



Statement of Work

Prefabricated Data Center: Start-Up Service



Startup Service

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1.0 Executive Summary

The Schneider Electric Prefabricated Data Center Start-Up Service is a key part of the delivery process, including power-up and correct initialization of all the equipment included in the solution by specialized Field Service Representatives (FSR). The service provides the customer with the assurance that the equipment present in the Prefabricated solution has been started up according to Schneider Electric standards and specifications, and the functionality checked in all modes of operation.

The Start-Up Service is performed after the Installation of the Prefabricated Module. The Start-Up Service is performed during normal business hours. Off-hours scheduling is available, please contact your Schneider Electric representative for details.

2.0 Features & Benefits

Features	Benefits
Peace of Mind	Start-Up is performed by specialized Prefabricated Field Service Engineers to warrant a successful deployment of the Prefabricated solution.
Certified Service Personnel	Certified Field Service Engineers, specialized in Prefabricated products and associated technologies (electrical, UPS, cooling, fire protection systems, monitoring and management systems) to ensure correct equipment start and operation as per manufacturer's specifications.
Start-Up expenses determined in advance	Fixed cost – providing service budgeting stability: travel, labor, tools and start-up work.
Complete and Precise Start-Up protocol	Complete Start-Up protocol including activities, tools, etc. to free customer resources and allowing you to concentrate on core business activities.



Features	Benefits
Reliability	Confirmation that the Prefabricated installation is in correct operational state allowing maximum service uptime.
Train customer's staff on basic operation of the equipment	Provides the customer with basic operation (start, stop, set-point modification, log check, etc.) and basic operational and maintenance recommendations.
Coordination of Start-Up activities	Avoidance of possible delays caused by scheduling conflicts, with a Prefabricated Engineer leading the Start-Up process.
Verify of installation	Verifies correct installation and operation of the equipment.
Customer specific site documentation	Records the baseline operational data of the equipment in the Prefabricated Module Operational Manual.
Set points / thresholds configuration	Definition and configuration of set points/thresholds as per environmental conditions and expected operational workload. Set points and thresholds mutually agreed with the customer.

3.0 Details of Service

The specific features and deliverables of this service are listed below. For each item listed below, Schneider Electric will perform the work described, creating a Start-Up document containing the key data and information for the whole process.

3.1 Prefabricated Module Structure

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the Prefabricated Module Enclosure

ISO and NON ISO Prefabricated Modules	
Activities	Description
Environmental Inspection	<p>Verification of external and internal environmental conditions before start-up operation, with module doors closed and any open space that allows connection from outdoor to indoor areas.</p> <p>Internal environmental variables measured: temperature, relative humidity, air particle concentration, electromagnetic fields.</p> <p>External environmental variables measured: temperature, relative humidity, electromagnetic fields, presence of dust or any type of ground or airborne contaminants.</p>



ISO and NON ISO Prefabricated Modules	
Activities	Description
Ground measurement	<p>Prefabricated Module ground cable resistivity measurement to confirm correct conductivity to earth.</p> <p>Confirmation of conductivity level of ground where the ground rod is dunked. Improvement proposals to increase ground conductivity will be recommended if necessary.</p> <p>Incorrect conductivity of ground connection can affect human safety and cause equipment failures.</p>
Visual Inspection	<p>Verification of the Module Structure physical elements:</p> <ul style="list-style-type: none"> - Enclosures to ensure there are no signs of damage after transportation, storage, installation and leveling (no broken parts, rusting, leaking, etc.). Internal and external check. - Power and data cables glands entering/leaving the module to ensure there are properly sealed, mounted and distributed. - Cable trays and supports check. - Drain lines and humidifier water lines entering/leaving the module - Air ventilation system - Module junctions to determine correct sealing (in case of Multi Module installation) - Check operation of any element with moveable parts (hinges, wheels, rails, etc.). - Check correct opening/closing and adjustment of the doors (rubber sealing). - Anti-panic door lock check with bar handle operability. - Check anchorages of electrical panels and other equipments on the walls. - Check labeling of main equipments and probes.
Documentation	<p>A comprehensive Start-Up document will be delivered, including a chapter for Module Structure with elements checked, values measured, and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.</p>

3.2 Electrical Installation, Switchgear & PDU

3.2.1 Switchgear

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the Switchgear.

Switchgear	
Activities	Description
Visual Inspection	Device inspection to ensure: <ul style="list-style-type: none">- Fuse and breaker sizes correspond to drawings- Barriers and shutters are installed- Filters are in place and vents are clear- Proper clearances are maintained to ensure the equipment operates within specifications- All anchorage, alignment, and grounding are in place- Check correct labeling of all switchgear elements and correspondence with Prefabricated Module electrical drawings.
Mechanical Inspection	Verify tightness of accessible bolted electrical connections; inspect all mechanical devices for proper operation; perform all mechanical operational tests on both the circuit breaker and its operating mechanism; confirm proper operation of interlocks and mechanisms.
Power-Up	Main power supply connection with Prefabricated Module and switchgear power-up. This operation needs to be coordinated with customer's facility management.
Functional Verification	Draw-out type instrument transformers: Test operation, alignment, and penetration of withdrawal disconnect, verify correct operation of withdrawal mechanism and grounding operation for drawer mounted devices. Circuit breakers: Confirm charge, close, trip and block close functions. For protective relays and other breaker control devices; verify relay trip output contacts.
Functional Check & Witness Test	Standard system tests such as insulation resistance testing, contact resistance, close / trip timing, trip / charge / close minimum voltage operation, vacuum integrity, protective device calibration and other appropriate testing as dictated by customer's equipment configuration. Demonstration of the integrity of the Switchgear and operation of the different elements to the customer or their representative.
Basic Operator Training	Training for Prefabricated Module operator on switchgear configuration, breaker elements associated with each device, other information elements and operational and maintenance recommendations.
Documentation	A comprehensive Start-Up document will be delivered, including a chapter for electrical installation and switchgear with elements checked, values measured, and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.

3.3 UPS & ATS

3.3.1 UPS

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the start-up and check of the UPS.

UPS	
Activities	Description
Visual Inspection & Installation Check	Check that the Input/Output Circuit Breakers are properly sized. Check the transformer type and configuration (if applicable). Verification that the power wiring to the system Input Circuit Breaker is correct and the Grounding system is installed properly (if applicable).
	Verification that the incoming voltages match the UPS specification, phasing and phase rotation.
	Verification that all power, control and communication wiring is correctly terminated.
	Check correct labeling of wiring and elements connected with UPS and correspondence with Prefab Module electrical drawings.
Battery Inspection	Verification of the mechanical integrity of the battery cabinet, air renovation system, and temperature ambient in the cabinet. Verification of battery configuration, integrity state and overall battery runtime.
Start-Up	UPS power up and functionality check in all modes of operation to ensure compliance with equipment specifications. Verify that communication options are properly configured, with presence of communication card and connection with Schneider Electric Remote Monitoring Service.
Bypass Check	Verification of UPS bypass functions, static and maintenance properly operating.
Functional Check & Witness Test	Checking that the system output voltage is within defined UPS specifications. Verification of the proper regulation of output waveform. Verification that the Internal battery voltages are within defined UPS specifications, where applicable. Verification of front panel readings for accuracy. Demonstration of the integrity of the UPS and main operation to the customer.
Basic Operator Training	Training for UPS operator on main maneuvers (start, stop, bypass, panel operation, events and alarms information) and operational/maintenance recommendations. Also the customer will be introduced to remote access tool for UPS operations and information purposes. Advanced training courses are available from Schneider Electric. Please contact your certified Schneider Electric sales representative for details.
Documentation	A comprehensive Start-Up document will be delivered, including a chapter for UPS with functions checked, values measured, and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.

3.3.2 ATS

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the ATS.

ATS	
Description	
Visual Inspection & Installation Check	Check correct labeling of ATS wiring of cables and correspondence with Prefabricated Module electrical drawings. Check that input/output Circuit Breaker is properly sized Verification of grounding coherence in the supply power lines and internal Prefabricated grounding system (TNS/TNC) Verification that incoming voltages match ATS specification, phasing and phase rotation.
Start-Up	ATS power up and functionality check in all modes of operation to ensure compliance with equipment specifications. Verify connection with Monitoring system to report incidents
Transition Check	Ensure that the transition functions from source A (generator) and UPS are operating properly.
Functional Check & Witness Tests	Verification of the transition functions from main power supply source A (generator) and UPS are operating properly. Demonstration of the integrity of the ATS and main operation to the customer or their representative.
Basic Operator Training	Training for ATS operator on main operations and maintenance recommendations. Advanced training courses are available from Schneider Electric. Please contact your certified Schneider Electric sales representative for details.
Documentation	A comprehensive Start-Up document will be delivered, including a chapter for ATS with functions checked, values measured, and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.

3.3 Cooling System

Applicable to: All types of Prefabricated Data Centers with DX Cooling system

Following is a description of the activities associated with the start-up and check of the Cooling System:

Cooling System (indoor and outdoor units)	
Description	
Visual Inspection & Installation Check	<p>Verification that the power wiring to the system Input Circuit Breaker is correct and the Grounding system is installed properly.</p> <p>Verification of voltages, phasing and phase rotation matching the Cooling system specification.</p> <p>Verification that all power, control and communication wiring are correctly terminated</p> <p>Perform a thorough check of all field installed piping, isolation valves, customer controls associated to the Cooling system.</p> <p>Verify correct voltages values and amperages of blowers/fan coils, compressors, condenser, fans and pumps.</p> <p>Verification of correct refrigeration circuit temperatures and gas pressures, adapted to specific environmental conditions where Prefabricated Module is installed.</p> <p>Verification correct connection of Humidifier/Dehumidifier system to power, and water supply/drainage piping correctly installed.</p> <p>Check correct labeling of wiring and elements connected with the Cooling System and correspondence with Prefabricated Module electrical and cooling drawings</p> <p>Verify filters presence and cleaning status. Clean in case of dust presence.</p>
Mechanical Inspection	<p>Verification of proper rotation of blowers/fan coils, compressors, condenser, fans and pumps.</p>
Start-Up	<p>Cooling system power up and functionality check in all modes of operation to ensure compliance with equipment specifications, for indoor and outdoor units.</p> <p>Configure temperature and relative humidity set-points, adapted both to external environment conditions and Prefabricated Module estimated workload.</p> <p>Configure alarm thresholds based on customer recommendations or best practices (ASHRAE recommendations).</p> <p>Verify that communication options are properly configured, with presence of communication card and connection with Schneider Electric Remote Monitoring Service.</p>
Basic Operator Training	<p>Training for Cooling operator on main maneuvers (start, stop, temperature setting, recirculation, panel operation, events and alarms information) and operational/maintenance recommendations. Advanced training courses are available from Schneider Electric. Please contact your certified Schneider Electric sales representative for details.</p>
Documentation	<p>A comprehensive Start-Up document will be delivered, including a chapter for Cooling system with functions checked, values measured, and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.</p>

3.4 Fire Protection System

Applicable to: All types of Prefabricated Data Centers

Following is a description of the installation activities associated with Prefabricated Module Fire Protection Systems.

Direct Expansion Cooling System (indoor and outdoor units)	
Description	
Fire detection central panel connection	Connection of fire detection central panel with smoke detectors, fire protection system manual system push buttons, alarm buzzers and extinguishing system. Certification by the Fire Field Service Engineer about the correct installation of the complete detection system.
Extinguishing system commissioning	Connection and activation of the elements associated with extinguishing agent release in the extinguishing system (cylinders). Certification by the Fire Field Service Engineer about the correct installation of the complete extinguishing system.

3.5 Monitoring & Management System

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the start-up and check of the Monitoring & Management System.

Monitoring & Management System: Woodward Controller	
Description	
Visual Inspection & Installation Check	<p>Verification that power supply is correctly connected.</p> <p>Verification of correct labeling of all communication buses that connect devices with Monitoring System, and correct connection to correspondent ports, following Monitoring & Control drawings.</p> <p>Verification that all monitored/managed devices are correctly connected to the end of communication buses, including sensors and probes, following Monitoring & Control drawings</p> <p>Verification of correct PLC firmware version.</p> <p>Verification of correct Monitoring and Management software version.</p>
Start-Up	<p>PLC power up and devices associated to Monitoring System.</p> <p>Configuration of communication ports and communication with RMS.</p>
Functional Check & Witness Test	<p>Verification of correspondence between values read by temperature and relative humidity sensors and values received by PLC.</p> <p>Verification of water detector functionality.</p> <p>Perform functional protocol checking:</p> <ul style="list-style-type: none"> - Correctness of readings coming from each device - Detection of equipment failures when forced manually - Correct response of equipment when applying operational changes <p>Demonstration of the integrity of the Monitoring & Management system and main operation to the customer or their representative.</p>
Basic Operator Training	<p>Training for Monitoring & Management System operator on main functionalities, events and alarms managed and maintenance/operations recommendations.</p> <p>Advanced training courses are available from Schneider Electric. Please contact your certified Schneider Electric sales representative for details.</p>
Documentation	<p>A comprehensive Start-Up document will be delivered, including a chapter for Monitoring & Management System with functionalities checked and conclusions.</p> <p>The Start-Up document is part of the Operations Manual delivered to the customer.</p>

3.6 Security and Access Control System

Applicable to: All types of Prefabricated Data Centers

Following is a description of the activities associated with the start-up and check of the Security and Access Control System.

Security and Access Control System	
Description	
Visual Inspection & Installation Check	Verification that power supply is correctly connected. Verification of correct anchorage of Access Control System, CCTV cameras and other devices part of the Security System. Verification of correct firmware and/or software version in the Security and Access Control devices installed.
Start-Up	Access Control System power up. Internal Access Control data base configuration (users allowed to access Prefabricated Module). No included connection with external data bases. CCTV and other Security devices power up and parameters configuration.
Functional Check & Witness Test	Verification of correct Prefabricated Module door aperture to authorized personnel only. Verification of correct remote reception of CCTV recorded video. Verification of correct functionality of other Security devices. Demonstration of the integrity of the complete Security & Access Control System to the customer or their representative.
Basic Operator Training	Training for Security & Access Control System operator on main functionalities and maintenance/operation recommendations.
Documentation	A comprehensive Start-Up document will be delivered, including a chapter for Security & Access Control System with functionalities checked and conclusions. The Start-Up document is part of the Operations Manual delivered to the customer.

4.0 Assumptions

The successful performance of the tasks defined in the Statement of Work (SOW) is based on the following key assumptions, which are agreed to by Schneider Electric.

- All services performed on-site by Schneider Electric will be executed during the Schneider Electric business hours unless otherwise requested by the customer.
- Schneider Electric will provide the customer with certified service personnel to Start-Up the IT Module.
- Schneider Electric will provide the customer with a Start-Up checklist indicating that the system was properly energized and the functionality of the system was checked in all modes of operation to ensure compliance with all Schneider Electric technical specifications.
- This service applies to a customer location with standard site and product access.
- The Start-Up service only applies to battery systems supplied by Schneider Electric.

The following items are outside the scope of this standard service offering. Start-Up of the following items can be integrated into a customized Statement of Work (SOW) at the customer's request. Please contact your certified Schneider Electric sales representative for more details.

- Prior to Start-Up, Installation of the Prefabricated Data Center must be completed. This includes:
 - Installation of Prefabricated Modules (ISO & Non-ISO)
 - Interface connection
 - Multi-module join works
 - Installation of Electrical Systems (Switchgear, UPS, PDU, ATS)
 - Systems and devices power connection
 - Grounding connection
 - Battery connection
 - Installation of Cooling Systems
 - Power connection
 - Drainage system
 - Indoor & outdoor unit and humidifier/dehumidifier piping connection
 - Refrigerant cooling gas loading
 - Installation of Fire Protection Systems
 - Fire detection central panel connection
 - Extinguishing system commissioning
 - Installation of Monitoring & Management Systems
 - Device connection & configuration
 - WAN interface connection

Requirements for Installation to occur include ensuring a flat surface, power supply, ground and additional connections are available

- In case of incorrect connection of equipment supplied by the customer, Schneider Electric will not carry out any work to reconnect correctly the equipment to the rest of Prefabricated equipment/systems supplied by Schneider Electric.
- Schneider Electric will define with the customer the best approach to find a solution and reserves the right not to execute any modification outside of its defined scope of responsibility.




5.0 Scope of Responsibility

The items stated here are responsibilities to and from both Schneider Electric and customer.

5.1 SCHNEIDER ELECTRIC SERVICE RESPONSIBILITIES

- Schedule certified and approved engineers to perform service.
- Manage and coordinate scheduling of the Start-Up Service.
- Ensure Start-Up is performed as per manufacturer specifications.
- Operate system in all modes of operation.
- Perform basic operator training.
- Identify and document open Schneider Electric and/or customer issues.
- Provide a signed copy of the Start-Up Service site forms to the customer.

5.2 CUSTOMER RESPONSIBILITIES

- Provide dates and times when the scheduled work can be performed.
 - Ensure Prefabricated Data Center has been fully installed and all electrical wiring and cabling is connected prior to Schneider Electric service personnel arriving on site
 - Provide a named resource for scheduling of the service.
 - Notify Schneider Electric service personnel of any security clearance and/or safety training and equipment requirements in advance of arrival.
 - Provide a point of contact during time of service.
 - Provide a point of contact at the completion of service to sign off on completed work.
 - Provide the name of the project manager (if applicable).
 - Have the parties responsible for operation of the equipment present for basic operator training.
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6.0 Project Work Details

The information stated here are the details of the project performed by Schneider Electric for the customer with specifications to schedule, location and successful completion criteria.

6.1 SCHEDULE

Actual set dates will be discussed and approved between Schneider Electric and the customer.

6.2 LOCATION

The location of this installation will be on-site and performed at the ship to location of the equipment unless informed of a new location by the customer in a 48-hour period before service is to be done.

6.3 COMPLETION CRITERIA

Schneider Electric is expected to have finished its written duties when one of the following occurs:

1. Completes all the tasks included in this SOW.
2. This project and SOW are terminated for other reasons, within the Customer Agreement.

7.0 Terms and Conditions

Schneider Electric standard Terms and Conditions apply.

The information provided in this Scope of Work cannot be used or duplicated, in full or in part. Other uses for this document are prohibited without written consent by Schneider Electric.

All documentation, photographs, imaging or other information provided by the customer, or gathered at the customer site, will be for internal use only and used solely for the purpose of report generation, analysis and recommendations.

All services' conditions included in this document apply (i) only between Schneider Electric and that organization that bought the Services Solutions; and (ii) only to those products and services ordered by the Customer at the time that the Schneider Electric Services information is current. Schneider Electric may change the Schneider Electric Services Information at any time. The Customer will be notified of any change in the Schneider Electric Services Information in the manner stated in the then current product ordering and/or services solutions related agreement between Schneider Electric and the Customer, but any such change shall not apply to products or service ordered by the Customer prior to the date of such change.

Schneider Electric will have no obligations to provide Services Solutions with respect to equipment and assets that are outside the Service Area. "Schneider Electric Service Area" means a location that is within (i) one hundred (100) miles or one hundred and sixty (160) kilometers radius of a Schneider Electric service location; and (ii) the country in which the Installation site is located, unless otherwise defined in the governing agreement with Schneider Electric, in which case the definition in the governing agreement prevails.

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