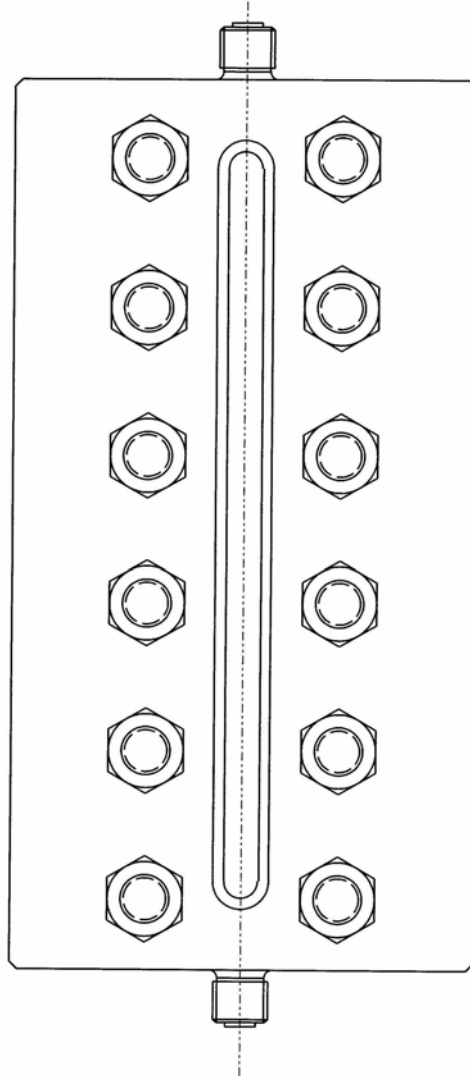


**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250****TA 120****120 bar, 323° C saturated steam**

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250**

1. Basic principles

On steam boilers at pressures above 35 bar, reflex glasses are rapidly worn out because of the high steam temperatures.

In consequence, liquid level gauges with smooth glasses are used for such conditions, the side exposed to steam being protected by mica shields. The final elements of the steam/water space in the centre-piece are therefore the micas.

Coloured liquids can easily be observed by passing a beam of light through the gauge, with water-clear liquids, however, the liquid level can only be made visible by reflecting a light source in the meniscus formed at the liquid surface.

For this purpose an illuminator is used, the light from which is projected at an angle from below into the liquid chamber.

Optimum visibility is obtained when the direction of observation relative to the liquid surface is symmetrical to the incoming ray of light; i.e. the angle between the light ray from the lamp and the liquid surface should be about to the angle between the liquid surface and the angle of observation. Small deviation are permissible, however, since the liquid surface is kept in motion by the condensate running down within the gauge so that a fairly large angle is created within which observation is still possible.

With vertically mounted gauges the correct observation point is usually found without difficulty in practice. If it is necessary to mount the gauge in an inclined position the angle of inclination should be as small as possible since otherwise points of observation may arise which cannot in fact be achieved in most boiler houses.

With correct observation the liquid surface can easily be seen as a bright band of light at distances up to about 20 m.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250****2. Glass breakages and their causes**

Glass breakages in type TA 120 gauges may result from the following causes:

- 2.1 Strong air-draughts (windows, lift doors etc. close to the gauge – in such cases the gauge should be screened).
- 2.2 Distorted cover plates and centre-piece: may be corrected by milling the surfaces.
- 2.3 Corroded cover plates and centre-piece: may be corrected by milling the surfaces.
- 2.4 Cushion gasket is too thick so that the glass projects beyond the cover plate. The glass is thereby exposed to the full bolt load and breaks.
The glass surface must in all cases be recessed by 0,15 – 0,35 mm.
- 2.5 Thermal shock caused by incorrect blowdown or by being taken into service too rapidly.
- 2.6 Cycling service conditions – e.g. sudden start-up of the boiler.
- 2.7 Glass has too little clearance in the glass recess and is clamped on start-up and breaks. The glass must be able to move slightly in all directions, preferably by a few tenths of a millimetre.
- 2.8 Cushion gasket is too long and tends to form corrugations. In this event the cushion gasket should be cut shorter with scissors: it may be 1 mm. shorter than the glass.
- 2.9 Distortion of the entire gauge through badly aligned boiler connections.
- 2.10 Use of graphite, Molykote etc. in order to prevent the cushion gasket from sticking – the coating is of uneven thickness and cushion gasket is thereby unevenly thickened.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
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TYPE TA 120 – PN 250****3. Glass corrosion and its causes**

Glass corrosion results from breakage of the mica shield, which may arise through the following causes:

- 3.1 The mica has been incorrectly installed – the better side (stamped with the word “Wasserseite”=“Waterside”) must always face towards the water chamber.
- 3.2 Our blow-down instructions (item 5.3) have not been properly observed – the mica is exposed to the full force of the steam jet.
- 3.3 Excessive torque – the sealing gasket is stressed beyond its maximum load-bearing capacity, flows outwards and inwards and tears or crushes the mica. Torque loading per bolt 300 Nm.
- 3.4 Use of Molykote etc. to prevent the sealing gasket from sticking. If, however, the gasket cannot grip, it begins to flow and tears or crushes the mica.
- 3.5 The mica shield is too thin – minimum thickness 0.3 mm.
- 3.6 The mica shield has been damaged by the edges of the cover plate. This is prevented by the use of a protective gasket (see enclosed description).

Note: the edges of the cover plate around the glass recess must always be well rounded off (see drawing on page 9).

- 3.7 As a naturally occurring substance mica is subject to greater variation in quality than industrially manufactured articles. Although we have very stringent tests it can happen that a hair-crack is present in the mica which becomes noticeable only when the gauge is taken into service.

4. Mounting on boiler

- 4.1 After insertion of graphite gasket, bolt gauge valves pressure-tight to boiler flanges.
- 4.2 After loosening the oval flanges the gauge can be turned to any desired position.
- 4.3 Adjustment of the illuminator and mirrors should be carried out by two fitters. It is advisable image is rapidly obtained.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250****5. Operating instruction**

5.1 After the gauge is first taken into service (also after replacement of packing sleeves or glasses) the cover nuts should be tightened to 300 Nm using a torque wrench and working at opposite sides alternately; the hexagon nuts for the securing bolts on the boiler flanges and the tightening nuts DVK/2 and Drain valve, should be moderately retightened with the cocks open. The packing sleeves must only be followed-up with the cocks in the open position.

5.2 Any leakages which arise in service should be put right as quickly as possible by re-tightening at the appropriate point.

5.3 The service life of the micas and thereby of the glasses may be beneficially influenced by correct blow-down.

The procedure is as follows:

Shut upper gauge cock and open drain cock to allow brief blow-through of the lower gauge cock.

The water in the gauge is thereby drawn out without the water chamber being completely pressure-relieved. On shutting the drain cock the water in the gauge is again pushed upwards. This opening and shutting of the drain cock should be repeated several times so that the water level in the gauge moves up and down and so cleans the mica of deposits. After shutting the upper and lower gauge cocks the gauge may be completely emptied of water by opening the drain cock.

To clean the bore of the upper gauge cock, the gauge should be completely emptied as described above, after which the drain cock should be shut and the upper gauge cock opened.

Before further blow-down the upper gauge cock must under all circumstances be shut and the procedure – as described above – be repeated.

This procedure ensures the maximum protection of the mica shields, which are highly stressed by the boiler pressure and by blow-down, and so extends their service life.

To further protect the mica, the period between blowdowns should be made as long as possible, which of course is dependent on the boiler water.

5.4 If the boiler is shut down for a lengthy period the gauge should be emptied by shutting the lower gauge cock and opening the drain cock.

Before putting into service again the lower gauge cock should be opened and the drain cock shut.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250****6. Dismantling and assembly instructions for gauge, gauge cocks and drain cock**

6.1 Replacement of glasses and mica shields (see drawings on pages 9 and 10)

6.2 Shut gauge cocks, empty gauge by opening drain cock, disconnect electrical supply and fixing screw for illuminator and lift off illuminator.

6.3 Remove hexagon nuts “13” and dismantle gauge.

6.4 Check centre-piece and cover plates with straight-edge.

There must be no unevenness caused by corrosion or distortion. Absolute cleanliness is essential when assembling the gauge.

6.5 There must be no trace of the previous cushion gasket on the cover plate – please clean carefully.

6.6 There must be no trace of the previous cushion gasket in the glass recess of the cover plate – please clean carefully

6.7 Using a clean cloth wipe off any impurities from the cushion gasket “8” and place it in the glass recess – do not use graphite, Molykote etc.

If the cushion gasket is too long and consequently tends to form corrugations it should be cut to the correct size with scissors. The cushion gasket may be about 1 mm. shorter than the glass “7”.

6.8 Insert glass “7”. It must lie loosely in the recess and must be able to move slightly in every direction, preferably a few tenths or a millimetre. Under no circumstances may it project beyond the cover plate “2”, but must be recessed by 0.1 – 0.4 mm.

6.9 Place protection gasket “11” and mica “10” on top. With marked micas the side stamped “Wasserseite” must face towards the centre-piece. Unstamped micas should be installed with the better side facing the centre-piece.

6.10 Clean sealing gasket “9” with a clean cloth and place on mica shield “10”. Do not use grease, Molykote, etc.

6.11 Place spacer gasket “6” on top.

6.12 Place centre-piece “1” on cover plate “2” – please watch correct position: (see drawing wT3047)

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
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TYPE TA 120 – PN 250**

6.13 The second cover plate should now be assembled as described above and placed on the centre-piece “1”.

6.14 Insert all body bolts “12” and lubricate threads with graphite or Molykote paste before screwing on the nuts.

The bolts should be tightened with a torque wrench (300 Nm per bolt) in the sequence shown on drawing page 9.

This torque must on no account be exceeded.

7. Basic information regarding service life of glasses.

The greatest enemy of micas and water level gauge glasses is cycling operation. The constant on - and off-loading of the boiler leads to more rapid wear of the micas and also to glass breakages. The service life may vary greatly. In general, under such working conditions one may expect a service life of about 8 weeks, whereas with continuous operations the glasses and micas may function perfectly satisfactorily throughout the entire heating period. A change of glasses and micas is in all events advisable before the plant is again put into service; at the same time all gaskets, cushion gaskets etc. should also be replaced.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
OF TRANSPARENT LEVEL GAUGES
TYPE TA 120 – PN 250****8. Brief recapitulation of the most important points.**

- 8.1 Only genuine KLINGER spares and replacement parts must be used, and they should be left in their original packings until installation in order to protect them from damage.
At such pressures and temperatures experiments and “make-do” solutions are much too dangerous. For example, it is absolutely impossible to make replacement micas oneself using scissors. Such micas are inherently damaged and absolutely unusable.
- 8.2 During assembly the greatest cleanliness is essential. All the points mentioned in section 6 should be observed exactly.
- 8.3 Avoid strong draughts. If there are windows or lift doors etc. close to the gauge it should be screened off since draughts may lead to glass breakages.
- 8.4 Any leakages should be stopped at once by re-tightening at the appropriate point.
- 8.5 If glasses become “milky” they should be replaced at once, otherwise continue to corrode, which at the high pressures for which these gauges are designed could have unforeseeable consequences.
- 8.6 The procedure for blow-down given in section 5.3 should be followed exactly.

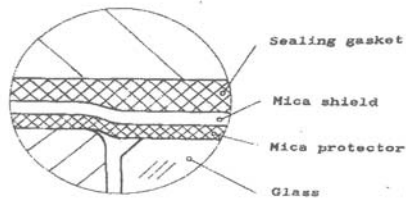
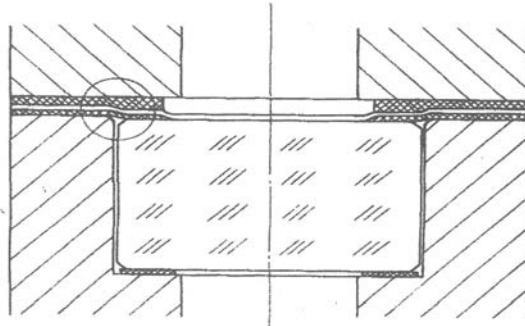
STORAGE

In accordance with DIN 3230, sheet 1, gauges etc. should be stored in closed rooms in a non-aggressive atmosphere and protected against dampness and dirt.

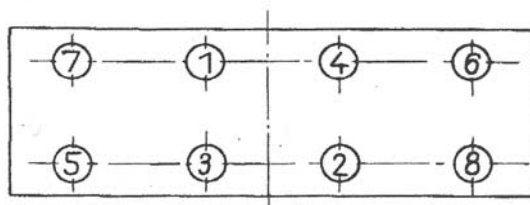
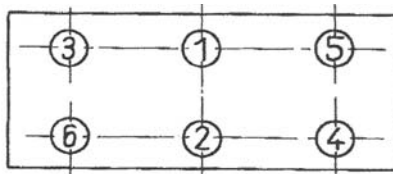
Replacement parts (gaskets, packing sleeves) must be stored in dry, cool rooms.

**INSTRUCTIONS FOR INSTALLATION AND OPERATION
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Correct assembling of glasses with gaskets and mica shield



**Correct Tightening sequence
For Body bolts TA 120**



**INSTRUCTIONS FOR INSTALLATION AND OPERATION
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TA 120 - Components

