

HUW2 series intelligent air circuit breaker

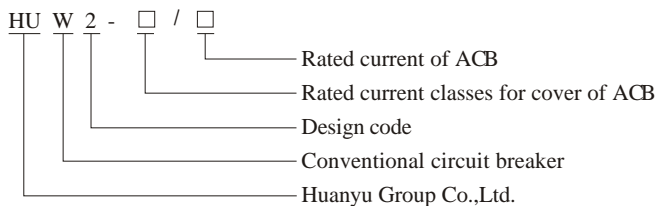


Application arrange

HUW2(DW15HH) for short series intelligent air circuit breaker(hereinafter called breaker) is applied in the network circuit of AC 50Hz, rated isolating voltage up to 690V, rated voltage below 690V and rated current between 400A and 4000A. It is mainly used for power distribution and protecting the circuit and power supply device from short-circuit, under voltage, single phase ground fault, and etc. This ACB has functions of intelligent protection and four-step selective protection, which can prevent system from unnecessary power cut and enhance reliability of power supply. Impulse withstand voltage of the breaker is 12,000V. The product accords with IEC60947-2 and IEC60947-4.

Model designation and classification

2.1 Model Designation



2.2. Classification

2.2.1 Classified as per application

A:---selective type

B:---unselective type

2.2.2 Classified as per energy reservation

a. Energy-reserved operation(operation of energy reservation and switching-in operation done twice)

b. Non- energy-reserved operation (operation of energy reservation and switching-in operation done once)

2.2.3 Classified as per operating types

a. Motor operated

b. Manually operated

2.2.4 Classified as per installation types

a. Stationary type

b. Drawable type

2.2.5 Classified as per pole numble.

- a. Three poles
- b. Four poles

2.2.6 Classified as per earthing in single phase or not

- a. Protection without single phase earthing
- b. Protection with single phase earthing

2.3 Categories of release

2.4. Property of intelligent over-current release

Intelligent over-current release; under-voltage instantaneous(or time delay) release; releasing release.

2.4.1 Functioning as overload long time-delay inverse time limit, short time-delay time setting limit and instantaneous action.

2.4.2 Protective function of single phase earthed

2.4.3 Overload alarming

2.4.4 Auto-examining: over-heat protection and auto diagnosis of micro-computer

2.4.5 Testing: testing action property of release

Normal operating and mounting condition

3.1 Ambient temperature

Upper limit value is no more than +40°C , lower limit value is no less than -5°C and average value in 24 hours is no more than +35°C.

3.2 Installation altitude is under 2000m

3.3 Air condition

Relative air humidity is no more than 50% if ambient temperature is to be +40°C. Under the condition of lower temperature, relatively higher humidity is allowed, monthly average relative humidity is to be 90% in the most humid month, and meanwhile the lowest average temperature is to be +25°C in this month.

3.4 Protection class:IP30

3.5 Application type: B type and A type

3.6 Mounting types: type of installing ACB and its under-voltage release and primary coil of power transformer is to be IV; type of auxiliary circuit and controlling circuit is to be III .

3.7 Mounting condition: mounting breaker as per this guide book and vertical gradient is no more than 5°.

Technical parameter and property

4.1 Rated current of ACB, see following Chart 1

Chart 1

Inm A	In A
2000	(400),630,800,100,1250,1600,2000
4000	2000,2500,2900,3200,4000

4.2 Rated operating current, breaking capacity, resistant current for short time and incoming modes see following chart
2. Arc-over distance is zero(ie.ACB has no external arc-over)

Chart 2

Inm A		4000	2000	Incoming modes
Breaking capacity for rated	400V	80	50	Upside incoming
Limited short circuit Icu(kA)O-CO	690V		30	Or downside incoming
Making capacity of rated short circuit n x Icu(kA)cos Φ	400V	176/0.2	105/0.25	
	690V			
Breaking capacity of rated operating short circuit Ics(kA)O-CO-CO	400V	60	40	
	690V			
Resistant current of rated short time Icw(kA) is time delay 0.4s,O-CO	400V	60	40	
	400V			

4.3 Protective property and function of intelligent over-current release

4.3.1 Protective property of over-current release

4.3.1.1 Setting value and error of release Ir(I/In), see Chart 3

Inm A	Long time delay	Short time delay I		Instantaneous		Earthing malfunction	
		Ir2	Error	In3	Error	Ir4	Error
2000	Ir1	Ir2	Error	In3	Error	Ir4	Error
4000	(0.4-1) In	(3-10)In (3-6)In	± 15%	(10-20) In (7-14)In	± 15%	(0.2-0.8)In (Max.1200A, and min.160A)	± 15%

Note: when release is to be L2, Ir3 is to be(3-10)In

4.3.1.2 Inverse time limit action property for long time delay over-current protection--- $I^2t_L = (1.5Ir1)^2t_L$, its action of (1.05-3.0), see Chart 4, and its time error is to be ±15%.

Note: t_L -setting time of long time delay 1.5 Ir1, T_L -action time of long time delay

1.05Ir1	1.3Ir1	Setting time for 1.5Ir1	30	60	120	240
>2h non-acting	<1h acting	3.0 Ir1	Resetting time>8s, and its current is to be 0.9 Ir1			

4.3.1.3 Acting time for short time delay is 0.2s and 0.4s respectively, and the accuracy is to be ±15%

4.3.1.4 Acting time of earthing protection is to be 0.2s, 0.4s, 0.6s and 0.8s respectively, and the accuracy is to be ±10%.

4.3.2 Classifications of intelligent release

Intelligent release is classified into L2, L3 and L4. Specific function see following Chart 5

Chart 5

Model	Basic function	
L2	1.Long time delay and instantaneous In(5-20) 2.Load current streamer indication 3.Operating indication under MCU 4.Indication under malfunction 5.Memory function of malfunction 6.Instantaneous testing function	1.Making and breaking for MCR and stimulant releasing function 2.Signal units for alarming(pre-alarming, auto-diagnosis and OCR releasing) 3.Under-voltage time-delay protective function
L3	1.Long time delay , short time delay(2-10) In(I frame), (2-10)In (II frame), and instantaneous In(5-20) In(I frame),(7-10)In(II frame). 2.Load current streamer indication 3.Operating indication under MCU 4.Indication under malfunction 5.Memory function of malfunction 6.Instantaneous testing function	1.Making and breaking for MCR and stimulant releasing function 2.Signal units for alarming(pre-alarming, auto-diagnosis and OCR releasing) 3.Under-voltage time-delay protective function
L4	1. long time delay , short time delay(3-10) In(I frame), (3-6)In (II frame), and instantaneous In(0.2-0.8)In(I frame),(7-14)In(II frame). malfunction protection for single phase earthing. 2.Load current streamer indication 3.Operating indication under MCU 4.Indication under malfunction 5.Memory function of malfunction 6.Instantaneous testing function	1.Making and breaking for MCR and stimulant releasing function 2.Signal units for alarming(pre-alarming, auto-diagnosis and OCR releasing) 3.Under-voltage time-delay protective function

4.4 Operating property of ACB(denoted by operating recycling times), see Chart 6

Chart 6

Inm A	Operating recycling times per hour	Operating recycling times under electrification	Operating recycling times no electrification	Total times
2000	20	500	4500	5000
4000	10	500	2500	3000

4.5 Working voltage and power of different release see Chart 7

Chart 7

Rated Voltage VA(W)	AC 50Hz		DC		Remarks
	220 (230)	380 (400)	110	220	
Name	220 (230)	380 (400)	110	220	
Under-voltage release	18	19	-	-	Max. instantaneous power
Shunt release	44	57	29	24	Max. instantaneous power
Releasing release	670	680	890	903	
Motor mechanism	200				
Intelligent release	≤15/25		≤10		Numerator without under-voltage Denominator with under-voltage

Note: within the range of 70%-35% under-voltage release breaks the breaker, when ≤35% U_e, the breaker does not switch out. Under 85%-110% U_e, the breaker is assured to be switched out; within the range of 1/2 and if main voltage is recovered to 85%, the breaker does not be off; reliable action of the release is in the range of 70%-110%;releasing(switch-off) electromagnet and reliable action voltage range for the motor operation mechanism is 85%-110%.

4.6.1 Property of auxiliary contacts

Chart 8

Application types	Making			Breaking			Times for making and breaking operation recycling and frequency		
	I/Ie	U/Ue	COS Φ or T0.95	I/Ie	U/Ue	COS Φ or T0.95	Operating frequency	Operation recycling time per min.	Electrification time (s)
AC-15	10	1.1	0.3	10	1.1	0.3	10	6 or same as the frequency of the main loop	0.05s
DC-13	1.1	1.1	300ms	1.1	1.1	300ms			

4.6.2 Making and breaking capacity for auxiliary contacts under normal conditions

Chart 9

Application types	Making			Breaking			Times for making and breaking operation recycling and frequency		
	I/Ie	U/Ue	COS Φ or T0.95	I/Ie	U/Ue	COS Φ or T0.95	Operating frequency	Operation recycling time per min.	Electrification time(s)
AC-15	10	1	0.3	1	1	0.3	60, 50	6	0.05s
DC-13	1	1	300ms	1	1	300ms			

4.7 Max. manually-operated force(Inm) of the breaker doesn't exceed 180N, Inm=4000 ≤410N(for repair and inspection only) and operating force for the handle of drawable type push-in mechanism is no more than 150N.