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Standard Inspection and Test Checklist

Engineered Product

STANDARD INSPECTION & TEST CHECKLIST for ENGINEERED PRODUCT

(FO64E)

Document No:	FO-64	Issue Date:	January 02, 2008	Page	1 of 6
Created By:	Mohan Iyer	Revision Date:	N/A	Revision No.	0

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Standard Inspection and Test Checklist

Engineered Product

Customer:	Bi PURE	Date:	05/31/10
Project:	TALOYOAK PLANT	Customer PO No:	100414-JY-02-1772
I&TP Number:		Moeller WO No:	CCC-20-05660/1

Power	240 V	60 Hz	1 Ph	Wire
AC Control	120 V	60 Hz	1 Ph	Wire
DC Control	V			

A1	Visual Check - Structure *Verify the following items:*	Assembly	QA Inspector	Remarks
1.1	Door component arrangement is per the LOP.		✓	
1.2	Door latches are supplied as ordered.		✓	
1.3	Paint color inside and outside are correct.		✓	
1.4	Door finish is free of scratches and abrasions.		✓	
1.5	Door nameplates are of the correct material & positioning, alignment and fastening are correct.		✓	
1.6	Door nameplate and equipment labeling is correct.		✓	
1.8	Door cutouts are deburred & painted. Paint is removed at the hinges.		✓	
1.9	Cover plates are gasketed correctly.		✓	
1.10	Openings are sealed where necessary.		✓	
1.11	Main Horizontal and vertical busbar are plated.		✓	
1.12	Main Horizontal and vertical busbar are fully insulated.		N/A	
1.13	Horizontal, vertical & ground bus ampere ratings is correct.		✓	
1.14	Check busbar support for bracing. Braced for 50 KA		✓	
1.15	Ground lug is mounted at both ends of ground bus.		✓	
1.16	Grounding of devices (*and doors if required*)		✓	Devices only
1.17	Lifting angles/bolts are tight.		✓	
1.18	Drawers move freely inside of compartment.		✓	
1.19	Drawer latch can be engaged.		✓	

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A1	Visual Check – Structure *(continued)* *Verify the following items:*	Assembly	QA Inspector	Remarks
1.20	Mounting plate & ground lug is complete and mounted correctly.		✓	
1.21	Mounting plate perforations are deburred.		✓	
1.22	Vertical bus shutter kit installed and operating properly.		N/A	
1.23	Component arrangement on mounting plate is as per the LOP.		✓	

A2	Visual Check - Components *Verify the following items:*	Assembly	QA Inspector	Remarks
2.1	Components are as per the Bill of Materials.		✓	
2.2	Proper short-circuit protection is provided (*Breaker Trip Unit, Fuses, Etc.*)		✓	
2.3	Breaker magnetic and thermal ranges and settings are correct.		✓	
2.4	A line and load cover is installed on breakers and disconnects.		✓	
2.5	Mechanical interlock for contactors is provided where required, and is functioning correctly.		N/A	
2.6	Overload relays have correct range and settings.		✓	
2.7	Overload relays are set to manual.		✓	
2.8	Door Mounted overload reset operates correctly.		✓	
2.9	Contactor sizes are correct.		✓	
2.10	Contactor and relay coil voltages and frequency are correct.		✓	
2.11	Control fuses and fuse holders are of correct type and size.		✓	
2.12	Ratings of control and distribution transformers are correct.		✓	
2.13	Range of meters are correct. (*Voltage, Amperage, Etc.*)		N/A	
2.14	Timer relays have correct range.		✓	
2.15	Tools, hardware and bus couplers are supplied, *as required.*		✓	no couplers

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A3	Visual Check - Wiring *Verify the following items:*	Assembly	QA Inspector	Remarks
3.1	Power plug wire is correct size & type. Size _____		✓	
3.2	Power wire is correct size & type. Size _____		✓	
3.3	Power wire phasing tape is colored and sequenced; *if required.* (-A, Black-B and Blue-C, White-Neutral & -Gnd).		✓	
3.4	Terminals for power & control wiring are of proper size & type.		✓	
3.5	Torque screws on devices and terminals are properly tightened in accordance with fabrication documents.		✓	
3.6	Torque screws are color coded and sealed.		N/A	
3.7	AC control wire is Red, #14 AWG, Stranded.		✓	
3.8	DC control wire is Blue, #14 AWG, Stranded.		✓	
3.9	Ground bus bolts and nuts are provided.		✓	
3.10	Power, control and communications harnesses are per arrangement drawing.		✓	
3.11	Power load terminals are as per BOM.		✓	
3.12	Control terminals are as per BOM.		✓	
3.13	Wire ferrules are provided per fabrication documents, as required.		✓	
3.14	Power and control harnesses are supported adequately, are neat, and facilitates component replacement.		✓	
3.15	All wiring is protected from contact with sharp metal edges.		✓	
3.16	Power and control wiring is according to drawings.		✓	
3.17	Control transformer X2 lead terminates in ring lug to ground and is accessible. *(if required)*		N/A	
3.18	Ty-Rap's are tensioned, trimmed and spaced.		✓	
3.19	Wire markers are provided per drawing, as required.		✓	

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A4	Visual Check - Labeling *Verify the following items:*	Assembly	QA Inspector	Remarks
4.1	Line, load, neutral and ground terminations are correctly labeled per wiring diagram.		✓	
4.2	Control terminals are correctly identified per wiring diagram.		✓	
4.3	Labels are installed on components, fuses, etc.		✓	
4.4	Breaker, magnetic trip block and disconnect are labeled properly.		✓	
4.5	Rating labels are on mounting plates.		✓	

B1	Electrical Testing *Verify the following items:*	QA Inspector	Remarks
1.1	Breaker/Disconnect switch handle and auxiliary contact operation is satisfactory.	✓	
1.2	Electrical clearances Phase-to-Phase and Phase-to-Ground are within tolerance.	✓	
1.3	Continuity test results are satisfactory.	✓	
1.4	Power and control dielectric test results are satisfactory and recorded on the FO65A. (*Refer to the PV manual*)	✓	
1.5	Power and control function test results are satisfactory. (*Refer to the PV manual*)	✓	
1.6	All auxiliary contacts are provided and wired per the drawings.	✓	
1.7	Mechanical and electrical interlocks of contactors are working satisfactory *(if required)*	N/A	
1.8	Ground Wires are reconnected after completion of tests and are checked for continuity.	✓	
1.9	All test devices, connections and jumpers are removed.	✓	
1.10	Inspection labels/stamps are provided on panel or starter units.	✓	

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C1	Final Pre-packaging *Verify the following items:*	QA Inspector	Material Handler	Remarks
1.1	Test records per section A1. A2, A3, A4 & B1 are complete and satisfactory.	✓		
1.2	All documents per the document list are provided (*site installation, maintenance and calibration manuals*).	✓		Maintenance Manuals Required: _____
1.3	QA Inspector and Assemblers stamps are affixed.	✓		
1.4	UL, CSA or ESA monogram is applied per drawing.	✓		
1.5	Assembly exterior and interior is cleaned and vacuumed.	✓		

D1	Post-packaging *Verify the following items:*	Material Handler	Remarks
1.1	Assembly is properly packaged per packing instructions.	✓	
1.2	Envelope with shipping papers is affixed to package.	✓	
1.3	Package is tagged and labeled correctly per packing instructions.	✓	

Assembler/Wireman Stamp(s)	QA Inspector's & Material Handlers Stamp(s)

	(Print Name)		
Project Technician:	ARIEL DACOS	Signature:	
Production Supervisor/ Team Leader:	(Print Name) SAVIO D'SILVA	Signature:	
Quality Supervisor or QA Inspector:	(Print Name) DOUG FERGUSON	Signature:	D. F

This Inspection and Test Checklist has been reviewed and approved by:

Gary J. Glover
Director of Quality Assurance
Moeller Electric

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MOELLER

Notice to Installer

For your safety and guaranteed performance, please check and re-tighten all terminals that may have become loose during shipment.

HA-NA 621-L (10/00)

HA-NA 621-L (10/0

Avis à l'installateur

Pour la protection du personnel et le bon fonctionnement de l'équipement, vérifier attentivement tout les raccords et les resserrer au besoin.

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Dielectric Test Certification

High Potential Testing Set (UH 27 & UH 270)

Customer:	Bi pure WATER	Date:	05/31/10
Project Name:	TAYOKAK TREATMENT PLANT	Work Order No:	cont 20-05640/1
Test Set *(circle)*	(UH 27) or UH 270	Serial No:	
		Calibration Date:	2010

APPLICATION

The dielectric test is performed on all control assemblies (e.g. Motor Control Centers, Custom Control Panels, Project Starters, etc.) in order to ascertain that the dielectric strength of the insulation is adequate. The dielectric test of individual devices only (e.g. contactors, control transformers, etc.) is not required as these tests are performed by the manufacturer(s).

GENERAL SAFETY MEASURES

The test set can produce a voltage of up to 5000 Volts AC and is therefore extremely dangerous.

The test area should be separated from other work areas by a barrier. Only personnel expressly trained and authorized should be permitted to enter the work area or handle the test unit.

Prior to starting the test, the QA Inspector must be convinced of the satisfactory state of the test equipment. The QA Inspector should also insure that the test voltage is properly set.

The unit to be tested must be firmly positioned and properly isolated from other devices.

The QA Inspector and the tested device should be insulated from ground by a rubber mat.

The QA Inspector must use both hands for testing, one pistol grip prong in each hand. It is unsafe to take both test prongs in one hand.

Should the QA Inspector be required to do any other task, such as turning or shifting the device being tested, they must first place both prongs in their holders and disconnect the test unit.

The QA Inspector must disconnect the test equipment before leaving the test area. The QA Inspector must also remove the key and the six pole plug on the UH 27 test set.

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Dielectric Test Certification

High Potential Testing Set (UH 27 & UH 270)

TEST PROCEDURE

A1	**Verification:** *Verify the following items:*	QA Inspectors Stamp	Remarks
1.1	Disconnect wires on the primary side of the control transformer(s). If there is no control transformer, disconnect control wires from *L1* & *L2*.	✓	
1.2	Disconnect the ground connection from *X2* on the secondary side of the control transformer(s), if supplied.	✓	
1.3	Make sure that no coil, indicating lights, voltage trips, measuring instruments or other devices remain connected between phases *A*, *B* & *C* (*L1*, *L2*, *L3*).	✓	
1.4	Close starter circuit breaker(s) or fusible disconnect switch(es). Terminals *T1*, *L1* and *T2*, *L2* and *T3*, *L3* of the fusible disconnect switch(es) have to be bridged over with jumpers if no fuses are supplied.	✓	
1.5	Place the emergency stop pushbutton station outside the test area, so that if an emergency occurs, attending personnel can quickly depress the emergency stop.	✓	
1.6	Connect the test set to 120VAC.	✓	
1.7	Turn the cam switch to the "START" position.	✓	
1.8	Insert the six pole plug *(UH 27 Test Set)* or key *(UH 270 Test Set)*.	✓	
1.9	Press "ON" pushbutton.	✓	
1.10	Press "T" pushbutton. The signal lamp & burning blinker lamp should light up. *(UH 27 Test Set Only)*	✓	
1.11	Adjust the test voltage according to the following table: **System Voltage** — **Test Voltage** 0 – 300 Volts — 2.0 kV for one second 301 – 600 Volts — 2.7 kV for one second	✓	

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Dielectric Test Certification

High Potential Testing Set (UH 27 & UH 270)

TEST PROCEDURE (continued)

B1	**Testing – MCC Structure:** *Verify the following items:*	**QA Inspectors Stamp**	**Remarks**
	Test the Bussbar @ 2.7kV for one second for each of the following:		
1.1	Phase A (L1) to Ground (Earth). Phase B (L2) to Ground (Earth). Phase C (L3) to Ground (Earth).	✓	
1.2	Phase A (L1) to Phase B (L2). Phase A (L1) to Phase C (L3). Phase B (L2) to Phase C (L3).	✓	

B2	**Testing – MCC Starters/Enclosed Starters/Control Panels:** *Verify the following items:*	**QA Inspectors Stamp**	**Remarks**
	Apply test voltage, *per A1.11*, between each of the following:		
1.1	Phase L1 to Ground (Earth). Phase L2 to Ground (Earth). Phase L3 to Ground (Earth).	✓	
1.2	Phase L1 to Phase L2. Phase L1 to Phase L3. Phase L2 to Phase L3.	✓	
1.3	Terminal T1 to Ground (Earth). Terminal T2 to Ground (Earth). Terminal T3 to Ground (Earth).	✓	
1.4	Terminal T1 to Terminal T2. Terminal T1 to Terminal T3. Terminal T2 to Terminal T3.	✓	
1.5	Between the Steel Structure and each Terminal in the Control Circuit. **(Verify the voltage & adjust per A1.11 as the control circuit may be a lower voltage)**	✓	
1.6	Reconnect all connections previously opened. Perform ground continuity test between the Control Transformer Grounding Screw on the mounting plate and the ground bus.	✓	

QA Inspector:	*(Print Name)*	**Signature:**	
Quality Supervisor:	*(Print Name)* Doug Ferguson	**Signature:**	D-[signature]

By signing above I have verified that the Dielectric Test [illegible] testing procedures.

This Dielectric Test Certification has been reviewed and approved by:

[signature]
Gary J. Glover
Director of Quality Assurance
Technical Resources Manager
Moeller Electric

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