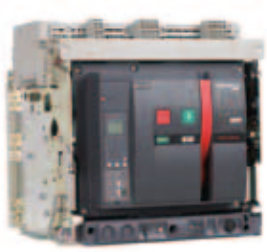
HDW9 Air Circuit Breaker

Standard: IEC 60947-2



Main Characteristics

- Frame(A):1600N, 4000H1, 4000H2, 6300L
- In (A):630 ~ 6300
- Ue (V):400/415, 690
- Poles: 3P & 4P
- Type: fixed type & draw-out type
- Certificates: CE KEMA
- Standards:IEC 60947-2

Intelligent Control Units

- iTR336

Basic function: L, S, I & G protection

- iTR336E

Basic protection function
Basic measurement function
Assistant function

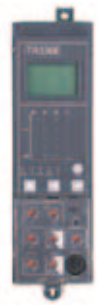
- iTR336H

Basic & advanced protection function
Multiple measurement function
Assistant function
Specific function
Communication function

- iTR336H-L

Basic & advanced protection function
Multiple measurement function
Assistant function
Specific function
Communication function
Suitable for high and low temperature

iTR336



iTR336E

iTR336H

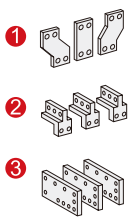
iTR336H-L

Wiring Situations

- Rear connection(horizontal & vertical)
- Front connection
- Mixed connection

Optional accessories

1. Spreaders
2. Vertical connection adapters
3. Cable lug adapters



Accessories

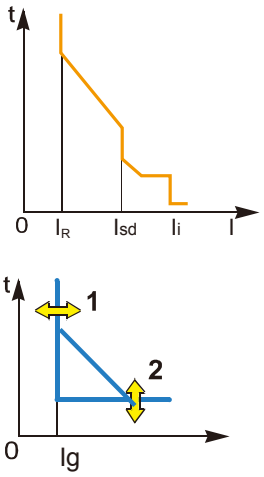
- Remote control: shunt release, closing release, opening release, electric motor
- Indication contacts: Auxiliary contacts, ready to close contact, 3-position indication contacts, fault-trip indication contact, remote reset contact
- Locks: chassis padlock, opening keylock, door interlock, 3-position interlock.
- Mechanical interlock: lever interlocks, cable interlocks
- Operation and protection: door frame, interphase barriers, safety shutters
- Accessories of the control unit: N-phase external CT, ground return CT,earth-leakage CT

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Overall View

iTR336

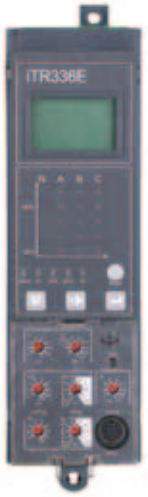


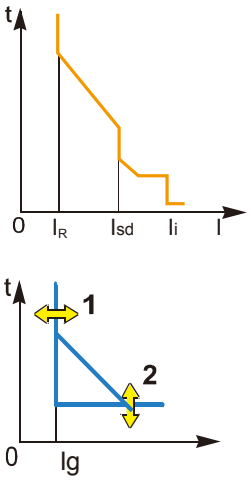
Basic Type

Protection:

Long time + short time + instantaneous + earth fault

iTR336E





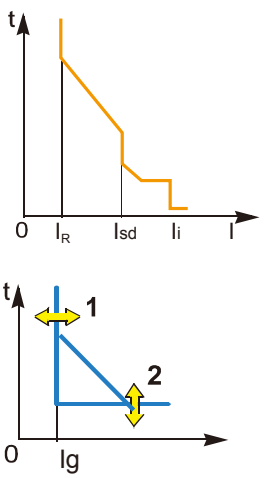
Standard Type

Protection:

Long time + short time + instantaneous + earth fault

LED lights indicate the status of 3 phases

iTR336H



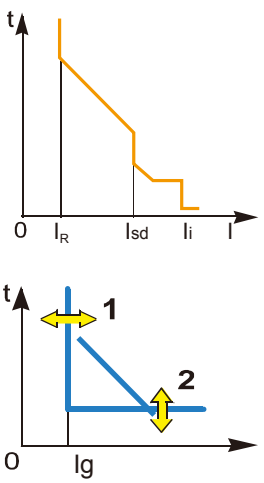
Advanced Type

Protection:

Long time + short time + instantaneous + earth fault

Multiple protection, measurement, maintenance, communication functions.

iTR336H-L



High-low Temperature Type

Protection:

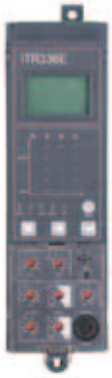
Long time + short time + instantaneous + earth fault

Multiple protection, measurement, maintenance, communication functions.

Available in extreme situations, between -40°C and 80°C

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

	iTR336	iTR336E	iTR336H	iTR336H-L
				
Protection	Long time-L Short time-S Instantaneous-I MCR Ground fault-G	Long time-L Short time-S Instantaneous-I MCR Ground fault-G	Long time-L Short time-S Instantaneous-I MCR Ground fault-G Under-voltage/alarm Over-voltage/alarm 3-phase imbalance/alarm Phase sequence/alarm Under-frequency/alarm Over-frequency/alarm Inverse power protection/alarm Voltage harmonic alarm(THDu) Current harmonic alarm(THDi)	Long time-L Short time-S Instantaneous-I MCR Ground fault-G Under-voltage/alarm Over-voltage/alarm 3-phase imbalance/alarm Phase sequence/alarm Under-frequency/alarm Over-frequency/alarm Inverse power protection/alarm Voltage harmonic alarm(THDu) Current harmonic alarm(THDi)
Measurement		Current Voltage Power Frequency Energy	Current Voltage Power Frequency Energy Harmonic	Current Voltage Power Frequency Energy Harmonic
Auxiliary fuction	Test function	Pre-Alarm Self-diagnose Fault history record Test function	Pre-Alarm Self-diagnose Fault history record Test function Load monitor ZSI	Pre-Alarm Self-diagnose Fault history record Test function Load monitor ZSI High to low temperature
Communication			Modbus	Modbus

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Overall View

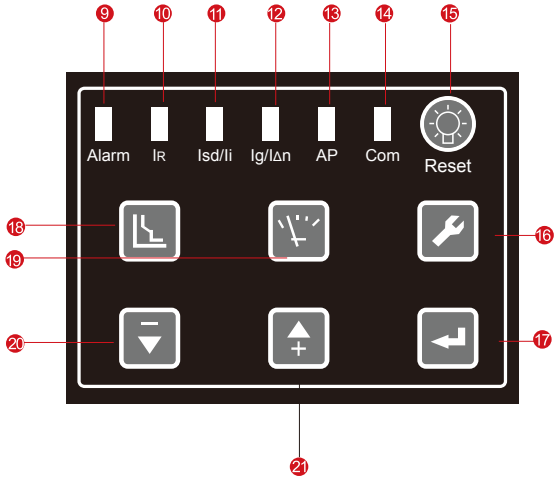
1. Top fix
2. LED indicator light
3. Data Sheet
4. Control panel
5. Bottom
6. Terminal connector
7. CT connector
8. Magnetic flow/micro switch

Direction

9. Alarm LED
10. Long-time LED
11. Short/instantaneous LED
12. Leakage LED
13. Advanced protect LED
14. Communication
15. Reset

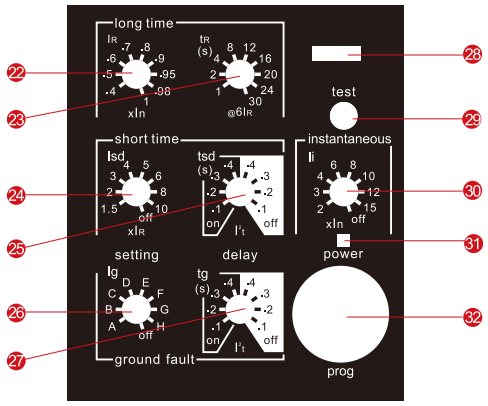
Navigator

16. System setting
17. Confirm
18. Protection interface/return
19. Measurement interface/return
20. Move down
21. Move up



Control Panel

22. Long time-current setting
23. Long time-time setting
24. Short time-current setting Isd
25. Short time-time setting tsd
26. Ground fault-current setting Ig
27. Ground fault-time setting tg
28. Padlock
29. Test,instantaneous
30. Instantaneous current setting
31. Power
32. Test port



HDW9 Air Circuit Breaker

Standard: IEC 60947-2

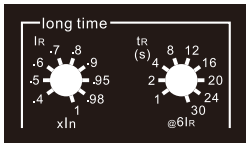
Protect Characteristics

The protect characteristics of intelligent control unit divide to inverse time delayed. protection and fixed time delayded protection.The intelligent control unit protect as fixed time delayded protection when the failure current is over inverse time delayed protection settings.

Inverse time delayed protection curve meet the curve of I^2t.

1600N,4000H1,4000H2

Over-load Protect Characteristics



Tripping Characteristics

<1.05 I_R: >2h non-tripping;

>1.2 I_R: <1h tripping;

≥1.2 I_R: delay tripping;

I_R setting range: 0.4In，0.5In，0.6In，0.7In，0.8In，0.9In，0.95In，0.98In，1.0In

Inverse Time Protection Tripping Characteristics I^2t: $t=(6/N)^2 * t_R$

Current	Tripping time								
1.5 I_R	16s	32s	64s	128s	192s	256s	320s	384s	480s
2 I_R	9s	18s	36s	72s	108s	144s	180s	216s	270s
6 I_R	1s	2s	4s	8s	12s	16s	20s	24s	30s

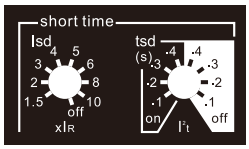
N---Failure current I/I_R

t---Failure tripping delayed time

t_R--- Long delayed time setting

Tripping time error ± 10%

Short-circuit Short Delay Protect Characteristics



Tripping Characteristics

<0.9 Isd: >2h non-tripping;

>1.1 Isd: <1h tripping;

≥1.1 Isd: delay tripping;

I_{sd} setting range: 1.5 I_R ， 2 I_R ， 3 I_R， 4 I_R， 5 I_R， 6 I_R， 8 I_R， 10 I_R+OFF

Current	Tripping Time					
Isd<I ≤ 8I_R	Inverse time		$I^2t=(8I_R)^2$ tsd			
		Setting time s	0.1，0.2，0.3，0.4			
I ≥ 1.1Isd	Tripping time of fixed is the minimum time.	Setting time s	0.1	0.2	0.3	0.4
		Min. s	0.08	0.14	0.23	0.35
Isd---Short time delay current		Max. s	0.14	0.2	0.32	0.5

I---Failure current

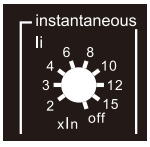
I_R---Long delay current

t---Tripping time

tsd--- Short delay inverse time

Tripping time error ± 20%

Short-circuit Instantaneous Protect Characteristics



Tripping Characteristics

<0.85Ii: non-tripping;

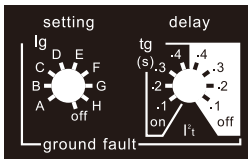
>1.15Ii: tripping;

Instantaneous current:2In，3In，4In，6In，8In，10In，12In，15In+OFF

Tripping time error ≤ 50ms

HDW9 Air Circuit Breaker

Standard: IEC 60947-2



Ground Return Protect Characteristics

Tripping Characteristics

<0.9 Ig: non-tripping;

>1.1 Ig: tripping;

≥1.1 Ig: delay tripping;

Current	A	B	C	D	E	F	G	H	OFF
In< 1250	0.2In	0.3In	0.4In	0.5In	0.6In	0.8In	0.9In	In	
In ≥ 1250	500A	600A	700A	800A	900A	1000A	1100A	1200A	
tg(s)	Inverse time	Tripping Characteristics							

$$t = \frac{(Ig)^2}{I^2} \times tg$$

	Tripping time of fixed is the minimum time.	Setting time s	0.1，0.2，0.3，0.4		
		Setting time s	0.1	0.2	0.3	0.4
		Min. s	0.08	0.14	0.23	0.35
		Max.s	0.14	0.2	0.32	0.5

Ig: ground protection current. In ≥ 1250, Ig=1200A.In<1250, Ig=In.

I: Breakdown current

T: Tripping delayed time

tg: Grounding inverse time

Inverse tripping time error ±20%

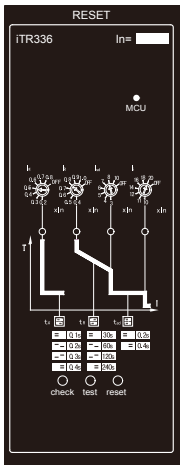
Factory Default Settings

Curve	Long delay		Short delay		Inst.	Ground fault		Memory
I²t	I_R	t_R	Isd	ts	Ii	Ig	tg	
	1In	30s	6In	0.2s	10In	G	0.4s	20min

Details refers to "HDW9 Intelligent Control Unit User Manual-1600N, 4000H1&H2"

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

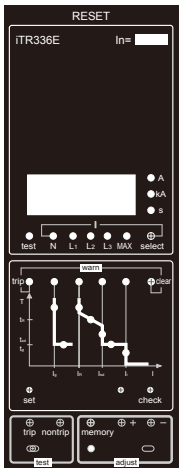


6300L

iTR336 Protect Characteristics

Over-load Protect Characteristics	
Tripping current I_R	（0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0）In+OFF
Delayed time setting t_R	30s, 60s, 120s, 240s
Short-circuit Short Delay Protect Characteristics	
Tripping current of fixed time Isd	（3, 4, 5, 6, 7, 8, 10）In+OFF
Delayed time of fixed time t_S	0.2s, 0.4s
Short-circuit Instantaneous Protect Characteristics	
Tripping current Ii	(7，8，9，10，11，12，14) In+OFF
Ground Return Protect Characteristics	
Tripping current Ig	（0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8）In+OFF
Delayed time t_g	0.1s，0.2s，0.3s，0.4s

iTR336E Protect Characteristics



Over-load Protect Characteristics	
Tripping current I_R	(0.4 ～ 1.0)In+OFF

Delayed time setting t_R

Failure Current	Delay Time					
t_R	15	30	60	120	240	480
$1.5xI_R$	15	30	60	120	240	480
$2xI_R$	8.4	16.9	33.8	67.5	135	270
$7.2xI_R$	0.65	1.3	2.6	5.2	10.4	20.8

$t=(1.5/N)^2xt_R$

N=Failure Current I/I_R

t=Delayed failure tripping time

t_R=Delayed tripping time

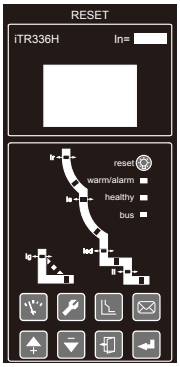
Short-circuit Short Delay Protect Characteristics	
Tripping current of fixed time Isd	0.4 ～ 15In+OFF Step: below 10kA: 2A, above 10kA: ≤ 10A
Delayed time of fixed time t_S	I^2T

Failure Current	Delay Time				
	ts(s)	0.1	0.2	0.3	0.4
I^2T: OFF	Min.delay(ms)	60	160	255	340
	Max.delay(ms)	140	240	345	460
I^2T:ON	Min.delay(ms)	60	160	255	340
$I>8I_R$	Max.delay(ms)	140	240	345	460
I^2T: ON	Inverse time	$t=(8I_R)^2/I^2 \times ts$			
$I \leq 8I_R$					

Short-circuit Instantaneous Protect Characteristics	
Tripping current Ii	2.0In ～ 100kA+OFF
Ground Return Protect Characteristics	
Tripping current Ig	(0.2 ～ 1.0)In+OFF
Delayed time tg	0.1s，0.2s，0.3s，0.4s，OFF

HDW9 Air Circuit Breaker

Standard: IEC 60947-2



iTR336H Protect Characteristics

Over-load Protect Characteristics	
Tripping current I_R	OFF+（0.4 ～ 1.0）In
Tripping curves	SI: Standard inverse time
Protection type	VI: Rapid Inverse Time
	EI(G): Express inverse time (distribution)
	EI(M): Express inverse time (electromotor)
	HV：High voltage fuse compatibility
	I^2t: Universal inverse time protection
Delayed time setting	C01 ～ C16
Short-circuit Short Delay Protect Characteristics	
Tripping current of inverse time Is	OFF+(0.4 ～ 15)In
Tripping current of fixed time Isd	OFF+(0.4 ～ 15)In
Delayed time of fixed time tsd	0.1 ～ 0.4s
Short-circuit Instantaneous Protect Characteristics	
Tripping current Ii	2.0In ～ 100kA+OFF
Ground Return Protect Characteristics	
Tripping current Ig	OFF+(0.2 ～ 1.0)In
Shearing coefficient of inverse time Cr	(1.5 ～ 6)+OFF
Delayed time tg	0.1 ～ 1s

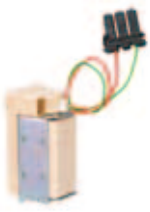
Factory Default Settings

Controller	Curve	Long delay		Short delay			Inst.	Ground fault		Monitering Ic1, Ic2	Memory
		I_R	t_R	Isd	Isd2	ts	Ii	Ig	tg		
iTR336											
iTR336E	I^2t	1In	60s	4In	/	0.2s	10In	0.8In	0.4s	1In	20min
iTR336H				6In	8In						

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Remote Operation



Shunt Release MX

After the circuit breaker is closed, the shunt release can open the circuit breaker instantaneously under required power voltage. The operation can be done remotely.

- Rated control power voltage: AC220V/AC230V, AC380V/AC400V, DC220V
- Operating voltage: (0.7-1.1) Us
- Break time: 50±10ms (1600N,4000H1&H2)
  <30ms (6300L)

Closing Release XF

After the circuit breaker completes energy storage, the closing release can close the circuit breaker under required power voltage. The operation can be done remotely.

- Rated control power voltage: AC220V/AC230V, AC380V/AC400V, DC220V
- Operating voltage: (0.85-1.1) Us
- Closing time: 55±10ms(1600N)
  70±10ms(4000H1&H2,>3200A,80±10ms)

Under-voltage Release MN

The under-voltage release can be divided s to under-voltage release and under-voltage delayed release.

After the circuit breaker is closed and the voltage will drop to 70% to 35% of rated voltage, the circuit breaker can be opened, and the breaker can only be closed again when the power voltage of the under-voltage release returns to 85% of rated voltage.

Rated control power voltage: AC220V/AC230V, AC380V/AC400V

- Operating voltage: (0.35-0.7) Ue
- Reliable closing voltage: (0.85-1.1) Ue
- Voltage that can not be closed: ≤ 0.35Ue
- Delay time: 0.5s, 0.9s, 1.5s, 3s(1600N,4000H1&H2),1s,3s,5s(6300L)

Under-voltage Delayed Release MNR

The under-voltage delay release can open the circuit breaker after 0.5s, 0.9s, 1.5s, 3s (1600N,4000H1&H2),1s,3s,5s(6300L)

Electric Motor MCH

The electric motor can store energy for the circuit breaker automatically when it is power on and the circuit breaker is open. The electric motor can open or close the circuit breaker with the shunt release, under-voltage release and closing voltage release. When there is no power supply, the handle can store energy for the circuit breaker.

- Rated control power voltage: AC220V/AC230V, AC380V/AC400V, DC220V
- Operating voltage: (0.85-1.1) Us
- Power consumption: 180W(1600N,4000H1&H2),150W(6300L)
- Energy storage time: <5s
- Utilization category: AC15, DC13

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Indication Contacts

Auxiliary Contacts OF

Default: 4NO and 4NC(12NO 12NC or 8NO 8NC are for option,5NO 5NC for 6300L) Auxiliary Contacts can be used to indicate the status of the circuit breaker, e.g.
connecting the status indicator of the circuit breaker.
Rated thermal current Ith: AC380V/AC400V 0.75A, AC220V/AC230V 1.3A, DC220V 0.15A

Ready to Close Contact PF

Ready to close contact is composed of a mechanical indicating contact and a transferring contact. It can send closing signal and indicate:
- The circuit breaker is disconnected
- The energy is stored
- No continued opening command

AC12/DC12: AC380V/AC400V 3A, DC220V 0.15A

Connection (CE), Separation (CD), Test (CT) Position Indication Contacts

Connection (CE), Separation (CD), Test (CT) position indication contacts are installed on the chassis for indicating the position of the circuit breaker.
Draw-out type only.

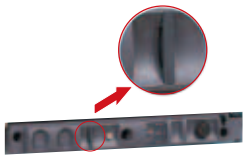
Fault-trip Indication Contact(Additional) SWT2

When there is electrical malfunction, the contact provides a set of malfunction signal outputs.

Remote Reset Contact Res

When there is electrical malfunction, after the circuit breaker is opening, the contact can allow malfunction locking device of the circuit breaker to be remotely reset. This contact is not compatible with additional SWT fault-trip indication contact.
Only for iTR336H, iTR336H-L

Keylocks and Interlocks



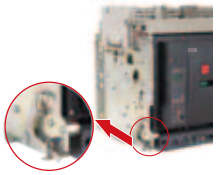
OFF Position Padlock

The padlock should be prepared by the client.
The rocker cannot be inserted after the padlock locked, when the circuit breaker is at "separation" position.

OFF Position Keylock

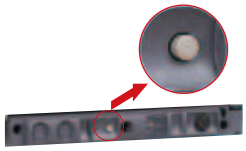
The opening lock can lock the circuit at OFF position. The circuit breaker can only be closed when the lock is opened with a key and the key is not pulled out. The opening lock can be divided s into 3 types (the latter 2 types are used in distribution system with two wirings and one contacting):

- 1 lock and 1 key
- 2 locks and 1 key
- 3 locks and 2 keys



Door Interlock

The interlock is installed at the side of draw-out type circuit breaker and linked with the door of the distribution cabinet. When the circuit breaker is at connection or test position, it ensures that the cabinet door cannot be opened. The cabinet door can be opened at separation position. It can prevent the circuit breaker from slipping and causing damage.



3-position Interlock

For the draw-out type circuit breaker, the "connection", "test" and "separation" position of the circuit breaker can be indicated by the indicator. The in-out button is locked at indicated by the indicator. The in-out button is locked at The in-out button is locked at each position. Push to unlock.

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Mechanical Interlock

Lever Interlock and Cable Interlock

- Lever interlock is used for two circuit breakers installed vertically. Cable interlock is used for 2 or 3 circuit breakers installed vertically or horizontally.
- The interlocks is used in distribution system with two wirings and one contacting.
- The interlocks build mechanical links between 2 or 3 circuit breakers.
- If one circuit breaker is closed, the linked circuit breaker will be opened.

Operation Protection

Door Frame

- The door frame is installed on the door of the distribution cabinet, and can increase the protection degree to IP40.
- Suitable for fix-type and draw-out type.

Interphase Barriers

- The Interphase barriers are insulating plates installed in the middle of busbar to increase creepage distance and insulating ability.
- The Interphase barriers are installed between the front and rear connecting terminals.

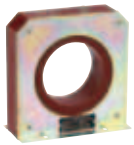
Safety Shutters

The safety shutters is installed in draw-out type circuit breaker. When the circuit breaker is at test or separation position, the safety shutters can protect contact cables prevent operators from touching live parts.

Accessories of Control Unit

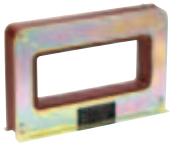
N-phase External Current Transformer

N-phase external current transformer is used to measure neutral phase current in 3P+N grounding system and it is installed on the grounding busbar by the client.



Ground Return Current Transformer

- Ground return current transformer is used to measure the neutral phase current under grounding type of grounding current return. The current transformer can also provide protection for up and down grounding defects of the circuit breaker.
- The grounding current transformer is only suitable for iTR336H and iTR336H-L controller.



Earth-leakage Current Transformer

Earth-leakage current transformer is used for the grounding protection type of leakage protection.
The Earth-leakage Current Transformer is suitable for iTR336H and iTR336H-L controller.

Power Supply Module

- The power supply module can be used in AC220V/AC230V, AC380V/AC400V, DC220V circuits and provide power supply for intelligent controller. And the output is DC24V.
- The power supply module of HDW9-6300L is used in DC220V circuits and provides power supply for intelligent controller. And signal convert module works with power supply module.

Signal Convert Module

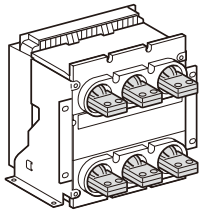
Signal convert module is used for communication function, e.g. zone selective interlock function. The iTR336H and iTR336H-L controller are equipped with it.

HDW9 Air Circuit Breaker

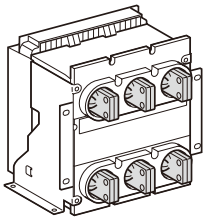
Standard: IEC 60947-2

Rear Connections

Horizontal



Vertical

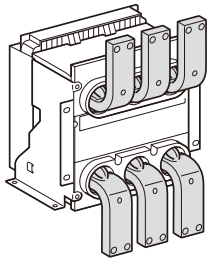


For 1600N, horizontal and vertical connection methods transforms by rotating the connection terminal 90 degree.

For 4000H1&H2, horizontal and vertical connection terminals are different, please remark when order.

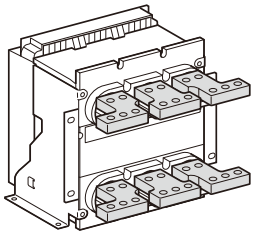
For 6300L, horizontal connection is the only methods.

Front Connections 630A~3200A

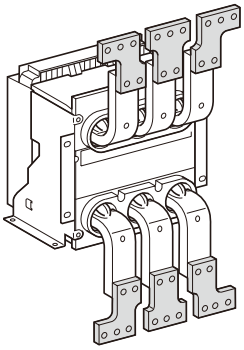


Spreaders (1600N only)

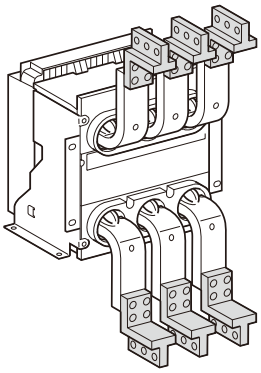
Horizontal Rear Connection with Spreadersl



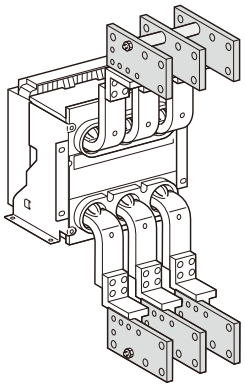
Front Connection with Spreaders



Vertical Adapters



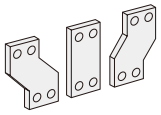
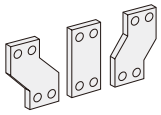
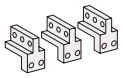
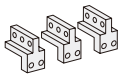
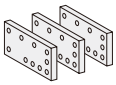
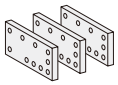
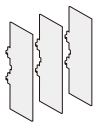
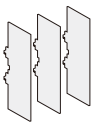
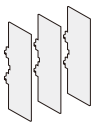
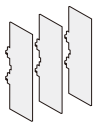
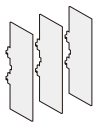
Cable-lug Adapters



HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Optional Connection Solutions

Type	1600N				4000H1, 4000H2				6300L
	Draw-out Type		Fixed Type		Draw-out Type		Fixed Type		Draw-out
	Rear	Front	Rear	Front	Rear	Front	Rear	Front	Rear
Spreaders									
									
Vertical-connection Adapters									
									
Cable-lug Adapters									
									
Interphase Barriers *1)			*1)		*2)		*2）		
									

*1) Interphase barriers must be used over 500V.

*2) 4000A horizontal rear connection is not included.

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

HDW9 Coding System

Product Name	Frame	Rated current	Poles	Installation method	MCH / XF / MX / Power supply module	MN/MNR	Auxiliary contact	Intelligent control unit
W9	40H2	32	3	DH	N	5	F	E
W9:HDW9	16N:1600N(Icu=50kA)	06:630A	3:3P	DH:Drawout Horizontal	N:AC230V	N:MN AC230V	F:4NO4NC	B:iTR336
	40H1:4000H1(Icu=65kA)	08:800A	4:4P	FH:Fixed Horizontal	V:AC400V	V:MN AC400V	E:8NO8NC	E:iTR336E
	40H2:4000H2(Icu=100kA)	10:1000A		DV:Drawout Vertical	D:DC220V	P:MNR AC230V	T:12NO12NC	H:iTR336H
	63L:6300L(Icu=120kA)	12:1250A		FV:Fixed Vertical		T:MNR AC400V	V:5NO5NC	L:iTR336H-L
		16:1600A		DF:Drawout Front-connection		5:None		
		20:2000A		FF:Fixed Front-connection				
		25:2500A						
		32:3200A						
		40:4000A						
		50:5000A						
		63:6300A						

Remarks:

1.Front-connection type device is NOT available for HDW9 which rated current is 4000A.

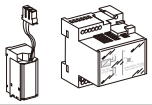
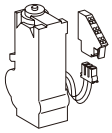
2.Fixed type device is NOT available for HDW9-6300L.

3.4P type device is NOT available for HDW9 which rated current is 6300A.

4.1600N offers 4NO4NC; 4000H offers 4NO4NC, 8NO8NC, 12NO12NC; 6300L offers 5NO5NC.

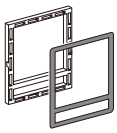
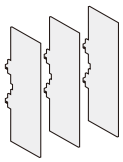
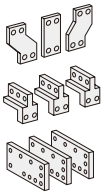
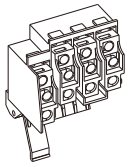
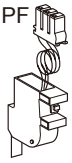
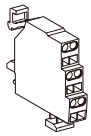
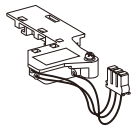
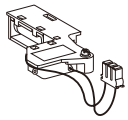
5.iTR336H-L is NOT available for 6300L.

Accessories References

	Reference	Remarks
Intelligent Control Unit		
	HDW9TU0	iTR336
	HDW9TUE	iTR336E
	HDW9TUH	iTR336H
	HDW9TUHL	iTR336H-L (1600N,4000H1&H2)
Remote Operation		
Shunt Release MX	HDW9MX2A	AC230V (1600N,4000H1&H2)
	HDW9MX4A	AC400V (1600N,4000H1&H2)
	HDW9MX2D	DC220V (1600N,4000H1&H2)
	HDW9MX2A63	AC230V (6300L)
	HDW9MX4A63	AC400V (6300L)
	HDW9MX2D63	DC220V (6300L)
Closing Release XF	HDW9XF2A	AC230V (1600N,4000H1&H2)
	HDW9XF4A	AC400V (1600N,4000H1&H2)
	HDW9XF2D	DC220V (1600N,4000H1&H2)
	HDW9XF2A63	AC230V (6300L)
	HDW9XF4A63	AC400V (6300L)
	HDW9XF2D63	DC220V (6300L)
Under-voltage Release MN	HDW9MN2A	AC230V (1600N,4000H1&H2)
	HDW9MN4A	AC400V (1600N,4000H1&H2)
	HDW9MN2A63	AC230V (6300L)
	HDW9MN4A63	AC400V (6300L)
Under-voltage delayed Release MNR	HDW9MNR2A	AC230V (1600N,4000H1&H2)
	HDW9MNR4A	AC400V (1600N,4000H1&H2)
	HDW9MNR2A63	AC230V (6300L)
	HDW9MNR4A63	AC400V (6300L)
Electric motor MCH	HDW9MCH162A	AC230V (1600N)
	HDW9MCH164A	AC400V (1600N)
	HDW9MCH162D	DC220V (1600N)
	HDW9MCH402A	AC230V (4000H1&H2)
	HDW9MCH404A	AC400V (4000H1&H2)
	HDW9MCH402D	DC220V (4000H1&H2)
	HDW9MCH632A	AC230V (6300L)
	HDW9MCH634A	AC400V (6300L)
	HDW9MCH632D	DC230V (6300L)

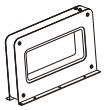
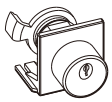
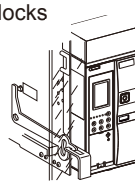
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Operation Protection		
Door Frame 	HDW916FCDP	1600N fixed type
	HDW916DCDP	1600N draw-out type
	HDW940FCDP	4000H1&H2 fixed type
	HDW940DCDP	4000H1&H2 draw-out type
	HDW963DCDP	6300L draw-out type
Interphase Barriers 	HDW916FEIP	1600N fixed type
	HDW916DEIP	1600N draw-out type
	HDW940FEIP	4000H1&H2 fixed type
	HDW940DEIP	4000H1&H2 draw-out type
	HDW963DEIP	6300L draw-out type
Connection Accessories		
	HDW9V3	1600N 3P vertical adapters
	HDW9V4	1600N 4P vertical adapters
	HDW9C3	1600N 3P cable-lug adapters
	HDW9C4	1600N 4P cable-lug adapters
	HDW9S3	1600N 3P spreaders
	HDW9S4	1600N 4P spreaders
Indication Contacts		
Auxiliary Contacts OF 	HDW9OF4416	4NO 4NC--1600N
	HDW9OF4440	4NO 4NC--4000H1&H2
	HDW9OF88	8NO 8NC--4000H1&H2
	HDW9OF12	12NO 12NC--4000H1&H2
	HDW9OF55	5NO 5NC--6300L
Ready to Close Contact PF 	HDW916PF	1600N
	HDW940PF	4000H1&H2
3-Position Indication Contacts(CE, CD, CT) 	HDW916EDT	1600N
	HDW940EDT	4000H1&H2
Fault-Trip Indication Contact(Additional) SWT2 	HDW916SWT2	1600N
	HDW940SWT2	4000H1&H2
Remote Reset Contact Res 	HDW916RES	1600N
	HDW940RES	4000H1&H2

HDW9 Air Circuit Breaker

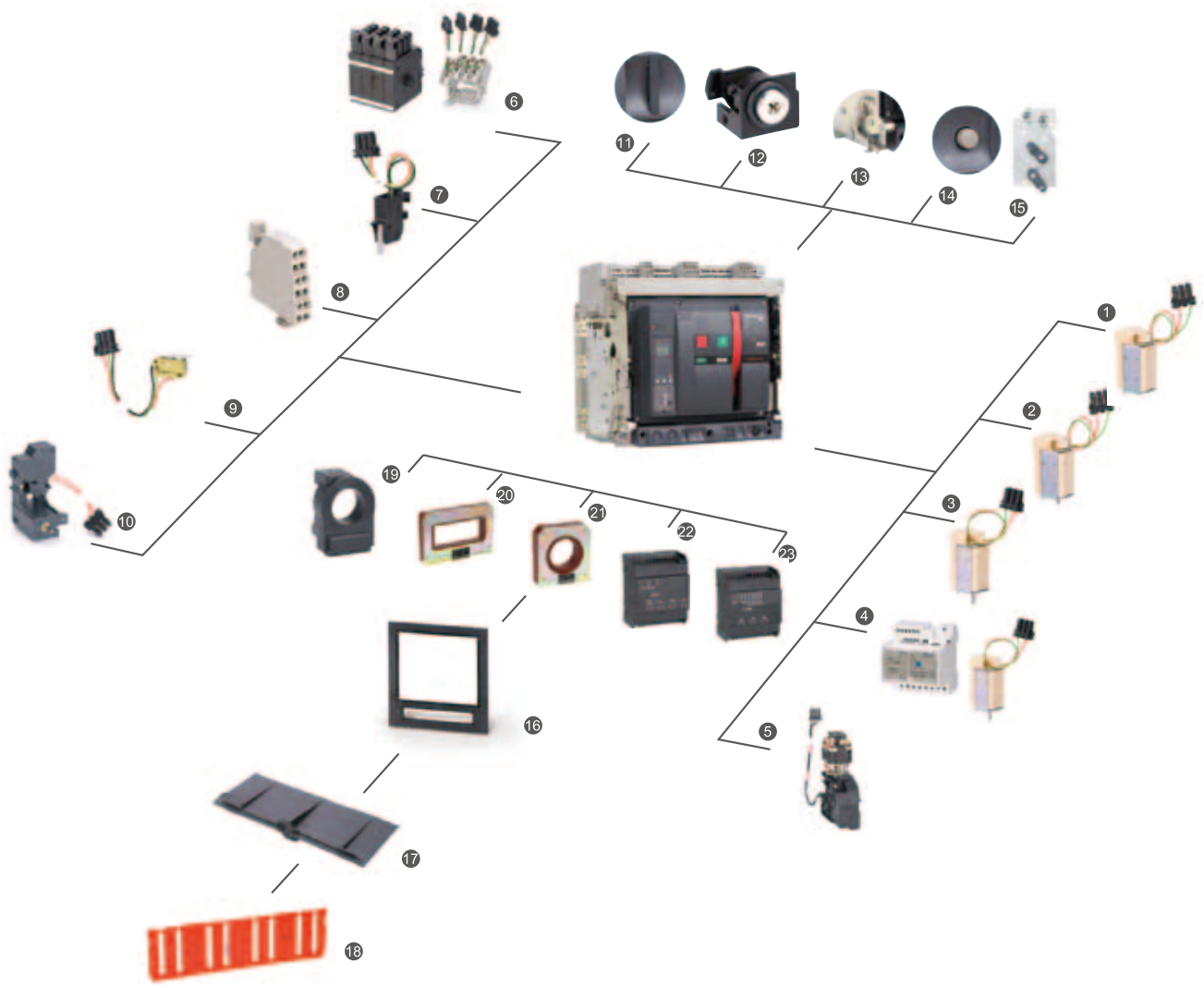
Standard: IEC 60947-2

Accessories of the Control Unit		
N-Phase External Current Transformer 	HDW9N16 HDW9N40 HDW9N63	1600N 4000H1&H2 6300L
Ground Return Current Transformer 	HDW9G	
Earth-Leakage Current Transformer 	HDW9L	
Power Supply Module 	HDW92AP HDW94AP HDW92DP	AC230V AC400V DC220V
Signal Convert Module 	HDW9TR	
Keylock and Interlock		
Keylocks 	HDW916L1 HDW916L2 HDW916L3 HDW940L1 HDW940L2 HDW940L3 HDW963L1 HDW963L2 HDW963L3	1600N--1 lock 1 key 1600N--2 locks 1 key 1600N--3 locks 2 keys 4000H1&H2--1 lock 1 key 4000H1&H2--2 locks 1 key 4000H1&H2--3 locks 2 keys 6300L--1 lock 1 key 6300L--2 locks 1 key 6300L--3 locks 2 keys
Door Interlocks 	HDW9DLL16 HDW9DLR16 HDW9DLL40 HDW9DLR40 HDW9DLL63 HDW9DLR63	1600N fixed type--left 1600N draw-out type--right 4000H1&H2 fixed type--left 4000H1&H2 draw-out type--right 6300L draw-out type--left 6300L draw-out type--right
Mechanical Interlock		
Cable Interlocks	HDW916FLL2 HDW916DLL2 HDW940FLL2 HDW940FLL3 HDW940DLL2 HDW940DLL3 HDW963DLL2 HDW963DLL3	1600N fixed type--2 devices 1600N draw-out type--2 devices 4000H1&H2 fixed type--2 devices 4000H1&H2 fixed type--3 devices 4000H1&H2 draw-out type--2 devices 4000H1&H2 draw-out type--3 devices 6300L draw-out type--2 devic 6300L draw-out type--3 devices
Lever Interlocks	HDW916FGL2 HDW916DGL2 HDW940FGL2 HDW940DGL2 HDW963DGL2 HDW963DGL3	1600N fixed type--2 devices 1600N draw-out type--2 devices 4000H1&H2 fixed type--2 devices 4000H1&H2 draw-out type--2 devices 6300L draw-out type--2 devices 6300L draw-out type--3 devices

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

HDW9 Accessories Instruction



Remote Operation	Indication Contacts	Locks	Mechanical Interlock	Protection	Controller Accessories
1 Shunt release	6 Auxiliary contacts	11 OFF position padlock	15 Mechanical interlock	16 Door frame	19 N-phase external CT
2 Closing release	7 Ready to close contact	12 OFF position keylock		17 Interphase barriers	20 Ground return CT
3 Under-voltage release	8 3-position indication contacts(CE, CD, CT)	13 Door interlockOF		18 Safety shutter	21 Earth-leakage CT
4 Under-voltage delayed release	9 Fault -trip indication contact (SWT)	14 3-position interlock			22 Power supply module
5 Electric motor	10 Remote reset contact				23 Signal convert module

HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Configuration

			1600N	4000H1	4000H2	6300L
Main Body						
Main body of circuit breaker			●	●	●	●
Components						
Intelligent control unit	iTR336		●	●	●	●
	iTR336E		●	●	●	●
	iTR336H		●	●	●	●
	iTR336H-L		●	●	●	
Remote operation	Shunt release		●	●	●	●
	Closing release		●	●	●	●
	Electric motor		●	●	●	●
	Under-voltage release		●	●	●	●
	Under-voltage delayed release		●	●	●	●
Operation protection	Door frame		●	●	●	●
	Interphase barriers *1)		●	●	●	●
Wiring methods	Horizontal rear connection		●	●	●	●
	Horizontal rear connection with spreaders		●			
	Vertical rear connection		●	●	●	
	Front connection *2)		●	●	●	
	Front connection with spreaders		●			
	Front connection with vertical-connection adapters		●			
	Front connection with cable-lug adapters		●			
Indication contacts	Auxiliary contacts	4NO 4NC	●	●	●	
		5NO 5NC				●
		8NO 8NC		●	●	
		12NO 12NC		●	●	
	Ready to close contact		●	●	●	
	Fault-trip indication contact SWT2 (additional)		●	●	●	
	3-position indication contacts *3)		●	●	●	
	Remote reset contact *4)*5)		●	●	●	
Control unit accessories	N-phase external current transformer		●	●	●	●
	Ground return current transformer *4)		●	●	●	●
	Earth-leakage current transformer *4)		●	●	●	●
	Power supply module		●	●	●	●
	Signal convert module *4)		●	●	●	●
Locks	OFF position keylock		●	●	●	●
	Door interlock		●	●	●	●
Mechanical interlock	Cable interlock		●	●	●	●
	Lever interlock		●	●	●	●

*1) Details refers to P132

*2) Front connection is not available for 4000H1&H2 4000A.

*3) Only for draw-out type

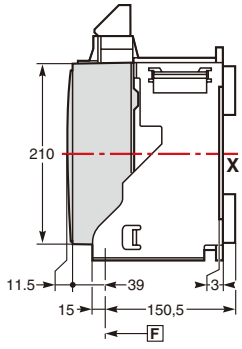
*4) Only for iTR336H, iTR336H-L

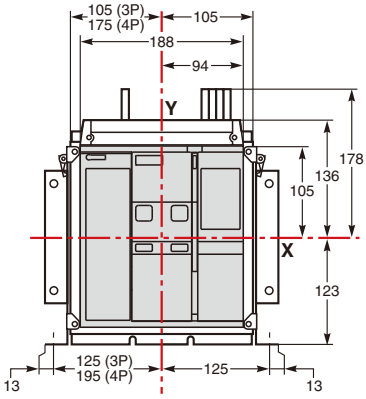
*5) Not compatible with additional fault-trip indication contact(SWT2)

HDW9 Air Circuit Breaker

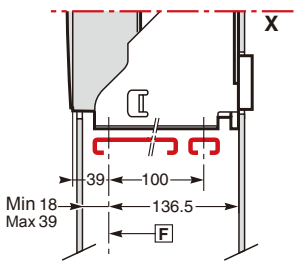
Standard: IEC 60947-2

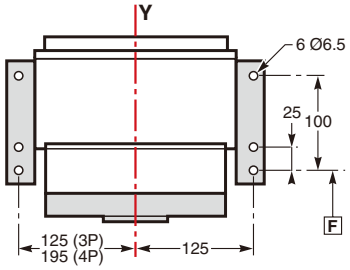
Dimensions



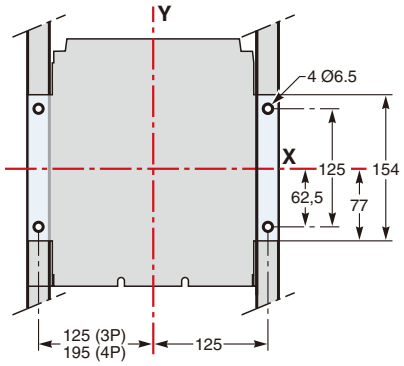


Horizontal installation on board or railway

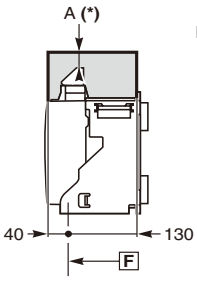


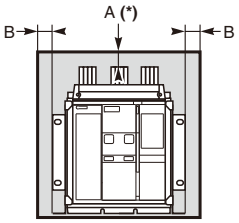


Vertical installation on back board or frame

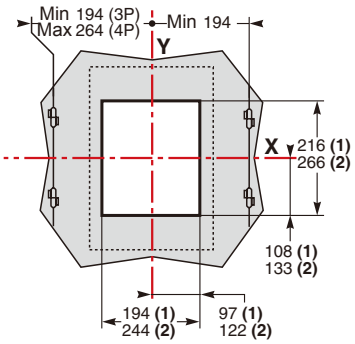


Safety clearances

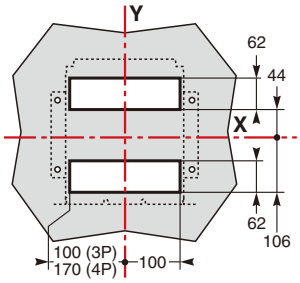




Door frame



Rear panel holes dimensions



F: Base point

	Non-conductor	Metals	Electric conductor
A	0	0	100
B	0	0	60

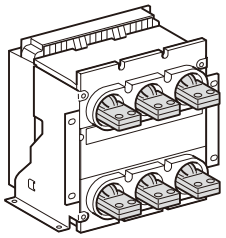
(1) Without door frame
(2) With door frame
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.
Removing the arc chutes needs 50mm safety clearance.
Removing terminal blocks needs 20mm safety clearance.

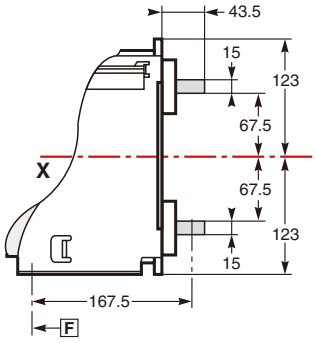
HDW9 Air Circuit Breaker

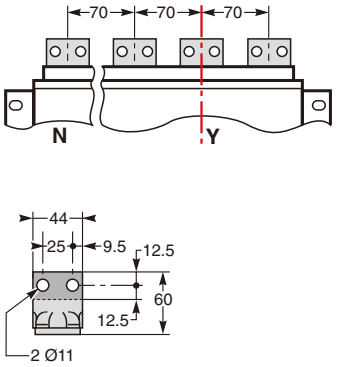
Standard: IEC 60947-2

Connections

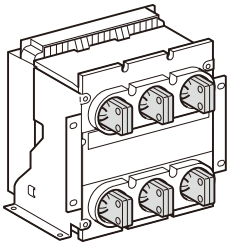
Horizontal rear connection

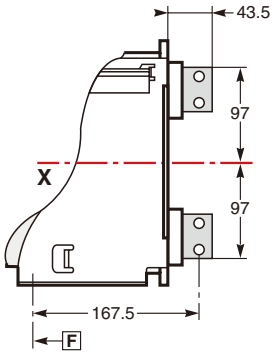


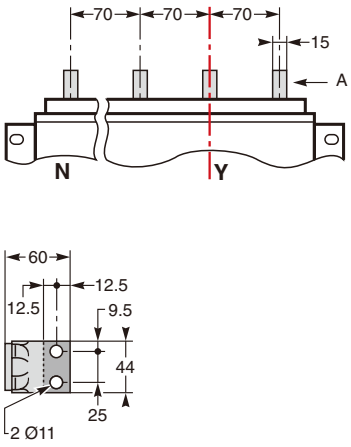




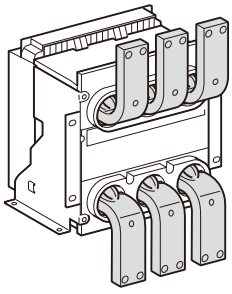
Vertical rear connection

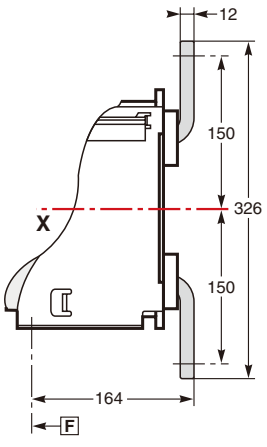


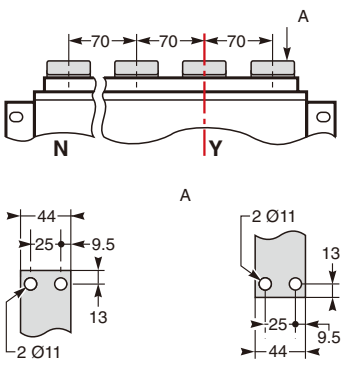




Front connection







Remarks: Screws: M10 Class8.8

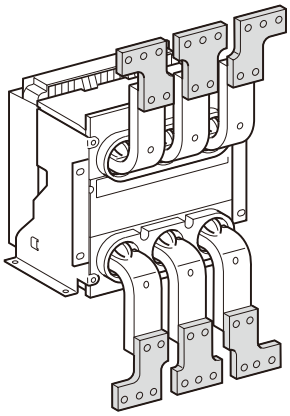
Fasten torque: 50Nm with gasket.

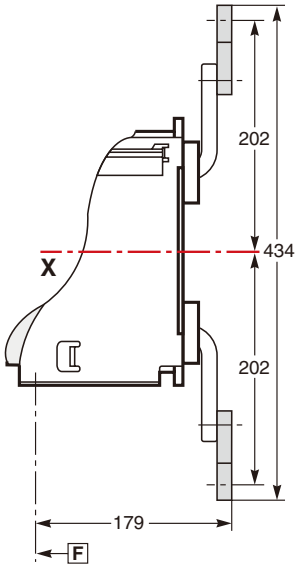
HDW9 Air Circuit Breaker

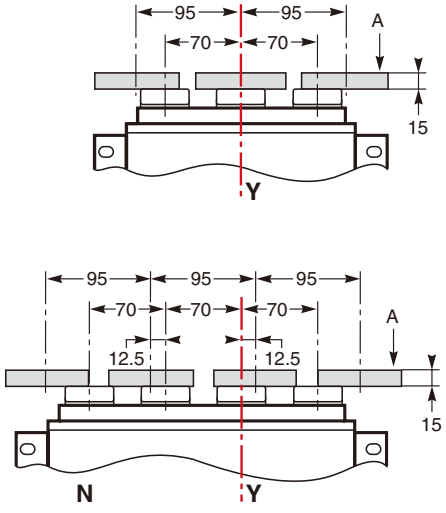
Standard: IEC 60947-2

Connections

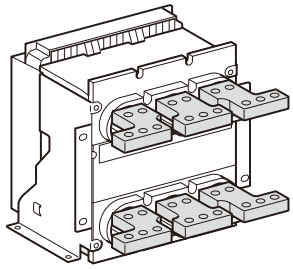
Front connection with spreaders

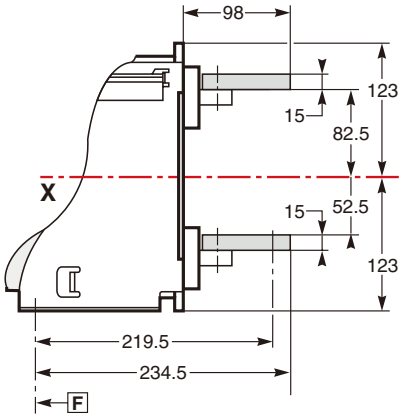


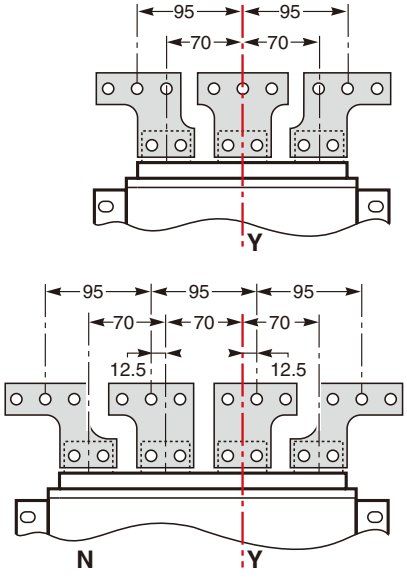




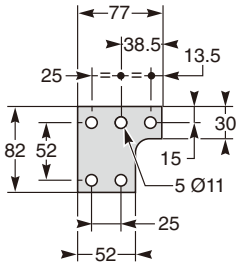
Rear connection with spreaders



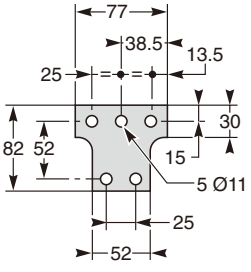




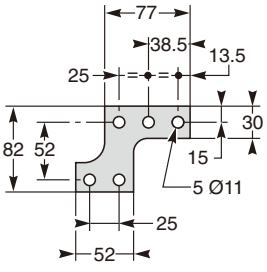
Middle left or right spreader for 4P



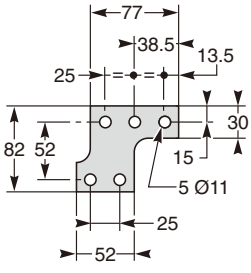
Middle spreader for 3P



Left or right spreader for 4P



Left or right spreader for 3P



F : Base point

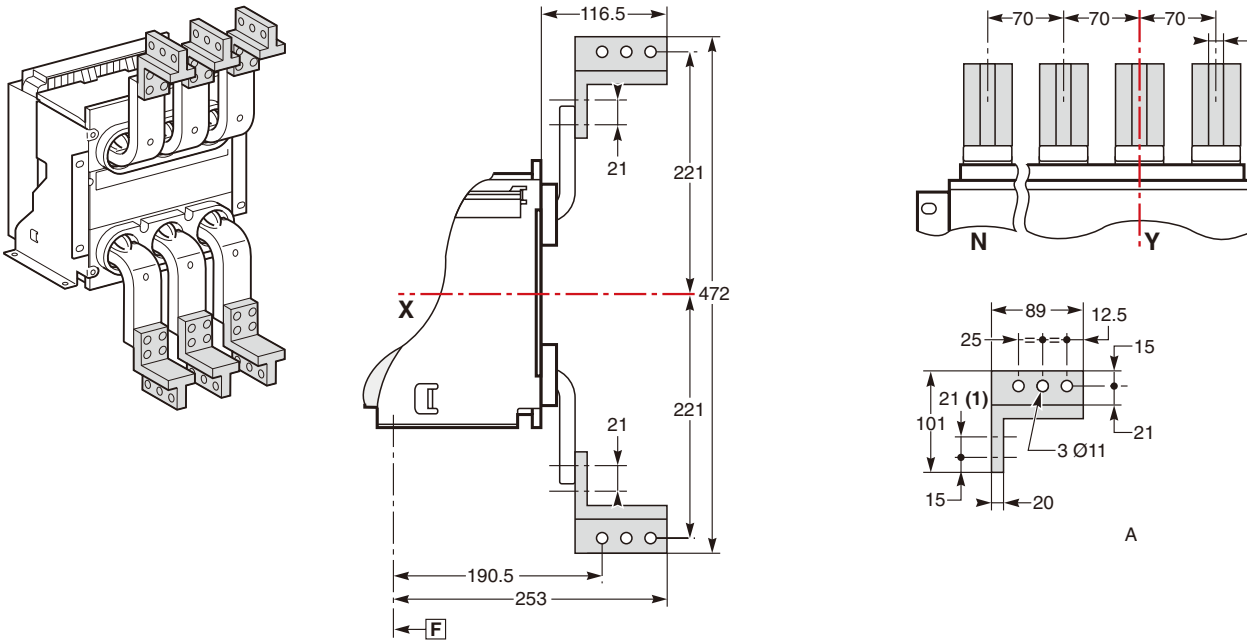
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

HDW9 Air Circuit Breaker

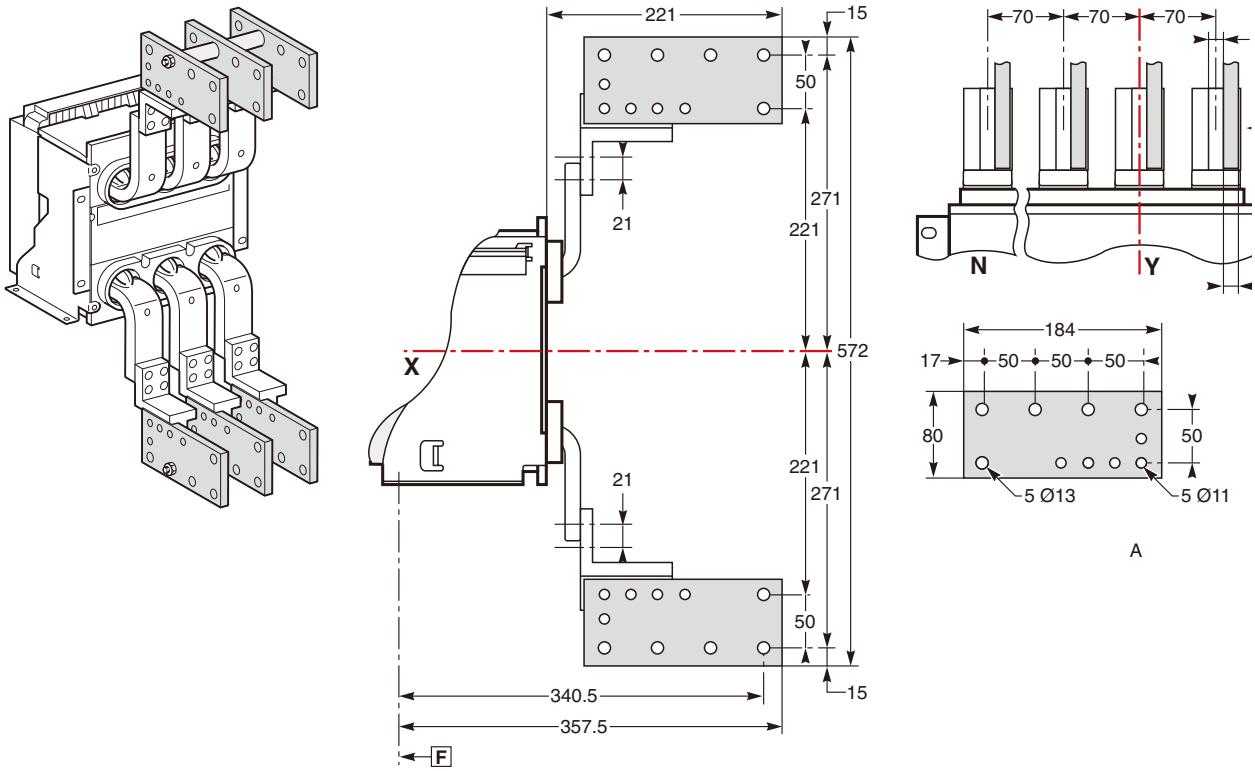
Standard: IEC 60947-2

Connections

Front connection with vertical-connection adapters



Front connection with vertical-connection adapters and cable-lug adaptersand cable-lug adapters



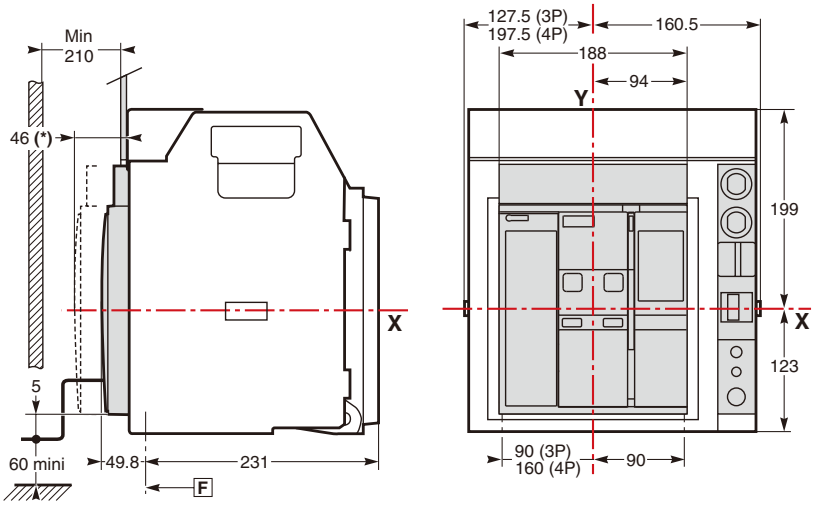
Remarks:Screws: M10 Class8.8

Fasten torque: 50Nm with gasket.

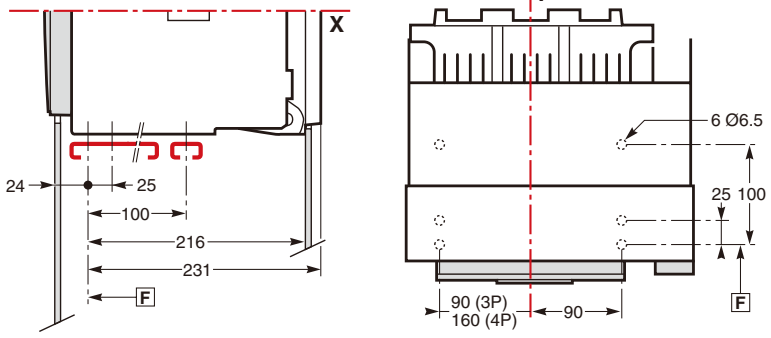
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

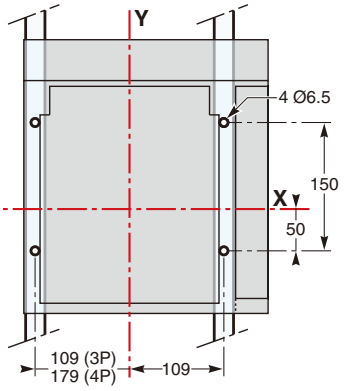
Dimensions



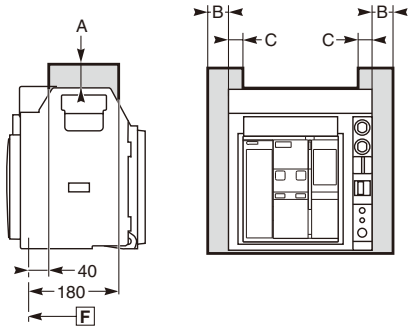
Horizontal installation on board or railway



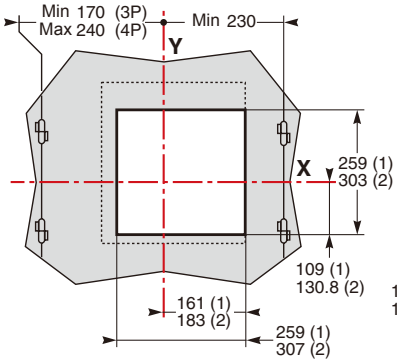
Vertical installation on back board or frame



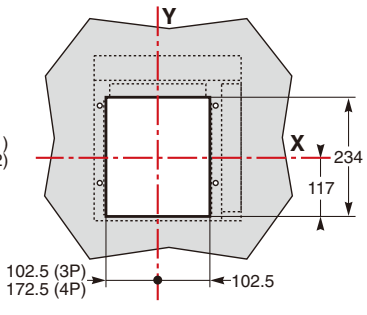
Safety clearances



Door holes dimensions



Rear panel holes dimensions



	Non-conductor	Metals	Electric conductor
A	0	0	90
B	10	10	60
C	0	0	90

F : Base point

(1) Without door frame

(2) With door frame

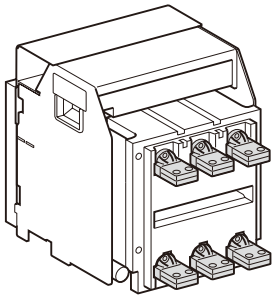
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

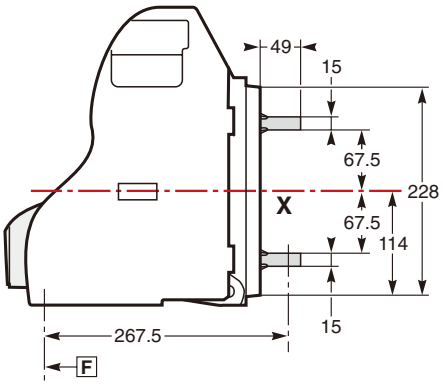
HDW9 Air Circuit Breaker

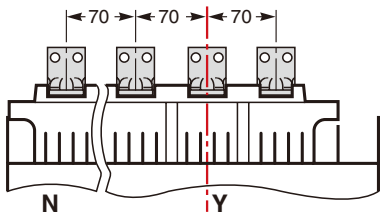
Standard: IEC 60947-2

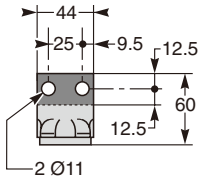
Connections

Horizontal rear connection

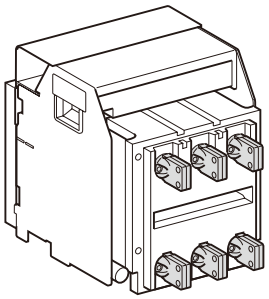


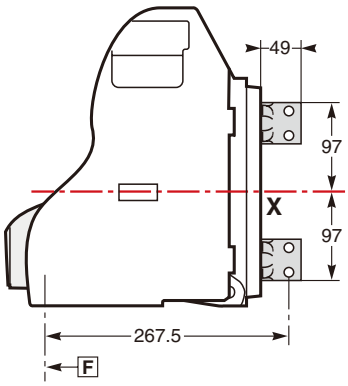


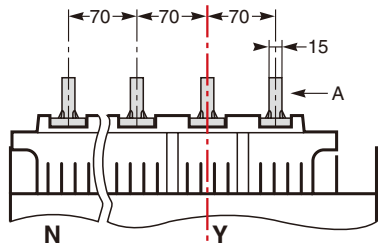


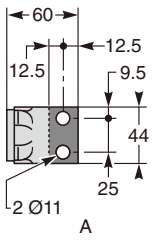


Vertical rear connection

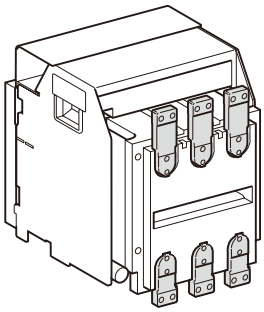


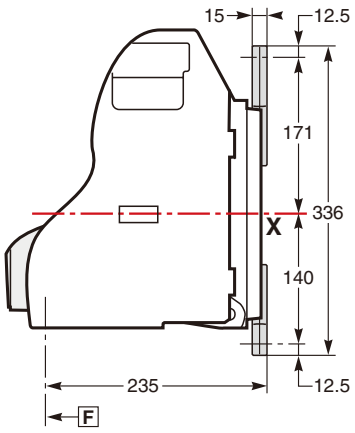


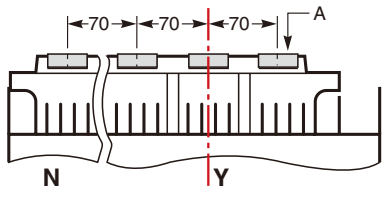


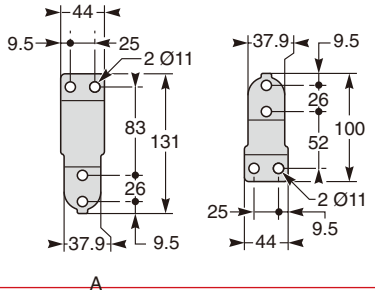


Front connection







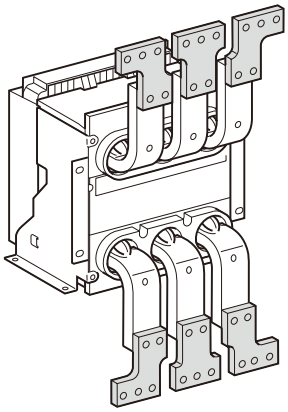


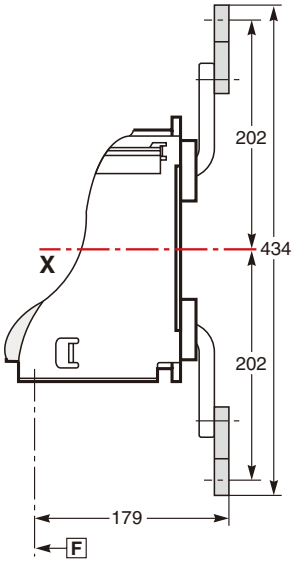
HDW9 Air Circuit Breaker

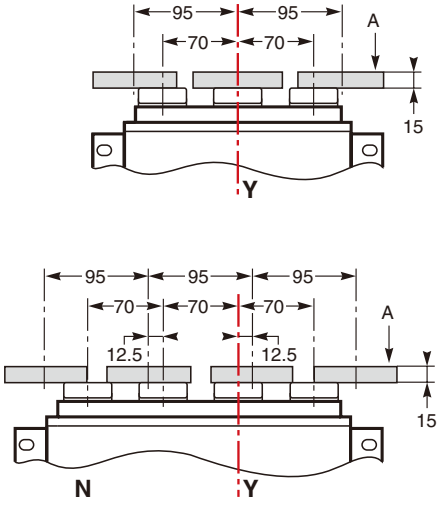
Standard: IEC 60947-2

Connections

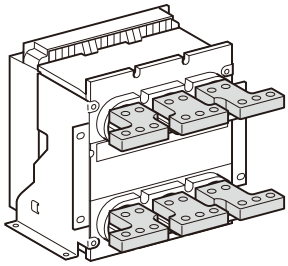
Front connection with spreaders

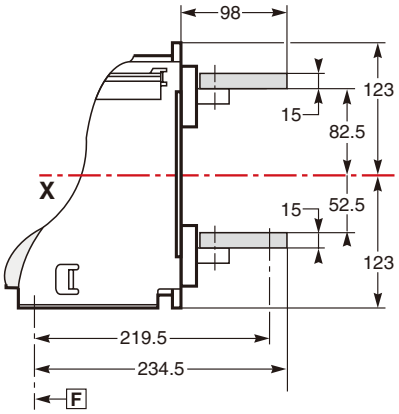


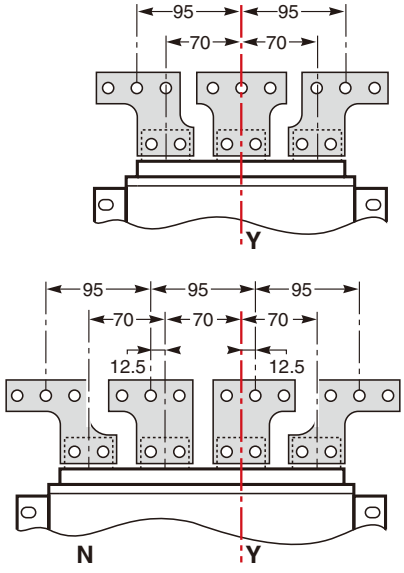




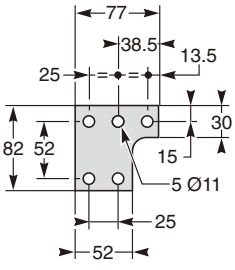
Rear connection with spreaders



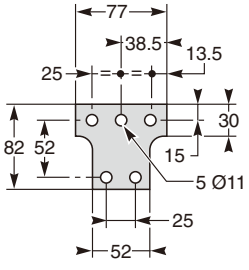




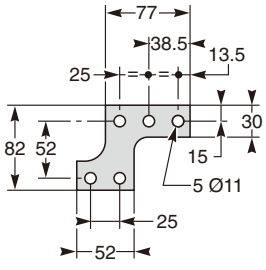
Middle left or right spreader for 4P



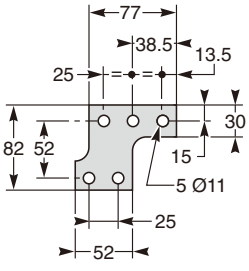
Middle spreader for 3P



Left or right spreader for 4P



Left or right spreader for 3P



F ： Base point

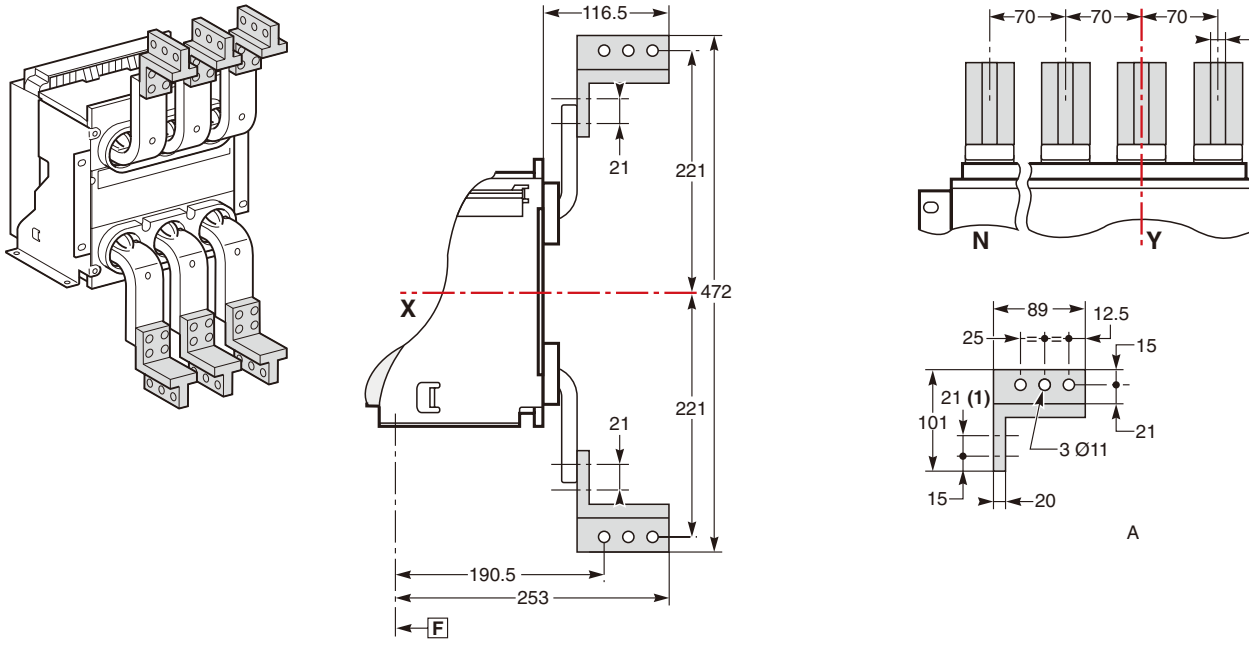
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

HDW9 Air Circuit Breaker

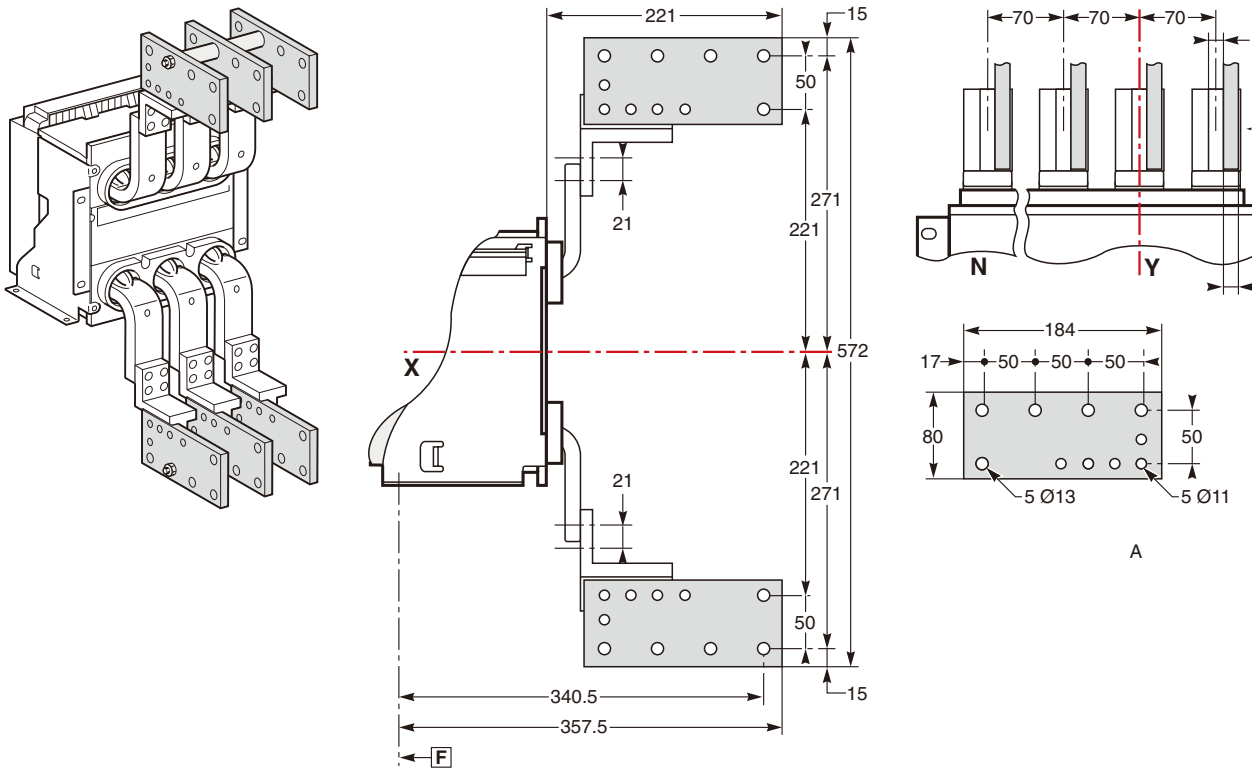
Standard: IEC 60947-2

Connections

Front connection with vertical-connection adapters



Front connection with vertical-connection adapters and cable-lug adaptersand cable-lug adapters



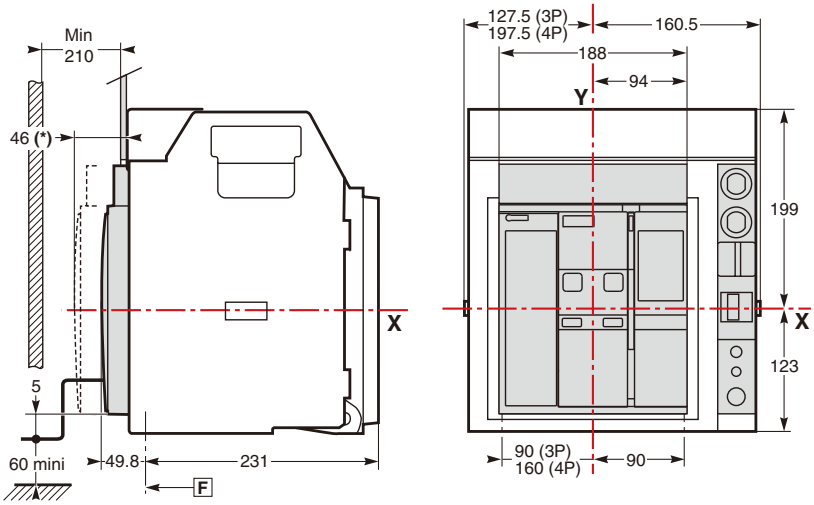
Remarks:Screws: M10 Class8.8

Fasten torque: 50Nm with gasket.

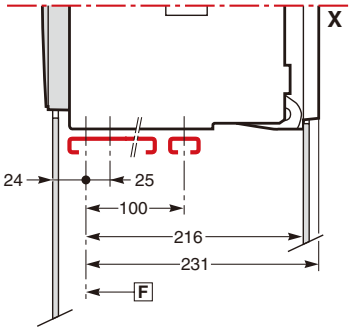
HDW9 Air Circuit Breaker

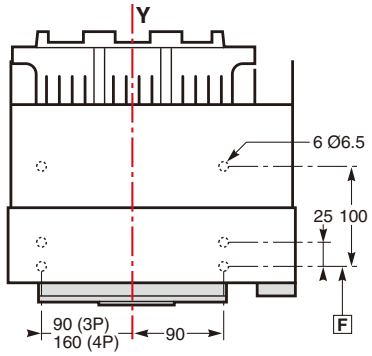
Standard: IEC 60947-2

Dimensions

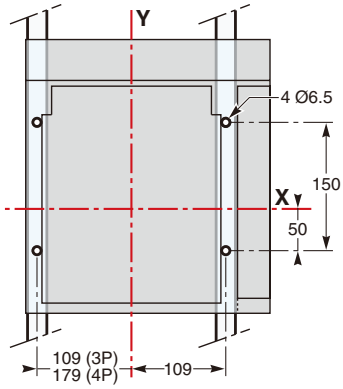


Horizontal installation on board or railway

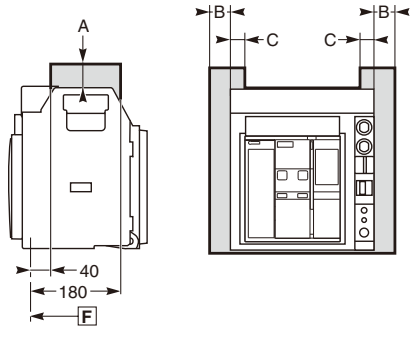




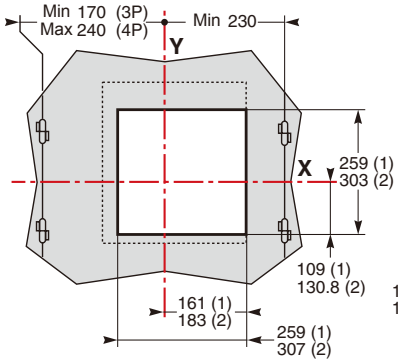
Vertical installation on back board or frame



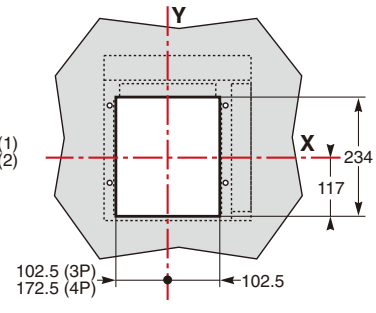
Safety clearances



Door holes dimensions



Rear panel holes dimensions



	Non-conductor	Metals	Electric conductor
A	0	0	90
B	10	10	60
C	0	0	90

F : Base point

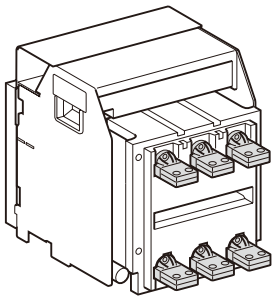
(1) Without door frame
(2) With door frame
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

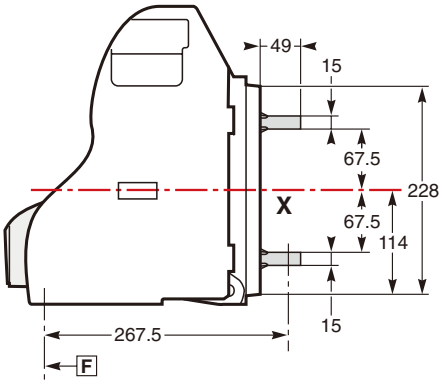
HDW9 Air Circuit Breaker

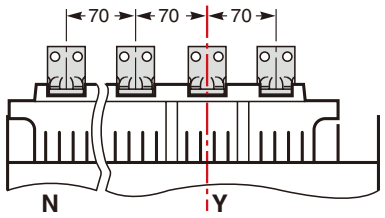
Standard: IEC 60947-2

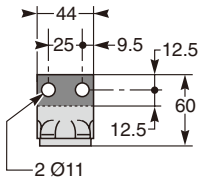
Connections

Horizontal rear connection

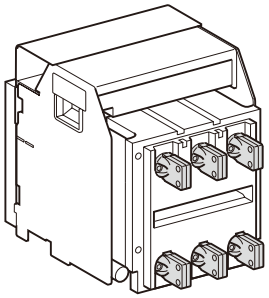


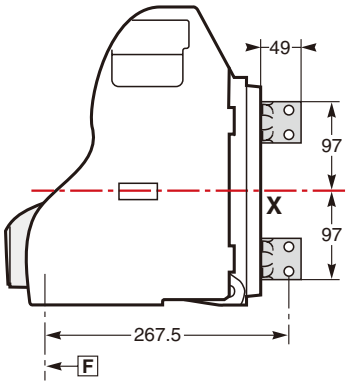


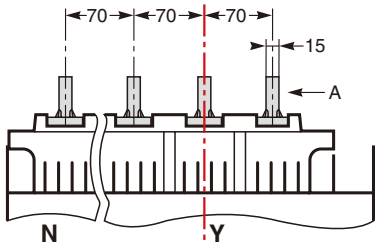


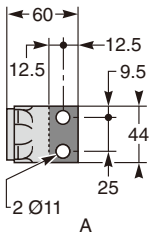


Vertical rear connection

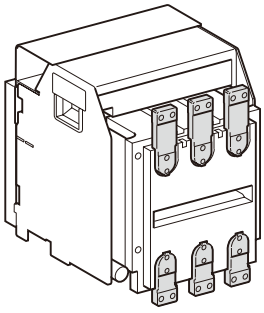


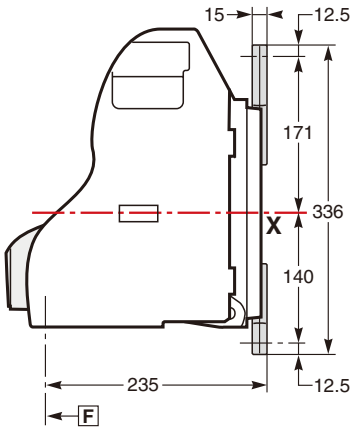


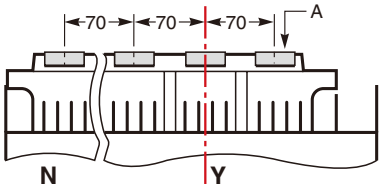


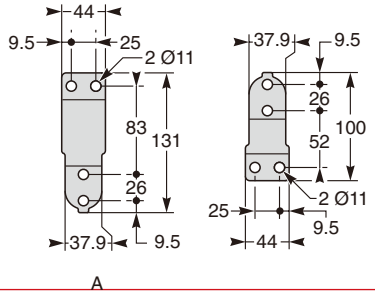


Front connection







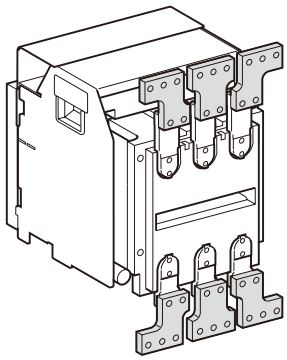


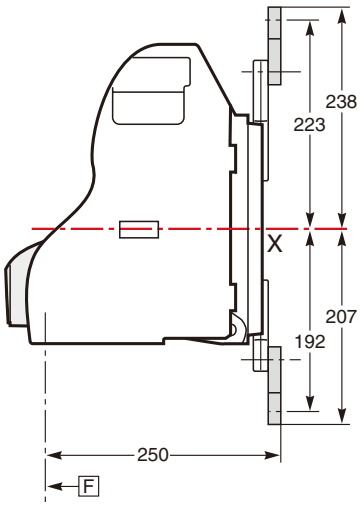
HDW9 Air Circuit Breaker

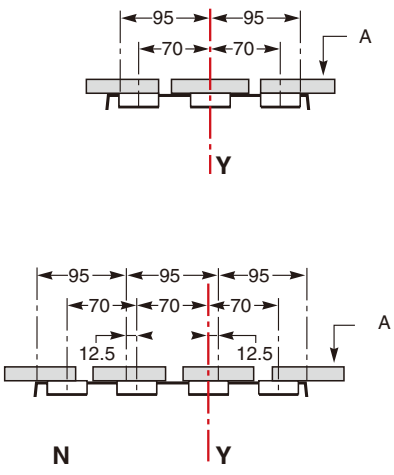
Standard: IEC 60947-2

Dimensions

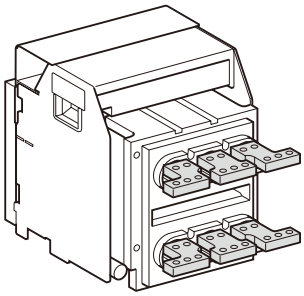
Front connection with spreaders

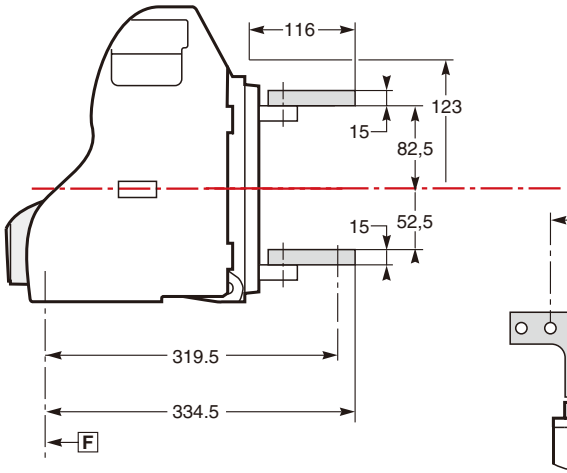


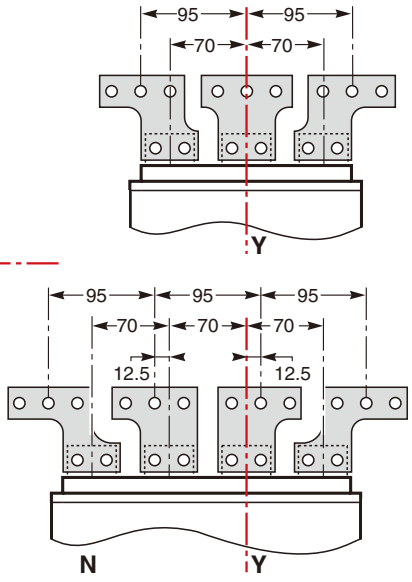




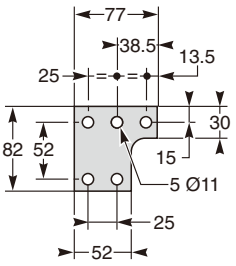
Rear connection with spreaders



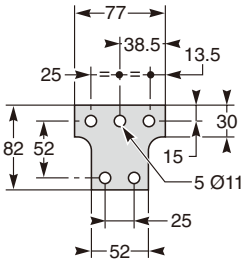




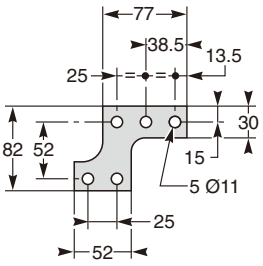
Middle left or right spreader for 4P



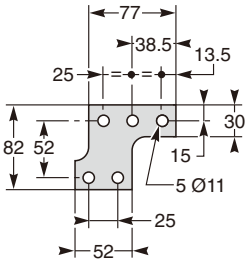
Middle spreader for 3P



Left or right spreader for 4P



Left or right spreader for 3P



F： Base point

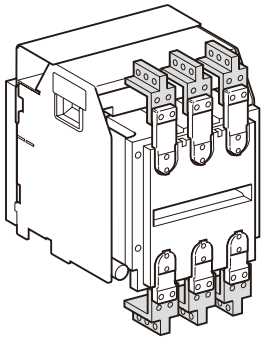
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

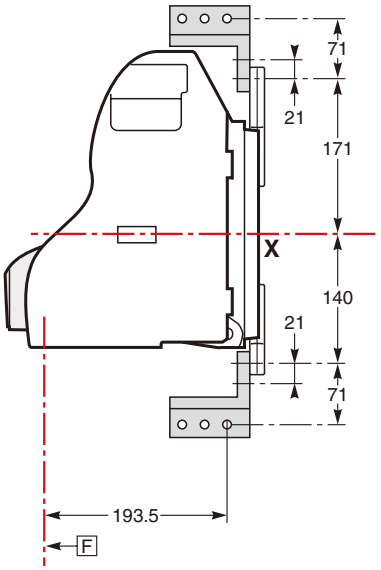
HDW9 Air Circuit Breaker

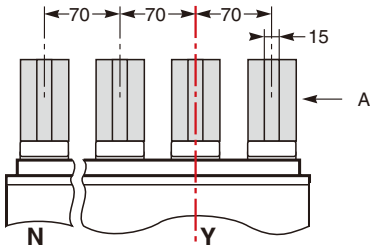
Standard: IEC 60947-2

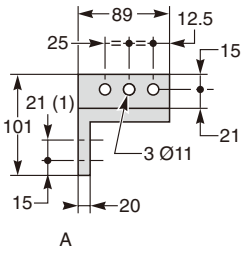
Connections

Front connection with vertical-connection adapters

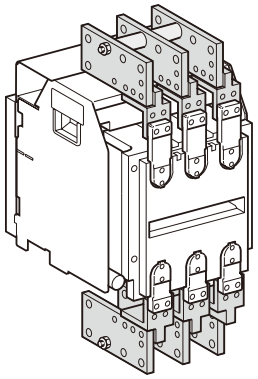


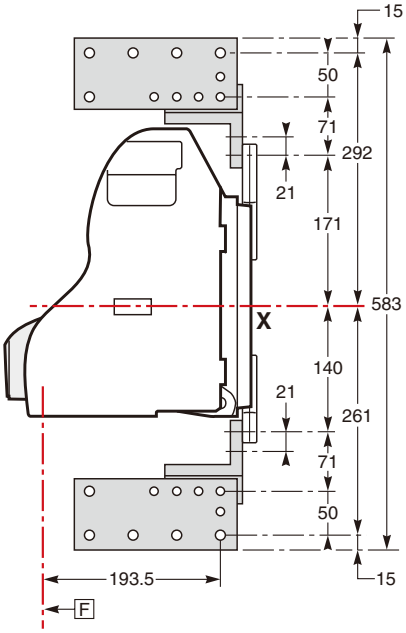


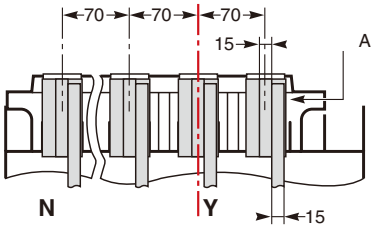


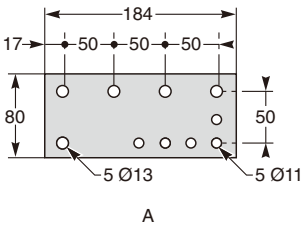


Front connection with vertical-connection adapters and cable-lug adapters









F : Base point

Remark: Screws: M10 Class8.8

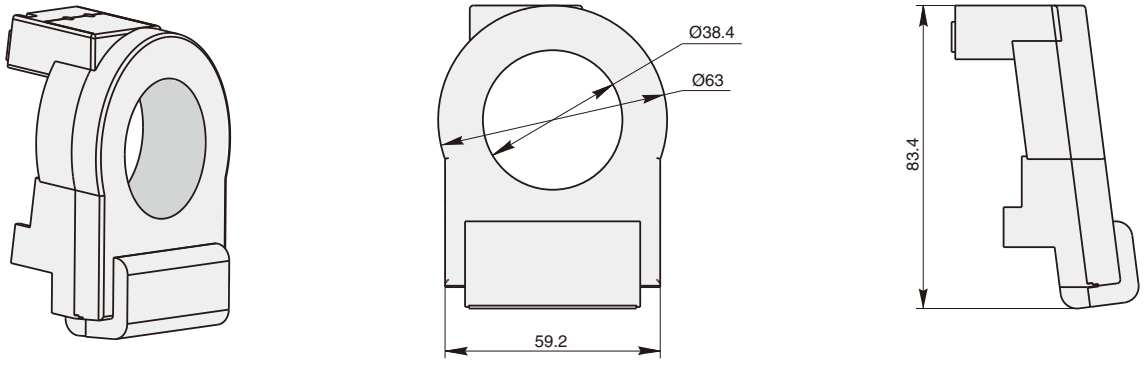
Fasten torque: 50Nm with gasket

HDW9 Air Circuit Breaker

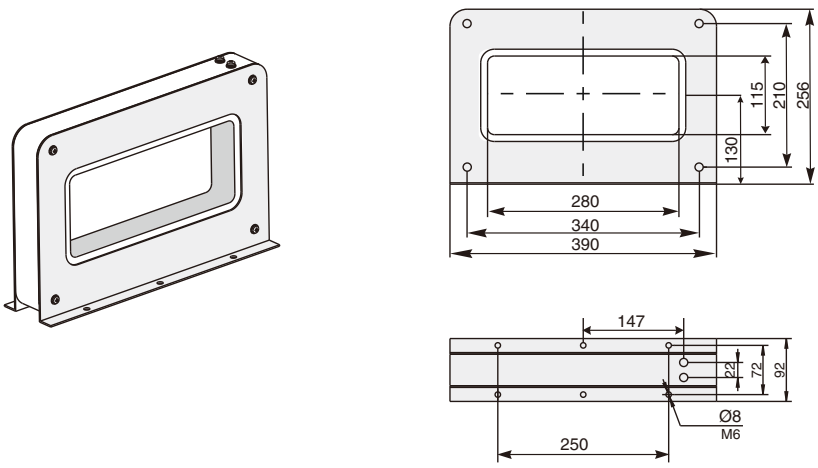
Standard: IEC 60947-2

Dimensions of Extend Current Transformers

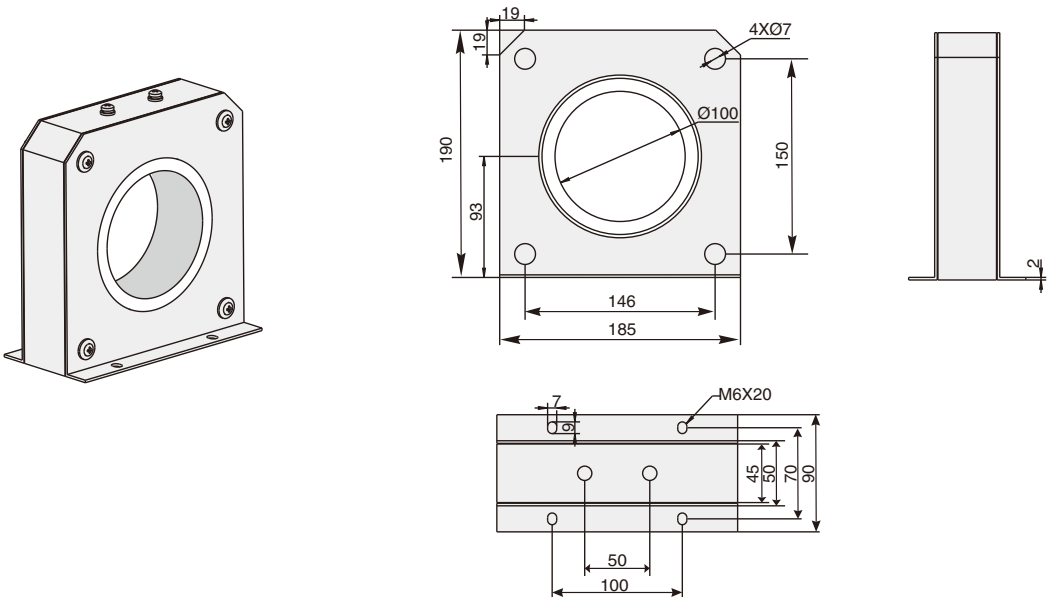
N-phase Extend Current Transformer



Earth-leakage Current Transformer



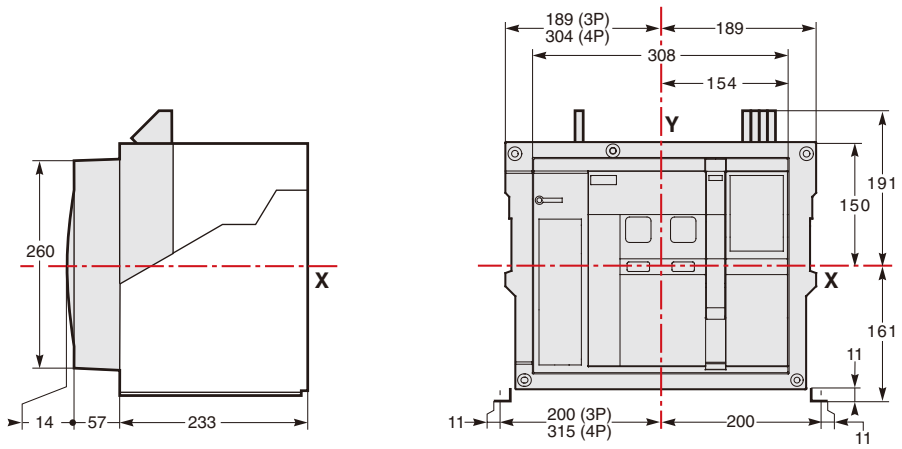
Ground Return Current Transformer



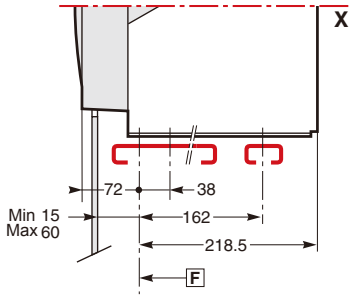
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

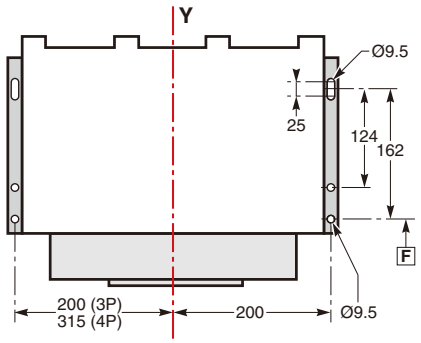
Dimensions



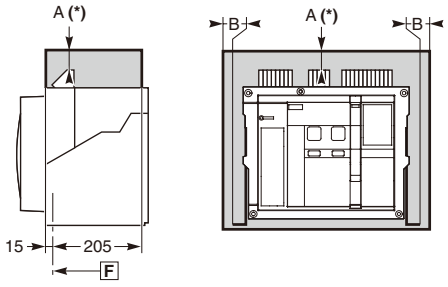
Horizontal installation on board or railway



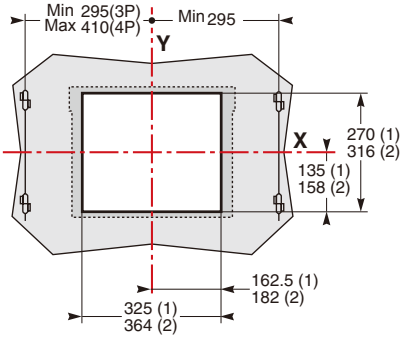
Vertical installation on back board or frame



Safety clearances



Door holes dimensions



	Non-conductor	Metals	Electric conductor
A	0	0	100
B	0	0	60

F : Base point

(1) Without door frame

(2) With door frame

Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

Removing the arc chutes needs 110mm safety clearance.

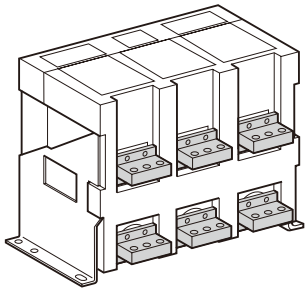
Removing terminal blocks needs 20mm safety clearance.

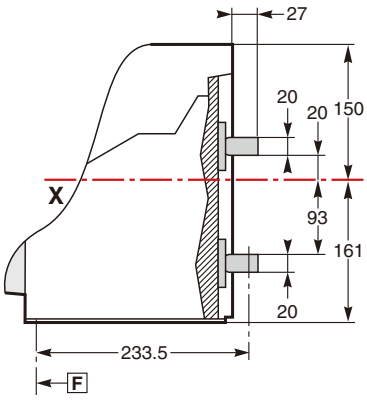
HDW9 Air Circuit Breaker

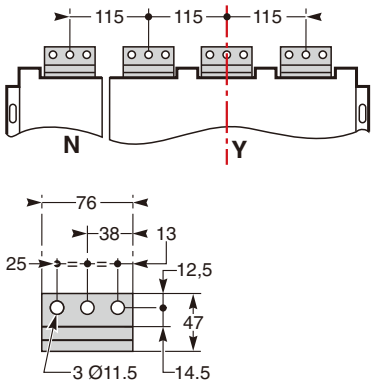
Standard: IEC 60947-2

Connections

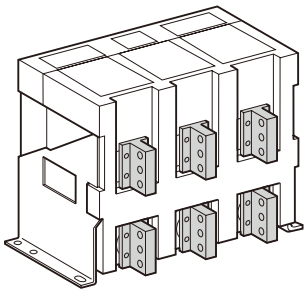
Horizontal rear connection

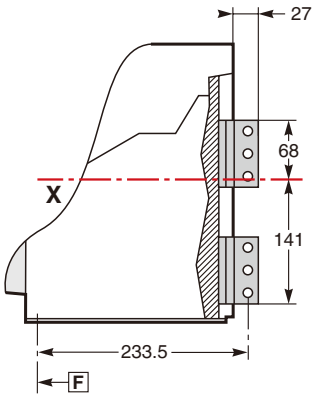


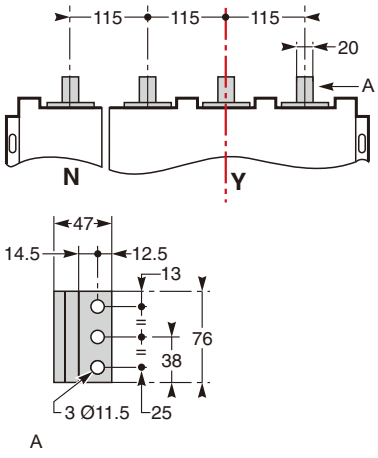




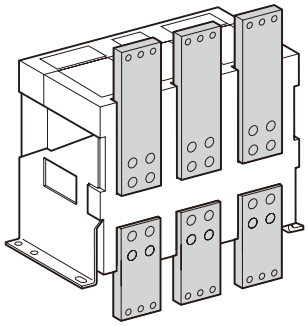
Vertical rear connection

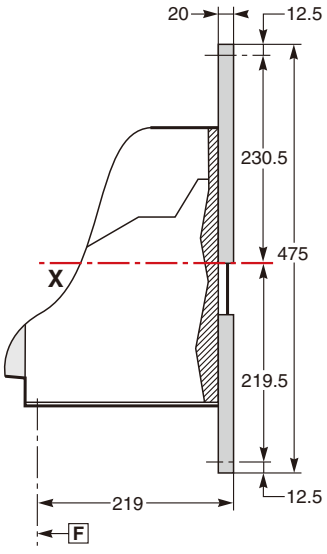


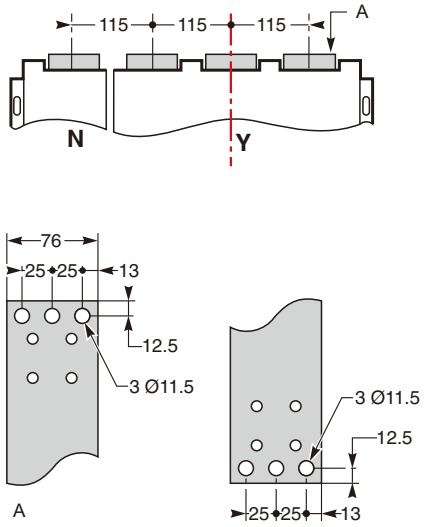




Front connection







F : Base point

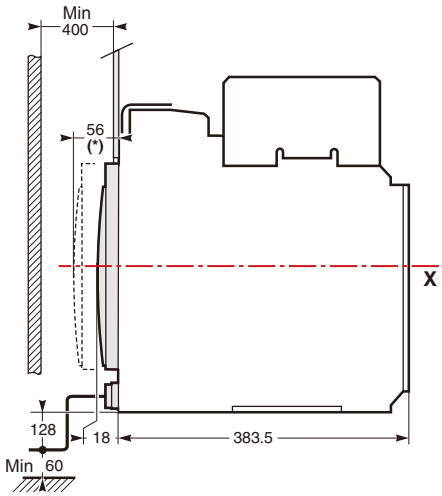
Remarks: Screws: M10 Class8.8

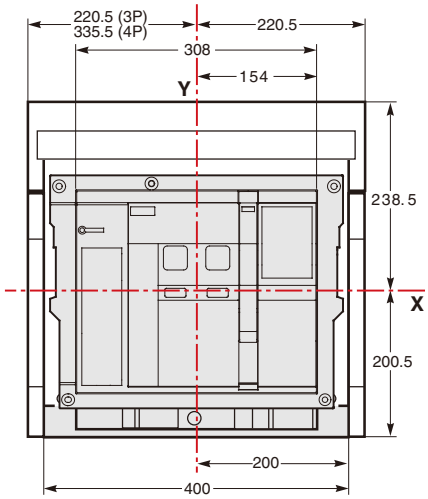
Fasten torque: 50Nm with gasket.

HDW9 Air Circuit Breaker

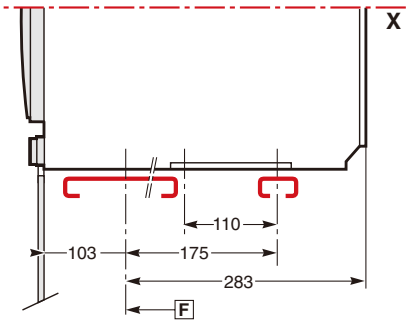
Standard: IEC 60947-2

Dimensions

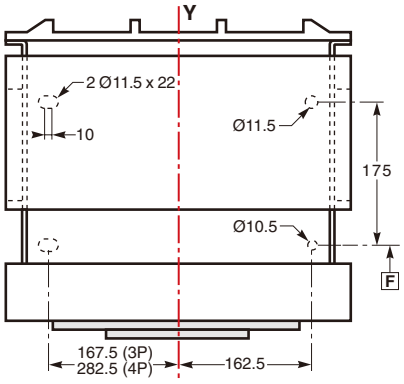




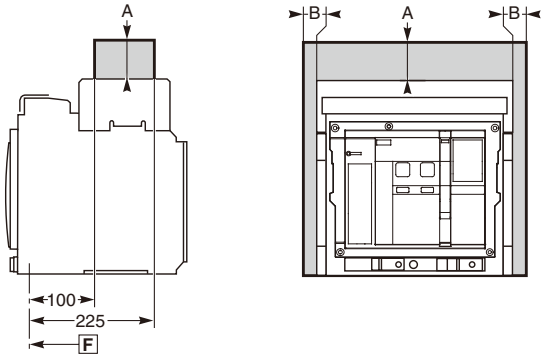
Horizontal installation on board or railway



Vertical installation on back board or frame



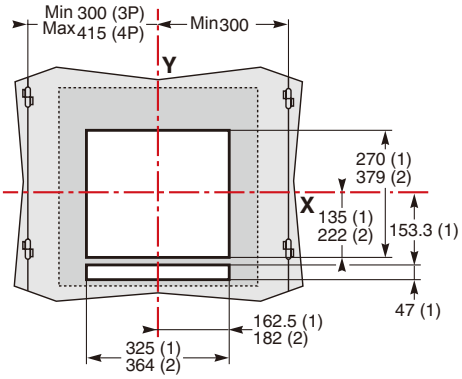
Safety clearances



	Non-conductor	Metals	Electric conductor
A	0	0	0
B	0	0	60

F : Base point

Door holes dimensions



(1) Without door frame

(2) With door frame

Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

Removing the arc chutes needs 110mm safety clearance.

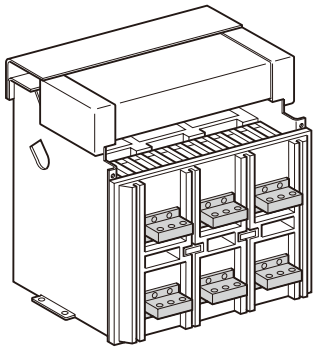
Removing terminal blocks needs 20mm safety clearance.

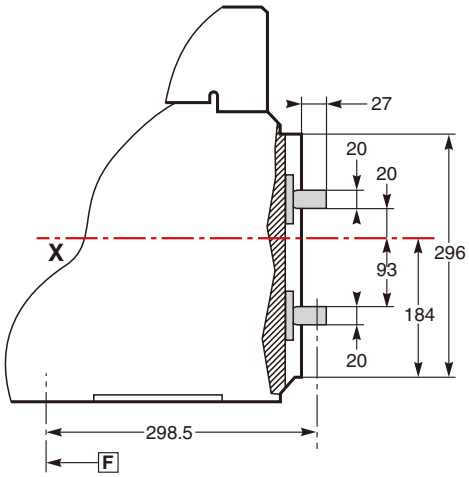
HDW9 Air Circuit Breaker

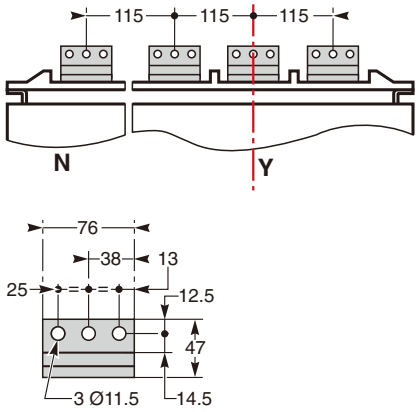
Standard: IEC 60947-2

Connections

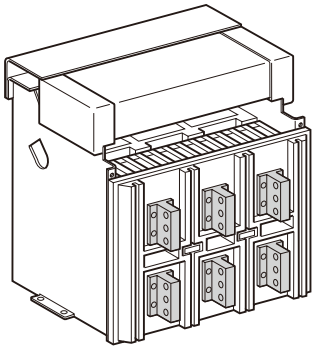
Horizontal rear connection

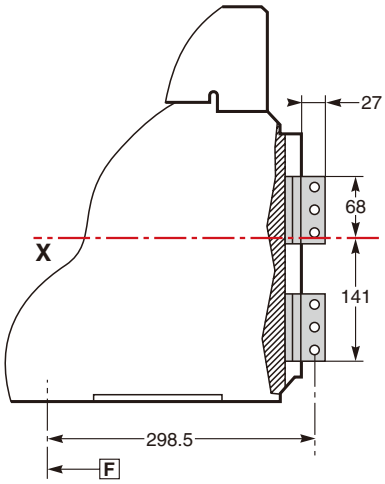


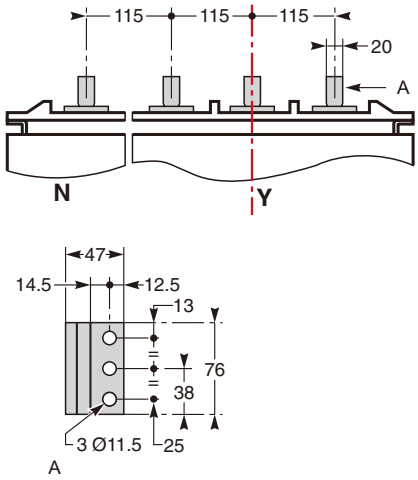




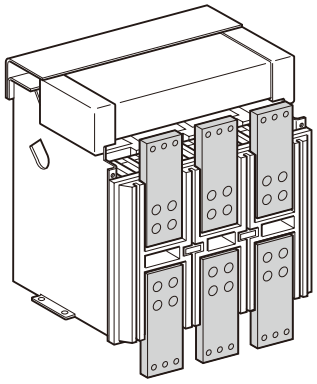
Vertical rear connection

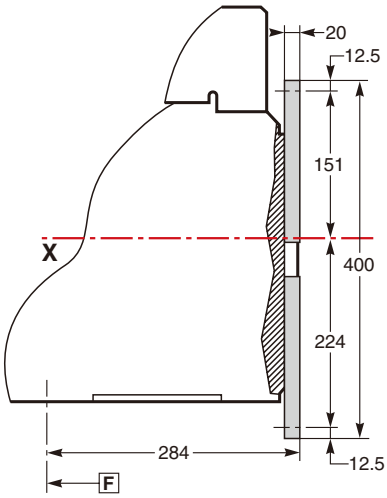


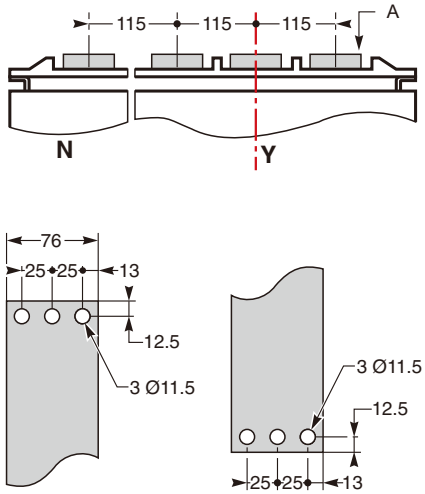




Front connection







F : Base point

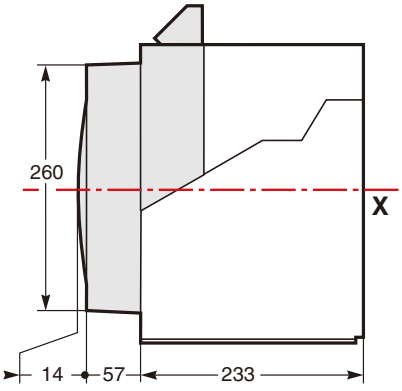
Remarks: Screws: M10 Class8.8

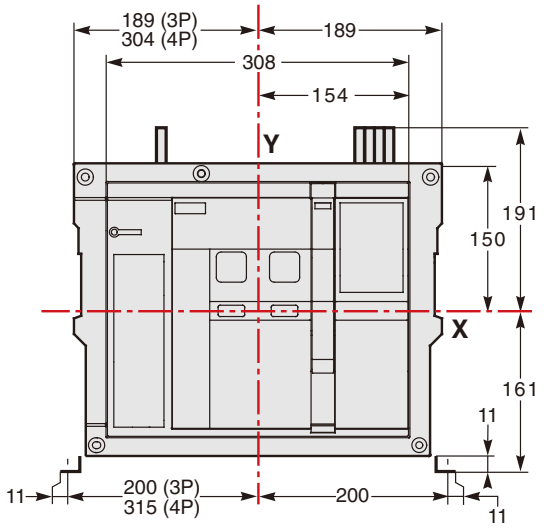
Fasten torque: 50Nm with gasket.

HDW9 Air Circuit Breaker

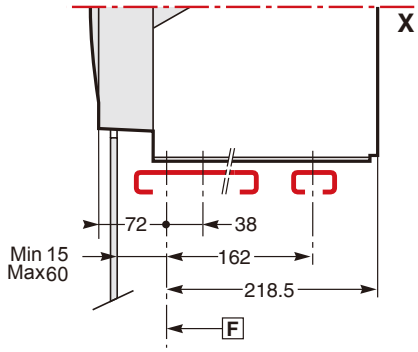
Standard: IEC 60947-2

Dimensions

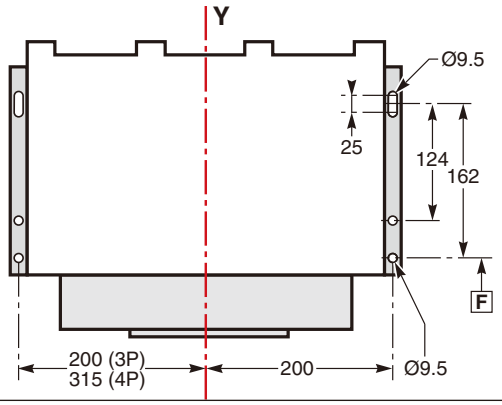




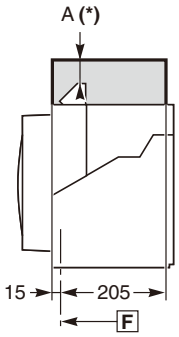
Horizontal installation on board or railway

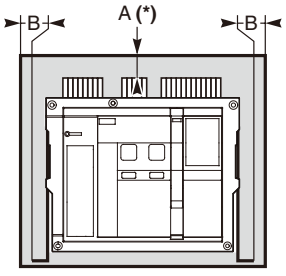


Vertical installation on back board or frame

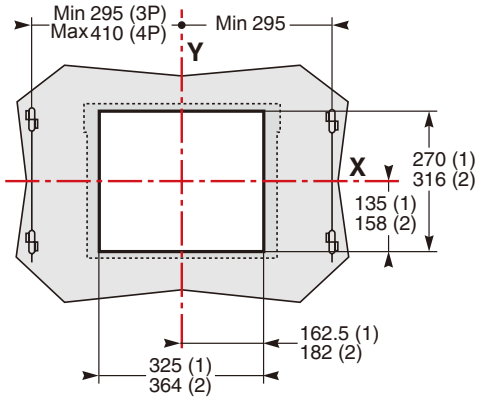


Safety clearances





Door holes dimensions



	Non-conductor	Metals	Electric conductor
A	0	0	100
B	0	0	60

F : Base point

(1) Without door frame

(2) With door frame

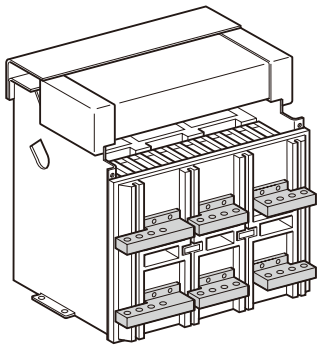
Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.
Removing the arc chutes needs 110mm safety clearance.
Removing terminal blocks needs 20mm safety clearance.

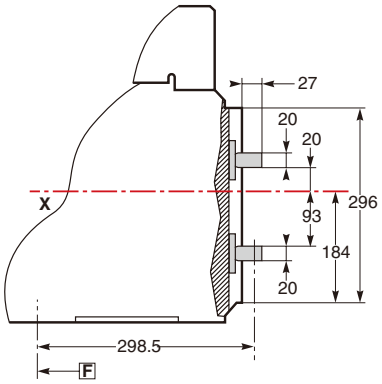
HDW9 Air Circuit Breaker

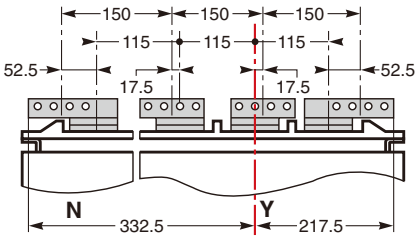
Standard: IEC 60947-2

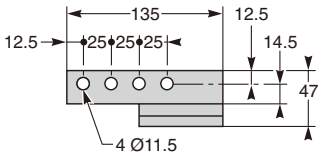
Connections

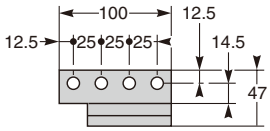
Horizontal rear connection



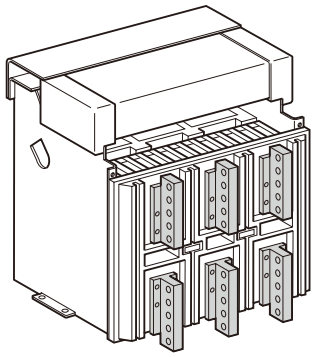


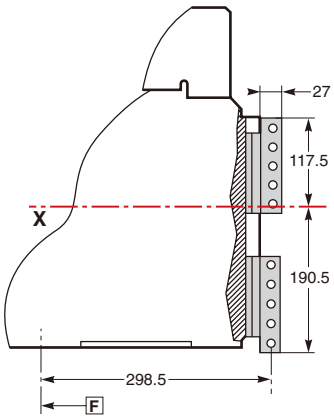






Vertical rear connection

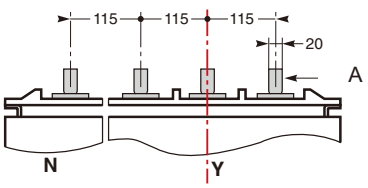


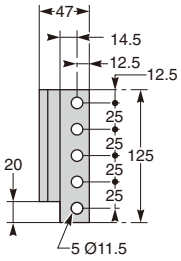


F : Base point

Remarks: Screws: M10 Class8.8

Fasten torque: 50Nm with gasket.

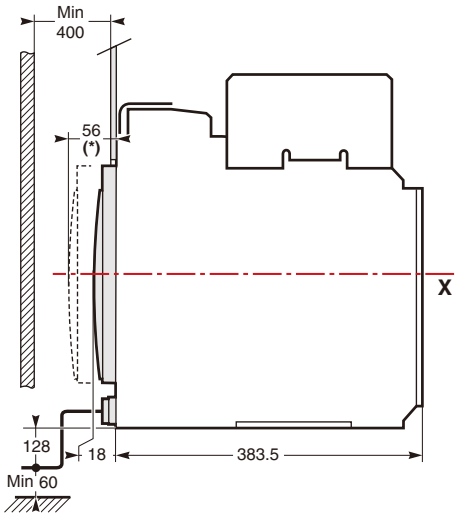


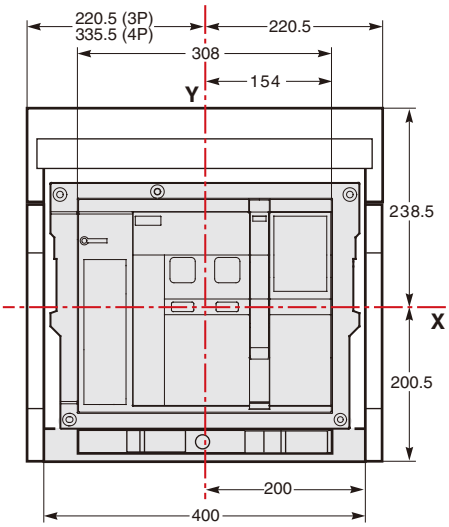


HDW9 Air Circuit Breaker

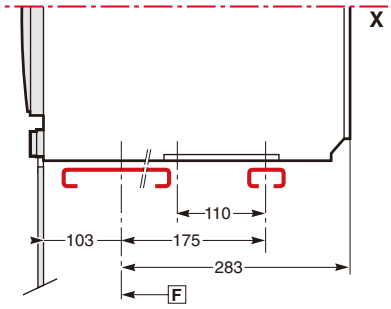
Standard: IEC 60947-2

Dimensions

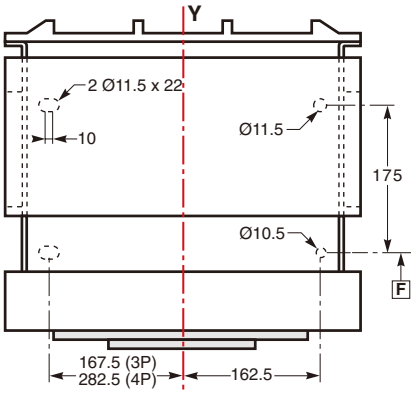




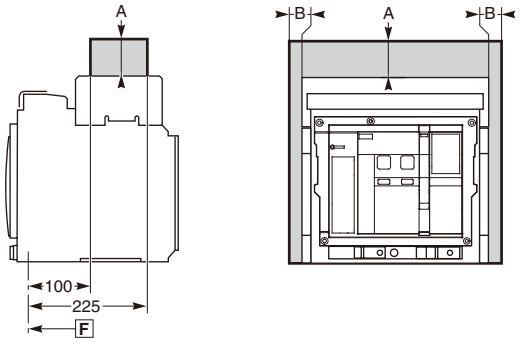
Horizontal installation on board or railway



Vertical installation on back board or frame



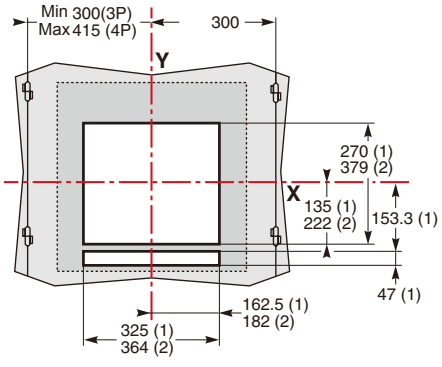
Safety clearances



	Non-conductor	Metals	Electric conductor
A	0	0	0
B	0	0	60

F : Base point

Door holes dimensions



(1) Without door frame

(2) With door frame

Remark: X axis and Y axis are the symmetry axis of 3-pole breaker's mask.

Removing the arc chutes needs 110mm safety clearance.

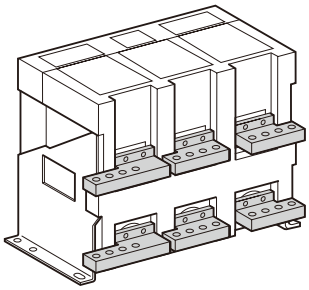
Removing terminal blocks needs 20mm safety clearance.

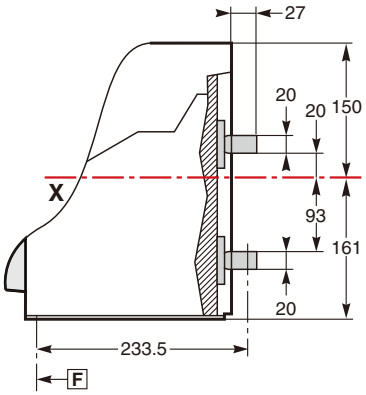
HDW9 Air Circuit Breaker

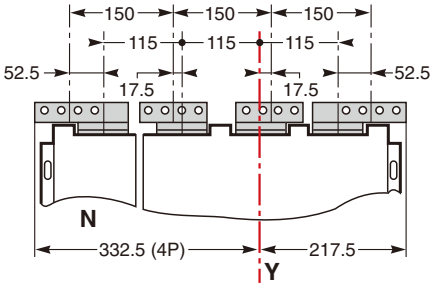
Standard: IEC 60947-2

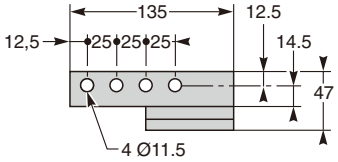
Connections

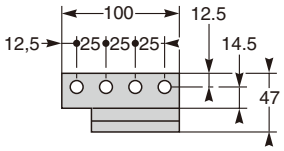
Horizontal rear connection



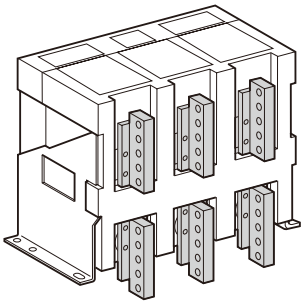


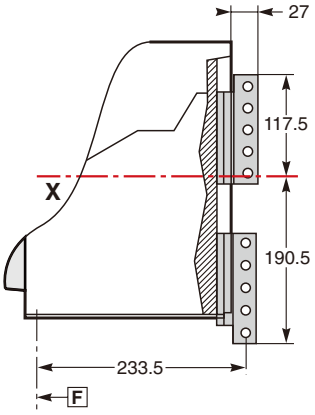


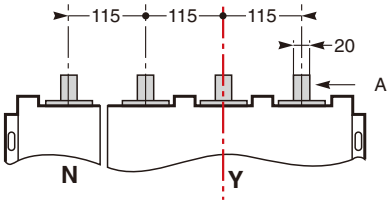


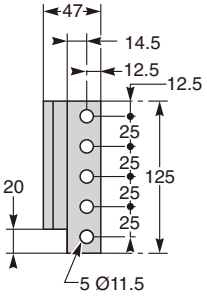


Vertical rear connection









F : Base point

Remarks: Screws: M10 Class8.8

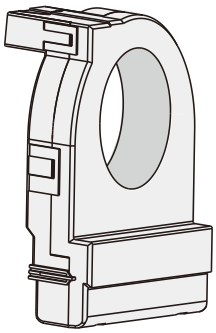
Fasten torque: 50Nm with gasket.

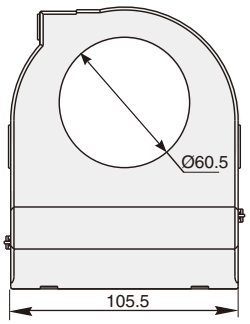
HDW9 Air Circuit Breaker

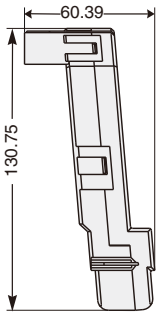
Standard: IEC 60947-2

Dimensions of Extend Current Transformers

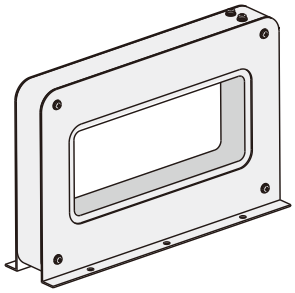
N-phase Extend Current Transformer

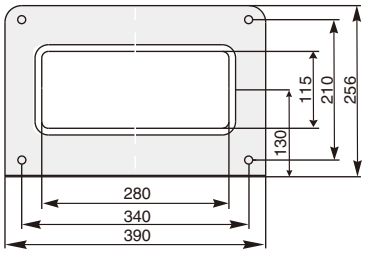


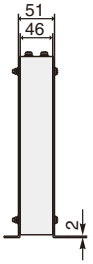


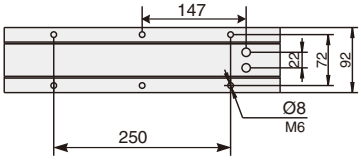


Earth-leakage Current Transformer

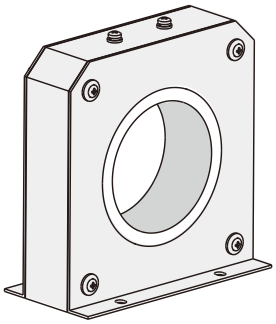


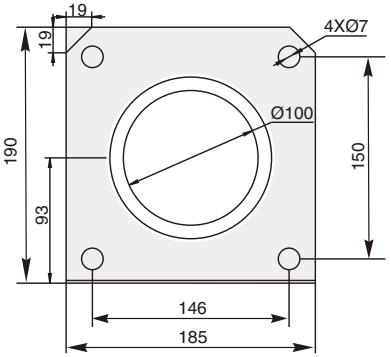


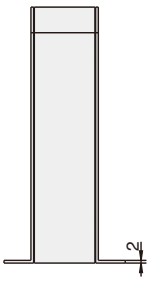


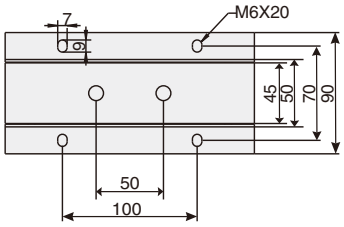


Ground Return Current Transformer





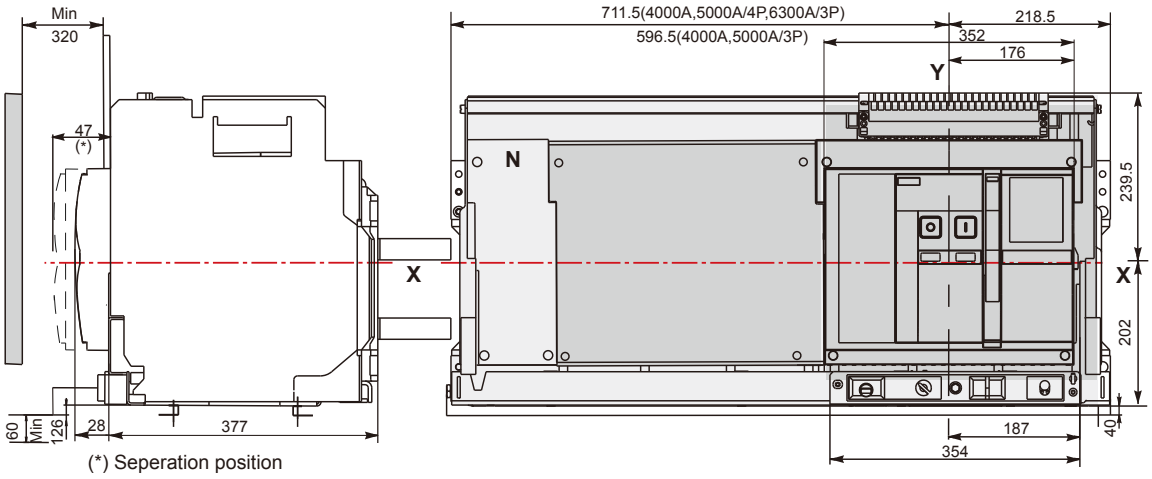




HDW9 Air Circuit Breaker

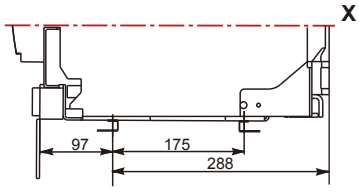
Standard: IEC 60947-2

Dimensions

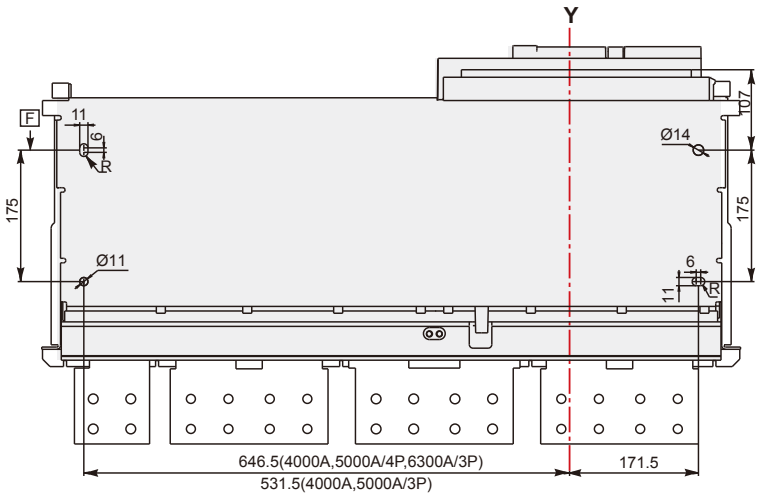


(*) Seperation position

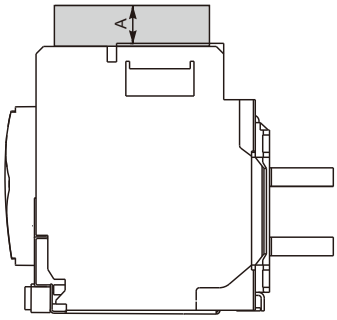
Horizontal installation on board or railway



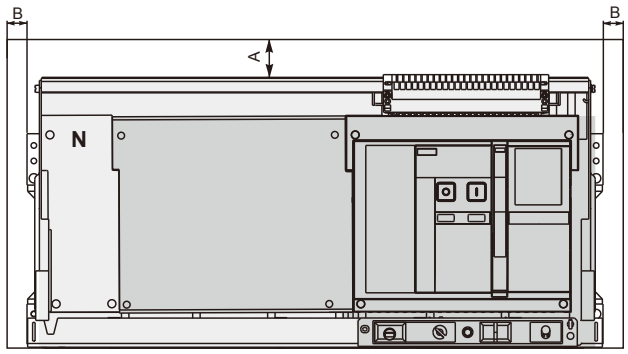
F : Base point



Safety clearances



Door holes dimensions



	Non-conductor	Metals	Electric conductor
A	0	0	0
B	0	0	60

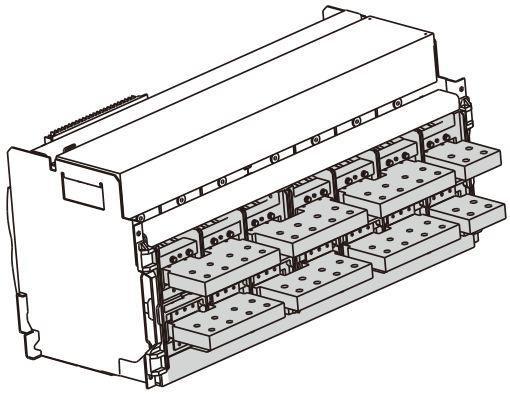
F : Base point

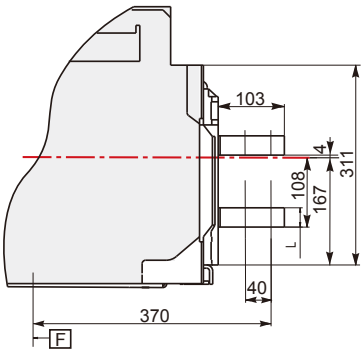
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

Connections

Horizontal rear connection

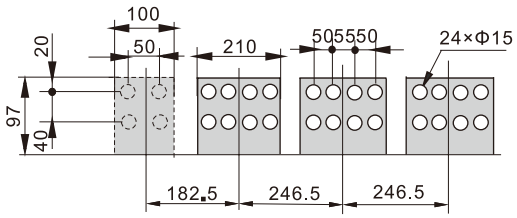




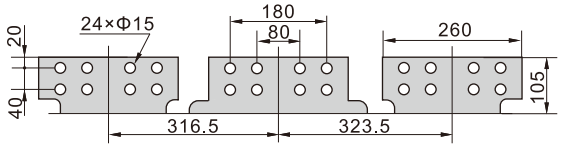
In(A)	L
4000A	20
5000A	30
6300A	30

Busbar dimensions

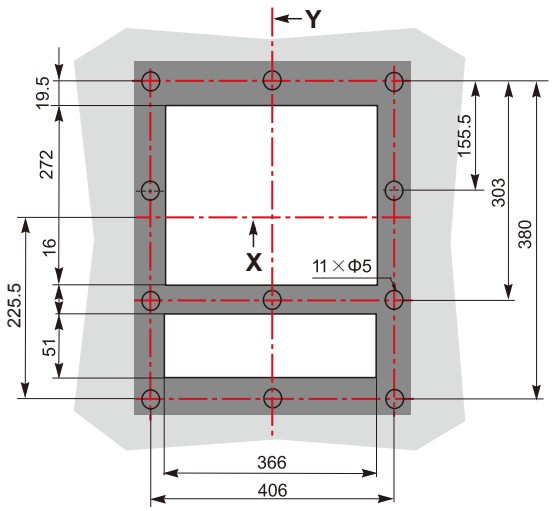
In=4000A、5000A



In=6300A



Rear panel holes dimensions



F： Base point

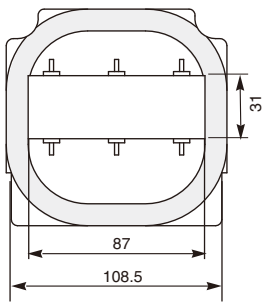
Remark: X axis and Y axis are the symmetry axis of breaker's mask.

HDW9 Air Circuit Breaker

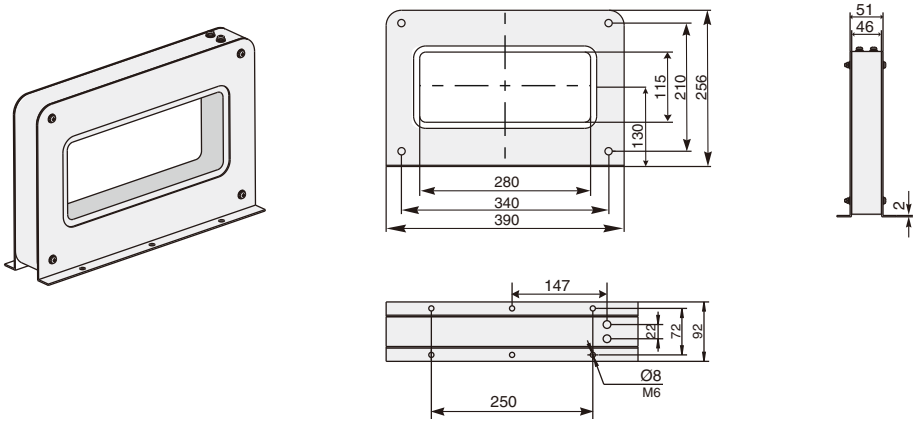
Standard: IEC 60947-2

Dimensions of Extend Current Transformers

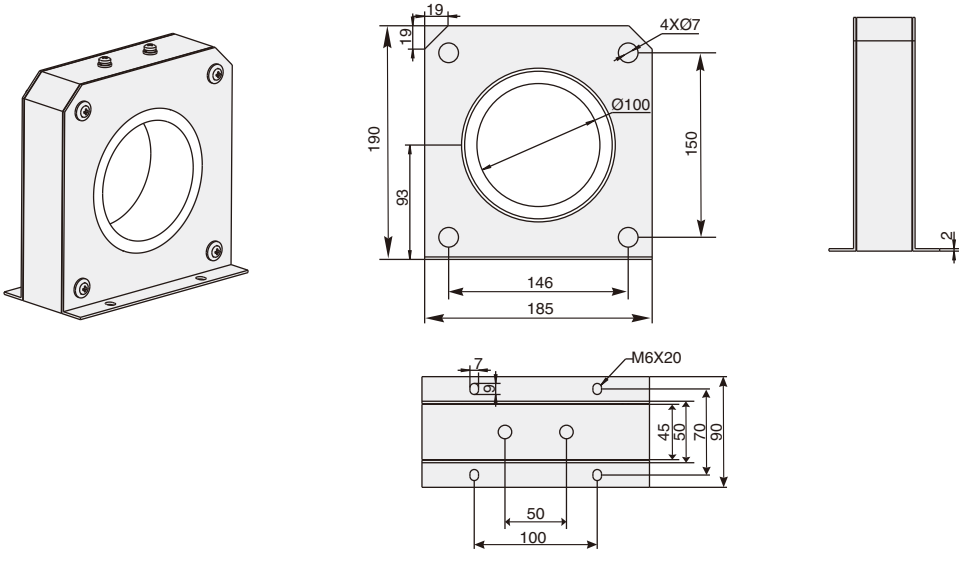
N-phase Extend Current Transformer



Earth-leakage Current Transformer



Ground Return Current Transformer

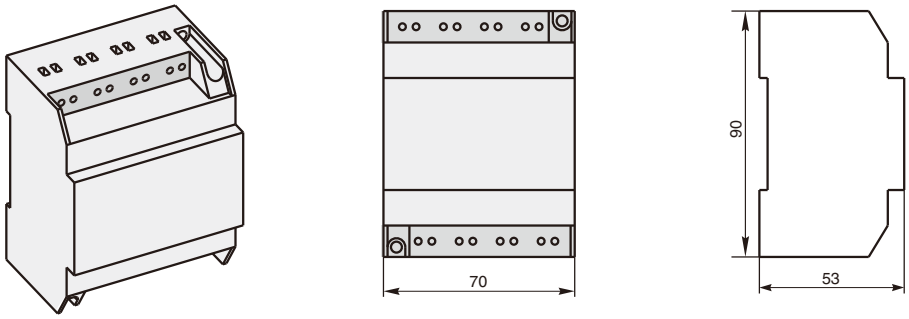


HDW9 Air Circuit Breaker

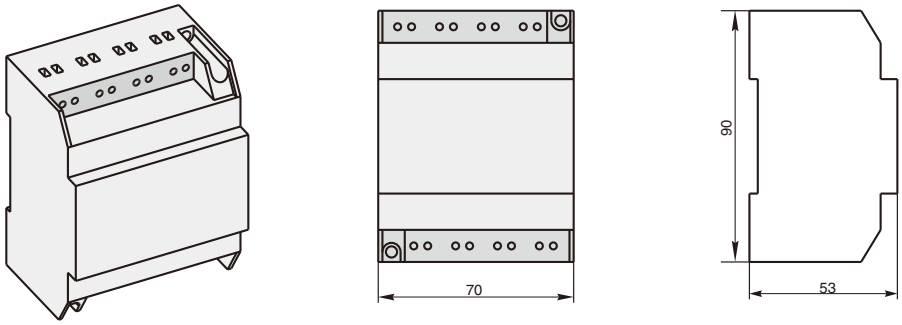
Standard: IEC 60947-2

Dimensions of Power Supply Module and Signal Convert Module

Power Supply Module



Signal Convert Module



Busbar Dimensions

In(A)	Ti=40℃			Ti=50℃			Ti=60℃		
	Qty	Size(mm×mm)	Section（mm²）	Qty	Size（mm×mm）	Section（mm²）	Qty	Size（mm×mm）	Section（mm²）
630	2	40×5	400	2	40×5	400	2	40×5	400
800	2	50×5	500	2	50×5	500	2	50×5	500
1000	2	60×5	600	3	50×5	750	3	60×5	900
1250	2	80×5	800	2	80×5	800	3	60×5	900
1600	2	100×5	1000	3	80×5	1200	3	80×5	1200
2000	3	100×5	1500	3	100×5	1500	3	100×5	1500
2500	4	100×5	2000	4	100×5	2000	4	100×5	2000
3200	3	100×10	3000	3	100×10	3000	4	100×10	4000
4000	5	100×10	5000	5	100×10	5000	6	100×10	6000
5000	5	120×10	6000	6	120×10	7200			
6300	6	120×10	7200	7	120×10	8400			

Remark: Ti stands for ambient temperature.

The material of busbar is bare copper.

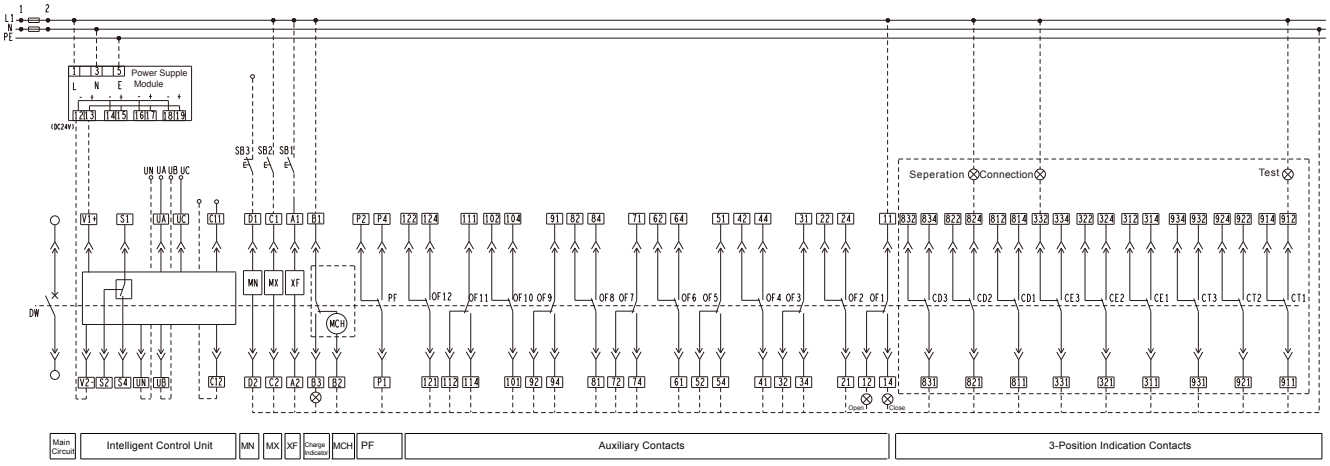
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

1600N,4000H1,4000H2

Electrical Schematic Diagram

iTR336, iTR336E



Note:

UM: Voltage test signal input

UN, UA, UB, UC stands for voltage signal form N, A, B, C.

Pow: Power input

Connect V1+, V2- to positive and negative poles on power supply module.

SWT: Fault-trip indication output

S1, S2, S4 are switch contacts, S1 is common port. Contact capacity: AC400V 5A

CT: External current transformer

C11, C12 are input port of CT

Remark 1: Intelligent control units work with power supply module. The input volatage of iAPU331 is AC220/230V; The input voltage of iAPU332 is AC380/400V; The input volatage of iAPU332D is DC220V.

Remark 2: HDW9-1600N offers 4NO 4NC auxiliary contacts.HDW9-4000H1&H2 offer 4NO 4NC auxiliary contacts as standard. 8NO 8NC or 12NO 12NC offer as optional.

Remark 3: HDW9-1600N offers CT1, CD1 and CD2.

Remark 4: Voltage measure function only for iTR336E.

Remark 5: ZT100 and ZCT1 offer as optional. The CT port can connect with one kind of CT only.

Client Preparation

SB1-Closing button

SB2-Opening button

SB3-Emergency stop button

Component

MN-Under-voltage release

MX-Opening release

XF-Closing release

MCH-Electric motor

PF-Ready to close contact

OF1~OF12-Auxillary contacts

ZCT1-Earth-leakage CT

ZT100-Ground return CT

CD1~CD3-Seperation position indication contacts

CT1~CT3-Test position indication contacts

CE1~CE3-Connect position indication contacts

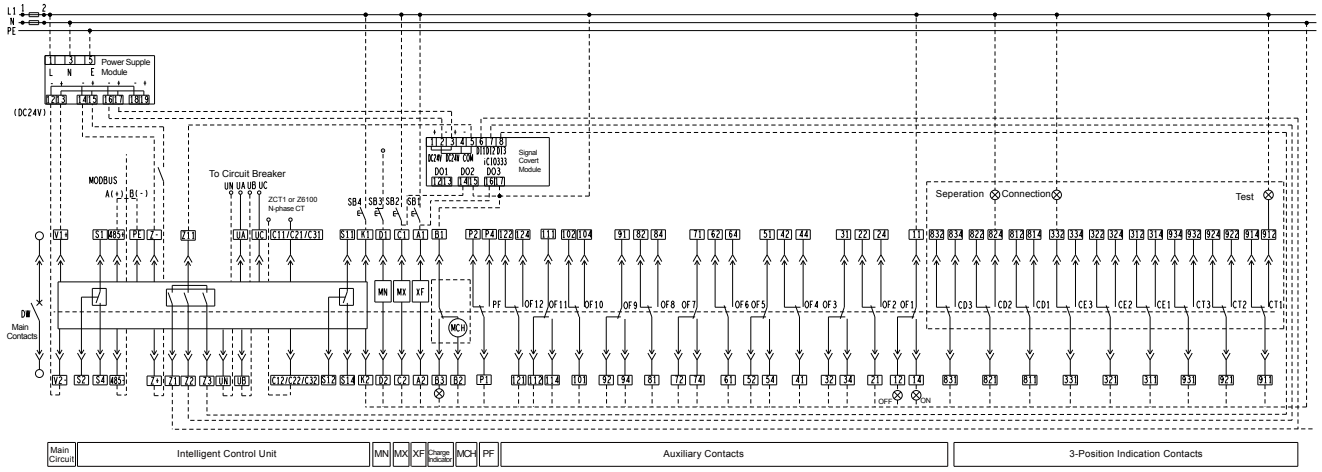
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

1600N,4000H1,4000H2

Electrical Schematic Diagram

iTR336H, iTR336H-L



Note:

UM: Voltage test signal input

UN, UA, UB, UC stand for voltage signal form N, A, B, C.

ZSI: Zone selective interlock

Z+, Z- are ZSI input port, AC24V .

Pow: Power input

Connect V1+, V2- to positive and negative poles on power supply module.

SWT: Fault-trip indication output

S1, S2, S4 are switch contacts, S1 is common port. Contact capacity: AC400V 5A

COM: Communication output

485+, 485- are communication output port; PE is protecting earth of the communication wire.

CT: External current transformer

C11, C12 are input port of CT

C21, C22 are input port of ZT100

C31, C32 are input port of ZCT1

Res: Remote reset

K1, K2 are the input port of remote reset.

SWT2: Fault-trip indication output 2

S11, S12, S14 are switch contacts, S11 is common port. Contact capacity: AC400V 5A

Client Preparation	Component		
SB1-Closing button	MN-Under-voltage release	PF-Ready to close contact	CD1~CD3-Seperation position indication contacts
SB2-Opening button	MX-Opening release	OF1~OF12-Auxillary contacts	CT1~CT3-Test position indication contacts
SB3-Emergency stop button	XF-Closing release	ZCT1-Earth-leakage CT	CE1~CE3-Connect position indication contacts
SB4-Remote reset button	MCH-Electric motor	ZT100-Ground return CT	

Remark 1: Intelligent control units work with power supply module. The input volatage of iAPU331 is AC220/230V; The input voltage of iAPU332 is AC380/400V; The input volatage of iAPU332D is DC220V.

Remark 2: ZT100 and ZCT1 offer as optional. This CT port can connect with one kind of CT only.

Remark 3: For remote control, iCIO333 signal convert module is necessary. The contact capacity of the module is AC240V 10A, DC24V 10A.

Remark 4: HDW9-1600N offers 4NO 4NC auxiliary contacts.HDW9-4000H1&H2 offer 4NO 4NC auxiliary contacts as standard. 8NO 8NC or 12NO 12NC offer as optional.

Remark 5: Communication protocol is Modbus as standard. Profibus module and Devicenet module should order for additional. Power supply module is necessary when communication module is used.

Remark 6: HDW9-1600N offers CT1, CD1 and CD2.

Remark 7: Res and SWT2 are optional parts, they are not compatible with each other.

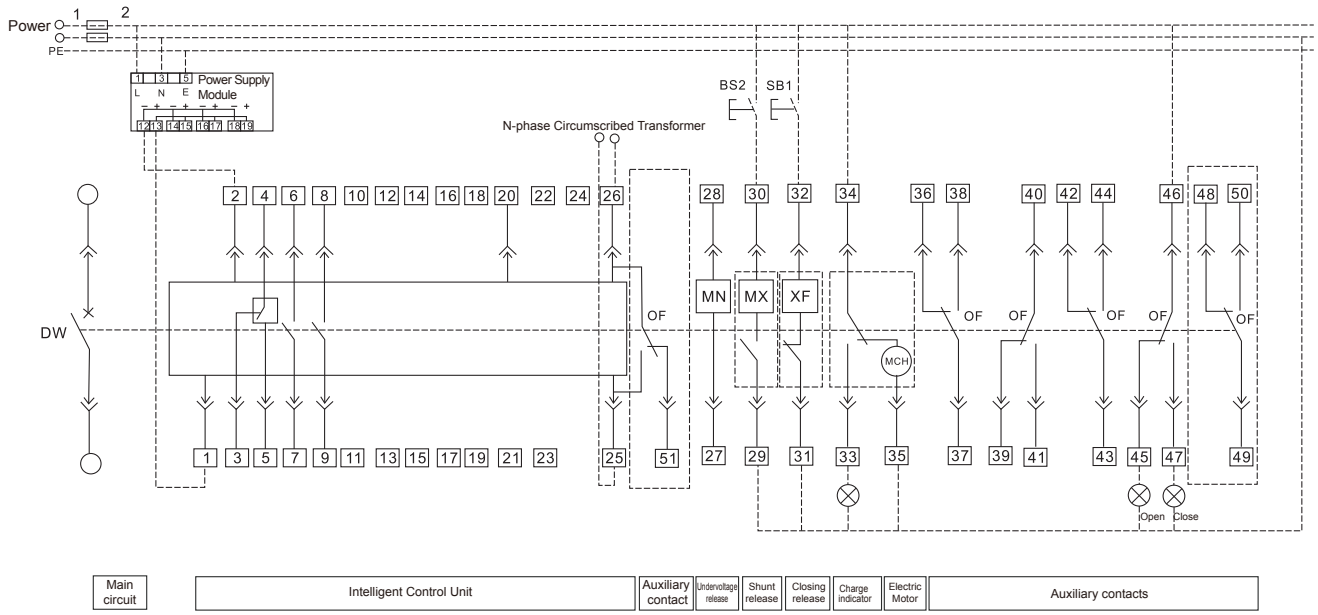
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

6300L

Electrical Schematic Diagram

iTR336, iTR336E



Pin Function:
1# and 2#: auxiliary supply input terminal,
1# for positive terminal when being DC
3#, 4# and 5#: contact output of tripping fault (4# refers to shared terminal);
contact capacity: AC 380V, 16A
6#, 7#, 8# and 9#: two groups of auxiliary terminals with circuit breaker status;
contact capacity: AC 380V, 16A
20#: PE wire, protection earthing wire
25# ~26#: output for circumscribed transformer

Components:
MN — Undervoltage Release
MX — Shunt Release
XF — Closing Release
OF — Auxiliary Contacts
MCH — Electric Motor
SB1 — Closing Button
SB2 — Opening Button

Remarks 1: terminal 27# ~ 28# of MN undervoltage release connect to main circuit

Remarks 2: MN, MX, XF and MCH shall be connected with different powers beacuse of control supply voltage. Auxilary contact OF is 5a5b, MX shunt release and XF Closing release have been tandem connected with normal open and normal close auxiliary contacts in the factory.

Remarks 3: Terminal 35# can not only be connected to the power supply directly (automatic pre-storing energy), but also to the power supply after adopting tandem connection with normal open button (manual pre-storing energy)

Remarks 4: Terminal 6# ~ 7# can output normal close contacts,if the users put forward.

Remarks 5: Power Module 1 is DC Power Module .No DC power Module when the power is AC power supply.The input & output terminals cannot be connected reversely (the draw-out type output terminal has been connected in the factory).

Remarks 6: The auxiliary contact is 5NO 5NC, 25# and 26# are circumscribed transformer, applied for (3P+N) T type earthing failure protection.

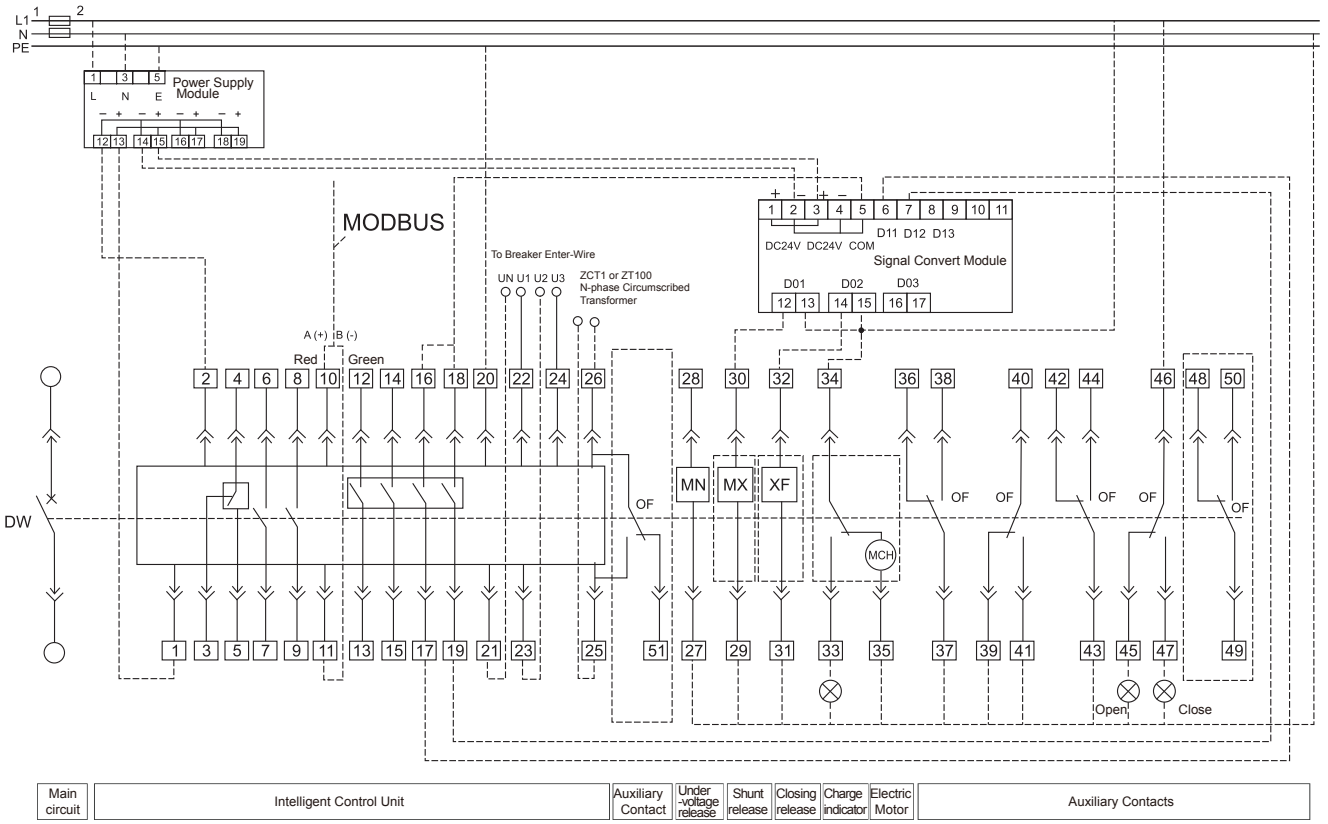
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

6300L

Electrical Schematic Diagram

iTR336H



Pin Function:
1# and 2#: auxiliary supply input terminal,
1# for positive terminal when being DC
3#, 4# and 5#: contact output of tripping fault (4# refers to shared terminal);
contact capacity: AC 380V, 16A
6#, 7#, 8# and 9#: two groups of auxiliary terminals with circuit breaker status;
contact capacity: AC 380V, 16A
10# and 11#: respective output wire of RS485A and RS485B communication
12#,13#: alarm signal output
14#,15#: error tripping signal output
16#,17#: communication remote control shunt release output
18#,19#: communication remote control make output
20#: PE Line, shielding earthing line.
21#: Neuter line voltage signal (N phase)
22#: voltage signal A phase
23#: voltage signal B phase
24#: voltage signal C phase
25#,26#: input of circumscribed transformer

Components:
MN — Under-voltage Release
MX — Shunt Release
XF — Closing Release
OF — Auxiliary Contact
MCH — Electric Motor
ZCT1 — Earth-leakage CT
ZT100 — Earthing Transformer

Remarks 1: terminal 27# ~ 28# of MN undervoltage release connect to main circuit

Remarks 2: MN, MX, XF and MCH shall be connected with different powers beacuse of control supply voltage. Auxilary contact OF is 5NO5NC, MX Shunt-trip Release and XF Closing release have been tandem connected with normal open and normal close auxiliary contacts
in the factory.

Remarks 3: Terminal 35# can not only be connected to the power supply directly (automatic pre-storing energy), but also to the power supply after adopting tandem connection with normal open button (manual pre-storing energy)

Remarks 4: Terminal 6# ~ 7# can output normal close contacts,if the users put forward.

Remarks 5: iAPU332D is DC power supply module, and there is no such module when the power is AC power supply.The input & output terminals cannot be connected reversely (the draw-out type output terminal has been connected in the factory)

Remarks 6:The auxiliary contact is five-open and five-close, 25# and 26# are circumscribed transformer, applied for (3P+N) T type earthing failure protection, or connect Z CT1 or ZT100(should order extra)

Remarks 7: long-range control should add signal module and power module capacity of signal module is: AC230V,10A; DC24V,10A

Remarks 8: communication agreement is Modbus. If use Profibus or other agreement, it needs extra order. Power module and signal module needs extra order.

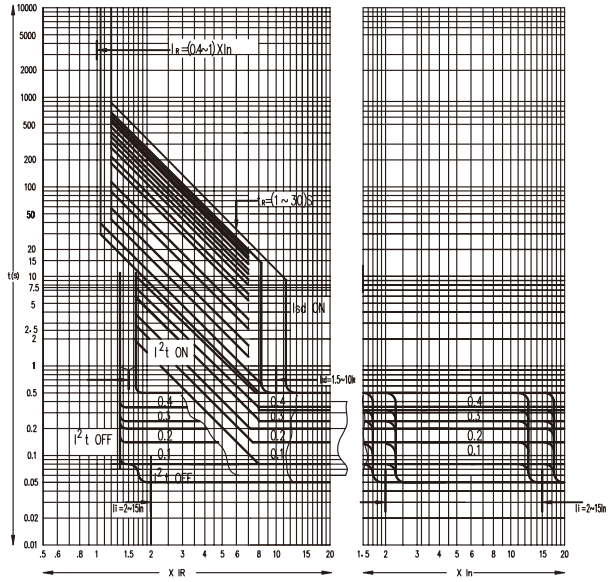
HDW9 Air Circuit Breaker

Standard: IEC 60947-2

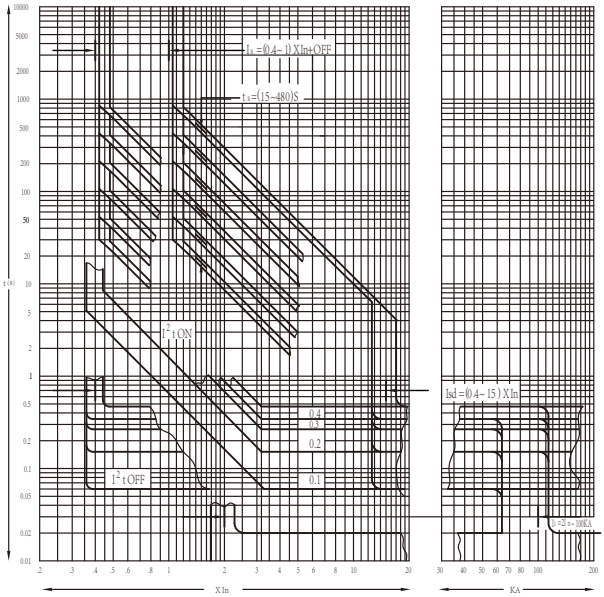
Tripping Curves

Normal Protections

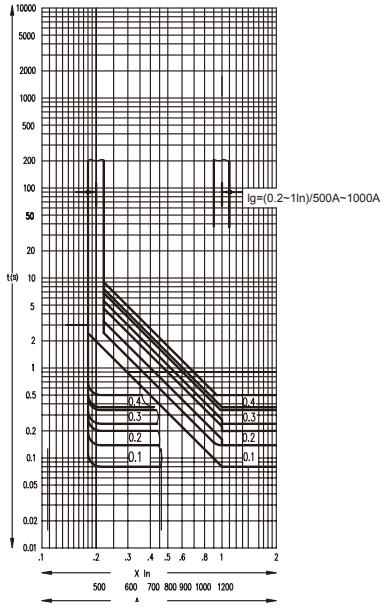
1600N,4000H1&H2

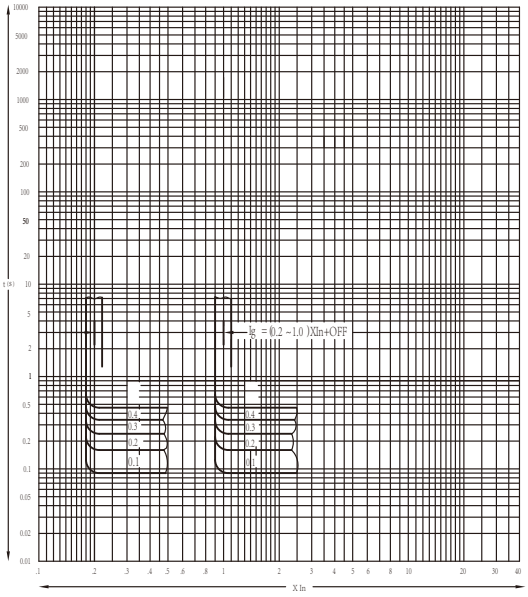


6300L



Ground Return Protection





HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Major Parameter

- Frame
  1000A、2000A、3200A、6300A
- Rated current In (A)
  200 ~ 6300
- Rated voltage Ue (A)
  400
- Number of poles
  3，4
- Installation way
  Fixed, Drawout

Intelligent controller

- ECW-L
  Basic function Protection(L,S,I & G)
- ECW-M
  Basic protection,Basic measurement,Miscellaneous function
- ECW-H
  Basic and Higher protection,Various measurement,Miscellaneous & Communication

Accessory

- Long-distance operation
  Shunt release,Undervoltage release,Closing release,Motor mechanism & Auxiliary contact
- Circumscribed Transformer
  N-phase circumscribed transformer

- Lock
  Divide release lock
- Connection
  Cable mechanical interlock,connecting-rod type mechanical interlock,Phase barrier
- Control module accessory
  Alternating current power supply module,Direct-current power supply module,Relay module
- Operation
  Doorframe

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Order Information

1 Select current

1000A Frame 2000A Frame 3200A Frame

6300A Frame

①Select frame		②Select current
10:1000A Frame		
Icu	42	02: 200A
Ics	30	04: 400A
Icw(0.5s)	30	06: 630A
		08: 800A
		10: 1000A
20:2000A Frame		
Icu	80	06: 630A
Ics	50	08: 800A
Icw(1s)	50	10: 1000A
		12: 1250A
		16: 1600A
		20: 2000A
32:3200A Frame		
Icu	80	20: 2000A
Ics	80	25: 2500A
Icw(1s)	65	32: 3200A
63:6300A Frame		
Icu	120	40: 4000A
Ics	100	50: 5000A
Icw(1s)	85	63: 6300A (Exclude 4P)

Doorframe and phase barrierare acquiescent

Product name		Frame	Rated current		
W6		10: 1000	02: 200A	12: 1250A	40: 4000A
		20: 2000	04: 400A	16: 1600A	50: 5000A
		32: 3200	06: 630A	20: 2000A	63: 6300A (Exclude 4P)
		63: 6300	08: 800A	25: 2500A	
			10: 1000A	32: 3200A	
		↓	↓		
W6	+	20	16		

↓

For example W620163DHDD54L

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Select of breaker

2 Select form

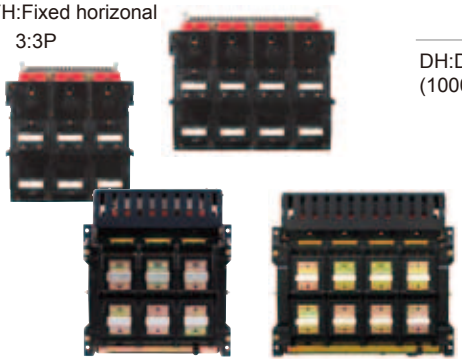
① Select installation way

FH:Fixed horizonal (1000AF-3200AF) 3:3P 4:4P

DH:Drawout horizonal (1000AF-6300AF) 3:3P 4:4P

FH:Fixed horizonal 4:4P

FH:Fixed horizonal 3:3P



DH:Drawout horizonal 3:3P

DH:Drawout horizonal 4:4P

3 Select control loop

Motor mechanism (MCH)

Closing voltage release (XF)

Shunt release (MX)

Undervoltage release (MN)

Undervoltage delayed release (MNR)

Auxiliary contact

Pole	Installation method		Motor mechanism(MCH)+Closing release(XF)
3: 3P	DH:Drawout horizonal (1000AF-6300AF)		D : DC220V
4: 4P	FH:Fixed horizonal (1000AF-3200AF)		N : AC230V
			V : AC400V
↓	↓		↓
3	DH	+	D

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

①Select
Motor mechanism (MCH)
Closing release (XF)

②Select
Shunt release (MX)
Undervoltage release

③Select
Auxilary contact

4 Select intelligent controller

①Select intelligent controller

Motor mechanism (MCH) + Closing release (XF) (Must Option)

D : DC220V
N : AC230V
V : AC400V

Shunt release(MX) (At least choose one of the Acc.from MX/MN/MNR)

D : DC220V
N : AC230V
V : AC400V
5 : Without shunt release

Undervoltage release (MN/MNR)

N : AC230V
V : AC400V
P : With undervoltage delayed AC230V
T : With undervoltage delayed AC400V
5 : Without undervoltage release

Auxilary contact (Must Option)
4 : four open and four close (1000AF)
6 : five open and five close (2000-6300AF)

ECW-L

ECW-M

ECW-H

Select intelligent controller

ECW-L: basic protection

ECW-M: standard protection

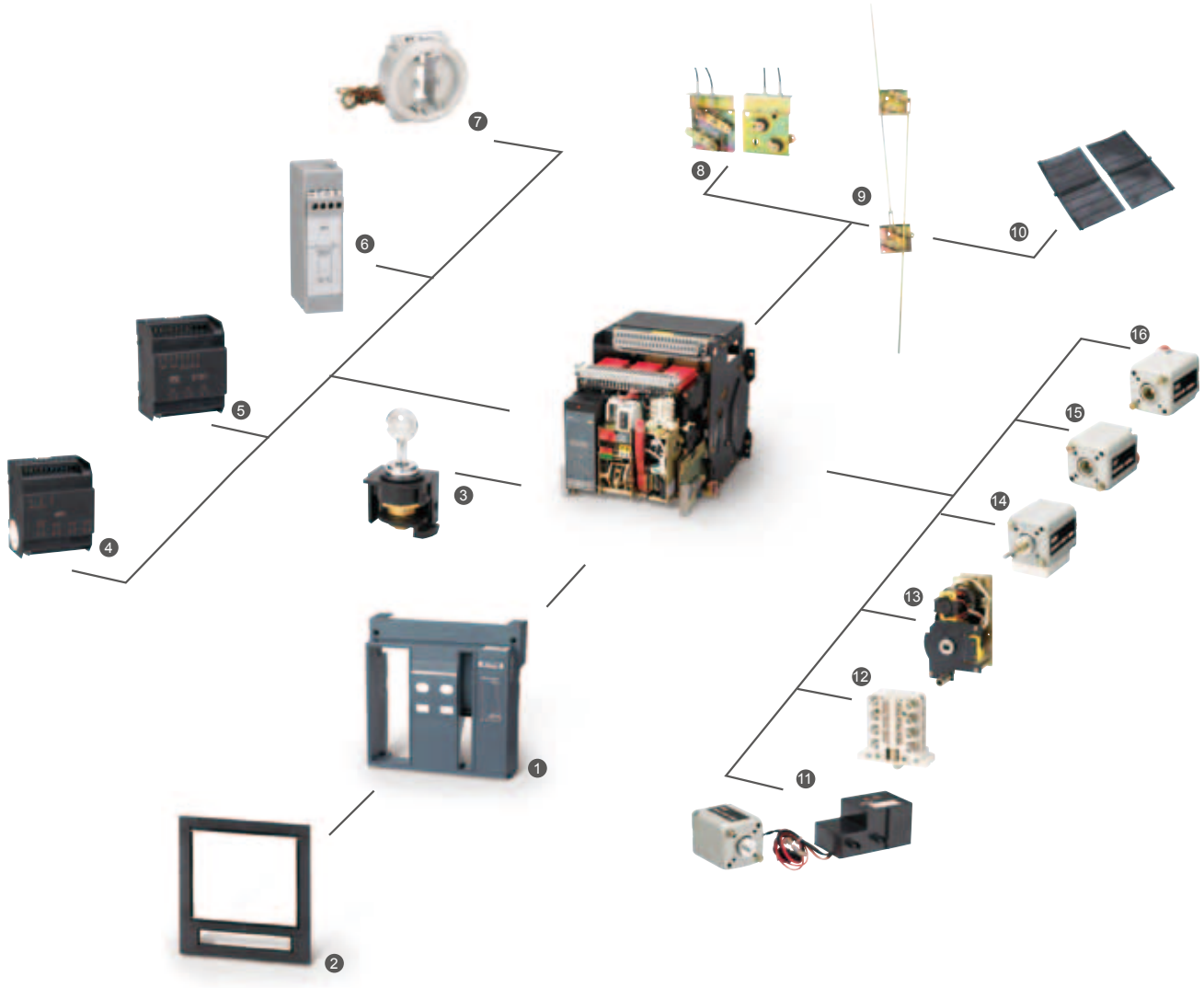
ECW-H:advanced protection

Shunt release(MX)	Undervoltage release	Auxilary contact	ESW series intelligent controller
D : DC220V	N : AC230V	4 : four open and four close	M : ECW-M
N : AC230V	V : AC400V	6 : five open and five close	L : ECW-L
V : AC400V	P : With undervoltage delayed AC230V		H : ECW-H
5 : Without shunt	T : With undervoltage delayed AC400V		
release	5 : Without undervoltage release		
↓	↓	↓	↓
+ D	5	4	+ L

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

The Indicator Diagram of HDW6 Air Circuit Breaker



1	Veil	5	Relay module	9	Connecting-rod type mechanical interlock	13	Motor mechanism
2	Doorframe	6	DC power supply module	10	Phase barrier	14	Undervoltage release
3	Key lock	7	N-phase circumscribed transformer	11	Undervoltage delayed release	15	Closing release
4	Power supply module	8	Cable mechanical interlock	12	Auxiliary contact	16	Shunt release

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Radio Accessories Guide

If you need more extend function,choose accessories by yourself.(Please see the appendix, order goods on the basis of accessories code.)

Accessory code

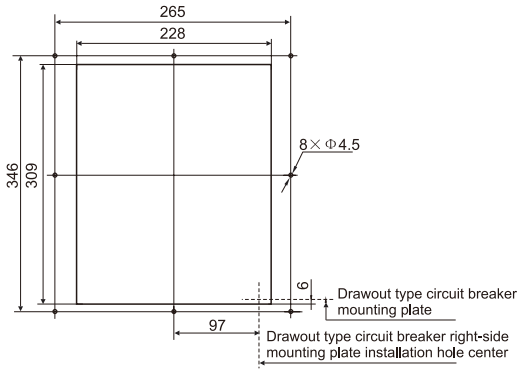
	Code	Accessory name	
• Control module accessory			
	HDW6AP	Power module	input AC230V/DC220V output DC24V 1000-6300AF
	HDW6DCP	DC power module	input DC220V output DC24V 1000-6300AF
	HDW6R	Relay module	Capacity AC230V/DC24V input DC24V 1000-6300AF
• The accessory is for protection and measure			
N-phase circumscribed transformer	HDW6N1002	N-phase circumscribed transformer	(200A 1000AF)
	HDW6N1008	N-phase circumscribed transformer	(400A-800A 1000AF)
	HDW6N1010	N-phase circumscribed transformer	(1000A 1000AF)
	HDW6N2008	N-phase circumscribed transformer	(630A-800A 2000AF)
	HDW6N2020	N-phase circumscribed transformer	(1000-2000A 2000AF)
	HDW6N3232	N-phase circumscribed transformer	(2000A-3200A 3200AF)
	HDW6N6363	N-phase circumscribed transformer	(4000A-6300A 6300AF)
• For lock function			
Button lock	HDW6L3	Three locks and two keys	(2000-6300AF)
	HDW6L2	Two locks and one key	(2000-6300AF)
	HDW6L1	One lock and one key	(2000-6300AF)
• For power supply changeover			
Cable mechanical interlock	HDW6FL2	Fixed cable mechanical interlock(two)	
	HDW6FL3	Fixed Cable mechanical interlock(three)	
	HDW6DL2	Drawout Cable mechanical interlock(two)	
	HDW6DL3	Drawout Cable mechanical interlock(three)	
Connecting-rod type mechanical interlock	HDW6FG2	Fixed connecting-rod type mechanical interlock(two)	
	HDW6FG3	Fixed connecting-rod type mechanical interlock(three)	
	HDW6DG2	Drawout connecting-rod type mechanical interlock(two)	
	HDW6DG3	Drawout connecting-rod type mechanical interlock(three)	

HDW6 Air Circuit Breaker

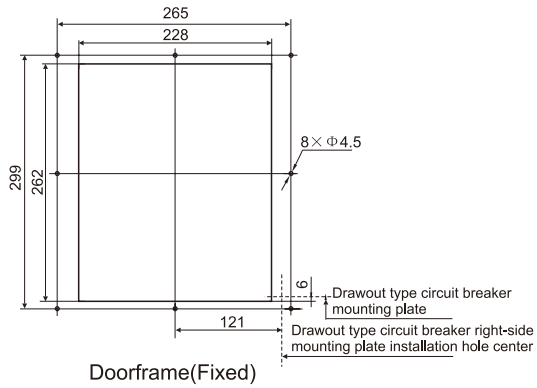
Standard: IEC 60947-2

Overall Dimensions

HDW6-1000



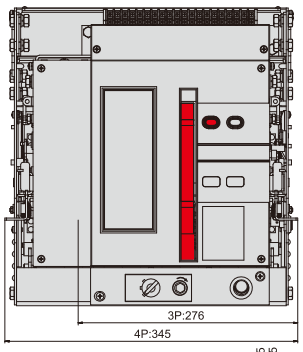
Doorframe(Drawout)

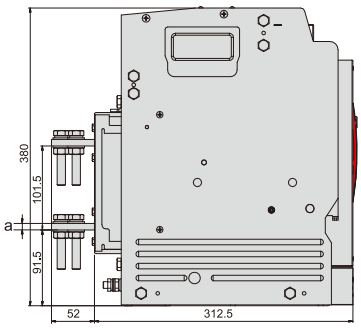


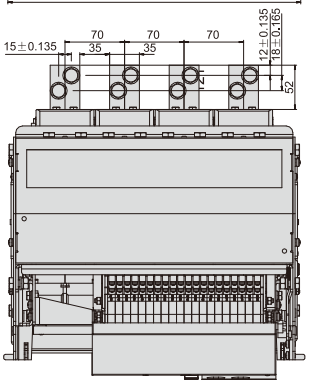
Doorframe(Fixed)

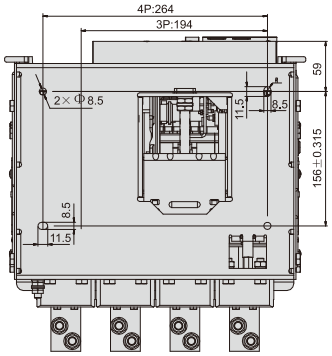
Volume

○ Drawout

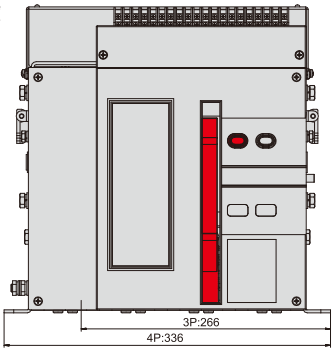


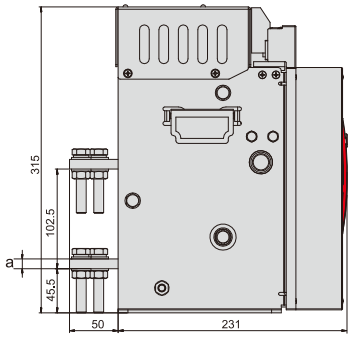


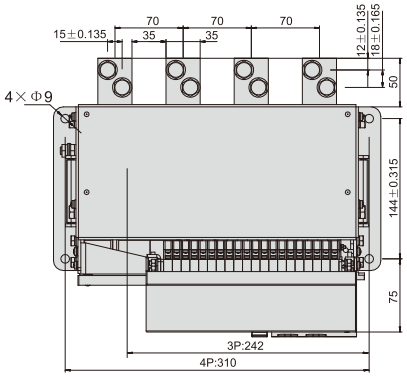




○ Fixed



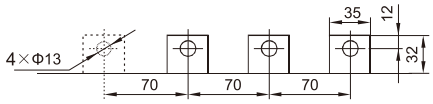




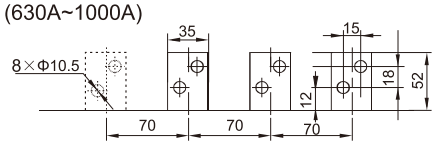
Busbar Dimension

○ Draw Out

(200A,400A)

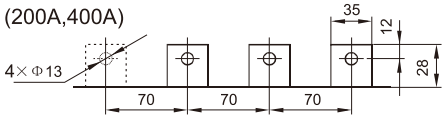


(630A~1000A)

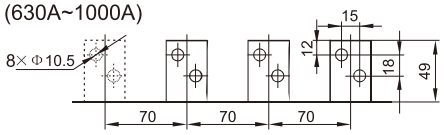


○ Fixed

(200A,400A)



(630A~1000A)



HDW6 Air Circuit Breaker

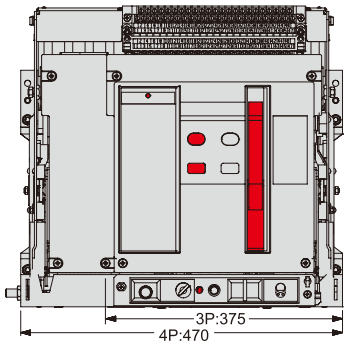
Standard: IEC 60947-2

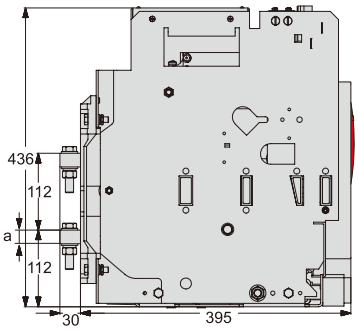
Overall Dimensions

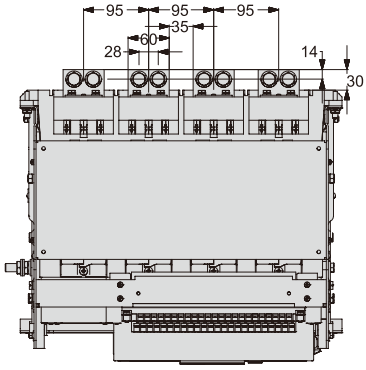
HDW6-2000

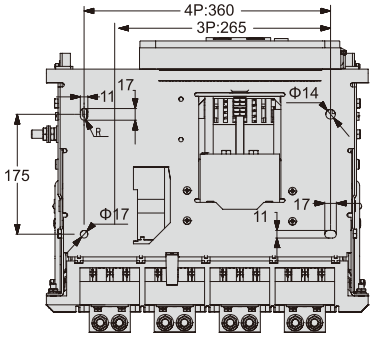
Volume

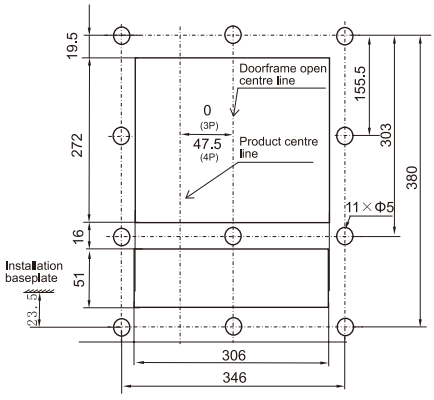
○ Drawout



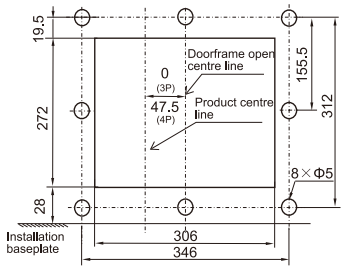






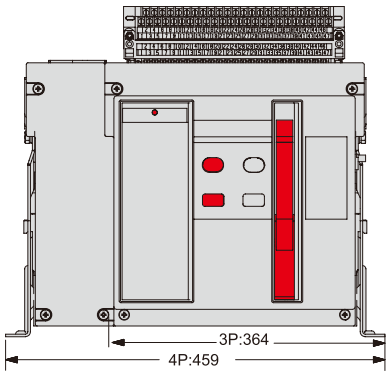


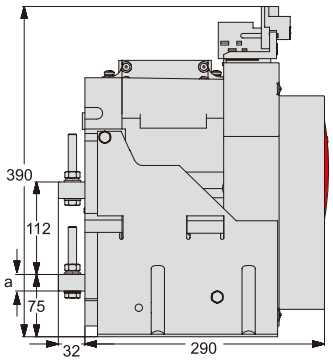
Doorframe(Drawout)

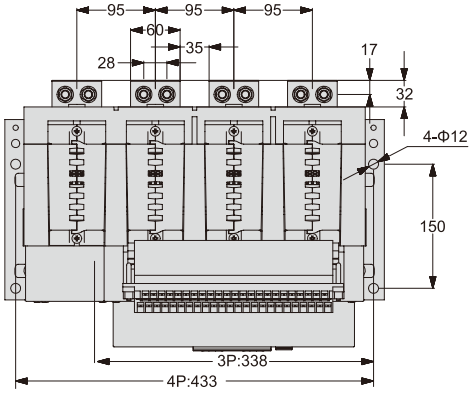


Doorframe(Fixed)

○ Fixed







HDW6 Air Circuit Breaker

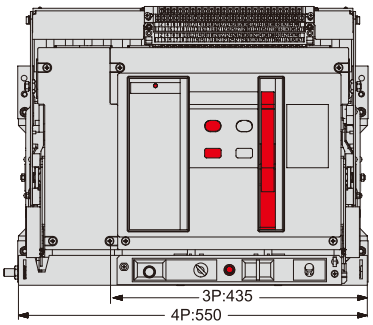
Standard: IEC 60947-2

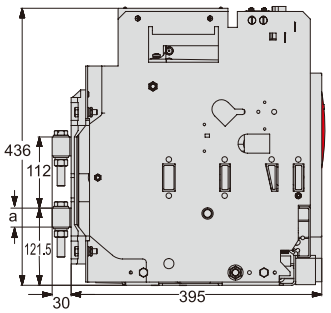
Overall Dimensions

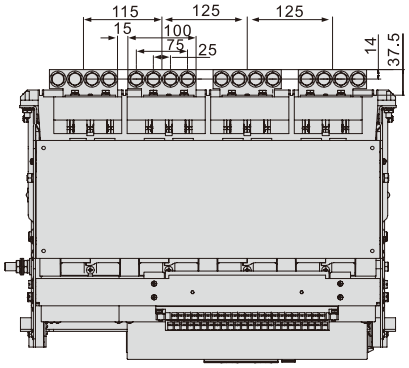
HDW6-3200

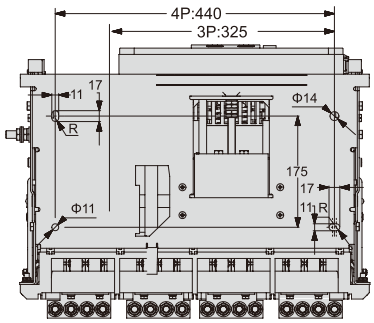
Volume

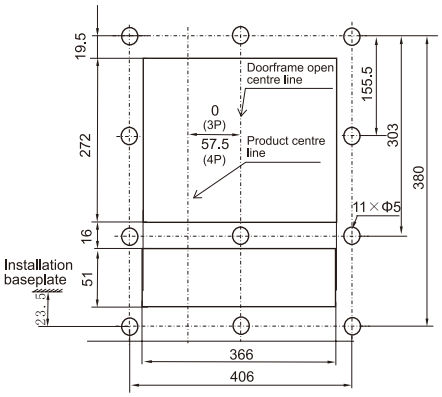
○ Drawout





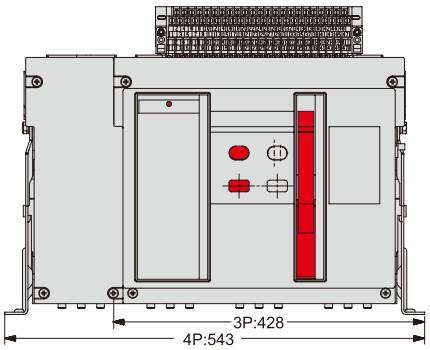


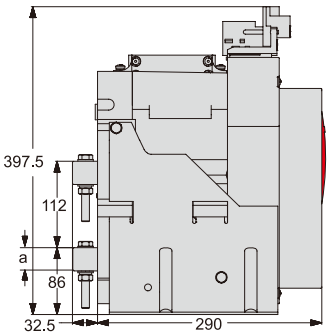


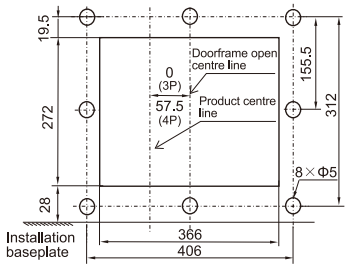


Doorframe(Drawout)

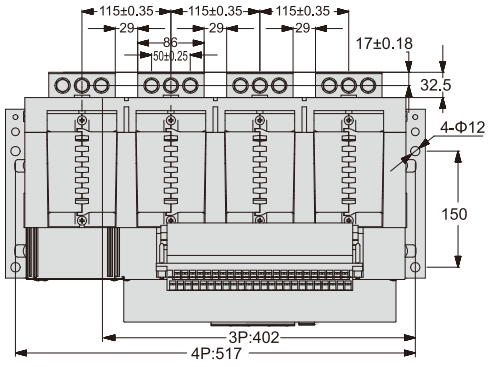
○ Fixed







Doorframe(Fixed)



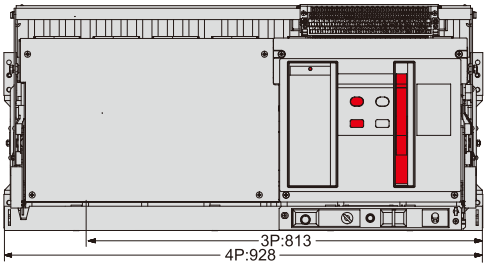
HDW6 Air Circuit Breaker

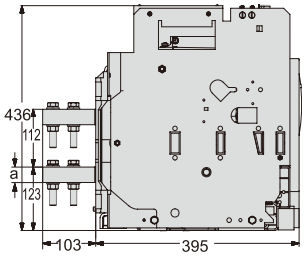
Standard: IEC 60947-2

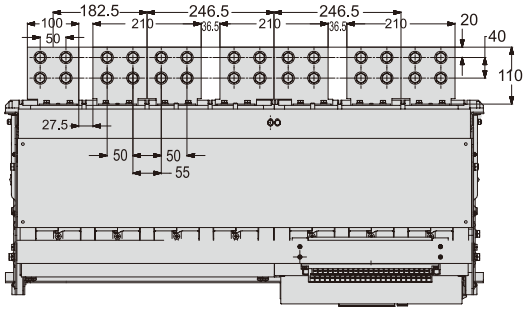
Overall Dimensions

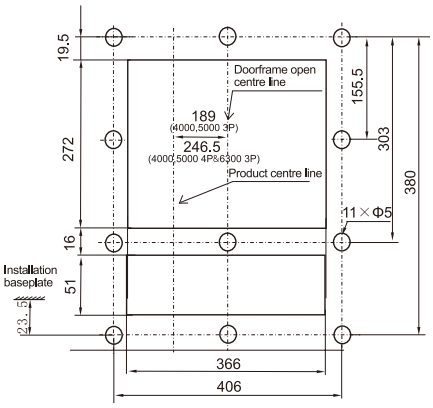
HDW6-6300

Volume

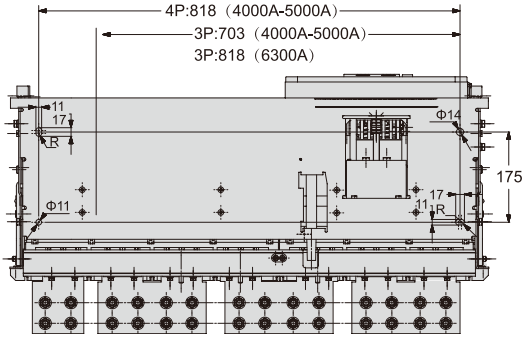


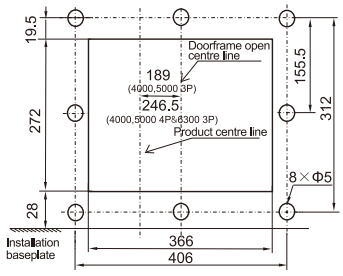






Doorframe(Drawout)





Doorframe(Fixed)

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Technical Parameter

Common characteristics		
Number of poles		3P, 4P
Rated insulation voltage Ui	V	800
Rated impulse withstand voltage Uimp	kV	8
Rated operational voltage Ue	V	400

Rated current				
In(A) \ In Frame(A)	1000	2000	3200	6300
200	•			
400	•			
630	•	•		
800	•	•		
1000	•	•		
1250		•		
1600		•		
2000		•	•	
2500			•	
3200			•	
4000				•
5000				•
6300				•

Breaking capacity				
Rated ultimate short circuit breaking capacity Icu (kA)	42	80	80	120
Rated service short circuit breaking capacity Ics (kA)	30	50	80	100
Rated Short-Time Withstand Current Icw (0.5s)	30			
Rated Short-Time withstand current Icw (kA/1s)		50	65	85

Service life				
Mechanical Life with Maintenance	10000	10000	8000	5000
Mechanical Life without Maintenance	2500	2500	2500	2500
Electric Life with Maintenance	1000	1000	1000	800
Electric Life without Maintenance	500	500	500	500

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Intelligent Controller

ECW-L

Function information		
Protection		Use
Long time delay	L	Protect cable,prevent ageing
Short time delay	S	Protect equipment,prevent impedance short circuit
Instantaneous	I	Protect equipment,prevent metallicity short circuit
Earthing	G	Prevent fire

ECW-L protection characteristics	Setting range	
Protection Characteristics for Overload Delay		
Action current I_R	(0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0)In+OFF	
Delay time t_L	30s, 60s, 120s, 240s	
Protection Characteristics for Short-Delay Short Circuit		
Action current Isd	(3, 4, 5, 6, 7, 8, 10)In+OFF	
Action time t_S	0.2s, 0.4s	
Protection Characteristics for Instantaneous Short Circuit		
Action current Ii	Setting range	Remark
	(10, 11, 12, 14, 16, 18, 20) In+OFF	1000AF 2000AF
	(7, 8, 9, 10, 11, 12, 14) In+OFF	3200AF 6300AF
Earthing protection		
Action current Ig	(0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8)In+OFF	
Actuation time t_G	0.1s,0.2s,0.3s,0.4s	

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Intelligent Controller

ECW-M

Function information		
Protection		**Use**
Long time delay	L	Protect cable,prevent ageing
Short time delay	S	Protect equipment,prevent impedance short circuit
Instantaneous	I	Protect equipment,prevent metallicity short circuit
Earthing	G	Prevent fire
Measure		
Current measurement		
Voltage measurement		
Miscellaneous function		
Pre-alarm		
Self-diagnosis function		
Fault log		
Test function		

ECW-M protection characteristics	Setting range						
Protection Characteristics for Overload Delay							
Action current I_R	(0.4~1.0I)n+OFF (>>100A)						
Delay time t_L	Fault current	Delay time					
	t_R	15	30	60	120	240	480
	$1.5xI_R$	15	30	60	120	240	480
	$2xI_R$	8.4	16.9	33.8	67.5	135	270
	$7.2xI_R$	0.65	1.3	2.6	5.2	10.4	20.8
	$t=(1.5/N)^2xt_R$						
	N=Fault current divided by the setting current I/I_R						
	t=Delay Time of Failure Action						
	t_R=Setting Value of Long-Delay Time						
Protection Characteristics for Short-Delay Short Circuit							
Action current Isd	(0.4~15)In+OFF Step setting 10kA below : ≤ 2A, 10kA above ≤ 10A						
Action time t_S	Inverse time Limit I^2T						
	Fault current	Delay time					
		ts(s)	0.1	0.2	0.3	0.4	
	I^2T: OFF	Min.delay(ms)	60	160	255	340	
		Max.delay	140	240	345	460	
	I^2T:ON	Min.delay	60	160	255	340	
	$I>8I_R$	Max.delay	140	240	345	460	
	I^2T: ON	Inverse time limit delay	$t=(8I_R)^2/I^2\times ts$				
	$I\leq 8I_R$						

Protection Characteristics for Instantaneous Short Circuit				
	HDW6-1000	HDW6-2000	HDW6-3200	HDW6-6300
Action current Ii	2.0In~20kA+OFF	2.0In~50kA+OFF	2.0In~75kA+OFF	2.0In~100kA+OFF

Earthing protection	
Action current I_g	(0.2~1.0)In+OFF
Actuation time t_G	0.1s, 0.2s, 0.3s, 0.4s, OFF

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Intelligent Controller

ECW-H

Function information					
Protection		Use			
Long time delay	L	Protect cable,prevent ageing			
Short time delay	S	Protect equipment,prevent impedance short circuit			
Instantaneous	I	Protect equipment,prevent metallicity short circuit			
Earthing	G	Prevent fire			
Measure					
Current measurement					
Voltage measurement					
Power measurement					
Harmonic wave measurement					
Miscellaneous function					
Pre-alarm					
Self-diagnosis function					
Fault log					
Test function					
Communication function					
ECW-H protection characteristics					
Parameter name		Setting range			
Overload long time delay					
Action current I_R		OFF+0.4~1.0In			
Protection curve Type selection		SI: Standard inverse time limit VI: Rapid inverse time limit EI(G): Express inverse time limit(distribution) EI(M): Express inverse time limit(electromotor) HV: High-Pressure Welding Fuse Compatibility I^2t: Universal inverse time limit protection			
Setting delay time		C01~C16			
Protection Characteristics for Short Delay					
Action Current of Inverse Time Limit Is		OFF+(0.4~15)In			
Action Current of Fixed Time Limit Isd		OFF+(0.4~15)In			
Delay Time of Fixed Time Limit tsd		(0.1~0.4s)			
Instantaneous protection Characteristics					
Action current Ii	HDW6-1000	HDW6-2000	HDW6-3200	HDW6-6300	
	2.0In~20kA+OFF	2.0In~50kA+OFF	2.0In~75kA+OFF	2.0In~100kA+OFF	
Earthing protction Characteristics					
Action current Ig		OFF+(0,2~1.0xIn)			
Inverse time limit shearing coefficient Cr		1.5~6, +OFF			
Delay time tg		(0.1~0.4)s			

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Accessories

Long-distance operation

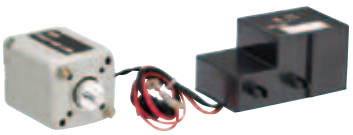
Shunt release

- Function introduce
- When the breaker is stored,under prescriptive voltage,through long-distance remote control operation,let the breaker break

Accessories parameter	
Rated operational voltage V	AC230V AC400V DC220V
Operation voltage	(0.7-1.1)Us
Consumption	300VA(AC) 40W(DC)
Breaking time	<30ms

Undervoltage release and undervoltage delay release

- Function introduce
- The undervoltage release automatically opens a circuit breaker when voltage drops to a value ranging between 35% to 70% of the line voltage. after tripping,the circuit breaker cannot be re-closed again when the voltage lowers than 35% or until returns to 85% of line voltage. Undervoltage relay release lets the breaker break in 1s-5s(adjustable)



Accessories parameter	
Rated operational voltage V	AC230V AC400V
Operational voltage	(0.35-0.7)Ue
Dependable closing voltage	(0.85-1.1)Ue
Unable closing voltage	≤0.35Ue
Consumption	12VA
Delay time	1s~3s

Closing release

- Function introduce
- When the breaker is stored,under prescriptive voltage,through long-distance remote control operation,let the breaker close

Accessories parameter	
Rated operational voltage V	AC230V AC400V DC220V
Operational voltage	(0.85-1.1)Us
Consumption	300VA(AC) 40W(DC)
Breaking time	<70ms

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Accessories

Motor mechanism

- Function introduce
- When the breaker is under breaking and power supply,motor mechanismis is automatic stored. So under shunt release,undervoltage and closing release, let the breaker break and close

Accessories parameter	
Rated control power voltage V	AC230V AC400V DC220V
Action voltage	(0.85-1.1)Us
Consumption	192VA(AC) 192W(DC)
Energy storage time	<5s

Auxiliary contact

- Function introduce
- It is used for keeping watch on the breaker's status,connecting position signal light and breaking indicator light

Accessories parameter				
Utilization category			AC-15	DC13
Auxiliary contact default type			5NO 5NC (4NO 4NC for 1000AF)	
Conventional thermal current Ith			6A	
Auxiliary contact's energized operational performance			Equal to circuit breaker operation performance	
Making& breaking capacity	Under normal conditions	I/Ie making	10	1
		I/Ie breaking	1	1
		U/Ue	1	1
		COSφor T0.95	0.3	6Pe*
	Under abnormal conditions	U/Ue	10	1.1
		I/Ie	1.1	1.1
		COSφor T0.95	0.3	6Pe*
		Operation cycles	10	10

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Accessories

Transformer

N-phase Circumscribed Transformer

- Function introduce

○ In the 3P+N earth connection,it is used for measure the current of the neutral phase

Note: 1. Only for 3P Breaker, and the Intelligent Controller should be 4P;
2. Max connect distance is 2M;
3. Customize according to the Intelligent Controller.

Lock

Divide Release Lock

- Function introduce

○ When the breaker is breaking,it could be lock in.

○ It is divided into three types: one lock and one key
two locks and one key
three locks and two keys

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Accessories

Connection

Cable Mechanical Interlock

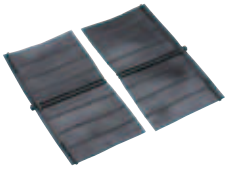
- Function introduce
- ○ It could connect two or three breakers to be linkage.

Note:The Max Horizonal installation distance is 2M;

Connecting-rod Type Mechanical Interlock

- Function introduce
- ○ It could connect two breakers to be linkage,one of the breakers is closing, the other is breaking

Note: Only for Vertical intallation, and the Max installation distance is 0.9M;



Phase Barrier

- Function introduce
- ○ Install in the middle of the breaker busbar,increase creepage distance, prevent to engender electric arc

Intelligent controller accessories

DC Power Module

- Function introduce
- ○ In the alternating current,supply auxiliary power supply for intelligent controllor
- ○ It is used for ST201 relay module or DC controllor power supply

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Accessories

Power Module

- Function introduce
  - In the direct current,supply auxiliary power supply for intelligent controller

Relay Module

- Function introduce
  - Exporting signal element is used for failure warning or indication

Note:HDW6AP & HDW6R only for H Intelligent Controller, and they use together as a set.

Other accessories

Doorframe

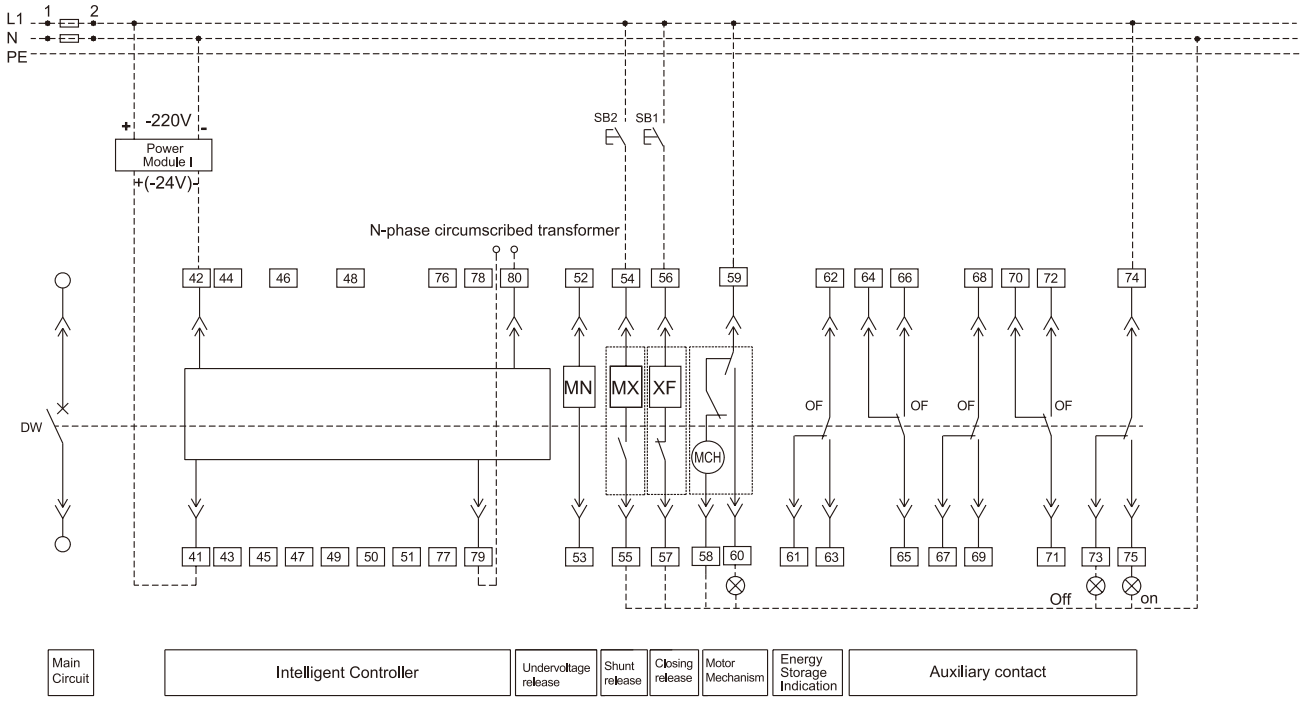
- Function introduce
  - Install on the power distribution cabinet door,increase IP protection grade to IP 40

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Auxiliary connection diagram

- L –Type and M –Type Intelligent Controller (1000AF)



Pin Function:
41# and 42#: auxiliary supply input terminal,
79#,80#: Input terminal of circumscribed transformer

Remarks 1: terminal 52# ~ 53# of MN undervoltage release connect to main circuit

Remarks 2:MN, MX, XF and MCH shall be connected with different power because of different control supply. When auxilary contact OF is 4a4b, MX Shunt-trip Release and MN Closing Release shall be tandem connected with NO and NO auxiliary contacts in the factory.

Remarks 3: Power Module1 is DC Power Module, and there is no such module when the power is AC power supply.The input & output terminals cannot be connected reversely (the draw - out type output terminal has been connected in the factory)

Remarks 4: the auxiliary contact is four-open and four-close; 79# and 80# are input terminal for circumscribed transformer, applied for (3P+N) T type earthing failure protection.

Components:

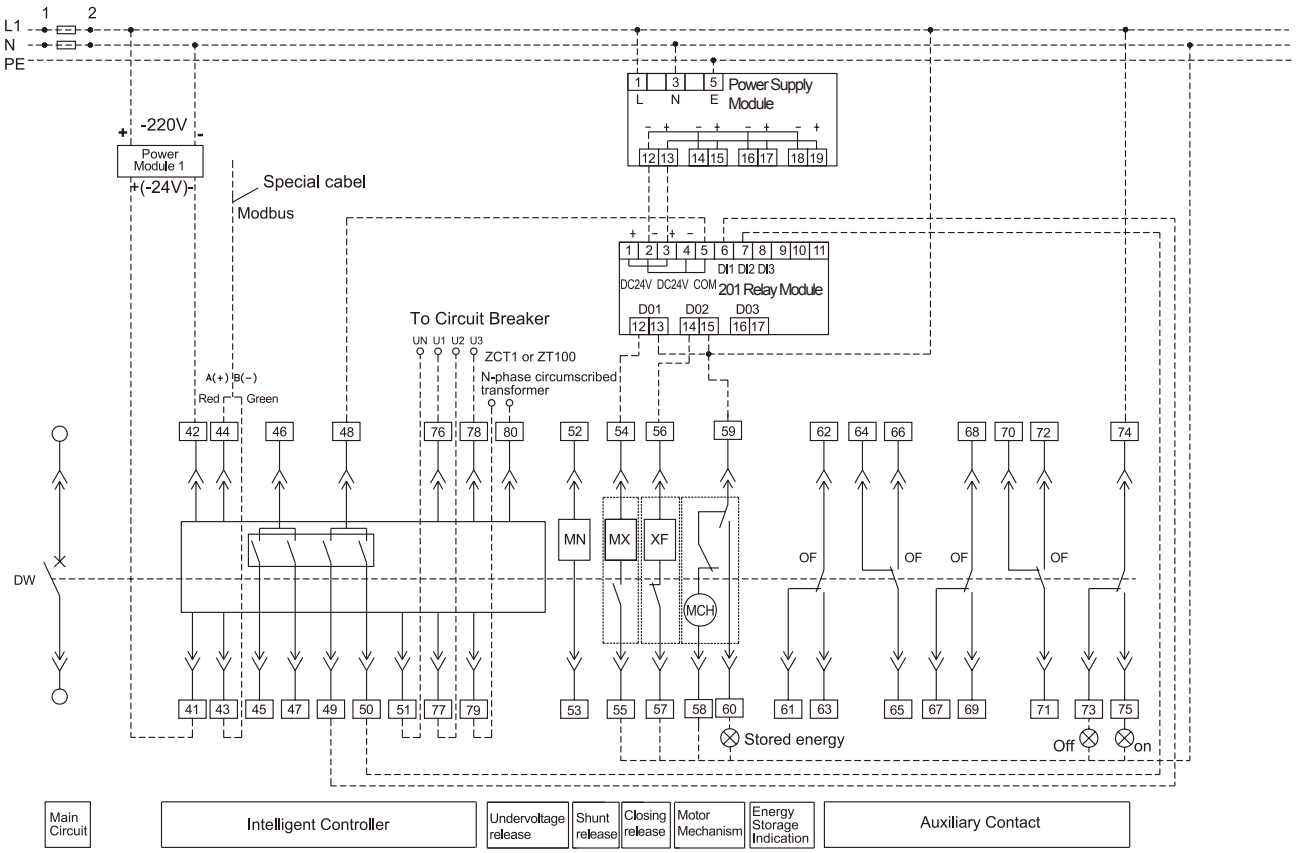
MN— Undervoltage Release
MX— Shunt Release
XF— Closing Release
OF— Auxiliary Contact
MCH— Motor Mechanism
SB1— Make Button
SB2— Shunt Button

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Auxiliary connection diagram

- H –Type Intelligent Controller (1000AF)



Pin Function:
41# and 42#: auxiliary supply input terminal,
43# and 44#: respective output communication wire of RS485B and RS485A
45#: alarm signal output
46#: signal contact output shared terminal 1
47#: error tripping output
48#: signal contact output shared terminal 1
49#: communication remote control shunt trip release output
50#: communication remote control make output
51#: Neuter line voltage signal (N phase)
76#: voltage signal A phase
77#: voltage signal B phase
78#: voltage signal C phase
79#,80#: input of circumscribed transformer

Components:

MN— Undervoltage Release
MX— Shunt Release
XF— Closing release
OF— Auxiliary Contact
MCH — Motor Mechanism
Z0T1 — Leakage transformer
ZT100 — Earthing transformer

Remarks 1: terminal 52# ~ 53# of MN undervoltage release connect to main circuit

Remarks 2: Remarks 2: MN, MX, XF and MCH shall be connected with different power because of different control supply. When auxilary contact OF is 4a4b, MX Shunt-trip Release and XF Closing Release shall be tandem connected with NO and NO auxiliary contacts in the factory.

Remarks 3: Power Module 1 is DC Power Module , and there is no such Module when the power is AC power supply.The input & output terminals cannot be connected reversely (the drawer-out type output terminal has been connected in the factory)

Remarks 4: the auxiliary contact is four-open and four-close; 79# and 80# are input terminal for circumscribed transformer, applied for (3P+N) T type earthing failure protection.or connect ZCT1 or ZT100(should order extra)

Remarks 5: long-range control should add 201 relay module and power module IV the capacity of relay module is: AC230V,10A; DC24V,10A

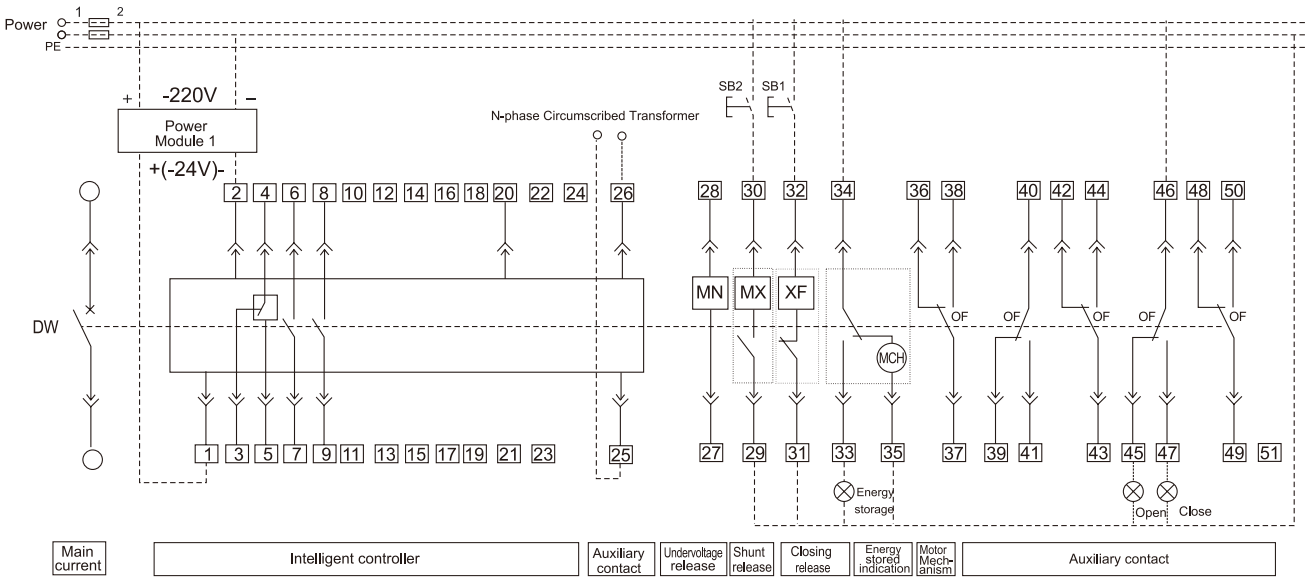
Remarks 6: communication agreement is Modbus. If use Profibus or other agreement, it needs extra order.
Power module IV and 201 relay module needs extra order.

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Auxiliary connection diagram

- L –Type and M –Type Intelligent Controller (2000-6300AF)



Pin Function:
1# and 2#: auxiliary supply input terminal,
1# for positive terminal when being DC
3#, 4# and 5#: contact output of tripping fault (4# refers to shared terminal);
contact capacity: AC 380V, 16A
6#, 7#, 8# and 9#: two groups of auxiliary terminals with circuit breaker status;
contact capacity: AC 380V, 16A

20#: PE wire, protection earthing wire
25# ~26#: output for circumscribed transformer

Components:

MN— Undervoltage Release
MX— Shunt Release
XF— Closing Release
OF— Auxiliary Contact
MCH— Motor Mechanism
SB1— Make Button
SB2— Shunt Button

Remarks 1: terminal 27# ~ 28# of MN undervoltage release connect to main circuit.

Remarks 2: MN, MX, XF and MCH shall be connected with different powers beacuse of control supply voltage. Auxilary contact OF is 5a5b, MX Shunt-trip Release and XF Closing release have been tandem connected with normal open and normal close auxiliary contacts in the factory.

Remarks 3: Terminal 35# can not only be connected to the power supply directly (automatic pre-storing energy), but also to the power supply after adopting tandem connection with normal open button (manual pre-storing energy)

Remarks 4: Terminal 6# ~ 7# can output normal close contacts,if the users put forward.

Remarks 5: Power Module 1 is DC Power Module , and there is no such Module when the power is AC power supply.The input & output terminals cannot be connected reversely (the drawer-out type output terminal has been connected in the factory)

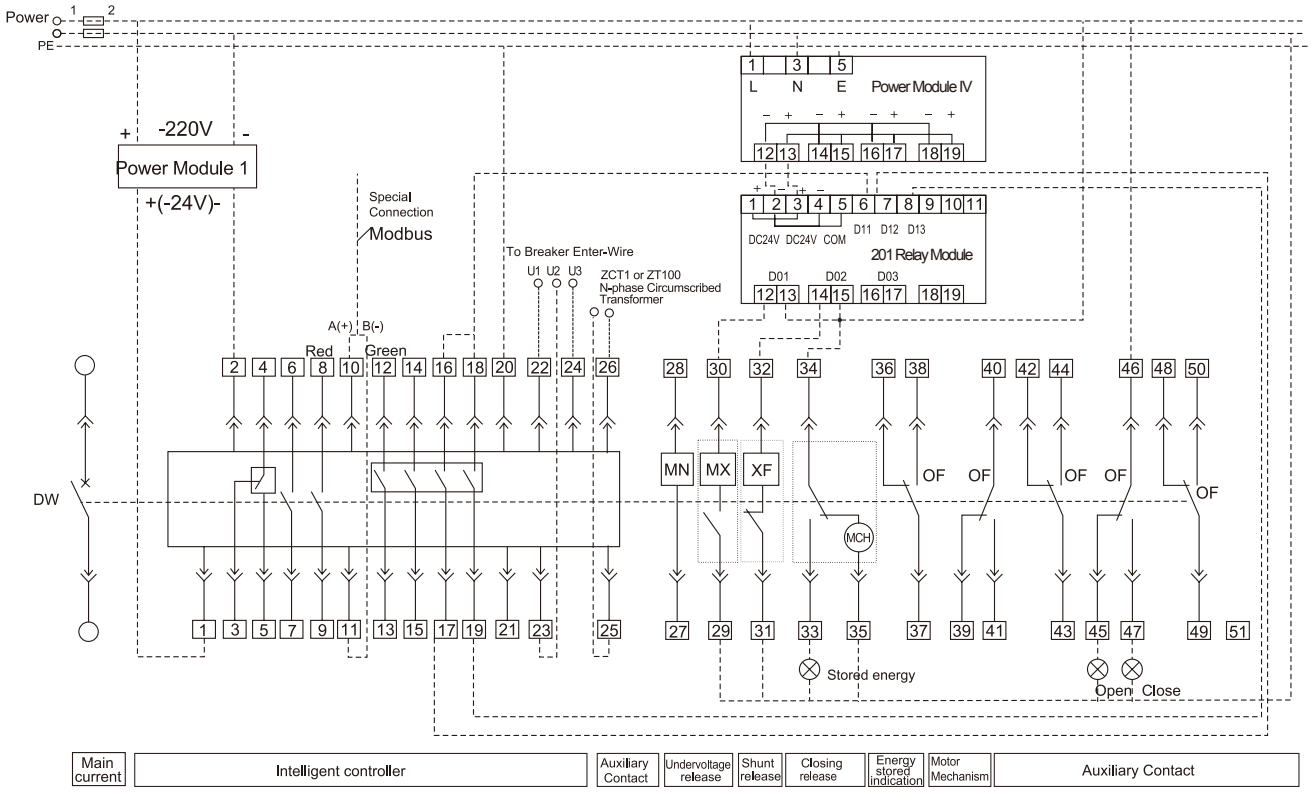
Remarks 6: The auxiliary contact is five-open and five-close, 25# and 26# are circumscribed transformer, applied for (3P+N) T type earthing failure protection.

HDW6 Air Circuit Breaker

Standard: IEC 60947-2

Auxiliary connection diagram

- H –Type Intelligent Controller (2000-6300AF)



Pin Function:
1# and 2#: auxiliary supply input terminal,
1# for positive terminal when being DC
3#, 4# and 5#: contact output of tripping fault (4# refers to shared terminal);
contact capacity: AC 380V, 16A
6#, 7#, 8# and 9#: two groups of auxiliary terminals with circuit breaker status;
contact capacity: AC 380V, 16A
10# and 11#: respective output wire of RS485A and RS485B communication
12#,13#: alarm signal output
14#,15#: error tripping signal output
16#,17#: communication remote control shunt release output
18#,19#: communication remote control make output
20#: PE Line, shielding earthing line.
21#: Neuter line voltage signal (N phase)
22#: voltage signal A phase
23#: voltage signal B phase
24#: voltage signal C phase
25#,26#: input of circumscribed transformer

Components:
MN — Undervoltage Release
MX — Shunt Release
XF — Closing Release
OF— Auxiliary Contact
MCH — Motor Mechanism
Z0T1 — Leakage Transformer
ZT100 — Earthing Transformer

Remarks 1: terminal 27# ~ 28# of MN undervoltage release connect to main circuit

Remarks 2: MN, MX, XF and MCH shall be connected with different powers beacuse of control supply voltage. Auxilary contact OF is 5a5b, MX Shunt-trip Release and XF Closing release have been tandem connected with normal open and normal close auxiliary contacts in the factory.

Remarks 3: Terminal 35# can not only be connected to the power supply directly (automatic pre-storing energy), but also to the power supply after adopting tandem connection with normal open button (manual pre-storing energy)

Remarks 4: Terminal 6# ~ 7# can output normal close contacts,if the users put forward.

Remarks 5: Power Module 1 is DC Power Module, and there is no such Module when the power is AC power supply.The input & output terminals cannot be connected reversely (the drawer-out type output terminal has been connected in the factory)

Remarks 6:The auxiliary contact is five-open and five-close, 25# and 26# are circumscribed transformer, applied for (3P+N) T type earthing failure protection, or connect Z CT1 or ZT100(should order extra)

Remarks 7: long-range control should add 201 relay module and power module IV the capacity of relay module is: AC230V,10A; DC24V,10A

Remarks 8: communication agreement is Modbus. If use Profibus or other agreement, it needs extra order. Power module IV and 201 relay module needs extra order.