

Scope: All units and sections are subjected to in-process inspection and test procedures

Summary of Systems Tests

Voltage Test : Applied the correct incoming voltage per the manufacturing documentation and checked for a correct voltage readout on the appropriate components.

Hi-POT: A.C Dielectric strength test was made to stress the device under test to an AC high voltage and check that there is no apparent breakdown or degradation. A HiPOT tester also checked that insulation distances, air or other, are respected.

	Description	Exceptions	Potential Applied	Exceptions for Potential Applied	Location Voltage is applied
Main Bus in Structures	Hi-Pot Main Buswork	When Hi-Potting main bus unit handles should be off to avoid nuisance breakdowns. Does not apply to unit only	2750 VAC - 5/+10% for a minimum of 1 second	Except when there is a control transformer do not hi-pot between the 2 phases that the transformer is in	Between all phases of power bus and ground (cabinet frame). Between all phases of neutral and ground and neutral, wires/busbars (if neutral is present)
Plug in Units and Frame Mount Assemblies	Hi-Pot all power wires with breaker or disconnects in the ON Position	Must be in the OFF position for units containing electronic devices including Drives, SMC's, PLC's, and SLC's	2750 VAC - 5/+10% for 1 second minimum	Except when there is a control transformer do not hi-pot between the 2 phases that the transformer is in	Between all phases of power wire and ground (unit frame).
Plug in Units and Frame Mount Assemblies	Hi-Pot all control wires	Space Heaters, Thermostats, and unit containing electronic/solid state devices including Drives, SMCs, Power Monitors, SS Timers, PLCs, SLCs, SMPs, etc.	1650 - 2750 VAC - 5/+10% for 1 second minimum	For common control units apply 2750 VAC - 5/+10% for 1 second min. For units with surge suppression apply 1650 VAC - 5/+10% for 1 second min.	Between Control Terminals and Ground

Insert Test: The electrical portion of the Insert Test Included:

- Electrical test to insure that the unit is in phase from stab through power blocks or customer wiring points. This includes single and multiple starter units, breakers, and disconnects
- Power applied to the unit to check for proper sequencing of the operation per diagram, made setting adjustments where necessary, applied proper voltage and/or current per order, observed polarity
- Verified electrical operation of all door mounted devices to ensure associated disconnect means are functioning correctly
- Checked all devices not wired into the circuit for operation (to include auxiliaries) using a continuity tester and external voltage or current

Phase Check Vertical Bus: Ensured that the stabs contact the vertical bus (on all three phases) and that the phase rotation is correct for all plug in units/modules. Ensured correct phasing on all power wires for frame mounted equipment and verified that all wires are connected to the correct points.

Main Breaker: The breaker was energized and phasing and connections were verified.

Electrical / Mechanical Operation: All solid-state controllers were tested per manufacturer's test requirements and all electromechanical devices were operated.

Smart Motor Controller (SMC) Test: A motor was connected to the load terminal connections in the unit and start, run, and stop commands were verified while operating as specified within the SMC Manual.

Drives Test: It was verified that the drive ramps up and down properly when using speed potentiometer, HIM's, or other inputs that control drive speed. All options that are applicable per the diagram to ensure operation of the unit were run. All drives were exercised using internal or external control.

Node Commissioning and Setting Baud Rate:	For DeviceNET products the node address was Hard-Set on the component per order requirements. The baud rate was set per order requirements.
Registering EDS Files in RSNetworx:	Electronic Data Sheet (EDS) Files were registered and uploaded until all unrecognized devices were registered.
IntelliCENTER/Network Devices:	It was verified that all inputs and outputs are per the requirements and functioning and that the Input Output mapping is correct. Address nodes and baud rates were set and confirmed per customer specification. System communications, component operation, built-in DeviceNet cable connections, DeviceNET port connections, and continuity for entire system were verified.
Verify Fan Operation:	It was verified that the fan is working and that airflow direction is correct. Voltage Ratings were checked by verifying that the correct voltage fan is connected to the correct power supply.
Verify transformers (configuration, grounding, ratio, voltage ratings):	The transformers were checked for proper connection and jumper installation according to the transformer unit label. Also verified primary voltages on the label (matching the application specified on the drawings), and measured the primary & secondary voltage prior to energizing further devices. Checked the ground connection by pull test, and the secondary side grounding if present with a continuity test and pull test.
Verify current transformers grounding/ratio:	Checked for the Current Transformer ratio by reading from the label to insure it matches the ratio specified in the drawings/BOM, measured the ground wires, performed continuity and pull test. (Simulate current for certain options)
Verify space heaters/thermostats & their indicators:	Checked mechanical installation, performed a wires connection & pull test, verified that the heating components match the documentation, and verified devices are operational. Checked that the wires are not in contact with any hot surfaces. Checked the indicators by switching the heater ON&OFF and observing the status lights where applicable.
Verify control station lights/indicators, selector switches, buttons, E-stops:	Verified the order, colors, and description of control station lights, push buttons, selector switches, and E-stops. Checked for functionality by assuring that corresponding devices reacted when pressing the button or switching the selector and verified that the lights lit according to their function.
Verify existing measuring systems:	Measuring systems were verified for reliable and proper measurements, including voltage, current, and frequency.



CERTIFIED TEST CHECKLIST

Customer: _____

Engineer: _____

A-B Order Serial Number: _____

Operations Quality Manager: _____

Rockwell Factory: Mark with "X" the factory where assembled and inspected

Brazil	
Katowice	
Monterrey	
Richland Center	
Shanghai	
Tecate	

The following tests were made in accordance with applicable NEMA, IEC, UL, and other requirements and/or specifications where applicable.

Test Name	Order Item #	Test Status
Voltage Test		
HI-POT		
Insert Test		
Phase Check vertical bus		
Main Breaker		
Electrical / Mechanical operation		
Smart Motor Controller Test		
Drives Test		
Node Commissioning and Setting Baud Rate		
Registering EDS Files in RSNetworkx		
IntelliCENTER/Network Devices		
Verify fan operation (airflow direction, voltage ratings)		
Verify transformers (configuration, grounding, ratio, voltage ratings)		
Verify current transformers grounding/ratio		
Verify space heaters/thermostats & their indicators		
Verify control station lights/indicators, selector switches, buttons, E-stops		
Verify existing measuring systems (powermonitor, meters)		

Test Exceptions: Any ship-less items or customer agreed exceptions

- 1)
- 2)
- 3)

System Testers Signatures:

Dates Tests Completed:



CERTIFIED INSPECTIONS

Customer: _____ Quality Manager: _____

A-B Order Serial Number: _____ Operations Quality Manager: _____

The following verification and inspection items are typical controls within our MCC factories. Throughout the manufacturing process, appropriate inspections are performed either in process or during end of line check or audits.

General Workmanship and Quality of Work	Status	Comments
Verified Workmanship Standard is Adhered To Where Indicated On Drawings	PASS	
Verified Wiring In Vertical and Horizontal Directions	PASS	
Verified Doors are Flushed and Adjusted Properly	PASS	
Verified that Bus Bolts are Torqued Properly	PASS	
Adequate Clearance/Support Bracing for In/Out going Cables	PASS	
Verified Equipment Is Clean	PASS	
Verified there is No Damage To Equipment	PASS	
Verified that the Color of exterior is in accordance with Specification/Data Sheet	PASS	
Verified there are no Major Scratches on Paint	PASS	

Wiring	Status	Comments
Verified Wires are Correct Type and Size	PASS	
Verified Wire Markings are Present Where Applicable	PASS	
Verified Wire Terminals are per order specification	PASS	
Verified Wiring Matches Drawings	PASS	
Verified Safety Grounding provided for Current Transformers, Voltage transformer, relays, doors, etc.	PASS	
Verified Control/DeviceNet Wiring is complete	PASS	

Component Inspection	Status	Comments
Verified All Devices and Features Listed Are Supplied	PASS	
Verified Equipment Ratings Match Specs And Data Sheets	PASS	
Verified all Bus is Continuous (Vertical, Horizontal & Ground)	PASS	
Verified Acceptable Horizontal & Vertical Bus Rating and Insulation	PASS	
Verified Acceptable Ground Bus Rating and Location	PASS	
Verified the Starter, Contactor, Disconnect Switch Sizes Match Drawings	PASS	
Verified Fuse Types Match Drawings	PASS	
Verified the Starter, Contactor, Disconnect Switch Locations are Correct	PASS	
Verified All Operable Functions and Indicating Lights are Working	PASS	
Verified All Switch Handles and Closing Hardware Work Properly	PASS	
Verified Proper Alignment of Bucket Ground Clips	PASS	
Verified Control Power Transformer, Current Transformer, Voltage Transformer Ratios/Ratings Match Drawings, Spec, Data Sheet	PASS	
Verified that Shorting Devices On Current Transformer Secondaries are Supplied	PASS	
Verified that All Components Match Approved Documentation	PASS	
Circuit Protective Devices:		
Checked the Magnetic circuit protector and Breaker Settings	PASS	
Verified Overloads and/or Overload Heaters are Sized Correctly	PASS	
Verified Fuse Size and Fuse Clip Ratings	PASS	
Verified Timing Relays are the Correct Range and Set Per Diagram	PASS	

Structure	Status	Comments
Verified Dimensions are Per Documentation	PASS	
Verified Weight Before Shipping	PASS	
Verified Door Swing Clearances	PASS	
Verified Floor Mounting is Per Documentation	PASS	
Verified Elevation is Per Documentation	PASS	
Verified Proper Gauge of Sheet Metal and Doors for the Structure	PASS	
Verified Cable Knock-Out Plates are present where required	PASS	
Verified Lifting Eyes for Lifting Angle are Correct	PASS	
Verified Shipping Splits Match Drawings	PASS	

Labels and Nameplates	Status	Comments
Verify Letter Size is per documentation	PASS	
Verified that Nameplate Data is Per the Documentation Provided	PASS	
Verified section serial plate	PASS	
Verified warning labels are present	PASS	
Verified Wiring Diagram Labels are present	PASS	

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