Installation & Maintenance

WIND TURBINE SERVICE LIFT

Models:

SHERPA-VPM-A17
SHERPA-VRM-A120
SHERPA-W-A17
SHERPA-W-A120
MANUFACTURER
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WARNINGS

• All personnel operating this equipment must read and completely understand this manual.

• All personnel must be thoroughly trained in the use of the equipment and its operational and safety features.

• Only authorized and physically fit personnel shall operate the equipment.

• All persons operating this equipment must wear a safety harness at all times and tie-off as required.

• The daily operation checklist must be performed before using the equipment.

• Any operation in violation of these instructions is at the operator’s own risk and may result in serious injury.

• While working under the TSL stable provisions shall be made to prevent unintended movement.

• This manual must be kept with the service lift at all times.

• Only use spare parts and steel wire rope approved by Power Climber.
## SYMBOLS USED IN THIS MANUAL

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>TERM</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Stop Symbol" /></td>
<td>STOP</td>
<td>STOP action immediately and follow instructions before continuing</td>
</tr>
<tr>
<td><img src="image" alt="Warning Symbol" /></td>
<td>WARNING</td>
<td>Warns against possible immediate injury or death</td>
</tr>
<tr>
<td><img src="image" alt="Caution Symbol" /></td>
<td>CAUTION</td>
<td>Warns against possible personnel injury or damage to equipment.</td>
</tr>
<tr>
<td><img src="image" alt="Electrical Hazard Symbol" /></td>
<td>ELECTRICAL HAZARD</td>
<td>Warns against possible electrical shock hazard.</td>
</tr>
<tr>
<td><img src="image" alt="Safety Gear Symbol" /></td>
<td>SAFETY GEAR</td>
<td>Mandatory use of safety gear</td>
</tr>
<tr>
<td><img src="image" alt="Note Symbol" /></td>
<td>NOTE</td>
<td>Must read this before performing any action that follows.</td>
</tr>
</tbody>
</table>
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1. EQUIPMENT DESCRIPTION

1.1 General Description

The purpose of the service lift is to raise and lower personnel and their tools inside the tower of wind turbine generators (WTG) for maintenance and inspection of the turbine nacelle and tower.

The service lift is permanently installed in a specific WTG and consists of:

1. Five aluminum panels. (left, right, front, rear, hood)
2. Aluminum floor
3. Aluminum roof with latch
4. Two polycarbonate windows
5. Power Climber hoist mounted on an overhead steel stirrup
6. Electrical control components and cables
7. Safety devices

1.2 Certification

The SHERPA service lift complies with the following safety requirements:

- SHERPA-W-A17 ASME A120.1, ASME A17.1, CSA B44, and is listed by UL 1322 to UL 1323
- SHERPA-W-A120 ASME A120.1 and CSA Z271
- SHERPA-VPM-A17 ASME A120.1, ASME A17.1, CSA Z271, CSA B44, and is listed by UL 1322 to UL 1323
- SHERPA-VPM-A120 ASME A120.1, ASME A17.1, CSA Z271, and is listed by UL 1322 to UL 1323

1.3 Specifications

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>3 Phase 208V / 60Hz</th>
<th>3 Phase 400V / 60Hz</th>
<th>3 Phase 600V / 60Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>Same for all Models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit-weight of lift (*)</td>
<td>160 kg / 352 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe Working Load (SWL)</td>
<td>240 kg / 528 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoisting Speed</td>
<td>10 m/min / 33 ft/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Load Limit of hoist (WLL)</td>
<td>400 kg / 880 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amperage at WLL</td>
<td>Up 6.5 A</td>
<td>Down 4.5 A</td>
<td></td>
</tr>
<tr>
<td>Motor Power</td>
<td>1.1 kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise level</td>
<td>70 dBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoist Wire Rope Diameter</td>
<td>5/16 in. galvanized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guide Wire Rope Diameter</td>
<td>5/16 in. galvanized</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Note: Unit-weight is without steel wire ropes and electrical power supply cable.
1.4 General View of Service Lift

1.5 Model Differences

SHERPA-VPMA17: Side Slide Window, North American Market
SHERPA-VRMA120: Side Slide Window, CE Market
SHERPA-WA17: Swingout Window, North American Market
SHERPA-WA120: Swingout Window, North American Market
2. TOWER REQUIREMENTS

2.1 Power Supply

Power Supply to the Service Lift must be fitted with the following:

1. Main switch
2. Residual current device (or earth leakage circuit breaker) of 30 mA
3. Overcurrent protective device (automatic fuse Type C10)

**ELECTRICAL HAZARD:**

- Check that the specifications of the electrical power supply in the tower match the power requirement of the Service Lift.
- Supply voltage may not be more than 10% above the nominal voltage.
2.2 Platform Opening Dimensions with Lift

2.2.1 Lift Model - VPM

2.2.2 Lift Model - W
2.3 Minimum Height Requirements
3. PRECAUTIONS AND RESTRICTIONS

3.1 General conditions of use

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>-10°C to +55°C (14°F to 130°F)</td>
</tr>
<tr>
<td>Humidity range</td>
<td>30% to 95%</td>
</tr>
<tr>
<td>Contaminants</td>
<td>Degree of protection IP 54</td>
</tr>
<tr>
<td>Voltage range</td>
<td>Nominal Voltage +10% to -15%</td>
</tr>
</tbody>
</table>

3.2 Precautions prior to use

1. Before using the equipment, operators must carry out the Daily Checklist and make sure that the equipment is in perfect working condition.
2. Every user must wear their personal safety equipment at all times when using the service lift.
3. All hazards related to the lift encountering obstructions are not completely covered by the lift's safety devices. The operator shall check for obstructions along the travel of the lift.

3.3 Precautions during use

1. The operators must stop using the lift and notify the service supervisor if faults, damage or other circumstances may jeopardize safety.
2. Every user must bring a suitable means of communication (e.g. mobile phone or means prescribed by site operating procedures) when using the service lift.
3.4 Tower Platform Safety Precautions

To prevent injury to personnel working on tower platforms while the service lift is in use, the following safety measures should be present on each platform:

1. Guardrails must be designed to meet applicable OSHA requirements.
2. A safety zone at each platform opening should be clearly marked on the floor to keep personnel at a safe distance from the guardrails.
3. Guardrails must be clearly marked with yellow/black warning tape.
4. Adequate lighting must be provided on the landing areas at different platform levels where it is possible to exit the Service Lift.

If the Service Lift is used to stop at intermediate tower platform levels, the following requirements should be observed to ensure safe entry to and from the Service Lift:

1. The clearance between the Service Lift and the platform floor should be no more than 80mm (3”), and no less than 40mm (1 ½”).
2. Guardrail doors, if used, should be hinged to rotate away from the Service Lift onto the platform, and should be self-closing and locking.
3. A clearly-visible crushing hazard warning sign must be placed on the guardrails at each platform level.
4. SERVICE LIFT ASSEMBLY

4.1 Service Lift Components

The Service Lift consists of the following parts to be bolted together:

1. Left panel
2. Right panel
3. Rear panel
4. Front Panel
5. Hood, Stirrup, and Contactor box
6. Roof with hatch
7. Roof guard
8. Floor
9. Window assembly
10. Hoist:
    - PCW PC3 (model A17)
    - Titan Sherpa-W (model A120)
11. Wire guide assemblies (x4)
12. Main Power Switch

Note: Items illustrated are not to scale