



BENSHAW
Applied Motor Controls



Quick Ship MVRXE Series - Up to 3000 HP

Medium Voltage Solid State Soft Starters

Rapid | Rugged | Global



MVRXE | Medium Voltage Soft Starters

MVRXE

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Introduction



Benshaw offers the most rugged, reliable and proven soft starter for your most demanding applications.

MVRXE starters provide solid state reduced voltage starting for normal operation and full voltage emergency back-up starting, with complete electronic motor protection at the flip of a switch.

This unique redundant design is ideal for critical applications where downtime is extremely disruptive and cannot be tolerated.

MX3 solid state controls provide precise digital starting and stopping, motor protection, metering, diagnostics and communications standard.

- Standard packaged MVRXE Starters - In Stock
- Prepackaged and Engineered control solutions
- Induction, two-speed, synchronous, reversing or wound rotor control
- 5kV, 7.2 or 15 kV to 30,000 HP
- 3, 10 or 20 mW class power electronics
- Intelligent control centers and lineups
- Retrofits and turnkey modernization solutions

For questions regarding our products, please contact us at quotes@benshaw.com.

To request a quote, please fill out this [checklist](#) form.

For additional information and support, please download the [MVRXE User Manual](#)



MVRXE Series



Benshaw's MVRXE Series sets the industry standard for performance and reliability.

Class E2 Severe Duty Starter with Load Break Fusible Disconnect and Emergency ATL Bypass.

KEY ADVANTAGES:

- NEMA 12 or NEMA 3R
- 45 kV BIL
- Built-in self test (BIST) features for "quick commissioning"
- Switch-selectable emergency back-up full voltage starter
- MX³ embedded digital control
- UL 347 certified and listed

STANDARD FEATURES:

- 50 kA (4800 VAC) / 50 kA (2600 VAC) withstand rating
- 500%-30 seconds rated solid state starter
- "R" class fusing protection
- Door-mounted controls
- Modbus communications standard
- Service entrance rated

MVRXE12 - 2300 V

Model Number	HP	Dimensions (in.)				Weight (lbs.)	NEMA 12 List Price	NEMA 3R List Price
		A	H	W	D			
MVRXE12-550-2300**	550	131	92	36	32	1,800	\$53,440	\$57,267
MVRXE12-750-2300**	750	200	92	36	32	1,800	\$55,187	\$59,052
MVRXE12-900-2300**	900	225	92	36	32	1,800	\$56,899	\$60,823
MVRXE12-1500-2300** †	1500	360	92	36	32	1,800	\$62,785	\$67,812

MVRXE18 - 4160 V

Model Number	HP	Dimensions (in.)				Weight (lbs.)	NEMA 12 List Price	NEMA 3R List Price
		A	H	W	D			
⌚ MVRXE18-1000-4160**	1000	131	92	36	32	2,000	\$58,161	\$61,939
⌚ MVRXE18-1500-4160**	1500	200	92	36	32	2,000	\$60,405	\$63,773
⌚ MVRXE18-1700-4160**	1700	225	92	36	32	2,000	\$64,748	\$68,235
⌚ MVRXE18-3000-4160**†	3000	360	92	36	32	2,000	\$70,756	\$74,680

Starters are top entry/bottom exit — Dimensions and weights are approximate.

** Insert appropriate option code as shown: NEMA 12 = 12 / NEMA 3R = 3R

† 350% for 30 seconds at max rating (360A)

⌚ Web stocked.

MODULAR OPTIONS

Option	Description	List Price
A	8-Channel RTD Module, 100 ohm Platinum (Also Available for Remote Mounting)	\$3,830
B	16-Channel RTD Module, 100 ohm Platinum (Also Available for Remote Mounting)	\$6,500
C	Ground Fault CT, 2000:1, 4.0:dia. (For MX ³ Use)	\$2,000

NOTE:

Power fuses ship loose. Must provide motor full load amps at time of order for proper fuse sizing.
Contact factory for additional options and accessories.

Spare Part Kits

Want to Minimize Downtime Loss of Production?

Recommended Spare Parts Kits Include the Following:

- Power phase/stack assembly (x1)
 - Includes the following packaged heat sink assembly:
 - Fiber optic SCR firing card
 - SCRs (x6)
 - DVDT filter cards (x3)
- Main control board
- Voltage divider board
- “R” class line fuses (x3)
- Primary fuses for CPT (x2)
- Secondary fuses for CPT (x3)
- Door-mounted keypad
- Door-mounted pilot lights, pushbuttons and switches
- Overload relay
- Control relays



1000 HP STARTERS (4160V)

Model Number	Motor Amps	List Price
MVRXE-400101-SP	46 to 55 A	\$12,588
MVRXE-400102-SP	56 to 75 A	\$12,694
MVRXE-400103-SP	76 to 90 A	\$13,046
MVRXE-400104-SP	91 to 131 A	\$14,680

1700 HP AND 3000 HP STARTERS (4160V)

Model Number	Motor Amps	List Price
MVRXE-400107-SP	46 to 55 A	\$15,454
MVRXE-400108-SP	56 to 75 A	\$15,820
MVRXE-400109-SP	76 to 90 A	\$16,189
MVRXE-400110-SP	91 to 131 A	\$16,608
MVRXE-400111-SP	132 to 180 A	\$18,326
MVRXE-400112-SP	181 to 270 A	\$18,733
MVRXE-400113-SP	271 to 360 A	\$19,132

*For amperage or voltage range not shown, consult factory.

Design Your Customized Quick-Ship

Only one option can be selected from each group, with the exception of the "Control Options" section.

Add the appropriate code for the options chosen to the code string across the center of the page.

Choose Enclosure Options		
12	NEMA 12	\$0
SH	NEMA 12 with space heater	\$945
3R	NEMA 3R with space heater	\$1,890

A

MVB43

B

225

C

B

0 to 1,500 HP			
A Choose core unit	B Choose Motor Current (A)**	C Choose Exit/Landing Option***	
MVB41	025	T	\$57,398
MVB41	025	B	\$57,111
MVB41	025	C	\$55,998
MVB41	045	T	\$57,398
MVB41	045	B	\$57,111
MVB41	045	C	\$55,998
MVB41	055	T	\$57,398
MVB41	055	B	\$57,111
MVB41	055	C	\$55,998
MVB41	080	T	\$57,398
MVB41	080	B	\$57,111
MVB41	080	C	\$55,998
MVB41	090	T	\$57,398
MVB41	090	B	\$57,111
MVB41	090	C	\$55,998
MVB41	133	T	\$57,398
MVB41	133	B	\$57,111
MVB41	133	C	\$55,998
MVB41	170	T	\$75,126
MVB41	170	B	\$72,884
MVB41	170	C	\$70,177

1,501 to 3,000 HP			
A Choose core unit	B Choose Motor Current (A)**	C Choose Exit/Landing Option***	
MVB43	025	T	\$68,459
MVB43	025	B	\$66,085
MVB43	025	C	\$63,860
MVB43	045	T	\$68,459
MVB43	045	B	\$66,085
MVB43	045	C	\$63,860
MVB43	055	T	\$68,459
MVB43	055	B	\$66,085
MVB43	055	C	\$63,860
MVB43	080	T	\$68,459
MVB43	080	B	\$66,085
MVB43	080	C	\$63,860
MVB43	090	T	\$68,459
MVB43	090	B	\$66,085
MVB43	090	C	\$63,860
MVB43	133	T	\$68,459
MVB43	133	B	\$66,085
MVB43	133	C	\$63,860
MVB43	170	T	\$75,026
MVB43	170	B	\$72,934
MVB43	170	C	\$70,427
MVB43	225	T	\$75,026
MVB43	225	B	\$72,934
MVB43	225	C	\$70,427
MVB43	330	T	\$75,026
MVB43	330	B	\$72,934
MVB43	330	C	\$70,427
MVB43	360	T	\$75,026
MVB43	360	B	\$72,934
MVB43	360	C	\$70,427

Choose Service Entrance Rated (for stand-alone single units)		
S	Yes	\$1,022
N	No	\$0

Choose Bus Options +		0 to 1,500 HP	1,500 to 3,000 HP
8N	800A non-insulated bus	\$3,956	\$3,956
8I	800A insulated bus	\$5,204	\$5,204
1N	1,200A non-insulated bus	\$4,174	\$4,174
1I	1,200A insulated bus	\$5,467	\$5,467
2N	2,000A non-insulated bus	\$5,815	\$5,815
2I	2,000A insulated bus	\$7,683	\$7,683
NR	None required	\$0	\$0

***Exit / Landing Options	
T	Top exit with landing pad
B	Bottom exit with landing pad
C	Top or bottom exit landing on bypass contactor

+Bus not required for single stand-alone unit.

Bus is required for connection of 2 or more units.

Any unit bus will require additional MLO section. Please contact factory for pricing and delivery.

Medium Voltage Soft Starter

Choose Option Zero Sequence Ground Fault CT 2000:1 (Residual included)		
G	Yes	\$710
N	No	\$0

Choose Communications Options (RS-485 Modbus RTU standard)		
D	DeviceNet	\$3,108
E	Ethernet	\$3,374
P	Profibus	\$5,686
N	None	\$0

1N	D	2
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D	E	F	G	H	I
N	B	N	N	E	E

Choose RTD Options (100 ohm platinum)		
2	8-Channel RTD	\$3,830
4	16-Channel RTD	\$6,728
N	None	\$0

Choose Control Options						
Choose one option for each item below						
D	A	ATL option*	D	N	None	\$2,220
E	B	Green start push button and red stop extended push button*	E	N	None	\$250
F	C	Red run light and green stop light	F	N	None	\$360
G	D	Amber fault light and black reset push button	G	N	None	\$305
H	E	Local-off-remote 3-position switch	H	N	None	\$246
I	F	Emergency stop push button	I	N	None	\$164

Choose Bus Splice Options (must match bus option selected)		
8N	800A non-insulated bus splice	\$360
8I	800A insulated bus splice	\$950
1N	1,200A non-insulated bus splice	\$885
1I	1,200A insulated bus	\$1,008
2N	2,000A non-insulated bus	\$1,724
2I	2,000A insulated bus	\$1,968
NR	None required	\$0

*ATL option comes with start and stop push buttons (i.e., start stop push buttons cannot be selected).

No selection = keypad control.
Recommend E-stop option be selected.

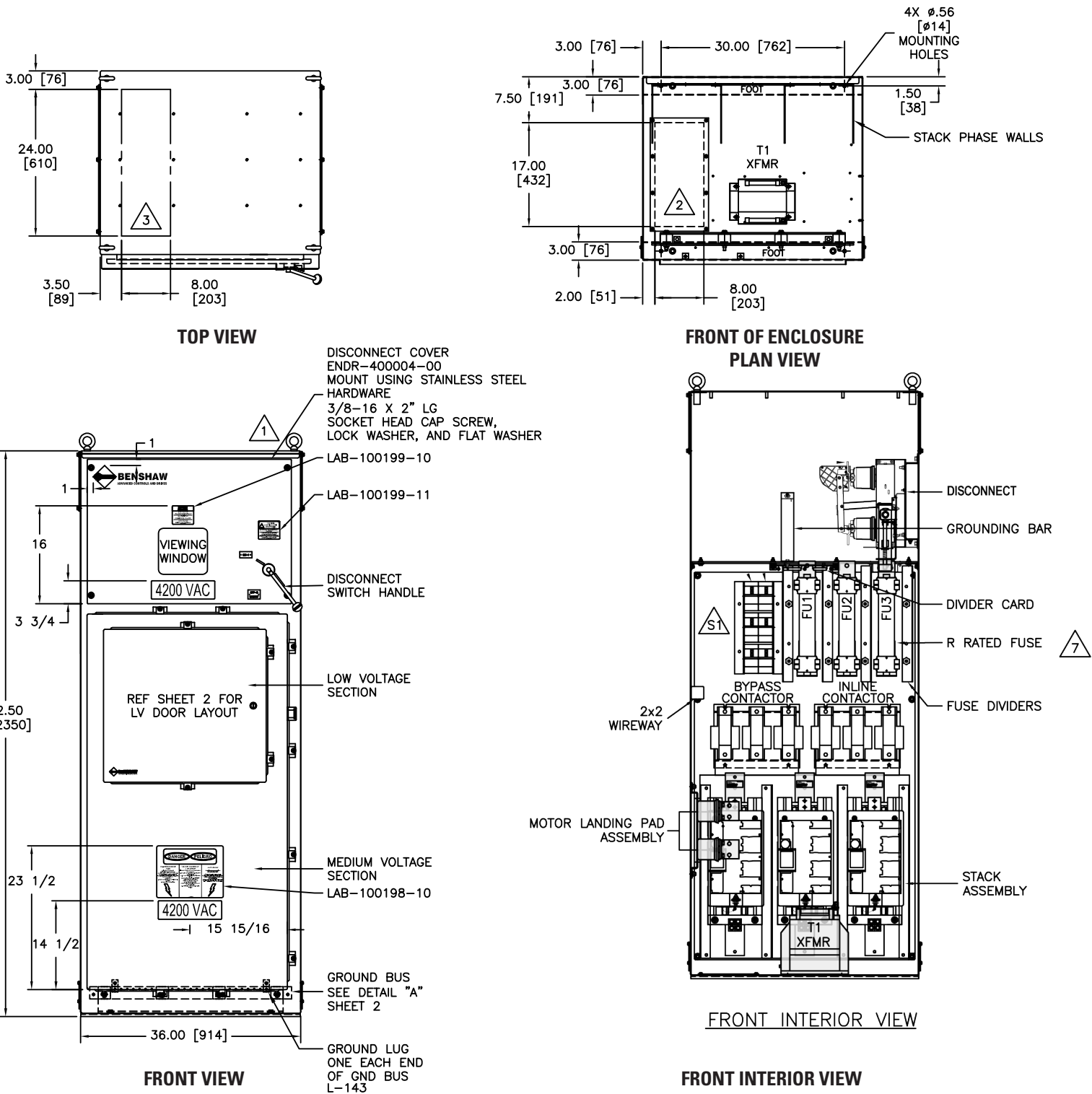
*** All built to order starters are 4160V only.**

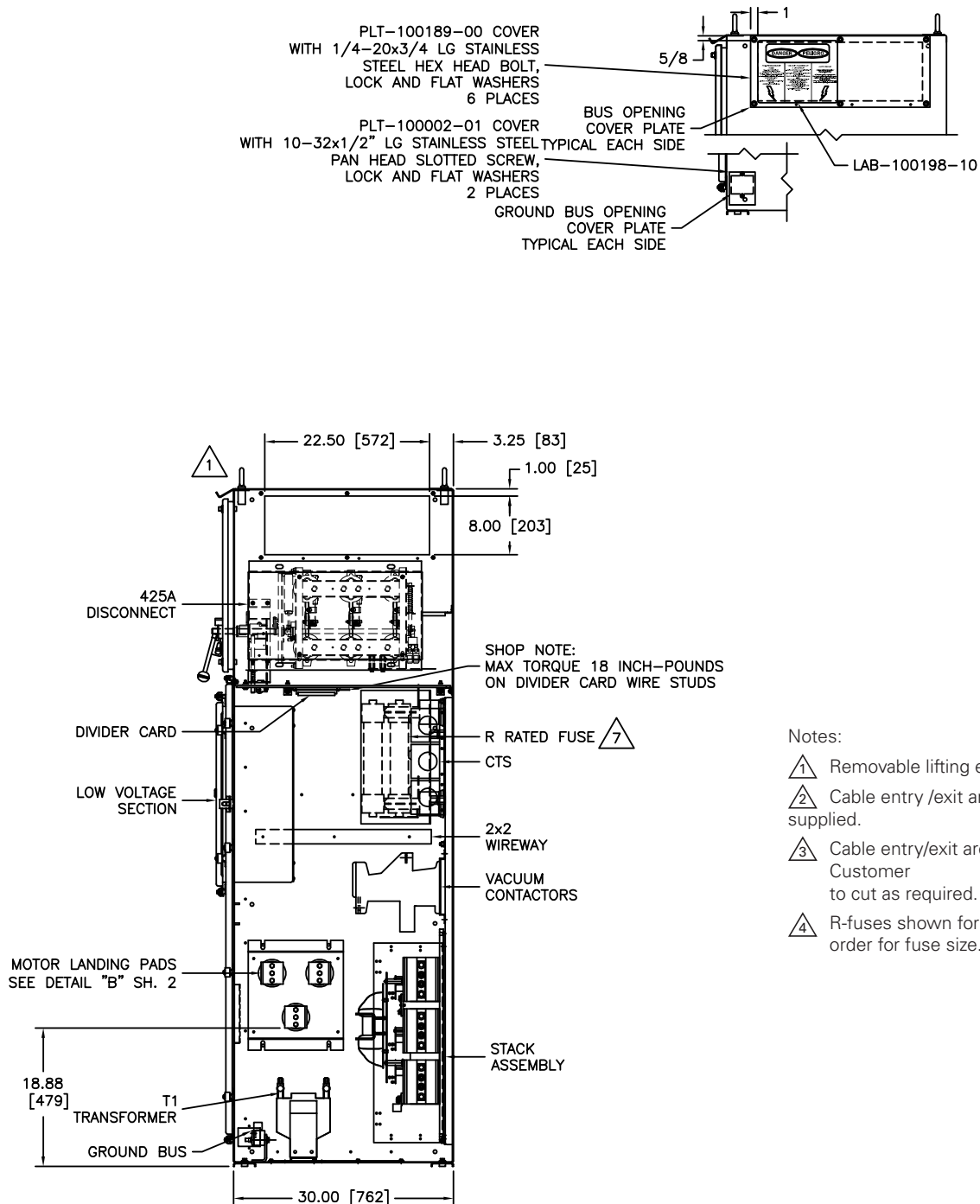
****Motor currents vs. HP are typical; confirm actual motor current.**

Service factor not accounted for; adjust if required.

Example: A 3,000 HP (MVB43), 225 A (225) unit with the following options: bottom exit w/landing pad (B), NEMA 12 enclosure (12), service entrance rated (S), with ground fault (G), 1,200 A non-insulated bus (1N), with start and stop buttons (B), without run and stop lights (N), without fault and reset lights (N), with a local-off-remote switch (E), with emergency stop push button (F), would build the following code string: MVB43225B12SG1N1ND2NBNNEF

Drawings





RIGHT SIDE INTERIOR VIEW

Notes:

- 1 Removable lifting eyebolts.
- 2 Cable entry /exit area. Cutout with cover plate supplied.
- 3 Cable entry/exit area. No cutout supplied. Customer to cut as required.
- 4 R-fuses shown for reference. Reference sales order for fuse size.

Standard MX³ Control Features

MULTIPLE STARTING MODES:

- Voltage ramp
- Current ramp
 - Adjustable initial current
 - Adjustable maximum current
 - Adjustable ramp time
- Torque ramp (TruTorque)
 - Adjustable initial torque
 - Adjustable maximum torque
 - Adjustable ramp time
- Power ramp
 - Adjustable initial torque
 - Adjustable maximum torque
 - Adjustable ramp time
- Linear / tach feedback control

MOTOR PROTECTION:

- Motor thermal overload
- Independent starting and running OLs
- Up to speed timer exceeded
- Low line voltage
- Low line frequency
- High line frequency
- Phase reversal
- Phase loss
- Instantaneous overcurrent
- Overcurrent
- Undercurrent
- Current imbalance
- Ground fault (residual or zero sequence)
- Shorted or open SCR
- Disconnect fault
- Inline contactor fault
- Control power low
- Stack over temperature
- Motor PTC input
- RTD modules

METERING:

- Accuracy:
 - 3% out-of-box
 - 2% factory calibrated
- Average current
- L1 current
- L2 current
- L3 current
- Current imbalance %
- Ground fault current
- Average volts
- L1–L2 voltage
- L2–L3 voltage
- L3–L1 voltage
- Overload %
- Power factor
- Watts
- VA
- VARS
- kW hours
- MW hours
- Phase order
- Line frequency
- Analog input
- Analog output
- Run time—days
- Run time—hours
- # of starts
- Tru Torque %
- Power %
- Peak starting current
- Last starting duration
- RTD temperatures
- Real-time clock

8 DIGITAL INPUTS CONFIGURABLE TO:

- Stop
- Fault
- Fault reset
- Bypass / inline confirm
- OL reset
- Local / remote selection
- Heater enable
- Heater disable
- Dual ramp selection
- 1 dedicated start input
- Disconnect
- Slow speed
- Brake enable
- Brake disable

6 RELAY OUTPUTS CONFIGURABLE TO:

- Faulted
- Running
- Up to speed
- Alarm condition
- Ready condition
- Locked out
- Over current
- Under current
- OL alarm
- Shunt trip
- Ground fault
- Energy saver indication
- Heating indication
- Cooling fan

1 ANALOG 4–20 MA / 0–10 VDC INPUT CONFIGURABLE TO:

- Trip high level
- Trip low level

1 ANALOG 4–20 MA / 0–10 VDC OUTPUT CONFIGURABLE TO:

- Current (0–200%/0–800%)
- Voltage (0–150%)
- OL (0–150%)
- kW (0–10 kW/0–100 kW)
- MW (0–1 MW)
- Analog input (0–100%)
- Firing (0–100%)
- Calibration

USER INTERFACE:

- Event log (99 events)
- Door-mounted LCD display
 - Set / examine operating parameters
 - View status information, line current, voltage and frequency
 - Start and stop the solid state starter

1 COMMUNICATION PORT:

- Modbus / RS485

ADVANCED FUNCTIONALITY:

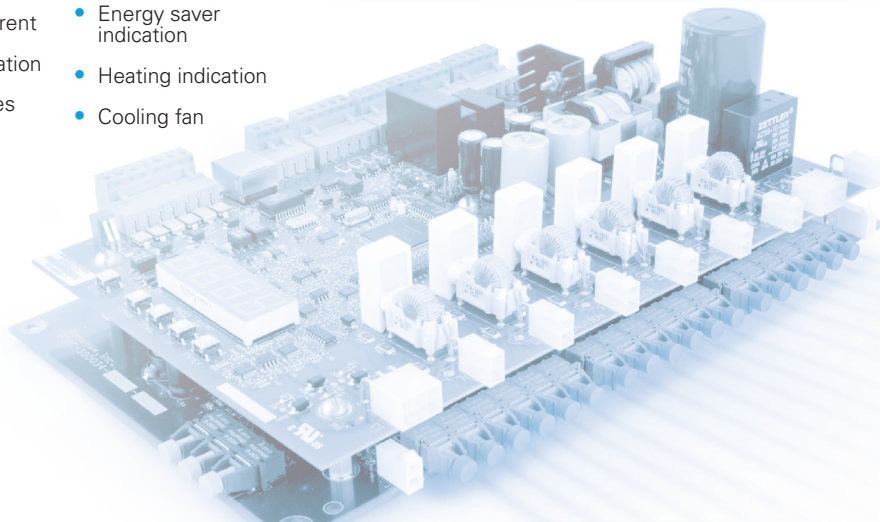
- Dual ramp selection
- Adjustable kick current
- Programmable decel modes
- MV BIST test (built-in self test)

FIBER OPTIC SCR FIRING

- Integrated technology
- Noise immunity
- High voltage isolation
- Safe, reliable SCR control



Keypad (Included)



Technical Support Services

Service and Support

Why Benshaw? Because when it absolutely has to work, it absolutely has to be from Benshaw.

FACTORY WARRANTY

Benshaw offers a three year warrantee on all of our medium voltage soft starters packages.*

Other manufacturers limit their warranties to one year.

But at Benshaw, we believe that because we build them better, we can guarantee them longer.

* With factory startup



Our technical support team is available 24/7 to answer questions and solve pressing issues before, during and after the sale.

Benshaw's knowledgeable Technical Support team help you evaluate both current and future motor control system requirements and develop a sound strategy for retrofit, upgrade or replacement. We can also help you submit a Request for Service Quotation. All services are performed by trained, experienced service technicians using the latest engineering, diagnostics and testing equipment.

- Retrofits
- Field service
- Factory service
- Technical training support
- Spare/repair parts
- Maintenance

Phone support hotline (1-800-203-2416)

Centralized coordination of all support services

24-hour dispatch from our operations in Pittsburgh, PA (USA) and Listowel, ON (Canada)

Overnight parts shipment



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