

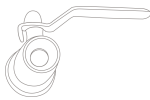
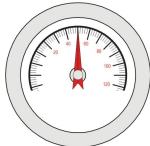
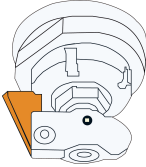
Figure	Name	Description
	Oil filling valve	when oil level of the MV transformer oil tank is low, open the valve for oil filling.
	Pressure Relief Valve	The valve automatically releases when the oil pressure inside the oil tank reaches 55kPa.
	Oil Level Indicator	The MV transformer will stop operating if the oil level falls below the lowest scale on the oil level indicator or below the oil level scale required for safe operation of the transformer. When the oil level is excessively high, open the drain valve to lower the oil level. When the oil level is excessively low, disconnect the transformer and check the oil tank for leakage.
	Oil Temperature Indicator	The alarm temperature is set to 95°C. When the oil temperature reaches the value, alarm signals will be sent to the intelligent power distribution cabinet or a communication unit provided by the customer. The tripping temperature is set to 100°C. When the oil temperature reaches the value, tripping signals will be sent to the intelligent power distribution cabinet or a communication unit provided by the customer. At the same time, the transformer will be disconnected from the upstream and downstream devices.

Figure	Name	Description
	Oil drain valve	Open the valve for oil drainage when the oil level is excessively high or when operations such as maintenance are required.
	Tap changer	The tap changer has five tap positions: 1, 2, 3, 4, 5. For more details, refer to " 7.1.1 Adjusting De-energized Tap Changer "



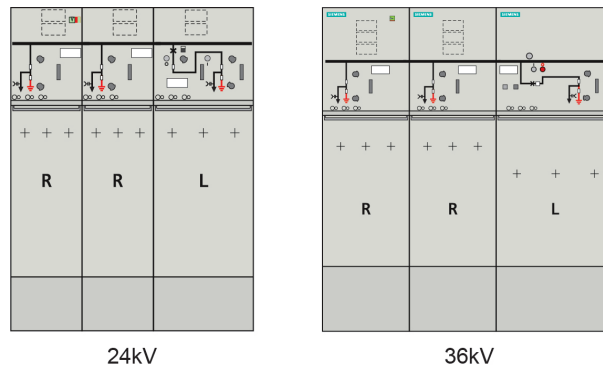
Parameters marked with a) and b) are factory default values and can be adjusted according to actual condition.

3.4.3 MV Switchgear

The MV switchgear consists of load switch cabinet, circuit breaker cabinet, and direct cable connection cabinet.

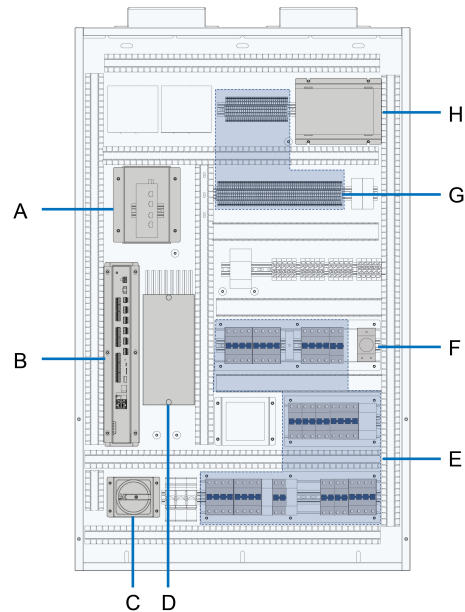
Names of the cabinets vary with MV switchgear manufacturers.

For example, the appearance of the CCV cabinet of Siemens is as follows:



3.4.4 Communication Distribution Panel

The internal layout of the communication distribution panel is shown in the following figure.



The figure above is indicative only, and actual product may differ.

No.	Discription
A	Ethernet switch
B	Logger4000
C	Load switch
D	Fiber terminal box
E	Circuit breaker
F	Socket
G	Wiring terminal block
H	24Vdc power supply

4 Identify and Store the MV Station

4.1 Scope of Supply

Tabelle 4-1 Standard deliverable list

No.	Name
Document	Certificate of Quality, Warranty Card, Product Test Report, System Manual
keys	Container door keys, LV SWG door keys
Screw	M6X20 hex head bolt three combination
	M8X20 hex head bolt three combination
	M10X25 hex head bolt (stainless steel)
	M12X40 hexagonal head bolt (LV cabinet input)
Flat washer class A	Φ10 (Stainless steel)
	Φ12
Standard spring washer	Φ10 (Stainless steel)
	Φ12
Nut	M12



The components in the table are for reference only, and the actual packing list shall prevail.

4.2 Identifying the MV Station

Identify the MV Station from its nameplate. The nameplate contains the following information: MV Station model, major technical parameters, marks of certification institutes, origins, and serial number.

WARNING

Very important technical parameters and MV Station-related parameters are displayed on the nameplate.

Protect the nameplate at all times!

4.3 Checking for Transport Damages

The MV Station has been strictly inspected and tested before delivery. Despite robust packaging, the container or inside devices may be damaged during transport. Therefore, once you receive the MV Station, a detailed inspection is necessary.

If any damage is detected, contact the forwarding company or Sungrow immediately.

Examine the contents of the shipment to check the scope of delivery for completeness.

- Check to make sure the MV Station and inner devices are of the same models as those in your order;
- Check thoroughly the MV Station and inner devices for any possible damages during transport.

WARNING

Install and commission the MV Station only when it is technically faultless! Make sure before installing the MV Station that:

- **the MV Station is intact without any damage; and**
- **all devices inside the MV Station are intact without any damages.**

4.4 Storage

If the MV Station is not to be installed immediately after delivery, store it appropriately:

- Store the MV Station indoors, for example, large warehouse or workshop, to prevent possible condensation or damp.
- If the MV Station has to be stored outdoors, elevate the MV Station base according to the geological and ambient conditions.
- When the ambient temperature is too low, heat the MV Station internal devices. Temperature: -40°C~+70°C. Relative humidity: 0 to 95%, and non-condensation
- Ensure that all the doors of the MV Station are closed.
- Store the MV Station on a dry, clean, and solid ground with sufficient load-bearing capacity. The ground should be flat without water, bumps, or plantings.
- Lock the MV Station internal devices and the MV Station during storage.
- Take proper protective method to prevent the water and dust penetrating into the MV Station. Protect the MV Station air inlets and outlets at least.
- The UPS and their batteries must be charged once every six months after leaving the factory (EXW Date).

Regularly, once every half a month at least, check the MV Station and internal devices.

5 Mechanical Installation

WARNUNG

Respect all local standards and requirements during mechanical installation.

WARNUNG

During installation and operation, follow the procedure for working at heights when walking on the top of the product.

5.1 Transport

All devices are installed inside the MV Station before delivery. The MV Station should be transported as a whole. Transport the MV Station by a crane with sufficient load capacity. The MV Station is delivered to the user by the forwarding company. After unloading, the MV Station will be transported to the installation site by the plant staff.

WARNUNG

Local standards and regulations on the transport and loading & unloading of the container, especially those safety instructions, should be observed at all times.

- **All the tools used on the product, or during operation, must have undergone proper maintenance.**
- **The MV Station must be transported by qualified personnel. Qualified personnel are those who have relevant training experience, especially safety-related experience.**

WARNUNG

Before transport, secure the platform using the four bottom securing points to the transport vehicle.

Choose the appropriate crane or hoist to transport the MV Station. The crane or hoist must be sufficiently capable of bearing the MV Station weight.



Keep in mind the dimensions and total weight of the MV Station at all times!

Ensure that the following requirements are met:

Road conditions:

- Before transport, inspect the transport route in advance, particularly for obstructions, to ensure the vehicle can travel safely and smoothly along the route. Pre-transport route inspection should cover the following items: road conditions, height limits, actual heights, width limits, actual widths, weight limits, traffic restrictions, and potential obstructions.
- In most cases, the total weight of a truck that carries the product will exceed the general weight limit on the road. Therefore, to transport the product in a truck, an overweight permit from the relevant local agency in that area may be required.
- Drive at a constant speed during transport, $\leq 70\text{km/h}$ on expressways, $\leq 50\text{km/h}$ on regular roads, $\leq 40\text{km/h}$ on Class 1 and 2 roads, $\leq 30\text{km/h}$ on roads in wind farms, $\leq 5\text{km/h}$ when turning. When crossing a bridge, maintain a slow, even speed of $\leq 5\text{km/h}$ and stay in the middle of the road. Sudden braking is not allowed.
- To transport the product by water, ensure the waterway meets the requirements for the vessel to sail fully-loaded.

Environmental conditions:

- The cabinet doors of the MV Station must all be locked.
- The MV Station must stand upright during transport.
- If the MV Station is transported lying down horizontally, ensure the tilt is $\leq 15^\circ$ during the whole transport process.
- Drive at a steady speed during transport, avoiding sudden braking or speeding up, with acceleration $\leq 3g$ ("g" for gravitational acceleration).
- An additional traction vehicle may be required when the road has a gradient.
- Anything, which may hinder the transport, like trees, cables (or the like), should be removed.
- If possible, transport the MV Station on fine weather days.

Additionally, the following requirements should be met when the MV Station is placed on the ground:

- Place the MV Station carefully and gently. Do not pull or push the MV Station on any surface.
- The place should be firm and flat with good drainage and no obstacles or outshoots. The MV Station should be supported by the four feet.

5.2 Hoisting the MV Station

5.2.1 Safety Precautions

WARNING

- **Observe the safety operating rules of the crane at all times.**
- **The hoisting work must be carried out in accordance with the hoisting requirements of the MV Station.**
- **Standing within 5 to 10 meters away from the hoisting areas is strictly prohibited! Anybody standing under the boom or MV Station is strictly prohibited in the whole hoisting process.**
- **The hoisting work must be stopped on violent weather days. For example, in strong wind, heavy rain, or thick fog conditions.**

Precautions Before Hoisting

- Use only specialized cranes, otherwise, it may result in personal injury or MV Station damage.
- All safety requirements must be met.
- A professional instructor is required in the whole hoisting process.
- Ensure the product is held steady and does not tilt during the whole hoisting process. The tilt during hoisting should be $\leq 30^\circ$.
- All the used slings must have the load-bearing capacity of at least 30t.
- The crane should have sufficient arm length and radius of gyration.
- Make sure the connections of slings are all secure and reliable, and the length of the sling connected to each corner fitting is the same.
- The length of the slings can be adjusted appropriately according to on-site conditions.
- Hoisting the MV Station by connecting the four top corner fittings.
- Some accessories may be required to ensure the safety during hoisting.
- All doors of the MV Station are closed and locked.

Precautions During Hoisting

- Ensure the product is held steady and does not tilt during the whole hoisting process. The tilt during hoisting should be $\leq 30^\circ$.
- Hoist the MV Station in a vertical manner. Do not drag or drop the MV Station on any surface.
- Keep the container stable and horizontal during hoisting, and ensure that the diagonal gradient of the container is within 5 degrees.
- The hoisting acceleration should not exceed 1.5g ("g" for gravitational acceleration).

- When the MV Station has been hoisted for about 300mm away from the ground, stop to check if all the connections are still firm. After confirmation, continue hoisting the MV Station.
- Lift and land the container slowly to prevent shock to the internal devices.
- When transported to the final location, the MV Station should be put down slowly and steadily.
- The final location should be firm, level, and well-drained. The MV Station is supported by four bottom fittings on the ground.
- Remove the ropes after ensuring that the container is placed evenly on the container bases.
- Secure the container hoisted before hoisting another one.

Please observe the following items:

The following figure illustrates the hoisting operations. Circle A describes the work areas of the crane. Anybody standing inside the circle B is prohibited for safety considerations.

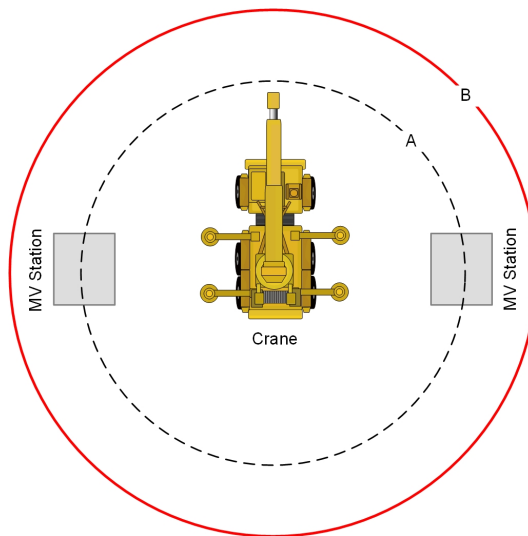


Abbildung 5-1 Hoisting the MV Station

5.2.2 Hoisting

The MV Station should be hoisted by four top corner fittings as shown in the following figure.

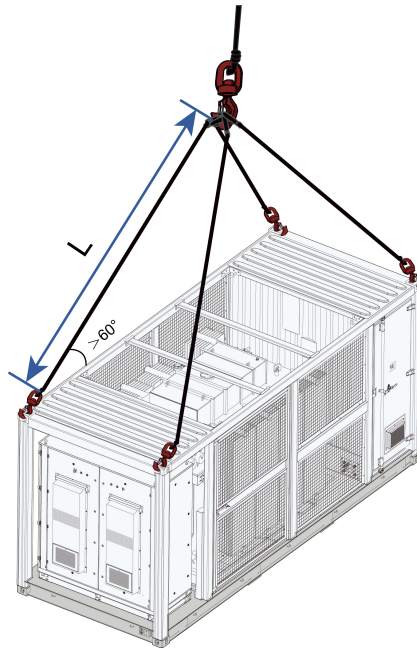


Abbildung 5-2 Hoisting from top fittings

Tabelle 5-1 The Substation Hoisting Parameters

Item	Requirement
Steel Length(L)	> 6.5 m
Steel Rope Qty.	4 pieces, the load of a single steel is not less than 30T.

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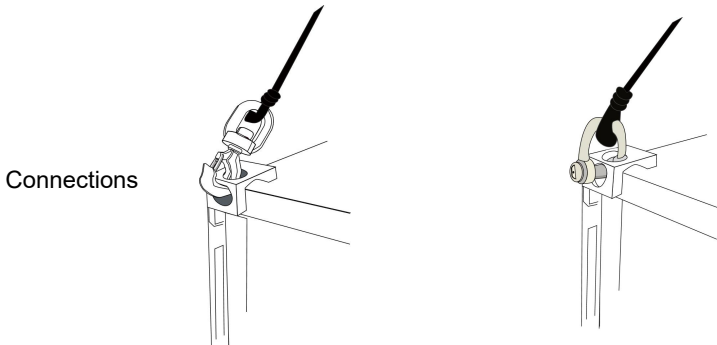
Hoist steadily , Otherwise, it may result in personal injury or MV Station damage!

- **Avoid collision, shocks or upside down.**
- **Nor keep the MV Station hoisted for a long time.**

5.2.3 Fastening of Connectors

Use slings with hooks or U-hooks to hoist the MV Station.

The lifting devices should be correctly connected to the MV Station.

	Lifting device	Hook	U-hook
Connections			
Notice	Insert the hook from inside to outside.		Lateral pin of the U-hook should be tightened.

WARNING

- **National and local safety rules should be observed at all times.**
- **Violating relevant safety rules may void pertinent warranty claims from Sungrow.**

5.3 Foundation

5.3.1 Selection of Installation Site

When selecting the installation site, consider the following requirements at least:

- Ambient and geological conditions, such as stress wave emissions, the level of underground water table and etc. should be taken into account.
- Far away from strong vibration, strong noise source and strong electromagnetic interference area.
- The ambient environment should be dry, well ventilated, and far away from inflammable materials.
- The ambient environment should be far away from dust, soot, harmful gases and the production or storage of corrosive, flammable, explosive places.
- The site location shall not be in a low-lying area and the site level shall be higher than the historical high water level in the area.
- Good soil condition, solid ground, no rubber soil, soft soil and other adverse geological conditions, do not choose the ground which is easy to get into water and easy to sink .
- The installation site should take the ventilation into account.
- Choose the open position, to ensure that there is no obstacles in 10 meters from the equipment surrounding.
- Keep at least 50 meters away from residential areas to avoid noise pollution.

- The ground at the installation site must be compacted enough. Relative compaction of the ground should be equal to or greater than 98%. Otherwise, take proper methods to strengthen the ground.

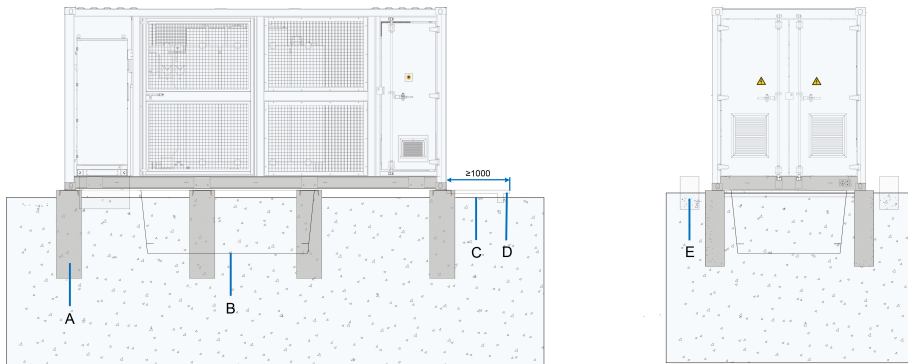
5.3.2 Recommended Foundation Construction Plan

The following conditions must be fulfilled:

- The bottom of the foundation should be firm enough.
- The foundations must be suitable for the weight of the MV Station.
- The foundation should be higher than the pea gravel ground on site to prevent the rain from damaging the base or penetrating into the MV Station.
- Sufficient cross-sectional area and depth of the foundation should be maintained. The depth is designed according to local soil conditions.
- Cable route should be taken into account.
- The LV cable trench must have enough space for personnel to enter.
- Backfill after securing cable clamps and connecting cables.

Overall construction effect is shown below.

The foundation plan described in this chapter is for reference only.



No	Name	Part source
A	Foundation	
B	Oil tray	
C	Pea gravel ground	Not in the scope of delivery
D	Platform	
E	Step	



Backfill after securing cable clamps and connecting cables.