Winnipeg	**INSPECTION FORM** **MOLDED CASE CIRCUIT BREAKER, < 1000V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Breaker Data			
	Location:	Panelboard/MCC:	Cell #:
	Manufacturer:	Type:	Serial #:
	Rated Voltage: V	Frame Size: A	Trip Unit:
	Interrupting Rating: kA	Comments:	

Visual Inspection / Cleaning		
	Breaker Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Cables Supported Appropriately: ☐ Yes ☐ No
	Connections: ☐ Good ☐ Acceptable ☐ Poor	Electro/Mechanical Interlock: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Exercise Circuit Breaker: ☐ Yes
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor	Other:
	Comments:	

Breaker Settings

Trip Unit Rating: A — Trip Unit Type: ☐ None ☐ Thermal Magnetic ☐ Electronic ☐ LI ☐ LSI ☐ LSIG

Breaker Setting (As Left)		**Range**	**Setpoint**	**Delay**	**I^2T**
Long Time	☐ Fixed ☐ Adj.	-	X A = A	sec	☐ On ☐ Off
Short Time	☐ Fixed ☐ Adj.	-	X A = A	sec	☐ On ☐ Off
Instantaneous	☐ Fixed ☐ Adj.	-	X A = A	N/A	
Ground Fault	☐ Fixed ☐ Adj.	-	A	sec	☐ On ☐ Off

Insulation Resistance Test

Perform insulation resistance measurements for breakers >= 250A, or as specified.

Temperature: °C

Source: ☐ Disconnected ☐ Connected (Source Isolated)

Load: ☐ Disconnected ☐ Connected (Load Isolated)

Approval is required, prior to leaving cables connected during the test.

Test Voltage (VDC)	**Insulation Resistance (MΩ)**								
	Phase To GND (Breaker Closed)			**Phase To Phase (Breaker Closed)**			**Line to Load (Breaker Open)**		
	A	**B**	**C**	**A – B**	**B – C**	**A - C**	**A**	**B**	**C**

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

Comments:

Contact Resistance

Perform contact measurements for breakers >= 250A, or as specified.

Resistance (μΩ)	**A**	**B**	**C**

Comments:

Test Summary
☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Final Analysis				
	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **EMERGENCY LIGHTING**	Page 1 of 1 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Battery Unit Data				
Location:		Fed From:		Circuit #:
Manufacturer:		Model:		Serial No:
Input Voltage: V AC	Input Current: A	Output Voltage: V DC		Wattage: W
Qty of Internal Lamps:	Internal Lamp Wattage: W	Type of Internal Lamps:		

Remote Fixtures			
Quantity:	Manufacturer:	Model:	
Input Voltage: V DC	Input Current: A	Qty of Lamps per Fixture:	
Lamp Wattage: W	Type of Lamps:	Wire Size: AWG	

Visual Inspection / Cleaning		
Identification Tag Installed: ☐ Yes ☐ No	Lamps Properly Aimed: ☐ Yes ☐ No	
Visual signs of Moisture: ☐ Yes ☐ No	Connections: ☐ Good ☐ Acceptable ☐ Poor	
Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	
Comments:		

Battery Testing	
Equipment Temperature: °C	**Test Summary** ☐ Test Passed ☐ Test Inconclusive ☐ Further Investigation Required. ☐ Test Failed
Test Results Stated Design Time (From Drawings): Min Time Until Lamps Turn Off: Min	
Comments:	

Final Analysis		
Returned to Service: ☐ Yes ☐ No	Comments:	
Monitoring / Inspection Required: ☐ Yes ☐ No		
Repair / Replacement Required: ☐ Yes ☐ No		

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSTRUMENTATION SWITCH CHECKLIST**	Page 1 of 1

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Instrument		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Instrument type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of sensor complete and correct		
4.	Block and drain valves		
5.	Pneumatic / hydraulic tubing leak tested		
6.	Heat tracing / insulation / instrument housing		
7.	Wiring correct		
8.	Drawings marked up as-built		
9.	HMI Graphic symbol and tag correct		

State Checklist					
State	**State Desc**	**PLC Input**	**Local HMI**	**SCADA**	**Alarm**	**Pass (P/F)**
0		☐	☐	☐	☐ On ☐ Off ☐ N/A	
1		☐	☐	☐	☐ On ☐ Off	

Calibration					
Transition	**Setpoint Trip Point** (incl. units)	**Actual Trip Point** (incl. units)	**Setpoint Time Delay**	**Actual Time Delay**	**Pass (P/F)**
0 → 1					
1 → 0					

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSTRUMENTATION TRANSMITTER LOOP CHECKLIST**	Page 1 of 2

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Instrument (Sensor / Element)		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Transmitter		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:
Units:	Design Range: -	
Output ☐ 4-20 mA ☐ 0-10 V ☐ Modbus ☐ Ethernet IP ☐ Other:		

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Instrument type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of sensor complete and correct		
4.	Block and drain valves		
5.	Pneumatic / hydraulic tubing leak tested		
6.	Heat tracing / insulation / instrument housing		
7.	Impulse lines pressure tested		
8.	Wiring correct		
9.	Drawings marked up as-built		
10.	HMI Graphic symbol, tag and units correct		

Signal Validation					
Input Signal	**Location**	**Design Value**	**Actual Value**	**Error (%)**	**Pass (P/F)**
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				
	Transmitter Display				
	Transmitter Output				
	Process Display				
	PLC				
	HMI				

Notes:
1. Attach factory calbration forms for all instruments where provided and/or specified.
2. Provide instrument parameters for each parameter changed from the factory default.

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSPECTION FORM** **MCC, 600V**	Page 1 of 6 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

MCC Data				
	Location:			# of Cells:
	Manufacturer:	Model:	Serial #:	
	Rated Voltage: V	Main Bus Rating: A	Main Bus Neutral Rating: A	
	Bus Conductor: ☐ Copper ☐ Aluminum	Current Withstand Rating: A		

Visual Inspection / Cleaning				
	Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Visual Signs of Moisture: ☐ Yes ☐ No		Visual Signs of Corona: ☐ Yes ☐ No	
	Fuse/Breaker Sizes Match Drawings: ☐ Yes ☐ No		PT and CT ratios match drawings: ☐ N/A ☐ Yes ☐ No	
	Elevation Drawings Correct: ☐ Yes ☐ No		Cables Supported Appropriately: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Insulators Condition: ☐ Good ☐ Acceptable ☐ Poor	
	Connections: ☐ Good ☐ Acceptable ☐ Poor		Electro/Mechanical Interlock System: ☐ Good ☐ Acceptable ☐ Poor	
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor		Vents/Filters: ☐ Good ☐ Acceptable ☐ Poor	
	Doors Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Exercise Active Components: ☐ Yes ☐ No	
	Cell Fit and Alignment: ☐ Good ☐ Acceptable ☐ Poor			
	Required Clearances are Met: ☐ Good ☐ Acceptable ☐ Poor			
	Indicating mechanisms: ☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned: ☐ Yes	Photograph Taken: ☐ Yes	
	Comments:			

Incoming Power	**Type:**	**Inspection**				
	☐ Main Breaker	Complete appropriate breaker inspection form.				
	☐ Disconnect	Complete appropriate disconnect inspection form.				
	☐ Main Lugs	Visual Inspection: ☐ Good ☐ Acceptable ☐ Poor				
		Connections Torqued: ☐ Yes				
		Connection Resistance (μΩ) As Left	**A**	**B**	**C**	**N**

Insulation Resistance Test (Buswork)

Test Preparation:
Source:
☐ Disconnected
☐ Connected with Source Isolated

Cable Dest. / Load:
☐ Disconnected
☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Temperature: °C

Test Voltage (dc)	Insulation Resistance (MΩ) Phase To Phase		
	A - B	B - C	C - A
1000 V			

Test Voltage	Insulation Resistance (MΩ) Phase To GND		
	A - GND	B - GND	C - GND
1000 V			

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Comments:

Ground Resistance Checks (Ductor Test)

Point A	Point B	Resistance (μΩ)
MCC GND Bus	Facility Ground Electrode	
MCC GND Bus	MCC Enclosure	
MCC GND Bus	System Neutral	

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Comments:

Feeder Breakers

Visual Inspect Requirements: G=Good, A=Acceptable, P=Poor Comments are required for all items identified in Poor condition.

1. Confirm identification tag / lamacoid is installed.
2. Look for visual signs of overheating.
3. Inspect and torque connections.
4. Inspect and test any electro/mechanical interlocks.
5. Confirm disconnect operation.
6. Check door mechanical condition.
7. Exercise circuit breaker.
8. Confirm cables are supported and routed appropriately.
9. Visually assess the general condition of the installation.

Note: Complete an appropriate Breaker Inspection Form for all breakers with separate adjustable Long and Short trip settings, Ground trip settings, or > 250A frame size.

Continued on next page

Feeder Breakers	Continued from previous page										
	ID	**Loc./ Cell**	**Frame Rating (A)**	**Trip Rating (A)**	**Manuf.**	**Model**	**Trip Unit Type**	**Inst Setting**	**Visual Inspection**	**Cleaned**	**Comments**
										☐	
										☐	
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	General Comments:										

Motor Starters / Contactors

Overcurrent Protection Type:	B=Breaker (Thermal Magnetic), M=Motor Circuit Protector, F=Fuse
Overload Protection Type:	T=Thermal, SS=Solid State, I=Intelligent
Visual Inspect Requirements:	G=Good, A=Acceptable, P=Poor Comments are required for all items identified in Poor condition.
1.	Confirm identification tag / lamacoid is installed.
2.	Look for visual signs of overheating.
3.	Inspect and torque connections.
4.	Inspect and test any electro/mechanical interlocks.
5.	Confirm disconnect operation.
6.	Check door mechanical condition.
7.	Exercise circuit breaker.
8.	Confirm cables are supported and routed appropriately.
9.	Visually assess the general condition of the installation.
Note:	Complete a Motor Starter Inspection Form for all Motor Starters Size 4 or larger, with VFDs, or with Soft Starters.

Motor Starters / Contactors

ID	Loc./ Cell	Overcurrent Protection				Contactor	Overload		Visual Insp.	Cleaned	Comments
		Type	Rating (A)	Manuf.	Model	Size / Rating	Type	Model			
										☐	
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										☐	
General Comments:											

Winnipeg	**INSPECTION FORM** **MCC, 600V**	Page 5 of 6 ID:

	ID	**Loc./ Cell**	**Overcurrent Protection**				**Contactor**	**Overload**		**Visual Insp.**	**Cleaned**	**Comments**
			Type	**Rating (A)**	**Manuf.**	**Model**	**Size / Rating**	**Type**	**Model**			
Motor Starters											☐	
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	General Comments:											

Final Analysis				Comments:
	Returned to Service:	☐ Yes	☐ No	
	Monitoring / Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**MODULATING CONTROL DEVICE CHECKLIST**	Page 1 of 1

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

Control Device		
Tag:	Description:	
Manufacturer:	Model:	Serial Number:

Inspection Checklist			
No.	**Item to be Inspected**	**Comments**	**Pass (P/F)**
1.	Actuator type and class per P&ID and specification		
2.	Instrument tag(s) installed and correct		
3.	Installation of actuator complete and correct		
4.	Wiring correct		
5.	Drawings marked up as-built		
6.	HMI graphic symbol, tag and units correct		

Control Validation					
Control Output	**Location**	**Design Value**	**Actual Value**	**Error (%)**	**Pass (P/F)**
0%	**PLC Output**				
	Field Device				
50%	**PLC Output**				
	Field Device				
100%	**PLC Output**				
	Field Device				

Notes:
1. Attach factory calbration forms for all instruments where provided and/or specified.
2. Provide instrument parameters for each parameter changed from the factory default.

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSPECTION FORM** **MOTOR STARTER, FVNR, 600V**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Starter Data						
	Load:		Starter Location:			Cell #:
	Manufacturer:		Type:			Serial #:
	Size:	Rated Voltage: V		Current Rating: A		Control Voltage: V
	Circuit Protection:	☐ Fused Disc.	Rating: A	Fuse Size: A	Fuse Mfg.	
					Model:	
		☐ Breaker ☐ MCP	Rating: A	Inst. Setting: A	Manufacturer:	
					Model:	
	Overload Protection:	☐ Thermal ☐ Electronic ☐ Intelligent	Class: ☐ 10 ☐ 20 ☐ 30 ☐ Unknown	Setting / Rating: A	Manufacturer:	
					Model:	
	Control Power Transformer:	Size: VA	Sec. Voltage: V	Primary Fuse: A	Secondary Fuse: A	
	Current Transformers:	Phases: ☐ A ☐ B ☐ C	☐ None	Ratio:	Ground Fault CT: ☐ Present ☐ Not Present	Ratio:

Motor Data			
	ID:	Size: kW / HP	Voltage: V
	Full Load Amps: A	Service Factor:	Other:

Visual Inspection / Cleaning		
	Starter Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Support Insulators: ☐ Good ☐ Acceptable ☐ Poor
	Connections ☐ Good ☐ Acceptable ☐ Poor	Electro/Mechanical Interlock: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Contactor Condition: ☐ Good ☐ Acceptable ☐ Poor
	Door Mechanical ☐ Good ☐ Acceptable ☐ Poor	Contact Alignment: ☐ Good ☐ Acceptable ☐ Poor
	Verify O/L element is correctly sized for the load: ☐ Yes ☐ No	Exercise Circuit Breaker/MCP/Disconnect ☐ Yes
	Cables Supported Appropriately: ☐ Yes ☐ No	Unit Cleaned: ☐ Yes Photograph Taken: ☐ Yes
	Comments:	

Contact/Pole Measurements	**Test**	**A**	**B**	**C**	**Test Summary**
	Contact Resistance (μΩ)				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Disconnect / Breaker / MCP Resistance (μΩ)				
	Fuse Resistance (μΩ)				
	Comments:				

Insulation Resistance Test

Test Preparation:
Source: ☐ Isolated
Contactor: ☐ Open
Cable Dest. / Load:
☐ Disconnected
☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Test	Voltage	Insulation Resistance (MΩ)			Ground all phases not under test!
		A	B	C	
Contactor Line To GND	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Contactor Load To GND	1000 VDC				
Contactor Line to Load	1000 VDC				

Comments:

Final Analysis

Returned to Service:	☐ Yes	☐ No	Comments:
Monitoring / Further Inspection Required:	☐ Yes	☐ No	
Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **AC MOTOR, LOW VOLTAGE**	Page: 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Motor Data				
	Size: kW / HP	Voltage: V		R.P.M:
	Manufacturer:	Model:		Serial Number:
	Frame Type:	FLA: A	Service Factor:	Other:
	Cooling: ☐ Air ☐ Fan	# Cooling Fans:	Winding Material:	

Visual Inspection / Cleaning				
	Motor Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Connections: ☐ Good ☐ Acceptable ☐ Poor		Air Baffles: ☐ Good ☐ Acceptable ☐ Poor	
	Paint: ☐ Good ☐ Acceptable ☐ Poor		Filter Media: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	
	Cooling Fans: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor		Fan Controls: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	
	Anchorage/Alignment: ☐ Good ☐ Acceptable ☐ Poor			
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor			
	Mechanical/Electrical Noise During Operation: ☐ Yes ☐ No		Lubrication Required: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Unit Cleaned: ☐ Yes	Photograph Taken: ☐ Yes

Winding Insulation Resistance	**Stator Winding**	**Test Voltage (Vdc)**	**Winding Temperature (°C)**	**Resistance (MΩ)**			**Dielectric Absorption Ratio**	**Polarization Index (a)**
				30 Sec	**1 min.**	**10 min. (a)**		
		500					-	-
			40					
		500					-	-
			40					
		500					-	-
			40					
	Notes: (a) Testing to 10 minutes and calculation of Polarization Index is only required for motors > 150 kW (200 HP)							
	Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed							

Winding Resistance	**Resistance (μΩ)**			**Test Summary**
	A - B	**B – C**	**A - C**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Comments:			

Winnipeg	**INSPECTION FORM** **AC MOTOR, LOW VOLTAGE**	Page: 2 of 2 ID:

Bearing Insulation Resistance

☐ Not Applicable

Bearing	Test Voltage (Vdc)	Bearing Temperature (°C)	Resistance (MΩ)	
			1 min.	Corrected to 40°C
	500			
	500			

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

RTD Resistance

☐ Not Applicable

Actual Winding Temperature: °C

Actual Bearing Temperature °C

RTD	Resistance (Ω)	Calculated Temperature (°C)	RTD	Resistance (Ω)	Calculated Temperature (°C)

Test Summary ☐ Test Passed ☐ Test Inconclusive. Further Investigation Required. ☐ Test Failed

Note: Test connection resistance of bolted connections. Report on cable inspection sheet.

Final Analysis

Returned to Service:	☐ Yes	☐ No	Comments:
Monitoring / Further Inspection Required:	☐ Yes	☐ No	
Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **NON-FUSIBLE DISCONNECT SWITCH, 600V**	Page 1 of 2 ID:

Project	Facility:	Project Name:
	Area :	Bid Opportunity:

Disconnect Data	Manufacturer:	Model:	
	Rated Voltage: V	Current Rating: A	Interrupting Rating: A

Visual Inspection / Cleaning	Identification Tag Installed:	☐ Yes ☐ No	Visual Signs of Overheating:	☐ Yes ☐ No
	Cleanliness (As Found):	☐ Good ☐ Acceptable ☐ Poor	Support Insulators:	☐ Good ☐ Acceptable ☐ Poor
	Connections:	☐ Good ☐ Acceptable ☐ Poor	Blade Condition:	☐ Good ☐ Acceptable ☐ Poor
	Ground Connection:	☐ Good ☐ Acceptable ☐ Poor	Verify Blade Mechanical Operation:	☐ Good ☐ Acceptable ☐ Poor
	Door Mechanical:	☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned:	☐ Yes
	Fit Plumb & Square:	☐ Yes ☐ No	Unit Lubricated:	☐ Yes
	Cables Supported Appropriately:	☐ Yes ☐ No	Other:	

Switchblade Resistance	**Resistance (μΩ) (As Left)**			**Test Summary**
	A	**B**	**C**	☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
	Comments:			

Insulation Resistance Test

Test Preparation: Source: ☐ Isolated Disconnect: ☐ Open

Cable Dest. / Load: ☐ Disconnected ☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Test	**Voltage**	**Insulation Resistance (MΩ)**			Ground all phases not under test!
		A	**B**	**C**	
Disconnect Line To GND	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Disconnect Load To GND	1000 VDC				
Disconnect Line to Load	1000 VDC				
Comments:					

Final Analysis	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	PLC DISCRETE INPUT CHECKLIST	Page 1 of 2

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

PLC	
PLC ID:	Description:
Rack:	Slot:

Pt	Tag	Description	State	State Desc.	PLC Input	Local HMI	SCADA	Alarm		Pass (P/F)
			0		☐	☐	☐	☐ On ☐ Off	☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off		
			0		☐	☐	☐	☐ On ☐ Off	☐ N/A	
			1		☐	☐	☐	☐ On ☐ Off		
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			1		☐	☐	☐	☐ On ☐ Off		

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**PLC DISCRETE OUTPUT CHECKLIST**	Page 1 of 2

Project	
Facility:	Project Name:
Area :	Bid Opportunity:

PLC	
PLC ID:	Description:
Rack:	Slot:

Pt	**Tag**	**Description**	**State**	**State Desc.**	**PLC Output**	**Field Device**	**Pass (P/F)**
			0		☐	☐	
			1		☐	☐	
			0		☐	☐	
			1		☐	☐	
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			0		☐	☐	
			1		☐	☐	

Comments:

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Tested By				
Witnessed By				

Winnipeg	**INSPECTION FORM** **PANELBOARD, LOW VOLTAGE**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Panelboard Data				
	Location:	Fed From:		No. of Circuits:
	Manufacturer:	Model:	Serial No:	
	Rated Voltage: V	Current Rating: A	Withstand Rating: A	
	☐ Single Phase ☐ 3 Phase, 3 Wire ☐ 3 Phase, 4 Wire	Neutral Bonded to Ground ☐ Yes ☐ No		
	☐ Main Lugs			
	☐ Main Breaker: Rating: A Manufacturer: Model: Inst. Setting:			
	Complete separate inspection form (F-BKR-MC-LV) for main breaker if >= 250A, or has long, short, or ground fault settings.			

Visual Inspection / Cleaning				
	Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
	Visual signs of Moisture: ☐ Yes ☐ No		Visual Signs of Corona: ☐ Yes ☐ No	
	Fuse/Breaker Sizes Match Drawings: ☐ Yes ☐ No		Cables Supported Appropriately: ☐ Yes ☐ No	
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Connections: ☐ Good ☐ Acceptable ☐ Poor	
	Door Mechanical: ☐ Good ☐ Acceptable ☐ Poor		Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	
	Exercise All Circuit Breakers: ☐ Yes ☐ No		Comments:	

Insulation Resistance Test

Test Preparation:
Source:
☐ Disconnected
☐ Connected with Source Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

Equipment Temperature: °C

Temperature Correction Factor to 20°C:

Test Voltage	**Insulation Resistance (MΩ) Ground all Phases not under test!**							
	A-GND		**B-GND**		**C-GND**		**N-GND**	
	RDG	20°C	RDG	20°C	RDG	20°C	RDG	20°C

Test Summary

☐ Test Passed
☐ Test Inconclusive
Further Investigation Required.
☐ Test Failed

Test Voltages: 120-300V → 500 VDC Test Voltage 301-600V → 1000 VDC Test Voltage

Comments:

Load/Feeder Breakers

Breakers < 100A and Without Inst. Setting

List by model of breaker. Multiple breakers of varying ampacity may be listed per line.

Type	**Manufacturer**	**Model Series**	**Interrupting Rating (kA)**	**Positions/Circuits**	**Notes**
A					
B					
C					
D					
E					
F					

Load/Feeder Breakers

Breakers >= 100A or with Inst. Setting

List each breaker individually. Complete separate inspection form (F-BKR-MC-LV) for breaker if >= 250A, or has long, short, or ground fault settings.

ID	Pos.	Manufacturer	Model	Trip Rating (A)	Int. Rating (kA)	Inst. Setting	Separate Form	Notes
							☐	
							☐	
							☐	
							☐	
							☐	
							☐	

Final Analysis

Returned to Service:	☐ Yes	☐ No	Comments:
Monitoring / Inspection Required:	☐ Yes	☐ No	
Repair / Replacement Required:	☐ Yes	☐ No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg

INSPECTION FORM
VARIABLE FREQUENCY DRIVE, 600V, <37 kW

ID:

Project

Facility:	Project Name:
Area :	Bid Opportunity:

VFD Data

Load:			VFD Location:		Cell #:
VFD:	Manufacturer:		Model:		Serial #:
	Size:	Rated Voltage: V	Current Rating: A		Control Voltage: V
Circuit Protection:	☐ Fused Disc.	Rating: A	Fuse Size: A		Fuse Mfg.
					Model:
	☐ Breaker	Rating: A	Inst. Setting: A		Manufacturer:
					Model:
Line Reactor:	☐ Present ☐ N/A	Rating:			Manufacturer:
					Model:
Load Reactor:	☐ Present ☐ N/A	Rating:			Manufacturer:
					Model:
Bypass Contactor:	Type: ☐ NEMA ☐ IEC ☐ N/A	Manufacturer:			Model:
		NEMA Size:	IEC Rating: A ☐ AC-3 ☐ AC-4		
Bypass Overload Protection:	☐ Thermal ☐ Electronic ☐ Not Applicable	Class: ☐ 10 ☐ 20 ☐ 30 ☐ Unknown	Setting / Rating: A		Manufacturer:
					Model:
Control Power Transformer:	Size: VA	Sec. Voltage: V	Primary Fuse: A		Secondary Fuse: A
Current Transformer:	Ratio:		Type:		

Motor Data

ID:	Size: kW / HP		Voltage: V
Full Load Amps: A	Service Factor: ☐ 1.00 ☐ 1.15	Inverter Duty ☐ Yes ☐ No	Other:

Visual Inspection / Cleaning

Starter Identification Tag Installed: ☐ Yes ☐ No		Visual Signs of Overheating: ☐ Yes ☐ No	
Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor		Support Insulators: ☐ Good ☐ Acceptable ☐ Poor	
Connections ☐ Good ☐ Acceptable ☐ Poor		Electro/Mechanical Interlock: ☐ Good ☐ Acceptable ☐ Poor	
Ground Connection ☐ Good ☐ Acceptable ☐ Poor		Contactor Condition: ☐ Good ☐ Acceptable ☐ Poor	
Door Mechanical ☐ Good ☐ Acceptable ☐ Poor		Contact Alignment: ☐ Good ☐ Acceptable ☐ Poor	
Verify Bypass O/L element is correctly sized for the load: ☐ Yes ☐ No ☐ N/A		Exercise Circuit Breaker/MCP/Disconnect ☐ Yes	
Cables Supported Appropriately: ☐ Yes ☐ No		Unit Cleaned: ☐ Yes	Photograph Taken: ☐ Yes
Comments:			

Contact / Pole Measurements

Test	A	B	C	Test Summary
Bypass Contactor Contact Resistance (μΩ)				☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Breaker/Disconnect Resistance (μΩ)				
Main Fuse Resistance (μΩ)				

Comments:

Insulation Resistance Test

Test Preparation: Source: ☐ Isolated Contactor: ☐ Open Cable Dest. / Load: ☐ Disconnected ☐ Connected with Load Isolated

Note: Approval of City's Representative is required, prior to leaving cables connected during the test.

WARNING: DISCONNECT ALL POWER CABLES FROM VFD MODULE AND ALL CONTROL POWER FUSES PRIOR TO TEST.

Test	Voltage	Insulation Resistance (MΩ)			Ground all phases not under test!
		A	B	C	
Disconnect Line to GND	1000 VDC				
Disconnect Load to GND	1000 VDC				
Disconnect Line to Load	1000 VDC				
Bypass Contactor Line To GND	1000 VDC				**Test Summary** ☐ Test Passed ☐ Test Inconclusive Further Investigation Required. ☐ Test Failed
Bypass Contactor Load To GND	1000 VDC				
Bypass Contactor Line to Load	1000 VDC				

Comments:

Operational Inspection	Test Preparation: Run motor at full load.					
	Ramp Up Time	Specified:	sec	Actual:	sec	Comments:
	Measured Motor Current	ØA	A	ØB	A	ØC A
	VFD Motor Current	ØA	A	ØB	A	ØC A
	Remote (RTU/PLC/DCS) Displayed Motor Current:	A				
	Ramp Down Time	Specified:	sec	Actual:	sec	

Settings	Record Parameters and Settings on Separate Sheet.			Comments:
	Completed:	☐ Yes	☐ No	

Final Analysis	Returned to Service:	☐ Yes	☐ No	Comments:
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg	**INSPECTION FORM** **TRANSFORMER, DRY TYPE, LOW VOLTAGE**	Page 1 of 2 ID:

Project		
	Facility:	Project Name:
	Area :	Bid Opportunity:

Transformer Data											
	KVA:	Phase:	Primary Voltage: V	Secondary Voltage: V							
	Manufacturer:		Type:	Serial Number:							
	Primary Winding: ☐ Δ ☐ YG ☐ Y ☐ Other:		Secondary Winding: ☐ Δ ☐ YG ☐ Y ☐ Other:								
	Winding Material: ☐ Copper ☐ Aluminum		Impedance: %Z	Temp Rise: °C	K Factor:						
	No Load Tap Changer	Tap	1	2	3	4	5				Tap Setting (As Found):
		Voltage									

Visual Inspection / Cleaning		
	Transformer Identification Tag Installed: ☐ Yes ☐ No	Visual Signs of Overheating: ☐ Yes ☐ No
	Bushings: ☐ Good ☐ Acceptable ☐ Poor	Support Insulators: ☐ Good ☐ Acceptable ☐ Poor
	Paint: ☐ Good ☐ Acceptable ☐ Poor	No Load Tap Changer: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Fans: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	Fan Controls: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor
	Temp. Gauge: ☐ N/A ☐ Good ☐ Acceptable ☐ Poor	Connections: ☐ Good ☐ Acceptable ☐ Poor
	Ground Connection: ☐ Good ☐ Acceptable ☐ Poor	Neutral Bonded to Ground: ☐ N/A ☐ Yes ☐ No
	Cleanliness (As Found): ☐ Good ☐ Acceptable ☐ Poor	Unit Cleaned: ☐ Yes Photograph Taken: ☐ Yes

Operational Inspection					
	Operational Conditions / Notes:				
	Primary Voltage:	H1:H2: V	H2:H3: V	H3:H1: V	Measured at:
	Secondary Voltage:	X1:__: V	X2:__: V	X3:__: V	Measured at:
	Current:	Ph A: A	Ph B: A	Ph C: A	Measured at:
	Tap Setting:	☐ Appears Satisfactory ☐ Further Monitoring Recommended. ☐ Recommend Changing Tap.		Tap Setting (As Left):	
	Thermographic Inspection Performed:	☐ Yes Attach report separately	Results: ☐ No Issues Found ☐ Potential Issue Identified.		

Insulation Resistance	**Winding**	**Test Voltage (Vdc)**	**Resistance (MΩ)**		**Dielectric Absorption Ratio 60s/30s**
			30 sec	**60 sec.**	
	Primary to Ground, Secondary Guarded				
	Secondary to Ground, Primary Guarded				
	Primary to Secondary, Ground Guarded				

Final Analysis				Comments:
	Returned to Service:	☐ Yes	☐ No	
	Monitoring / Further Inspection Required:	☐ Yes	☐ No	
	Repair / Replacement Required:	☐ Yes	☐ No	

	Company	**Name**	**Signature**	**Date** (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person(s) performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.