ASSEMBLY AND MAINTENANCE INSTRUCTIONS

035a/11/2010-A

OUTDOOR SWITCH DISCONNECTOR

TYP **CUB 3**

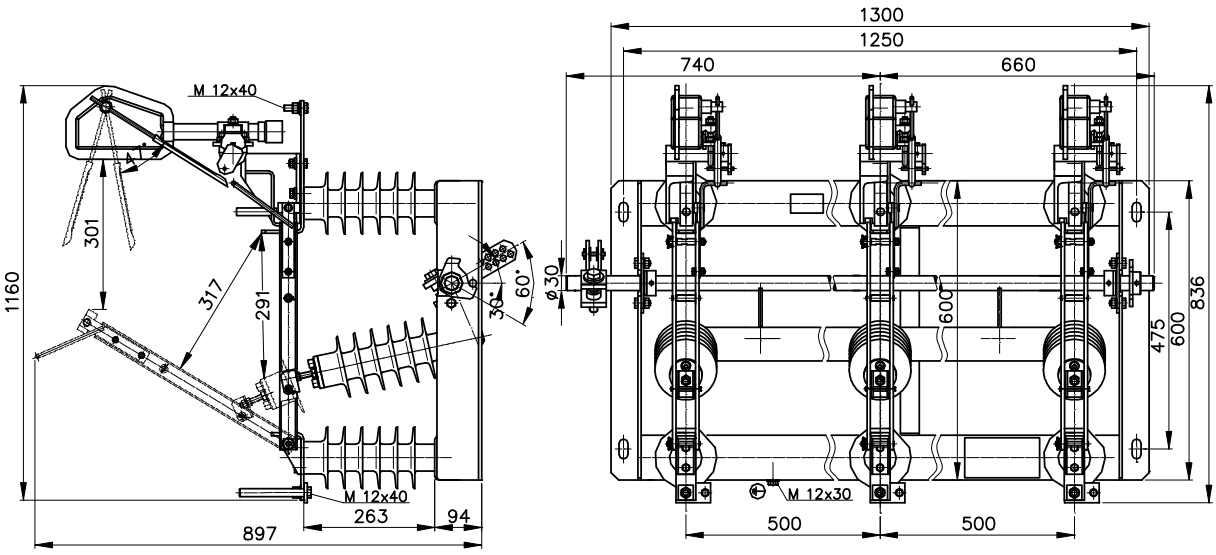
12, 25 a 38,5 kV, 400 A, 630 A

ISO 9001:2009
ISO 14001:2005

ivep®

THREE – POLE SWITCH DISCONNECTOR TYPE CUB 3

Vertical design, fixed poles, 1 pole with 3 insulators



ASSEMBLY RULES

Basic works on site consist in the following work steps:

- mounting and securing the switch disconnector, the drive and guiding bearings onto the pole;
- establishing of mechanical links between the switch disconnector and the control pull rod; adjustment of limit positions;
- connection of power lines and earthing conductors;
- earthing of the switch disconnector and the drive.

Mounting of switch disconnector

Switch 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. 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 double-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 switch 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

The CUB 3 switch disconnectors a switching device which necessitates 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).
The purpose of such a visual inspection is also the verification of the state of insulators.

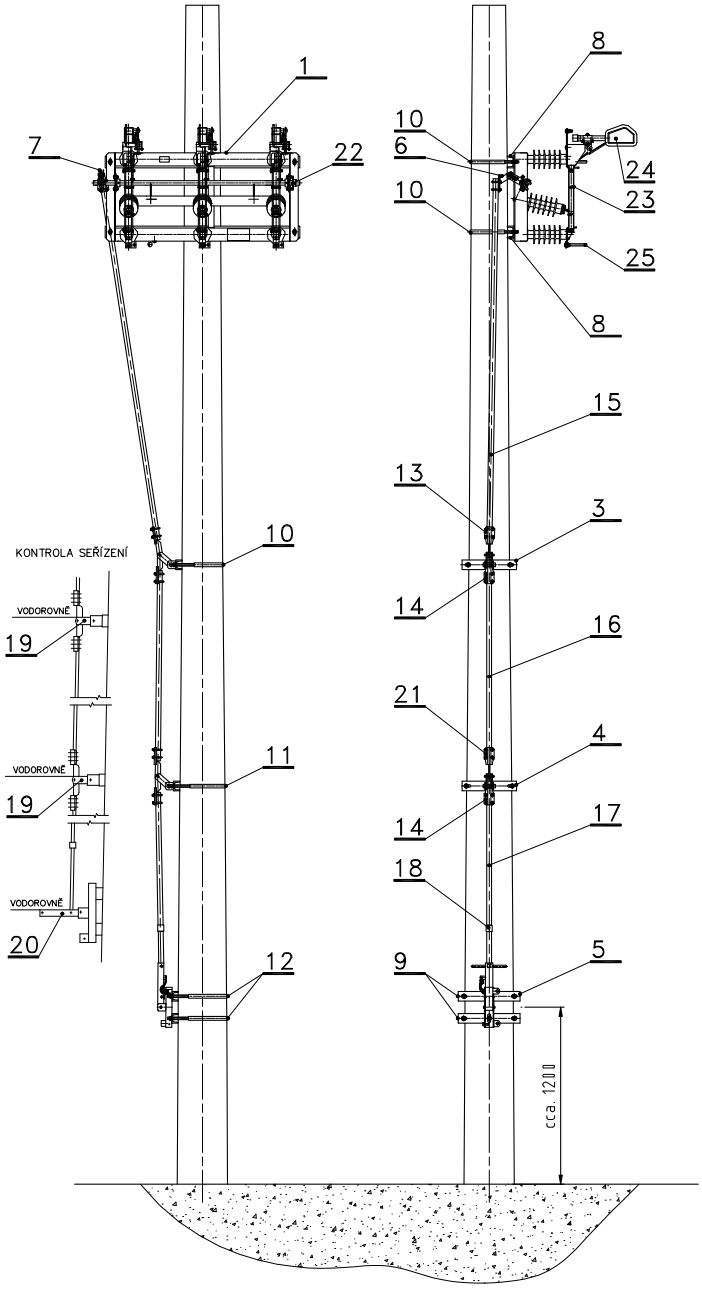
Section switches being out of operation for a longer period should regularly be switched ON and OFF in no-load state, which provides for the cleaning of the contact surfaces and enables to verify the correct mechanical operation of the switching device.

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 bearings, cleaning and greasing with the „plastic MOGUL G 3 grease (to ČSN 656912).
c) Inspection of the state of supporting and tensile insulators. Cleaning of the insulators.
d) Verification of the mechanical operation of both the drive mechanism and the section switch.

TYPICAL ARRANGEMENT OF SWITCH DISCONNECTOR TYPE CUB 3

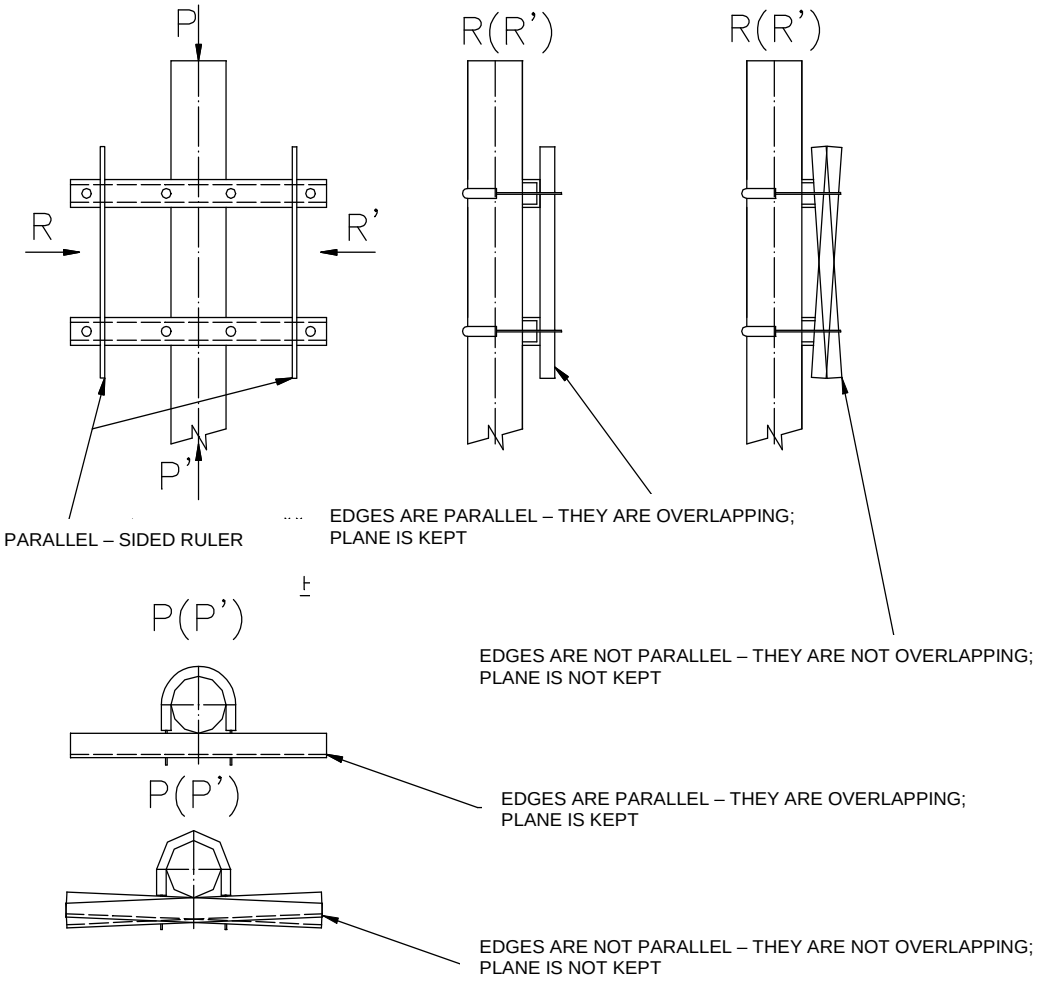
Fig. 1



1 – CUB 3 load-disconnector
3 – upper rocker bearing
4 – rocker bearing
5 – hand operated drive
6 - inclined clamping terminal with barrel
7 – penetrating lever on disconnector shaft
8 - holder of load-disconnector
9 – fastening yoke
10 - R130 sleeve
11 - R150 sleeve
12 - R178 sleeve
13 – single-arm clamping terminal with barrel
14 – double-arm clamping terminal
15 – upper position operating pull rod
16 - medium position operating pull rod
17 – bottom position operating pull rod
18 – coupling piece on the drive pull rod
19 – swinging handle of the bearing
20 – drive operating manual handle
21 – single-arm clamping terminal without barrel
22 – disconnector cam
23 – current carrying knives
24 – breaking chamber
25 – earthing clamping terminal

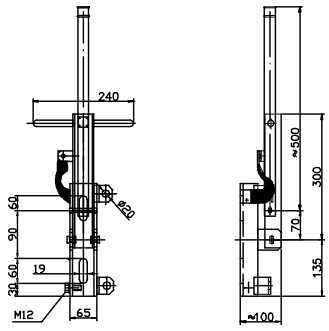
CHECKING THE HOLDERS PLANE

Fig. 2



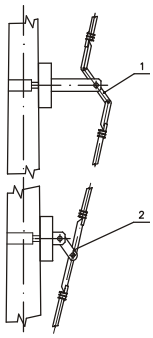
MANUAL DRIVE MECHANISM

Fig. 3



TYPES OF SUPPORTING BEARINGS USED

Fig. 4



1 – Turn-round bearing
2 – Rocking bearing

PACKING AND TRANSPORT REGULATIONS

a) The packing takes place using transport crates made available by the manufacturer. During the transport the section switch is in ON switching position.
b) The transport may be carried out using any available transport means.
c) During the transport it is not necessary to protect the switching device against the atmosphere. Take care when depositioning the device. It is forbidden to unload the device by leaning it on the contact horns or other parts of the contact system.
d) The assembly procedures when mounting the section switch on the pole are described in the „Assembly rules“ section.

LIST OF TOOL 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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