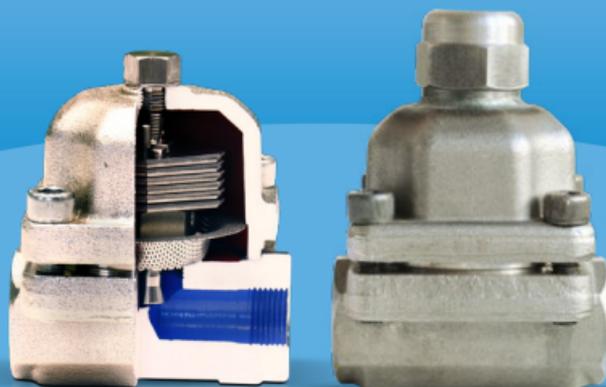


CE

 **AYVAZ**



# USER MANUAL

**BIMETALLIC STEAM TRAP**  
TK-1/ TK-1A

## SYMBOLS AND DESCRIPTIONS

### Warning Signs in User's Guide



**IMPORTANT INFORMATION** Shows useful tips and suggestions.



**DANGER**

Indicates danger to life and property.



**HIGH VOLTAGE**

Warning danger of electric shock!



**FIRE DANGER**

Warning danger of fire!



**HOT SURFACE**

Warning risk of hot surface!

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AYVAZ® is a registered trademark.

Please read this manual before you start using it!

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## 1. GENERAL INFORMATION



- Products are designed and manufactured by professional persons. All parts are manufactured with high quality standards and environmental factors in mind.
- The user manual describes the correct and safe use of the device. All health and safety instructions must be followed during the installation.
- The operating area must be selected correctly to prevent accidents.
- That user manual is a part of the product and must be kept. If the product is replaced, it must be returned with the user manual.
- The installer must carry out the installation in accordance with the warnings and information specified in the user manual.
- General terms and conditions stated at sales document.
- Ayvaz reserves the right to change products, specifications at any time and without any prior notice.

**Product Code:** TK-1 / TK-1A

## 2. GENERAL FEATURES



### 2.1 GENERAL SAFETY INFORMATION

The safety use of steam trap according to working instructions can be done if it can be installed and maintained by qualified person. Installation of steam trap to the line, safety instructions, safety tools and correct use of tools must be available too.

#### PRESSURE

Before the maintenance, be careful if there is pressure at the pipeline which the steam trap is installed. If there is a pressure in the system, it should be discharged safely.

#### TEMPERATURE

Before the maintenance, be careful for the temperature of steam trap. It can cause some physical injuries. Please wait until the temperature is nominal.

TK-1 Bimetallic steam trap is the combination of thermostatic and thermodynamic steam trap. The opening and closing is provided with bi-metal plates. Valve design is like check valve. It can be mounted horizontally, vertically, and at an angle, paying attention to the flow direction. Housing cover is made of forged steel and stainless steel.

### 3. SAFETY AND ENVIRONMENTAL INS.

This product is produced for commercial use. It is dangerous for household use.

#### 3.1 General Safety Instructions

- Follow the installation and maintenance instructions of the user manual.
  - Wear protective goggles and gloves during operation.
  - Repairs should only be carried out by technical experts. Otherwise, accidents may occur.
    - Do not use non-operating switches and electronic devices. Contact the authorized service for support.
    - Signs should be placed where the fluid temperature is 60 ° C and above.
- The device must be operated in accordance with the general safety instructions listed above. Ayvaz cannot be held responsible for problems arising from use that does not comply with the safety instructions.

#### 3.2 Working Conditions

|  |      |
|--|------|
| Pressure Class                         | PN40 |
| PMA-Pressure Maximum Allowable (bar)   | 40   |
| TMA-Temperature Maximum Allowable (°C) | 400  |
| PMO-Pressure Maximum Operating (bar)   | 32   |
| TMO-Temperature Maximum Operating (°C) | 250  |
| PMX-Maximum Pressure Difference (bar)  | 32   |

#### 3.3 Incorrect Usage

Incorrect use may result in hazardous situations and injuries.

- Do not make any changes to the product without authorization. Otherwise the product will not be covered by the warranty.
- Do not use the product in hazardous areas.

Ayvaz cannot be held responsible for any dangerous situations and injuries caused by incorrect usage.

Do not use this device in combination with safety precautions or emergency devices.

### 3.4 Responsibility of the User

This device is a commercial product. Therefore, the user is responsible for legal obligations related to occupational safety.

Along with the safety instructions specified in this user manual; accident prevention measures and environmental protection laws must be observed.

To use the device safely, the user must follow the instructions below;

- The user must be regularly familiar with occupational health and safety issues, be familiar with first aid and be able to follow the instructions in this manual.
- User must read user manual and safety instructions and understand.
- Do not test the device and do not go beyond the instructions for use.
- Control of the safety, pressure and temperature of the facility where the device will be used belongs to the user.

### 3.5 User Competence

Operating and handling errors can cause serious damage to the user and the product.

- Actions described in this guide, a user with professional qualifications which is mentioned below can perform operations.

### Competent User

A competent user is an individual authorized by the company, who is able to understand the technical information contained in this manual, has knowledge of measurement and control, knows the legal responsibilities of the country in which he performs the operation or installation operation, is able to operate independently in dangerous areas, in compliance with current standards and regulations.

### 3.6 Personal protective equipment

Personal protective equipment is a means of protecting competent users from hazards that may occur during operation. The competent user must wear personal protective equipment during installation. Follow the protection directives at the work site. Personal protective equipment must be supplied by the company that purchased the product.

## 4. TRANSPORT, PACKAGING AND STORAGE



### 4.1 Transport

After the device reaches you, check for damage caused by the transport. Report any significant damage immediately.

### 4.2 Packaging and Storage

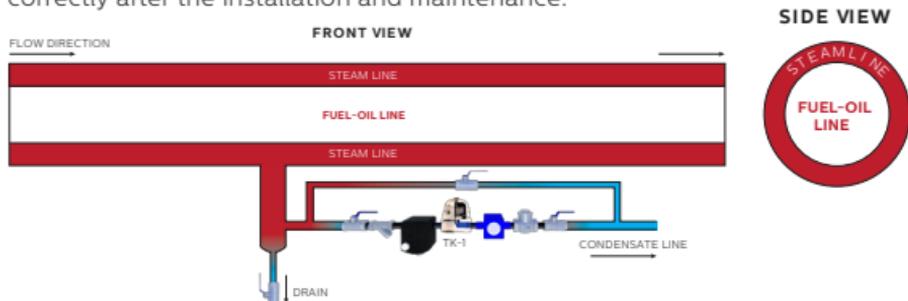
Do not remove the package before installing the device. Keep the device in a safe place for damage.

## 5. INSTALLATION



Before the installation, you should read safety instructions carefully.

- a- Check the label and technical information sheet if the product is suitable for the required installation.
- b- Check the maximum pressure and temperature values. If the pressure in the system is higher than the maximum value of the product, provide the use of safety tools in order to prevent the excess pressure.
- c- Indicate the flow direction and correct installation position. (The flow directions is on the body.)
- d- Take off the covers from the product.
- e- Consider the temperature of the released condensate as 100°C if there is discharge of condensate into atmosphere. Be sure that the system is working correctly after the installation and maintenance.



## 6. OPERATION



The main element in bimetallic steam traps is the valve and bimetallic itself. bimetal; It is a composite material consisting of two separate plates having different coefficients of expansion.

### OPENING

When the system is cold, the valve is open and non-condensing gases and cold condensate are discharged. When the system is activated, the metallic plates that shrink by the cooling of the condensate from the condensate provide the discharge of the condensate by pushing the valve from the bed.

### CLOSING

When the hot condensate arrives, the long protrusions and then the short ones are respectively bent, since the amount of bending at different temperatures is proportional to the length of the protrusions. Therefore, they gradually pull the valve towards its seat. As the temperature increases, the applied force increases and stabilizes the bearing. As it is understood from the working principle, it keeps the condensate in the steam chamber and waits for the temperature to drop below a few degrees. This feature should be considered in practice.

## 7. MAINTENANCE AND CLEANING (i)

### 7.1 Maintenance

Before doing any operation on the trap, such as; the condensate must be isolated from the supply line and return line and the pressure in the system must be relieved safely.

The trap should then be allowed to cool. When reassembling the system, all connection surfaces must be clean.

### 7.2 Cleaning

**It can cause physical injury, product damage and environmental damage.**

The fluid in the device can be a risk to the user, the environment and the device itself.

• If there is a closing valve, first the bottom and then the top closing valve is closed. The fluid inside the device is discharged into a suitable storage container through the drain plug or valve.

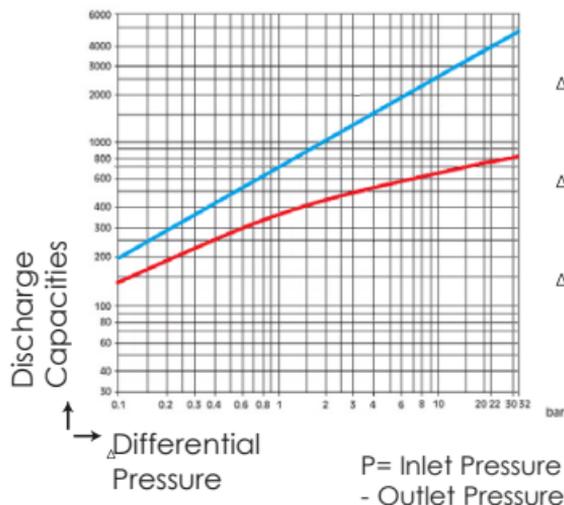
- The device is carefully disassembled.
- The inside of the device is cleaned with a soft brush and the outside with a wet cloth and left to dry.
- Electrical connections should not contact to wet area.

**It can cause product damage and environmental damage.**

- Do not clean with sharp or hard objects.

## Discharge Capacities

(1/2" - 2")



### Red Chart

- Δ p = Condensate Discharge at the temperature which is max 10° C lower than steam saturation temperature.

### Blue Chart

- Δ p = Cold Condensate Discharge at the temperature which is 20°C

## 8. DISASSEMBLY, MAINTENANCE AND CUT-OUT



Fluid that can cause physical injury, product damage and environmental damage.

- Carefully clean the dismantled device to eliminate physical injuries, fluid damage, and damage to the environment.

### 8.1 Disassembly

If there are closing valves, remove the device safely after closing the closing valves. If there is not closing valve, remove only the device to be disassembled on the tank when the system pressure and electrical connections are cut off.

### 8.2 Maintenance

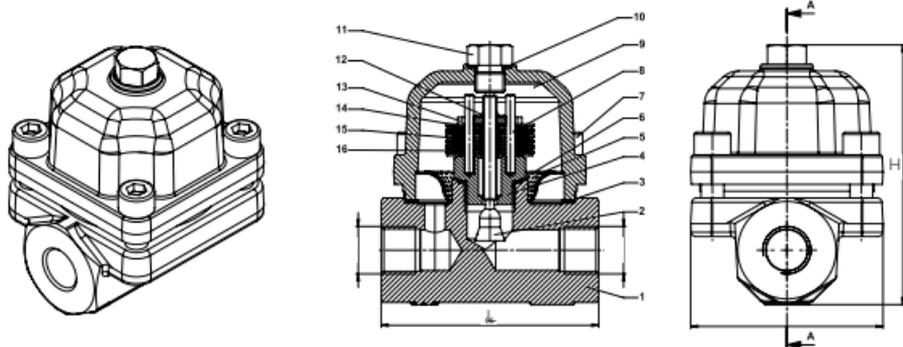
Clean the device carefully to eliminate physical injuries, product damage, and environmental damage from the fluid before sending it to maintenance. Contact our customer representative for shipping operations.

### 8.3 Cut-Out

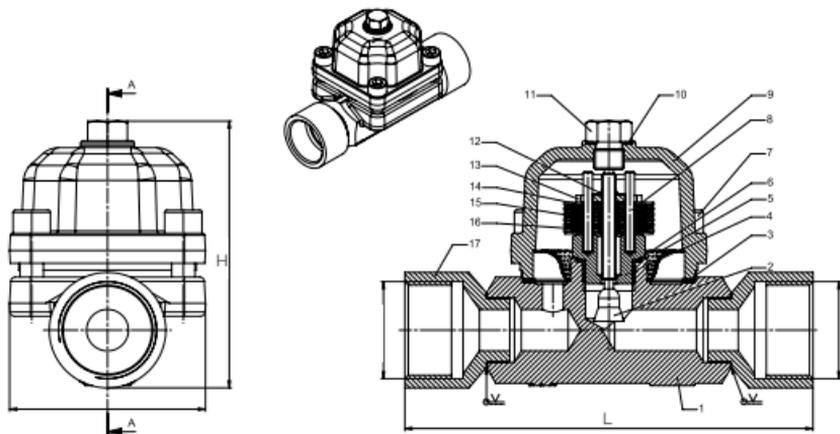
This product is made of high quality parts and materials which are recyclable and reusable. Therefore, do not dispose of the product with household or other waste at the end of its service life.

Metal recycling facilities can be taken to recycling.

## 9. TECHNICAL DRAWING

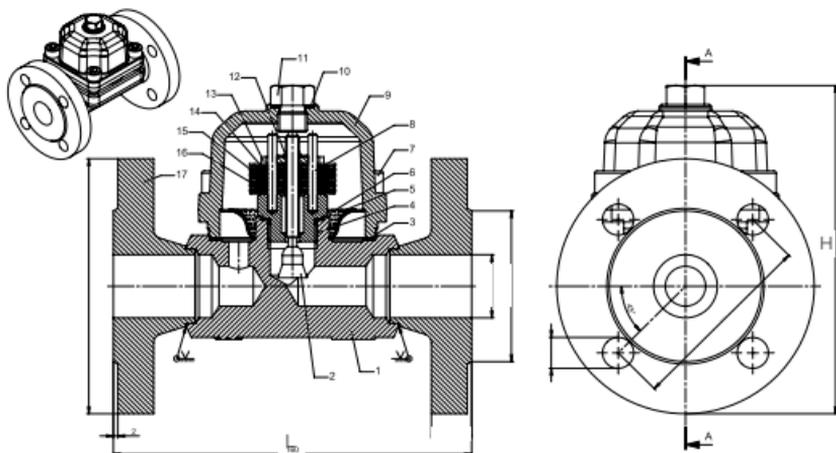


| DN(mm) | H     | L  |
|--------|-------|----|
| 15     | 114,5 | 95 |
| 20     | 114,5 | 95 |
| 25     | 114,5 | 95 |



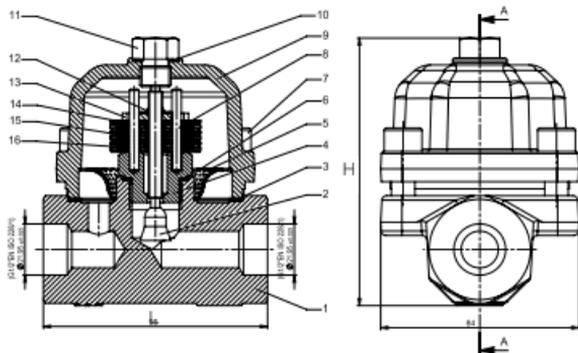
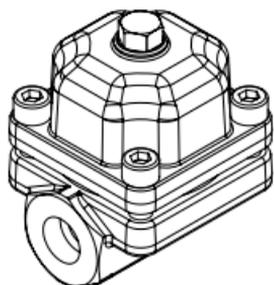
| DN(mm) | H     | L     |
|--------|-------|-------|
| 32     | 115,5 | 175   |
| 40     | 121   | 185   |
| 50     | 125,5 | 195,5 |

| PART LIST |                       |           |
|-----------|-----------------------|-----------|
| No        | Part Name             | Material  |
| 1         | Body                  | C 22,8    |
| 2         | Control Unit Seat     | AISI 304  |
| 3         | Gasket                | Klingerit |
| 4         | Seat                  | AISI 304  |
| 5         | Filter                | AISI 304  |
| 6         | Seat Gasket           | AISI 304  |
| 7         | Bolt                  | 8,8       |
| 8         | Bimetallic Plate Stem | AISI 304  |
| 9         | Cover                 | C 22,8    |
| 10        | Cover Set Gasket      | AISI 304  |
| 11        | Cover Set Stopper     | 9 SMn 36  |
| 12        | Gasket Rove           | AISI 304  |
| 13        | Set Bolt Cushion      | AISI 304  |
| 14        | Bimetallic Plate      | AISI 304  |
| 15        | Bimetallic Plate      | AISI 304  |
| 16        | Bimetallic Plate Part | AISI 304  |
| 17        | Threaded Reduction    | 9 SMn 36  |



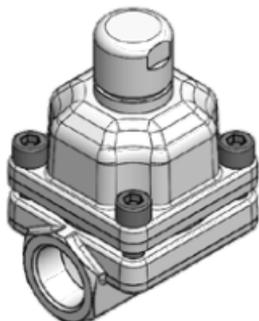
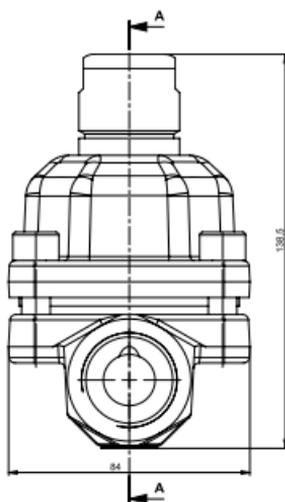
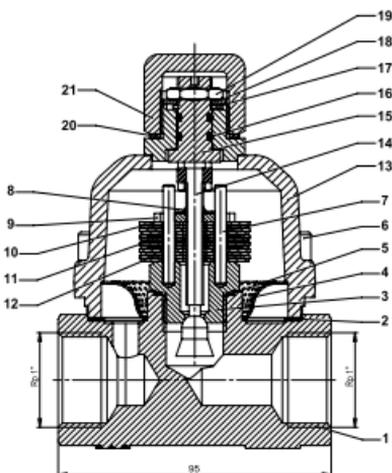
| DN(mm) | H     | L   |
|--------|-------|-----|
| 15     | 114,5 | 150 |
| 20     | 114,5 | 150 |
| 25     | 114,5 | 160 |
| 32     | 115,5 | 175 |
| 40     | 121   | 185 |
| 50     | 125,5 | 195 |

| PART LIST |                       |           |
|-----------|-----------------------|-----------|
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| 3         | Gasket                | Klingerit |
| 4         | Seat                  | AISI 304  |
| 5         | Filter                | AISI 304  |
| 6         | Seat Gasket           | AISI 304  |
| 7         | Bolt                  | 8,8       |
| 8         | Bimetallic Plate Stem | AISI 304  |
| 9         | Cover                 | C 22,8    |
| 10        | Cover Set Gasket      | AISI 304  |
| 11        | Cover Set Stopper     | 9 SMn 36  |
| 12        | Gasket Rove           | AISI 304  |
| 13        | Set Bolt Cushion      | AISI 304  |
| 14        | Bimetallic Plate      | AISI 304  |
| 15        | Bimetallic Plate      | AISI 304  |
| 16        | Bimetallic Plate Part | AISI 304  |
| 17        | Flange                | C 22,8    |
| 18        | Adapter               | C 1030    |



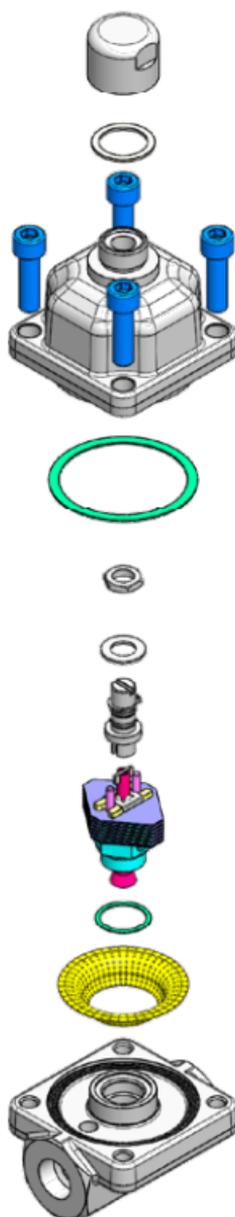
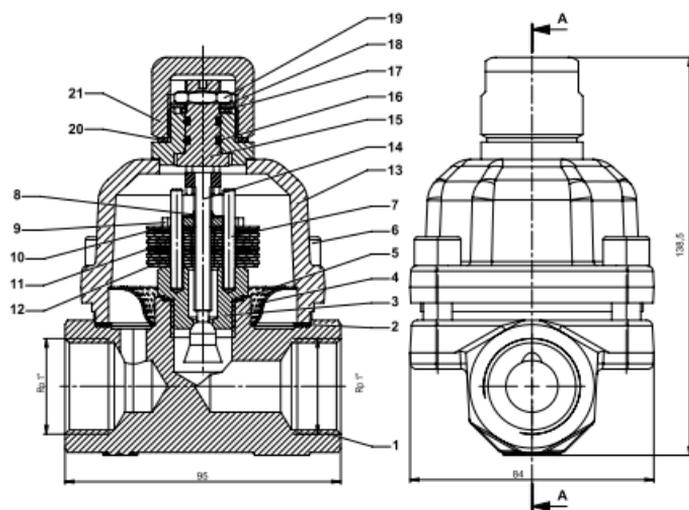
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| 9         | Cover                 | C 22,8    |
| 10        | Cover Set Gasket      | AISI 304  |
| 11        | Cover Set Stopper     | 9 SMn 36  |
| 12        | Gasket Rove           | AISI 304  |
| 13        | Set Bolt Cushion      | AISI 304  |
| 14        | Bimetallic Plate      | AISI 304  |
| 15        | Bimetallic Plate      | AISI 304  |
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PART LIST

| No | Part Name                       | Material  |
|----|---------------------------------|-----------|
| 1  | Body                            | C 22,8    |
| 2  | Gasket                          | Klingerit |
| 3  | Seat                            | AISI 304  |
| 4  | Filter                          | AISI 304  |
| 5  | Seat Gasket                     | AISI 304  |
| 6  | Imbus Bolt                      | 8,8       |
| 7  | Bimetallic Plate Stem           | AISI 304  |
| 8  | Bolt Ring                       | AISI 304  |
| 9  | Adjustment Nut Bearing          | AISI 304  |
| 10 | Bimetallic Plate                | AISI 304  |
| 11 | Bimetallic Plate                | AISI 304  |
| 12 | Bimetallic Plate                | AISI 304  |
| 13 | Cover & Seat Welding Connection |           |
| 14 | Stem & Flap Welding Connection  | AISI 304  |
| 15 | Adjustment Bolt                 | AISI 304  |
| 16 | O-ring                          | Viton     |
| 17 | Bolt Ring                       |           |
| 18 | Ring                            | 1.0482    |
| 19 | Nut                             |           |
| 20 | Gasket                          | AISI 304  |
| 21 | Adjustment Handle               | 1.0482    |


**PART LIST**

| No | Part Name                       | Material  |
|----|---------------------------------|-----------|
| 1  | Body                            | C 22,8    |
| 2  | Gasket                          | Klingerit |
| 3  | Seat                            | AISI 304  |
| 4  | Filter                          | AISI 304  |
| 5  | Seat Gasket                     | AISI 304  |
| 6  | Imbus Bolt                      | 8,8       |
| 7  | Bimetallic Plate Stem           | AISI 304  |
| 8  | Bolt Ring                       | AISI 304  |
| 9  | Adjustment Nut Bearing          | AISI 304  |
| 10 | Bimetallic Plate                | AISI 304  |
| 11 | Bimetallic Plate                | AISI 304  |
| 12 | Bimetallic Plate                | AISI 304  |
| 13 | Cover & Seat Welding Connection |           |
| 14 | Stem & Flap Welding Connection  | AISI 304  |
| 15 | Adjustment Bolt                 | AISI 304  |
| 16 | O-ring                          | Viton     |
| 17 | Bolt Ring                       |           |
| 18 | Ring                            | 1.0482    |
| 19 | Nut                             |           |
| 20 | Gasket                          | AISI 304  |
| 21 | Adjustment Handle               | 1.0482    |

### Montage and Dismantling

- a. Remove the cover clamps
- b. Clean the strainer. Loosen the regulator.
- c. The regulator is one piece. No need to disassemble to clean.
- d. Clean the housing, clean the cover, clean the regulator, clean the gasket seating surfaces and remove the gasket.
- e. to Install a new cover gasket, replace the cover and tighten the bolts evenly.

| PART LIST |                         |            |
|-----------|-------------------------|------------|
| No        | Part Name               | Material   |
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| 4         | Seat                    | AISI 304   |
| 5         | Filter                  | AISI 304   |
| 6         | Seat Gasket             | AISI 304   |
| 7         | Imbus Bolt              | 8,8        |
| 8         | Bimetallic Plate Stem   | AISI 304   |
| 9         | Cover                   | C 22,8     |
| 10        | Cover Adjust Bolt       | AISI 304   |
| 11        | Adjust Bolt Cover       | 9 SMn 36   |
| 12        | Bolt Lock               | AISI 304   |
| 13        | Adjust Seat             | AISI 304   |
| 14        | Bimetallic Plate        | AISI 304   |
| 15        | Bimetallic Plate        | AISI 304   |
| 16        | Bimetallic Plate Gasket | AISI 304   |
| 17        | Flange                  | C 22,8     |
| 18        | Adapter                 | C 1030     |

### IMPORTANT

The thermal energy of the steam line is utilized to prevent heat loss in the fuel-oil line. This prevents heat loss in the fuel-oil line.

In these lines, a bimetallic trap is used because of its working principle.

To benefit from the energy of the steam, bimetallic plates should be used to open at the lowest point of the saturated steam temperature.

## 11. ADJUSTMENT TK-1 A



1. Wear heat protection gloves for your own safety.
2. Remove the stem cover with tool.
3. Adjust the discharge temperature stem with screwdriver.
4. Close the stem cover.



 **AYVAZ**

### HEAD OFFICE - FACTORY

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