

H.V. Distribution Equipment

Air load break switches

General information

■ Description

- 3.6/7.2kV, 100–600 Amps (LB)
- 3.6/7.2kV, 200 Amps (LBS)
- 12/24/36kV, 600–1200 Amps (RF)

FUJI air load break switch type LBS is provided with current limiting power fuses and type LB is not so fitted. Both types are compact and incorporate arc-extinguishing devices of FUJI's own design. The arc is drawn into a long narrow chamber with close clearances in which the gases are rapidly cooled and dispersed. Contact points therefore wear very slowly, so giving switches a long service life. FUJI air load break switches are recommended for use with power capacitors and transformers.

■ Features

- Excellent arc-extinguishing characteristics
The arc-extinguishing system uses a gas-cooling method. This results in less contact wear than that of comparable oil-immersed types, so ensuring a longer service life and lower maintenance costs.
- Light and compact design
The load break switch and fuses are incorporated into one body and are ideally suited for H.V. cubicle or metal-clad switchgear assembly applications.
- High current-limiting power fuses
The LBS type is provided with FUJI power fuses so ensuring an accurate and uniform interrupting performance.
- Economical first cost
The use of these fuses eliminates the need for circuit breakers with trip mechanisms, and so reduces initial installation costs.
- Safe fuse replacement
Fuses can easily be replaced or changed to different ratings in perfect safety.
- A shunt trip mechanism
A trip mechanism can be attached to LBS and LB having 100 and 200 Amps ratings. It can be tripped remotely.
- Blown fuse indicator
LBS and LB200 to 400 Amps rated switches can be supplied with a blown indicator limit switch attached for remote indication use.
- Auxiliary contacts
All these switches can be attached with 2NO+2NC 15 Amps switches.
- Motor-driven-types available
The standard versions are for stick operation. Motor-driven versions are also available. For further details please contact FUJI.



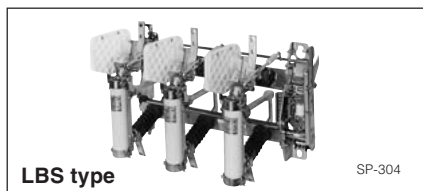
■ LB type

3.6kV/7.2kV up to 600 Amps 3-pole
3.6kV/7.2kV 200 and 400 Amps 3-pole with power fuse

The LB-type air load break switches are provided with the following major features:

1. They have been down-sized so that they can be installed in compact cubicles.
2. An improved interrupting performance and greater operating safety, achieved through a rotating arc contact and redesigned arc chute.
3. Accessories are built using a modular system, so that power fuse frames, gang-operated mechanisms and auxiliary switches can easily be added to the main switch body as required. These can be fitted in position on site without adjustment.

In addition, the shunt trip mechanism (f) can be incorporated into the basic frame. Previously they were regarded as ↗



■ LBS-type

3.6/7.2kV, 200 Amps 3-pole

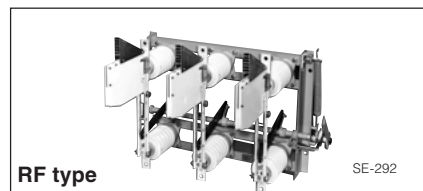
The LBS is an air load break switch with attached power fuses. A striker is incorporated into this unit, a feature which is not found in conventional load break switches.

The striker is a trip mechanism which operates the moment the fuse blows. When this occurs the striker causes all 3-pole to open at the same time. If air load break switches do not have this striker feature it is possible for some of the phases to remain alive after the fuse has blown, so resulting in a dangerous situation. This FUJI feature adds to the safety of the electrical system.

As LBS-type air load break switches are provided with a built-in auto trip mechanism the R290B and R293B remote gang-operated mechanisms cannot be fitted.

accessories. If shunt trip is required f suffix should be added to the type number when ordering.

Shunt trip mechanisms are factory-fitted before shipment. Please note that the R290B or R293B remote gang-operated mechanism cannot be incorporated with these shunt trip mechanisms. Those LB-type air load break switches of 200AF and 400AF can be fitted with power fuses. However, even if the LB-type units have 400AF ratings, power fuses up to 200 Amps only are required.



■ RF-type

12/24/36kV up to 1200 Amps 3-pole

The RF-type load break switch consists of a main blade, an auxiliary blade and an arc chute. The auxiliary blade is located at the arc chute and connected with the main blade. It will make contact at the same time as the main blade. The auxiliary blade will be momentarily held in contact in the arc chute at the time when the main blade opens. Once the main blade has reached the limit of travel the auxiliary blade will rapidly return to its position against the main blade under the influence of stored energy in the spring. This quick-break device functions effectively even when manually operated, and since the contact moves at high speed the arc is rapidly elongated and gas-cooled in the arc chute.

■ **General specification of switch body**

Description	LBS type		LB type					
	LBS-6/200	LBS-6/210 LBS-6/200f	LBS-6/210 LBS-6/210f	without shunt trip device			with shunt trip device	
			LB-6/100	LB-6/200	LB-6/400	LB-6/600	LB-6/100f	LB-6/200f
Rated	Voltage (kV)	7.2/3.6	7.2/3.6	7.2/3.6	7.2/3.6	7.2/3.6	7.2/3.6	7.2/3.6
	Current (A)	200	200	100	200	400	600	200
	Short-time current (1 sec.) (kA)	—	—	4	8	12.5	8	4
	Making short-circuit current (kA)	—	—	10	20 ¹	31.5 ¹	20 ¹	10
	Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Insulation	Dielectric strength (1 minute) (kV)	22	22	22	22	22	22	22
	BIL (1.2 × 50μs) (kV)	60	60	60	60	60	60	60
Main active load breaking capacity (A)	200	200	100	200	400	200	100	200
Cable charging breaking capacity (A)	10	10	10	10	10	10	10	10
Transformer off load breaking capacity (A)	10	10	5	10	20	10	5	10
Capacitor breaking current (A)	30	30	30	30	50	30	30	30
Fuse	Holder with blown indicator	—	—	—	FH-2	FH-2	—	—
	Holder without blown indicator	—	—	—	FH-1	FH-1	—	—
	Link	JC-6 ⁴	JC-6 ⁵	—	HF337E	HF337E	—	—
	Interrupting capacity (kA)	40	40	—	40 ³	40 ³	—	—

Description	RF250 type		RF248 type		
	RF250III/ 20/600	RF250III/ 20/600	RF248III/ 20/600	RF248III/ 20/1200	RF248III/ 30/600
Rated	Voltage (kV)	12/24	12/24	12/24	36
	Current (A)	600	600	1200	600
	Short-time current (1 sec.) (kA)	22	22	27	22
	Making short-circuit current (kA)	40	40	40	40
	Frequency (Hz)	50/60	50/60	50/60	50/60
Insulation	Dielectric strength (1 minute) (kV)	50	50	50	70
	BIL (1.2 × 50μs) (kV)	125	125	125	170
Main active load breaking capacity (A)	600	75	75	50	50
Cable charging breaking capacity (A)	20	20	20	15	15
Transformer off load breaking capacity (A)	20	10	10	10	10
Closing loop breaking capacity (A)	600	75	75	50	50

Note: *1: 20kA when operated by R290-B.
 10kA when operate by R293B.

*2: 200A is maximum for fuse-link.
 *4: 75A is maximum for fuse-link.

*3: 31.5kA when 200A power fuse is used at 7.2kV.
 *5: 100A is maximum for fuse-link.

LBS and LB types

■ **Construction**

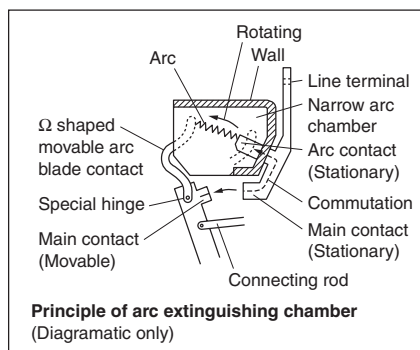
Arc extinguishing chute
 FUJI new LBS and LB type airload break switches are compact and have superior safety characteristics. This is mainly due to the newly-developed arc extinguishing chamber.

■ **Features**

1. The arc extinguishing chute is so designed that it is enclosed on three sides and the arc-extinguishing method uses a "narrow-gap arc-extinguishing method". Since the chute is closed in three directions the arcs and ionized gas are not dispersed to the back thus ensuring safety. Moreover, the gap of the arcing chamber is narrow so enabling the high temperature gas to be abruptly cooled thus ensuring a highly efficient extinction of arc.
2. Ω shaped rotary movable blade arc contacts are employed. These contacts are designed to carry out the interruption while rotating. This design is aimed at improving the interrupting performance, and as arcs are not ejected in the direction of the operator there is greater safety.
3. The contacts use a tandem method in which an arc contact and a main contact

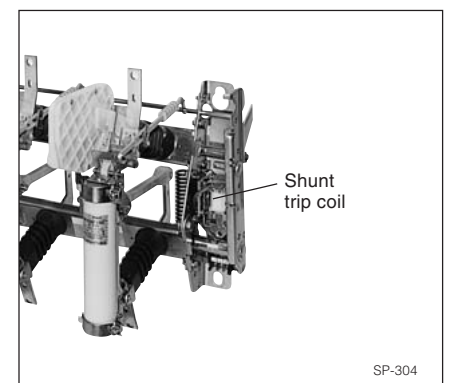
are provided for each pole.
 The operation is carried out as follows:
 When the LB switch is interrupted at high speed the load current is commutated to the arc contact immediately before the main contact being opened.

The trip coil for DC use has a short-time rating of 5 secs.



■ **Shunt trip mechanism**

The shunt trip mechanism will trip the LB switch when a 100V AC or DC is applied to the coil. This enables tripping to be carried out from a distance. The trip coil for AC use has a continuous rating and power consumption is 50VA.



Ratings

Switch body	Coil ratings	Operating time
LBS-6/200f	100/110V AC•DC	0.1 sec.
LBS-6/210f	3A	
LB-6/100f	AC: Continuous	
LB-6/200f	DC: 5 sec.	