Portable emergency pump

for mechanisms with hydraulic energy transfer (Type AHMA, HMB, HMC)

The portable emergency pump for operating mechanisms allows a manual charging of the circuit breaker operating mechanism – especially when the power supply has failed temporarily or when the oil pump of the operating mechanism has any malfunction. Through this manual operation, the energy storage can be charged until a safe OPEN operation is possible.
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Funktional description
The portable emergency pump 1HDS112207R0200 is used for the manual charging of circuit breaker operating mechanisms in case of failure of the motor charging. It is suitable for ABB circuit breaker operating mechanisms of type AHMA, HMB and HMC.

The portable emergency pump is supplied in a transportation case. Figure 1 shows the scope of supply. The detailed scope of supply is printed on a packing list provided with the transportation case.

The portable emergency pump (5) is connected with a high pressure hose (2) to the high pressure termination of the circuit breaker operating mechanism. Low pressure hose (1) connects the low pressure terminations of emergency pump and operating mechanism. The hand crank (10) and the extension (3) are inserted into link (4) and the portable emergency pump is operated manually. The portable emergency pump can be fixed with base plate (6) at the bottom plates of the operating mechanisms or at the support structure of the gas−insulated switchgear (GIS). Alternatively the base plate can be used on the ground fixing it with the feet.
2 Safety instructions
2.1 Intended use
The portable emergency pump shall only be used for the manual charging of the spring storage module of the following circuit breaker operating mechanisms manufactured by ABB. The applications is only permitted with original operating mechanisms:

- AHMA-1
- AHMA-4
- AHMA-8
- HMB-1 and HMB-1s
- HMB-2 and HMB-2s
- HMB-3 and HMB-3s
- HMB-4
- HMB-8
- HMB-16
- HMC-2
- HMC-4

The application with other types of operating mechanisms or operating mechanisms by different manufacturers is not permitted.

The use of the portable emergency pump is only for the case that operation with the integrated pump or the motor supply voltage are down. In all other cases charge the spring storage module only via the control circuits by motor or operation with the integrated pump.

The intended use requires the use of the supplied pressure hoses. The intended use requires also that the operating mechanisms are filled with oil approved by ABB.

Approved types of oil are:
- Mobil UNIVIS HVI 13
- AEROSHELL Fluid 41
2.2 Safety information
When using the portable emergency pump regard all local regulations concerning safety on work and those regulations of the operator of the installation.

Disconnect control and motor voltage of the faulty circuit breaker operating mechanism to prevent an accidental operation of the operating mechanism by motor. Secure against reconnection. In addition prevent any switching operation during manual charging.

Never install the portable emergency pump on top of the GIS. This causes falling hazard. The pressure hoses have sufficient length to operate the portable emergency pump on the floor.

There is a risk of stumbling. Block the working place to prevent stumbling on the emergency pump or the pressure hoses.

Only personnel which has been trained on the product (operating mechanism, switching apparatus, portable emergency pump) shall operate the portable emergency pump.

A mechanically controlled safety valve in the operating mechanisms AHMA, HMB and HMC prevents overcharging of the energy storage.

An overpressure valve which is integrated into the portable emergency pump prevents a rise in nominal pressure.

Wear safety glasses during the work!

2.3 Standards and directives
The portable emergency pump is in conformance with the machine directive 2006/42/EG.

Additional directives do not apply.

A bit adapter has been supplied for lining a cordless screwdriver. The selection of a suitable cordless screwdriver is within the responsibility of the operator. The operator shall indicate possible vibrations to the user when operating with a cordless screwdriver.
3 Transportation and storage
Store the portable emergency pump including the accessories only in the supplied case. Store the pressure hoses protected from light in the supplied case.
Store only in dry and dust-free areas. Storage temperature +5°C...+40°C.

4 Commissioning
Check all parts of the portable emergency pump for damage before commissioning:
1. Check portable emergency pump for damage if portable emergency pump is damaged do not put into operation.
2. Check pressure hoses for damage.
   If the pressure hoses are damaged replace the damaged pressure hoses by new pressure hoses before commissioning.
3. Check if the date of expiry of the pressure uses is exceeded.
   The date of expiry is five years from purchase. If the date of expiry of the pressure hoses is exceeded replace the pressure hoses by new pressure hoses.

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WARNING

Danger
Danger of injury by bursting pressurized parts.

Cause
Damaged parts can burst at nominal pressure.

Action
Replace damaged parts and parts which expiry date is exceeded by new parts. The device shall only be repaired by the manufacturer.
5 Installation
5.1 Installation of the portable emergency pump
5.1.1 Using the portable emergency pump on the floor.

1. Place portable emergency pump on the floor.
2. Insert hand crank into link (1).
3. During cranking step on the base plate (2) of the portable emergency pump and fix it on the floor.

Installation for operation of the portable emergency pump on the floor - Figure 02

1 Link for hand crank
2 Base plate
5.1.2 Fixation of base plate at operating mechanisms
The base plate contains boreholes for fixation of the portable emergency pump directly at the operating mechanism.

Example for fixation at HMB:
1. Fix base plate (2) of portable emergency pump using the boreholes at the fixation points (1) at the operating mechanism.
2. Tighten screws at specified torque.
5.1.3 Fixation at gas−insulated switchgear
Fix the portable emergency pump exclusively to the support structure of the switchgear. Do not open flange connections of the pressurized enclosure.

Fixation to busbar module of gas−insulated switchgear type ELK−04
The portable emergency pump can be fixed to the busbar module of gas−insulated switchgear type ELK−04. The base plate of the portable emergency pump is fixed between nuts (1) and (2) at the busbar module. This kind of fixation is available for flange diameter 520 mm as well as flange diameter 735 mm.

The nuts (1) are not fixed after coupling of the bays and are not used during operation of the switchgear anymore. However, the nuts (2) must never be loosened because they fix pressurized parts. The base plate must never be fixed between nuts (1) and the housings of the compensation units (3) because in this case the compensation of dilatation is not effective anymore.

Fixations points at busbar of gas−insulated switchgear type ELK−04 - Figure 04

1 Nuts
2 Nuts
3 Balancer
**WARNING**

**Danger**
Personal injury or damage to equipment due to sudden loss of pressure.

**Cause**
Loosening nuts which fix pressurized parts will result in sudden loss of pressure. This can result in failure of the insulation and in a fault arc.

**Action**
Follow exactly the instructions. Tighten and loosen only the nuts which are mentioned in the instructions.

1. Select the suitable borehole pattern of base plate (1) fitting to the flange diameter of the GIS.
2. Attach base plate to bolts (3).
3. Fix base plate with two nuts (2). Apply the specified torque. The specified torques are listed in chapter Installation of the operating instructions provided with the GIS.

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**Fixation at busbar ELK−04 - Figure 05**

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1. Base plate
2. Nuts
3. Bolts
5.2 Connection and removal of pressure hoses

Before connection of the pressure hoses check if the terminations are clean. Contamination of the oil can result in damage to the operating mechanism.

For connection of the hoses consider also the operating instructions which have been supplied with the operating mechanism (position of terminations).

The terminations for high pressure and low pressure connections are designed to prevent false connections. For connection of the portable emergency pump to the operating mechanism carry out the following procedure:

1. Install portable emergency pump according to chapter Installation.
2. Open housing of circuit breaker operating mechanism.
3. Remove covers from high pressure and low pressure hose.
4. Remove cover from high pressure termination (Minimess connection) and from oil release tap at operating mechanism.
5. Connect low pressure hose to low pressure termination (2) at portable emergency pump and connect with an adapter to the oil release tap/directly to Minimess coupling (depending on operating mechanism type).
6. Connect high pressure hose to high pressure termination (1) at portable emergency pump.
7. Remove cover from oil filling termination at operating mechanism.
8. Open oil release tap (if available with mechanism variant).
9. Operate pump until oil flows continuously out of the high pressure hose.
   This is necessary because the portable emergency pump is not filled at time of delivery. This prevents that air is pumped into the operating mechanism.
10. HMB−4/8 only:
    First connect angle adaptor to high pressure termination of operating mechanism.
11. Connect high pressure hose to high pressure termination at the operating mechanism.
12. Close oil filling termination with cover again. Apply a torque of 25 Nm.

Connection of pressure hoses - Figure 06

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1 High pressure termination
2 Low pressure termination
Removal of portable emergency pump

1. Close oil release tap.
2. Disconnect hoses.
   - HMB-4/8 only:
     The angle adaptor remains at the operating mechanism at first. This is necessary because otherwise the back pressure valve is bypassed and oil can be released.
3. HMB-4/8 only:
   Remove angle adaptor from high pressure termination of operating mechanism.
4. Dismantle portable emergency pump with base plate.
5. Close oil release tap and high pressure termination at operating mechanism with cover.
   Apply a torque of 25 Nm.
6. Check oil level and, if necessary, correct oil level according to the operating instructions of the operating mechanism.
7. Close housing of operating mechanism.
8. Close terminations of pressure hoses with cover caps.
   The hoses have a back pressure valve. The pressure hoses need not to be drained.
9. Fix covers to terminations at the operating mechanism.
10. Pack portable emergency pump, pressure hoses and accessories into transportation case.
11. Store closed case in a dry, dust-free room at +5...+40°C.
6 Operation

Install the portable emergency pump as described in chapter Installation and connect pressure hoses.

1. Make sure that during manual charging all switching operations are blocked.
2. Insert hand crank, if necessary with extension, into link (1) at emergency pump.
3. Turn hand crank until the necessary spring travel for a C or an O operation is reached. The sense of rotation does not play a role.

Dismantle the portable emergency pump as described in chapter Installation.

Take the spring travel from the technical documentation which has been supplied with the operating mechanism.

Measure the O and C blocking values via the spring travel switch of the operating mechanism (contacts 03~04 for O blocking and 23~24 for CO blocking) with a suitable measuring instrument with acoustic or optical indication and check them.

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1 Link for hand crank
7  Maintenance

Replacement of pressure hoses
Replace the pressure hoses when expiry date has been reached.

Replacement of bursting protection.

Spare part list - Table 01

<table>
<thead>
<tr>
<th>Part</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>High pressure hose 4 m with back pressure valves</td>
<td>1HDS112207P0222</td>
</tr>
<tr>
<td>High pressure hose 1 m with back pressure valves</td>
<td>1HDS112207P0223</td>
</tr>
<tr>
<td>Low pressure hose 4 m</td>
<td>1HDS112207P0221</td>
</tr>
<tr>
<td>Low pressure hose 1 m</td>
<td>1HDS112207P0220</td>
</tr>
</tbody>
</table>
8 Troubleshooting

Pressure cannot be generated

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoses are connected incorrectly</td>
<td>Check hoses and connect them correctly.</td>
</tr>
<tr>
<td>Ball tap at operating mechanism is closed</td>
<td>Open ball tap at operating mechanism.</td>
</tr>
<tr>
<td>Oil does not flow into the portable emergency pump</td>
<td>Open oil filling termination at operating mechanism.</td>
</tr>
<tr>
<td>Overpressure valve has released</td>
<td>Release some pressure. Built up slowly the pressure again while using the hand crank.</td>
</tr>
<tr>
<td>The oil level in the complete system is too low</td>
<td>Fill oil into operating mechanism according to operating instructions.</td>
</tr>
<tr>
<td>Oil leaks from operating mechanism (external leakage)</td>
<td>Put operating mechanism out of service and organize repair.</td>
</tr>
</tbody>
</table>

9 Disposal

The portable emergency pump contains materials which can be recycled. The main components are aluminum (portable emergency pump, base plate) and steel (fixation material).

Portable emergency pump and hoses can contain a small amount of oil. Observe the local regulations for this case. In doubt contact the local ABB representative.

10 Technical data

<table>
<thead>
<tr>
<th>Technical data of portable emergency pump - Table 02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Einheit</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Maximum pressure (Bursting pressure of bursting protection)</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Length of pressure hoses</td>
</tr>
<tr>
<td>Maximum rotation speed</td>
</tr>
<tr>
<td>Temperature range (during operation)</td>
</tr>
<tr>
<td>Storage (long term)</td>
</tr>
</tbody>
</table>

11 Manufacturer

ABB AG
High Voltage Products
Brown-Boveri-Strasse 30
63457 Hanau-Grossauheim, Germany

Gas insulated switchgear 52-170 kV: After-sales service
INFORMATION
In case of an ABB Power Care contract the customer is able to use our 24-h hotline for free. In case of emergency our troubleshooting experts offers a fast and reliable support.

24-h-Hotline: +49 (0) 180 6222 007

Please have following information ready when calling our 24-h-Hotline:
• Your contact details
• Designation of station
• Order / Serial No
• Bay No
• Module No

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EG declaration of conformity

Original declaration of conformity in accordance with the EG machine 2006/42/EG of 17th May 2006, appendix IIA

We hereby declare that the following described machine in the version put by us into circulation is in accordance with all relevant requirements of the EC machine directive 2006/42/EG:

Manufacturer/Representative: ABB AG
Kallstadter Straße 1
68309 Mannheim
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Authorized person for technical documentation: Markus Ramel, CSTD-HE
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Description of the machine: Portable emergency pump for operating mechanisms with hydraulic energy transfer
1HDS112207R0200

Applied harmonized standards: EN ISO 12100:2010

Mannheim, 19th May 2017

[Signature]
Peter Wehrmeister
LBU Manager Service