


elimsan



SF6 GAS CIRCUIT BREAKERS

Rated Voltage: 7,2 kV to 36 kV

Rated Current: 630 A to 2500 A

Rated Breaking Current: Up to 25 kA

Standard: IEC 56

Why SF6 ?

Sulfur Hexafluoride (SF6) is an excellent gaseous dielectric for high voltage power applications. It has been used extensively in high voltage circuit breakers and other switchgears employed by the power industry. Applications for SF6 include gas insulated transmission lines and gas insulated power distributions. The combined electrical, physical, chemical and thermal properties offer many advantages when used in power switchgear. Some of the outstanding properties of SF6 which make it desirable to use in power applications are:

- ✓ High dielectric strength
- ✓ Unique arc-quenching ability
- ✓ Excellent thermal stability
- ✓ Good thermal conductivity

General Information

Elimsan SF6 circuit breaker is equipped with independent poles each having its own gas. In all types of the circuit breaker, the gas pressure is 2 bars (absolute 3 bars).

Even if the pressure drops to 1 bar, there will not be any change in the breaking properties of the circuit breaker owing the superior features of SF6 and Elimsan's high safety factor for the poles. During arcing, the circuit breaker maintains a relatively low pressure (max 5 - 6 bars) inside the chamber and there will be no danger of explosion and spilling of the gas

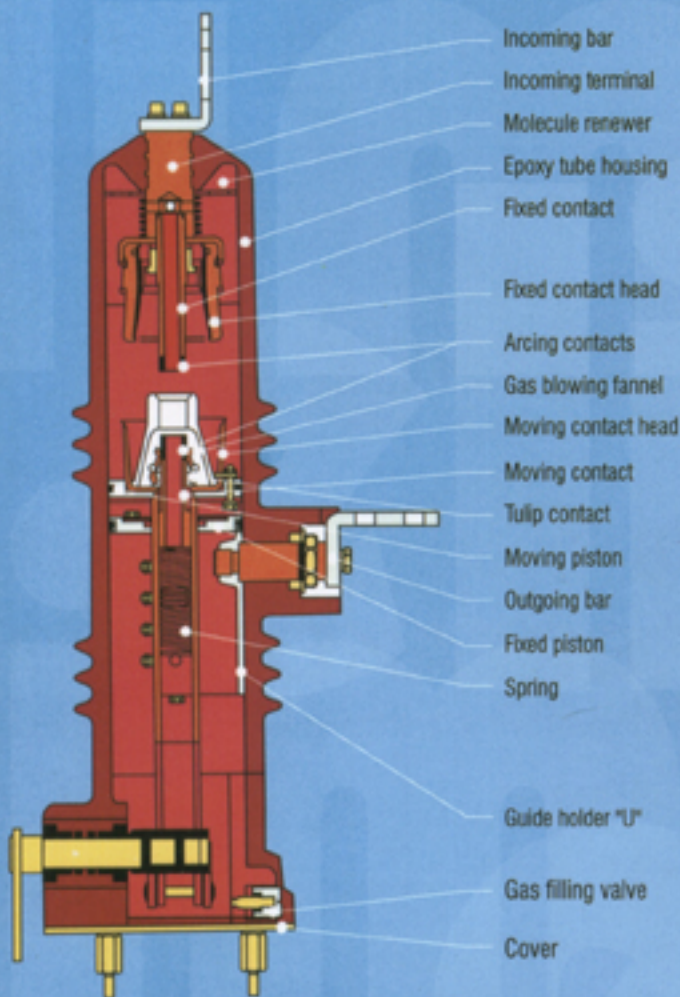
around, any leakage from the chamber will not create a problem since SF6 can undergo considerable decomposition, in which some of toxic products may stay inside the chamber in the form of white dust. If the poles are dismantled for maintenance, it needs special attention during removal of the parts of the pole. This type of maintenance should be carried out only by the experts of the manufacturer.

(According to DISSAN Arcing Products and Safety Instruction for Working on SF6 Circuit Breakers).

Operation of Circuit Breaker

In general, the circuit breakers consist of two main parts, the poles and the mechanism. The poles consist of contact and arc-extinguishing devices. The mechanism is the part which opens or closes the contacts in the poles at the same time instantaneously (with max. 5 millisecc. Tolerance). The closing and opening procedures are performed through springs which are charged by a servomotor and a driving lever. In the system, the closing springs are first charged. If "close" button is pressed the opening springs are charged while the contacts are closed. Thus, circuit breaker will be ready for opening. The mechanical operating cycle of the circuit breaker is (OPEN -3 Min CLOSE/OPEN-3 Min - CLOSE/OPEN) or (OPEN-0.3 sec-CLOSE/OPEN-3 Min CLOSE/OPEN). The second cycle is valid when the circuit breaker is used with re-closing relay. In this event, after the closing operation, the closing springs are charged by the driving lever or by driving motor (if equipped). Thus, the circuit breaker will be ready for opening and re-closing.

CROSS SECTION OF A 16 KA POLE AND PART NAMES



INSIDE VIEW OF THE MECHANISM



Mechanical Life and Maintenance of mechanism

Elimsan "L" type breaker mechanism can perform 10.000 opening-closing operations without changing any component. The mechanical life of the circuit breaker is minimum 10.000 operations. However, it needs a periodical maintenance depending on its environment. In ideal working conditions, a lubrication once a year or after 1000 operations is sufficient. In dusty and damp environment, the mechanism should be lubricated at each 3-6 months period or after 250 - 500 operations.

Thin machine oil and grease with molybdenum must be used for lubricating. Because of mechanism is capable of operating between -5°C and + 40 °C it does not require a heater.

Auxiliary Switch

The auxiliary switch which is mounted on the circuit breaker has 12 contacts. One of them is for antipumping circuit, four of them are allocated for opening and closing coils. The remaining

7 contacts are spare. Three of them are normally opened and four are normally closed. When it is necessary, the number of the contacts can be increased.

Rapid automatic R-Closing

The circuit breaker opens in case of a short circuit failure, can be re-closed after a pre selected time by are-closing relay" assuming the fault is temporary. Thus, the Interruption of the supply for a long duration is prevented against temporary short circuits. But, if the fault lasts after re-closure, the protection relay will trip to open the circuit breaker again.

What to be specified when ordering?

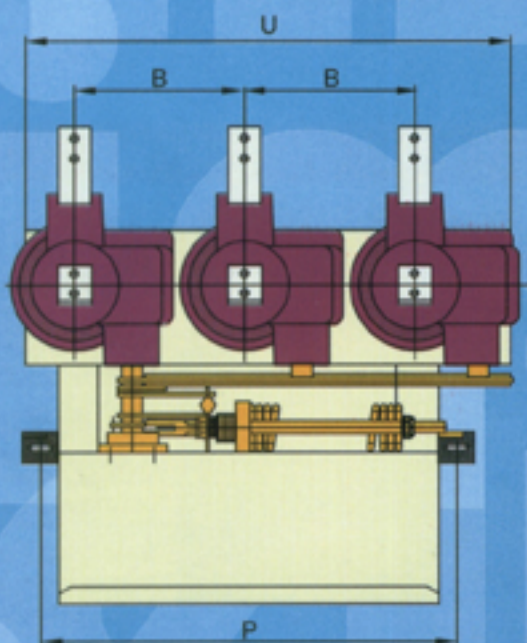
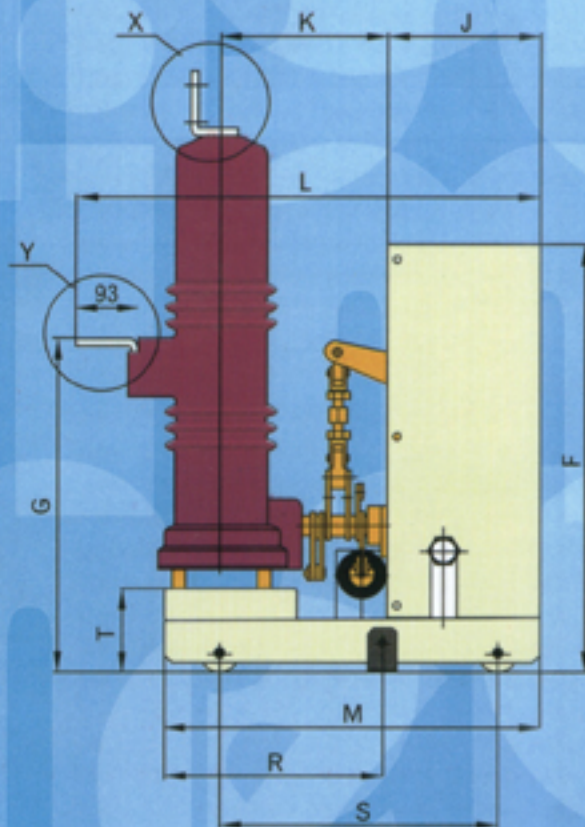
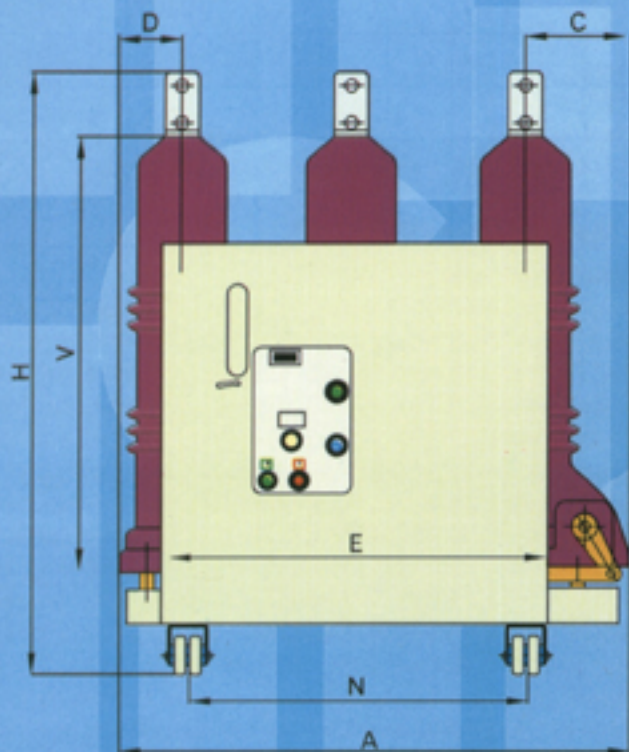
1. Rated voltage of the circuit breaker
2. Rated current of the circuit breaker
3. Rated short circuit breaking current
4. Voltages of opening and closing coils
5. Motor supply voltage (if equipped)

RANGE OF TYPES AND TECHNICAL FEATURES

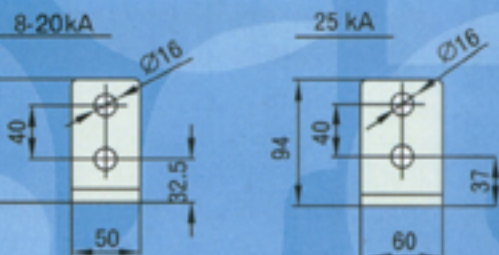
TYPE		S																											
		EGB 1 20-06F		EGB 1 20-12F		EGB 1 28-06F		EGB 1 28-12F		EGB 2 12-06F		EGB 2 12-12F		EGB 2 16-06F		EGB 2 16-12F		EGB 2 25-06F		EGB 2 25-12F		EGB 3 12-06F		EGB 3 12-12F		EGB 3 16-06F		EGB 3 16-12F	
Rated voltage	kV	7,2						12						17,5															
Rated lightning impulse withstand voltage 1,2/50 μ s	kV	60						75						95															
Rated power frequency withstand voltage 1 min	kV	22						28						38															
Rated normal current	A	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250
Rated short circuit breaking current	kA	20		28		12,5		16		25		12,5		16		25		12,5		16		25							
Rated short circuit making current	kA	50		70		31,5		40		63		31,5		40		63		31,5		40		63							
Rated cable-charging breaking current	A	10						25						31,5															
DC component	%	30						31																					
Rated no-load transformer breaking current	A	20																											
Rated single capacitor bank breaking current	A	500																											
Rated operating sequence		0 - 0.3 s - CO - 3 min. - CO / CO - 15 s - CO																											

TYPE		SL						S						LM															
		EGB 4 12-06F		EGB 4 12-12F		EGB 4 16-06F		EGB 4 16-12F		EGB 4 20-12F		EGB 5 08-06F		EGB 5 08-12F		EGB 5 12-06F		EGB 5 12-12F		EGB 5 16-06F		EGB 5 16-12F		EGB 5 25-12F		EGB 5 25-16F		EGB 5 25-25F	
Rated voltage	kV	24						36						50															
Rated lightning impulse withstand voltage 1,2/50 μ s	kV	125						170						250															
Rated power frequency withstand voltage 1 min	kV	50						70						100															
Rated normal current	A	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	630	1250	1600	2500										
Rated short circuit breaking current	kA	12,5		16		20		8		12,5		16		25															
Rated short circuit making current	kA	31,5		40		50		20		31,5		40		63															
Rated cable-charging breaking current	A	31,5						50																					
DC component	%	32																											
Rated no-load transformer breaking current	A	20																											
Rated single capacitor bank breaking current	A	500																											
Rated operating sequence		0 - 0.3 s - CO - 3 min. - CO / CO - 15 s - CO																											

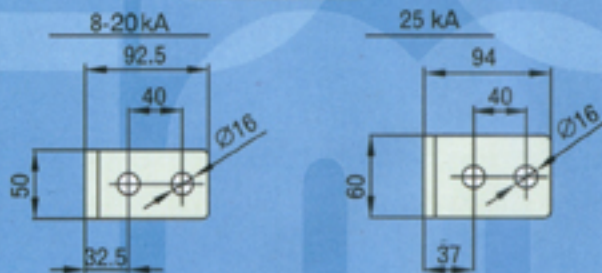
MAIN DIMENSIONS (in mm)



X DETAIL

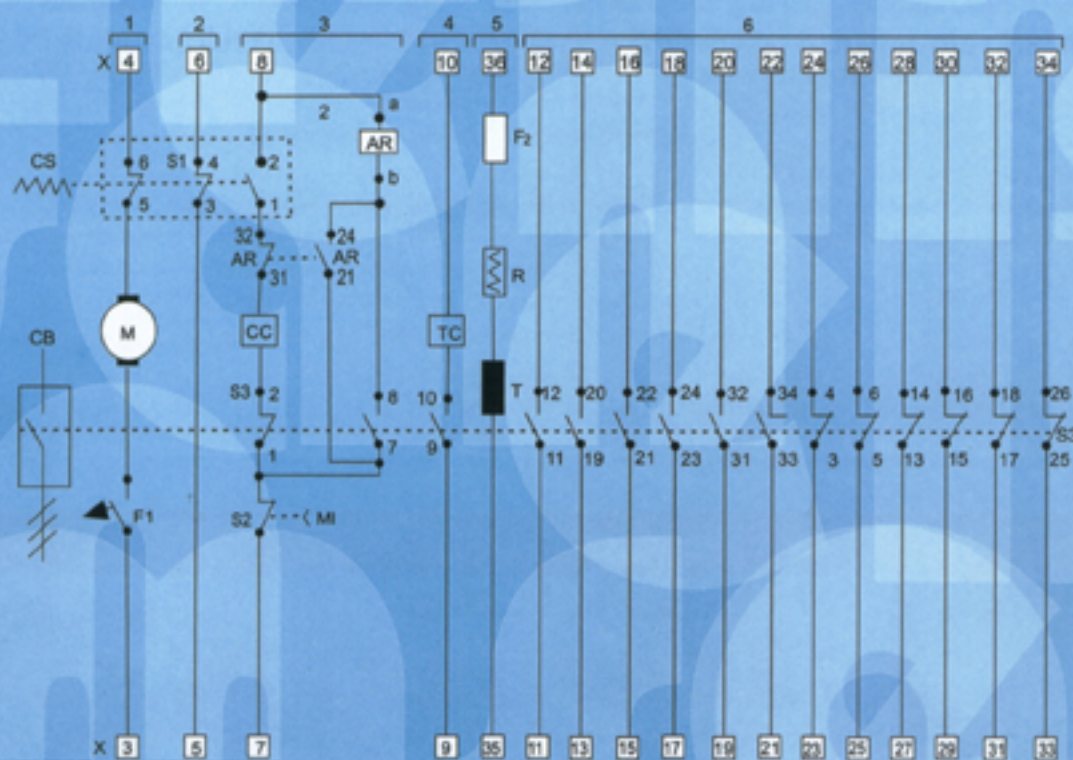


Y DETAIL



TYPE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
EGB5 25-25 F	1065	400	159	107	705	705	510	1038	230	257	708	578	630	735	350	350	137	1020	772
EGB5 25-12 F	985	360	159	107	705	705	510	1038	230	257	708	578	630	735	350	418	137	940	772
EGB5	968	360	155	96	570	640	495	895	225	243	683	549	504	625	320	409	130	930	640
EGB4	758	255	155	96	570	640	495	895	225	243	683	549	504	625	320	409	130	720	640
EGB3	758	255	155	96	570	640	495	895	225	243	683	549	504	625	320	409	130	720	640
EGB2	758	255	155	96	570	640	495	895	225	243	683	549	504	625	320	409	130	720	640
EGB1	758	255	155	96	570	640	495	895	225	243	683	549	504	625	320	409	130	720	640

ELECTRICAL CONNECTION SCHEMA



LEGEND

- 1- Spring charging motor circuit
- 2- Signal for the spring release
- 3- Closing and antipumping circuit
- 4- Tripping circuit
- 5- Heater circuit
- 6- Auxiliary contacts (S0 + S3)

- MI: Mechanical Interlocking
- TC: Tripping Coil
- CC: Closing Coil
- CS: Closing Spring
- CB: Circuit Breaker
- AR: Antipumping Relay
- M: Motor for spring charging
- S1: Limit Switch
- S2: Limit Switch for electrical interlocking
- S3: Auxiliary Switch (S0 + S3)
- F1: Automatic cut-out
- X: Terminal Board
- R: Heater resistance
- T: Thermostate adjustable
- F2: Fuse

ELİMSAN Electromechanic plant has been built on 550.000 m² area and is one of the biggest firm over the world which satisfies all requirements placed on electric power plants and distribution.

ELİMSAN plant has a very developed computer controlled high voltage test laboratory, and its products are manufactured with CNC controlled machines under inconvenience ISO 9000 quality standards.

ELİMSAN is a symbol for contemporary and reliability for power plants and distribution systems.

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