Safety Rated Rail Brake
RB15, RB20, RB25, RB30, RB35, RB45

nexsafe Certified Safety Products
In accordance with Nexen’s established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

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DANGER

Read this manual carefully before installation and operation. Follow Nexen’s instructions and integrate this unit into your system with care. This unit should be installed, operated and maintained by qualified personnel ONLY. Improper installation can damage your system, cause injury or death. Comply with all applicable codes.

This document is the original, non-translated, version.

Conformity Declaration: In accordance with Appendix II B of CE Machinery Directive (2006/42/EC):

A Declaration of Incorporation of Partly Completed Machinery evaluation for the applicable EU directives was carried out for this product in accordance with the Machinery Directive. The declaration of incorporation is set out in writing in a separate document and can be requested if required.

This machinery is incomplete and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the applicable provisions of the Directive.
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### GENERAL SPECIFICATIONS

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<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding Force</td>
<td>Up to 3400 N [764 lbs]</td>
</tr>
<tr>
<td>Release Pressure</td>
<td>5.5 bar [80 psi] (lower release pressure units available)</td>
</tr>
<tr>
<td>Service Temperature</td>
<td>4.5 - 65.5°C [40 - 150°F]</td>
</tr>
<tr>
<td>Backlash</td>
<td>See Tech Data Sheet</td>
</tr>
<tr>
<td>Engagement Time</td>
<td>See Tech Data Sheet</td>
</tr>
</tbody>
</table>

### GENERAL SAFETY PRECAUTIONS

**WARNING**

Keep indoors. This product is intended for indoor environments only. Use of the brake outdoors will damage components. No Excessive Dust or humidity permitted.

**CAUTION**

Watch for sharp features when installing and servicing the brake. The brake has complex and machined edges.

**DANGER**

Moving parts can crush and cut. Keep hands clear.

**CAUTION**

Springs contain stored energy, use caution while removing.

*Figure 1*
The Nexen Rail Brake has been developed for braking on a profile guide rail. These spring engaged, air released brakes are designed to hold in a safe position by default. Brakes are intended for static holding applications and Emergency Stop situations.

**NOTE**
The proper installation and maintenance of these brakes must be observed to prevent damage to unit or improper use of unit.

**Engaged State:** In the engaged state, each compression spring pushes on a piston and wedge assembly to engage the friction facings directly onto the center of the guide rail. If air pressure is lost, the unit will default to the brake engaged state.

**Disengaged State:** When air pressure is applied, a piston will push back on the wedge assembly, disengaging the friction facing from the guide rail.
SAFETY STANDARD COMPLIANCE

ISO 13849 is a Safety Standard which applies to machines and systems, and aims to reduce risk, in event of machine failure. This section clarifies our Rail Brake's intended use as a part of a system or machine that must comply with this standard.

Brakes intended for safety related applications are to be installed in accordance with the required performance level/category level per ISO 13849-1:2015. The category rating of safety channels and performance level of the machine is the responsibility of the system manufacturer. For fulfillment of the safety function, the brake is to be viewed as an individual component.

Braking Function: All safety rated rail brakes use two independent actuators with a spring, wedge assembly and friction facing. The use of independent actuators ensures that a reduced braking force will be available in the event of spring failure.

Safety Guidelines: Adhere to the guidelines for safe and reliable locking and error-free operation:
- Rail Brake is required to be installed and maintained per this literature
- Observe intended use of the Rail Brake
- Rail Brake is sized and applied correctly per system requirements
- Rail Brakes are to be selected and integrated into the safety machine in accordance with ISO 13849-1:2015 by the system manufacturer.

Refer to table below for effects on safety if brake is used outside of Nexen specification range.

<table>
<thead>
<tr>
<th>Specification Deviation</th>
<th>Effect on Safety Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pressure too high</td>
<td>Unit will leak, not hold force</td>
</tr>
<tr>
<td>Air pressure too low</td>
<td>Fail to disengage</td>
</tr>
<tr>
<td>Apply too much force</td>
<td>Will not hold applied force and will slip</td>
</tr>
<tr>
<td>Exceed environmental specs</td>
<td>Not operate as intended</td>
</tr>
</tbody>
</table>

TRANSPORT, HANDLING & STORAGE

During transport, the product will be in the default (engaged) position, eliminating the possibility of parts shifting. Rail Brakes can be handled without the use of special equipment.

Nexen products have a shelf life of 7 years beginning on the date of packaging serialization located on the original shipping container of the item.

The following criteria must be maintained to achieve full shelf life of the product:
1. Original packaging must remain unopened and intact.
2. Product must have been stored in a temperature and humidity controlled environment.
   - Temperature range of 65°F ±15°F (18.3°C ±8.3°C)
   - Relative humidity range of 35%-55%
REQUIRED TOOLS

- Clean, pressurized air
- Mounting bolts and appropriate wrench
  (See Table 1)

AIR CONNECTIONS

All Nexen pneumatically actuated devices require clean and dry air, which meet or exceed ISO 8373.1: 2001 Class 4.4.3 quality.

CAUTION

Do not use rigid pipe and tubing when making air line connections. Doing so will result in damage to the product or system.

CAUTION

While the lubricated air will keep the seals well lubricated, it may wash away the factory applied lubrication over time. For this reason, once lubricated air is used with a Nexen Rail Brake, it must always be used. Discontinuing use of lubricated air may cause seal failure.

Note: Pneumatic components are in accordance with ISO 4414.

ACCESSORIES

- 4 mm [5/32 inch] soft air tubing
- Air valve
- Quick exhaust valve (optional)

DANGER

Support the load before disengaging the Rail Brake. Failure to support the load may result in serious injury or death.

The Rail Brake is equipped with one air inlet port used to disengage the brake (Refer to Figure 3 for location).

NOTE: Clean air is important for proper Rail Brake functioning. Debris inside the Rail Brake may inhibit performance and/or decrease product life.

1. Route clean air to the Rail Brake using soft lines.
   Supply adequate air pressure to ensure complete disengagement.

NOTE: For faster engagement and disengagement, install the valve close to the Rail Brake. Increasing air pressures will also speed the disengagement time, but do not exceed 8.3 bar [120 psi] air pressure.
MOUNTING ON A RAIL

The Rail must be lubricated and free of particulate for optimum performance.

Assembly Shims: This installation recommends the use of assembly shims to ensure proper alignment. The assembly shim is a .08mm (.003") rectangular shaped piece of shim stock that runs the full length of the facings. See Figure 5 for an example. Each shim will be different depending on rail type. The shim is customer provided and one is required for each side.

1. Disengage Brake.
   a. SPRING ENGAGED VERSION: Apply minimum 5.5 BAR (80 PSI) to air inlet of brake to disengage. (Refer to AIR CONNECTIONS for details).

2. Using installation shims, slide brake onto rail with shims between the facing and the rail on both sides. The installation shims are approximately the same thickness as the gap between the facing and the rail. Because of this some drag is expected while completing this step.

3. Once brake is approximately in position, install mounting screws finger tight. Do not tighten at this point.

4. Engage Brake, this will center it on the rail, then tighten the mounting screws. Do not remove shims at this point. Ensure mounting screws are fully secured to avoid any unintended movement between brake and table.

Table 1

<table>
<thead>
<tr>
<th>Model</th>
<th>Screw Insertion Depth (mm)</th>
<th>Socket Head Cap Screw Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>RB15</td>
<td>5.0</td>
<td>5.2</td>
</tr>
<tr>
<td>RB20</td>
<td>6.0</td>
<td>7.2</td>
</tr>
<tr>
<td>RB25</td>
<td>8.0</td>
<td>9.0</td>
</tr>
<tr>
<td>RB30</td>
<td>8.0</td>
<td>9.0</td>
</tr>
<tr>
<td>RB35</td>
<td>8.0</td>
<td>9.0</td>
</tr>
<tr>
<td>RB45</td>
<td>12.0</td>
<td>14.0</td>
</tr>
<tr>
<td>RB55</td>
<td>12.0</td>
<td>14.0</td>
</tr>
<tr>
<td>RB65</td>
<td>16.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Table (end view)

Note: Brake width is slightly under carriage width. Small gap (0.010) to be expected.
ALIGNMENT VERIFICATION

1. With the shims still in place, mounting bolts tightened, and brake disengaged, run the brake the full length of machine travel. If an alignment issue exists, the brake will drag at those spots where there is misalignment.

2. If an alignment issue is found re-adjust the rail per the manufacture’s recommendations.

3. Remove shims.

4. Again by hand, run the brake the full length travel of the machine. NO drag should be felt between the facing and rail. If drag is experienced, repeat alignment steps.

FRICITION FACING GAP ADJUSTMENT

Adjusting friction facing gap is not recommended. If the friction facing gap is adjusted, holding force of the brake needs to be validated per application requirements.

Friction facing gap adjustment should not be necessary as the gap is factory set to accommodate standard rail sizes and types. Before attempting to adjust the facing gap. Ensure the mounting and alignment processes are complete.

1. Disengage Brake.

2. Cut the label between the housing and the guide using a straight edge. Leave the label in place so it can act as a reference to the original position.

3. Adjust the position of the facing by turning the guides on each side of the unit counter clockwise. Notes regarding adjustment:
   a. Make sure each side is turned an equal amount. Failure to do this could cause misalignment.
   b. 1/8 of a turn is equivalent to approximately .127mm (.005in). There should be no need to adjust more than this amount.

4. Repeat mounting and alignment verification steps.
Nexen’s Magnetic Proximity Sensors may be used to gather operational data from the Rail Brake. These sensor(s) may be used by system manufacturers to gain higher safety category ratings per ISO 13849-1. Rating of the safety function is the responsibility of the system manufacturer.

Each Proximity Sensor can be setup to sense one of the following functions of the Rail Brake:

**Disengagement Sensor Definition:**
Sensor is activated when the rated air pressure is applied and the piston and facing pair move to a disengaged position.

**Engagement Sensor Definition:**
Sensor is activated when the pistons and facing pair move out of the disengaged position into a position in which the facings will transmit force to the rail.

**SENSOR WIRING**
Nexen’s Magnetic Proximity Sensor is available in two modes, See Table 2. System manufacturer is responsible for selecting appropriate sensor type for specific safety application.

**PNP Mode (Sourcing)**
Normally Open (N.O.) or Normally Closed (N.C.) PNP type Sourcing Output available, see Figure 12. Typically matched with a PLC Sinking Input.

**NPN Mode (Sinking)**
Normally Open (N.O.) or Normally Closed (N.C.) NPN type Sinking Output available, see Figure 12. Typically matched with a PLC Sourcing Input.

**SENSOR INSTALLATION AND SETUP**
Note: Validate sensor functionality in application, including possible temperature range.

The Rail Brake can be equipped with one or two magnetic proximity sensors. If two sensors, they can be configured to detect redundant or individual engaged and / or disengaged states. If sensors are setup for redundant detection, the sensor states should always match. If sensors are setup for individual, opposing detection, the sensor states should always be opposite. To ensure proper operation, compare the expected state to the measured state. Once installed on the rail, Nexen recommends checking the positioning of the sensor for proper switching location.

Wire magnetic sensor following the included instructions. Provide power to sensor, and complete the following:

**Sensing Brake Disengagement Position:**
1. With brake on rail, supply air pressure to the brake so it is disengaged.
2. Install sensor as shown in Figure 13. Start with sensor positioned farthest from the middle of the brake, past the sensing target. Slide the sensor towards the middle of the brake until LED is lit. Once the LED is lit, move sensor a small amount further into sensing target.
3. Use a standard flat-head screwdriver or 1.5mm allen wrench to turn the screw and fix the sensor in the t-slot.
4. Cycle air pressure to ensure the LED is lit only when air pressure is removed from the brake.

**Sensing Brake Engagement Position:**
1. With brake on rail, remove air pressure so the brake is engaged.
2. Install sensor as shown in Figure 13. Start with sensor positioned closest to the middle of the brake, before the sensing target is reached. Slide the sensor farther away from the middle of the brake until LED is lit. Once the LED is lit, move sensor a small amount further into sensing target.
3. Use a standard flat-head screwdriver or 1.5mm allen wrench to turn the screw and fix the sensor in the t-slot.
4. Cycle air pressure to ensure the LED is lit only when air pressure is removed from the brake.

**Figure 11**
Note: Ferrous Materials in Close Proximity may interfere with sensor function.

**Figure 12**
Sensor Wiring

**Figure 13**
LED Light on Sensor
Wire Must Use Strain Relief
Sensor Adjustment Direction

(Brake Disengagement or Engagement Sensors)
SERVICE

Note: Safety Rated Units are not customer serviceable. Please contact Nexen for repair or replacement.

Do not attempt to remove or dismantle any part of the Rail Brake assembly. This product is spring loaded and under pressure. If the product malfunctions, replace the unit or contact Nexen.

Mission Time: 10 years maximum *

*Dependent upon cycle rate and useful time per ISO 13849-1:2015

Nexen recommends only properly trained personnel in the installation and maintenance procedures allowed to install and perform maintenance on product.

People do not interact directly with this product during operation, but maintenance personnel may interact with this product. Adequate space must be allowed to ensure safety, Nexen recommends a minimum of 3 feet.

Disposal of product in responsibility of machine builder or end user.

TROUBLESHOOTING

Note: Safety Rated Units are not customer serviceable. Please contact Nexen for repair or replacement.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Probable Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to engage Rail Brake.</td>
<td>Weak or broken springs.</td>
<td>Replace Rail Brake.</td>
</tr>
<tr>
<td>Failure to disengage Rail Brake.</td>
<td>Control valve malfunction - air not getting to Rail Brake.</td>
<td>Check for low air pressure or replace the control valve.</td>
</tr>
<tr>
<td></td>
<td>Air is leaking.</td>
<td>Check air inlet connection.</td>
</tr>
<tr>
<td>Loss of holding force.</td>
<td>Debris on rail.</td>
<td>Check rail and clean if necessary.</td>
</tr>
<tr>
<td></td>
<td>Rail is worn.</td>
<td>Reposition so Rail Brake is clamping on an unworn section of rail.</td>
</tr>
<tr>
<td>Sensor Feedback not working.</td>
<td>Magnetic sensor interference.</td>
<td>Sensor is detecting a magnetic field. Avoid any ferrous materials in close proximity to sensor.</td>
</tr>
<tr>
<td></td>
<td>Sensor positioning.</td>
<td>Check sensor position. Follow installation instructions.</td>
</tr>
</tbody>
</table>
**WARRANTY**

Warranties
Nexen warrants that the Products will (a) be free from any defects in material or workmanship for a period of 12 months from the date of shipment, and (b) will meet and perform in accordance with the specifications in any engineering drawing specifically for the Product that is in Nexen’s current product catalogue, or that is accessible at the Nexen website, or that is attached to this Quotation and that specifically refers to this Quotation by its number, subject in all cases to any limitations and exclusions set out in the drawing. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if: (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

Exclusive Remedy
The exclusive remedy for the Buyer for any breach of any warranties provided in connection with this agreement will be, at the election of Nexen: (a) repair or replacement with new, serviceably used, or reconditioned parts or products; or (b) issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

Agent’s Authority
Buyer agrees that no agent, employee or representative of Nexen has authority to bind Nexen to any affirmation, representation, or warranty concerning the Products other than those warranties expressly set forth herein.

Limitation on Nexen’s Liability
TO THE EXTENT PERMITTED BY LAW NEXEN SHALL HAVE NO LIABILITY TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER ARISING OUT OF BREACH OF WARRANTY OR OTHER BREACH OF CONTRACT, NEGLIGENCE OR OTHER TORT, OR OTHERWISE, EVEN IF NEXEN SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH POTENTIAL LOSS OR DAMAGE. For all of the purposes hereof, the term "consequential damages" shall include lost profits, penalties, delay damages, liquidated damages or other damages and liabilities which Buyer shall be obligated to pay or which Buyer may incur based upon, related to or arising out of its contracts with its customers or other third parties. In no event shall Nexen be liable for any amount of damages in excess of amounts paid by Buyer for Products or services as to which a breach of contract has been determined to exist. The parties expressly agree that the price for the Products and the services was determined in consideration of the limitation on damages set forth herein and such limitation has been specifically bargained for and constitutes an agreed allocation of risk which shall survive the determination of any court of competent jurisdiction that any remedy herein fails of its essential purpose.

Inspection
Buyer shall inspect all shipments of Products upon arrival and shall notify Nexen in writing, of any shortages or other failures to conform to these terms and conditions which are reasonably discoverable upon arrival without opening any carton or box in which the Products are contained. Such notice shall be sent within 14 days following arrival. All notifications shall be accompanied by packing slips, inspection reports and other documents necessary to support Buyer’s claims. In addition to the foregoing obligations, in the event that Buyer receives Products that Buyer did not order, Buyer shall return the erroneously shipped Products to Nexen within thirty (30) days of the date of the invoice for such Products; Nexen will pay reasonable freight charges for the timely return of the erroneously shipped Products, and issue a credit to Buyer for the returned Products at the price Buyer paid for them, including any shipping expenses that Nexen charged Buyer. All shortages, overages and nonconformities not reported to Nexen as required by this section will be deemed waived.

Limitation on Actions
No action, regardless of form, arising out of any transaction to which these terms and conditions are applicable may be brought by the Buyer more than one year after the cause of action has accrued.