



Operating and Maintenance Instructions

Hydraulic Cylinders

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Scope	General operating and maintenance instructions for AGIROSSI hydraulic cylinders
Note	These instructions do not replace any project-specific operating manual, drawing, conformity assessment or risk assessment of the complete machine.

Project-specific drawings, data sheets, approvals and catalogue information take precedence.

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1. Purpose and scope

These operating and maintenance instructions apply to general AGIROSSI hydraulic cylinders unless otherwise specified in the data sheet, drawing, quotation, order confirmation or project-specific documentation.

They are intended for operators, machine manufacturers, installation personnel, maintenance personnel and qualified specialists. They describe the safe handling of hydraulic cylinders as components, not the complete risk assessment or operating instructions for the complete machine.

For special cylinders, telescopic cylinders, position measuring systems, end-position damping, special seals, ATEX requirements, special media, high temperatures or safety-related functions, the project-specific documents must be observed as binding.

2. Applicable documents and technical limits

The drawings, data sheets, nameplates, catalogue sheets, test reports, installation notes and written approvals included in the scope of delivery are binding.

The maximum permissible operating data such as pressure, temperature, stroke, installation position, mounting type, speed, media approval, load, transverse load and environmental influences must not be exceeded.

Standards, statutory requirements and operator obligations must be checked in the currently valid version. For hydraulic systems, ISO 4413 / DIN EN ISO 4413 and the requirements of the complete machine must be considered in particular.

3. Intended use

The hydraulic cylinder is intended as a linear hydraulic drive element for the operating conditions described in the technical documents.

Non-intended use includes in particular operation outside the approved pressure, temperature or media limits, use as a load-bearing safety element without separate design, modifications to the component, welding or machining without written approval, and operation with insufficient filtration or unsuitable hydraulic fluid.

The machine manufacturer or operator is responsible for safe integration into the machine, guards, emergency stop functions, pressure limitation, hose and pipe routing, and the risk assessment of the complete system.

4. Personnel qualification and personal protective equipment

Installation, commissioning, maintenance and troubleshooting may only be carried out by qualified hydraulic specialists. Electrical connections may only be made by qualified electricians.

Depending on the activity, safety glasses, safety shoes, suitable gloves, close-fitting work clothing and suitable skin protection when working with pressure fluid must be used.

Pressurized hydraulic fluid can penetrate the skin. Never search for leaks by hand. Use suitable aids and depressurize the system first.

5. Basic safety instructions

Before working on the hydraulic cylinder, secure the system against being switched on again, support loads, relieve residual pressure and discharge stored energy in a controlled manner.

Crushing, shearing and drawing-in points in the movement range of the cylinder must be protected by the machine manufacturer. Persons must not remain in the danger zone.

Operating pressure must be secured by suitable pressure-limiting devices. Pressure peaks, cavitation, uncontrolled movements and load drop must be prevented by the system design.

Hot surfaces, escaping oil and slippery floors can cause injuries. Collect leaked pressure fluid immediately and dispose of it in accordance with applicable regulations.

In case of visible damage, severe corrosion, deformed components, unusual noises, jerky movement or impermissible leakage, operation must be stopped and the cause clarified by qualified personnel.

6. Transport, goods receipt and storage before installation

On receipt of the goods, check the delivery for transport damage, completeness, nameplate, plugs and conformity with the order/drawing.

Transport cylinders only with suitable lifting gear, sufficient load capacity and secured against tipping/slipping. Do not attach lifting gear to the piston rod, sensor cable, fitting or protective caps unless this has been expressly approved.

Keep connection ports closed until installation. Protect the piston rod from impacts, scratches, welding spatter, grinding dust and corrosion.

Store cylinders dry, low in dust, frost-free and free of aggressive vapours. For storage periods over 6 months, check corrosion protection, close ports and, if necessary, fill with suitable preservation oil. Before commissioning, coordinate preservation with the operating medium.

7. Installation and mechanical mounting

Before installation, clean all connection surfaces, lines and the surrounding area. Dirt, chips, scale, sealant residues and fibres must not enter the hydraulic system.

The cylinder must be installed free of stress. Mountings must be aligned; lateral forces, tilting and bending moments on the piston rod and bearing points must be avoided.

Mounting screws must correspond to the drawing or design. If no specification exists, suitable screw grades must be selected according to relevant standards; tightening torques, locking elements and thread engagement depths must be defined by the design.

Route pipes and hoses free of stress and secure them against abrasion, kinking, twisting and impermissible tensile/compressive loads. Consider movements of the cylinder and machine.

Hemp, putty, unsuitable sealing tapes or fibrous sealants are not permitted if particles can enter the hydraulic system. Suitable hydraulic sealing and connection elements must be used.

8. Pressure medium, cleanliness and filtration

Approved pressure media can be found in the AGIROSSI catalogue sheets, data sheets or project-specific approvals. In general, HLP hydraulic oils according to DIN 51524 and approved biodegradable hydraulic fluids may be suitable; seal compatibility must always be checked.

Do not mix pressure fluids without prior checking. Additives, viscosity, temperature range, water content, ageing condition and manufacturer approvals must be observed.

The filtration of the system is essential for the service life of seals, guides and surfaces. The cleanliness level must be defined according to the requirements of the complete system and the most sensitive component. ISO 4406 may be used as a common cleanliness code.

Pipes, tanks and components must be cleaned, flushed and protected against renewed contamination before installation and commissioning. Warm-bent or welded pipes must be cleaned and preserved after suitable post-treatment.

9. Electrical and electronic components

Position measuring systems, inductive proximity switches, reed contacts, valves or other electrical components must be connected according to the circuit diagram, data sheet and manufacturer information.

Before connection work, isolate the power supply and secure it against being switched on again. Check supply voltage, degree of protection, connector pin assignment, EMC requirements, line protection and environmental influences.

After connection, a function test must be carried out without endangering persons or the machine. Sensor and cable damage lead to malfunctions and must be repaired before operation.

10. Commissioning

Before the first movement, ensure that mechanical stops, guards, pressure limitation, lines, mountings, sensors and control system are correctly installed and checked.

Move the cylinder slowly and in a controlled manner at low pressure. Air in the system can cause jerky movements. Bleed the cylinder and lines carefully until bubble-free pressure fluid escapes.

Observe leakage, unusual noises, jerky movements, pressure peaks, impermissible heating and end-position behaviour. In case of deviations, stop commissioning and clarify the cause.

After successful functional testing, document operating data: pressure, temperature, medium, cleanliness level if available, stroke, speed, leakage pattern, mountings and special features.

11. Operation

The cylinder may only be operated within the approved operating data. Pressure peaks, lateral loads, mechanical overload, insufficient lubrication of bearing points and contaminated medium reduce service life and safety.

Piston rod surfaces must remain clean and undamaged. Adhering particles, welding spatter, paint mist, grinding dust or aggressive media can damage seals and surfaces.

For outdoor operation or corrosive environments, suitable protective measures, regular visual inspections and, if necessary, additional preservation are required.

12. Maintenance and inspection

Hydraulic cylinders themselves are essentially low-maintenance when operated properly. Bearings, swivel bearings, spherical plain bearings, pins and external guides must be checked and lubricated according to the machine or lubrication plan.

Maintenance intervals depend on load spectrum, environment, medium, temperature, switching frequency and safety requirements. The operator must define and document suitable intervals.

At every maintenance operation, check external leakage, mountings, bearing points, piston rod, corrosion, protective devices, hoses/pipes, connection fittings, sensor cables, function and operating noises.

Seals are wear parts. In the case of impermissible internal or external leakage, damage or malfunction, seals must be replaced properly. AGIROSSI recommends having the seal kit and cylinder condition checked as a whole.

13. Recommended maintenance and inspection plan

Interval	Check / activity	Note
Before every commissioning after installation	Visual inspection, mountings, lines, connections, bleeding, danger zone	First movement only at low pressure and with secured load.
Regularly during operation	External leakage, running behaviour, noises, temperature, contamination of the piston rod	Operator to define interval according to operating conditions.
Monthly or according to operator plan	Screw connections, bearing points, pivot points, corrosion protection, sensor cables	Define shorter intervals for dynamic or safety-related applications.
At oil change / system service	Pressure medium, cleanliness level, filter condition, water content, foaming, discoloration	Define limit values according to system, medium and components.
In case of fault or leakage	Take cylinder out of operation, secure load, determine cause professionally	Do not dismantle under pressure. Check seals and guides as a whole.
Before long-term storage	Cleaning, preservation, connection plugs, dry storage	If stored over 6 months, check condition regularly.

14. Faults and possible causes

Fault	Possible cause	Measure
Cylinder does not move or moves jerkily	Air in the system, pressure too low, blocked load, incorrect control, contaminated valve	Secure system, bleed, check pressure supply and control.
Unusual external leakage	Seal worn/damaged, piston rod damaged, overpressure, unsuitable medium	Stop operation, check cause, inspect seal kit/cylinder.

Load drops / internal leakage	Piston seal worn, valve leakage, pressure loss in the system	Check cylinder and hydraulic system separately; secure load against falling.
Increased temperature	Pressure loss too high, wrong viscosity, continuous operation, insufficient cooling	Check operating data, design/optimize system.
Piston rod shows scoring/corrosion	Dirt, transverse load, defective scraper, aggressive environment	Assess operation, check surface and sealing system, add protective measures.
Sensor does not provide plausible signal	Incorrect connection, cable damage, supply voltage, EMC, mechanical damage	Check according to circuit diagram; consult electrician.

15. Dismantling, repair and seal replacement

Before dismantling, depressurize the system, secure loads, secure the cylinder against falling and collect hydraulic fluid.

Seal replacement may only be carried out by qualified specialists using suitable tools, a clean environment and suitable spare parts. Do not damage seals with sharp-edged tools.

After repair, cleaning, proper assembly, bleeding, functional testing and leak testing are required. In safety-related applications, the test must be documented accordingly.

In case of uncertainty, AGIROSSI recommends returning the cylinder for assessment and professional repair.

16. Spare parts and enquiries

Seal kits can be requested by specifying the cylinder article number with suffix S, provided that the article number logic applies to the respective cylinder.

For quick processing, please provide: article number, serial number, drawing number, year of manufacture/delivery date if known, operating conditions, medium, pressure, fault pattern, photos of nameplate and damaged area.

Only suitable spare parts and sealing materials may be used. Deviating materials or third-party parts can impair function, tightness and safety.

17. Shutdown and disposal

Before shutdown, depressurize the cylinder, drain residual medium and collect it in an environmentally sound manner. Close open ports.

Dispose of pressure fluid, seals, metallic components, packaging and cleaning agents in accordance with applicable legal requirements and safety data sheets.

For contaminated media, special protection and disposal regulations must be observed.

18. Documentation and operator obligations

The operator or machine manufacturer must appropriately document installation, commissioning, maintenance, changes, faults and repairs.

For the complete machine, the risk assessment, operating instructions, CE/UKCA/other conformity requirements, protective measures and periodic inspections must be defined by the person responsible for the complete system.

These instructions must be made accessible to operating and maintenance personnel and passed on when the cylinder is transferred.

19. Contact

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