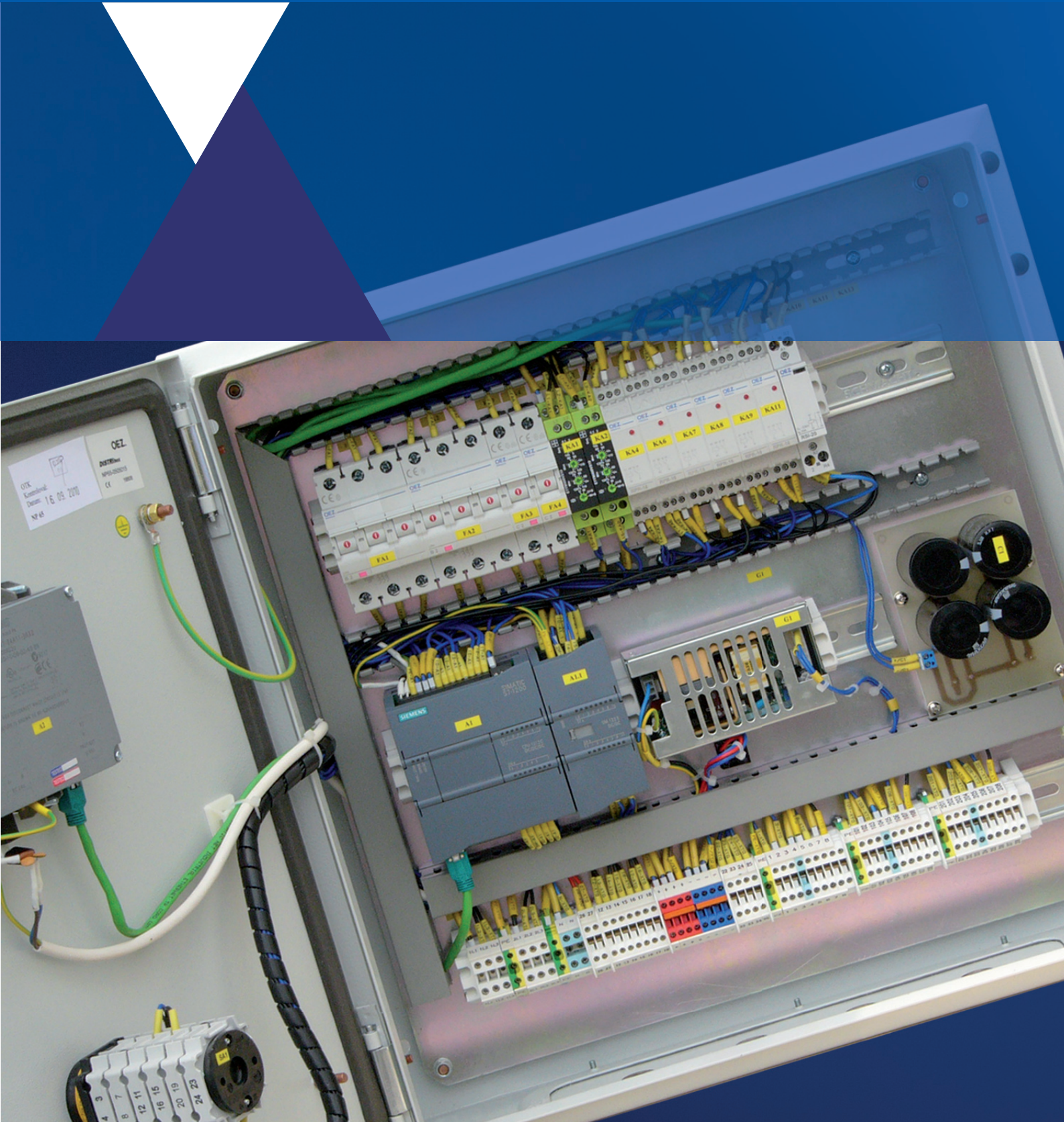


Automatic standby units



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DESCRIPTION



Use of automatic standby units in QA cabinets

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.

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

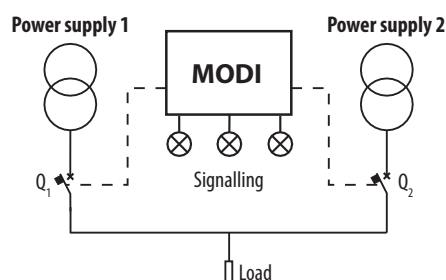
The automatic standby unit must be supplied either from controlled power supplies (or from a momentarily active one) or from an independent external power supply such as UPS or AKU (for detailed information see page 9). The function of the automatic standby unit depends in some cases on the power supply 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 STOP button with arrest to the standby unit. If the button is pressed, circuit breakers switch off immediately, and it is not possible to switch them on while the button is pressed. After the „STOP“ button is released, it is necessary first to reset the automatic standby unit before further handling. The button is not part of the automatic standby unit. There is normally a jumper on the terminals for the stop button (terminals 30 and 31).

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



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.

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 furthermore, for setting the parameters for automatic control of the standby mode: example: reaction times (for detailed information see „Specifications“ on page 9), automatic standby mode (see “Functions and modes” on page 4 and 5) or security password, which can protect the automatic unit against unauthorized resetting.
- 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).

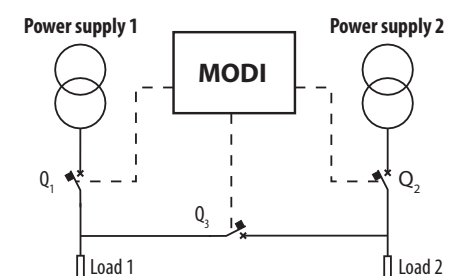
In the automatic standby unit

- 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.

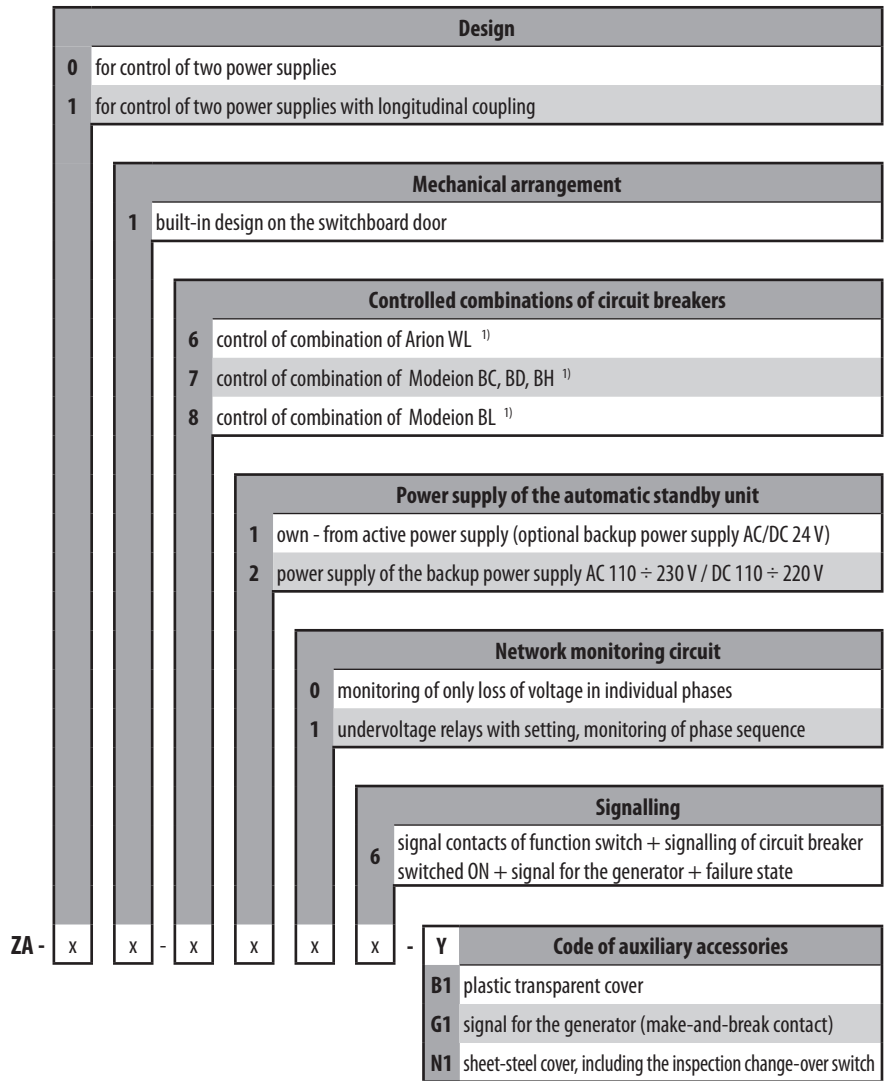
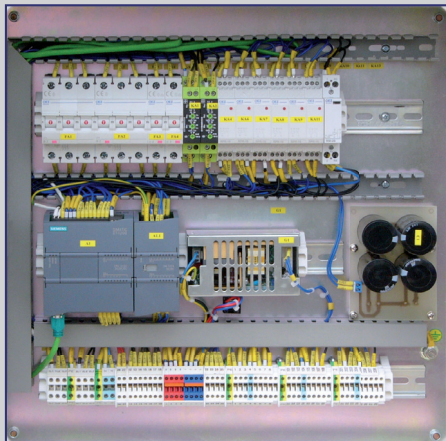
The arrangement of circuit breakers / switch-disconnectors and their connection to the automatic standby unit

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.

for control of two power supplies with longitudinal coupling



COMPOSITION OF TYPE DESIGNATION



Optionally it is possible to deliver an automatic standby unit communicating in English.

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

Controlled combinations of circuit breakers					
	BC160	BD250	BH630	BL...	ARION WL
BC160	+	+	+	-	-
BD250	+	+	+	-	-
BH630	+	+	+	-	-
BL...	-	-	-	+	-
ARION WL	-	-	-	-	+

- 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:

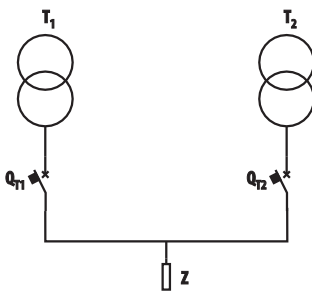
- a) equivalent power supplies
- b) priority of 1st power supply
- c) priority of 2nd power supply

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⁾ – 3). The switching also takes place automatically after loss of voltage of 2nd power supply.

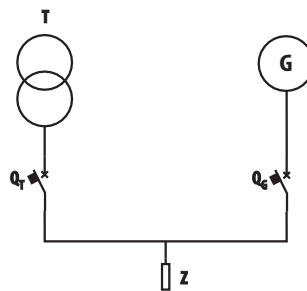


2) MANUAL OPERATION - OPERATION ONLY WITH 1ST POWER SUPPLY (switch position 1, signalling H1)

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 supply can only be connected manually (by turning the switch gradually from position 1 to position 0¹⁾ – 1).

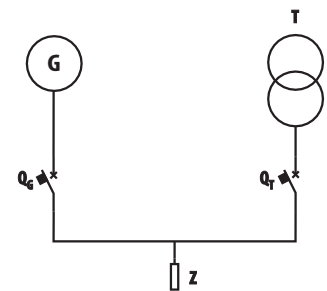
b) PRIORITY OF 1ST POWER SUPPLY (the mode is intended above all for power supply of the load from a transformer as the main power supply and generator as a backup power supply – 1st power supply is a transformer, 2nd power supply is a generator) – see time diagram 2

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.



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)

¹⁾ In position 0 it is necessary to wait at least 2 s before further handling the switch.

FUNCTIONS AND MODES

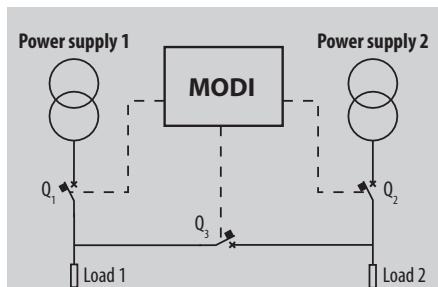
FUNCTION OF THE AUTOMATIC STANDBY UNIT FOR CONTROL OF TWO POWER SUPPLIES WITH LONGITUDINAL COUPLING

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 (T_2), time for detection of voltage (T_3) and power supply failure (T_1).



Circuit breaker of 2nd power supply Q_2	0	1	1	0	1	0
Longitudinal coupling switch Q_3	0	0	1	0	0	1
Circuit breaker of 1st power supply Q_1	0	0	0	1	1	1

MODE:

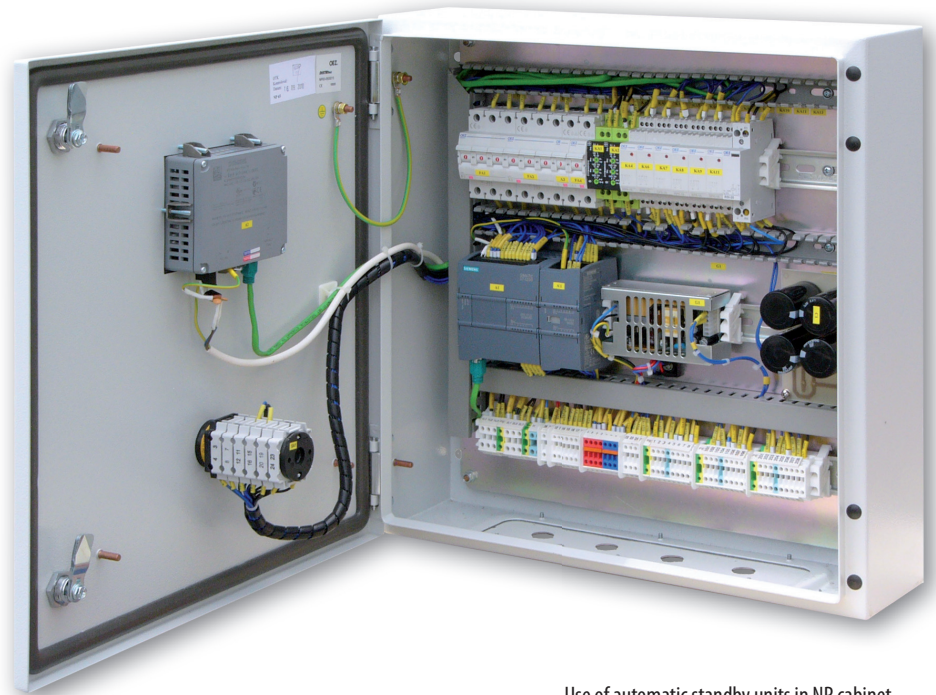
a) EQUIVALENT

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)

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).



Use of automatic standby units in NP cabinet

b) STANDBY FOR 1ST POWER SUPPLY

1st load can be supplied from 1st power supply or 2nd power supply. 2nd load can only be supplied from 2nd power supply. In case of loss of voltage of 1st power supply, 1st load is disconnected from 1st power supply, and connected to 2nd power supply (via coupling closing). After voltage renewal of 1st power supply the coupling opens and 1st load is connected to 1st power supply. In case of loss of voltage of 2nd power supply, 2nd load is disconnected from 2nd power supply. 2nd load remains without voltage for the time of 2nd power supply failure. No standby is carried out (the coupling does not close).

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).

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 0¹⁾ – 4).

c) STANDBY FOR 2ND POWER SUPPLY

2nd load can be supplied from 1st power supply or 2nd power supply. 1st load can only be supplied from 1st power supply. In case of loss of voltage of 2nd power supply, 2nd load is disconnected from 2nd power supply, and connected to 1st power supply (via coupling closing). After voltage renewal of 2nd power supply the coupling opens and 2nd load is connected to 2nd power supply. In case of loss of voltage of 1st power supply 1st load is disconnected from 1st power supply. 1st load remains without voltage for the time of 1st power supply failure. No standby is carried out (the coupling does not close).

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 0¹⁾ – 2).

7) MANUAL OPERATION – OPERATION WITH BOTH POWER SUPPLIES (switch position 5, signalling H5)

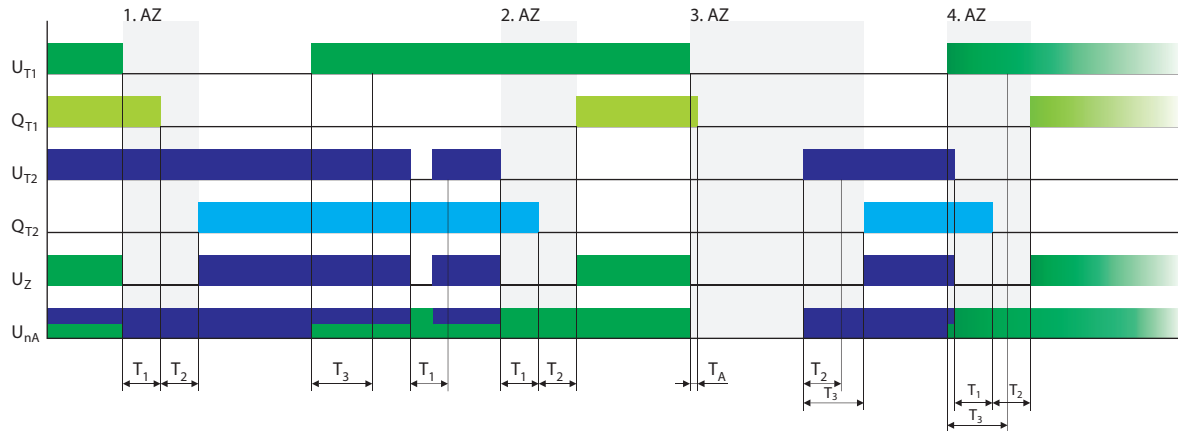
Example: reaction times (for detailed information see. 2nd load is permanently supplied from 2nd power supply. In case of loss of voltage, the power supply is disconnected from the load automatically. The power supply will remain disconnected even after voltage renewal. The power supply can only be connected manually (by turning the switch gradually from position 5 to position 0¹⁾ – 5).

¹⁾ In position 0 it is necessary to wait at least 2 s before further handling the switch.

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)



U_{T1} voltage of 1st transformer
 Q_{T1} circuit breaker of 1st transformer
 U_{T2} voltage of 2nd transformer
 Q_{T2} circuit breaker of 2nd transformer
 U_Z voltage on the load
 U_{nA} power supply of the automatic standby unit
 T_1 controlled time of loss of voltage
 T_2 min. time between circuit breaker switching
 T_3 controlled time of voltage renewal
 T_A time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied, $T_A = 0.5$ s

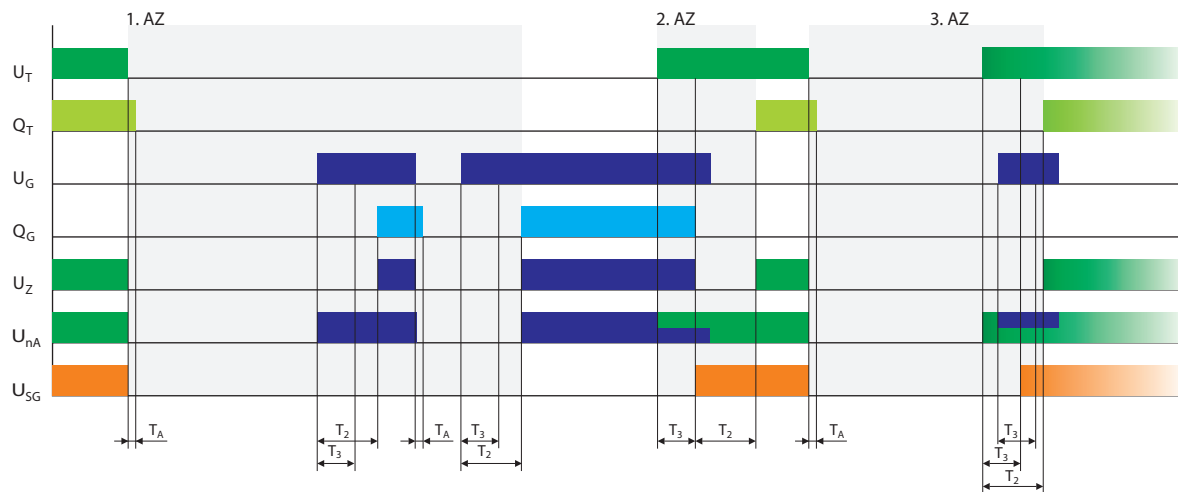
FUNCTION DESCRIPTION

- 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 U_{T1} for min. T_1 , Q_{T1} is switched off automatically and if U_{T2} exists for at least T_2 , Q_{T2} is switched on automatically after T_2 . As the automatic standby unit works in the mode of equivalent power supplies, Q_{T2} remains on even after renewal of U_{T1} for a time longer than T_3 . In case of loss of U_{T2} for a time longer than T_1 , the automatic standby unit does not react to such loss of voltage.
- 2nd automatic standby:** In case of loss of U_{T2} for a time longer than T_1 , Q_{T2} is switched off automatically and if U_{T1} already exists for at least T_3 , Q_{T1} is switched on automatically after T_2 .
- 3rd automatic standby:** In case of loss of U_{T1} and absence of U_{T2} , Q_{T1} is switched off automatically after T_A . After renewal of U_{T2} for min. T_3 , Q_{T2} is switched on automatically. The condition of automatic switching Q_{T2} on is expiration of time T_2 .
- 4th automatic standby:** In case of loss of U_{T2} for min. T_1 , Q_{T2} is switched off automatically and if U_{T1} exists for at least T_3 , Q_{T1} is switched on automatically after T_2 .

Note: times T_1, T_2, T_3 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)



U_T voltage of the transformer
 Q_T circuit breaker of the transformer
 U_G voltage of the generator
 Q_G circuit breaker of the generator
 U_Z voltage on the load
 U_{nA} power supply of the automatic standby unit
 U_{SG} signal for generator function
 T_1 controlled time of loss of voltage
 T_2 min. time between circuit breaker switching
 T_3 controlled time of voltage renewal
 T_A time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied, $T_A = 0.5$ s

FUNCTION DESCRIPTION

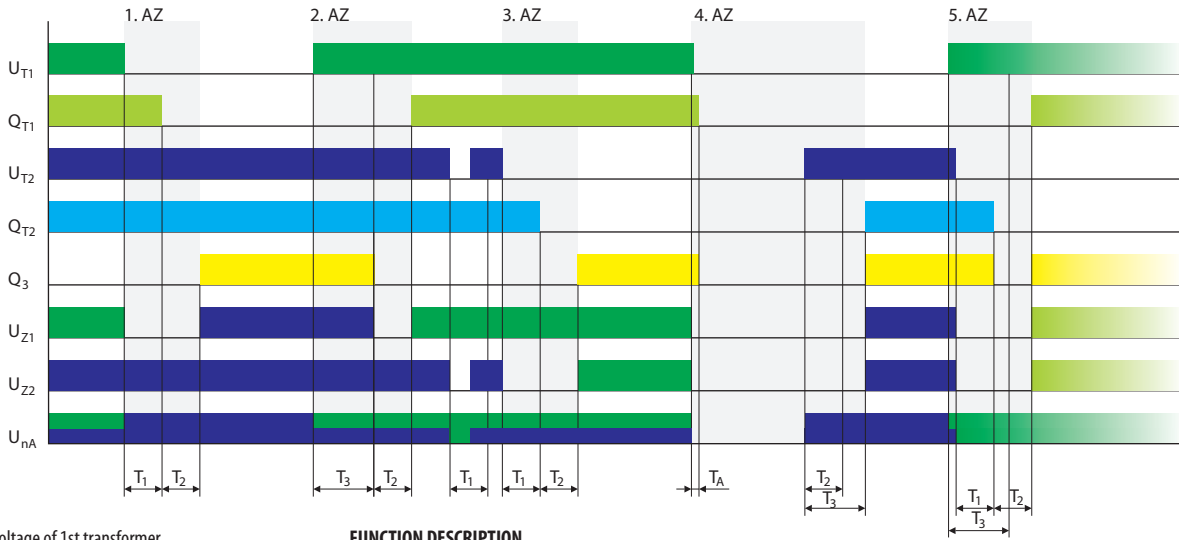
- Initial state:** Voltage is on 1st power supply. The load is supplied from 1st power supply.
- 1st automatic standby:** In case of loss of U_T , Q_T is switched off automatically, and the generator start signal is active. If U_G exists for at least T_3 , Q_G is switched on automatically. The condition for switching Q_G on is expiration of time T_2 . In case of loss of U_G and absence of U_T , Q_G is switched off automatically after T_A . 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_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 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



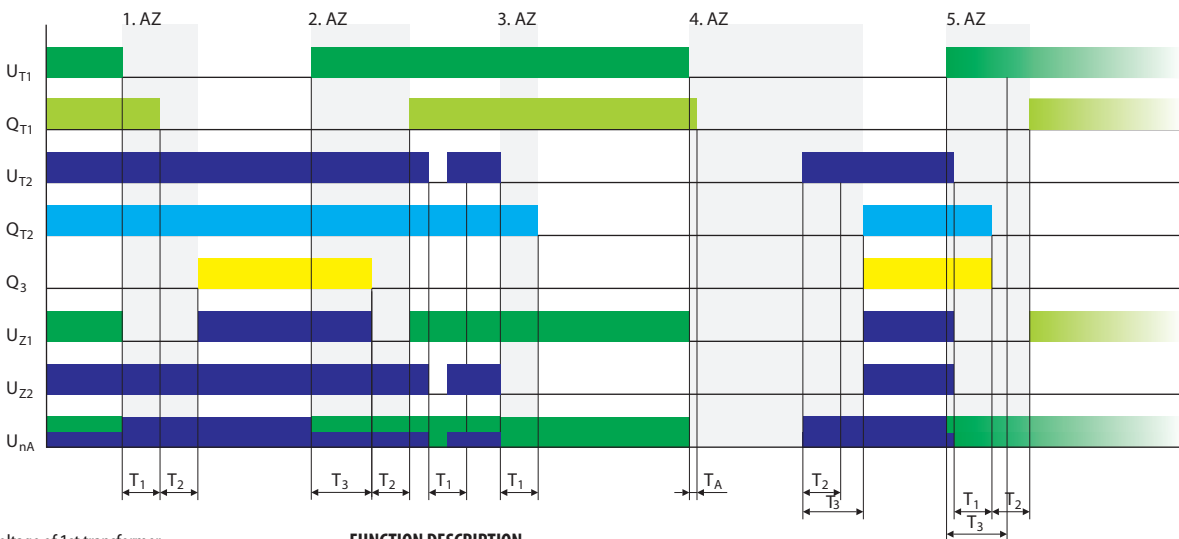
U_{T1} voltage of 1st transformer
 Q_{T1} circuit breaker of 1st transformer
 U_{T2} voltage of 2nd transformer
 Q_{T2} circuit breaker of 2nd transformer
 Q_3 switch-disconnector of the longitudinal coupling
 U_{Z1} voltage on the load No. 1
 U_{Z2} voltage on the load No. 2
 U_{nA} power supply of the automatic standby unit
 T_1 controlled time of loss of voltage
 T_2 min. time between circuit breaker switching
 T_3 controlled time of voltage renewal
 T_A time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied

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 U_{T1} for min. T_1 , Q_{T1} is switched off automatically and if U_{T2} exists for at least T_3 , Q_3 is switched on automatically after T_2 .
- 2nd automatic standby:** In case of loss of U_{T2} for a time longer than T_1 , Q_{T2} is switched off automatically and Q_3 is switched on automatically after T_2 .
- 3rd automatic standby:** In case of loss of U_{T1} and absence of U_{T2} , Q_{T1} and Q_3 are switched off automatically after T_A . After renewal of U_{T2} for min. T_3 , Q_{T2} and Q_3 are switched on automatically. The condition of automatic switching Q_{T2} on is expiration of time T_2 .
- 4th automatic standby:** In case of loss of U_{T1} and absence of U_{T2} , Q_{T1} and Q_3 are switched off automatically after T_A . After renewal of U_{T2} for min. T_3 , Q_{T2} and Q_3 are switched on automatically. The condition of automatic switching Q_{T2} and Q_3 on is expiration of time T_2 .
- 5th automatic standby:** In case of renewal of U_{T1} and loss of voltage of U_{T2} in T_3 , Q_{T2} and Q_3 are switched off automatically after T_1 . If T_3 expires before T_1 , Q_{T2} and Q_3 are switched off after T_3 , Q_{T1} and Q_3 are switched on automatically after T_2 .

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



U_{T1} voltage of 1st transformer
 Q_{T1} circuit breaker of 1st transformer
 U_{T2} voltage of 2nd transformer
 Q_{T2} circuit breaker of 2nd transformer
 Q_3 switch-disconnector of the longitudinal coupling
 U_{Z1} voltage on the load No. 1
 U_{Z2} voltage on the load No. 2
 U_{nA} power supply of the automatic standby unit
 T_1 controlled time of loss of voltage
 T_2 min. time between circuit breaker switching
 T_3 controlled time of voltage renewal
 T_A time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied

FUNCTION DESCRIPTION

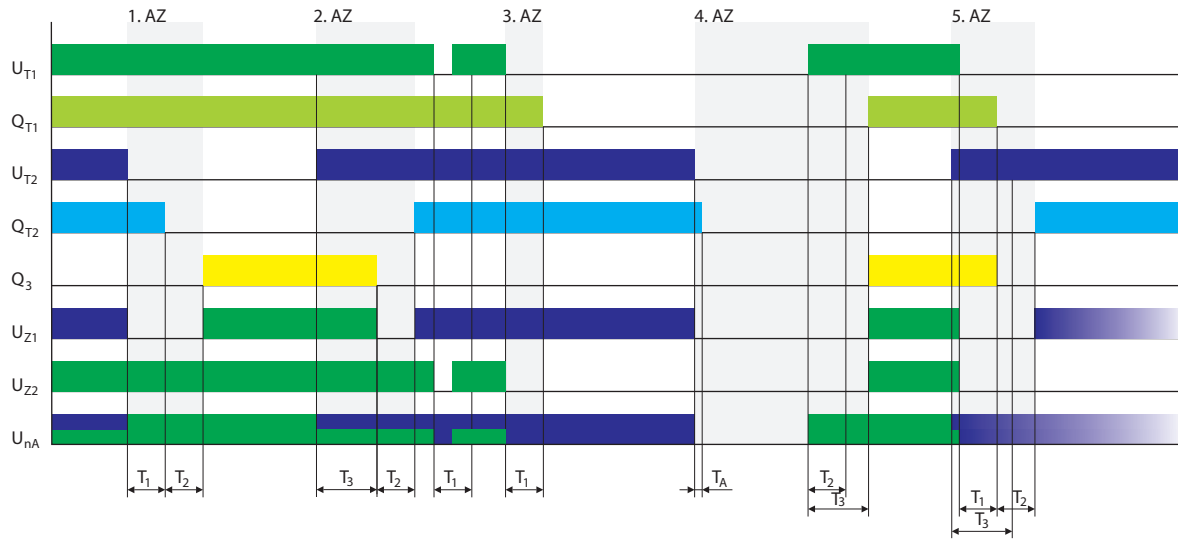
- Initial state:** Voltage exists on both 1st power supply and 2nd power supply. 1st load is supplied from 1st power supply. 2nd load is supplied from 2nd power supply.
- 1st automatic standby:** In case of loss of U_{T1} for min. T_1 , Q_{T1} is switched off automatically and if U_{T2} exists for at least T_3 , Q_3 is switched on automatically after T_2 .
- 2nd automatic standby:** If U_{T1} is renewed for a time longer than T_3 , Q_3 is switched off automatically, and Q_{T1} is switched on automatically after T_2 . In case of loss of U_{T2} for a time shorter than T_1 , the automatic standby unit does not react to such loss of voltage.
- 3rd automatic standby:** In case of loss of U_{T2} for a time longer than T_1 , Q_{T2} is switched off automatically. As the automatic standby unit works in mode of standby only for power supply 1, Q_3 does not close.
- 4th automatic standby:** In case of loss of U_{T1} and absence of U_{T2} , Q_{T1} is switched off automatically after T_A . After renewal of U_{T2} for min. T_3 , Q_{T2} and Q_3 are switched on automatically. The condition of automatic switching Q_{T2} and Q_3 on is expiration of time T_2 .
- 5th automatic standby:** In case of renewal of U_{T1} and loss of voltage of U_{T2} in T_3 , Q_{T2} and Q_3 are switched off automatically after T_1 . If T_3 expires before T_1 , Q_{T2} and Q_3 are switched off after T_3 , Q_{T1} is switched on automatically after T_2 .

TIME DIAGRAMS

Time diagram 5 - automatic standby unit for control of two power supplies with longitudinal coupling

Function: automatic standby **Mode:** standby for power supply No. 2 (1st power supply is a transformer, 2nd power supply is a transformer)

Power supply of the automatic standby unit: from active power supply



- U_{T1} voltage of 1st transformer
- Q_{T1} circuit breaker of 1st transformer
- U_{T2} voltage of 2nd transformer
- Q_{T2} circuit breaker of 2nd transformer
- Q_3 switch-disconnector of the longitudinal coupling
- U_{Z1} voltage on the load No. 1
- U_{Z2} voltage on the load No. 2
- U_{nA} power supply of the automatic standby unit
- T_1 controlled time of loss of voltage
- T_2 min. time between circuit breaker switching
- T_3 controlled time of voltage renewal
- T_A time from loss of voltage to circuit breaker action in case that the automatic standby unit is not supplied

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 U_{T2} for min. T_1 , Q_{T2} is switched off automatically and if U_{T1} exists for at least T_3 , Q_3 is switched on automatically after T_2 .
- 2nd automatic standby:** If U_{T2} is renewed for a time longer than T_3 , Q_3 is switched off automatically, and Q_{T2} is switched on automatically after T_2 . In case of loss of U_{T1} for a time shorter than T_1 , the automatic standby unit does not react to such loss of voltage.
- 3rd automatic standby:** In case of loss of U_{T1} for a time longer than T_1 , Q_{T1} is switched off automatically. As the automatic standby unit works in mode of standby only for power supply 2, Q_3 does not close.
- 4th automatic standby:** In case of loss of U_{T2} and absence of U_{T1} , Q_{T2} is switched off automatically after T_A . After renewal of U_{T1} for min. T_3 , Q_{T1} and Q_3 are switched on automatically. The condition of automatic switching Q_{T1} and Q_3 on is expiration of time T_2 .
- 5th automatic standby:** In case of renewal of U_{T2} and loss of voltage of U_{T1} in T_3 , Q_{T1} and Q_3 are switched off automatically after T_1 . If T_3 expires before T_1 , Q_{T1} and Q_3 are switched off after T_3 . Q_{T2} is switched on automatically after T_2 .

SPECIFICATIONS

AUTOMATIC STANDBY UNIT MODI			
Dimensions	W x H x D	see page 19	
Weight	m	ZA-01-xxxx or ZA-11-xxxx 11 kg	
Standards		EN 60947-6-1; EN 60204-1; EN 60068-2-1; EN 60068-2-2; EN 60068-3-3	
POWER SUPPLY			
Voltage of power supplies (both main and standby)	AC	230 V/400 V	
External (outlets 26, 27)	from independent power supply		
Rated operating voltage	AC U _e	24 V ²⁾ u ZA-xx-x1xx, or 110 ÷ 230 V for ZA-xx-x2xx	
	DC U _e	24 V ²⁾ u ZA-xx-x1xx, or 110 ÷ 220 V for ZA-xx-x2xx	
Input power	AC/DC	100 VA / 100 W	
Overvoltage category		I ⁵⁾	
Internal ²⁾	from active power supply		
Rated frequency	f _n	50/60 Hz	
Degree of protection	external/internal	ZA-x1-xxxx according to switchboard design / IP20	
Electromagnetic compatibility	standards	EN 60947-1; EN 55011	
	radio emission	class A	
	disturbing voltages	class B	
Connecting cross-section		0.5 ÷ 1 mm ² (recommended section min. 0.75 mm ²)	
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 I _e /U _e	10 A/230 V (AC-3) (potential-less contacts)
	(outlets 22-25)	DC I _e /U _e	0.1 A/24 V (against terminal -)
Connecting cross-section		0.5 ÷ 1 mm ² (recommended section min. 0.75 mm ²)	
UNDERVOLTAGE RELAY - only ZA-XX-XX1X			
Undervoltage setting		70 ÷ 120 % U _e	
Overvoltage setting		80 ÷ 130 % U _e	
TIME SETTING			
Min. time between circuit breaker switching (standby time)		3 s (according to circuit breaker design)	
Controlled time of loss of voltage ³⁾	T1	0 ÷ 999 s, by 1 s	
Delay between the switching of circuit breakers ³⁾	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 ⁴⁾	T _A	0.5 s	

Note: I_k⁴⁾ is short-circuit current in the circuit of power supplies.

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⁾ In case of permanent supplying of the automatic standby unit.

⁴⁾ In case that the automatic standby unit is not supplied.

⁵⁾ 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

Circuit breaker type	BC160	BD250	BH630	BL...	ARION WL
Accessories					
Undervoltage release	SP-BC-X024	SP-BHD-X024	SP-BHD-X024	SP-BL-X024	see page 10
Auxiliary switch	2x PS-BC-0010-Au	PS-BHD-1100-Au	PS-BHD-1100-Au	PS-BL-2200-Au	see page 10
Signal switch ¹⁾	NS-BC-0010-Au	PS-BHD-1000-Au	PS-BHD-1000-Au	-	see page 10
Relative switch	-	-	-	PS-BL-2200-Au	see page 10
Motor drive	MP-BC-X230-B	MP-BD-X230	MP-BH-X230	MP-BL-X230	see page 10
Mechanical interlocking	-	see page 10	see page 10	see page 10	see page 10

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

¹⁾ For switch-disconnectors it is not necessary to install a signal switch.

TYPE DESIGNATION OF CIRCUIT BREAKER ARION WL

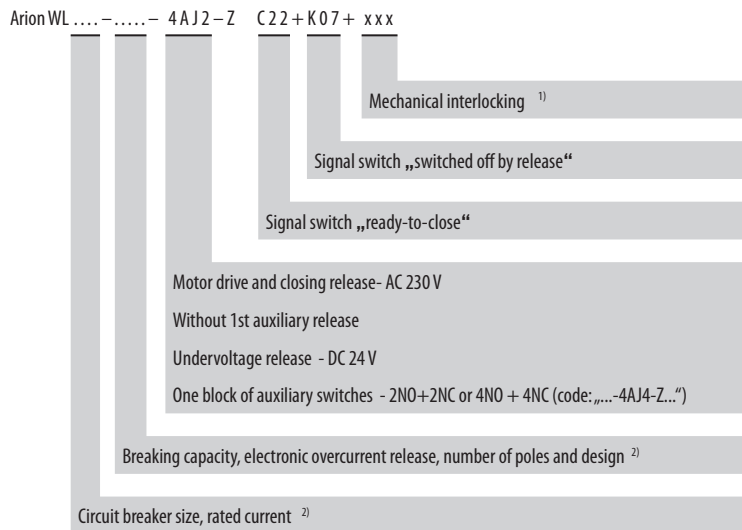
Circuit breaker equipment must include these accessories:

- 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 A J 2 - Z C 22 + K 07 + xxx

Type designation description:



¹⁾ xxx – 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.

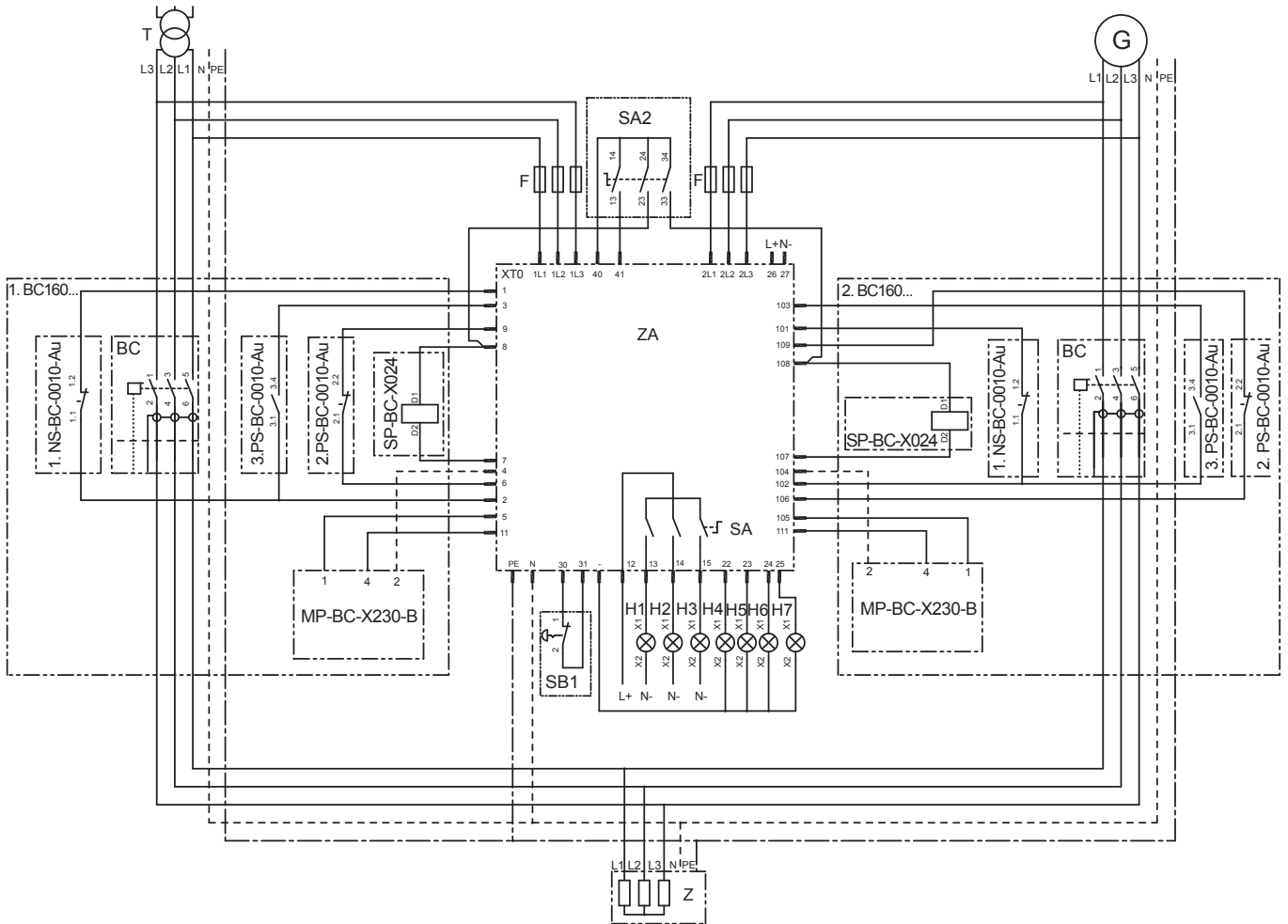
DETERMINATION OF MECHANICAL INTERLOCKING OF CIRCUIT BREAKERS MODEION

Circuit breaker combination		Mechanical interlocking according to circuit breakers designs			
1st circuit breaker	2nd circuit breaker	Fixed	Plug-in	Withdrawable	Fixed/withdrawable (plug-in)
BC160	BC160	-	-	-	-
BD250	BD250	MB-BD-PV05	MB-BD-PV05	MB-BD-PV05	MB-BD-PV05
BD250	BH630	MB-BHD-PV03	MB-BHD-PV03	MB-BHD-PV03	MB-BHD-PV03
BH630	BH630	MB-BH-PV04	MB-BH-PV04	MB-BH-PV04	MB-BH-PV04
BH630	BD250	MB-BHD-PV03	MB-BHD-PV03	MB-BHD-PV03	MB-BHD-PV03
BL...	BL...	MB-BL-PP07	-	MB-BL-VV06	MB-BL-PV08

DIAGRAM

Connecting for BC160

ZA-0x-7xxx



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

ZA - automatic standby unit

- XT0 - connecting terminal block
- SA - function switch
- H1-3 - 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)
- 26(L+), 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

Setting of the mode of the motor drive control



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

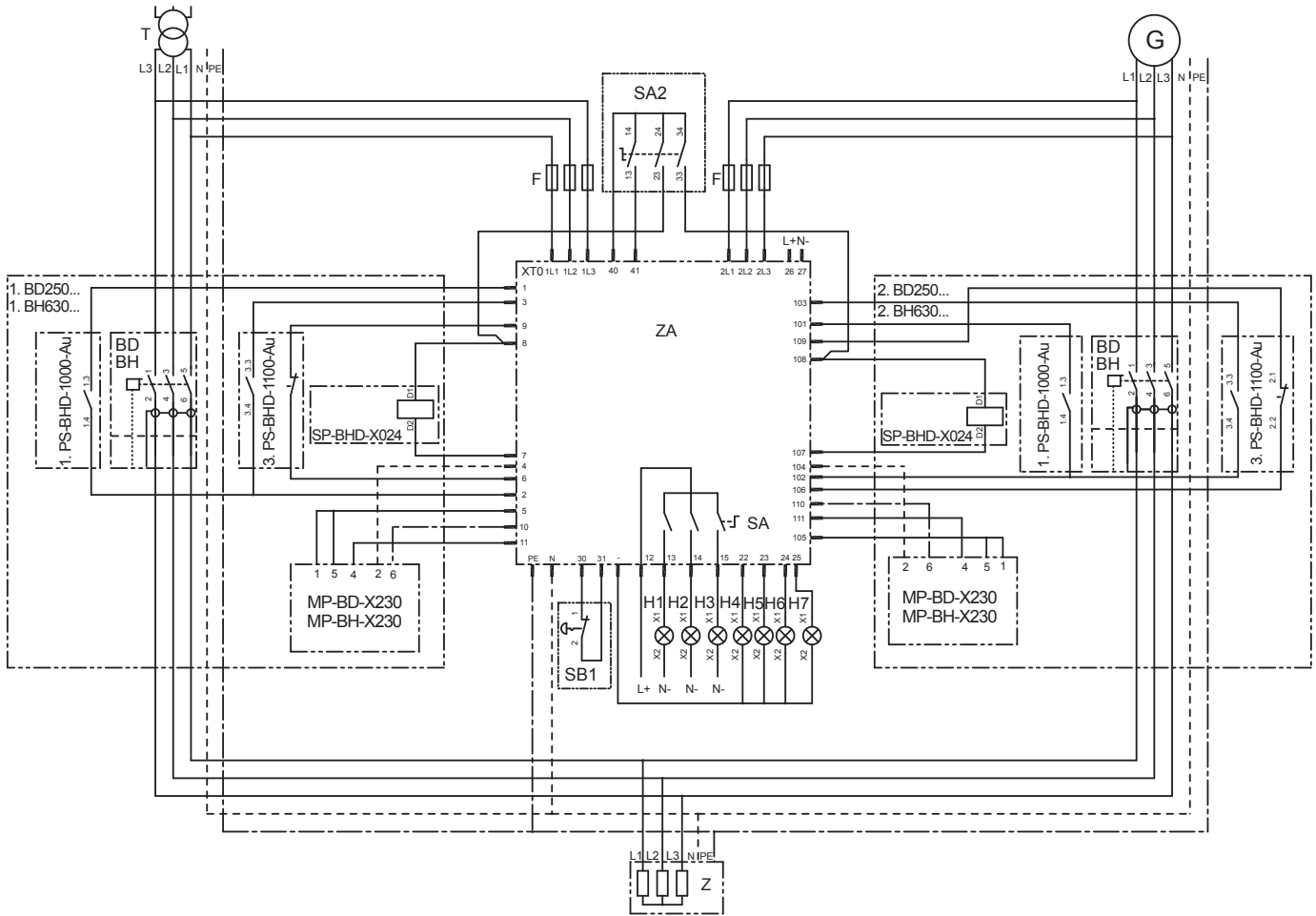
Z - load

Note: During the use of the switch-disconnector it is not necessary to use the signal switch. In 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.

DIAGRAM

Connecting for BD250 and BH630

ZA-0x-7xxx



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

ZA - automatic standby unit

- XT0 - connecting terminal block
- SA - function switch
- H1-3 - function signalling of automatic standby unit
- H4 - generator start signal - AC 230 V 10 A (AC-3)
- 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)
- 26(L+), 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. BD250...(1. BH630...) - circuit breaker of power supply 1

- 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

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-X230 (MP-BH-X230) - motor drive

Z - load

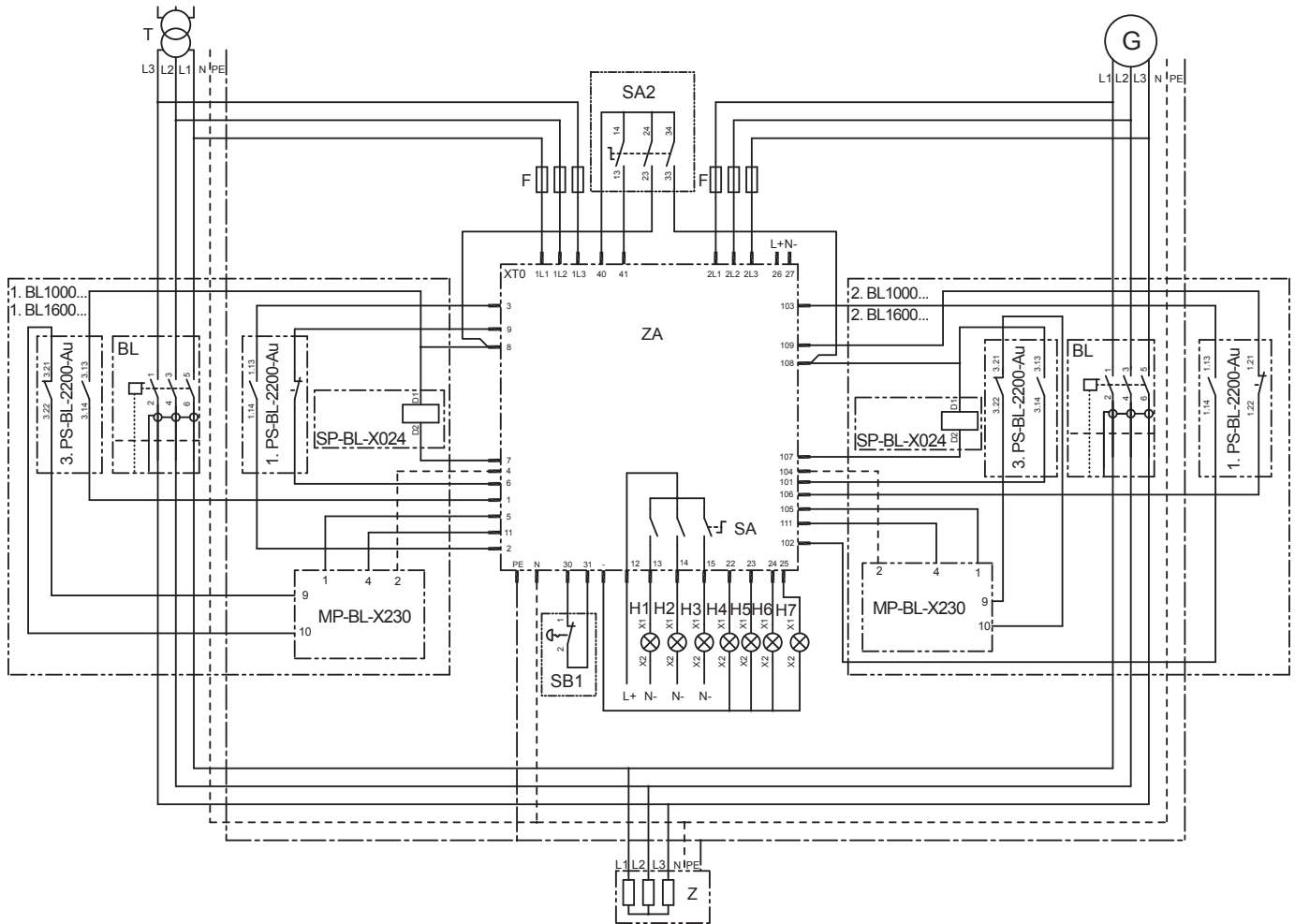
Note: During the use of the switch-disconnector it is not necessary to use the signal switch. In the case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102).

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.

DIAGRAM

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 gG

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)
- 26(L+), 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

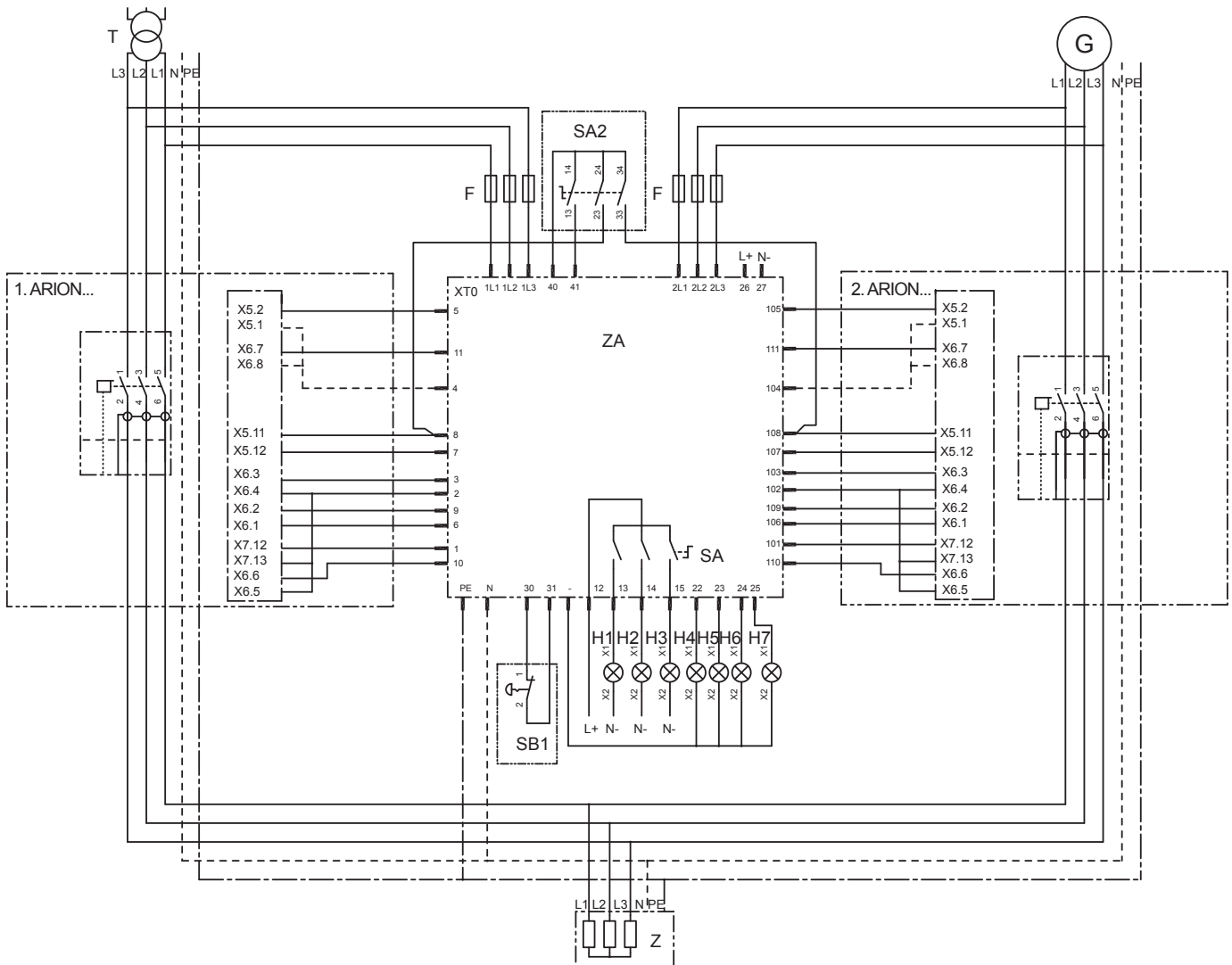
Z - load

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.

DIAGRAM

Connecting for Arion WL

ZA-0x-6xxx



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

ZA - automatic standby unit

- XT0 - connecting terminal block
- SA - function switch
- H1-3 - 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)
- 26(L+), 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. 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)

Z - load

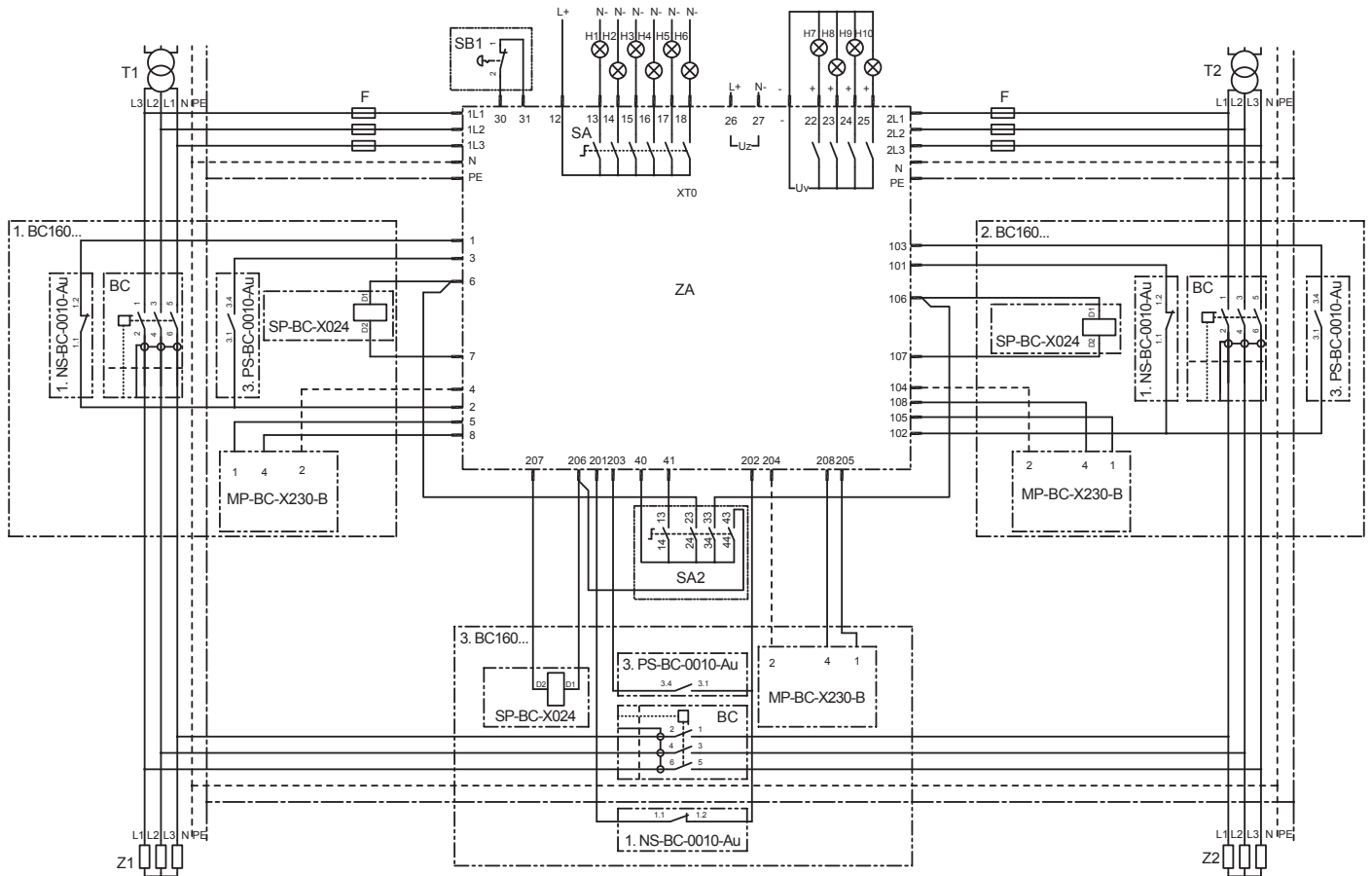
Note: If the switch-disconnector is used, it is not necessary to use the signal switch “switched off by release”. In the case that the switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102).

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.

DIAGRAM

Connecting for BC160 with longitudinal coupling

ZA-1x-7xxx



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
- 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
- 26(L+), 27(N-) - external supplying from independent power supply
- SB1 - possibility of connection of the STOP button (in the standard version with a jumper)
- SA2 - possibility of connection of the change-over switch

Setting of the mode of the motor drive control



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

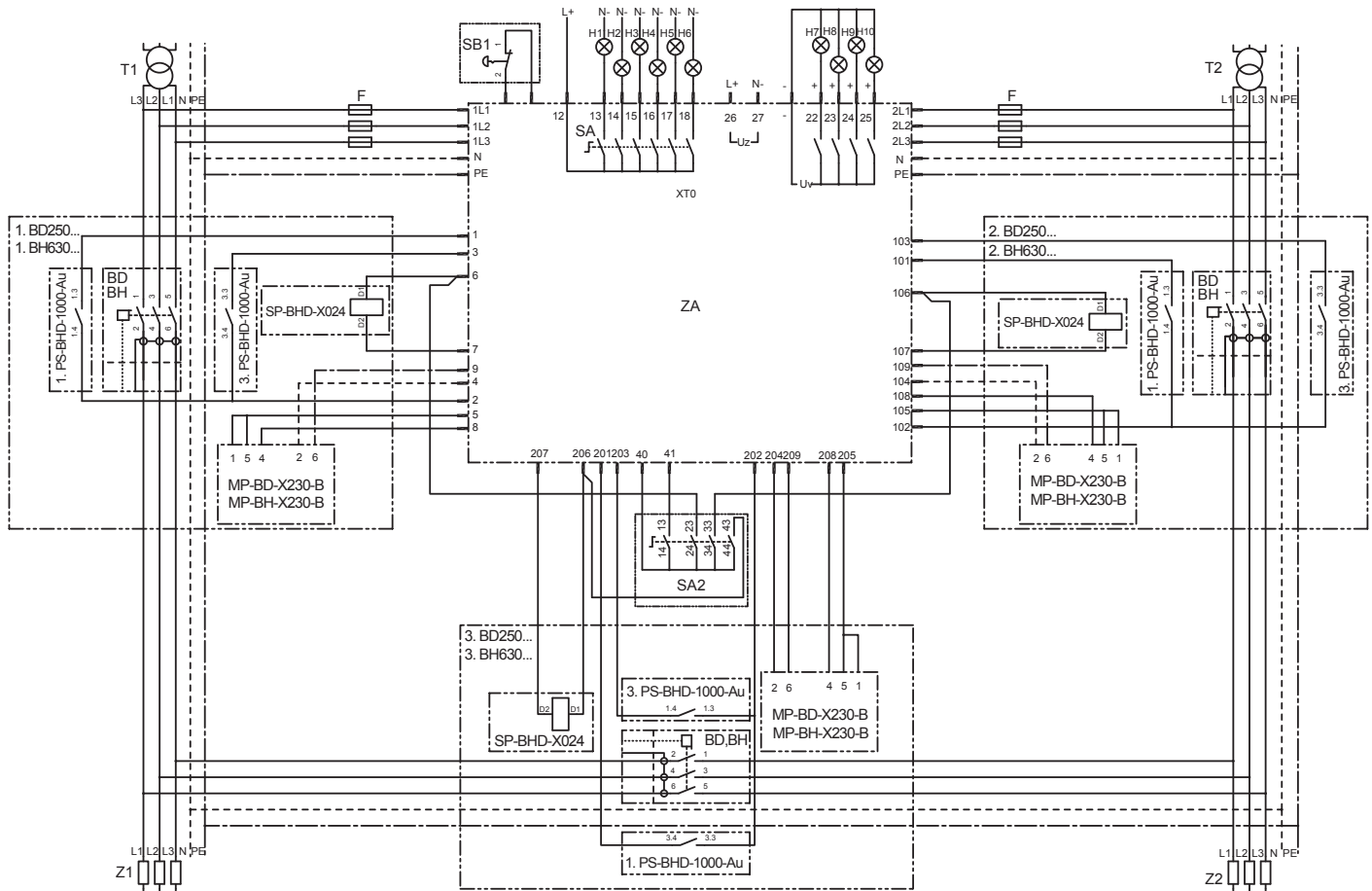
Z - load

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.

DIAGRAM

Connecting for BD250 and BH630 with longitudinal coupling ZA-1x-7xxx



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)
- 26(L+), 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. BD250... (1. BH630...) - circuit breaker of power supply 1

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

Z - load

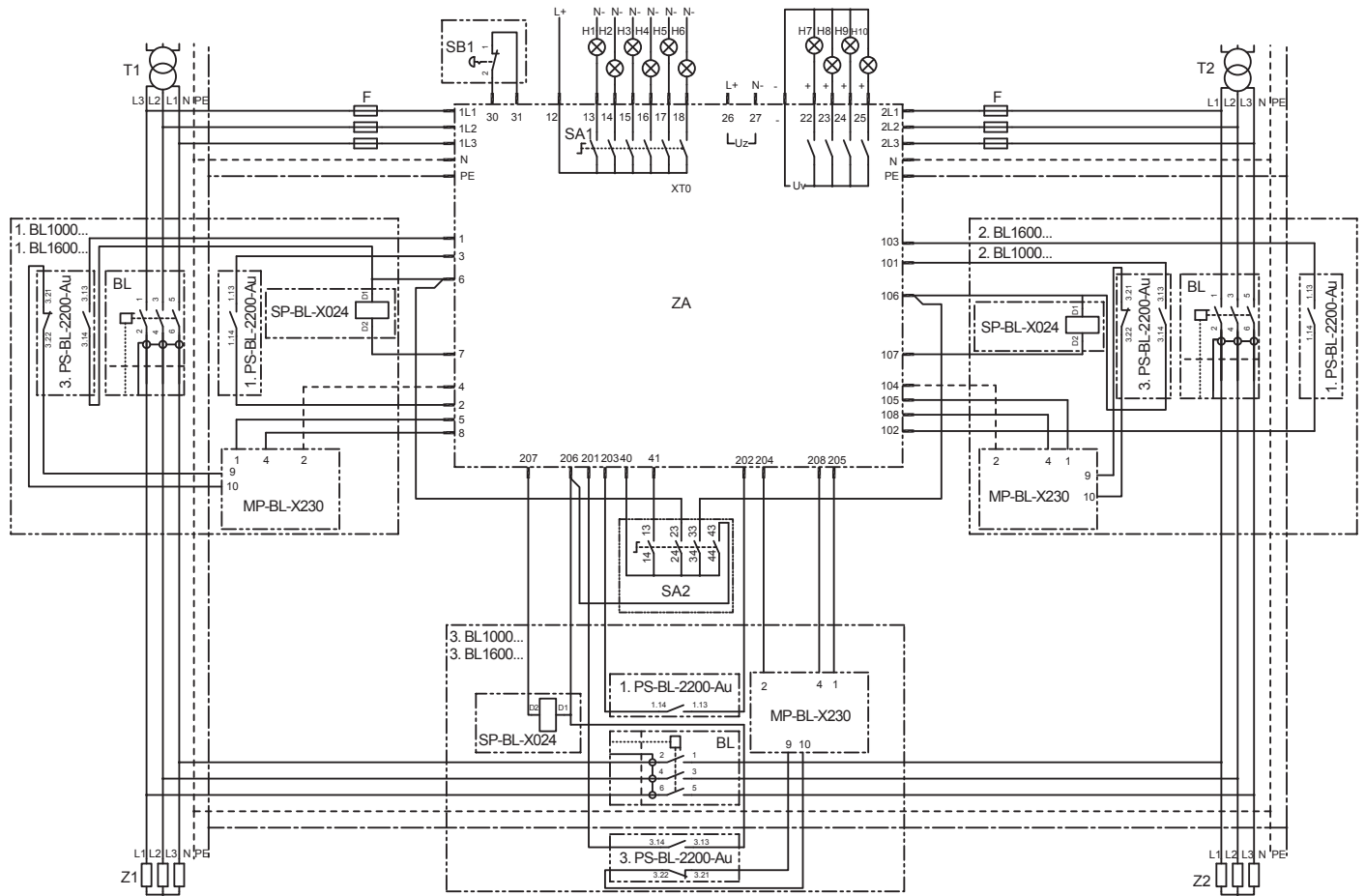
Note: During the use of the switch-disconnector it is not necessary to use the signal switch. In the case that the signal switch is not installed, it is necessary to interconnect terminals for connection of the switch (1st source - terminals 1 and 2; 2nd source - terminals 101 and 102; longitudinal coupling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

DIAGRAM

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 G

ZA - automatic standby unit

- XT0 - connecting terminal block
- SA - 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
- 26(L+), 27(N-) - external supplying from independent power supply
- 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

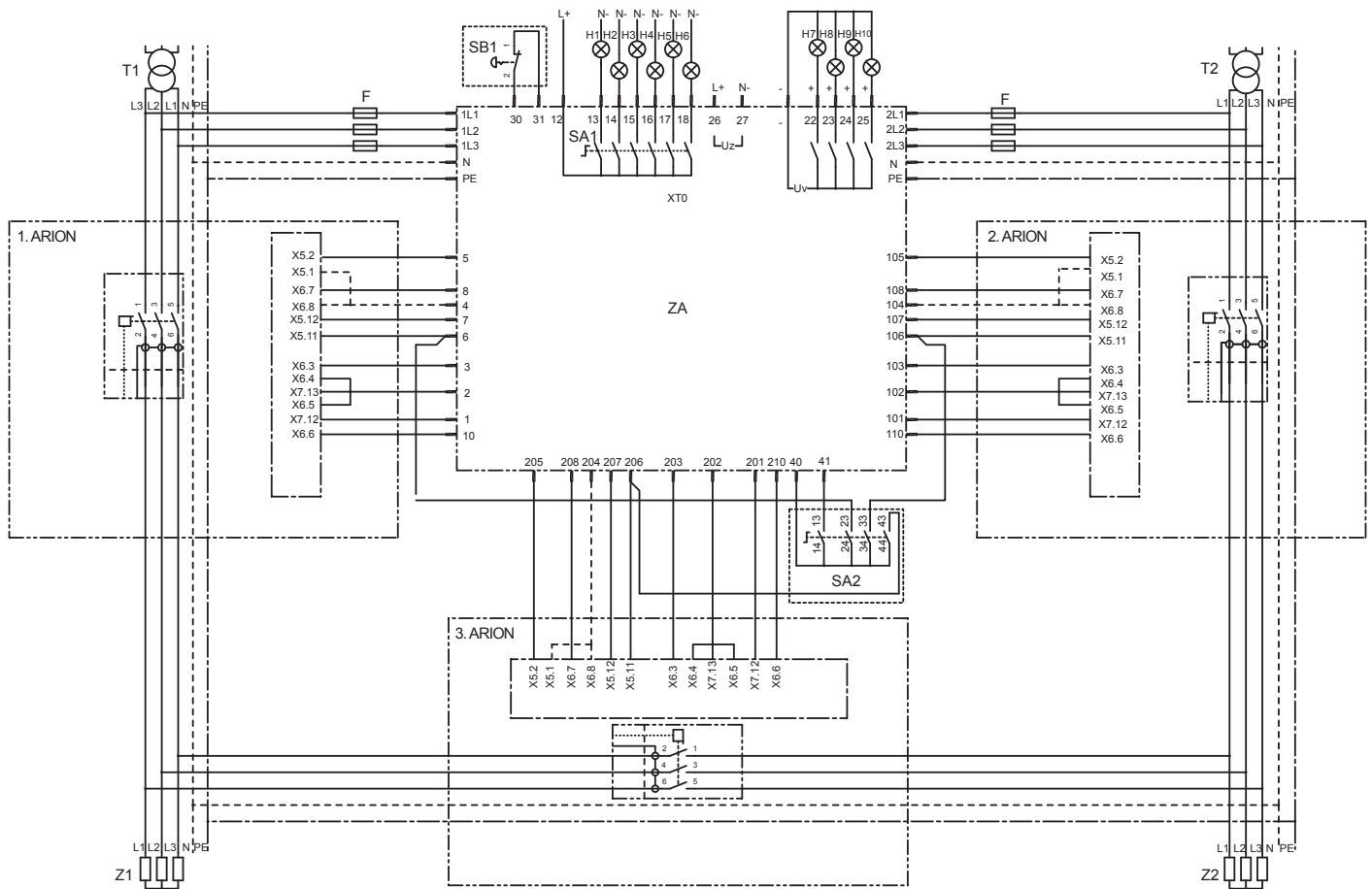
Z - load

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.

DIAGRAM

Connecting for Arion WL with longitudinal coupling

ZA-1x-6xxx



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 - signal chyba - DC 24 V 0.1 A (against terminal / - / minus)
- 26(L+), 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. 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)

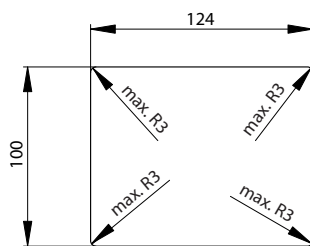
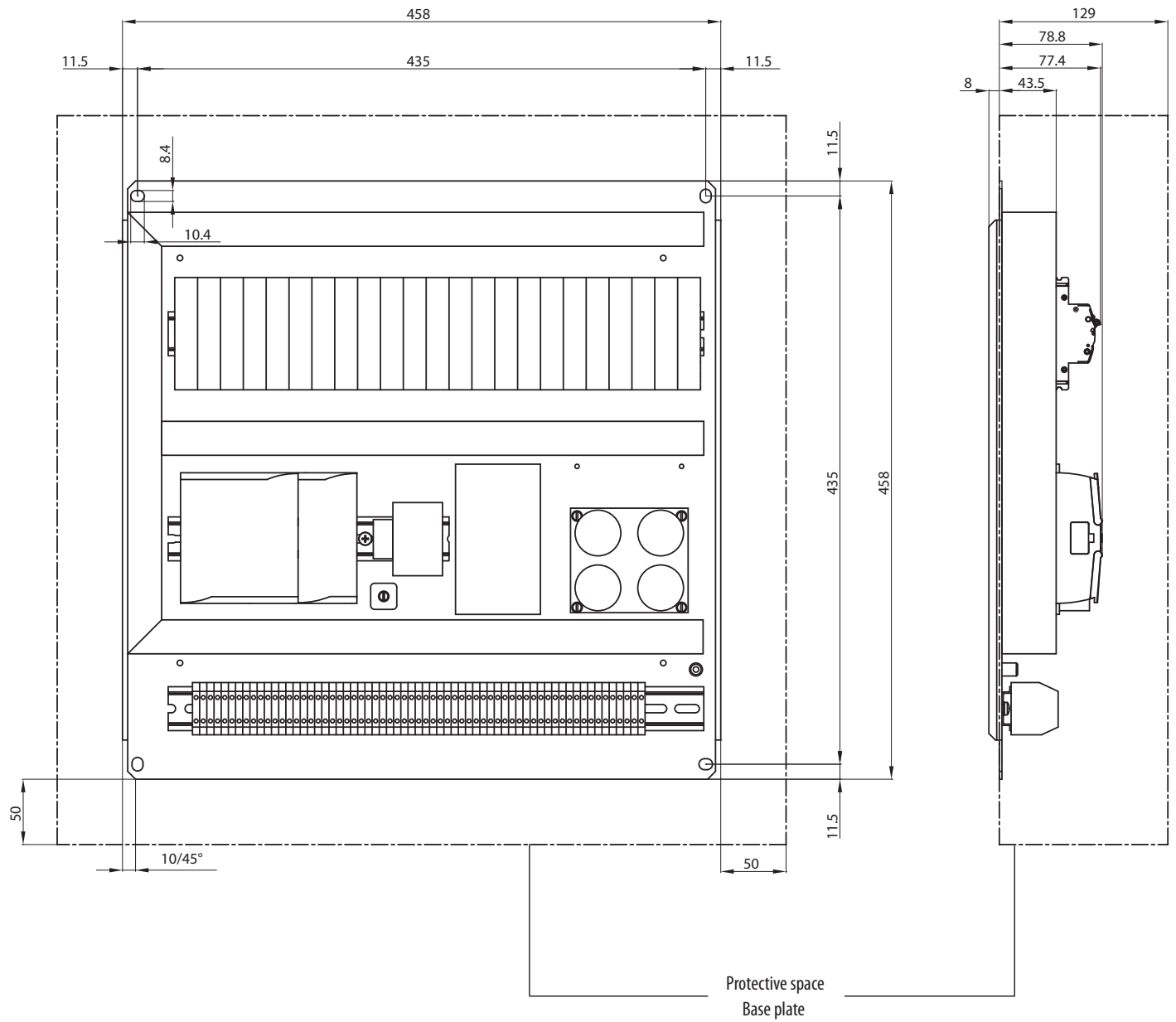
Z - load

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).

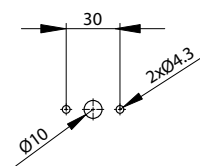
The automatic standby unit does not include: circuit breakers / switch-disconnectors with accessories, fuses F, transformer, generators, SA2 and SB1 switches, H1 to H7 indicator lights.

DIMENSIONS

Built-in design ZA-x1-xxxx



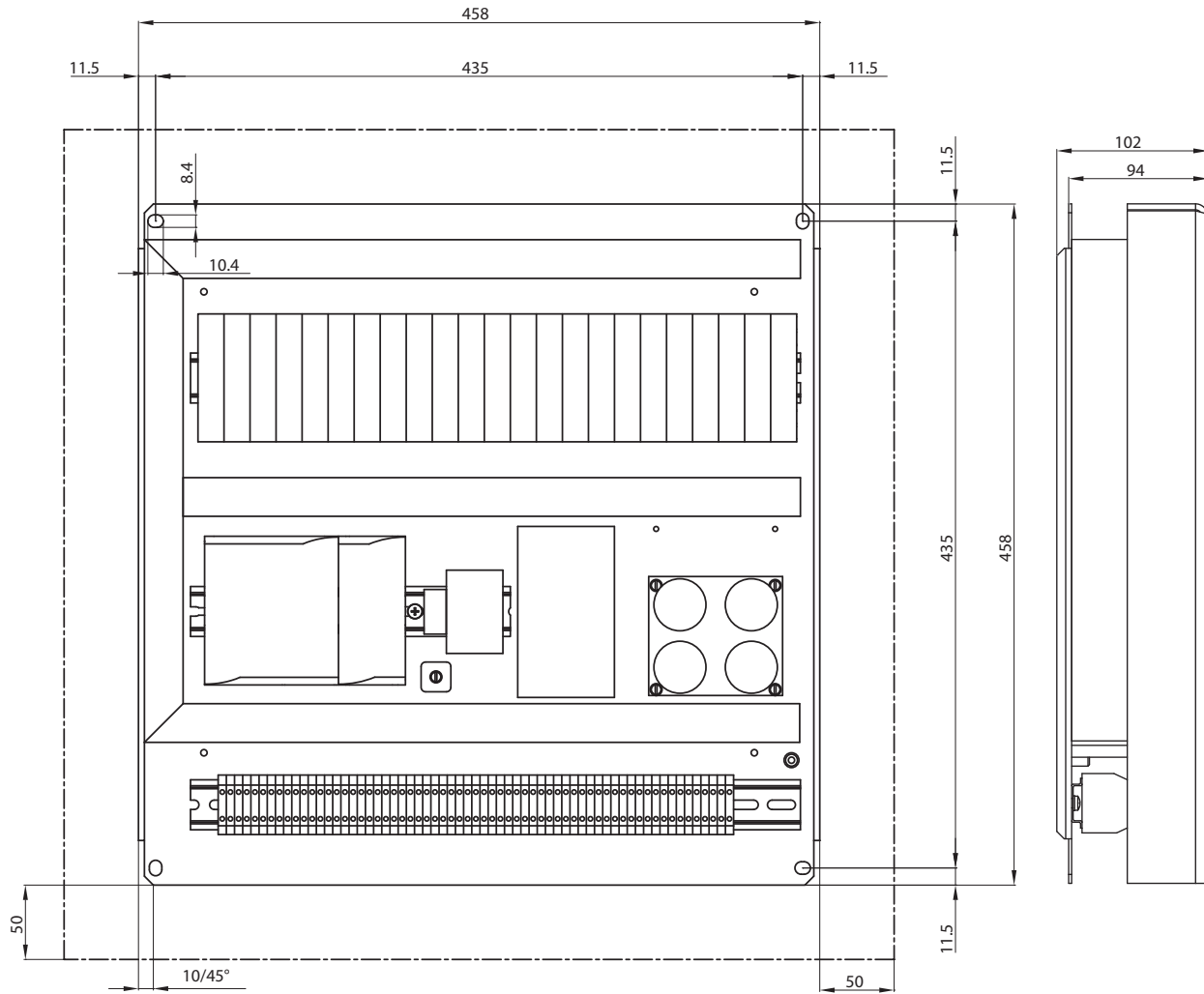
Opening for display



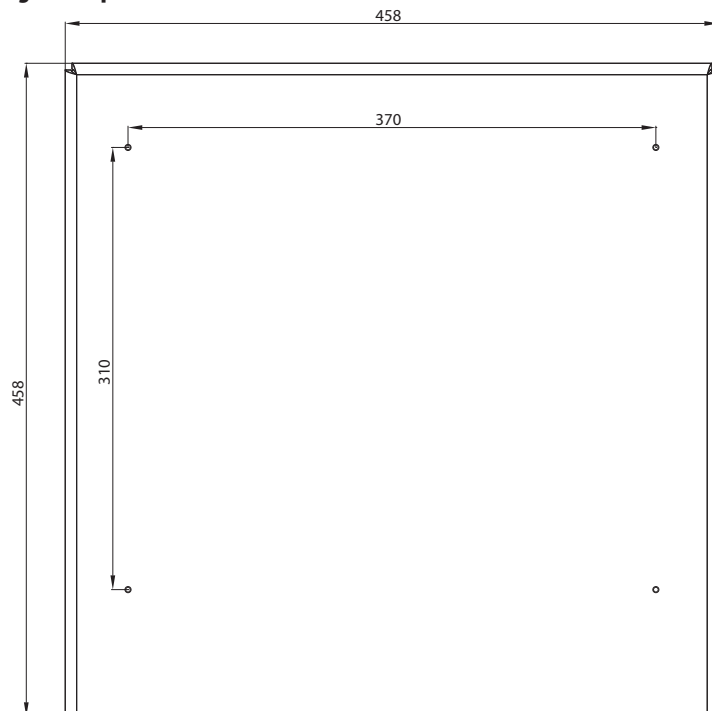
Opening for functions switch

DIMENSIONS

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

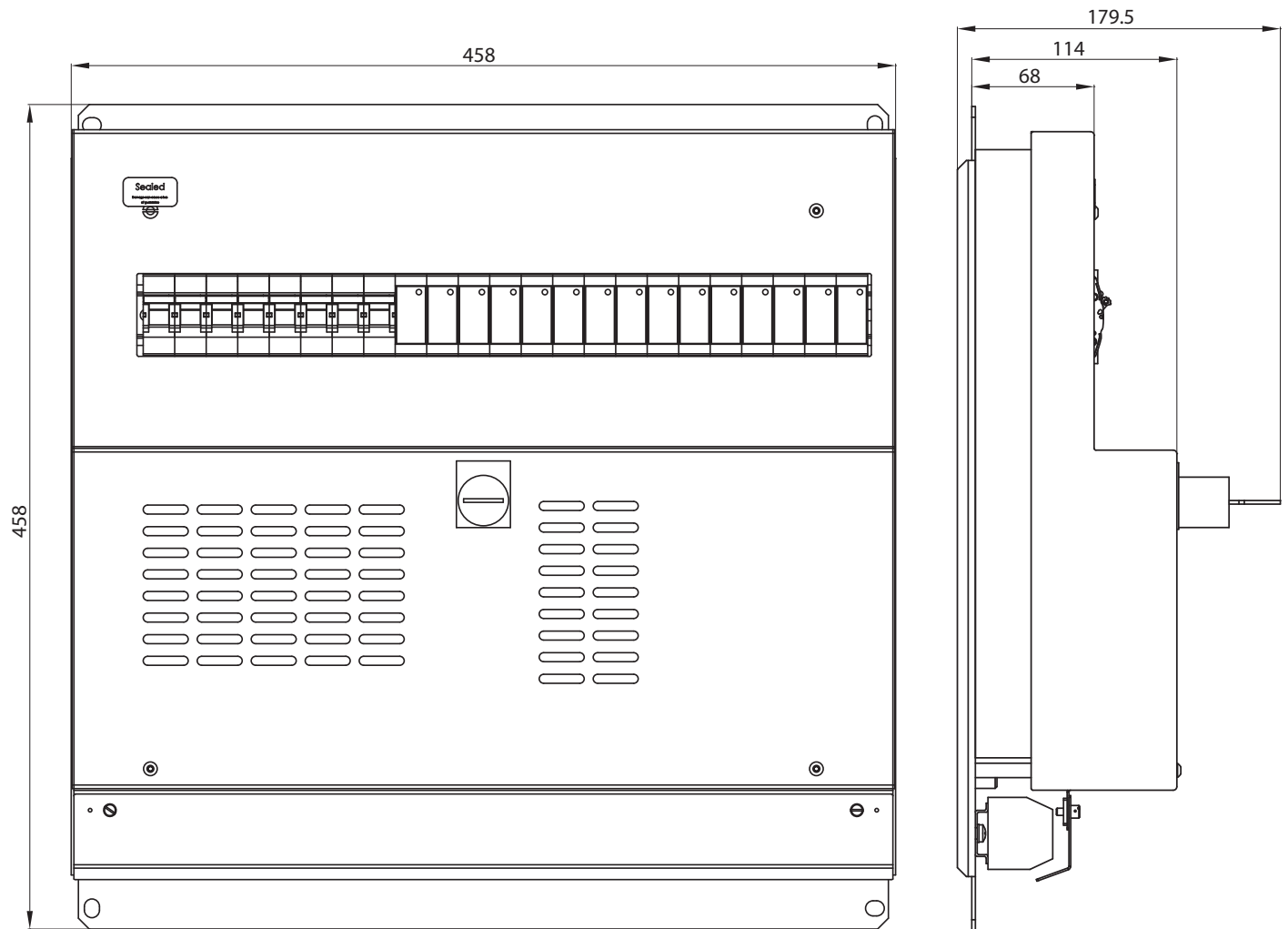


Drilling diagram for mounting of the plastic cover



DIMENSIONS

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



NOTES

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