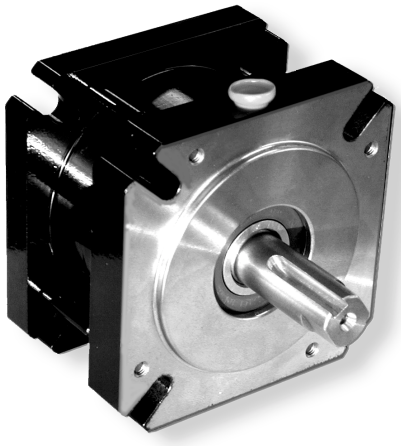
nexen™

ECLIPSE™ PRODUCTS

User Manual



Eclipse Servo Motor Brake

Flange Mounted, Pneumatically Engaged, Spring Released
Sizes 2, 3, 4, and 5

FORM NO. L-21067-A-0201

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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ISO 9001 Certified

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 or cause injury or death.

Comply with all applicable codes.

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INSTALLATION ONTO MOTOR SHAFT

NOTE: Refer to Figures 1, 2 & 3.

Prior to performing any installation steps, Nexen recommends applying air pressure to the Servo Brake. When air pressure is applied, the brake will remain engaged, and the shaft will not rotate. This will aid in the following installation operations.

1. Place the Clamping Collar (Item 7) on the input (female) end of the servo brake shaft. Finger tighten the cap screw until the Collar is nearly snug. Then slide the Collar down the Shaft until it is firmly against the shaft step.

NOTE: The Clamp Collar for size 4 and 5 requires two cap screws to provide necessary clamp load.

2. Remove the Access Plugs (Item 14) from the Input Flange (Item 10). Rotate the Clamping Collar (Item 7) until the cap screw is lined up with the access hole. Then insert an Allen driver or a T-handle wrench through and engage the head of the cap screw. Leave this driver or wrench in place while you perform the next two steps.

CAUTION: Do not lubricate either the Clamping Collar or the Shaft. Any lubricant on the contact surfaces could result in torque transfer failure. If necessary, clean the Shaft with a non-petroleum based solvent, such as isopropyl alcohol, and wipe dry before assembly.

3. Slide the Motor Shaft into the input (female) end of the Output Shaft (Item 1) until the Flanges of the Motor and Brake come together.

4. Using four customer-supplied Socket Head Cap Screws (See Table 2), bolt the Flanges together. Tighten the cap screws evenly to the recommended torques listed in Table 2 (Page 3).

5. Using the Allen driver or wrench used in Step 2, tighten the cap screws in the Clamping Collar (Item 7) to the recommended torque listed in Table 1 (Page 3).

CAUTION: Under-tightening the Collar may cause slippage between the motor and the Brake. This can cause damage to the System, Motor and/or Brake.

6. Reinstall the Access Plugs (Item 14) into the access holes on the Input Flange (Item 10).

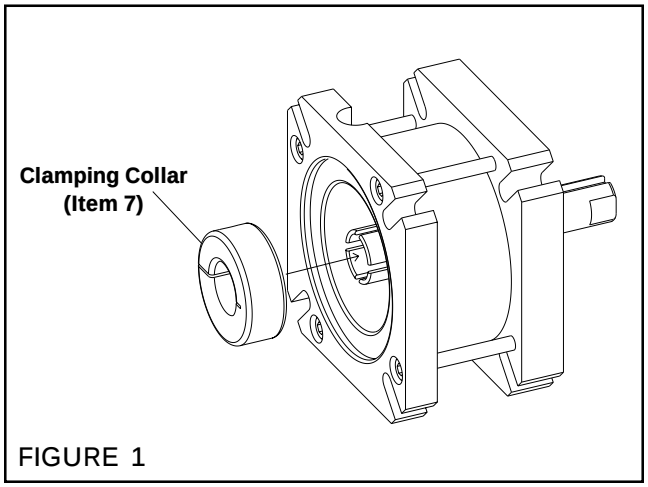

FIGURE 1

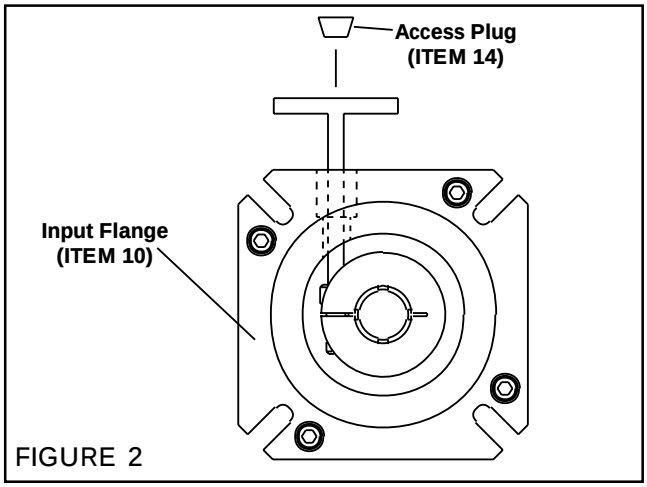

FIGURE 2

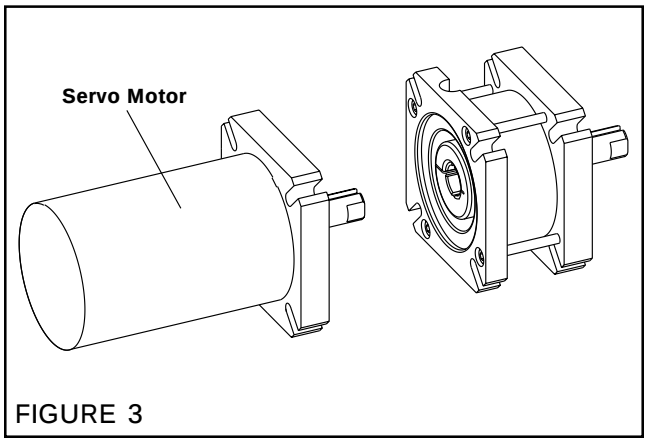

FIGURE 3

DANGER

Support the load before disengaging the brake.
Failure to support the load could result in serious bodily injury.

MOUNTED ON THE SHAFT END OF A MOTOR (continued)

7. Attach the Quick Exhaust Valve (Item 23) to the Servo Brake. Use Teflon tape and/or pipe sealant on the threads. If you are using the optional Solenoid Valve (Item 12) in conjunction with the Quick Exhaust Valve, assemble the Solenoid Valve to the Quick Exhaust Valve. Using the two valves in conjunction with each other will decrease the brake disengagement time.

8. If you are using the optional Solenoid Valve (Item 12) in place of the Quick Exhaust Valve (Item 23), assemble the optional Solenoid Valve directly to the Servo Brake using the supplied fittings. Use Teflon tape and/or pipe sealant on the threads. The fitting for the air line itself is O-ring sealed and does not require tape or sealant.

CAUTION: The Servo Brake will engage if you depress the brass button on the Solenoid Valve (if air pressure is supplied). The LED will illuminate when the Solenoid Valve is actuated and the Servo Brake is engaged.

NOTE: Align the air inlet ports in the down position to allow condensation to drain out of the air chamber.

9. Attach the air line to the valve

10. Connect the lead wires from the valve to the brake control connection points on the Motor Drive or the PLC. Refer to Table 3 (Page 3).
    Lead Wire Cable:
    Brown wire = positive
    White wire = common
    Green wire = ground

11. The lead wire contains a full bridge rectifier and surge suppressor which converts AC power to rectified AC power and provides circuit protection.

12. Attach the Gear Reducer or the load to the Brake Shaft.

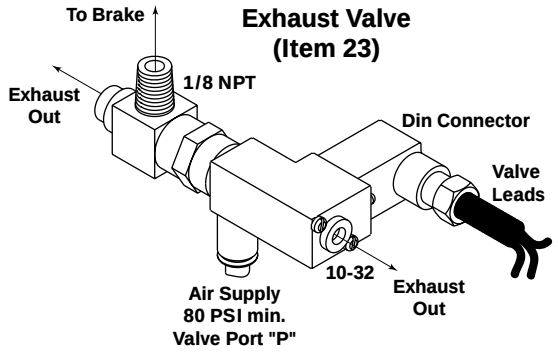

FIGURE 4

DANGER

Support the load before disengaging the brake.
Failure to support the load could result in serious bodily injury.

MOUNTED BETWEEN A GEAR REDUCER AND A MOTOR

NOTE: Refer to Figure 5.

1. To mount the Servo Brake to the Motor, follow steps 1-11 on pages 1-2.
2. Insert the Brake Shaft into the customer supplied gear reducer coupling. Use the supplied key (if required).
3. Use customer supplied screws, washers and nuts to bolt the flanges together. Apply Loctite® 242 to the threads of the screws. For recommended torque values, refer to Table 2.
4. Tighten the Coupling. Refer to the instructions that are supplied with the Gear Reducer.
5. Install any plugs or related items that are detailed in the Gear Reducer instructions.

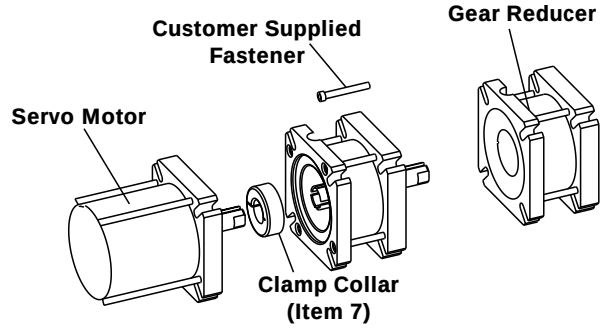

FIGURE 5

TABLE 1

Brake Model	Shaft Size	Cap Screw	Recommended Collar Screw Torque
Size 2	14 mm	M5	9.5 N-m [84.1 in-lb]
Size 3	16 mm	M6	16.0 N-m [142.0 in-lb]
Size 4	15 mm	M6	16.0 N-m [142.0 in-lb]
Size 5	24 mm	M6	16.0 N-m [142.0 in-lb]

TABLE 2

Brake Model	Socket Head Cap Screw (Customer Supplied)	Recommended Fastening Torque
Size 2	M5	7 Nm [63 in-lb]
Size 3	M6	12 Nm [107 in-lb]
Size 4	M8	29 Nm [260 in-lb]
Size 5	M10	58 Nm [520 in-lb]

TABLE 3

OPTIONAL SOLENOID VALVE SPECIFICATIONS				
Voltage	**Power**	**Resistance**	**Current**	**CV**
Standard Coil: *24VDC	2.5 Watts	235 Ohms	.100 Amps	.08

* Can be used as either AC (50/60 Hz) or DC.
Use Nexen's rectifier lead wire for AC (50/60 Hz) operation.

DANGER

Support the load before disengaging the brake.
Failure to support the load could result in serious bodily injury.

FORM NO. L-21067-A-0201

AIR PREPARATION

For long life, the Brake requires clean and pressure regulated air (filtered to five microns or better). Nexen does not recommend lubricated air for this product.

BRAKE ASSEMBLY

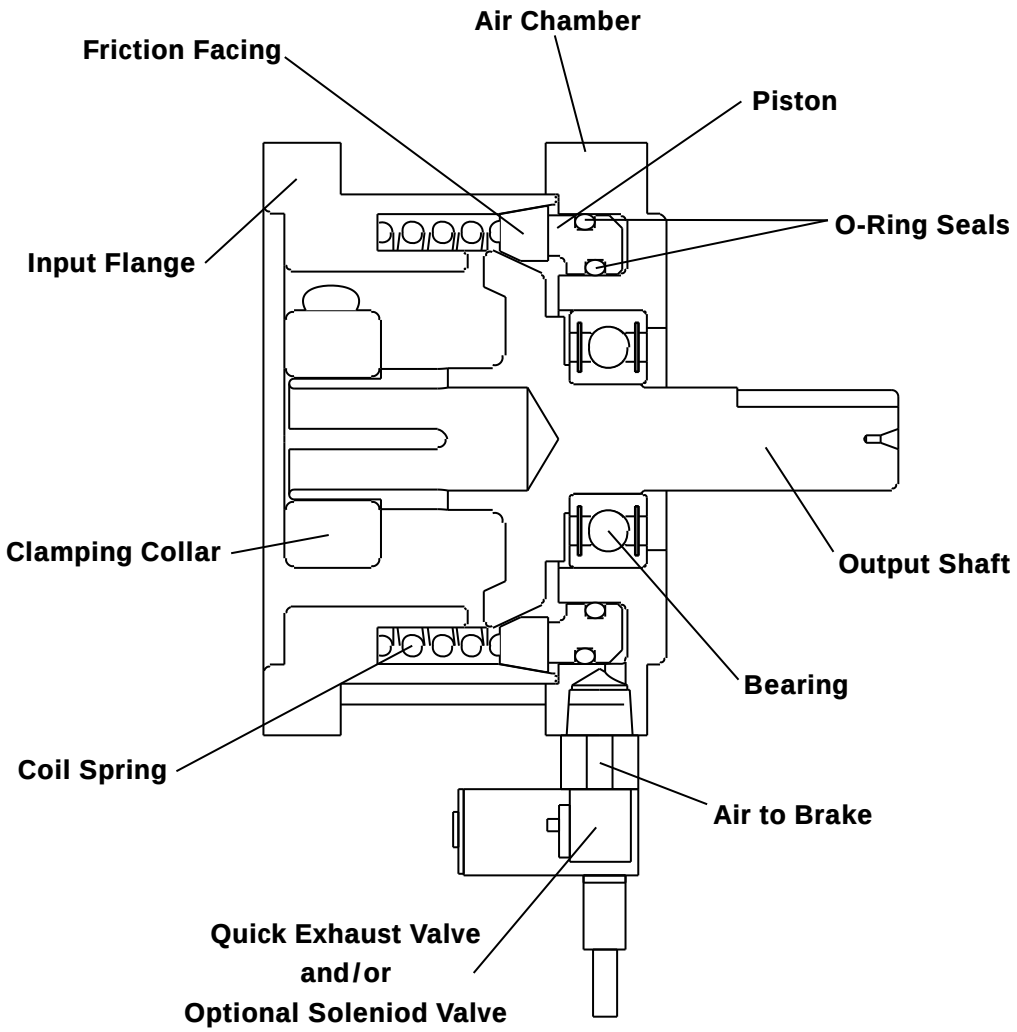

FIGURE 6

SIZES 2, 3, 4, 5

NOTE: Refer to Figures 7 & 8.

1. Alternately and evenly, remove the four Socket Head Cap Screws (Item 11) and separate the Air Chamber (Item 6) from the Input Flange (Item 10).
2. Remove the Output Shaft (Item 1) from the Ball Bearing (Item 2) by pressing in on the output shaft.
3. Remove the Piston (Item 5) from the Air Chamber (Item 6). You may need to apply compressed air to the air inlet to remove the Piston.
4. Remove the old O-ring Seals (Items 3, 4) from the Piston.
5. Remove the Retaining Ring (Item 21) and press the Bearing (Item 2) out of the Air Chamber (Item 6).
6. Clean the bearing bore of the Air Chamber (Item 6) with fresh solvent, removing old Loctite®.
7. Apply a continuous bead of Loctite® 680 around the inner circumference of the Air Chamber (Item 6) bearing bore.
8. Carefully align the outer race of the new Bearing (Item 2) with the bore of the Air Chamber (Item 6).
9. Supporting the Air Chamber (Item 6) and pressing on the outer race of the new Bearing (Item 2), press the new Bearing into the Air Chamber.
10. Visually inspect the inner diameter grooves and the outer diameter grooves of the Piston (Item 5) for debris. Clean as necessary.
11. Reinstall the retaining ring.
12. Coat the O-ring contact surfaces of the Air Chamber (Item 6), the Piston (Item 5), and the O-ring Seals (Items 3, 4) with a thin film of O-ring lubricant and install the new O-ring Seals.
13. Slide the Piston (Item 5) into the Air Chamber (Item 6).

DANGER

Working with spring or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

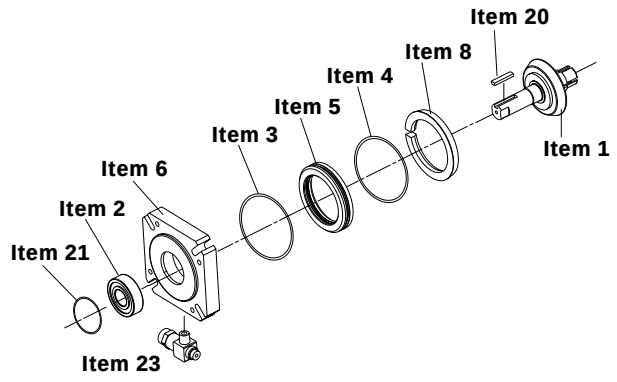

FIGURE 7

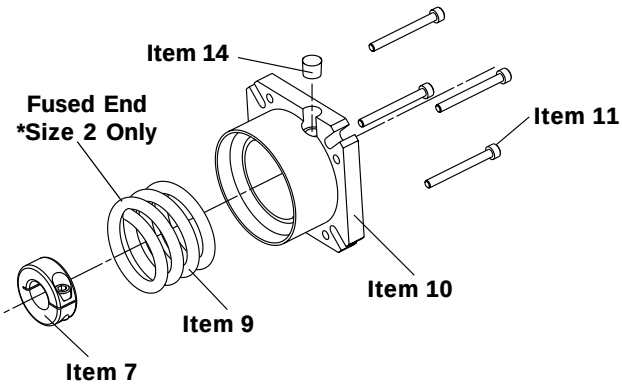

FIGURE 8

(continued...)

BRAKE ASSEMBLY (continued...)

14. Clean the friction surface of the Input Flange and Output Shaft (Item 6) with solvent.

15. Position the Friction Facing on top of the piston with the narrow end of the taper pointing up. Use care to ensure that the Friction Facing is concentric to the piston, as this will aid in the installation of the output shaft in step 16.

16. Support the inner race of the new Ball Bearing (Item 2) and press the Output Shaft (Item 1) into the new Bearing (Item 2) and Air Chamber (Item 6).

17. Replace the Spring (Item 9) and Input Flange (Item 10).

NOTE: On the Size 2 Spring, one end will be fused. Be sure that the fused end is down and makes contact with the facing (Item 8).

18. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 11).

19. Reinstall and tighten the four Socket Head Cap Screws (Item 11), securing the Air Chamber (Item 6) to the Input Flange (Item 10). Alternate as you tighten the four Socket Head Cap Screws so that the Input Flange remains evenly parallel to the Air Chamber. Refer to Table 4 for the recommended assembly torque values.

TABLE 4

Brake Model	Socket Head Cap Screw (Item 11)	Recommended Assembly Torque
Size 2	M4	4.2-5.4 Nm [37-48 in-lb]
Size 3	M5	7.0-9.2 Nm [62-81 in-lb]
Size 4	M6	9.2-11.9 Nm [81-105 in-lb]
Size 5	M8	26.2-34.0 Nm [232-301 in-lb]

TROUBLESHOOTING

Problem	Probable Cause	Solution
Failure to disengage (brake).	Weak or broken spring.	Replace broken spring.
Failure to engage (1).	Control valve malfunction - air not getting to the brake.	Check for low air pressure or replace the control valve. **NOTE:** Pressure needed to engage should NOT exceed 80 psi.
Failure to engage (2).	Air is leaking around the O-ring seals.	Replace the O-rings.
Loss of torque.	Friction Facing is worn or dirty.	Replace the Friction Facing.

REPLACEMENT PARTS LIST

To order replacement parts, indicate servo brake model size, item number, item description, and quantity. Replacement parts are available through your local Nexen Distributor.

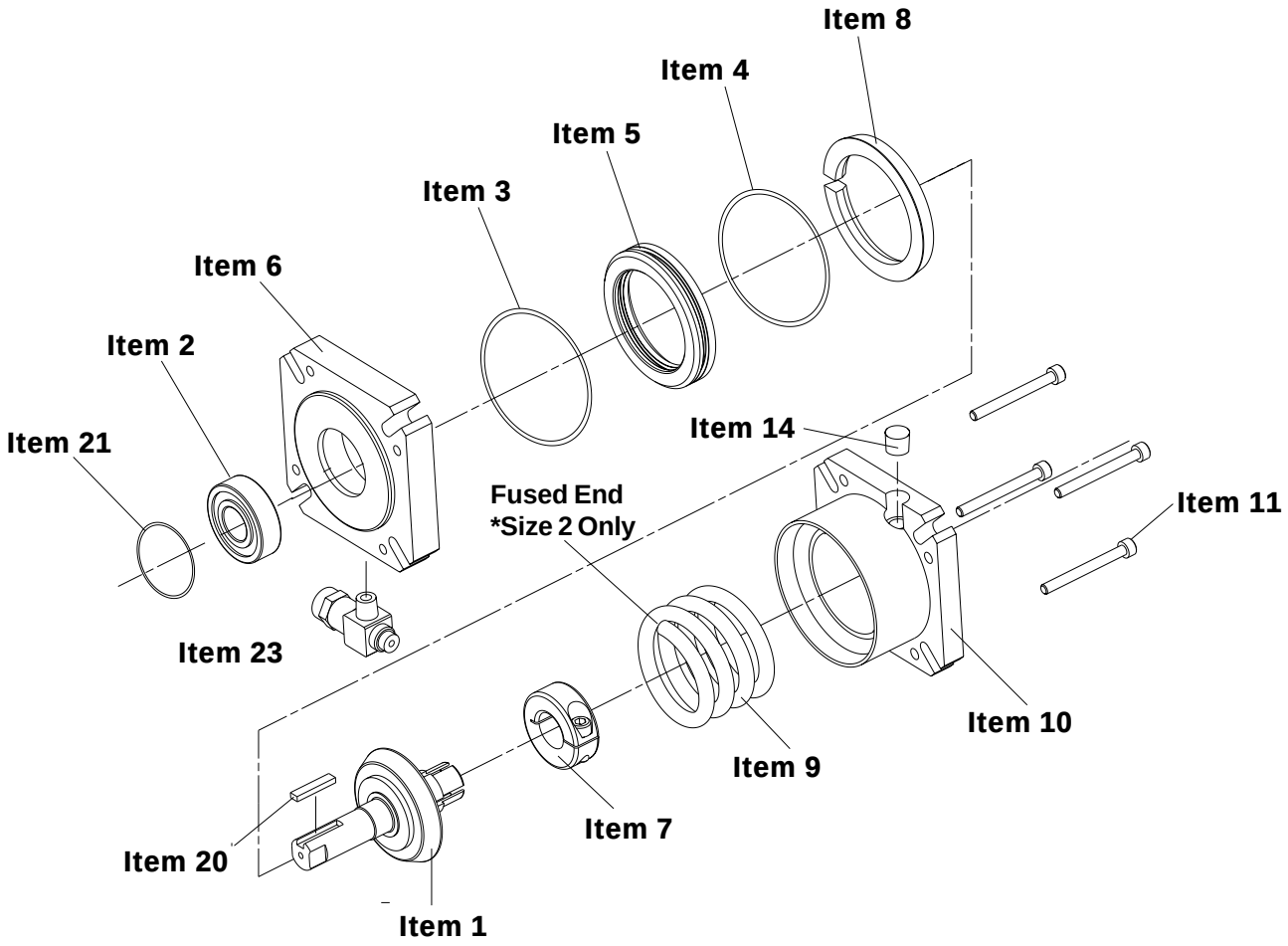

FIGURE 9

ITEM	DESCRIPTION	QTY
1	Output Shaft	1
2	Ball Bearing	1
3	O-ring Seal	1
4	O-ring Seal	1
5	Piston	1
6	Air Chamber	1
7	Clamping Collar	1
8	Friction Facing	1
9	Spring	1
10	Input Flange	1
11	Socket Head Cap Screw	4
12	Solenoid Valve (Optional)	1
14	Access Plug	1
20	Key	1
21	Retaining Ring	1
23	Quick Exhaust Valve, Eclipse	1

SPECIFICATIONS

Size	Max RPM	Torsional Rigidity (Estimated)	Inertia (Calculated)	Weight
2	4,500	4,431 Nm/rad 3,267 ft-lb/rad	.197 kg-cm5 [1.74 x 10^{-4} in-lb-s^2]	1.1 kg [2.5 lbs]
3	4,000	5,287 Nm/rad 3,900 ft-lb/rad	.680 kg-cm^2 [6.02 x 10^{-4} in-lb-s^2]	2.0 kg [4.5 lbs]
4	3,500	7,456 Nm/rad 5,500 ft-lb/rad	2.43 kg-cm^2 [2.15 x 10^{-3} in-lb-s^2]	4.5 kg [9.9 lbs]
5	3,500	23,448 Nm/rad 17,294 ft-lb/rad	11.56 kg-cm^2 [1.02 x 10^{-2} in-lb-s^2]	7.5 kg [16.6 lbs]

Pneumatic units accept an optional solenoid valve (normally closed) controlled by 24VDC at 104 mA. Solenoid valves are fitted with 18" flying leads standard. To order the solenoid valve (optional), please refer to Nexen product #964650.

ACCESSORIES

DESCRIPTION	PROD. NO.
Optional Solenoid Valve	964650

WARRANTY

Warranties
Nexen warrants that the Products will be free from any defects in material or workmanship for a period of 12 months from the date of shipment. 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 of the Buyer for any breach of the warranties set out above will be, at the sole discretion of Nexen, a repair or replacement with new, serviceably used or reconditioned Product, or issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

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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 images, 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.

Limitation of Damages
In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

Warranty Claim Procedures
To make a claim under this warranty, the claimant must give written notice of the alleged defect to whom the Product was purchased from and deliver the Product to same within one year of the date on which the alleged defect first became apparent.

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