Automatic standby unit

MODI
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DESCRIPTION

Application
The automatic standby unit is used for ensuring continuous supply of electrical power in various sectors of services, industry etc.

Function
The automatic standby unit ensures automatic and, above all, safe control of switching of two power supplies to two loads so that the electric power is supplied without long outages.

The automatic standby unit is designed for collaboration with circuit breakers/switch-disconnectors Medicion or ARION WL, which ensure power switching. See page 10 for detailed information on circuit breaker/switch-disconnector fitting.

The power supplies can be switched over by a failure of one or more phases, undervoltage or overvoltage of the power supplies. The unit can be equipped with the control (of switching on/off) of a backup source (generator).

Safety
The circuit breakers/switch-disconnectors are electrically interlocked by means of the automatic standby unit so that in no case both the power supplies can be switched on simultaneously. The circuit breakers must also be interlocked mechanically according to standard EN 947-6-1.

Power supply
The automatic standby unit must be supplied either from controlled power supplies (or from a momentarily active one) or from an independent external power supply such as UPS or AKU (see page 10 for detailed information). The function of the automatic standby unit depends in some cases on the power supply method (see time diagrams on p. 6 and 7).

Control and setting
Basic functions of the automatic standby unit are selected by a rotary switch on the front panel, and additional settings (modes and reaction times) are set by means of control push-buttons.

Example: reaction times (for detailed information see the table "Parameters" on page 10), automatic standby mode (see "Functions and modes" on page 4 and 5), or security password, which can protect the automatic unit against unauthorized resetting.

c) rotary switch for setting of basic functions of the automatic standby unit (for detailed description see "Functions and modes" on page 4 and 5)

In the automatic standby unit
a) the user can use undervoltage relays (if the automatic unit is equipped with them) to set the values of undervoltage or overvoltage (independently of each other) to be evaluated by the unit as a power supply failure with taking an appropriate action
b) there is a screw terminal board for connection of individual conductors, which connect the automatic unit with circuit breakers/switch-disconnectors.

two basic versions
Automatic standby unit is delivered:
a) in version in plastic switchboard IP54 for the type without a longitudinal coupling
b) in version to be built in the switchboard door, for the type with or without the longitudinal coupling

Arrangement of circuit breakers/switch-disconnectors and their connection to the automatic standby unit
The arrangement of circuit breakers (a distance between them) is not limited in any way. If mechanical interlocking is used to increase safety in manual control, the distance between the circuit breakers/switch-disconnectors is given by the used mechanical interlocking.

Normally, the cable is not included in the scope of delivery. However, the cable of a required length can be made by the manufacturer on order basis.

The cables for the connection of the automatic standby unit with controlled circuit breakers/switch-disconnectors can be led on the rear or upper side of the plastic switchboard. The automatic standby unit of built-in version shall be connected with the controlled circuit breakers by a shielded cable.

Advantages
Automatic standby time from 0.8 s.
The display of the automatic standby unit informs the operator of the immediate state of circuit breakers, power supplies and actually performed action.
The automatic standby unit can be protected by a password against unauthorized setting.

Basic block diagram

without longitudinal coupling

with longitudinal coupling

Version in plastic switchboard IP54
## TYPE DESIGNATION

The version to be built in the switchboard door can be delivered by agreement with the manufacturer.

### Mechanical arrangement
- 0: version in plastic switchboard
- 1: version built in the switchboard door

### Controlled combinations of circuit breakers
1. control of combination of ARION WL
2. control of combination of MODI ZA BD (BH)
3. control of combination of MODI ZA BL

### Power supply of the automatic standby unit
1. independent external power supply 24 V d.c.
2. own - from active power supply (optional backup power supply 24 V d.c.)
3. independent external power supply 110 - 230 V a.c./d.c.

### Network monitoring circuit
- 0: monitoring of only failure in individual phases
- 1: undervoltage relays with setting, monitoring of phase sequence, at setting -15 % the automatic standby unit must be in version ZA-xx-x0xx or ZA-xx-x2xx

### Signalling
1. signal contacts of function switch
2. signal contacts of function switch + failure state
3. signal contacts of function switch + signalling of circuit breaker switched on
4. signal contacts of function switch + signal for the generator + failure state
5. signal contacts of function switch + signalling of circuit breaker switched on + signal for the generator
6. signal contacts of function switch + signalling of circuit breaker switched on + signal for the generator + failure state

### Other special design according to the customer's requirements

### Controlled combinations of circuit breakers

<table>
<thead>
<tr>
<th>Controlled combinations of circuit breakers</th>
<th>Controlled combinations of circuit breakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD250</td>
<td>BD250</td>
</tr>
<tr>
<td>BD250</td>
<td>BH630</td>
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<td>BH630</td>
<td>BH630</td>
</tr>
<tr>
<td>BL...</td>
<td>BL...</td>
</tr>
<tr>
<td>ARION WL</td>
<td>ARION WL</td>
</tr>
</tbody>
</table>

* Only for version without longitudinal coupling, i.e. ZA-0x-xxxx

1) Only if the undervoltage monitoring level set to more than -15 % Uₖ (see p. 10), the standby power supply must be ensured; the automatic standby unit must be in version MODI ZA-xx-x0xx or ZA-xx-x2xx

2) - Standardly the automatic standby unit is delivered for the control of these combinations of circuit breakers:
- These combinations of circuit breakers cannot be interlocked mechanically, see p. 11

- On request we deliver the automatic standby unit and a wiring diagram for control of these combinations of circuit breakers:
FUNCTIONS AND MODES

Function: determines automatic or manual operation (it is set by the rotary switch)

FUNCTION OF THE AUTOMATIC STANDBY UNIT WITHOUT LONGITUDINAL COUPLING

1) AUTOMATIC OPERATION – AUTOMATIC STANDBY (switch position 3)

The automatic standby unit can work in three modes, which are selected by means of control push-buttons. Possible settings:

a) equivalent power supplies
b) priority of power supply 1
c) priority of power supply 2

Furthermore, it is possible to set min. time of switching between power supplies ($T_2$), time for detection of voltage ($T_3$) and power supply failure ($T_1$).

MODE

a) EQUIVALENT POWER SUPPLIES (the mode intended above all for power supply from two transformers) - see time diagram 1 and 2

The load can be supplied permanently from any power supply. In case of loss of voltage of the power supply the load is supplied from the load is disconnected from the power supply and connected to the other power supply. After voltage renewal of the power supply the load was originally supplied from the other power supply remains connected to the load, because the automatic standby unit works in the equivalent mode. It is possible to switch to the original power supply manually (by switching the switch gradually from position 3 to position 0) – 3.

The switching also takes place automatically after loss of voltage of the other power supply.

b) PRIORITY OF POWER SUPPLY 1 (this mode is intended above all for load feeding from a transformer as the main power supply and generator as a backup power supply – power supply 1 is a transformer, power supply 2 is a generator) - see time diagram 3 and 4

The load is supplied permanently from the main power supply (transformer). In case of loss of voltage, the main power supply is disconnected from the load automatically and, depending on the version, a generator start signal can be activated. After startup the generator is connected to the load automatically. After voltage renewal of the main power supply the power supplies are switched over automatically, and the load is again supplied from the main power supply.

c) PRIORITY OF POWER SUPPLY 2 (analogy to mode b) PRIORITY OF POWER SUPPLY 1, but the power supplies are in reverse order

1. power supply 1 generator
2. power supply 2 transformer

2) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 1 (switch position 1)

The load is permanently supplied from power supply 1. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 1 to position 0) – 1.

3) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 2 (switch position 2)

The load is permanently supplied from power supply 2. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 2 to position 0) – 2.

4) POWER SUPPLY 1 AND POWER SUPPLY 2 IS OFF (switch position 0)

$T_1\ G\ QG\ QT$ $T_2\ Q\ T2\ T1\ QT$ $GT\ Q\ G\ QT$ $G\ Q\ T1\ T2\ QT$

1) in position 0 it is necessary to wait at least 1 s before further handling the switch.
FUNCTIONS AND MODES

FUNCTION OF THE AUTOMATIC STANDBY UNIT WITH LONGITUDINAL COUPLING

1) AUTOMATIC OPERATION – AUTOMATIC STANDBY (switch position 6)

The automatic standby unit can work in three modes, which are selected by means of control push-buttons. Possible settings:

a) standby for both power supplies
b) standby for power supply 1
c) standby for power supply 2

Furthermore, it is possible to set min. time of switching between power supplies (T2), time for detection of voltage (T3) and power supply failure (T1).

MODE:

a) EQUIVALENT

Both loads can be supplied permanently from any power supply. In case of loss of voltage of the power supply the load is supplied from the load is disconnected from the power supply and connected (via coupling closing) to the other power supply. After voltage renewal of the original power supply the coupling opens, and the load is connected to the original power supply.

b) STANDBY FOR POWER SUPPLY 1

Load 1 can be supplied from power supply 1 or power supply 2; the load 2 can only be supplied from power supply 2. In case of loss of voltage of power supply 1, the load 1 is disconnected from the power supply 1, and connected to power supply 2 (via coupling closing). After voltage renewal of the power supply 1 the coupling opens and the load 1 is connected to power supply 1. In case of loss of voltage of power supply 2, the load is disconnected from power supply 2. Load 2 remains dead voltage for the time of outage of power supply 2; no standby is carried out (the coupling does not close).

c) STANDBY FOR POWER SUPPLY 2

Load 2 can be supplied from power supply 2 or power supply 1; the load 1 can only be supplied from power supply 1. In case of loss of voltage of power supply 2, load 2 is disconnected from the power supply 2, and connected to power supply 1 (via coupling closing). After voltage renewal of the power supply 2 the coupling opens and the load 2 is connected to the power supply 2. In case of loss of voltage of power supply 1 the load 1 is disconnected from power supply 1. Load 1 remains dead for the time of outage of power supply 1; no standby is carried out (the coupling does not close).

2) MANUAL OPERATION – BOTH POWER SUPPLY 1 AND POWER SUPPLY 2 ARE OFF (switch position 0)

Only the load 1 is supplied permanently from the power supply 1. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 1 to position 0 – 1).

3) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 1 (switch position 1)

Both loads are permanently supplied from power supply 1. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 3 to position 0 – 3).

4) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 2 (switch position 2)

Both loads are permanently supplied from power supply 2. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 4 to position 0 – 4).

5) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 1 WITH CLOSED COUPLING (switch position 3)

Both loads are permanently supplied from power supply 1. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 3 to position 0 – 3).

6) MANUAL OPERATION - OPERATION ONLY WITH POWER SUPPLY 2 WITH CLOSED COUPLING (switch position 4)

Both loads are permanently supplied from power supply 2. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 4 to position 0 – 4).

7) MANUAL OPERATION – OPERATION WITH BOTH POWER SUPPLIES (switch position 5)

Both loads are permanently supplied from power supply 1, load 2 from power supply 2. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. It can only be connected manually (by turning the switch gradually from position 5 to position 0 – 5).

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1) In position 0 it is necessary to wait at least 1 s before further handling the switch.
**TIME DIAGRAMS**

**Time diagram 1 - automatic standby unit without longitudinal coupling**

**Function:** automatic standby  
**Mode:** equivalent (power supply 1 is a transformer, power supply 2 is a transformer)  
**Automatic standby unit feeding:** from active power supply

---

1. **AZ**  
2. **AZ**  
3. **AZ**  
4. **AZ**

- **UT1** voltage of the first transformer  
- **QT1** circuit breaker of the first transformer  
- **UT2** voltage of the second transformer  
- **QT2** circuit breaker of the second transformer  
- **UZ** voltage on the load  
- **UnA** automatic standby unit feeding  
- **T1** controlled time of loss of voltage  
- **T2** min. time between circuit breaker switching  
- **T3** controlled time of voltage renewal  
- **TnA** time from loss of voltage to circuit breaker action

**FUNCTION DESCRIPTION**

**Initial state:** Voltage exists on both power supply 1 and power supply 2. The load is supplied from power supply 1.

**1st automatic standby:** In case of loss of **UT1** for min. **T1**, **QT1** is switched off automatically, and if **UT2** exists for at least **T3**, **QT2** is switched on automatically after **T2**. As the automatic standby unit works in the mode of equivalent power supplies, **QT2** remains on even after renewal of **UT1** for a time longer than **T3**. In case of loss of **UT2** for a time shorter than **T1**, the automatic standby unit does not react to such failure.

**2nd automatic standby:** In case of loss of **UT2** for a time longer than **T1**, **QT2** is switched off automatically, and if **UT1** already exists for at least **T3**, **QT1** is switched on automatically after **T2**.

**3rd automatic standby:** In case of loss of **UT1** and absence of **UT2**, **QT1** is switched off automatically after **TnA**. After renewal of **UT2** for at least **T3**, **QT2** is switched on automatically. The condition of automatic switching **QT2** on is expiration of time **T2**.

**4th automatic standby:** In case of loss of **UT2** for min. **T1**, **QT2** is switched off automatically, and if **UT1** exists at least **T3**, **QT1** is switched on automatically after **T2**.

---

**Time diagram 2 - automatic standby unit without longitudinal coupling**

**Function:** automatic standby  
**Mode:** equivalent (power supply 1 is a transformer, power supply 2 is a transformer)  
**Automatic standby unit feeding:** from independent external power supply

---

1. **AZ**  
2. **AZ**  
3. **AZ**  
4. **AZ**

- **UT1** voltage of the first transformer  
- **QT1** circuit breaker of the first transformer  
- **UT2** voltage of the second transformer  
- **QT2** circuit breaker of the second transformer  
- **UZ** voltage on the load  
- **UnA** automatic standby unit feeding  
- **T1** controlled time of loss of voltage  
- **T2** min. time between circuit breaker switching  
- **T3** controlled time of voltage renewal

**FUNCTION DESCRIPTION**

**Initial state:** Voltage exists on both power supply 1 and power supply 2. The load is supplied from power supply 1.

**1st automatic standby:** In case of loss of **UT1** for min. **T1**, **QT1** is switched off automatically, and if **UT2** exists for at least **T3**, **QT2** is switched on automatically after **TnA**. As the automatic standby unit works in the mode of equivalent power supplies, **QT2** remains on even after renewal of **UT1** for a time longer than **T3**. In case of loss of **UT2** for a time shorter than **T1**, the automatic standby unit does not react to such failure.

**2nd automatic standby:** In case of loss of **UT2** for a time longer than **T1**, **QT2** is switched off automatically, and if **UT1** already exists for at least **T3**, **QT1** is switched on automatically after **TnA**.

**3rd automatic standby:** In case of loss of **UT1** for min. **T1**, **QT1** is switched off automatically. After renewal of **UT2** for min. **T3**, **QT2** is switched on automatically. The condition of automatic switching **QT2** on is expiration of time **T2**.

**4th automatic standby:** In case of loss of **UT2** for min. **T1**, **QT2** is switched off automatically, and if **UT1** exists for at least **T3**, **QT1** is switched on automatically after **T2**.
**TIME DIAGRAMS**

**Time diagram 3 - automatic standby unit without longitudinal coupling**

**Function:** automatic standby  
**Mode:** priority of power supply 1 (power supply 1 is a transformer, power supply 2 is a generator)  
**Automatic standby unit feeding:** from active power supply

---

**Initial state:** Voltage is on power supply 1. The load is supplied from power supply 1.

**1st automatic standby:** In case of loss of $U_T$ for min. $T_1$, $Q_T$ is switched off automatically, and the generator start signal is active. If $U_G$ exists for at least $T_3$, $Q_G$ is switched on automatically. The condition for switching $Q_G$ on is expiration of time $T_2$. In case of loss of $U_G$ for a time shorter than $T_1$, the automatic standby unit does not react to such failure.

**2nd automatic standby:** If $U_T$ is renewed for min. $T_3$, $Q_G$ is switched off automatically, and the generator start signal becomes inactive. $Q_T$ is switched on automatically after $T_2$.

**3rd automatic standby:** In case of loss of $U_T$ for min. $T_1$, $Q_T$ is switched off automatically, and the generator start signal is active. If $U_T$ is renewed for min. $T_3$ before appearance of $U_G$ for min. $T_3$, $Q_T$ is switched on automatically. The condition of automatic switching $Q_T$ on is expiration of time $T_2$.

---

**Note:** Times $T_1$, $T_2$, $T_3$ are adjustable

---

**Time diagram 4 - automatic standby unit without longitudinal coupling**

**Function:** automatic standby  
**Mode:** priority of power supply 1 (power supply 1 is a transformer, power supply 2 is a generator)  
**Automatic standby unit feeding:** from independent external power supply

---

**Initial state:** Voltage is on power supply 1. The load is supplied from power supply 1.

**1st automatic standby:** In case of loss of $U_T$, $Q_T$ is switched off automatically, and the generator start signal is active. If $U_G$ exists for at least $T_1$, $Q_G$ is switched on automatically. The condition for switching $Q_G$ on is expiration of time $T_2$. In case of loss of $U_T$ and absence of $U_G$, $Q_T$ is switched off automatically after $T_3$. If $U_G$ exists for at least $T_3$, $Q_G$ is switched on automatically. The condition for switching $Q_G$ on is expiration of time $T_2$.

**2nd automatic standby:** If $U_T$ is renewed for min. $T_3$, $Q_G$ is switched off automatically, and the generator start signal becomes inactive. $Q_T$ is switched on automatically after $T_3$.

**3rd automatic standby:** In case of loss of $U_T$ for min. $T_1$, $Q_T$ is switched off automatically, and the generator start signal is active. If $U_T$ is renewed for min. $T_3$ before appearance of $U_G$ for min. $T_3$, $Q_T$ is switched on automatically. The condition of automatic switching $Q_T$ on is expiration of time $T_3$.

---

**Note:** Times $T_1$, $T_2$, $T_3$ are adjustable
**TIME DIAGRAMS**

**Time diagram 5 - the automatic standby unit with longitudinal coupling**

**Function:** automatic standby  
**Mode:** equivalent (power supply 1 is a transformer, power supply 2 is a transformer)  
**Automatic standby unit feeding:** from active power supply

.Function description:

- **Initial state:** Voltage exists on both power supply 1 and power supply 2. The load is supplied from power supply 1. Load 2 is supplied from power supply 2.

- **1st automatic standby:** In case of loss of UT1 for min. T1, QT1 is switched off automatically, and if UT2 exists for at least T3, Q3 is switched on automatically after T2.

- **2nd automatic standby:** In case of loss of UT1 for a time longer than T1, QT1 is switched off automatically, and Q3 is switched on automatically after T2.

- **3rd automatic standby:** In case of loss of UT2 for a time longer than T1, QT2 is switched off automatically. As the automatic standby unit works in mode of standby only for power supply 1, Q3 does not close.

- **4th automatic standby:** In case of loss of UT1 and absence of UT2, QT1 is switched off automatically after TA. After renewal of UT2 for min. T3, QT2 and Q3 are switched on automatically. The condition of automatic switching QT2 and Q3 on is expiration of time T2.

- **5th automatic standby:** In case of renewal of UT1 and failure of UT2 in T3, QT2 and Q3 are switched off automatically after T1. If T3 expires before T1, QT2 and Q3 are switched off after T3. QT1 is switched on automatically after T2.

- **Symbols:**
  - UT1 voltage of the first transformer
  - QT1 circuit breaker of the first transformer
  - UT2 voltage of the second transformer
  - QT2 circuit breaker of the second transformer
  - Q3 switch-disconnector of the longitudinal coupling
  - UZ1 voltage on the load 1
  - UZ2 voltage on the load 2
  - UnA automatic standby unit feeding
  - T1 controlled time of loss of voltage
  - T2 min. time between circuit breaker switching
  - T3 controlled time of voltage renewal
  - TA time from loss of voltage to circuit breaker action

**Time diagram 6 - automatic standby unit with longitudinal coupling**

**Function:** automatic standby  
**Mode:** standby for power supply 1 (power supply 1 is a transformer, power supply 2 is a transformer)  
**Automatic standby unit feeding:** from active power supply

.Function description:

- **Initial state:** Voltage exists on both power supply 1 and power supply 2. Load 1 is supplied from power supply 1, load 2 is supplied from power supply 2.

- **1st automatic standby:** In case of loss of UT1 for min. T1, QT1 is switched off automatically, and if UT2 exists for at least T3, Q3 is switched on automatically after T2.

- **2nd automatic standby:** If UT1 is renewed for a time longer than T3, Q3 is switched off automatically, and QT1 is switched on automatically after T2. In case of loss of UT2 for a time shorter than T1, the automatic standby unit does not react to such failure.

- **3rd automatic standby:** In case of loss of UT2 for a time longer than T1, QT2 is switched off automatically. As the automatic standby unit works in mode of standby only for power supply 1, Q3 does not close.

- **4th automatic standby:** In case of loss of UT1 and absence of UT2, QT1 is switched off automatically after TA. After renewal of UT2 for min. T3, QT2 and Q3 are switched on automatically. The condition of automatic switching QT2 and Q3 on is expiration of time T2.

- **5th automatic standby:** In case of renewal of UT1 and failure of UT2 in T3, QT2 and Q3 are switched off automatically after T1. If T3 expires before T1, QT2 and Q3 are switched off after T3. QT1 is switched on automatically after T2.
### TIME DIAGRAMS

#### Time diagram 7 - automatic standby unit with longitudinal coupling

**Function:** automatic standby  
**Mode:** standby for power supply 2 (power supply 1 is a transformer, power supply 2 is a transformer)  
**Automatic standby unit feeding:** from active power supply

<table>
<thead>
<tr>
<th>U₁₁</th>
<th>U₂₂</th>
<th>Q₁₁</th>
<th>Q₂₂</th>
<th>Q₃</th>
<th>U₃₁</th>
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</thead>
<tbody>
<tr>
<td>UT₁</td>
<td>UT₂</td>
<td>QT₁</td>
<td>QT₂</td>
<td>Q₃</td>
<td>U₁</td>
<td>U₂</td>
</tr>
</tbody>
</table>

#### Function Description

**Initial state:** Voltage exists on both power supply 1 and power supply 2. Load 1 is supplied from power supply 1. Load 2 is supplied from power supply 2.

1. **1st automatic standby:** In case of loss of UT₂ for min. T₁, QT₂ is switched off automatically, and if UT₁ exists for at least T₃, Q₃ is switched on automatically after T₂.

2. **2nd automatic standby:** If UT₂ is renewed for a time longer than T₃, Q₃ is switched off automatically, and QT₂ is switched on automatically after T₂. In case of loss of UT₁ for a time shorter than T₁, the automatic standby unit does not react to such failure.

3. **3rd automatic standby:** In case of loss of UT₁ for a time longer than T₁, QT₁ is switched off automatically. As the automatic standby unit works in mode of standby only for power supply 2, Q₃ does not close.

4. **4th automatic standby:** In case of loss of UT₃ and absence of UT₁, Q₃ is switched off automatically after T₄. After renewal of UT₁ for min. T₅, Q₃ and Q₄ are switched on automatically. The condition of automatic switching Q₃ and Q₄ on is expiration of time T₅.

5. **5th automatic standby:** In case of renewal of UT₂ and failure of UT₁ in T₅, Q₃ and Q₄ are switched off automatically after T₅. If T₅ expires before T₅, Q₄ is switched on automatically after T₅.
PARAMETERS

**AUTOMATIC STANDBY UNIT MODI**

| Dimensions | **W x H x D** | ZA-00-... 300 x 500 x 165 mm  
ZA-01-... see p. 22;  
ZA-11-... see p. 22 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td><strong>m</strong></td>
<td>10 kg</td>
</tr>
<tr>
<td>Standards</td>
<td></td>
<td>EN 947-6-1</td>
</tr>
<tr>
<td><strong>POWER SUPPLY</strong></td>
<td></td>
<td>(I_{e}^{<em>} = ) max. 10kA, (I_{e}^{</em>} &gt; 10kA ) – necessary protection by fuses 6 – 16 A with characteristic gG</td>
</tr>
<tr>
<td>External (outlets 26, 27)</td>
<td>from independent power supply</td>
<td></td>
</tr>
</tbody>
</table>
| Rated operating voltage | \(U_{e}^{*} \) 24V, 110, 230 V a.c.  
\(U_{e}^{**} \) 24V, 110, 220 V d.c. |
| Internal **2** | from active power supply |
| Rated frequency | \(f_{s} \) 50/60 Hz |
| Degree of protection | ZA-00-... IP54  
ZA-01-.../ZA-11-... IP54/IP20 |
| Range of ambient temperature | 0 – 50 °C |

**OPERATION SIGNALLING** (the signalling only functions if the automatic standby unit is supplied)

| Local: | LCD |
| Remote: (outlets 13-15) | Rated operating current \(I_{e}/U_{e}^{*} \) (AC-3) 10 A/230 V a.c.  
(outlets 22-25) | \(I_{e}/U_{e}^{**} \) 0.1 A/24 V d.c. (against terminal 27 / N-/)
| Connecting section | \(S \) 0.5 – 1 mm² (recommended section \(\geq 0.75 \) mm²) |

**UNDERVOLTAGE RELAY**

| Undervoltage setting | max. - 30 % \(U_{e}^{*} \) |
| Overvoltage setting | max. + 30 % \(U_{e}^{**} \) |
| **Time setting** | |
| Controlled time of loss of voltage \(6^6 \) | \(T_{1} \) 0 – 15, by 0.1 s |
| Min. time between circuit breaker switching | \(T_{2} \) 2 – 30, by 1 s |
| Controlled time of voltage renewal | \(T_{3} \) 0 – 15, by 0.1 s |
| Time from loss of voltage to circuit breaker action \(5 \) | \(T_{4} \) 0.5 s |

**EQUIPMENT OF CIRCUIT BREAKERS**

<table>
<thead>
<tr>
<th>Circuit breaker type</th>
<th><strong>BD250</strong></th>
<th><strong>BH630</strong></th>
<th><strong>BL...</strong></th>
<th><strong>ARION WL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undervoltage release</td>
<td>SP-BHD-X024</td>
<td>SP-BHD-X024</td>
<td>SP-BL-X024</td>
<td>see p. 11</td>
</tr>
<tr>
<td>Auxiliary switch</td>
<td>PS-BHD-1100-Au</td>
<td>PS-BHD-1100-Au</td>
<td>PS-BL-2200-Au</td>
<td>see p. 11</td>
</tr>
<tr>
<td>Signal switch</td>
<td>PS-BHD-1000-Au</td>
<td>PS-BHD-1000-Au</td>
<td>-</td>
<td>see p. 11</td>
</tr>
<tr>
<td>Relative switch</td>
<td>-</td>
<td>-</td>
<td>PS-BL-2200-Au</td>
<td>see p. 11</td>
</tr>
<tr>
<td>Motor drive</td>
<td>MP-BD-X230</td>
<td>MP-BH-X230</td>
<td>MP-BL-X230</td>
<td>see p. 11</td>
</tr>
<tr>
<td>Mechanical interlocking</td>
<td>see p. 11</td>
<td>see p. 11</td>
<td>see p. 11</td>
<td>see p. 11</td>
</tr>
</tbody>
</table>

**Note:**

1) depending on version, see page 3
2) from the power supply which is connected to the load; in failure of both power supplies the automatic standby unit is without voltage until voltage is renewed on one of the power supplies
3) the times can be extended on demand
4) in case of permanent supplying of the automatic standby unit
5) in case that the automatic standby unit is not supplied
6) if the undervoltage monitoring level is set to more than - 15% \(U_{e}^{*} \), a backup power supply of the automatic standby unit must be provided - the automatic standby unit must be in version: MODI ZA-xx-0xx, or ZA-xx-x2xx

*Note:* For detailed information on circuit breakers/switch-disconnectors BD250, BH630 and BL... see the catalogue Moulded Case Circuit Breakers J1-2006-A
For detailed information on circuit breakers/switch-disconnectors ARION WL see the catalogue Air Circuit Breakers VJ1-2007-A
**TYPE DESIGNATION OF CIRCUIT BREAKER ARION WL**

Circuit breaker equipment must include these accessories:

- Undervoltage release – 24 V d.c.
- Auxiliary contacts – 2z + 2r
- „Ready-to-close“ signal switch (S20)
- „Opened by release“ signal switch (S24)
- Mechanical interlocking

**Type designation:**

ARION WL . . . . – 4 AJ 2 – Z + C2 2 + K0 7 + xxx

**Type designation description:**

ARION WL . . . . – 4 AJ 2 – Z + C2 2 + K0 7 + xxx

- Mechanical interlocking ¹
- „Opened by release“ signal switch (S24)
- „Ready-to-close“ signal switch (S20)

Motor drive and closing coil – 230 V a.c.
Without the first auxiliary release
Undervoltage release – 24 V d.c.
One block of auxiliary switches – 2z + 2r

Breaking capacity, electronic overcurrent release, number of poles and design ²

Circuit breaker size, rated current ²

¹ xxx – Mechanical interlocking according to circuit breaker design:
   SSS – Fixed design
   RSS – Withdrawable design

² see the catalogue Air Circuit Breakers VJ1-2007-A

**DETERMINATION OF MECHANICAL INTERLOCKING OF CIRCUIT BREAKERS Modeion**

<table>
<thead>
<tr>
<th>Circuit breaker combination</th>
<th>Mechanical interlocking depending on circuit breaker design</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st circuit breaker</td>
<td>2nd circuit breaker</td>
</tr>
<tr>
<td>BD250</td>
<td>BD250</td>
</tr>
<tr>
<td>BH630</td>
<td>BH630</td>
</tr>
<tr>
<td>BD250</td>
<td>BH630</td>
</tr>
<tr>
<td>BH630</td>
<td>BD250</td>
</tr>
<tr>
<td>BL…</td>
<td>BL…</td>
</tr>
</tbody>
</table>
WIRING DIAGRAM

Wiring diagram for BD250 and BH630

ZA-00-4xxx (version in plastic switchboard)

- transformer - phase sequence must be observed in connection
- generator - phase sequence must be observed in connection
- fuses 6-16 A with characteristic gG

- automatic standby unit
  - XT0 - connecting terminal board
  - SA - function switch
  - H1-3 - ZA function signalling - 10 A/230 V a.c. (AC-3)
  - H4 - generator start signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
  - H5 - power supply 1 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
  - H6 - power supply 2 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
  - H7 - error signal - 0.1 A/24 V d.c. (against terminal 27 / N-)

- external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

- circuit breaker of power supply 1
  - BD250 (BH630)

- circuit breaker of power supply 2
  - BD250 (BH630)

- undervoltage release
- auxiliary switch
- signal switch
- motor drive

- load
WIRING DIAGRAM

Wiring diagram for BD250 and BH630

ZA-01-4xxx (built-in version)

T - transformer - phase sequence must be observed in connection
G - generator - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG

ZA - automatic standby unit

XT0, X53, XS5 - connecting terminal board
SA - function switch
H1-3 - ZA function signalling - 10 A/230 V a.c. (AC-3)
H4 - generator start signal - 0.1 A/24 V d.c. (against terminal 27 / N-/) 
H5 - power supply 1 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-/)
H6 - power supply 2 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-/)
H7 - error signal - 0.1 A/24 V d.c. (against terminal 27 / N-/)

26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1.BD250 (1.BH630) - circuit breaker of power supply 1
2.BD250 (2.BH630) - circuit breaker of power supply 2

SP-BHD-X024 - undervoltage release
3.PS-BHD-1100-Au - auxiliary switch
1.PS-BHD-1000-Au - signal switch
MP-BD-X... (MP-BH-X230) - motor drive

Z - load
WIRING DIAGRAM

Wiring diagram for BL… ZA-00-5xxx (version in plastic switchboard)

T - transformer  - phase sequence must be observed in connection
G - generator  - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG
ZA - automatic standby unit
XT0  - connecting terminal board
SA  - function switch
H1-3  - ZA function signalling  - 10 A/230 V a.c. (AC-3)
H4  - generator start signal  - 0.1 A/24 V d.c. (against terminal 27 / N-)
H5  - power supply 1 ON signal  - 0.1 A/24 V d.c. (against terminal 27 / N-)
H6  - power supply 2 ON signal  - 0.1 A/24 V d.c. (against terminal 27 / N-)
H7  - error signal  - 0.1 A/24 V d.c. (against terminal 27 / N-)
26(L+), 27(N-): external supplying from independent power supply  - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c.  - depending on version see page 3

1.BL... circuit breaker of power supply 1
2.BL... circuit breaker of power supply 2
SP-BL-X024  - undervoltage release
3.PS-BL-2200-Au  - relative switch
1.PS-BL-2200-Au  - auxiliary switch
MP-BL-X…  - motor drive

Z - load
WIRING DIAGRAM

Wiring diagram for BL...  ZA-01-5xxx (built-in version)

T - transformer - phase sequence must be observed in connection
G - generator - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG
ZA - automatic standby unit
XTO, X53, X55 - connecting terminal board
SA - function switch
H1-3 - ZA function signalling - 10 A/230 V a.c. (AC-3)
H4 - generator start signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H5 - power supply 1 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H6 - power supply 2 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H7 - error signal - 0.1 A/24 V d.c. (against terminal 27 / N-)

26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1.BL... - circuit breaker of power supply 1
2.BL... - circuit breaker of power supply 2
SP-BL-X024 - undervoltage release
3.PS-BL-2200-Au - relative switch
1.PS-BL-2200-Au - auxiliary switch
MP-BL-X... - motor drive

Z - load
**WIRING DIAGRAM**

**Wiring diagram for ARION WL**

**ZA-00-3xxx (version in plastic switchboard)**

- **T** - transformer - phase sequence must be observed in connection
- **G** - generator - phase sequence must be observed in connection
- **F** - fuses 6-16 A with characteristic gG
- **ZA** - automatic standby unit
- **X10** - connecting terminal board
- **SA** - function switch
- **H1-3** - ZA function signalling - 10 A/230 V a.c. (AC-3)
- **H4** - generator start signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
- **H5** - power supply 1 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
- **H6** - power supply 2 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
- **H7** - error signal - 0.1 A/24 V d.c. (against terminal 27 / N-)

26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1. **ARION WL** - circuit breaker of power supply 1
2. **ARION WL** - circuit breaker of power supply 2

**Z** - load

- **X5**, **X6**, **X7** - connector for connection of accessories (for description see the documentation of circuit breaker ARION WL)
WIRING DIAGRAM

Wiring diagram for ARION WL

T - transformer - phase sequence must be observed in connection
G - generator - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG
ZA - automatic standby unit
X10, X53, X55 - connecting terminal board
SA - function switch
H1-3 - ZA function signalling - 10 A/230 V a.c. (AC-3)
H4 - generator start signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H5 - power supply 1 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H6 - power supply 2 ON signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
H7 - error signal - 0.1 A/24 V d.c. (against terminal 27 / N-)
26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1. ARION WL - circuit breaker of power supply 1
2. ARION WL - circuit breaker of power supply 2
X5...., X6...., X7.... - connector for connection of accessories (for description see the documentation of circuit breaker ARION WL)

Z - load
WIRING DIAGRAM

Wiring diagram for BD250 and BH630 with longitudinal coupling
ZA-11-4xxx (built-in version)

T1, T2 - transformer  - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG

ZA - automatic standby unit
  X10, X33, X55, X66 - connecting terminal board
  SA1 - function switch
  H1-6 - ZA function signalling - 10 A/230 V a.c. (AC-3)
  H7 - power supply 1 ON signal - 0.1 A/24 V d.c.
  H8 - power supply 2 ON signal - 0.1 A/24 V d.c.
  H9 - error signal - 0.1 A/24 V d.c.
  H10 - optional signal - 0.1 A/24 V d.c.
  26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1.BD250 (1.BH630) - circuit breaker of power supply 1
2.BD250 (2.BH630) - circuit breaker of power supply 2
3.BD250 (3.BH630) - switch-disconnector – longitudinal coupling

SP-BHD-X024 - undervoltage release
3.PS-BHD-1100-Au - auxiliary switch
1.PS-BHD-1000-Au - signal switch
MP-BD-X230 (MP-BH-X230) - motor drive

Z1, Z2 - load
WIRING DIAGRAM

Wiring diagram for BL... with longitudinal coupling ZA-11-5xxx (built-in version)

T1, T2 - transformer - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG

ZA - automatic standby unit
X10, X33, X55, X56 - connecting terminal board
SA1 - function switch
H1-6 - ZA function signalling - 10 A/230 V a.c. (AC-3)
H7 - power supply 1 ON signal - 0.1 A/24 V d.c.
H9 - error signal - 0.1 A/24 V d.c.
H10 - optional signal - 0.1 A/24 V d.c.
26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1.BL... - circuit breaker of power supply 1
2.BL... - circuit breaker of power supply 2
3.BL... - switch-disconnector – longitudinal coupling

SP-BL-X024 - undervoltage release
3.PS-BL-2200-Au - relative switch
1.PS-BL-2200-Au - auxiliary switch
MP-BL-X... - motor drive

Z1, Z2 - load
WIRING DIAGRAM

Wiring diagram for ARION WL with longitudinal coupling

ZA-11-3xxx (built-in version)

T1, T2 - transformer - phase sequence must be observed in connection
F - fuses 6-16 A with characteristic gG

ZA - automatic standby unit
X10, X53, X55, X56 - connecting terminal board
SA1 - function switch
H1-6 - ZA function signalling - 10 A/230 V a.c. (AC-3)
H7 - power supply 1 ON signal - 0.1 A/24 V d.c.
H8 - power supply 2 ON signal - 0.1 A/24 V d.c.
H9 - error signal - 0.1 A/24 V d.c.
H10 - optional signal - 0.1 A/24 V d.c.
26(L+), 27(N-) - external supplying from independent power supply - 24 V a.c./d.c., 110 V a.c./d.c., 230 V a.c., 220 V d.c. - depending on version see page 3

1. ARION WL - circuit breaker of power supply 1
2. ARION WL - circuit breaker of power supply 2
3. ARION WL - switch-disconnector – longitudinal coupling

X5...., X6...., X7.... - connector for connection of accessories (for description see the documentation of circuit breakers ARION WL)

Z1, Z2 - load
Automatic standby unit MODI

**DIMENSIONS**

*Version ZA-00-xxxx* - version in plastic switchboard IP54

Optionally rear or upper outlets

Rear view

Side view
DIMENSIONS

Version ZA-01-xxxx/ZA-11-xxxx - built-in version

Opening for control system

Holes for function switch
Internal side of the door

Base plate

Door

Protective distance

Internal side of the door

External side of the door

Function switch

Frame

Control unit

Earthing link

Connector XS1

Base plate

Connector XS

Terminal board

XT0

Connector XS5

Connector XS6

Protective distance

386
Automatic standby unit

MODI