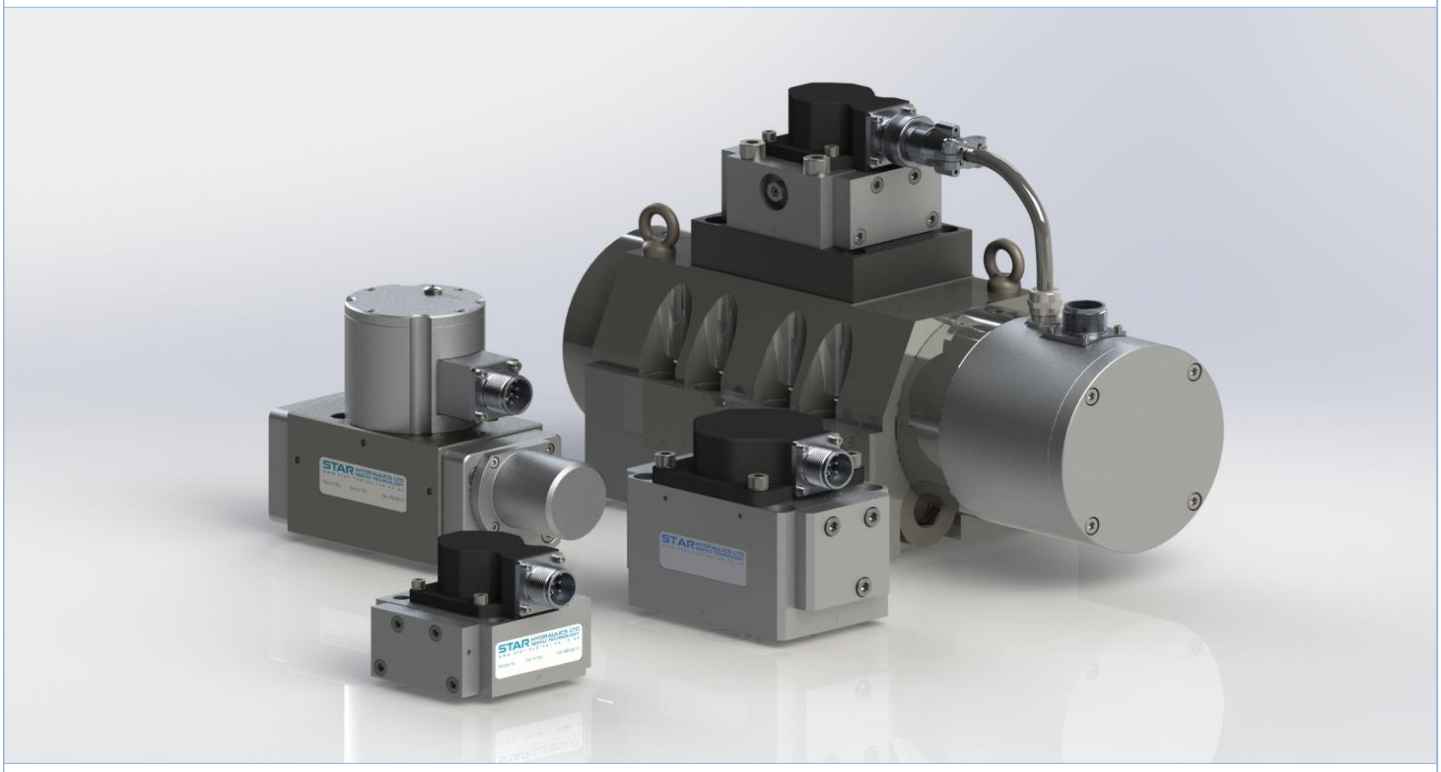
Installation and Commisioning of Servo & Propotional Control Valves



Star Hydraulics Limited
Severn Drive
Tewkesbury Business Park
Tewkesbury
Gloucestershire
GL20 8SF
England (UK)

www.star-hydraulics.co.uk

ST-Install-2011.1-En

General

Installation / removal / commisioning of electro hydraulic control valves should only be carried out by experienced personnel that have completed appropriate hydraulic, control and automation training courses. Publications such as ISO 4413 provide general rules and safety requirements for hydraulic fluid power systems and components and significant hazards associated with new installations and upgrades to such systems. The STAR product data sheets provide essential technical details for each model.

All Star servo and proportional valves are calibrated in accordance with ISO 10770 standards for electrical hydraulic control valve and fluid cleanliness monitored and controlled ISO 4406 : 1999 to class 12 /10 /8 or better and viscosity VG 32.

All products supplied by STAR are fitted with protective shipping plates to prevent ingress of contaminaiton and should not be removed until the very moment that the valve is to be fitted to the system.

Flushing & Fluid Cleanliness

Contamination control in hydraulic systems is the most important aspect when preventing system failures, more than 75% of all failures can be traced back to contaminated oil.

New oil is a source of contamination and is not supplied to any cleanliness classification.

Effective flushing processes and monitoring must be adopted to ensure fluid cleanliness has been achieved and maintained prior to fitting a new or repaired servo valve.

The system must be flushed without the servo valve fitted. Instead use a flushing plate that connects the manifold pressure port back to tank. If the system allows the use of manual or low cost directional control valves may also be used that can also allow flushing of the control lines.

The flushing time is goverened by the degree of contamination within a sample of fluid and can only be determined by continuous monitoring with a particle counter or by sucessive bottle samples. Samples must be taken from several points around the system.

Rapid removal of contamination from within the system occurs when turbulent flow exists. System variables such as flow rate, fluid viscosity and pipe bore diameters need to be assessed. Turbulent flow occurrs when the Reynolds value exceeds 4000.

There is no such thing as a 'x' micron rated system. Fluid clealiness standards relate to the amount of particles by number in a given quantity of oil. The most commonly used are:-

ISO 4406 : 1999
NAS 1638-01/1964
SAE AS 4059E

Always flush the system one class cleaner than the minimum requirement.

Filtration

The main areas for filter location are pressure line (pump outlet), return (tank) line, off-line (kidney loop), often used for filling circuit. Reservoirs should also be fitted with filtered breathers to prevent external contaminants from entering the tank.

Ensure pressure and return filter element pressure drop ratings are adequate for the full spectrum of operating temperatures/fluid viscosity ratings. Do not use fine rated filters where dynamic changes occurr within the system, they could fatigue. Do use filters without by-pass and clogging indicators.

Use good quality elements, low cost elements could shed during use and therefore introduce more con-taminants into the system.

The Beta ratio (βx) is an indicator of how well a filter controls particulate. Therefore filters with higher ratio values provide better system protection.

Recommended filter micron ratings:-

pump outlet	10 µm
return line & tank breather	3 µm
off-line	2 µm

Valve Installation

When installating and removing valves ensure that the immediate area is clean. Use only lint free cloth or special paper for cleaning.

Install the control valve only after completion of the flushing procedure. Ensure the manifold interface surface finish and geomtry meet the product data sheet specification.

Most valves have a locating pin to ensure correct port orientation. Make sure the pin lines up with the mating hole in the manifold interface. If there is no locating pin make sure the valve P port is lined up with the system pressure port and ensure all ports are aligned.

Secure the valve to the manifold with the appropriate bolt torque values.

All hydraulic functions must first be tested at low pressures under fully controlled conditions.

Warranty

1. STAR warrants that each item of its manufacture is free from defects in material and workmanship at the date of shipment. This warranty shall not apply to any part or parts supplied to but not manufactured by STAR. As to such parts, STAR agrees to purchase the same from a reputable supplier and to assign to its customer whatever rights STAR may have under warranties of such suppliers.

2. Unless otherwise specified, STAR's obligation under this warranty is limited to replacing or repairing any item supplied as new, which within twelve (12) months from date of shipment is proven by STAR inspection to have been defective at the time of shipment. As a condition of this warranty, the purchaser shall notify STAR in writing of any claim(s) immediately upon discovery and shall return the item to STAR for inspection. Unless specifically approved in writing, STAR shall not provide uncompensated field service under this warranty. No allowance will be made for repairs or alterations unless STAR has previously agreed in writing to such allowance. STAR shall not be responsible for any work carried out by any other party. STAR must in the first instance carry out all warranty investigations on STAR units, which must not have been tampered with before being returned to STAR, In the event that disassembly part or whole by anyone other than authorized STAR personnel will immediately void the terms of this warranty.

3. Unless STAR is specifically requested to provide installation assistance under the terms of this quotation, proper installation and checkout shall be the sole responsibility of the customer.

4. STAR shall not be liable for improper use, installation, operation or maintenance of items manufactured by STAR, nor for any damage resulting from improper use, installation, operation or maintenance. In addition, STAR shall not be responsible for any damages for loss of production or profits, damage to product or economy of operation, or any other consequential or incidental damages occasioned by defects in, or failure of any goods supplied by STAR or by defects in or failure of any product in which a component manufactured by STAR is incorporated.

5. STAR shall not be responsible for the performance of any product, which incorporates component parts manufactured by STAR unless such performance is expressly designated as STAR's responsibility under the terms of the written agreement between STAR and the Customer.

6. The warranties contained herein are exclusive and are given in lieu of all other warranties, express, implied or statutory, including the implied warranty of merchantability or fitness for a particular purpose and all other obligations and liabilities.

7. Special and extended warranty periods are available from STAR under approved conditions of contract. These special conditions come into effect on a case-by-case basis and the scope of these conditions is advised under Addendum Clauses to these conditions authorised only by a Board Director of STAR.