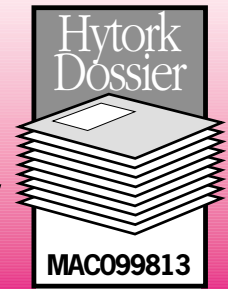


Installation, Operating and Maintenance Instructions

HYTORK



XLW Series Water Operated Actuators

Types: EDNW
EIAW
EDFW

Contents

Important Safety Procedures	1
Introduction	2
Corrosion Protection	3
DURASTRIP 'W' Bearings	4
Operating Media	5
Piping Instructions	6
Mounting and Operating Instructions	7
Speed of Operation	8
Maintenance Requirements	9
Testing and Cycling of Infrequently Used or Stored Actuators	10
Spares Kits	11
Service	12

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1 Important Safety Procedures

When carrying out maintenance on XLW Actuators follow the specific XLW instructions given in this Dossier (MACxxxx1) and the general XL instructions given in Hytork I, O & M Dossier MACxxxx1.

Qualified maintenance personnel should read and follow these straightforward instructions.

Always disconnect the Air or alternative Operating Pressure and Electrical Supplies before carrying out any form of maintenance on an Actuator.

On Spring Return models always contain the Spring Tension with HYTORK Retractor Rods as explained in HYTORK Dossier MACxxxx1. Follow instructions for using the Retractor Rod carefully.

Never attempt to remove the pistons from the Actuator body by using air or other pressure mediums when the End Caps have been removed.

Do not shorten or distort the SAFEKEYS; correct length SAFEKEYS are supplied with the Spares Kit.

When replacing items use only HYTORK authorised components.

Numbers in brackets (#) refer to parts on the exploded XLW diagram (Fig. 1).

Read the relevant sections carefully before continuing.

2 Introduction

There are many applications where it can be a benefit to operate the Actuators using pressurised water instead of compressed air. This can be particularly useful in remote areas where compressed air is not available.

The most common situation is when using mains water supply which is normally in the pressure range from 60-100psi (4 - 7 bar).

Standard XL Actuators have been used successfully in many water applications but HYTORK recommends that XLW Actuators are used in this application to assure smooth and reliable operation.

HYTORK XLW Actuators are specifically prepared for operating by water. This preparation is concerned with corrosion protection, bearings and the preventing the ingress of particles with the water. Contaminated water can cause damage to the Actuator Seals and bearing areas and reduce the operating efficiency and Actuator life.

3 Corrosion Protection

3.1 Aluminium Components.

Aluminium body components on HYTORK'S standard XL Actuators are treated with CERAMIGARD, a unique Di-Aluminium Tri-Oxide (AL₂O₃) surface treatment, which provides a hard, corrosion resistant, ceramic-like coating protecting all body parts against wear and corrosion.

This CERAMIGARD finish is particularly efficient in water applications and many years of site experience with

Differences between Standard XL and XLW Actuators

Part No.	Component	Quantity	Differences between the Standard XL and XLW Models	Part No.	Component	Quantity	Differences between the Standard XL and XLW Models
1	Travel stops & Seals	2	Standard XL	7	Springs*	2, 3 or 4	Standard XL
2	End Caps	2	Standard XL	8	Retractor Caps*	2	Standard XL
3	Pistons	2	Standard XL	9	Pinion Radial Bearings	2	DURASTRIP 'W'
4	Pinion	1	Standard XL or CORROGARD Finish	10	Piston Bearings	2	DURASTRIP 'W'
5	Body	1	Standard XL	11	Piston 'O' Rings	2	Standard XL
6	SAFEKEY & 'O' Rings	2	Standard XL	12	End Cap 'O' Rings	2	Standard XL
				13	Pinion 'O' Rings	2	Standard XL
				14	Thrust Bearings	2	DURASTRIP 'W'
				15	Steel Thrust Washers	2	Standard XL
				16	Snap Ring (Circlip)	1	Standard XL
				17	Position Indicator	1	Standard XL
				18	Sealing 'O' Ring*	2	Standard XL
				19	Sealing Bolts*	2	Standard XL

* Spring Return models only

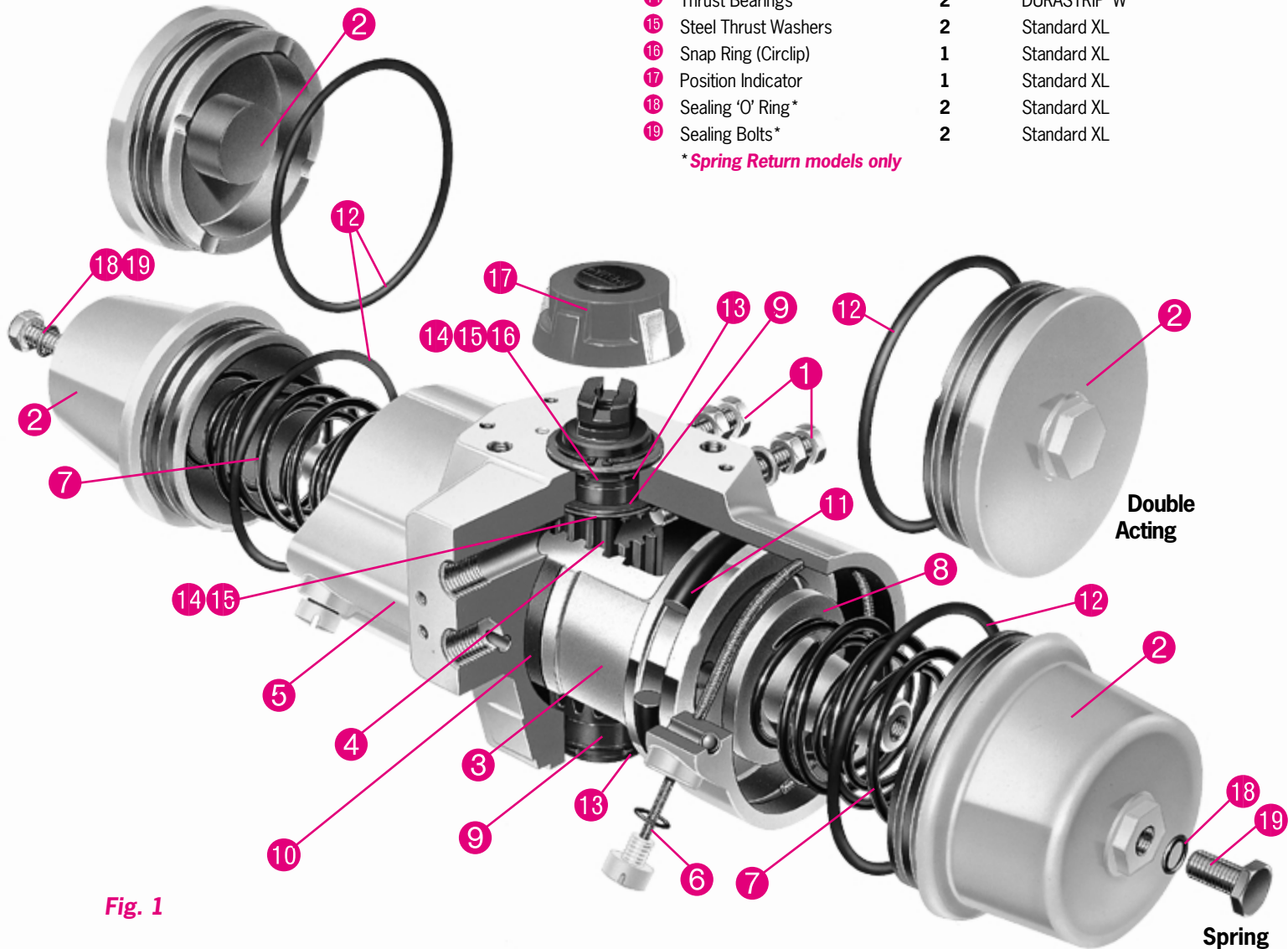


Fig. 1

water operation and water in air lines has shown excellent protection against corrosion.

3.2 Pinion. (4)

The finish on the Pinion will, in most cases, be the standard XL treatment. There are certain applications (as with high chlorine concentrations, for example) where one of the HYTORK

CORROGARD Fluoropolymer treatments may be more suitable. HYTORK will be pleased to give exact details of the finish required once the specification of the water is known.

3.3 Spring Return Actuators.

The Springs are protected by an Electro Phoretic finish as standard.

3.4 External Surface Finish.

The externals of all XLW Actuators are treated with a long cure, two part epoxy coating to provide extra protection against aggressive environments.

4 DURASTRIP 'W' Bearings

Continuous immersion in water will cause the standard XL Bearing to wear prematurely. To maximise Actuator Bearing life DURASTRIP 'W' Bearings are used.

5 Operating Media

5.1 Operating Media.

XLW Actuators can be operated by clean air or filtered water. The water must be clean and free from any particles that could damage the Seals or score the Actuator cylinders. Solenoid directional control Valves require a clean operating media and any form of contamination may cause the spool to stick.

5.2 Water Filtration.

It is recommended that a filter of 10 microns be used on all water supplies. Failure to use clean water will reduce Actuator life and may cause malfunction of both the Actuator and directional control Valve.

5.3 Maximum Operating Pressure.

XL models 45 to 2585
Do not exceed 8.3 bar (120 psi).

XL models 4580
Do not exceed 7 bar (100 psi).

The normal XL operating pressures should be adhered to unless HYTORK has given specific authorisation in writing that this may be increased. The fact that water is virtually incompressible means that it may be possible to utilise higher pressures in certain applications. If you have an application where higher operating pressures are required please consult HYTORK with full details for an assessment to be made.

6 Piping Instructions *(Fig. 2a & 2b)*

All Actuators can be either piped with solid or flexible tubing with the Solenoid Valve mounted remotely from the Actuator or by mounting the Solenoid DIRECTLY onto the NAMUR mounting pad on the side of the Actuator. (*ONLY Solenoids made to the NAMUR standard can be mounted in this way.*)

6.1 Solenoid Valves.

Care must be taken to ensure that Solenoid directional control Valves used on water applications are designed for this purpose. For the best possible performance it is recommended that the internal porting of Solenoid Valves is as large as possible.

6.2 Direct Acting Low Cv Solenoid Valves.

Low Cv (*direct acting*) Solenoid Valves must not be used even on small Actuators as the small port sizes and low spring forces used in this design of Valve will cause problems.

6.3 HYTORK CATS Solenoid valves.

The CATS Solenoid Valve **MUST NOT BE** used on water applications with Spring Return Actuators. The Spring chamber must be allowed to vent to atmosphere.

7 Mounting and Operating Instructions *(Refer to Fig. 1)*

7.1 Actuator to Valve Installation.

The mounting hole sizes and bolt hole circle of the holes are to ISO 5211. These holes are ISO METRIC COARSE on metric models (*UNC COARSE on USA models*) as standard. When mounting the Actuator to a Valve using a Mounting Kit, the Pinion drive, coupling device and Valve stem should be centred and concentric to prevent any side loading to the bottom Pinion Radial Bearing.

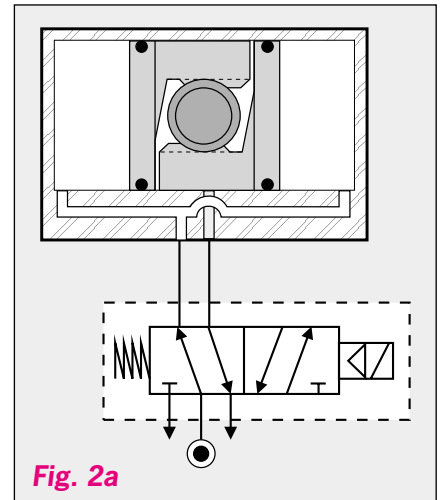


Fig. 2a

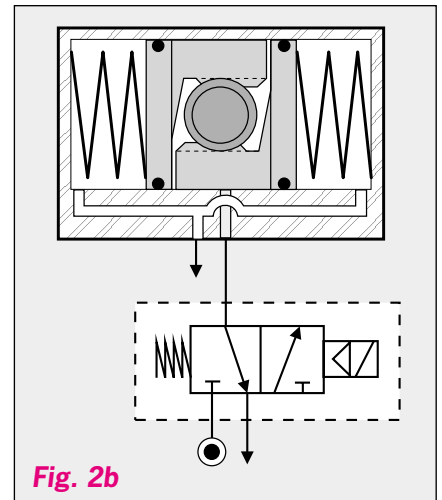


Fig. 2b

Ensure that the square shaft or drive adaptor to be operated is a close, but free sliding fit, to the female drive in the Actuator shaft (4).

8 Speed of Operation

Water used as the operating medium reduces the operating speed considerably. The actual time will depend on the Cv of the Solenoid Valve used and the friction losses along the pipe. Small diameter and/or long pipes will increase these losses and reduce operating speeds significantly.

8.1 Speed control.

Water is virtually incompressible which makes it ideal for accurate speed control. Always ensure that any speed adjustment is of the exhaust water.

9 Maintenance Requirements

It is recommended that XLW Actuators that have been operated by water be overhauled after 250,000 cycles. Follow the instructions in HYTORK DOSSIER MACxxxx1 and ask for the XLW Spares Kit.

9.1 Spares Recommendations.

When disassembling and carrying out maintenance work on an XLW Actuator, HYTORK recommends that a HYTORK XLW Spares Kit is used replacing all 'O' Rings, DURASTRIP Bearings, washers etc. This kit is only available from HYTORK or its Stocking Distributors.

10 Testing and Cycling of Infrequently Used or Stored Actuators

Actuators not in current use (*ie: Actuators in stores or stock and/or not operated for at least a 3 month period*), should be cycled a minimum of ten times and tested against the possible 'pre-set' of the seals.

11 Spares Kits

XLW Actuators

Contents List:

- 1 x I, O & M (XL) Instructions
- 1 x I, O & M (XLW) Instructions
- 2 x SAFEKEY Assemblies (6)
- 2 x SAFEKEY Seal 'O' Rings (6)
- 2 x Piston DURASTRIP 'W' Bearing Strips (10)
- 2 x Steel Thrust Washers (15)
- 1 x Pinion top 'O' Ring (13)
- 1 x Pinion top DURASTRIP 'W' Radial Bearing Strip (9)
- 2 x DURASTRIP 'W' Thrust Bearing (14)
- 1 x Pinion bottom 'O' Ring (13)
- 1 x Pinion bottom Radial DURASTRIP 'W' Bearing (9)
- 2 x Stop Seals (1)
- 2 x Piston 'O' Rings (11)
- 2 x End Cap 'O' Rings (12)
- 1 x Pinion Snap Ring (Circlip) (16)

12 Service

It is the policy of HYTORK to give the best possible service to our customers. We are happy to assist you in any way we can and if you have any questions about HYTORK Actuators or other HYTORK Products please do not hesitate to contact one of HYTORK'S VALVE AUTOMATION CENTERS or your local HYTORK Stocking Distributor.

Quality Assured registered management systems to ISO 9001

MAC099813

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UK Patents:

GB 2 102 887 B;
GB 2 123 517 B;
GB 2 138 505 B;
GB 2 216 229 B;
GB 2 225 079 B;
GB 2 229 254 B;
GB 2 253 459 B;
GB 2 268 574 B.

US Patents:

4,496,071;
4,651,627;
4,716,815.

Warranties:

Unauthorised modification to any Hytork Product totally invalidates all warranties.

Important:

We have endeavoured in this publication to make the contents as accurate as possible, but being given as general information, it is not to be taken as binding unless specifically confirmed in writing. Due to Hytork's continuing commitment to engineered product advancement, the product specifications and data presented in this publication are subject to change without notice.

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