

Model 56SQ2 – AC/DC Power Supply, VME

Features



- 300 Watts, Typical
- Ruggedized
- Designed and Manufactured Per NAVMAT Guidelines
- EMI Filtering Designed to MIL-STD-461E
- Transient Protection per MIL-STD-704 & Mil-Std-1399
- Remote Error Sensing
- BIT
- Extensive Signaling Options
- Holdup Time
- Optional Current Share

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Description

The NAI 56SQ2 is a high power density, low profile VME power supply which accepts either a single phase or three phase input. The 56SQ2 is ideally suited for VME & CPCI applications and is **designed to plug into a standard 6U rack**. Its intelligent design allows for many different standard features as well as the flexibility to address special needs.

Electrical Specifications

Input Characteristics:

Input	115/208 Vac, Single Phase 115Vac, Three Phase
Frequency Range	47Hz to 440Hz
EMI/RFI Characteristics	Designed to meet requirements of MIL-STD-461E – CE102, CS101, CS114 a & b, CS116; (CE101 for Single phase input only)
Input Transient Protection	Per MIL-STD-704E (Three Phase and Single Phase); Per Mil-Std-1399 sec 300A (Single Phase only)

DC Output Characteristics:

Output Power	See Table 1; 300 watts typical at 85°C
Output Voltage	See Table 1; VME outputs standard
Efficiency	75% typical

Line Regulation	Within 0.1% or 10mv (whichever is greater) for low to high line changes at constant load
Load Regulation	0.1% or 10mv (whichever is greater) for 0 to 100% of rated load at nominal input line; with remote sense
PARD (Noise and Ripple)	50mv p-p max. Measurements are made with a 20 Mhz bandwidth instrument connected on load wires < 5 inches from power supply and terminated with 1uF capacitors across load lines
Load Transient Recovery	Output voltage returns to regulation limits within 0.5 msec, half to full load
Load Transient Under/Overshoot	5% of nominal output voltage set point (1.4v max)
Short Circuit Protection	Protected for continuous short circuit with automatic recovery
Current Limiting	All outputs 105% to 130%
OverVoltage Protection	Automatic electronic shutdown if outputs exceed 125% \pm 10%
Holdup Time	20 milliseconds at nominal load standard; 50 milliseconds optional; height changes to 2" (see note on sheet 6); 4 millisecond power fail warning per ANSI/VITA
Remote Error Sensing	Sensing pins compensate for up to 0.5-volt drop on all output leads
Isolation Voltage	1000 VDC input to output and input to case; 100 VDC output to case.
Insulation Resistance	50 Megohm at 50 VDC

Signal Types:

Enable (standard on all versions)	$V_{IL} = 1V$ max, $V_{IH} = 3V$ min. Input has an internal 1K Pull-up resistor to an internal +5Vdc supply. Floating or High enables switched outputs. Low disables the switched outputs (polarity can be changed optionally)
DC Good (see option sets, table 5)	Open collector output capable of sinking 50 mA. Output will be low (conducting) when outputs are within 5% of nominal value
Power Fail Warning (PFW) (see option sets, table 5)	Open collector output capable of sinking 50 mA. Output will be low (conducting) when input is insufficient to produce full power
Over Current (OC) (see option sets, table 5)	Open collector output capable of sinking 50 mA. Output will be low (conducting) when outputs are not in over-current limit.
Over Temp Warn (see option sets, table 5)	Open collector output capable of sinking 50 mA which provides warning that unit is about to go into over temperature condition
AC Fail (ANSI/VITA) Option Set 3, table 5	AC Failure - An open-collector driven signal which indicates that the AC input to the power supply is no longer being provided or that the required AC input voltage levels are not being met.
Sys Reset (ANSI/VITA) Option Set 3, table 5	System Reset (SYSRESET*) is an open-collector line driven by the Power Monitor module, or by any board in response to a push-button switch closure.
Reset (ANSI/VITA) (see option sets, table 5)	Input to power supply via switch; resets system without power off applied
Current Share (see option sets, table 5)	Available for outputs V1 through V4. Connect Share lines from each output together on two or more power supplies for increased system power or redundancy.
Share OK Signal (see option sets, table 5)	Indicates that current share is operational
SCL Clock (see option sets, table 5)	Via I ² C interface standard for overtemp monitor and overtemp shutdown
SDA Data Line (see option sets, table 5)	Via I ² C interface standard for overtemp monitor and overtemp shutdown

Physical/Environmental Specifications

Temperature Range	Operating: -40°C to +85°C at 100% load (Temperature measured at thermal seating plane; conduction via entire thermal seating plane); Storage: -55°C to +100°C
Temperature Coefficient	0.01% per °C
Shock	30 G's each axis, per MIL-STD-810C, Method 516.2, Procedure 1; Hammer Shock per Mil-S901, ½ sine wave
Vibration	Per MIL-STD-810C, Method 514.2, Procedure 1A.
Acceleration	6 G's per MIL-STD-810C, Method 513.2, Procedure 11, and 14 G's per Procedure 1
Humidity	95% at 71°C per MIL-STD-810C, Method 507.1 (non-condensing)
Altitude	40,000 feet per MIL-STD-810C, Method 504.1, Category 6 Equipment
Dimensions	See Sheet 6
Salt Fog	Per MIL-STD-810C, Method 509.1
Sand/Dust/Fungus	Per MIL-STD-810C
Enclosure	Aluminum housing to aluminum Baseplate
Finish	Yellow Chem film IAW MIL-C-5541 Class 1A
Interface	Connector per Table 4
Weight	4.5lbs Typical

Table 1. Output Power

Designation	Volts	Amps
V1	+5.0	30
V2	+12	2
V3	-12	2
V4 * see note 1	+3.3 *see note 1	20 * see note 1
V5 ** See note 2	+3.3	10

*Note 1: This voltage comes standard as a +3.3vdc @ 20 amps output. It can also be configured to, +5, +12, +15, +24, +26 or +28vdc @ 150 watts. V4 is also an isolated output.

** Note 2: V5 can be referenced to either the V1 or V4 rtn line

Table 2. Input Pinout Designations (J1)

Pins	3 Phase	1 Phase
A5, A6	Phase A	Hot
C5, C6	Phase B	Hot
B2	Phase C	Neutral
B9	Ground	Ground

Table 3. Output Pinout Designations (J2)

Pin #	Signal Name	Description
B2, B5	Out (V1)	Output for channel 1
A13, B13, C13	Out (V2)	Output for channel 2
A14, B14, C14	Out (V3)	Output for channel 3
B22	Out (V4)	(Isolated) Output for Channel 4 *see note 1
B31	Out (V5) *see note 2	Output for channel 5
B8, B11	V1, V2 & V3 Rtn	Common return line for channels 1 through 3
B25	V4 Rtn	(Isolated) Return line for channel 4
B28	V5 Rtn	Return line for channel 5
A18	V1 Sense	Remote sense for channel 1
A19	V2 Sense	Remote sense for channel 2
B18	V3 Sense	Remote sense for channel 3
C19	V4 Sense	Remote sense for channel 4 *see note 1
C20	V5 Sense	Remote sense for channel 5
B19	Sense Rtn	Common sense return for V1 through V3
B15	V1 Share	Current share line for channel 1
A15	V2 Share	Current share line for channel 2
C15	V3 Share	Current share line for channel 3
C16	V4 Share	Current share line for channel 4
B17	Enable	Enables / Disables switched outputs
A16	DC Good/ShareOK	Indicates switched outputs are within regulation
A17	OverTemp	Warns of overtemp condition
B16	Power Fail Warn	Warns of insufficient input power
C18	Reserved	Reserved
B20	SCL	Serial Clock I ² C bus
A20	SDA	Serial Data I ² C bus

***Note 1: V4 is isolated from other outputs. The return line can be connected at either the system motherboard or at the unit connector. The sense return is internally connected for the V4 output and becomes common when all other grounds are connected together.**

**** Note 2: V5 can be referenced to either the V1 or V4 rtn line**

Table 4. Option Sets (refer to sheet 2 for signal descriptions)

Set #	Description
1	Standard, no additional options
2	Power Fail Warn (PFW), DC Good & Over Temp Warn Signals
3	ANSI/VITA Signaling, includes AC Fail, Sys Reset & Reset
4	Current Share option, plus following signals: Share OK, Power Fail Warn (PFW) & Over Temp Warn
5	Temperature monitoring & temperature shutdown when temperature reaches 95°C, via I ² C bus using SCL and SDA signals. Also has DC Good Signal
6	<ul style="list-style-type: none"> ○ Power Fail Warn (PFW), DC Good & Over Temp Warn Signals. ○ Enable signal pulled up internally and outputs will be disabled when an external low is applied. ○ Unit uses Calmark VHA260-4.80ET2LK wedgelocks in place of standard wedgelocks.
7	<ul style="list-style-type: none"> ○ Power Fail Warn (PFW), DC Good & Over Temp Warn Signals. ○ Enable signal pulled up internally and outputs will be enabled when an external low is applied. ○ Unit uses Calmark VHA260-4.80ET2LK wedgelocks in place of standard wedgelocks.
8	<ul style="list-style-type: none"> ○ Power Fail Warn (PFW), DC Good & Over Temp Warn Signals ○ 50 Milliseconds of Holdup Time; unit has a modified top cover to accommodate area around the holdup capacitors. Refer to sheet 7 for outline diagram titled “Mechanical Layout for Code 8 Version 56SQ2”

Table 5. Testing Options

Option #	Description
1	Standard Testing, includes ESS Temperature cycling per NAVMAT
2	Optional Testing includes Standard ESS Temperature testing and 100% vibration testing per NAVMAT

Table 6. Connectors

Connector/Pins	Part Number - Series
Input Unit Connector	DIN 41612 Type M/3, 12+2: Male
Input Mating Connector*	DIN 41612 Type M/3, 12+2: Female
Output Unit Connector	DIN 41612 Type M, 24+8: Male
Output Mating Connector*	DIN 41612 TYPE M, 24+8: Female

*Not Supplied

Ordering Information for 56SQ2

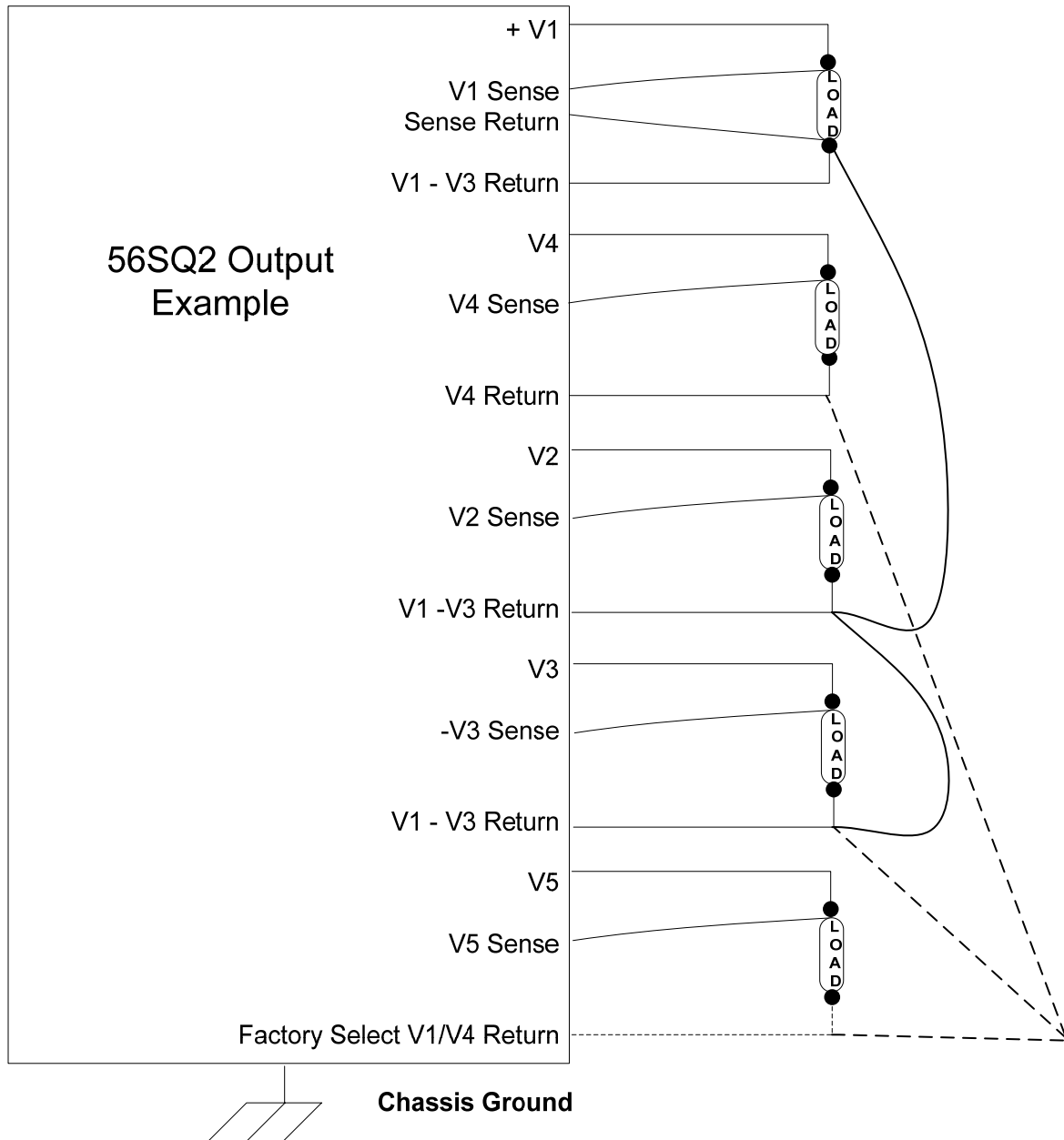
For all Outputs,
refer to Table 1,
Output Power

56	S	Q2	--	Input	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	V5 Ref	Opt Set	Testing
Series 56 = AC/DC	Wattage	Mechanical Config		1 = Single Phase 3 = Three Phase	D = +5vdc	A = Blank F = +12vdc G = +15vdc	<p>Negative Value Only A = Blank F = -12vdc G = -15vdc</p>	<p>A = Blank C = +3.3vdc D = +5vdc F = +12vdc G = +15vdc J = +24vdc K = +26vdc L = +28vdc</p>	<p>A = Blank C = +3.3vdc</p>	<p>1 = V1 ref 4 = V4 ref 0 = no V5</p>	See Table 4	See Table 5

Output Channel Codes

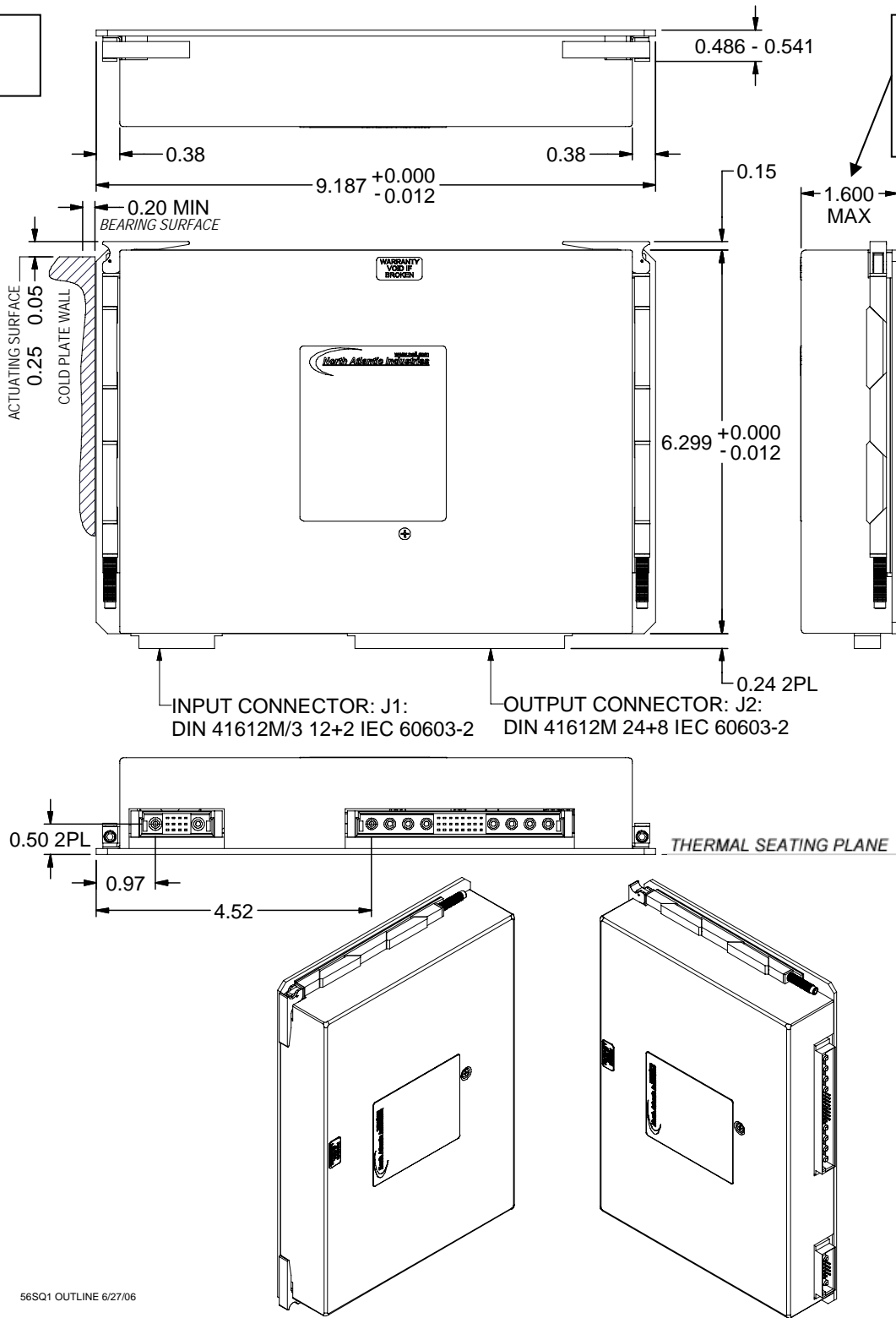
Code	Voltage
A	Blank
B	Reserved
C	+3.3vdc
D	+5vdc
E	Reserved
F	+12vdc
G	+15vdc
H	Reserved
J	+24vdc
K	+26vdc
L	+28vdc

56SQ2 Output Diagram Example



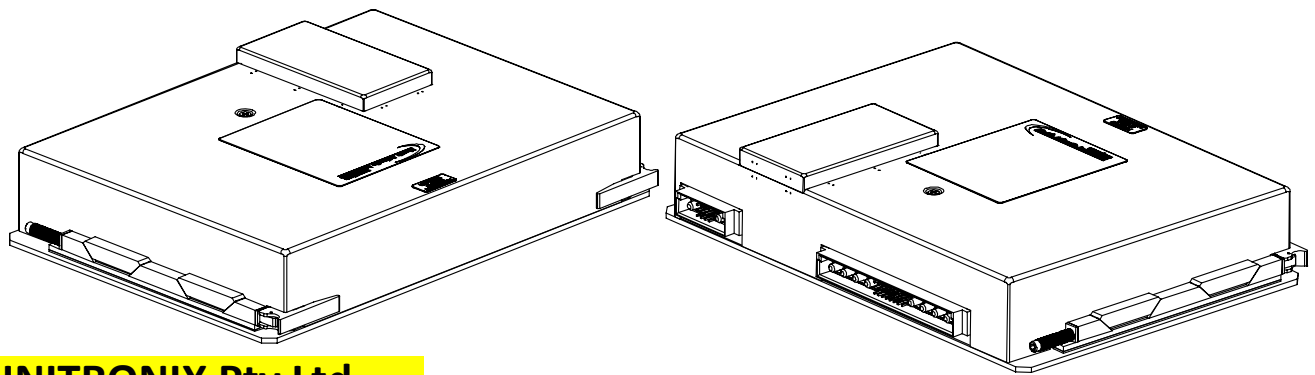
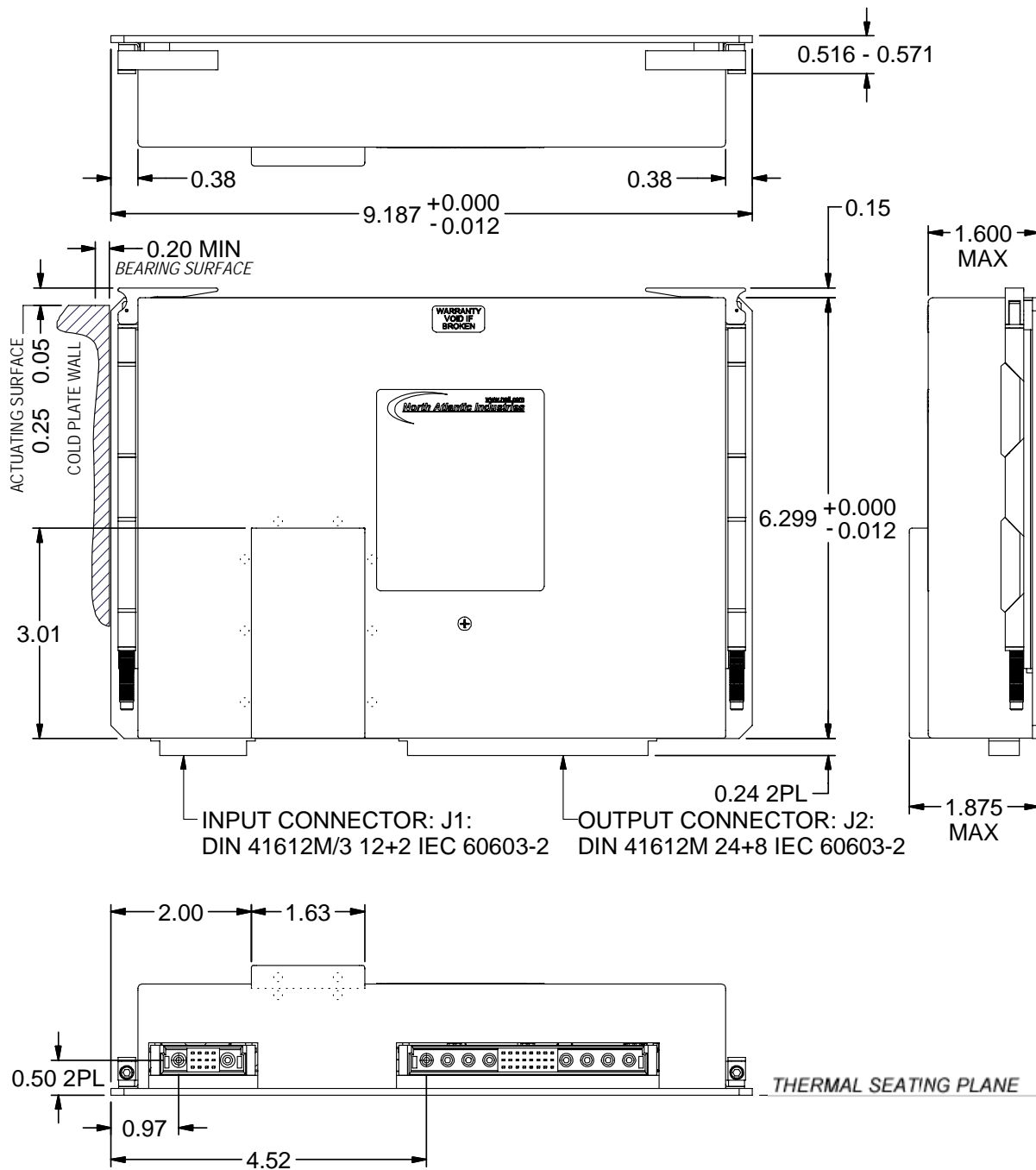
Mechanical Layout for Standard 56SQ2

Note:
All Dimensions are
shown in inches



Note:
Height increases
to 2.0" with 50
millisecond
holdup time
option

Mechanical Layout for Code 8 Version 56SQ2



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Revision History