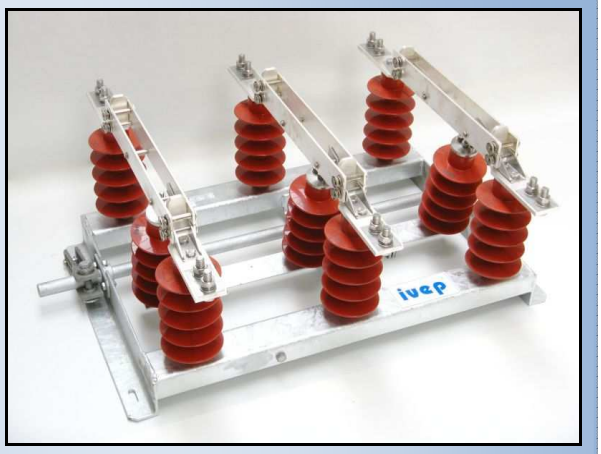


ASSEMBLY AND MAINTENANCE INSTRUCTIONS

PD 006/7/2011-A

OUTDOOR LOAD DISCONNECTOR
DISCONECTER

TYPE KBE 3 FLE S

ISO 9001:2009
ISO 14001:2005

ivep®

TYPE DESIGNATION OF OUTDOOR LOAD DISCONNECTORS AND DISCONNECTORS FOR WHICH THIS ACCOMPANYING DOCUMENTS APPLY

KBE 3D	- outdoor disconnector
KBEZ 3D	- combination of the KBE 3D disconnector and an earthing switch
KBE 3P	- combination of the KBE 3D disconnector and a fuse base
KBE 3S	- outdoor load disconnector, with breaking rod in function of arc quenching mechanism
KBEZ 3S	- combination of the KBE 3S load disconnector and an earthing switch
KBE 3SP	- combination of the KBE 3S load disconnector and a fuse base
FLE S	- outdoor load disconnector with arc quenching chamber
FLE SP	- combination of the FLE S load disconnector and a fuse base

ASSEMBLY REGULATIONS

Mounting ot disconnectors and load disconnectors

Disconnectors and load disconnectors are mounted to the pole/mast to a level, for which the a safe insulating distance can be guaranteed. The installation is done on two U8 holders (position 8, Fig. 1), fixed to the pole using two R130 sleeves (position 10, Fig. 1). In order to ensure proper functioning of the adjusted switching device the bearing surfaces of the holders have to be at the same level (Fig. 2). If this virtual plane is not adhered to, the construction of the switch gets twisted which causes the current-carrying knives to collide with the power line connecting flags (which prevents the disconnector´s making operation).

Mounting of the manually operated drive mechanism and the accessories

When leaving the manufacturer´s plant the cut-in lever (position 7, Fig. 1) on the shaft of the disconnector or load disconnector is mounted on the outer left side. The drive mechanism for this operating condition (position 5, Fig. 1) is not fixed to the bottom side of the disconnector but it is turned round by 90º to the disconnector´s left side. If it is impossible to mount the drive mechanism (position 5, Fig. 1) at this location (because of limitations in the access or interference in the control of disconnector), the drive mechanism may also be mounted to the left or right bottom side (under an angle of 90º). In such a case also the cut-in lever (position 7, Fig. 1) is to be displaced to another place in the inside of the switching device (most frequently in between the side pole and the lever which is welded on to the shaft, either from the left or right hand side). The cut-in lever is then to be located under the same angle as it was when mounted at the outer side, then cut in and retightened using a torque of 140 Nm.

The mounting of the drive mechanism and the assembly of accessories continues in the following way:

Fix the hand operated drive mechanism (position 5, Fig. 1) to two holders (position 9, Fig. 1) which are secured to the pole by two R178 sleeves (position 12, Fig. 1). Screw in one end of the lower threaded pull rod – pipe (position 17, Fig. 1) into the coupling (position 18, Fig. 1) of the manual operated drive, and grip the other end into the two-arm terminal (position 14, Fig. 1) of the lower rocking bearing (position 4, Fig. 1). This bearing is fixed to the pole using the R 155 sleeve (position 11, Fig. 1). The central pull rod (position 16, Fig. 1) is fixed at its one end into the single-arm clamping terminal (position 21, Fig. 1) of the lower rocking bearing. The other end of the pull rod is clamped into the double-arm clamping terminal (position 14, Fig. 1) of the upper rocking bearing (position 3, Fig. 1), which, in turn, is fixed through the R130 sleeve (position 10, Fig. 1) to the pole. Proper position of the bearings (positions 3 and 4, Fig. 1) on the pole is achieved when both the swinging levers (position 19, Fig. 1) and the manual lever (position 20, Fig. 1) have achieved the vertical position at the same time. In such a way the correct assembly of the bearings and the drive mechanism is being verified.

Assembly of the upper pull rod (position 15, Fig. 1)

Both the drive mechanism and the switching device find themselves in ON switching position. Fit the skew barrel-sleeved clamping terminal onto the cut-in lever (position 7, Fig. 1) at the load disconnector shaft. Clamp slightly, through one stirrup only, the upper pull rod into the single-arm clamping terminal (position 13, Fig. 1), place the pull rod to the skew clamping terminal and measure the length. The pull rod should now be adjusted to the length required. Turn round the lever of the manual drive mechanism back by about 20º to 30º before the point in which the ON

switching position is attained and at this position fix the pull rod into the clamping terminals. Perform the ON and OFF switching operation and check whether it is possible to push the drive mechanism until the stop, in which case the ON position should be achieved. Then check the cam (position 22, Fig. 1) and the current-carrying knife contacts (position 23, Fig. 1) which now should be at the stop. The drive pull rod, when in ON position, has to be under spring pressure (generated by the drive mechanism) which is essential for the contact knives that all the time have to be pushed onto the stop. In order to achieve a safe opening distance of the switching device when in OFF position, also the cam has to be checked. If we are not successful in succeeding to adjust the system for the first time, we have to change the length of the upper pull rod (by moving it) in the skew clamping terminal and repeatedly check the proper function of the switching device in terms of achieving the ON and OFF switching position.

After having finished the adjustment perform 5 ON-OFF operations. If all is O.K. retighten the cut-in lever on the disconnector´s shaft, using a torque of 140 Nm, and re-check the rigidity of the screw connections. Now the assembly process and the adjustment of the switch are finished.

Any interference into the device, which does not correspond with the manufacturers instructions, may be detrimental to both the mechanical and the electrical properties of the device. For such a modified product the warranty is void and null.

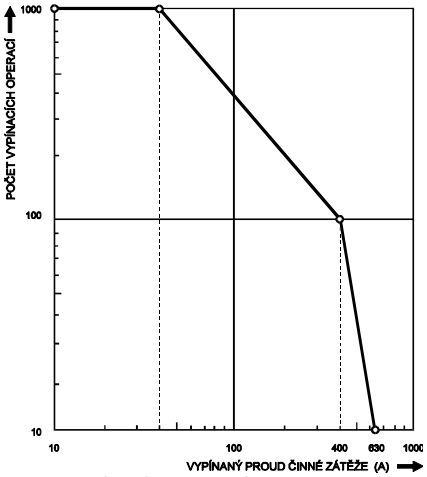
MAINTENANCE INSTRUCTIONS

Outdoor load disconnectors and disconnectors are switching devices of extended service life which necessitate only a very limited extent of maintenance and revision works to have performed. In order to ensure the required reliability of the device it is recommended to check the device and the drive mechanism visually on a regular basis (approx. once a year), also in order to exclude any unintended or intentional mechanical damage.
The purpose of such a visual inspection is also the verification of the state of insulators.

In the course of the revision works, which are recommended to be performed once in 10 years in the voltage-free state of the switching device, the following servicing works are performed:

a) Verification of the state of main contacts, cleaning and greasing of the contact surfaces using the „Barrieta L 55/1“ grease (manufacturer: Klüber Lubrikation – Germany)
b) Verification of the state of rocking bearings, cleaning and greasing with the „plastic MOGUL G 3 grease (to ČSN 656912).
c) Inspection of the rigidity of all screw connections.
d) Verification of the mechanical operation of both the drive mechanism and the switching device.
e) The NPAK 5 arc quenching chamber from ABB Transmit Oy is a maintenance-free component, providing the number of switching cycles at specified loads or the total mechanical service life has not been exceeded.

Curve of the switching service life of the arc quenching chamber



Počet vypínacích operací = number of breaking operations
Vypnutý proud činné zátěže = active load breaking current

The NPAK 5 arc quenching chamber, manufactured by ABB Transmit Oy, is a maintenance-free component until the moment when some of the values in the graphics No. 1 (number of switching cycles), or the total mechanical service life have been exceeded.
In 1998 the company ABB Transmit OY has performed the mechanical service life test with 2000 C-O operations on the NPAK 5 chamber. The test result was satisfactory. Once the area delineated by the switching curve has been exceeded, it is not necessary to replace the NPAK 5 chamber with a new one.
If the boundaries of the curve have been exceeded due to a too high number of operation currents broken, it is only necessary to replace 2 pcs of plastic plates of CXBY 67036.2 type in the chamber. If the curve boundaries have been achieved due to the breaking of short-circuit currents of excessive values (more than 8 000 A), it becomes also necessary to replace the fixed contact type NPAZ 151 and the burnout contact knife type NPAZ 159 (in addition to the plastic plates).

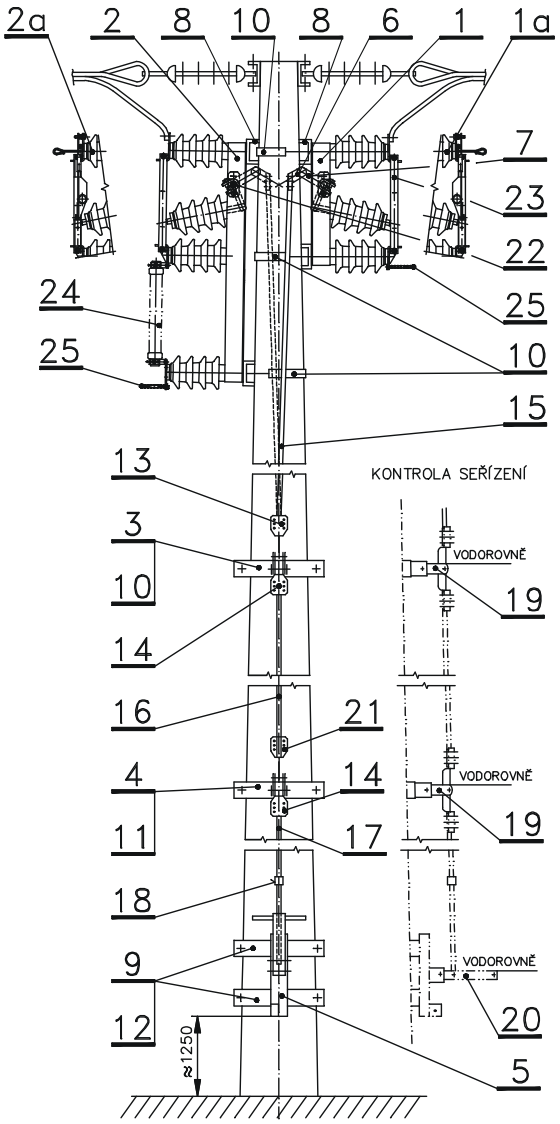
According to the ABB Transmit OY information, based on our mutual long-term relationship, the replacement of the above spare parts in the inside of the arc quenching chamber may be performed, without any problemy, by the user himself.

PACKING AND TRANSPORT REGULATIONS

a) The packing takes place using non-returnable transport crates made available by the manufacturer. The accessories to the switching device is stored in bags, the pull rods and the holders are packed as loose items.
b) The transport may be carried out using any available transport means, and also it is not necessary to protect the switching device against the surrounding atmosphere. However, it is necessary to protect the device against mechanical damage during the transport.

TYPE KBE 3 DISCONNECTOR OR LOAD DISCONNECTOR assembly arrangement with manually operated drive mechanism

Fig. 1

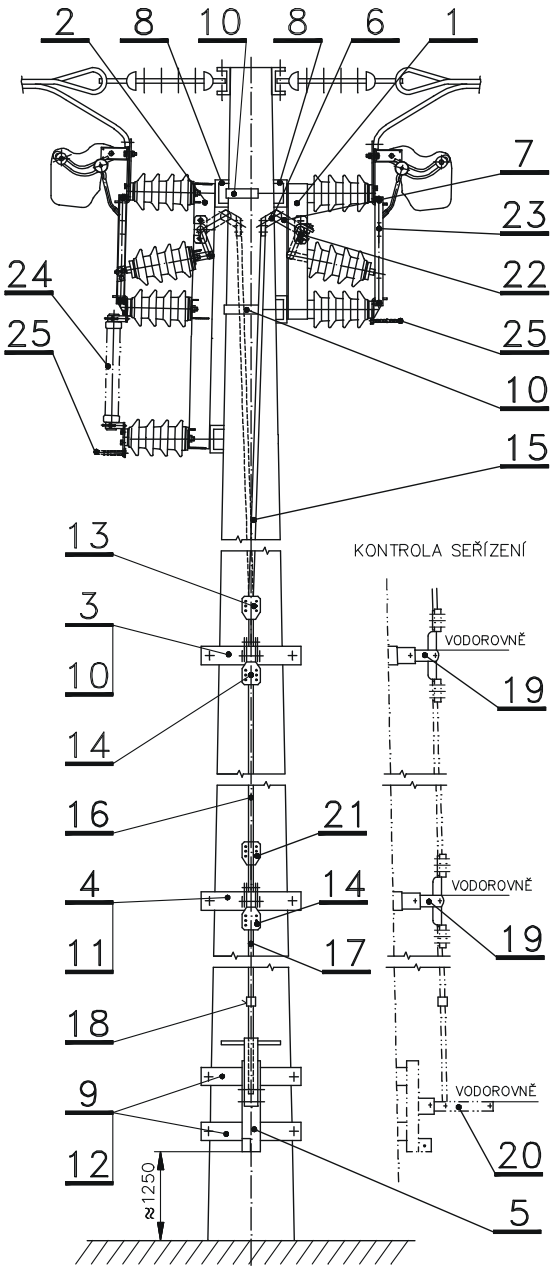


1 – the KBE 3D disconnector
2 - KBE 3P disconnector
1a - KBE 3S load disconnector
2a - KBE 3SP load disconnector
3 – upper rocking bearing
4 – lower rocking bearing
5 – manually operated drive mechanism
6 – skew clamping terminal with barrel-shaped sleeve
7 – cut-in lever on the disconnector shaft
8 – U8 holder
9 – fastening stirrup
10 - R130 sleeve
11 - R155 sleeve
12 - R178 sleeve
13 – single-arm clamping terminal with barrel-shaped sleeve
14 – double-arm clamping terminal
15 – upper control pull rod
16 – central control pull rod
17 – lower control pull rod
18 – coupling (pipe-shaped) on the drive mechanism pull rod
19 – bearing rocking lever
20 – drive mechanism manual lever
21- single-arm clamping terminal without barrel
22 – cam (of the disconnector)
23 – current-carrying contact knives
24 - fuse 2 – 100 A (being not a part of the delivery)
25 – earthing bolt (on request)

TYPE FLE S AMD FLE SP LOAD DISCONNECTOR
assembly arrangement of a system with manually operated drive mechanism

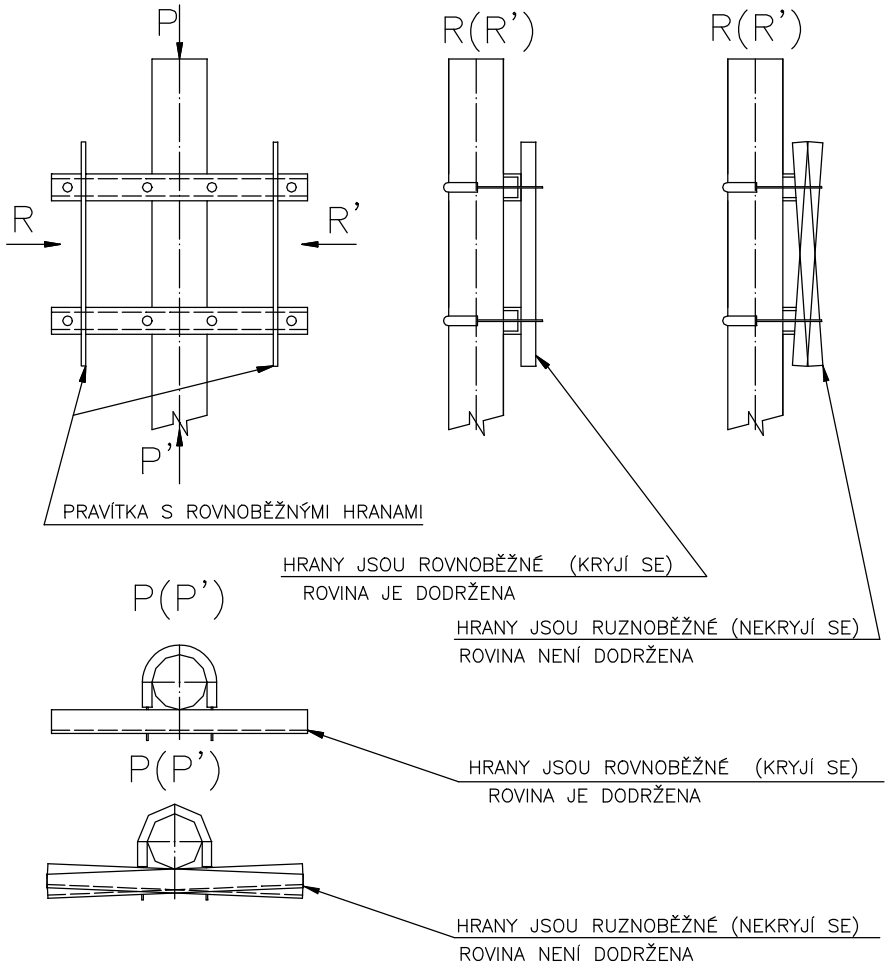
Fig. 1a

1. FLE S load disconnector
2. FLE SP load disconnector
3. Upper rocking bearing
4. Lower rocking bearing
5. Manually operated drive mechanism
6. Skew clamping terminal with barrel
7. Cut-in lever on the load disconnector shaft
8. U8 holder
9. Fastening stirrup
10. R 130 sleeve
11. R 155 sleeve
12. R 178 sleeve
13. Single-arm clamping terminal with barrel-type sleeve
14. Double-arm clamping terminal
15. Upper control pull rod
16. Central control pull rod
17. Lower control pull rod
18. Coupling on the drive pull rod
19. Bearing rocking lever
20. Manual lever of the drive mechanism
21. Signle-arm clamping terminal, without barrel
22. Load disconnector cam
23. Current-carrying contact knives
24. Fuse 2 - 100 A
    (being not a part of the delivery)
25. Earthing bolt (on request)



CHECKING THE HOLDERS PLANE

Fig. 2



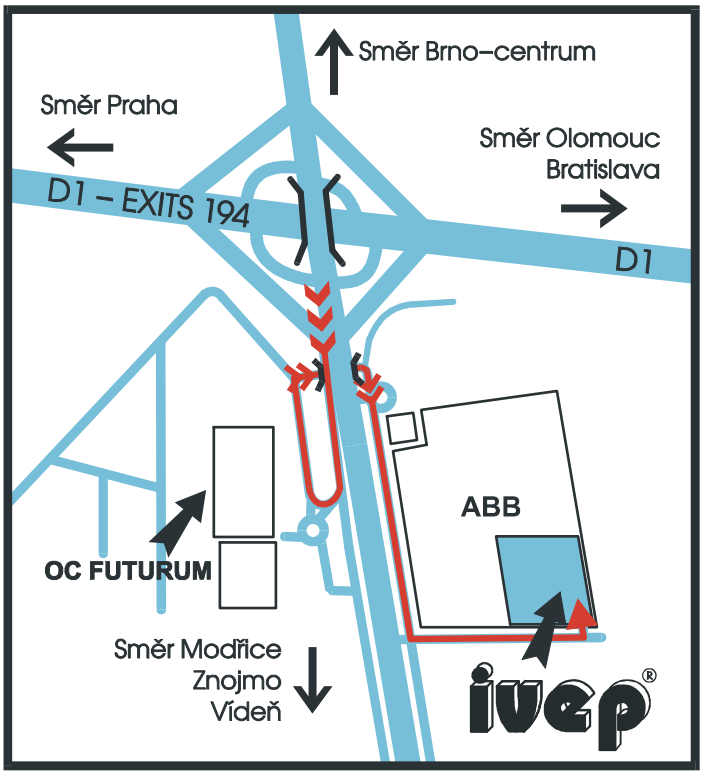
LIST OF ACCESSORIES

Item	Position	Title	No. of pcs
1.	3	upper rocking bearing with barrel	1
2.	4	lower rocking bearing without barrel	1
3.	5	manually operated drive mechanism	1
4.	6	skew clamping terminal with barrel	1
5.	8	U8 holder	2
6.	9	holder of the drive mechanism, complete	2
7.	10	R 130 sleeve, complete	3
8.	11	R 155 sleeve, complete	1
9.	12	R 178 sleeve, complete	2
10.	15	upper pull rod	1
11.	16	central pull rod	1
12.	17	lower pull rod with thread	1

The fuse insert (position 24) is not a part of the delivery. This component is supplied on customer request.

LIST OF TOOLS NECESSARY FOR MOUNTING

1.	ring spanner No.	19; 24
2.	open-end wrench No.	19; 24
3.	socket wrench No.	17 (16); 24; 30
4.	torque wrench	140 Nm, No. 24



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