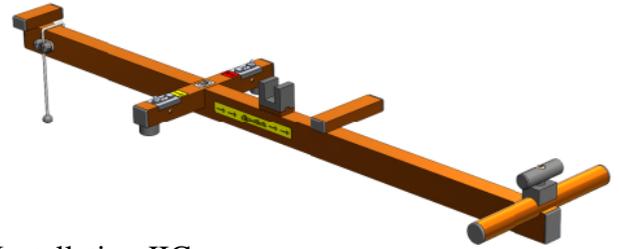


INSTALLATION INSTRUCTION

SECTION INSULATOR HSD3 / HS 25 / HSD 25 / HL 25

V 2017/02



Installation JIG:

Item no. 655.540.002 (25 kV version)

item no. 655.540.004 (HSD3)

Accessories for installation of the FLURY section insulator

- 1 Spring balance (item no. 655.181.000)
- 1 Open-end wrench
- 1 Torque wrench 17 mm (50 Nm) (item no. 655.114.000)
- 1 Installation JIG (item no 655.540.002 or item no. 655.540.004)
- 1 Adjustable spirit level (item no 655.141.000)
- 1 Alignment bar for JIG (item no. 696.016.010)
- 1 Metal cutter (+ possibly 1 metal cutting saw)

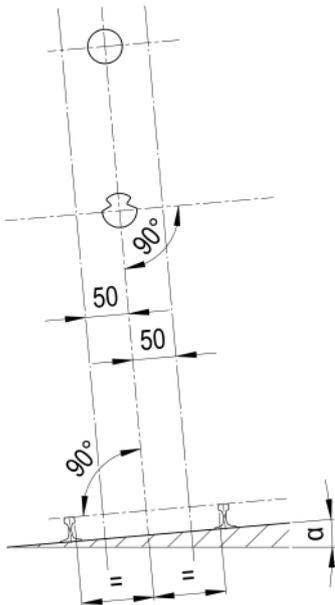
- 1 Hammer
- 1 Flat nose pliers and gas pliers
- 1 Straightening tool
- 1 Measuring scale

- 1 Pulley block with 2 cable sockets (mounting dead end clamps) for:
 - *Cut-in the messenger wire insulator*
 - *Replacement of a used section insulator*

Preparation of contact and messenger wire

Straighten the contact wire at the installation location and make sure it is not twisted.

Each section insulator should be well centred and aligned parallel to the track.



Align the contact wire and the messenger wire in the middle of the track (+/- 50 mm).

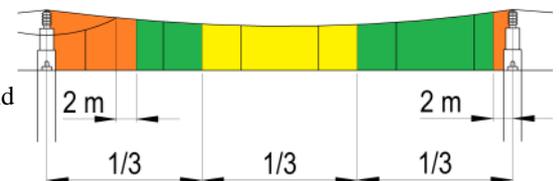
Contact wire and the messenger wire must be positioned vertically above each other).

Installation location

The section insulator is preferably installed in the green zone, at least 2 m away from the guide arm or stitch wire. The yellow zone is less optimal and the orange zone is least recommendable.

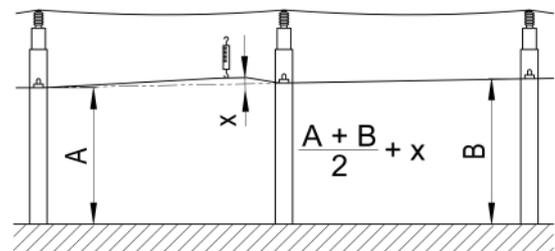
with Y-wire without Y-wire

The sloping angle of the messenger wire insulator should not exceed 5° if saddle clamps are able to glide.



Hogging

In case the section insulator is installed at a new location, use a spring balance and pull the contact wire with 120 N- 150 N to measure the possible excess height (value x).



When replacing an existing section insulator measure the height of the contact wire at masts A and B. Calculate the average value. The hogging value should be minimum $x = 70$ mm.

! RISK OF DEATH !

Before start working in the overhead line:
Make sure that the overhead line is switched off and correctly grounded on both sides in the distance of at least 70 m!

1. Adjust the level of the JIG



Measure the inclination with an adjustable spirit level with rotatable indicator.



Place the JIG with red side to the installation direction. Adjust the spirit level for the red side.

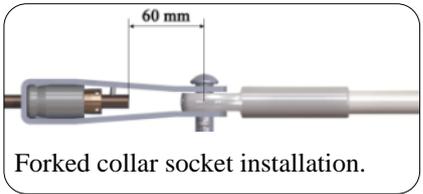
Turn the JIG 180° and place the JIG with yellow side to the installation direction. Adjust the spirit level for the yellow side.



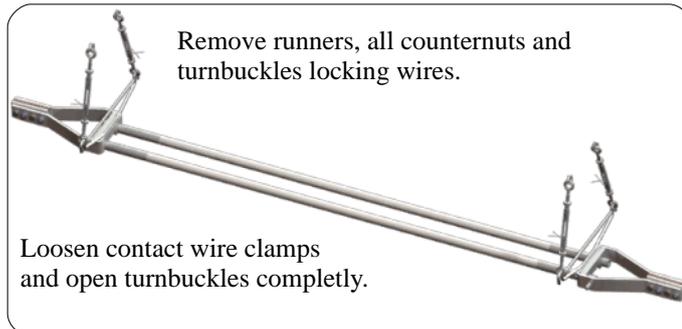
2. Install Messenger Wire Insulator



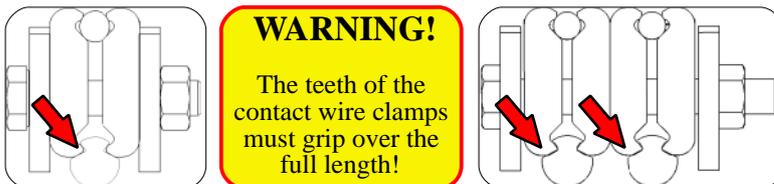
First install the messenger wire insulator with saddle clamp and cable hangers.



3. Prepare Section Insulator



4. Mount Section Insulator onto contact wire without runners



Tighten the bolts of the contact wire clamps with 50 Nm by using a torque wrench and retighten 2 times (until every bolt is tightened 3 times in total).



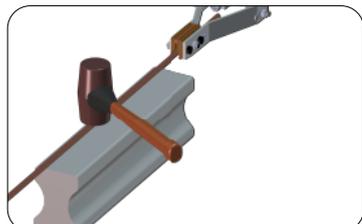
5. Cut contact wire



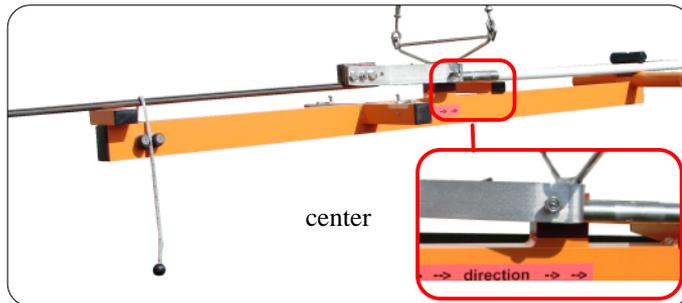
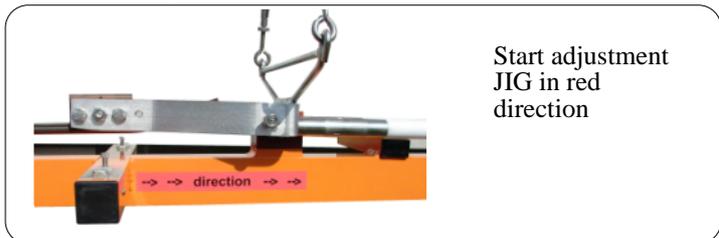
6. Bend contact wire ends up 30 - 45°



7. Repair buckling



8. Montage des JIG



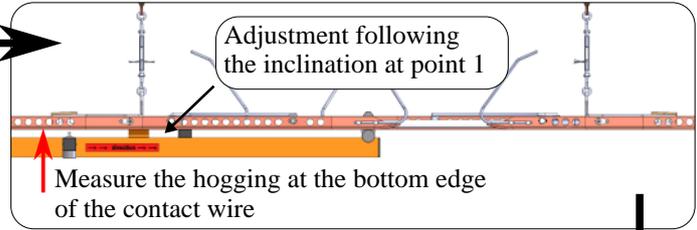
9a. Hogging and runner installation



Hang the runners temporarily onto the section insulator body to reach the overall weight.

Add suspensions and adjust the section insulator height by value x according to Hogging Instruction on page 1. (if not known value = 70 mm).

Tighten hanger clamp after hogging.



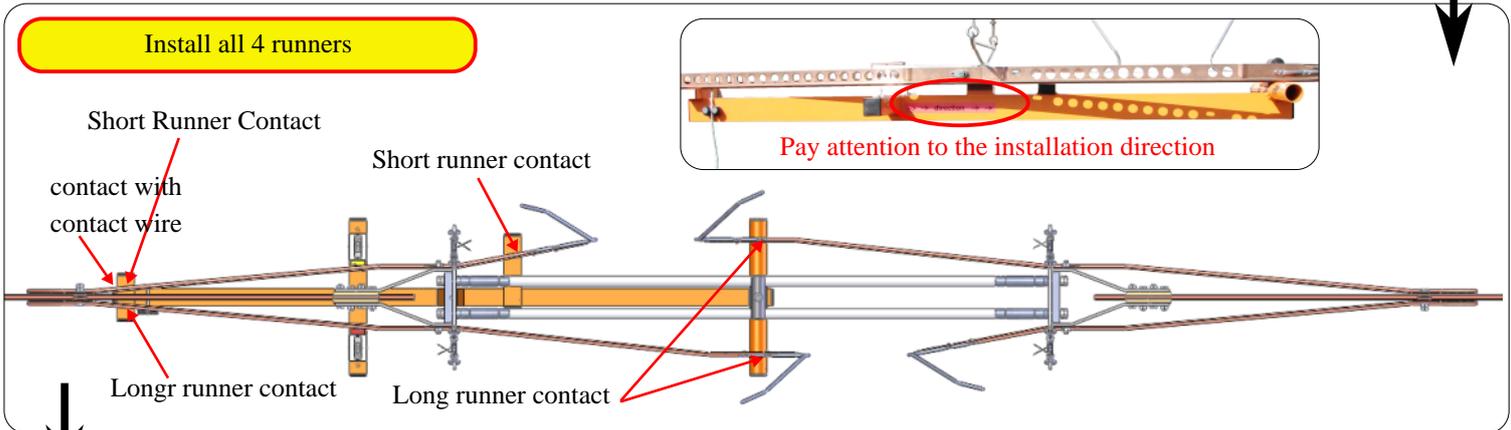
Adjustment following the inclination at point 1

Measure the hogging at the bottom edge of the contact wire



Fine adjustment
Set the insulator-body parallel to the track by using the spirit level on the JIG.

Install all 4 runners



Short Runner Contact

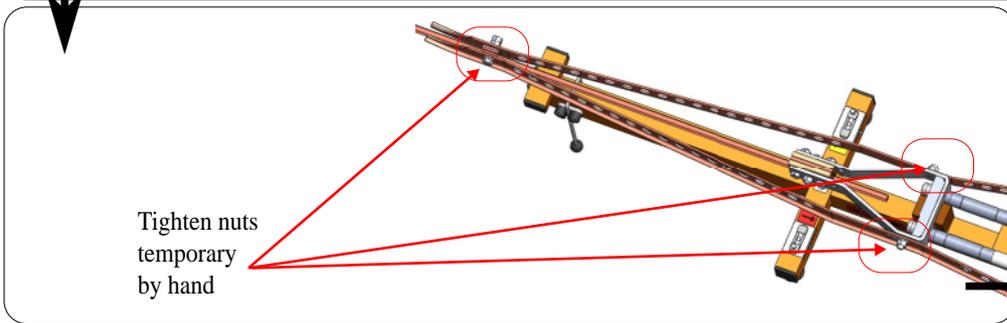
Short runner contact

contact with contact wire

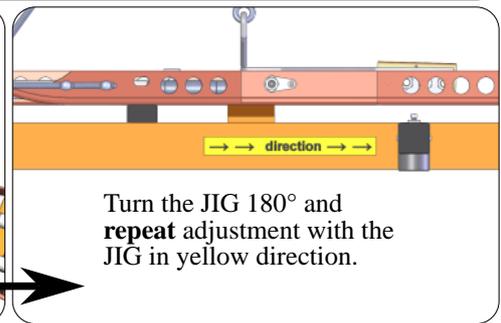
Long runner contact

Long runner contact

Pay attention to the installation direction

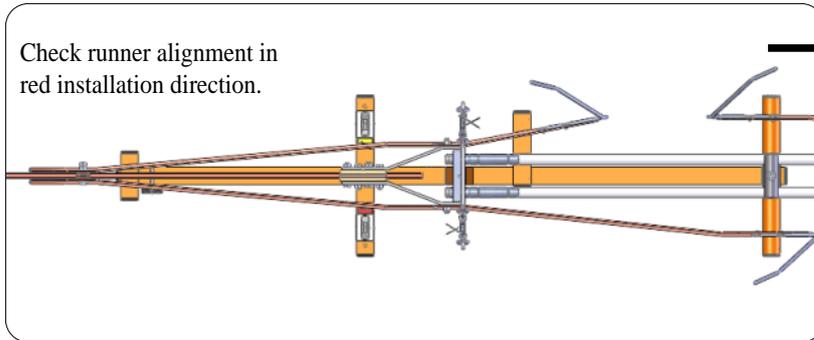


Tighten nuts temporary by hand



Turn the JIG 180° and repeat adjustment with the JIG in yellow direction.

9b. Tighten the runner fixation

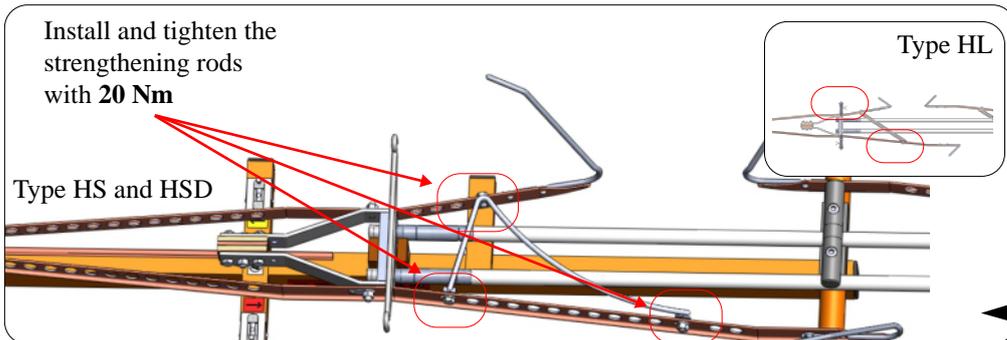


Check runner alignment in red installation direction.



Tighten nut with 50 Nm and block with second counternut.

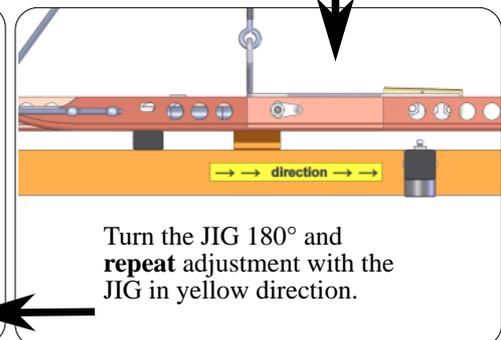
Tighten Nuts with 50 Nm



Install and tighten the strengthening rods with 20 Nm

Type HS and HSD

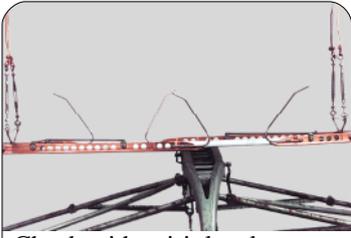
Type HL



Turn the JIG 180° and repeat adjustment with the JIG in yellow direction.



10. Check gliding



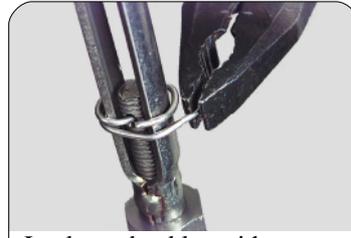
Check with spirit level or pantograph for optimal gliding

11. Block turnbuckles



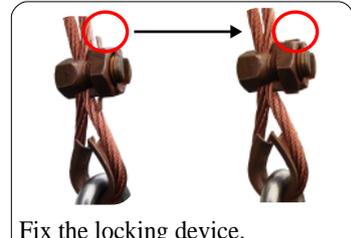
Check all counter nuts once more. Block turnbuckles with counter nuts.

12. Secure turnbuckles



Lock turnbuckles with a locking wire.

13. Secure hanger clamp



Fix the locking device.

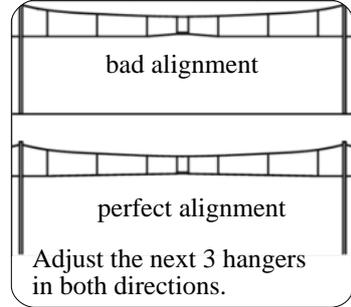


After complete hogging and fine adjustment (red and yellow) cut the excess hanger wire.

Caution! Danger of accident if these points are not observed:

- The contact wire and messenger wire must be positioned vertically above each other at the installation location. Otherwise the hangers are not equally tensioned and optimal functioning is impossible. In extreme cases it may even occur that the pantograph hooks into the runners at the air gap which leads to damage.
- The bolts at the contact wire clamps must be retightened three times. Otherwise the teeth do not grip the contact wire material completely. The contact wire could otherwise slide out later and falling parts could cause damage of material or even injure people.
- The bolts must be restrained with a ring wrench when tightening the counter nuts of the contact wire clamps. The screws could otherwise loosen when tightening the counter nuts and this could cause the contact wire to slide out, damaging material and injuring people.
- The runners of the section insulator must be correctly adjusted as described. Otherwise shocks might damage the section insulator or the pantographs.
- Turnbuckles must be locked with counter nuts and secured with locking wires. These could otherwise open and the resulting incorrect position of the section insulator could cause malfunction of the overhead line.
- All screws and nuts must be tightened correctly according to the description. They could otherwise become loosened by vibration and cause malfunction of the overhead line.
- Should the protective plastic finish of Silicone or PTFE of one of our insulators be so severely damaged, either that the glass fiber inside is visible or that humidity and dirt can obviously penetrate, the insulator must be replaced immediately. Otherwise a high-voltage flash-over could damage the insulator and the overhead line.
- **Arthur Flury AG rejects responsibility for any damage caused by not observing this installation instruction.**

14. Check alignment



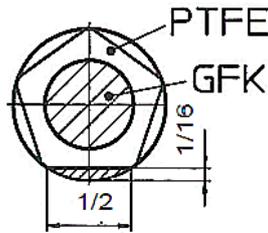
Maintenance and Service

You can find a detailed Maintenance Instruction under www.aflury.ch

A well adjusted section insulator of Arthur Flury AG does not require any maintenance for a long period of time.

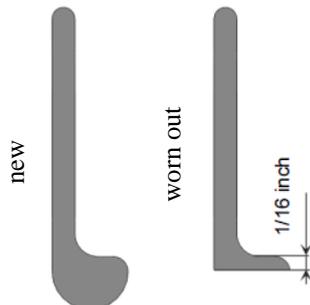
Insulator

In case of possible wear (max. 1/16 inch) the insulator rod can be turned by 2 marks at full mechanical load as follows: Use gas pliers to turn the steel sleeves, first on one side and then on the other side, each by 2 marks in the same direction. Tighten screws if they have been loosened by the turning process. The insulator can be used in 5 positions at most. After that it must be replaced. The insulator must be replaced if the GRP rod becomes visible through damage of the PTFE cover. The PTFE cover of the insulating rod is cleaned well enough by rain water under normal circumstances. In case of exceptionally strong dirt accumulation (for instance from frequent diesel traffic) we suggest cleaning the insulator every 2-3 years with our Special Cleaner for High Voltage Insulators (order no 655.168.000).



Runners

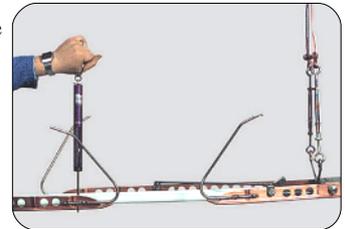
Well adjusted runners need to be checked first after approximately 200'000 to 300'000 passages of current collectors. Should the wear have reached the maximum value (bulb only 1/16 inch thick) the runners must be replaced.



Recommendations and Trouble shooting of AF Insulators

a) Notice:

A well adjusted section insulator can be raised by a spring balance at any extreme point of the runners (tips of runners at the arcing horns) applying 30 - 35 lbft without releasing the hanger load. If hangers get loose, the insulator must be hung higher step by step (each 1/2 inch) until it remains straight.



b) Performance:

The AF section insulator must provide a constant performance for passing pantograph and remain stable. Observe the suspension while passing current collectors. If it swings strongly or gets loose, the pantograph presses the section insulator too much and tries to lift it. In this case the section insulator must be positioned higher so that the suspension remains stable when being passed.

c) Excessive wear of runners:

It is a sign of inaccurate adjustment if the runners show excessive wear at the entry points. They must be readjusted according to the detailed installation instructions. Well adjusted runners show a constant wear from the beginning till the end of the section insulator.