Interruptores MT en SF6
SF1 y SFset

El progreso y la innovación en la tecnología del SF6 ha llevado a un número importante de hallazgos en el campo de los interruptores de MT. Los niveles de alto rendimiento y la confiabilidad de los interruptores automáticos Merlin Gerin son ampliamente el resultado de las cualidades sobresalientes del gas SF6.

La gama SF de interruptores automáticos de MT de ejecución fija para instalación interior, se utiliza principalmente para seccionar y proteger redes de distribución pública, industriales y comerciales, de 1 a 36 kV.

Descripción del equipamiento

La versión básica de interruptores SF está compuesta por:

■ 3 polos principales independientes, que están mecánicamente vinculados y bajo una envolvente de resina del tipo “sellada de por vida” con gas SF6 a muy baja presión.

■ El mecanismo de operación:

□ manual tipo RI (que puede ser operado eléctricamente - opcional).

■ El panel frontal con el mecanismo de operación manual y la indicación correspondiente.

■ Terminales para la conexión de los circuitos de potencia.

■ Un terminal para la conexión de circuitos auxiliares externos.

Cada interruptor de la gama puede ser opcionalmente equipado con:

■ Mecanismo de operación remota (motorización).

■ Carro de estructura soporte con ruedas y frenos de seguridad.

■ Enclavamiento del interruptor en posición abierto mediante la instalación de un candado en el panel de control.

■ Presostato en las versiones de mayor performance (consultar).

■ Ficha de conexión de BT de 42 pines.(

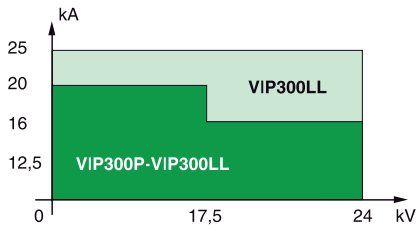
El interruptor SFset provee la cadena completa de protección.

Se provee con la protección electrónica autónoma VIP300 (no necesita tensión auxiliar) y los captores de corriente CS.

□ Los **captores de corriente** proveen medición y tensión auxiliar al relé y a la unidad de disparo.

□ El **relé electrónico (VIP300)** procesa la medición de corriente, detecta la falla y da la orden de disparo a la unidad de disparo.

□ La apertura del interruptor y la extinsión del arco eléctrico ocurre dentro del polo con SF6.

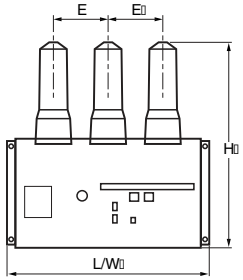


Interruptores MT en SF6 características

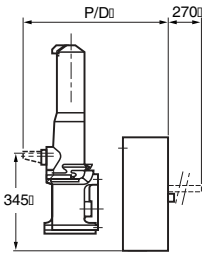
Interuptor SF1

Interuptor SFset

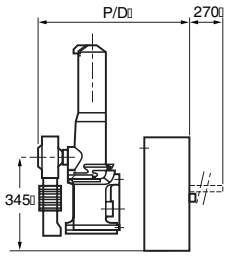
SF1, SFset



SF1



SFset



Dimensiones y pesos

Intensidad asignada (A)	dimensiones (mm) H	L	P	E	Peso (kg)	Tensión (kv)
SF1						
mando frontal						
630,	745	766	490	220	78	17.5
1250	745	886	490	280	80	24
	745	927	559	350	85	36
	745	1260	565	380	88	36
SFset						
mando frontal						
630,	745	766	620	220	88	17.5
1250	745	886	620	280	90	24

Características eléctricas según IEC 62271-100

Interruptores automáticos SF1

Distancia entre fases (mm)			220	280	350(*)	380
Un 17,5 kV	**Icc**	**Ir**				
Ud 38 kV 50 Hz, 1 mn	12,5 kA	1250 A	■			
Up 95 kV cresta	20 kA	400 A	■			
		630 A	■			
		1250 A	■			
	25 kA	630 A	■			
		1250 A	■			
Un 24 kV	**Icc**	**Ir**				
Ud 50 kV 50 Hz, 1 mn	12,5 kA	400 A		■		
Up 125 kV cresta		630 A		■		
		1250 A		■		
	16 kA	400 A		■		
		630 A		■		
		1250 A		■		
	20 kA	630 A		■		
		1250 A		■		
	25 kA	630 A		■		
		1250 A		■		
Un 36 kV	**Icc**	**Ir**				
Ud 70 kV 50 Hz, 1 mn	12,5 kA	400 A			■	■
Up 170 kV cresta		630 A			■	■
	20 kA	630 A			■	■
		1250 A			■	■
	25 kA	630 A			■	■
		1250 A			■	■

Interruptores automáticos SFset

Distancia entre fases (mm)			220	280
Un 17,5 kV	**Icc**	**Ir**		
Ud 38 kV 50 Hz, 1 mn	12,5 kA	1250 A	■	
Up 95 kV cresta	20 kA	400 A	■	
		630 A	■	
		1250 A	■	
	25 kA	630 A	■	
		1250 A	■	
Un 24 kV	**Icc**	**Ir**		
Ud 50 kV 50 Hz, 1 mn	12,5 kA	400 A		■
Up 125 kV cresta		630 A		■
		1250 A		■
	16 kA	400 A		■
		630 A		■
		1250 A		■
	20 kA	630 A		■
		1250 A		■
	25 kA	630 A		■
		1250 A		■

(*) Mando frontal únicamente.

Características adicionales según IEC 62271-100

Interruptores automáticos SF1 y SFset

Temperatura de funcionamiento	T	– 25°a 40 °C
Frecuencia asignada	fr (Hz)	50/60
Corriente de corta duración admisible	I_k/t_k (kA)	Icc/3 s
Corriente de cresta admisible	Ip cresta (kA)	2,5 Icc (50 Hz)
		2,6 Icc (60 Hz)
Corriente de cierre en cortocircuito	Cresta (kA)	2,5 Icc (50 Hz)
		2,6 Icc (60 Hz)
Secuencia de maniobras		O-0,3 s-CO-15 s-CO
		O-0,3 s-CO-3 mn-CO
		O-3 mn-CO-3 mn-CO
Tiempos de maniobras	Apertura	< 50 ms
	Corte	< 60 ms
	Cierre	< 65 ms
Endurancia mecánica	Clase	M2
	Número de maniobras	10000
Endurancia eléctrica	Clase	E2
Poder de corte por corriente capacitiva	Clase	C2

description

SF1 circuit breaker

Basic fixed SF1.

application

The **SF1** is a 3-pole MV circuit breaker for indoor installation.
It is used primarily for switching and protection of **1 to 36 kV public, industrial** and **commercial distribution networks**.
All standard protection units (**Sepam**, **Statimax**) may be used with the SF1 circuit breaker.
Note that it may also be equipped with an integrated protection system to form a fully autonomous circuit breaker (see the SFset).

technology

The SF1 implements the **auto-compression technique using SF6** gas as the current interruption and insulation medium.

The SF1 is available in three versions:
■ **basic fixed unit**;
■ **fixed unit with a support frame**;
■ **withdrawable unit** (please consult us).

Each version can be equipped with an operating mechanism installed on the right side, left side or in front.

The basic fixed unit comprises:
■ **three independent main poles** that are mechanically connected; each comprises:
□ **an insulating enclosure** of the "sealed pressure system" type (in compliance with IEC 56, 1987 edition, appendix EE) forming a hermetic assembly filled with SF6 at a low relative pressure (0.05 MPa, i.e. 0.5 bars or 0.2 MPa depending on system characteristics);
□ **active parts** housed in the insulating enclosure;
■ **an RI-type stored-energy** operating mechanism (see the "operating mechanism" section);
■ **a front panel** with all the controls and indicators;
■ **upstream and downstream terminals** for connection of the power circuits.

The fixed unit with a support frame comprises:
■ **the basic fixed unit** described above;
■ **a support frame** fitted with:
□ rollers for handling and installation;
□ lugs for securing to the floor.

options(1)

For each version, options include:
■ **an electrical RI operating mechanism**;
■ **a device for locking** the circuit breaker in the open position (via a keylock);
■ **a keylock** for the locking option;
■ **a pressure switch for each pole**, equipped with an NO contact for continuous monitoring of the SF6 (please consult us);

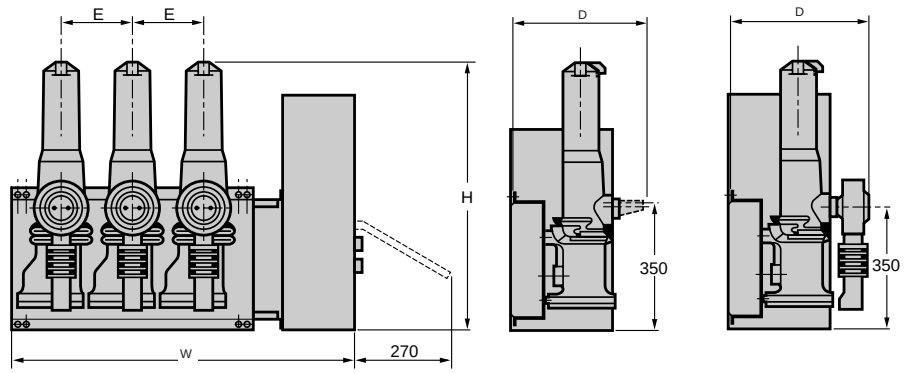
(1) The "operating mechanism" section describes other specific auxiliaries.

dimensions

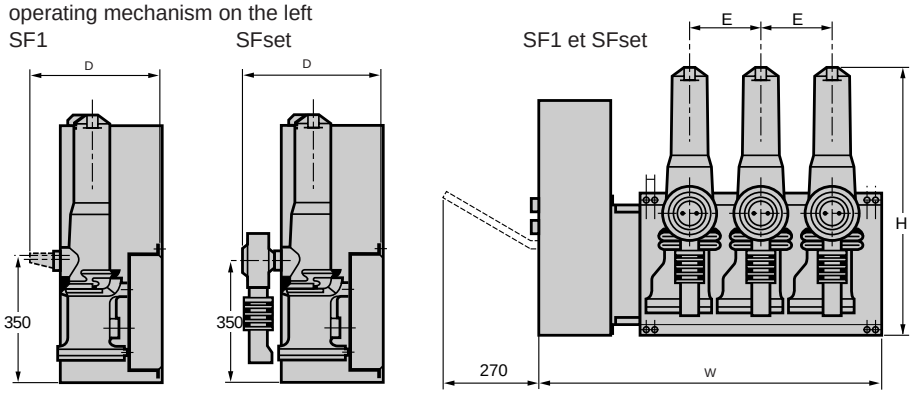
SF1, SFset

Basic fixed unit

operating mechanism on the right SF1 and SFset

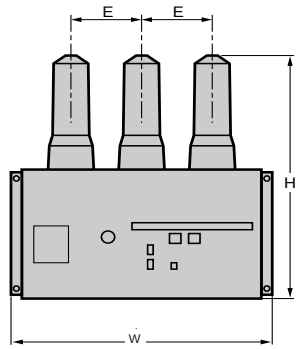


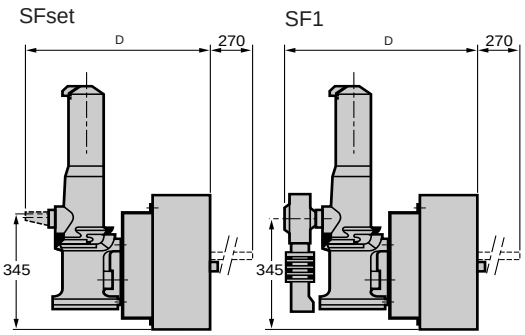
operating mechanism on the left



operating mechanism in front

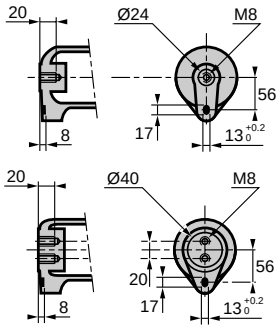
SF1 and SFset





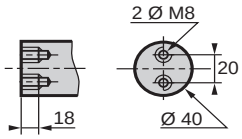
Upper connection (all versions, all types of operating mechanisms)

SF1 and SFset

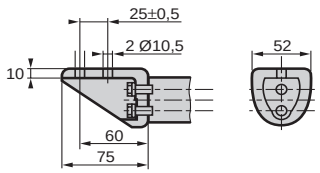


Lower connection

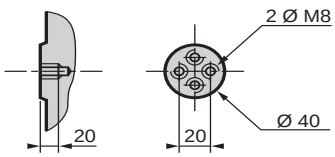
SF1, insulation ⩽ 125 kV impulse



SF1, insulation ⩽ 170 kV impulse



SFset



Dimensions and weights

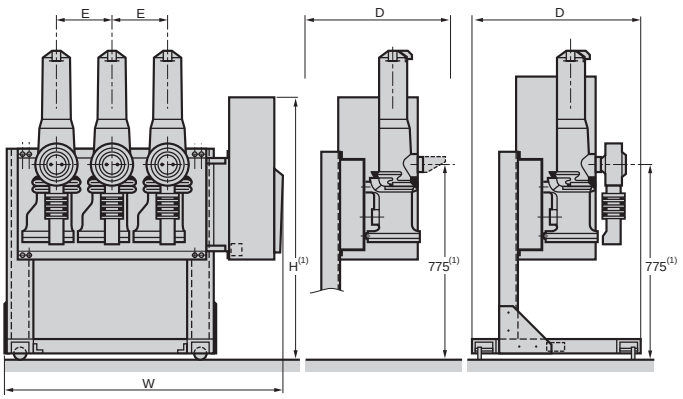
rated current (A)	**dimensions** (mm) H	W	D	E	**weight** (Kg)	**rated voltage kV**
SF1						
operating mechanism on the right or on the left						
630,	750	993	290	220	78	17,5
1250(2)	750	1143	290	280	80	24
	750	1560	365	380	88	36
operating mechanism in the front						
630,	745	766	490	220	78	17,5
1250(2)	745	886	490	280	80	24
	745	927	559	350	85	36
	745	1260	565	380	88	36
SFset						
operating mechanism on the right or on the left						
630,	750	993	420	220	88	17,5
1250(2)	750	1143	420	280	90	24
operating mechanism in the front						
630,	745	766	620	220	88	17,5
1250(2)	745	886	620	280	90	24

(2) When there are several lines of values for a given rated current, each line corresponds to a different insulation level.

Fixed unit with support frame

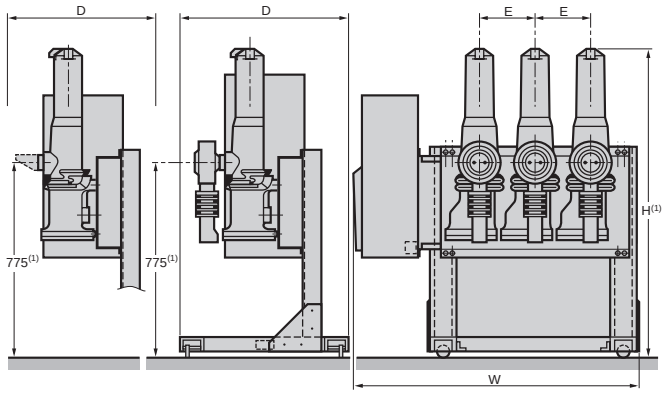
operating mechanism on the right

SF1 and SFset SF1 SFset



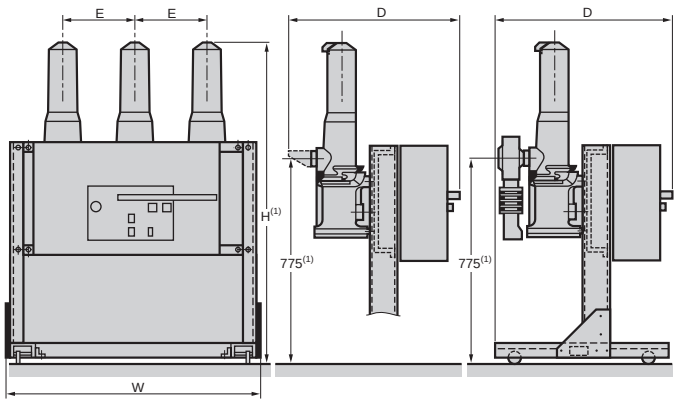
operating mechanism on the left

SF1 SFset SF1 and SFset



operating mechanism in front

SF1 and SFset SF1 SFset



Dimensions and weights

rated current (A)	**dimensions** (mm) H	W	D	E	**weights** (Kg)	**rated voltage kV**
SF1						
operating mechanism on the right or on the left						
630, 1250(1)(2)	1175	1065	600	220	103	17,5
	1175	1215	600	280	105	24
	1175	632	600	380	113	36
operating mechanism in the front						
630, 1250(1)(2)	1175	853	600	220	103	17,5
	1175	973	600	280	105	24
	1175	1347	600	380	113	36
SFset						
operating mechanism on the right or on the left						
630, 1250(1)(2)	1175	1065	600	220	103	17,5
	1175	1215	600	280	105	24
operating mechanism in the front						
630, 1250(1)(2)	1175	853	649	220	103	17,5
	1175	973	649	280	105	24

(1) Additional holes are provided on the frame for positioning the unit 215 mm lower.
(2) When there are several lines of values for a given rated current, each line corresponds to a different insulation level.

general (cont.)

electrical characteristics

		type	**SF1 circuit breaker**									
CEI 56, VDE 0670, BS 5311, UTE C 64-100/101												
rated voltage (kV 50/60 Hz)			17.5				24				36		
insulation level	kV rms 50 Hz-1 min		38				50				70		
	kV impulse 1.2/50 µs		95				125				170		
rated current		400	■	■			■	■			■		
Ia (A)		630	■	■	■		■	■	■	■	■	■	■
		1250	■	■	■		■		■	■		■	■
		2500											
		3150											
breaking capacity	at (kV) :	**⩽ 17,5**	12.5	20	25								
Isc (kA rms)		**24**					12.5	16	20	25			
		36									12.5	20	25
		40,5											
making capacity (kA peak)			31.5	50	63		31.5	40	50	63	31.5	50	63
short-time withstand current (kA rms-3s)			12.5	20	25		12.5	16	20	25	12.5	20	25
capacitor breaking	for Ia (A) :	400	280	280	280		280	280	280		280	280	280
capacity		630	440	440	440		440	440	440		440	440	440
(A)		1250	875	875	875		875	875	875		875	875	875
		2500											
		3150											
rated operation	O-3 min-CO-3 min-CO		■				■				■		
sequence	O-0.3 s-CO-15 s-CO		■				■				■		
	O-0.3 s-CO-3 min-CO		■				■				■		
approximate operating		opening	50				50				50		
times (ms)		breaking	65				65				65		
		closing	70				70				70		
ANSI C37.04-C37.06-C37.09													
rated maximum voltage		kV, 60 Hz	15.5 (2)				25.8 (1) (2)				38 (4)		
rated voltage range		K factor	1				1				1		
rated insolation level	kV, rms. 60 Hz-1 mn		50				60				80		
	kV, impulse 1,2/50 µs		110				150				150		
rated continuous current	A	600	■				■						
		1200	■				■				■		
		2000											
		3000											
rated short-circuit current (at rated max kV)	kA, rms.		25				25				25		
rated maximum symmetrical interrupting capability and rated short-time current	kA, rms		25				25				25		
closing and latching capability (2.7 K times rated short-circuit current)	kA, crest		68				68				68		
rated interrupting time	cycles 60 Hz		5				5				5		
rating operation sequence	CO-15 s-CO		■				■				■		

(1) Please consult us.
(2) This values are valid for outdoor installations.
(3) Above 24 kV, the SFset is equipped with conventional current transformers.
(4) Indoor installations.
(5) Interphase barriers.
(6) Only in fix installations.