

Abbildung 6-11 Securing single-core cables

Three-core cable

If a three-core cable is used:

- Inside switchgear: The phase B cable must be secured with a cable clip.
- Switchgear base: Add a cable clip under the three-branch breakout boot to secure it. Rubber or other insulating materials can be used to fill the gap to enhance friction.

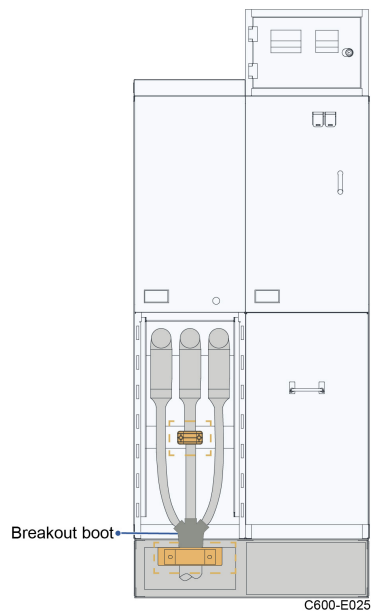


Abbildung 6-12 Securing a three-core cable

* The switchgear in the figures are for reference only and may differ from the real product.

6.7 PLC Communication Connection(Optional)

The inverter and communication distribution panel have built-in PLC communication modules, enabling MVS to support PLC communication.

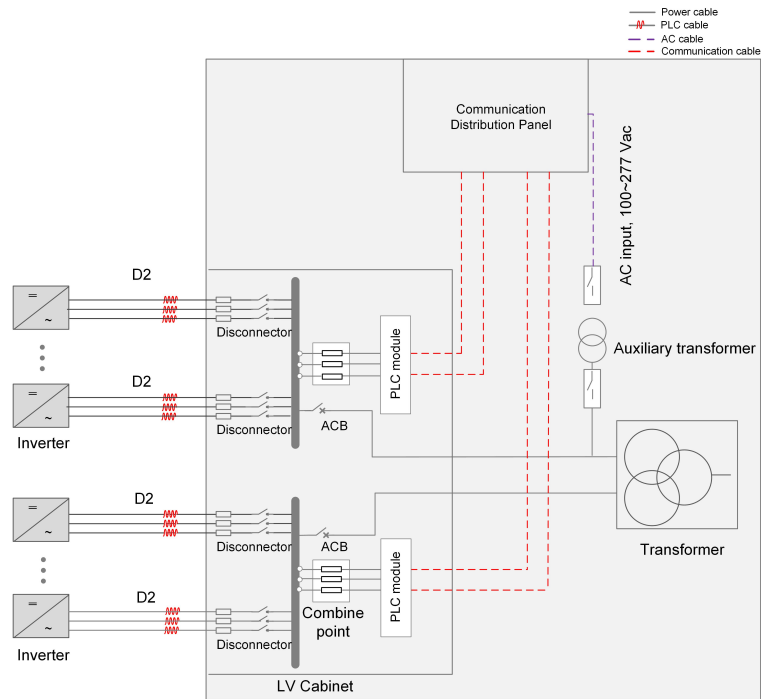


Abbildung 6-13 PLC wiring diagram

Description of parameters in the diagrams is listed in the table below.

Tabelle 6-4

Parameter	Description	Cable Specification
D2	Length of PLC cable from MVS to inverter	- If using multicore AC cable, the length should be $\leq 990\text{m}$. - If using single-core AC cable, the single-core cable length should be $\leq 790\text{m}$. - If using parallel-pair cables, the length requirements are the same as above.

Requirements for PLC wiring from MVS to inverter

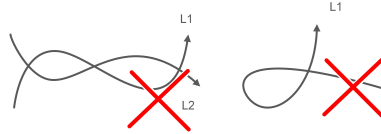
General requirements

The cable connecting the box-type transformer and the inverter can be a multicore AC cable, single-core AC cable, or parallel-pair cables, depending on the specific requirements of the project.

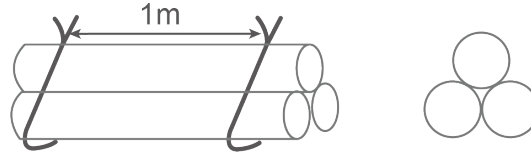


To ensure communication quality, the use of multicore cables is recommended.

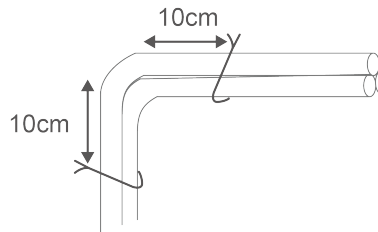
- The cable should be laid in cable trenches, cable ducts, or conduits.
- The cables should be laid parallel without any knots or twists.



- For three-phase single-core cables, they should be fixed every 1 meter and arranged in a "triangular" shape.



In this scenario, the cables are not easily bent. It is recommended to tie them separately at positions 10cm before and after the bend.



- If the single-core cables exceed 400 meters, log into the Web UI of Logger4000, on the **MPLC** page, set the PLC master node's frequency to **Band2** or **Band3**.

Requirements for parallel-pair cables

When using parallel-pair cables, to ensure MPLC communication quality, the length difference between the two sets of cables must not exceed 5 meters. For single-core parallel-pair, the requirements for both sets of cables and the frequency band settings are the same as mentioned above.

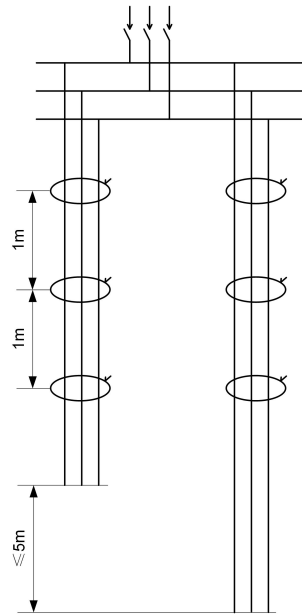
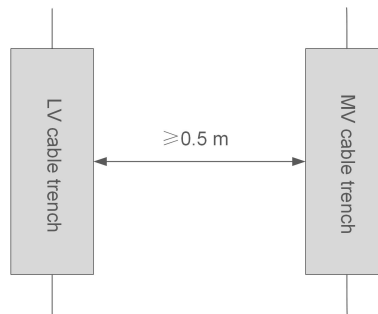


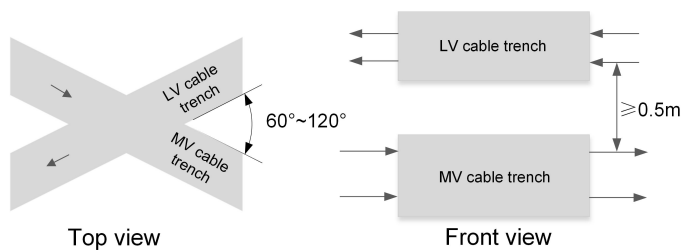
Abbildung 6-14 Parallel-pair cables layout

PLC cable installation requirements

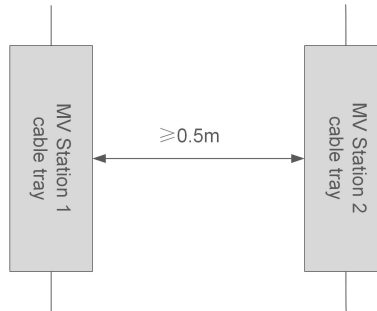
- The distance between low-voltage AC cables and medium-voltage AC cables should meet the following requirements:
 - Maintain a minimum horizontal distance of 0.5m between low-voltage AC cables and medium-voltage AC cables when laid parallel.



- If two cables are laid in a crossing manner, the angle of crossing should be between 60° and 120°, and the vertical distance should be no less than 0.5m.



- Only AC cables under the same box-type transformer can be laid in the same cable trench.
- When using different box-type transformers, the distance between the low-voltage side cable trays should meet the following requirements:
 - Maintain a minimum horizontal distance of 0.5m between cable trays from different box-type transformers.



- If two cables are laid in a crossing manner, the angle of crossing should be between 60° and 120° , and the vertical distance should be no less than 0.5m.

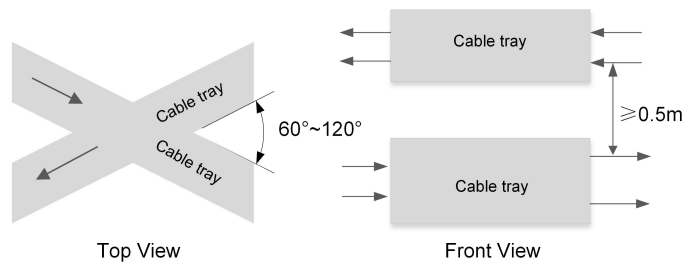
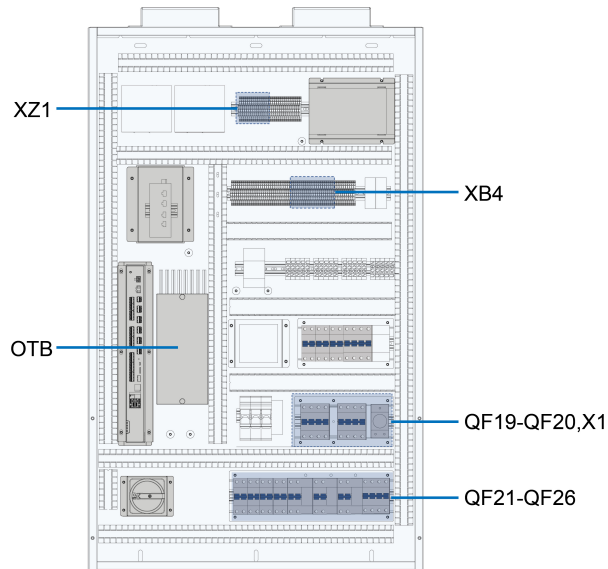


Abbildung 6-15 Vertical crossing distance between PLC cables

Choose an AC cable equipped with PLC communication, wiring method reference ["6.6.2 Procedure"](#).

6.8 Communication Distribution Panel Connection

The communication and distribution area is shown in the following figure. Connect cables according to on-site requirements.

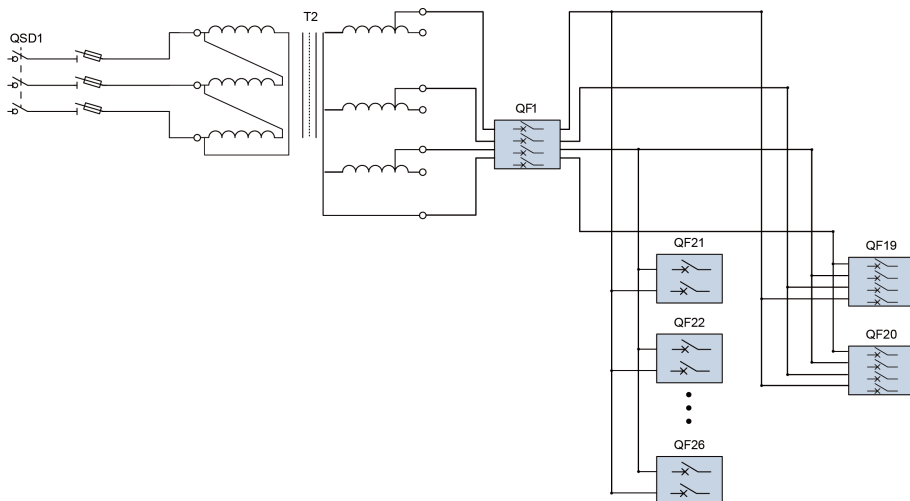


The figure above is indicative only, and actual product may differ.

No.	Description
QF19	Reserved for 400Vac power supply
QF20	Reserved for 400Vac power supply
QF21- QF26	Reserved for 230Vac power supply
OTB	Reserved fiber optic wiring port
X1	Socket
XZ1	Reserve RS485 communication
XB4	Reserve 24Vdc power supply

Wiring diagram

The wiring diagram of external power supply is shown in the figure below. Perform cable connection according to this diagram.



6.9 Checking after Electrical Connection

Checking Item	Requirement
Equipment appearance	The equipment is intact, and free from rust and paint flake-off.
	Repaint areas with paint flake-off (if any).
	The labels on the equipment are legible.
	The damaged labels must be replaced in time.
Appearance of cable	Cable sheathings are properly wrapped and free from obvious damage.
	Hoses that contain cables are intact.
Cable connection	Cables are connected in the designed positions.
	Terminals are prepared as required and securely connected.
	Labels on both ends of each cable are clear and specific, and attached in the same direction.
Cable routing	Power cables and communication cables must be routed separately.
	Cables are neat and tidy.
	The joints of cable ties are evenly cut without burrs.
	Cables are placed properly and not tense at turning points.
	Cable routes are straight and smooth, and do not intersect inside a cabinet.
Container	The container is clean and tidy inside, without any unnecessary cables, cable heads, terminals, or tools. No obvious garbage is found outside the equipment.
	Clean up the dust and sandstorms inside the container.
Others	Check the bottom of the MV Station and seal the gaps between the cables with fireproof mud. If cable glands are used, make sure they are tightened. Seal the unused terminal.
	Reassemble the protective grid removed.
	Water-proof processing should be done on the foundation of the MV Station.

7 Powering up and Powering down

HINWEIS

The operations described in this chapter must be performed by professional personnel in accordance with local regulations/standards.

7.1 Operation before Power on

7.1.1 Adjusting De-energized Tap Changer

Adjust the output voltage of the transformer. When operating the de-energized tap changer, ensure that the transformer is in a non-excitation state, that is, the high and low voltage sides of the transformer are uncharged.

When the voltage on the LV side remains unchanged, the output voltage on the HV side under different gears is:

Gear	Output Voltage
1 (A)	Standard voltage x 1.05
2 (B)	Standard voltage x 1.025
3 (C)	Standard voltage x 1.0
4 (D)	Standard voltage x 0.975
5 (E)	Standard voltage x 0.95

Take adjusting to gear 1 as an example, operate the de-energized tap changer as follows.

