

Operation and Maintenance Instruction

Current Collector rack out device

3,3 kV-System

Baoshan

The current collector rack-out device is used for isolating the crane electrically from the live conductor rail. At the same time it must in particular be ensured that the work cycles rack-out and rack-in take place at two different points in the 3.3 kV high voltage system. In this connection the conductor rail system can be considered as a busbar and the lowerable phase current collectors can be regarded as isolating switches.

Particular note should be taken of the fact that the contact conductor system as such, at a service voltage of 3.3 kV, is not protected from accidental touching!

The rack-out frame of the current collector rack-out device can be secured in two positions, making use of the Castell lock provided by the customer. It must be ensured that for the isolating switch on the crane and for the rack-out device (Castell lock) the same keys must be used and that the keys are not duplicated.

The phase current collectors are fastened to a carriage which can be moved on a bracket arm. The carriage can be locked in two positions by means of stop bolts, additional locking screws are provided as a safeguard. The whole of the sub-structure of the phase current collectors can be racked-in into the conductor rail and racked-out by means of the lifting device.

The earth current collector is rigidly mounted separately above the phase current collectors and remains always racked-in, even when the phase current collectors are racked-out. The earth current collector is to be racked-in and racked-out manually. All work on the protective conductor current collector is to be carried out with racked-out phase current collectors, attention being paid to the safety precautions necessary for this.

As a matter of principle, in the case of the current collector rack-out device a distinction can be made between two positions and/or operating conditions:

- upper end position, i.e. the current collector is racked-in and is located in its normal operating position.
- bottom end position, i.e. the current collector is released and is located in its maintenance position,

intermediate positions are to be avoided. The rack-out device is to be interlocked in the particular end position by means of a Castell lock. Changes of position are only to be made with due regard to all the relevant safety precautions and regulations.

The setting, i.e. the operating condition, of the current collector rack-out device is, in each case, to be carried out with the inclusion of the following steps ⇒

- General basic safety rules for work on electrical equipment:

all work in the high-voltage range and/or on parts of the 3.3 kV system must be carried out with due regard being given to VDE regulation 0105 T1 Para. 9, Operation of High-voltage units, exclusively by qualified personnel authorised for the purpose.

● isolating from voltage:

- isolating
- securing against switching-on again
- checking to ensure that de-energised
- earthing and short-circuiting
- covering or fencing-off of adjacent live parts

● energising:

- in the reverse order

Racking-out of the current collectors:

- the crane-side 3.3 kV unit part, is to be de-energised by means of the power switch
- the crane-side 3.3 kV unit part, is to be secured against switching-on again by removal of the key on the power switch.
- before the start of the racking-out of the phase current collectors the plastic push-in panels are to be removed from their holders.
- the interlocking of the Castell lock is to be opened by means of the keys from the power switch
- the phase current collectors are to be lowered by means of the lifting device
- after the maintenance position has been reached the rack-out device is to be interlocked again by means of the Castell lock.
- immediately after interlocking in the maintenance position the plastic push-in panels are to be pushed into the push-in openings provided for the purpose and to be secured (in accordance to drawing 08-S261-0293 page 2).
- the working room has to be protected through the installation of the side shields (in accordance to drawing 08-S261-0293 page 2).
- the safety precautions must on no account be removed while the current collector rack-out device is in the maintenance position
- the operating personnel must ensure that the relevant regulations for the handling of the high-voltage unit are adhered to at all times
- the earth current collector has to be in operation permanently while the phase current collectors are racked-out.

After the carrying out of the steps listed the crane is isolated from the live conductor rail (bus bar), spatial separation is possible as a result of the push-in plastic panels.

As an alternative to the steps mentioned, with due regard being given to the relevant regulations, the whole 3.3 kV system can also be de-energised.

For all work on the protective conductor current collector the steps listed above must at all costs be carried out beforehand.

There has to be taken care that the earth current collector resp. the earth circuit hastens after to the face current collectors racking-out resp. opening.

Racking-in of the phase current collectors:

since for the racking-in of the current collectors, due to unit-induced tolerances, safe insertion of the current collector heads is not reliably ensured, there is a need to be able to access the contact conductor system. For this reason, the 3.3 kV system is to be completely de-energised during the racking-in process.

- The complete 3.3 kV conductor rail system is to be de-energised for the duration of the racking-in process. For this the above listed safety rules are to be observed as a matter of principle.
- the earth circuit must be closed, this means for example there has to be ensured that the earth current collector is in operating, before further steps are done.
- only after the ascertaining of de-energised state and the short-circuiting of the conductor rail (bus bar) may the side shields and the plastic push-in panels be taken out.
- the interlock of the Castell lock is to be opened before a start can be made on the lifting of the rack-out frame.
- the rack-out frame is lifted with the help of the lifting device until the current collector heads, with slight pressure, sit firmly on the conductor rail or possibly already engage in the slotted aperture. Before the operating position is reached a visual check must be made to see whether all the current collector heads are engaging into the slotted aperture of the conductor rail. Should this not be the case the current collector heads are to be manually adjusted. For this purpose, if necessary, the access flap on the phase contact conductors can be opened. This is to be closed, i.e. bolted down again immediately after the completion of the engaging.
- once all the current collector heads have been exactly adjusted, the rack-out frame, with the help of the lifting device, is to be lifted up again as far as the operating position.
- after the operating position has been reached the Castell lock is to be interlocked.
- immediately after the interlocking of the Castell lock the plastic push-in panels are to be placed upright in their holders.
- after that with the help of the keys which are to be removed from the Castell lock, the interlock of the crane-side power switch can be opened.
- after the completion of these steps and the checking of all the cranes which are connected to the common conductor rail (bus bar), the 3.3 kV conductor rail system can, all the relevant regulations being observed, be switched on again.

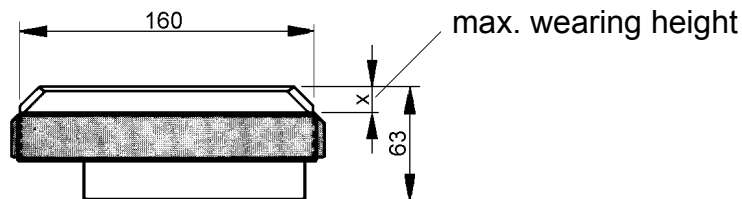
Checks on the conductor rail system and / or the current collectors during operation:

- during the first year of operation we recommend:

checking all the carbon brushes for wear approx. every 3 weeks , when the maximum wear level is reached the carbon brushes are to be replaced.

If, besides a high degree of wear, an unusual appearance (striation or suchlike) of the contact face becomes evident, developments are to be observed and the conductor rail system is possibly to be checked for assembly errors.

Carbon brush 081003 (with insulation shroud for 250 Amps)



- after the first year of operation or, rather, once constant wear figures have become established the checking intervals can be fixed or extended in accordance with the fixed wear period.
- during every test process the current collectors are to be checked with regard to the ease of movement and the wear features. In the case of an appropriate condition, either the whole current collector or possibly the affected part is to be replaced.
- the whole rack-out device is to be serviced at least once a year (if practice reveals the necessity of shorter intervals, shorter intervals are to be chosen) in the following way:
 - greasing of the slide rails
 - check on wear on the guide rollers
 - tightening up of all bolts and nuts
 - checking and ensuring of the ease of motion and the functional movements
 - removal of dust deposits and contamination which detrimentally affect functionality and/or safety.

For the replacement of parts or assemblies only **wampfler** original parts or assemblies are to be used.