

EXPLO National Manual for Projects Management

Volume 10, chapter 3

Testing & Commissioning Checklists and Templates



Document No. EPM-KT0-RG-000007 Rev 003



Testing & Commissioning Checklists and Templates

Document Submittal History:

Revision:	Date:	Reason For Issue
000	30/10/2017	For Use
001	06/02/2018	For Use
002	25/11/2018	For Use
003	22/09/2021	For Use



Testing & Commissioning Checklists and Templates

THIS NOTICE MUST ACCOMPANY EVERY COPY OF THIS DOCUMENT

IMPORTANT NOTICE

This document, ("Document") is the exclusive property of the Government Expenditure and Projects Efficiency Authority.

This Document should be read in its entirety including the terms of this Important Notice. The government entities may disclose this Document or extracts of this Document to their respective consultants and/or contractors, provided that such disclosure includes this Important Notice.

Any use or reliance on this Document, or extracts thereof, by any party, including government entities and their respective consultants and/or contractors, is at that third party's sole risk and responsibility. Government Expenditure and Projects Efficiency Authority, to the maximum extent permitted by law, disclaim all liability (including for losses or damages of whatsoever nature claimed on whatsoever basis including negligence or otherwise) to any third party howsoever arising with respect to or in connection with the use of this Document including any liability caused by negligent acts or omissions.

This Document and its contents are valid only for the conditions reported in it and as of the date of this Document



Testing & Commissioning Checklists and Templates

Table of Contents

1.0	PURPOSE OF THE DOCUMENT	6
2.0	SCOPE.....	6
3.0	DEFINITIONS	6
4.0	REFERENCES	7
5.0	RESPONSIBILITIES.....	7
6.0	PROCESS	7
7.0	ATTACHMENTS.....	8
Attachment 1 - EPM-KT0-TP-000001 - Checklist - Pre-start up for Pumps.....		10
Attachment 2 - EPM-KT0-TP-000002 - Checklist - Pre-start up for Fire Pumps		11
Attachment 3 - EPM-KT0-TP-000003 - Checklist - Pre-start up for Fans		12
Attachment 4 - EPM-KT0-TP-000004 - Checklist - Pre-start up for Centralized AHU		13
Attachment 5 - EPM-KT0-TP-000005 - Checklist - Pre-start up for VAV Box		14
Attachment 6 - EPM-KT0-TP-000006 - Checklist - Pre-start up for FCU		15
Attachment 7 - EPM-KT0-TP-000007 - Checklist - Pre-start up for CRAC.....		16
Attachment 8 - EPM-KT0-TP-000008 - Checklist - Pre-start up for Chillers.....		17
Attachment 9 - EPM-KT0-TP-000009 - Checklist - Pre-start up for Cooling Towers.....		18
Attachment 10 - EPM-KT0-TP-000010 - Checklist - Pre-start up for Plate Heat Exchangers		19
Attachment 11 - EPM-KT0-TP-000011 - Checklist - Pre-start up for Boilers.....		20
Attachment 12 - EPM-KT0-TP-000012 - Checklist - Pre-start up for Condensate Recovery Unit.....		21
Attachment 13 - EPM-KT0-TP-000013 - Checklist - Pre-start up for Water Treatment Plant		22
Attachment 14 - EPM-KT0-TP-000014 - Checklist - Pre-start up for Waste Water Treatment Plant		23
Attachment 15 - EPM-KT0-TP-000015 - Checklist - Pre-start up for Electric Traction Elevator.....		24
Attachment 16 - EPM-KT0-TP-000016 - Checklist - Pre-start up for Escalator and Moving Walks		25
Attachment 17 - EPM-KT0-TP-000017 - Checklist - Pre-start up for Building Maintenance Unit (BMU) ...		26
Attachment 18 - EPM-KT0-TP-000018 - Checklist - Pre-start up for Generator Set		27
Attachment 19 - EPM-KT0-TP-000019 - Checklist - Pre-energization for HV/MV Switchgear		28
Attachment 20 - EPM-KT0-TP-000020 - Checklist - Pre-energization for Switchboards.....		29
Attachment 21 - EPM-KT0-TP-000021 - Checklist - Pre-energization for Transformers.....		30
Attachment 22 - EPM-KT0-TP-000022 - Checklist - Pre-commissioning for HV/MV Ring Main Unit.....		30
Attachment 23 - EPM-KT0-TP-000023 - Checklist - Pre-commissioning for HV/MV Capacitor Banks		32
Attachment 24 - EPM-KT0-TP-000024 - Checklist - Pre-energization for MV/LV Automatic Transfer Switch.....		33
Attachment 25 - EPM-KT0-TP-000025 - Checklist - Pre-energization for UPS.....		34
Attachment 26 - EPM-KT0-TP-000026 - Checklist - Pre-energization for MCC/Distribution Boards		35
Attachment 27 - EPM-KT0-TP-000027 - Checklist - Pre-energization for HV/LV Cables.....		36
Attachment 28 - EPM-KT0-TP-000028 - Checklist - Pre-commissioning for Grounding (Earthing)		37
Attachment 29 - EPM-KT0-TP-000029 - Checklist - Functional and Performance Test for Fire Pumps....		38
Attachment 30 - EPM-KT0-TP-000057 - Checklist - Pre-start Up for VoIP		39
Attachment 31 - EPM-KT0-TP-000059 - Checklist - Pre-start Up for LAN/WLAN.....		40
Attachment 32 - EPM-KT0-TP-000030 - Checklist - Functional and Performance Test for Chilled Water Pumps		41
Attachment 33 - EPM-KT0-TP-000031 - Checklist - Functional and Performance Test for Central Fans..		42
Attachment 34 - EPM-KT0-TP-000032 - Checklist - Functional and Performance Test for Centralized AHU.....		43
Attachment 35 - EPM-KT0-TP-000033 - Checklist - Functional and Performance Test for CRAC (Precision Unit)		44
Attachment 36 - EPM-KT0-TP-000034 - Checklist - Functional and Performance Test for FCU		45
Attachment 37 - EPM-KT0-TP-000035 - Checklist - Functional and Performance Test for Cross Flow Cooling Towers		46
Attachment 38 - EPM-KT0-TP-000036 - Checklist - Functional and Performance Test for Boilers		47
Attachment 39 - EPM-KT0-TP-000037 - Checklist - Functional and Performance Test for Water Treatment Plant		48
Attachment 40 - EPM-KT0-TP-000038 - Checklist - Functional and Performance Test for Waste Water Treatment Plant		49



Testing & Commissioning Checklists and Templates

Attachment 41 - EPM-KT0-TP-000039 - Checklist - Functional and Performance Test for Condensate Recovery Unit	50
Attachment 42 - EPM-KT0-TP-000040 - Checklist - Functional and Performance Test for Electric Traction Elevators	51
Attachment 43 - EPM-KT0-TP-000041 - Checklist - Functional and Performance Test for Escalators and Moving Walks.....	52
Attachment 44 - EPM-KT0-TP-000042 - Checklist - Functional and Performance Test for Building Maintenance Unit	53
Attachment 45 - EPM-KT0-TP-000043 - Checklist - Functional and Performance Test for HV/MV Capacitor Banks.....	54
Attachment 46 - EPM-KT0-TP-000044 - Checklist - Functional and Performance Test for UPS	55
Attachment 47 - EPM-KT0-TP-000056 - Checklist - Functional and Performance Test for Pressure Independent VAV	56
Attachment 48 - EPM-KT0-TP-000058 - Checklist - Functional and Performance Test for VoIP	57
Attachment 49 - EPM-KT0-TP-000060 - Checklist - Functional and Performance Test for LAN/WLAN	58
Attachment 50 - EPM-KT0-TP-000045 - Template - NFPA 20 for Fire Pumps Acceptance Test Form	59
Attachment 51 - EPM-KT0-TP-000046 - Template - FDAS Test Package	60
Attachment 52 - EPM-KT0-TP-000047 - Template - Earth Electrode Testing	61
Attachment 53 - EPM-KT0-TP-000048 - Template - Door Intercom Testing	62
Attachment 54 - EPM-KT0-TP-000049 - Template - Car Park Access System Testing	63
Attachment 55 - EPM-KT0-TP-000050 - Template - Security and Access Control Testing	64
Attachment 56 - EPM-KT0-TP-000051 - Template - BMS Graphics Testing	65
Attachment 57 - EPM-KT0-TP-000052 - Template - BMS Control Set-point and Parameter Testing	66
Attachment 58 - EPM-KT0-TP-000053 - Template - BMS and EPMS PTP and Loop Testing	67
Attachment 59 - EPM-KT0-TP-000054 - Template - Cable Testing	68
Attachment 60 - EPM-KT0-TP-000055 - Template - Equipment/Device Calibration log	69
Attachment 61 - EPM-KT0-TP-000061 - Template - Warranty of Materials	70
Attachment 62 - EPM-KT0-TP-000062 - Checklist- Testing & Commissioning Process	71
Attachment 63 - EPM-KT0-TP-000063 - Energization Notice.....	72
Attachment 64 - EPM-KT0-TP-000064 - DESIGN TURNOVER CERTIFICATE	73



Testing & Commissioning Checklists and Templates

1.0 PURPOSE OF THE DOCUMENT

This document has been prepared to support the Project Testing and Commissioning Guideline (EPM-KT0-PR-000003) and Project Testing and Commissioning Procedure (EPM-KT0-PR-000006) for better understanding of Pre-commissioning and commissioning process checklists and commissioning templates that is described in these documents.

2.0 SCOPE

The scope of this document is to provide Testing and Commissioning Checklist and Templates to be used as a guide in the preparation of Testing and Commissioning Methodology for infrastructure projects. Sample checklist and templates as included in this document shall be tailored accordingly referenced to the project specifications, design requirements, systems and equipment characteristics. Listed below are the most common mechanical, electrical, plumbing equipment to be tested during pre-commissioning and commissioning stages.

3.0 DEFINITIONS

Abbreviations	Description
AHJ	Authority Having Jurisdiction
AHU	Air Handling Unit
AP	Access Point
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
BMS	Building Management System
BMU	Building Maintenance Unit
BPDU	Bridge Protocol Data Unit
CCTV	Closed Circuit Television
CDR	Call Digital Record
CIM	Control Interface Module
CRAC	Computer Room Airconditioning Unit
CT / VT	Current Transformer / Voltage Transformer
C&EM	Cause and Effect Matrix
DDC	Direct Digital Controller
DHCP	Dynamic Host Control Protocol
DPS	Differential Pressure Sensor
ELV	Extra Low Voltage
EPMS	Electrical Power Management System
ERD	Emergency Rescue Device
ESP	External Static Pressure
FACP	Fire Alarm Control Panel
FAT	Factory Acceptance Test
FCU	Fan Coil Unit
FDAS	Fire Detection and Alarm System
GFCI / RCD	Ground Fault Circuit Interruptor / Residual Current Device
HOA	Hand – Off - Automatic
HSRP	Hot Standing Router Protocol
HVAC&R	Heating, Ventilating, and Air Conditioning and Refrigeration
ICCB/MCCB	Insulated Case Circuit Breaker/Molded Case Circuit Breaker
IEC	International Electro-technical Commission
I/O Point	Input / Output Point
LAB	Limited Approach Boundary
LACP	Link Aggregation Control Protocol
LAN/ VLAN	Local Area Network / Virtual Local Area Network
LED	Light Emitting Diode
MAS	Material Approval Sheet
MCC	Motor Control Center



Testing & Commissioning Checklists and Templates

Abbreviations	Description
MCCB	Molded Case Circuit Breaker
MIM	Monitor Interface Module
MSFD	Motorized Smoke and Fire Damper
NAC	Notification Appliance Circuit
NETA	interNational Electrical Testing Association
NFPA	National Fire Protection Association
NTP	Network Time Protocol
OCPD	Over Current Protective Device
OPR	Owner Project Requirement
OSPF	Open Shortest Path First
PABX	Private Automatic Branch Exchange
PAVA	Public Annunciation and Voice Alarm
PCB	Power Circuit Breaker
PoW	Point of Wave
PPE	Personal Protective Equipment
PTP Testing	Point to Point Testing
P&ID	Process and Instrumentation Diagram (for BMS)
RCBO	Residual Current Circuit Breaker with Overload
RCD	Residual Current Device
RMU	Ring Main Unit
RODI	Reverse Osmosis De-ionize Water
RTT	Round Trip Time
SNMP	Simple Network Management Protocol
TAB	Testing and Balancing
TCP/IP	Tele Communications Protocol over Internet Protocol
TDS	Total Dissolved Solids
TFTP	Trivial File Transfer Protocol
TSP	Total Static Pressure
UL/FM	Underwriters Laboratory / Factory Mutual
UPS	Uninterruptible Power Supply
VAV	Variable Air Volume
VESDA	Very Early Smoke Detection Appliance
VFD	Variable Frequency Drive
VG	Voltage Gateways
VoIP	Voice Over Internet Protocol
VPC	Virtual Private Cloud

4.0 REFERENCES

1. Project Testing and Commissioning Guideline - EPM-KT0-000003
2. Project Testing and Commissioning Procedure – EPM-KT0-PR-000006

5.0 RESPONSIBILITIES

This document will be owned and maintained by Expro Engineering. Entities are responsible to provide this checklist and templates to all parties responsible for the preparation of T&C Methodology.

6.0 PROCESS

Not Applicable



Testing & Commissioning Checklists and Templates

7.0 ATTACHMENTS

1. EPM-KT0-TP-000001 - Checklist - Pre-start up for Pumps
2. EPM-KT0-TP-000002 - Checklist - Pre-start up for Fire Pumps
3. EPM-KT0-TP-000003 - Checklist - Pre-start up for Fans
4. EPM-KT0-TP-000004 - Checklist - Pre-start up for Centralized AHU
5. EPM-KT0-TP-000005 - Checklist - Pre-start up for VAV Box
6. EPM-KT0-TP-000006 - Checklist - Pre-start up for FCU
7. EPM-KT0-TP-000007 - Checklist - Pre-start up for CRAC
8. EPM-KT0-TP-000008 - Checklist - Pre-start up for Chillers
9. EPM-KT0-TP-000009 - Checklist - Pre-start up for Cooling Towers
10. EPM-KT0-TP-000010 - Checklist - Pre-start up for Plate Heat Exchangers
11. EPM-KT0-TP-000011 - Checklist - Pre-start up for Boilers
12. EPM-KT0-TP-000012 - Checklist - Pre-start up for Condensate Recovery Unit
13. EPM-KT0-TP-000013 - Checklist - Pre-start up for Water Treatment Plant
14. EPM-KT0-TP-000014 - Checklist - Pre-start up for Waste Water Treatment Plant
15. EPM-KT0-TP-000015 - Checklist - Pre-start up for Electric Traction Elevator
16. EPM-KT0-TP-000016 - Checklist - Pre-start up for Escalator and Moving Walks
17. EPM-KT0-TP-000017 - Checklist - Pre-start up for Building Maintenance Unit (BMU)
18. EPM-KT0-TP-000018 - Checklist - Pre-start up for Generator Set
19. EPM-KT0-TP-000019 - Checklist - Pre-energization for HV/MV Switchgear
20. EPM-KT0-TP-000020 - Checklist - Pre-energization for Switchboards
21. EPM-KT0-TP-000021 - Checklist - Pre-energization for Transformers
22. EPM-KT0-TP-000022 - Checklist - Pre-commissioning for HV/MV Ring Main Unit
23. EPM-KT0-TP-000023 - Checklist - Pre-commissioning for HV/MV Capacitor Banks
24. EPM-KT0-TP-000024 - Checklist - Pre-energization for MV/LV Automatic Transfer Switch
25. EPM-KT0-TP-000025 - Checklist - Pre-energization for UPS
26. EPM-KT0-TP-000026 - Checklist - Pre-energization for MCC/Distribution Boards
27. EPM-KT0-TP-000027 - Checklist - Pre-energization for HV/LV Cables
28. EPM-KT0-TP-000028 - Checklist - Pre-commissioning for Grounding (Earthing)
29. EPM-KT0-TP-000029 - Checklist - Functional and Performance Test for Fire Pumps
30. EPM-KT0-TP-000030 - Checklist - Functional and Performance Test for Chilled Water Pumps
31. EPM-KT0-TP-000031 - Checklist - Functional and Performance Test for Central Fans
32. EPM-KT0-TP-000032 - Checklist - Functional and Performance Test for Centralized AHU
33. EPM-KT0-TP-000033 - Checklist - Functional and Performance Test for CRAC (Precision Unit)
34. EPM-KT0-TP-000034 - Checklist - Functional and Performance Test for FCU
35. EPM-KT0-TP-000035 - Checklist - Functional and Performance Test for Cross Flow Cooling Towers
36. EPM-KT0-TP-000036 - Checklist - Functional and Performance Test for Boilers
37. EPM-KT0-TP-000037 - Checklist - Functional and Performance Test for Water Treatment Plant
38. EPM-KT0-TP-000038 - Checklist - Functional and Performance Test for Waste Water Treatment Plant
39. EPM-KT0-TP-000039 - Checklist - Functional and Performance Test for Condensate Recovery Unit
40. EPM-KT0-TP-000040 - Checklist - Functional and Performance Test for Electric Traction Elevators
41. EPM-KT0-TP-000041 - Checklist - Functional and Performance Test for Escalators and Moving Walks
42. EPM-KT0-TP-000042 - Checklist - Functional and Performance Test for Building Maintenance Unit
43. EPM-KT0-TP-000043 - Checklist - Functional and Performance Test for HV/MV Capacitor Banks
44. EPM-KT0-TP-000044 - Checklist - Functional and Performance Test for UPS
45. EPM-KT0-TP-000056 - Checklist - Functional and Performance Test for Pressure Independent VAV
46. EPM-KT0-TP-000045 - Template - NFPA 20 for Fire Pumps Acceptance Test Form
47. EPM-KT0-TP-000046 - Template - FDAS Test Package
48. EPM-KT0-TP-000047 - Template - Earth Electrode Testing
49. EPM-KT0-TP-000048 - Template - Door Intercom Testing
50. EPM-KT0-TP-000049 - Template - Car Park Access System Testing
51. EPM-KT0-TP-000050 - Template - Security and Access Control Testing
52. EPM-KT0-TP-000051 - Template - BMS Graphics Testing
53. EPM-KT0-TP-000052 - Template - BMS Control Set-point and Parameter Testing
54. EPM-KT0-TP-000053 - Template - BMS and EPMS PTP and Loop Testing
55. EPM-KT0-TP-000054 - Template - Cable Testing
56. EPM-KT0-TP-000055 - Template – Equipment/Device Calibration log
57. EPM-KT0-TP-000057 - Checklist - Pre-start Up for VoIP
58. EPM-KT0-TP-000058 - Checklist - Functional and Performance Test for VoIP
59. EPM-KT0-TP-000059 - Checklist - Pre-start Up for LAN/WLAN



Testing & Commissioning Checklists and Templates

- 60.EPM-KT0-TP-000060 - Checklist - Functional and Performance Test for LAN/WLAN
- 61.EPM-KT0-TP-000061 - Template - Warranty of Material
- 62.EPM-KT0-TP-000062 - Checklist- Testing & Commissioning Process
- 63.Attachment 63 - EPM-KT0-TP-000063 - Energization Notice
- 64.Attachment 64 - EPM-KT0-TP-000064 - DESIGN TURNOVER CERTIFICATE



Testing & Commissioning Checklists and Templates

Attachment 1 - EPM-KT0-TP-000001 - Checklist - Pre-start up for Pumps

PROJECT NAME:		DRAWING NO.		REV.
No.	IN SPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
1	Equipment is de-energized, safe and locked-out.	☐	☐	☐
2	Equipment is identified and tagged correctly in accordance with as-build drawings.	☐	☐	☐
3	Nameplate parameters are in compliance with design documents.	☐	☐	☐
4	Equipment has no visible signs of damage, including rust or corrosion.	☐	☐	☐
5	Grounding is complete and in accordance with project specifications.	☐	☐	☐
6	Pump foundations are complete and equipment is adequately anchored.	☐	☐	☐
7	Grouting is complete.	☐	☐	☐
8	Adequate space is available to permit equipment removal for maintenance with minimal piping, tray/conduit or other equipment dismantling. Lifting equipment is installed in accordance with design documents.	☐	☐	☐
9	Auxiliary systems (i.e. lube oil, purge, quench, balance, cooling, seal, etc.) are properly installed with no visible signs of damage.	☐	☐	☐
10	Lubrication grease (oil) is properly filled and lubrication tags or records are available.	☐	☐	☐
11	Preservative compounds, greases, and oils are cleaned from equipment surfaces. Any desiccant is removed as required.	☐	☐	☐
12	Forced lubrication systems are correctly piped and no leaks or openings are evident.	☐	☐	☐
13	Coupling and guards are assembled or available. (Alignment records are required for turnover).	☐	☐	☐
14	Visibly inspect for installation of mechanical seals/packing.	☐	☐	☐
15	Drains and vents are installed and adequately routed, if required.	☐	☐	☐
16	Pump leak off is piped or channeled to convenient floor drain.	☐	☐	☐
17	Strainers in suction piping are installed; and adequate means and space is available for cleaning.	☐	☐	☐
18	Vibration instruments/probes are correctly mounted and undamaged.	☐	☐	☐
19	Vibration panels are properly installed and internals are clean and free of debris or rust. Internal components are securely mounted and labeled in accordance with project specifications.	☐	☐	☐
20	Components, including control/junction boxes, are clean and internal components are correctly installed and labeled.	☐	☐	☐
21	Piping connections are correctly bolted with proper gasket materials (if visible).	☐	☐	☐
22	All cabinets/control panels, junction boxes, etc. are properly sealed with door/covers closed and properly bolted.	☐	☐	☐
23	Piping appurtenances installed such as pressure gauges, universal test plugs, thermowell, etc.	☐	☐	☐
24	Produce punchlist items for identified defects.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 2 - EPM-KT0-TP-000002 - Checklist - Pre-start up for Fire Pumps

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Items			
1	General Items	☐	☐	☐
2	Equipment is de-energized, safe and locked-out.	☐	☐	☐
3	Equipment is identified and tagged correctly in accordance with as-build drawings.	☐	☐	☐
4	Nameplate parameters are in compliance with design documents.	☐	☐	☐
5	Equipment has no visible signs of damage, including rust or corrosion.	☐	☐	☐
6	Grounding is complete and in accordance with project specifications.	☐	☐	☐
7	Pump foundations are complete and equipment is adequately anchored.	☐	☐	☐
8	Grouting is complete.	☐	☐	☐
9	Adequate space is available to permit equipment removal for maintenance with minimal piping, tray/conduit or other equipment dismantling. Lifting equipment is installed in accordance with design documents.	☐	☐	☐
10	Auxiliary systems (i.e., lube oil, purge, quench, balance, cooling, seal, etc.) are properly installed with no visible signs of damage.	☐	☐	☐
11	Lubrication grease (oil) is properly filled and lubrication tags or records are available.	☐	☐	☐
12	Preservative compounds, greases, and oils are cleaned from equipment surfaces. Any desiccant is removed as required.	☐	☐	☐
13	Forced lubrication systems are correctly piped and no leaks or openings are evident.	☐	☐	☐
14	Coupling and guards are assembled or available. (Alignment records are required for turnover).	☐	☐	☐
15	Visibly inspect for installation mechanical seals/packing.	☐	☐	☐
16	Drains and vents are installed and adequately routed, if required.	☐	☐	☐
17	Pump leak off is piped or channeled to convenient floor drain.	☐	☐	☐
18	Strainers in suction piping are installed; and adequate means and space is available for cleaning.	☐	☐	☐
19	Vibration instruments/probes are correctly mounted and undamaged.	☐	☐	☐
20	Vibration panels are properly installed and internals are clean and free of debris or rust. Internal components are securely mounted and labeled in accordance with project specifications.	☐	☐	☐
21	Components, including control/junction boxes, are clean and internal components are correctly installed and labeled.	☐	☐	☐
22	Piping connections are correctly bolted with proper gasket materials (if visible).	☐	☐	☐
23	All cabinets/control panels, junction boxes, etc. are properly sealed with door/covers closed and properly bolted.	☐	☐	☐
24	Test manifold available with UL/FM flowmeter and gauge. Straight pipe lengths downstream and upstream of the flowmeter comply to the requirement of the flowmeter.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 3 - EPM-KT0-TP-000003 - Checklist - Pre-start up for Fans

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Cabinet and General Installation			
1	Permanent labels affixed, including for fans.	☐	☐	☐
2	Air flow capacity and ESP indicated in the fan nameplate are same as the approved document.	☐	☐	☐
3	Motor rating such as Hp (Kw) and insulation class conforms to the approved document.	☐	☐	☐
4	Equipment tagging is in compliance to the as-build drawings.	☐	☐	☐
5	Casing condition good: no dents, leaks, door gaskets installed.	☐	☐	☐
6	Flexible connection between duct and unit tight and in good condition.	☐	☐	☐
7	Vibration isolation equipment installed & released from shipping locks.	☐	☐	☐
8	Instrumentation installed according to specification (flow switch, differential pressure, pressure sensor, etc.).	☐	☐	☐
9	Transport block removed (for centrifugal fans).	☐	☐	☐
10	Clean up of equipment completed per contract documents.	☐	☐	☐
	Fans and Dampers			
11	Fan and motor alignment correct.	☐	☐	☐
12	Fan belt tension and condition good.	☐	☐	☐
13	Fan protective shrouds for belts in place and secure.	☐	☐	☐
14	Fan and motor properly lubricated.	☐	☐	☐
15	All dampers close tightly.	☐	☐	☐
16	All damper linkages have minimum play.	☐	☐	☐
	Electrical and Controls			
17	Pilot lights are functioning.	☐	☐	☐
18	Power disconnects in place and labeled.	☐	☐	☐
19	All electric connections tight.	☐	☐	☐
20	Proper grounding installed for components and unit.	☐	☐	☐
21	Safeties in place and operable.	☐	☐	☐
22	Starter overload breakers installed and correct size.	☐	☐	☐
23	Sensors calibrated (see below).	☐	☐	☐
24	Control system interlocks hooked up and functional.	☐	☐	☐
25	Smoke detectors in place (as applicable).	☐	☐	☐
	Variable Frequency Drive			
26	VFD powered (wired to controlled equipment).	☐	☐	☐
27	VFD interlocked to control system.	☐	☐	☐
28	Static pressure or other controlling sensor properly located and per drawings and calibrated.	☐	☐	☐
29	Static pressure or other controlling sensor calibrated.	☐	☐	☐
30	Drive location not subject to excessive temperatures.	☐	☐	☐
31	Drive location not subject to excessive moisture or dirt.	☐	☐	☐
32	Drive size matches motor size.	☐	☐	☐
33	Internal setting designating the model is correct.	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 4 - EPM-KT0-TP-000004 - Checklist - Pre-start up for Centralized AHU

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Cabinet and General Installation			
1	Permanent labels affixed, including for fans.	☐	☐	☐
2	Air flow capacity and ESP indicated in the fan nameplate are same as the equipment schedule and approved document.	☐	☐	☐
3	Motor rating in Hp (Kw) and insulation class conforms to the approved document.	☐	☐	☐
4	Equipment tagging is in compliance to the as-build drawings.	☐	☐	☐
5	Casing condition good: no dents, leaks, door gaskets installed.	☐	☐	☐
6	Access doors close tightly - no leaks.	☐	☐	☐
7	Flexible connection between duct and unit tight and in good condition.	☐	☐	☐
8	Vibration isolation equipment installed and released from shipping locks.	☐	☐	☐
9	Maintenance access acceptable for unit and components.	☐	☐	☐
10	Internal sound attenuation installed (as applicable for arrayed fans).	☐	☐	☐
11	Thermal insulation properly installed and according to specification.	☐	☐	☐
12	Instrumentation installed according to specification (thermometers, pressure gages, flow meters, etc.).	☐	☐	☐
13	Clean up of equipment completed per contract documents.	☐	☐	☐
14	Filters installed and replacement type and efficiency permanently affixed to housing - construction filters removed.	☐	☐	☐
15	Arrangement of internal accessories (filters, coil, humidifier, fans, etc.) as per approved document.	☐	☐	☐
16	Transport blocks removed for centrifugal fans.	☐	☐	☐
	Valves, Piping, Accessories and Coils			
17	Pipe fittings complete and pipes properly supported.	☐	☐	☐
18	Pipes properly labeled.	☐	☐	☐
19	Pipes properly insulated.	☐	☐	☐
20	Strainers in place and clean.	☐	☐	☐
21	Piping system properly flushed.	☐	☐	☐
22	No leaking apparent around fittings.	☐	☐	☐
23	All coils are clean and fins are in good condition.	☐	☐	☐
24	All condensate drain pans clean and slope to drain, per spec.	☐	☐	☐
25	Valves properly labeled.	☐	☐	☐
26	Valves installed in proper direction (as applicable).	☐	☐	☐
27	chilled water supply sensors properly located and secure	☐	☐	☐
28	Sensors calibrated (see calibration section below).	☐	☐	☐
29	plugs and isolation valves installed per drawings.	☐	☐	☐
	Fans and Dampers			
30	Supply fan and motor alignment correct.	☐	☐	☐
31	Supply fan belt tension and condition good.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 6 - EPM-KT0-TP-000006 - Checklist - Pre-start up for FCU

PROJECT NAME:		DRAWING NO.		REV.
No.	INSPECTION ITEM	CHECKED SATISFACTOR Y		
		N/A	YES	NO
	Cabinet and General Installation			
1	FCU labelling matches the equipment labelling as per the as-build drawings.	☐	☐	☐
2	FCU capacity (tonner, air flow, and fan ESP) matches the capacity indicated in the equipment schedule and approved documents.	☐	☐	☐
3	Visual inspection and no apparent damage noticed.	☐	☐	☐
4	Condensate drain piped to waste with p-trap depth sufficient to handle the maximum static pressure.	☐	☐	☐
5	Unit free of dirt and debris.	☐	☐	☐
6	Filters installed and clean.	☐	☐	☐
7	Fan impeller rotates freely.	☐	☐	☐
8	Vibration isolators installed.	☐	☐	☐
9	Ductwork complete and leak tested.	☐	☐	☐
10	Duct joint sealant properly installed (gaskets, cleats, sealant bands).	☐	☐	☐
11	All protective covers (plastics) removed from duct openings.	☐	☐	☐
12	All third fix (air diffusers and terminals) installed.	☐	☐	☐
13	All manual balancing dampers installed and locked at 100% open.	☐	☐	☐
14	Flexible duct properly installed.	☐	☐	☐
15	Chilled water system flushed and chemical treatment completed.	☐	☐	☐
16	CHW piping properly insulated and adequately supporter.	☐	☐	☐
17	Control valve properly installed with strainers.	☐	☐	☐
18	All required appurtenance such as pressure gauges, temp. gauges, universal plugs, isolation valves, balancing valve, etc. installed and accessible.	☐	☐	☐
19	Air vents available and system properly vented including equipment.	☐	☐	☐
20	Flushing loop available	☐	☐	☐
	Electrical Check			
21	Local isolator and DDC installed in accessible location.	☐	☐	☐
22	All power and control wiring completed as per circuit diagram.	☐	☐	☐
23	All connections tight and approved.	☐	☐	☐
24	BMS control points (point to point and loop test) completed.	☐	☐	☐
25	DDC signal matches field device control signal (0-10 vdc, 2-10vdc, 0-5 vdv, 4-20mA).	☐	☐	☐
26	Thermostat installed and configured (for PID type thermostat).	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 7 - EPM-KT0-TP-000007 - Checklist - Pre-start up for CRAC

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Cabinet and General Installation			
1	Permanent equipment labels are fixed and matches the equipment tag in the as-build drawings.	☐	☐	☐
2	Capacity indicated in the nameplate complies with the design requirements and as per approved documents. Capacity shall be confirmed as follows: - Cooling Capacity for Dx Type - Air Flowrate - ESP for Ducted System - Heating Capacity - Humidification Capacity	☐	☐	☐
3	Motor rating in Hp (Kw) and motor insulation class conforms to the approved documents.	☐	☐	☐
4	Casing in good condition with no visible damage.	☐	☐	☐
5	Duct flexible connectors between duct and unit in good condition (as applicable).	☐	☐	☐
6	Fan transport block removed (for centrifugal fans).	☐	☐	☐
7	Vibration isolators installed and released from shipping locks.	☐	☐	☐
8	Maintenance access acceptable for unit and components.	☐	☐	☐
9	Thermal insulation properly installed and according to the Specification.	☐	☐	☐
10	Instrumentation (thermometers, pressure gauges, etc.) installed according to the approved drawings.	☐	☐	☐
11	Clean up of equipment completed as per contract requirement.	☐	☐	☐
12	Air filters installed.	☐	☐	☐
	Valves, Piping, Accessories and Coil			
13	Pipe fittings complete and pipes properly supported.	☐	☐	☐
14	Pipes properly labeled.	☐	☐	☐
15	Pipes properly insulated.	☐	☐	☐
16	Strainers in place and clean.	☐	☐	☐
17	Piping system properly flushed.	☐	☐	☐
18	No leaking apparent around fittings.	☐	☐	☐
19	All coils are clean and fins are in good condition.	☐	☐	☐
20	All condensate drain pans clean and slope to drain, per spec.	☐	☐	☐
21	Valves properly labeled.	☐	☐	☐
22	Valves installed in proper direction (as applicable).	☐	☐	☐
23	Sensors calibrated (see calibration section below).	☐	☐	☐
24	plugs and isolation valves installed per drawings.	☐	☐	☐
	Fan and Dampers			
25	Supply fan and motor alignment correct.	☐	☐	☐
26	Supply fan belt tension and in good condition.	☐	☐	☐
27	Supply fan protective shrouds for belts in place and secure.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 8 - EPM-KT0-TP-000008 - Checklist - Pre-start up for Chillers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	General appearance good with no apparent damage.	☐	☐	☐
2	Equipment nameplate nominal capacity conforms to the design and approved documents.	☐	☐	☐
3	Cooler casing pressure rating conforms to the approved documents.	☐	☐	☐
4	Equipment label is affixed and conforms to the as-build drawing tagging.	☐	☐	☐
5	Proper vibration isolators installed and adjusted.	☐	☐	☐
6	Seismic restrain in place.	☐	☐	☐
7	Isolation valves and balancing valves installed.	☐	☐	☐
8	Pipe fittings and accessories completed.	☐	☐	☐
9	Pipes not supported on chillers.	☐	☐	☐
10	Hydronic flushing completed and strainers cleaned.	☐	☐	☐
11	No visible damage on condenser fins (for air cooled condenser).	☐	☐	☐
12	Condenser water piping flushing completed (as applicable).	☐	☐	☐
13	Evaporator air vent provided (for indoor chiller).	☐	☐	☐
14	Refrigerant relief pipe extended to outside (for indoor chiller).	☐	☐	☐
15	Accessories such as thermometers, pressure gauge and test plugs installed.	☐	☐	☐
16	Flow meter (as required) and flow switch installed.	☐	☐	☐
17	Equipment is properly charged and refrigerant in the tank is at the correct level.	☐	☐	☐
18	No visible oil leakage.	☐	☐	☐
19	Piping and flow direction labelled on piping.	☐	☐	☐
20	Oil heater is properly functioning.	☐	☐	☐
21	Oil filter clean.	☐	☐	☐
	Electrical and Controls			
22	Power wiring installed properly.	☐	☐	☐
23	All electrical components are grounded properly.	☐	☐	☐
24	Control wiring, devices, and interlocks are hooked up.	☐	☐	☐
25	Sensors calibrated (as per calibration certificate date or site method for calibration).	☐	☐	☐
26	Electrical isolators are installed as per design.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 9 - EPM-KT0-TP-000009 - Checklist - Pre-start up for Cooling Towers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTOR Y		
		N/A	YES	NO
	General Installation			
1	Equipment labelling matches the equipment tagging as per the As-build.	☐	☐	☐
2	Capacity of cooling tower matches the equipment schedule and approved documents.	☐	☐	☐
3	Cooling Tower in good condition and no apparent damage noticed.	☐	☐	☐
4	Fan belts properly installed and tensioned.	☐	☐	☐
5	Fan shaft collars installed and tight.	☐	☐	☐
6	Fan and motor lubricated.	☐	☐	☐
7	Fan blade pitch adjusted (for propeller fans).	☐	☐	☐
8	Tower basin access in place.	☐	☐	☐
9	Tower basin sump strainers clean and sump filled.	☐	☐	☐
10	Sump heater and other freeze protection in place (alarms, etc.) as applicable.	☐	☐	☐
11	All appurtenances installed such as pressure and temperature gauges in the condenser water piping.	☐	☐	☐
12	Spray water inlet strainer installed and spray nozzle clean.	☐	☐	☐
13	Pipe fitting and accessories installation complete.	☐	☐	☐
14	Make-up water piping installation complete including float valve or motorized valve and float switches/level sensors.	☐	☐	☐
15	All piping are correctly labelled and valves are properly tagged.	☐	☐	☐
16	Chemical treatment system or plan installed.	☐	☐	☐
17	Water treatment report submitted.	☐	☐	☐
18	Distribution header balanced.	☐	☐	☐
19	Test plug installed.	☐	☐	☐
20	Isolation and balancing valves installed as per drawing.	☐	☐	☐
21	Gear box lubricated (as applicable for rotating water header with fix speed fan motor).	☐	☐	☐
	Electrical and Controls			
22	Power to unit and disconnect installed.	☐	☐	☐
23	All electrical components grounded.	☐	☐	☐
24	Power available to the sump heater (as applicable).	☐	☐	☐
25	Motor protection and safeties installed.	☐	☐	☐
26	Sensors and field devices installed and calibrated.	☐	☐	☐
27	Control system interlocks hooked up and functional.	☐	☐	☐
28	Bypass valve and tower isolation valve spanning calibrated.	☐	☐	☐
29	Motorized valves, dampers, and float switches functional.	☐	☐	☐
30	Vibration alarm tested and functional.	☐	☐	☐
31	Test high and low water alarms and automatic closing/opening of make-up water.	☐	☐	☐

Testing & Commissioning Checklists and Templates

Attachment 10 - EPM-KT0-TP-000010 - Checklist - Pre-start up for Plate Heat Exchangers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORILY N/A YES NO		
	General Installation			
1	Equipment labelling matches the equipment tagging as per the As-build.	☐	☐	☐
2	Capacity of heat exchanger matches the equipment schedule and approved documents.	☐	☐	☐
3	Equipment is in good condition and no apparent damage observed.	☐	☐	☐
4	Pipework flushing, venting, and chemical treatment completed.	☐	☐	☐
5	Pipework supported and properly insulated	☐	☐	☐
6	Isolation valves, strainers, installed including control valves for multiple-parallel heat exchanger.	☐	☐	☐
7	Piping appurtenances installed such as pressure gauge, temperature gauge, P/T sensors, and universal test plugs.	☐	☐	☐
8	Double regulating valve or automatic balancing valve installed.	☐	☐	☐
9	Flushing bypass loop provided with isolation valve.	☐	☐	☐
10	Heat exchanger insulated and cladded.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 11 - EPM-KT0-TP-000011 - Checklist - Pre-start up for Boilers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	General appearance good and no apparent damage.	☐	☐	☐
2	Equipment label affixed and matches the equipment tagging in the as-build drawing.	☐	☐	☐
3	Capacity indicated in the nameplate matches the capacity ("from and at" rating or Boiler Hp) in the design and approved documents.	☐	☐	☐
4	Space adequate for boiler tube pulling and cleaning.	☐	☐	☐
5	Required seismic restrain in place.	☐	☐	☐
6	Flue completely installed and horizontal piping sloped properly.	☐	☐	☐
7	Combustion air supply complete.	☐	☐	☐
8	System filled with water and lowest permissible water level marked.	☐	☐	☐
9	Accessories such as pressure gauges, temperature gauges and P/T plugs installed as per drawing.	☐	☐	☐
10	Multiple boiler interlock completed.	☐	☐	☐
11	Room has sufficient ventilation system.	☐	☐	☐
	Piping and Accessories			
12	Fuel piping installed and tested.	☐	☐	☐
13	Hydronic piping completed and proven functioning including blow down system, make-up water piping and safety relief.	☐	☐	☐
14	Hydronic system flushing completed and ex-pur-gers cleaned.	☐	☐	☐
15	Isolation valves, fuel stop valves, regulator and balancing valves installed.	☐	☐	☐
16	Pipe fittings and accessories completed.	☐	☐	☐
17	Bleed lines and relief lines available.	☐	☐	☐
18	Test ports installed near all control sensors.	☐	☐	☐
19	Flow switch and flow meter installed as required.	☐	☐	☐
20	Piping type and flow direction labelled on piping.	☐	☐	☐
21	Chemical treatment system installed.	☐	☐	☐
22	ASME Pressure Vessel Data Sheet or certification tag posted in each expansion and pressure tank.	☐	☐	☐
23	Expansion tank verified not air bounded and completely filled with water.	☐	☐	☐
24	Air vents and bleeds at high points of system available.	☐	☐	☐
	Electrical and Controls			
25	Power to the unit and disconnect available.	☐	☐	☐
26	All electrical components grounded.	☐	☐	☐
27	Sensors calibrated.	☐	☐	☐
28	Control System interlocks hooked up and functional.	☐	☐	☐
29	All control device, pneumatic tubing and wiring complete.	☐	☐	☐
30	Motorized valves, dampers, and float switches functional.	☐	☐	☐
31	Emergency shutdown switch, combustion air switch, fail switch and low fire switch available and functional.	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 12 - EPM-KT0-TP-000012 - Checklist - Pre-start up for Condensate Recovery Unit

PROJECT NAME:		DRAWING NO.	REV.		
No.	INSPECTION ITEM	CHECKED SATISFACTOR Y			
		N/A	YES	NO	
	General Items				
1	Equipment is identified and tagged correctly in accordance with as-build drawings.	☐	☐	☐	
2	Nameplate parameters are in compliance with design documents.	☐	☐	☐	
3	Equipment has no visible signs of damage, including rust or corrosion.	☐	☐	☐	
4	Grounding is complete and in accordance with project specifications.	☐	☐	☐	
5	Equipment foundation is complete and equipment is adequately anchored.	☐	☐	☐	
6	Adequate space is available to permit equipment removal for maintenance with minimal piping, tray/conduit or other equipment dismantling. Lifting equipment is installed in accordance with design documents.	☐	☐	☐	
7	Auxiliary systems (i.e., lube oil, purge, quench, balance, cooling, seal, etc.) are properly installed with no visible signs of damage.	☐	☐	☐	
8	Lubrication grease (oil) is properly filled and lubrication tags or records are available.	☐	☐	☐	
9	Preservative compounds, greases, and oils are cleaned from equipment surfaces. Any desiccant is removed as required.	☐	☐	☐	
10	Forced lubrication systems are correctly piped and no leaks or openings are evident.	☐	☐	☐	
11	Coupling and guards are assembled or available. (Alignment records are required for turnover).	☐	☐	☐	
12	Visibly inspect for installation mechanical seal packing.	☐	☐	☐	
13	Drains and vents are installed and adequately routed, if required.	☐	☐	☐	
14	Pump leak off is piped or channeled to convenient floor drain.	☐	☐	☐	
15	Strainers in suction piping are installed; and adequate means and space is available for cleaning.	☐	☐	☐	
16	Components, including control/junction boxes, are clean and internal components are correctly installed and labeled.	☐	☐	☐	
17	Piping connections are correctly bolted with proper gasket materials (if visible).	☐	☐	☐	
18	All cabinets/control panels, junction boxes, etc. are properly sealed with door/covers closed and properly bolted.	☐	☐	☐	
19	Condensate tank provided with steam vent to outside of the building.	☐	☐	☐	
20	Condensate tank provided with overflow pipe with p-trapping.	☐	☐	☐	
21	Level control switches installed including the controllers for pump automatic operation.	☐	☐	☐	
22	Sufficient head is provided between tank and pump to avoid cavitation.	☐	☐	☐	
23	Unit is properly insulated and cladded.	☐	☐	☐	
24	Pilot lights are functioning.	☐	☐	☐	
25	All electrical connections inspected and approved.	☐	☐	☐	
26	Proper grounding installed for components and units.	☐	☐	☐	



Testing & Commissioning Checklists and Templates

Attachment 13 - EPM-KT0-TP-000013 - Checklist - Pre-start up for Water Treatment Plant

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	All equipment general appearance is good with no apparent damage.	☐	☐	☐
2	Equipment nameplate (for pumps, fans, filters, etc.) nominal capacity conforms to the design and approved documents.	☐	☐	☐
3	Corrosion resistant materials of construction are used for all equipment from the supply source to the membrane including piping, vessels, instruments and wetted parts of pumps.	☐	☐	☐
4	All piping and equipment is compatible with designed pressure.	☐	☐	☐
5	All piping and equipment is compatible with designed pH range (cleaning).	☐	☐	☐
6	All piping and equipment is protected against galvanic corrosion.	☐	☐	☐
7	Media filters are backwashed and rinsed.	☐	☐	☐
8	New/clean cartridge filter is installed directly upstream of the high pressure pump.	☐	☐	☐
9	Feed line, is purged and flushed, before pressure vessels are connected.	☐	☐	☐
10	Chemical addition points are properly located.	☐	☐	☐
11	Check/anti-siphon valves are properly installed in chemical addition lines.	☐	☐	☐
12	Provisions exist for proper mixing of chemicals in the feed stream.	☐	☐	☐
13	Dosage chemical tanks are filled with the right chemicals.	☐	☐	☐
14	Provisions exist for preventing the RODI system from operating when the dosage pumps are shut down.	☐	☐	☐
15	Provisions exist for preventing the dosage pumps from operating when the RODI system is shut down.	☐	☐	☐
16	If chlorine is used, provisions exist to ensure complete chlorine removal prior to the membranes.	☐	☐	☐
17	Planned instrumentation allows proper operation and monitoring of the pretreatment system.	☐	☐	☐
18	Planned instrumentation is installed and operative.	☐	☐	☐
19	Instrument calibration is verified.	☐	☐	☐
20	Pressure relief protection is installed and correctly set.	☐	☐	☐
21	Provisions exist for preventing the permeate pressure from exceeding the feed/concentrate pressure more than 5 psi (0.3 bar) at any time.	☐	☐	☐
22	Interlocks, time delay relays and alarms are properly set.	☐	☐	☐
23	Provisions exist for sampling permeate from individual modules.	☐	☐	☐
24	Provisions exist for sampling raw water, feed, permeate and concentrate streams from each stage and the total plant permeate stream.	☐	☐	☐
25	Pressure vessels are properly piped both for operation and cleaning mode.	☐	☐	☐
26	Pressure vessels are secured to the rack or frame per manufacturer's instructions.	☐	☐	☐
27	Membranes are protected from temperature extremes (freezing, direct sunlight, heater exhaust, etc.).	☐	☐	☐
28	Pumps are ready for operation: aligned, lubricated, proper rotation.	☐	☐	☐
29	Fittings are tight.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 14 - EPM-KT0-TP-000014 - Checklist - Pre-start up for Waste Water Treatment Plant

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	Tanks are completely free from mud, sand, gravel, and other debris.	☐	☐	☐
2	Pre-filter are installed to prevent large untreatable objects to enter the waste water tank.	☐	☐	☐
3	The plant must be installed level with proper beddings or pads.	☐	☐	☐
4	Plant that is installed partially or totally below grade, anchors shall be provide to avoid floatation.	☐	☐	☐
5	Backfilling should be completed after tanks are set to avoid wall stress and ponding around the plant.	☐	☐	☐
6	For metal tanks, cathodic protection must be connected prior to back filling.	☐	☐	☐
7	Top of buried tanks are sufficiently above the finished grade to prevent surface water from entering the plant.	☐	☐	☐
8	Perimeter fence are provided for safety and prevent vandalism.	☐	☐	☐
9	The plant site should be covered with gravel.	☐	☐	☐
10	A suitable access road to the plant must be provided for adequate maintenance.	☐	☐	☐
11	Skimmers and sludge returns are equipped with proper valving.	☐	☐	☐
12	Float in dosing chamber must be set at elevations noted on the approved plans to ensure proper dosing of the filter.	☐	☐	☐
13	Block voids of filters must be filled with grout and walls sealed inside and outside with tar.	☐	☐	☐
14	Filter sand is certified as acceptable for placement.	☐	☐	☐
15	Chlorinator/dechlorinator units are installed correctly with the weir properly in place.	☐	☐	☐
16	All tanks are properly marked with label and matching to the approved plans and as-builds.	☐	☐	☐
17	Individual equipment (fans, pumps, mixer, aerators, etc.) are functional tested and accepted. Capacity of equipment verified in compliance to the approved documents. Equipment cycling control tested and functioning.	☐	☐	☐
18	All water and air piping completed and tested including floats valves, switches, and meters.	☐	☐	☐
19	All tanks are leak tested including connections.	☐	☐	☐
20	High and low water level alarms provided, tested, and working properly.	☐	☐	☐
21	All works for aeration tank, equalization tank, settling chamber, sludge holding tank, tertiary filters, chlorinator, and effluent dosing tank are completed and accepted.	☐	☐	☐
	Pipe, fittings and Appurtenances			
22	Pipe fittings complete and pipes properly supported.	☐	☐	☐
23	Pipes properly labeled.	☐	☐	☐
24	Pipes properly insulated.	☐	☐	☐
25	Strainers in place and clean.	☐	☐	☐
26	Piping system properly flushed.	☐	☐	☐
27	No leaking apparent around fittings.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 15 - EPM-KT0-TP-000015 - Checklist - Pre-start up for Electric Traction Elevator

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Check			
1	Capacity of traction motors including all of elevator accessories conforms to the approved documentation. Lifting capacity shall be in accordance to Specification and equipment approved MAS (Material Approval Sheet)	☐	☐	☐
2	Installation conforms to the requirement of ASME A.17 and accepted by the Client Representatives.	☐	☐	☐
	Lift Pit Check			
3	Dimensions of the lift pit (length, width, depth) conforms to the plan and requirements of the elevator system.	☐	☐	☐
4	Pit is clean and dry.	☐	☐	☐
5	Car pit buffer provided and in good condition. Oil buffer shall be provided for lift car with traveling velocity more than 1.5 m/s.	☐	☐	☐
6	Counter weight pit buffer provided and in good condition. Oil buffer shall be provided for lift car with traveling velocity more than 1.5 m/s.	☐	☐	☐
7	Counterweight guard screen provided and weights are properly stacked and secured with isolators.	☐	☐	☐
8	Lighting provided in the pit.	☐	☐	☐
9	Pit switch provided to stop the elevator car manually from the pit.	☐	☐	☐
10	Governor rope tension pulley has free movement.	☐	☐	☐
11	Limit switches rollers have free movement.	☐	☐	☐
12	Trailing cable properly terminated and in good condition.	☐	☐	☐
13	Power outlet provided with GFCI or RCD.	☐	☐	☐
14	Drain system or sump provide to remove accumulation of water.	☐	☐	☐
15	Access ladder provide if depth is more than 815 mm.	☐	☐	☐
	Lift Car Check (Internal)			
16	Capacity of the lift car is displayed or labelled inside the car.	☐	☐	☐
17	Exhaust blower provided and in working order.	☐	☐	☐
18	Alarm bell provided and operational.	☐	☐	☐
19	Light point provided terminating in socket or holder.	☐	☐	☐
20	Two-way communication handset provided.	☐	☐	☐
21	Floor indication display provided.	☐	☐	☐
22	Lift car internal condition is acceptable. Free from damage and scratches.	☐	☐	☐
23	Car door condition is satisfactory and operable.	☐	☐	☐
24	Clearance between car sill and landing sill is not more than 30mm. in each floor.	☐	☐	☐
	Lift Car Check (Top)			
25	Maintenance switch provided to manually direct car (up or down).	☐	☐	☐
26	Switch board provided for lighting and power sockets.	☐	☐	☐
27	All metal part shall be earthed.	☐	☐	☐
28	Hoist way lighting provided.	☐	☐	☐
29	Retiring cam do not contact with the lever of gate locks.	☐	☐	☐
30	Guide shoe liners (car and counter weight) in good condition and playing freely.	☐	☐	☐
31	Trailing cable is in good condition with no visible damage.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 16 - EPM-KT0-TP-000016 - Checklist - Pre-start up for Escalator and Moving Walks

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTOR Y		
		N/A	YES	NO
1	The escalator/moving walk installed and inspected in accordance with ASTM A.17.1 Standards.	☐	☐	☐
2	Assembly is in good condition with no apparent damages noticeable.	☐	☐	☐
3	Capacity of traction motors including all of elevator accessories conforms to the approved documentation. Lifting capacity shall be in accordance to Specification and equipment approved MAS (Material Approval Sheet).	☐	☐	☐
4	Escalators and moving walk material enclosure shall conform to non-combustible or limited-combustible definition by NFPA 101.	☐	☐	☐
5	Adequate ventilation provided to the driving machine, control system, and truss enclosure spaces.	☐	☐	☐
6	Construction requirements for the inclination and geometry (balustrades height and material used, handrails width and height, width and tread for moving walk, etc.) shall comply to the requirements of ASTM A.17.1 section 7.2 to 7.3.	☐	☐	☐
7	Entrance and egress ends shall have comb plates and tread ways compliance to ASTM A.17.1 section 7.4.	☐	☐	☐
8	Comb plate and comb step impact device or safety switch provided.	☐	☐	☐
9	Entrance and exit zones free from any obstructions and obstacles.	☐	☐	☐
10	No missing fixing screws for entrance and exit covers.	☐	☐	☐
11	Deck barricade and anti-slide device provided for escalator.	☐	☐	☐
12	Step and up thrust safety device and other safety devices (see functional test checklist for escalator and moving walk) provided for escalator and moving walk.	☐	☐	☐
13	Is there adequate access and exit clearance from the end of the handrail?	☐	☐	☐
14	Are the entry and exit points sufficiently illuminated?	☐	☐	☐
15	Are the caution stickers provided and legible?	☐	☐	☐
16	Is the escalator/moving walk stop switch provided, clearly labelled, and red in color?	☐	☐	☐
17	Is the escalator/moving walk handrail in good condition? i.e. no sharp edges or other hazards where fingers can get caught or pinched.	☐	☐	☐
18	Are all the combs in place? Max. 1 tooth missing in any one comb. Minimum comb teeth width 2.5mm.	☐	☐	☐
19	Are the combs at least 6 mm deep meshing into step/belt guides?	☐	☐	☐
20	Are there any signs of step misalignment – scraping marks on the sides of the guarding?	☐	☐	☐
21	Step clearance between side of step and skirt guarding not exceeding 4mm gap.	☐	☐	☐
22	Clearance between step edges (of consecutive steps) not exceeding 6 mm gap.	☐	☐	☐
23	Does all the guarding have its locating screws/rivets in place?	☐	☐	☐
24	Is the speed governor installed and in good condition?	☐	☐	☐
25	Electrical power system installed according to NFPA 70 and ASMT A.17 requirements.	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 17 - EPM-KT0-TP-000017 - Checklist - Pre-start up for Building Maintenance Unit (BMU)

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Check			
1	Capacity of platform/cradle or BMU traction motors including all accessories conforms to the approved documentation. Lifting capacity shall be in accordance to Specification and equipment approved MAS (Material Approval Sheet).	☐	☐	☐
2	Installation conforms to the requirement of the contract, specifications, and drawings. Complete installation is accepted by the Client Representatives.	☐	☐	☐
3	All bolts and nuts for rail system fixing are 100% torque tested.	☐	☐	☐
4	Load testing conducted for each tiers and base anchors of BMU track railing by applying force equivalent to half of the anchor capacity.	☐	☐	☐
5	Safe entry and exit provided for the workers for coming into and out of the cradle.	☐	☐	☐
6	All metal parts are grounded.	☐	☐	☐
7	Traction cables in good condition, lubricated, no visible entanglement and excessive sagging.	☐	☐	☐
8	Guide rail is structurally sound and properly installed including anchoring, brackets, bolting/fixing, and framings.	☐	☐	☐
9	Cradle is provided with bump protection and rollers.	☐	☐	☐
10	Anti-fall anchorage provided in the cradle.	☐	☐	☐
11	All electrical installation and testing conforms to the requirement of NFPA 70 and other electrical standards.	☐	☐	☐
12	Equipment moving parts are properly lubricated.	☐	☐	☐
13	Equipment safeties are in place and properly working such as cradle overload device, cradle trip bar, jib slew end of travel limit switch, cradle emergency retrieval hand wind, slack rope device, over-speed detector and brake, emergency stop, residual current device, cross bar slew end of travel limits, electrical phase failure detector, harness attachment points, cradle full-up detector, lanyard restraint trip bar, secondary cradle full-up over travel detector and wire rope equalizer.	☐	☐	☐
14	Operational labelling provided within the cradle (emergency retrieving, up/down control, slewing, etc.)	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 18 - EPM-KT0-TP-000018 - Checklist - Pre-start up for Generator Set

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	General appearance good and no apparent damage.	☐	☐	☐
2	Equipment label affixed and matches the equipment tagging in the as-built drawing.	☐	☐	☐
3	Capacity indicated in the nameplate matches the capacity (KVA) based on service power rating (standby, prime power, or continuous power rating) and temperature derating in the design and approved documents.	☐	☐	☐
4	Room space adequate for equipment and paralleling switchgear maintenance.	☐	☐	☐
5	Required vibration isolation (inertia pad as required) and seismic restrain in place.	☐	☐	☐
6	Exhaust piping completely installed including silencer and horizontal piping sloped properly.	☐	☐	☐
7	Room has sufficient ventilation system and sand traps louvers.	☐	☐	☐
8	Equipment completely installed inclusive of paralleling switchgear/switchboard, ATS, and NGR (Neutral Ground Resistors). All metering accessories (VT and CT), sensors, actuators, interlocks, etc. are completely installed and accepted.	☐	☐	☐
9	All metallic parts are grounded.	☐	☐	☐
10	All safety precaution and warnings are in place.	☐	☐	☐
11	Equipment has passed the table shake testing (required in healthcare). Factory Certificates shall be provided.	☐	☐	☐
	Piping and Accessories			
12	Fuel piping installed (transfer and supply return) and tested inclusive of motorized valves and controls.	☐	☐	☐
13	Fuel tanks (main and day tank) installed including appurtenances such as level float switches, level indicators, overflow control valves, and controllers.	☐	☐	☐
14	Isolation valves, fuel stop valves, and regulator installed.	☐	☐	☐
15	Cooling piping and fittings including accessories installation completed.	☐	☐	☐
16	Piping type and flow direction labelled on piping.	☐	☐	☐
17	Pipes are painted, insulated, and clad (as required).	☐	☐	☐
18	Air vents and bleeds at high points of system available.	☐	☐	☐
	Exhaust Ducting			
19	Exhaust air ducting provided with flexible connectors.	☐	☐	☐
20	Louvers and effective exhaust opening comply to the requirements of the equipment.	☐	☐	☐
21	Backdraft damper provided for multiple unit with common discharge plenum.	☐	☐	☐
	Electrical and Controls			
22	Power to the unit and disconnect available.	☐	☐	☐
23	Batteries are in good condition, filled with electrolyte and battery chargers properly working.	☐	☐	☐
24	All electrical components grounded.	☐	☐	☐
25	Sensors calibrated.	☐	☐	☐
26	Control System interlocks hooked up and functional.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 19 - EPM-KT0-TP-000019 - Checklist - Pre-energization for HV/MV Switchgear

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORILY		
		N/A	YES	NO
	Main Busbar Mechanical Check and Visual Inspection			
1	Verify the Bus bar sizes are as per the approved manufacturer schematic.	☐	☐	☐
2	Inspect for physical damage/defects.	☐	☐	☐
3	Check bus arrangement for conformance with approved drawings.	☐	☐	☐
4	Check tightness of all bolted connections (torque wrench method).	☐	☐	☐
5	Check that all enclosure grounding is securely connected.	☐	☐	☐
6	Inspect internal compartments for cleanliness (free from dust and moisture).	☐	☐	☐
7	Check for watertight seals at all joints including expanding interface points.	☐	☐	☐
8	Check bus conductor support insulators for cracked insulation chipped porcelain, etc.	☐	☐	☐
9	Check quality of paint work (inside and outside)	☐	☐	☐
10	Check that ventilation openings are not blocked and screened against ingress of insects and rain.	☐	☐	☐
11	Moisture drain holes available at bottom of enclosure.	☐	☐	☐
12	Check anti-condensation heaters mounted at the correct locations (Bottom)			
	Main Busbar Electrical Check			
13	Insulation resistance testing done and acceptable.	☐	☐	☐
14	Contact resistance for joints and connections done and acceptable.	☐	☐	☐
	Power Circuit Breaker Mechanical Check			
15	Inspect for physical damage/defects.	☐	☐	☐
16	Check quality of paintwork.	☐	☐	☐
17	Check nameplate information for correctness.	☐	☐	☐
18	Verify the circuit breaker ratings are as per the approved drawing	☐	☐	☐
19	Check tightness of all bolted connections (torque wrench method).	☐	☐	☐
20	Check racking mechanism for alignment and smoothness of operation.	☐	☐	☐
21	Check operation of all mechanical interlocks.	☐	☐	☐
22	Check for correct breaker position indication.	☐	☐	☐
23	Check for correct spring status indication (spring charged/discharged).	☐	☐	☐
24	For air magnetic breakers, check the arc chutes for damage and correct positioning above the interrupter contacts.	☐	☐	☐
25	For minimum oil breakers, check correct oil level in each pole.	☐	☐	☐
26	For SF6 breakers, check the correct gas pressure, quality and leakage.	☐	☐	☐
27	For SF6 breakers, check the operation of the gas density switch (alarm and lockout functions).	☐	☐	☐
28	Perform all specific checks on the breaker and spring operating mechanism according to the manufacturer's instructions.	☐	☐	☐
29	Check that all control wiring is correct according to the approved drawings and terminal connections are secure.	☐	☐	☐
	Power Circuit Breaker Electrical Test			
30	Contact resistance for joints and connections done and acceptable.	☐	☐	☐
31	Timing Testing conducted and results are acceptable.	☐	☐	☐
	Current Transformer Mechanical Check			



Testing & Commissioning Checklists and Templates

Attachment 20 - EPM-KT0-TP-000020 - Checklist - Pre-energization for Switchboards

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORI		
		N/A	YES	NO
	Main Busbar Mechanical Check and Visual Inspection			
1	Verify the Bus bar sizes are as per the approved manufacturer schematic	☐	☐	☐
2	Inspect for physical damage/defects.	☐	☐	☐
3	Check bus arrangement for conformance with approved drawings.	☐	☐	☐
4	Check tightness of all bolted connections (torque wrench method).	☐	☐	☐
5	Check that all enclosure grounding is securely connected.	☐	☐	☐
6	Inspect internal compartments for cleanliness (free from dust and moisture).	☐	☐	☐
7	Check for watertight seals at all joints including expanding interface points.	☐	☐	☐
8	Check bus conductor support insulators for cracked insulation chipped porcelain etc.	☐	☐	☐
9	Check quality of paint work (inside and outside)	☐	☐	☐
10	Check that ventilation openings are not blocked and screened against ingress of insects and rain.	☐	☐	☐
11	Moisture drain holes available at bottom of enclosure.	☐	☐	☐
12	Check anti-condensation heaters mounted at the correct locations (Bottom)			
	Main Busbar Electrical Check			
13	Insulation resistance testing done and acceptable.	☐	☐	☐
14	Contact resistance for joints and connections done and acceptable.	☐	☐	☐
	Insulated Case Circuit Breaker Mechanical Check			
15	Inspect for physical damage/defects.	☐	☐	☐
16	Check quality of paintwork.	☐	☐	☐
17	Check nameplate information for correctness.	☐	☐	☐
18	Verify the circuit breakers ratings are as per the approved drawing	☐	☐	☐
19	Check tightness of all bolted connections (torque wrench method).	☐	☐	☐
20	Check racking mechanism for alignment and smoothness of operation.	☐	☐	☐
21	Check operation of all mechanical interlocks.	☐	☐	☐
22	Check for correct breaker position indication.	☐	☐	☐
23	Check for correct spring status indication (spring charged/discharged).	☐	☐	☐
24	For air magnetic breakers, check the arc chutes for damage and correct positioning above the interrupter contacts.	☐	☐	☐
25	For minimum oil breakers, check correct oil level in each pole.	☐	☐	☐
26	Perform all specific checks on the breaker and spring operating mechanism according to the manufacturer's instructions.	☐	☐	☐
27	Check that all control wiring is correct according to the approved drawings and terminal connections are secure.	☐	☐	☐
	Insulated Circuit Breaker Electrical Test			
28	Contact resistance for joints and connections done and acceptable.	☐	☐	☐
29	Timing Testing conducted and results are acceptable.	☐	☐	☐
	Current Transformer Mechanical Check			
30	Inspect for physical damage/defects.	☐	☐	☐
31	Check nameplate information for correctness.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 21 - EPM-KT0-TP-000021 - Checklist - Pre-energization for Transformers

PROJECT NAME:		DRAWING NO.		REV.
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
1	Equipment is de-energized, safe and locked-out.	☐	☐	☐
2	Nameplate parameters are in compliance with design documents.	☐	☐	☐
3	Transformer is correctly tagged in accordance with design layout drawings.	☐	☐	☐
4	Transformer installation, mountings and anchorage are in accordance with design drawings.	☐	☐	☐
5	Grounding is in accordance with project specifications.	☐	☐	☐
6	Shipping bracing materials, temporary shipping grounds/shoring steps are removed.	☐	☐	☐
7	Oil storage tank levels are correct.	☐	☐	☐
8	Oil filling tube is properly installed and sealed. The oil level indicator is reading correct level.	☐	☐	☐
9	No oil leakage and/or seepage should be found on or around transformer.	☐	☐	☐
10	Cooling system radiators are properly installed and free of physical damage.	☐	☐	☐
11	Cooling system fans/pumps are correctly fitted and rotate freely.	☐	☐	☐
12	All terminations are clean, undamaged and correctly aligned.	☐	☐	☐
13	Porcelain bushings surface should be clean and free of cracks or scars.	☐	☐	☐
14	All valves on oil lines are free to move in open and close directions. Flanges are well sealed.	☐	☐	☐
15	Check that non-magnetic gland plates are installed when using single core cables.	☐	☐	☐
16	All cables are identified, free of physical damage and adequately supported with bend radius in compliance with project specifications.	☐	☐	☐
17	Check condition of all bushing joints and seals, and that that there is no fluid leak.	☐	☐	☐
18	Pressure relief valve installation and wiring are correct.	☐	☐	☐
19	Positive pressure is maintained on gas-blanketed transformers.	☐	☐	☐
20	Safety gas channel and rupture disc are properly installed.	☐	☐	☐
21	Inspect liquid temperature indicator and pressure-vacuum indicator for appropriate readings.	☐	☐	☐
22	Tap changer mechanism is correctly fitted and locked in appropriate position.	☐	☐	☐
23	All termination enclosures have correct gaskets and fixing bolts.	☐	☐	☐
24	For breather type transformers check: - Position of the conservator valve - Silica gel condition/color	☐	☐	☐
25	Produce punchlist items for identified defects.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 22 - EPM-KT0-TP-000022 - Checklist - Pre-commissioning for HV/MV Ring Main Unit

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORRY		
		N/A	YES	NO
	General Installation			
1	General appearance good and no apparent damage.	☐	☐	☐
2	Equipment label affixed and matches the equipment tagging in the as-build drawing.	☐	☐	☐
3	Breaker capacity and ratings indicated (voltage and amperage) and type (gas or vacuum) in the nameplate matches the capacity and ratings in the design and approved documents with derating factors considered. Date of manufacturing shall also be indicated.	☐	☐	☐
4	Site is clean and tidy.	☐	☐	☐
5	Location of unit and orientation correct as per drawing.	☐	☐	☐
6	Check concrete pad and unit is bolted to pad properly.	☐	☐	☐
7	All electrical warning and safety signs provided and in proper place.	☐	☐	☐
8	Unit ventilation grids clear from any obstruction.	☐	☐	☐
9	Locks installed and functional and door/lids in working order.	☐	☐	☐
10	Gas struts in good condition (applicable for SF6 insulated).	☐	☐	☐
11	Doors and frames are earthed correctly.	☐	☐	☐
12	Neutral/earth connection to standards.	☐	☐	☐
13	Vacant conduits capped.	☐	☐	☐
14	Vermin proofing (conduits filled with foam fill and/or gland plates installed) provided.	☐	☐	☐
15	Cables correctly supported.	☐	☐	☐
16	Cable termination correctly labelled and identified including phasing and destination tags. Phasing heat shrink to be below termination.	☐	☐	☐
17	HV/LV bushing without any apparent damage.	☐	☐	☐
18	All connections tight to relevant torque requirements.	☐	☐	☐
19	Check gas level is ok.	☐	☐	☐
20	Check switch numbering/labelling is correct and installed properly.	☐	☐	☐
21	Status indicator on switch correct.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 23 - EPM-KT0-TP-000023 - Checklist - Pre-commissioning for HV/MV Capacitor Banks

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	General appearance good and no apparent damage.	☐	☐	☐
2	Equipment label affixed and matches the equipment tagging in the as-build drawing.	☐	☐	☐
3	Unit capacity and ratings indicated (KVAR, voltage, and amperage) and type of breakers (gas or vacuum) in the nameplate matches the capacity and ratings in the design and approved documents with derating factors considered. Date of manufacturing shall also be indicated.	☐	☐	☐
4	Site is clean and tidy.	☐	☐	☐
5	Location of unit and orientation correct as per drawing.	☐	☐	☐
6	Check concrete pad and unit is bolted to pad properly.	☐	☐	☐
7	All electrical warning and safety signs provided and in proper place.	☐	☐	☐
8	Unit ventilation grids clear from any obstruction.	☐	☐	☐
9	Locks installed and functional and door/lids in working order and swings freely.	☐	☐	☐
10	Gas struts in good condition (applicable for SF6 insulated) and gas level is ok.	☐	☐	☐
11	Doors and frames are earthed correctly.	☐	☐	☐
12	Neutral/earth connection to standards.	☐	☐	☐
13	Cables correctly terminated, labelled, and supported.	☐	☐	☐
14	HV/MV bushing without any apparent damage.	☐	☐	☐
15	All connections tight to relevant torque requirements.	☐	☐	☐
16	Vermin proofing (conduits filled with foam fill and/or gland plates installed) provided.	☐	☐	☐
17	Check that mounting frames are correctly bonded to the appropriate capacitor bushing as per the manufacturer drawing. No mounting frame should be floating.	☐	☐	☐
18	Check all HV/MV equipment has specified phase to phase and phase to earth clearance.	☐	☐	☐
19	Check earth switch and other isolator operation. Should be properly functioning.	☐	☐	☐
20	Check operation of discharge timers and electrical interlocking with control system and HV/MV CB and switches capable of energizing the banks.	☐	☐	☐
21	Check operation of point on wave (POW) relays, including adaptive capability of the POW relays.	☐	☐	☐
22	Check mechanical interlocking system works correctly and that the instruction diagram showing operation of the system is fixed to the unit.	☐	☐	☐
23	Ensure interlock system keys are provided.	☐	☐	☐
24	Check cubicle lighting operation.	☐	☐	☐
25	Check all fuses/links are in place.	☐	☐	☐
26	Check all CT secondary links are closed.	☐	☐	☐
27	Check VT are working properly.	☐	☐	☐
28	Ensure that MSDS for capacitor dielectric fluid is on site.	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 24 - EPM-KT0-TP-000024 - Checklist - Pre-energization for MV/LV Automatic Transfer Switch

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	General appearance good and no apparent damage.	☐	☐	☐
2	Equipment label affixed and matches the equipment tagging in the as-build drawing.	☐	☐	☐
3	Unit ratings indicated (voltage, amperage, KAIC) in the nameplate matches the ratings in the design and approved documents. Date of manufacturing shall also be indicated.	☐	☐	☐
4	Site is clean and tidy.	☐	☐	☐
5	Location of unit and orientation correct as per drawing.	☐	☐	☐
6	Check concrete pad and unit is bolted to pad properly.	☐	☐	☐
7	All electrical warning and safety signs provided and in proper place.	☐	☐	☐
8	Locks installed and functional and door/lids in working order and swings freely.	☐	☐	☐
9	Doors and frames are earthed correctly.	☐	☐	☐
10	Neutral/earth connection to standards.	☐	☐	☐
11	Cables correctly terminated (right phase-rotation), labelled and supported.	☐	☐	☐
12	MV/LV bushing without any apparent damage.	☐	☐	☐
13	All connections tight to relevant torque requirements.	☐	☐	☐
14	Vermin proofing (conduits filled with foam fill and/or gland plates installed) provided.	☐	☐	☐
15	Check CT and VT are working properly.	☐	☐	☐
16	Clearance between cables and switching mechanism as per standard requirements.	☐	☐	☐
17	Appropriate lubrication applied for moving current-carrying parts.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 25 - EPM-KT0-TP-000025 - Checklist - Pre-energization for UPS

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General			
1	All packing materials and restrains has been removed from each cabinet.	☐	☐	☐
2	UPS Main breaker coordination study has been completed prior to acceptance.	☐	☐	☐
3	Each cabinet in the UPS system is placed in its installed location.	☐	☐	☐
4	All cabinets except standalone cabinets are bolted together.	☐	☐	☐
5	Grounding bond is installed between all cabinets that are bolted together.	☐	☐	☐
6	All switchboards, conduits, and cables are properly routed to the UPS and auxiliary cabinets.	☐	☐	☐
7	Power cables are terminated on by-pass terminals.	☐	☐	☐
8	Power cables are terminated on the input breaker.	☐	☐	☐
9	Aground conductor is properly installed.	☐	☐	☐
10	If neutral is used, no other neutral to ground bonds exist downstream of the UPS.	☐	☐	☐
11	Battery cables and harness are terminated on the battery contactor.	☐	☐	☐
12	Internal battery cabinet connections have been completed (bus bars, plugs, etc.).	☐	☐	☐
13	Air conditioning equipment is installed and operating properly.	☐	☐	☐
14	The area around the installed UPS is clean and dust free.	☐	☐	☐
15	Adequate workspace exists around the UPS and other cabinet.	☐	☐	☐
16	Adequate lighting is provided around all UPS equipment.	☐	☐	☐
17	Insulation resistance and continuity testing conducted on bus bars and results are satisfactory.	☐	☐	☐
18	Labelling provided in cables, conduits, and equipment.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 26 - EPM-KT0-TP-000026 - Checklist - Pre-energization for MCC/Distribution Boards

PROJECT NAME:		DRAWING NO.		REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORILY			
		NA	YES	NO	
1	Equipment is de-energized, safe and locked-out.	☐	☐	☐	
2	Equipment is identified and tagged correctly in accordance with design layout drawings.	☐	☐	☐	
3	Equipment is undamaged, positioned, aligned correctly and securely bolted.	☐	☐	☐	
4	Equipment compartments are accessible and doors operate freely with adequate clearance.	☐	☐	☐	
5	Panel interiors are clean and door seals are clean and free of tears or damage.	☐	☐	☐	
6	Panel doors are closed and secured with appropriate bolting/closure mechanisms.	☐	☐	☐	
7	Breaker nameplate data is in agreement with load requirements.	☐	☐	☐	
8	Equipment is grounded in accordance with project specifications including ground connection to ground bus.	☐	☐	☐	
9	Panel interior components are securely installed and undamaged.	☐	☐	☐	
10	Panel front mounted components, indicators, lamps and meters are securely mounted, undamaged and correctly labeled.	☐	☐	☐	
11	Lock devices are fitted to support LOTO (lock out tag out) activities.	☐	☐	☐	
12	Gland plates and terminations are correct and suitable for external cables.	☐	☐	☐	
13	Bus bars are clean and clear of debris and torqued to specifications (torques records available).	☐	☐	☐	
14	Shipping split terminations are complete (wiring and bus bars).	☐	☐	☐	
15	Shipping blocks and temporary ground straps are removed.	☐	☐	☐	
16	Cables are terminated, clearly identified/labeled, loomed and segregated in accordance with project specifications.	☐	☐	☐	
17	Fuses are installed or available.	☐	☐	☐	
18	Special tools, including racking grounding devices, are available.	☐	☐	☐	
19	Safety signs (coordinated with ESH and construction) are fixed at appropriate locations and contact numbers are displayed for emergency notification.	☐	☐	☐	
20	Shock hazard and Arc Flash labels are applied to equipment.	☐	☐	☐	
21	Arc flash Limited Approach Boundary (LAB) is identified by markings or signage.	☐	☐	☐	
22	Single line drawings of station distribution are wall mounted/available in electrical distribution rooms/areas.	☐	☐	☐	
23	Adequate lighting is in operation.	☐	☐	☐	
24	Appropriate fire extinguishers are available.	☐	☐	☐	
25	Appropriate Arc Flash PPE is available to support energized testing/operation activities.	☐	☐	☐	
26	Produce punchlist items for identified defects.	☐	☐	☐	
No.	Reviewer's Comments	Resolution			

Testing & Commissioning Checklists and Templates

Attachment 27 - EPM-KT0-TP-000027 - Checklist - Pre-energization for HV/LV Cables

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY N/A YES NO		
	General			
1	Check visible sections of cables for physical damage.	☐	☐	☐
2	Cables are routed in accordance with cable drawing (where visible).	☐	☐	☐
3	Cables are adequately supported and correctly fixed to cable trays or structures.	☐	☐	☐
4	Cable bends are within design limits or manufactures minimum allowable.	☐	☐	☐
5	Cables are correctly loomed and segregated in accordance with project specifications.	☐	☐	☐
6	Strain relief is provided for conductors at the terminations.	☐	☐	☐
7	Cable and wire tags are in accordance with project specifications and visible.	☐	☐	☐
8	Glands, shrouds and earthing are in accordance with design specifications.	☐	☐	☐
9	Cable splice and term kits, including insulation, are in accordance with design documents.	☐	☐	☐
10	Termination lugs/connectors are of correct size.	☐	☐	☐
11	Stress cones are properly installed in accordance with design documents.	☐	☐	☐
12	Shield ground and termination are properly installed.	☐	☐	☐
13	Cables are identified in project cable schedules.	☐	☐	☐
14	Produce punchlist items for identified defects.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		

Testing & Commissioning Checklists and Templates

Attachment 28 - EPM-KT0-TP-000028 - Checklist - Pre-commissioning for Grounding (Earthing)

PROJECT NAME:		DRAWING NO.	REV.
No.	INSPECTION ITEM	CHECKED SATISFACTORY	N/A YES NO
	General		
1	Check all grounding bars are installed and labeled in accordance with project drawings.	☐	☐
2	Ground cables are correctly installed and tagged.	☐	☐
3	Connections are tight, clean and coated.	☐	☐
4	Exposed parts of electrodes are free of corrosion.	☐	☐
5	Check physical condition for damage.	☐	☐
6	Produce punchlist items for identified defects.	☐	☐
No.	Reviewer's Comments	Resolution	
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:	



Testing & Commissioning Checklists and Templates

Attachment 29 - EPM-KT0-TP-000029 - Checklist - Functional and Performance Test for Fire Pumps

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK (General)			
1	Fire pump flowrate and head within $\pm 5\%$ with the pump performance curve at 0%, 25%, 50%, 75%, 100%, 125% and 150% of the flow at the corrected rated speed (based on calculation if measured rpm differs to the rated rpm). Pump must be able to deliver 150% of the rated flow.	☐	☐	☐
2	Pump head is not less than 85% of the rated head at 150% flow for centrifugal pump.	☐	☐	☐
3	Pump head is not more than 140% of the rated head at 0% flow for centrifugal pump.	☐	☐	☐
4	Pump rotation correct.	☐	☐	☐
5	Rotational speed for the pump as per the nameplate correct.	☐	☐	☐
6	Pump has no unusual noise or vibration during operation.	☐	☐	☐
7	Packing gland water drip frequency as per the manufacturer's recommendation.	☐	☐	☐
8	No cavitation present (or air released in the air relief valve) at 150% of the rated capacity.	☐	☐	☐
9	Circulation relief valve operating to release water for cooling when pump is running at shut-off head (applicable for electric driven pump).	☐	☐	☐
10	Unlatching the controller front cover shall not start pump.	☐	☐	☐
11	All supervisory circuit for normally open normally closed valves, and unlatched panel front cover shall be tested to send supervisory signal to FACP controller for notification.	☐	☐	☐
12	All initiating circuit for flow switch and differential pressure switch shall be tested to send initiating signal to the FACP.	☐	☐	☐
	For Electric Driven Fire Pumps			
13	Supply voltage to the pump appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
14	Current drawn by the pump motor does not exceed rated current at rated capacity.	☐	☐	☐
15	Activating the emergency run handle will automatically run fire pump.	☐	☐	☐
	For Diesel Driven Fire Pumps			
16	Speed governor shall regulate engine not to have more than 10% speed difference between shut off and maximum load (150% of the rated flow).	☐	☐	☐
17	Speed verification switch shall be tested to increase engine speed and to shut down when speed exceeds 120% of the rated speed. Reset manually in the engine instrument panel to restart the engine.	☐	☐	☐
18	Battery in good condition including charger.	☐	☐	☐
19	Engine heater operating normally when engine is off (as applicable).	☐	☐	☐
20	No apparent visible air leakage from the exhaust system.	☐	☐	☐
	SYSTEM PERFORMANCE CHECK			
21	Starting with the system in static, water is released to reduce the system pressure. The system response shall be confirmed as follows: Jockey pump (JP) starts at set cut-in pressure (JP set pressure is higher than lead FP (Fire Pump) set pressure but lower than system pressure). Record JP start pressure and turn off power to the JP.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 30 - EPM-KT0-TP-000057 - Checklist - Pre-start Up for VoIP

PROJECT NAME:		DRAWING NO.	REV.		
No.	INSPECTION ITEM	CHECKED SATISFACTORY			
		N/A	YES	NO	
	Visual Inspection				
1	Verification of System Hardware	☐	☐	☐	
	• System rack is properly positioned and secured	☐	☐	☐	
	• VoIP active components are mounted on the system rack as per design	☐	☐	☐	
	• VoIP components are connected to the rack earth ground bus.	☐	☐	☐	
	• VoIP equipment are powered by corporate AC power source	☐	☐	☐	
	• VoIP equipment are connected to LAN	☐	☐	☐	
	• VoIP equipment and their cable connections are properly labelled, managed, and tested	☐	☐	☐	
	• VoIP equipment is connected to the VoIP Service Provider and working	☐	☐	☐	
	• Verify LED indicators of VoIP equipment. Red (for alarm), amber (minor), green (fine)	☐	☐	☐	
	• Verify restart/reboot of VoIP equipment. Observe the restart/reboot process both soft and hard.	☐	☐	☐	
	• Verify shutdown of VoIP equipment (both soft and hard shutdown)	☐	☐	☐	
	• Verify power up of VoIP equipment and servers	☐	☐	☐	
	• Check the Ethernet ports of the VoIP at design speed/capacity (Mbps/full duplex)	☐	☐	☐	
2	Verification of VoIP Data Network Configuration				
	• Verify VLAN (Virtual Local Area Network) assignment of VoIP server	☐	☐	☐	
	• Verify IP Address assignments of VoIP equipment (both server, hard phones, and soft phones).	☐	☐	☐	
	• Verify DHCP Scope, options, and parameters of the VoIP phones.	☐	☐	☐	
	• Verify Static Scopes, options, and parameters of the VoIP phones.	☐	☐	☐	
3	Verification of VoIP system software				
	• Verify software release/version of the VoIP equipment conform to the design	☐	☐	☐	
	• Verify Software Update , Patch and Service Pack of the VoIP equipment as applicable	☐	☐	☐	
	• Verify Firmware Update of the VoIP equipment as applicable	☐	☐	☐	



Testing & Commissioning Checklists and Templates

Attachment 31 - EPM-KT0-TP-000059 - Checklist - Pre-start Up for LAN/WLAN

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Visual Inspection			
	General			
1	Check that each networking device is placed in its proper location as per the rack face elevation.	☐	☐	☐
2	Visually check each networking device along with the modules inserted in it if any and make sure they are fine.	☐	☐	☐
3	Check the cabling connections terminated on the networking devices.	☐	☐	☐
4	Check the networking devices are labelled correctly as per the network design	☐	☐	☐
5	Check the power supplies of each networking device and make sure they are working properly by turning them up and checking the power LED is glowing.	☐	☐	☐
	Data Switch/Router			
6	Visually check the Data Switch Supervisor Engine and make sure it's intact.	☐	☐	☐
7	Visually check the Data Switch Line Cards and make sure they are intact.	☐	☐	☐
8	Visually check the power supplies and make sure they are intact. Turn the power ON and check the power LED is glowing	☐	☐	☐
9	Visually check the switch fabric modules and make sure they are intact	☐	☐	☐
10	Visually check the Chassis and make sure it's intact	☐	☐	☐
	Fire Wall	☐	☐	☐
11	Visually check the fixed ports and make sure they are intact.	☐	☐	☐
12	Visually check the I/O module ports and make sure they are intact.	☐	☐	☐
13	Visually check the power supplies and make sure they are intact. Turn the power ON and check the power LED is glowing	☐	☐	☐
14	Visually check the Chassis and make sure it's intact	☐	☐	☐
	System Servers (All Types)	☐	☐	☐
15	Visually check all Ethernet ports and make sure they are intact.	☐	☐	☐
16	Visually check the power supplies and make sure they are intact	☐	☐	☐
17	Turn the power ON and check the power LED is glowing.	☐	☐	☐
18	Visually check the Chassis and make sure it's intact	☐	☐	☐
	For WLAN (Wireless Local Area Network)			
19	Visually check installed Access Points if it conforms to the approved models and antennas are oriented as per manufacturer instruction.	☐	☐	☐
20	Visually check all Ethernet ports and make sure they are intact.	☐	☐	☐
21	Turn the power ON and check the power LED is glowing.	☐	☐	☐
22	Visually check the Controller Chassis and make sure it's intact	☐	☐	☐
23	Confirm that every APs are coordinated with Network Administrator and properly configured for IP addresses.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 32 - EPM-KT0-TP-000030 - Checklist - Functional and Performance Test for Chilled Water Pumps

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		NA	YES	NO
	FUNCTIONAL CHECK			
1	Pump flowrate and head matches with the pump performance curve at 0%, 50%, and 100% flow.	☐	☐	☐
2	Supply voltage to the pump appropriate compared to the rated voltage.	☐	☐	☐
3	Current drawn by the pump motor does not exceed rated current.	☐	☐	☐
4	Pump rotation correct.	☐	☐	☐
5	Rotational speed for the pump as per the nameplate correct.	☐	☐	☐
6	Pump has no unusual noise or vibration during operation.	☐	☐	☐
7	The HOA switch properly activates and deactivates the unit.	☐	☐	☐
8	Hydronic piping differential pressure sensor is located 2/3rds down the piping circuit (for conventional control valve) and not subject to turbulence from elbows, vanes, etc: - Record location of sensor - Record sensor reading at BMS - Verify sensor setpoint.	☐	☐	☐
9	Hydronic piping differential pressure sensor is located at the index circuit (for Pressure Independent Control Valve) and not subject to turbulence from elbows, vanes, etc: - Record location of sensor - Record sensor reading at BMS - Verify sensor setpoint.	☐	☐	☐
10	Pump differential pressure switch mapped correctly to BMS: Verify alarm at BMS upon flow failure.	☐	☐	☐
11	Pump VFD speed reporting reliable values: - Record reading at BMS - Record VFD Hz at minimum and maximum.	☐	☐	☐
12	Specified sequences of operation and operating schedules have been implemented with all variations documented.	☐	☐	☐
13	Specified point-to-point checks have been completed and documentation record submitted for this system. All alarm points have been tested and confirmed.	☐	☐	☐
	EQUIPMENT PERFORMANCE CHECK			
14	Adjust measured flowrate and head if rotational speed measured differs greatly with the rated rpm using pump affinity law formula. Calculate the water power using the flowrate and head.	☐	☐	☐
15	Take current drawn during testing of rated capacity and head. Record voltage for the phases and calculate the electrical power drawn.	☐	☐	☐
16	Calculate the overall efficiency of the pump and motor assembly by dividing the water power with the electrical power. Calculated total efficiency of the pump+motor assembly shall be equal or greater compare to the manufacturer rated total efficiency of the assembly.	☐	☐	☐
	SYSTEM PERFORMANCE CHECK			



Testing & Commissioning Checklists and Templates

Attachment 33 - EPM-KT0-TP-000031 - Checklist - Functional and Performance Test for Central Fans

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORI		
		N/A	YES	NO
FUNCTIONAL CHECK				
1	Fan air flow and ESP matches compare to fan performance curve at 0%, 50% and 100% flow.	☐	☐	☐
2	Supply voltage to the fan appropriate compared to the rated voltage at rated capacity.	☐	☐	☐
3	Current drawn by fan motors does not exceed rated current.	☐	☐	☐
4	Fan rotation correct.	☐	☐	☐
5	Rotational speed for the fan correct compared to the equipment nameplate.	☐	☐	☐
6	Fan has no unusual noise or vibration.	☐	☐	☐
7	Suction damper stroke fully without binding and spans calibrated.	☐	☐	☐
8	The HOA switch properly activates and deactivates the unit.	☐	☐	☐
9	Supply air duct static pressure sensor is located 2/3rds down longest supply duct in duct and not subject to turbulence from elbows, vanes, etc. (as applicable for VFD drive fan): - Record location of sensor - Record sensor reading at BMS - Verify sensor setpoint from TAB Report.	☐	☐	☐
10	Fan flow or differential pressure sensor mapped correctly to BMS: Verify alarm at BMS upon flow failure	☐	☐	☐
11	Fan VFD speed reporting reliable values (as applicable): - Record reading at BMS - Record VFD Hz at minimum and maximum.	☐	☐	☐
12	Fan airflow monitoring station reporting reliable values (as applicable): - Record reading at BMS - Record supply airflow with all terminal units at maximum airflow - Record supply airflow with all terminal units at minimum airflow.	☐	☐	☐
13	Fan flow graphic is correct in BMS: Graphic easily displays system On/Off.	☐	☐	☐
14	Specified sequences of operation and operating schedules have been implemented with all variations documented (as applicable).	☐	☐	☐
15	Specified point-to-point checks have been completed and documentation record submitted for this system. All alarm points have been tested and confirmed.	☐	☐	☐
EQUIPMENT PERFORMANCE CHECK				
16	Adjust measured flowrate and head if rotational speed measured differs greatly with the rated rpm using fan affinity law formula. Calculate the air power using the flowrate and head.	☐	☐	☐
17	Take current drawn during testing of rated capacity and head. Record voltage for the phases and calculate the electrical power drawn.	☐	☐	☐
18	Calculate the overall efficiency of the fan and motor assembly by dividing the air power with the electrical power. Calculated total efficiency of the fan+motor assembly shall be equal or greater compare to the manufacturer rated total efficiency of the assembly.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 34 - EPM-KT0-TP-000032 - Checklist - Functional and Performance Test for Centralized AHU

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK			
1	Supply fan air flow and ESP matches compare to fan performance curve at 0%, 50% and 100% flow.	☐	☐	☐
2	Exhaust fan air flow and ESP matches compare to fan performance curve at 0%, 50% and 100% flow.	☐	☐	☐
3	Supply voltage to the supply fan appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
4	Supply voltage to the exhaust fan appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
5	Current drawn by supply and return fan motors does not exceed rated current at rated capacity.	☐	☐	☐
6	Supply fan rotation correct.	☐	☐	☐
7	Return fan rotation correct.	☐	☐	☐
8	Rotational speed for the supply and exhaust fan correct compared to the equipment nameplate.	☐	☐	☐
9	Return fan has no unusual noise or vibration.	☐	☐	☐
10	Supply fan has no unusual noise or vibration.	☐	☐	☐
11	All dampers (exhaust, supply, mixed air, energy recovery wheel as applicable) stroke fully without binding and spans calibrated.	☐	☐	☐
12	Cooling and heating valves stroke fully and easily, and spanning is calibrated.	☐	☐	☐
13	Valves verified to not be leaking through coils when closed at normal operating pressure.	☐	☐	☐
14	The HOA switch properly activates and deactivates the unit.	☐	☐	☐
15	Supply Air duct static pressure sensor is located 2/3rds down longest supply duct in duct and not subject to turbulence from elbows, vanes, etc: - Record location of sensor - Record sensor reading at BMS - Verify sensor setpoint from TAB Report.	☐	☐	☐
16	Outdoor air sensor is reporting reliable values: - Record location of OA sensor - Record sensor temperature reading at BMS.	☐	☐	☐
17	Supply fan flow or differential pressure sensor mapped correctly to BMS: Verify alarm at BMS upon flow failure.	☐	☐	☐
18	Supply fan VFD speed reporting reliable values: - Record reading at BMS - Record VFD Hz at minimum and maximum.	☐	☐	☐
19	Supply airflow monitoring station reporting reliable values: - Record reading at BMS - Record supply airflow with all terminal units at maximum airflow - Record supply airflow with all terminal units at minimum airflow.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 35 - EPM-KT0-TP-000033 - Checklist - Functional and Performance Test for CRAC (Precision Unit)

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK			
1	Supply fan air flow and ESP matches compare to fan performance curve at 100% flow.	☐	☐	☐
2	Supply voltage to the supply fan appropriate compared to the rated voltage at rated capacity. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
3	Current drawn by supply fan motors does not exceed rated current.	☐	☐	☐
4	Supply fan rotation correct.	☐	☐	☐
5	Rotational speed for the supply fan correct compared to the equipment nameplate.	☐	☐	☐
6	Supply fan has no unusual noise or vibration.	☐	☐	☐
7	All dampers (supply and return) stroke fully without binding and spans calibrated.	☐	☐	☐
8	Cooling valves stroke fully and easily, and spanning is calibrated.	☐	☐	☐
9	Valves verified to not be leaking through coils when closed at normal operating pressure.	☐	☐	☐
10	CRAC monitoring station reporting reliable values: - Record status (On/Off) at BMS - Record actual site status.	☐	☐	☐
11	Room temperature and humidity monitoring station reporting reliable values: - Record temperature and %RH values at BMS - Record actual site instrument reading for temperature and %RH.	☐	☐	☐
12	CRAC flow graphic is correct in BMS Graphic easily displays system On/Off.	☐	☐	☐
13	Specified point-to-point checks have been completed and documentation record submitted for this system. All alarm points have been tested and confirmed.	☐	☐	☐
	EQUIPMENT PERFORMANCE CHECK			
14	Adjust measured flowrate and TSP (Total Static Pressure) if rotational speed measured differs greatly with the rated rpm using fan affinity law formula. Calculate the air power using the flowrate and TSP. TSP is ESP (external static pressure drop+ pressure drop across the CRAC which includes filters and coils).	☐	☐	☐
15	Take current drawn during testing of rated capacity and TSP. Record voltage for the phases and calculate the electrical power drawn. Ensure that heater for humidification and heater for humidity control (for high latent load) is not activated by temporary removing electrical connections. Restore connection once current reading is completed.	☐	☐	☐
16	Calculate the overall efficiency of the fan and motor assembly by dividing the air power with the electrical power. Calculated total efficiency of the fan+motor assembly shall be equal or greater compare to the manufacturer rated total efficiency of the assembly.	☐	☐	☐
17	Measure on-coil and off-coil air temperature and %RH and calculate the cooling coil capacity by the measured air flowrate and enthalpy taken from the Psychrometric chart. Calculated cooling capacity must be close to the manufacturer published adjusted cooling rating based on actual condition.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 36 - EPM-KT0-TP-000034 - Checklist - Functional and Performance Test for FCU

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK			
1	Supply fan air flow and ESP matches compare to fan performance curve at 100% flow.	☐	☐	☐
2	Supply voltage to the supply fan appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
3	Current drawn by supply fan motors does not exceed rated current at rated capacity.	☐	☐	☐
4	Supply fan rotation correct.	☐	☐	☐
5	Rotational speed for the supply fan correct compared to the equipment nameplate.	☐	☐	☐
6	Supply fan has no unusual noise or vibration.	☐	☐	☐
7	All dampers (supply and return) stroke fully without binding and spans calibrated.	☐	☐	☐
8	Cooling valves stroke fully and easily, and spanning is calibrated.	☐	☐	☐
9	Thermostat, FCU controller, and control valve properly functioning and maintains room temperature with minimal swing.	☐	☐	☐
10	Valves verified to not be leaking through coils when closed at normal operating pressure.	☐	☐	☐
11	FCU status monitoring station reporting reliable values (as applicable): - Record status (On/Off) at BMS - Record actual site status.	☐	☐	☐
12	Room temperature monitoring station reporting reliable values (as applicable): - Record temporary values at BMS - Record actual site instrument reading for temp.	☐	☐	☐
13	FCU flow graphic is correct in BMS (as applicable): Graphic easily displays system On/Off.	☐	☐	☐
14	Specified point-to-point checks have been completed and documentation record submitted for this system. All alarm points have been tested and confirmed.	☐	☐	☐
	EQUIPMENT PERFORMANCE CHECK			
15	Adjust measured flowrate and ESP (External Static Pressure) if rotational speed measured differs greatly with the rated rpm using fan affinity law formula. Calculate the air power using the flowrate and ESP.	☐	☐	☐
16	Take current drawn during testing of rated capacity and ESP. Record voltage for the phases and calculate the electrical power drawn.	☐	☐	☐
17	Calculate the overall efficiency of the fan and motor assembly by dividing the air power with the electrical power. Calculated total efficiency of the fan+motor assembly shall be equal or greater compare to the manufacturer rated total efficiency of the assembly.	☐	☐	☐
18	Measure on-coil and off-coil air temperature and %RH and calculate the cooling coil capacity by the measured air flowrate and enthalpy taken from the Psychrometric chart. Calculated cooling capacity must be close to the manufacturer published adjusted cooling rating based on actual condition.	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 37 - EPM-KT0-TP-000035 - Checklist - Functional and Performance Test for Cross Flow Cooling Towers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK			
1	Fan air flow matches to the approved manufacturer documents.	☐	☐	☐
2	Supply voltage to the fan appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limit.	☐	☐	☐
3	Current drawn by fan motors does not exceed rated current at rated capacity.	☐	☐	☐
4	Fan rotation correct.	☐	☐	☐
5	Rotational speed for the fan correct compared to the equipment nameplate.	☐	☐	☐
6	Fan has no unusual noise or vibration.	☐	☐	☐
7	The HOA switch properly activates and deactivates the unit (for VFD Drive CT).	☐	☐	☐
8	Fan speed modulates (increase or decrease) to maintain condenser water temperature to 85°F (for VFD drive CT).	☐	☐	☐
9	For multiple CT, staging of CT is proven by closing motorized valve to CT and turning off-fan when further decrease in load is required while all CT fan motor are at minimum allowable frequency (usually 15 to 18Hz).	☐	☐	☐
10	No water over-flowing on basin during staging and de-staging of Cooling Towers. Water level is maintained within limits as per manufacturer's instruction.	☐	☐	☐
11	No vortex formed in CT basin.	☐	☐	☐
12	Water is evenly sprinklered or loaded across the CT fill. No excessive overlapping of loading area which reduces water to air contact (fill performance) in the cellular fill media.	☐	☐	☐
13	No excessive water loading to the walls of the CT which result in lower cellular media water to air contact.	☐	☐	☐
14	Correct water spray nozzle provided.	☐	☐	☐
15	Make-up water and float valve (or motorized valve and level switches) properly functioning.	☐	☐	☐
16	Low and high level water alarms functional.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 38 - EPM-KT0-TP-000036 - Checklist - Functional and Performance Test for Boilers

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Preparation for Firing			
1	Check that the boiler is filled with water to the appropriate level, and is vented, and the condition of water is chemically correct.	☐	☐	☐
2	Check that the main valve in the main steam distribution header is closed.	☐	☐	☐
3	Check that all water feed isolation valve and fuel line isolation valve are all open.	☐	☐	☐
4	Air vents on the boiler shell are open.	☐	☐	☐
5	Check that the main boiler stop valve and drain valves are closed for the level and alarm controls.	☐	☐	☐
6	Check that the feed check valve and the isolation valves to the water level controls and the alarm and the feed pumps are open.	☐	☐	☐
7	Check blowdown valve fully closed.	☐	☐	☐
8	Check the electrical supplies are available at the boiler control panel and the feed system is available for immediate use.	☐	☐	☐
9	Check the operation of the water level controller by allowing the feed water pump to run until switched off by the water level controller. Open the blowdown valve and check that the pump restarts at correct level. Close the blowdown valve afterwards.	☐	☐	☐
10	Check the operation of the high level alarm by isolating the water level controller and opening its drain valve. The high level alarm should sound when the water level has raised the pre-set condition. Open the isolating valve on the level controller and close the drain valve afterwards.	☐	☐	☐
11	Check the operation of the low level alarm by opening the blow down valve. The low level alarm should sound at low water level. Refill the tank with water and repeat the low level alarm test, the burner lock out at the second low level alarm should be activated.	☐	☐	☐
12	Check that the water level in the blow-down vessel is satisfactory and that the vent is adequate.	☐	☐	☐
13	Ensure that steam loads are available to check performance of the boiler.	☐	☐	☐
14	Mains power to motors and controllers appropriate and accepted by Client Representatives.	☐	☐	☐
	Performance Testing			
15	A full load performance testing shall be carried out for each boiler by the following method:	☐	☐	☐
	a. Each boiler main isolation valve shall be open gradually (see method for distribution piping preheat) to use the line flowmeter for reading steam flow.	☐	☐	☐
	b. During the rated steam flow, measure the head (mean) and temperature of steam (if available) developed by the boiler.	☐	☐	☐
	c. Measure the fuel consumption during the test and its temperature (for liquid fuel)	☐	☐	☐
	d. Measure the flue gas temperature	☐	☐	☐
	e. Measure the feed water temperature.	☐	☐	☐
	f. Flue gas shall be analyzed and composition shall conform to local or international environmental requirements (e.g. carbon dioxide, Sulphur dioxide, and nitrogen emission) based on type of fuel used.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 39 - EPM-KT0-TP-000037 - Checklist - Functional and Performance Test for Water Treatment Plant

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Installation			
1	All equipment current drawn are within normal limits and no noticeable abnormalities observed.	☐	☐	☐
2	Float valves, float switches, and motorized valves are properly working and controlling water levels.	☐	☐	☐
3	Plant is producing the required treatment capacity (m3 per day) and water quality is within the acceptable contract parameter based on the raw water parameters considered.	☐	☐	☐
4	Permeate flow and water recovery as per the approved documents based on the raw water quality (TDS), temperature, and pH considered.	☐	☐	☐
5	All equipment (pumps and accessories) including controllers are individually tested and accepted.	☐	☐	☐
	Pre-Treatment			
6	Feedwater temperature and pH is within the design range (25°C and 7.8pH). TDS is within acceptable limits.	☐	☐	☐
7	Reject water flowrate as per the design recovery rate.	☐	☐	☐
8	Feedwater pressure in compliance to the minimum pressure required by the equipment.	☐	☐	☐
9	Pre-chlorination dosing system (pumps, control, and tanks) properly working.	☐	☐	☐
10	Filter feed pump working properly including backwash function.	☐	☐	☐
11	Pressure sand filter is operational and fully automatic including backwash function.	☐	☐	☐
12	Carbon filter is operational and fully automatic including backwash function.	☐	☐	☐
13	Anti-scalant dosing system (pumps and dosing tanks) operational.	☐	☐	☐
14	Pipe and fittings has no visible leaks during operation and valves automatically isolates and direct flows.	☐	☐	☐
15	All pressure gauges installed and readings does not exceed half of the dial reading.	☐	☐	☐
	Reverse Osmosis Plant			
16	Cartridge filter in place.	☐	☐	☐
17	High pressure pump properly working without excessive vibration and noise.	☐	☐	☐
18	Reverse osmosis membrane installed according to the required number of elements and producing required flowrate.	☐	☐	☐
19	Brine throttling control valve properly working.	☐	☐	☐
20	Low pressure switch protection for the RO membrane properly working.	☐	☐	☐
21	Conductivity meter installed and calibrated and results in within acceptable limits.	☐	☐	☐
22	Flowmeter (rotameter) is within limit to indicate proper flow and velocity.	☐	☐	☐
23	No visible leakage for the high pressure piping.	☐	☐	☐
24	All pressure gauges installed and readings does not exceed half of the dial reading.	☐	☐	☐
25	Clean in Place (CIP) installed inclusive of flushing tank and properly working (as required by the contract).	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 40 - EPM-KT0-TP-000038 - Checklist - Functional and Performance Test for Waste Water Treatment Plant

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Check			
1	No unpleasant smell around the WWT Plant.	☐	☐	☐
2	All equipment current drawn are normal and no noticeable abnormalities observed.	☐	☐	☐
3	Float valves, float switches, and motorized valves are properly working and controlling water levels.	☐	☐	☐
4	Plant is producing the required treatment capacity (m3 per day) and water bacteriological analysis is within the acceptable parameter.	☐	☐	☐
	Equalization Tank			
5	Incoming wastewater are filtered efficiently and all large materials are retained by trash trap, bar screen and comminutors.	☐	☐	☐
6	Pumps and pretreatment blowers are operating and cycling properly. Flow to the treatment is regulated.	☐	☐	☐
7	High and low level alarms are operating properly.	☐	☐	☐
	Aeration Tank			
8	Aeration mixing is adequate and blower is visibly operating and properly cycling. Liquid appearance must be chocolate brown with minimal foaming.	☐	☐	☐
9	Diffusers all open, no dead spots, and air flow-balanced.	☐	☐	☐
10	Liquid leaving Aeration Tank is clear with satisfactory smell.	☐	☐	☐
	Settling Tank			
11	All equipment functioning with settling tank surface clean with clear effluent.	☐	☐	☐
12	Skimmers are removing scums automatically on water surface.	☐	☐	☐
13	Effluent free from excess foaming and solids.	☐	☐	☐
14	Sludge return pump operating properly and cycling as per schedule.	☐	☐	☐
15	Sides/hoppers wall scraped regularly.	☐	☐	☐
	Sludge Holding Tank			
16	Properly used and operating for sludge wasting.	☐	☐	☐
17	Sludge being hauled as needed.	☐	☐	☐
	Tertiary Filters			
18	Operating properly with backwash pumps (for mechanical filtering).	☐	☐	☐
19	Air blowers and aerator operating properly with no visible clogs and solid build up (filter ponds).	☐	☐	☐
20	High-water alarm operating properly for filter/polishing ponds.	☐	☐	☐
	Chlorinator			
21	Chlorine is properly injected and dozed. Equipment is operating properly.	☐	☐	☐
	Effluent Tank			
22	Effluent appears clear and free of suspended solids and foaming.	☐	☐	☐
23	Pumps are operating and cycling properly.	☐	☐	☐
24	High level alarm properly functioning.	☐	☐	☐
25	Perform necessary operational and control tests (settle ability test, pH, chlorine residual, etc.).	☐	☐	☐
No.	Reviewer's Comments	Resolution		



Testing & Commissioning Checklists and Templates

Attachment 41 - EPM-KT0-TP-000039 - Checklist - Functional and Performance Test for Condensate Recovery Unit

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	FUNCTIONAL CHECK			
1	Pump flowrate and head matches with the pump performance curve at 0%, 50%, and 100% flow.	☐	☐	☐
2	Supply voltage to the pump appropriate compared to the rated voltage. Voltage imbalance between phases within acceptable limits.	☐	☐	☐
3	Current drawn by the pump motor does not exceed rated current.	☐	☐	☐
4	Pump rotation correct.	☐	☐	☐
5	Rotational speed for the pump as per the nameplate correct.	☐	☐	☐
6	Pump has no unusual noise or vibration during operation.	☐	☐	☐
7	No cavitation observed when pumps are running.	☐	☐	☐
8	The HOA switch properly activates and deactivates the unit.	☐	☐	☐
9	In auto position, pumps are staging based on cut-in and cut-off level of magnetic-activated level switches installed in the condensate tank for lead and lag pump.	☐	☐	☐
10	High level and low level alarm functional test conducted by manually lifting and releasing float of the magnetic-activated level switch.	☐	☐	☐
	EQUIPMENT PERFORMANCE CHECK			
11	Adjust measured flowrate and head if rotational speed measured differs greatly with the rated rpm using pump affinity law formula. Calculate the water power using the flowrate and head.	☐	☐	☐
12	Take current drawn during testing of rated capacity and head. Record voltage for the phases and calculate the electrical power drawn.	☐	☐	☐
13	Calculate the overall efficiency of the pump and motor assembly by dividing the water power with the electrical power. Calculated total efficiency of the pump+motor assembly shall be equal or greater compare to the manufacturer rated total efficiency of the assembly.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 42 - EPM-KT0-TP-000040 - Checklist - Functional and Performance Test for Electric Traction Elevators

PROJECT NAME:		DRAWING NO.		REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY			
		N/A	YES	NO	
	Electric Elevators				
1	Electric traction elevators shall be tested according to ASME A.17.1 Category 1 and Category 5 in the presence of Certified Third Party Testing Agency. Category 1 Testing (No Load and Low Speed) comprise of: a. Oil Buffers according to Section 8.11.2.2.1 b. Car and Counterweight Safety System according to Section 8.11.2.2.2 c. Speed Governors according to Section 8.11.2.2.3 d. Slack-rope Devices on Winding Drum Machines according to Section 8.11.2.2.4 e. Normal and Final Terminal Stopping Devices according to Section 8.11.2.2.5 f. Fire Fighter's Emergency Operation according to Section 8.11.2.2.6 g. Emergency Power Operation according to Section 8.11.2.2.7 h. Power Operation of Door System according to Section 8.11.2.2.8 i. Broken Rope, Tape, or Chain Switch according to Section 8.11.2.2.9 j. Electrical Protective Devices according to Section 8.11.2.2.10 Category 5 Testing (Rated Load and Rated Speed) comprise of: a. Car and Counterweight Safety System according to Section 8.11.2.3.1 b. Speed Governors according to Section 8.11.2.3.2 c. Oil Buffers according to Section 8.11.2.3.3 d. Braking System and braking distance according to Section 8.11.2.3.4 e. Emergency Power Operation according to Section 8.11.2.3.5 f. Emergency Terminal Stopping and Speed Limiting Device according to Section 8.11.2.3.6 g. Power Opening of Doors according to Section 8.11.2.3.7 h. Levelling Zone and Levelling Speed according to Section 8.11.2.3.8 i. Inner Landing Zone according to Section 8.11.2.3.9 j. Emergency Stopping Devices according to Section 8.11.2.3.10.	☐	☐	☐	
2	For electric traction elevator with emergency power system and permitted to carry passengers, shall be tested at 125% of the rated load at rated speed according to ASMEA.17.1	☐	☐	☐	
3	All electrical installation and testing shall conform to NFPA 70 and ASME requirements inclusive of overloads.	☐	☐	☐	
4	Fireman's service phase I and Phase II recall tested with the FDAS System.	☐	☐	☐	
No.	Reviewer's Comments	Resolution			
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:			



Testing & Commissioning Checklists and Templates

Attachment 43 - EPM-KT0-TP-000041 - Checklist - Functional and Performance Test for Escalators and Moving Walks

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General			
1	Escalators and Moving Walks shall be tested according to ASME A.17.1 Category 1 (no load) in the presence of Certified Third Party Testing Agency. Category 1 Testing is composed of the following test: a. Machine Space accessibility as per Section 8.11.4.2.1 b. Stop Switch operation test as per Section 8.11.4.2.2 c. Controller and wiring functionality test as per Section 8.11.4.2.3 d. Drive machine and brake test including braking distance as per Section 8.11.4.2.4 e. Speed Governor test to shut-down if speed increase/decrease more than 120% as per Section 8.11.4.2.5 f. Broken Drive Chain Device safety test as per Section 8.11.4.2.6 g. Reversal Stop Switch testing as per Section 8.11.4.2.7 h. Broken Step Chain or Treadway Device test as per Section 8.11.4.2.8 i. Step Up thrust Device testing as per Section 8.11.4.2.9 j. Missing Step or Pallet Device testing as per Section 8.11.4.2.10 k. Step or Pallet Level Device testing as per Section 8.11.4.2.11 l. Step, Pallet, Step or Pallet Chain and trusses structural soundness test as per Section 8.11.4.2.12 m. Handrail Safety Systems test as per Section 8.11.4.2.13 n. Heater testing (as required) as per Section 8.11.4.2.14 o. Permissible Stretch in escalator chain safety test as per Section 8.11.4.2.15 p. Response to smoke detector test as per Section 8.11.4.2.16 q. Comb-Step or Comb-Pallet Impact Device test as per Section 8.11.4.2.17 r. Step/Skirt Performance Index testing as per Section 8.11.4.2.18 s. Clearance between Step and Skirt (loaded gap) as per Section 8.11.4.2.19 t. Inspection of Control Devices as per Section 8.11.4.2.20 u. u. Step Lateral Displacement Device test as per Section 8.11.4.2.21	☐	☐	☐
2	All electrical installation and testing shall conform to NFPA 70 and ASME requirements inclusive of overloads, electrical ratings, insulation resistance, earthing resistance, etc.	☐	☐	☐
3	Escalators tested for 15 minutes forward or up direction and another 15 minutes backward or down direction continuously without any deficiencies.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 44 - EPM-KT0-TP-000042 - Checklist - Functional and Performance Test for Building Maintenance Unit

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	General Check			
1	Capacity of platform/cradle or BMU traction motors including all accessories conforms to the approved documentation. Lifting capacity shall be in accordance to Specification and equipment approved MAS (Material Approval Sheet).	☐	☐	☐
2	Installation conforms to the requirement of the contract, specifications, and drawings. Complete installation is accepted by the Client Representatives.	☐	☐	☐
3	All bolts and nuts for rail system fixing are 100% torque tested.	☐	☐	☐
4	Load testing conducted for each tiers and base anchors of BMU track railing by applying force equivalent to half of the anchor capacity.	☐	☐	☐
5	Safe entry and exit provided for the workers for coming into and out of the cradle.	☐	☐	☐
6	All metal parts are grounded.	☐	☐	☐
7	Traction cables in good condition, lubricated, no visible entanglement, and excessive sagging.	☐	☐	☐
8	Guide rail is structurally sound and properly installed including anchoring, brackets, bolting/fixing and framings.	☐	☐	☐
9	Cradle is provided with bump protection and rollers.	☐	☐	☐
10	Anti-fall anchorage provided in the cradle.	☐	☐	☐
11	All electrical installation and testing conforms to the requirement of NFPA 70 and other electrical standards.	☐	☐	☐
12	Equipment moving parts are properly lubricated.	☐	☐	☐
13	Equipment safeties are in place and properly working such as cradle overload device, cradle trip bar, jib slew end of travel limit switch, cradle emergency retrieval hand wind, slack rope device, over-speed detector and brake, emergency stop, residual current device, cross bar slew end of travel limits, electrical phase failure detector, harness attachment points, cradle full-up detector, lanyard restraint trip bar, secondary cradle full-up over travel detector and wire rope equalizer.	☐	☐	☐
14	Operational labelling provided within the cradle (emergency retrieving, up/down control, slewing, etc.).	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 45 - EPM-KT0-TP-000043 - Checklist - Functional and Performance Test for HV/MV Capacitor Banks

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORILY		
		N/A	YES	NO
	General			
1	Identification record of each capacitor bank such as Manufacturer's name, serial number, year of manufacture, rated and measured capacitance, rated output, rated voltage, rated current, temperature category and di-electric fluid type has been provided.	☐	☐	☐
2	Identification record of any tuning reactor such as Manufacturer's name, serial number, year of manufacture, rated reactance, rated voltage and rated current has been provided.	☐	☐	☐
3	Discharge test has been carried out for capacitors build to IEC 60871. Discharge voltage shall be 75V or less from initial peak voltage of $\sqrt{2}$ Un (Un is the rated voltage) within 10 mins. discharge time.	☐	☐	☐
4	Discharge test has been carried out for capacitors build to AS 2897. Discharge voltage shall be 50V or less from initial peak voltage of $\sqrt{2}$ Un (Un is the rated voltage) within 5 mins. discharge time for Un $\leq$ 25 kV. Discharge voltage shall be 75V or less from initial peak voltage of $\sqrt{2}$ Un (Un is the rated voltage) within 10 mins. discharge time for Un $\geq$ 25 kV.	☐	☐	☐
5	Insulation resistance test has been conducted and yield acceptable test results.	☐	☐	☐
6	Capacitance test has been conducted and yield acceptable test results.	☐	☐	☐
7	High voltage withstand test has been conducted on capacitors (as applicable).	☐	☐	☐
8	Balance check of each capacitor bank has been conducted.	☐	☐	☐
9	Primary injection test conducted to check balance between banks (as applicable).	☐	☐	☐
10	Load test conducted immediately on all protection and metering circuits after energization.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 46 - EPM-KT0-TP-000044 - Checklist - Functional and Performance Test for UPS

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Functional Test for On-line UPS			
1	Phase rotation testing conducted and passed.	☐	☐	☐
2	All other electrical pre-start testing (insulation resistance, continuity, battery testing, etc.) conducted and passed.	☐	☐	☐
3	Primary power has been applied and stable for 3 days without any noticeable malfunction for the UPS and its control and monitoring system.	☐	☐	☐
4	Load testing shall be conducted with the use of capacitor banks. Run down time shall be proven including battery back-up as well as charging time as specified in the design/manufacture.	☐	☐	☐
5	Transfer switch and by-pass tested without any foreseen problems (flickering, brown-out, black-out, etc.).	☐	☐	☐
6	Alarm system tested including overrides.	☐	☐	☐
7	System testing for 30 days shall be conducted (UPS is in service for 30 days) prior to final acceptance.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 47 - EPM-KT0-TP-000056 - Checklist - Functional and Performance Test for Pressure Independent VAV

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		NA	YES	NO
	FUNCTIONAL CHECK			
1	Minimum and design air flowrates are programed into the VAV intelligent controller/ actuator.	☐	☐	☐
2	Mains power provided to the actuator/controller appropriate in terms of voltage (24VAC or 24VDC or 220VAC).	☐	☐	☐
3	Thermostat is connected to the VAV controller/actuator, calibrated and functioning properly.	☐	☐	☐
4	During the static AHU performance (AHU speed is fixed as well as the system pressure), turn-off thermostat to see if VAV is able to maintain the minimum air flowrate.	☐	☐	☐
5	During the variable speed AHU performance (AHU speed is variable based on pressure sensor located 2/3 or 3/4 of the duct run) at high room cooling load, verify if VAV is able to maintain design air flowrate.	☐	☐	☐
6	During the variable speed AHU performance (AHU speed is variable based on pressure sensor located 2/3 or 3/4 of the duct run) at low room cooling load, verify if VAV is able to adjust air flowrate.	☐	☐	☐
7	For VAV equipped with heaters (in case of healthcare patient rooms where minimum ACH is maintained), see if the heater is able to maintain room temperature at low room cooling load (at night).	☐	☐	☐
8	For unoccupied mode test (as applicable), set the thermostat to unoccupied mode and see if the temperature setting adjusted to higher value (say 82°F). Air flow should reduce correspondingly.	☐	☐	☐
9	For VAV status monitoring, controller/actuator reporting reliable values (as applicable): - Record status (On/Off) at BMS - Record actual site status.	☐	☐	☐
10	Room temperature monitoring station reporting reliable values (as applicable): - Record temperature values at BMS - Record actual site instrument reading for temp.	☐	☐	☐
11	VAV flow graphic is correct in BMS (as applicable): Graphic easily displays system On/Off.	☐	☐	☐
12	Specified point-to-point checks have been completed and documentation record submitted for this system. All alarm points have been tested and confirmed.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 48 - EPM-KT0-TP-000058 - Checklist - Functional and Performance Test for VoIP

PROJECT NAME:		DRAWING NO.	REV.	
No.	INSPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Initial Testing			
1	Verification of Redundancy Server Configuration	☐	☐	☐
	• Verify the pros IP address in the configure server webpage	☐	☐	☐
	• Verify Main Server IP address in the configure server webpage	☐	☐	☐
	• Verify whether redundancy server is added in the Main Server	☐	☐	☐
	• Verify Main and redundancy server status	☐	☐	☐
	• Verify that all main gateways are registered to the Main Server	☐	☐	☐
	• Verify IP Media Resource status are registered	☐	☐	☐
2	Verification of Redundancy Fallback Support System	☐	☐	☐
	• Verify the IP Address that needs to be configured	☐	☐	☐
	• Verify the Redundancy Call Processor. Turn-off all Call-Manager (CM) Server service.	☐	☐	☐
	• Check the Redundancy Call Processor for other Voice Gateways (VG). Turn-off all other Call Manager Server service.	☐	☐	☐
	• Check the auto-assign for SRST	☐	☐	☐
	• Check Call-Manager fallback VG. Turn-on all CM Server service	☐	☐	☐
	• Check other Call-Manager fallback VG. Turn-on all CM Server service	☐	☐	☐
	Functional Testing			
3	Conduct Rack Server Failure Test to confirm behavior of rack server in the event of failure of main terminal. Test is to confirm back-up service in the event of main terminal failure.	☐	☐	☐
4	Conduct SIP Session Test to test call from internal station to a landline or mobile phone.	☐	☐	☐
5	Conduct Call-Transfer Test by making a call between phone stations and dialing call transfer button followed by another station number to transfer the call.	☐	☐	☐
6	Conduct Call-Forward Test by making a call between phone stations and confirm call-forward function based on set rules.	☐	☐	☐
7	Conduct Call Recording Test by making a call between phone stations equipped with auto call recording. Check recorded call via recording webpage.	☐	☐	☐
8	Conduct Call Billing Test by making a call between local line and outside line. Open the Call Detail Record (CDR) to check call duration.	☐	☐	☐
9	Conduct test to confirm auto uploading of TFTP files from TFTP webpage once an IP Phone is plug in the data outlet.	☐	☐	☐
No.	Reviewer's Comments	Resolution		
Originator's Name / Signature and Date:		Checker's Name / Signature and Date:		



Testing & Commissioning Checklists and Templates

Attachment 49 - EPM-KT0-TP-000060 - Checklist - Functional and Performance Test for LAN/WLAN

PROJECT NAME:		DRAWING NO.	REV.	
No.	IN SPECTION ITEM	CHECKED SATISFACTORY		
		N/A	YES	NO
	Data Link Testing			
1	Verify the VLAN configuration is correct	☐	☐	☐
2	Verify that UDLD (Uni-Directional Link Detection) has been configured on the relevant interfaces	☐	☐	☐
3	Verify the Spanning Tree Protocol operation.	☐	☐	☐
4	Verify that Port-Channels are correctly configured and also are up and running. Also check that Aggregation Protocol is LACP (Link Aggregation Control Protocol) in Active mode.	☐	☐	☐
5	Confirm that the dot1q trunk configuration of the port-channel interface is correct	☐	☐	☐
6	Confirm that the BPDU (Bridge Protocol Data Unit)-Guard feature operates as expected on access ports.			
7	Verify spanning tree port fast on all network switches.	☐	☐	☐
		☐	☐	☐
	vPC (Virtual Private Cloud) Test	☐	☐	☐
8	Verify the configuration of vPC Peer Link, vPC Keep Alive Link and vPC Member Port	☐	☐	☐
9	Verify the traffic flow in the event of vPC Peer Link failure	☐	☐	☐
10	Verify the traffic flow in the event of vPC keep-alive Link failure	☐	☐	☐
11	Verify the traffic flow in the event of vPC Access Switch failure	☐	☐	☐
12	Verify the traffic flow in the event of vPC Distribution Switch failure.	☐	☐	☐
13	Verify the traffic flow in the event of vPC Member port failure at Distribution switch.	☐	☐	☐
14	Verify the traffic flow in the event of vPC Member port failure at Access Switch.	☐	☐	☐
		☐	☐	☐
	Network Test	☐	☐	☐
15	Verify that the correct IP addresses have been configured on the relevant interfaces. Confirm IP connectivity over directly connected links.	☐	☐	☐
16	Verify that the OSPF (Open Shortest Path First) configuration and topology for the network conforms to documented design.	☐	☐	☐
17	Verify the routing configuration (Routing tables).	☐	☐	☐
18	Verify the HSRP (Hot Standby Router Protocol, a fault-tolerant default gateway) Configuration and Operation.	☐	☐	☐
19	Verify that Port-Channels are correctly configured and also are up and running	☐	☐	☐
	Router/ Switch Test			
20	Verify that a complete switch failure (power-down) does not impact traffic flows through the network.	☐	☐	☐
21	Verify that a SUP (Supervisor Engine) Failure does not impact traffic flows through the network	☐	☐	☐
22	Verify operation during a fabric card failure on switch.	☐	☐	☐
23	Confirm that the failure of a single power supply in the Nexus chassis does not impact data forwarding capabilities.	☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 50 - EPM-KT0-TP-000045 - Template - NFPA 20 for Fire Pumps Acceptance Test Form

20-98

INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION

Centrifugal Fire Pump Acceptance Test Form

Information on this form covers the minimum requirements of NFPA 20-2013 for performing acceptance tests on pumps with electric motors or diesel engine drivers. Other forms are available for periodic inspection, testing and maintenance.

Owner: _____
Owner's Address: _____
Property on which pump is installed: _____
Property Address: _____
Date of Test: _____
Demand(s) of Fire Protection Systems Supplied By Pump: _____

Pump: ☐ Horizontal ☐ Vertical
Manufacturer: _____ Shop/Serial Number: _____
Model or Type: _____
Rated GPM _____ Rated Pressure _____ Rated RPM _____
Suction From _____ If Tank, Size and Height _____
Driver: ☐ Electric Motor ☐ Diesel Engine
Manufacturer: _____ Shop/Serial Number: _____
Model or Type: _____
Rated Horsepower: _____ Rated Speed: _____
If Electric Motor, Rated Voltage _____ Operating Voltage _____
Rated Amps _____ Phase Cycles _____ Service Factor _____
Controller Manufacturer: _____
Shop/Serial Number: _____ Model or Type: _____
Jockey Pump on System? ☐ Yes ☐ No Settings: On _____ Off _____

All questions are to be answered Yes, No or Not Applicable.
All No answers are to be explained in the comments portion of this form.

I. Flush Test (Conduct before Hydrostatic Test)
Suction piping was flushed at _____ gpm? ☐ Yes ☐ No ☐ N/A
(See Table 14.1.1.1 of NFPA 20.)
Certificate presented showing flush test? ☐ Yes ☐ No ☐ N/A

II. Hydrostatic Test
Piping tested at _____ psi for 2 hours? ☐ Yes ☐ No ☐ N/A
(Note: NFPA 20 requires 200 psi or 50 psi above maximum system pressure whichever is greater.)
Piping passed test? ☐ Yes ☐ No ☐ N/A
Certificate presented showing test? ☐ Yes ☐ No ☐ N/A

III. People Present
Were the following present to witness the test:
A. Pump manufacturer/representative ☐ Yes ☐ No ☐ N/A
B. Engine manufacturer/representative ☐ Yes ☐ No ☐ N/A
C. Controller manufacturer/representative ☐ Yes ☐ No ☐ N/A
D. Transfer switch manufacturer/rep. ☐ Yes ☐ No ☐ N/A
E. Authority having jurisdiction/rep. ☐ Yes ☐ No ☐ N/A

IV. Electric Wiring
Was all electric wiring including control interwiring for multiple pumps, emergency power supply, and the jockey pump completed and checked by the electrical contractor prior to the initial start-up and acceptance test? ☐ Yes ☐ No ☐ N/A

V. Flow Test
Run the pump at no-load, rated load and peak load (usually 150% of rated load) conditions. For variable speed drivers, run the test with the pressure limiting control "on" at 25, 50, 75, 100, 125, and 150% of rated load and then again at rated speed with the pump isolated from the fire protection system and the relief valve closed.
A. Was the manufacturers' certified pump test curve available for comparison to the acceptance test? ☐ Yes ☐ No ☐ N/A
B. Equipment and gages calibrated? ☐ Yes ☐ No ☐ N/A
Date of last calibration: _____
C. If dry charge batteries were supplied, was electrolyte added at least 24 hours prior to engine start and were batteries given a conditioning charge? ☐ Yes ☐ No ☐ N/A

D. For each test, record the following for each load condition:

Test	Driver Speed rpm	Suction Pressure psi	Discharge Pressure psi	Nozzle Size inch	Pitot Readings or Flow					
					1	2	3	4	5	6
0										
100%										
150%										

E. For electric motor driven pumps also record:

Test	Voltage	Amperes
0		
100%		
150%		

F. Calculate Net Pressure and Total Flow:
 $P_{Net} = P_{Discharge} - P_{Suction}$ $Q = 29.83 \text{ cd}^2 \sqrt{P}$

Test	Net Pressure	Flow (Q) (use formula above)						Total Flow
		1	2	3	4	5	6	
0								
100%								
150%								

G. For electric motors operating at rated voltage and frequency, is the ampere demand on each phase less than or equal to the product of the full load ampere rating times the allowable service factor as stamped on the motor nameplate? ☐ Yes ☐ No ☐ N/A

H. For electric motors operating under varying voltage:

- Was the product of the actual voltage and current demand on each phase less than or equal to the product of the rated full load current times the rated voltage times the allowable service factor? ☐ Yes ☐ No ☐ N/A
- Did the voltage stay within the range of 95 to 110% of the rated voltage during the test? ☐ Yes ☐ No ☐ N/A

I. Did engine-drive unit show no signs of overload or stress? ☐ Yes ☐ No ☐ N/A

J. Was the governor set to properly regulate the engine speed at rated pump speed? ☐ Yes ☐ No ☐ N/A

K. Did the gear drive assembly operate without excessive objectionable noise, vibration or heating? ☐ Yes ☐ No ☐ N/A

L. Was the unit started and brought up to rated speed without interruption under discharge conditions equal to peak load? ☐ Yes ☐ No ☐ N/A

M. Did the fire pump perform equal to the manufacturer's curve within the accuracy limits of the test equipment? ☐ Yes ☐ No ☐ N/A

N. Did the unadjusted performance discharge curve meet or exceed the fire protection system demand(s)? ☐ Yes ☐ No ☐ N/A

O. No vibrations that could potentially damage any fire pump component? ☐ Yes ☐ No ☐ N/A

P. The fire pump performed at all conditions without objectionable overheating of any component? ☐ Yes ☐ No ☐ N/A

Q. Electric motor pumps passed phase reversal test on normal and alternate (if provided) power? ☐ Yes ☐ No ☐ N/A

R. If a break tank is provided, was the refill mechanism tested 5 times and did it operate correctly? ☐ Yes ☐ No ☐ N/A
Record refill rate: _____

S. For vertical turbine pumps taking suction from wells, is the water level capable of being recorded? ☐ Yes ☐ No ☐ N/A

© 2012 National Fire Sprinkler Association, 40 Jon Barrett Road, Patterson, NY 12563 (845) 878-4200

Form 20-A Sheet 1 of 2

FIGURE A.14.2.6.4 Centrifugal Fire Pump Acceptance Test Form. (Source: National Fire Sprinkler Association, Inc.)



2013 Edition



Testing & Commissioning Checklists and Templates

Attachment 51 - EPM-KT0-TP-000046 - Template - FDAS Test Package

FIRE ALARM TESTING AND COMMISSIONING

Fire Detection Alarm System (FDAS) Test Package

Witnessed by	:	_____
Representing	:	_____
Signature	:	_____
Date	:	_____
System	:	FIRE ALARM SYSTEM
Building	:	_____
Contract	:	_____
Client	:	_____
Consultant	:	_____

Remarks:		
Date:	Engineer:	Sheet No.
ENGINEER'S REPORT SHEET		



Testing & Commissioning Checklists and Templates

Attachment 52 - EPM-KT0-TP-000047 - Template - Earth Electrode Testing

Project:						Document No.			Rev.	
Location:						System:			Date:	
Building:						Panel Ref.			Sheet Ref.	
Earth Pit Ref.	Test Number	Test Electrode Spacing from C1 (M)			Soil Type	Electrode Under Testing			Resistance Ohms	Comments
		P2	C2	Depth		Type	Depth	Material		
Test Instrument Type : _____		Contractor's Signature: _____			Commissioning Agent's Signature: _____			Consultant's Signature: _____		
SL No. : _____		Date: _____			Date: _____			Date: _____		
Calibrated On : _____										
Calibration Due On : _____										



Testing & Commissioning Checklists and Templates

Attachment 53 - EPM-KT0-TP-000048 - Template - Door Intercom Testing

Project:			Panel Location:		
Package No.			Asset Code:		Sheet No.
Building:			Plant Ref:		Rev.
Number	System Function Description	Pass	Fail	Comments	
	1) Press the Push Button on the outdoor speaker panel and check the ringing tone is present on the indoor Phone unit.				
	2) Remove the Phone hand set and speak to the person at the Chalet Entrance, check that the speech is audible.				
	3) Press the " DO NOT DISTURB " button on the indoor Phone set and check the Phone set "LED" has come on.				
	4) Check the Chalet Entrance door panel has the " DO NOT DISTURB " Sign illuminated and is visible.				
	5) With the " DO NOT DISTURB " sign illuminated, press the Push Button and check that the indoor Phone handset does not Ring.				
Tested by:		Witnessed by:		Accepted by:	
Date:		Date:		Date:	
Test Instrument(s):					



Testing & Commissioning Checklists and Templates

Attachment 54 - EPM-KT0-TP-000049 - Template - Car Park Access System Testing

Project:			Panel Location:	
Package No.			Asset Code:	Sheet No.
Building:			Plant Ref:	Rev.
System Function Number	System Function Description	Pass	Fail	Comments
Tested by:		Witnessed by:		Accepted by:
.....				
Date:		Date:		Date:

SAMPLE



Testing & Commissioning Checklists and Templates

Attachment 55 - EPM-KT0-TP-000050 - Template - Security and Access Control Testing

Project:					Panel Location:	
Package No.					Asset Code:	Sheet No.
Building:					Plant Ref:	Rev.
Camera Number	From Location	Cable ID	To Location	Cable ID	Continuity OK	Comments
Tested by:			Witnessed by:		Accepted by:	
.....						
Date:			Date:		Date:	



Testing & Commissioning Checklists and Templates

Attachment 56 - EPM-KT0-TP-000051 - Template - BMS Graphics Testing

Project:					Panel Location:			
Package No.					Asset Code:		Sheet No.	
Building:					Plant Ref:		Rev.	
Description	Field Sensor		MS		Graphic Display			Comments
	Measured Value Test Instrument	Units Measured	Graphic Display	Units Display	Digital Input	Digital Output	Analog Output	
Tested by:			Witnessed by:			Accepted by:		
.....								
Date:			Date:			Date:		



Testing & Commissioning Checklists and Templates

Attachment 57 - EPM-KT0-TP-000052 - Template - BMS Control Set-point and Parameter Testing

Project:					Panel Location:		
Package No.					Asset Code:		Sheet No.
Building:					Plant Ref:		Rev.
Point Name (A & 1000 Acronym)	Description Control Function	Control Setpoint Value	P-Band Value	Integral Time	Alarm Limits		Comments
					High	Low	
Tested by:		Witnessed by:			Accepted by:		
Test Instruments Sr No.		Date:			Date:		



Testing & Commissioning Checklists and Templates

Attachment 58 - EPM-KT0-TP-000053 - Template - BMS and EPMS PTP and Loop Testing

Project:									Panel Location:				
Package No.									Asset Code:			Sheet No.	
Building:									Plant Ref:			Rev.	
SR No.	Equipment & Functional Description	Analog		Digital			Peripheral		Cable Termination		Continuity	Comments	
		I/P	O/P	STS	ALM	O/P	Device	Inst'n	Panel	Field			
Tested by:						Witnessed by:				Accepted by:			
..... Date:						 Date:				 Date:			



Testing & Commissioning Checklists and Templates

Attachment 59 - EPM-KT0-TP-000054 - Template - Cable Testing

Project:							Location:				
Network Type:							Asset Code:		Sheet Ref.		
Cable Type: ☐ UTP ☐ STP ☐ Fiber Optic			Type of Test: ☐ Pre-Termination ☐ Post Termination				No. of Pairs / Cores: ☐ Two ☐ Four				
Cable Number	Route		Continuity				Loop Ω				Comments
	From	To	Pair/Core One	Pair/Core Two	Pair/Core Three	Pair/Core Four	Pair One	Pair Two	Pair Three	Pair Four	
Tested by: Date:			Witnessed by: Date:				Accepted by: Date:				
Test Instrument(s):											



Testing & Commissioning Checklists and Templates

Attachment 60 - EPM-KT0-TP-000055 - Template - Equipment/Device Calibration log

Creation Date:
Revision number:
Revision date:

Sr	Name	Description	ID Tag	Certificate no	Calibration Date	Next calibration	Hand over to entity	Remark
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

Comments if any :

Contractor's Representative:	Consultant's Representative:	Client's Representative:
Date:	Date:	Date:
Signature:	Signature:	Signature:



Testing & Commissioning Checklists and Templates

Attachment 61 - EPM-KT0-TP-000061 - Template - Warranty of Materials

Serial Number	Material Description	Manufacture Name	Supplier Name	Delivery Date	Manufacture / Supplier Warranty Date start	Manufacture / Supplier Warranty Date Finish	Warranty Certificate Number	Contractor Name	Contractor Warranty Date Start	Contractor Warranty Date Finish

Consultant's Representative:	Contractor's Representative:	Client's Representative:
Date:	Date:	Date:
Signature:	Signature:	Signature:



Testing & Commissioning Checklists and Templates

Attachment 62 - EPM-KT0-TP-000062 - Checklist- Testing & Commissioning Process

PROJECT NAME:		DISCIPLINE:	REV.		
Stage No.	Requirements	MANDATORY	Completeness Status		
			N/A	YES	NO
1-	Initial Planning				
1.1	The preliminary commissioning Owner Project Requirements are being established. Refer to EPM-KT0-GL-000003_002 T&C guideline part#3.1.1	√	☐	☐	☐
1.2	The preliminary commissioning plan is being developed which should include at a minimum commissioning budget and schedule. Refer to EPM-KT0-PR-000006_002 part# 5.1	√	☐	☐	☐
1.3	The Commissioning team of the client has been identified and formed.		☐	☐	☐
1.4	Initial stakeholder engagement and permitting plans have been identified.		☐	☐	☐
1.5	Initial handover plan is prepared	√	☐	☐	☐
2-	Tender for Design				
2.1	Commissioning scope and plan included in the designer scope of work	√	☐	☐	☐
2.3	Required resources (contractor and consultants) of testing and commissioning have been included in the scope if needed.		☐	☐	☐
3-	Design				
INFO.	The responsibilities of the commissioning team during the design review and the required deliverables during the design stage are shown in Attachment 1.1, refer to EPM-KT0-PR-000006_002 : Testing and Commissioning Flow Charts/Project Stage Gates		☐	☐	☐
3.1	The commissioning owner project requirements have been reviewed for clarity and completeness to recommend improvements (if any).	√	☐	☐	☐
3.2	Basis of Design is developed, reviewed, and accepted.	√	☐	☐	☐
3.3	Commissioning methodology is prepared and reviewed	√	☐	☐	☐
3.4	Constructability review is considered.		☐	☐	☐



Testing & Commissioning Checklists and Templates

Attachment 63 - EPM-KT0-TP-000063 - Energization Notice

Energization Notice																																			
CONSTRUCTION CONTRACTOR:		CONTRACT No.																																	
TITLE:		COMPLETION/ACCEPTANCE NODE:																																	
Is it safe to energize this Equipment? [refer to checklist attachment 7] ☐ YES ☐ NO	ENERGIZATION DATE: DD / MM / YY	CORRESPONDING TO: DD / MM / YY																																	
THE FOLLOWING DEPARTMENT REPRESENTATIVES HAVE REVIEWED THE ASSETS TO BE ENERGIZED AND ENDORSE THEIR COMPLIANCE TO THE TERMS AND CONDITIONS OF THE CONTRACT EXCEPT AS NOTED ON THE ATTACHED DEFICIENCY LIST. NUMBER OF ITEMS ON DEFICIENCY LIST ATTACHED _____ (STATE NO. OF ITEMS, IF NONE, STATE ZERO) <table border="1"><thead><tr><th>Prior to Energization</th><th>Yes</th><th>No</th><th>N/A</th></tr></thead><tbody><tr><td>1. Inspection Records Approved</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>2. Testing [FAT / SAT / Functional] Completed</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>3. Wiring tested and <u>Passed</u></td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>4. Etc.</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>5.</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>6.</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>7.</td><td>☐</td><td>☐</td><td>☐</td></tr></tbody></table>				Prior to Energization	Yes	No	N/A	1. Inspection Records Approved	☐	☐	☐	2. Testing [FAT / SAT / Functional] Completed	☐	☐	☐	3. Wiring tested and <u>Passed</u>	☐	☐	☐	4. Etc.	☐	☐	☐	5.	☐	☐	☐	6.	☐	☐	☐	7.	☐	☐	☐
Prior to Energization	Yes	No	N/A																																
1. Inspection Records Approved	☐	☐	☐																																
2. Testing [FAT / SAT / Functional] Completed	☐	☐	☐																																
3. Wiring tested and <u>Passed</u>	☐	☐	☐																																
4. Etc.	☐	☐	☐																																
5.	☐	☐	☐																																
6.	☐	☐	☐																																
7.	☐	☐	☐																																
<table border="1"><thead><tr><th>TITLE</th><th>NAME</th><th>SIGNATURE</th><th>DATE</th></tr></thead><tbody><tr><td>Contractor Rep</td><td></td><td></td><td></td></tr><tr><td>Owner Rep</td><td></td><td></td><td></td></tr></tbody></table>				TITLE	NAME	SIGNATURE	DATE	Contractor Rep				Owner Rep																							
TITLE	NAME	SIGNATURE	DATE																																
Contractor Rep																																			
Owner Rep																																			



Testing & Commissioning Checklists and Templates

Attachment 64 - EPM-KT0-TP-000064 - DESIGN TURNOVER CERTIFICATE

DESIGN TURNOVER CERTIFICATE																																							
Designer:		CONTRACT No.																																					
TITLE:		COMPLETION/ACCEPTANCE NODE:																																					
WILL THIS TURNOVER COMPLETE THE CONTRACT? ☐ YES ☐ NO	TURNOVER DATE: DD / MM / YY	CORRESPONDING TO: DD / MM / YY																																					
THE FOLLOWING DEPARTMENT REPRESENTATIVES HAVE REVIEWED THE DESIGN PACKAGE TO BE TURNED OVER AND ENDORSE THEIR COMPLIANCE TO THE TERMS AND CONDITIONS OF THE CONTRACT EXCEPT AS NOTED ON THE ATTACHED DEFICIENCY LIST. NUMBER OF ITEMS ON DEFICIENCY LIST ATTACHED _____ (STATE NO. OF ITEMS, IF NONE, STATE ZERO) <table border="1"><thead><tr><th>Prior to Turnover:</th><th>Yes</th><th>No</th><th>N/A</th></tr></thead><tbody><tr><td>1. Design Basis Report</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>2. Design Review Reports</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>3. Design Guidelines</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>4. Applicable Standards and Codes</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>5. Project Specifications</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>6. Typical Construction Detail Drawings</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>7. Design Packages stamped with issued for construction [IFC]</td><td>☐</td><td>☐</td><td>☐</td></tr><tr><td>8. TOP boundary limit definition and boundary marked up drawings</td><td>☐</td><td>☐</td><td>☐</td></tr></tbody></table>				Prior to Turnover:	Yes	No	N/A	1. Design Basis Report	☐	☐	☐	2. Design Review Reports	☐	☐	☐	3. Design Guidelines	☐	☐	☐	4. Applicable Standards and Codes	☐	☐	☐	5. Project Specifications	☐	☐	☐	6. Typical Construction Detail Drawings	☐	☐	☐	7. Design Packages stamped with issued for construction [IFC]	☐	☐	☐	8. TOP boundary limit definition and boundary marked up drawings	☐	☐	☐
Prior to Turnover:	Yes	No	N/A																																				
1. Design Basis Report	☐	☐	☐																																				
2. Design Review Reports	☐	☐	☐																																				
3. Design Guidelines	☐	☐	☐																																				
4. Applicable Standards and Codes	☐	☐	☐																																				
5. Project Specifications	☐	☐	☐																																				
6. Typical Construction Detail Drawings	☐	☐	☐																																				
7. Design Packages stamped with issued for construction [IFC]	☐	☐	☐																																				
8. TOP boundary limit definition and boundary marked up drawings	☐	☐	☐																																				
TITLE	NAME	SIGNATURE	DATE																																				
A/E Authorized Rep.																																							
ENGINEERING DEPARTMENT:																																							
CONTRACTS REPRESENTATIVE:																																							
PROJECT MANAGER:																																							