

■ **FUJI vacuum circuit breakers**

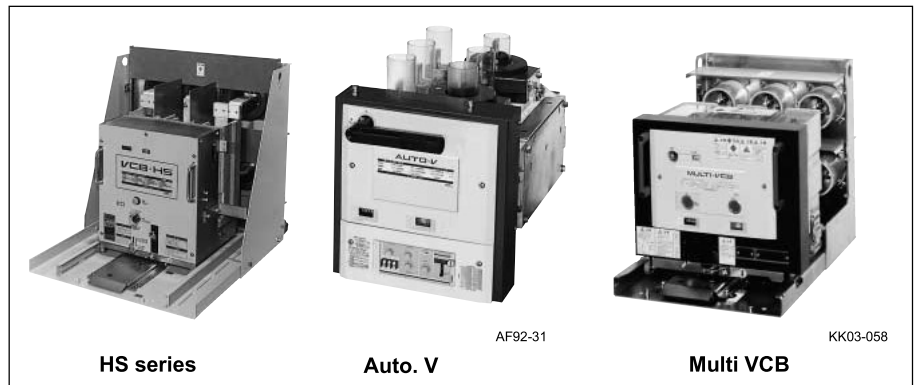
Vacuum circuit breakers are compact circuit breakers designed for safe operation, high reliability and easy maintenance, and are widely used for various types of high voltage circuits. FUJI V-circuit breakers (VCB) have been developed through the use of our many years of successful experience and advanced technology. They are compact and light-weight, and are available in a number of current ratings.

● **HS series**

These types are available in all ratings from 3.6 to 36kV, and can be applied to a variety of H.V. switchgear. The motor-spring stored-energy types feature auto-reclosing. The HS types are comparatively high in breaking current with ratings of over 7.2kV, 20kA.

- Breaking currents: 12.5kA to 50kA
- Rated voltage: 3.6kV to 36kV
- Standards: JEC, IEC

See page 12/4.



● **Auto. V**

Auto. Vs are provided with a built-in electronic overcurrent relay and toroidal-type CT. They require little space for installation and also facilitate the system wide protective coordination. The inverse-time operating and instantaneous trip currents can be set by means of the dial.

- Breaking currents: 8kA, 12.5kA
- Rated voltage: 3.6/7.2kV
- Standards: JIS C4603

See page 12/26.

● **Multi VCB**

The Multi VCBs are general purpose VCBs which are small in size and simple in construction thus allowing them to be applied to many types of switchgear.

- Breaking currents: 8kA, 12.5kA
- Rated voltage: 3.6/7.2kV
- Standards: JIS C4603

See page 12/45.

■ **Quick selection table**

Breaking current (kA)	Rated current JIS, JEC (A)	Rated voltage (kV)	Closing system	Type □ : Installation	Breaking current (kA)	Rated current JIS, JEC (A)	Rated voltage (kV)	Closing system	Type □ : Installation
20	600 1200 2000	3.6/7.2	Motor-spring	HS2006□-06Mf-E	40	1200 2000 3000 4000	12	Motor-spring	HS4010□-12Mf-NA
				HS2006□-12Mf-E					HS4010□-20Mf-NA
25	600 1200 2000	3.6/7.2	Motor-spring	HS2506□-06Mf-E	50	1200 2000 3000	12	Motor-spring	HS4010□-30Mf-N
				HS2506□-12Mf-E					HS4010□-40Mf-N
31.5	1200 2000 3000	3.6/7.2	Motor-spring	HS2506□-20Mf-E	12.5	600 1200	24	Manual-spring	HS5010□-12Mf-NA
				HS3106□-12Mf-E					HS5010□-20Mf-NA
40	1200 2000 3000 4000	3.6/7.2	Motor-spring	HS3106□-20Mf-E	16	600 1200	24	Motor-spring	HS5010□-30Mf-N
				HS3106□-30Mf-N					HS1220□-06Mf-K
50	1200 2000 3000	3.6/7.2	Motor-spring	HS4006□-12Mf-E	25	600 1200 2000	24	Motor-spring	HS1620□-06Mf-E
				HS4006□-20Mf-E					HS1620□-12Mf-E
12.5	600 1200 2000	12	Motor-spring	HS4006□-30Mf-N	40	1200 2000 3000	24	Motor-spring	HS2520□-06Mf-E
				HS4006□-40Mf-N					HS2520□-12Mf-E
16	600 1200 2000	12	Motor-spring	HS5006□-12Mf-NA	25	600 1200 2000	36	Motor-spring	HS2520□-20Mf-E
				HS5006□-20Mf-NA					HS4020□-12Mf-N
20	600 1200 2000	12	Motor-spring	HS5006□-30Mf-N	8.0	400	3.6/7.2	Manual-spring	HS4020□-20Mf-N
				HS1210□-06Mf-E					HA08□-H□
25	600 1200 2000	12	Motor-spring	HS1210□-12Mf-E	12.5	600	3.6/7.2	Motor-spring	HA12□-H□
				HS1210□-20Mf-E					HA08□-A□
31.5	1200 2000 3000	12	Motor-spring	HS1610□-06Mf-E	8.0	400	3.6/7.2	Motor-spring	HA12□-A□
				HS1610□-12Mf-E					HA08A□-A8
31.5	1200 2000 3000	12	Motor-spring	HS1610□-20Mf-E	12.5	600	3.6/7.2	Motor-spring	HA12A□-A8
				HS2010□-06Mf-E					HA08□-A□
31.5	1200 2000 3000	12	Motor-spring	HS2010□-12Mf-E	8.0	400	3.6/7.2	Motor-spring	HA12□-A□
				HS2010□-20Mf-E					HA08A□-A□
31.5	1200 2000 3000	12	Motor-spring	HS2510□-06Mf-E	12.5	600	3.6/7.2	Motor-spring	HA12A□-A□
				HS2510□-12Mf-E					HA12A□-A□
31.5	1200 2000 3000	12	Motor-spring	HS2510□-20Mf-E	8.0	400	3.6/7.2	Motor-spring	HA12A□-A□
				HS3110□-12Mf-E					HA12A□-A□
31.5	1200 2000 3000	12	Motor-spring	HS3110□-20Mf-E	12.5	600	3.6/7.2	Motor-spring	HA12A□-A□
				HS3110□-30Mf-N					HA12A□-A□

Note: □ Installation : See pages 12/4 for HS series, 12/26 for Auto. V and 12/45 for Multi VCB.

H.V. Distribution Equipment

Vacuum circuit breakers

HS series/General information

■ Description

HS type 3.6kV to 36kV up to 63kA. FUJI HS series vacuum circuit breakers are designed to meet the many special needs of industry. The vacuum interrupter system employed reflects the latest technology. The circuit breaker has a very stable and constant breaking performance over a wide range of currents up to the rated short circuit current value.

The motor spring type (M) closing system can perform high speed reclosing.

The contacts are made of a special alloy and require no maintenance over their long life time.

The interrupter is provided with a contact-wear indicator which gives notice when replacement is required. The open and close positioning indicator, operating counter, pushbutton for manual interruption and manual closing device are conveniently installed on the control section of the dead-front operating panel, and are isolated from the high-voltage breaking section for safety reasons and to facilitate operation and inspection. FUJI VCBs comprise the fixed mounted (P) type and cradle (X and Y) types. Since the cradle version is provided with a draw-out system switchgear assembly is easily carried out.

■ Ordering information

Specify the following:

1. Type number
2. Rated voltage, current and frequency
3. Rated breaking capacity
4. Installation system
5. Operating voltage and frequency (M) of closing system
6. Voltage and current of tripping system
7. Optional accessories, if required



Series of FUJI VCB

Breaking current \ Rated voltage	Rated voltage					
	3.6kV	7.2kV	12kV	15kV	24kV	36kV
12.5kA	-	-	HS1210: 600A 1200A, 2000A	-	HS1220: 600A 1200A	-
16kA	-	-	HS1610: 600A 1200A, 2000A	HS1615: 600A, 1200A, 2000A	HS1620: 600A 1200A	-
20kA	HS2006: 600A 1200A, 2000A	HS2010: 600A 1200A, 2000A	HS2015: 600A, 1200A, 2000A	-	-	-
25kA	HS2506: 600A 1200A, 2000A	HS2510: 600A 1200A, 2000A	HS2515: 600A, 1200A, 2000A	HS2520: 600A, 1200A, 2000A	HS2530: 600A 1200A, 2000A	-
31.5kA	HS3106: 1200A 2000A, 3000A	HS3110: 1200A 2000A, 3000A	HS3115: 600A, 1200A, 2000A	-	-	-
40kA	HS4006: 1200A 2000A, 3000A, 4000A, 4000A	HS4010: 1200A 2000A, 3000A	HS4015: 600A, 1200A, 2000A	HS4020: 1200A 2000A, 3000A	-	-
50kA	HS5006: 1200A, 2000A, 3000A	HS5010: 1200A 2000A, 3000A	-	-	-	-
63kA	HS6306: 1200A, 2000A	-	-	-	-	-

■ Type number nomenclature

Basic type		Tripping system	
HS: 7.2kV 12.5kA and over		f : Shunt trip Specify the frequency and voltage (AC or DC)	
Rated breaking current		Closing system	
12: 12.5kA 31: 31.5kA 16: 16kA 40: 40kA 20: 20kA 50: 50kA 25: 25kA 63: 63kA		M: Motor-spring stored energy (High speed reclosing) Specify the frequency and voltage (AC or DC)	
Rated voltage		Rated current	
06: 3.6/7.2kV 20: 24kV 10: 12kV 30: 36kV		06: 600, 630A 20: 2000A 12: 1200, 1250A 30: 3000A 40: 4000A	
Installation			
P : Fixed type X : Draw-out type with cradle for JEM1425 Class CW U : Draw-out type with cradle for JEM1425 Class CW Y : Draw-out type with cradle and shutter for JEM1425 MW, PW M : Draw-out type for HS2530			

■ **Specifications**

Type		HS1210□ -■Mf-E	HS1610□ -■Mf-E	HS2010□ -■Mf-E	HS2510□ -■Mf-E	HS3110□ -■Mf-E
Rated voltage [kV]		12	12	12	12	12
Rated current [A] ■: 06, 12, 20	JEC	600, 1200 2000	600, 1200 2000	600, 1200 2000	600, 1200 2000	1200, 2000
	IEC	630, 1250 2000	630, 1250 2000	630, 1250 2000	630, 1250 2000	1250, 2000
Rated breaking capacity	[kA]	12.5	16	20	25	31.5
	[MVA] Ref. value	260	330	415	520	650
Rated short-circuit making current [kA]		31.5	40	50	63	80
Rated short-time withstand current [kA]	JEC: 2 sec.	12.5	16	20	25	31.5
	IEC: 1 sec. *1	12.5	16	20	25	31.5
Rated breaking time [cycle]		3	3	3	3	3
Rated withstand voltage	Power frequency (1 min.)	JEC [kV] 28	28	28	28	28
		IEC [kV] 28	28	28	28	28
	Impulse (1.2/50 μs) [kV]	75	75	75	75	75
Closing time at no load [sec.]		0.04	0.04	0.04	0.04	0.04
Rated operating sequence	JEC IEC	O-1min-CO-3min-CO, CO-15s-CO or O-0.35s-CO-1min-CO O-3min-CO-3min-CO, CO-15s-CO or O-0.3s-CO-3min-CO				
Opening time [sec.]	JEC	0.03	0.03	0.03	0.03	0.03
	IEC	0.03	0.03	0.03	0.03	0.03
Closing system		Motor-spring stored energy (High speed reclosing) (M)				
Operating voltage and current for closing		100V AC/DC, 1.7A (600, 1200A), 2.5A (2000A) 200V AC/DC, 1A (600, 1200A), 1.7A (2000A)				100V AC/DC, 2.5A 200V AC/DC, 1.7A
Control voltage and current for closing		100V AC/DC, 4A (600, 1200A), 5A (2000A) 200V AC/DC, 2A (600, 1200A), 2.5A (2000A)				100V AC/DC, 5A 200V AC/DC, 2.5A
Tripping system*2		Shunt trip (f)				
Operating voltage and current for tripping		100V DC, 4A 200V DC, 2A				100V DC, 4A 200V DC, 2A
Auxiliary contact		4NO+4NC, Rating 100/200V AC: 20/10A, 100/200V DC: 5/3A				
Durability	Mechanical [operations]	10000				
	Electrical [operations]	10000				
Installation □		P, Y X (600, 1200A only)	P, Y X (600, 1200A only)	P, Y X (600, 1200A only)	P, Y X (600, 1200A only)	P, X, Y
Mass (draw-out type, without cradle) [kg]		71 (Y: 600A)	71 (Y: 600A)	71 (Y: 600A)	75 (Y: 600A)	122 (X, Y: 1200A)
		71 (Y: 1200A)	71 (Y: 1200A)	71 (Y: 1200A)	75 (Y: 1200A)	130 (X, Y: 2000A)
		130 (X, Y: 2000A)	130 (X, Y: 2000A)	130 (X, Y: 2000A)	130 (X, Y: 2000A)	

Notes: *1 Contact FUJI for the information concerning the 3 sec. rating of IEC.

*2 If capacitor tripping system is required, connect a capacitor trip device VCB-T1A or VCB-T2A (optional accessory) to an AC power supply.

H.V. Distribution Equipment

Vacuum circuit breakers

HS series

■ Types and ratings, 12kV

Rating			Closing system		Tripping voltage Shunt-trip(f)	Type	Ordering code	□ : Available installation system *1	
Volts (kV)	Breaking current (kA)	Current (A)	Closing system *2	Operating voltage					
12	25	600	M	100/110V DC	100/110V DC	HS2510□-06Mf-E		P, X, Y	
		1200	M	100/110V DC	100/110V DC	HS2510□-12Mf-E			
		2000	M	100/110V DC	100/110V DC	HS2510□-20Mf-E			
	31.5	1200	M	100/110V DC	100/110V DC	100/110V DC	HS3110□-12Mf-E		P, X, Y
		2000	M	100/110V DC	100/110V DC	100/110V DC	HS3110□-20Mf-E		
		3000	M	100/110V DC	100/110V DC	100/110V DC	HS3110□-30Mf-N		
	40	1200	M	100/110V DC	100/110V DC	100/110V DC	HS4010□-12Mf-NA		P, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS4010□-20Mf-NA		
		3000	M	100/110V DC	100/110V DC	100/110V DC	HS4010□-30Mf-N		P, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS4010□-40Mf-N		X
	50	1200	M	100/110V DC	100/110V DC	100/110V DC	HS5010□-12Mf-NA		P, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS5010□-20Mf-NA		
M			100/110V DC	100/110V DC	100/110V DC	HS5010□-30Mf-N			

Notes: *1 Installation system P: Fixed type
 X: Draw-out type with cradle for JEM 1425 Class CW
 Y: Draw-out type with cradle and shutter for JEM 1425 Class MW, PW
 *2 Closing system M: Motor-spring stored-energy (High speed reclosing)

■ Types and ratings, 15kV

Rating			Closing system		Tripping voltage Shunt-trip(f)	Type	Ordering code	□ : Available installation system *1	
Volts (kV)	Breaking current (kA)	Current (A)	Closing system *2	Operating voltage					
15	12.5	600	M	100/110V DC	100/110V DC	HS1215□-06Mf-N		P, X, Y	
		1200	M	100/110V DC	100/110V DC	HS1215□-12Mf-N			
		2000	M	100/110V DC	100/110V DC	HS1215□-20Mf-N			
	16	600	M	100/110V DC	100/110V DC	100/110V DC	HS1615□-06Mf-N		P, X, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS1615□-12Mf-N		
			M	100/110V DC	100/110V DC	100/110V DC	HS1615□-20Mf-N		
	20	600	M	100/110V DC	100/110V DC	100/110V DC	HS2015□-06Mf-N		P, X, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS2015□-12Mf-N		
			M	100/110V DC	100/110V DC	100/110V DC	HS2015□-20Mf-N		
	25	600	M	100/110V DC	100/110V DC	100/110V DC	HS2515□-06Mf-N		P, X, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS2515□-12Mf-N		
			M	100/110V DC	100/110V DC	100/110V DC	HS2515□-20Mf-N		
	31.5	1200	M	100/110V DC	100/110V DC	100/110V DC	HS3115□-12Mf-N		P, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS3115□-20Mf-N		
			M	100/110V DC	100/110V DC	100/110V DC	HS3115□-30Mf-N		
	40	1200	M	100/110V DC	100/110V DC	100/110V DC	HS4015□-12Mf-N		P, Y
			M	100/110V DC	100/110V DC	100/110V DC	HS4015□-20Mf-N		
			M	100/110V DC	100/110V DC	100/110V DC	HS4015□-30Mf-N		

Notes: *1 Installation system P: Fixed type
 X: Draw-out type with cradle for JEM 1425 Class CW
 Y: Draw-out type with cradle and shutter for JEM 1425 Class MW, PW
 *2 Closing system M: Motor-spring stored-energy (High speed reclosing)

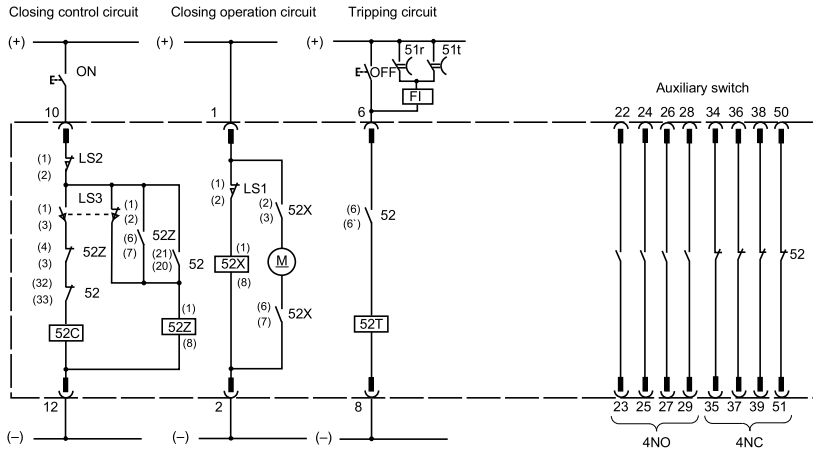
H.V. Distribution Equipment

Vacuum circuit breakers

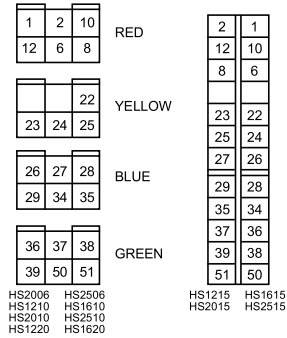
HS series

■ Wiring diagrams

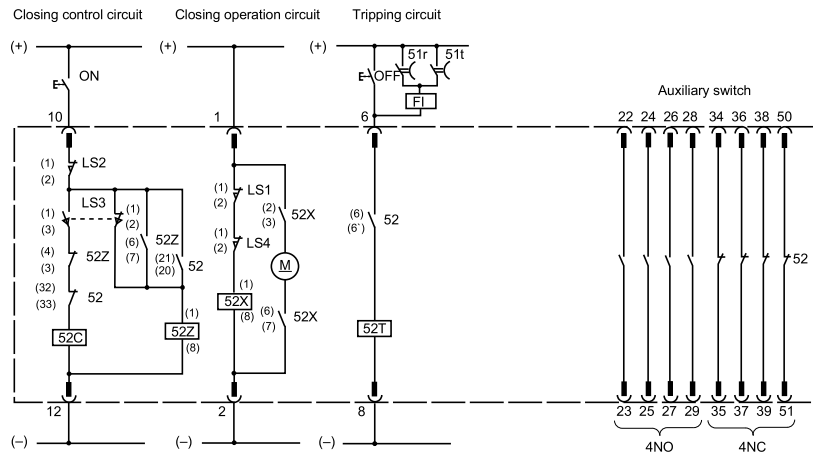
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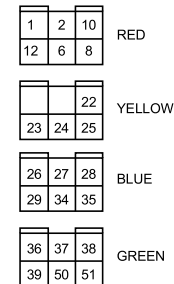
Terminal arrangement of control circuit receptacle
(A front view of CB mounted receptacles)



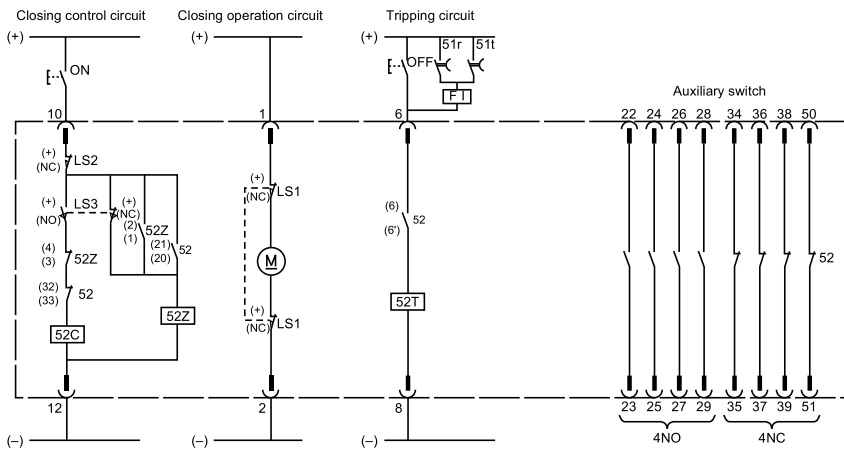
- HS3106-E, HS4006-E, HS3110-E



Terminal arrangement of control circuit receptacle
(A front view of CB mounted receptacles)



- HS3106-N, HS4006-N, HS5006, HS6306, HS3110-N, HS4010, HS5010, HS3115, HS4015, HS2520, HS4020, HS2530



Terminal arrangement of control circuit receptacle
(A front view of CB mounted receptacles)



External terminal of VCB

- 52 : VCB
- 52a : NO contact of auxiliary switch
- 52b : NC contact of auxiliary switch
- 52X : Magnetic contactor
- 52Z : Anti-pumping relay
- 52C : Closing coil
- 52T : Shunt trip coil

- M : Motor
- LS₁ : Limit switch (Opens when the closing spring is in the stored condition)

- LS₂ : Interlocking contact (Only draw-out type)
- LS₃ : Limit switch (Closes when the closing spring is in the stored condition)
- LS₄ : Limit switch (Opens when the closing pushbutton is operated)
- 51R, 51T : Overcurrent relay