Automatic standby units
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**Application**
The automatic standby unit is used to provide power supply without any long-term blackouts 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 failures.

The automatic standby unit is designed for collaboration with circuit breakers / switch-disconnectors Modeion or Arion WL, which ensure power switching. For detailed information on circuit breaker / switch-disconnector fitting see page 9.

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

**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 (for detailed information see page 9). The function of the automatic standby unit depends in some cases on the power supply method (see time diagrams on page 6 + 8).

**Control and setting**
Basic functions of the automatic standby unit are selected by a rotary switch, and additional settings (modes and reaction times) are set by means of the touch display.

STOP button (SB1) - it is possible to connect so called inspection switch to the automatic standby unit to perform inspection. After changing over the switch it is possible to control both circuit breakers manually on their motor drives. The automatic unit is disabled, and after switching off the mechanical interlocking it is possible to switch on the both circuit breakers simultaneously and thus it is necessary to pay attention to parallel operation of power supplies. For designs with metal sheet cover (N1), the inspection switch is part of the automatic unit. For the other designs, the switch is not part of the automatic standby unit.

**Description**
The devices on the front panel:

a) a touch display informing the operator about immediate state of circuit breakers, power supplies and actually performed action.

b) 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 automatic standby unit as a power supply failure with taking an appropriate action.

b) there is a screw terminal block for connection of individual conductors, which connect the automatic unit with circuit breakers / switch-disconnectors.

**The 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.

**Inspection switch (SA2)** - it is possible to connect so called inspection switch to the automatic standby unit to perform inspection. After changing over the switch it is possible to control both circuit breakers manually on their motor drives. The automatic unit is disabled, and after switching off the mechanical interlocking it is possible to switch on the both circuit breakers simultaneously and thus it is necessary to pay attention to parallel operation of power supplies. For designs with metal sheet cover (N1), the inspection switch is part of the automatic unit. For the other designs, the switch is not part of the automatic standby unit.

**Advantages**

**Automatic standby time from 3 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.

**Use of automatic standby units in QA cabinets**

Basic block diagram of automatic standby units for control of two power supplies

![Basic block diagram of automatic standby units](image_url)
Modi

**COMPOSITION OF TYPE DESIGNATION**

<table>
<thead>
<tr>
<th>Design</th>
<th>0 for control of two power supplies</th>
<th>1 for control of two power supplies with longitudinal coupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical arrangement</td>
<td>1 built-in design on the switchboard door</td>
<td></td>
</tr>
<tr>
<td>Controlled combinations of circuit breakers</td>
<td>6 control of combination of Arion WL ¹)</td>
<td>7 control of combination of Modeion BC, BD, BH ¹)</td>
</tr>
<tr>
<td>Power supply of the automatic standby unit</td>
<td>1 own - from active power supply (optional backup power supply AC/DC 24 V)</td>
<td>2 power supply of the backup power supply AC 110 ÷ 230 V / DC 110 ÷ 220 V</td>
</tr>
<tr>
<td>Network monitoring circuit</td>
<td>0 monitoring of only loss of voltage in individual phases</td>
<td>1 undervoltage relays with setting, monitoring of phase sequence</td>
</tr>
<tr>
<td>Signalling</td>
<td>6 signal contacts of function switch + signalling of circuit breaker switched ON + signal for the generator + failure state</td>
<td></td>
</tr>
<tr>
<td>Code of auxiliary accessories</td>
<td>ZA - x x x x x - Y</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>plastic transparent cover</td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>signal for the generator (make-and-break contact)</td>
<td></td>
</tr>
<tr>
<td>N1</td>
<td>sheet-steel cover, including the inspection change-over switch</td>
<td></td>
</tr>
</tbody>
</table>

¹) Standardly the automatic standby unit is delivered for the control of these combinations of circuit breakers:

<table>
<thead>
<tr>
<th>Controlled combinations of circuit breakers</th>
<th>BC160</th>
<th>BD250</th>
<th>BH630</th>
<th>BL ...</th>
<th>ARION WL</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC160</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BD250</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BH630</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BL ...</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>ARION WL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

- on order the automatic standby unit is delivered in other combinations of the circuit breakers / switch-disconnectors

**Customised design:**

- **B1** - The automatic standby unit is fitted with a plastic transparent cover. For dimensions see page 20.
- **G1** - Signal for the generator start - make-and-break contact.
  - The automatic standby unit is fitted with a relay with a make-and-break contact. Terminals 32, 33, 34 are conducted to the terminal block. Terminals 32 and 34 - make contact, 32 and 33 - break contact.
  - In the case of use of the G1 design, the H4 signalling is not connected.
- **N1** - Sheet-steel cover with an inspection change-over switch. Possibility of sealing of the terminal block for connection of the control circuits. For dimensions see page 21.

After an agreement with the manufacturer it is possible to deliver other modifications of the automatic standby unit as well.
FUNCTIONS AND MODES

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

**FUNCTION OF THE AUTOMATIC STANDBY UNIT
FOR CONTROL OF TWO POWER SUPPLIES**

1) AUTOMATIC OPERATION – AUTOMATIC STANDBY
(switch position 3, signalling H3)

The automatic standby unit can work in three modes, which
are selected by means of the touch display of the automatic
standby unit. Possible setting:

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

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

**MODE**

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

The load can be supplied permanently from any power
supply. In case of loss of voltage of the power supply
the load is supplied, the load is disconnected from the
power supply and connected to 2nd power supply. After
voltage renewal of the original power supply, the load
was originally supplied from 2nd 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 turning the switch
gradually from position 3 to position 01). The switching
also takes place automatically after loss of voltage of 2nd
power supply.

b) PRIORITY OF 1ST POWER SUPPLY
(the mode is intended above all for power supply
of the load from a transformer as the main power
supply and generator as a backup power supply – 1st
power supply is a transformer, 2nd power supply is
a generator) – see time diagram 2

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 a generator start signal is 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 2ND POWER SUPPLY
analogy to mode b) PRIORITY OF 1ST POWER SUPPLY,
but the power supplies are in reverse order
1st power supply is a generator
2nd power supply is a transformer

2) MANUAL OPERATION
- OPERATION ONLY WITH 1ST POWER SUPPLY
(switch position 1, signalling H1)

The load is permanently supplied from 1st power supply.
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. The power sup-
ply can only be connected manually (by turning the switch
gradually from position 1 to position 01 – 1).

3) MANUAL OPERATION
- OPERATION ONLY WITH 2ND POWER SUPPLY
(switch position 2, signalling H2)

The load is permanently supplied from 2nd power supply.
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. The power supply
can only be connected manually (by turning the switch
gradually from position 2 to position 01 – 2).

4) 1st POWER SUPPLY and 2nd POWER SUPPLY IS OFF
(switch position 0)

In position 0 it is necessary to wait at least 2 s before further handling the switch.
FUNCTIONS AND MODES

FUNCTION OF THE AUTOMATIC STANDBY UNIT FOR CONTROL OF TWO POWER SUPPLIES WITH LONGITUDINAL COUPLING

1) AUTOMATIC OPERATION – AUTOMATIC STANDBY
   (switch position 6, signalling H6)
   The automatic standby unit can work in three modes, which are selected by means of the touch display of the automatic standby unit. Possible setting:
   a) standby for both power supplies
   b) standby for 1st power supply
   c) standby for 2nd power supply
   Furthermore, it is possible to set min. time of switching between power supplies (T₁), time for detection of voltage (T₂) and power supply failure (T₃).

   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 disconnected from the power supply and connected (via coupling closing) to 2nd power supply. After voltage renewal of the original power supply, the coupling opens, and the load is connected to the original power supply.

   2) MANUAL OPERATION - both 1st power supply and 2nd power supply are OFF
      (switch position 0)

   3) MANUAL OPERATION - OPERATION ONLY WITH 1ST POWER SUPPLY
      (switch position 1, signalling H1)
      Only 1st load is supplied permanently from 1st power supply. 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. The power supply can only be connected manually (by turning the switch gradually from position 1 to position 0¹ – 1).

   4) MANUAL OPERATION – OPERATION ONLY WITH 2ND POWER SUPPLY
      (switch position 2, signalling H2)
      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. The power supply can only be connected manually (by turning the switch gradually from position 2 to position 0² – 2).

   5) MANUAL OPERATION - OPERATION ONLY WITH 1ST POWER SUPPLY WITH CLOSED COUPLING
      (switch position 3, signalling H3)
      Both loads are permanently supplied from 1st power supply. In case of loss of voltage, the power supply is disconnected from the loads automatically. The power supply will remain disconnected even after voltage renewal. The power supply can only be connected manually (by turning the switch gradually from position 3 to position 0¹ – 3).

   6) MANUAL OPERATION – OPERATION ONLY WITH 2ND POWER SUPPLY WITH CLOSED COUPLING
      (switch position 4, signalling H4)
      Both loads are permanently supplied from 2nd power supply. In case of loss of voltage, the power supply is disconnected from the loads automatically. The power supply will remain disconnected even after voltage renewal. The power supply can only be connected manually (by turning the switch gradually from position 4 to position 0² – 4).

   7) MANUAL OPERATION – OPERATION WITH BOTH POWER SUPPLIES
      (switch position 5, signalling H5)
      Example: reaction times (for detailed information see. 2nd load is permanently supplied from 2nd power supply. 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. The power supply can only be connected manually (by turning the switch gradually from position 5 to position 0³ – 5).

Table of logic states of circuit breakers

| Circuit breaker of 2nd power supply Q₂ | 0 | 1 | 0 | 1 | 0 |
| Longitudinal coupling switch Q₃    | 0 | 0 | 1 | 0 | 0 |
| Circuit breaker of 1st power supply Q₁ | 0 | 0 | 1 | 1 | 1 |

5) In position 0 it is necessary to wait at least 2 s before further handling the switch.

Use of automatic standby units in NP cabinet
**TIME DIAGRAMS**

Time diagram 1 - automatic standby unit for control of two power supplies  
**Function:** automatic standby  
**Mode:** equivalent: (1st power supply is a transformer, 2nd power supply is a transformer)

- **Uₜ₁**: voltage of 1st transformer  
- **Qₜ₁**: circuit breaker of 1st transformer  
- **Uₜ₂**: voltage of 2nd transformer  
- **Qₜ₂**: circuit breaker of 2nd transformer  
- **Uₜₐ**: power supply of the automatic standby unit  
- **Tₚ**: controlled time of loss of voltage  
- **Tₗ**: min. time between circuit breaker switching  
- **Tₚ**: time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied, Tₚ = 0.5 s

**FUNCTION DESCRIPTION**

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

**1st automatic standby:** In case of loss of Uₜ₁ for min. Tₚ, Qₜ₁ is switched off automatically and if Uₜ₂ exists for at least Tₚ, Qₜ₂ is switched on automatically after Tₚ. 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 Tₚ. In case of loss of Uₜ₂ for a time shorter than Tₚ the automatic standby unit does not react to such loss of voltage.

**2nd automatic standby:** In case of loss of Uₜ₂ for a time longer than Tₚ, Qₜ₂ is switched off automatically and if Uₜ₁ already exists for at least Tₚ, Qₜ₁ is switched on automatically after Tₚ.

**3rd automatic standby:** In case of loss of Uₜ₁ and absence of Uₜ₂, Qₜ₁ is switched off automatically after Tₛ. After renewal of Uₜ₂ for min. Tₚ, Qₜ₂ is switched on automatically. The condition of automatic switching Qₜ₂ on is expiration of time Tₚ.

**4th automatic standby:** In case of loss of Uₜ₂ for min. Tₚ, Qₜ₂ is switched off automatically and if Uₜ₁ exists for at least Tₚ, Qₜ₁ is switched on automatically after Tₚ.

**Note:** Times Tₚ, Tₗ, Tₚ are adjustable.

Time diagram 2 - automatic standby unit for control of two power supplies  
**Function:** automatic standby  
**Mode:** priority of 1st power supply (1st power supply is a transformer, 2nd power supply is a generator)

- **Uₜ**: voltage of the transformer  
- **Qₜ**: circuit breaker of the transformer  
- **Uₜ**: voltage of the generator  
- **Qₜ**: circuit breaker of the generator  
- **Uₜₐ**: power supply of the automatic standby unit  
- **Tₚ**: controlled time of loss of voltage  
- **Tₗ**: min. time between circuit breaker switching  
- **Tₚ**: time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied, Tₚ = 0.5 s

**FUNCTION DESCRIPTION**

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

**1st automatic standby:** In case of loss of Uₜ, Qₜ is switched off automatically, and the generator start signal is active. If Uₜ exists for at least Tₚ, Qₜ is switched on automatically. The condition for switching Qₜ on is expiration of time Tₚ. In case of loss of Uₜ and absence of Uₜ, Qₜ is switched off automatically after Tₛ. After renewal of Uₜ for min. Tₚ, Qₜ is switched on automatically. The condition for switching Qₜ on is expiration of time Tₚ.

**2nd automatic standby:** If Uₜ is renewed for min. Tₚ, Qₜ is switched off automatically, and the generator start signal becomes inactive. Qₜ is switched on automatically after Tₚ.

**3rd automatic standby:** In case of loss of Uₜ for min. Tₚ, Qₜ is switched off automatically, and the generator start signal is active. If Uₜ is renewed for min. Tₚ, Qₜ is switched on automatically. The condition for automatic switching Qₜ on is expiration of time Tₚ.

**Note:** Times Tₚ, Tₗ, Tₚ are adjustable.
**TIME DIAGRAMS**

### Time diagram 3 - automatic standby unit for control of two power supplies with longitudinal coupling

**Function:** automatic standby  
**Mode:** equivalent (1st power supply is a transformer, 2nd power supply is a transformer)  
**Power supply of the automatic standby unit:** from active power supply

#### Function Description

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

**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, QT2 is switched off automatically. As the automatic standby unit works only for power supply 1, Q3 does not close.

**3rd automatic standby:** In case of loss of UT1 and absence of UT2, QT1 and Q3 are 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 on is expiration of time T2.

**4th automatic standby:** In case of renewal of UT1 and loss of voltage 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.

**5th automatic standby:** In case of renewal of UT1 and loss of voltage of UT2, 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 diagram 4 - automatic standby unit for control of two power supplies with longitudinal coupling

**Function:** automatic standby  
**Mode:** standby for power supply No. 1 (1st power supply is a transformer, 2nd power supply is a transformer)  
**Power supply of the automatic standby unit:** from active power supply

#### Function Description

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

**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 renewal of UT1 and loss of voltage 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.

**3rd automatic standby:** In case of loss of UT1 and absence of UT2, QT1 and Q3 are 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 on is expiration of time T2.

**4th automatic standby:** In case of renewal of UT1 and loss of voltage of UT2, 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.

**5th automatic standby:** In case of renewal of UT1 and loss of voltage of UT2, 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.
FUNCTION DESCRIPTION

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

1st automatic standby: In case of loss of UT2 for min. T2, Q2 is switched off automatically and if UT1 exists for at least T3, Q3 is switched on automatically after T2.

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 loss of voltage.

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.

4th automatic standby: In case of loss of UT2 and absence of UT1, QT2 is switched off automatically after TA. After renewal of UT1 for min. T3, Q1 and Q3 are switched on automatically. The condition of automatic switching Q1 and Q3 on is expiration of time T2.

5th automatic standby: In case of renewal of UT2 and loss of voltage of UT1 in T3, Q1 and Q3 are switched off automatically after T1. If T3 expires before T1, Q1 and Q3 are switched off after T1. QT2 is switched on automatically after T2.
**AUTOMATION STANDBY UNIT MODI**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ZA-01-xxxx or ZA-11-xxxx 11 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong> W x H x D</td>
<td>see page 19</td>
</tr>
<tr>
<td><strong>Weight</strong> m</td>
<td></td>
</tr>
<tr>
<td><strong>Standards</strong></td>
<td>EN 60947-6-1; EN 60204-1; EN 60068-2-1; EN 60068-2-2; EN 60068-3-3</td>
</tr>
</tbody>
</table>

**POWER SUPPLY**

<table>
<thead>
<tr>
<th>Voltage of power supplies (both main and standby)</th>
<th>AC 230V/400V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External</strong> (outlets 26, 27)</td>
<td>from independent power supply</td>
</tr>
<tr>
<td><strong>Rated operating voltage</strong> AC Ue</td>
<td>24V ≤ 2ZAX-xx-x1xx, or 110 – 230 V for ZA-xx-x2xx</td>
</tr>
<tr>
<td><strong>DC Ue</strong></td>
<td>24V ≤ 2ZAX-xx-x1xx, or 110 – 220 V for ZA-xx-x2xx</td>
</tr>
<tr>
<td><strong>Input power</strong> AC/DC</td>
<td>100VA / 100W</td>
</tr>
<tr>
<td><strong>Overvoltage category</strong> f</td>
<td>1 (5)</td>
</tr>
</tbody>
</table>

**Internal** (from active power supply)

| **Rated frequency** f                          | 50/60 Hz |
| **Degree of protection**                       | external/internal ZA-xx-xxxx according to switchboard design / IP20 |
| **Electromagnetic compatibility**              | EN 60947-1; EN 55011 |
| **Radio emission**                              | class A |
| **Disturbing voltages**                         | class B |
| **Connecting cross-section**                   | 0.5 – 1 mm² (recommended section min. 0.75 mm²) |
| **Range of ambient temperature**               | 0 – 50 °C |

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

| **Local:** LCD                                  |                                    |
| **Remote:** (outlets 12-18)                     | AC Ie /Ue 10 A/230 V (AC-3) (potential-less contacts) |
| **(outlets 22-25)**                             | DC Ie /Ue 0.1 A/24 V (against terminal -) |
| **Connecting cross-section**                   | 0.5 – 1 mm² (recommended section min. 0.75 mm²) |

**UNDervoltage RELAY** - only ZA-XX-XX1X

| **Undervoltage setting**                       | 70 – 120 % Ue |
| **Overvoltage setting**                        | 80 – 130 % Ue |

**TIME SETTING**

| **Min. time between circuit breaker switching (standby time)** | 3 s (according to circuit breaker design) |
| **Controlled time of loss of voltage** | T1 0 – 999 s, by 1 s |
| **Delay between the switching of circuit breakers** | T2 0 – 999 s, by 1 s |
| **Controlled time of voltage renewal** | T3 0 – 999 s, by 1 s |
| **Time from loss of voltage to circuit breaker action** | T4 0.5 s |

**Note:** 

- Ie” is short-circuit current in the circuit of power supplies.
- 1) 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.
- 2) In case of permanent supplying of the automatic standby unit.
- 3) In case that the automatic standby unit is not supplied.
- 4) With regard to classification of the device in the overvoltage category I (sensitive electronic devices) according to EN 60664-1 it is recommended to protect the automatic standby unit MODI against overvoltage in accordance with EN 62305. For selection of an appropriate overvoltage protection it is possible to refer to the Overvoltage protections application manual, which can be freely downloaded at www.oez.com.

**EQUIPMENT OF CIRCUIT BREAKERS**

<table>
<thead>
<tr>
<th>Circuit breaker type</th>
<th>BC160</th>
<th>BD250</th>
<th>BH630</th>
<th>BL…</th>
<th>ARION WL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undervoltage release</td>
<td>SP-BX-024</td>
<td>SP-BHD-024</td>
<td>SP-BHD-024</td>
<td>SP-BL-024</td>
<td>see page 10</td>
</tr>
<tr>
<td>Auxiliary switch</td>
<td>2x PS-BC-0010-Au</td>
<td>PS-BHD-1100-Au</td>
<td>PS-BHD-1100-Au</td>
<td>PS-BL-2200-Au</td>
<td>see page 10</td>
</tr>
<tr>
<td>Signal switch 5)</td>
<td>NS-BC-0010-Au</td>
<td>PS-BHD-1000-Au</td>
<td>PS-BHD-1000-Au</td>
<td>-</td>
<td>see page 10</td>
</tr>
<tr>
<td>Relative switch</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>see page 10</td>
</tr>
<tr>
<td>Mechanical interlocking</td>
<td>see page 10</td>
<td>see page 10</td>
<td>see page 10</td>
<td>see page 10</td>
<td>see page 10</td>
</tr>
</tbody>
</table>

**Note:** 

- For the exact equipment of circuit breakers, including the number of switches, see the wiring diagrams.
- For detailed information on circuit breakers / switch-disconnectors BC160, BD250, BH630 and BL… see the catalogue Moulded case circuit breakers
- For detailed information on circuit breakers / switch-disconnectors Arion WL see the catalogue Air circuit breakers
- 5) For switch-disconnectors it is not necessary to install a signal switch.
TYPE DESIGNATION OF CIRCUIT BREAKER ARION WL

Circuit breaker equipment must include these accessories:
- Motor drive – AC 230 V
- Undervoltage release – DC 24 V
- Auxiliary contacts – 2NO + 2NC
- Signal switch „ready-to-close”
- Signal switch „switched off by release”

Type designation:
Arion WL . . . . – 4 AJ 2 – Z C 2 2 + K 0 7 + x x x

Type designation description:
Arion WL . . . . – 4 AJ 2 – Z C 2 2 + K 0 7 + x x x

Mechanical interlocking 1)

Motor drive and closing release - AC 230 V
Without 1st auxiliary release
Undervoltage release - DC 24 V
One block of auxiliary switches - 2NO+2NC or 4NO + 4NC (code: „...-4AJ4-Z...”)

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

Circuit breaker size, rated current 2)

1) x x x  – Mechanical interlocking according to circuit breaker design (only if required):
S55 – Fixed design of circuit breaker
R55 – Withdrawable design of circuit breaker

2) See the catalogue Air circuit breakers VJ1-2012-A.

DETERMINATION OF MECHANICAL INTERLOCKING OF CIRCUIT BREAKERS MODEION

<table>
<thead>
<tr>
<th>Circuit breaker combination</th>
<th>Mechanical interlocking according to circuit breakers designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st circuit breaker</td>
<td>2nd circuit breaker</td>
</tr>
<tr>
<td>BC160</td>
<td>BC160</td>
</tr>
<tr>
<td>BD250</td>
<td>BD250</td>
</tr>
<tr>
<td>BD250</td>
<td>BH630</td>
</tr>
<tr>
<td>BH630</td>
<td>BH630</td>
</tr>
<tr>
<td>BH630</td>
<td>BD250</td>
</tr>
<tr>
<td>BL...</td>
<td>BL...</td>
</tr>
</tbody>
</table>
**T** - transformer - phase sequence must be observed

**G** - generator - phase sequence must be observed

**F** - fuses \(6 \div 16\) A with characteristic \(g6\)

**ZA** - automatic standby unit

**ZA-0x-7xx**

1. **BC160** - circuit breaker of power supply 1
   - SP-BC-X024 - undervoltage release
   - 2. PS-BC-0010-Au - auxiliary switch
   - 3. PS-BC-0010-Au - auxiliary switch
   - 1. NS-BC-0010-Au - signal switch
   - MP-BC-X230-B - motor drive

2. **BC160** - circuit breaker of power supply 2
   - SP-BC-X024 - undervoltage release
   - 2. PS-BC-0010-Au - auxiliary switch
   - 3. PS-BC-0010-Au - auxiliary switch
   - 1. NS-BC-0010-Au - signal switch
   - MP-BC-X230-B - motor drive

**Z** - load

Note: During the use of the switch-disconnector, it is not necessary to use the signal switch. In case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses \(F\), transformer, generators, \(SA2\) and \(SB1\) switches, \(H1\) to \(H7\) indicator lights.
Connecting for BD250 and BH630

1. BH630...
2. BD250...
3. PS-BHD-1100-Au
1. PS-BHD-1000-Au
MP-BD-X230 (MP-BH-X230) - motor drive
MP-BD-X230 (MP-BH-X230) - motor drive

Note: During the use of the switch-disconnector it is not necessary to use the signal switch. In the case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for BL1600/BL1000

ZA-0x-8xxx

**T** - transformer - phase sequence must be observed  
**G** - generator - phase sequence must be observed  
**F** - fuses 6 ÷ 16 A with characteristic g6  
**ZA** - automatic standby unit

- **XT0** - connecting terminal block  
- **SA** - function switch  
- **H1-3** - function signalling of automatic standby unit - AC 230 V 10 A (AC-3)  
- **H4** - generator start signal - DC 24 V 0.1 A (against terminal / - / minus)  
- **H5** - power supply 1 switched ON signal - DC 24 V 0.1 A (against terminal / - / minus)  
- **H6** - power supply 2 switched ON signal - DC 24 V 0.1 A (against terminal / - / minus)  
- **H7** - error signal - DC 24 V 0.1 A (against terminal / - / minus)  
- **Z6L(+), 27(N-)** - external supplying from independent power supply - AC/DC 24 V for ZA-xx-x1xx, or AC 110 ÷ 230 V / DC 110 ÷ 220 V for ZA-xx-x2xx  
- **SB1** - possibility of connection of the STOP button (in the standard version with a jumper)  
- **SA2** - possibility of connection of the change-over switch  

1. **BL...** - circuit breaker of power supply 1
   - SP-BL-X024 - undervoltage release  
   - 3. PS-BL-2200-Au - relative switch  
   - 1. PS-BL-2200-Au - auxiliary switch  
   - MP-BL-X230 - motor drive  

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-X230 - motor drive  

**Z** - load

Note: The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for Arion WL

**1. Arion - circuit breaker of power supply 1**
- Connector for connection of accessories (see the documentation of circuit breaker Arion WL)

**2. Arion - circuit breaker of power supply 2**
- Connector for connection of accessories (see the documentation of circuit breaker Arion WL)

**Z** - Load

Note: If the switch-disconnector is used, it is not necessary to use the signal switch “switched off by release”. In the case that the switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for BC160 with longitudinal coupling

1. BC160 - circuit breaker of power supply 1
   SP-BC-X024 - undervoltage release
   3. PS-BC-0010-Au - auxiliary switch
   1. NS-BC-0010-Au - signal switch
   MP-BC-X230-B - motor drive

2. BC160 - circuit breaker of power supply 2
   SP-BC-X024 - undervoltage release
   3. PS-BC-0010-Au - auxiliary switch
   1. NS-BC-0010-Au - signal switch
   MP-BC-X230-B - motor drive

3. BC160 - circuit breaker of the coupling
   SP-BC-X024 - undervoltage release
   3. PS-BC-0010-Au - auxiliary switch
   1. NS-BC-0010-Au - signal switch
   MP-BC-X230-B - motor drive

Z - load

**Note:** During the use of the switch-disconnector it is not necessary to use the signal switch. In the case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102; longitudinal coupling - terminals 201 and 202).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for BD250 and BH630 with longitudinal coupling

**Diagram**

**ZA-x-7xxx**

1. **T1, T2** - transformer
2. **F** - fuses 6 - 16 A with characteristic g6
3. **ZA** - automatic standby unit
   - X0 - connecting terminal block
   - S - function switch
   - H1-6 - function signalling of automatic standby unit
   - H7 - circuit breaker 1 switched ON signal
   - H8 - circuit breaker 2 switched ON signal
   - H9 - circuit breaker 3 switched ON signal (coupling)
   - H10 - error signal
   - ZA-xx-x1xx, or AC 110 ÷ 220 V for ZA-xx-x2xx
   - SB1 - possibility of connection of the STOP button (in the standard version with a jumper)
   - SA2 - possibility of connection of the change-over switch

1. **BD250…(1. BH630…) - circuit breaker of power supply 1**
   - SP-BHD-X024 - undervoltage release
   - 1. PS-BHD-1000-Au - signal switch
   - MP-BD-X230 (MP-BH-X230) - motor drive

2. **BD250…(2. BH630…) - circuit breaker of power supply 2**
   - SP-BHD-X024 - undervoltage release
   - 1. PS-BHD-1000-Au - signal switch
   - MP-BD-X230 (MP-BH-X230) - motor drive

3. **BD250…(3. BH630…) - circuit breaker of the coupling**
   - SP-BHD-X024 - undervoltage release
   - 1. PS-BHD-1000-Au - signal switch
   - MP-BD-X230 (MP-BH-X230) - motor drive

4. **Z - load**

**Note:**
During the use of the switch-disconnector it is not necessary to use the signal switch. In the case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102; longitudinal coupling - terminals 201 and 202).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for BL1600/BL1000 with longitudinal coupling

ZA-1x-8xxx

T1, T2  - transformer  - phase sequence must be observed
F  - fuses 6 - 16 A with characteristic gG
ZA  - automatic standby unit
XT0  - connecting terminal block
SA  - function switch
H1-6  - function signalling of automatic standby unit  - AC 230 V 10 A (AC-3)
H7  - circuit breaker 1 switched ON signal  - DC 24 V 0.1 A (against terminal / - / minus)
H8  - circuit breaker 2 switched ON signal  - DC 24 V 0.1 A (against terminal / - / minus)
H9  - circuit breaker 3 switched ON signal (coupling)  - DC 24 V 0.1 A (against terminal / - / minus)
H10  - error signal  - DC 24 V 0.1 A (against terminal / - / minus)
Z6(L+), Z7(N-)  - external supplying from independent power supply  - AC/DC 24 V for ZA-xx-x1xx, or  AC 110 ÷ 230 V / DC 110 ÷ 220 V for ZA-xx-x2xx
SB1  - possibility of connection of the STOP button (in the standard version with a jumper)
SA2  - possibility of connection of the change-over switch

1. BL...  - circuit breaker of power supply 1
SP-BL-X024  - undervoltage release
3. PS-BL-2200-Au  - relative switch
1. PS-BL-2200-Au  - auxiliary switch
MP-BL-X230  - motor drive

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-X230  - motor drive

3. BL...  - circuit breaker of the coupling
SP-BL-X024  - undervoltage release
3. PS-BL-2200-Au  - relative switch
1. PS-BL-2200-Au  - auxiliary switch
MP-BL-X230  - motor drive

Z  - load

Note: The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
Connecting for Arion WL with longitudinal coupling

1. Arion - circuit breaker of power supply 1
   X5, 6, 7  - connector for connection of accessories (see the documentation of circuit breaker Arion WL)

2. Arion - circuit breaker of power supply 2
   X5, 6, 7  - connector for connection of accessories (see the documentation of circuit breaker Arion WL)

3. Arion - circuit breaker of the coupling
   X5, 6, 7  - connector for connection of accessories (see the documentation of circuit breaker Arion WL)

Z  - load

Note: If the switch-disconnector is used, it is not necessary to use the signal switch “switched off by release”. In the case that the switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102; longitudinal coupling - terminals 201 and 202).

The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.
**DIMENSIONS**

Built-in design ZA-x1-xxxx

- Automatic standby units

---

**Protective space**

**Base plate**

- Opening for display
- Opening for functions switch

---

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Value</th>
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<tr>
<td>11.5</td>
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</table>

**DIMENSIONS**

Built-in design with plastic cover ZA-x1-xxxx-B1

![Drilling diagram for mounting of the plastic cover](image)

Automatic standby units
DIMENSIONS

Built-in design with sheet-steel cover ZA-x1-xxxx-N1