



USER MANUAL

EYS PISTON PUMP

May 2017

Congratulations on your purchase of the EYS Piston Pump!

We are glad that you chose EYS piston pump and are confident that you will be more than satisfied with your purchase.

This manual is intended to provide basic information about the operation of the EYS piston pump, and to point out to main areas of consideration while operating and maintaining the machine. Please read this manual carefully before operating the machinery, and keep it in an easily accessible place for future reference. If any of your questions or concerns are not covered in this manual, please contact the respective dealer who had installed the machinery. Your dealer's contact information is:

If you are not able to reach your dealer and in need of immediate support, then please contact EYS directly at:

EYS ENDÜSTRİ MAKİNA SAN. VE TİC. A.Ş.

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Apart from providing technical and operational instructions, this manual also includes certain safety warnings that must be followed by the user. **The safety instructions and warnings listed in this manual are by no means a complete list of all safety concerns associated with operating the machine. Users must apply common sense and abide by the general safety guidelines that govern operating of machinery.**

Contents of this manual refer to the latest product models currently in production at the time of preparation of the document. EYS reserves the right to make changes in the product design at any time.

Carefully following the instructions set forth in this manual are essential for maintaining operator safety as well as the longevity and efficiency of the machinery. Dealers must provide a copy of this manual to the customer along with the purchased product.

Please make sure that the operator in charge of operating and/or maintaining this product has full access to this manual and that he/she has read it entirely prior to running or servicing the machine. Also please record your product model number and serial number from the machine's info-tag to the following section. These info will be necessary and useful when ordering replacement parts in the future.

Congratulations again on your purchase of the EYS piston pump!

Product : PISTON PUMP

Model

Serial Number : _____

Dealer : _____

Adress : _____

Tel : _____

Fax : _____

Installation Date : _____

Manufacturer : EYS ENDÜSTRİ MAKİNA SAN. VE TİC. A.Ş.

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HAND-OVER FORM (TO BE SIGNED OFF BETWEEN THE DEALER AND THE CUSTOMER)**Product** : PISTON PUMP**Model****Serial Number** : _____**Dealer** : _____**Adress** : _____**Tel** : _____**Fax** : _____**Installation Date** : _____**Manufacturer** : EYS ENDÜSTRİ MAKİNA SAN. VE TİC. A.Ş.

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This form confirms that the product installation and start-up has been completed successfully. Basic training has been provided and this manual has been handed over to the responsible personnel below.

Responsible person on behalf of the
dealer/distributor
(date and sign)

Responsible person on behalf of the
customer
(date and sign; please print name)

**NOTE**

Manufacturer's warranty is not valid unless this form is signed and dated upon installation!

INTRODUCTION

Qualified Operators should be properly trained in their assigned area of responsibility, be knowledgeable about general machinery handling precautions and related hazards/risks, capable of foreseeing and preventing potential damages to the machine before they happen, and be able to apply necessary first-aid practices as necessary.

Operational Responsibility

Responsibility of operating the machine in accordance with its intended purposes lies with the customer. The manufacturer is not in anyway responsible for any damages that may be caused by inappropriate handling of the waste streams resulting from the operation of the product. Likewise, the manufacturer can not be held responsible for any damages resulting from the use of un-approved and/or non-original spare parts on the machine.

Second-hand Ownership

In the case of transfer of ownership of the product to a new customer, the original owner is responsible for handing over this user-manual to the new owner. New owner must be informed and trained about the basic operation of the product accordingly.

Operational Liability

The entire liability of operating the product properly lies with the customer. The customer is responsible for making sure that the product is used in accordance with the guidelines set forth in this document, plus other general machinery operating rules that may not be covered here but are expected to be known by any machinery operator. The maximum liability of the manufacturer in any event can not exceed the monetary value of the product itself.

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Sign	Explanation
	This warning box is used to highlight safety related precautions throughout the document. Remember that there is risk of personal injury with every “warning” sign topic and it is of utmost importance to understand and follow the contained
	Failure to follow instructions can result in damage to a part or the whole of the machine, possibly putting the machine out of commission.
	It is especially important to understand and implement the instructions highlighted therein for the successful long-term operation of the machine.
	Read the instructions
	Electrical Shock or Burn Hazard
	Do not use the machine without check all parts
	Use your personal protective equipment
	Danger of explosion

1. SAFETY INSTRUCTIONS

FOR CORRECT AND SAFE USAGE



NOTE

It's strictly forbidden for untrained, unauthorised personnel to montage, maintain and operate the machines and to be around the machine.

EYS piston pumps can not be used except of it's intended use.

Control Panel

All information about EYS piston pump's electrical details are available on identification label(power, voltage, frequency, current).

Usage Information

- Never change thermic settings.
- Never disable or bridge relays in control panel such as phase protection relay, liquid leakage relay etc.
- If voltage is different than identification label or the value range in this manual, don't start the engine.
- Make sure the control panel is properly ventilated and protected against rain and moisture.
- Professional electricians should maintain control panels in 6 month periods and malfunctioning and defect parts should be replaced.
- Never supply power from EYS piston pump control panel to external devices or external environments.
- While sending EYS piston pump to manufacturer for maintenance, send control panel if necessary.
- Contact EYS for every situation like maintenance, repairment etc.



All control panels must be grounded.

Check conformance with safety instructions prior to each start-up!

1. In addition to the specific instructions contained in this document, general machinery operating rules and precautions must be followed!
2. Safety related signs are marked on the product as necessary. These signs and stickers are important for personal safety, so do not remove them!
3. Do not operate the machine before replacing/installing all safety and protection related parts/covers!
4. Make sure you understand the general functioning principle of the machine before operation!
5. Put on relatively snug operational outfit when operating the machine. Loose outfits and long sleeves can get caught by the moving parts during operation and servicing.
6. Slurry can emit flammable gases under certain conditions; so avoid smoking or carrying open fire near the machine!
7. Machine should be installed at a properly ventilated area. Avoid spending long periods of time in poorly ventilated areas around the slurry!



Electric Driven Equipment

1. All electrical work except standard maintenance must be carried out by a professional electrician!
2. Malfunctioned or defect plug, socket etc. must be replaced by a professional electrician!
3. If there is an application including plug and socket (hoist, modular control panel etc.) never unplug cables. Firstly make sure the machines are not running and main power is off. A damaged electric cable may cause leakage of electricity and cause short circuit. Never cut electric cables (to pass the cable through wall etc.). pull the plug not cable.
4. Extention cables which are connected to main power line or extention cables which will be used for main power line must only be used for a short time! Never should be a long term solution!
5. If extention cables are to be extended on a road, they must be connected from 5 meters height minimum.
6. Then executing any operation on the machine, make sure the main power is off.
7. Before starting the machine always check cables for damages, cuts etc. protect cables from direct sunlight, sharp edges and oil. Replace unusable cables before starting the machine.
8. If there is not enough precautions against moisture and dust in sticky or fire risky area, don't use electrical equipment.
9. Covering electric motors can prevent proper cooling and can cause heat consistence and can cause harm to the equipments, even fire!
10. Control panel components must be checked for any broken parts/faults by a professional electrician once every 6 month.



NOTE

Make sure all the malfunctions are solved when the power is back on.



NOTE

Check electric cables regularly. This process must be done after the main power is cut off.

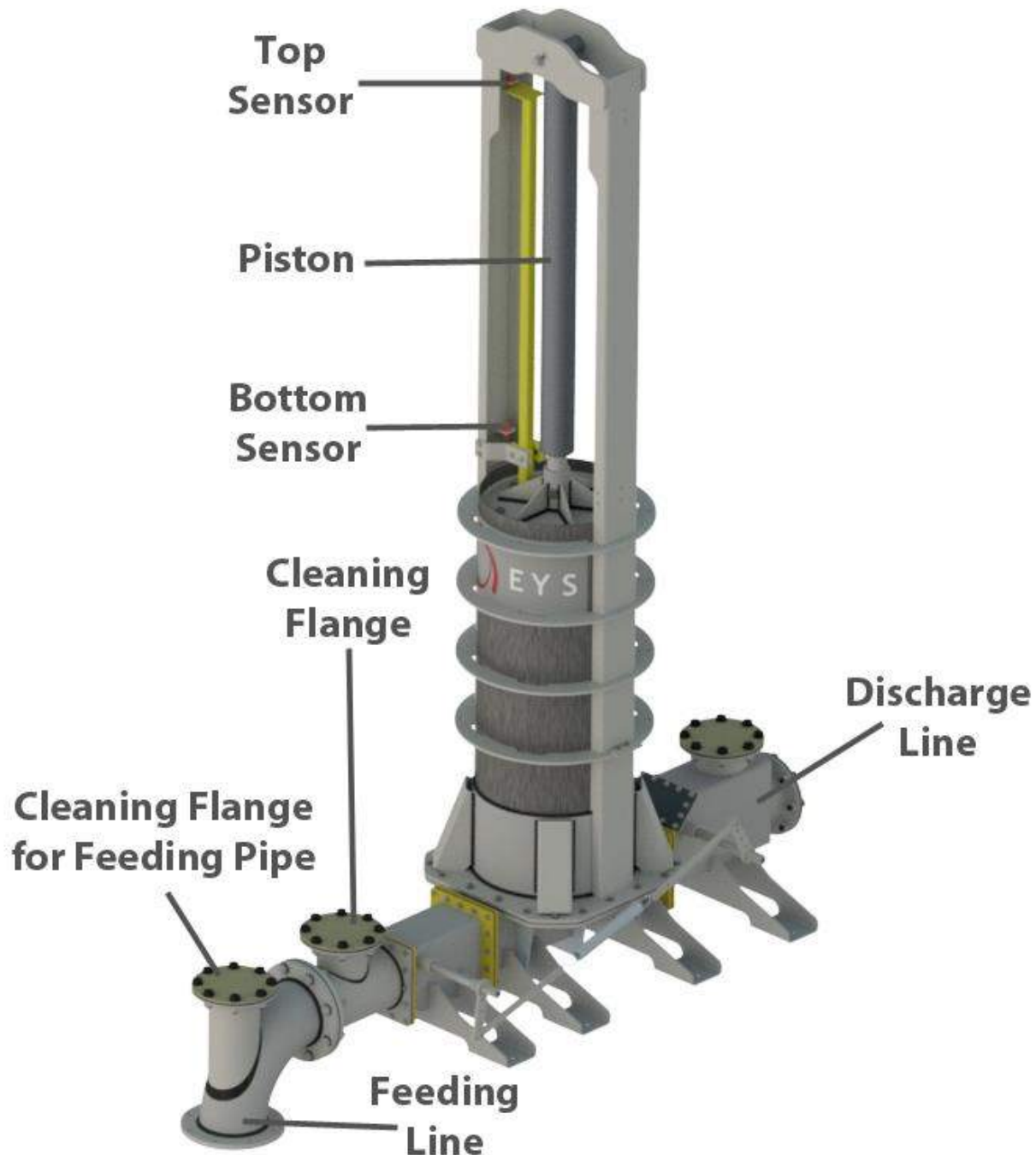
Maintenance

1. Never perform any maintenance, service or cleaning before fully stopping the machine and the other system components.
2. Always check and verify that the bolts/nuts on the machine are securely tightened.
3. Always wear work gloves when handling sharp and metal objects during maintenance.
4. Always observe local regulations when disposing of lubricants/grease, etc.
5. Never work on the control panel and/or electrical connections without fully cutting off the power first.
6. Only manufacturer approved spare parts must be used for repairs and replacements.



2. GENERAL INSTRUCTIONS

All EYS machine and equipment are manufactured and quality controlled at each stage of production process. EYS piston pumps are produced to satisfy fully the needs in slurry pits. They are proper to be used in slurry pits which have high viscosity and also for all pits containing stick, hay and even piece of fabric. Additional advantage of piston pumps are ease of use and to be safe with maximum performance.



Basic description of EYS piston pump is shown in above image. 8" feeding pipe will be connected to feeding elbow of piston pump. If feeding pipe is blocked, by removing cleaning flange, the pipe can be cleaned. Same process can be used for other flanges.

3. DELIVERY, HANDLING AND STORAGE

3.1. Qualification of Personnel

Handling of machines must be carried out by professional crew according to safety standards. All personnel who are attending to handling of machines must have necessary certification and educations for the job.

3.2. Safety Instructions for Handling

In order to prevent damages to products and injuries of personnel, pay attention to;

- For lifting the machines, only use rope slings as shown in the image below. These rope slings must be chosen based on product weights.
- For safe handling, please choose correct ropes and forklift for 1000 kg product weight.



- Never use damaged or torn rope slings or chains to lift the machines.
- While carrying and unpacking EYS piston pump, make sure the package isn't exposed to damages and electric cable isn't damaged.
- Before accepting the delivery, control the machine and it's equipment to see if there are any missing or damaged parts.



WARNING

After delivery is accepted and delivery record is signed, any occurring damage will not be covered by warranty!

3.3. Handling

Cranes and forklifts can be used to lift EYS piston pump. Of course correct lifting machine must be chosen based on machine weight.

To lift the machine, connect rope slings to top part of machine, on each side of piston. Then lift the machine.

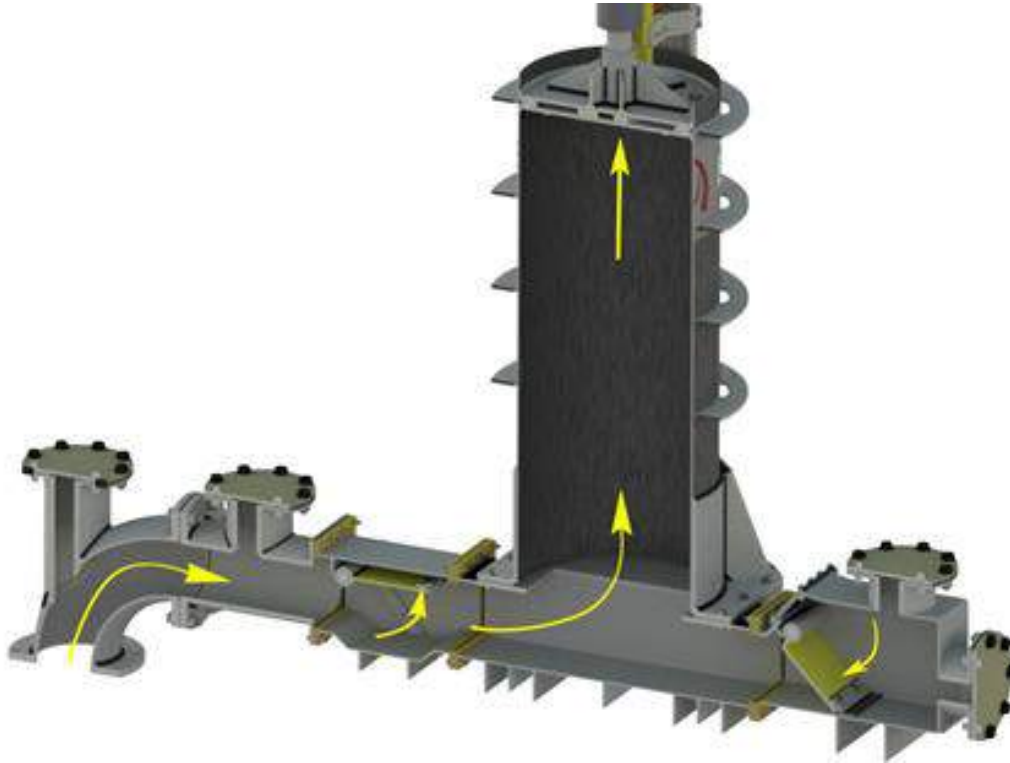
3.4. Storage

If piston pump won't be used for a long period of time, clean the machine against corrosion. Lubricate all necessary parts.

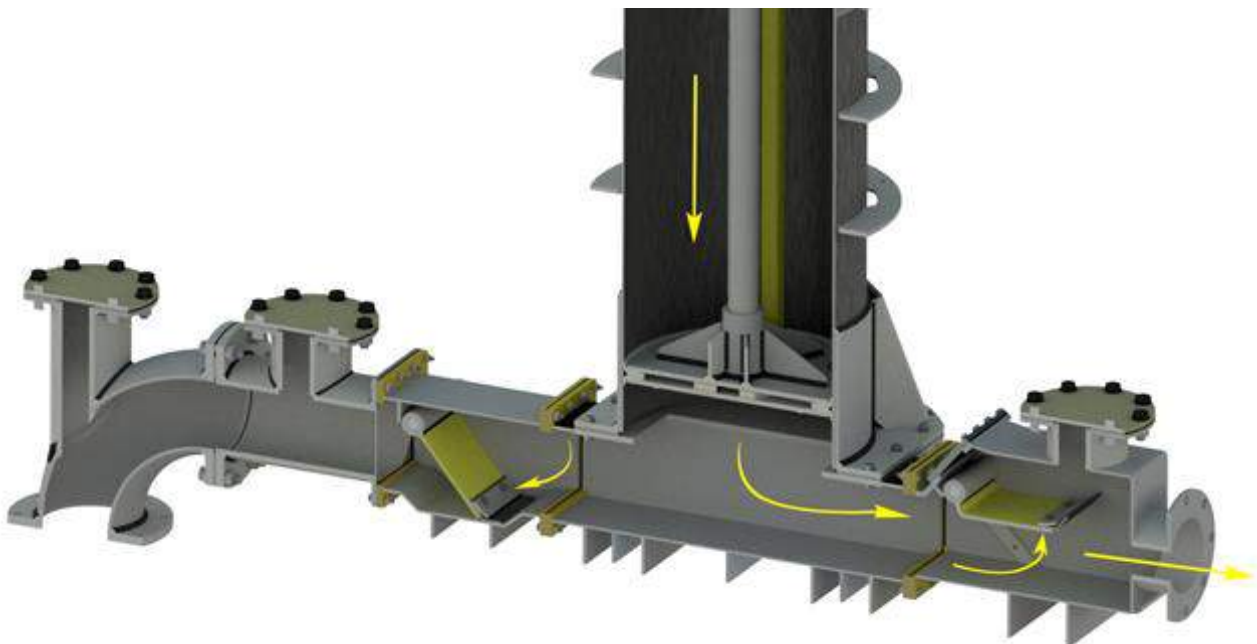
4. WORKING PRINCIPLE AND COMPONENTS

General view of EYS piston pump can be seen in section 2.

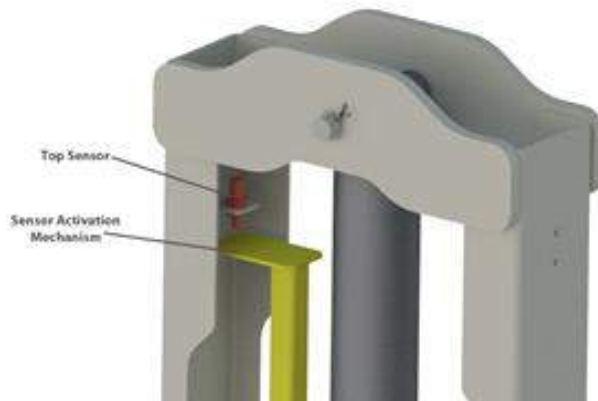
There are two working cycles for piston pump, sucking and pumping cycles. The piston moves upward during suction cycle. Air pressure inside pump body is reduced. Air pressure and slurry pressure force outlet valve to close and inlet valve to open. Then pump body will be filled with slurry. Suction cycle can be seen below.



Piston moves downward during pumping cycle. Slurry pressure forces inlet valve to close and outlet valve to open. Then slurry will be pumped through outlet pipe. Pumping cycle can be seen below.

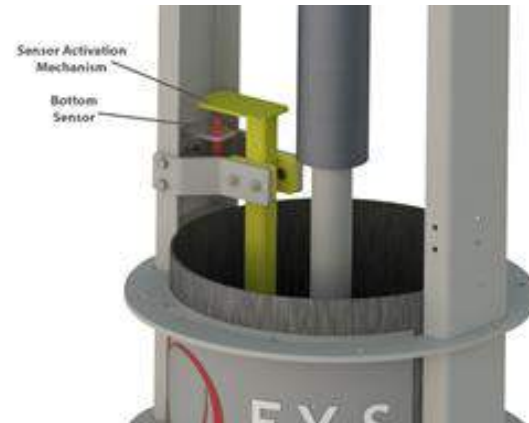


When piston pump is running, sensor activation mechanism will move with piston.



When sensor activation mechanism reaches top point, it will activate top sensor and downward movement (pumping cycle) will begin.

There are two nuts on each sensor. To set sensors to desired position, tighten or loosen nuts until they are in desired position.



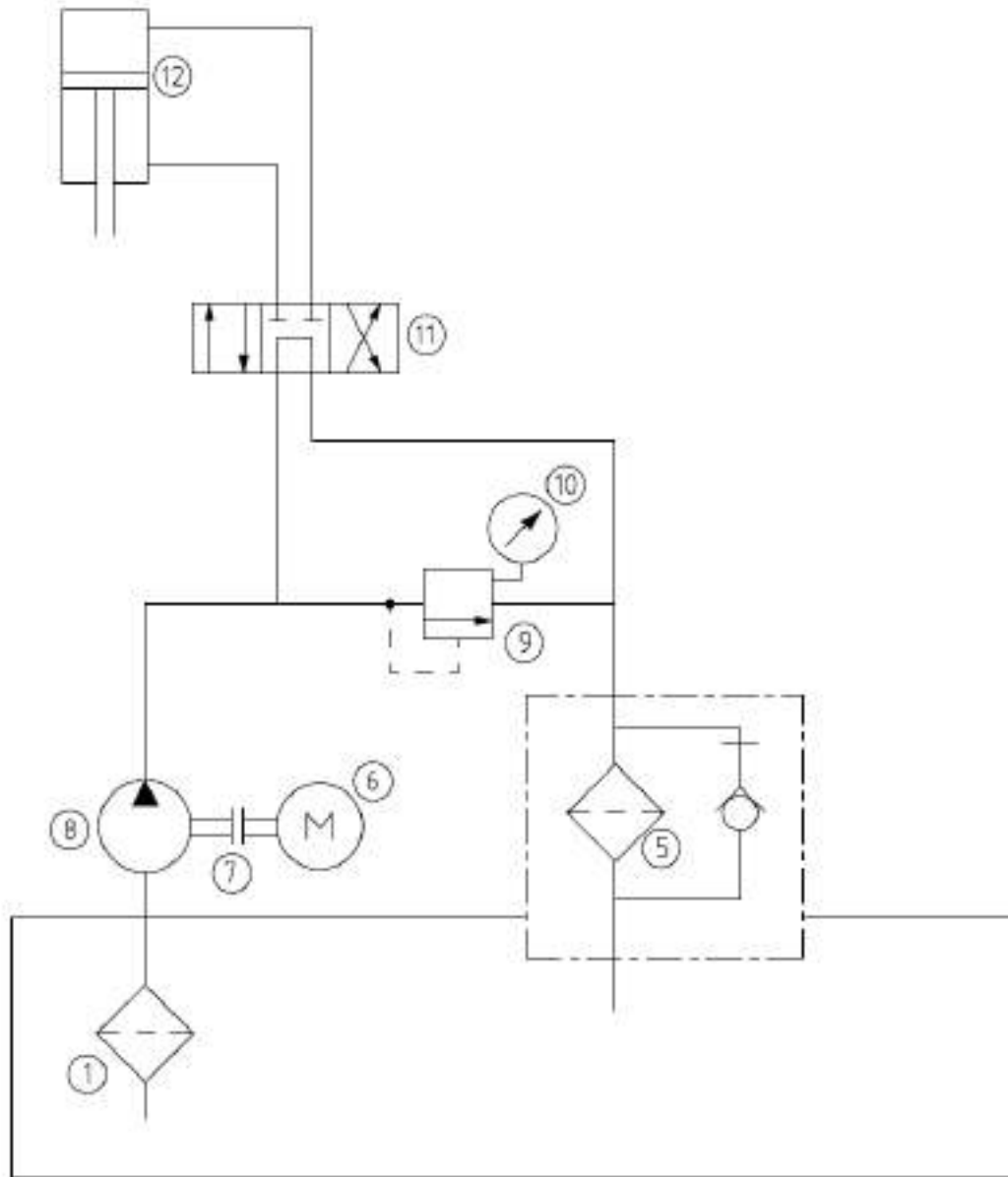
When sensor activation mechanism reaches bottom point, it will activate bottom sensor and upward movement (sucking cycle) will begin.

4.1. Hydraulic Unit Components

1. Intake filter 125 lt/min
2. Oil drain plug ½"
3. Oil level indicator 127 mm
4. Oil filler cap
5. Return filter
6. 5,5 kW electric motor
7. Coupled equipment
8. 33 lt/min hydraulic pump
9. NG 10 pressure relief valve + directional control valve block
10. Pressure gauge Ø63 mm
11. NG 10 directional control valve
12. Hydraulic cylinder
13. Hydraulic oil tank (125 lt)



ISO VG 46 hydraulic oil is used in hydraulic unit. The amount of used oil is 125 liters.



5. PRELIMINARY AND INSTALLATION

Pay attention to following points while installing EYS piston pumps;

- Make sure the installation is carried out based on safety standards,
- Before accepting the delivery, control the machine and it's equipment to see if there are any missing or damaged parts.
- Use only correct equipment for installation.
- Don't leave electric cables open.
- Installation must be completed by professional personnel.
- If there is a leakage of oil, protective material etc. prevent contact with skin.
- If there are any openings, windows etc. opened for installation, make sure they are closed when installation is completed. Otherwise humans or animals can fall into the pits.

5.1. Preliminary to Installation



NOTE

Measure your mains voltage. The measured value can be tolerated between -%10 and +%6 rate for each phase.

Necessary equipment for installation

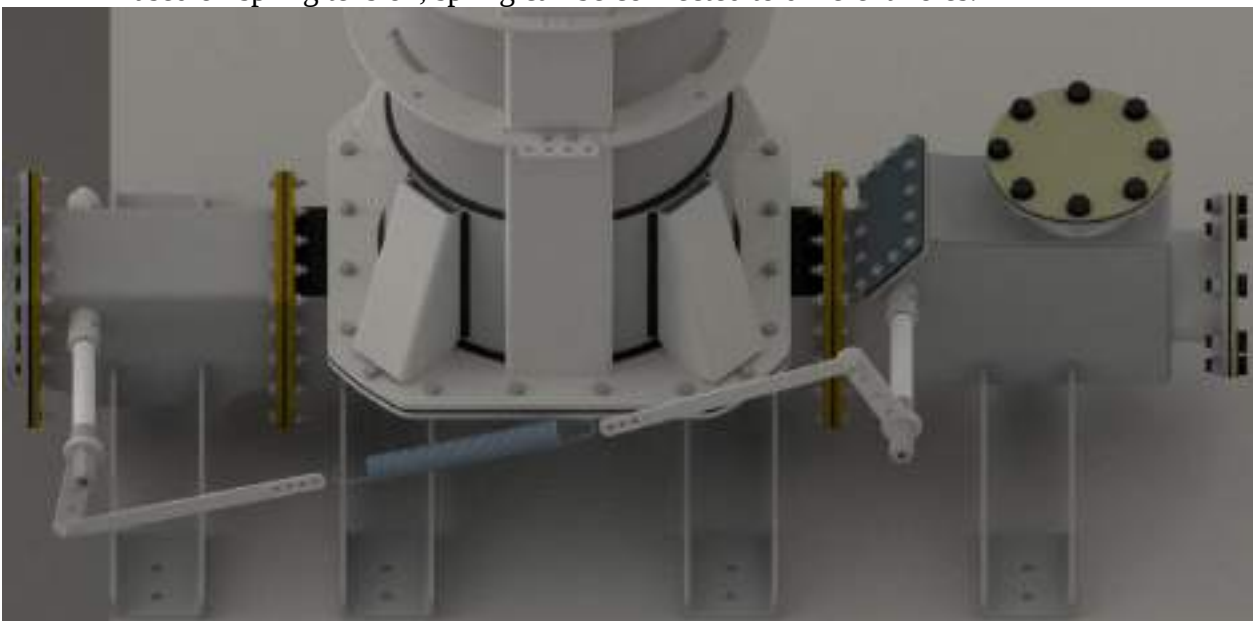
EQUIPMENT	PURPOSE
Forklift	Lifting the unit
Rope	Lifting the unit
Safety chain	Lifting the unit
Hammer drill	To drill a hole in concrete base
Drill bit	To drill a hole in concrete base
Hammer	To hammer pins
Wrench set	To tension screws
Toolbox	To tension screws
Torque wrench or Impact gun	To tension screws

5.2. Installation

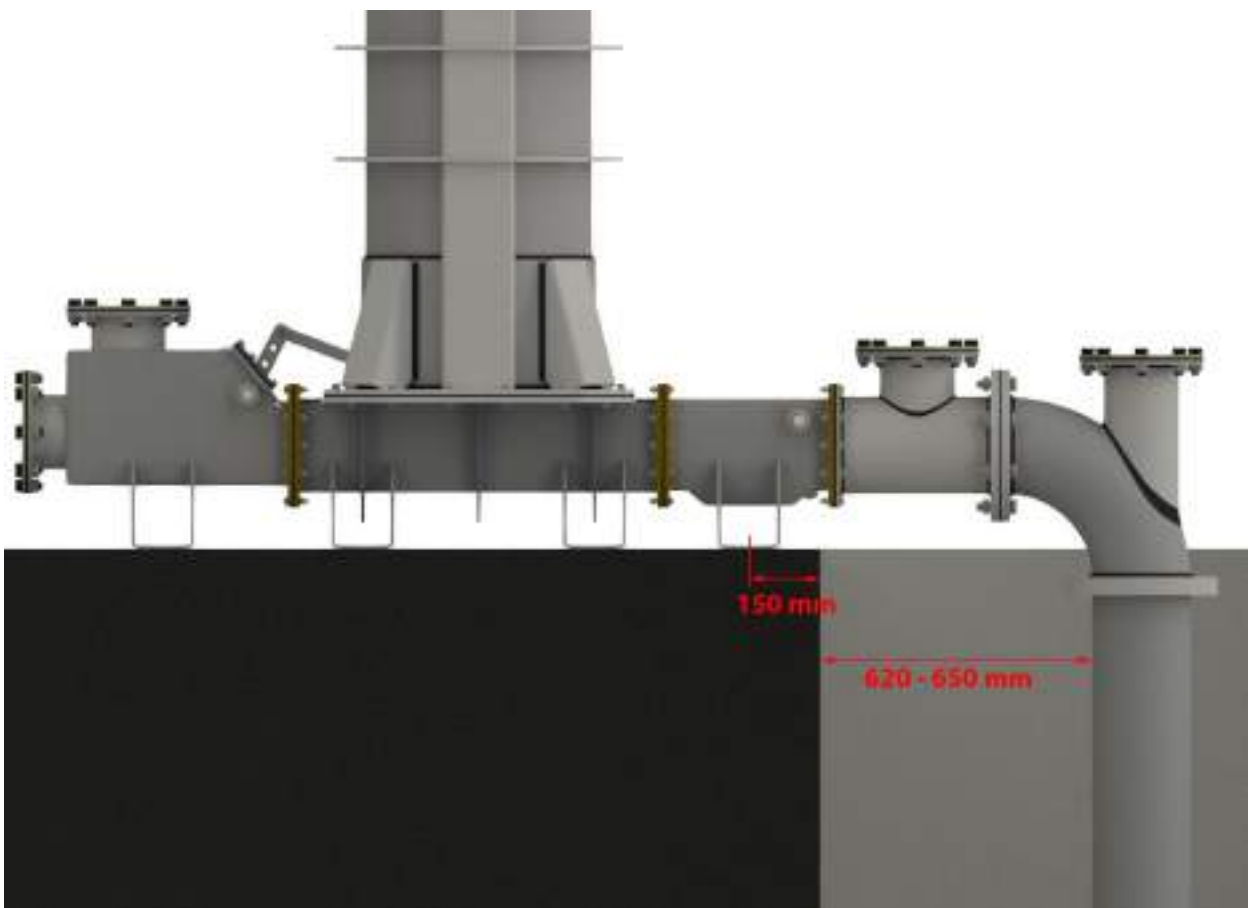
- EYS piston pumps must be installed to a concrete surface only. The installation can not be done to stone masonry, brick or briquette pit.
- Support legs will be placed on a flat surface. Recommended surface is top level of pit. Then legs will be fixed to ground with steel pins. Necessary pins for installation is sent in a package with the machine itself.
- The distance between pit's inner wall and center of hole of closest support leg is minimum 150 mm. This distance can be seen in image above. The distance between feeding pipe and pit wall surface can be 620 – 670 mm.
- Place control panel to a suitable location and make necessary connections based on wiring diagram. Wiring diagram is available in control panel.
- Grease the system. Greasing is described in maintenance section.
- Then connect feeding pipe and piston pump is ready for first start.



- For hydraulic unit connections, please check section 4.1.
- Default installation position of valves and spring mechanism is shown in below photo. When one valve is open, other one must be closed. With piston's movement, pumping and sucking cycles will continue based on this principle. There are connection holes on levers. Based on spring tension, spring can be connected to different holes.



 WARNING	Before starting installation, make sure main power connection is shut down.
 WARNING	When the machine is lifted, make sure there is nobody under the machine.
 WARNING	The capacity of lifting machine must be at least 1000 kg!



5.3. Final Controls Before First Run

Make sure the oil level is full in hydraulic unit oil tank. The level of necessary oil can be determined by oil level indicator on hydraulic unit.

Make sure the phases are connected correctly.

6. ELECTRIC CONTROL PANEL

6.1. Control Panel Components and Their Works

1. **Cam Switch:** Using for switching the direction of mixing rotation.
2. **Fuses:** Protects against possible accident and fault on circuits units by ignoring overcurrent.
3. **Contactors:** Electromagnetic switches that let us control circuits by closing normally open contacts or opening normally closed contacts when the coil is energized. Contactors are chosen according to the motor power values.
4. **Phase control relay:** Prevents 3 phase motor from damages of staying 2 phase. It provides protection by stopping motor when phase instability is occurred. It controls phase connections. If red light is turned on, it means phase connection is wrong and there is no way to run the agitator. When the light is green, means phase connections are correct.
5. **Start-Stop button:** The lighted buttons are used for run and stop the motor. Start buttons lights up green during running. Stop button lights up red on fault situation. (According to customer request, we use water gauge to control automatically agitator running. That prevents the agitator to work without liquid. By that way, ON/OFF posioned control switch is used.)
6. **Emergency button:** To disable the energy in case of emergency.
7. **Indicator lamps:** Show us working situation of R-S-T phases. The lamb does not work whose phase has trouble such as breaking off or overcurrent.
8. **DC power supply:** Provides us 24V DC to use as control phase.



NOTE

Measure your mains voltage. The measured value can tolerated between -%10 and +%6 rate for each phase.



WARNING

Fuses do not protect you! Fuses protects circuit elements in case of exceeding the current that written on them. Thus, be carefull against to electrical shock!

6.2. The Symbols of Control Panel Components

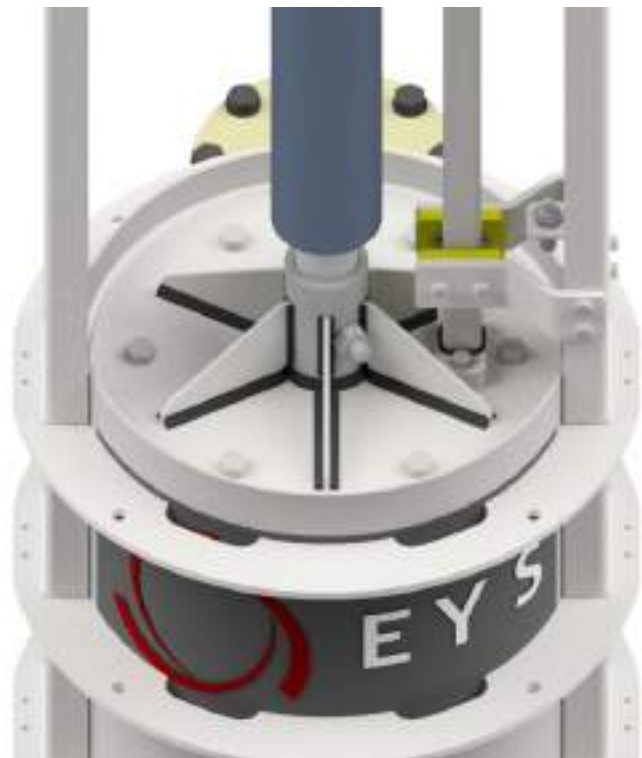
- QA : Cam switch (1-0-2)
- Q1 : Thermal magnetic motor circuit breaker
- F1 : Fuse for control phase
- F2 : Fuse for socket
- F3 : Fuse for DC power supply (For the panels which use 24V DC control phase)
- K1 : Contactor
- K2 : Contactor for delta (Δ) connection
- K3 : Contactor for star (Y) connction
- U1 : Socket
- U2 : Phase protection relay
- U3 : EYS-TKR15 relay for over-heating and liquid leakage
- U4 : Timer relay to start star-delta connection
- B1 : Start button with green lighted up during running
- B2 : Stop butonu with red lighted up during fail
- A01 : Emergency stop button
- H1 : Indicator lamb for R phase
- H2 : Indicator lamb for S phase

H3 : Indicator lamp for T phase

G1 : DC power supply (for the panels which have 24V DC control phase)

7. MAINTENANCE

FREQUENCY	OPERATION
Daily check	Check oil level in hydraulic unit and add oil if necessary. ISO VG 46 hydraulic oil is used in hydraulic unit and total volume is 125 liters.
Every Week	Grease the system from four grease nipples on machine body.
Every 50 working hours	Check tension of screws every 50 working hours and tighten if necessary.
Every 2 months	Check hydraulic hoses against damages visually. If there are damages, replace hoses.
Every 15 days or when necessary	Check pipes for blockage. If there is blockage, remove flanges as described in previous sections and clean inside.
Every year	Replace motor oil.



There are total four grease nipples on piston pump. They are connected on machine body as shown in photo above. These grease nipples are connected to shafts of valves by hydraulic hoses. Apply grease to all grease nipples once a week until grease comes out of valve shaft.

Add 6 liters of ISO VG 10 oil to top of main piston.

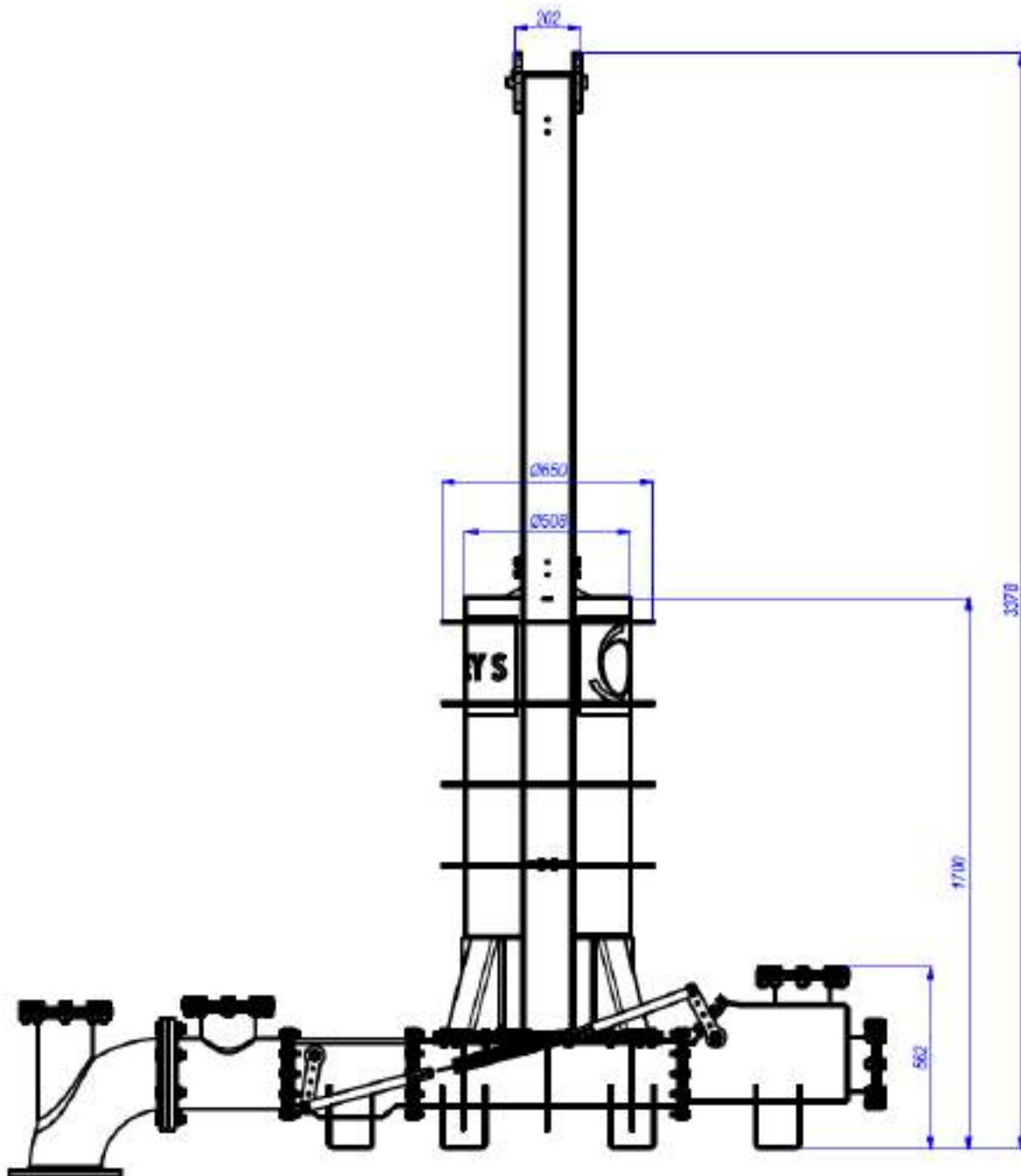
8. TECHNICAL SPECIFICATIONS

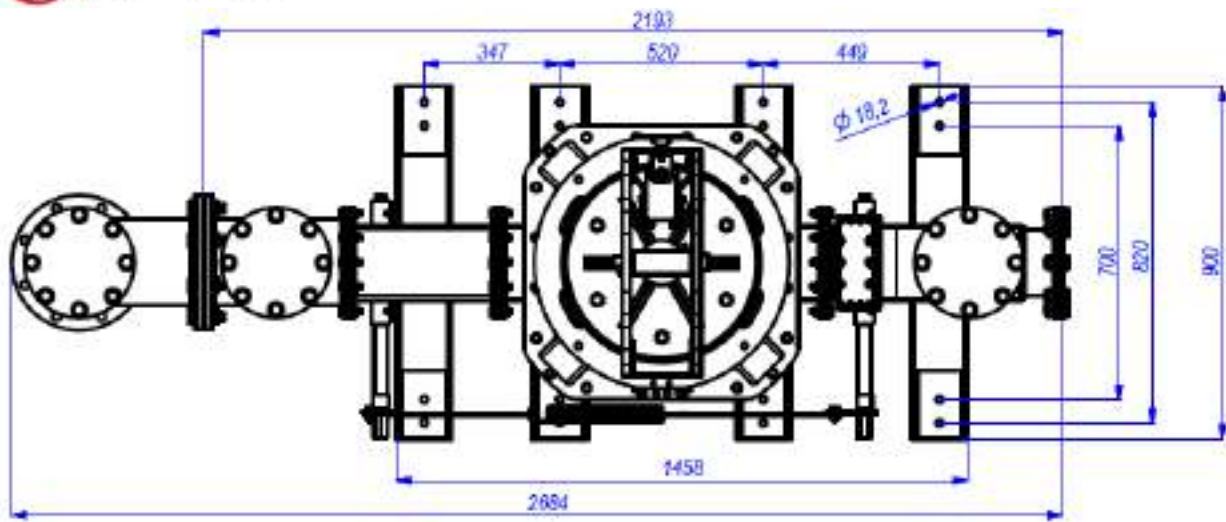
MOTOR POWER	PUMPING DISTANCE	MANURE TYPE	THROUGHPUT	HYDRAULIC CYLINDER DIAMATER
5,5 kW	Up to 1 km*	Suitable for viscous manure	Up to 40 m ³ /h*	100 mm

*Values vary based on manure type.

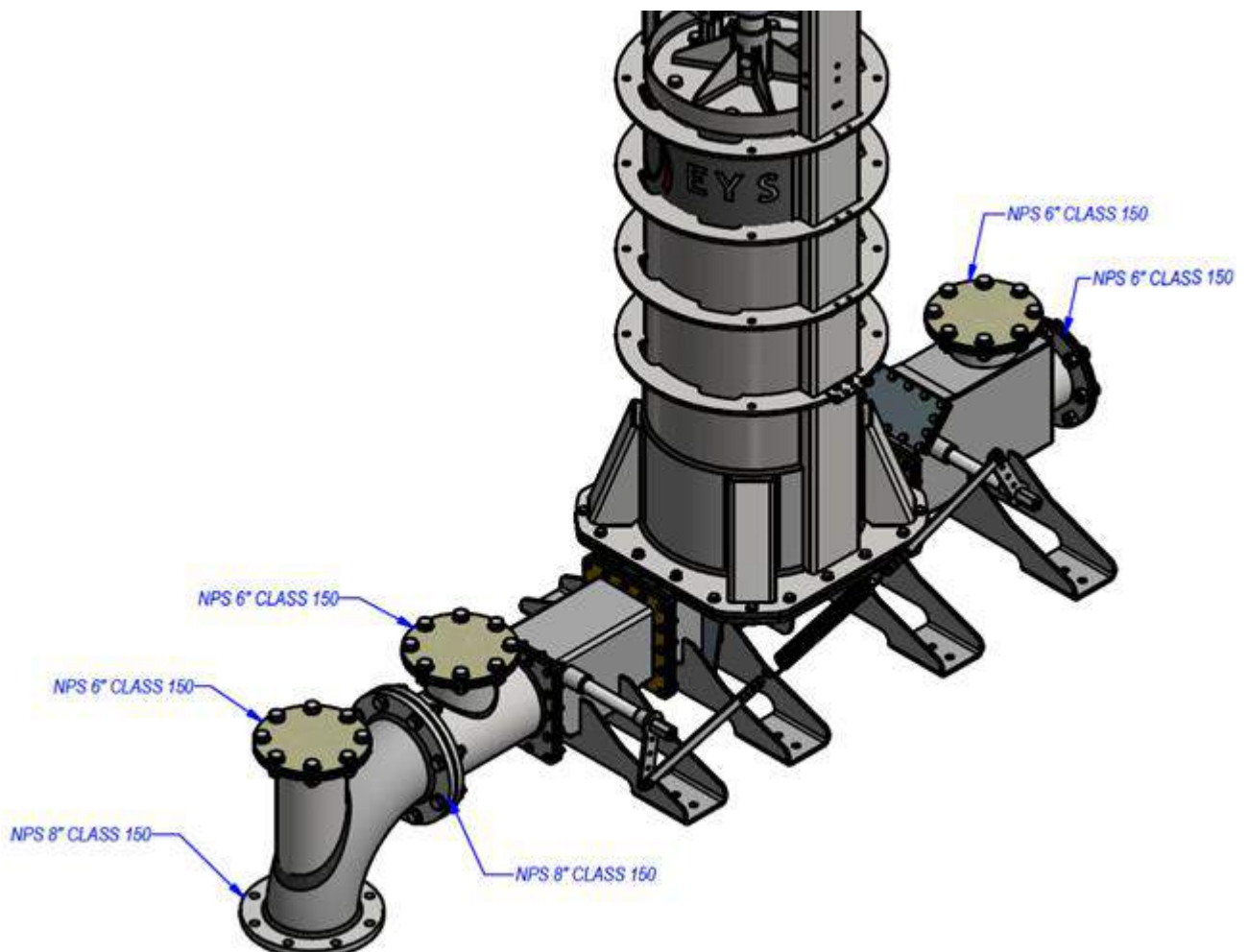
Noise level of piston pump is 93.6 dB. Depending on regular oil usage on top of piston area, noise level can be reduced.

9. MACHINE DIMENSIONS AND CONNECTIONS





Connection dimensions of EYS piston pump is written below.



10. MACHINE TAG

When you call your dealer for consultancy, service or replacement parts, please keep your machine tag information handy.

		 ISO 9001	
Description	:		
Model	:		
Year	:		
Serial Number	:		
EYS Endüstri Makina Sanayi ve Ticaret A.Ş.			
www.e-y-s.com / info@e-y-s.com Made in Turkey			

11. MANUFACTURER'S WARRANTY

All EYS products are under warranty for 12 months from the date of installation against all manufacturing defects.

12. LONG TERM STORAGE

If EYS piston pump will not be used for prolonged periods, it is best to uninstall the machine and keep it in a dry and safe enclosure. It is also recommended to place some moisture absorbants (such as silica gel) hydraulic unit of the motor. Replace hydraulic oil. Dispose of the old oil in accordance with your local environmental regulations. Lubricate all parts based on maintenance steps.

13. TROUBLESHOOTING

PROBLEM	REASON	SOLUTION
Machine is not working.	Emergency stop button might be active.	Check emergency stop button, disable it and try again.
	Power might be off.	Turn power on and try again.
	Motor on hydraulic unit might be broken.	Check motor and connections. Replace if necessary.
Machine is running but piston isn't moving or is running unstable.	Insufficient oil level in hydraulic unit.	Check oil level and add oil.
	Wrong hydraulic hose connections or damage on hoses.	Check hydraulic hose connections and hoses against damage. Replace if necessary.
Capacity has dropped.	Materials blocked pipes.	Remove flanges and clean pipes.
When piston is at top point, it doesn't move or vice versa.	Sensor error or fault.	Check top and bottom sensors and connections. Replace if necessary.

14. EC DECLARATION OF CONFORMITY**EC DECLARATION OF CONFORMITY****MANUFACTURER** EYS ENDÜSTRİ MAKİNA SAN. VE TİC. A.Ş.**ADDRESS** TEPECİK MAHALLESİ, ŞEHİT PİYADE ER M.ALİ TOSUN BULVARI, NO:
234/1 EFELER, AYDIN, TURKEY

The undersigned Company certifies under its sole responsibility that the item of equipment specified below satisfies the requirements of the Machinery Directive 2006/42/EC which applies to it. The item of equipment identified below has been subject to internal manufacturing checks with monitoring of the final assessment by **EYS ENDÜSTRİ MAKİNA SAN. VE TİC. A.Ş.**

PRODUCT PISTON PUMP**MODEL / TYPE****DIRECTIVES** MACHINERY DIRECTIVE 2006/42/EC
LOW VOLTAGE DIRECTIVE 2006/95/EC**REGULATIONS APPLIED ACCORDING TO HARMONIZED STANDARDS**

EN ISO 12100:2010, EN 60204-1:2006, EN ISO 13857, TS EN 809

Place and date of issue AYDIN / TURKEY 09.2014**Name and position of authorized person** ORHUN ÇETİN
TECHNICAL MANAGER**Signature of authorized person**
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