Model S3534SR

50% Sag Ride-Thru System
For Variable Frequency AC Drives

Customer Reference Manual

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Bonitron, Inc.
Nashville, TN

An industry leader in providing solutions for AC drives.

ABOUT BONITRON

Bonitron designs and manufactures quality industrial electronics that improve the reliability of processes and variable frequency drives worldwide. With products in numerous industries, and an educated and experienced team of engineers, Bonitron has seen thousands of products engineered since 1962 and welcomes custom applications.

With engineering, production, and testing all in the same facility, Bonitron is able to ensure its products are of the utmost quality and ready to be applied to your application.

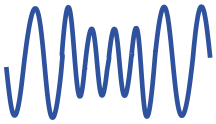
The Bonitron engineering team has the background and expertise necessary to design, develop, and manufacture the quality industrial electronic systems demanded in today's market. A strong academic background supported by continuing education is complemented by many years of hands-on field experience. A clear advantage Bonitron has over many competitors is combined on-site engineering labs and manufacturing facilities, which allows the engineering team to have immediate access to testing and manufacturing. This not only saves time during prototype development, but also is essential to providing only the highest quality products.

The sales and marketing teams work closely with engineering to provide up-to-date information and provide remarkable customer support to make sure you receive the best solution for your application. Thanks to this combination of quality products and superior customer support, Bonitron has products installed in critical applications worldwide.

AC Drive Options

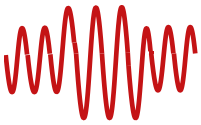
In 1975, Bonitron began working with AC inverter drive specialists at synthetic fiber plants to develop speed control systems that could be interfaced with their plant process computers. Ever since, Bonitron has developed AC drive options that solve application issues associated with modern AC variable frequency drives and aid in reducing drive faults. Below is a sampling of Bonitron's current product offering.

World Class Products



Undervoltage Solutions

Uninterruptible Power for Drives
(DC Bus Ride-Thru)
Voltage Regulators
Chargers and Dischargers
Energy Storage



Overvoltage Solutions

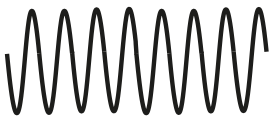
Braking Transistors
Braking Resistors
Transistor/Resistor Combo
Line Regeneration
Dynamic Braking for Servo Drives

Common Bus Solutions

Single Phase Power Supplies
3-Phase Power Supplies
Common Bus Diodes

Portable Maintenance Solutions

Capacitor Formers
Capacitor Testers



Power Quality Solutions

12 and 18 Pulse Kits

Green Solutions

Line Regeneration

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1. INTRODUCTION

1.1. WHO SHOULD USE

This manual is intended for use by anyone who is responsible for integrating, installing, maintaining, troubleshooting, or using this equipment with any AC Drive System.

Please keep this manual for future reference.

1.2. PURPOSE AND SCOPE

This manual is a user's guide for the Model S3534SR 50% sag DC Bus Ride-Thru System. It will provide the user with the necessary information to successfully install, integrate, and use the S3534SR System in a variable frequency AC drive system.

In the event of any conflict between this document and any publication and/or documentation related to the AC drive system, the latter shall have precedence.

1.3. MANUAL VERSION AND CHANGE RECORD

The initial release of this manual is Rev 00a.

Figure 1-1: Typical S3534SR Ride-Thru System

1.4. SYMBOL CONVENTIONS USED IN THIS MANUAL AND ON EQUIPMENT

	Earth Ground or Protective Earth
	AC Voltage
	DC Voltage
 **DANGER!**	Electrical Hazard - Identifies a statement that indicates a shock or electrocution hazard that must be avoided.
 **DANGER!**	DANGER: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.
 **CAUTION!**	CAUTION: Identifies information about practices or circumstances that can lead to property damage, or economic loss. Attentions help you identify a potential hazard, avoid a hazard, and recognize the consequences.
 **CAUTION!**	Heat or burn hazard - Identifies a statement regarding heat production or a burn hazard that should be avoided.

2. PRODUCT DESCRIPTION / FEATURES

Bonitron's S3534SR Sag Ride-Thru Systems provide protection from short term AC line voltage sag events for Variable Frequency Drives (VFDs) that use a fixed rectifier and DC bus. The S3534SR provides sag protection for up to 2 seconds at 50% line sag on all 3 phases.

Industries with continuous processes can suffer huge losses from equipment downtime, loss of production, or damaged product when VFDs trip on under-voltage conditions. While many drives claim to have ride thru capability such as auto restart or kinetic buffering, none are able to control the motor during a complete loss of power.

Typical UPS solutions are designed to increase drive availability, but are connected in series which decreases overall drive system reliability. All Bonitron Ride Thru products connect in parallel with the drive, thus increasing system availability and reliability.

The internal M3534 boost module regulates the dropping voltage up to the drives desired DC bus level. This allows the drive to "ride through" these events while, maintaining motor speed and torque without experiencing drive shutdown.

A complete S3534SR system includes a booster, an interface module, a display, and an enclosure.

2.1. RELATED PRODUCTS AND DOCUMENTS

2.1.1. PRODUCTS

S3534CR SERIES RIDE-THRU SYSTEMS

Complete systems that use electrolytic capacitor storage for short term power outages.

S3534UR SERIES RIDE-THRU SYSTEMS

Complete systems that use ultracapacitor storage for short term power outages.

S3534BR SERIES RIDE-THRU SYSTEMS

Complete systems that use batteries for longer term power outages.

M3534 SERIES RIDE-THRU MODULES

Voltage regulators used for sag or outage protection of higher power systems.

M3528 BATTERY AND ULTRACAPACITOR CHARGERS

Chargers for high voltage storage strings.

M3628 ULTRACAPACITOR SAFETY DISCHARGERS

Automatic discharge for large capacitor storage banks for safety and quick maintenance entry.

2.1.2. DOCUMENTS

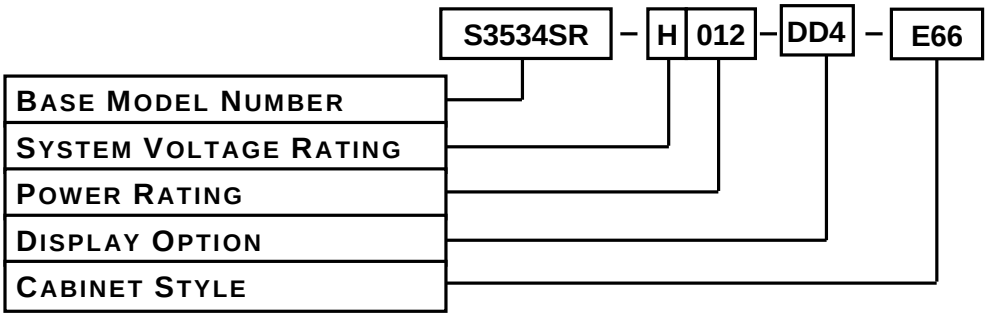
Please refer to the M3534 Ride-Thru Module manual.

Please refer to the ASM 3660DD4 manual when this unit is equipped with the DD4 Digital Display option.

These manuals are available at www.bonitron.com or by contacting Bonitron.

2.2. PART NUMBER BREAKDOWN

Figure 2-1: Example of Part Number Breakdown



BASE MODEL NUMBER

The base model number for the 50% sag Ride- Thru System is S3534SR.

SYSTEM VOLTAGE RATING

The System Voltage rating indicates the nominal AC / DC voltage levels of the AC Drive system the Ride-Thru is intended to support. A code letter indicates the system voltage.

Table 2-1: System Voltage Rating Codes

RATING CODE	VOLTAGES (NOMINAL AC LINE / DC BUS)
L	230VAC / 320VDC
E	380 - 415VAC / 540 - 585VDC
H	460VAC / 640VDC

POWER RATING (KW)

The Power rating indicates the maximum power in kilowatts that can safely be handled by the S3534SR. This rating is directly represented by a 3-digit value. For instance, the code **012** indicates that it is rate for 12kW.

Table 2-2: Power Rating Codes

RATING CODE	POWER (KW)	CURRENT (A)
E 010	10 kW	20 A
H 012	12 kW	20 A
E 020	20 kW	40 A
H 024	24 kW	40 A
E 043	43 kW	85 A
H 050	50 kW	85 A

DISPLAY OPTION

The display option indicates which display is mounted on the front of the enclosure. The displays show the M3534 operating status and also permit a system test to be performed. The DD4 digital display has many more features than the DP10 analog

display, including Sag and fault logging. Please refer to the ASM 3660DD4 manual for a full description of features.

CABINET STYLE

Enclosure type and size is indicated by a code as shown in table 2-3. See Section 6 for complete dimensional outline.

Table 2-3: Cabinet Codes and Sizes

CHASSIS CODE	CHASSIS DESCRIPTION	PROTECTION CATEGORY NEMA
E61	24"(H) x 20"(W) x 12"(D)	Type-12 wall mount enclosure
E63	30"(H) x 24"(W) x 12"(D)	Type-12 wall mount enclosure
E66	36"(H) x 30" (W) x 12" (D)	Type-12 wall mount enclosure

2.3. GENERAL SPECIFICATIONS

Table 2-4: General Specifications Table

PARAMETER	SPECIFICATION
Boost Module Power Rating	6 – 50kW
AC Input Voltage	208 – 480VAC
DC Output Voltage	285 – 585VDC
DC Output Current	20 – 85 Amps DC
Maximum Sag Duration	50% all 3 phases for 2 seconds
Inactive Power Usage	Less than 25 watts
Field Connections	AC Line Input DC Bus Output Ground
Disconnect	5-pole for AC in / DC out with door mounted actuator
Display	DD3 Digital Display is standard
Enclosure	Type-12
Operating Temperature	40°C
Storage Temp	-20ºC to +65ºC
Humidity	Below 90% non-condensing
Atmosphere	Free of corrosive gas and conductive dust

2.4. General Precautions and Safety Warnings

DANGER!

- High voltages may be present!
- Never attempt to operate this product with the enclosure door open!
- Never attempt to service this product without first disconnecting power to and from the unit!
- Always allow adequate time for residual voltages to drain before opening the enclosure door.
- **FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH!**

CAUTION!

- This product will generate high ambient temperatures during operation.
- This product should be installed accordingly on non-flammable surfaces with clearances of at least two inches in all directions.
- Always allow adequate time for the unit to cool before attempting service on this product.
- Before attempting installation or removal of this product, always review all AC drive documentation for pertinent safety precautions.
- Installation and/or removal of this product should only be accomplished by a qualified electrician in accordance with National Electrical Code or equivalent regulations.

ANY QUESTIONS AS TO APPLICATION, INSTALLATION, OR SERVICE SAFETY SHOULD BE DIRECTED TO THE EQUIPMENT SUPPLIER.

3. INSTALLATION INSTRUCTIONS

DANGER!

Installation and/or removal of this product should only be performed by a qualified electrician in accordance with National Electrical Code or local codes and regulations.

Proper installation of the S3534SR Ride-Thru should be accomplished following the steps outlined below. Be sure to refer to the AC Drive instruction manual as these steps are performed. Please direct all installation inquiries that may arise during the installation and startup of this product to the equipment supplier or system integrator.

See Section 7.1 for additional installation considerations.

3.1. ENVIRONMENT

The installation site for the module should be chosen with several considerations in mind.

- The enclosure has a NEMA-12 rating and will therefore require some protection from the elements.
- Conduit access for field wiring may be provided on the top-right surface of the enclosure, if desired.
- The unit will require a minimum clearance of two (2) inches in all directions around it when mounted near a non-heat source.
- The mounting surface should be clean and dry.

3.2. UNPACKING

Upon receipt of this product, please verify that the product received matches the product that was ordered and that there is no obvious physical damage to the unit. If the wrong product was received or the product is damaged in any way, please contact the supplier from which the product was purchased.

3.3. MOUNTING

Once the installation site has been selected as outlined above, the unit should be mounted in place. The enclosure is provided with (4) 7/16" diameter mounting holes.

Mounting holes should be drilled and mounting studs or anchors installed before positioning the enclosure. Mounting hardware is not supplied.

Refer to Section 6.4 of this manual to determine the correct mounting dimensions and provisions for the unit.

WARNING!

- **THE S3534SR ENCLOSURE IS HEAVY!**
- **A MINIMUM OF TWO PEOPLE SHOULD BE USED TO POSITION THE UNIT!**

3.4. WIRING AND CUSTOMER CONNECTIONS

This section provides information pertaining to the field wiring connections of the S3534SR Drive Ride-Thru. Actual connection points and terminal numbers of the AC Drive system will be found in the documentation provided with that system.

Be sure to review all pertinent AC Drive System documentation as well as this entire Section before proceeding.

3.4.1. POWER WIRING

DANGER!

INTERCONNECT WIRING OF THIS PRODUCT SHOULD ONLY BE DONE BY A QUALIFIED ELECTRICIAN IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE OR EQUIVALENT REGULATIONS

ENSURE THAT ALL SOURCES ARE DISCONNECTED AND LOCKED OUT BEFORE ATTEMPTING SERVICE OR INSTALLATION.

FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS INJURY OR DEATH!

Refer to the documentation supplied with the drive system for field connection points within that system.

Field connection terminals for the DC Bus output and AC Line input are located on field connection Disconnect Switch DISC1 at the top right of the enclosure backplate. The ground connection is located on the right side of the backplate. See Table 3-1 for wire sizing.

Table 3-1: Power Wiring Connections

TERMINAL	FUNCTION	ELECTRICAL SPECS		MIN WIRE AWG	MAX WIRE AWG	TORQUE
DISC1-1	DC Power Output +	12 kW	650VDC, 20A	14 AWG	8 AWG	7 - 14 lb-in
DISC1-2	DC Power Output -		650VDC, 20A			7 - 14 lb-in
DISC1-3,4,5	AC Power Input		460VAC, 30A			7 - 14 lb-in
GND	System Ground		Limited by Ring Lug 3/8"			40 - 50 lb-in
DISC1-3	DC Power Output +	24 kW	650VDC, 40A	14 AWG	8 AWG	7 - 14 lb-in
DISC1-4	DC Power Output -		650VDC, 40A			7 - 14 lb-in
DISC1-3,4,6	AC Power Input		460VAC, 60A			7 - 14 lb-in
GND	System Ground		Limited by Ring Lug 3/8"			40 - 50 lb-in
DISC1-5	DC Power Output +	50 kW	650VDC, 85A	12 AWG	2 AWG	30 - 35 lb-in
DISC1-6	DC Power Output -		650VDC, 85A			30 - 35 lb-in
DISC1-3,4,7	AC Power Input		460VAC, 120A			30 - 35 lb-in
GND	System Ground		Limited by Ring Lug 3/8"			40 - 50 lb-in

All terminals connections are located in the upper right hand section of the enclosure.

DC BUS OUTPUT (DSC1-1, 2)

The DC output connections supply power to the drive being backed up. Connect them directly to the bus capacitors of the VFD. Make sure that there is no precharge resistor or DC link choke between this connection and the main DC bus filter capacitors of the drive. Failure to do so can lead to poor operation or failure. Make the DC bus output interconnections at DSC1-1 (DC Pos.) and DSC1-2 (DC Neg.). See Table 3-1 for wire size.

3-PHASE AC LINE INPUT (DSC1-3, 4, 5)

The incoming 3 phase AC input connections are made at terminals DISC1-3, DISC1-4, and DISC1-5. Wire size depends on the rated power of the backup

system. See Table 3-1 for wire size.

GROUND

A main system ground should be connected to the grounding stud mounted on the backplate. This ground wire can be one gauge smaller than the incoming AC lines.

Figure 3-1: S3534SR Field Connection Terminal Layout

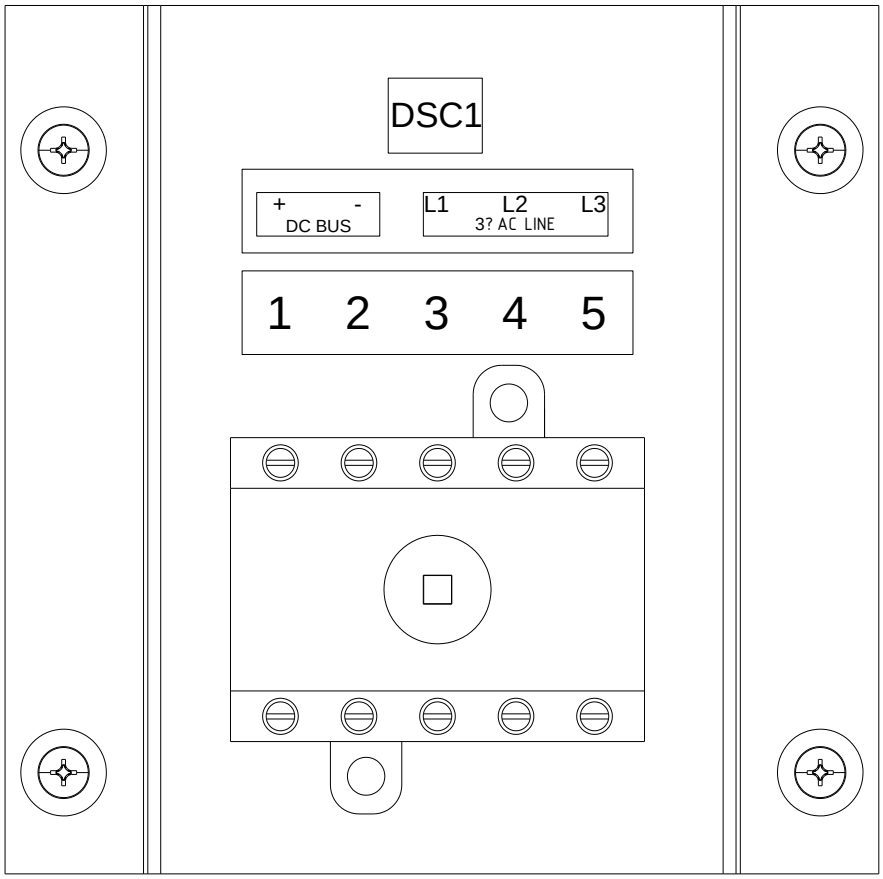


Figure 3-2: Typical S3534SR Interconnection with Existing Drive System

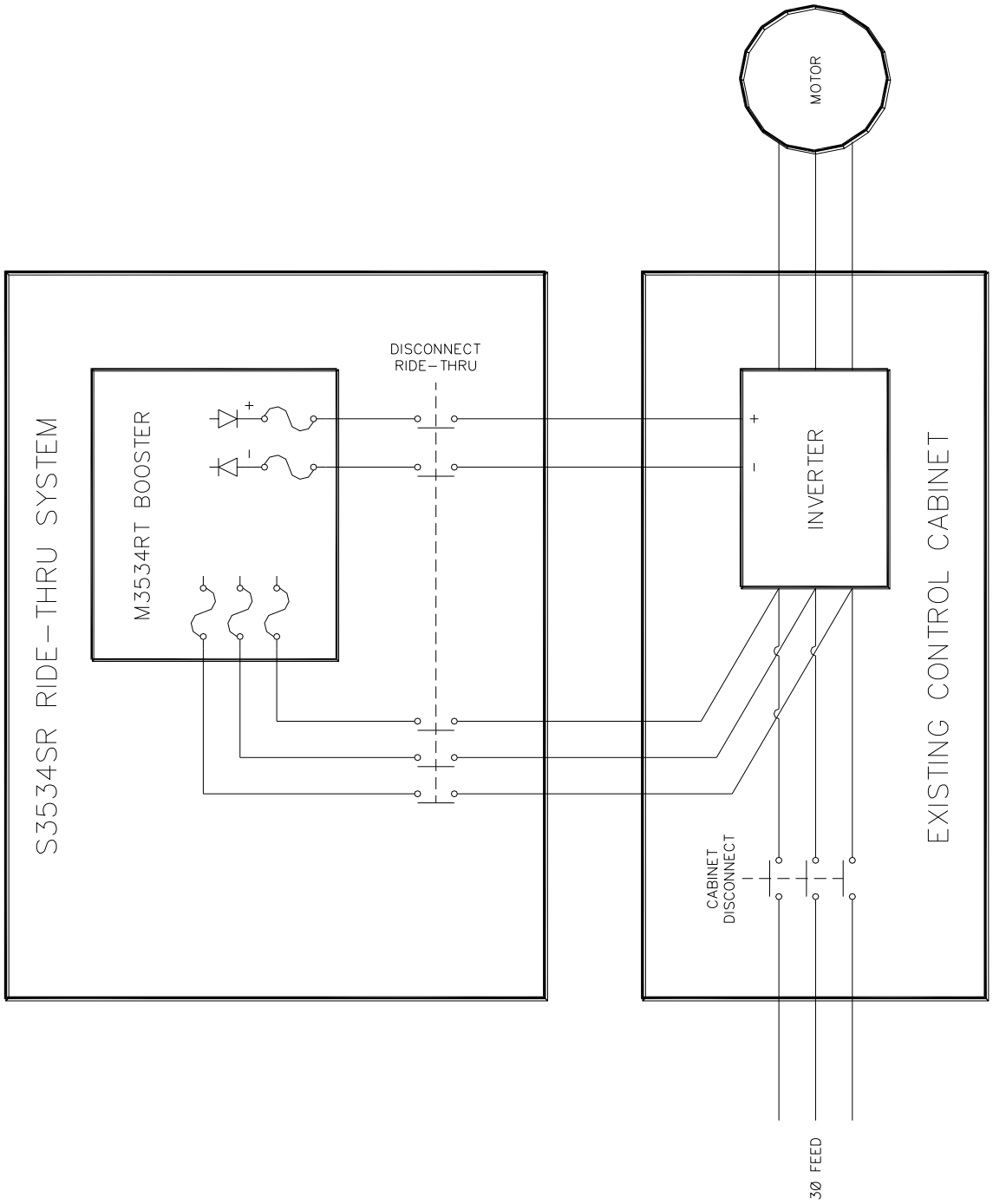
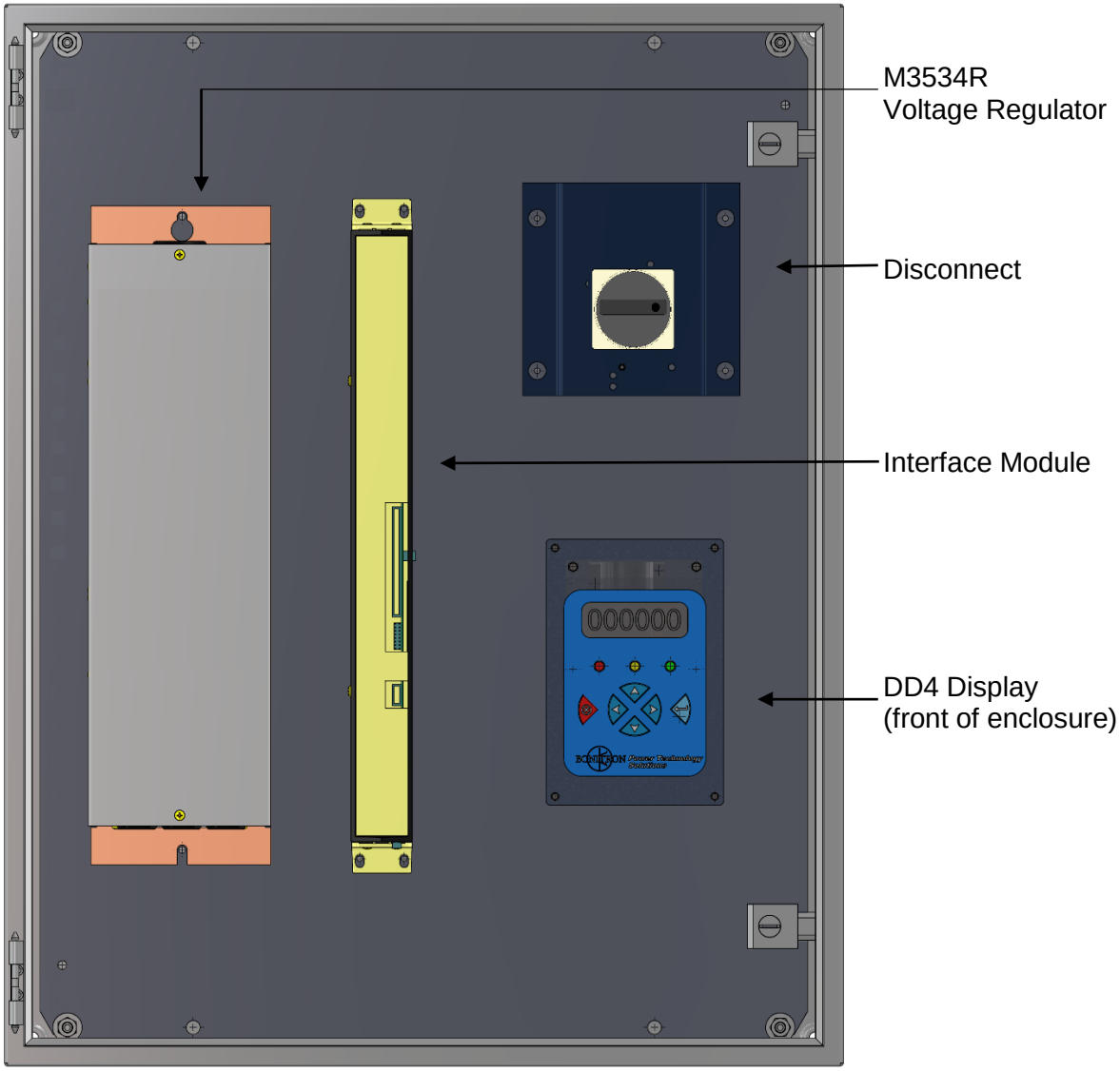


Figure 3-3: S3534SR Drive Ride-Thru System in E66 Cabinet Internal Layout



4. OPERATION

4.1. FUNCTIONAL DESCRIPTION

The S3534SR Ride-Thru System monitors the DC bus of the attached variable frequency drive and provides power in a voltage controlled, current limited supply directly to the filter capacitor section of the drive above the inverter stage.

During a sag event the internal DC bus of the VFD drops. When this level meets the threshold voltage of the S3534SR, power is delivered through blocking diodes to hold up the voltage in the VFD. The boost module regulates and boosts the output voltage to the drive at a constant voltage. In standby mode, or when the incoming AC power is normal, the system energy consumption is minimal.

4.2. FEATURES

4.2.1. FAULT LOGIC DETAILS

All S3534SR systems use the M3534R Voltage Regulator module. The Voltage Regulator modules are equipped with basic fault and status outputs. See Figures 3-3 for the location of the Voltage Regulator module inside each S3534SR cabinet. For connection details see the manual for the M3534R Voltage Regulator used in your system.

4.2.2. LOCAL INDICATORS

Indicators for the S3534SR are located on the front door of the enclosure.

- DP 10 display (optional) records number of cycles the Ride-Thru has been active and has indicators for the following:
    - POWER
    - PRECHARGE COMPLETE (not used for S3534CR)
    - RIDETHRU READY
    - RIDETHRU ACTIVE
    - VOLTAGE FAULT (not used for S3534CR)
    - OVERTEMP
    - TEST SYSTEM

  See M3534 manual for more information.
- DD4 display module (optional) includes a digital display that can be used to monitor, test, and log information about the M3534 and its activity, it has the following indicators:
    - Red LED (Fault).
    - Yellow LED (Ride-Thru Active)
    - Green LED (Display Power)

  See ASM 3660DD4 manual for more information.

4.3. STARTUP

4.3.1. PRE POWER CHECKS

1. Ensure the Bonitron Ride-Thru has been properly installed as per the instructions in Section 3 of this manual.
2. The Ride-Thru DC bus threshold must be coordinated with the under voltage trip setting of the inverter. If the threshold is too close to the nominal bus, the Ride-Thru may supply power to the drive continuously, and overheat. If the threshold is too close to the under voltage trip level of the inverter, the system may not "ride through", and under voltage trips will still occur. Most inverters have an under voltage trip point of -15% of nominal. Some inverters can be reprogrammed to change this trip level. Bonitron typically calibrates DC bus threshold to be about -10% of the nominal bus. For example, Bonitron sets all 460VAC systems to hold the DC bus to 585VDC.
   - Refer to your inverter's documentation for details on adjustment of the under voltage trip setting.
   - Some inverters automatically change this setting when the main voltage is programmed, and is typically 80-85% of full DC bus voltage.
   - Some inverters do not allow adjustment.
3. If start-up must be done during production runs, due to the wide variety of ground fault sensing schemes, and the fact that a few inverters may have a ground fault trip when using a parallel boost module, it is recommended to disable the inverter ground fault until testing can be done.
4. Ensure that the associated inverter is working properly.
5. Confirm the under voltage trip point if possible.

4.3.2. STARTUP PROCEDURE AND CHECKS

1. With power already applied to the associated drive, turn on disconnect switch.
2. Display should read drive bus level and the AC line input.
3. There should be no faults on the display and no current flow from the Ride-Thru to the drive.
4. S3534SR is now ready for operation.
5. Full power operational testing is recommended during commissioning. Each Bonitron Ride-Thru should be tested under load during initial start up to verify the functionality of the test circuit and that the test does not negatively affect the process. However, Bonitron recommends that, if the process is critical, the TEST cycle be initiated only during a shutdown.
6. Verify switching circuits by pressing the **TEST** button while running the inverter at full load.
   - Ride-Thru DC bus current should flow during the 2-second test cycle.
   - Inverter input current should drop.
   - Ride-Thru DC bus voltage should rise above the threshold. (+17% if lightly loaded, less if fully loaded.)
   - Inverter DC bus voltage should rise above the threshold. (+17% if lightly loaded, less if fully loaded.)
   - Ride-Thru Active LED should turn **ON.**

- Motor speed should remain constant.
- Ride- Thru Active event should be saved in the display memory.

5. MAINTENANCE AND TROUBLESHOOTING

Repairs or modifications to this equipment are to be performed by Bonitron approved personnel only. Any repair or modification to this equipment by personnel not approved by Bonitron will void any warranty remaining on this unit.

5.1. MAINTENANCE ITEMS

Bonitron Model M3534R Ride-Thru uses high quality aluminum electrolytic capacitors and is designed for long life without maintenance. While a typical inverter may require capacitor replacement after a certain time due to the heavy ripple currents, the M3534R typically is in a standby mode waiting for a power disturbance.

With typical operating conditions of 35ºC, caps running at 75% rated voltage, and a duty cycle of one sag per month, Bonitron recommends the capacitors be checked or replaced every 20 years.

5.2. TROUBLESHOOTING

Symptom	Action

No Ride-Thru capability	• Check for Power LED on Voltage Regulator module.
	• Check for voltage reading on capacitor bank.
	  • If OK, check DC output fuses in Voltage Regulator module.
	  • If OK, do capacity test, checking for activity on Voltage Regulator module.

No voltage on meter	• Check for 3-phase AC voltage at input to box. • Check for 3-phase AC downstream of disconnect. • Check AC line fuses inside Voltage Regulator module. • Check capacitor bank fuse on backplate. • Check voltmeter and wires to meter.

Low voltage on meter	• Check each individual capacitor pack, measuring on capacitor terminals.
	  • Each capacitor pack supplies some voltage to meter. If one out of two capacitor packs is at zero volts, the meter will read half voltage.
	  • Bonitron's design will allow a capacitor pack to fail short and not affect the remaining capacitor packs, with the Capacitor Voltage Meter reading proportionally low.

No POWER LED on Voltage Regulator module	• Check for 3-phase AC downstream of disconnect. • Check AC line fuses inside Voltage Regulator module. • If OK, replace Voltage Regulator module.
No RTA LED on Voltage Regulator module	• Ensure voltage regulator threshold is set properly. • If DC bus drops below threshold setting, and no activity occurs, replace Voltage Regulator module.

OT LED is ON	• Check temperature of Voltage Regulator module.
	  • Warmth indicates excessive activity or current flow.
	  • Check threshold setting and lower if nominal DC bus level is within 10V of threshold.
	  • Measure static current flow. Presence of line chokes in series with the drive may allow excessive current flow through voltage regulator's parallel rectifier bridge.

CAUTION!

REPAIRS OR MODIFICATIONS TO THIS EQUIPMENT ARE TO BE PERFORMED BY BONITRON APPROVED PERSONNEL ONLY. ANY REPAIR OR MODIFICATION TO THIS EQUIPMENT BY PERSONNEL NOT APPROVED BY BONITRON WILL VOID ANY WARRANTY REMAINING.

5.3. TECHNICAL HELP – BEFORE YOU CALL

If possible, please have the following information when calling for technical help:

- Exact model number of affected units
- Serial number of unit
- Name and model number of attached drives
- Name of original equipment supplier
- Brief description of the application
- The AC line to line voltage on all 3 phases
- The DC Bus voltage
- KVA rating of power source
- Source configuration Wye/Delta and grounding

This information will help us support you much more quickly. Please contact us at (615) 244-2825 or through www.bonitron.com

6. ENGINEERING DATA

6.1. RATINGS

Table 6-1: S3534SR Cabinet Systems Ratings Table

50% Sag Booster with disconnect, display, and fusing

MODEL NUMBER	BOOSTER kW	AC LINE CURRENT	DC BUS CURRENT	DC BUS VOLTAGE
230 VAC DRIVES				
S3534SR-L006	6	30	20	285
S3534SR-L012	12	60	40	285
S3534SR-L025	24	120	85	285
380 VAC DRIVES (380-415 VAC)				
S3534SR-E010	10	30	20	485
S3534SR-E020	20	60	40	485
S3534SR-E043	40	120	85	485
460 VAC DRIVES				
S3534SR-H012	12	30	20	585
S3534SR-H024	24	60	40	585
S3534SR-H050	50	120	85	585

6.2. WATT LOSS

All S3534SR are 93% efficient (or better) at full load.

Table 6-2: S3534SR Watt Loss

MODEL NUMBER	DC BUS CURRENT	WATT LOSS
230 VAC DRIVES		
S3534SR-L006	20 A	20 W
S3534SR-L012	40 A	25 W
S3534SR-L025	85 A	30 W
380 VAC DRIVES (380-415 VAC)		
S3534SR-E010	20 A	20 W
S3534SR-E020	40 A	25 W
S3534SR-E043	85 A	30 W
460 VAC DRIVES		
S3534SR-H012	20 A	20 W
S3534SR-H024	40 A	25 W
S3534SR-H050	85 A	30 W

6.3. FUSE/CIRCUIT BREAKER SIZING AND RATINGS

20 – 24kW (40 Amp) fuses are located inside the M3534R Booster enclosure.
40 – 50kW (85 Amp) fuses are located on cabinet backplate.

Table 6-3: Fuse Sizing and Rating

RIDE-THRU MODEL NUMBER	AC FUSE	DC FUSE	AC INPUT WIRE GAUGE	DC OUTPUT WIRE GAUGE
230 VAC INPUT				
S3534SR-L006	A60Q30	A70Q25	10 AWG	8 AWG
S3534SR-L012	A60Q40	FWP50	8 AWG	8 AWG
S3534SR-L025	FWP125	A70QS80	2 AWG	2 AWG
380 VAC INPUT				
S3534SR-E010	A60Q30	A70Q25	10 AWG	8 AWG
S3534SR-E020	A60Q40	FWP50	8 AWG	8 AWG
S3534SR-E043	FWP125	A70Q80	2 AWG	2 AWG
460 VAC INPUT				
S3534SR-H012	A60Q30	A70Q25	10 AWG	8 AWG
S3534SR-H024	A60Q40	FWP50	8 AWG	8 AWG
S3534SR-H050	FWP125	A70Q80	2 AWG	2 AWG

- Fuses recommended for use with the M3534 are Gould-Shawmut A70QS series, Buss FWP series, or equivalent semiconductor fuses.
- The input power source must be capable of handling a current surge of up to 200% of the M3534 nominal rating for the time specification of the M3534. Maximum duty cycle is 1% at full rated load.

6.4. DIMENSION AND MECHANICAL DRAWING

Figure 6-1: E61 Enclosure Dimensional Outline

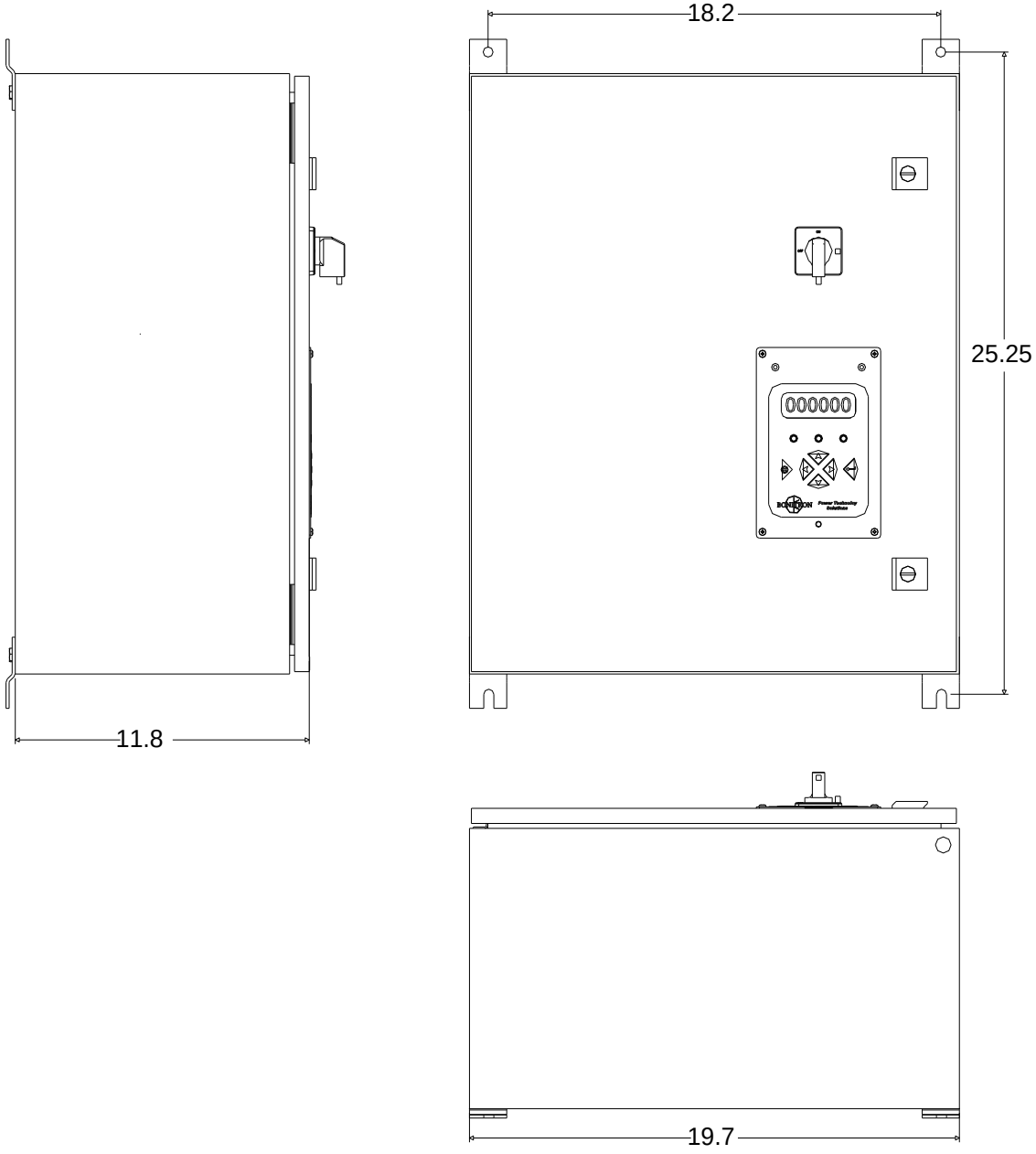


Figure 6-2: E63 Enclosure Dimensional Outline

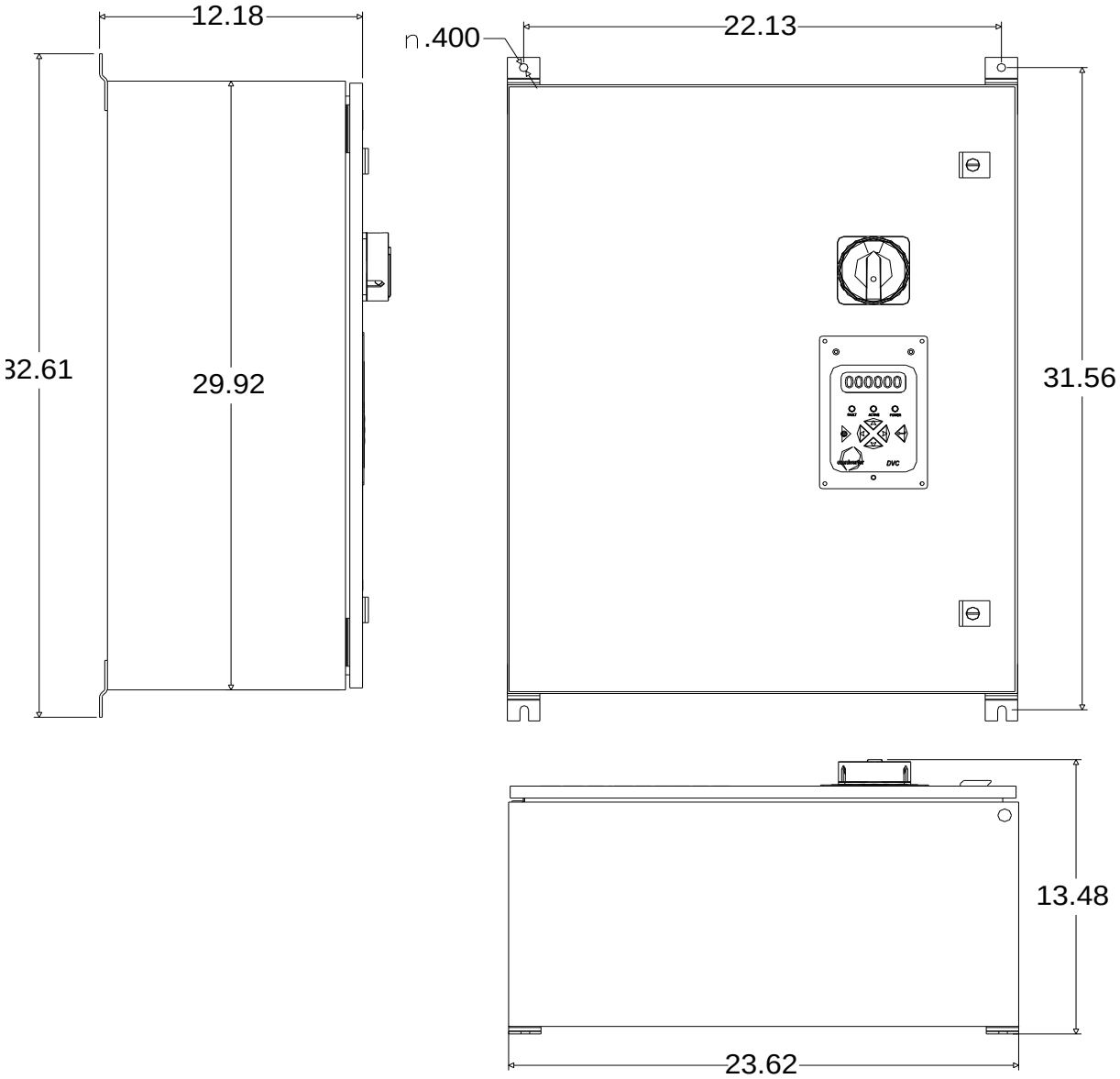
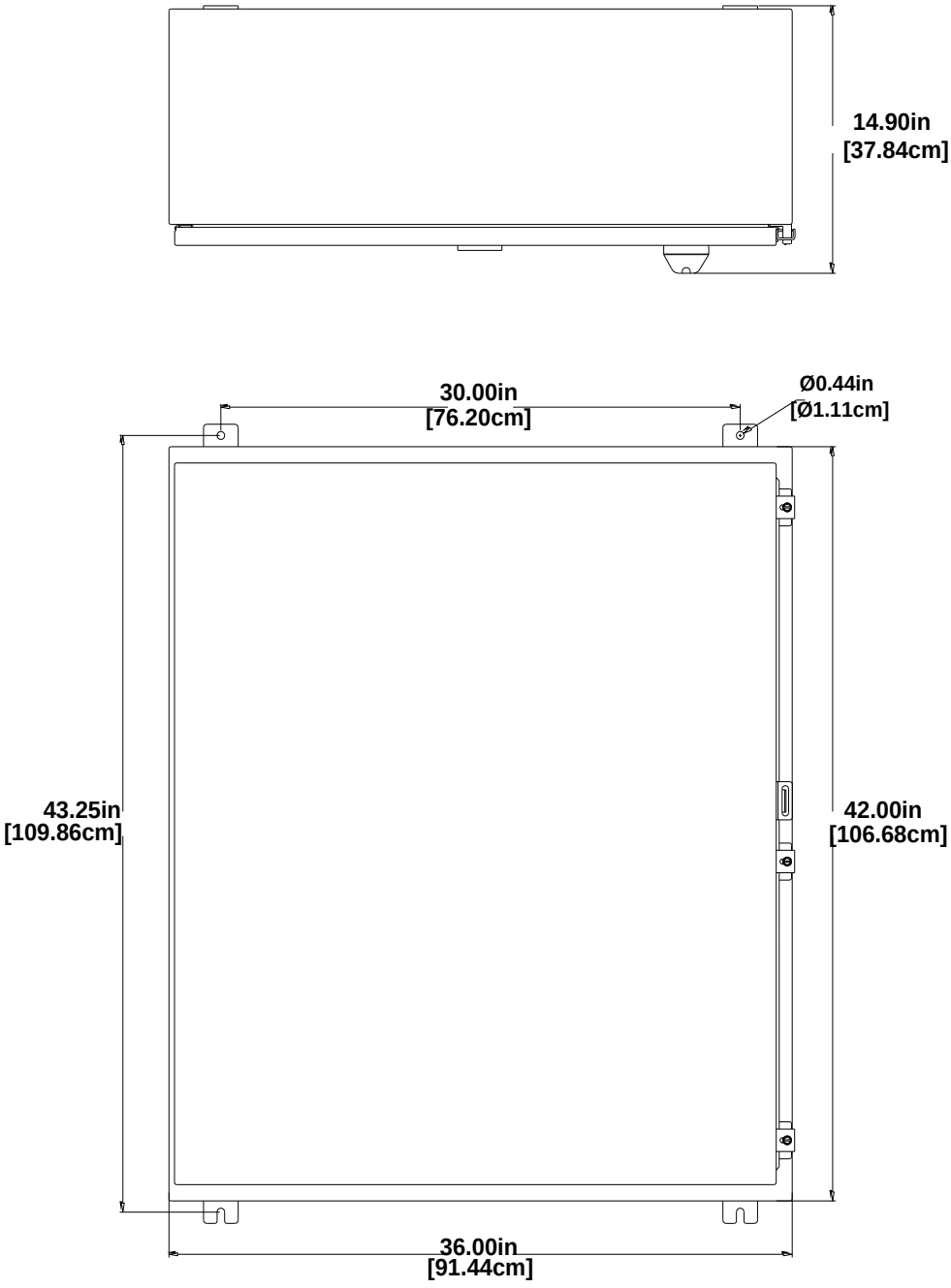
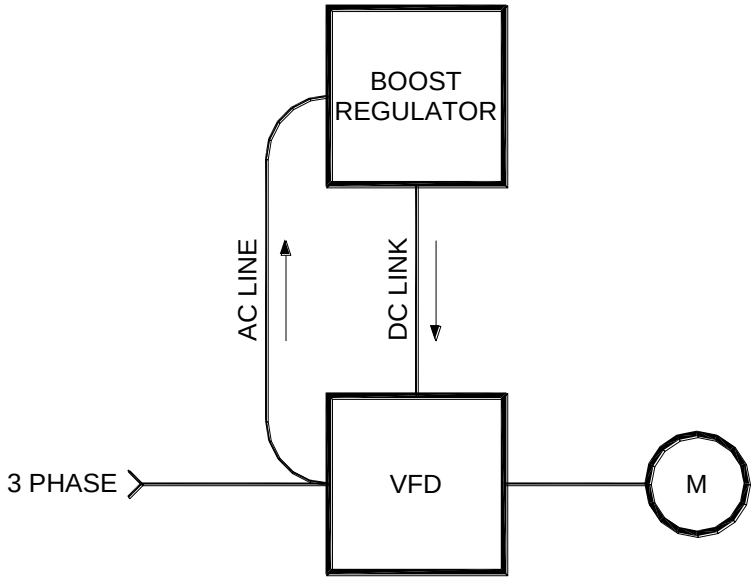


Figure 6-3: E66 Enclosure Dimensional Outline



6.5. BLOCK DIAGRAMS

Figure 6-4: Ride-Thru System Configuration



2 SECOND, 50% SAG PROTECTION USING DC BOOSTER ONLY

6.6. SUPPLEMENTAL DRAWINGS

Figure 6-5: Drive DC Bus without Bonitron for 50% Sag

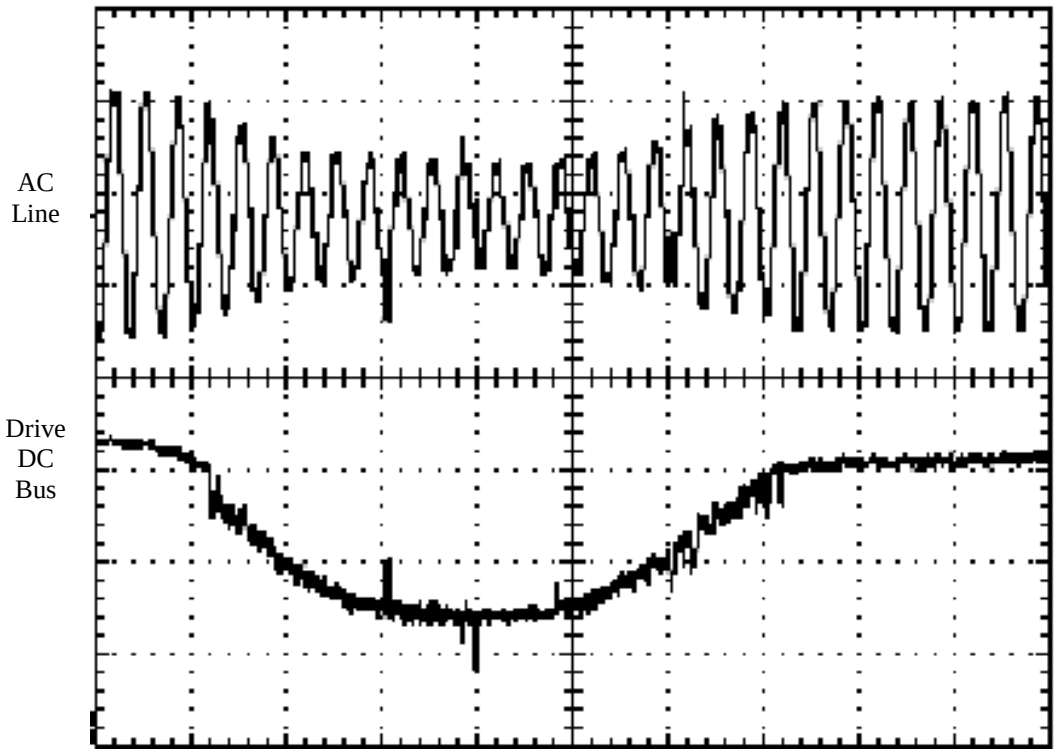
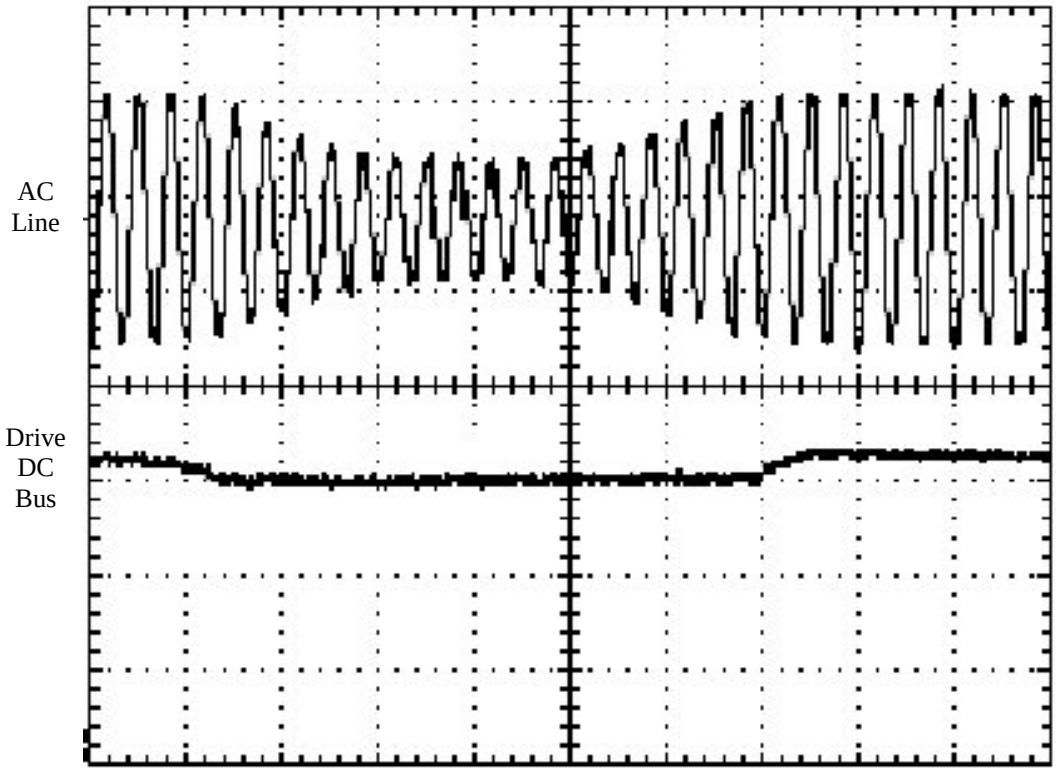


Figure 6-6: Drive DC Bus with Bonitron for 50% Sag



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7. APPENDICES

7.1. INSTALLATION CONSIDERATIONS FOR DRIVE RIDE-THRU SYSTEMS

The following items should be considered when installing a Bonitron Ride-Thru module.

1. Applica Inverter logic voltage must be "backed up"
2. Most new Inverters derive logic supply from DC bus
3. Install small UPS on circuits with AC feed
4. Any control or Interlock relays must be "backed up"
   - Test Relays at half voltage for dropout
   - Use DC relays on logic supply
   - Install small UPS on circuits with AC feed
5. Determine the maximum motor voltage needed
   - To ensure "Threshold" level is sufficient to supply motor
   - Most inverters automatically compensate RMS to motor with 10% low DC bus level
6. Verify actual AC line voltage and DC bus level
   - To ensure "Threshold" level is set – 10% of actual DC bus level
   - To ensure valleys of ripple do not cause unwanted activity
7. Determine Inverter low bus trip point
   - To ensure "Threshold" level is above inverter dropout
8. Determine Inverter high bus trip point
   - To ensure "Test" level will not over voltage inverter
9. Inverter ground fault circuits
   - Ride-Thru currents on 20 amp model may use Inverter bridge negative diodes during operation
   - Circuits can be de-sensitized
   - External "upstream" ground fault circuits may be added
10. Electrical safety
    - Ride-Thru should not have AC power when inverter does not
    - RT and Inverter should feed from same point
    - Use shunt trip interlock between Inverter and Ride-Thru if RT power is not fed downstream of inverter power switch
    - Label Inverter as having two power sources
11. Input feed should be capable of 2x rated current during the 2 sec 50% dip
    - RT RMS rating is 1 percent of system KW
    - Most Inverter feeds have been sized for a 150-200% surge for motor starting
12. IR drop of wiring
    - This subtracts from the 50% dip spec

A disable command should be given in cases where activity extends beyond the specified ride through time

NOTES

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