



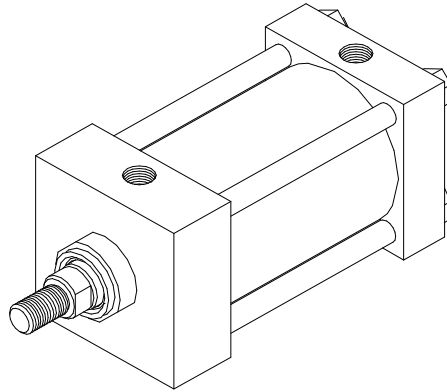
**DeZURIK VENDOR
INSTRUCTIONS
RDC Control Series HL, HM
and HP Hydraulic Cylinder
Valve Actuators**

Instruction DP11006
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 **DeZURIK** | **APCO** | **HILTON** | **WILLAMETTE**



OPERATION AND MAINTENANCE MANUAL
FOR HYDRAULIC CYLINDERS



SERIES HL – HM - HP
MEDIUM AND HEAVY DUTY, NFPA INTERCHANGEABLE

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A-STORAGE

If your RDC Contrôle hydraulic cylinder is not installed immediately, follow the procedure below for proper storage:

- 1- Store hydraulic cylinders in an indoor area which has a dry, clean and non corrosive atmosphere. Take care to protect the cylinders from both corrosion and external damage.
- 2- Whenever possible, store cylinders in a vertical position (piston rod up) to prevent corrosion from possible condensation inside the cylinder.
- 3- Do not remove the port protector plugs until time of installation.
- 4- Apply a protective grease coating on all threads and other unpainted surfaces. After several weeks of storage, cylinders should be lubricated and cycled before being installed and submitted to any load.

B-INSTALLATION

RDC Contrôle hydraulic cylinders are normally shipped with protective plastic plugs covering the ports. These plugs prevent dirt and other particles from entering the cylinder to avoid damaging the internal seals. We recommend removal of the port plugs just before connecting the oil supply.

- 1- Attachment: Fix the cylinder strongly to its working attachments, making sure that the piston rod aligns perfectly with its mating component in both the extended and retracted position. Improper alignment could result in excessive rod gland and/or cylinder bore wear.
- 2- Protection: Special care should be given to the cylinder piston rod. Its surface should be free from any marks that could damage the piston rod wiper. Therefore any cylinders installed near a source of abrasive particles should be equipped with either a rod scraper or protective rod boot.
- 3- Cleanliness: Before connecting any oil supply to the cylinder, all piping should be thoroughly cleaned to remove all chips or burrs, which might have resulted from cutting operation.



C-OPERATION

Each RDC Contrôle hydraulic cylinder is meticulously assembled assuring perfect adjustment between all components. It is then inspected according to very high specifications to assure our customers of a premium quality product.

However, it is recommended to follow these instructions in order to get the best possible performance from your RDC Contrôle cylinder:

- 1- Pressure: The maximum operating pressure of Series HL hydraulic cylinder should never exceed the recommended pressure for a specific bore (up to 2000psig (13.6MPa)). The maximum operating pressure of Series HM and HP hydraulic cylinder should never exceed 3000psig (20.5MPa). See our HL and HM brochures for more information.
- 2- Filtration: The oil supplied should always remain free from any particles exceeding 30 microns.

D- MAINTENANCE

RDC Contrôle cylinders are designed to give a very long life expectancy. However, packings and seals might need periodical changes to which the frequency will depend on the operating conditions and cycling.

- 1- Checking Rod packings and seals
 - a) Apply oil pressure to rod end cap port (head) of cylinder.
 - b) Check for any apparent oil leak.
- 2- Checking barrel sealing
 - a) Apply an oil pressure at the blind end cap port of the cylinder.
 - b) Check for any apparent oil leak. Verify if all four tie rods are torque adequately according to the chart included in our brochures. If leakage persists, cylinder should be dismantled to correct the problem (see dismantling and assembling instructions).
 - c) Repeat steps a), b) and c) for the rod end cap (head).



E-REPAIR

Repair of hydraulic cylinders should always be done in a clean area, equipped with adequate tooling. However, we recommend sending any defective hydraulic cylinder to RDC Contrôle for repair by our qualified technicians.

1- Dismantling the cylinder:

- a) Loosen the tie rod nuts 1/4 turn at a time alternating from corner to corner until tension is completely relieved on the tie rods.

CAUTION: SPRING-RETURN CYLINDERS

Cylinders loaded with a compressed spring are normally identified with a special nameplate. If you have any doubt, communicate with RDC Contrôle to have the serial number verified.

The tie rods on a spring-return cylinder are normally left longer to allow easier and safer dismantling of the cylinder. It is very important to protect these extensions from any damages and corrosion.

When removing the tie rod nuts of spring-return cylinders, ensure that the tie rods do not loosen from the cylinder head. Remove the nuts from the tie rods when the spring is totally decompressed.

In cases where the tie rod extensions have been cut or damaged, it is possible to dismantle the cylinder by removing two tie rods from opposite corners and replacing them with threaded rods of the same size and sufficient length. Afterward, remove the other two tie rods and relieve the spring by removing the nuts from the threaded rods.

RDC Contrôle can not be held responsible for any personal injuries or property when a customer attempts to repair any spring loaded cylinder. We recommend to send all spring-return cylinders to our facility to have them repaired by our qualified technicians with proper equipment.

- b) Remove the nuts and tie rods from cylinder head.
- c) Remove cylinder head from assembly.
- d) Remove the piston and piston rod assembly from the barrel.



- e) Remove cylinder cap.
- f) Inspect the barrel internal surface for any scores that could damage the packings.
- g) Remove the gland bushing from the head using a wrench.
- h) Remove packings from both piston and gland bushing, noting orientation of packing lips.
- i) Clean all parts thoroughly.
- j) Check all parts for excessive wear. Damaged parts should be replaced.
- k) In cases where the piston rod has to be removed from the piston, secure piston rod in a vise equipped with soft jaws. Use a long socket on the piston nut and a "D" wrench on the rod flats. Caution: the threads have been locked with an anaerobic sealant; you may have to heat the assembly to ease removal.

2- Assembling the cylinder:

A) HL Series:

- a. If the piston rod has been removed from the piston, re-insert the piston rod into the piston. Apply a few drops of an anaerobic sealant (RDC Contrôle recommends Loctite #262). Secure the piston on the piston rod with the nut.
- b. Leave the piston flat on a table with the piston rod standing up.
- c. Install the first packing in the upper groove making sure to align the packing lips upward.
- d. The centre groove on the piston is meant to insert a Teflon wear strip. Roll the band around the piston; the two ends of the band should meet with an approximate space of 1/8". Hold in place with one hand until the insertion of the piston in the barrel.



- e. Insert the piston and piston rod assembly into the barrel. The bottom groove should remain empty. If necessary, use a nylon tip to help the insertion of the packing to avoid any damage. Slide the piston all the way to the other end of the barrel and let the empty groove come out of the tube.
- f. Install the second packing with its lips in the opposite direction.
- g. Push the piston back in the tube and put aside.
- h. Apply a thin coat of grease on the barrel O-rings to make them stick in their grooves (RDC Contrôle recommends any lithium based precision grease equivalent to Dow Corning #44). Make sure to set them correctly in their groove on the head and cap.
- i. Let the barrel sit in the cap face groove.
- j. Screw the tie rods into the head`s threaded holes.
- k. Insert the gland seals and packings in their respective grooves making sure that both seals have their lips facing the oil pressure.
- l. Apply a light coat of grease to the internal surface of the bushing and screw this into the head using a wrench. Torque firmly.
- m. Install the head-tie rods-bushing assembly on the other end of the cylinder barrel being careful not to damage the rod seals.
- n. Screw the tie rod nuts and tighten 1/4 turn at a time proceeding from opposite corner to opposite corner. Consult the recommended torque chart supplied.



B) HM - HP Series:

- a. If the piston rod has been removed from the piston, re-insert the piston rod into the piston. Apply a few drops of an anaerobic sealant (RDC Contrôle recommends Loctite #262). Secure the piston on the piston rod with the nut.
- b. Leave the piston flat on a table with the piston rod standing up.
- c. Insert the piston packing into the centre groove of the piston.
- d. Install a Teflon wear strip into the first and third grooves. Roll the band around the piston; the two ends of the band should meet with an approximate space of 1/8". Hold in place with one hand until the insertion of the piston in the barrel.
- e. Apply a thin coat of grease on the barrel O-rings to make them stick in their grooves (RDC Contrôle recommends any lithium based precision grease equivalent to Dow Corning #44). Make sure to set them correctly in their groove on the head and cap.
- f. Let the barrel sit vertically in the head face groove. The head should be installed on a support high enough to clear off the piston rod length exceeding from the head, when finally installed.
- g. Screw the tie rods into the head`s threaded holes.
- h. Insert the piston and piston rod assembly into the barrel. If necessary, use a nylon tip to help the insertion of the packing to avoid any damage. Slide the piston all the way down until the rod touches the assembly floor.



- i. Install the cap end on the other end of the cylinder barrel being careful not to damage the rod seals.
- j. Insert the gland seals and packings in their respective grooves making sure that both seals have their lips facing the oil pressure.
- k. Apply a light coat of grease to the internal surface of the bushing and screw this into the head using a wrench. Torque firmly.
- l. Screw the tie rod nuts and tighten 1/4 turn at a time proceeding from opposite corner to opposite corner. Consult the recommended torque chart supplied.



F-TIE ROD TORQUE CHART

HL Series	Tie rod		TORQUE
Bore	Material	Diameter	Steel barrel
1-1/2"	Stressproof steel	1/4"	5 lbs-ft
2"	Stressproof steel	5/16"	10 lbs-ft
2-1/2"	Stressproof steel	5/16"	10 lbs-ft
3-1/4"	Stressproof steel	3/8"	20 lbs-ft
4"	Stressproof steel	3/8"	20 lbs-ft
5"	Stressproof steel	1/2"	50 lbs-ft
6"	Stressproof steel	1/2"	50 lbs-ft
7"	Stressproof steel	5/8"	80 lbs-ft
8"	Stressproof steel	5/8"	95 lbs-ft
10"	Stressproof steel	3/4"	130 lbs-ft
12"	Stressproof steel	3/4"	160 lbs-ft
14"	Stressproof steel	7/8"	230 lbs-ft



HM - HP Series	Tie rod		TORQUE
Bore	Material	Diameter	Steel barrel
1-1/2"	Stressproof steel	3/8"	30 lbs-ft
2"	Stressproof steel	1/2"	40 lbs-ft
2-1/2"	Stressproof steel	1/2"	80 lbs-ft
3-1/4"	Stressproof steel	5/8"	190 lbs-ft
4"	Stressproof steel	5/8"	190 lbs-ft
5"	Stressproof steel	7/8"	550 lbs-ft
6"	Stressproof steel	1"	700 lbs-ft
7"	Stressproof steel	1-1/8"	950 lbs-ft
8"	Stressproof steel	1-1/4"	1250 lbs-ft
10" *	Stressproof steel	1-1/8"	950 lbs-ft
12" *	Stressproof steel	1-1/4"	1250 lbs-ft
14" **	Stressproof steel	1-1/4"	1250 lbs-ft

Note:

* 2 tie rods per corner, total 8 tie rods

** 3 tie rods per corner, total 12 tie rods



Need Knife Gate Valve pricing or support for your mining project? Contact us for more assistance.

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