User Instructions

Installing and Setting a TRV4PSB Self-Balancing TRV Pack

Disclaimer

Before proceeding, please ensure you have the necessary qualifications and safety equipment to handle plumbing and heating systems. Incorrect installation can lead to damage to your system or property.

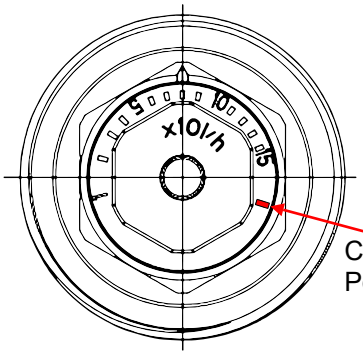
It is strongly recommended to consult a qualified plumber or heating engineer for the installation of any new heating system components.

Tools Required:

- Adjustable spanner
- Screwdriver

Approximate temperature marking values

TRV Setting	*	1	2	3	4	5	MAX
Room Temperature	7°C	11-14°C	15-17°C	18-21°C	21-25°C	25-28°C	29-32°C



Commissioning Position

Installation Steps:

1. **Turn off the heating system:** Ensure the boiler and all radiators are turned off.
2. **Close the radiator valve:** Turn the manual valve on the radiator fully clockwise to close it.
3. **Remove the old TRV:** Carefully unscrew the old TRV from the radiator valve using the adjustable spanner.
4. **Fit the TRV4PSB:**
   - Screw the TRV4PSB onto the radiator valve. Tighten securely with the adjustable spanner, but avoid over tightening.
   - Ensure the TRV head is aligned correctly.
5. **Reopen the radiator valve:** Slowly turn the manual valve on the radiator counterclockwise to reopen it.
6. **Turn on the heating system:** Start the heating system and allow it to run for a period to allow the TRV to adjust.

Installation and Operation Instructions for Auto-Balancing TRVs

General Overview: Tower auto-balancing TRVs are engineered to maintain a constant flow rate in each radiator, independent of fluctuations in system pressure or adjustments to other TRVs within the system. This technology ensures that each area of your home remains evenly heated, eliminating cold spots and enhancing boiler efficiency.

Operating Principle: The valves feature an internal cartridge that consistently regulates the water flow through the radiator. To achieve optimal performance, it is crucial to set the valve according to the radiator's specific output requirements, ensuring accurate water flow at all times.

Installation Guidelines:

- **Flow Direction:** Pay close attention to the flow direction markings on the valve to ensure correct installation.
- **Commissioning the Valve:** The valve is shipped in the commissioning position. To adjust the valve setting, use a 13mm spanner or socket to turn the hex on the top of the valve insert until the setting value aligns with the index mark. This adjustment guarantees the radiator receives the appropriate flow, irrespective of changes in system pressure or the activity of other valves.
- **Lockshield Valve:** The lockshield should be fully open during operation and only used to isolate the radiator when necessary.

Mounting Precautions:

- **Jointing Compound Usage:** Care must be taken to avoid excess jointing compound reaching the valve seat, which can impair valve functionality.

- **Avoid Excessive Heat:** Do not install capillary fittings near the valves. Exposure to high temperatures from tools like blowtorches can damage the internal components of the valve. Ensure the thermostatic head does not exceed 50 degrees Celsius.

Balancing Considerations:

- **System Efficiency:** High return water temperatures can reduce the efficiency of your heating source.
- **System Performance:** Unbalanced systems may lead to uneven heating, resulting in uncomfortable hot and cold spots throughout the property.
- **User Satisfaction:** An unbalanced system can lead to dissatisfaction due to uneven heating.
- **Challenges with Manual Balancing:** Manual valve adjustments are only precise for a static set of conditions; dynamic changes such as TRVs closing can cause fluctuations in other parts of the system.
- **Preservation of Settings:** Valve settings may be altered during routine maintenance such as decorating or radiator replacement.
- **Inaccuracy of Lockshield Valves:** Traditional balancing using Lockshield valves often lacks precision and should not be solely relied upon for system balancing.

Setting the TRV4PSB temperature:

The TRV4PSB is self-balancing, meaning it automatically adjusts the radiator's heat output. However, you may need to adjust the desired room temperature:

1. **Identify the temperature setting:** The TRV head usually has a dial display to set the desired temperature.
2. **Adjust the temperature:** Turn the TRV head to set the desired temperature. Higher numbers indicate a warmer room.
3. **Monitor the room temperature:** Observe the room temperature and make adjustments as needed.

Additional Tips:

- **Bleeding the radiator:** If the radiator is cold at the top, it might need bleeding. This can be done using a radiator bleed key.
- **Regular maintenance:** Check the TRV regularly for any signs of damage or leaks.
- **Winterisation:** In extremely cold conditions, you might need to adjust the TRV setting to prevent freezing.

Remember: The TRV4PSB is designed to optimise heat distribution. Avoid manually adjusting the radiator valves as this can interfere with the self-balancing function.

If you encounter any issues or have further questions, please consult the manufacturer's instructions or contact a qualified professional.

Disclaimer: This information is provided as a general guide and may not be suitable for all situations. Always follow the specific instructions provided with your TRV4PSB.

Would you like to know more about bleeding a radiator or winterising your heating system?

Optimal Solutions:

- **Use of Modulating Pumps:** Consider installing a modulating pump and setting it to the lowest effective level to maintain the correct temperature differential across the system.
- **Installation of Auto-Balancing TRVs:** Implementing auto-balancing TRVs ensures that each radiator consistently receives the necessary flow to maintain the correct temperature differential. Valves should remain in their commissioning position during system maintenance such as draining or refilling. Adjustments should only be made based on the output requirements of each radiator. By following these instructions, you can ensure your heating system operates efficiently and effectively, providing consistent and comfortable warmth throughout your property.

Optimize Your Heating with Our TRV4PSB Setting Recommendation Tool

At Tower, we are committed to enhancing your heating system's efficiency and performance. Our online utility for the TRV4PSB Auto Balancing Thermostatic Radiator Valve offers a quick and convenient way to obtain initial setting recommendations based on the output of your radiator.

Please Note: While our tool provides an immediate suggestion to help you get started, we strongly recommend conducting a thorough calculation to determine the optimal setting for your specific needs. This ensures maximum efficiency and comfort by tailoring the TRV4PSB settings to the unique characteristics of your heating system and environmental conditions.

Take the first step towards a more efficient heating setup with our recommendation tool, and fine-tune the settings based on precise calculations for the best results. **https://www.tfc-tech.co.uk/trv4psb-delta/**

Experience the difference with Tower TFC Group — where technology meets precision in heating solutions.

Example of pre-setting using angled 15mm dynamic thermostatic valves

Let us suppose we have to balance three circuits having the following characteristics:

Designed power:

Circuit 1 A1 = 1800 kcal/h
Circuit 2 A2 = 800kcal/h
Circuit 3 A3 = 1600 kcal/h

Design temperature difference: ΔT=20℃ (temperature、difference between the actual local temperature and the room temperature that need to be set)

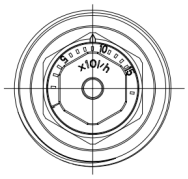
Designed heat: The flow rate per radiator group is calculated according to the following formula:

$$Q = A / \Delta T$$

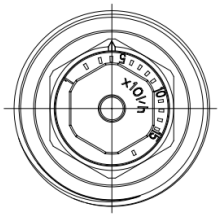
Radiator1 Q = 90 l/h
Radiator2 Q = 40 l/h
Radiator3 Q = 80 l/h

Flow pre-regulation and actual flow rate Considering the use of thermostatic controllers, the scale to be adjusted for the corresponding flow rate is therefore selected according to the proportional S-2K hydrodynamic curve,which can calculate:

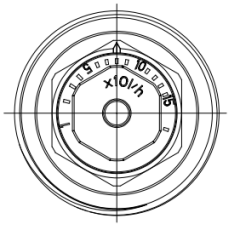
Radiator1 Q = 90 l/h



Radiator2 Q = 40 l/h



Radiator3 Q = 80 l/h



Operating principle

The thermostatic valve has been designed with the purpose of controlling a flow rate of thermal medium in the radiators of two-pipe heating systems that is:

- adjustable in accordance with the requirements of the part of the circuit controlled by the device
- constant despite any variation in differential pressure conditions in the circuit.

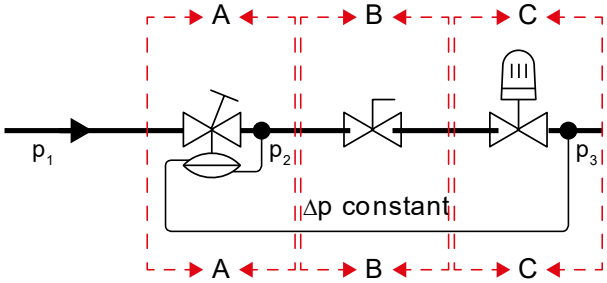
The device, in conjunction with a thermostatic control head, combines different functions in a single component:

A. ***Differential pressure regulator,*** which automatically cancels the effect of the pressure fluctuations typical of variable flow rate systems and prevents noisy operation.

B. ***Device for pre-setting flow rate,*** which allows direct setting of the maximum flow rate value, thanks to the combination with the differential pressure regulator.

C. ***Flow rate control depending on the ambient temperature,*** thanks to the combination with a thermostatic control head. The flow rate control is optimised because it is pressure-independent.

Where:
p1 = upstream pressure
p2 = intermediate pressure
p3 = downstream pressure
(p1 - p3) = total valve Δp
(p2 - p3) = constant Δp



Device (A) regulates the Δp and keeps it constant across the device (B+C), by means of an automatic action (balancing between the force generated by the differential pressure and the internal opposing spring). If (p1-p3) increases, the internal Δp regulator reacts to close the bore and maintains Δp constant; in these conditions the flow rate will remain constant.
Device (B) regulates flow rate G by changing its bore cross section. The change in bore cross section determines the hydraulic coefficient value (Kv) of the regulator device (B), which remains constantly at:
-a manually pre-set value
-a value determined by the actuator's regulating action.

Working range

For the device to keep the flow rate constant independently from the circuit's differential pressure conditions, the total valve Δp (p1-p3) must be in the range between the minimum Δp value (10 kPa for adjustments from 1 to 4 and 15 kPa for adjustments 5 and 6) and the maximum value of 150 kPa.

(*) Recommended working range: for the best behaviour without problems linked to the passage of the water flow through the valve it is recommended to work with Δp < 70 kPa.

Δp min (20÷80 l/h): 10 kPa Δp min (100-120 l/h): 15 kPa