2024.12

D112.0901
D112.0902
D112.0903

INSTRUCTIONS FOR USE

PRB-1F Switchgear for single-phase, Portable Shunt, 250 A

hubix
SAFETY IN POWER

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1. DESTINY

The D112.0901, D112.0902 and D112.0903 portable shunt disconnectors are single-pole devices used to bypass sections of electrical circuits intended for dismantling, replacement or repair, while maintaining the continuity of current flow.

The portable shunt disconnector is particularly suitable for work under voltage in distribution devices up to 500 V.

2. REQUIREMENTS

The requirements for the portable shunt disconnector have been developed on the basis of the following standards.

- PN-EN 61439-1:2021-10 " Low-voltage switchgear and controlgear assemblies - Part 1: General rules (IEC 61439-1:2020/COR2:2023)
- PN-EN 61439-4:2013 *"Low-voltage switchgear and controlgear assemblies - Part 4: Assemblies for construction sites (ACS) (IEC 61439-4:2012)*
- PN-EN IEC 60900:2018-10 *"Live working - Hand tools for use up to 1 000 V AC and 1 500 V DC*

3. CONDITIONS OF USE OF THE SWITCH

D112.090x shunt disconnectors may only be used by persons authorised by the person operating the electrical equipment, under the conditions specified in the detailed instructions for working under voltage approved by the person operating the equipment.

4. CONSTRUCTION OF A SHUNT SWITCH

The basic element of the portable shunt disconnector is the single-pole fuse switch type FH1.

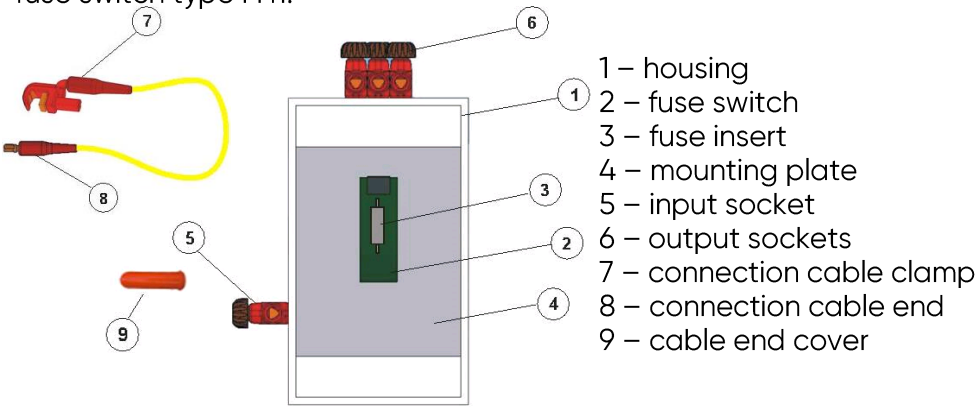


Fig. 1. Construction of a single-phase shunt disconnector

The fuse switch is placed in a thermosetting housing type OTU 26x40, protection class IP 44 .

^{2}/35 mm ^{2} connection cable set , connected to the input and output sockets of the switch disconnector, enables bypassing of sections of simple and branched circuits with loads up to 250 A.

4.1 Input and output sockets

The switch has one 200 A input socket and one, two or three 200 A output sockets. The copper end of the connecting cable should be inserted into the socket (Fig. 2a) and then the socket knob should be tightened (Fig. 2b). The special design of the socket allows the cable end to be inserted into it in only one specific position.

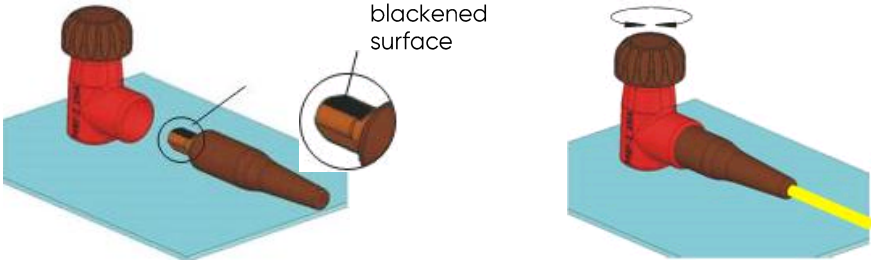


Fig. 2a and 2b Connecting the cable to the socket

4.2 Connection terminals

The disconnector connecting cables have 100 A and 200 A connecting terminals for rail, cable terminal or piercing. The profiling of the terminals allows them to be mounted on a rail or pin. Piercing terminals are mounted on insulated cables. The terminals are tightened using an insulated butterfly screw. The connecting cables are equipped with insulating cable end covers.

Fig. 3a Cable lug clamp Fig. 3b Piercing clamp

4.3 Technical parameters

rated switching current	200A
half-hour current (cable with 200 A terminal)	250A
rated switching voltage	690V/AC
	250V/DC

rated insulation voltage	500V/AC
impulse withstand voltage	8kV
short-time withstand current	6kA / 0.5s
maximum fuse link	250A
fuse link size	NH1
weight (without fuse links and connecting cables)	9kg
permissible ambient temperature	-25°C ÷ +55°C
mechanical strength	1400 cycles
case	OTU 26/40
external dimensions	(260x400x250) mm
degree of protection	IP44

5. PREPARING THE SHUNT SWITCH FOR OPERATION

Before each use, please inspect to check:

- technical condition of the disconnector, completeness and functionality, durability of element fixings,
- condition of current paths – stability of screw connections,
- the condition of the insulation of the connecting cables – the outer fibrous sheath,
- technical condition of input and output connection sockets.
- technical condition of the terminals of the connecting cables.

Damaged (cracks) or excessively worn (deformations, signs of overheating) components should be replaced with new ones.

If the outer covering of the connecting wires (fibrous layer) is damaged or the insulation slips off at the point of connection with the connecting terminals, they must be replaced with new ones!

6. SHUNTING THE LOAD CIRCUIT

- check the load capacity of the shunted section of the circuit,
- open the fuse switch cover,
- insert an appropriate NH-1 fuse insert into the fuse switch cover, selected according to the following criteria:
  - when bypassing a section of the circuit containing protection devices, the rated current of the fuse link must be at least equal to the highest value of the current intensity of the protection device subject to bypass,
  - the value of the fuse link operating current must be at least equal to the value of the switching off (starting) current of the shunt protection,
  - in case of bypassing a part of the circuit not containing protection, place a jumper in size NH-1 on the disconnector cover.

- select appropriate locations for installing the shunt disconnector connection terminals to the shunted circuit,
- clean the connection points of the shunt disconnector terminals to the circuit,
- connect the wires with the appropriate terminals to the input and output sockets of the shunt disconnector
- place the clamps that bypass the circuit fragment on the previously prepared connection points,

Attention: – in the case of connecting the connecting wires to the multiple shunt branching system, after connecting the first wire, connect the next ones in reverse order – first to the circuit, and then after checking the phase compatibility to the output socket of the multiple shunt branching system – direct shunting. Sockets to which the wires are not connected should be covered with protective caps. (Fig. 4)

- check the correct connection of the bypass switch wires to the bypassed section of the circuit,
- check the correct installation of the fuse link or jumper,
- check the correct assembly of the system, remove unnecessary objects from the work area,
- turn on the fuse switch,
- check the effectiveness of the circuit shunting (using a clamp ammeter - current intensity, or a voltage indicator - presence of voltage on both sides of the disconnector fuse link).

Note: If there is no load on the bypass switch and there is no voltage present on one of the poles of the fuse link of the fuse switch, do not attempt to disconnect, connect or unscrew the bypass circuit.

The effectiveness of the bypass should be checked during work, and in particular before each operation of connecting or disconnecting elements of the bypassed circuit.

7. DISCONNECTING THE SHUNT SWITCH

- check the current flow in the bypassed section of the circuit,
- turn off the fuse switch,
- remove the jumper or fuse link from the cover,
- remove the wires that bypass the circuit.

Note! Connecting and disconnecting connecting cables in a bypass circuit may only be done with the fuse switch cover open

Attention! the wires of the multiple system are live until the last wire is disconnected from the circuit, despite the fuse switch being open. The wires of the second and third multiple systems should be disconnected in the switch and then, after insulating them, disconnect the other ends from the circuit.
Before disconnecting each wire in the bypass circuit, the load must be checked.
Exercise extreme caution – direct disconnection.

8. WHAT TO DO IF A FUSE LINKS BLOWS.

If a fuse link in a disconnector burns out, all work under voltage must be stopped in order to determine the cause of the burnout.

It is prohibited to perform any connection or disconnection operations on the circuit if the fuse link in the disconnector is blown!

9. PROCEDURE IN THE EVENT OF WEAR OR DAMAGED SWITCH ELEMENTS

Excessively worn or damaged device elements should be replaced with new ones. The manufacturer is not responsible for introducing changes to the device without its consent, individual adjustment of working elements that are not part of the device equipment and are not adapted for work under voltage. The manufacturer guarantees full service of the offered device.

10. DEVICE MAINTENANCE

Dirty housing parts, wires and insulating elements of sockets and terminals should be cleaned with a dry cloth. In case of heavy contamination, clean the disconnector elements with a cloth moistened with ASOREL and dry thoroughly. For cleaning and maintenance of conductive parts of sockets, terminals and disconnector, use technological oil that displaces moisture and improves electrical conductivity

11. PERIODIC TESTS

Shunt switches are subject to periodic inspections. Below are the manufacturer's recommendations for periodic inspection of the technical condition of the shunt switch. These recommendations constitute minimum requirements, which, depending on the conditions and intensity of use of the equipment, may be modified by the user.
Periodically, but no less than every 12 months, the full scope of inspections specified in point 5 should be carried out.

12. STORAGE AND TRANSPORT

Shunt disconnectors should be stored in dry rooms, in a chemically non-aggressive atmosphere and protected from sunlight. Input and output sockets should be covered with a protective cap (Fig. 4)

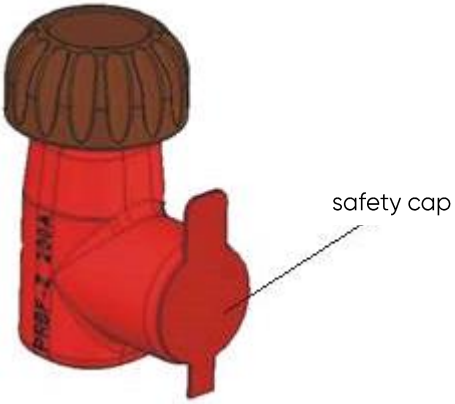


Fig. 4. Securing the socket with a cap

Cables should be transported in a case in a way that protects them from mechanical damage. Covers should be placed on the ends of the cables.

13. EXAMPLES OF APPLICATION OF THE PORTABLE SHUNT SWITCH

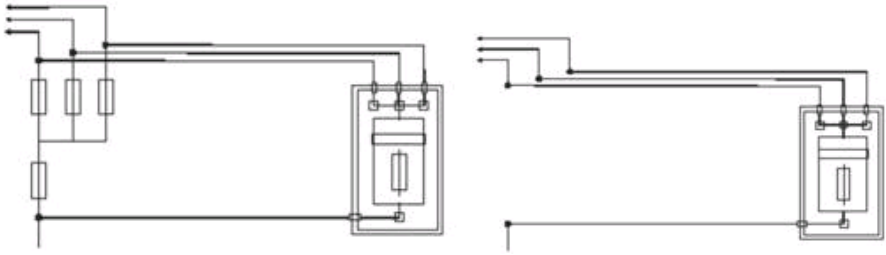
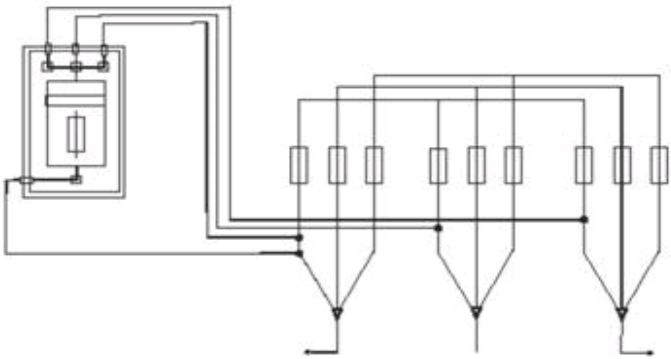


Fig. 5. Shunting of internal protection of power supply lines (WLZ)



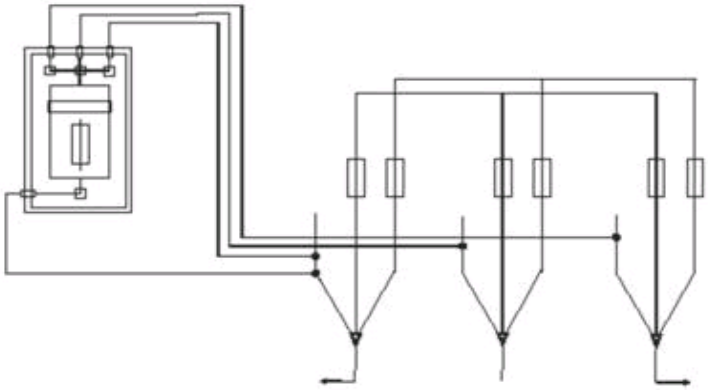


Fig. 6. Shunting one phase of a three-phase ZK3a cable connector system

14. PORTABLE SHUNT SWITCH EQUIPMENT SPECIFICATION

List of equipment items: **Quantity:**

- FH1 fuse switch 1 pc.
- OTU housing 26x40 1 pc.
- SILICOUL connection cables 1.1 kV (*)

name of the wire	product code	rated current	wire cross-section	Length of wires
with rail clamp	**D112.2011**	200A	35mm ^{2}	2m
with cable lug clamp	**D112.2002**	100A	25mm ^{2}	2m
	D112.2006	200A	35mm ^{2}	2m
with piercing clamp	**D112.2009**	200A	25mm ^{2}	2m

(*) *type, length and number of cables according to customer requirements*.

- NH-1 jumper 1 pc.
- case for connecting cables 1 pc.
- cover for the end of the connecting cable 1/cable

Number of output sockets:

one(D112.0901)
two(D112.0902)
three(D112.0903)

Standard cables included in the kit

Product code	number of entries	number of outputs	standard cables	
D112.0901	1	1	D112.2006	2 pcs.
D112.0902	1	2	D112.2002	1 pc.
			D112.2006	2 pcs.
D112.0903	1	3	D112.2002	1 pc.
			D112.2006	3 pcs.

15. UTILIZATION

The device is made of recyclable materials.
This device is marked in compliance with European Directive 2002/96/EC (WEEE) on waste electrical and electronic equipment. By ensuring this device is disposed of correctly, you can help in preventing potential negative consequences for the environment and human health.
The symbol on the device or in the documentation accompanying it indicates that the device must not be treated as normal household waste. It should be taken to a special collection point for the disposal and recycling of electrical and electronic devices.
When disposing of the appliance, render it unusable by cutting off the power cable.
Dispose of the appliance in accordance with local waste disposal regulations, taking it to a special collection point; do not leave the appliance unattended even for a few days as it may pose a risk to people.

GUARANTEE

The warranty is granted for a period of 12 months, counted from the date of sale of the product. In the event of finding defects in the product caused by improper workmanship or use of improper materials, HUBIX undertakes to repair free of charge during the warranty period, or to replace defective parts, provided that the validity of the complaint is confirmed by the Quality Control of our Plant.

The warranty becomes null and void in the following cases:

- mechanical damage caused by improper transportation or storage at the recipient's premises
- using the product contrary to its intended purpose
- unauthorized replacement of original parts or their repair
- making design changes
- improper use of the product

In the event that the warranty rules in the contracts are regulated differently than the generally accepted principles, the principles resulting from the contracts shall apply.