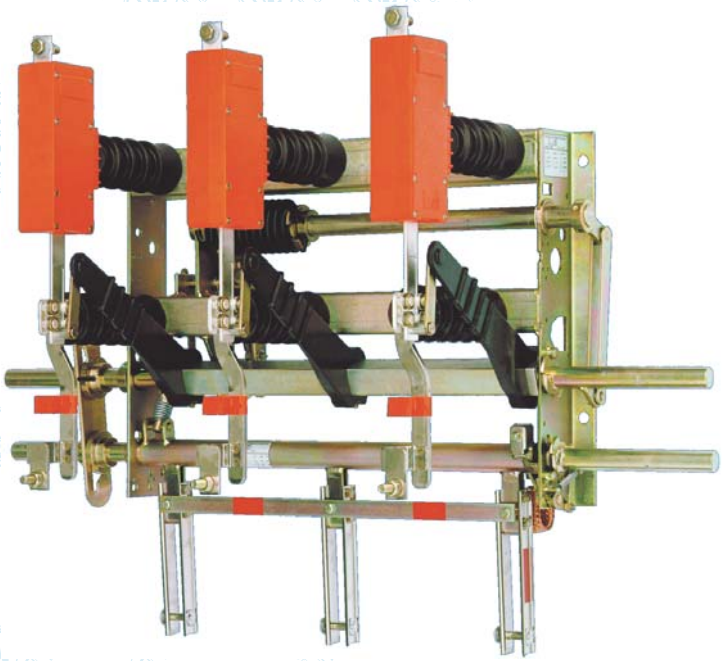
Indoor load disconnectors H 27

three-pole design
rated voltage 12 and 25 kV
rated current 630 A



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ISO 9001
ISO 14001
BUREAU VERITAS Certification

Indoor load disconnectors H 27

The load disconnectors are used as loading devices in medium voltage, indoor operating environment, in normal operating conditions (class „minus 15“, indoor design).

The design of H 27 load disconnectors complies with the requirements of EN 62271-1, EN 62271-102, EN 62271-103 and EN 62271-105 standards.

The H27 load disconnectors are supplied with the following phase pitch design: 275 mm, 225 mm and 170 mm.

All parts and frames made of steel are galvanized and chromate coated.

The drive shafts are seated in bronze bearings and this is why the material as such cannot be subjected to corrosion.

All parts of the current carrying path are made of drawn electrolytical copper.

The control of load disconnectors occurs through the following:

- SHA, DK or FT hand operated drives (for disconnectors mounted on the front wall), adaptor for „D“ type drive, with an extension part (in case of necessity, for disconnectors mounted to the side wall)
- motor operated drives of types VM, NM and UM.

In case when the load disconnector is equipped with earthing switch there is to be additional drive mechanism for the control of the earthing switch.

Under normal operating conditions it is not necessary for the load disconnectors to undergo a preventive maintenance during the period of ten years.

Main advantages

- a reliable and safe arc extinguishing
- increased safety of the operating personnel due to the use of earthing switches with an increased short-circuit withstand capability
- load disconnectors of a compact design, necessitating only a very limited area in the respective load gear frame or cubicle
- current disconnecting path which can visually be inspected
- easy operation
- high number of loading cycles
- very limited maintenance requirements
- no necessity to use burn-up contacts or contacts with delayed operation

Types of H 27 load disconnectors

H 27 EK for wall mounting, quick-make and quick-break operation

H 27 EA for wall-mounting, quick-make and quick-break operation, trip-free

H 27 F-EK for front-panel mounting quick-make and quick-break operation

H 27 F-EA for front-panel mounting, quick-make and quick-break operation, trip-free

H 27 SEA for wall mounting, quick-make and quick-break operation, trip-free; with fuse holders mounted below for high-voltage high-breaking-capacity (HV HBC) fuses with striker release 1). When a fuse is blown, the disconnecting mechanism disconnects all the three poles of the load disconnector.

H 27 SuT for side mounting, quick-make and quick-break operation, trip-free; with fuse holders mounted below for HV HBC fuses with striker release. When a fuse is blown the disconnecting mechanism disconnect all the three poles of the load disconnector. The contact counterparts are mounted on supports on a special console. The fuses can be removed from the side.

H 27 F-SuT for front-panel mounting, quick-make and quick-break operation, trip-free; integrated fuse tripping mechanism for HV HBC fuses with striker release. Insulators with mounted HV HBC fuse holders on two special consoles.

All models with the exception of H 27 SuT and H 27 F-SuT are available with or without integrated earthing switch with short-circuit making capability (UESV). In the case of load disconnector H 27 SuT is the earthing switch with short-circuit making capability (UESV) mounted on the special consol (this can be fitted subsequently).

The H27 F-SuT load disconnectors can be provided with a special earthing load having the short-circuit withstand capability (UESV) and with a built-in drive disc used for the loading via operating lever.

Supplementary accessories

Working release - 24 V, 60 V, 110 V and 220 V DC, 110 V and 230 V AC
The H22 EA and H22 SEA load disconnectors can be equipped with a working release. Simultaneously, the function of release can be blocked with an additional switch.

Additional switch - in order to indicate the switching position the disconnectors with built-in earthing switches can be equipped with additional switches
The basic setup of switches can be modified without the necessity to disassemble the disconnector, by using special tools (such as when changing the contacts from making to breaking, or changeover contact etc.).

Motor operated drive - see drives catalogue

Requests on disconnectors for horizontal assembly please notify in order.

Energy storing mechanism

One of the robust, low-maintenance energy storage mechanism of type EK or EA is mounted on the base frame, on which the three switch poles are installed. Many hundred thousands of these devices have already been used successfully in the H 22 load disconnectors.

The **EK energy storage mechanism** operates with only a single torsion spring for quick-make and quick-break operation without trip-free release. The torsion spring is tensioned for switching ON or OFF. After tensioning, the spring energy is released for the particular switching operation (ON or OFF).

The **EA energy storage mechanism** operates with two torsion springs for trip-free quick-make and quick-break operation.

Both torsion springs are tensioned when the switch is closed.

The ON switch spring is tripped after tensioning and releases its energy for switching ON, while the OFF witch spring remains tensioned until it is released by the tripping device, HV HBC fuses with striker release, or manually for switching OFF.

With non-manual release the operating shaft remains in the ON position and must be moved to the neutral position OFF manually for reclosing.

Wall-mounting devices can be actuated via a linkage system operated by a detachable lever or by any of the actuators according to requirements and situation.

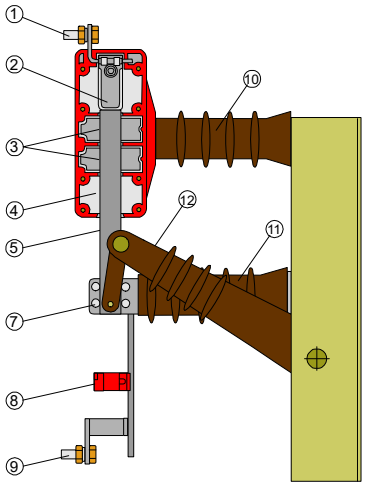
Laterally mounted switches can be operated directly by fixing a sleeve for D-drives with internal twelve-sided polygon 24 on the operating shaft and using the detachable lever with hexagonal attachment.

Front-panel mounted devices can be operated by means of a detachable lever with a driving pulley integrated in the switch.

Arc extinction

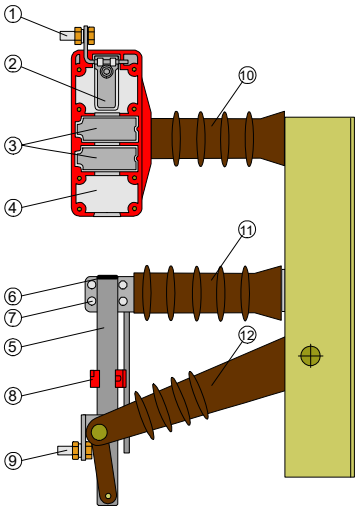
When closing the switch, the switch blade (5) with the arcing tip (6) is withdrawn from the contact jaw (2). The arc that occurs is extinguished in the enclosed, four-section arcing chamber (4), comprising pressure and expansion chambers. In the pressure chamber two extinguishing plates (3) are forced into the path of the arc by lateral spring pressure. At low currents the arc is extinguished by deionising action due to the cooling effect of the walls. Arc extinction is achieved in the higher current ranges by the arc extinguishing gases produced in the pressure chamber flowing out into the expansion chamber. Due to this rational combination of arc quenching principles the entire current range of the load-break switch is effectively covered.

The arcing chambers require no maintenance.



←ON OFF→

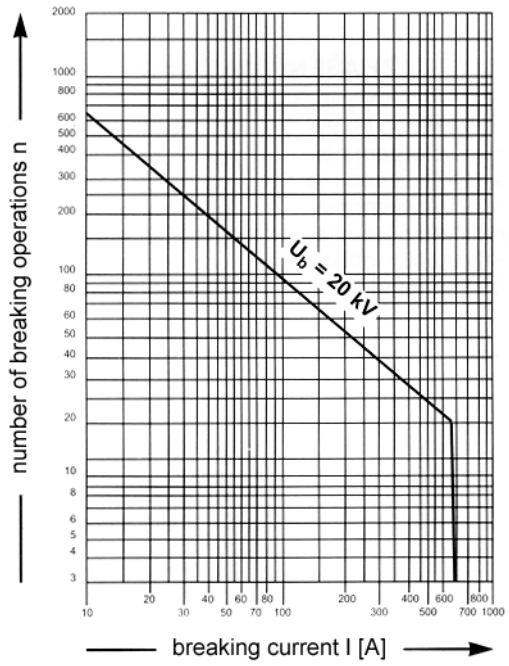
1 upper connecting contact
2 contact jaw
3 extinguishing plates
4 arcing chamber
5 switch blade
6 arcing tip
7 roller guide contact
8 guide lug
9 lower connecting contact



Technical data

rated voltage	U_r	kV	12	25	
rated frequency	f_r	Hz	50	50	
rated current	I_r	A	630	630	630
rated short-time current	I_k*	kA	20	16	20
rated peak withstand current	I_p*	kA	50	40	50
rated making current	I_{ma}*	kA	50	40	50
rated breaking current – cos ϕ 0,7	I_{load}	A	630	630	630
rated breaking current of closed loop	I_{loop}	A	630	400	630
rated breaking current of unloaded transformer	I_{nltr}	A		10	
rated breaking current of no-load cable	I_{cc}	A	10	35	
rated breaking current of no-load power line	I_{cc}	A		10	
rated breaking current of the earth fault	I_{ef1}	A	300	320	
rated cable charging breaking current below earth fault conditions	I_{ef2}	A	18	178	
mechanical lifetime class				M1	
electrical lifetime class				E1	

* These values also apply to added earthing switches



Maintenance-free load disconnector operations as a function of the breaking current at cos φ ≥ 0,7.

Withstand voltages

rated voltage	kV	12	25
rated short-time withstand power frequency voltage / 1min.			
against the earth, across the poles and between contacts	kV	75	125*
across the isolating distance	kV	85	145
rated lightning pulse withstand voltage			
against the earth, across the poles and between contacts	kV	28	50
across the isolating distance	kV	32	60

* For load disconnectors with p = 170 mm without use of insulation plates 95 kV

Indoor load disconnectors H 27 F-EA and F-EK for front panel mounting

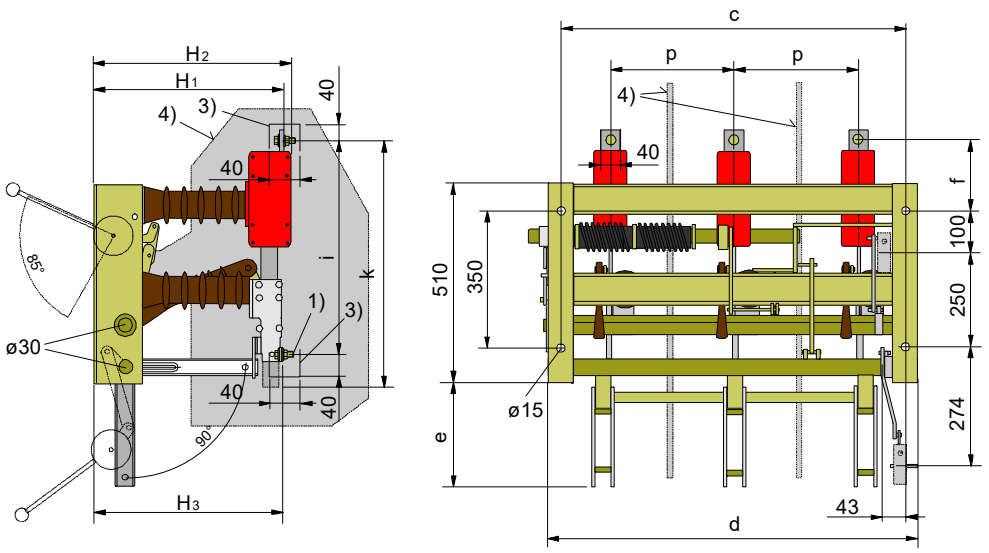


Figure: H 27 F-EA with earthing switch with short-circuit making capability mounted bellow (UESV)

1) Hexagonal screw M12x40 with two span washers and nut
3) Outside this zone, the connecting bar have to be insulated
4) Phase barriers (25 kV: p = 170 mm)
Insulation level with phase barriers: U_w 125 kV
Insulation level without phase barriers: U_w 95 kV

type	U_r [kV]	I_r [A]	I_k [kA]	p	c	d	e	f	i	k	H_1	H_2	H_3
H 27 F-EK	12	630	20	155	465	500	117	103	493	545	310	324	314
H 27 F-EA	12	630	20	155	465	500	117	103	493	545	310	324	314
H 27 F-EK	25	630	16	170	495	530	202	161	591	663	385	401	388
H 27 F-EK	25	630	16	225	605	640	202	161	591	663	385	401	388
H 27 F-EK	25	630	20	170	495	530	202	161	591	663	390	406	394
H 27 F-EK	25	630	20	225	605	640	202	161	591	663	390	406	394
H 27 F-EA	25	630	16	170	495	530	202	161	591	663	385	401	388
H 27 F-EA	25	630	16	225	605	640	202	161	591	663	385	401	388
H 27 F-EA	25	630	20	170	495	530	202	161	591	663	390	406	394
H 27 F-EA	25	630	20	225	605	640	202	161	591	663	390	406	394

					without earthing switch		with earthing switch mounted bellow (UESV)	
type	U_r [kV]	I_r [A]	I_k [kA]	p	part nr.	weight [kg]	part nr.	weight [kg]
H 27 F-EK	12	630	20	155	727 35000	38	727 35014	42
H 27 F-EA	12	630	20	155	727 36000	38	727 36014	42
H 27 F-EK	25	630	16	170	727 65150	44	727 65154	46
H 27 F-EK	25	630	16	225	727 65350	45	727 65351	47
H 27 F-EK	25	630	20	170	727 75150	46	727 75152	51
H 27 F-EK	25	630	20	225	727 75350	49	727 75351	51
H 27 F-EA	25	630	16	170	727 66150	46	727 66154	48
H 27 F-EA	25	630	16	225	727 66300	48	727 66314	54
H 27 F-EA	25	630	20	170	727 76150	46	727 76154	48
H 27 F-EA	25	630	20	225	727 76300	51	727 76314	53

Indoor load disconnectors H 27 F-SuT for front panel mounting

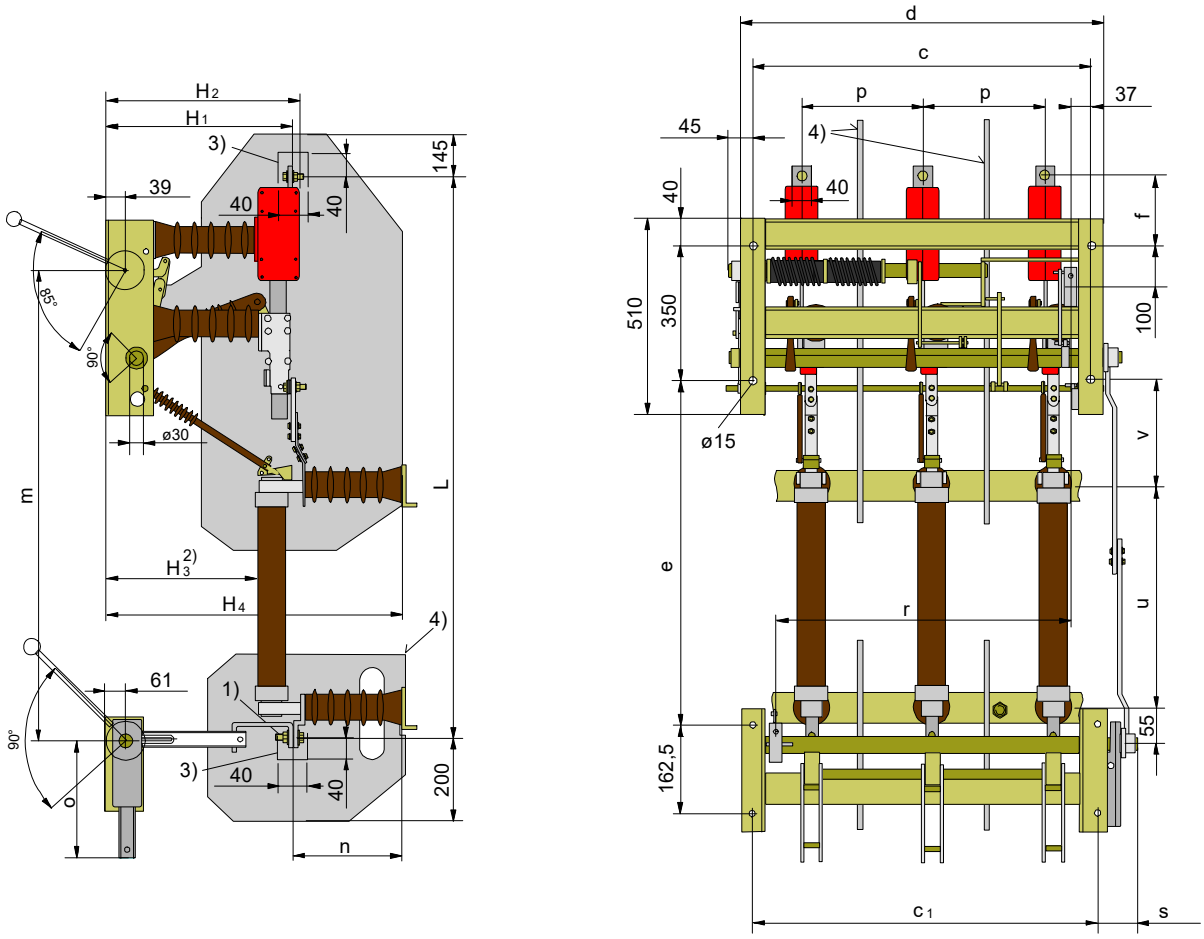


Figure: H 27 F-SuT with separated earthing switch mounted bellow (UESV) and with two separated cross-rails

1) Hexagonal screw M12x40 with two span washers and nut
2) Max. fuse diametral (88 mm) after DIN 43625, IEC 282-1/1985, ČSN EN 60282-1
3) Outside this zone, the connecting bar have to be insulated
4) Phase barriers (25 kV: p = 170 mm)
   Insulation level with phase barriers: U_w 125 kV
   Insulation level without phase barriers: U_w 95 kV

type	U_r [kV]	I_r [A]	I_k [kA]	p	c	c_1	d	e	f	H_1	H_2	H_3	H_4	L	m	n	o	r	s	u	v
H 27 F-SuT	12	630	20	155	465	471	500	567	103	310	324	225	472	1047	843	147	204	382	74	325	214
H 27 F-SuT	25	630	16	170	495	501	530	751	156	385	401	299	626	1291	1027	227	280	412	42	475	240
H 27 F-SuT	25	630	16	225	605	611	640	751	156	385	401	299	626	1291	1027	227	280	412	42	475	240

type	U_r [kV]	I_r [A]	I_k [kA]	p	without earthing switch		with earthing switch mounted bellow (UESV)	
					part nr.	weight [kg]	part nr.	weight [kg]
H 27 F-SuT	12	630	20	155	727 37100	58	727 37111	64
H 27 F-SuT	25	630	16	170	727 67150	64	727 67171	70
H 27 F-SuT	25	630	16	225	727 67350	69	727 67351	75

Indoor load disconnectors H 27 EK and EA for wall mounting

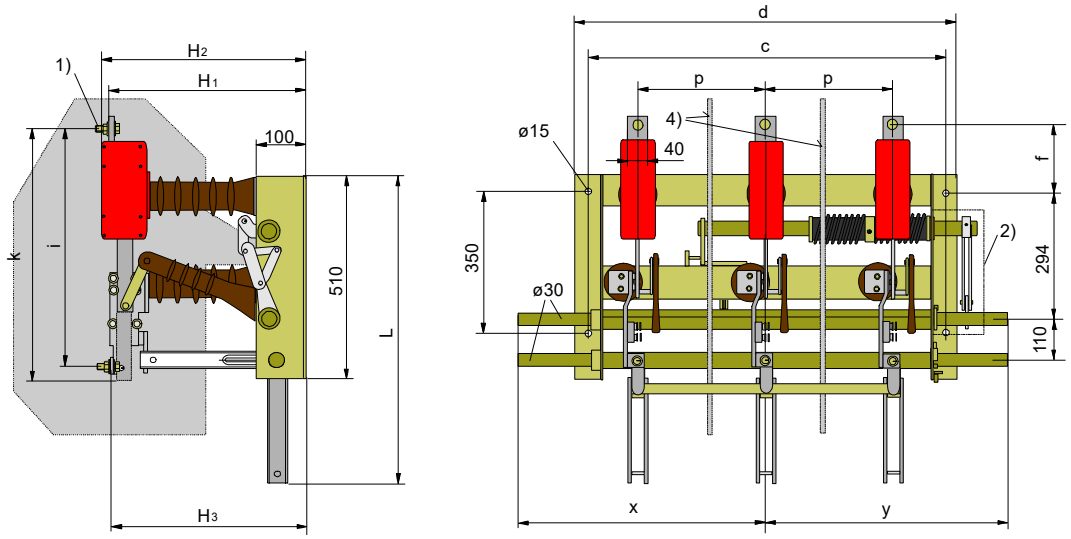


Figure: H 27 EA with earthing switch with short-circuit making capability mounted bellow (UESV)

1) Hexagonal screw M12x40 with two span washers and nut
2) Covering
4) Phase barriers (25 kV: p = 170 mm)
Insulation level with phase barriers: U_w 125 kV
Insulation level without phase barriers: U_w 95 kV

type	U_r [kV]	I_r [A]	I_k [kA]	p	c	d	f	H_1	H_2	H_3	i	k	L	x	y
H 27 EK	12	630	20	155	465	500	103	310	324	314	493	545	627	290	290
H 27 EK	12	630	20	210	575	610	103	310	324	314	493	545	627	450	450
H 27 EA	12	630	20	155	465	500	103	310	324	314	493	545	627	290	290
H 27 EA	12	630	20	210	575	610	103	310	324	314	493	545	627	450	450
H 27 EK	25	630	16	170	495	530	161	385	401	388	591	663	712	460	460
H 27 EK	25	630	20	170	495	530	161	390	406	394	591	663	712	460	460
H 27 EK	25	630	16	225	605	640	161	385	401	398	556	663	712	440	440
H 27 EK	25	630	20	225	605	640	161	390	406	394	591	663	712	440	440
H 27 EK	25	630	16	275	705	740	161	385	401	388	591	663	712	565	565
H 27 EK	25	630	20	275	705	740	161	390	406	394	591	663	712	565	565
H 27 EA	25	630	16	170	495	530	161	385	401	388	591	663	712	460	460
H 27 EA	25	630	20	170	495	530	161	390	406	394	591	663	712	460	460
H 27 EA	25	630	16	225	605	640	161	385	401	388	591	663	712	440	440
H 27 EA	25	630	20	225	605	640	161	390	406	394	591	663	712	440	440
H 27 EA	25	630	16	275	705	740	161	385	401	388	591	663	712	565	565
H 27 EA	25	630	20	275	705	740	161	390	406	394	591	663	712	565	565

					without earthing switch		with earthing switch mounted bellow (UESV)	
type	U_r [kV]	I_r [A]	I_k [kA]	p	part nr.	weight [kg]	part nr.	weight [kg]
H 27 EK	12	630	20	155	727 31100	34	727 31114	39
H 27 EK	12	630	20	210	727 31400	41	727 31414	46
H 27 EA	12	630	20	155	727 32100	34	727 32114	39
H 27 EA	12	630	20	210	727 32400	41	727 32414	46
H 27 EK	25	630	16	170	727 61515	38	727 61516	44
H 27 EK	25	630	20	170	727 71500	38	727 71514	44
H 27 EK	25	630	16	225	727 21351	45	727 21354	51
H 27 EK	25	630	20	225	727 51300	45	727 51314	51
H 27 EK	25	630	16	275	727 21151	40	727 21153	46
H 27 EK	25	630	20	275	727 51100	48	727 51114	54
H 27 EA	25	630	16	170	727 62500	40	727 62514	46
H 27 EA	25	630	20	170	727 72500	47	727 72514	53
H 27 EA	25	630	16	225	727 62300	48	727 62353	58
H 27 EA	25	630	20	225	727 72300	51	727 72314	62
H 27 EA	25	630	16	275	727 62151	51	727 62153	62
H 27 EA	25	630	20	275	727 72100	53	727 72114	65

Indoor load disconnectors H 27 SEA for wall mounting

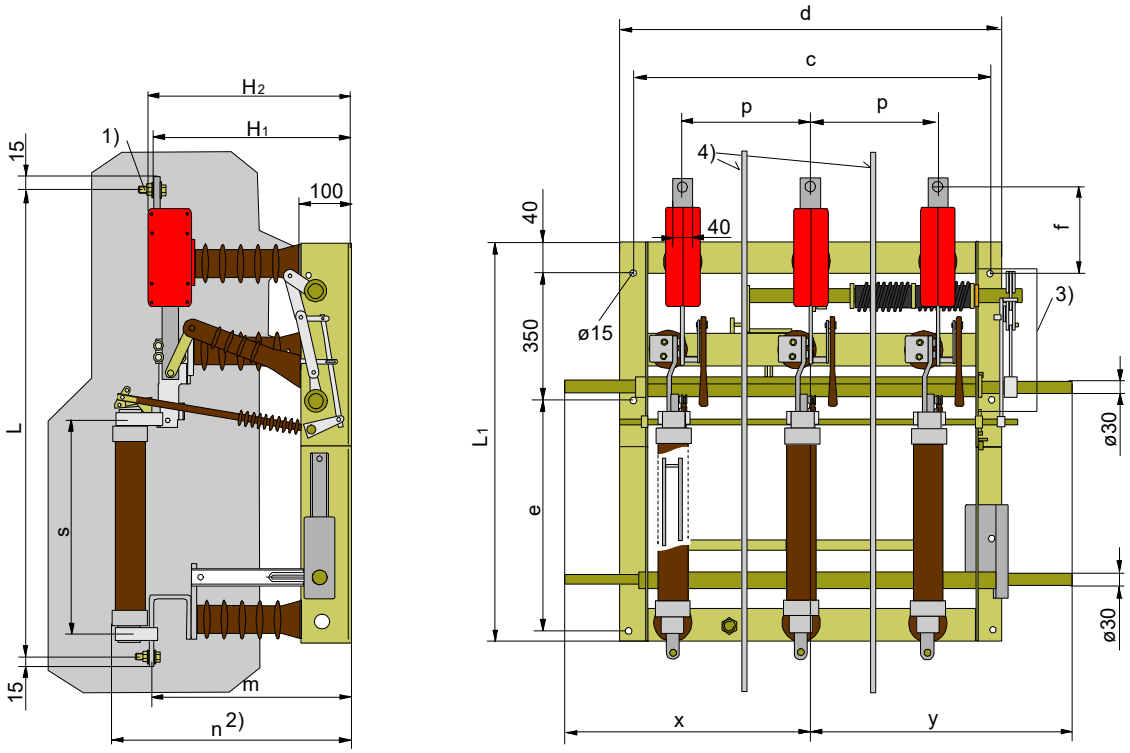


Figure: H 27 SEA with earthing switch with short-circuit making capability mounted bellow (UESV)

1) Hexagonal screw M12x40 with two span washers and nut
2) Max. fuse diametral (88 mm) after DIN 43625, IEC 282-1/1985, ČSN EN 60282-1
3) Covering
4) Phase barriers (25 kV: p = 170 mm)
Insulation level with phase barriers: U_w 125 kV
Insulation level without phase barriers: U_w 95 kV

type	U_r [kV]	I_r [A]	I_k [kA]	p	c	d	e	f	H_1	H_2	L	L_1	m	n	s	x	y
H 27 SEA	12	630	20	155	465	500	500	103	310	324	1013	925	254	354	325	340	340
H 27 SEA	12	630	20	210	575	610	500	103	310	324	1013	925	254	354	325	450	450
H 27 SEA	25	630	16	170	495	530	478	161	385	401	1045	903	388	488	475	460	460
H 27 SEA	25	630	16	225	605	640	478	161	385	401	1045	903	388	488	475	440	440
H 27 SEA	25	630	16	275	705	740	478	161	385	401	1045	903	388	488	475	565	565

					without earthing switch		with earthing switch mounted bellow (UESV)	
type	U_r [kV]	I_r [A]	I_k [kA]	p	part nr.	weight [kg]	part nr.	weight [kg]
H 27 SEA	12	630	20	155	727 33852	44	727 33864	51
H 27 SEA	12	630	20	210	727 33870	51	727 33874	60
H 27 SEA	25	630	16	170	727 63500	61	727 63514	68
H 27 SEA	25	630	16	225	727 23351	64	727 23353	74
H 27 SEA	25	630	16	275	727 23151	68	727 23153	79

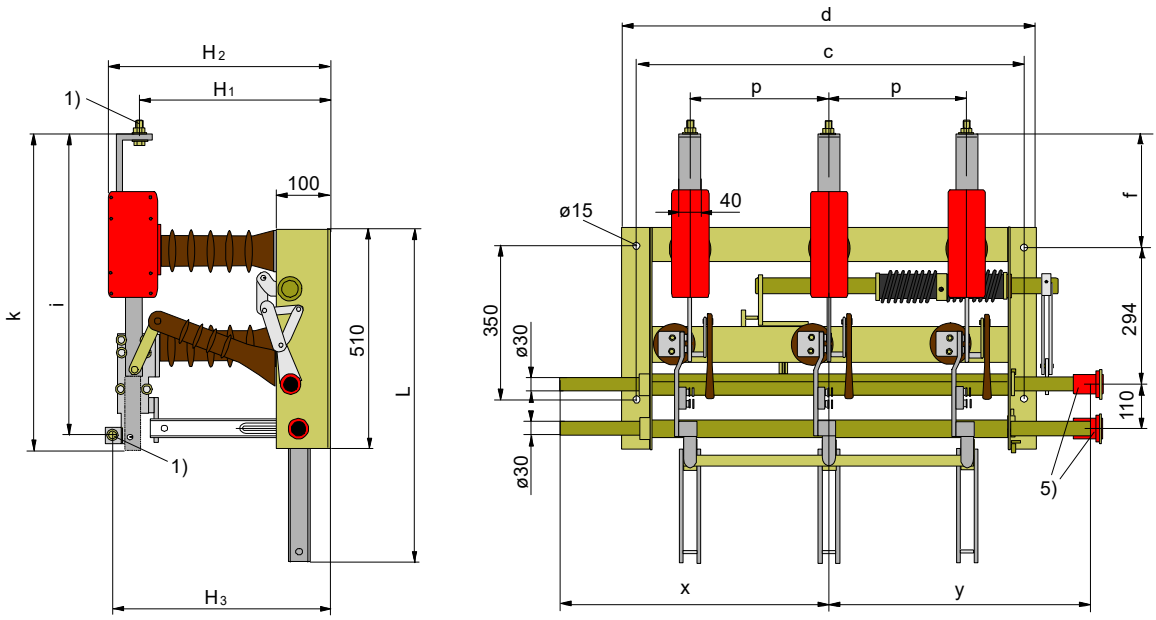


Figure: H 27 EA with earthing switch with short-circuit making capability mounted bellow (UESV)

1) Hexagonal screw M12x40 with two span washers and nut
5) Drive box and clamping washer with ON / OFF indicator

type	U_r [kV]	I_r [A]	I_k [kA]	p	c	d	f	H_1	H_2	H_3	i	k	L	x	y
H 27 EK	12	630	20	155	465	500	197	310	324	314	493	639	627	287	398
H 27 EK	25	630	16	275	705	740	255	360	399	358	685	757	712	513	513
H 27 EK	25	630	20	275	705	740	255	360	404	375	685	757	712	513	513
H 27 EA	25	630	16	275	705	740	255	360	401	358	685	757	712	513	513
H 27 EA	25	630	20	275	705	740	255	360	406	375	685	757	712	513	513

					without earthing switch		with earthing switch mounted bellow (UESV)	
type	U_r [kV]	I_r [A]	I_k [kA]	p	part nr.	weight [kg]	part nr.	weight [kg]
H 27 EK	12	630	20	155	727 31190	42	727 31292	53
H 27 EK	25	630	16	275	727 61201	51	727 61204	62
H 27 EK	25	630	20	275	727 71171	48	727 71950	59
H 27 EA	25	630	16	275	727 62271	50	727 62215	61
H 27 EA	25	630	20	275	727 72201	53	727 72205	64

Indoor load disconnectors H 27 SuT for lateral mounting

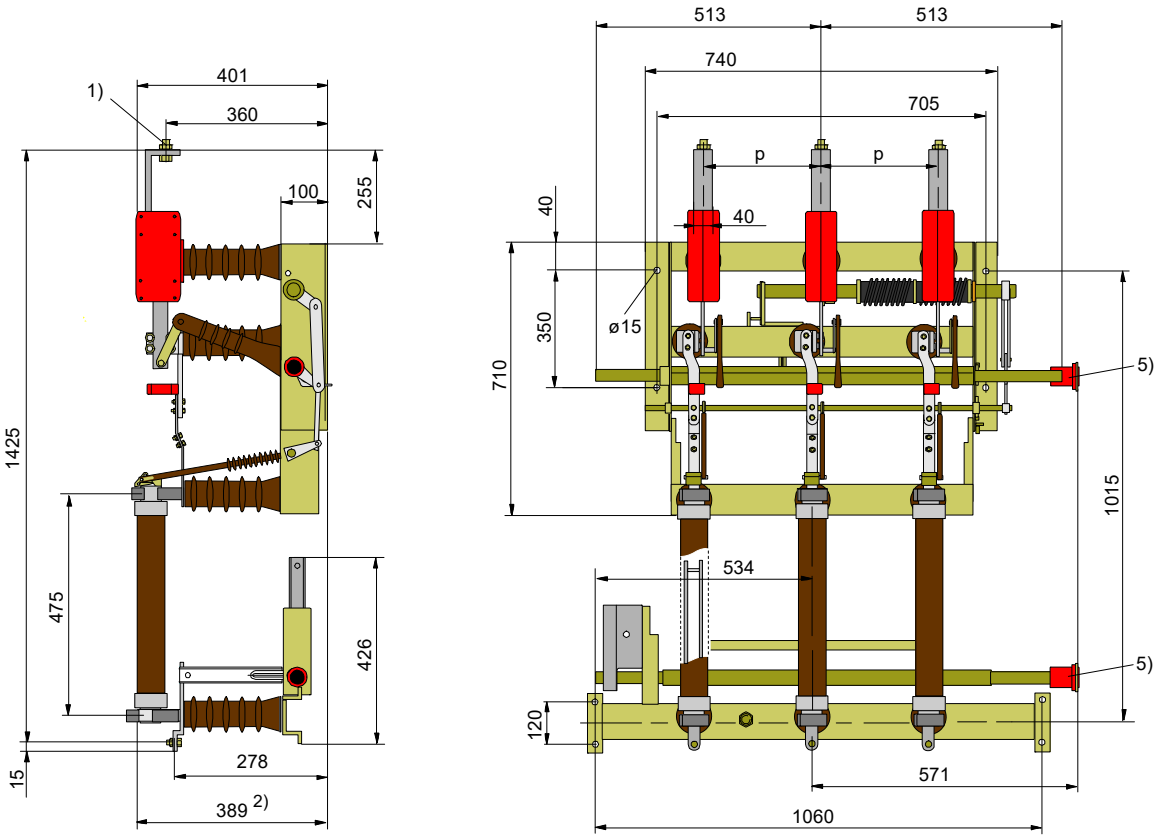


Figure: H 27 SuT with separated earthing switch mounted bellow (UESV) and with two separated cross-rails

1) Hexagonal screw M12x40 with two span washers and nut
2) Max. fuse diametral (88 mm) after DIN 43625, IEC 282-1/1985, ČSN EN 60282-1
5) Drive box and clamping washer with ON / OFF indicator

					without earthing switch		with earthing switch mounted bellow (UESV)	
type	**U_r [kV]**	**I_r [A]**	**I_k [kA]**	**p**	**part nr.**	**weight [kg]**	**part nr.**	**weight [kg]**
H 27 SuT	25	630	16	275	727 63001	74	727 63004	88

Indoor load disconnectors H 27 SEA for lateral mounting

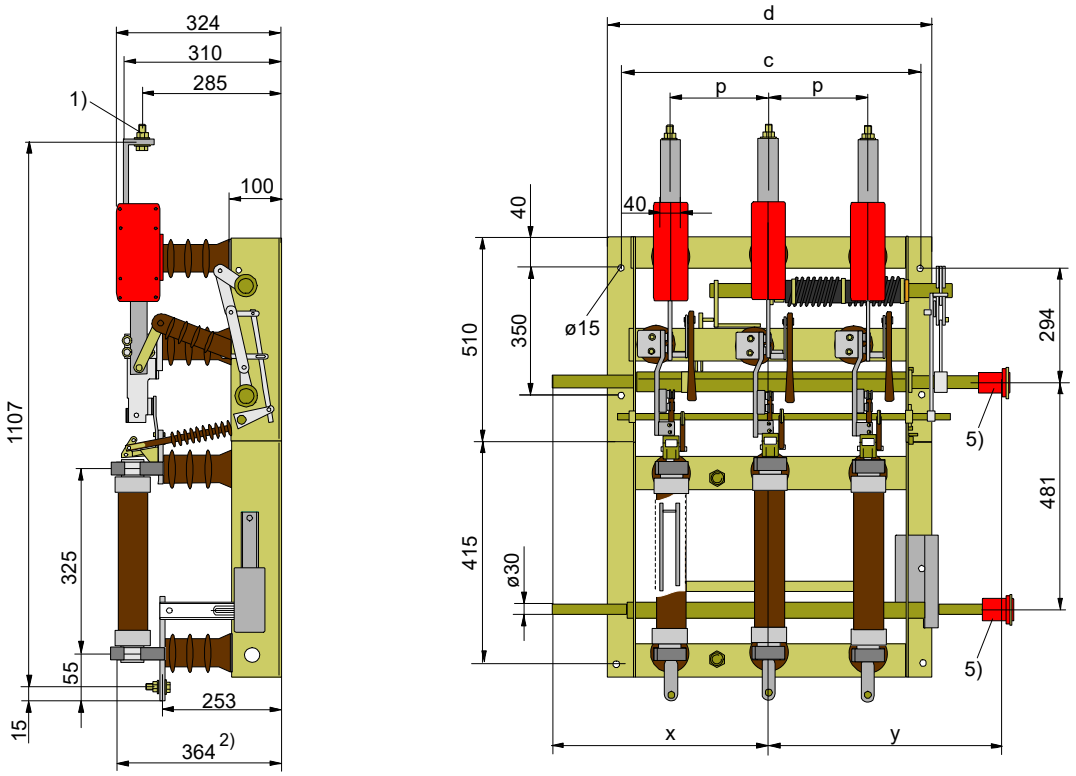


Figure: H 27 SEA with earthing switch with short-circuit making capability mounted bellow (UESV)

1) Hexagonal screw M12x40 with two span washers and nut
2) Max. fuse diametral (88 mm) after DIN 43625, IEC 282-1/1985, ČSN EN 60282-1
5) Drive box and clamping washer with ON / OFF indicator

									without earthing switch		with earthing switch mounted bellow (UESV)	
typ	U_r [kV]	I_r [A]	I_k [kA]	p	c	d	x	y	part nr.	weight [kg]	part nr.	weight [kg]
H 27 SEA	12	630	20	155	465	500	287	398	727 33295	61	727 33297	77
H 27 SEA	12	630	20	210	575	610	450	450	727 33490	68	727 33494	86

Switch-fuse combination on distribution transformers

Switch-fuse combinations are three-pole switches comprising a functional unit of load switch and current-limiting fuse. The scope of application of these combinations is predominantly in transformer protection systems where it covers the range of small and medium ratings.

The standard specification of the switch-fuse combinations governs complete protection, i.e. all fault currents above a permissible overload range (usually 1.5 times the rated capacity of the transformer) up to the rated short-circuit breaking current are reliably controlled.

Transformer protection can therefore be implemented reliably, simply and most economically using a switch-fuse combination, making a circuit-breaker with overcurrent time protection and associated current transformers no alternative. Protection measures such as Buchholz protection or thermal protection can still be implemented with the switch.

Rated voltage kV	Transformer rated capacity kVA	Type of load disconnector H 27	Rated current of HV fuse min. A	max. A
12	50	Yes	6,3	6,3
	80	Yes	10	10
	100	Yes	10	16
	125	Yes	16	20
	160	Yes	20	25
	200	Yes	25	31,5
	250	Yes	31,5	40
	315	Yes	31,5	50
	400	Yes	40	50
	500	Yes	50	63
	630	Yes	63	
	800	Yes	80	
	1000	Tripping delay	100	
	1250	No	125	
	1600	No	Circuit breaker	
25	50	Yes	6,3	6,3
	80	Yes	6,3	6,3
	100	Yes	6,3	10
	125	Yes	10	16
	160	Yes	10	20
	200	Yes	16	20
	250	Yes	16	25
	315	Yes	20	25
	400	Yes	25	31,5
	500	Yes	25	40
	630	Yes	31,5	50
	800	Yes	40	50
	1000	Yes	50	63
	1250	Yes	63	
	1600	Yes	80	
	2000	Tripping delay	100	
	2500	Tripping delay	125	
	3150	No	Circuit breaker	