

Practical guidance for technical staff on carrying out hydraulic balancing using room-by-room control systems with automated hydraulic balancing

1. Overview of certified products

The aim of hydraulic balancing is to ensure thermal comfort without over-heating individual rooms, whilst covering all standard operating conditions and utilising energy as efficiently as possible. In accordance with Section 60c(3) of the German Building Energy Act (GEG), since 1 October 2024, alternative, equivalent methods – such as temperature-based methods – have been permitted in addition to the methods set out in Method B of the ZVSHK-VdZ (German Association of Building Technology) – VDMA technical regulation. The base stations fall under the category of thermal balancing (temperature-based methods).

The following products from Möhlenhoff are **certified by TÜV Rheinland 2026** for automated hydraulic balancing and can be used to assist in carrying out hydraulic balancing in accordance with Method B.

Product name	Model code	Certificate number
Alpha direct Balance Base Station	B x1902-08N2	 Automatisierter hydraulischer Abgleich Anerkennung der Gleichwertigkeit www.tuv.com ID 000089973
Alpha direct Base Station Balance Switch / Modbus	B x1903-08N2 / BM x1903-08N2	 Automatisierter hydraulischer Abgleich Anerkennung der Gleichwertigkeit www.tuv.com ID 000089974
Alpha Smartware Base Station Standard / Premium	BSS 21001-xxN2 / BSS 21101-xxN2	 Automatisierter hydraulischer Abgleich Anerkennung der Gleichwertigkeit www.tuv.com ID 000089975
Alpha RF Light Base Station	BSL 21001-08N2	 Automatisierter hydraulischer Abgleich Anerkennung der Gleichwertigkeit www.tuv.com ID 000089976

It should be noted in day-to-day practice that the base stations mentioned above do not fully replace the hydraulic balancing procedure carried out in accordance with Method B, and does not exempt one from complying with the basic requirements for hydraulic balancing in accordance with Method B. The base station has no effect on sections of the pipework network located upstream of the heating manifold. It only begins to affect the system from the heating manifold onwards.

The base stations mentioned above distribute the heat to the connected heating circuits as required, thereby preventing individual rooms from being underheated. It is important to note that the heating curve, maximum heating temperature, flow temperature and pump head are not controlled by the base stations.

The following section sets out in detail, in accordance with the checklist issued by the Federal Ministry for Economic Affairs and Climate Action (BMWK) and the German Federal Office for Economic Affairs and Export Control (BAFA), which elements of the hydraulic balancing procedure (Method B) are to be carried out by the base stations and which are to be carried out by the installation contractor.

2. Guidelines for the technician

The base stations handle the automated balancing and demand-based distribution at heating circuit level. However, they do not replace the heating load as a basis for planning, nor do they replace the settings for the heat generator, the heating curve, the pump system or the technical documentation.

In practice, this means: At the heating circuit level, the amount of manual adjustment required is significantly reduced. However, the technician's overall responsibility for the system remains unrestricted. All key steps in hydraulic balancing are assessed in accordance with the following criteria and serve as a basis for action for heating engineers in practice.

The assessment of the individual steps/tasks involved in hydraulic balancing is presented according to the following system:

Step	Describes the relevant practical stage of hydraulic balancing.
Job description: Technician	Includes all activities that remain the responsibility of the specialist contractor.
Takeover by base stations	Indicates functions that are carried out automatically or supported by the base station.
Not applicable	Indicates only those manual steps that are no longer required.

3. Detailed practical procedure

Practical note:

Even though certain steps in carrying out hydraulic balancing at heating circuit level are no longer required, planning, heat generator adjustment, pump parameterisation, pressure testing and documentation remain entirely relevant.

4.1 Room-by-room calculation of the heating load

The room-by-room heating load forms the basis for the system design, the calculation of flow rates, the flow temperature and hydraulic balancing. In new-build projects, it is drawn up by

the designer or energy consultant and checked for plausibility by the technician. In older buildings, it can be determined in accordance with DIN EN 12831 or using simplified methods, depending on the available data.

Job description: Technician	- Obtain the heating load calculation from the designer or, in the case of existing buildings, arrange for it to be carried out in accordance with an approved method. - Carry out a plausibility check on the heating load. For new buildings, the list of criteria gives 30–50 W/m² as a rough guide. - Use the room-by-room heating load as the binding basis for all subsequent steps.
Takeover by base stations	The base stations do not take over the calculation of the heating load.
Not applicable	Not a single step is omitted. The heating load remains the basis for the entire hydraulic balancing process.

4.2 Determining the lowest possible design temperatures

Determining the lowest possible design temperatures is a key task in the planning process. The temperature is determined by the heating load, the heat output per unit area and the flow rate. The aim is to achieve the lowest temperature at which all rooms can meet their heating requirements.

Job description: Technician	- Check or calculate the heating surface output. - Determine the volume flow rates by calculation. - Assess temperature pairs in new and existing buildings, either theoretically or in practice, and determine the lowest operational design temperature. - Document the design temperatures.
Takeover by base stations	- No active optimisation of the flow temperature by the base stations. - There is an indirect influence, but no independent optimisation.
Not applicable	Not a single step is omitted. The determination of the design temperatures remains the responsibility of the technician or is set out in the design documentation.

4.3 Setting and optimising the heating curve

The heating curve is an essential part of system optimisation. For panel heating systems, it should be set to the low setting. The heating curve must be set manually by the technician, as this is not a self-learning control system with automated heating curve optimisation.

Job description: Technician	- Set the heating curve on the heat generator. - In new builds, set the heating curve on the base line of the plans. - In older buildings, lower the heating curve gradually, monitor the rooms and readjust as necessary. - Record heating curve values.
Takeover by base stations	No automated optimisation of heating profiles by the base stations.
Not applicable	Not a single step is omitted. The heating curve is still set manually on the heat generator.

4.4 Setting setbacks and shutdowns

This section covers night-time temperature reduction, night-time shutdown, summer shutdown, holiday mode and occupancy control. These functions are assigned to the heat generator's heating control system.

Job description: Technician	• Activate the temperature schedules and adjust them to suit your usage profile. • Check and adjust the summer setback, holiday setback and other automated setbacks. • Check the relevant sensors. • Document the parameters.
Takeover by base stations	• The base stations have no effect.
Not applicable	• Not a single step is omitted. These settings remain entirely with the technician or on the heat generator.

4.5 Setting the maximum heating temperature

The heating cut-off temperature should be set so as to reduce the number of days when the heating is on and the duration of the heating season. This setting is not adjusted on the Möhlenhoff control unit, but on the heat generator.

Job description: Technician	• Set or optimise the heating limit temperature on the heat generator. • Monitor and document the effects in the population.
Takeover by base stations	• The base stations do not set the maximum heating temperature .
Not applicable	• Not a single step is omitted.

4.6 Selecting, configuring and testing a pump

An efficient, correctly adjusted pump is an essential part of hydraulic balancing. The base station does not provide any data on the pump head and cannot affect the pump head.

Job description: Technician	• Select a pump suitable for the system or check the existing pump. • Set the pump performance curve and operating mode. • Minimise pump output, provided that the supply remains secure. • Check for flow noise, heat distribution and return temperatures. • Document the pump settings.
Takeover by base stations	• The base stations do not adopt the pump settings .
Not applicable	• Not a single step is omitted. Pump control remains the responsibility of the technician or the pump engineering department.

4.7 Ensuring room-by-room supply

The base station distributes the supply room-by-room at the transfer point, counteracts under-supply and stabilises the system. However, it does not guarantee an exact target flow rate for each room and does not expressly rule out the possibility of an excess supply.

Job description: Technician	- Check that the system is, in principle, correctly configured and ready for operation. - Ensure that upstream components, such as heat generators and pump systems, are set correctly. - Check that it is working correctly during operation.
Takeover by base stations	- Room-by-room distribution of the supply at the handover point. - Support to address the lack of resources in individual rooms. - Stabilisation of the system whilst meeting the simultaneous output requirements of several heating circuits. - Continuous, automated adjustment of power requirements to ensure that heat flows are distributed in line with demand.
Not applicable	No comprehensive manual intervention in the traditional sense is required when it comes to distributing heat flows according to demand at the heating circuit level.

4.8 Hydraulic balancing of heating circuits

The base stations are calibration facilities within the meaning of the regulation. Additional flow restrictors, pre-settings on valves and the use of flow meters for adjustment are no longer necessary. There is no need to adjust the heating manifold.

Job description: Technician	- Ensure that the higher-level hydraulic components are correctly adjusted, in particular the circulator pump, circuit control valves or main pipes, transfer units, heat generators and special hydraulic circuits. - Continue to use the target flow rates derived from planning and calculations as the basis for documentation.
Takeover by base stations	- Automated balancing of the heating circuits. - Software-based control algorithm with optimisation of valve opening and closing times. - Thermal or algorithmic balancing of individual sections at heating circuit level.
Not applicable	- Additional mechanical flow restrictors are not required. - There is no need to pre-set the valves; manual pre-setting is not required. - Flow meters no longer need to be used for calibration. - There is no need to adjust the heating manifold.

4.9 Record the volume flow rates for each heating circuit

Hydraulic balancing requires evidence that the flow rates for each heating circuit have been determined. The base stations do not measure actual flow rates per heating circuit and do not provide any values subject to documentation requirements directly from the control system.

Job description: Technician	- Derive design values from space heating loads and temperature differentials. - Consolidate target and plant data for documentation purposes.
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Takeover by base stations	No direct transfer of measurement or documentation data by the base stations.
Not applicable	No documentation step is omitted. The technician remains responsible for keeping records.

4.10 Determining the differential pressure and pump head

The base stations cannot measure the differential pressures of the individual heating circuits, nor can they provide data on the pump head. The pump diagram, pump performance curve and design or pipework network calculations should be used for the documentation.

Job description: Technician	- Record the system differential pressure using the pump diagram or pump data. - Determine the required pump head from the calculation and the performance curve. - Adjust the circulator pump accordingly.
Takeover by base stations	These tasks are not carried out by the base stations.
Not applicable	Not a single step is omitted.

4.11 Check the pre-charge, fill and final pressures at the expansion vessel

This point is an essential component of the plant's stability. Initial pressure, filling pressure and final pressure are explicitly named and explained in their respective contexts.

Job description: Technician	- Determine and set the pre-pressure. - Set the filling pressure correctly. - Check the final pressure whilst the system is warm. - Document values.
Takeover by base stations	Base stations do not take on this task .
Not applicable	Not a single step is omitted.

4.12 Check the pipe insulation

A visual inspection of the pipework insulation is one aspect of heating optimisation. In the event of any discrepancies, the technician should recommend that the system be supplemented or replaced.

Job description: Technician	- Carry out a visual inspection of the insulation on heating and hot-water pipes. - Document any defects and advise on additional insulation or replacement.
Takeover by base stations	This item is not handled by the base stations.
Not applicable	Not a single step is omitted.

4.13 Preparing and handing over plant documentation

The hydraulic balancing must be documented, including all technical parameters, and made available to the building owner. In the case of automated control, the process description must be set out in a clear and comprehensible manner.

Job description: Technician	• Prepare full system documentation. • Compile all relevant parameters, including design temperature, heating load, heat generator output, pump settings, MAG values, heating curve and setbacks. • Handover of documentation to the owner.
Takeover by base stations	• This item is not handled by the base stations.
Not applicable	• Not a single step is omitted. The complete set of documentation is not generated automatically by the base stations .

5. Quick guide for practical use

The base stations perform the following tasks:

- Distribution of heat flows to the heating circuits in line with demand.
- Room-by-room supply at the handover point.
- Automated balancing of the heating circuits.
- Co-ordination of valve opening times to reduce simultaneous effects.

The following manual steps are no longer required:

- Additional mechanical flow restrictors are not required.
- No pre-adjustments to the valves are necessary; they are not required.
- Flow meters no longer need to be used for calibration.
- There is no need to adjust the heating manifold.

These tasks remain the responsibility of the technician:

- Calculate or apply the heating load.
- Determine the design temperatures.
- Set and optimise the heating curve.
- Set night-time setback, summer shutdown, holiday setback and other setbacks.
- Set the maximum heating temperature.
- Select, configure and document a pump.
- Record the differential pressure and the pump head.
- Check the MAG prints.
- Check the pipework insulation.
- Create the complete documentation.

7. Supporting documentation

The information is based on the contents of the checklist issued by the Federal Ministry for Economic Affairs and Climate Action (BMWK) and the German Federal Office for Economic Affairs and Export Control (BAFA) entitled 'Recognition of Equivalence – Automated Hydraulic Balancing – as at 1 January 2026'.