DRIESCHER -Outdoor Switch-Disconnector FLa 15/60

- Three-pole
- Rated voltage
- 12 kV, 24 kV, 36 kV and 38.5 kV
- Rated current 400 A





ELEKTROTECHNISCHE WERKE FRITZ DRIESCHER & SÖHNE GMBH



D-85366 MOOSBURG • TEL. +49 87 61 6 81-0 • FAX +49 87 61 68 11 37 http://www.driescher.com infoservice@driescher.de

DRIESCHER – Outdoor Switch-Disconnector FLa 15/60

in compliance with DIN VDE 0670, Part 301 and IEC 60265-1

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General

For decades DRIESCHER - Outdoor switch-disconnector have been used as line sectionalizers in medium voltage overhead line networks and have proven to be extremely satisfactory based on their reliability and operating safety. The switch is in compliance with the regulations as per DIN VDE 0670 Part 301.

The arc extinguishing device in its weatherproof housing, operates in accordance with the oil flow principle of the well-established DRIESCHER circuit-breakers and is shunted in the On condition. Each arcing chamber is filled at the factory with approximately 0.5 litres of **Shell Diala D** switchgear oil.

The switch frame and the operating shafts mounted in bronze bearings are hot-galvanized. All insulators (catalogue 712) used in the construction are made of cycloaliphatic cast resin (Color RAL 8017 brown).

The contacts with flat terminations in accordance with DIN 46206 are made of electrolyte copper and are silver plated.

The switch has a current path with contacts that are designed with an adequate cross section. Even after many years of operation, a spring guarantees a constant contact pressure as well as easy and satisfactory switching. The nuts, washers and spring washers of stainless steel ensure corrosion-free connections even under extreme climate conditions.

The switchgears are fastened to supports for mounting on wooden or concrete poles.

For the wide span system the switches are delivered in three single poles (for mounting on concrete crossarms) with coupling shafts. The latter are adjusted to the required pole centre gauge.

Shaft support bearings for wide span system (see page 8) prevent a unilateral pressure load of the operating shafts at the centre pole through the linkage operating mechanism.

When using larger concrete cross-arms, due to the greater tension (as from approx. 30 kN), **underframes** (see page 8) are assembled in the factory under the breaker pole as the normal pole frame length is no longer sufficient.

Outdoor operating mechanisms in accordance with our catalogue 776 are available for operating the disconnectors and earthing switches.

The short-circuit strength specified in the following table applies to switch-disconnectors as well as to the earthing switches mounted on the switches.

Technical data

Rated voltage	Ur	kV	12	24	36	38,5
Rated current	I,	А	400	400	400	400
Frequency rating	f _r	Hz	50	50	50	50
Rated short time current	l _k	kA	16	16	16	16
Rated peak withstand current	I _p	kA	40	40	40	40
Rated short-circuit making current	l _{ma}	kA ¹⁾	10	10	10	10
Rated mainly active load breaking current	I ₁	А	400	400	400	400
Rated distribution line closed-loop breaking current	I_{2a}	А	400	400	400	400
Rated no-load transformer breaking current	I ₃	А	50	50	10	10
Rated cable-charging breaking current	I_{4a}	А	11	11	11	11
Rated earth fault breaking current	l _{6a}	А	56	56	30	30
Nominal cable-charging breaking current						
under earth fault	I _{6b}	А	-	-	32	32

1) by draughty manual operation

Description of function



Current flow, closed position, switching position and opening operation are shown in the above illustrations.

The contact arm mounted on the hinged insulator has two concave hemispheres 2 at the end.

A stainless steel forked piece ③ extends as counter-contact out of the arcing chamber ①. When the switch is actuated this fork piece is forcibly driven by the contact arm during both making and breaking operations.

A high-speed control mechanism connected in the center of the arcing chamber closes and disconnects the contacts.



During the switching on, first the main contact closes and then the contact in the arcing chamber.

During the switching off procedure no external arc occurs because during the opening of the main contacts, the arcing chamber in the parallel connection remains closed until the main contacts are sufficiently opened.

The hinged insulator continues to move until the isolated position is attained.

The switching off takes place in the arcing chamber. The arcing chamber is shunted.

Arcing chamber sectional model



- ① Filling screw with dipstick and vent
- (2) Lower section of arcing chamber (sectional view)
- ③ Fork piece (of stainless steel)
- Main contact with external spring mounting
- 5 Cast resin insulator GSA
- 6 Connecting rail with screw
- ⑦ Switching pin
- 8 Secondary contact
- Iteration Toggle mechanism (rapid make and break)
- 10 Upper section of arcing chamber (sectional view)

FLa 15/60 • three pole • for mounting on wooden or concrete pole



1) Hexagonal screw with nut, washer and spring washer

		Par	t-no.													
Rated voltage kV	Rated current A	without earthing switch	with earthing switch	р	b	d	е	≈ h	k	L	v ₁	α	β	γ	Weight approx. kg	Drawing-No.
12	400	762 22011		700	600	1465	405	612	215	1530	-	29°	60°	-	99,0	LH3-044679
12	400		762 22111	700	600	1465	405	612	215	1530	175	29°	60°	52°	115,0	LH3-044679
24	400	762 52011		700	600	1465	405	682	215	1530	-	25°	60°	-	109,0	LH3-044679
24	400		762 52111	700	600	1465	405	682	215	1530	175	25°	60°	60°	125,0	LH3-044679
24	400	762 52013		1000	600	2065	405	682	215	2130	-	25°	60°	-	126,0	LH3-044679
24	400		762 52113	1000	600	2065	405	682	215	2130	175	25°	60°	60°	145,0	LH3-044679
24	400	762 52014		1200	600	2465	405	682	215	2530	-	25°	60°	-	136,0	LH3-044679
24	400		762 52114	1200	600	2465	405	682	215	2530	175	25°	60°	60°	157,0	LH3-044679
36	400	762 82013		1000	650	2065	455	762	265	2130	-	25°	60°	-	138,0	LH3-044679
36	400		762 82113	1000	650	2065	455	762	265	2130	250	25°	60°	67°	157,0	LH3-044679
36	400	762 82014		1200	650	2465	455	762	265	2530	-	25°	60°	-	148,0	LH3-044679
36	400		762 82114	1200	650	2465	455	762	265	2530	250	25°	60°	67°	169,0	LH3-044679
38,5	400	762 82023		1000	650	2065	455	762	265	2130	-	25°	60°	-	145,0	LH3-107662
38,5	400		762 82123	1000	650	2065	455	762	265	2130	250	25°	60°	67°	164,0	LH3-107662

2) The weights include Cu tension straps (for dimension of Cu tension straps see table on page 6)

For tension units please refer to page 9 • Outdoor operating mechanisms in accordance with catalogue 776

Mounting supports

for switch-disconnectors as per drawing LH 3-44679, as given on page 5



on single pole



Hexagonal screw with nut and spring washer
 Gewindebolt with nut and washers
 Hexagonal screw and washer



on double pole

Drawing no. FT 4-44328 • Part no. 760 10130 Weight (with accessories) approx. 15.4 kg

Cu tension straps (3 x 30 x 1, tin-plated) • Standard lengths

Part-no.	531 71 004	531 71006		531 71009	5	31 71011
Lengths	1100 mm	1340 mm	1540 mm		1	740 mm
Switch mounting		Anchoring	For rated voltage kV	Straps le Fixed insulator side	engths Hinged insulator side	quantity of straps each side and each pole • 400 A
On wooden or conc	rete pole	Single staying	12	1100	1340	1
On wooden or concr	rete pole	Single staying	24	1100	1340	1
On wooden or concr	rete pole	Single staying	36	1340	1540	1
On wooden or concr	rete pole	Double staying	12	1340	1540	1
On wooden or concr	rete pole	Double staying	24	1340	1540	1
On wooden or concr	rete pole	Double staying	36	1540	1740	1
On concrete cross-a	rms (wide span system)	Single staying	24	1340	1540	1
On concrete cross-a	rms (wide span system)	Single staying	36	1340	1540	1
On concrete cross-a	rms (wide span system)	Double staying	24	1540	1540	1
On concrete cross-arms (wide span system)		Double staying	36	1540	1540	1

Note: The tension straps with 3 layers 30 x 1 mm each are riveted together in the centre (page 9).

FLa 15/60 • three-pole • for assembly on concrete cross-arms

For wide span system - comprising 3 single poles interconnected using coupling shafts



• without ear	rthing switc	h											
Rated voltage kV	Rated current A	Part-no.	р			b	е	t	w	α	β	Weight approx. kg	Drawing-no.
24	400	762 5605	of 1000 mm to 2400 mm	steppe	d	670	420	100	110	26°	60°	97,0	LH 3-44465
36	400	762 8606	by 200 mm respective	ely 3)		990	475	135	375	26°	60°	118,0	LH 3-44465
• with earthin	ig switch												
Rated voltage kV	Rated current A	Part-no.	Earthing switch	b	r	^r 1	v	۷1	w	γ	δ	Weight approx. kç	Drawing-no.
24	400	762 56151	Fixed insulator side	670	-	50	-	535	110	67°	- <u>or</u>	113,0	LH 3-44465
24	400	762 56251	Hinged insulator side	840	75	-	255	-	280	-	73° 肾	119,0	LH 3-42501
24	400	762 56351	Fixed and hinged insulator side	840	75	50	255	535	280	67°	73° 🛱	⁸ 135,0	LH 3-42501
36	400	762 86151	Fixed insulator side	990	-	50	-	590	375	81°	- be	134,0	LH 3-42501
36	400	762 86251	Hinged insulator side	990	75	-	350	-	375	-	67° 👸	134,0	LH 3-42501
36	400	762 86351	Fixed and hinged insulator side	990	75	50	350	590	375	81°	67° ⁶	150,0	LH 3-42501

The weights include the CU tension straps, but not the coupling shafts (for dimensions of Cu tension straps please refer to table on page 6)
 For dimensions and weights and part numbers of the coupling shafts please refer to following table

Coupling shafts for switch-disconnectors (wide span system)

Pole distance p	Shaft diameter	Part-no.	2 coupling shafts for switch without earthing switch Weight approx. kg	4 coupling shafts for switch with earthing switch Weight approx. kg	6 coupling shafts for switch with 2 earthing switches Weight approx. kg	_
1000	30	641 14460	4,5	9,0	13,5	Ta
1200	30	641 14360	6,7	13,4	20,1	wing
1400	30	641 14370	8,9	17,8	26,7	- Z
1600	30	641 14390	11,1	22,2	33,3	0. Þ
1800	30	641 14400	13,3	26,6	39,9	Ń
2000	40	641 14420	28,0	56,0	84,0	4-28
2200	40	641 14430	32,0	64,0	96,0	ې کې
2400	40	641 14440	36,0	72,0	108,0	4

Underframe

for wide span system (drawing no. LH 3-43667) • Underframe fully assembled for three-pole switch-disconnector • rated voltage 24 kV Part no. 760 20120 (drawing no. LH 4-44069), weight approx. 32 kg, for oversized concrete cross-arms



Support bearing

For switch-disconnectors without earthing switch for mounting on concrete cross arms (page 10) with appropriately cast threaded bushes



Underframe	Part-no.	h	Weight approx. kg	Drawing-no.
without	760 20105	85	1,9	LH 4-44099
with	760 20106	159	3,1	LH 4-44099

Support bearing

For switch-disconnectors with earthing switch for mounting on concrete cross-arms with appropriately cast threaded bushes



Rated voltage	Underframe	Part-no.	h a	Weight pprox. kg	Drawing-no.
24 kV	without	760 20110	85	1,9	LH 3-42752
24 kV	with	760 20104	159	3,1	LH 3-42753

Support bearing for switch-disconnectors with earthing switches, rated voltage 36 kV, on request

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Accessories for tension units

		Designation	Part-no.	Drawing-No.	Weight approx. kg
1		Small suspension hinge for switch On wooden or concrete pole without top cross arm (see page 5) (suspended in switch frame)	2-760 10121	FT 4-17086	0.8
2	¢	Strap for spacer	2-515 11064	FT 4-17090/1	1.0
3		Spacer	2-760 10126	FT 4-17089	2.9
4		Forked strap s=100 mm for switch on wooden pole	2-775 43010	FT 4-38202/1	1.2
		Forked strap s=250 mm for horn-break switch in wide span system version	2-775 42010	FT 4-38202/2	1.9
5		Adjustable strap for switch on auf concrete pole with T-head cross arm in wide span system version (adjustable by 50 mm)	2-760 20111	FT 4-15728	2.1
6	ŧ	Turned double ring for spacer			
7	ĊĊ	Tensioning stiffener up to 70 mm ²			
8	P	Clamping cable lug 35 to 70 mm ² (required in addition)			
9		Cu tension straps 3 x 30 x 1 mm L= 1100 mm L= 1340 mm L= 1540 mm L= 1740 mm	2-531 71004 2-531 71006 2-531 71009 2-531 71011	WN 4-37028	0.9 1.1 1.3 1.4

Design of tension units

Single staying

Double staying



Permissible tension angle



Concrete cross arm

For mounting an outdoor switch-disconnector FLa 15/60 with tension units



1) cast threaded bushes for shaft support bearings

Remark: For peak tensions (>30 kN) underframes are usually required for breaker pole mounting (see page 8).

Arrangement of operating mechanisms for outdoor switch-disconnectors FLa 15/60 (wide span system)

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Outdoor switch-disconnector FLa 15/60

Arranged in three levels as shown in to system diagram. The three single poles are actuated by an upright linkage rod.



Dimensions, weights, diagrams and descriptions in this brochure are non-binding. Subject to change without notice.

switching • electricity • safely

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ELEKTROTECHNISCHE WERKE FRITZ DRIESCHER & SÖHNE GMBH

D-85366 MOOSBURG • TEL. +49 87 61 6 81-0 • FAX +49 87 61 68 11 37 http://www.driescher.com infoservice@driescher.de

