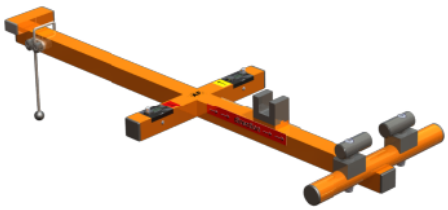
INSTALLATION INSTRUCTION

PHASE BREAK NS 25 Edition 2019/01



Install using the special AF JIG:
Article Number 655.900.000

Accessories for installation of the FLURY phase break

1 Spring balance (item no. 655.181.000)
1 Ring spanner 17 mm
1 Torque wrench 17 mm (50 Nm)
1 Flury-Adjusting JIG (item no 655.900.000)
1 Spirit level (item no 655.141.000)
1 Metal cutter (+ possibly 1 metal cutting saw)
1 Hammer
1 Flat nose pliers and gas pliers
1 Straightening tool
1 Measuring scale

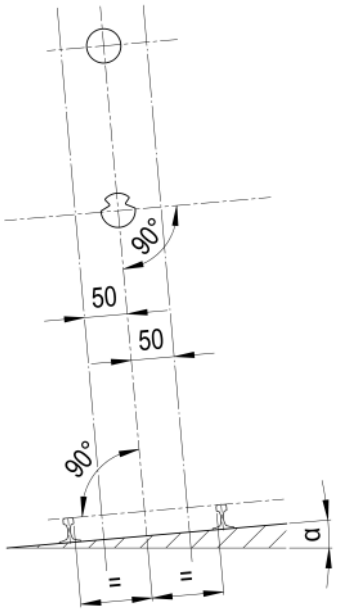
Additionally for:
- *Cut-in the messenger wire insulator*
- *Replace of a used phase break*

1 Pulley block with 2 cable sockets (mounting dead end clamps)

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.



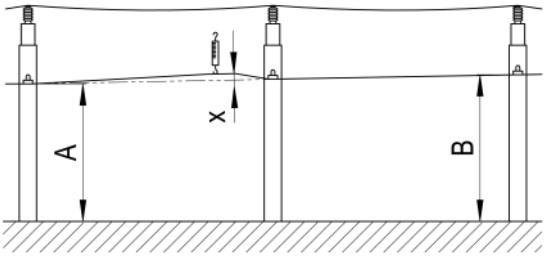
Align the contact wire and the messenger wire in the middle of the track (+/ 50 mm).

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

Hogging

In case the phase break is installed at a new location, use a spring balance and pull the contact wire with 120 N - 150 N to measure the excess height.

The hogging value should be double the excess height X evaluated with the spring balance.

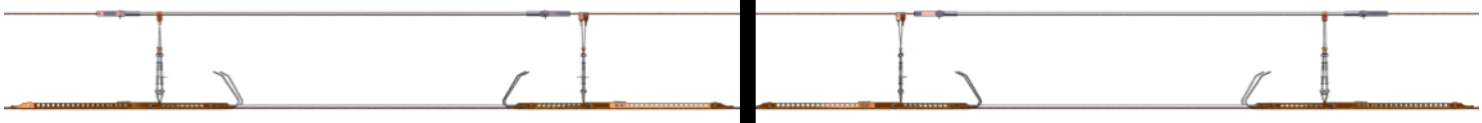


Hogging = 2 · X (should not be less than 100 mm).

When replacing an existing phase break measure the height of the contact wire at masts A and B. Calculate the average value.

The hogging value should be minimum = 100 mm.

Installation Location



Install the phase break elements
each right and left to a cantilever (see general layout).

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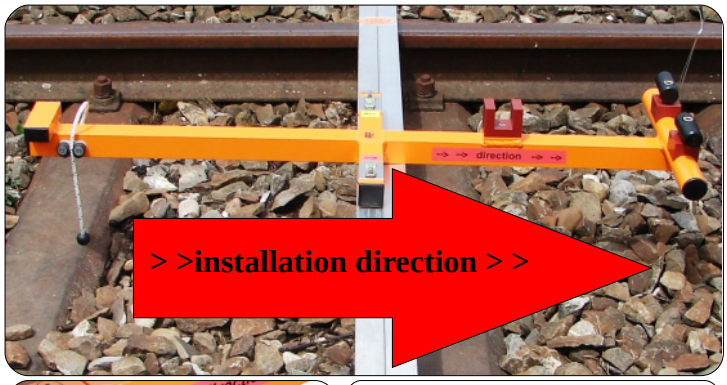
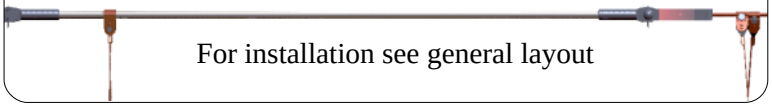
1. Adjust the level of the JIG



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

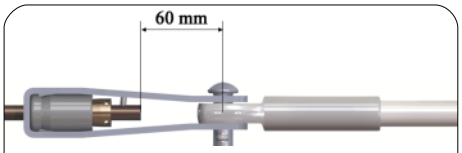
Turn the JIG **180°** and place the JIG with yellow side to the installation direction.
Adjust the spirit level for the yellow side.

2. Install Messenger Wire Insulator



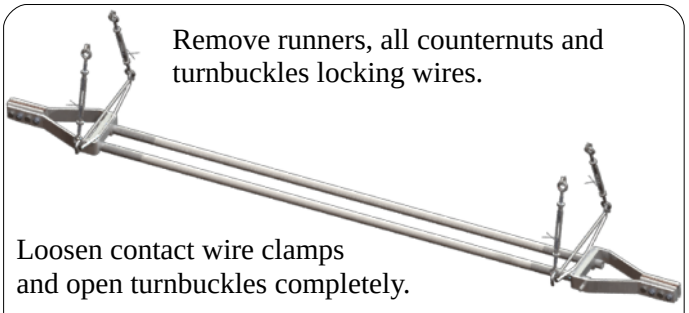
For installation see general layout

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



Forked collar socket installation.

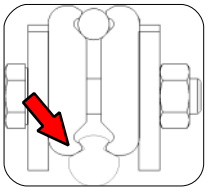
3. Prepare Section Insulator



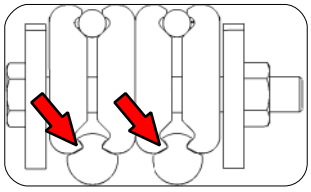
Remove runners, all counternuts and turnbuckles locking wires.

Loosen contact wire clamps and open turnbuckles completely.

4. Mount Section Insulator at contact wire.



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

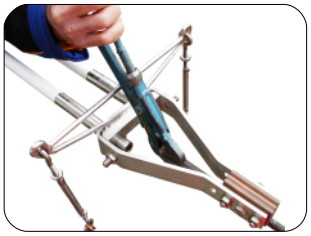


Tighten the bolts of the contact wire clamp **with 50 Nm** by using a tourque wrench and **retighten 3 times**.

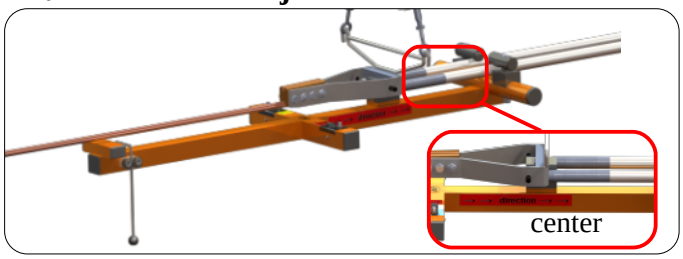
Mount counternuts (50 Nm)

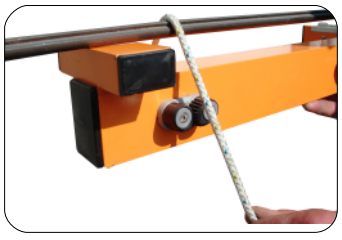
5. Cut contact wire

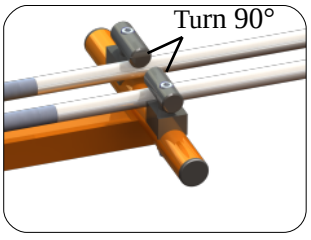
6. Bend contact wire ends up 30 - 45°



7. Mount the Adjustment JIG

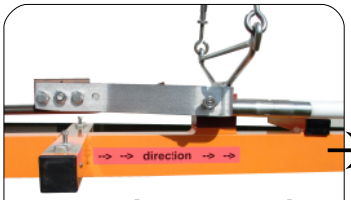




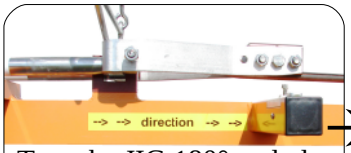


! RISK OF DEATH !
Do not begin to work on the overhead line before you have ensured that it is switched off and correctly grounded!

8. Suspend section insulator adjust hogging



Start adjustment with JIG in red direction.



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

Adjust the cantilever height as well.

Add suspensions and adjust the section insulator height by value according to hogging instruction on page 1. *(2 · X, minimum 100 mm)*

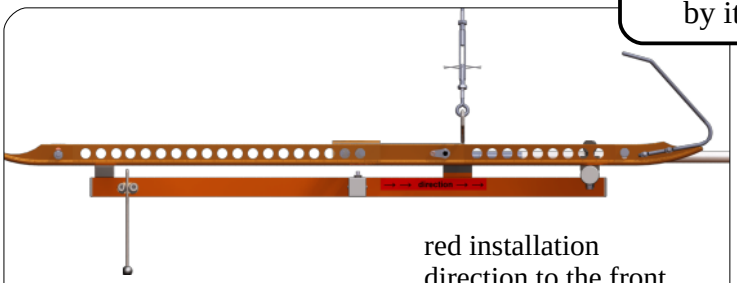
Tighten hanger clamp after hogging.

Fine adjustment

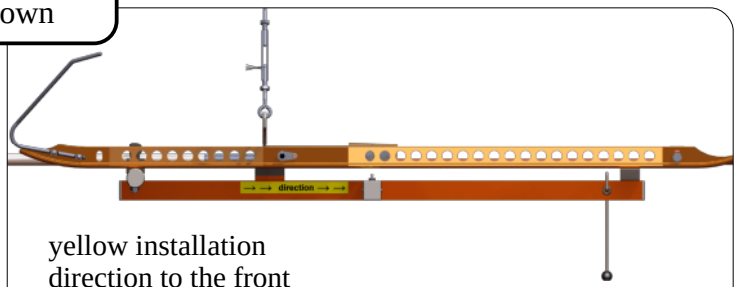
Set the insulator-body parallel to the track by using the spirit level on the JIG.

9. Runner installation

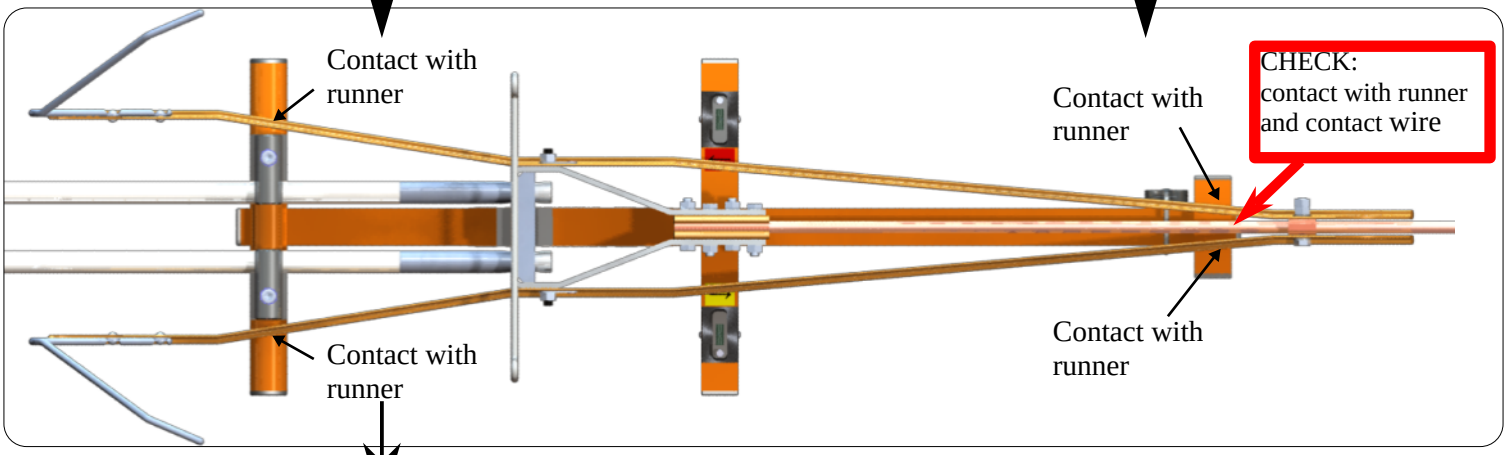
Install each side by it's own

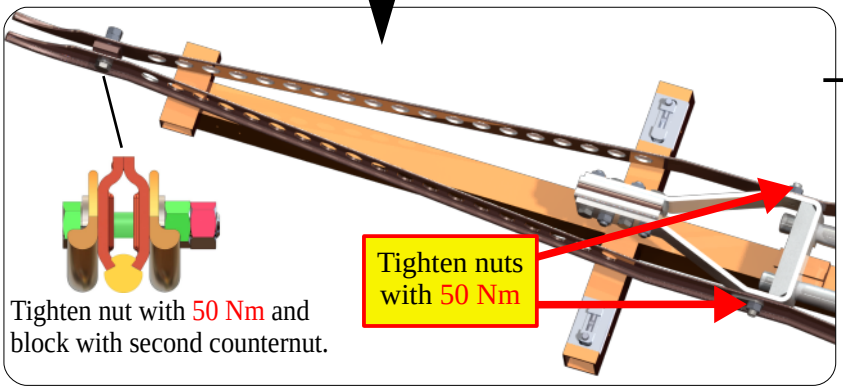


red installation direction to the front

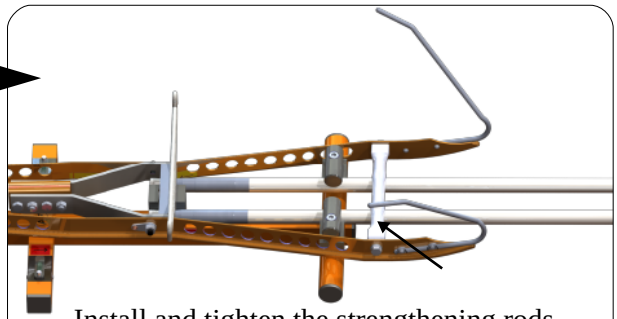


yellow installation direction to the front



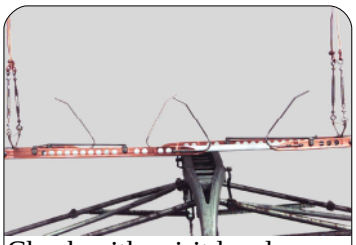


Tighten nut with 50 Nm and block with second counternut.



Install and tighten the strengthening rods with 50 Nm - counter with 20 Nm.

10. Check gliding



Check with spirit level or pantograph for optimal gliding.

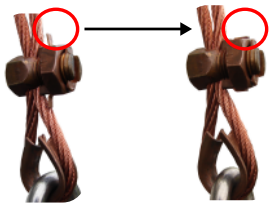
11. Block turnbuckles

Check all counternuts once more. Block turnbuckles with counternuts.

12. Secure turnbuckles

Lock turnbuckles with a locking wire.

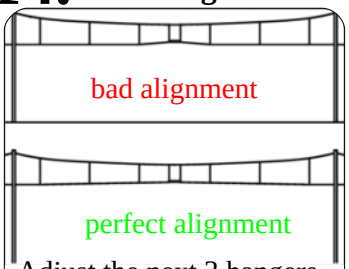
13. Secure hanger clamp



Fix the locking device.

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

14. Check alignment



Adjust the next 3 hangers in both directions.

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 counternuts at the contact wire clamps. The screws could otherwise get loosened when tightening the counternuts 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 counternuts 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.**

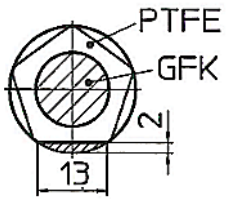
Maintenance and Service

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.

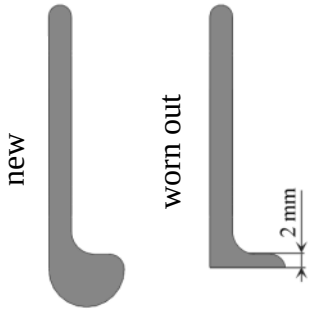
Insulator

In case of possible wear (max. 2 mm) the insulator rod can be turned by 2 marks at full mechanical load as follows:



Use a cylinder wrench 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 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.

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