Ergonomix
OF SWEDEN

Manual

Ergonomix height adjustment system

General information

Prohibitions - Warnings - Regulations

Installation - Dismantling - Repair

Försäkran för inbyggnad av en delvis fullbordad maskin.
Maskindirektivet (2006/42/EG)
(Bilaga II.1.B)

Tillverkare:

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försäkrar härmed att den delvis fullbordade maskinen

Maskindel:

Produktnr.:	MOTxOx, MOAx0x, MOMF, MF, MB0, MB1
Märke:	Motordriven/manuellt driven hydraulpump
Typ:	Hydraulik system
Märkningsår:	2010

- som omfattas av denna försäkran för inbyggnad uppfyller följande grundläggande hälso- och säkerhetskrav i maskindirektivet (2006/42/EG):
  - 1.2 Styrsystem
  - 1.3 Skydd av mekaniska riskkällor
  - 1.5 Risker pga andra riskkällor
  - 1.6 Underhåll
  - 4 Ytterligare Grundläggande ..... i samband med lyft.

- samt att följande relevanta tekniska dokumentation har sammanställts i enlighet med bilaga VII.B:
  - Ritningsunderlag med beräkningar, tester och prövningsintyg.
  - Riskbedömning
  - Monteringsanvisningar

Följande europeiska harmoniserade standarder enligt Artikel 7.2 har använts:

SS-EN ISO 12100-1/A1:2009 Maskinsäkerhet - Grundläggande begrepp. Del 1
SS-EN ISO 12100-2/A1:2009 Maskinsäkerhet - Grundläggande begrepp. Del 2

Motorenheterna är dessutom tillverkad i överensstämmelse med:

- Rådets direktiv av den 12 december 2006 om harmonisering av medlemsstaternas lagstiftning om elektrisk utrustning avsedd användning inom vissa spänningsgränser (2006/95/EEG)

- Rådets direktiv av den 3 maj 1989 om tillnärmning av Medlemsstaternas lagstiftning om elektromagnetisk kompatibilitet (89/336/EEG)
- EN 61000-6-3:2001,En 55022 Class B
- EN 61000-3-2: 2001,
- EN 61000-3-3: 1995, A1:2001
- EN 61000-6-2: 2001
- EN 61000-4-2, -3, -4, -5, -6, -8, -11

Vi åtar oss att på motiverad begäran av nationella myndigheter tillhandahålla relevant information om den delvis fullbordade maskinen som den här försäkran gäller.

En delvis fullbordad maskin får ej tas i drift förrän den fullständiga maskin som den byggts in i har förklarats överensstämma med bestämmelserna i direktiv 2006/42/EG.

Företag: Ergonomix AB
Namn: Lars Carlander
Titel: Teknisk Chef

Borås 2010-04-26 — Lars E Carlander

Datum — Underskrift

General information

You are now holding a hydraulic system that is primarily used to set working surfaces to ergonomically suitable heights.

The Ergonomix system has been designed to adjust the height of:

- Desks
- Worktops
- Frames
- Machines
- Platforms
- Beds
- etc.

The system can easily be fitted to, e.g. existing tables to make these height adjustable.

How the system works

The Ergonomix hydraulic system works according to the principle of two communicating vessels. One of the vessels is located in the pump (4) below the table while the other (cylinder) is located in one of the table legs (6); the vessels are interconnected using a plastic tube (5).

When the table is raised, the amount of oil required is quite simply pressed out of the vessel in the pump (4), through the tube (5) to the cylinder in the table leg (6) and in this way the table is lifted upwards.

When the table is to be lowered, an underpressure is created in the pump (4), by retracting the piston (3). The oil in the cylinder is then pressed back through the tubing into the pump by the overpressure created by the weight of the table.

The vessels located in the pumps are mechanically connected with each other in a plastic nut (2) so that all the table legs are at the same height, and remain at the same height irrespective of whether one table leg bears a higher load than the other legs.

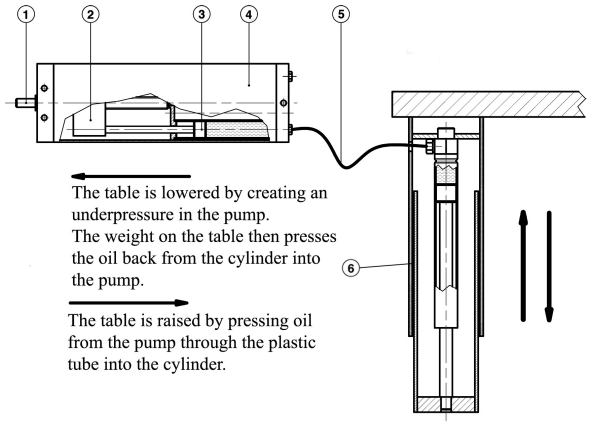
Movement in the system is brought about when the screw (1) that runs through the plastic nut is turned, either by means of a manual crank or by means of an electric motor unit.

Varying the diameters of the pumps and cylinders gives different lifting forces and speeds. *See Product specifications, page 9.*

Product warranty

The Ergonomix system has a 12-month warranty against manufacturing faults calculated from the system's date of manufacture.

The Ergonomix warranty only applies as long as the system has be used as prescribed and has not been dismantled or subjected to damage in any way.



Prohibitions - Warnings - Regulations

General information

- System may not be used for continuous operation, i.e. max. 2 minutes of operation followed by at least 8 minutes of rest.
- This manual should always be available by the system.
- The validity of warranties cease when using a motor unit that has not been approved in writing by Ergonomix AB.
- The system may be sensitive to corrosive environments, please contact Ergonomix AB before using in such environments.
- The electric controlbox may only be connected to a socket with the same voltage as stated on its rating plate.

Risk information

- Tubing must not rest against sharp edges, undeburred holes, moving parts or the like.
- The bending radius of the tubing should be at least 30 mm.
- Tie up all loose hanging tubing and cables.
- When there is a risk of tubing being damaged in any way it should be built in or protected by an appropriate protection tubing such as article no. TUBSK available at Ergonomix AB.
- Workplaces must be designed so that there are no risks of tipping or falling.
- The system's max. load must not be exceeded, statically or dynamically.
- The system must not be subjected to mechanical, thermal, chemical, electromagnetic or electrical field (e.g. high voltage cables) effects over and above that stated as the limits in this manual.
- The fitter bears responsibility to ensure that suitable safety devices are used to prevent injury or damage if the Ergonomix system is used in areas where there is a risk of damage to property or personal injury caused by the movement of the system. For example, by using pinch guards, light curtains, emergency stops, etc. Sockets for this type of safety device are ready fitted to the Ergonomix motor unit.
- In the event of oil leakage or spillage, wipe up the split oil immediately and clean using an appropriate cleaning agent (e.g. detergent or windscreen washer fluid) to eliminate the risk of slipping.

Using the system

This system has been designed for the height adjustment of workplaces.

The system must not be used as:

- a safety component
- a clamping device
- a stop
- a press machinery

without the written approval of Ergonomix AB

It is directly prohibited to use the system in:

- explosive environments
- space industry
- radioactive environments

as well as in all those environments that exceed the limits defined in this manual.

In the event of uncertainty or if you have any questions please contact Ergonomix AB or its representative.

Maintenance and repairs

- The system should always be unloaded and the motor unit deenergized when work is carried out on the system.
- Residual oil obtained during installation or repair work must be treated as environmentally hazardous waste, even if it is judged not to represent a risk with normal handling.

- Ergonomix product liability only covers products that were impaired by faults from the factory. Ergonomix product liability ceases completely or in part if the user does not follow the maintenance instructions or uses spare parts that are not original spare parts.

There are written instructions available for each repair to minimise the risk of error, order these instructions when ordering spare parts and read carefully through them before starting the repair work.

The following applies for the product warranty to be valid after a repair has been made:

- only original spare parts may be used with repairs.
- no work may be done on products such as pumps, cylinders, motors, transformers and circuit boards.
- repairs must be made according to the enclosed instructions
- .- the system shall still only be used according to the specified data.
-

Installation - Dismantling - Repair

All work on the system, irrespective of whether it is a question of installation, dismantling, repairs or anything else, must be done with the system depressurised and deenergized. Other points concerning all work on the system are:

- Tubing must not rest against sharp edges, undeburred holes, moving parts or the like.
- The bending radius of the tubing should be at least 30 mm.
- When there is a risk of tubing being damaged in any way is should be built in or protected.
- Workplaces must be designed so that there are no risks of tipping or falling.

Connecting the cylinder and pump

- It is important that the points below are followed when the cylinders and pump are to be connected together and that you then follow the instructions “Connection cylinder - pump”.
- If the system has not been assembled, i.e. the cylinders are not connected, the pump must not be cranked or the motor actuated.
- The pump is always filled on delivery with the oil the system shall work with.
- The oil in the cylinders on delivery is used to “vent” the tubing that connects the pump and cylinders and should always be emptied before the tubing is connected to the pump. See “Connection cylinder - pump”.
- When a motor unit is installed on the crank drive system at a later date, the trapezoidal screw in the pump **MUST** be lubricated with Ergonomix special grease.
- If the system is crank driven the trapezoidal screw in the pump must **NOT** be lubricated. If it is lubricated then the self-braking in the pump can disappear causing the table to lower by its own weight.

Final assembly on the table

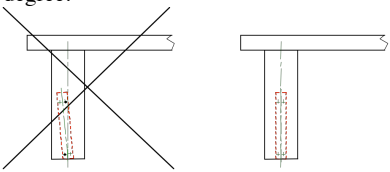
Pump and motor unit

- Install the system so that there is a minimal risk of impact against the legs or the like.
- Use bolts that are not so easy to remove, e.g. Torx headed bolts, when mounting the pump and motor unit under the worktop.
- When using the motor unit always secure the transformer on the same surface as the system so that it does not lie loose on the floor.
- Neither the pump nor the cylinder should be installed so that they sit under tension.

- Always tie up cables and tubes that hang loose.

Cylinder

- Never use longer bolts than that stated in the warning text on the cylinder when mounting the AB-or AM- cylinders.
- When using AC-or AS- cylinders (or variants) they are constructed to take up axial force, so consequently, never install the cylinders so that they can take up lateral loads (bends).
- Ensure with integration or addition that the system, i.e. the cylinders, can move freely over their entire stroke length, otherwise the system may be damaged.
- Ensure the cylinders are always installed straight. Tolerance + 1 degree to – 1 degree.



- AB-, and AM- cylinders are constructed to take up some uneven loads, however not while moving.
- Neither the pump nor the cylinder should be installed so that they sit under tension.

Dismantling or scrapping the system

Hydraulic oil must be left at a suitable destruction or treatment station in the event of leakage or when scrapping the system. Otherwise the system consists of fully recyclable and, in that, environment friendly parts.

Repairs and spare parts

With all work on the system it should always be unloaded and the motor unit deenergized.

The following parts can be replaced on the motor unit:

- Electric motor
- Control box
- Hand control
- Limit switch

When repairing the cylinders or pump only complete units may be replaced; these must not be dismantled and thereby prevent the risk of malfunction. All these parts are supplied by Ergonomix AB or its representatives as spare parts.

There are also instructions available for each repair to minimise the risk of error, order these instructions when ordering spare parts and read carefully through them before starting the repair work. Please state the designation from the product's rating plate when ordering.

The following applies for the product warranty to be valid after a repair has been made:

- only original spare parts may be used with repair work.
- no work may be done on products such as pumps, cylinders, motors or motor units.
- repairs must be made according to the enclosed instructions.
- the system shall still only be used according to the specified data.

Residual oil obtained during installation or repair work must be treated as environmentally hazardous waste, even if it is judged not to represent a risk with normal handling.

Ergonomix product liability only covers products that were impaired by faults from the factory. Ergonomix product liability ceases completely or in part if the user does not follow the maintenance instructions or uses spare parts that are not original spare

Connection cylinder - pump

1. Cut the tubing to the required lengths, use a carpet knife to get a clean and square cut.
2. Unscrew the seal plug on the first cylinder.

3. Slip the pressure nut followed by the compression ring on the tube (when using an AB- or AM- cylinder *first* slip on the black plastic cap).
4. Insert the tube fully into the connection hole on the cylinder, slide down the compression ring and tighten the nut to 10 Nm. Make sure you hold the tube in "position" while tightening the pressure nut.

Important ! The cylinder must not be clamped by the cylinder tube or piston rod while tightening.

5. If you have an AB or AM- cylinder, press down the black plastic cap on the cylinder.
6. Hold the cylinder vertical with the tube connection facing upward, insert the end of the tube into a bottle of oil and then push the piston rod in fully. On the AB and AM- cylinder the piston rod should be flush with the housing while on AS and AC-cylinders the piston rod will protrude 12 mm when the cylinder is completely retracted.
7. Do not allow the loose tube end to hang or rest against anything for a long period of time, as there can be a risk of air entering the system.
8. Repeat points 2-7 for the other cylinders.
9. Place the pump vertical with the tube connections facing upwards.
10. Unscrew the seal plugs on the pump.
11. Crank/run out the system a ½ turn or until you see oil running out of the connection holes on the pump.
12. First thread on the pressure nut and then the compression ring on to the tube from the cylinder and connect to the pump as described for the cylinder above and tighten to 10 Nm.
13. Repeat points 12 for the remaining cylinders.
14. Crank/run out the system halfway and check that the cylinders start to move at the same time and that they travel out the same amount with a smooth action. Also check that the cylinders do not feel "spongy" when under pressure.

If one or more of the cylinders feel "spongy" follow the instructions "Refilling of individual cylinders" and test again as set out above.

15. Fit the cylinders and pump in position. Tie up any loose hanging tubes.

The system is now ready for use.

<u>Important:</u>

- Make sure the cylinders are completely empty of all oil before they are connected to the pump otherwise the system will be damaged.

- Ensure connections are tightened to 10 Nm, otherwise there is a risk of oil leakage..

Refilling of individual cylinders

Start by unloading the system (table) by blocking it up or by placing the table on its side.

1. Crank/run out the system (UNLOADED) until the defective cylinder has travelled 30-40 mm.
2. Loosen the pump from the table if possible, and place it vertically with the tube connections facing upwards, if this is not possible make sure the pump end with the tubes is placed higher than the other end.

Important ! Take care not to damage the tubes, min. bending radius 30 mm.

3. Unscrew the affected cylinder's tube connection on the pump.
4. Keep the tube end under the oil level in the bottle of oil that was sent to you and slowly pull out the cylinder piston rod, oil is sucked in by the vacuum that is formed, keep the piston rod in the extended position for 1-1½ min.
5. Keep the cylinder vertical with the tube connections facing upward (unscrew the cylinder from the table if necessary) and press in the piston ring until air-free oil comes out of the tube.

Tip! This is best seen if the end of the tube is kept under the oil level in the bottle.

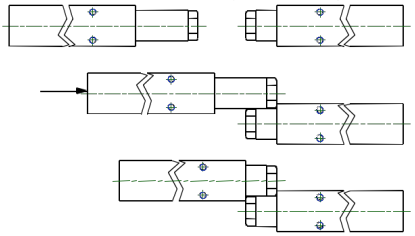
6. Repeat points 4 and 5 until the piston rod on this cylinder protrudes about 50 mm longer than on the "correct"cylinders.
7. Crank/run out the system about a ½ turn or until oil comes out of the open connection hole on the pump.
8. Connect the tube on the pump again.
9. Crank/run back the pump to the bottom position at the same time as you press in the piston rod on the refilled cylinder. Now press in the piston rods on the other cylinders.
10. With the pump in the bottom position, the piston rod on the refilled cylinder should protrude further than the piston rods on the other cylinders.
11. Unscrew the tube connections from the pump again and press out the excess oil into the oil bottle by:

- **on a crank powered system** pressing the piston rod to the bottom.
- **on a motor powered system** pressing in the piston rod until it protrudes by the same amount as on the other cylinders

Tip! on motor powered systems place the piston rod as illustrated in the diagram when pressing out the oil. Connect the tube to the pump again and tighten to 10 Nm.

12. Crank/run out the system halfway and check that the cylinders start to move at the same time and that they travel out the same amount. Also check that the refilled cylinder does not feel "spongy" when under pressure. Repeat the above if necessary until the system functions correctly again.
13. Fit the cylinder and pump in position again.

The system is now ready for use again.



Trouble shooting chart Hydraulic system

Fault:	Reason:	Actions to be taken:
Motor is audible and the coupling rotates, but the system does not move	Safety pin broken	Order instruction “Replacing the safety pin on the motor unit”.
	Pump broken	Order instruction “Replacing the Pump”.
Motor is audible and the coupling does not rotate	Worm gear motor broken	Order instruction “Replacing the electric motor”.
Motor is not audible , but the relay click is audible when the power plug is put into the wall socket (no current to the motor)	Control unit overloaded	Let the system rest for appr 15 minutes, the fuse resets automatically when cooled down.
	Motor broken	Order instruction “Replacing the electric motor”.
	Limit switches broken	Order instruction “Replacing the limit switch”
Motor is not audible and no relay click is audible when the power plug is put into the wall socket.	Control unit broken	Replace the control unit
The system can only be run in one direction	Control unit broken	Replace the control unit
	Limit switch broken	Order the instruction “Replacing the limit switch”.
Cylinder leakage	Tube connections not tight	Order the instruction “Refilling description of individual cylinders” and replace connection components.
	Cylinder broken	Order the instruction “Replacing the cylinder”
Pump leakage	Tube connections not tight	Order the instruction “Refilling description of individual cylinders” and replace connection components.
	Pump broken	Order the instruction “Replacing the pump”.
Tube rupture	Damaged tube	Order the instruction “Replacing the tube”.

NOTE! The system should always be unloaded and the motor unit deenergized with all repair work.

Product specification

Product

Ergonomix hydraulic height adjustment equipment.

Model

MOMF, MOAB0M, MOAB1M plus all models there of and crank driven systems 1-legged to 8-legged systems.

System's operating principle

Single acting hydraulic system with manual crank operation or electric motor powered.

Operating conditions

The system is not intended for continuous operation, maximum 2 minutes operation followed by 18 minutes of rest.

The system may be sensitive to corrosive environments, please contact Ergonomix AB before using in such environments.

Maximum load per cylinder:

These loads may not be exceeded, neither static nor dynamic

Cylinder Ø	D1	D2	D3	D4	D5
Max load	100 kg	140 kg	200 kg	275 kg	395 kg

Maximum systemloads on different system combinations

These loads may not be exceeded, neither static nor dynamic

Pump with diameter D1 in the pressure element

Cylinder Ø	1-ben	2-ben	3-ben	4-ben	5-ben	6-ben	7-8 ben
D1	100 kg	200 kg	300 kg	400 kg	500 kg	600 kg	600 kg
D2	140 kg	280 kg	420 kg	560 kg	700 kg	840 kg	845 kg
D3	200 kg	400 kg	600 kg	800 kg	1000 kg	1200 kg	1200 kg
D4	275 kg	550 kg	825 kg	1100 kg	1375 kg	1650 kg	1710 kg
D5	395 kg	790 kg	1185 kg	1580 kg	1975 kg	2370 kg	2400 kg

Pump with diameter D2 in the pressure element

Cylinder Ø	1-ben	2-ben	3-ben	4-ben	5-ben	6-ben	7-8 ben
D1	100 kg	200 kg	300 kg	400 kg	425 kg	425 kg	425 kg
D2	140 kg	280 kg	420 kg	560 kg	600 kg	600 kg	600 kg
D3	200 kg	400 kg	600 kg	800 kg	845 kg	845 kg	845 kg
D4	275 kg	550 g	825 kg	1100 kg	1200 kg	1200 kg	1200 kg
D5	395 kg	790 kg	1185 kg	1580 kg	1710 kg	1710 kg	1710 kg

Pump with diameter D3 in the pressure element

Cylinder Ø	1-ben	2-ben	3-ben	4-ben	5-ben	6-ben	7-8 ben
D1	100 kg	200 kg	300 kg	300 kg	300 kg	300 kg	300 kg
D2	140 kg	280 kg	420 kg	425 kg	425 kg	425 kg	425 kg
D3	200 kg	400 kg	600 kg	600 kg	600 kg	600 kg	600 kg
D4	275 kg	550 kg	825 kg	845 kg	845 kg	845 kg	845 kg
D5	395 kg	790 kg	1185 kg	1200 kg	1200 kg	1200 kg	1200 kg

Pump with diameter D4 in the pressure element

Cylinder Ø	1-ben	2-ben	3-ben	4-ben	5-ben	6-ben	7-8 ben
D1	100 kg	200 kg	212 kg	212 kg	212 kg	212 kg	212 kg
D2	140 kg	280 kg	300 kg	300 kg	300 kg	300 kg	300 kg
D3	200 kg	400 kg	425 kg	425 kg	425 kg	425 kg	425 kg
D4	275 kg	550 kg	600 kg	600 kg	600 kg	600 kg	600 kg
D5	395 kg	790 kg	845 kg	845 kg	845 kg	845 kg	845 kg

Pump with diameter D5 in the pressure element

Cylinder Ø	1-ben	2-ben	3-ben	4-ben	5-ben	6-ben	7-8 ben
D1	100 kg	150 kg	150 kg	150 kg	150 kg	150 kg	150 kg
D2	140 kg	212 kg	212 kg	212 kg	212 kg	212 kg	212 kg
D3	200 kg	300 kg	300 kg	300 kg	300 kg	300 kg	300 kg
D4	275 kg	425 kg	425 kg	425 kg	425 kg	425 kg	425 kg
D5	395 kg	600 kg	600 kg	600 kg	600 kg	600 kg	600 kg

These values only apply when one cylinder is used on each of the table legs. When other solutions are employed, e.g. two cylinders per table leg, other maximum loads apply.

Please contact Ergonomix AB or its representative for further information.

Note! Make sure that "The maximum load per cylinder" isn't exceeded when choosing your system.

Physical dimensions: See enclosed dimension diagrams.

Temperature range:
Operation: 0˚to +45˚C
Transport: -20˚to + 60˚C
After transport in temperatures below 0˚C, the system must stand in a room at its operating temperature for at least 3 hours before starting.

Electrical supply

Frequency: 50 - 60 Hz

Primary voltage: 230 V AC (Also available as 110 - 115 V AC)

Secondary voltage: 29 V AC

Secondary current (at max load): 12 A

Max power consumption: 350 W

Fuse 1 in transformer: PTC thermal fuse on the rectifier (automatic reset)

Fuse 2 in transformer: PTC thermal fuse on the MOSFET (automatic reset)

EMC-requirements: Sources of disturbance with stronger emissions of electromagnetic or electric fields (for example heavy voltage cables), than what is permitted by applicable EMC directives must not be placed in the vicinity of the motor-pump units.

The hydraulic system

Tube:

Outside diameter: 4,5 mm

Material: PA12 (Nylon)

Min bending radius: 30 mm

Miscellaneous: The tubing must be protected from mechanical, thermal chemical and other damage. The tubing must be built into a protective case if necessary. An appropriate protection tubing is available from Ergonomix AB.with article no. TUBSK.

Hydraulic oil:
Castrol Hyspin AWS 15

Oil volume 4 leg system - stroke 300 mm: 0,25 litres

Oil volume 6 leg system - stroke 300 mm: 0,35 litres

Olje flash point (closed): above 140˚ C

When oil leakage appears:

Wipe up the split oil immediately and clean using an appropriate cleaning agent (e.g. detergent or windscreen washer fluid) to eliminate the risk of slipping.
Deposit waste oil and other contaminates at an appropriate environment station or the like for correct handling. Oil must **NOT** be released into the sewage system

First aid procedures - oil

Eyes: Rinse immediately for a long time using large amounts of water.

Skin: Wash thoroughly with soap and water or using a suitable skin cleaner as soon as possible**.**

Inhalation: Move away from vapour exposure.

Consumption: Seek medical assistance, reporting the product code**.** Do **NOT** induce vomiting

Appropriate fire fighting: Carbon dioxide extinguisher, powder or water vapour. Do **use a water jet.**

Cleaning: Only mild cleaning agents may be used, for example windscreen washer fluid for cars.
Strong cleaning agents containing, e.g. acids, ammonia, or lye must **not** be used.

Enviromental protection: Hydraulic oil must, as mentioned above, be left at a suitable destruction or treatment station in the event of leakage or when scrapping the system. Otherwise the system consists of fully recyclable and, in that, environment friendly parts.

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