INSTRUCTIONS FOR INSTALLATION
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Annex1: Influence of temperature and length for the Qbiss Screen HR façade element on the dimension of the transversal joint
1.0 System Description

1.1 Ventilated façade – in general

Ventilated facades consist of several materials and a ventilation cavity (air gap). They usually incorporate thermal insulation, but there are also facade walls without thermal insulation. The calculation shows the need for a vapor barrier in individual cases, and the need for wind barrier depends on the choice of thermal insulation. In addition to adjusting temperature differences, the air gap on the facade also serves to dry excess moisture that accumulates in the ventilation cavity from inside or outside. This is especially important for the renovation of older buildings and other buildings with loadbearing walls of porous materials such as various types of bricks, aerated concrete, sand-lime block, etc.

Fig. 1.1.1: Schematic view of a ventilated façade – with air, temperature and water flow,
1.2 Ventilated façade system Qbiss Screen

Qbiss Screen system is a metal rainscreen, where, besides the aesthetic function, it performs a protective function - the protection of the façade envelope against atmospheric effects. Ventilated facades are divided into those with thermal insulation and those without thermal insulation. The panel module size and joint gap appearance can be varied to the project requirements within production limits.

Fig. 1.2.1: Horizontal installation

1. Qbiss Screen HR facade element
2. Air gap
3. Thermal insulation for ventilated facade system with fastener
4. Substructure
5. Support wall
1.3 Qbiss Screen system composition

Main system parts are rectangular façade elements Qbiss Screen HR, corner elements Qbiss Screen HR, transversal joint gasket, aluminium decorative profiles, flashings and fixing material. The modular Qbiss Screen façade system dimensions are defined with:

- **design length** - the distance between midline of the transversal joints - R and
- **façade module width** - distance between midline of the longitudinal joints - M.

Joint can be recessed, flush or combination of both in horizontal and vertical installation.

Fig. 1.3.1: Horizontal installation

![Horizontal Installation Diagram](image1)

Fig. 1.3.2: Vertical Installation

![Vertical Installation Diagram](image2)

R - distance between supports (façade element length)
M - module width

The longitudinal joint is a tongue and groove type formed at the edges of the façade element.

The transversal joint consists of the façade element’s transversal edges through which the façade elements are fixed to the structure, using fixing profile HF 63 with screws.

1.4 Joint visual appearances

Qbiss Screen system allows the combining of various permutation of recessed and flush joints by horizontal installation Fig. 1.4.1 and vertical installation Fig.1.4.2.

Fig. 1.4.1: Joints options for horizontal installation

<table>
<thead>
<tr>
<th>Panel Type and visual apperance</th>
<th>Transversal joint</th>
<th>Longitudinal joint</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Qbiss Screen HR B</strong></td>
<td><img src="image3" alt="Transversal Joint" /></td>
<td><img src="image4" alt="Longitudinal Joint" /></td>
</tr>
<tr>
<td><strong>Qbiss Screen HR F-B</strong></td>
<td><img src="image5" alt="Transversal Joint" /></td>
<td><img src="image6" alt="Longitudinal Joint" /></td>
</tr>
</tbody>
</table>
1.5 Joint dimensions and tolerances

- **R₁** - Design length – Left placed Qbiss Screen HR façade element
- **R₂** - Design length – Right placed Qbiss Screen HR façade element
- **R₁'** - Face length – Left placed Qbiss Screen HR façade element
- **R₂'** - Face length – Right placed Qbiss Screen HR façade element
- **M₁** - Module width – Bottom Qbiss Screen HR façade element
- **M₂** - Module width – Upper Qbiss Screen HR façade element
- **M₁'** - Face width – Bottom Qbiss Screen HR façade element
- **M₂'** - Face width – Upper Qbiss Screen HR façade element
- **a_{min}, b_{min}** - Minimal width of support (a_{min} = b_{min} = 50 mm)
NOTE:
The dimensions are relevant at the temperature of the element $T = 10 \, ^\circ C$. To insure the design length ($R$) of the façade element; the thermal expansion ($\Delta R$) of the Qbiss Screen HR façade element must be considered during installation.
See Annex1 - Influence of temperature and length for the Qbiss Screen HR façade element on the dimension of the transversal joint.
2.0 Qbiss Screen HR façade element technical specifications

2.1 Element composition

Qbiss Screen HR rain screen façade element is designed for ventilated façade applications and for both new-build and refurbishment use. It comprises of an aluminium honeycomb core, held between two metal skins, with each element corner formed without cutting or folding. All joints are specially formed for fixing and sealing, with prefabricated lap joint on the side for self-weight fixing.

Fig. 2.1.1.: Qbiss Screen HR element’s main parts

1. Front-side pre-painted steel sheet
2. Aluminium honeycomb core
3. Back-side pre-painted steel sheet with laps
4. Corner sealing element

* Aluminium decorative profile HF 14 is factory applied on Qbiss Screen HR façade element types B (longitudinal joint dimension 23mm); F-B element types are without longitudinal joint dimension 4 mm

2.2 Technical specification

Table 2.2.1: Qbiss Screen HR technical data

<table>
<thead>
<tr>
<th>Properties</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element thickness (d)</td>
<td>50 mm</td>
</tr>
<tr>
<td>Element width (M)</td>
<td>Standard 1000 mm; available 600-1200 mm</td>
</tr>
<tr>
<td>Element length (R)</td>
<td>550 – 6500 mm *</td>
</tr>
<tr>
<td>Front / Back-side surface (side A / side B)</td>
<td>Smooth</td>
</tr>
<tr>
<td>Core</td>
<td>Aluminium honeycomb</td>
</tr>
<tr>
<td>Core combustibility (EN 13501-1; EN 13823)</td>
<td>Non-combustible Class A1</td>
</tr>
<tr>
<td>Weight</td>
<td>14,4 kg/m2 **</td>
</tr>
<tr>
<td>Reaction for fire (EN 13501-1)</td>
<td>A2-s1, d0 ***</td>
</tr>
</tbody>
</table>

* Element length depends on the design requirements consistent with the structural analysis and the mechanical characteristics of the Qbiss Screen element.
** Weight 14.4 kg/m² based on Qbiss Screen HR façade element dimension (R x M) 1000mm x 1000mm and thickness of front/back-side steel metal skin 0.7/0.6 mm. In the case of different values from these the m² weight changes from 12.7 kg/m² to 18.4 kg/m². For specific individual project requirements please contact Trimo technical support [Customer service].
*** Valid for individual elements of surface > 3m²: For specific individual project requirements please contact Trimo technical support.
2.3 Qbiss Screen HR façade element performance data

R – Design length
R’ – Qbiss Screen HR façade element face length
M – Module width
M’ – Qbiss Screen HR façade element face width

Fig. 2.3.1: Qbiss Screen HR B

- Front-side pre-painted steel sheet
- Back-side pre-painted steel sheet
- Aluminium honeycomb core

Fig. 2.3.2: Qbiss Screen HR F-B

- Front-side pre-painted steel sheet
- Back-side pre-painted steel sheet
- Aluminium honeycomb core
Table 2.3.1: Qbiss Screen HR variants

<table>
<thead>
<tr>
<th>Element Name</th>
<th>Installation Method</th>
<th>Longitudinal joint dimension</th>
<th>Characteristic*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qbiss Screen HR B</td>
<td>Horizontal</td>
<td>23 mm</td>
<td>two laps, each side of panel at top of transversal joint</td>
</tr>
<tr>
<td>Qbiss Screen HR B</td>
<td>Vertical</td>
<td>23 mm</td>
<td>four laps, each corner in transversal joint</td>
</tr>
<tr>
<td>Qbiss Screen HR F-B</td>
<td>Horizontal</td>
<td>4 mm</td>
<td>two laps, each side of panel top of transversal joint</td>
</tr>
<tr>
<td>Qbiss Screen HR B</td>
<td>Horizontal - Brick</td>
<td>23 mm</td>
<td>two laps, each side of panel top of transversal joint</td>
</tr>
<tr>
<td>Qbiss Screen HR B</td>
<td>Vertical - Brick</td>
<td>23 mm</td>
<td>four laps, each corner in transversal joint</td>
</tr>
<tr>
<td>Qbiss Screen HR F-B</td>
<td>Horizontal - Brick</td>
<td>4 mm</td>
<td>two laps, each side of panel top of transversal joint</td>
</tr>
</tbody>
</table>

* For horizontal panel lap position see Fig. 4.5 and for a vertical panel see Fig. 4.7

2.4 Accessory material

Fig. 2.4.1: Fixing profile HF 63 – wind load

Fig. 2.4.2 Screws – wind load fixing

Fig. 2.4.3: Fixing screw for fixing internal sheet-lap joint

Fig. 2.4.4: Transversal gasket - Silicone

Fig. 2.4.5: Decorative profile HF 64 – recessed look of transversal joint

Fig. 2.4.6: EPDM square gasket

Fig. 2.4.7: Cross spacer for Qbiss Screen HR F-B installation
3.0 Installation

3.1 Installation methods

Horizontal installation

Fig. 3.1.1: Horizontal installation with aligned joints

The horizontal façade system consists of individual façade elements which are joined together and linked in a horizontal direction (longitudinally) using a tongue and groove system and attached vertically (transversally) to the load-bearing structure. Transversal joints (vertical joints) are sealed with a specially profiled silicon gasket.

Horizontal Brick installation (by shifting)

Fig. 3.1.2: Horizontal installation with shifted vertical joints

Horizontal installation by shifting or so-called “Brick Installation” enables the shift (shifting of the vertical joint in the middle of the upper or lower façade element) but also means that the vertical joints can be located anywhere on the longitudinal axis of neighbouring horizontal façade elements. Qbiss Screen HR façade elements for this installation method are special – elements are not interchangeable with Qbiss Screen HR façade elements for installation with alignment joints.

Vertical installation

Fig. 3.1.3: Vertical installation with aligned joints

Vertical installation system is composed of individual façade elements, joined in a vertical direction (longitudinal joint) with a tongue - groove system and affixed to the supporting structure in a horizontal direction (transversal joint).

Vertical Brick installation (by shifting)

Fig. 3.1.4: Vertical installation with shifted longitudinal joints

Vertical installation with shifted longitudinal joints or so-called “Brick Installation”. Qbiss Screen HR façade elements for this installation method are special – elements are not interchangeable with Qbiss Screen HR façade elements for installation with alignment joints.
3.2 Installation requirements

Important: Before starting the installation, check the actual state of the building and check the placement of the substructure against the raster in the design of particular project.

Substructure

a. The base support of the Qbiss Screen façade system must be horizontally aligned, otherwise, the vertical joints will not be of the same width.
b. Permissible tolerances of the substructure for the Qbiss Screen façade are shown below.
c. For already installed substructure, the distances between vertical support must be checked for horizontal installation and distances between horizontal support must be checked for vertical installation.

The functionality of Qbiss Screen façade system can only be guaranteed if it is installed according to the following requirements.

The following MUST be provided:
a) HORIZONTAL ALIGNMENT OF THE BASE SUPPORT ANGLE - perform measurements to ensure that it is level. This is crucial for ensuring that the contact surface of the first row of Qbiss Screen façade elements is levelled, otherwise, irregular vertical placing of Qbiss Screen façade elements will occur, causing size increases of transversal joints. Consequently, it will be impossible to finish the transversal joints.

The permissible deviations of alignment for the base angle profile must satisfy two conditions (A and B):
A. Permissible deviation along the whole length of individual Qbiss One Screen façade elements is +/- 0.5 mm.
B. Permissible deviation of alignment of the complete building façade is +/- 2 mm.

b) VERTICAL ALIGNMENT OF THE STRUCTURE/SUBSTRUCTURE perpendicular to the facade surface - perform measurements to ensure that it is level

This is crucial for ensuring that the corner elements will fit properly - otherwise, the façades will not connect perpendicularly but at an angle, causing the CORNER FACADE ELEMENTS TO STACK IMPROPERLY. Consequently, it is impossible to finish the corner of the Qbiss Screen façade system, leading to loss of visual appearance of the facade.
c) FACADE RASTER - distances between vertical supports and the total distance of the substructure - performing the measurement to check for eventual deviations from the predicted position. The distances between vertical supports differ between those specified in the design and the actual distances. THEREFORE, BEFORE INSTALLING THE Qbiss Screen FACADE ELEMENTS, DEVIATIONS MUST BE MEASURED. The deviations can be compensated using the Qbiss Screen façade elements with the transversal joint tolerance by compressing or expanding the area by +2 / -1 mm.

The permissible deviations for distances between verticals are +/- 2 mm, however, they must not add up. The transversal joint of the Qbiss Screen façade system allows some tolerance for façade structure/substructure deviations, up to +2 / -1 mm. This is crucial to ensure that all transversal joints are of the right width. Otherwise, narrowing or widening of the joint can occur. As a consequence, it will be impossible to finish the transversal joints.
Substructure deviation

Δ1 - Deviations of the vertical substructure in ground plan from the building axis in facade direction
Δ1 = ± 2mm

Δ2 - Deviation of the distance between two adjacent verticals in ground plan
Δ2 = ± 2mm

Δ3 - Deviations of the vertical line to the ideal line connecting its adjacent verticals
Δ3 = ± 2mm

Δ4 - Rotation of the vertical substructure around ideal vertical axis
Δ4 = ± 0,5°

Δ5 - Deviations from the vertical line perpendicular to the facade surface at elevation H
Δ5 = ± H/1000mm

Δ6 - Deviations of the vertical substructure length
Δ6 = ± 10mm

Δ7 - Curvature of the vertical substructure according from the centre line
Δ7 = ± 2mm

Fig. 3.2.4: Deviation of substructure

3.3 Preparing Qbiss Screen HR façade element prior to installation

A protective foil for the protection of varnished surfaces against minor scratches caused during transport, handling, and assembly, is applied on both sides of Qbiss Screen façade elements. Immediately before the placement of the Qbiss Screen façade element to the assembly location it is necessary to:

1. completely remove the protective foil from element’s back side,
2. partially remove the protective foil just prior to installation from the element’s front side, at the fixing locations, both longitudinal joints, under edges, etc. (Fig. 3.3.1:). Foil needs to be removed completely when installation is completed at the latest at the end of working day.

NOTE:
- For Qbiss Screen façade elements that are stored for a long period of time, the foil should be removed within three months, at the latest.
- If the Qbiss Screen façade elements are to be stored outside in the open, they should be protected against the sun; otherwise the complete removal of foil is no longer possible.
- During installation, the foil must be removed from all joints of the Qbiss Screen façade element.
- Immediately following installation remove foil completely at the latest at the end of working day.

Fig. 3.3.1: Removal of the protective foil
3.4 Installation according to design requirements of Qbiss Screen HR façade

Fig. 3.4.1: HF 63 profile location

General equation for distance between profiles HF 63 is:

\[
\frac{(M-373 \text{ mm})}{(n_{HF63} - 1)} \quad \text{for Qbiss Screen HR B and}
\]
\[
\frac{(M-354 \text{ mm})}{(n_{HF63} - 1)} \quad \text{for Qbiss Screen HR F-B}
\]

where

- M – panel module in [mm]
- \(n_{HF63}\) – number of fixing profiles in the joint according to static calculation and design

1. Qbiss Screen HR façade element
2. Screw – wind load fixing
3. Fixing profile HF 63
When Qbiss Screen element is in its final position, levelled properly and fixed through laps on each side in horizontal installation or upper laps in vertical installation HF 63 aluminium profiles can be fixed. Position of fixing profiles in transversal joint must be so that the first and last profile are at the extreme positions and the rest of fixing profiles are spread evenly along the length of the joint (Fig. 4.1.1).

Number of screws per fixing profile HF 63 may vary according to static calculation in the project. There can be 1, 2 or 3 screws per profile. In each case it is important that screws are inserted symmetrically in HF 63 profile in the joint (Fig. 3.4.2).

**Table 3.4.1: Minimum distance between fixing elements according to maximum number of fixing elements HF 63 in the transversal joint.**

<table>
<thead>
<tr>
<th>Qbiss Screen HR Design width (M)</th>
<th>Maximal number of fixing elements</th>
<th>Distance between fixing elements l [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Joint type B</td>
</tr>
<tr>
<td>813mm – 1200mm</td>
<td>5</td>
<td>(M-373 mm)/4</td>
</tr>
<tr>
<td>703mm – 812 mm</td>
<td>4</td>
<td>(M-373 mm)/3</td>
</tr>
<tr>
<td>600mm – 702mm</td>
<td>3</td>
<td>(M-373 mm)/2</td>
</tr>
</tbody>
</table>

Example: Panel Qbiss Screen B with module M1000, According to static calculation must be fixed with 4 HF 63 profiles, upper and bottom profile have each 2 screws, middle profiles which are 2, have just the 1 screw each.

First check that the 4 fixing profiles are less than the maximum allowed 5 for the M1000 (Tab. 3.4.1). Distance between HF 63 profiles is

\[ l = (1000\text{ mm} - 373\text{ mm})/3 = 209\text{ mm}. \]
3.5 **Elements cutting**

Qbiss Screen façade elements are made in accordance with project requirements and their cutting is generally not allowed! In case cutting is needed, only the use of sheet metal shears and saws that do not overheat the varnished steel sheet is permitted. In case cutting cannot be avoided, consult with Trimo technical support. Use of a circular saw is recommended.

**NOTE:**
- Marking and scratching with nails or similar sharp objects that can damage the protective paint layer is strictly prohibited.
- Use of any disc grinding machines and welding devices destroys the anti-corrosion protection.
- Small metal particles that appear as a result of cutting and drilling MUST be immediately removed from the surfaces of façade elements by completion of the day’s work at the latest (metal particles exposed to moisture cause corrosion).

| Should cutting be required please contact Trimo |

Fig. 3.5.1: Allowed equipment; Sheet metal shears and saws

| Fig. 3.5.2: Prohibited equipment; disc grinding and welding machines |

Should cutting be required please contact Trimo
3.6 Storage, handling and lifting of Qbiss Screen HR façade elements

Qbiss Screen elements must be handled carefully during transport and unloading. Elements are firmly bundled on wooden pallets into a packet to ensure safe handling.

During unloading, the truck cover must be fully open. Cover supports must be removed in such a manner that enables safe manipulation of packages and prevents Qbiss Screen façade elements from damage during lifting from the truck.

Qbiss Screen elements are packed in standard packaging of heights between 200 and 1320 mm (depends on number of elements) and with up to 1240 mm (depends on the type and module width).

Fig. 3.6.1: Side view of a stack prepared for transport by truck

1. Cover
2. Protective corner
3. Label
4. Front side
5. Polystyrene
6. Handling instructions
7. Façade elements and all protective elements wrapped in packaging foil

NOTE:
- Do not transport open packages!
- The crane, mobile crane or fork lifter may be used for handling of packages.
- Moving or pushing of packages with forks of a fork-lifter is strictly forbidden.
- The use of steel wire ropes is not allowed during handling by crane. The packages must be attached with appropriate load-bearing bands.
- The centre of gravity must always be between forks or load-bearing bands.

IT IS STRICTLY FORBIDDEN TO LIFT MORE THAN ONE PACKAGE AT A TIME!

Upon delivery, package must be examined for any damage that could cause the moisture to penetrate it. In said case the package needs to be opened and the elements that have become wet must be removed and dried to avoid the formation of spots or corrosion. Any damage must be reported immediately and confirmed by the forwarding agent.

The following provisions must be considered when storing Qbiss Screen façade elements:

- It is highly recommended to store Qbiss Screen façade elements in their original packaging thus assuring adequate protection against exposure to dust and sun.
- While storing the products outdoors, the Qbiss Screen façade elements should remain in its original packaging until commencement of assembly to prevent eventual damage.
- Also, removal of stretchable protective foil from the Qbiss Screen façade elements may become difficult when storing the products unpacked for certain periods. The foil MUST be removed within three months at the latest.
- In other case, Qbiss façade elements should be stored in closed, covered, and dry premises – they should not be exposed to the sun and other weather impacts.
- The packages should be stacked on flat and solid surfaces to prevent immersion, leaning, and falling of separate packages, especially in winter periods, when the package’s protective foil is covered with ice.
Wear protective gloves to prevent injury and avoid making any marks on elements. Individual elements must be handled from the package by a two-man team, standing on each side of the element. Element should be slid along the surface of the panel beneath to release the slight vacuum between them and then lifted carefully. Carry elements in a vertical position. Use of vacuum grippers is recommended (Fig. 3.6.2).

**Fig. 3.6.2: Vacuum gripper attached to crane**

**Fig. 3.6.3: Small hand vacuum grippers**

**NOTE:**
Specific requirements for handling elements manufactured by Trimo.
- Manipulation carried out only with certified vacuum manipulators for panels.
- The maximum suction under pressure of vacuum suction cups is 30 kPa.
- Follow vacuum manipulators manufacturer’s instructions on the safe use of vacuum lifting equipment.
3.7 Tools and accessories used for installation

Qbiss Screen elements must be handled carefully during transport and unloading. Elements are firmly bundled on wooden pallets into a packet to ensure safe handling.

During unloading, the truck cover must be fully open. Cover supports must be removed in such a manner that enables safe manipulation of packages and prevents Qbiss Screen façade elements from damage during lifting from the truck.

Qbiss Screen elements are packed in standard packaging of heights between 200 and 1320 mm (depends on number of elements) and with up to 1240 mm (depends on the type and module width).

3.7.1 Installation tool kit

With Qbiss Screen façade kit delivery a separate installation tool kit is delivered.

The contents of installation tool kit for Qbiss Screen B are comprised of:

- 8 x Qbiss Screen B installation crosses (Fig. 3.7.1a)
- 8 x Qbiss Screen Installation device for fixing HF 63 (Fig. 3.7.2)
- 8 x Qbiss Screen 2mm installation plates (vertical installation only) (Fig. 3.7.3)
- 2 x wooden blocks with protective felt for inserting the decorative profile and the transversal gasket (Fig. 3.7.4)
- 1 x spraying bottle with lubricant (soap water) (Fig. 3.7.5)
- 1 x installation instruction

Installation crosses are used to achieve the correct gap between adjacent elements. Installation devices are used to correctly position and fix the HF 63 profile into the transversal joint. Wooden blocks with protective felt are used for inserting the decorative profile and the transversal gasket into final position without damaging adjacent elements or decorative profile. When installing vertical façade 2mm installation plates must be used to keep the panels level and supported at the drip detail. When installing Brick one arm of the installation cross is to be removed.

The contents of installation tool kit for Qbiss Screen F-B are comprised of:

- 8 x Qbiss Screen F-B installation crosses (Fig. 3.7.1b)
- 8 x Qbiss Screen Installation device for fixing HF 63 (Fig. 3.7.2)
- 2 x wooden blocks with protective felt (Fig. 3.7.4)
- 1 x spraying bottle with lubricant (soap water) (Fig. 3.7.5)
- 1 x installation instruction

Installation crosses are used to achieve the correct gap between adjacent elements. Installation devices are used to correctly position and fix the HF 63 profile into the transversal joint. Wooden blocks with protective felt are used for inserting the decorative profile and the transversal gasket into final position without damaging adjacent elements or decorative profile. When installing Brick one arm of the installation cross is to be removed.
3.7.2 Additional tools to be used in installation

In addition to installation kit the following tools must also be used and prepared before starting the installation.

1. For a horizontal and vertical alignment of the substructure the following: laser, bulb level, plumb can be used.
2. Temperature measurement device for measuring temperature of façade elements.
3. A drilling device and drill bits [to drill holes for screws].
4. Wrenches / attachments [for tightening screws]
5. Cutting devices and tools [metal shears, saws, jigsaws, etc.].
6. Hammer [for inserting the decorative profile with the transversal gasket]
7. Vacuum grippers [for easy carrying of Qbiss Screen elements]
4.0 Installation manual

**Installation direction**

Installation direction need not to be specified. The installation is preferably initiated using a Qbiss Screen corner element at the outer boundary axis of the building. Alternatively, installation can start with the first adjacent Qbiss Screen façade element and the bottom row. Regardless of installation direction, the first row on the main beam should be constructed, and all the other rows should be installed as “pyramidal” system, as shown on fig. 4.1 (horizontal installation) and 4.2 (vertical installation).

![Fig. 4.1: Horizontal installation from left to the right](image1)

![Fig. 4.2: Horizontal installation from right to the left](image2)

![Fig. 4.3: Vertical installation from left to the right](image3)

![Fig. 4.4: Vertical installation from right to the left](image4)
Qbiss Screen façade element orientation

Correct orientation at horizontal installation must be ensured to allow the water to drain [the tongue on the longitudinal joint must always face upwards] (see Fig. 4.5:).

Fig. 4.5: Horizontal installation – Element orientation

![Horizontal installation - Element orientation](image)

mid position

Fig. 4.6: Qbiss Screen HR façade element positioning – horizontal installation

![Horizontal installation - Element positioning](image)

Qbiss Screen HR B – horizontal installation
Longitudinal joint: 23 mm; ±2/-0
Transversal joint: 25 mm; ±2/-1 (T=10°C)

Qbiss Screen HR F-B – horizontal installation
Longitudinal joint: 4 mm; ±2/-0
Transversal joint: 25 mm; ±2/-1 (T=10°C)

1. Qbiss Screen façade element – already installed
2. Qbiss Screen façade element – to be installed (Fig. 4.1)
3. Vertical substructure
4. Electrochemical potential insulation tape
5. Cross spacer
6. Fixing profile HF 63 – wind load
7. Position device for Fixing profile HF 63
8. Screw – wind load fixing
9. Longitudinal joint
10. Transversal joint
Correct orientation at vertical installation ensures the longitudinal thermal extension with the position of screws in the laps of the element for self-weight fixing [Fig.4.7:].

Fig.4.7: Vertical installation – Element orientation

Fig.4.8: Qbiss Screen HR façade element positioning – vertical installation method

1. Qbiss Screen façade element – installed
2. Qbiss Screen façade element – to be installed [Fig. 4.3]
3. Vertical substructure
4. Electrochemical potential insulation tape
5. Cross spacer
6. Fixing profile HF 63 – wind load
7. Position device for Fixing profile HF 63
8. Screw – wind load fixing
9. Longitudinal joint
10. Transversal joint

- Before attaching the first Qbiss Screen facade element, the substructure geometry must be checked.
- The base load-bearing profile must be laid horizontally, otherwise, the uniformity of the horizontal and vertical joints of the Qbiss Screen facade system cannot be guaranteed.
- The horizontal alignment of the substructure must be checked using a suitable measuring equipment. This device must be used to ensure that the panels are laid horizontally.
4.1 Horizontal installation

Support for the Qbiss Screen HR façade element base depends on the type of load bearing profiles (Fig. 4.1.1)

Fig. 4.1.1: Type of supports for the Qbiss Screen HR façade element base detail

The substructure consists of the following components:

- Brackets made from metal or fibre-reinforced plastics or combinations of these materials
- Stand-off bolts or distance pieces
- Thermal separators / isolators
- Anchor components
- Load-bearing profiles (L, T, Z, U, Ω-profiles or similar)
- Fasteners

Fig.4.1.2: Elements of load bearing structure

1. Anchor components
2. Bracket
3. Load bearing profile
Fig. 4.1.3: Support for the Qbiss Screen HR façade element base detail

![Diagram of support for Qbiss Screen HR façade element base detail]

Fig. 4.1.4: Qbiss Screen HR façade element base detail – Dimensions for placing

![Diagram showing dimensions for placing Qbiss Screen HR façade element]

1. Base materials – wall
2. Substructure – Load bearing profile
3. Thermal insulation (mineral wool)
4. Thermal insulation base support
5. Base load-bearing profile for the Qbiss Screen HR façade element
6. Perforated section – Insect protection
7. Fixing screws
8. Rivet

**NOTE:**

The permissible deviations of alignment for the base load-bearing profile must satisfy two conditions

- Permissible deviation along the whole length of individual facade elements is ± 0.5 mm.
- The absolute deviation of alignment for the whole distance of the building facade is ± 2 mm.

Fig. 4.1.5: Qbiss Screen HR corner element installation – Self-weight load fixing

![Diagram showing Qbiss Screen HR corner element installation]

1. Qbiss Screen HR corner element; A - side
2. Qbiss Screen HR corner element; B - side
3. Substructure – Load bearing profile
4. Base load-bearing profile for the Qbiss Screen HR façade element
5. Upper prefabricated lap; A - side
6. Bottom prefabricated lap; A - side
7. Upper prefabricated lap; B - side
8. Bottom prefabricated lap; B - side
9. Screws – self-weight load fixing
NOTE:
- Before fixing the Qbiss Screen corner element, vertical and horizontal level need to be checked.
- If a corner leg is longer than 500 mm it needs to be self-weight supported at every 500 mm from transversal joint by a steel flat plate fixed to the element back-side steel sheet and to substructure (Fig.4.1.6).
- If a corner is U-shape formed, it needs to be self-weight supported at the middle position of mid leg at longitudinal tongue joint by a steel flat plate fixed to the element back-side steel sheet and to substructure (Fig.4.1.6).

The installation is continued using installation crosses and by regularly checking the horizontal/vertical alignment of installed Qbiss screen façade elements.

NOTE:
Before fixing the Qbiss Screen element, horizontal alignment of two façade elements through a vertical joint need to be checked.
Installation phases of the Qbiss Screen façade element

1. Panel 1, Panel 2, Panel 3 – Pos. 1 (Fig. 4.1.9) are already installed Qbiss Screen elements. Two elements on the right can be either panels or corner elements the bottom left element is a panel.

2. Inserting the installation cross [pos.3] into the joint between three already installed Qbiss Screen façade elements (pos. 1) to enable correct positioning (Fig. 4.1.9).

3. Place the Qbiss Screen façade element to be installed [pos.2] onto the bottom Qbiss Screen façade element [pos.1], so that they form a longitudinal joint and aligning transversal joint (Fig. 4.1.0).

4. Inserting the installation cross [pos. 3] into the joint between two Qbiss Screen façade elements [pos. 1] on the free side of Qbiss Screen façade element [pos.2], to enable correct positioning [Fig. 4.1.11].

5. Checking the level/horizontal alignment of two adjusted façade elements through vertical/transversal joint and make correction (Fig. 4.1.12).

6. Carry out self-weight load fixing with screws [pos. 4] through the lap joints on the back-side steel sheet. Lap joint flanges with stubends are positioned in the middle of the slotted holes of horizontal Qbiss Screen element (Fig. 4.1.13).

7. Installing HF 63 profile [pos. 5] for wind load fixing use installation device [pos. 6] (Fig. 4.1.14). A limited number of fasteners can be installed depending on the width of the element [Table 3.4.1]. For HF 63 profile location see Fig. 3.4.1. Number of screws [pos. 7] and their type to be determined by structural analysis. It is possible to put three screws on one HF 63 profile - for location see Fig.3.4.2.

Fig. 4.1.9: **Step 2** Inserting the installation cross (pos. 3) into the joint between three already installed Qbiss Screen façade elements (pos. 1)

Fig. 4.1.10: **Step 3** Place the Qbiss Screen façade element to be installed (pos.2) onto the bottom Qbiss Screen façade element (pos.1)

Fig. 4.1.11: **Step 4** Inserting the installation cross (pos.3) into the joint between two Qbiss Screen façade elements (pos.1) on the free side of Qbiss Screen façade element (pos.2)
Fig. 4.1.12: **Step 5** Checking the level/horizontal alignment of two adjacent façade elements through vertical/transversal joint

Fig. 4.1.13: **Step 6** Self-weight load fixing with screws [pos. 4] through the lap joints on first element [pos. 2] and second installed element [pos. 1] on the back-side steel sheet

Fig. 4.1.14: **Step 7** Wind load fixing use HF 63 profile [pos. 5] with installation device [pos. 6] and screws [pos. 7]

Fig. 4.1.15: Wind load fixing in 3 steps

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5. Fixing profile HF 63 – wind load
6. Position device for Fixing profile HF 63
7. Screw – wind load fixing
4.2 **Vertical installation**

Fig.4.2.1: An example of a substructure for vertical installation

1. Base support for the Qbiss Screen HR façade element
2. Substructure – Horizontal load bearing profile
3. Substructure – Vertical profile for fixing horizontal load bearing profiles and for base support for element
4. Thermal insulation
5. Insulation fastener

Fig.4.2.2: Base support detail for the Qbiss Screen HR façade element

1. Base materials – wall
2. Substructure – Load bearing profile
3. Thermal insulation (mineral wool)
4. Thermal insulation support profile
5. base support for the Qbiss Screen HR façade element
6. Perforated section – Insect protection
7. Fixing screws
8. Rivet
9. Fixing console
10. Drip flashing
11. Electrochemical potential insulation tape

Fig.4.2.3: Qbiss Screen HR façade element base detail – Dimensions for placing

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**NOTE:**
The permissible deviations of alignment for the base load-bearing profile must satisfy two conditions:

- Permissible deviation along the whole length of individual facade elements is ± 0.5 mm.
- The absolute deviation of alignment for the whole distance of the building facade is ± 2 mm.
Fig. 4.2.4: Qbiss Screen HR corner element installation – Self-weight load fixing

1. Qbiss Screen HR corner element; A - side
2. Qbiss Screen HR corner element; B - side
3. Substructure – Load bearing profile
4. Base support for the Qbiss Screen HR façade element
5. Upper prefabricated lap; A - side
6. Bottom prefabricated lap; A - side
7. Upper prefabricated lap; B - side
8. Bottom prefabricated lap; B - side

NOTE:
* Upper fixing points are in the upper position; Bottom fixing points are in the middle position

Fig. 4.2.5: Position of lap joint flange with stubend in lap joint on Qbiss Screen HR corner element – Self-weight load fixing

NOTE:
Before fixing the Qbiss Screen corner element, vertical and horizontal level need to be checked.
Installation phases of the Qbiss Screen façade element

1. Inserting the installation cross (pos. 3) into the joint between three Qbiss Screen façade elements (pos. 1) to enable correct positioning (Fig. 4.2.7).
2. Place the Qbiss Screen façade element to be installed (pos. 2) onto the bottom Qbiss Screen façade element (pos. 1), so that they form a longitudinal joint and transversal joint (Fig. 4.2.8).
3. Inserting the installation cross (pos. 3) into the joint between two Qbiss Screen façade elements (pos. 1) on the free side of Qbiss Screen façade element (pos. 2), to enable correct positioning (Fig. 4.2.9).
4. Checking the level/horizontal alignment of two adjacent façade elements through vertical/transversal joint and make correction (Fig. 4.2.10).
5. Carry out self-weight load fixing with screws (pos. 4) through the lap joints on the back-side steel sheet. Lap joint flanges with stubends are positioned in the slotted holes (Fig. 4.2.5 and 4.2.11).
6. Installing HF 63 profile (pos. 5) for wind load fixation use installation device (pos. 6) (Fig. 4.2.12). A limited number of fasteners can be installed depending on the width of the element (Table 4.1.1). For HF 63 profile location see Fig. 4.1.17. Number of screws (pos. 7) and their type to be determined by structural analysis. On one HF 63 profile is possible to put three screws - their location in Fig. 4.1.18.

Fig. 4.2.7: **Step 1** Inserting the installation cross (pos. 3) into the joint between three already installed Qbiss Screen façade elements (pos. 1)

Fig. 4.2.8: **Step 2** Place the Qbiss Screen façade element which to be installed (pos. 2) onto the bottom Qbiss Screen façade element (pos. 1)

Fig. 4.2.9: **Step 3** Inserting the installation cross (pos. 3) into the joint between two Qbiss Screen façade elements (pos. 1) on the free side of Qbiss Screen façade element (pos. 2)
Fig. 4.2.10: **Step 4** Checking the level/horizontal alignment of two adjusted façade elements through vertical/transversal joint

Fig. 4.2.11: **Step 5** Self-weight load fixing with screws through the lap joints on the back-side steel sheet

Fig. 4.2.12: **Step 6** Wind load fixing use HF 63 profile (pos.5) with installation device (pos.6) and screws (pos.7)
4.3 Finishing of the transversal joint

NOTE:
The transversal joint is sealed with transversal joint gasket and decorative Alu profile HF 64 to prevent rain water to enter the joint and the interior of Qbiss Screen HR Façade element.

Transversal joint gasket must be installed shortly after installing the Qbiss Screen HR façade element or at the end of the day at the latest! Do not leave the façade open and unsealed during heavy rains! Decorative profile HF 64 is coloured for visual appearance of the joint. It provides uniform recessed look of transversal joint.
Use of additional lubricant (soapy water) and a bar with protective felt (hammer tools) from damage when positioning transversal gasket and Alu profile HF 64.

The same sequence applies to vertical installation – joints are rotated for 90°.

Transversal joint gasket is inserted together with the inserted decorative profile [Fig.4.3.1].

Installation sequence:

COMPLETE ALL STEPS from Sections 4.1 or 4.2 continuing the installation of Qbiss Screen HR façade elements.

Assembling or combining the transversal joint gasket and the decorative profile into one before they are inserted into the transversal joint.

Inserting both elements into the transversal joint, beginning from the top / last Qbiss Screen HR façade element Gradual pressing both elements into the transversal joint by hand:
press from the top of the transversal joint gasket to the bottom of the joint.
For final position use of additional wood bar with felt and hammer tools [Fig.4.3.3].

This forms a transversal/vertical joint with a depth of 24 mm and a width of 25 mm [at the element temperature T=10°C].

For visual control of the insertion depth, you can use the same level of the decorative profile of the horizontal joint, which is also at a standard depth of 24 mm.

The average joint depth is 24 mm +0.5/-1.0 [24.5 mm – 23.0 mm].

Fig.4.3.1: Transversal joint gasket with decorative profile insertion

1. Qbiss Screen HR façade element; installed
2. Substructure – Load bearing profile
3. Electrochemical potential insulation tape
4. Transversal joint gasket together with the inserted decorative profile
5. Transversal joint
6. Longitudinal joint
Fig.4.3.2: Use of additional lubricant [soapy water]

Fig.4.3.3: Finishing the transversal joint gasket with decorative profile insertion
Extending the transversal joint gasket

The extension is performed in case the length of the transversal joint gasket is insufficient to completely seal the transversal joint. In this case, extension is performed as follows:

1. Cut the top transversal gasket at an angle of 45°.
2. Cut the bottom transversal gasket at an angle of 45°.
3. Assemble both transversal gaskets with a head-to-head joint under a 45° angle. Apply sealing compound onto the joint site.

![Fig.4.3.4: Extending the transversal joint gasket](image)

Extending the decorative profile

The standard length for decorative profiles is 4 metres. Extension is performed using a dilation slot of 10 mm, meaning that the profiles are not in contact to prevent internal stress and eventual loss of profiles due to thermal expansion of aluminium.

Profiles are cut to length in manufacturing according to the specifics of individual projects and installation details.

They can however also be cut on site if necessary. Ensure that the cut is clean and straight.

![Fig.4.3.5: Extending the decorative profile HF 64](image)

NOTE:
- Extending the gasket and the decorative T-Profile MUST NOT be performed on the same spot!
- Minimum distance between both extensions is 500 mm (or up or down)
**Finishing the transversal joint gasket and the decorative profile on the drain detail**

Finishing the transversal joint gasket and the decorative profile on the draining is performed as per Fig. 4.3.6: Finishing is performed the next steps:

1. Cutting the standing part of the decorative profile by 20 mm (as shown in the details).
2. Assembling the transversal gasket and the decorative profile.
3. Inserting both elements into the transversal joint.

Fig.4.3.6: Finishing the decorative profile and positioning of the transversal joint gasket in free state and in joint

**Execution of joints connection ends under the cover flashing or frame**

For better visual appearance and sealing, ends of the joints need to be specially finished with the square gasket and the decorative profile as per Fig.4.3.7:

Fig.4.3.7: Joints connection ends under the cover flashing or frame

1. Qbiss Screen façade element
2. Decorative profile – bent
3. Square EPDM gasket + sealing compound
4. Cover flashing

The sealing compound must be applied around the square gasket (Fig. 4.3.7 b).
5.0 Reference documents

The reference documents together with this document contain a comprehensive overview and information about the Qbiss Screen HR modular façade system.

1. Qbiss Screen HR – Technical document
2. Qbiss Screen HR Details – horizontal & vertical assembly
3. Packing, Transport and Storage – Technical document

6.0 The Check-list-steps for checking the installation

Standard steps for checking whether the installation was performed according to the instructions and good installation practice to ensure quality installation. Prior to installation check all tools (see Ch. 3.6) are on hand!

<table>
<thead>
<tr>
<th>Check-list</th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Substructure meets tolerance requirements (horizontally, vertically, dimensions, plains)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2. Façade elements (vertical and horizontal) are installed according to the details</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. Main beam attachment installed and attached according to the details</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. Electrochemical potential insulation tapes installed onto the substructure</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. Protective foil partially removed from the façade elements before the installation and fully after installation</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6. First row of façade elements installed horizontally with vertical joint gaps within tolerances</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7. Façade elements attached through the back-side metal sheet according to the installation instructions</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8. The number of screws used for attachment through the eAlu HF 63 to front side metal sheet conforms to the design</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9. Screws for attachment through the Alu HF 63 to front side metal sheet tightened accordingly</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10. Gasket of the transversal joint and the decorative T-profile inserted into the vertical joint with the insertion bar and according to the details for extending and sealing at the beginning and end of gasket</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>11. Corner endings of façades installed, attached and sealed according to the details</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12. Suitable tools used to cut façade elements</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13. Window, door and other openings from aluminium profiles installed, attached and sealed according to the details</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>14. Linings installed, attached and sealed according to the details</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Annex A.1: Influence of temperature and length for the Qbiss Screen HR façade element on the dimension of the transversal joint

To insure the design length (R) of the façade element; the thermal expansion (ΔR) of the Qbiss Screen HR façade element must be considered.

Fig. A 1.1: Thermal expansion (ΔR)

Basic temperature for installation of the Qbiss Screen HR façade element is 10°C. The temperature range of the elements varies between -20°C and +80°C.

Formula for calculating ΔR

\[ ΔR = R \times (T - T_0) \times α \]

- \( R \) – Design length of Qbiss Screen HR façade element [mm]
- \( T_0 \) – Initial temperature [10 °C]
- \( T \) – Measured temperature of Qbiss Screen HR façade element for install [°C].
- \( α \) – linear expansion coefficient [m/mK] (Qbiss Screen HR façade element is: 1.2*10^-5 m/(mK))

The joint allows the distance between two adjacent elements in transversal direction (gap; not to be confused with ventilation air gap) between 21 and 26 mm.

Fig. A 1.2: Minimal/maximal gap between two adjacent Qbiss Screen HR façade elements

Required dimensions of the gaps

Case 1: \( T_1 = T_2 \) & \( R_1 = R_2 \)

- \( T_1 \) – Temperature of installed Qbiss Screen HR façade element
- \( T_2 \) – Temperature of Qbiss Screen HR façade element for installation
- \( R_1 \) – Design length of installed Qbiss Screen HR façade element
- \( R_2 \) – Design length of Qbiss Screen HR façade element for installation
Table A 1.1: Dimensions for gaps; depend on element temperature (T) and design length (R)

<table>
<thead>
<tr>
<th>Design length (R) [mm]</th>
<th>Element temperature (T) [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-20</td>
</tr>
<tr>
<td>2500</td>
<td>26</td>
</tr>
<tr>
<td>3000</td>
<td>26</td>
</tr>
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</tr>
<tr>
<td>6000</td>
<td>26</td>
</tr>
<tr>
<td>6500</td>
<td>26</td>
</tr>
</tbody>
</table>

Case 2: T₁ ≠ T₂ or R₁ ≠ R₂

T₁ – Temperature of installed Qbiss Screen HR façade element
T₂ – Temperature of Qbiss Screen HR façade element for installation
R₁ – Design length of installed Qbiss Screen HR façade element
R₂ – Design length of Qbiss Screen HR façade element for installation

Formula for calculating dimension of gap (F)

\[ F = 25 \text{mm} + \left(\frac{\Delta R_1 + \Delta R_2}{2}\right) \]

\(\Delta R_1\) – Thermal expansion of installed Qbiss Screen HR façade element
\(\Delta R_2\) – Thermal expansion of Qbiss Screen HR façade element for installation

Table A 1.2: Thermal expansion of Qbiss Screen HR façade element (ΔR); depend on element temperature (T) and design length (R)

<table>
<thead>
<tr>
<th>Design length (R) [mm]</th>
<th>Element temperature (T) [°C]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>--5</td>
</tr>
<tr>
<td>550</td>
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<td>6500</td>
<td>2</td>
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</tbody>
</table>

Example:

Installed Qbiss Screen HR façade element
Qbiss Screen HR façade element for installation
T = 60 °C
R = 4500 mm
\(\Delta R_1 = -3\) mm (see table A 1.2)
\(\Delta R_2 = 0\) mm (see table A 1.2)

\[ F = 25 \text{mm} + \left(\frac{|\Delta R_1 + \Delta R_2|}{2}\right) = 25 \text{mm} + \left(\frac{|-3\text{mm} + 0\text{mm}|}{2}\right) = 25 \text{mm} - 1.5 \text{mm} = 23.5 \text{mm} \]
Fig. A 1.3: Measuring the element temperature [T] [°C]

- Measured temperature  36 °C
- Calculating temperature  40 °C

Fig. A 1.4: Measure the dimensions R [design length] & M [design width] after installation
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