This document is valid for the Power2 series:

Power2 340-H

Purpose
The assembly instructions explain how the low- and high-pressure stage of ABB Turbo Systems is fitted to the engine correctly and without any health and safety risks.

Target group
The assembly instructions are intended for engineers and mechanics responsible for fitting the low- and high-pressure stage on the engine.

Power2 performance package
Two-stage turbocharging solution for highest turbocharging efficiency
Assembly Instructions

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1 Introduction

1.1 Purpose of the assembly instructions

The assembly instructions explain how the low- and high-pressure stage of ABB Turbo Systems is fitted to the engine correctly and without any health and safety risks. This element of the documentation is supplied with the product, as is required for partly completed machinery in accordance with machinery directive 2006/42EC.

The assembly instructions are a complement to and expansion of existing national regulations for occupational safety, accident prevention and environmental protection.

1.2 Definition of target group

The assembly instructions are intended for engineers and mechanics responsible for fitting the low- and high-pressure stage on the engine. Basic mechanical training is a prerequisite.

All persons who are involved in the transportation and installation of the low and high-pressure stage have read and understood the assembly instructions.

1.3 Symbols, definitions

Symbols

The following symbols are used in this document:

- Indicates an action step.
1. Indicates a numbered action step.
  - Indicates a list.
[➙ ] Refers to a page number

Terms used

The following terms are used in this document:

- Two-stage turbocharging (Power2)
- Low-pressure stage (Power2 LP)
- High-pressure stage (Power2 HP)
- Low-pressure and high-pressure stage

The trademarks of outside companies are used in this document. These are marked with the ® symbol.
Design variants

This document is valid for different design variants of low and high-pressure stages. There may be sections and descriptions of components that are not relevant for a specific low or high-pressure stage.

ABB Turbocharging Service Stations will be happy to provide information about questions regarding a design variant (see "Contact Information" on our website www.abb.com/turbocharging).

Accuracy of illustrations

The illustrations in this document are general in nature and intended for ease of understanding. Differences in detail are therefore possible.

ABB Turbo Systems

ABB Turbo Systems Ltd is identified as ABB Turbo Systems in this document.

Official service stations of ABB Turbo Systems

Official service stations are identified in this document as ABB Turbocharging Service Stations. They are regularly audited and certified by ABB Turbo Systems. See "Contact Information" on our website at www.abb.com/turbocharging.

Definition of pictograms

The following pictograms can occur in this document. These point out actions that must be taken in accordance with the meaning of the relevant pictogram.

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Meaning</th>
<th>Pictogram</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Pictogram" /></td>
<td>Tighten with specified torque</td>
<td><img src="image2" alt="Pictogram" /></td>
<td>Oil free, grease free and dry</td>
</tr>
<tr>
<td><img src="image3" alt="Pictogram" /></td>
<td>Tighten over specified tightening angle</td>
<td><img src="image4" alt="Pictogram" /></td>
<td>Affix</td>
</tr>
<tr>
<td><img src="image5" alt="Pictogram" /></td>
<td>Hand-tight, tighten without tools</td>
<td><img src="image6" alt="Pictogram" /></td>
<td>Measure</td>
</tr>
<tr>
<td><img src="image7" alt="Pictogram" /></td>
<td>Oil</td>
<td><img src="image8" alt="Pictogram" /></td>
<td>Note</td>
</tr>
<tr>
<td><img src="image9" alt="Pictogram" /></td>
<td>Apply screw locking paste (e.g. Loctite)</td>
<td><img src="image10" alt="Pictogram" /></td>
<td>Visually inspect</td>
</tr>
<tr>
<td><img src="image11" alt="Pictogram" /></td>
<td>Apply high-temperature grease</td>
<td><img src="image12" alt="Pictogram" /></td>
<td>See document</td>
</tr>
<tr>
<td><img src="image13" alt="Pictogram" /></td>
<td>Apply other paste in accordance with specifications</td>
<td><img src="image14" alt="Pictogram" /></td>
<td>Dispose of in an environmentally compatible, professional way and in compliance with locally applicable regulations.</td>
</tr>
</tbody>
</table>

Table 1: Definition of pictograms
1.4 Definition of warning, caution, note

**Definition of Warning**
Non-compliance or inaccurate compliance with working or operating instructions indicated by this symbol and the word **WARNING** can lead to serious injuries to personnel and even to fatal accidents.

- Warning signs must always be observed.

**Definition of Caution**
Non-compliance or inaccurate compliance with working or operating instructions indicated by this symbol and the word **CAUTION** can lead to serious damage to engine or property with grave consequences.

- Caution signs must always be observed.

**Note**
The note provides advice which facilitates the work.

1.5 Definition of mandatory signs

<table>
<thead>
<tr>
<th>To be worn at all times</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Protective clothing" /></td>
<td><strong>Protective clothing</strong></td>
</tr>
<tr>
<td><img src="image" alt="Safety footwear" /></td>
<td><strong>Safety footwear</strong> to protect against mechanical hazards</td>
</tr>
</tbody>
</table>

Table 2: Personal protective equipment to be worn at all times

<table>
<thead>
<tr>
<th>To be worn specific to the respective task</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Safety glasses" /></td>
<td><strong>Safety glasses</strong></td>
</tr>
<tr>
<td><img src="image" alt="Safety goggles" /></td>
<td><strong>Safety goggles</strong></td>
</tr>
<tr>
<td><img src="image" alt="Safety gloves" /> to protect against - Mechanical hazards - Chemical hazards - Heat hazards</td>
<td><strong>Respiratory mask</strong> to protect against - Dusts - Gases</td>
</tr>
<tr>
<td><img src="image" alt="Safety helmet" /></td>
<td><strong>Ear protection</strong></td>
</tr>
</tbody>
</table>

Table 3: Personal protective equipment to be worn specific to the respective task
2 Safety

2.1 Introduction

The two-stage turbocharging system (Power2) manufactured by ABB Turbo Systems is state of the art and complies with the respective health and safety standards in effect at the time the system was built. Thus Power2 is safe to operate. Nevertheless, there may be some residual risks during operation of the Power2 and work on Power2 components, such as low-pressure stage and high-pressure stage, which:

- Are caused by Power2 itself or its accessories.
- Are caused by the operating equipment used or supplies and materials.
- Are a consequence of insufficient compliance with safety instructions.
- Are a consequence of insufficient or inappropriate performance of maintenance and inspection work.

The operating company is responsible for defining measures that regulate safe access to and safe handling of the Power2.

All instructions contained in this chapter must be observed for safe and trouble-free operation of the Power2 and during all work on the Power2 components.

All further safety instructions contained and specifically identified in every chapter of this document (see section Definition of safety instructions) must also be observed.

Information

Low-pressure and high-pressure stages from ABB Turbo Systems comply with the Machinery Directive 2006/42/EC and are partly completed machinery as defined by Article 2 g.

Responsibility of the operating company

In awareness of its responsibility, the operating company must ensure that only authorised personnel work on the Power2, who:

- Are versed in the general and locally applicable regulations for occupational safety and accident prevention
- Are equipped with the prescribed personal protective equipment
- Have read and understood the Operation Manual
- Have been instructed in the use of the Power2.

The safety-conscious work of the personnel and adherence to the Operation Manual must be checked periodically.

Suitable working materials and personal protective equipment must be kept in a perfect condition.

Only authorised personnel may remain in the vicinity of the Power2 when the engine is running.
2.2 Lifting of loads

**Suspended loads**
Loads that are not attached according to regulations can cause injury to personnel or fatal accidents.

- Loads must always be fastened to properly functional lifting gear with a sufficient load limit.
- Pay attention to the correct attachment of loads on the crane hook.
- People must not stand beneath suspended loads.

Wear safety gloves against mechanical risks.

Wear safety helmet.

![Figure 1: Attachment of loads on the crane hook](image)

If there are two or more suspension points, the attachment angle of 45° must not be exceeded. This prevents excessive loading due to diagonal pull.

- Use a suitable edge guard if there are sharp edges.
- The assembly devices must be completely screwed in and must not unscrew during use.
- Use assembly devices only for the described applications.
2.3 Occupational safety

Occupational safety

Injuries to persons
Severe injuries to personnel or fatal accidents can be caused by mechanical influences as a consequence of hazardous and inadequate operational procedures or non-compliance with safety and health standards.

- When working on the Power2, always wear safety footwear and protective clothing to protect against mechanical hazards.
- Keep personal protective equipment in perfect condition.
- Obey mandatory signs.
- Observe the general rules for occupational safety and prevention of accidents.
- Only perform operations that are described in this chapter.
- Only perform operations for which you have received instruction or training.

Wear safety footwear against mechanical risks.

Wear protective clothing.

Risk of falling
When work is performed on the low-pressure or high-pressure stage, there is a risk of falling.

- Do not climb onto the low-pressure or high-pressure stage or onto attached parts and do not use them as climbing aids.
- Use suitable climbing aids and working platforms for work above body height.

- Only perform work on the low-pressure or high-pressure stage when you are in a physically and psychologically stable condition.
- Only work with suitable tools, equipment and appliances that function properly.
- Keep the workplace clean; clear away any loose objects and obstacles on the floor.
- Keep the floor, equipment and the low-pressure and high-pressure stage clean.
- Have oil binding agents ready and provide or keep oil pans at hand.

Welding work
- When performing welding work in the vicinity of the low-pressure stage, always cover the filter silencer to prevent the filter mat from being damaged.
- Keep flammable objects and substances out of the vicinity of flying sparks.
Cover all connections on the low-pressure and high-pressure stage so that no foreign objects can enter the low-pressure or high-pressure stage.

Mechanical hazards when working on the low-pressure and high-pressure stage

**Physical hazards due to rotating parts**

The rotor can rotate due to the stack draught alone. Contact with rotating parts can cause severe injury.

- Secure rotor against turning.

**Mechanical hazards**

Severe injuries to personnel or fatal accidents can be caused by mechanical influences as a consequence of hazardous and inadequate operational procedures.

- Observe the general rules for occupational safety and prevention of accidents.
- Ensure workplace safety.
- Only perform operations that are described in this document.
- Only perform operations for which you have previously received instruction or training.

Hazards due to operating materials and supplies

Operating materials and supplies can include: Oils, greases, coolants, cleaning agents and solvents, acids or similar substances.

**Handling operating materials and supplies**

Swallowing or inhaling vapours of operating materials and supplies or contact with them may be harmful to health. Flammable and combustible operating materials and supplies can catch fire or resulting vapours can lead to an explosion.

- Do not breathe in these substances and avoid contact with the skin.
- Ensure proper ventilation.
- Observe the information in the material safety data sheet for the operating materials and supplies.
- Comply with local legislation.

Wear safety goggles.

Wear safety gloves against mechanical risks.

Wear a respiratory mask to protect against gases.
3 Weight and transportation of the low-pressure and the high-pressure stages

Lifting gear with a sufficient load limit must be used for installing the low-pressure and high-pressure stages. The following weight specifications apply to the heaviest variant possible. Depending on the specification, the weight specified on the rating plate may be lower than the standard values specified here.

![Figure 3: Suspending the low-pressure and high-pressure stages](image)

**A** High-pressure stage  
**B** Low-pressure stage

<table>
<thead>
<tr>
<th>Product</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-pressure stage</td>
<td>440</td>
</tr>
<tr>
<td>High-pressure stage</td>
<td>280</td>
</tr>
</tbody>
</table>

Table 4: Weights of the low-pressure and high-pressure stages

Two swivel lifting eyes are required for the safe lifting of loads. These are not included in the ABB Turbo Systems scope of delivery.

<table>
<thead>
<tr>
<th>Swivel lifting eyes to be used</th>
<th>Thread:</th>
<th>Length:</th>
<th>Minimum load limit:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12</td>
<td>21 mm</td>
<td>200 kg</td>
</tr>
</tbody>
</table>

Table 5: Swivel lifting eyes to be used
4 Installing the low-pressure stage

4.1 Inserting gaskets

**CAUTION**

Inserting the gaskets

Damaged or improperly inserted gaskets lead to oil leaks.

- Always use new gaskets and insert them carefully into the slot.

The oil is supplied (02) and drained (03) through the bracket (01).

The necessary sealing is provided by O-rings. The gaskets are not included in the ABB Turbo Systems scope of delivery and must be provided by the enginebuilder.

![Diagram of gasket insertion](image)

Figure 4: Inserting gaskets into the bracket

<table>
<thead>
<tr>
<th>01</th>
<th>Bracket</th>
<th>02</th>
<th>Oil supply</th>
<th>04</th>
<th>Slot for gasket</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Oil supply</td>
<td>03</td>
<td>Oil drain</td>
<td>05</td>
<td>O-rings</td>
</tr>
<tr>
<td>03</td>
<td>Oil drain</td>
<td>04</td>
<td>Slot for gasket</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**

Pin (06) as installation safety device

The low-pressure stage can have an oil inlet either on its right or left side, and this can be different for the low-pressure stage fitted on the left and right engine bank.

A pin can be installed in the support as an installation safety device to prevent inadvertent incorrect fitting. This pin fits into the respective slot on the foot of the bearing casing. Instructions of the enginebuilder must be observed.
4.2 Fixing screws

The fixing screws for fastening the low-pressure stage are not included in the ABB Turbo Systems scope of delivery and must be provided by the enginebuilder.

General information

![Diagram](image)

Figure 5

<table>
<thead>
<tr>
<th>Subject</th>
<th>Related requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material of fixing elements</td>
<td>ISO property class 10.9 and 12.9 according to DIN/ISO 898</td>
</tr>
<tr>
<td>(for securing low-pressure stage on bracket)</td>
<td></td>
</tr>
<tr>
<td>Value a</td>
<td>125 mm</td>
</tr>
<tr>
<td>Depth of thread c</td>
<td>≥ 1.5 x nominal thread diameter</td>
</tr>
<tr>
<td>Coefficient of friction</td>
<td>0.12 (lightly oiled)</td>
</tr>
<tr>
<td>Thread sizes</td>
<td>M20 (through hole in the bearing casing, 21 mm)</td>
</tr>
</tbody>
</table>

Table 6
4.3 Placing the low-pressure stage on the bracket and aligning

The screws for attaching the low-pressure stage are not included in the ABB Turbo Systems scope of delivery. Ensure the following:

- Property class 10.9 / 12.9
- Use in accordance with DIN EN ISO 898 Part 1
- Lightly oiled thread.

Figure 6: Placing the low-pressure stage on the bracket

1. Make sure that the O-rings are placed correctly in the slots of the bracket (04).
2. Attach the lifting gear to the suspension lug / eye and additionally loop it around the gas outlet casing (61001).
3. Clean the contact surfaces of the fixing screws (01) in the bearing casing.
4. Place the low-pressure stage on the bracket (04) and align it. The oil inlet of the low-pressure stage must fit the oil supply of the bracket. A positioning pin (03) may have been fitted in the bracket to ensure correct positioning.
5. Fit the fixing screws (01). Observe the steps for fastening the low-pressure stage (see following section).
6. If present, fit the support (61300) on the bracket. To do this, slightly loosen the screw (61003) connecting the gas outlet casing (61001) and the support (61300). Once the support can be turned, the three fixing screws (05) can be fitted. Observe the steps for fastening the low-pressure stage (see following section).
4.4 Steps for fastening the low-pressure stage

Figure 7: Low-pressure stage, tightening the fixing screws.

- Tighten the fitted fixing screws (01) according to the following table:

<table>
<thead>
<tr>
<th>Power2</th>
<th>Fixing screws (01) [mm]</th>
<th>Tightening torques [Nm] (friction coefficient µ=0.12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 LP</td>
<td>M20</td>
<td>455</td>
</tr>
</tbody>
</table>

Table 7: Fixing screw tightening torque (01)

- If a support is present, tighten the fixing screws (05) according to the following table:

<table>
<thead>
<tr>
<th>Power2</th>
<th>Fixing screws (05) [mm]</th>
<th>Tightening torques [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 LP</td>
<td>M16</td>
<td>180</td>
</tr>
</tbody>
</table>

Table 8: Fixing screw tightening torque (05)

- Then tighten the hexagon-head screw (61003).

<table>
<thead>
<tr>
<th>Power2</th>
<th>Hexagon-head screws (61003) [mm]</th>
<th>Tightening torques [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 LP</td>
<td>M20</td>
<td>320</td>
</tr>
</tbody>
</table>

Table 9: Tightening torque (61003)

- Remove lifting gear.

4.4.1 Completion work, if required

- Attach all gas, air, water and oil pipes in accordance with the enginebuilder's instructions.
- Fit insulation components.
- Fit speed sensor and plug in cable connector.

Version with water-cooled bearing casing

- Remove the screw plugs on the water connections.
- Fit the water pipes according to the enginebuilder's instructions.
5 Installing the high-pressure stage

5.1 Inserting gaskets

**CAUTION**

Inserting the gaskets
Damaged or improperly inserted gaskets lead to oil leaks.
- Always use new gaskets and insert them carefully into the slot.

**Figure 8: Gaskets in the slots of the bearing casing**

<table>
<thead>
<tr>
<th>Part Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>42001</td>
<td>Bearing casing</td>
</tr>
<tr>
<td>42198</td>
<td>O-ring</td>
</tr>
<tr>
<td>42199</td>
<td>O-ring</td>
</tr>
<tr>
<td>01</td>
<td>Oil supply</td>
</tr>
<tr>
<td>02</td>
<td>Oil drains</td>
</tr>
</tbody>
</table>

The oil is supplied (01) and drained (02) through the bracket.

- Insert the O-rings (42198 and 42199) into the slots of the bearing casing.
5.2 Fixing elements

Figure 9

Scope of delivery of the high-pressure stage

The following fixing elements are included in the ABB Turbo Systems scope of delivery.

42190 Expansion bush
42191 Threaded rod
42193 Centering bush
42201 Clamping nut (with thrust washer)

NOTICE

Clamping nut (42201)
Using a clamping nut (42201), the required initial tension is achieved with commercially available torque spanners.

Screws (01)

The three screws (01) for attaching the support are not included in the ABB Turbo Systems scope of delivery and must be provided by the enginebuilder.

<table>
<thead>
<tr>
<th>Power2</th>
<th>Material DIN/ISO 898 (Part 1)</th>
<th>Thread</th>
<th>Minimum length</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 HP</td>
<td>10.9 / 12.9</td>
<td>M12</td>
<td>35 mm</td>
</tr>
</tbody>
</table>

Table 10

► The dimensions for attaching the support are shown in the Outline drawings documentation.
5.3 Placing the high-pressure stage on the bracket

1. Insert expansion bush (42190) into bearing casing.
2. Screw the clamping nut (42201) flush onto the threaded rod (42191). The hexagon of the thread screw is at the top.
3. Place thrust washer (01) of clamping nut onto expansion bush.
4. Lead threaded rod (42191) with screwed-on clamping nut through thrust washer, expansion bush and bearing casing.
5. Screw the centering bush (42193) flush onto the threaded rod from below.

Figure 10: Preparing the fastening elements of the high-pressure stage
1. Lightly lubricate hole into which centering bush (42193) is inserted with screw grease.
2. Position threaded rod with centering bush into bracket and insert until stop.
3. Carefully lower high-pressure stage onto bracket and position using the centering bushes (42193) located in the bracket.
4. Check value x.
   If value x is not reached, the high-pressure stage must be lifted up from the bracket and realigned.
5. Screw threaded rod into bracket up to value L using hexagon.
   If value L is not reached or the threaded rod jams while being screwed in, the threaded rod must be loosened by no more than 1/2 revolution (this will loosen the centering bush which may have jammed the rod). Then continue screwing in.
   If value L is not reached, undo the screw connection, carefully take the high-pressure stage off the bracket and repeat the procedure starting with Step 1.

> Observe the steps for fastening the high-pressure stage (see following section).

<table>
<thead>
<tr>
<th>Value X</th>
<th>Value L</th>
</tr>
</thead>
<tbody>
<tr>
<td>106 ±2 mm</td>
<td>60 mm</td>
</tr>
</tbody>
</table>

Table 11: Values X and L
5.4 Steps for fastening the high-pressure stage

**Support (61300)**

In radial gas outlet casings, the gas forces cause high torques to act on the high-pressure stage. If the high-pressure stage is fastened improperly, this can damage the high-pressure stage and cause serious injuries to persons or even fatal accidents.

- When using a radial gas outlet casing, only operate the high-pressure stage with a completely fitted support (61300).

Figure 12

- Tighten the clamping nuts (42201) (see section Tightening the clamping nut).
- Tighten the fixing screws (01) of the support (61300) according to the following table.

<table>
<thead>
<tr>
<th>Power2</th>
<th>Fixing screws (01) [mm]</th>
<th>Tightening torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 HP</td>
<td>M12</td>
<td>110</td>
</tr>
</tbody>
</table>

Table 12

- Tighten the screw (61003) of the connection between gas outlet casing (61001) and support (61300).

<table>
<thead>
<tr>
<th>Power2</th>
<th>Hexagon-head screw (61003) [mm]</th>
<th>Tightening torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 HP</td>
<td>M16</td>
<td>180</td>
</tr>
</tbody>
</table>

Table 13
5.5  Tightening the clamping nut

Preparations for tightening the clamping nut

**CAUTION**

Do not clean pressure screws (04)

The pressure screws are equipped with a permanent sliding layer that must not be removed.

Do neither clean nor lubricate the pressure screws. In case of non-compliance, it cannot be ensured that the necessary tension force is reached.

- Do not clean pressure screws.
- Do not lubricate pressure screws.

**NOTICE**

Pressure screws (04) must not protrude from the clamping nut (03) in the direction of the thrust washer (02)

In order to correctly fit the clamping nut, the pressure screws must not protrude in the direction of the thrust washer.

![Diagram showing the tightening procedure](image)

Figure 13: Preparing the clamping nut for the tightening procedure

1. Clean the thread of the bolt (01) and the contact surface.
2. Lightly oil the bolt thread.
3. Position the thrust washer (02) in place.
4. Tighten clamping nut (03) by hand.
5. Unscrew clamping nut (03) by ¼ of a turn (90°).

The distance between the thrust washer and the clamping nut is now about 1 mm.
Tightening pressure screws

![Figure 14: Tightening pressure screws](image)

<table>
<thead>
<tr>
<th>Power2</th>
<th>Fixing screw [mm]</th>
<th>Tightening torques [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 HP</td>
<td>M24</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 14: Tightening torque of clamping nut pressure screws

1. Screw in pressure screws crosswise by hand until reaching the stop.
2. Tighten pressure screws crosswise to 50 % of the tightening torque specified in the table.
3. Tighten pressure screws crosswise to 100 % of the tightening torque specified in the table.
4. Work in a circle to tighten all pressure screws to 100 % of the tightening torque specified in the table.
5. Tighten pressure screws to 100 % in 5 … 7 rounds until the required residual tightening angle of < 20° is achieved.

5.5.1 Completion work, if required

- Attach all gas, air, water and oil pipes in accordance with the enginebuilder's instructions.
- Fit insulation components.
- Fit speed sensor and plug in cable connector.
6 Storage of new low-pressure and high-pressure stages

Storage of new low-pressure and high-pressure stages and cartridge groups for up to 6 months

New low-pressure and high-pressure stages and cartridge groups from ABB Turbo Systems can be stored in their closed packages for 6 months from the date of delivery without additional mothballing measures (indicated by VCI label on package).

Only dry rooms with 40...70 % atmospheric humidity, in which no water condensation can form, are suitable as storage locations.

Storage of new low-pressure and high-pressure stages and cartridge groups for more than 6 months (VCI)

![VCI](VolatilCorrosionInhibitor(VCI))

**Health protection when handling VCI**

VCI products are not hazardous in terms of the Ordinance on Hazardous Substances. Nevertheless, the following points must be observed when handling VCI:

- Ensure proper space ventilation.
- Do not eat, drink or store food at the workplace while working with VCI.
- Wear safety gloves.
- Clean hands and face after working with VCI.
- For more information, see www.branopac.com.

Every 6 months, the following mothballing measures are required:

- Open package.
- Remove VCI corrosion protection emitter from package and replace with a new VCI corrosion protection emitter of the same kind. New VCI corrosion protection emitters can be obtained from www.branopac.com.
- Old VCI corrosion protection emitters must be disposed of in an environmentally compatible, professional way and in compliance with locally applicable regulations.
- Close package. The more tightly the package is sealed, the longer the protection duration.
Long-term storage of replacement low-pressure and high-pressure stages or replacement cartridge groups

ABB Turbo Systems will prepare low-pressure and high-pressure stages or cartridge groups for long-term storage if requested in the purchase order. The package is equipped with a hygrometer (see illustration).

![Figure 16: Package with hygrometer](image)

Every 6 months, the following measures are required:

- Check the hygrometer (02) in the sight-glass. There is an opening (01) in the wooden crate to enable you to perform this check. If the 70% indicator field has changed colour, the maximum admissible atmospheric humidity has been exceeded. In this case, the low-pressure or high-pressure stage or the cartridge group must be checked and repackaged by an ABB Turbocharging Service Station.

- Check the package for damage. If the package is damaged, the low or high-pressure stage or the cartridge group must be checked and repackaged by an ABB Turbocharging Service Station.

After every 3 years, the following steps must be carried out by an ABB Turbocharging Service Station:

- Checking the component
- Replacing the desiccant
- Repackaging the component.

**Replacement components which are ready for operation**

If the 70% field of the hygrometer (02) has not changed colour and the package is not damaged, the replacement low-pressure or high-pressure stage or the replacement cartridge group can be put into operation without previously having been checked by an ABB Turbocharging Service Station.
8 Further information

The Operation Manual must be observed with regard to commissioning, operation, maintenance and ordering spare parts.

Operation Manual

The Operation Manual for the low-pressure and high-pressure stage with the relevant serial number is available online on our website www.abb.com/turbocharging.

Figure 17: Serial number of the low-pressure and high-pressure stage on the rating plate

One rating plate is attached on the left of the bearing casing and another is attached on the right.

1. Read the serial number (02) on the rating plate (01) of the low-pressure and high-pressure stage.

- The Operation Manual can be found online in accordance with the details on the following page.
2A. 
www.abb.com/turbocharging

2B. 
www.abb.com/turbocharging

3. 
4. 

5. Follow the instructions on the website.

Figure 18: Finding the Operation Manual online
Operation Manual / Contact information

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www.abb.com/turbocharging

Further information

Find your local service team on our website (see section “contact us” / “Contact information”).

Find and download the Operation Manual of your product on our website (see “Need product information” / “Operating instructions”).

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