Outdoor load disconnectors Fla 15/60 GB

three-pole design
rated voltage 25 and 38.5 kV
rated current 630 A

DRIBO, spol. s r.o.

Pražákova 36
619 00 Brno
Czech Republic

Tel.: +420 533 101 111, **Fax:** +420 543 216 619, **E-mail:** dribo@dribo.cz, **Internet:** http://www.dribo.eu

Fla GB outdoor load disconnectors

Outdoor design, load disconnectors of Fla 15/60 GB series have been developed by the DRIBO company as design version of the Fla 15/60 load disconnectors which prove its high reliability and operation safety since many years on the world market.

The Fla GB load disconnectors may be used as a replacement for the Fla 15/60, Fla 15/6400 and Fla 15/6410 outdoor load disconnectors.

One of the advantages of this load disconnector series is the possibility of working of the staff under voltage, easy and quick mounting of overvoltage limiters onto the switching device, thus providing for a simplification of mounting the disconnector on the pole, and a better handling of the device due to its reduced weight.

The load disconnectors comply with requirements of the following standards: EN 62271-1 and EN 62271-103. Used insulators satisfy the fourth grade of contamination area.

The switching takes place in proven and tightly closed arc quenching chamber filled with Shell transformer. Each arc quenching chamber contains about 0.5 l of oil.

No release of arc decomposition products occurs and, therefore, the Fla GB load disconnectors meet the most severe environmental requirements.

All current carrying components are made of silver plated electrolytical copper and constitute a loop-less current conduction path.

The cross-section of the conductors the current-carrying path consists of is sufficiently dimensioned.

Appropriate contact pressures of the stainless steel springs are one of the prerequisites for a fault-free switching even after many years of load disconnector's operation under extreme operating conditions and also under hoarfrost loads.

The load disconnectors can be provided with supports, made of cycloaliphatic resins with additives used to improve the material properties against the environmental impact (UV radiation, high temperature changes etc.). The material resistance has been verified by a long-term (during more than 30 years) period of disconnector usage.

The Fla GB load disconnector design, for the first time, has been arranged in a way to provide for the installation of overvoltage limiters.

The load disconnectors can be controlled either by manually operated drive mechanisms or remote controlled motor driven drives in outdoor design.

The load disconnectors can also be provided with encapsulated auxiliary switches (IP 44 protection degree), mounted straight on onto the frame. The auxiliary switches provide for a reliable indication of the closed and opened switching position.

The short-circuit capacity of the load disconnector is met with a high reserve.

The construction of the load disconnectors, the quality level of material used and care exercised in the production process, which is governed by the principles of the ISO 9001:2000 standard, is a guarantee for low operation and maintenance costs in the future.

Under normal operating conditions it is not necessary for the load disconnectors to undergo a preventive maintenance during the period of twenty years for hand operated devices and ten years for motor operated devices (remote control).

Versions of the Fla GB load disconnectors

Version	Load disconnector characterization	Rated voltage (kV)	Pole height (m)	Ordering number	Weight (kg)
Fla 15/60 GB	Horizontal-design load disconnector for mounting on a concrete pole	25	10,5 12	01001009 01001209	83
Fla 15/60 GB K	Load disconnector for mounting on a concrete pole and provided with a cable drop-in	25	10,5 12	05011009x 05011209x	86
Fla 15/60 GB P	Load disconnector for mounting on a concrete pole and provided with fuse holders and cable drop-in	25	10,5 12	05021009x 05021209x	105
Fla 15/60 GB R	Load disconnector for mounting on a concrete pole for dead ended line	25	10,5 12	01001005R 01001205R	97
Fla 15/60 GB	Horizontal-design load disconnector for mounting on a concrete pole	38,5	10,5 12	03001009 03001209	103
Fla 15/60 GB K	Load disconnector for mounting on a concrete pole and provided with a cable drop-in	38,5	10,5 12	07011009y 07011209y	109
Fla 15/60 GB P	Load disconnector for mounting on a concrete pole and provided with fuse holders and cable drop-in	38,5	10,5 12	07021009y 07021209y	131
Fla 15/60 GB R	Load disconnector for mounting on a concrete pole for dead ended line	38,5	10,5 12	03001005R 03001205R	107

* The last digit of the ordering number (symbol *x*, optionally *y*) means the type of used overvoltage limiters.

As an option the switching device may be equipped with overvoltage limiters. These devices have in their version description also word *O*. For example *Fla 15/60 KO* – load disconnector for mounting on a concrete pole and provided with a cable drop-in, equipped with overvoltage limiters. The limiters are mounted either at the manufacturer's plant or later on site. Generally, all kind of overvoltage limiter (arrester) can be used. There are, however, a few recommended types, as follows: RAYCHEM, type HDA-24NA; ABB, type POLIM D 24N or MWK 25 and Tridelta type SBK-I 31/5 or SBK-I 31/10.

Rated voltage U_r v kV	x	y	Used overvoltage limiters
25	-	-	Without limiters
25	1	-	ABB, type POLIM D 24N
25	2	-	ABB, type MVK 25
25	3	-	RAYCHEM, type HDA-24NA
25	4	-	TRIDELTA, type SBK-I 31/5
25	5	-	TRIDELTA, type SBK-I 31/10
38,5	-	-	Without limiters
38,5	-	1	ABB, type MVK 39
38,5	-	2	RAYCHEM, type HDA-40N
38,5	-	3	TRIDELTA, type SBK-I 48/5
38,5	-	4	TRIDELTA, type SBK-I 48/10

Technical data

Rated voltage	**U_r**	**kV**	**25**	**38,5**
rated current	I_r	A	630	630
rated short-time withstand current	I_k	kA	20	20
rated peak withstand current	I_p	kA	50	50
rated short-circuit making current	I_{ma}	kA[1)]	18	11
rated breaking current - i cosϕ 0.7, ind.	I_{load}	A	630	400
rated breaking current of closed loop	I_{loop}	A	400	400
rated breaking current of no-load transformer	I_{nltr}	A	53	10
rated breaking current of no-load cable power line	I_{cc}	A	20	20
rated breaking current flowing into earth connection	I_{ef1}	A	56	40
mechanical service life			5000xCO	5000xCO

[1)] Applies for adequately rapid manual control

Withstand voltages

rated voltage	kV	25	38,5
rated short-time withstand power frequency voltage / 1min. to be applied in both dry and wet environmental conditions			
against the earth, across the poles and between disconnected contacts	kV	50	80
across the isolating distance	kV	60	90
rated lightning pulse withstand voltage			
against the earth, across the poles and between disconnected contacts	kV	125	180
across the isolating distance	kV	145	210

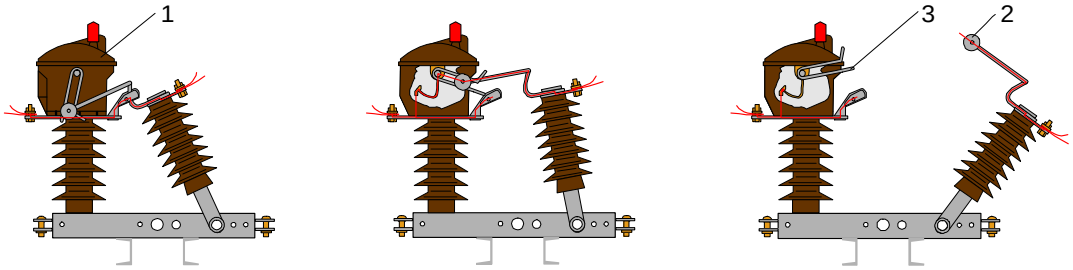
Climatic conditions

highest temperature	°C	+ 40
lowest temperature	°C	- 30
highest relative humidity	%	100
highest wind pressure	Pa (m/s)	700 (34)
admissible hoar frost	mm	20
typical altitude	m a. s.	up to 1000

Usages in higher altitudes please consult with producer.

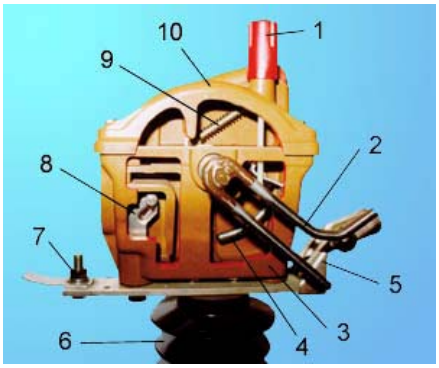
Function description

Tried and tested oil extinguishing chambers, parallelly connected to the main circuit, are provided with a quick-action switching mechanism. The extinguishing chambers are of an adequately sturdy structure ensuring that their tightness remains undamaged even under extreme service conditions. Each extinguishing chamber is filled with a quantity of about 0,5 l of Shell Diala D or Shell Fluid 4600 oil.



The above drawings show the current flow during switching in switched-on position, intermediate position and switched-off position of the disconnector. The contact arm mounted on the pendulum bearing is provided, on its end, with two rollers (2) their concave sides being inwards oriented. The extinguishing chamber (1) is controlled by the stainless-steel forked contact (3). When controlling the switch, the roller both during switching-on and switching-off positively entrains the fork. The snap-action mechanism connected with the said fork acts on the contact system inside the chamber and closes or opens immediately the contacts of the extinguishing chamber independently on the speed of the hand control. When switching-off, first of all the main contacts are opened and only after having achieved the safety switching-off distance the contact system inside the extinguishing chamber is opened by the snap-action mechanism.

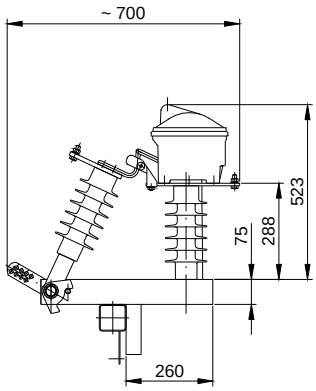
Sectional view of the extinguishing chamber

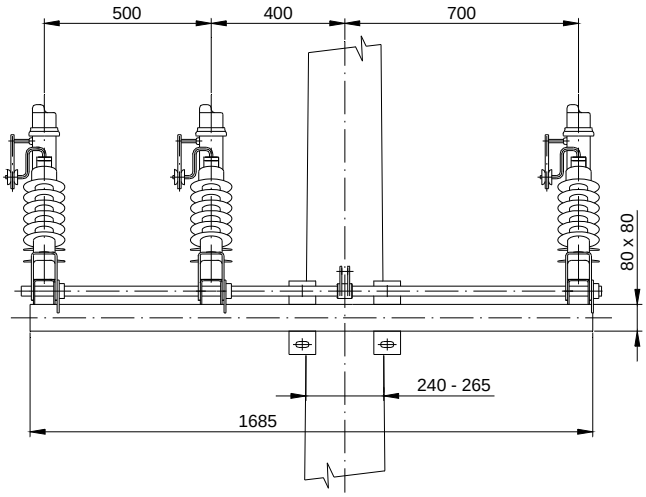


1. closure of the filling opening with the gauge and the air release valve
2. control lever (made of stainless steel)
3. bottom part of the extinguishing chamber (sectional view)
4. contact rod
5. main contact
6. supporting insulator
7. connecting clamp with a screw
8. auxiliary contact
9. snap-action mechanism
10. upper part of the extinguishing chamber (sectional view)

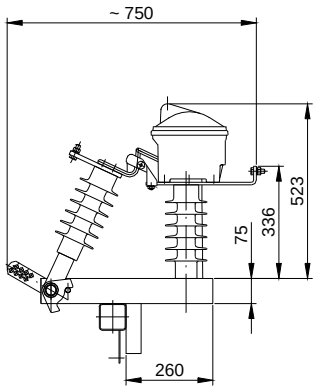
Three-pole outdoor load disconnectors Fla 15/60 GB for U_r of 25 kV

Fla 15/60 GB

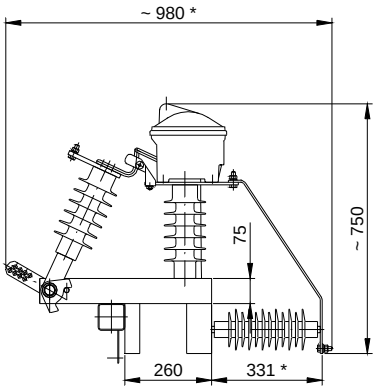




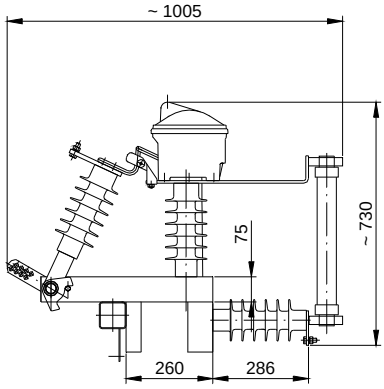
Fla 15/60 GB K



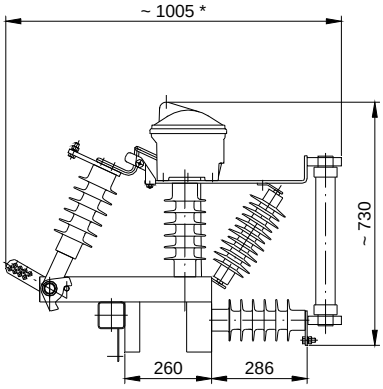
Fla 15/60 GB KO



Fla 15/60 GB P



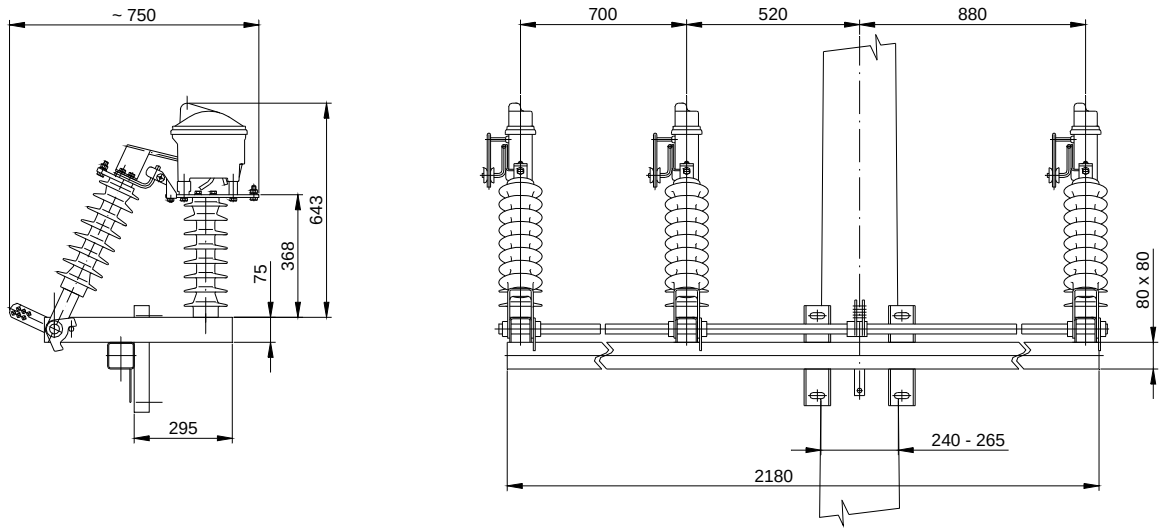
Fla 15/60 GB PO



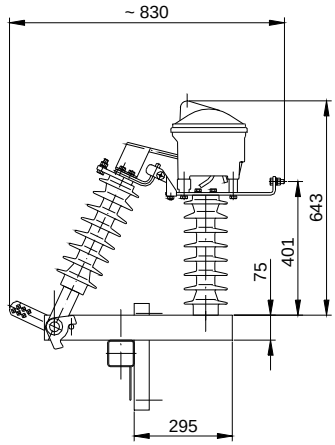
* dimension depends on used overvoltage limiter (here shown: RAYCHEM HDA24-NA)

Three-pole outdoor load disconnectors Fla 15/60 GB for U_r of 38.5 kV

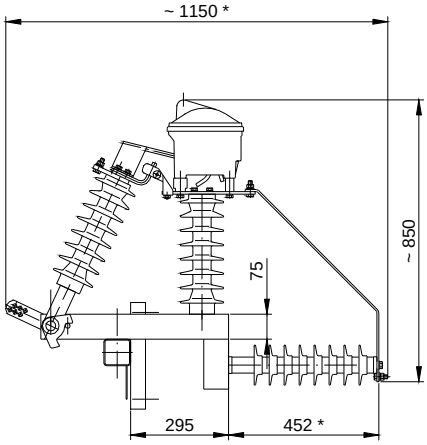
Fla 15/60 GB



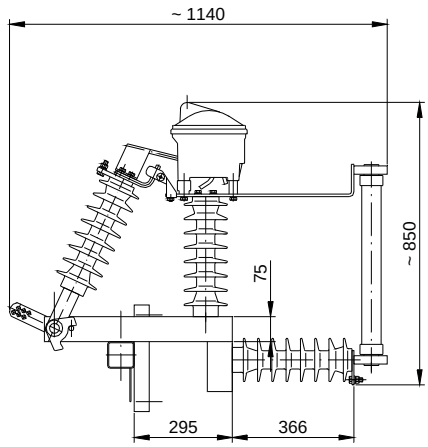
Fla 15/60 GB K



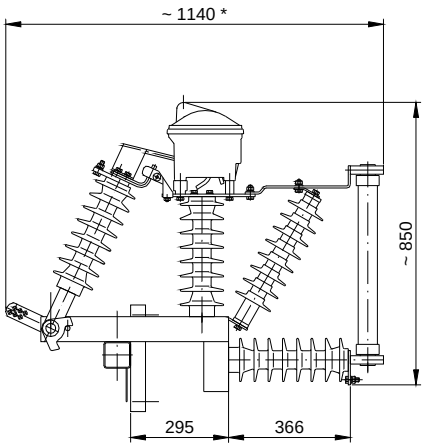
Fla 15/60 GB KO



Fla 15/60 GB P



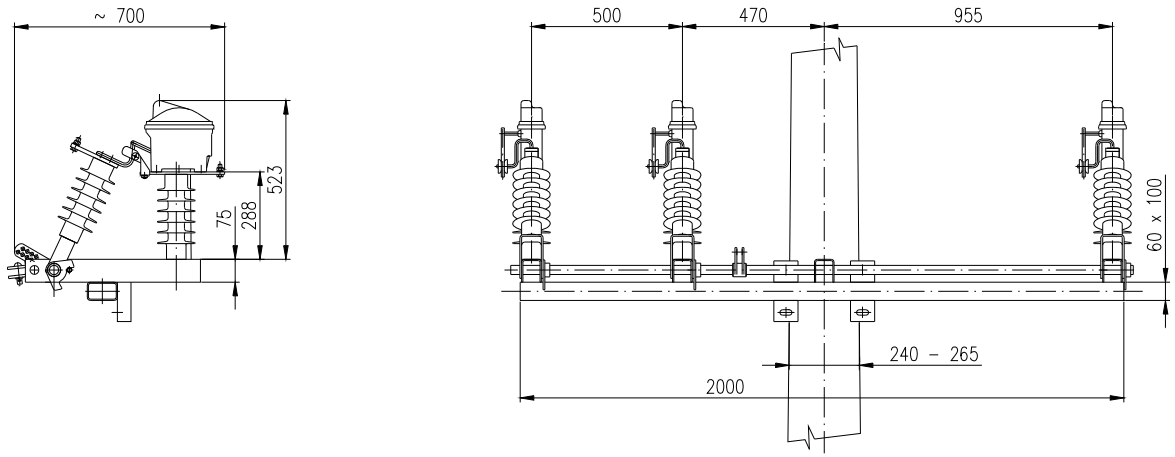
Fla 15/60 GB PO



* dimension depends on used overvoltage limiter (here shown: TRIDELTA SBK-I 48/5 ev. SBK-I 48/10)

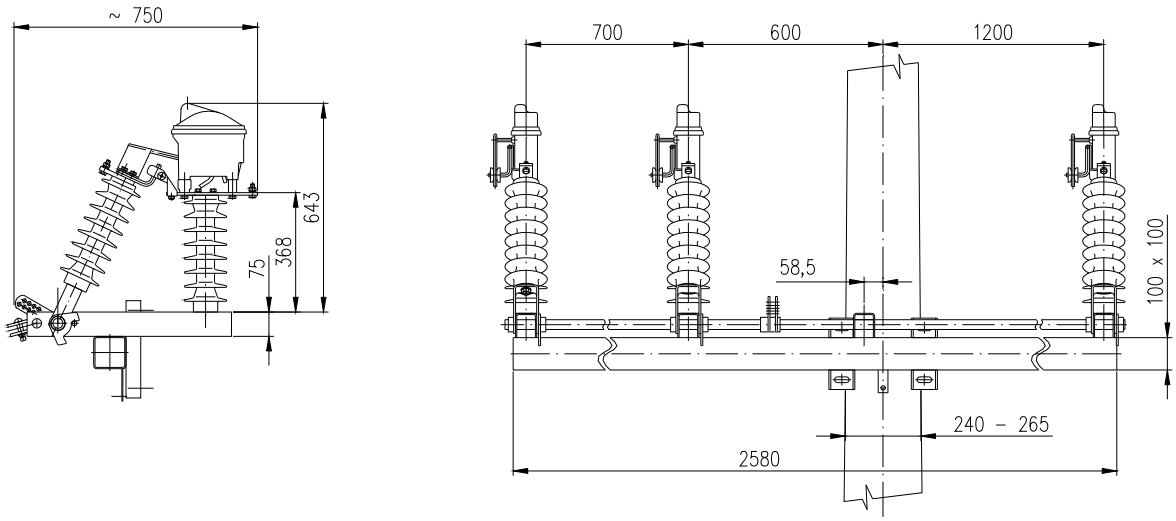
Three-pole outdoor load disconnectors Fla 15/60 GB R for U_r of 25 kV

Fla 15/60 GB R

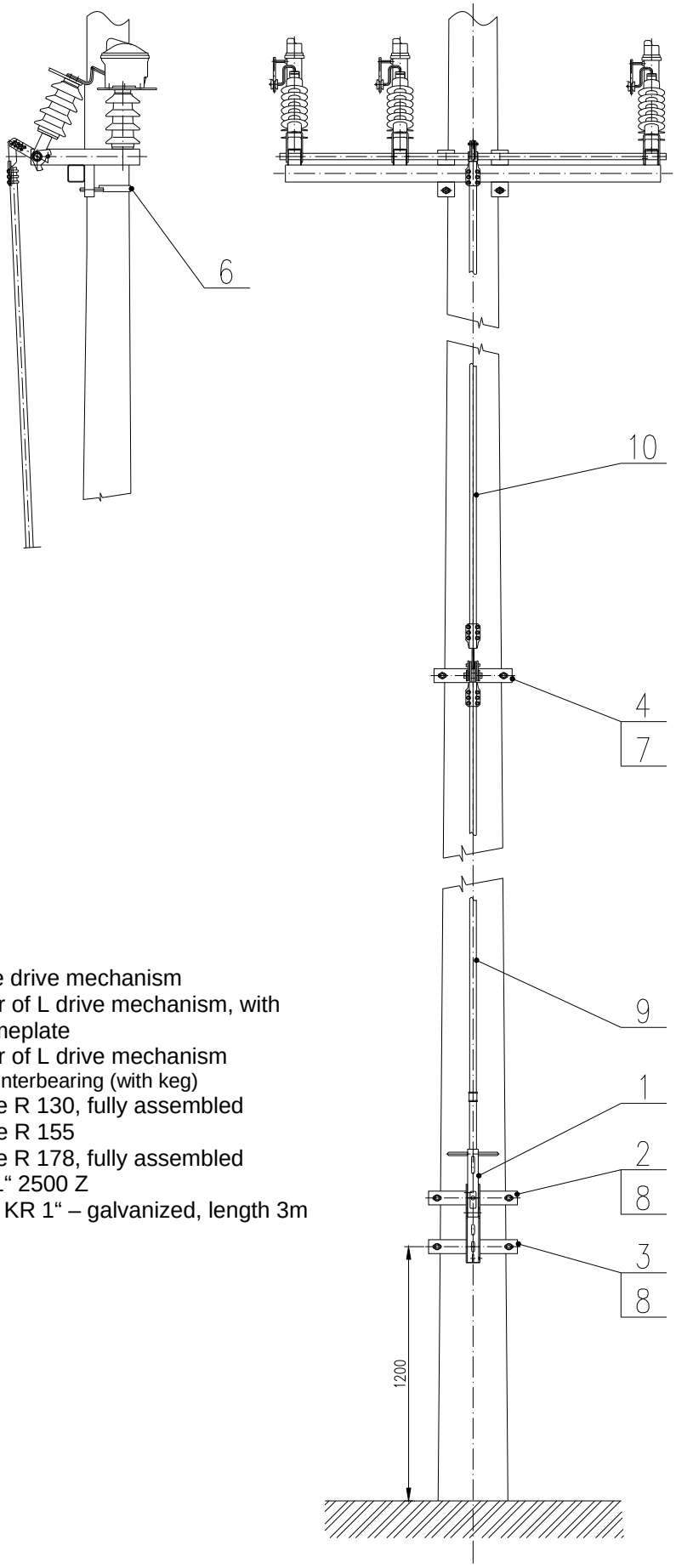


Three-pole outdoor load disconnectors Fla 15/60 GB R for U_r of 38.5 kV

Fla 15/60 GB R

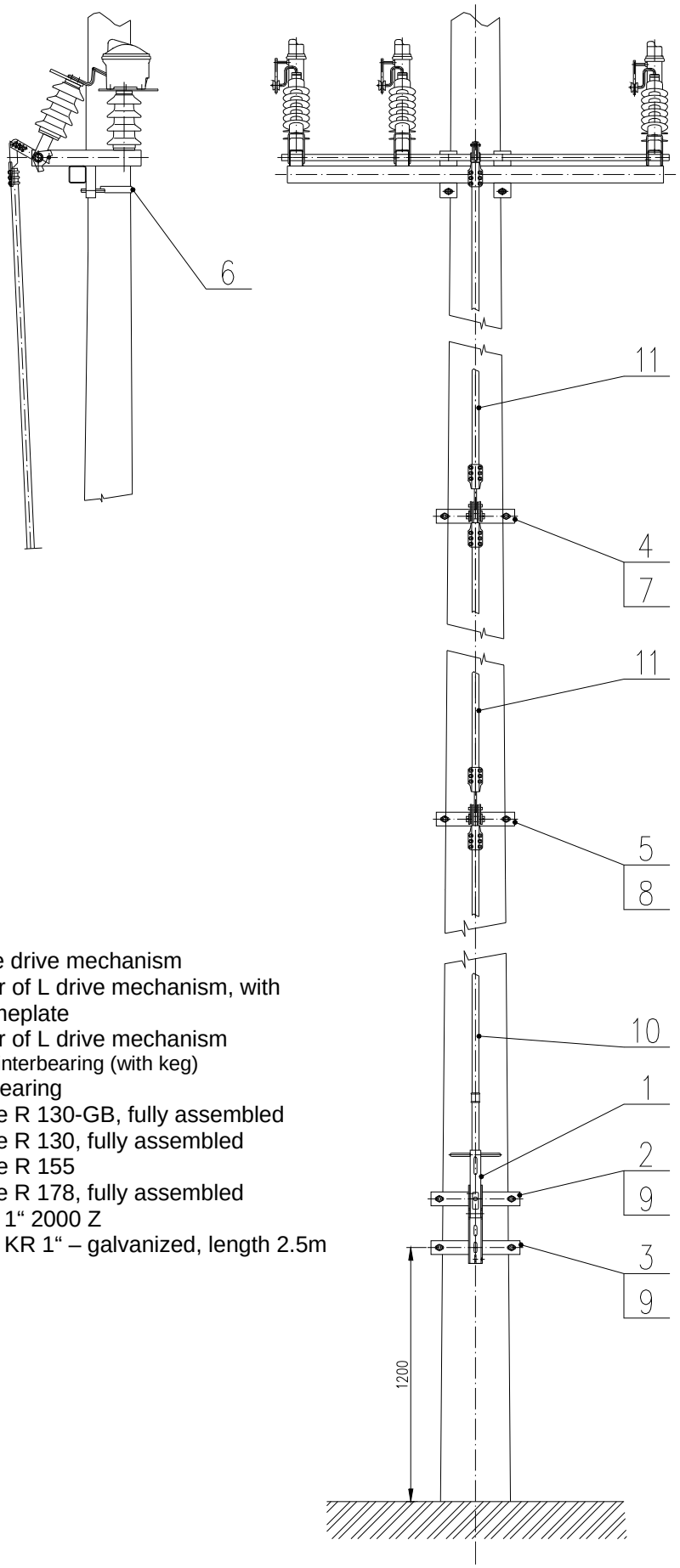


Drive mechanism installation for outdoor load disconnectors Fla 15/60 GB mounted on a pole of 10.5 m height



1 – L type drive mechanism
2 – holder of L drive mechanism, with a nameplate
3 – holder of L drive mechanism
4 – upper interbearing (with keg)
6 – sleeve R 130, fully assembled
7 – sleeve R 155
8 – sleeve R 178, fully assembled
9 – pipe 1“ 2500 Z
10 – pipe KR 1“ – galvanized, length 3m

Drive mechanism installation for outdoor load disconnectors Fla 15/60 GB mounted on a pole of 12 m height



1 – L type drive mechanism
2 – holder of L drive mechanism, with a nameplate
3 – holder of L drive mechanism
4 – upper interbearing (with keg)
5 – interbearing
6 – sleeve R 130-GB, fully assembled
7 – sleeve R 130, fully assembled
8 – sleeve R 155
9 – sleeve R 178, fully assembled
10 – pipe 1“ 2000 Z
11 – pipe KR 1“ – galvanized, length 2.5m