Industrial Motors

Commercial &
Appliance Motors

Automation

Digital &
Systems

Energy

Transmission &
Distribution

Coatings

AIR CIRCUIT BREAKERS

Safety and protection
in all applications

Driving efficiency and sustainability

WEG

SUMMARY

ABW

ABB CIRCUIT BREAKER

DIGITAL TRIP RELAY
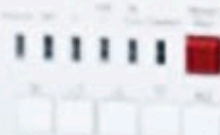
weg

OFF

Safety and protection
in all applications

WEG line of air circuit breakers is used to **protect electrical circuits against overloads and short circuits, with microprocessed electronic protection**. Developed for the industry, it integrates technology and quality to improve the performance and safety of your applications. The circuit breaker has a "stored-energy" operating mechanism with pre-charged springs. Those springs are manually charged with the front lever or electrically charged with a motor, supplied as an accessory.

Offering a variety of accessories assembled at the factory, WEG air circuit breakers are the ideal solution for different applications, including critical industries such as mining, oil and gas.

Benefits

Complete accessory line

Network communication

Accessories assembled at the factory

Microprocessed electronic protection unit

Standard LSIG protection

Earth leakage protection (optional)

Suitable for different applications

Wide range of current setting

Overview of the line

Designed to protect low voltage electrical circuits, the circuit breakers are available in 5 frames, fixed and withdrawble versions with currents from 800 A to 6,300 A.

ABWC800/ABWC1600
In 800~1,600 A
Icu = 50 kA @ 380 V
Ics = 100% Icu

ABW800/ABW1600
In 800~1,600 A
Icu = 65 kA @ 380 V
Ics = 100% Icu

ABW4000/ABW5000
In 4,000~5,000 A
Icu = 100 kA @ 380 V
Ics = 100% Icu

ABW2000/ABW2500/
ABW3200
In 2,000~3,200 A
Icu = 85 kA @ 380 V
Ics = 100% Icu

ABW6300
In 6,300 A
Icu = 120 kA @ 380 V
Ics = 100% Icu

■ Ics = 100% Icu in the whole line

| Ics = Icu @ 220 / 380 / 415 V		Ics = Icu @ 440 / 480 / 500 V		Ics = Icu @ 600 / 690 V	
ABWC800/ABWC1600	50 kA	ABWC800/ABWC1600	42 kA	ABWC800/ABWC1600	42 kA
ABW800/ABW1600	65 kA	ABW800/ABW1600	65 kA	ABW800/ABW1600	50 kA
ABW2000/ABW2500/ABW3200	85 kA	ABW2000/ABW2500/ABW3200	85 kA	ABW2000/ABW2500/ABW3200	85 kA
ABW4000/ABW5000	100 kA	ABW4000/ABW5000	100 kA	ABW4000/ABW5000	85 kA
ABW6300	120 kA	ABW6300	120 kA	ABW6300	100 kA

Operation system

The circuit breakers operate by means of a spring system, which can be manually charged with a front lever or electrically charged with a motor (supplied as an accessory).
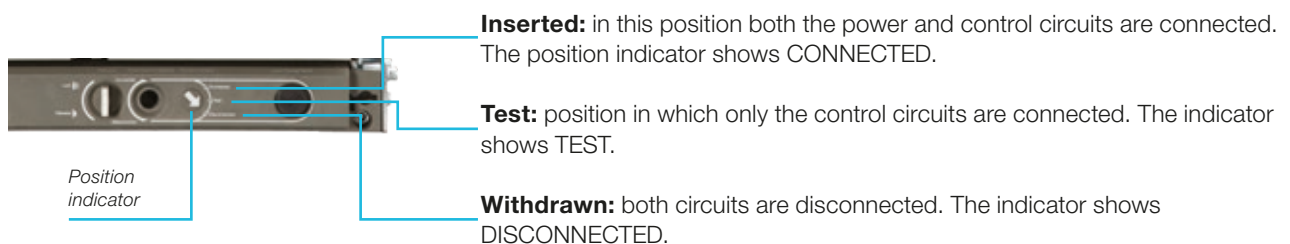
When the springs are charged (situation in which the charge indicator displays CHARGED), the circuit breaker is able to be locally operated with the *ON* and *OFF* buttons.

Remote operation is also possible by means of the closing and opening coils installed inside the circuit breaker. The closing coil has anti-pumping circuit, which prevents multiple breaker closures.

There is also a front indicator of the circuit breaker state: ON or OFF.

OFF button

ON button

Charging lever

ON/OFF indicator

Spring charge indicator

Position indicator
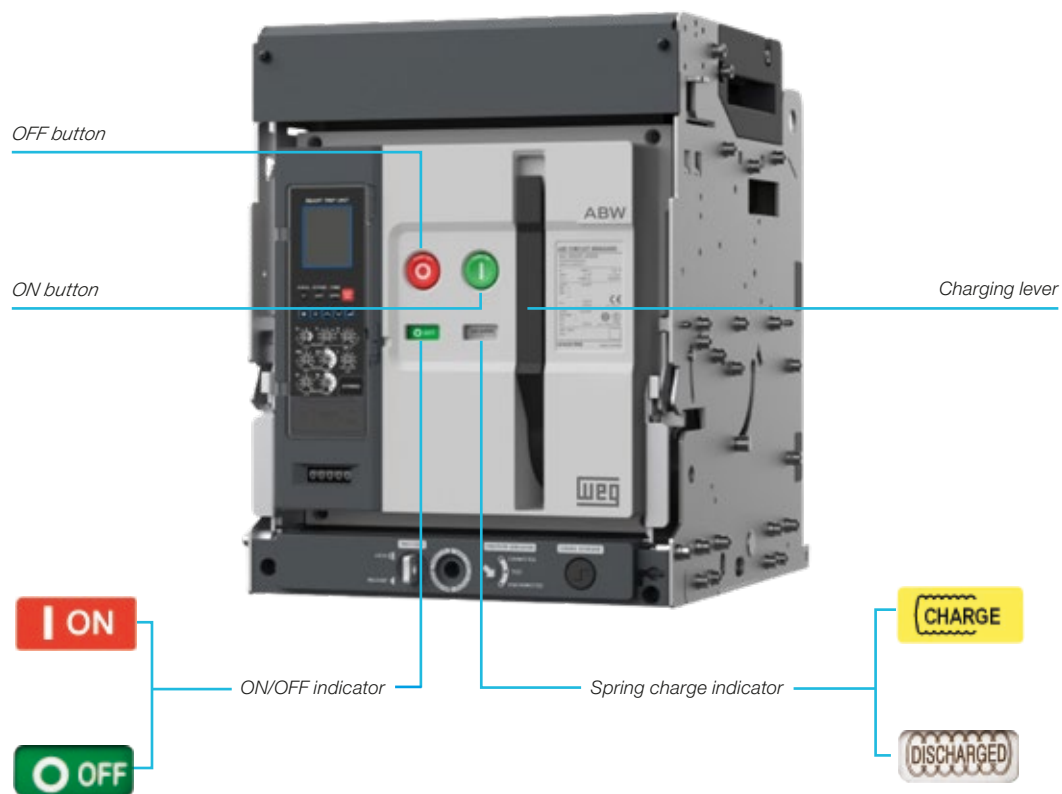
Regarding the installation, the circuit breakers can be supplied as fixed-mounted or withdrawable; the second version is recommended for applications in which the occasional replacement or maintenance should be done as quickly as possible. These circuit breakers can be positioned at three distinct points in the withdrawable rack:
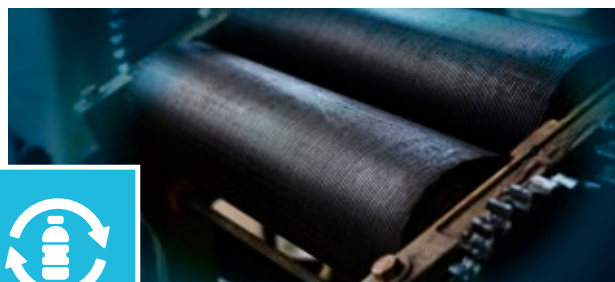
Inserted: in this position both the power and control circuits are connected. The position indicator shows CONNECTED.

Test: position in which only the control circuits are connected. The indicator shows TEST.

Withdrawn: both circuits are disconnected. The indicator shows DISCONNECTED.

Main applications

Mining

Chemical and Oil

Steel and Metallurgy

Pulp and Paper

Food & Beverage

Plastic

Automotive

Water

Textil

Sugar & Ethanol

Construction characteristics[1)]

Spring loading lever

Protection unit

Arc extinction chambers

Suspension slots

ABW

OFF button

ON button

Operation
counter

Status indicator
ON / OFF

Spring charge indicator -
Charged / Not Charged

Technical data

Withdrawable rack

Withdrawable rail (withdrawable)

Position indicator – Inserted / Test /
Withdrawn (withdrawable)

Position locked by padlock
(withdrawable)

Note: 1) Image for illustrative purpose.

General characteristics

Circuit breaker		ABWC08	ABWC16	ABW08	ABW16	ABW20	ABW25	ABW32	ABW40	ABW50	ABW63
Standard		IEC 60947-2									
Maximum rated current (40 °C) - In max. (A)		800	1,600	800	1,600	2,000	2,500	3,200	4,000	5,000	6,300
Current setting		(0.4 ~1.0) x In max									
Rated operational voltage - Ue (V)		690									
Rated insulation voltage - Ui (V)		1,000									
Impulse voltage - Uimp (kV)		12									
Frequency (Hz)		50 / 60									
Number of poles		3									
Versions		Fixed - withdrawable									
Protection units		LSIG Electronics									
Rated ultimate short-circuit breaking capacity - Icu (kA)	220 / 380 / 415 V	50	50	65	65	85	85	85	100	100	120
	440 / 480 / 500 V	42	42	65	65	85	85	85	100	100	120
	600 / 690 V	42	42	50	50	85	85	85	85	85	100
Rated service short-circuit breaking capacity - Ics (kA)	...% x Icu	100%									
Rated short-time withstand current - Icw (kA)	1s	42	42	50	50	85	85	85	85	85	100
	2s	-	-	42	42	75	75	75	75	75	90
	3s	25	25	36	36	65	65	65	65	65	85
Rated making capacity - Icm (kA peak)	220 / 380 / 415 V	88.2	88.2	143	143	187	187	187	220	220	264
	440 / 480 / 500 V	88.2	88.2	143	143	187	187	187	220	220	264
	600 / 690 V	88.2	88.2	105	105	187	187	187	187	187	220
Utilization categories		B									
Operating time (ms)	Opening (max.)	40									
	Closing (max.)	80									
Mechanical lifespan (number of operations)	Without maintenance	12,500	12,500	20,000	20,000	15,000	15,000	15,000	10,000	10,000	10,000
	With maintenance[1]	12,500	12,500	30,000	30,000	20,000	20,000	20,000	15,000	15,000	15,000
Electrical lifespan (number of operations)	Without maintenance	6,000	6,000	5,000	5,000	5,000	5,000	5,000	2,000	2,000	2,000
	With maintenance[1]	6,000	6,000	10,000	10,000	10,000	10,000	10,000	5,000	5,000	5,000
Altitude (m)		≤2,000[2]									
Ambient temperature	Operation	-5...40 °C[3]									
	Storage	-20...60 °C									
Weight (kg)[4]	Withdrawable	38	38	61	61	85	85	85	143	143	184
	Fixed	16	16	32	32	42	42	42	74	74	101
Connection terminals - withdrawable/fixed	Horizontal	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	Vertical	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional	Optional
External dimensions H x W x D (mm)	Withdrawable	364 x 272 x 269	364 x 272 x 269	430 x 334 x 375	430 x 334 x 375	430 x 412 x 375	430 x 412 x 375	430 x 412 x 375	430 x 629 x 375	430 x 629 x 375	430 x 785 x 375
	Fixed	322 x 272 x 198	322 x 272 x 198	300 x 300 x 295	300 x 300 x 295	300 x 378 x 295	300 x 378 x 295	300 x 378 x 295	300 x 597 x 295	300 x 597 x 295	300 x 751 x 295

Notes: 1) According to the maintenance routines indicated in the manual.
2) For installation above 2,000 m from sea level, please consider the voltage and current derating factors, as shown in the chart below.
3) For ambient temperature above 40 °C, check maximum rated current values in the chart below.
4) It may vary according to the configuration of optional accessories.

General characteristics

Tightening torque					
Tightening torque of the busbars at the rear terminals for all circuit breaker models	Screw	Torque (kgf.cm)	Tolerance	Torque (N.m)	Tolerance
	M8	135	±16	13.3	±1.6
	M10	270	±32	26.5	±3.2
	M12	480	±57	46.6	±5.6

Ratio-corrector factor

Altitude - h	Rated operational voltage (V)	Insulation voltage (V)	Rated current reduction factor
h ≤2,000 m	690	1,000	1.00
2,000 < h ≤3,000 m	590	900	0.99
3,000 < h ≤4,000 m	520	700	0.96
4,000 < h ≤5,000 m	460	600	0.94

Ambient temperature	Horizontal position terminal - Temperature (°C) x Current (A)									
	ABWC08	ABWC16	ABW08	ABW16	ABW20	ABW25	ABW32	ABW40	ABW50	ABW63
40 °C	800	1,600	800	1,600	2,000	2,500	3,200	4,000	5,000	6,300
45 °C	800	1,600	800	1,600	2,000	2,500	3,200	4,000	5,000	6,300
50 °C	800	1,600	800	1,520	2,000	2,500	3,100	3,920	4,900	6,170
55 °C	800	1,550	800	1,480	2,000	2,400	3,000	3,860	4,800	6,040
60 °C	800	1,500	800	1,420	2,000	2,300	2,900	3,800	4,700	5,900
65 °C	800	1,450	800	1,240	1,900	2,220	2,600	3,650	4,000	5,020
70 °C	800	1,390	800	1,180	1,800	2,140	2,460	3,500	3,800	4,780

Ambient temperature	Vertical position terminal - Temperature (°C) x Current (A)									
	ABWC08	ABWC16	ABW08	ABW16	ABW20	ABW25	ABW32	ABW40	ABW50	ABW63
40 °C	800	1,600	800	1,600	2,000	2,500	3,200	4,000	5,000	6,300
45 °C	800	1,600	800	1,600	2,000	2,500	3,200	4,000	5,000	6,300
50 °C	800	1,600	800	1,580	2,000	2,500	3,120	3,960	4,950	6,220
55 °C	800	1,600	800	1,550	2,000	2,500	3,050	3,900	4,900	6,160
60 °C	800	1,600	800	1,500	2,000	2,400	2,950	3,880	4,850	6,100
65 °C	800	1,550	800	1,320	2,000	2,320	2,650	3,750	4,150	5,220
70 °C	800	1,500	800	1,260	2,000	2,240	2,530	3,620	3,950	4,980

Internal resistance and dissipated power[1]

Circuit breaker	Rated current (A)	Fixed version		Withdrawable version	
		Internal resistance (mΩ)	Dissipated power (W/3 fases)	Internal resistance (mΩ)	Dissipated power (W/3 fases)
ABWC08	800	0.02	38	0.035	67
ABWC16	1,600	0.02	154	0.035	269
ABW08	800	0.02	38	0.04	77
ABW16	1,600	0.02	154	0.04	307
ABW20	2,000	0.013	156	0.027	324
ABW32	3,200	0.01	307	0.02	614
ABW40	4,000	0.008	384	0.011	528
ABW50	5,000	0.008	600	0.011	825
ABW63	6,300	0.005	595	0.007	833

Note: 1) Power factor 1.

Coding

ABWC16 DN 3 - 16 AZ1 F - C 0 2 2 0

Maximum current	
08	800 A
16	1,600 A

Phase sequence	
DN	p/ 1,600 A - RST (N)

Rated current	
08	800 A
16	1,600 A

Number of poles	
3	3P

Version	
F	Fixed
E	Withdrawable
FF	Fixed - Front

Standard auxiliary contacts	
C	4 NOC
Optional (withdrawable version)	
D	4 NOC with position contacts

Protection unit	
Standard unit	
AZ1	LSIG + current - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
Optional units	
000	No protection unit
AZ6	LSIG + current - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AZ2	LSIG + current - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
AZ7	LSIG + current - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
AF1	LSI + earth leakage + current - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
AF6	LSI + earth leakage + current - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AF2	LSI + earth leakage + current - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
AF7	LSI + earth leakage + current - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
AC1	LSIG + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
AC6	LSIG + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AC2	LSIG + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
AC7	LSIG + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
PC1	LSIG + voltage + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
PC6	LSIG + voltage + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
PC2	LSIG + voltage + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
PC7	LSIG + voltage + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 50 Hz

Accessories	
	No accessories
B	ON/OFF button lock
K	Key lock
K2	Key interlock
M	Mechanical interlock for 2 circuit breakers[1]
M3	Mechanical interlock for 3 circuit breakers[1]
D	Door interlock
BK	B+K
B2	B+K2
BM	B+M
BD	B+D
KM	K+M
KD	K+D
CP	Profibus communication
CM	Modbus communication
R	Ready to close contact

Undervoltage release	
Standard	
0	No release
Optional	
1	100~130 Vac/dc
2	200~250 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vac
6	200~250 Vac/dc with delay
7	100~130 Vac/dc with delay
8	48~60 Vac/dc with delay
9	380~480 Vac with delay

Standard opening coil	
2	200~250 Vac/dc
Optional	
0	No release
1	100~130 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vac

Standard closing coil	
2	200~250 Vac/dc
Optional	
0	No release
1	100~130 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vdc

Motorized operator	
Standard	
0	No motor operator
Optional	
1	100~130 Vac/dc
2	200~250 Vac/dc
3	24~30 Vdc

Accessories supplied as optional items	
Motorized operator	Door frame
Undervoltage release	Transparent cover
Condenser trip device	Mechanical interlock
Key lock	Door interlock
Key interlock	Position auxiliary contact

Accessories supplied as standard for the entire range
Auxiliary contacts (4NO+4NC)
Alarm contacts
Opening coil 200~250 Vac/dc
Closing coil 200~250 Vac/dc
Operation counter
Position locking with padlock (padlock not included) - withdrawable version
Position indicator (Inserted /Test/ Withdrawn) - withdrawable version

Notes: 1) 2 circuit breakers are already considered for mechanical interlock M.
   3 circuit breakers are already considered for mechanical interlock M3.
   2) For communication via Profibus network, it is necessary to use the ABW-CP accessory.
   For communication via Modbus network, see the Communication section of this catalog.

Coding

ABW 16 DN 3 - 16 AH1 F - A 0 2 2 0

Maximum current	
08	800 A
16	1,600 A
20	2,000 A
25	2,500 A
32	3,200 A
40	4,000 A
50	5,000 A
63	6,300 A

Phase sequence	
DN	p/ 1,600 A - RST (N)
ES	p/ 2,000~3,200 A - RST (N)
FS	p/ 4,000~5,000 A - RST (N)
GS	p/ 6,300 A - RST (N)

Number of poles	
3	3P

Rated current	
08	800 A
16	1,600 A
20	2,000 A
25	2,500 A
32	3,200 A
40	4,000 A
50	5,000 A
63	6,300 A

Version	
F	Fixed
E	Withdrawable

Standard auxiliary contacts	
A	5NO+5NC
Optional (withdrawable version)	
B	5NO+5NC with position contacts

Accessories	
	No accessories
B	ON/OFF button lock
K	Key lock
K2	Key interlock
M	Mechanical interlock for 2 circuit breakers[1]
M3	Mechanical interlock for 3 circuit breakers[1]
D	Door interlock
BK	B+K
B2	B+K2
BM	B+M
BD	B+D
KM	K+M
KD	K+D
CP	Profibus communication
CM	Modbus communication

Protection unit	
Standard unit	
AH1	LSIG + current - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
Optional units	
000	No protection unit
AH6	LSIG + current - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AH2	LSIG + current - electronics power supply 24~48 Vdc and measurement frequency 60 Hz LSI
AH7	LSIG + current - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
AU1	LSI + earth leakage + current - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
AU6	LSI + earth leakage + current - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AU2	LSI + earth leakage + current - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
AU7	LSI + earth leakage + current - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
AD1	LSIG + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
AD6	LSIG + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
AD2	LSIG + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
AD7	LSIG + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 50 Hz
PS1	LSIG + voltage + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 60 Hz
PS6	LSIG + voltage + current + communication[2] - electronics power supply 100~250 Vac/dc and measurement frequency 50 Hz
PS2	LSIG + voltage + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 60 Hz
PS7	LSIG + voltage + current + communication[2] - electronics power supply 24~48 Vdc and measurement frequency 50 Hz

Undervoltage release	
Standard	
0	No release
Optional	
1	100~130 Vac/dc
2	200~250 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vac
6	200~250 Vac/dcc with delay
7	100~130 Vac/dc with delay
8	48~60 Vac/dc with delay
9	380~480 Vac with delay

Standard opening coil	
2	200~250 Vac/dc
Optional	
0	No release
1	100~130 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vac

Standard closing coil	
2	200~250 Vac/dc
Optional	
0	No release
1	100~130 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380~480 Vdc

Motorized operator	
Standard	
0	No motor operator
Optional	
1	100~130 Vac/dc
2	200~250 Vac/dc
3	24~30 Vdc
4	48~60 Vac/dc
5	380 Vac
6	480 Vac

Accessories supplied as standard for the entire range
Auxiliary contacts (5NO+5NC)
Alarm contacts
Opening coil 200~250 Vac/dc
Closing coil 200~250 Vac/dc
Operation counter
Position locking with padlock (padlock not included) - withdrawable version
Position indicator (Inserted /Test/ Withdrawn) - withdrawable version
Contact ready to close (RTC)

Accessories supplied as optional items	
Motorized operator	Door frame
Undervoltage release	Transparent cover
Condenser trip device	Mechanical interlock
Key lock	Door interlock
Key interlock	Position auxiliary contact

Notes: 1) 2 circuit breakers are already considered for mechanical interlock M.
　　　　3 circuit breakers are already considered for mechanical interlock M3.
　　2) For communication via Profibus network, it is necessary to use the ABW-CP accessory.
　　　　For communication via Modbus network, see the Communication section of this catalog.

Accessories

Auxiliary contacts

They indicate the circuit breaker status, ON or OFF. For ABW there are 5 Axa contacts (NO) and 5 Axb contacts (NC) and for ABWC there are 4 Axc contacts (NOC).

Configuration		Resistive load	Inductive load
Switching capacity (A)	125 Vac	10	6
	250 Vac	10	6
	460 Vac	5	6
	30 Vdc	10	6
	125 Vdc	0.6	0.6
	250 Vdc	0.3	0.3

Auxiliary contact
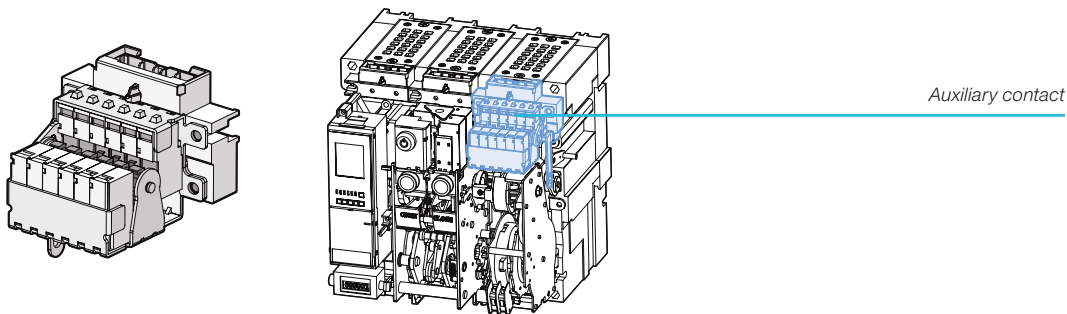
Alarm contacts

These contacts are incorporated in the protection units and indicate the occurrence of a trip by any of the protection functions. The contacts are Alarm 1, Alarm 2 and Contacts 524, 534 and 544.

Configuration	2NO (generic) + 4NO (individual)
Switching capacity (A)	250 Vac	5
	380 Vac	3
	30 Vdc	5
	125 Vdc	1
Minimum application levels	5 Vdc / 10 mA

Accessories

Closing coil

This coil allows closing the circuit breaker by means of electrical control. This remote control is valid only if the springs of the operating mechanism are charged. This accessory is supplied as standard at voltage 250 V$_{AC}$/V$_{DC}$. The closing coils are interchangeable with the ABWC line.

Characteristics		Specification				
Reference		ABW-BF C34	ABW-BF E27	ABW-BF E10	ABW-BF E12	ABW-BF D85
Code		11193568	11193767	11193789	11193790	11193795
Power supply		24~28 V$_{DC}$	48~60 V$_{AC/DC}$	100~130 V$_{AC/DC}$	200~250 V$_{AC/DC}$	380~480 V$_{AC}$
Operation voltage		0.75...1.1 x Un				
Consumption (VA)	Energization	200				
	Steady-state	5				
Closing time (ms)		≤80				
Anti-pumping characteristic		Yes, through electronic circuit				
Minimum supply time for operation (ms)		200				

Standard	
Power supply	Reference
200...250 V$_{AC/DC}$	ABW-BF E12

Closing coil
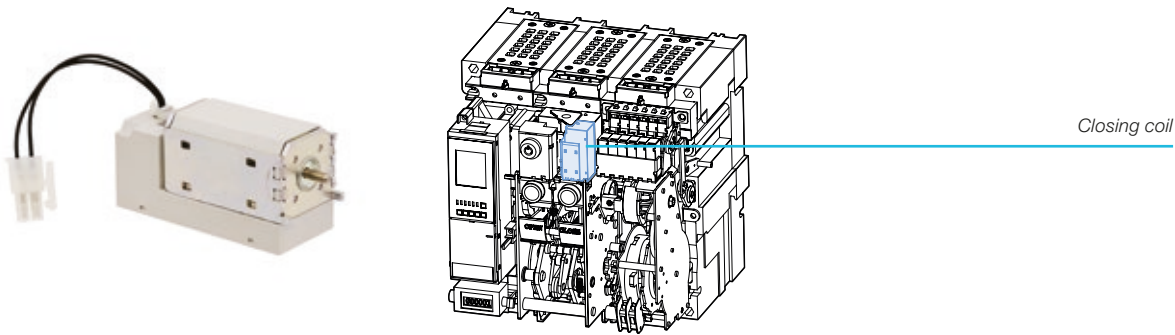
Accessories

Opening coil

This coil allows opening the circuit breaker by means of electric control. This accessory is supplied as standard at voltage 250 V$_{AC}$/V$_{DC}$. The opening coils are interchangeable with the ABWC line.

Standard	
Power supply	Reference
200...250 V$_{AC/DC}$	ABW-BA E12

Characteristics		Specification				
Reference		ABW-BA C34	ABW-BA E27	ABW-BA E10	ABW-BA E12	ABW-BA D85
Code		11193796	11193875	11193879	11193880	11193881
Power supply		24~28 V$_{DC}$	48~60 V$_{AC/DC}$	110~130 V$_{DC}$	200~250 V$_{DC}$	380~480 V$_{AC}$
Operation voltage		0.75...1.1 x Un				
Consumption (VA)	Energization	200				
	Steady-state	5				
Opening time (ms)		≤40				
Anti-pumping characteristic		Yes, through electronic circuit				
Minimum supply time for operation (ms)		200				
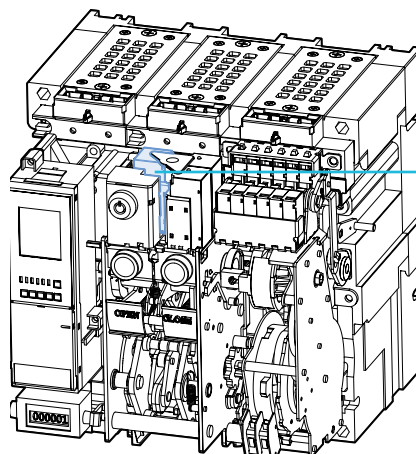
Opening coil

Motor operator

The motorized drive is used for the automatic charging of the springs of the circuit breaker operating mechanism. The operation begins immediately after the circuit breaker opens and, at the end of this process, an auxiliary contact indicates that the springs are charged. Even if the motorized drive is installed, it is also possible to charge the springs manually through the front lever. The standard circuit breaker allows charging the spring in the ON position.

Characteristics	Specification								
Reference	ABW-AM E10	ABWC-AM E10	ABW-AM E12	ABWC-AM E12	ABW-AM C34	ABWC-AM C34	ABW-AM E27	ABW-AM D33	ABW-AM D74
Code	11193480	14794817	11193484	14794848	11193457	14794850	11193478	11193486	11193487
Power supply	100~130 V$_{DC/AC}$	100~130 V$_{DC/AC}$	200~250 V$_{AC/DC}$	200~250 V$_{AC/DC}$	24~28 V$_{DC}$	24~28 V$_{DC}$	48~60 V$_{AC/DC}$	380 V$_{AC}$	440 V$_{DC}$
Rated current (A)	1	1	0.5	0.5	5	5	3	0.3	0.3
Starting current (A)	5 x rated current								
Motor speed (rpm)	1,500~1,900 rpm								
Charge time (for spring charging) (s)	≤5								
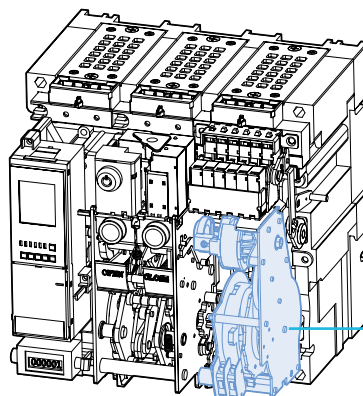
Motorized operator

Accessories

Charged spring auxiliary contact

It is supplied incorporated to the motorized drive. This auxiliary contact sends a signal when the motor is charged. It has two open contacts: 1 used for communication in general, and the other used for springs charged indication.

Undervoltage release

It automatically disconnects the circuit breaker in cases of undervoltage or phase loss. Interchangeable with the ABWC line.

Characteristics		Specification				
Reference		ABW-UVT E10	ABW-UVT E12	ABW-UVT E55	ABW-UVT C34	ABW-UVT E27
Code		11193884	11193888	11193854	11193882	11193883
Power supply		100~130 Vac/dc	200~250 Vac/dc	380~480 Vac	24~28 Vdc	48~60 Vac/dc
Operation voltage range		0.65...0.85 x Un				
Drop-out voltage range		0.4...0.6 x Un				
Trip time (instantaneous)		≤50ms				
Consumption (VA or W)	Energization	200				
	Steady-state	5				
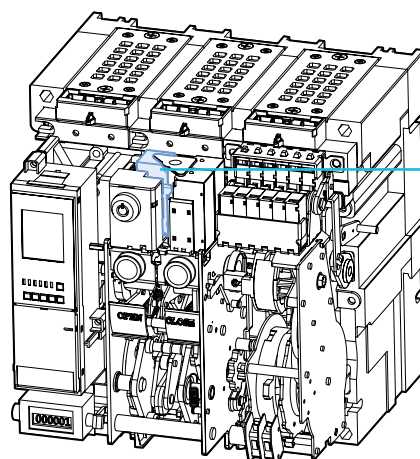
Undervoltage release

Undervoltage time delay module

It delays the opening of the circuit breaker after the command from the undervoltage release. Interchangeable with the ABWC line.

Characteristics		Specification			
Reference		ABW-UDC E10	ABW-UDC E12	ABW-UDC E55	ABW-UDC E27
Code		11193451	11193452	11193453	11193406
Power supply		100~130 Vac/dc	200~250 Vac/dc	380~480 Vac	48~60 Vac/dc
Operation voltage range		0.65...0.85 x Un			
Drop-out voltage range		0.4...0.6 x Un			
Time delay (s)		0.5 - 1 - 1.5 - 3			
Consumption (VA)	Energization	200			
	Steady-state	5			

Wiring diagram
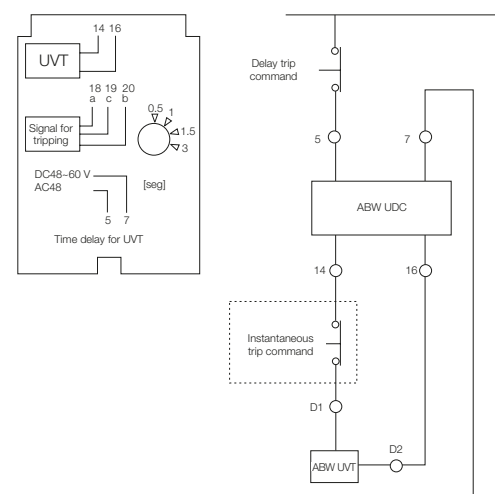
Note: 18 = Common
19 = Normally Closed
20 = Normally Open.

Accessories

ABW position auxiliary contact

It is a contact that indicates the current position of the ABW (CONNECTED, TEST, DISCONNECTED).
(Common use for all models.)
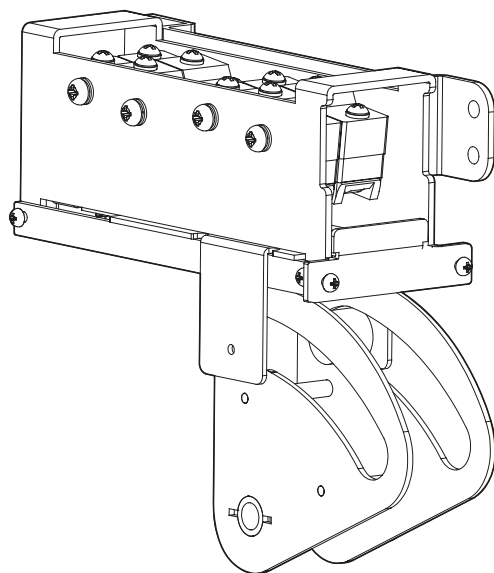
Operating characteristics

ABW position		Disconnected		Connected
		Disconnected	Test	Connected
Contact operation	CL1, CL2 (Connected)	OFF		ON
	CL3 (TEST)	OFF	ON	
	CL4 (Disconnected)	ON	OFF	
Contact capacity	Voltage (V)		Resistive load	Inductive load
	AC	460	5	2.5
		250	10	10
		125		
	DC	250	3	1.5
		125	10	6
		30	10	10

com. 341 — CL4 — 342 NC / 344 NO
com. 331 — CL3 — 332 NC / 334 NO
com. 321 — CL2 — 322 NC / 324 NO
com. 311 — CL1 — 312 NC / 314 NO

com. 381 — CL4 — 382 NC / 384 NO
com. 371 — CL3 — 372 NC / 374 NO
com. 361 — CL2 — 362 NC / 364 NO
com. 351 — CL1 — 352 NC / 354 NO
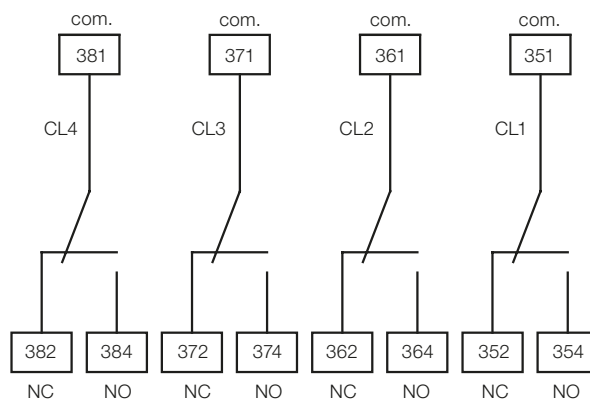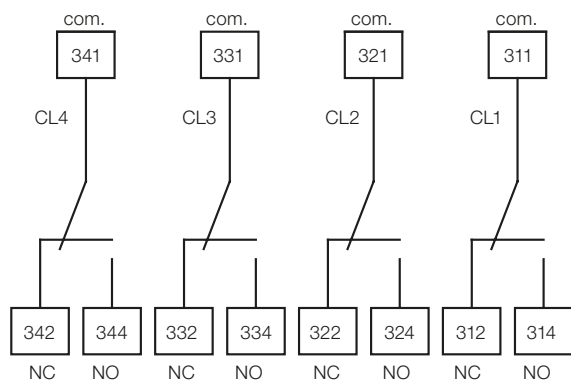
Installation method

Install the position auxiliary contact on the right plate, as shown in the figure, since it is interlocked with the main shaft in the truck.
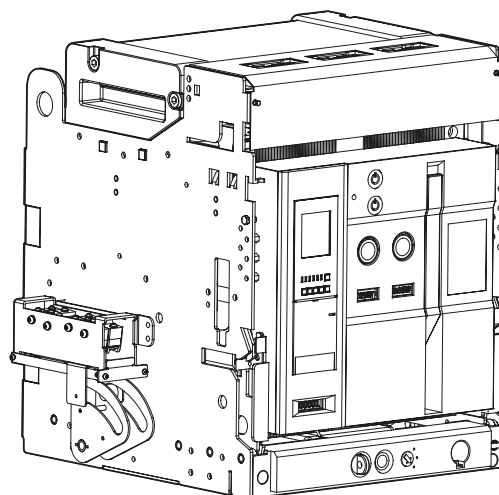
Accessories

ABWC position auxiliary contact

ABWC position auxiliary contact

■ It is a contact that indicates the curren position of the ABWC (CONNECTED, TEST, DISCONNECTED)

Operating characteristics

ABWC position			Disconnected		Connected
			Disconnected	Test	Connected
Contact operation		CL1, CL2 (Connected)	OFF		ON
		CL3 (TEST)	OFF	ON	
		CL4 (Disconnected)	ON	OFF	
Contact capacity		Voltage (V)	Resistive load		Inductive load
	AC	460	5		2.5
		250	10		10
		125			
	DC	250	3		1.5
		125	10		10
		30	10		

com. 341 — CL4 — 342 (NC) 344 (NO)

com. 331 — CL3 — 332 (NC) 334 (NO)

com. 321 — CL2 — 322 (NC) 324 (NO)

com. 311 — CL1 — 312 (NC) 314 (NO)

com. 381 — CL4 — 382 (NC) 384 (NO)

com. 371 — CL3 — 372 (NC) 374 (NO)

com. 361 — CL2 — 362 (NC) 364 (NO)

com. 351 — CL1 — 352 (NC) 354 (NO)
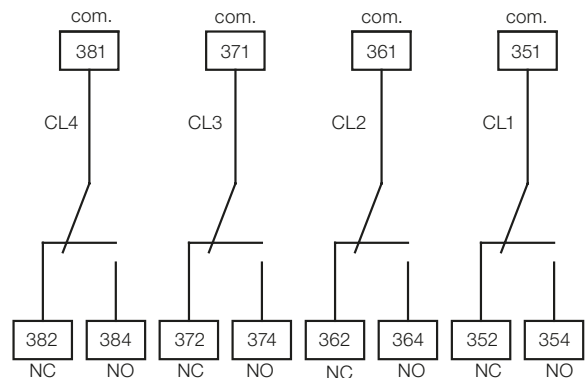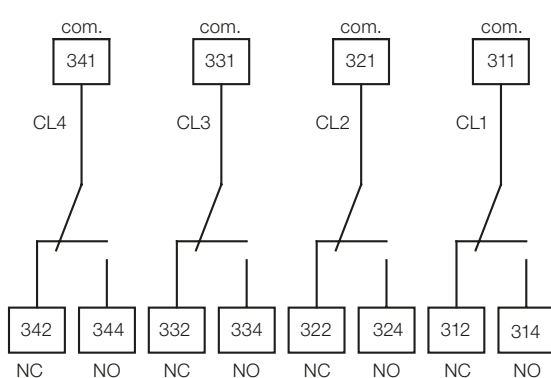
Accessories

Key lock

It locks the circuit breaker in the OFF position.

Circuit breakers	Reference	Code
ABW 08...63	ABW-BK1	11194682
ABWC 08...16	ABWC-BK1	14795246

Key interlock

It allows the interlock of three circuit breakers in the configuration below:

Circuit breakers	Reference	Code
ABW 08...63	ABW-IK2	11194685
ABWC 08...16	ABWC-IK2	14802482

■	Release/ circuit breaker ON
■	Lock/ circuit breaker OFF

Circuit breaker (1)	Circuit breaker (2)	Circuit breaker (3)	Status	
			Load 1	Load 2
■	■	■	OFF	OFF
■	■	■	ON	ON
■	■	■	ON	ON
■	■	■	ON	ON
■	■	■	OFF	OFF
■	■	■	OFF	ON
■	■	■	ON	OFF
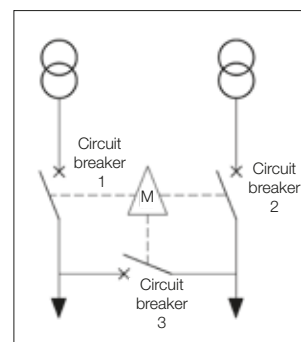
Notes: 1) When the key releases the circuit breaker, it is not possible to remove it from the interlock. Only in this position is it possible to close the circuit breaker.
2) It is not possible to actuate the air circuit breaker locally or remotely (by closing coil) with the key interlock actuated. The key is able to be removed only when the interlock in actuated.

Accessories

Position locked by padlock

ON/OFF button lock
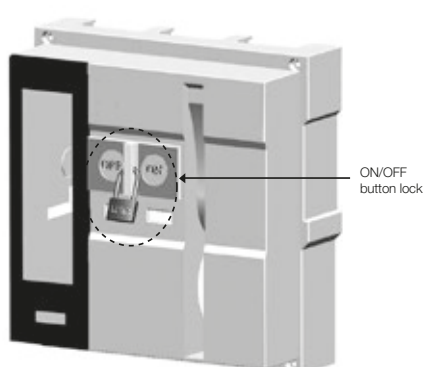
It allows locking the access to the circuit breaker ON and OFF buttons.

Circuit breakers	Reference	Code
ABW08...63	ABW-BB	11194681
ABWC08...16	ABWC-BB	14795244

Rear terminals

ABW and ABWC circuit breakers can be supplied with the terminals in the Horizontal (Standard) or Vertical (Optional) position. To change the terminals from horizontal to vertical on models ABWC and ABW up to 3,200 A, the terminal is simply rotated and tightened according to the tightening torque table on page 10.

For models ABW40, ABW50 and ABW63, the terminals need to be replaced with different models to allow their rotation. Below are the codes for the vertical terminal models.

Circuit breakers	Reference	Code
ABW40...50	ABW4000/5000 3P	11965750
ABW63	ABW6300 3P	11965751

Condenser trip device

This device electrically trips the circuit breaker within a preset time when the control power is OFF. It discharges a capacitor by directly operating the opening coil. It includes a lamp to indicate whether the capacitor is charged and a discharge button. Installation on panel door.

Characteristics	Specification	
Reference	ABW-CTD D58	ABW-CTD D64
Power supply (V_{AC})	100...110	200...220
Operation voltage	0.85...1.1 x Un	
Frequency (Hz)	50/60	
Charging time (s)	Up to 5 seconds	
Possible trip time (m)	Up to 3 minutes	Up to 2 minutes
Code	11193370	11193376

Accessories

Wiring diagram
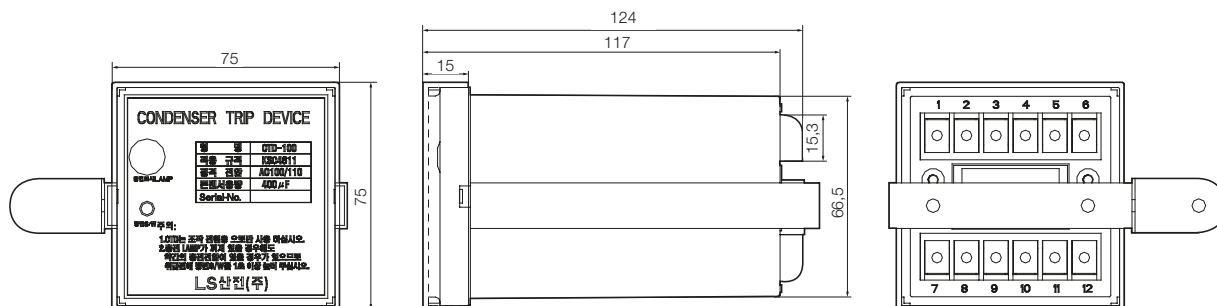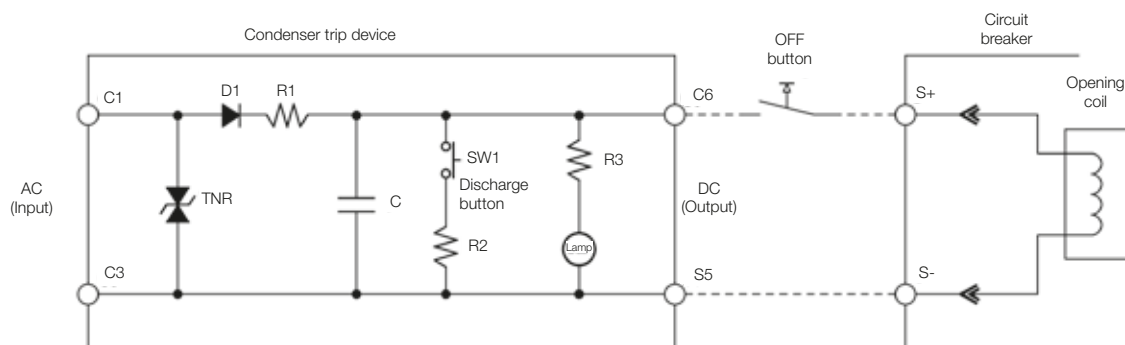
Door frame

Door frame. Supplied in the fixed and withdrawable versions.

Circuit breakers	Model	References	Code
ABW08...63	Fixed	ABW-DFF	11321382
ABW08...63	Withdrawable	ABW-DFE	11195048
ABWC08...16	Fixed	ABWC-DFF	14795247
ABWC08...16	Withdrawable	ABWC-DFE	14795328
Degree of protection	IP3X		
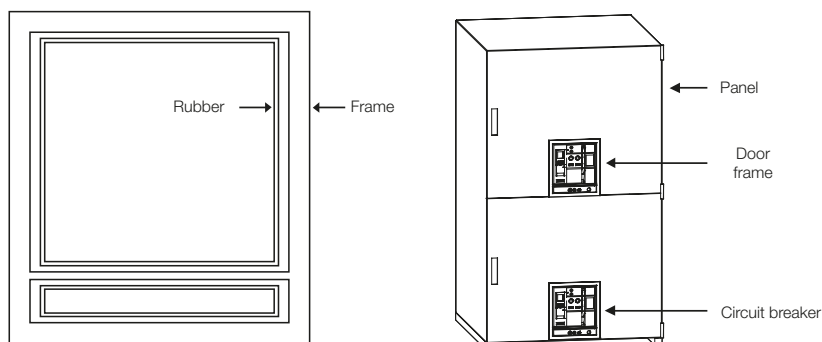
Accessories

Door frame

Installation method

Insert the door frame into the panel door cut-out and secure it with 10 M5 screws.

Transparent cover
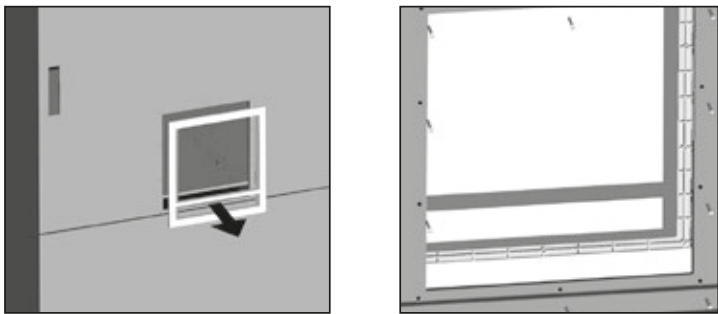
Dust cover — Door frame — Panel door
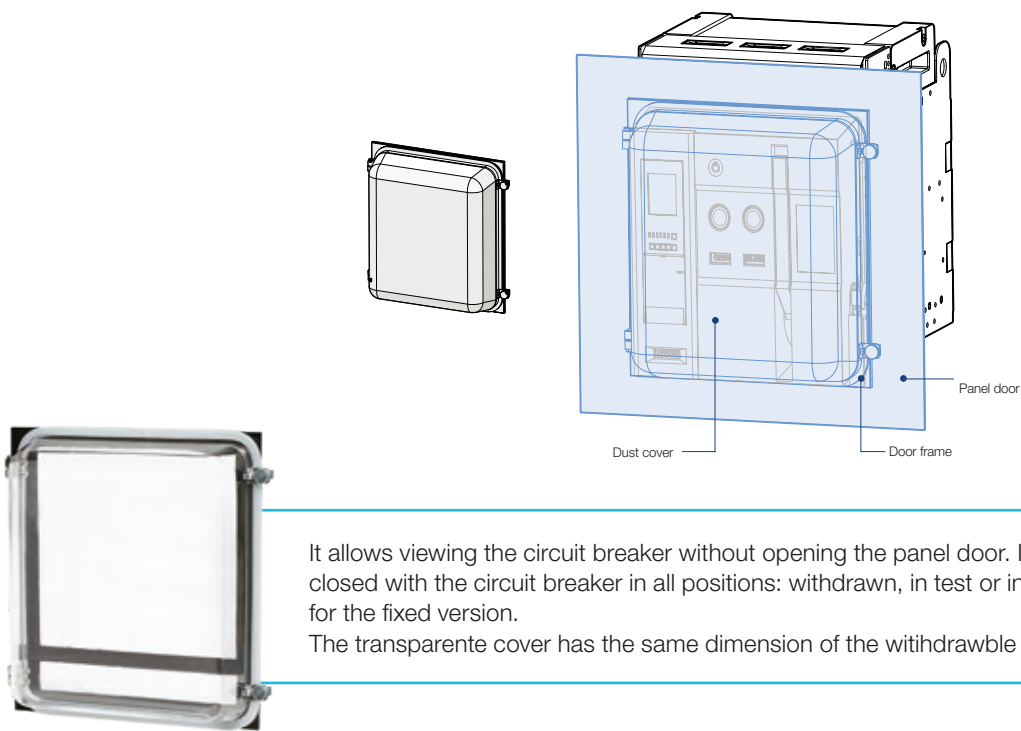
It allows viewing the circuit breaker without opening the panel door. It can be opened or closed with the circuit breaker in all positions: withdrawn, in test or in operation. Also used for the fixed version.
The transparente cover has the same dimension of the witihdrawble door frame model DFE.

	Circuit breakers	References	Code
	ABW08...63	ABW-DC	11195053
	ABWC08...16	ABWC-DC	14802564
Degree of protection	IP5X[1][2]		

Notes: 1) Protection only against dust, which is the agent that causes faults in this type of product and installation.
2) The Transparent Cover can be closed even if the withdrawable circuit breaker is in the test position.

Accessories

Mechanical interlock
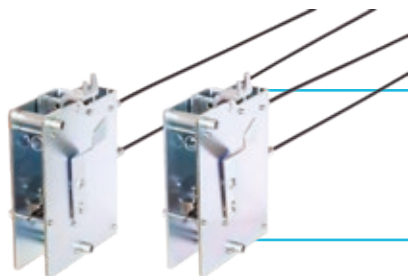
It enables two or three circuit breakers to be mechanically interlocked with cables, controlling the closing and trip operations mutually.

Circuit breakers	Quantity of circuit breakers	Reference	Code
ABW08/16/40/50	2	ABW-IM1 2D/F	11194710
ABW20/25/32/63	2	ABW-IM2 2E/G	11194711
ABW08/16/40/50	3	ABW-IM1 3D/F	11194713
ABW20/25/32/63	3	ABW-IM2 3E/G	11194717
ABWC08/16	2	ABWC-IM1 2D/F	14802487
ABWC08/16	3	ABWC-IM1 3D/F	14802509

For mechanical interlock between two circuit breakers, consider the following interlock options:

1	2
O	O
I	O
O	I
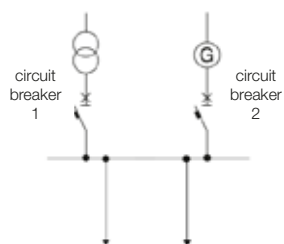
0: circuit breaker OFF
I: circuit breaker ON
It allows the configuration of a circuit breaker ON and a circuit breaker OFF and vice versa.
The mechanical interlock cables length are 1.6 m.
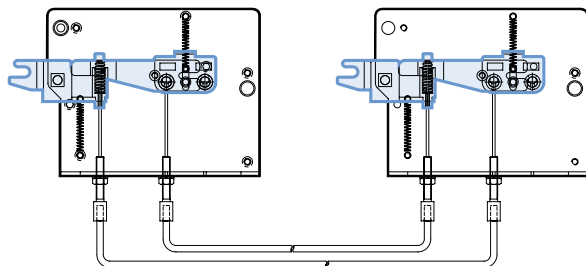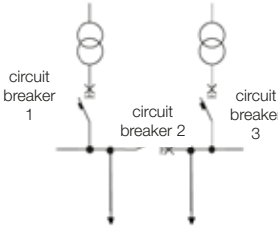
Accessories

Mechanical interlock

For mechanical interlock between three circuit breakers, consider the following interlock options:

1	2	3
O	O	O
I	O	O
I	I	O
O	I	I
O	O	I
I	O	I
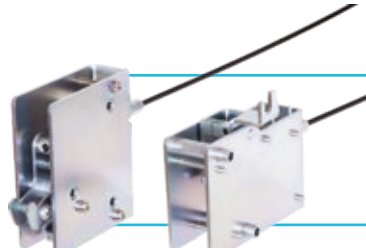
0: circuit breaker OFF
I: circuit breaker ON
It allows the status of two circuit breakers ON and a circuit breaker OFF.
The mechanical interlock cables length between circuit breaker 1 and 2 is 1.3m and between circuit breaker 2 and 3 is 1.3 m.

circuit breaker 1

circuit breaker 2
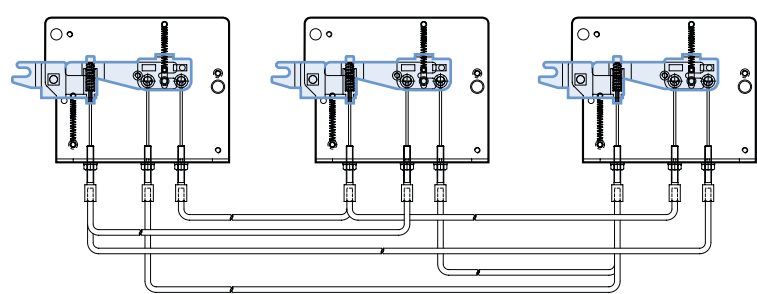
circuit breaker 3

Door interlock

It prevents the panel door from being opened while the circuit breaker is ON.

Circuit breaker	Reference	Code
ABW08...63	ABW-DI	11195050
ABWC08/16	ABWC-DI	14805726
Cable length (m)	1.6	

Install on the side plate of the ABC truck

Install on the panel door
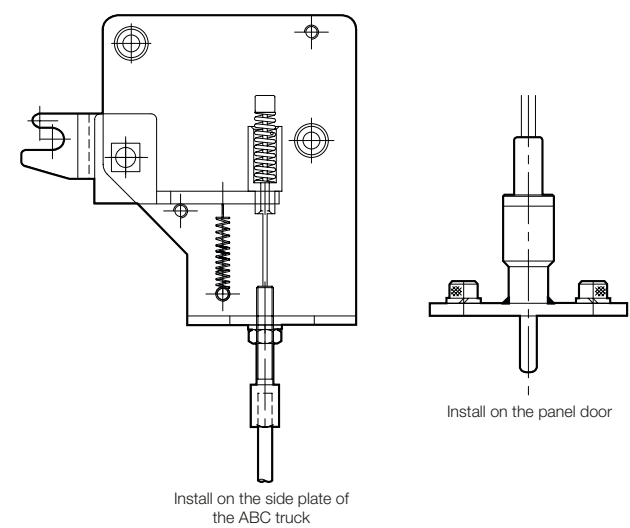
Accessories

Communication module

The communication module is an optional item that has an I/O unit, enabling the circuit breaker remote operation. All ABW and ABWC circuit breakers, with protection units A and P, are able to communicate via network, allowing the user to verify the status of the circuit breaker and operate it through a Modbus or Profibus-DP network.

The communication module can be installed either on the circuit breaker withdrawable rack (withdrawable version) or on a DIN rail.

1. Modbus/RS485 communication: two types of Modbus communication are available:
   - Reading: for an only-reading communication, the circuit breaker must be installed as slave, and another device as master; it is not necessary to purchase the ABW-CM accessory (supplied as an optional item).
   - Control/writing: for a control Modbus communication, it is necessary to install the ABW-CM accessory (supplied as optional item).
2. Profibus-DP communication: for a Profibus network communication (reading or writing), it is necessary to install the ABW-CP accessory (supplied as an optional item), which allows the user to check the circuit breaker status and operate it.

Classification		Range	Note
Circuit breaker control	Contact switching capacity	230 Vac 16 A / 30 Vdc 16 A	-
	Max. switching power	3,680 VA / 480 W	-
Alarm	Contact switching capacity	230 Vac 6 A / 25 Vdc 6 A	Load introduction (cosØ = 0.4, L/R = 7ms)
	Max. switching power	1,880 VA / 150 W	

Wiring diagram with the ABW-CP and ABW-CM modules:

Circuit breakers	Reference	Code
ABW08...63	ABW-CP	11193400
ABWC08...16		
ABW08...63	ABW-CM	11193398
ABWC08...16		
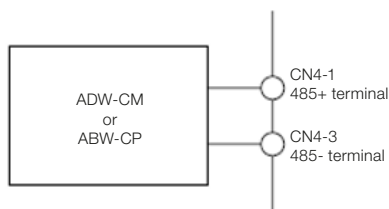
Remote I/O unit
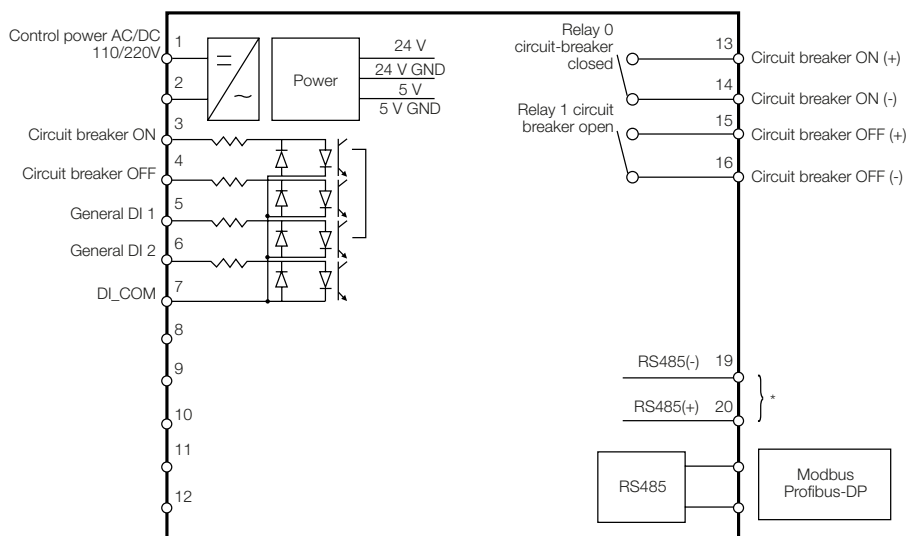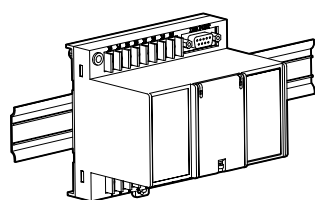
Note: if using Profibus-DP communication, it must communicate with the circuit breaker trip relay.

Accessories

Communication module

- The remote I/O unit has the I/O contact that can remotely trip or close the ACB via communication.
- For the general DO, the output of DI1 or DI2 is selectable.
- The remote I/O unit communicates basically via Modbus/RS485; Profibus-DP has to be purchased separately.
- It supports the SBO (Select Before Operation) function and ensures control reliability.
- The remote I/O unit can be installed on the ACB truck or inside the panel.

- Baud rate settings
- Communication address settings
- Temperature settings

LED		Status
1	DI1	Indicates the condition of digital input 1
2	DI2	Indicates the condition of digital input 2
3	DO ON	Indicates that the temperature alarm output is ON
4	DO OFF	Indicates that the temperature alarm output is OFF
5	Circuit breaker ON	Indicates the closed circuit breaker condition
6	Circuit breaker OFF	Indicates the open circuit breaker condition
7	Operation LED	Indicates the operating condition of the unit
8	Circuit breaker ERROR	Indicates a disconnection/circuit breaker terminal control error condition

Insulation barrier (IB)

The insulation barrier is an accessory that increases the insulation characteristics between the phases.
- In fixed circuit breakers, the insulation barrier must be installed in direction A, as shown in the figure below.
- In withdrawable circuit breakers, the insulation barrier must be installed in direction C, as shown in the figure below.

Circuit breakers	Reference	Code
ABW08-63	ABW-IB	11194726
ABWC08...16	ABWC-IB-E	11194726
ABWC08...16	ABWC-IB-F	14825646
ABWC08...16	ABWC-IB-FF	14825645

Fixed circuit breaker
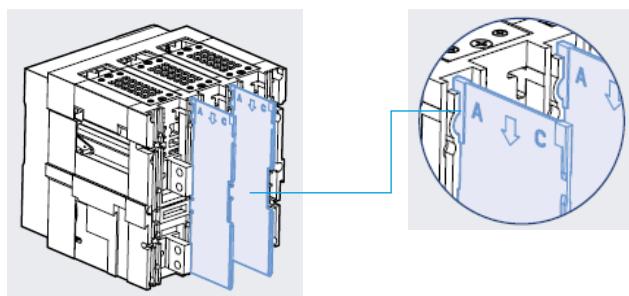
Withdrawable circuit breaker
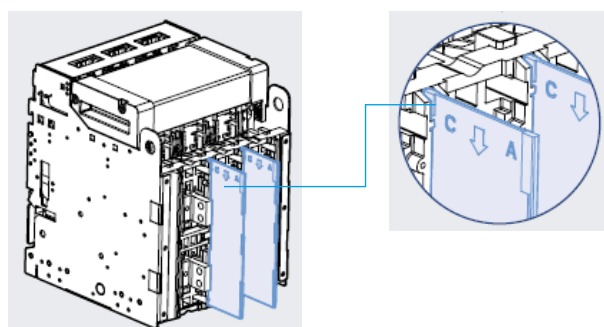
Accessories

Zero arc space (ZAS)

The zero arc space is an accessory used to increase the application safety. It extinguishes the electric arc generated to the external environment.

Circuit breaker	Reference	Code
ABW16	CAMARA EXTINCAO ZERO ARCO ABW-ZAS 16	13443038
ABW32	CAMARA EXTINCAO ZERO ARCO ABW-ZAS 32	13443039
ABW50	CAMARA EXTINCAO ZERO ARCO ABW-ZAS 50	13443040
ABW63	CAMARA EXTINCAO ZERO ARCO ABW-ZAS 63	13443042

Note: accessory only applicable to withdrawable circuit breakers.

Zero Arc Space (ZAS)
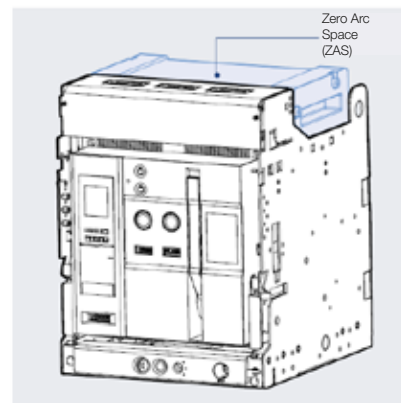
Current transformer (toroid)

The leakage current can be set from 0.5 A to 30 A according to the table below; the fault protection must be disabled.

Earth leakage (optional)												
Current setting (A)	I∆n		0.5	1	2	3	5	10	20	30	OFF
Time delay (ms) Accuracy ± 15%	∆t	Alarm time	140	230	350	800	950	-	-	-	-
		Trip time	140	230	350	800	-	-	-	-	-

Reference	Current	Code
ABW-ZCT-120	1,000 A	11195018
ABW-ZCT-200	2,000 A	11195019

Dimensions

WEG CT (ratio 30/5 A)
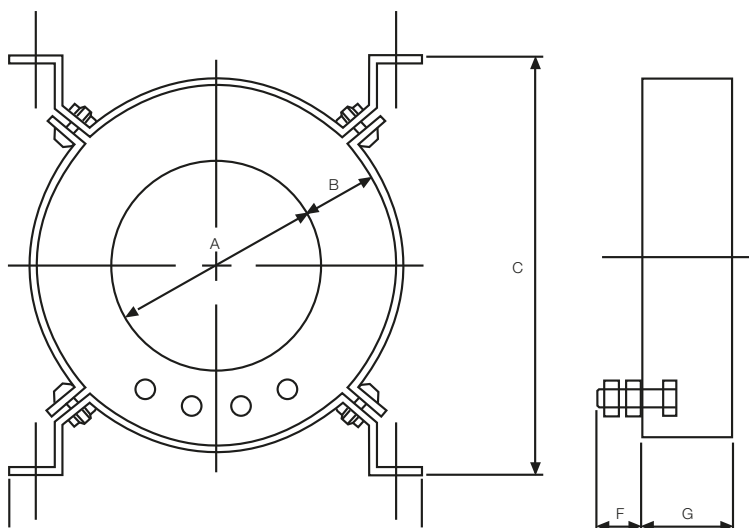
Available in two models:

Model	A	B	C	D	E	F	G	H
ZCT-120	120	45	225	180	210	20	55	35
ZCT-200	200	53	310	260	286	20	70	35

Accessories

Protection units

On the ABW and ABWC air circuit breakers, the ABW-OCR microprocessed electronic protection units perform the protections. The OCR AZ1 is standard for ABWC and OCR AH1 is standard for ABW and offers protection against overload (L), timed short circuit (S), instantaneous short circuit (I) and ground fault (G)—functions which are set on the front dials. Other models are supplied as optional accessories, allowing network communication, voltage measurement, earth leakage protection (external CT required - supplied as optional accessory) and other protections.

Circuit breaker model	Code	Reference	Protection unit supply voltage	Protection unit measurement frequency	
ABWC	14794814	ABWC-AZ1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + current reading
		ABWC-AZ6	100~250 Vac/dc 50 Hz	50 Hz	
	15019080	ABWC-AZ2	24~48 Vdc	60 Hz	
		ABWC-AZ7	24~48 Vdc	50 Hz	
	14794811	ABWC-AC1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + current reading + communication
		ABWC-AC6	100~250 Vac/dc 50 Hz	50 Hz	
	15019085	ABWC-AC2	24~48 Vdc	60 Hz	
		ABWC-AC7	24~48 Vdc	50 Hz	
	14794810	ABWC-AF1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + ground fault + current reading
		ABWC-AF6	100~250 Vac/dc 50 Hz	50 Hz	
	14794812	ABWC-PC1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + voltage and current reading + communication
		ABWC-PC6	100~250 Vac/dc 50 Hz	50 Hz	
	15019083	ABWC-PC2	24~48 Vdc	60 Hz	
		ABWC-PC7	24~48 Vdc	50 Hz	
ABW	17627802	ABW-AH1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + current reading
		ABW-AH6	100~250 Vac/dc 50 Hz	50 Hz	
	17627803	ABW-AH2	24~48 Vdc	60 Hz	
		ABW-AH7	24~48 Vdc	50 Hz	
	17627687	ABW-AD1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + current reading + communication
		ABW-AD6	100~250 Vac/dc 50 Hz	50 Hz	
	17627798	ABW-AD2	24~48 Vdc	60 Hz	
		ABW-AD7	24~48 Vdc	50 Hz	
	17627799	ABW-AU1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + ground fault + current reading
		ABW-AU6	100~250 Vac/dc 50 Hz	50 Hz	
	17627800	ABW-AU2	24~48 Vdc	60 Hz	
		ABW-AU7	24~48 Vdc	50 Hz	
	17627804	ABW-PS1	100~250 Vac/dc 60 Hz	60 Hz	LSIG protection + voltage and current reading + communication
		ABW-PS6	100~250 Vac/dc 50 Hz	50 Hz	
	17627805	ABW-PS2	24~48 Vdc	60 Hz	
		ABW-PS7	24~48 Vdc	50 Hz	

Accessories

Overcurrent relay ABWC

A Z 1

Reading	
A	Current
P	Current and voltage

Communication	
Z	No communication
C	With communication
F	Earth leakage

Power supply		
Code	OCR	Line reading frequency
1	100~250 Vac/dc	60 Hz
2	24~48 Vdc	60 Hz
6	100~250 Vac/dc	50 Hz
7	24~48 Vdc	50 Hz

			AZ	AC	AF	PC
Power supply			100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc
Consumption			5 VA	5 VA	5 VA	5 VA
Line frequency	1/2		60 Hz	60 Hz	60 Hz	60 Hz
	6/7		50 Hz	50 Hz	50 Hz	50 Hz
Protection functions	Standard	L - Overload	✓	✓	✓	✓
		S - Short circuit (timed)	✓	✓	✓	✓
		I - Short circuit (instantaneous)	✓	✓	✓	✓
		G - Ground fault	✓	✓	✗	✓
	Optional	Earth leakage (external CT required - option)	✗	✗	✓	✗
		ZSI (protective coordination)	✓	✓	✓	✓
		Under and overcurrent	✗	✗	✗	✓
		Frequency out of range	✗	✗	✗	✓
		Unbalance (current/voltage)	✗	✗	✗	✓
		Discrimination / trip type indication	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)
Measurements		Current (R / S / N / T)	✓	✓	✓	✓
		Current / Voltage RMS	✗	✗	✗	✓
		Power (P, Q, S), FP (3 phases)	✗	✗	✗	✓
		Frequency	✗	✗	✗	✓
Fault recording			✓	✓	✓	✓
		Number of records	10	10	10	256
		Event sequence	✓	✓	✓	✓
		Broken current value	✓	✓	✓	✓
		Total breaking time	✓	✓	✓	✓
		Event recording	✗	✗	✗	256
Digital outputs			3 fixed	3 fixed	3 fixed	3 programmable
Parameterization		Front adjustment knobs	✓	✓	✓	✓
		Display + navigation keys	✓	✓	✓	✓
		Parameterization password	✓	✓	✓	✓
Network communication		Door	✗	RS485	✗	RS485
		Protocol	✗	Modbus[1]	✗	Modbus[1]
		Baud rate	✗	9,600 bps, 19,200 bps, 38,400 bps	✗	9,600 bps, 19,200 bps, 38,400 bps

Note: 1) In order to use network communication, see the Communication Module topic in this catalog.

Accessories

Overcurrent relay ABW

A H 1

Reading	
A	Current
P[1]	Current and voltage

Communication	
H	No communication
D	With communication
S[1]	With communication
U	Earth leakage

Power supply		
Code	OCR	Line reading frequency
1	100~250 Vac/dc	60 Hz
2	24~48 Vdc	60 Hz
6	100~250 Vac/dc	50 Hz
7	24~48 Vdc	50 Hz

			AH	AD	AU	PS
Power supply			100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc	100~250 Vac/dc 24~48 Vdc
Consumption			5 VA	5 VA	5 VA	5 VA
Line frequency	1/2		60 Hz	60 Hz	60 Hz	60 Hz
	6/7		50 Hz	50 Hz	50 Hz	50 Hz
Protection functions	Standard	L - Overload	✓	✓	✓	✓
		S - Short circuit (timed)	✓	✓	✓	✓
		I - Short circuit (instantaneous)	✓	✓	✓	✓
		G - Ground fault	✓	✓	✗	✓
	Optional	Earth leakage (external CT required - option)	✗	✗	✓	✗
		ZSI (protective coordination)	✓	✓	✓	✓
		Under and overcurrent	✗	✗	✗	✓
		Frequency out of range	✗	✗	✗	✓
		Unbalance (current/voltage)	✗	✗	✗	✓
		Discrimination / trip type indication	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)	✓ (LEDs / aux. cont.)
Measurements		Current (R / S / N / T)	✓	✓	✓	✓
		Current / Voltage RMS	✗	✗	✗	✓
		Power (P, Q, S), FP (3 phases)	✗	✗	✗	✓
		Frequency	✗	✗	✗	✓
Fault recording			✓	✓	✓	✓
			127	127	127	127
		Record of events	32	32	32	127
		Event sequence	✓	✓	✓	✓
		Broken current value	✓	✓	✓	✓
		Total breaking time	✓	✓	✓	✓
Digital outputs			3 fixed	3 fixed	3 fixed	3 programmable
Parameterization		Front adjustment knobs	✓	✓	✓	✓
		Display + navigation keys	✓	✓	✓	✓
		Parameterization password	✓	✓	✓	✓
Network communication		Door	✗	RS485	✗	RS485
		Protocol	✗	Modbus[2]	✗	Modbus[2]
		Baud rate	✗	9,600 bps, 19,200 bps, 38,400 bps	✗	9,600 bps, 19,200 bps, 38,400 bps

Notes: 1) The protection unit P type has only the model PS.
2) In order to use network communication, see the Communication Module topic in this catalog.

Accessories

ABWC Type A trip relay

Technical data

The trip relay has characteristics that meet the requirements of most systems and applications. It is supplied as standard for ABWC circuit breakers.

- Overload protection (L)
  - Long timing
- Short circuit protection
  - Short timing (S)
  - Instantaneous (I)
  - I^2t ON/OFF optional (short timing)
- Ground fault protection (G)
  - I^2t ON/OFF optional
- Earth leakage protection
  - External CT required (accessory)
  - It cancels the Ground fault function (G)
- Fault recording
  - 10 records (Fault/Current/Date and Time)
- 3 fixed digital outputs to indicate protection alarm
- Network communication option
  - Modbus/RS485
  - Profibus-DP

Display

The home screen indicates the instantaneous current values per phase. It is also possible to check other information, available in different menus.

Indication LEDs

LED	Function	Indication
1	Alarm	Indicates the possibility of overload (lights up at 90% of the set current and flashes above 105%)
2	Battery/Self-diagnosis	Protection unit and battery charge self-diagnosis
3	Ir	Indicates overload trip
4	Isd/Ii	Indicates short-circuit trip
5	Ig/Δn	Indicates ground fault trip
6	Communication	Indicates network communication

Navigation keys

Used for navigation through the available menus.

Key	Function
M	Menu
↻	Moves the cursor or setting right / left
△	Moves the cursor up or increases a setting value
▽	Moves the cursor down or decreases a setting value
↵	Enter
Reset Esc	Fault reset / ESC from menu

Setting of the protection

Parameter	Function / Setting range
Iu	Overload current setting (0.5-0.6-0.7-0.8-0.9-1.0) x In
Ir	Overload current setting (protection function L) (0.8-0.83-0.85-0.88-0.89-0.9-0.93-0.95-0.98-1.0) x Iu
tr	Overload tripping delay (0.5-1-2-4-8-12-16-20-OFF) s @ 6xIr
Is	Timed short-circuit tripping current (protection function S) (1.5-2-3-4-5-6-7-8-9-10-OFF) x Ir
tsd	Is current delay I^2t OFF (0.05-0.1-0.2-0.3-0.4) x Ir I^2t ON (0.1-0.2-0.3-0.4) x Ir
Ii	Instantaneous short circuit tripping current (protection function I) (2-3-4-6-8-10-12-15-OFF) x In
Ig	Ground fault detection current (protection function G) (0.2-0.3-0.4-0.5-0.6-0.7-0.8-1-OFF) x In
tg	I^2t OFF (0.05-0.1-0.2-0.3-0.4) I^2t ON (0.1-0.2-0.3-0.4)

Accessories

Type A
Protection
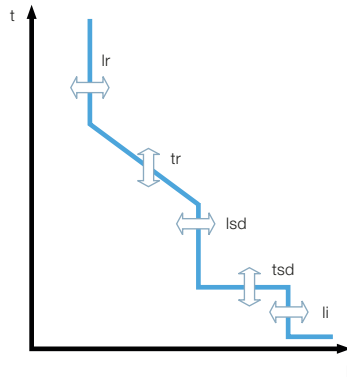
Long time		0.5	0.6	0.7	0.8	0.9	1.0			
Current setting (A)	Iu = In×...	0.5	0.6	0.7	0.8	0.9	1.0	-		
	Ir = Iu×...	0.8	0.83	0.85	0.88	0.9	0.93	0.95	0.98	1.0
Time delay (s) Precision ±15% 100ms	tr@ (1.5×Ir)	12.5	25	50	100	200	300	400	500	OFF
	tr@ (6.0×Ir)	0.5	1	2	4	8	12	16	20	OFF
	tr@ (7.2×Ir)	0.34	0.69	1.38	2.7	5.5	8.3	11	13.8	OFF

Short time											
Current setting (A) Precision ±10%	Isd = Ir×...		1.5	2	3	4	5	6	8	10	OFF
Time delay (s) @ 10×Ir	tsd	I²t OFF	0.05	0.1	0.2	0.3	0.4		-		
		I²t ON		0.1	0.2	0.3	0.4		-		
	(I²t OFF)	Minimum opening time	20	80	160	260	360		-		
			80	140	240	340	440		-		

Instantaneous										
Current setting (A)	Ii = In×...	2	3	4	6	8	10	12	15	OFF
Opening time		Below 50ms								

Ground fault											
Operating current (A) Precision: ±10% (Ig>0.4In) ±20% (Ig≤0.4In)	Ig = In×...		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	OFF
Time delay (s) @ 1×In	tg	I²t OFF	0.05	0.1	0.2	0.3	0.4		-		
		I²t ON		0.1	0.2	0.3	0.4		-		
	(I²t OFF)	Minimum opening time	20	80	160	260	360		-		
		Maximum opening time	80	140	240	340	440		-		

Earth leakage (optional)											
Current setting (A)	IΔn		0.5	1	2	3	5	10	20	30	OFF
Time delay (ms) Precision: ±15%	Δt	Alarm time (ms)	140	230	350	800	950		-		
		Opening time (ms)	140	230	350	800			-		

Note: earth leakage function available with external CT.

Accessories

ABWC Type P protection unit

Technical data

The trip relay was developed for applications with high technical requirements. Available for the entire ABWC line.

- Overload protection (L)
  - Long timing
- Short circuit protection
  - Short timing (S)
  - Instantaneous (I)
  - I^2t ON/OFF optional (short timing)
- Ground fault protection (G)
  - I^2t ON/OFF optional
- Protection against under and overcurrent, under and overvoltage, current unbalance, voltage unbalance, frequency out of range and reverse power
- Fault event sequence up to 256 faults
- Event sequence up to 256 events the user chooses
- Protection coordinated by the ZSI (Zone Selective Interlocking)
- Fine tuning
- Measurements of current / phase angle / voltage / power / frequency / power factor / others
- 3 programmable digital outputs for alarm, trip and general purpose
- Network communication
  - Modbus/RS485
  - Profibus-DP

Display

The home screen indicates the instantaneous current values per phase. It is also possible to check other information, available in different menus.

Indication LEDs

LED	Function	Indication
1	Alarm	Indicates the possibility of overload (lights up at 90% of the set current and flashes above 105%)
2	Battery/Self-diagnosis	Protection unit and battery charge self-diagnosis
3	Ir	Indicates overload trip
4	Isd/Ii	Indicates short-circuit trip
5	Ig/Δn	Indicates ground fault trip
6	Communication	Indicates network communication

Setting of the protection functions

Navigation keys

Used for navigation through the available menus.

Key	Function
M	Menu
↺	Moves the cursor or setting right / left
△	Moves the cursor up or increases a setting value
▽	Moves the cursor down or decreases a setting value
↵	Enter
Reset/Esc	Fault reset / ESC from menu

Parameter	Function / Setting range
Ir	Overload current setting (protection function L) (0.4-0.5-0.6-0.7-0.8-0.9-1.0) x In
tr	Overload tripping delay (0.5-1-2-4-8-12-16-20-OFF) s @ 6xIr
Is	Timed short circuit tripping current (protection function S) (1.5-2-3-4-5-6-7-8-9-10-OFF) x Ir
tsd	Is current delay I^2t OFF (0.05-0.1-0.2-0.3-0.4) x Ir I^2t ON (0.1-0.2-0.3-0.4) x Ir
Ii	Instantaneous short circuit tripping current (protection function I) (2-3-4-6-8-10-12-15-OFF) x In
Ig	Ground fault detection current (protection function G) (0.2-0.3-0.4-0.5-0.6-0.7-0.8-1-OFF) x In
tg	I^2t OFF (0.05-0.1-0.2-0.3-0.4) I^2t ON (0.1-0.2-0.3-0.4)
tg	I^2t OFF (0.05-0.1-0.2-0.3-0.4) I^2t ON (0.1-0.2-0.3-0.4)
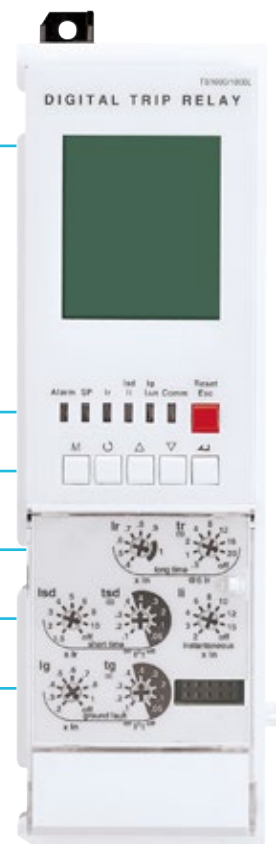
Accessories

Type P
Protection
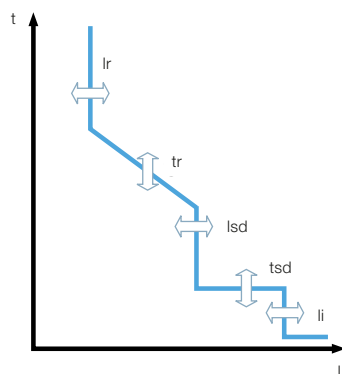
Long time											
Current setting (A)	Ir = In×...		0.4	0.5	0.6	0.7	0.8	0.9	1.0		-
Time delay (s) Precision: ±15% 100ms	tr@ (1.5×Ir)		12.5	25	50	100	200	300	400	500	OFF
	tr@ (6.0×Ir)		0.5	1	2	4	8	12	16	20	OFF
	tr@ (7.2×Ir)		0.34	0.69	1.38	2.7	5.5	8.3	11	13.8	OFF

Short time											
Current setting (A)	Isd = Ir×...		1.5	2	3	4	5	6	8	10	OFF
Precision: ±10%											
Time delay (s) @ 10×Ir	tsd	I²t OFF	0.05	0.1	0.2	0.3	0.4		-		
		I²t ON	-	0.1	0.2	0.3	0.4		-		
	(I²t OFF)	Minimum opening time	20	80	160	260	360		-		
		Maximum opening time	80	140	240	340	440		-		

Instantaneous											
Current setting (A)	Ii = In×...	2	3	4	6	8	10	12	15	OFF
Opening time	Below 50ms									

Ground fault											
Operating current (A) Precision: ±10% (Ig>0.4In) ±20% (Ig≤0.4In)	Ig = In×...		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	OFF
Time delay (s) @ 1×In	tg	I²t OFF	0.05	0.1	0.2	0.3	0.4		-		
		I²t ON	-	0.1	0.2	0.3	0.4		-		
	(I²t OFF)	Minimum opening time	20	80	160	260	360		-		
		Maximum opening time	80	140	240	340	440		-		

Earth leakage (optional)											
Current setting (A)	IΔn		0.5	1	2	3	5	10	20	30	OFF
Time delay (ms) Precision: ±15%	Δt	Alarm time (ms)	140	230	350	800	950		-		
		Opening time (ms)	140	230	350	800			-		

Pre-trip alarm											
Current setting (A)	Ip = Ir x ...	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
Time delay (ms) Precision: ±15%	tp@ (1.2×Ip)	1	5	10	15	20	25	30	35	OFF

Note: earth leakage function available with external CT.

Other protections		Operation			Time delay (s)		
		Setting range	Measurement	Precision	Setting range	Measurement	Precision
Undervoltage		80 V ~ 0 V_Operation	1 V	±5%	1.2 ~ 40s	0.1s	±0.1s
Overvoltage		UV_Operation ~ 980 V	1 V	±5%			
Unbalance voltage		6% ~ 99%	1%	±2.5% ou (*±10%)			
Reverse power		10~500 kW	1 kW	±10%	0.2 ~ 40s		
Overpower		500~5,000 kW	1 kW	±10%			
Unbalance current		6% ~ 99%	1%	±2.5% ou (*±10%)			
Over-frequency	60 Hz	UF_Operation ~ 65	1 Hz	±0.1 Hz	1.2 ~ 40s		
	50 Hz	UF_Operation ~ 55	1 Hz	±0.1 Hz			
Under-frequency	60 Hz	55 Hz ~ OF_Operation	1 Hz	±0.1 Hz			
	50 Hz	45 Hz ~ OF_Operation	1 Hz	±0.1 Hz			

Accessories

ABW trip relay

	A type	P type
Externals		
Current relay	L(N), S, I, G, PTA, Gext	L(N), S1, I, G, PTA, Gext D, S(V)1, IU
Voltage relay	-	UV1, OV1, RV, VU
Frequency relay	-	UF1, OF1, ROCOF
Power relay	-	RP, RQ1, OP, OQ, UP
Relay fine tuning	-	Possible (adjust knob and freely set operating value current)
ERMS	Control by DI and communication	Control by DI and communication
IDMTL Support	L relay element (thermal, DT, SIT, VIT, EIT, EIT50)	L relay element (thermal, DT, SIT, VIT, EIT, EIT50)
Trip information Maintenance LED	L, S, I, G/Gext/PTA, SP	L, S, I, G/Gext/PTA, SP
Incident record — Screen	Display of 32 incident events (incident phase/current/time)	Display of 127 incident events (incident phase/current/time)
Incident record — Memory	Saves 127 incident events Saves 6 incident waveforms (in case of operation by self power, incident waveform is not saved)	Saves 127 incident events Saves 6 incident waveforms (in case of operation by self power, incident waveform is not saved)

Trip relay types

	A type	P type
Measuring function	Current (A/B/C/N) External CT current Current phase (based on the phase A) Vector sum zero sequence current Imbalance negative sequence current Previous current demand for each phase	Current (A/B/C/N) External CT current Vector sum zero sequence current 3 phase voltage, line - to - line voltage Frequency Voltage/current phase (based on the phase A) Total/each phase power (P, Q, S) Positive/negative, effective/reactive/apparent energy Vector sum zero sequence voltage Positive, negative sequence current Previous current demand for each phase Previous apparent, reactive and active power demand
Accuracy degree of measurement — Current	0.5%	0.5%
Accuracy degree of measurement — Voltage	-	0.5%
Accuracy degree of measurement — Power	-	Class 1 (IEC 62053 - 21. 22)
Accuracy degree of measurement — Frequency	50 Hz or 60 Hz	0.1% (10 ~ 200Hz)
PQ function	Voltage/current harmonics harmonics 63rd Current THD, TDD, K – Factor	Voltage/current harmonics harmonics 63rd Voltage THD Current THD, TDD, K - factor
Measurement record	Max. Ext Io Max. current demand Max. Io Max. In Max. Max. internal temperature	Max. current demand Demand for max. apparent, reactive and active power Max. active power Max. Vo Max. Io Max. Ext Io Max. In Max. internal temperature
Real time waveform	Using USB/RS485 communication	Using USB/RS485 communication Using LCD screen

Accessories

A type trip relays
Product appearance and structure

1 - Segment LCD: Displaying information of measurement or status

2 - LED: Indicating information of status or measurement

- RUN/AL:
  - RUN: Indicating the operation (Blinking blue LED during turn on)
  - AL: Indicating an overload (turn on above 90%, blink above 105%) (self diagnose error: blinking blue and red LED)
- SP/ERMS:
  - Override/MCR operation: Red LED, ERMS operation: Blue LED
- COMM:
  - Communication display LED (green)
- Ir:
  - Display for long-time over current relay operation
- Isd/Ii:
  - LED Display for short-time/Instantaneous over current relay operation
- G/PTA:
  - LED displaying operation for ground/leakage fault protection relay, PTA

3 - Fault Reset/Esc Key: Fault/LED reset, Return to menu, Battery test

4 - Key: Move to menu or reset

Enter: Enter into secondary menu or setting input

Up/Down: Move the cursor up/down on screen or increase/decrease a setting value

Tap: Move setting item/Fix screen

Menu: Menu display - Measurement display

5 - Iu/Ir: Long-time current setting, tr: Long-time tripping delay setting
6 - Isd: Short-time current setting, tsd: Short-time tripping delay setting
7 - Ii: Instantaneous current setting
8 - Ig: Ground fault current setting, tg: Ground fault tripping delay setting
9 - Rating Plug
10 - Battery

Accessories

Protection
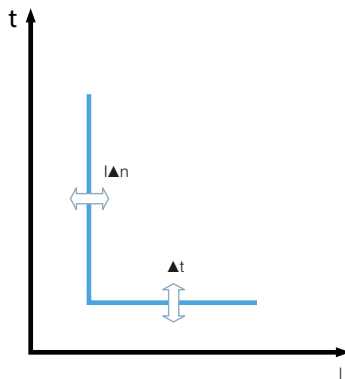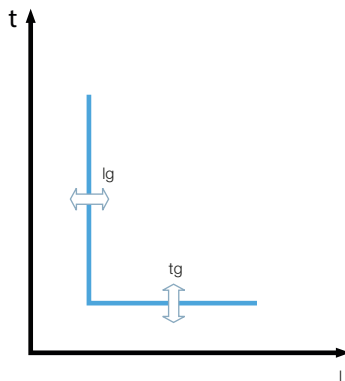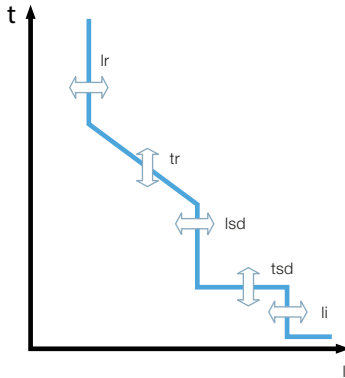
Long time

Pick up (A) between 1.05 and 1.15 Ir	Iu = In×...	0.5	0.6	0.7	0.8	0.9	1.0	-		
	Ir = Iu×...	0.8	0.83	0.85	0.88	0.9	0.93	0.95	0.98	1.0
Time delay (s) tolerance pick largest value between ±10% (Ir < 6In), ±20% (Ir ≥ 6In), or ±40ms	tr@ (1.5×Ir)	12.5	25	50	100	200	300	400	500	OFF
	tr@ (6.0×Ir)	0.5	1	2	4	8	12	16	20	OFF
	tr@ (7.2×Ir)	0.34	0.69	1.38	2.7	5.5	8.3	11	13.8	OFF

Short time

Threshold (A) Accuracy: ±10%	Isd = Ir×...		1.5	2	3	4	5	6	8	10	OFF
Time delay (s) tolerance I²t On: Pick largest value between ±15% (Is ≤ 6In), ±20% (Is > 6In), or ±40ms I²t Off: Pick largest value between ±10% or 40ms	tsd	I²t OFF	0.05	0.1	0.2	0.3	0.4	-			
		I²t On@ (10×Ir)	-	0.1	0.2	0.3	0.4	-			
ZSI	ZSI Time (s)	0.04 ~ 0.2 (0.01s steps), OFF									
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	Above 1.2×Isd (10 A steps)									
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF									

Instantaneous

Threshold (A) accuracy: ±10%	Ii = In×...	2	3	4	6	8	10	12	15	OFF
Trip time	Under 50ms									
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	(2.0~16)×In(10 A steps)								
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF								

Ground fault

Threshold (A) accuracy: ±10%	Ig = In×...		0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0	OFF
Time delay (s) Tolerance I²t On: Pick largest value between ±15% or ±40ms I²t Off: Pick Largest value between ±10% or 40ms	tg	I²t OFF	0.05	0.1	0.2	0.3	0.4		-		
		I²t On@ (1×Ir)		0.1	0.2	0.3	0.4		-		
ZSI	ZSI time (s)	0.04 ~ 0.2 (0.01s steps), OFF									
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	(0.2 ~1.0)×In (10 A steps)									
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF									

Earth leakage (optional)

Threshold (A) accuracy: (0.8~1.0)×IΔn	IΔn		0.5	1	2	3	5	10	20	30	OFF
Time delay(ms) tolerance I²t On: ±25% I²t Off: Pick largest value - AJ type: ±10% (IΔn ≥ 5 A), ±20% (IΔn Δ 5 A) or 40ms - AY type: ±10% (IΔn ≥ 2 A), ±20% (IΔn Δ 2 A) or 40ms	tΔt	Alarm time (ms)	140	230	350	800	950		-		
		Trip time (ms)	140	230	350	800			-		
ZSI	ZSI time (s)	0.04 ~ 0.2 (0.01s steps), OFF									
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	Above 1.2×Isd (0.1 A steps)									
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF									

PTA(Pre Trip Alarm)

Threshold (A) accuracy: ±5%	Ip = Ir×...	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
Time delay (ms) tolerance Pick largest value between ±10% (Ip < 1.2In), ±20% (Ip ≥ 1.2In), or ±40ms	tp@(1.2×Ip)	1	5	10	15	20	25	30	35	OFF

Accessories

P type trip relays
Product appearance and structure
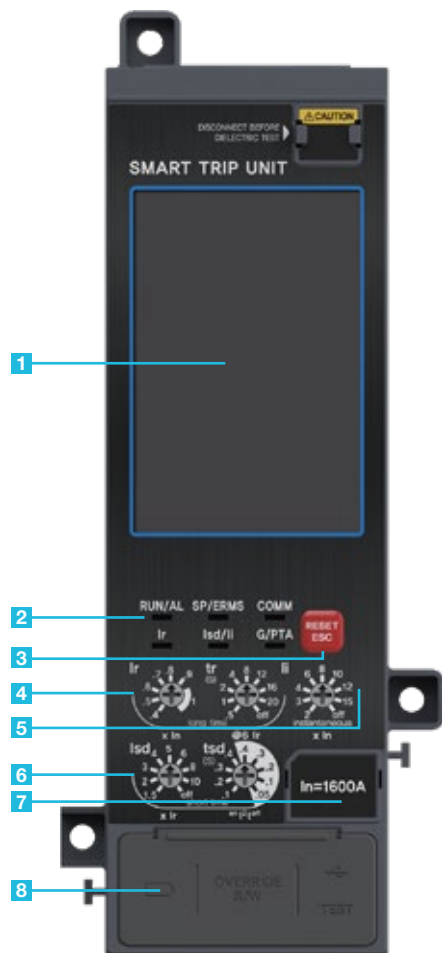
1 - 3.5 inch graphic LCD (touch): Displaying information of measurement or status

2 - LED: Indicating information of status or measurement
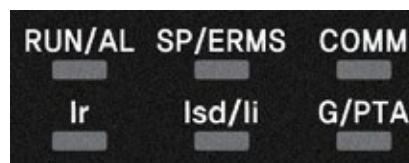
- RUN/AL
  - RUN: Indicating the operation (blinking blue LED during turn on)
  - AL: Indicating an overload (turn on above 90%, blink above 105%) (self diagnose error: blinking blue and red LED)
  - Self diagnose error: Blinking blue and red LED
- SP/ERMS
  - Override/MCR operation: Red LED
  - ERMS operation: Blue LED
- COMM
  - Communication display LED (green)
- Ir
  - Display for long-time over current relay operation
- Isd/Ii
  - LED Display for short-time/Instantaneous over current relay operation
- G/PTA
  - LED displaying operation for ground/leakage fault protection relay, PTA

3 - Reset/Esc Key: Fault/LED reset, Return to menu, Battery test

4 - Ir: Long-time current setting, tr: Long-time tripping delay setting

5 - Ii: Instantaneous current setting

6 - Isd: Short-time current setting, tsd: Short-time tripping delay setting

7 - Rating plug

8 - Battery

Accessories

Protection

Long time										
Pick up (A) between 1.05 and 1.15 Ir	Iu = In×...	0.4	0.5	0.6	0.7	0.8	0.9	1.0	-	
Time delay (s) tolerance pick largest value between ±10% (Ir < 6In), ±20% (Ir ≥ 6In), or ±40ms	tr@ (1.5×Ir)	12.5	25	50	100	200	300	400	500	OFF
	tr@ (6.0×Ir)	0.5	1	2	4	8	12	16	20	OFF
	tr@ (7.2×Ir)	0.34	0.69	1.38	2.7	5.5	8.3	11	13.8	OFF

Short time										
Threshold (A) accuracy: ±10%	Isd = Ir×...		1.5	2	3	4	5	6	8	10	OFF
Time delay (s) tolerance I²t On: Pick largest value between ±15% (Is ≤ 6In), ±20% (Is > 6In), or ±40ms I²t Off: Pick largest value between ±10% or 40ms	tsd	I²t OFF	0.05	0.1	0.2	0.3	0.4	-		
		I²t On@ (10×Ir)	-	0.1	0.2	0.3	0.4	-		
ZSI	ZSI Time (s)	0.04 ~ 0.2 (0.01s steps), OFF								
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	(1.5~10)×In (10 A steps)								
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF								

Instantaneous										
Threshold (A) accuracy: ±10%	Ii = In×...	2	3	4	6	8	10	12	15	OFF
Trip time	Under 50ms									
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A)	(2.0~16)×In (10 A steps)								
	Time delays (s)	0.1 ~ 30 (0.1s steps), OFF								

Ground fault	
Threshold (A) accuracy: ±10%	Ig = In×... 0.2 ~1.0 (1 A steps), OFF
Time delay (s) tolerance I²t On: Pick largest value between ±15% or ±40ms I²t Off: Pick largest value between ±10% or 40ms	tg — I²t can choose On/Off 0.05 ~ 3.0 (0.01s steps)
ZSI	ZSI time (s) — 0.04 ~ 0.2 (0.01s steps), OFF
Start-up tolerance: Pick largest value between ±10% or 40ms	Pick up (A) — (0.2 ~1.0)×In (10 A steps)
	Time delays (s) — 0.1 ~ 30 (0.1s steps), OFF

PTA (Pre Trip Alarm)	
Threshold (A) accuracy: ±5%	Ip = Ir×... 0.6 ~ 1.0 (1 A steps), OFF
Time delay (ms) tolerance Pick largest value between ±10% (Ip < 1.2In), ±20% (Ip ≥ 1.2In), or ±40ms	tp@(1.2×Ip) — I²t can choose On/Off tp=1 ~ 45 (0.01s steps)

Protection	Setting rage		Step	Accuracy	Setting rage	Step	Tolerance
Under voltage	Y-connection	0.5 ~ 0.98)×Vn/√3	0.1 V	±5% (> 100 V) ±10% (≤ 100 V)	0.1 ~ 120s, OFF	0.01s	Choose larget value: ±10% or ±40ms
	Δ-connection	0.5 ~ 0.98)×Vn					
Over voltage	Y-connection	(1.02 ~ 1.5)×Vn/√3					
	Δ-connection	1.02 ~ 1.5)×Vn					
Current unbalance	5 ~ 90%		1%	Choose larget value: Operating value ±10% or abs of operating value ±2%	0.5 ~ 60s, OFF		
Voltage unbalance	5 ~ 90%						
Under frequency	12 ~ 150		1 Hz	±5%	0.2 ~ 120s, OFF		
Over frequency	20 ~ 200						
Rate of change of frequency	0.4 ~ 10		0.01 Hz/s	Choose larget value: ±20% or 300 mHz/s	0.5 ~ 10s, OFF		Choose larget value: ±30% or ±300ms
Reverse power/ Reactive power relay	Vn×In×0.1/ √3~ Vn×In×1.2× √3		1 W	±10% (> 0.2In), ±20% (≤ 0.2In)	0.5 ~ 100s, OFF		Choose larget value: ±20% or ±200ms
Over power/ Reactive power relay	Vn×In×0.1/ √3~ Vn×In×1.2× √3						
Under power/ Reactive power relay	Vn×In×0.1/ √3~ Vn ×In×0.9× √3			±10%			

Operation characteristics
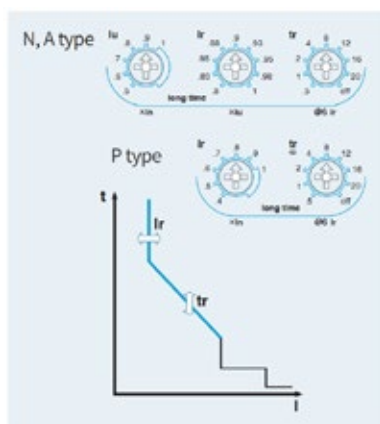
Long-time delay (L)

The function for overload protection which has time delayed characteristic in inverse ratio to fault current.

- Standard current setting knob: Ir
  - Setting range in P type: (0.4-0.5-0.6-0.7-0.8-0.9-1.0)
  - Setting range in A type: (0.4 ~1.0)×I
    - Iu: (0.5-0.6-0.7-0.8-0.9-1.0)×In
    - Ir: (0.8-0.83-0.85-0.88-0.9-0.93-0.95-0.98-1.0)×Iu
- Time delay setting knob: tr
  - Standard operating time is based on the time of 6×Ir
  - Setting range: 0.5-1-2-4-8-12-16-20-Off sec
- Relay pick-up current
  - When current over (1.11)×Ir flows in, relay is picked up.
- Relay operates basing on the largest load current among R/S/T/N phase.
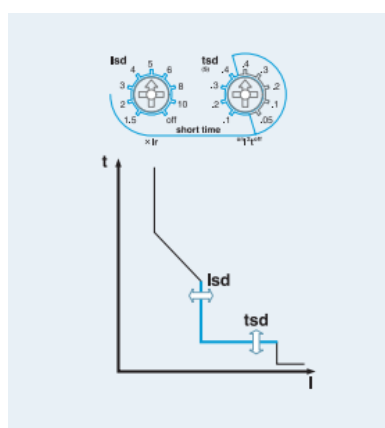
Short-time delay (S)

The function for fault current (over current) protection which has definite time characteristic and time delayed in inverse ratio to fault current.

- Standard current setting knob: Isd
  - Setting range: (1.5-2-3-4-5-6-8-10-Off)×Ir
- Time delay setting knob: tsd
  - Standard operating time is based on the time of 10×Ir
  - Inverse time (I^{2}t On): 0.1-0.2-0.3-0.4sec
  - Definite time (I^{2}t Off): 0.05-0.1-0.2-0.3-0.4sec
- Relay operates basing on the largest load current among R/S/T/N phase.
- When ZSI function was set, the protection operation will take place instantaneously with input absence by downstream devices. It is advised to disable its ZSI function on the last downstream device.
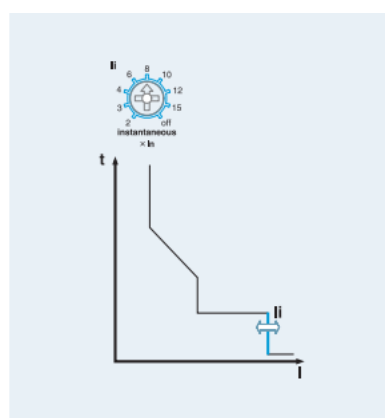
Instantaneous (I)

The function for breaking fault current above the setting value within the shortest time to protect the circuit from short-circuit.

- Standard current setting knob: Ii
  - P type setting range: (2-3-4-6-8-10-12-15-Off)×In
- Relay operates basing on the largest load current among R/S/T/N phase.
- Total breaking time is below 50ms.

Operation characteristics
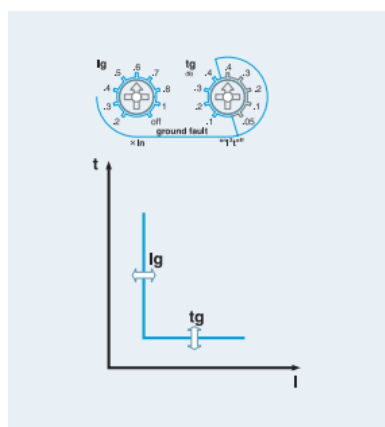
Ground Fault (G)

The function for breaking ground fault current above setting value after time-delay to protect the circuit from ground fault.

- Standard setting current knob: Ig
  - Setting range: (0.2-0.3-0.4-0.5-0.6-0.7-0.8-1.0-Off)×In
- Time delay setting knob: tg
  - A type setting range
    - Inverse time (I2t On): 0.1-0.2-0.3-0.4sec
    - Definite time (I2t Off): 0.05-0.1-0.2-0.3-0.4sec
    - P type setting range: 0.05 ~ 3.0sec
- The fault current is the value detected by Vector sum of the current input as the R, S, T phase (3P) or the R, S, T, N (4P).
- When ZSI function was set, the protection operation will take place instantaneously with input absence by downstream devices. It is advised to disable its ZSI function on the last downstream device.
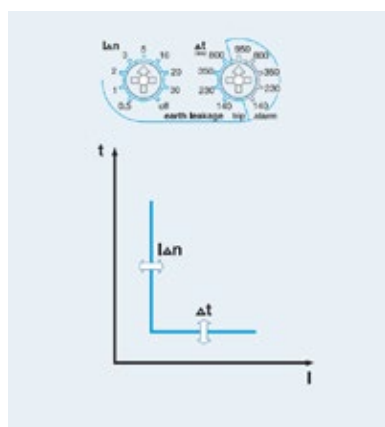
Earth Leakage (G) - Option

The function for breaking earth leakage current above setting value after time delay to protect the circuit from earth leakage. (A, P type).

- Standard setting current knob: IΔn
  - A type setting range: 0.5-1-2-3-5-10-20-30-Off (A)
  - P type setting range: 0.1 ~ 30 (A)
- Time delay setting knob: Δt
  - A type setting range
    - Trip time: 140-230-350-800ms
    - Alarm time: 140-230-350-800-950ms
  - P type setting range (Same as Trip/Alarm)
    - Long-time: 0.1 ~ 3.0sec
    - Short-time: (0.1 ~ 3.0sec)@30 A
- Settings within its alarm range will prevent its breaker from tripping but activating its alarm.
- This function is enabled and can be used only with standard ZCT provided by WEG or private external CT(secondary output 5 A) selected by customers.
- When ZSI function was set, the protection operation will take place instantaneously with input absence by downstream devices. It is advised to disable its ZSI function on the last downstream device.
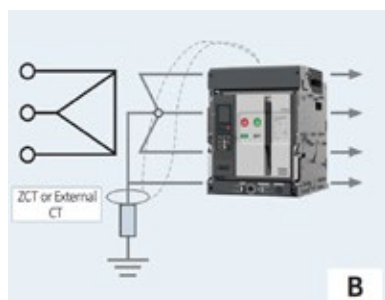
Measurement function

Type		Class.	Measurement element	Detailed element	Unit	Measurement range
P type	A type	Current	Line current	a, Ib, Ic	A	0.02In~1.2 In
			Normal current	I_1		
			Reverse current	I_2		
		Voltage	Line voltage	Vab, Vbc, Vca	V	1,200 V
			Phase voltage	Va, Vb, Vc	V	600 V
			Normal voltage	V_1	V	3 V~690 V
			Reverse voltage	V_2		
		Angle	Line-to-line Line-to-current	<Vabla, <Vablb, <Vablc, <VabVbc, <VabVca	°	0~360°
			Phase-to-phase	<VaVb, <VaVc		
			Phase-to-current	<Vala, <Vblb, <Vclc		
		Power	Active power	Pa(ab), Pb(bc), Pc(ca), P	kW	0 kW~99,999 kW
			Reactive power	Qa(ab), Qb(bc), Qc(ca), Q	kVAr	0 kVAr~99,999 kVAr
			Apparent power	Sa(ab), Sb(bc), Sc(ca), S	kVA	0 kVA~99,999 kVA
		Energy	Active energy	WHa(ab), WHb(bc), WHc(ca), WH	kWh, MWh	0 kWh~999,999 MWh
			Reactive energy	VARHa(ab), VARHb(bc), VARHc(ca), VARH	kVArh, Mvarh	0 kVArh~999,999 MVArh
			Reverse active energy	rWHa(ab), rWHb(bc), rWHc(ca), rWH	kWh, MWh	0 kWh~999,999 MWh
		Freq.	Frequency (F)	Frequency	Hz	10~200 Hz
		Power factor	Power factor (PF)	PFa(ab), PFb(bc), PFc(ca), PF	-	+ : Lead - : Lag
		Unbalance	Unbalance rate	Iunalance, Vunbalance	%	0.0~100.0
		Demand	Active power demand	Peak demand	kW	0 kW~99,999 kW
			Current demand	Peak demand	A	0.02In~1.2 In
		Harmonics	Voltage harmonics	1st~63th harmonics of Va(ab),Vb(bc),Vc(ca)	V	4~690 V
			Current harmonics	1st~63th harmonics of Ia,Ib,Ic	A	95% (3, 5, 7) / 65% (etc)
			THD, TDD	-	%	0.0 ~ 100.0
			K – factor	-	-	1.0 ~

Dimensions

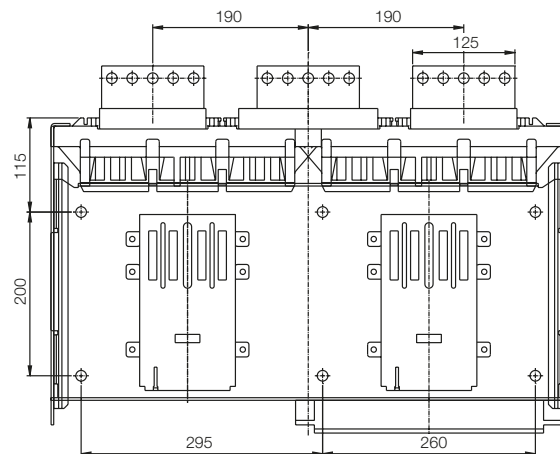## ABWC08...16DN3F_H - fixed version

Front view
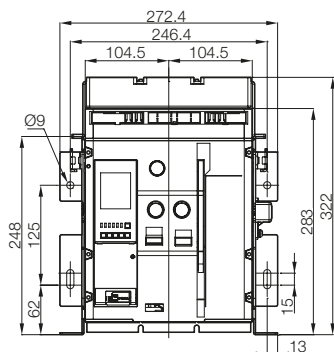
Horizontal rear terminal - side view
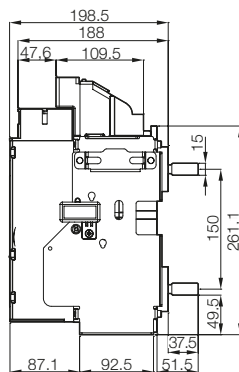
Vertical rear terminal - side view
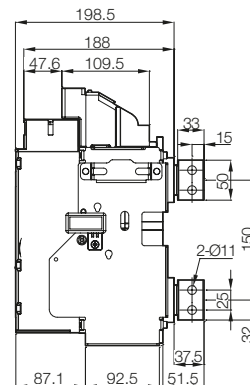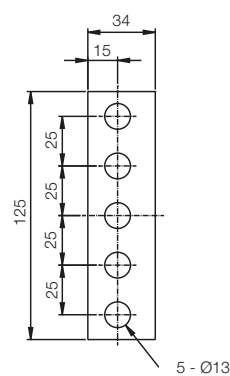

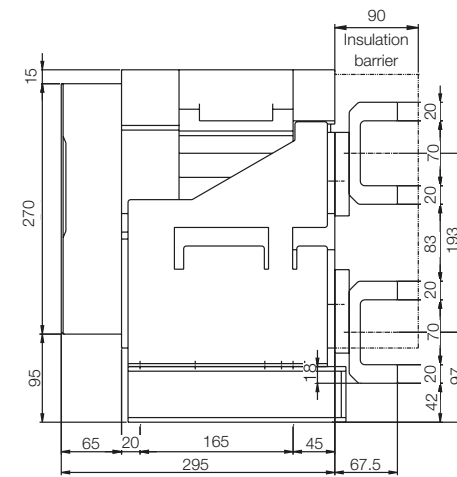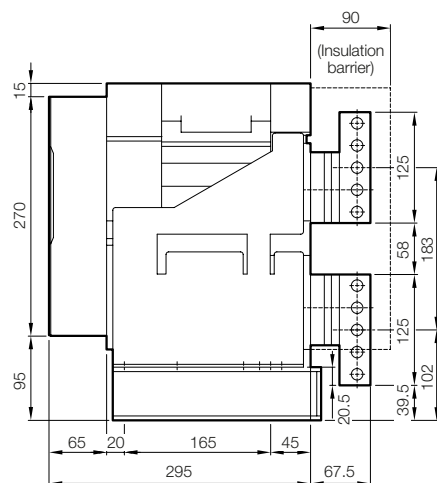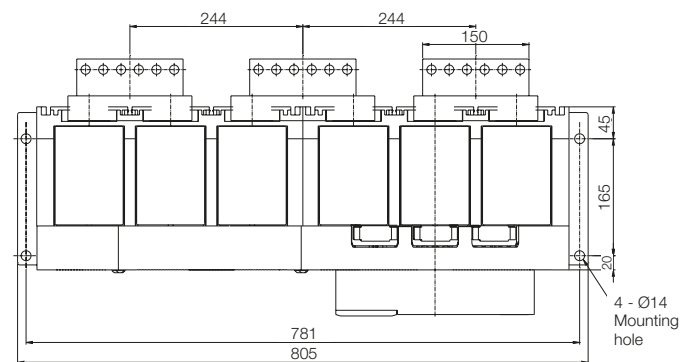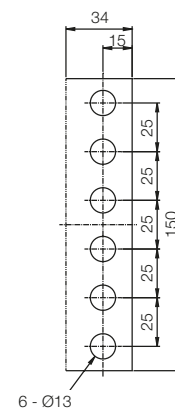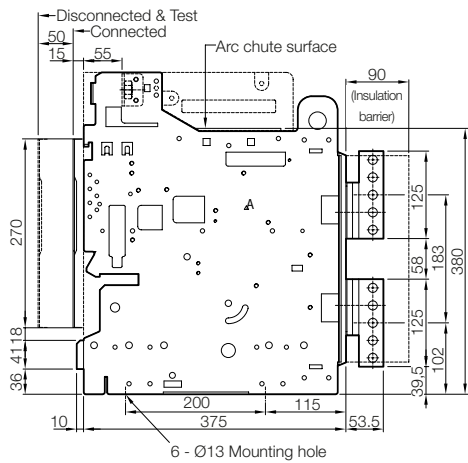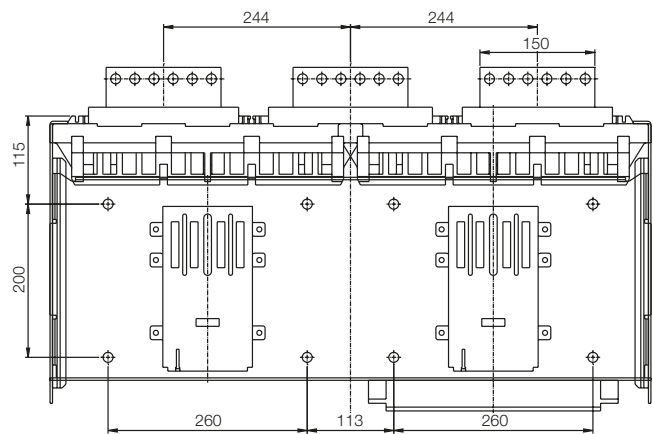### Horizontal rear terminal - top view
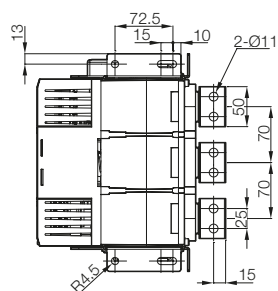
Type H (horizontal type)

Vertical rear terminal - side view
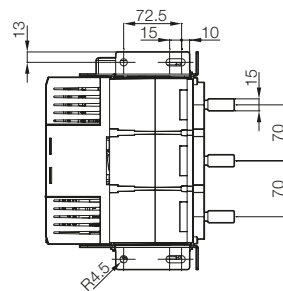
Type V (vertical type)

Rear terminal dimensions
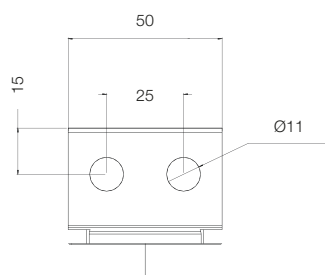
Dimensions

ABWC08...16 - withdrawable version

Front view

272.2
364.3
256

Horizontal rear terminal - side view

15
111.3
150
88
Ø8,5
56

Vertical rear terminal - side view

93.8
50
150
25
70.5
Ø8,5
56

Horizontal rear terminal - top view

75
170.5
57.7
140
2-Ø11
50
70
70
25
15
4-Ø8.5

Type H (horizontal type)

Vertical rear terminal - side view

75
170.5
57.7
140
15
70
70
56
4-Ø8.5

Type V (vertical type)

Rear terminal dimensions

50
15
25
2x Ø11
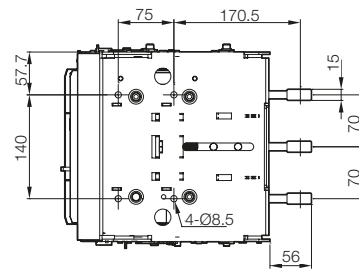
Dimensions

ABWC08...16 - fixed version - front terminal

Front view

246.4

353.37

125

15

Ø9

Bottom view

9

72.5

15

272.4

Side view

190.5
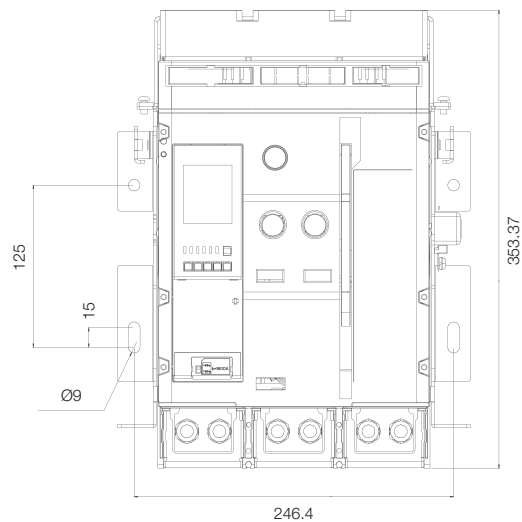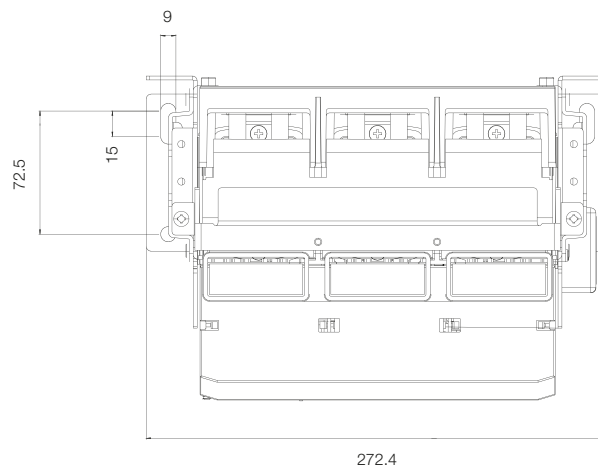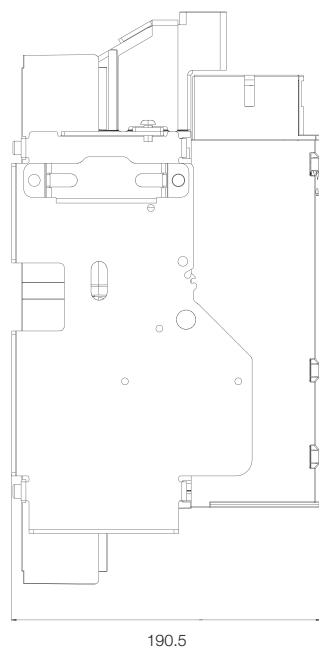
Dimensions

ABW08...16 - fixed version

Front view

### Horizontal rear terminal - side view


Vertical rear terminal - side view

Horizontal rear terminal - top view


### Vertical rear terminal - top view

3P
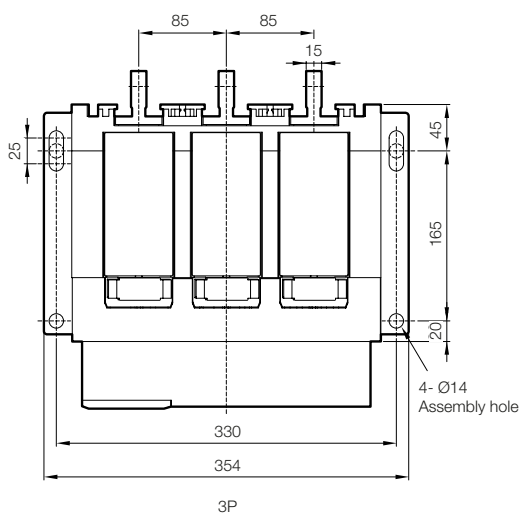
Rear terminal dimensions
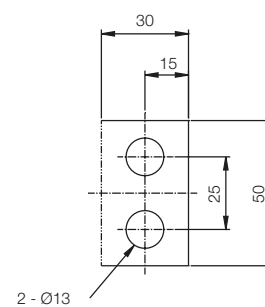
Dimensions

ABW08...16 - withdrawable version

Front view

2-M12 Tap
CMB-U/F

Horizontal rear terminal - side view

4 - Ø13 Mounting hole

Vertical rear terminal - side view

6 - Ø13 Mounting hole

Horizontal rear terminal - top view

Vertical rear terminal - top view

3P

Rear terminal dimensions

2 - Ø13
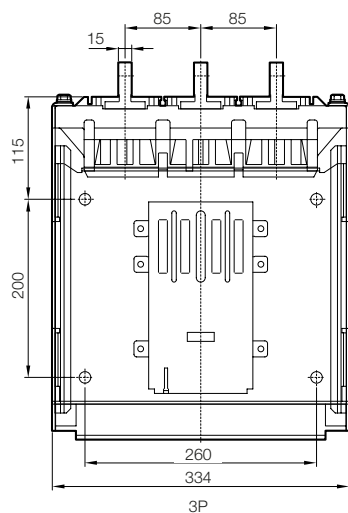
Dimensions

ABW20...32 - fixed version

Front view

Horizontal rear terminal - side view

Vertical rear terminal - side view

Horizontal rear terminal - top view

4 - Ø14
Mounting hole

Vertical rear terminal - top view

4 - Ø14
Mounting hole

3P

Rear terminal dimensions

3 - Ø13

Dimensions

ABW20...32 - withdrawable version
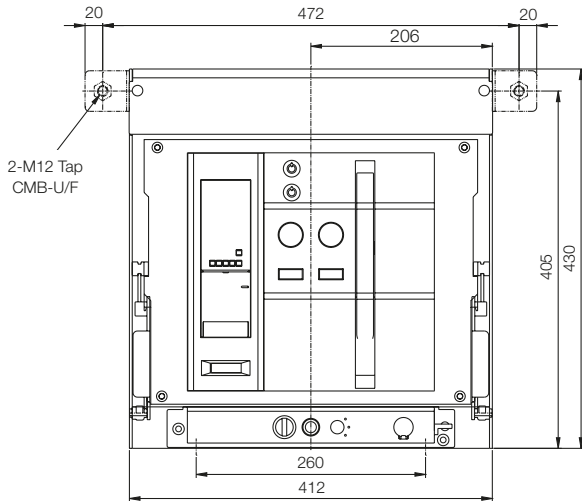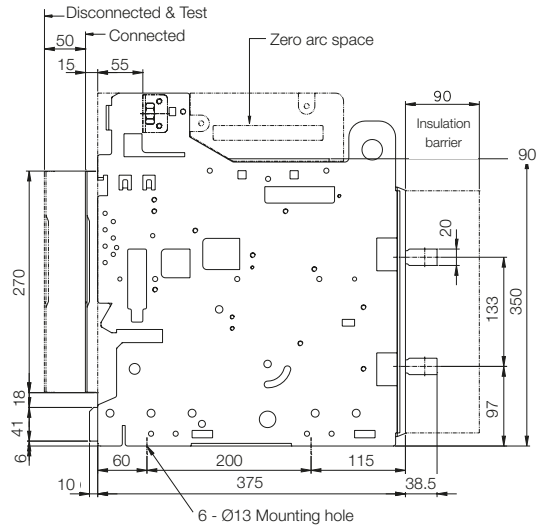
Front view

2-M12 Tap
CMB-U/F

Horizontal rear terminal - side view

6 - Ø13 Mounting hole

Vertical rear terminal - side view

6 - Ø13 Mounting hole

Horizontal rear terminal - top view

Vertical rear terminal - top view

3P
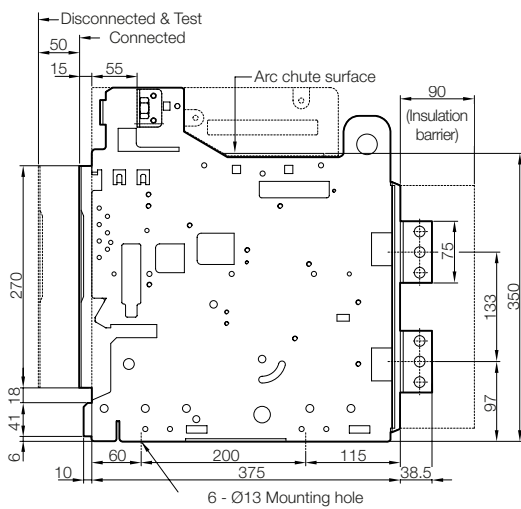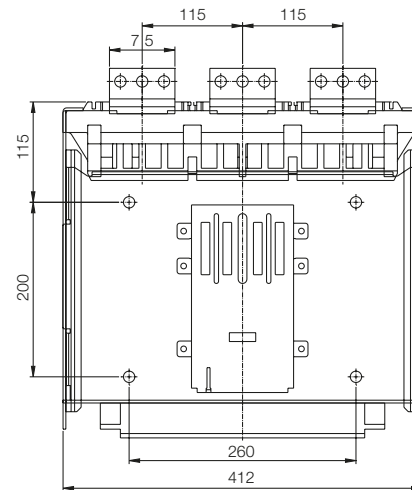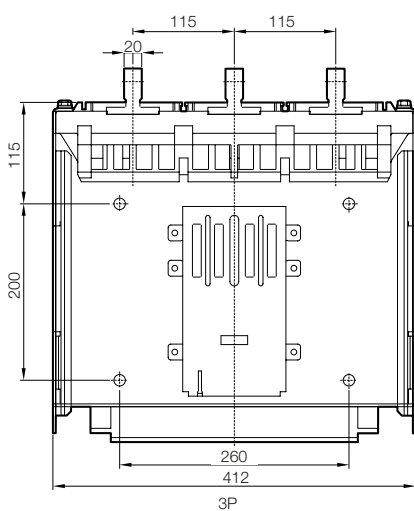
Vertical terminal dimensions

3 - Ø13
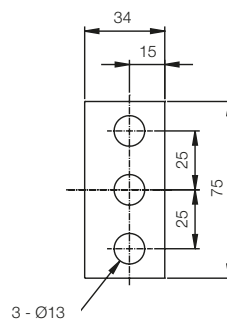
Dimensions

ABW40...50 - fixed version

Front view
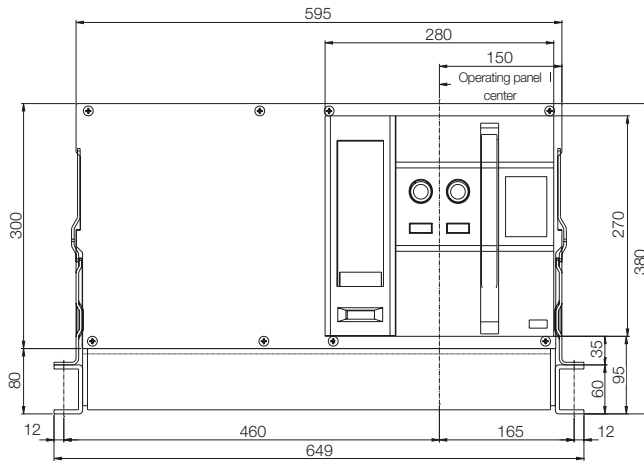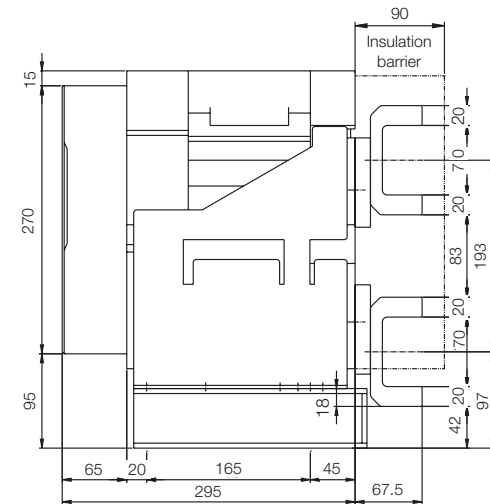
Horizontal rear terminal - side view

Vertical rear terminal - side view

Horizontal rear terminal - top view

Vertical rear terminal - side view

3P
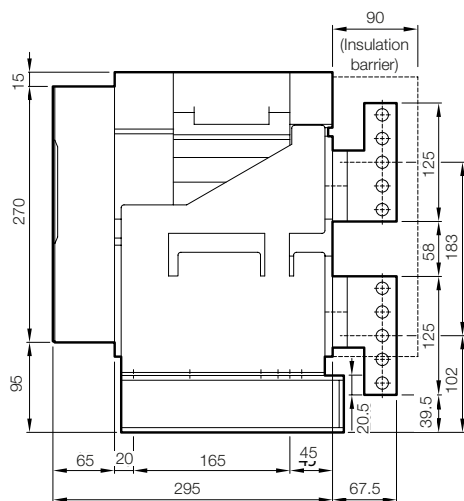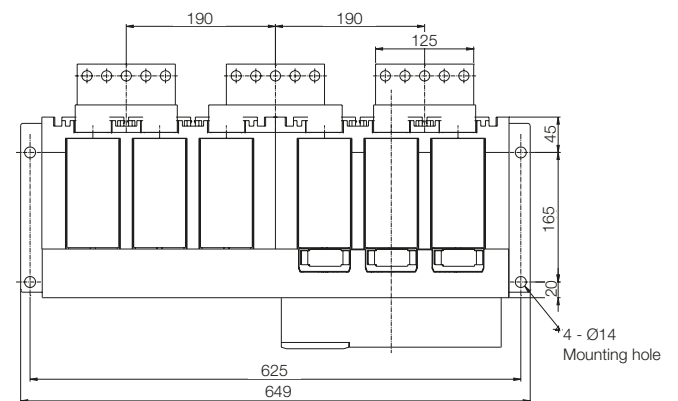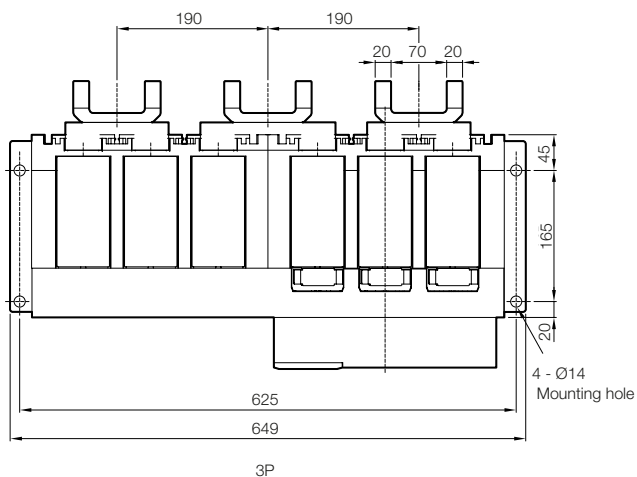
Rear terminal dimensions
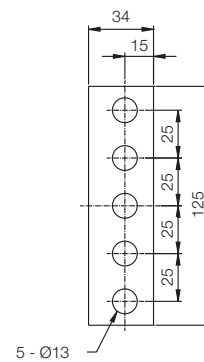
Dimensions

ABW40...50 - withdrawable version

Front view

2-M12 Tap
CMB-U/F

Horizontal rear terminal - side view

6 - Ø13 Mounting hole

Vertical rear terminal - side view

6 - Ø13 Mounting hole

Horizontal rear terminal - top view

Vertical rear terminal - top view

3P

Rear terminal dimensions

5 - Ø13
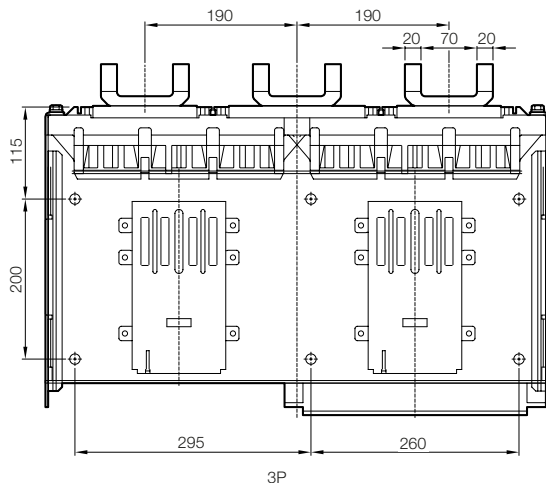
Dimensions

ABW63 - fixed version

Front view
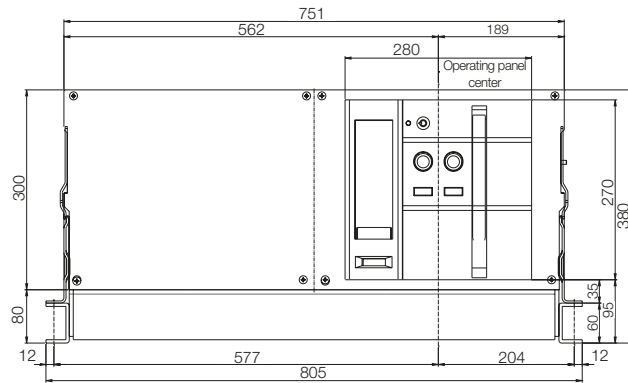
Horizontal rear terminal - side view

Vertical rear terminal - side view

Horizontal rear terminal - top view

4 - Ø14 Mounting hole

Vertical rear terminal - top view

4 - Ø14 Mounting hole

3P

Rear terminal dimensions

6 - Ø13
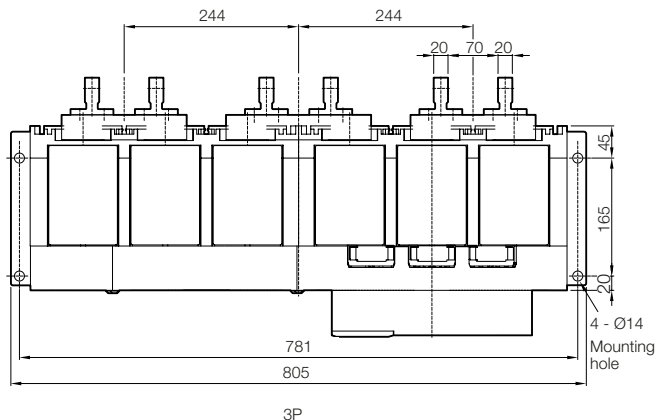
Dimensions

ABW63 - withdrawable version
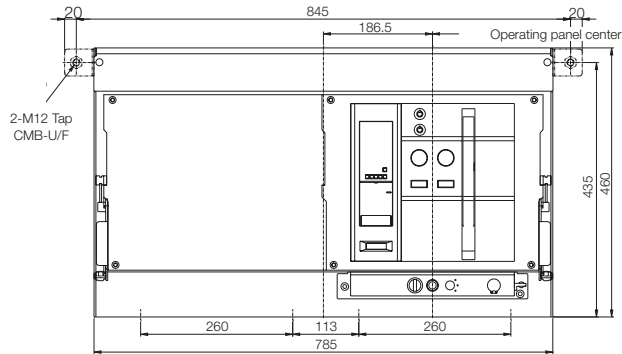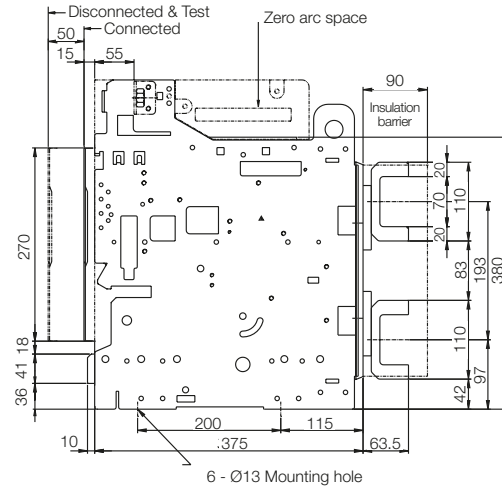
Front view

Horizontal rear terminal - side view

Vertical rear terminal - side view

Horizontal rear terminal - top view

Vertical rear terminal - top view
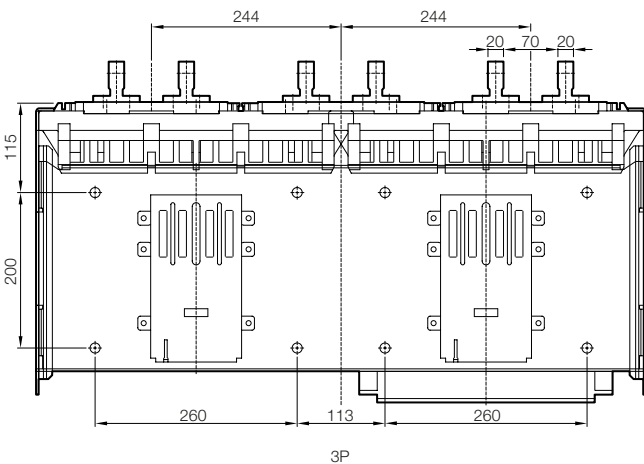
Rear terminal dimensions
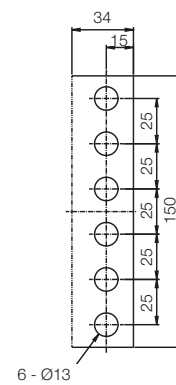
Dimensions

Panel cutout - fixed version
ABWC

ABW08...32

Lower part of the withdrawable rack

ABW40...63

Lower part of the withdrawable rack
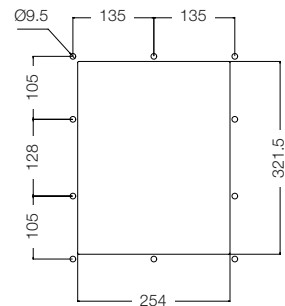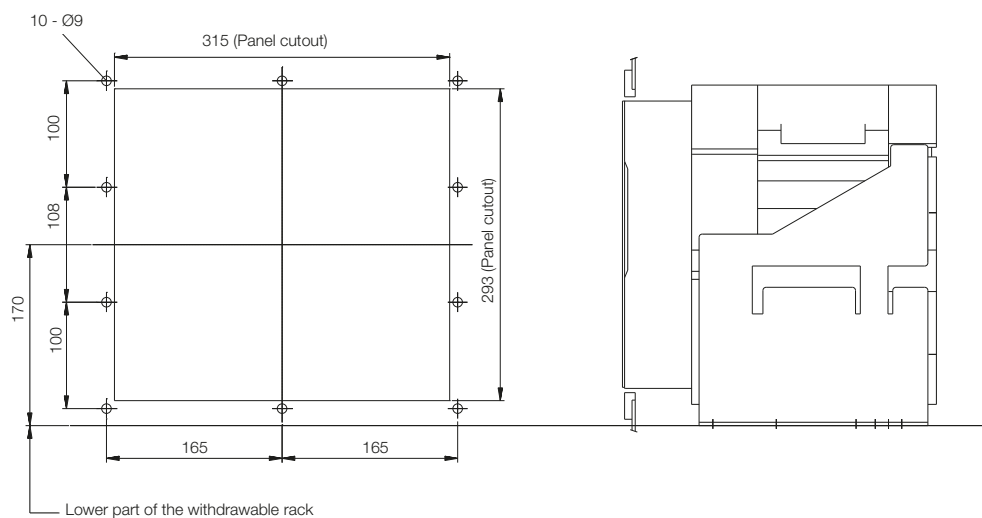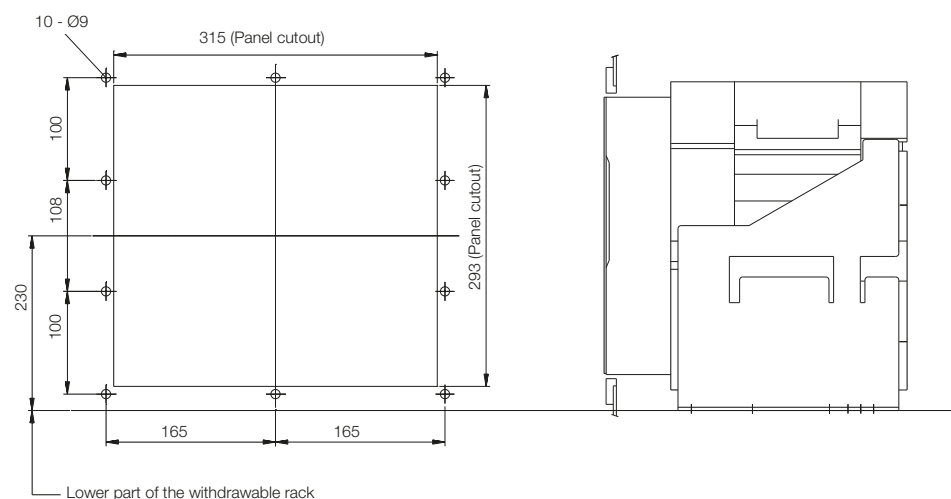
Dimensions

Panel cutout - withdrawable version

ABWC
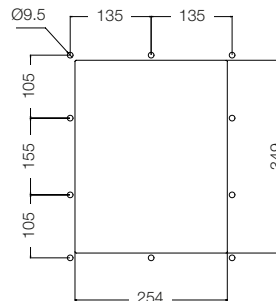
ABW08...16
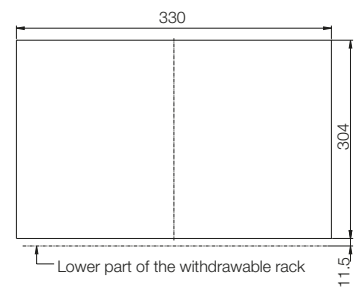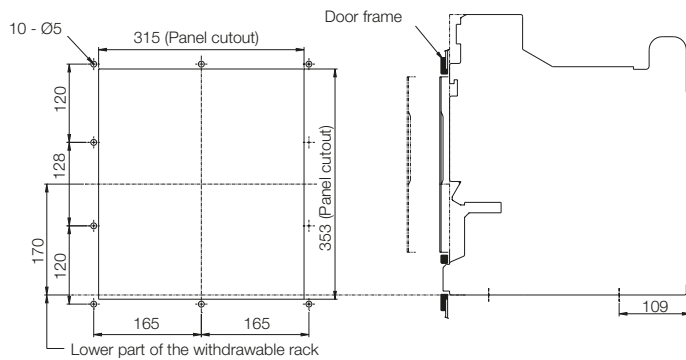
ABW20...32
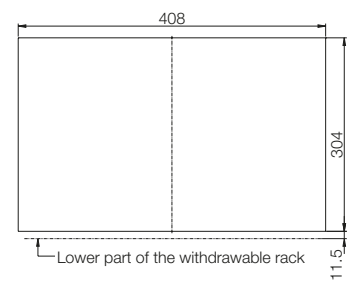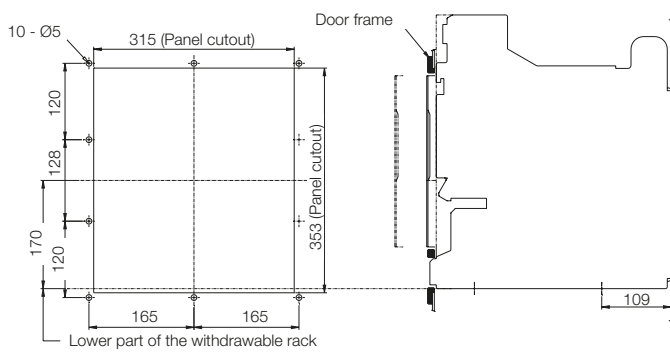
ABW40...50
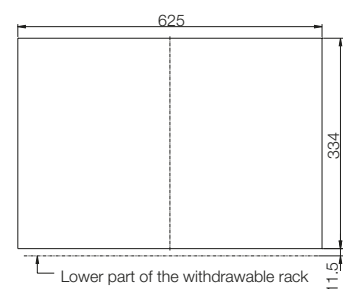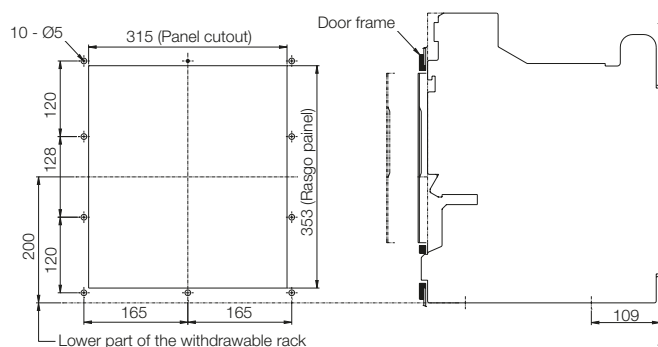
Dimensions

ABW63
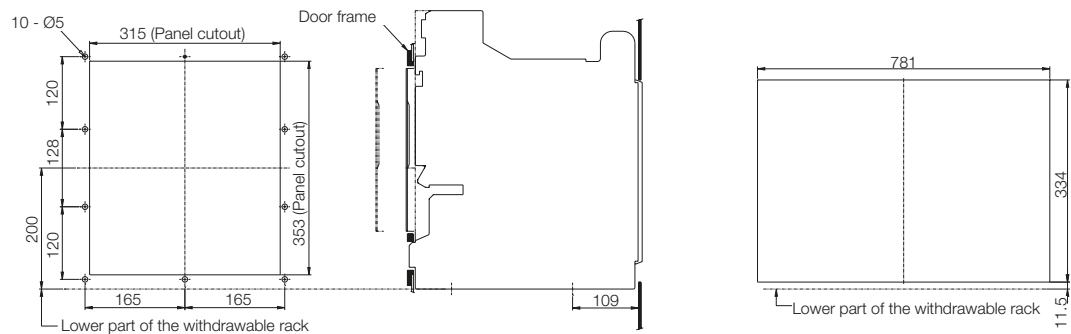
Minimum distances
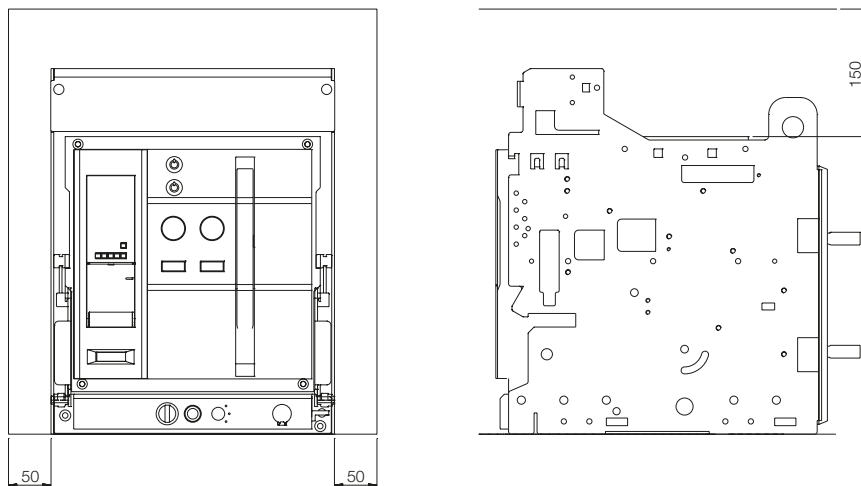
Minimum insulation distance

Follow the minimum insulation distance between poles below.

Insulation voltage (Ui)	Min. insulation distance (X min)
600 V	8 mm
1,000 V	14 mm
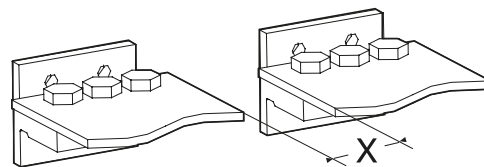
ABW - UDC - delay module for undervoltage release
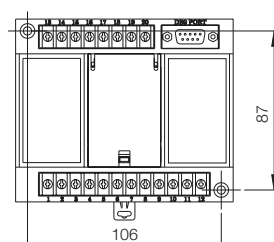
Dimensions

Condenser trip device ABW - CTD
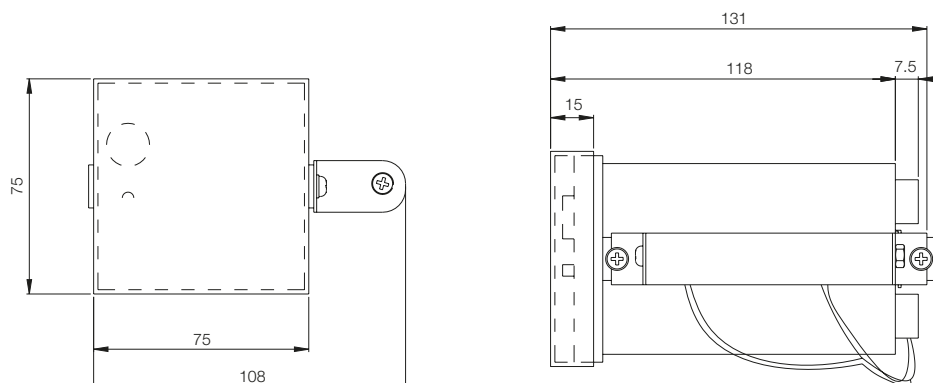
Installation recommendations

Busbar connections cable

Connections

Make sure there are no excessive mechanical forces applied to the circuit breaker back terminals.
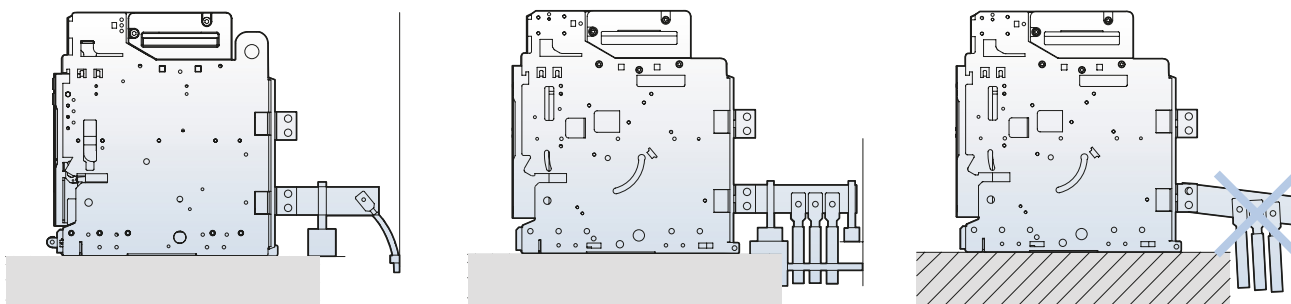
Input busbar - connection to the general busbar

The connector bars between the circuit breaker and the general busbar must be supported by insulators, avoiding the transfer of its own weight to the circuit breaker terminals. In the fixation of these busbars to the circuit breaker terminals, tighten the M12 screw with 50 Nm torque.
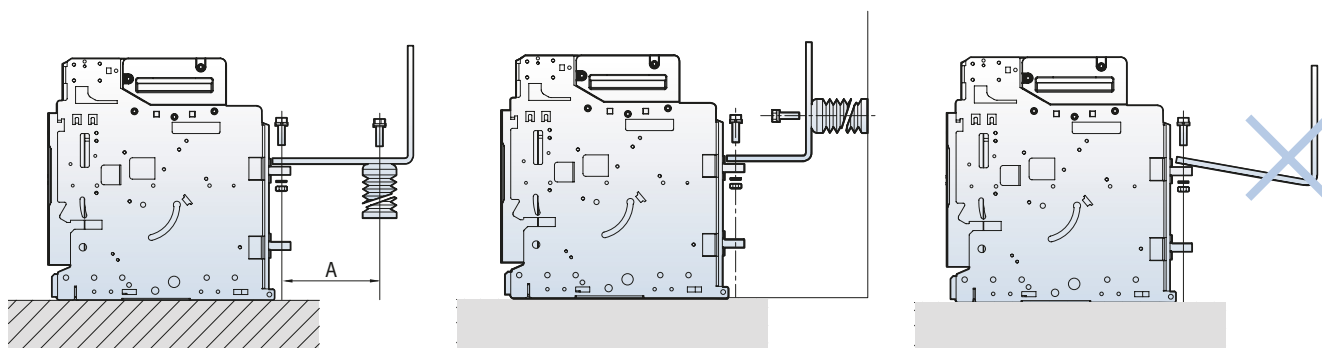
Maximum safe distance A

The forces resulting from short circuits must not be absorbed by the circuit breaker terminals. Position insulators with maximum clearance "A" between the terminals and the anchoring point. See table below:
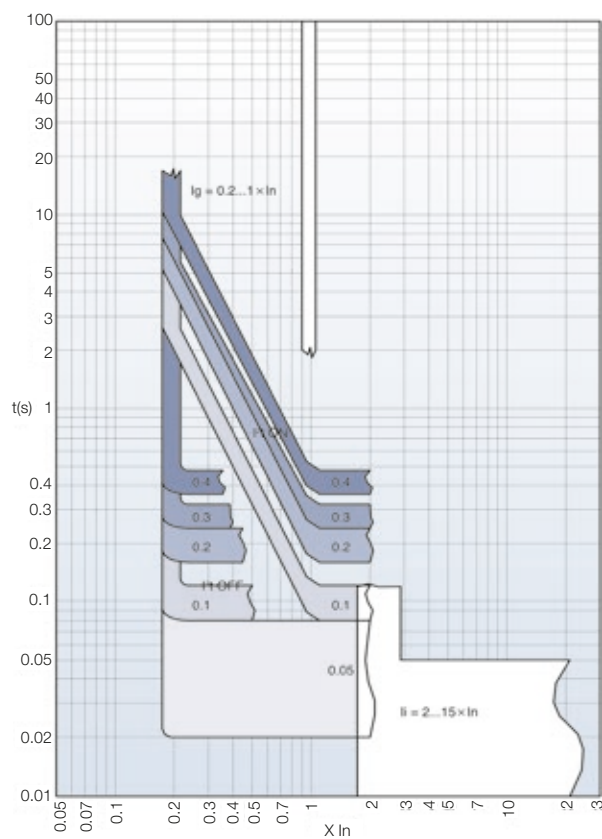
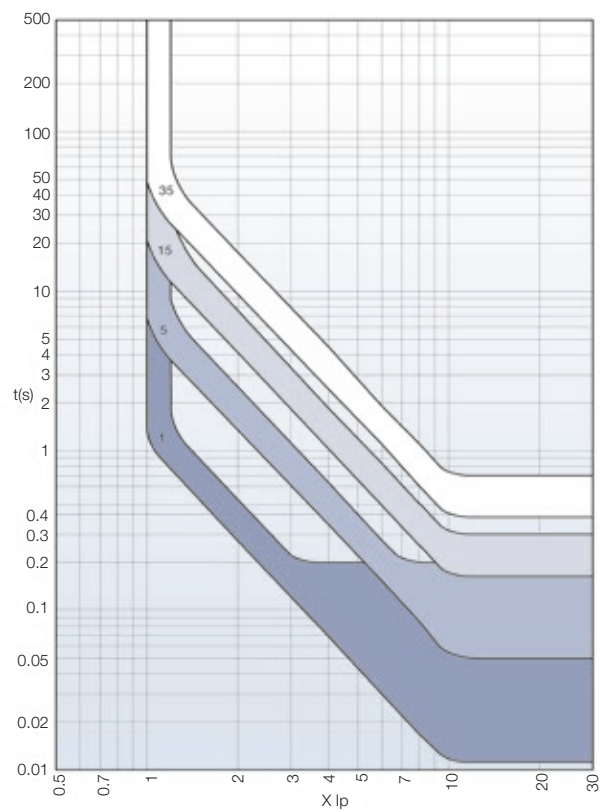| Short circuit capacity (kA)	30	50	65	80	100	150
Length A (mm)	350	300	250	150	150	150

Curves

IDMTL
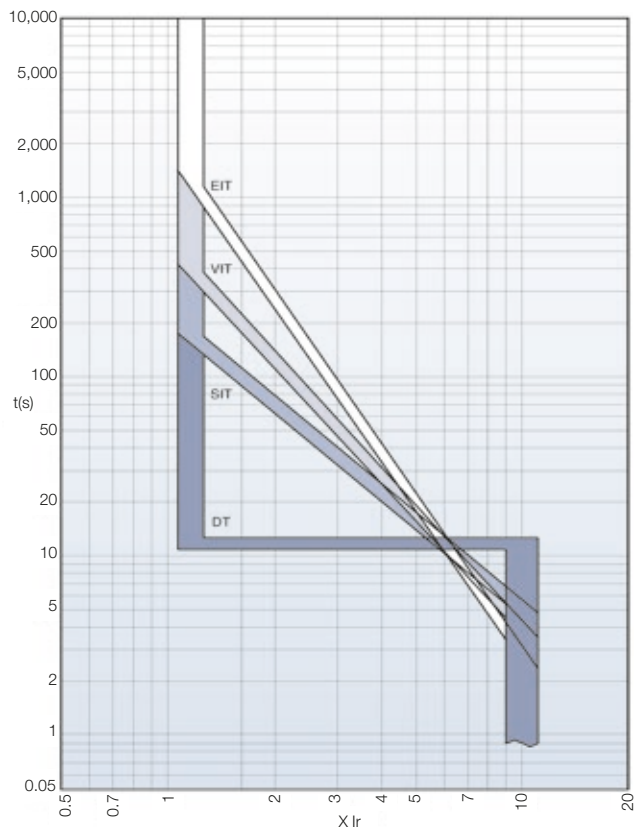
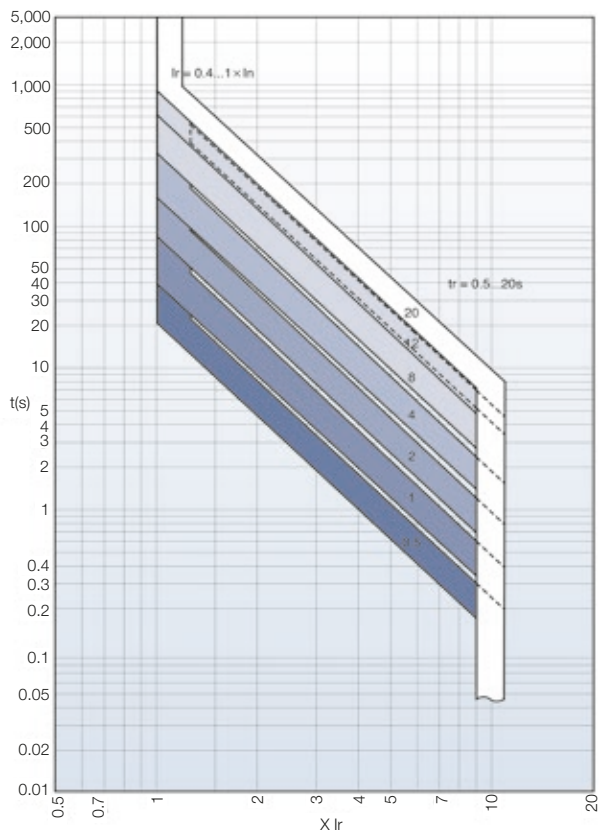## Instantaneous - ground fault
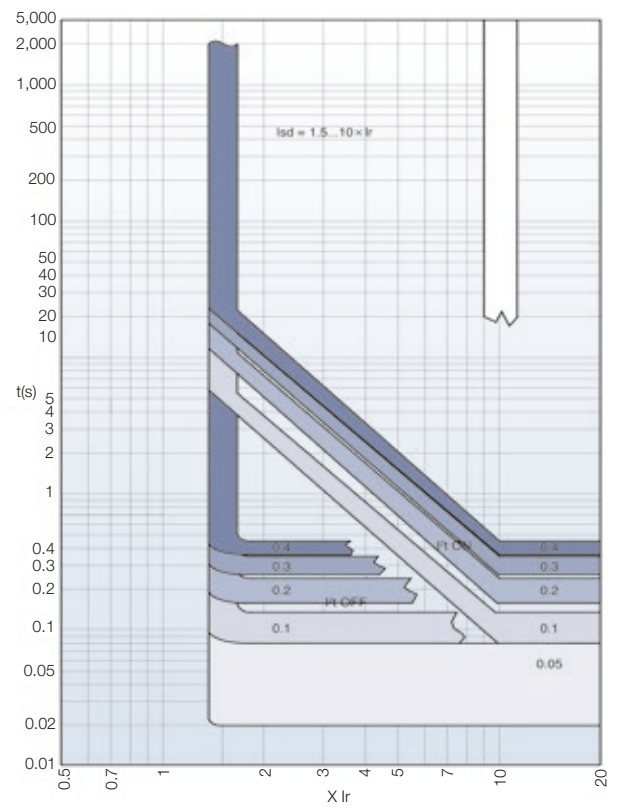
Curves

Pre trip alarm
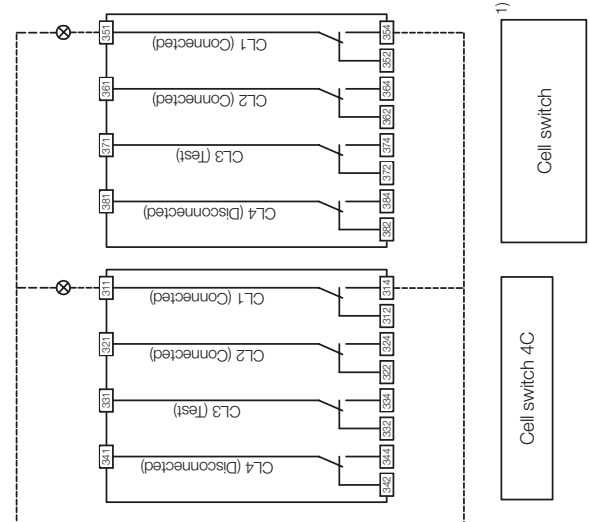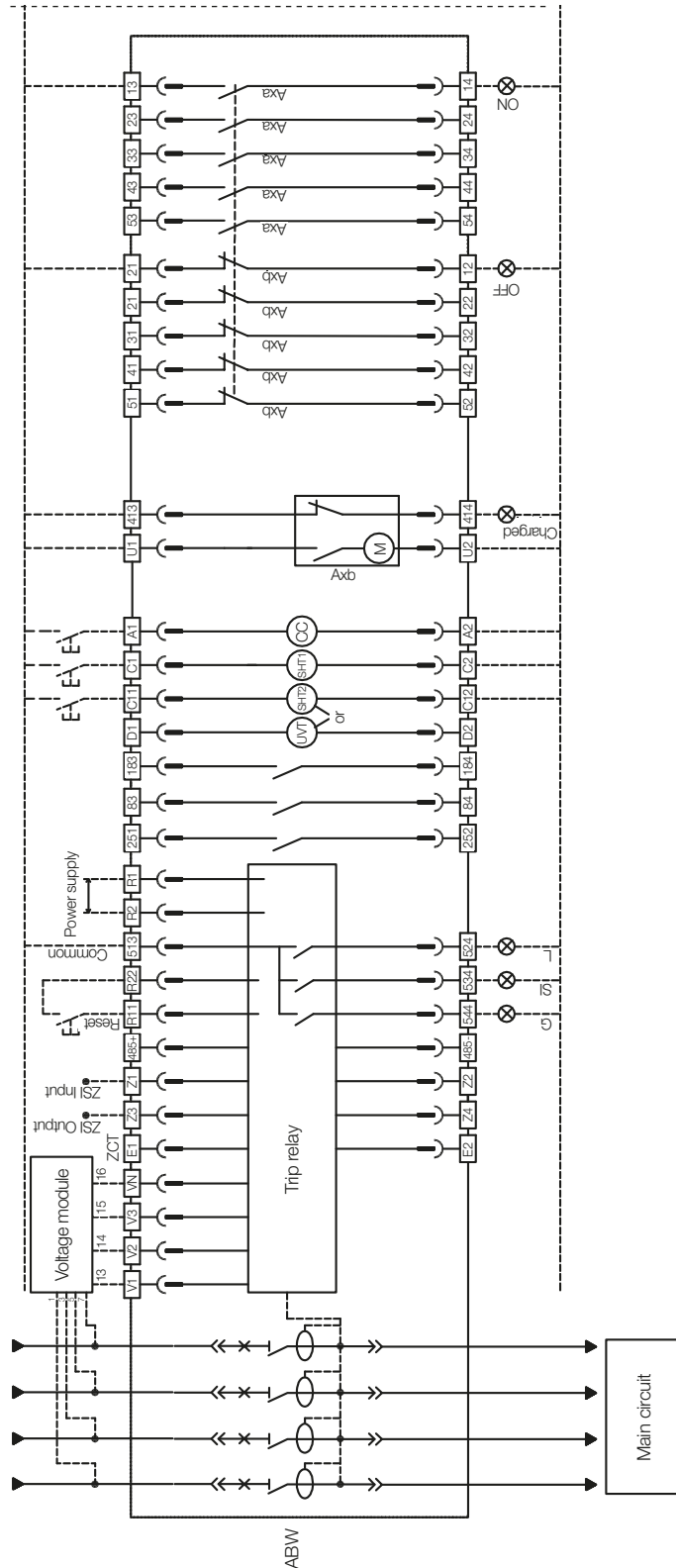
Curves

Long delay

Short delay

ABW wiring diagram

This diagram considers the ABW in the inserted position, in the open position (OFF) and motor loaded.
In the withdrawable version (with truck), the truck release latch must be in the regular (released) position.

Accessory code description:

Axa, Axb	Auxiliary switch
L	Long time delay trip indicator
SI	Short time delay/instantaneous
G	Ground fault trip indicator
CL1~CL4	Cell switch
M	Motor
CC	Closing coil
SHT1	Shunt tripping device 1
SHT2	Shunt tripping device 2
UVT	UVT coil

Z1	Z2		ZSI input
Z3	Z4		ZSI output
E1	E2		ZCT
VN	~	V3	Voltage module
311	~	314	Position switch

Terminal code description:

|				
13	14	63	64	Auxiliary switch "NO"
11	12	61	62	Auxiliary switch "NC"
413	414			Charged signal
U1	U2			Motor charging
A1	A2			Closing coil
C1	C2			Shunt trip
C11	C12			2nd Shunt trip
D1	D2			Voltage input terminal of UVT
83	84			Alarm trip 1
183	184			Alarm trip 2
251	252			Ready to close. Is on when ACB is open and Spring is charged
R1	R2			Control power
513	~	544		Alarm contact LSIG
R11	R22			Alarm reset
485+	485-			RS485 Communication

Note: 1) Available on request.

ABWC wiring diagram

This diagram considers the ABWC in the inserted position, in the open position (OFF) and motor loaded.
In the withdrawable version (with truck), the truck release latch must be in the regular (released) position.
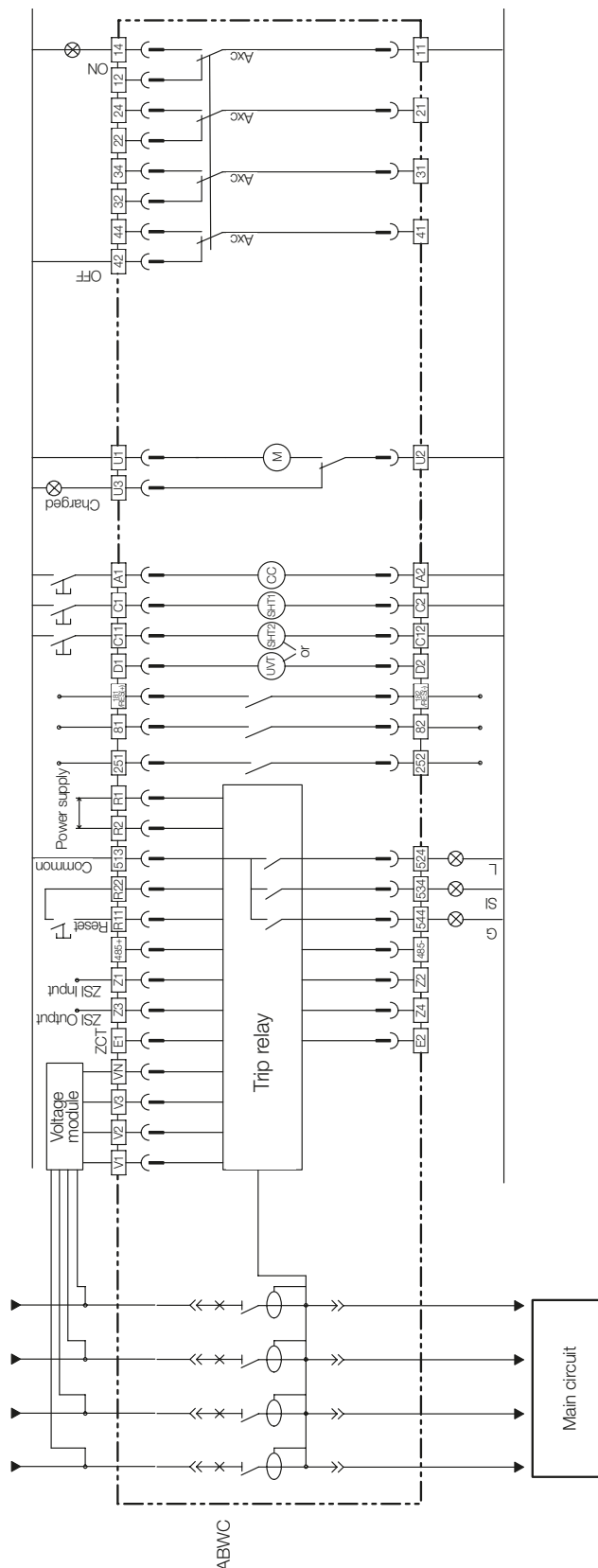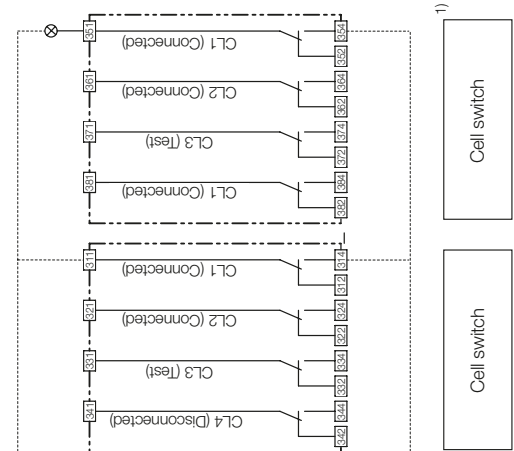
Auxiliary position contacts, optional item for the withdrawable circuit-breaker:

311 ~ 344	Cell switch

Accessory code description:

Axc	Auxiliary switch
L	Long time delay trip indicator
SI	Short time delay/instantaneous
G	Ground fault trip indicator
CL1~CL4	Cell switch
M	Motor
CC	Closing coil
SHT1	Shunt tripping device 1
SHT2	Shunt tripping device 2
UVT	UVT coil

Z1	Z2	ZSI input
Z3	Z4	ZSI output
E1	E2	External CT
VN	~ V3	Voltage module
485+	~ 485-	RS485 Communication
311	~ 314	Auxiliary position switch

Terminal code description:

11	12 ~ 41	42	Auxiliary switch "b" contact
11	14 ~ 41	44	Auxiliary switch "a" contact
U3	U2		Spring loaded
U1	U2		Motor of spring charging
A1	A2		Closing coil
C1	C2		Shunt trip
C11	C12		2nd shunt trip
D1	D2		Voltage input terminal of UVT
81	82		Alarm trip 1
181	182		Alarm trip 2
251	252		Ready to close, the circuit breaker is turned off and the spring is loaded
R1	R2		Control power
513	~ 544		Alarm contact
R11	R22		Alarm reset

Note: 1) Available on request.

Notes

Notes

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is essential, as much as understanding your needs.

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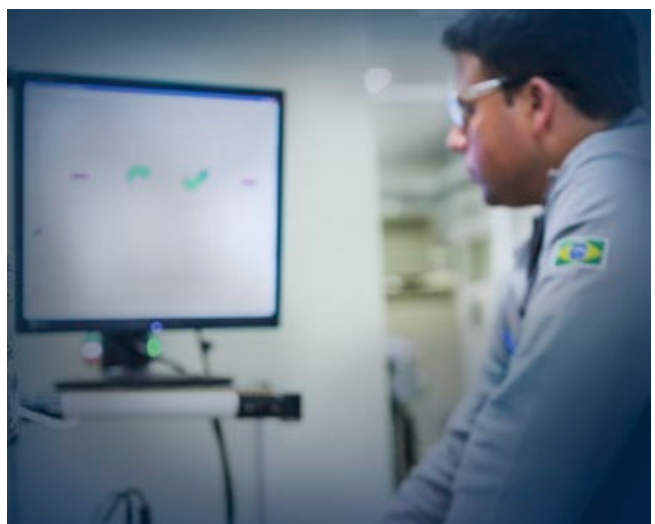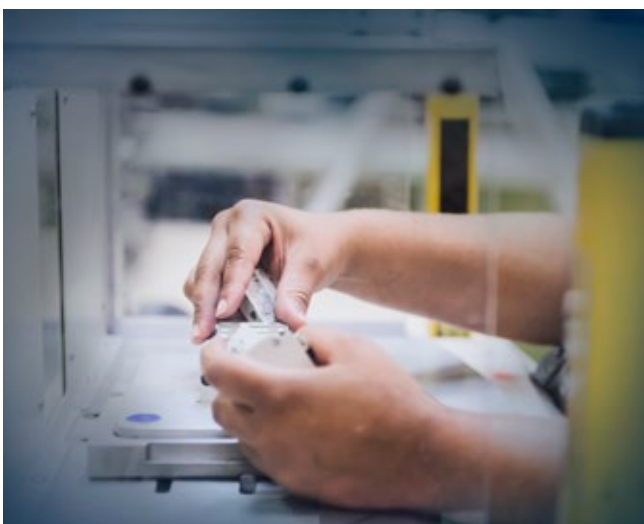
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📞 **+55 47 3276.4000**

✉ **automacao@weg.net**

📍 **Jaraguá do Sul - SC - Brazil**