

INSTALLATION INSTRUCTION

SECTION INSULATOR ZS / ZSD

Edition 2011/10



We recommend installation of the section insulator with the Flury Adjusting-JIG.

This allows a quick and a faultless installation.

ZS / ZSD 3: Article number 655.400.000

ZS / ZSD 15: Article number 655.400.001

Accessories for Installation of the FLURY Section Insulator

- 1 Ring spanner 17 mm
- 1 Torque wrench 16 and 17 mm (50 Nm)
- 1 Level gauge (item no 655.141.000)
- 1 Metal cutter (+ maybe 1 metal saw)
- 1 Straightening wood
- 1 Hammer
- 1 Flat nose pliers or gas pliers

- 1 Measuring scale
- 1 Spring balance (item no 655.181.000)
- 1 Fastening belt

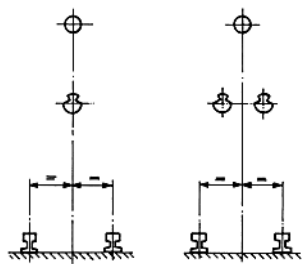
Additionally for:

- *Cut-in the messenger wire insulator*
- *Replacement of a used section insulator*
- 1 Pulley block with 2 cable sockets

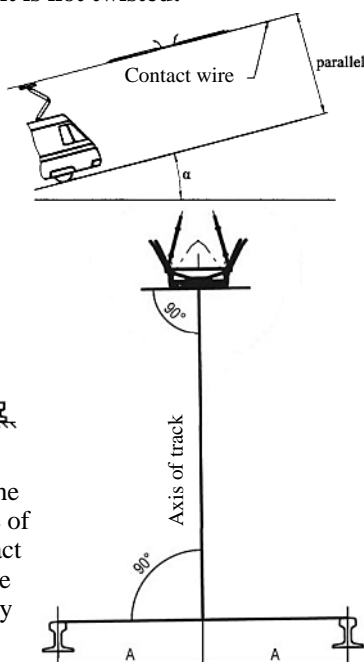
Preparation of contact and messenger wire

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

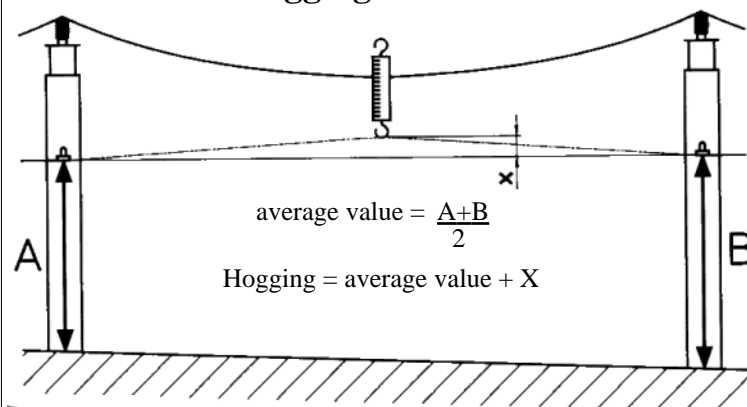
Each section insulator should be well centred and aligned parallel to the track.



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.



Hogging Instruction

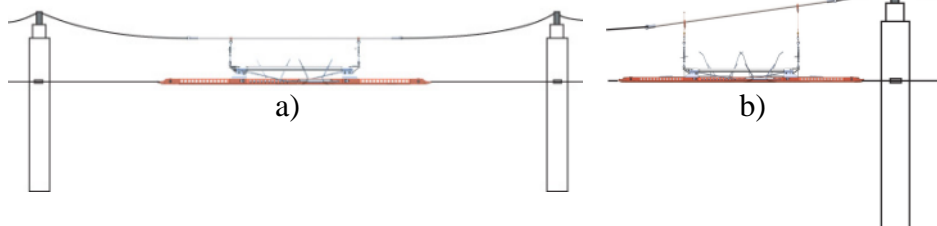


Measure the height of the contact wire at the guide arm clamps before (A) and after (B) the installation location. Calculate the average value. Use a spring balance and pull the contact wire with 120 N - 150 N to measure the possible excess height (value x)



Installation Location

- a) In autotensioned systems, install the section insulator mid span.
- b) If the messenger wire is fix terminated install the section insulator near to a cantilever. Mounting angle max. 5°.



1. Take the level of the track

Place the level gauge on the track as mentioned.

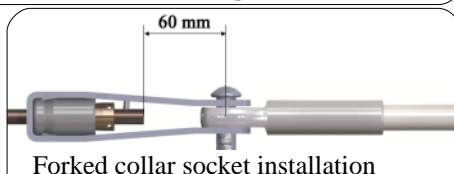


Measure the inclination of the track with a spirit level.

2. Install messenger wire insulator



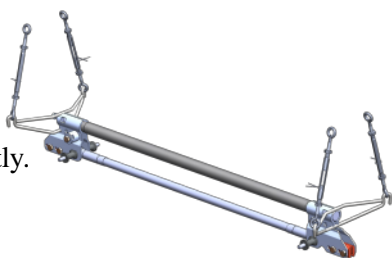
First install the messenger wire insulator with saddle clamp and cable hangers.



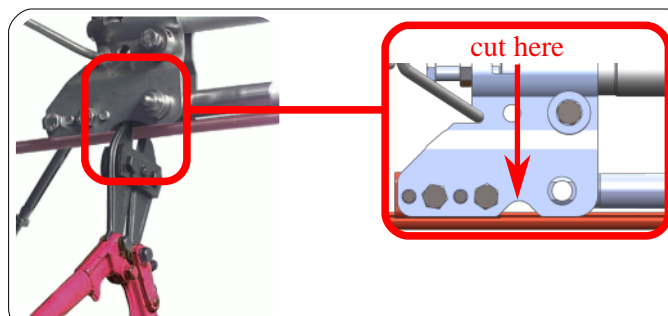
Forked collar socket installation

3. Preparation for installation

Take off the runners, the counter nuts and the safety wires of the turnbuckles. Loosen contact wire clamps and open turnbuckles completely. Renewed installation: Set the compression insulator to 0.



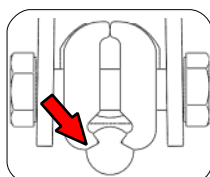
5. Cut contact wire



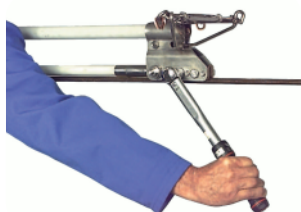
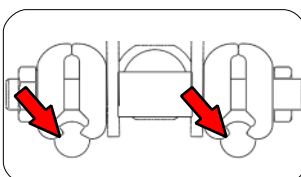
The ends of the contact wire should be bent upwards by using a hammer.

Buckling in contact wire can be repaired with hammer and straightening wood.

4. Mount Section Insulator onto contact wire (without runners)



Warning!
The teeth of the contact wire clamps must grip over the full length.



Tighten the contact wire clamps 3 times with 50 Nm.



With a fastening belt suspend the section insulator in the middle of the pressure insulator onto the messenger wire insulator.

6. Hogging



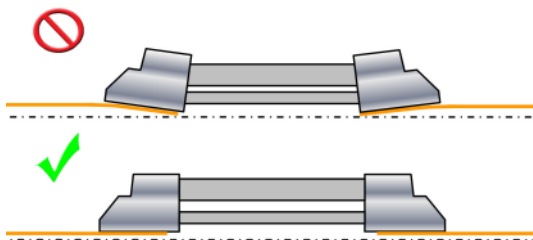
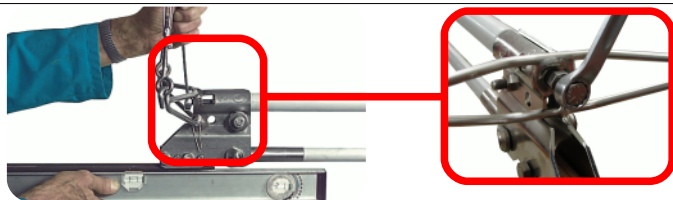
Add suspensions and adjust the section insulator height by value x according to Hogging Instruction on page 1. (if not known value = 70mm).

Hook the runners onto the pressure insulator for correct weight.

! RISK OF DEATH !

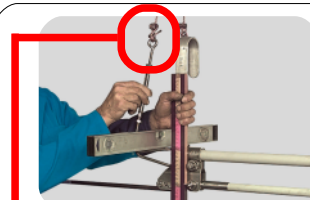
Do not begin to work on the overhead line before you have ensured that it is switched off and correctly grounded!

7. Adjust and check pretension

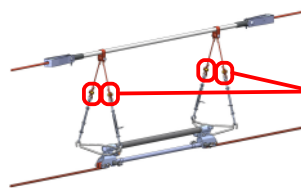


Adjust the pressure insulator so that the contact wire clamps hold the contact wire without deflection. Check with the level gauge. After that counter with the locking nut.

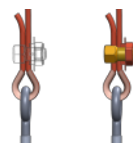
8. Mount and adjust suspension



Then adjust precisely. Set the insulator body parallel to the track by using a spirit level.



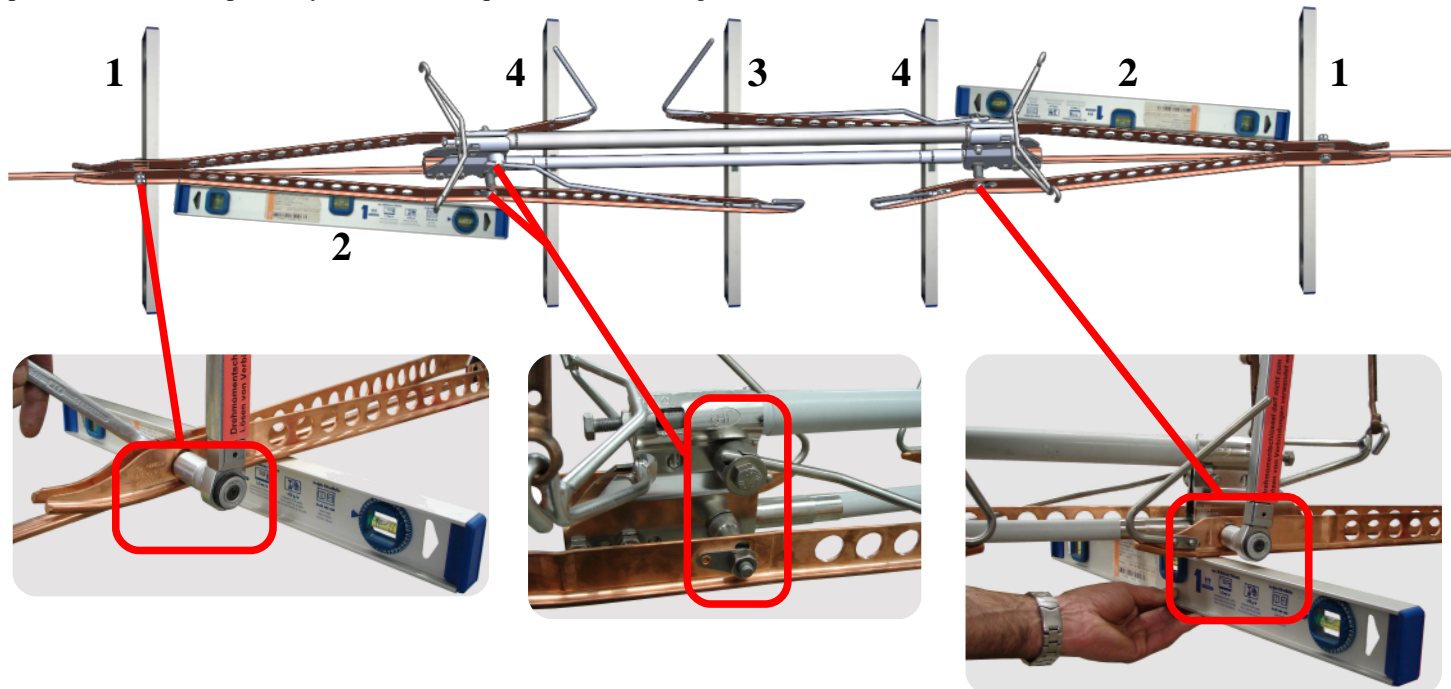
Same tension



Tighten hanger clamp after hogging.

9. Fix the runners

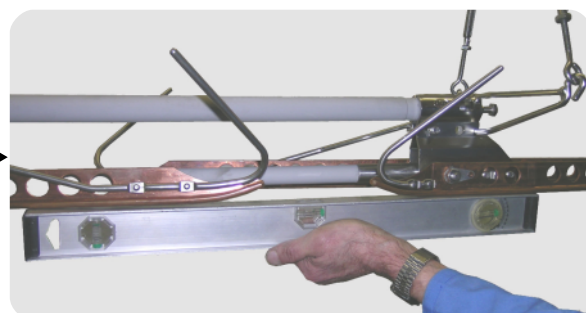
Mount the runners provisionally on the section insulator. Then, using a level gauge which is parallel to the track, position the runners precisely (follow the sequence 1 to 4) and tighten them with 50Nm.



10. Check runner setting



Parallel to the track
(point 1)



11. Check gliding



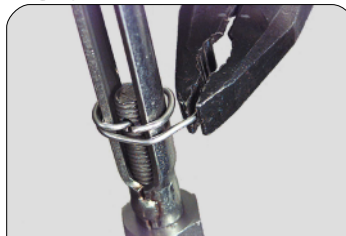
Check with spirit level or pantograph for optimal gliding

12. Block turnbuckles



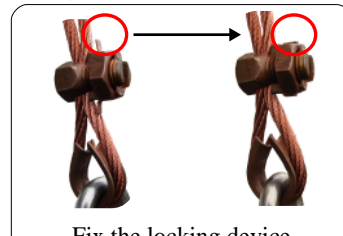
Check all conternuts once more. Block turnbuckles with conternuts.

13. Secure turnbuckles

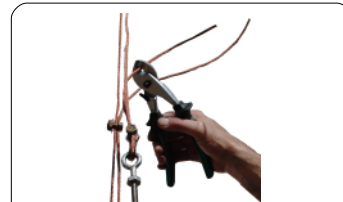


Lock turnbuckles with a locking wire.

14. Secure hanger clamp



Fix the locking device.

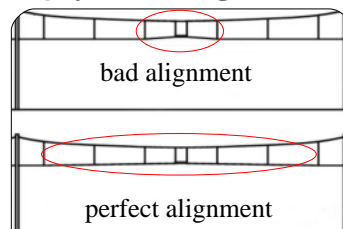


After complete hogging and fine adjustment (red and yellow) cut the unnecessary hanger rope.

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

- The contact wire and messenger wire must lay vertically on each other at the installation location. Otherwise the hangers are not under continuous tension and optimal functioning is impossible. In extreme cases it may even occur that the current collector hooks into the runners at the spark gap which leads to damage.
 - The screws 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 therefore slide out later and falling parts could cause damage of material or even injure people.
 - The screws must be restrained with a ring wrench when tightening the conternuts at the contact wire clamps. The screws could otherwise get loosened when tightening the conternuts and this could cause the contact wire to slide out, damage material and injure people.
 - The runners of the section insulator must be correctly adjusted as described. Otherwise shocks might damage the section insulator or the carbon sliders.
 - Turnbuckles must be locked with conternuts 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.**

15. Check alignment



Adjust the next 3 hangers in both directions.

Maintenance and Service

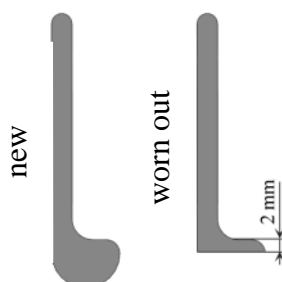
A well adjusted section insulator of Arthur Flury AG does not require any maintenance for a long period of time.

Insulator

The Insulator must be replaced if the GRP rod becomes visible through damage of the cover (silicone). The 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, installation in a tunnel) we suggest cleaning the insulator every 2 – 3 years with water slightly soaped water.

Runner

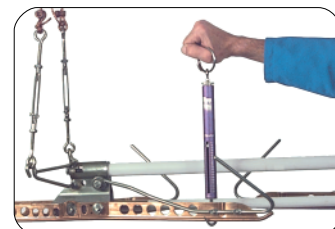
Well adjusted runners need to be checked first after approximately 200'000 to 300'000 passages of current collectors and to be readjusted in case of wear >3 mm. Should the wear have reached the maximum value (bulb only 1 – 2 mm thick) the runners must be replaced.



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 120 N without releasing the hanger load. If hangers get loose, the insulator must be hung higher step by step (each 10 mm) until it remains straight.



b) Performance:

The AF section insulator must provide a constant performance for passing current collectors 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 intake point. 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.

