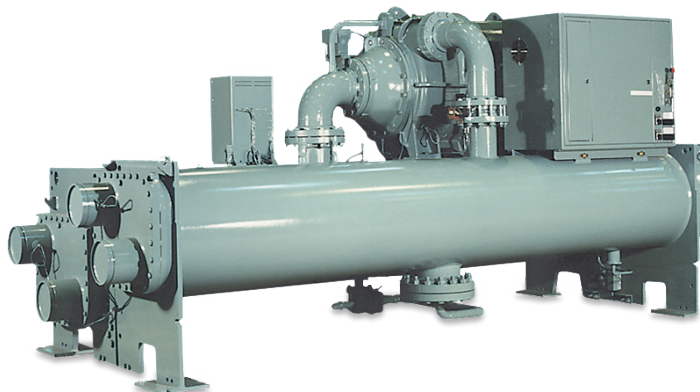
Regeneration can occur on an occasional basis or periodically (cyclical) depending on the type of load. A dynamic brake module and resistor are required to be added to the drive to dissipate this excess power. The module and resistor must be sized correctly depending on the application.

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 BENSRAW 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

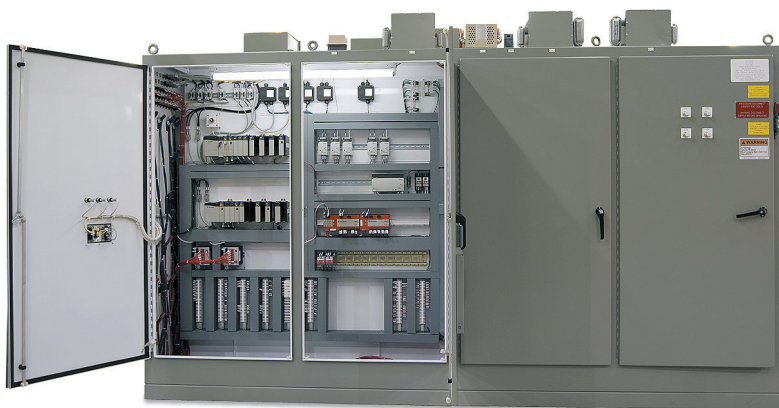
ENCLOSURES — TO MATCH YOUR ENVIRONMENT

- 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

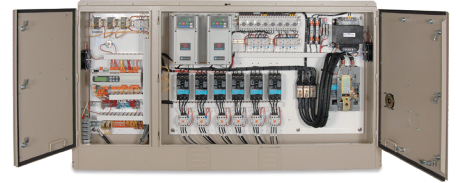
CUSTOM-ENGINEERED DRIVE SOLUTIONS.

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.

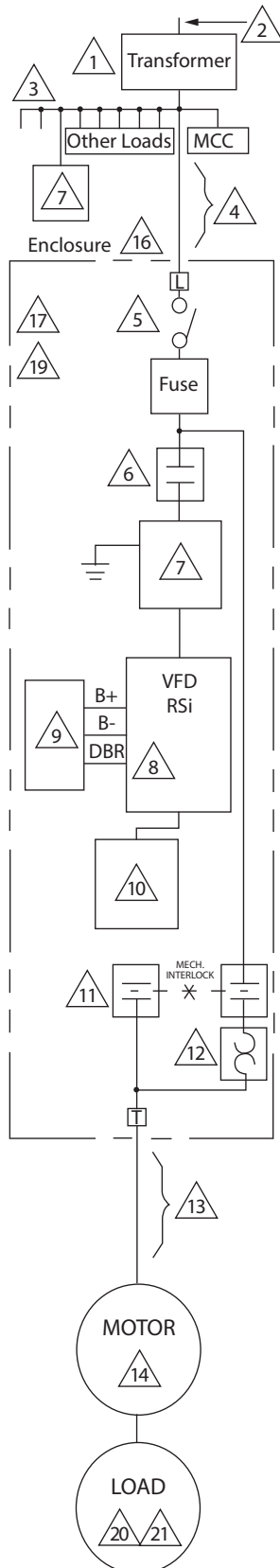
STANDARD FEATURES:

- 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: ☐ Yes ☐ No ☐ Grounded ☐ Ungrounded
PCC (Point of Common Coupling)	2	Harmonic Restrictions at PCC: ☐ Yes ☐ No ☐ IEEE 519-1992
Other Connected Loads	3	Other Connected Loads Present? Please list in detail in comments. Ex. PFCC, VFD, etc. ☐ Yes ☐ No
Feeder Cable	4	Cable Length ____ ☐ Conduit ☐ Teck ☐ Non-Shielded ☐ Shielded
Main Disconnect	5	☐ Breaker ☐ Fusible Disc. ☐ Line Fuses KAIC Rating ____
Input Isolation Contactor	6	☐ Yes ☐ No ☐ HP Rated ☐ NEMA Rated
Harmonic Suppression	7	Input Line Reactor ☐ 3 or 5 % Imp. ☐ Transformer ☐ Passive Filter ☐ Active Filter ☐ 18 Pulse ☐ RFI/EMI Filter
VFD Ratings	8	VFD - HP ____ KVA ____ KW ____ CT ☐ VT ☐ Volts ____ V ____ Amps ____ Model - RSi - ____ HP - ____ V - ____ Encl.
Dynamic Braking	9	Load Type: ☐ Decel Only ☐ Overhauling Duty Cycle ☐ 5% ☐ 10% ☐ 25% ☐ 50% ☐ 100%
Output Filter	10	☐ Reactor ☐ Long Lead ☐ Sine Wave 50 ft. ~ 300 ft. 300 ft. ~ 1500 ft. > 1500 ft.
Bypass	11	☐ 2 Contactor ☐ 3 Contactor ☐ RVSS ☐ HP Rated ☐ NEMA Rated ☐ 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: ☐ Non-Shielded ☐ Shielded ☐ 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 ☐ Yes ☐ No; See  Over temperature protection: Thermostat Thermistor RTD and type ☐ 100 Pt ☐ 10 Cu ☐ 100Ni ☐ 120Ni Does the motor require a blower for low speed operation? ☐ Yes ☐ No Insulated Bearing(s) ☐ Yes ☐ No		
Options		☐ Start P/B ☐ Local/Remote Sw. ☐ Stop P/B ☐ Pilot Lights ☐ Emergency Stop P/B ☐ - Run/Stop ☐ HOA Switch ☐ - Forward/Reverse ☐ Forward P/B ☐ - Jog ☐ Reverse P/B ☐ - Power ☐ Jog Forward P/B ☐ - Fault ☐ Jog Reverse P/B ☐ Potentiometer ☐ Fault Reset P/B ☐ Other _____		
Enclosure		UL Type _____ (1, 12, 3R, 4, 4X) Ambient temperature range _____ °C to _____ °C Altitude 0 to 3,300 ft. (1,000m) ☐ Other _____ Cable Entry/Exit Locations _____ Enclosure Size Restrictions H _____ W _____ D _____ Description _____		
Control		☐ Keypad ☐ Multi-Motor ☐ Terminal ☐ Master ☐ Follower ☐ 0 to 5VDC ☐ Analog Outputs ☐ 0 to 10VDC ☐ Analog Inputs ☐ ± 10VDC ☐ Digital Inputs ☐ 0/4 to 20mA ☐ Relay Outputs		

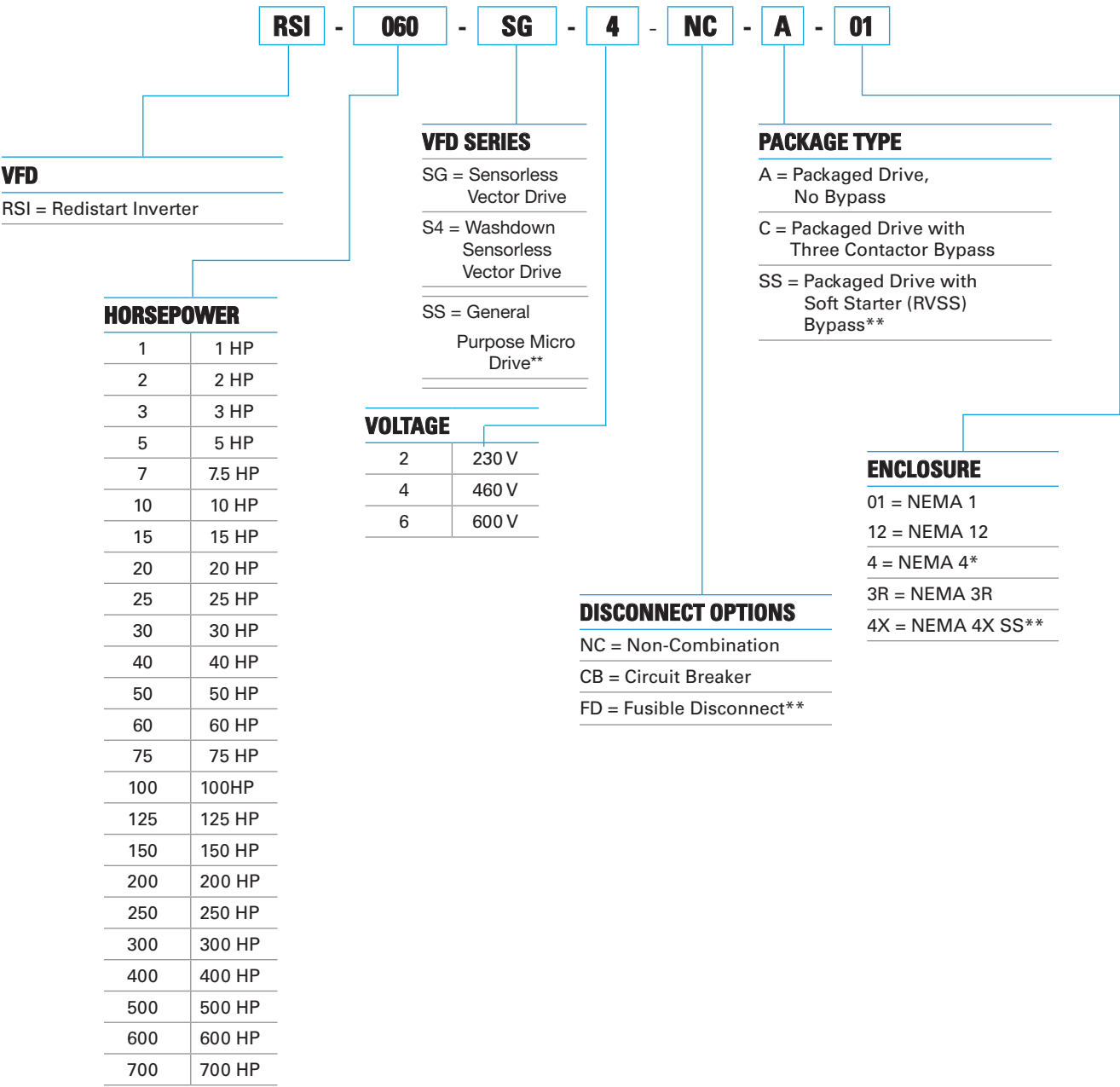
VFD PRE-ORDER CHECK LIST

Communications		☐ DeviceNet	☐ Modbus RTU		
		☐ Profibus	☐ Other _____		
Motors		Motor Amps _____	Motor Volts _____		
		Frequency _____	RPM _____		
		Other (Please Specify) _____			
Application Details		☐ Constant Torque (150% for 60s)	☐ Standard-Duty Torque (120% for 60s)	☐ Variable Torque (110% for 60s)	
		☐ Load-Steady	☐ Pulsing	☐ Regenerative	
		Speed Range _____ to _____ RPM			
		☐ Load Flywheel Inertia (WK ²)			
		☐ Load Torque Profile			
		☐ Breakaway Torque lb.-ft.			
		Breakaway Torque Duration _____ sec.			
		Max. Peak Torque _____ lb.-ft.			
		Accel. Time _____ Decel. Time _____			
		☐ Torque vs. Speed Curve			
		Deceleration:	☐ Coast	☐ Ramp	☐ DC Injection
		Pump/Fan			
		Speed _____ Min. Speed _____ Starting and stopping cycle (details) _____			
		Holding Brake required?		☐ Yes	☐ No
Load Details		Fan	☐ Fin Fan Cooler	☐ Cooling Tower Fan	
		Pump	☐ Centrifugal Pump	☐ Centrifugal Compressor	☐ Electrical Submersible Pump (ESP)
		Oil Pump	☐ Pumpjack (PG)	☐ Progressive Cavity Screw Pump (PCP)	☐ PD Pump ☐ Slurry Pump
		Conveyor	☐ Screw Conveyor	☐ Belt Conveyor	☐ Flat Conveyor ☐ Bucket Conveyor ☐ Air Conveyor
		Extruder	☐ Single Extruder	☐ Dual Extruder	☐ Piston Extruder
		Other	☐ Number Throws	☐ Centrifuge	☐ Canter Line
			☐ Step-up Transformer:	☐ KVA	☐ Vprim ☐ Vsec ☐ V Z
		Gear ratio/Sheave ratio (Motor RPM/Load RPM) _____:_____ ☐ 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	
	HP	Amps	HP	Amps	HP	Amps
RSI-007-SG2-NC-XX	7.5	22	7.5	22	5	15.2
RSI-010-SG2-NC-XX	10	29	10	29	7.5	22
RSI-015-SG2-NC-XX	15	42	15	42	10	28
RSI-020-SG2-NC-XX	20	54	20	54	15	42
RSI-025-SG2-NC-XX	25	68	25	68	20	54
RSI-030-SG2-NC-XX	30	80	30	80	25	68
RSI-040-SG2-NC-XX	40	104	40	104	30	80

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	
	HP	Amps	HP	Amps	HP	Amps
RSI-007-SG4-NC-XX	7.5	11	7.5	11	5	8
RSI-010-SG4-NC-XX	10	14	10	14	7.5	11
RSI-015-SG4-NC-XX	15	21	15	21	10	14
RSI-020-SG4-NC-XX	20	27	20	27	15	21
RSI-025-SG4-NC-XX	25	34	25	34	20	27
RSI-030-SG4-NC-XX	30	40	30	40	25	34
RSI-040-SG4-NC-XX	40	52	40	52	30	40
RSI-050-SG4-NC-XX	50	65	50	65	40	52
RSI-060-SG4-NC-XX	60	77	60	77	50	65
RSI-075-SG4-NC-XX	75	96	75	96	60	77
RSI-100-SG4-NC-XX	100	125	100	125	75	96
RSI-125-SG4-NC-XX	125	156	125	156	100	125
RSI-150-SG4-NC-XX	150	180	150	180	125	156
RSI-200-SG4-NC-XX	200	240	200	240	150	180
RSI-250-SG4-NC-XX	250	302	250	302	200	240
RSI-350-SG4-NC-XX	350	414	350	361	250	302
RSI-400-SG4-NC-XX	400	477	400	477	300	361
RSI-500-SG4-NC-XX	500	590	500	515	350	414
RSI-600-SG4-NC-XX	600	731	600	590	400	477
RSI-700-SG4-NC-XX	700	877	700	804	500	590

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	
	HP	Amps	HP	Amps	HP	Amps
RSI-007-SG2-CB-XX	7.5	22	7.5	22	5	15.2
RSI-010-SG2-CB-XX	10	28	10	28	7.5	22
RSI-015-SG2-CB-XX	15	42	15	42	10	28
RSI-020-SG2-CB-XX	20	54	20	54	15	42
RSI-025-SG2-CB-XX	25	68	25	68	20	54
RSI-030-SG2-CB-XX	30	80	30	80	25	68
RSI-040-SG2-CB-XX	40	104	40	104	30	80

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	
	HP	Amps	HP	Amps	HP	Amps
RSI-007-SG4-CB-XX	7.5	11	7.5	11	5	8
RSI-010-SG4-CB-XX	10	14	10	14	7.5	11
RSI-015-SG4-CB-XX	15	21	15	21	10	14
RSI-020-SG4-CB-XX	20	27	20	27	15	21
RSI-025-SG4-CB-XX	25	34	25	34	20	27
RSI-030-SG4-CB-XX	30	40	30	40	25	34
RSI-040-SG4-CB-XX	40	52	40	52	30	40
RSI-050-SG4-CB-XX	50	65	50	65	40	52
RSI-060-SG4-CB-XX	60	77	60	77	50	65
RSI-075-SG4-CB-XX	75	96	75	96	60	77
RSI-100-SG4-CB-XX	100	125	100	125	75	96
RSI-125-SG4-CB-XX	125	156	125	156	100	125
RSI-150-SG4-CB-XX	150	180	150	180	125	156
RSI-200-SG4-CB-XX	200	240	200	240	150	180
RSI-250-SG4-CB-XX	250	302	250	302	200	240
RSI-350-SG4-CB-XX	350	414	350	361	250	302
RSI-400-SG4-CB-XX	400	477	400	477	300	361
RSI-500-SG4-CB-XX	500	590	450	515	350	414
RSI-600-SG4-CB-XX	600	731	600	590	400	477
RSI-700-SG4-CB-XX	700	877	600	804	500	590

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

PILOT LIGHTS

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

SELECTOR SWITCHES

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

For additional options, contact factory.

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METERS

Model Number	Description
KT	Analog Ammeter
KU	Analog Ammeter (3-phase with selector)
KV	Analog Voltmeter
KW	Analog Voltmeter (3-phase with selector)
KX	Elapsed Timer Meter (analog, non-resettable)
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
S7	1 Turn Potentiometer - NEMA 1
S8	10 Turn Potentiometer - NEMA 1

SPACE HEATERS

Model Number	Description
A171	Space Heater with Thermostat

ENGINEERED PACKAGE OPTIONS

SENSORLESS VECTOR DRIVES — LINE REACTORS (INSTALLED)

230 V — INPUT 3% AC LINE REACTORS

Model Number	HP	Volts
GA	1	230
GB	2	230
GC	3	230
GD	5	230
GE	7.5	230
GF	10	230
GG	15	230
GH	20	230
GJ	25	230

460 V — INPUT 3% AC LINE REACTORS

Model Number	HP	Volts
GL	2	460
GM	3	460
GN	5	460
GP	7.5	460
GQ	10	460
GR	15	460
GS	20	460
GT	25	460
GU	30	460
GV	40	460
GW	50	460
GX	60	460
GY	75	460
GZ	100	460
H2	125	460
H3	150	460
H4	200	460
H5	250	460
H6	300	460
H7	350	460
H8	400	460
H9	500	460
HA	600	460
HB	700	460

460 V — INPUT 5% AC LINE REACTORS

Model Number	HP	Volts
HN	2	460
HP	3	460
HQ	5	460
HR	7.5	460
HS	10	460
HT	15	460
HU	20	460
HV	25	460
HW	30	460
HX	40	460
HY	50	460
HZ	60	460
J2	75	460
J3	100	460
J4	125	460
J5	150	460
J6	200	460
J7	250	460
J8	300	460
J9	350	460
JA	400	460
JB	500	460
JC	600	460
JD	700	460

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
JW	1	460
JX	2	460
JY	3	460
JZ	5	460
K2	7.5	460
K3	10	460
K4	15	460
K5	20	460
K6	25	460
K7	30	460
K8	40	460
K9	50–60	460
KA	75	460
KB	100	460
KC	125	460
KD	150	460
KE	200	460
KF	250	460
KG	300	460
KH	350	460
KJ	400	460
KK	500	460
KL	600	460
KM	700	460

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.

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