

OPERATOR MANUAL

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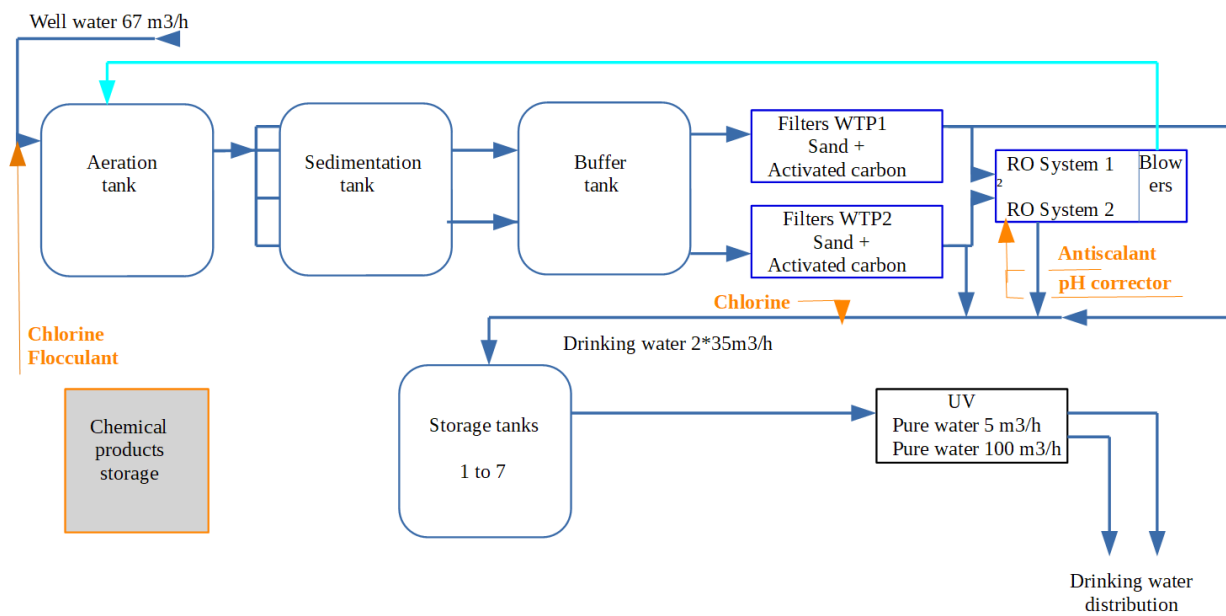
1_PREAMBLE

The new water treatment plant can treat 65 m³/h daily supplied by the well water pump by means a pre-treatment : aération, settlement, two separated lines of sand filters and activated carbon filters. This treatment is possibly followed by to lines 35 m³/h each of reverse osmosis available when this treatment will be operated.

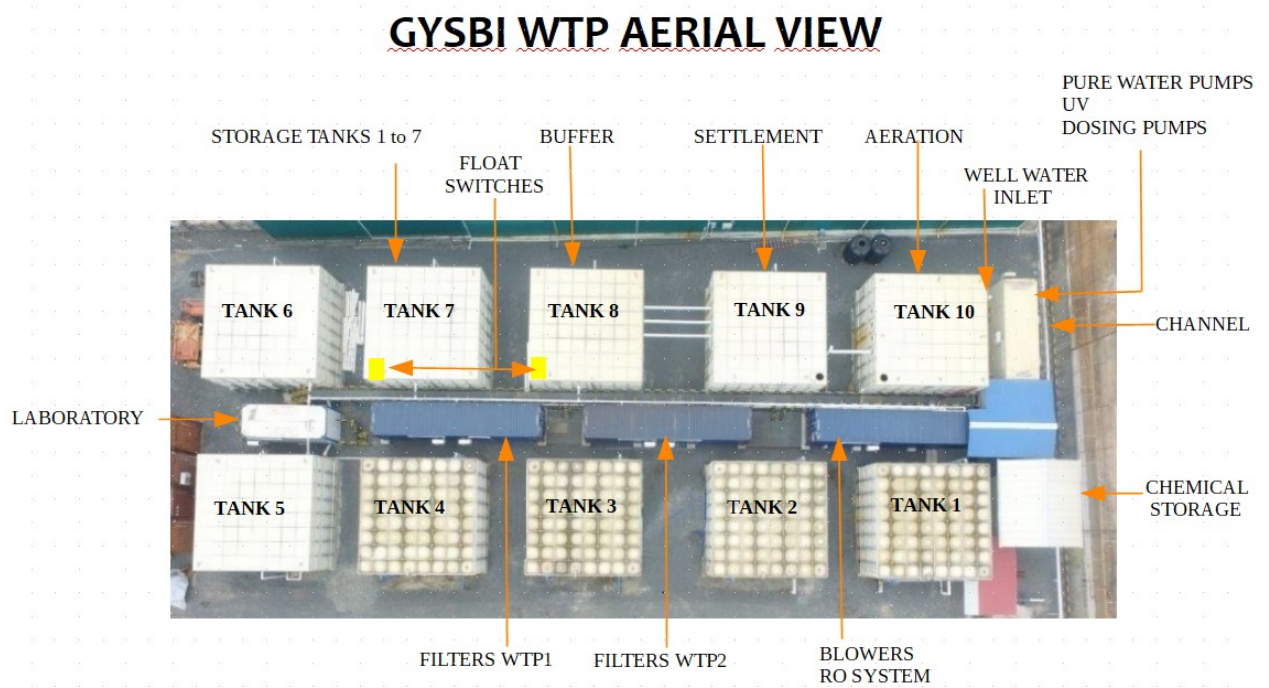
This treatment contains :

- a well water pump with its own cabinet and a remote control system to start and stop the pump from buffer tank 8.
- a pretreatment with :
 - one aeration tank
 - one sedimentation tank
 - one buffer tank
- two lines of filters
 - each line has 6 filters, the first 3 ones are sand filters and the second 3 ones are sand + activated carbon.
- two lines of Reverse Osmosis (stand-by) capacity 65 m³.h⁻¹
 - each line is protected by a 5 µm filter.
- Two lines UV disinfection
- Two pure water supply pumps, one 5m³/h. and one 100 m³/h.
- A chemical products storage.
- 7 tanks for the storage of produced water.
- Chemical products circuits with dosing pumps and injections.
- 6 Electrical cabinets on the WTP. and 1 for the well water pump.

2_SCHEMATIC DIAGRAM

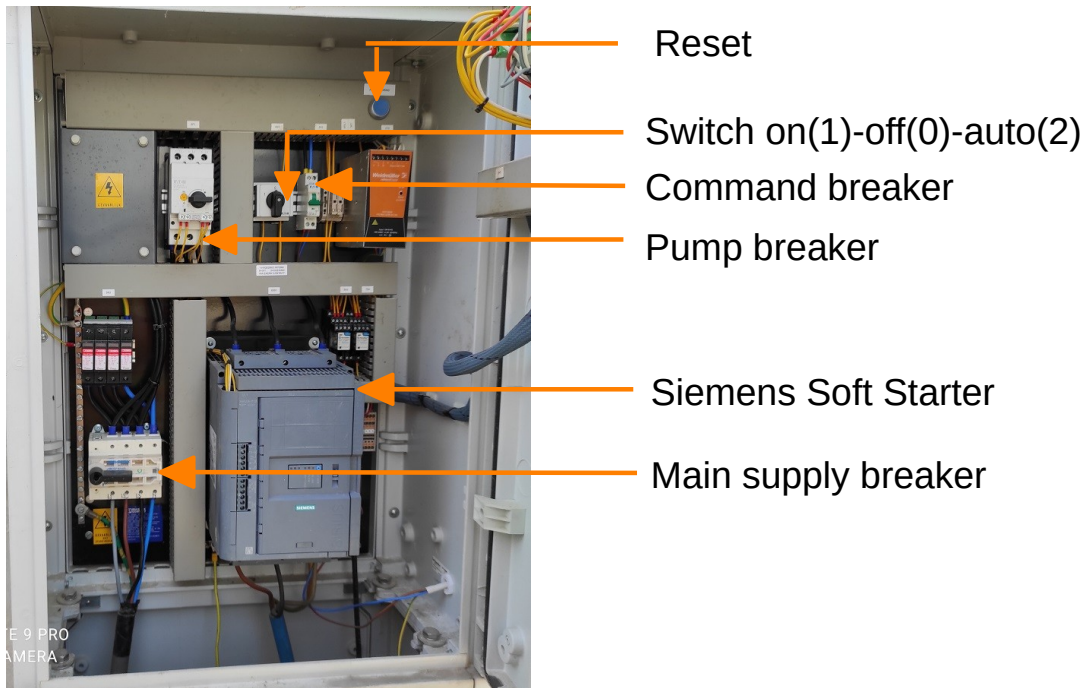


3_WTP AERIAL VIEW



4_WELL WATER REMOTE CONTROL

WELL WATER CABINET



For maintenance of the well water refer to the documentation of the constructor and manufacturers of the equipments.



Remote control transmitter

Supply of the remote control is located in the container Pure water

Radio transmitter is located on tank6

Radio receiver is located in the area of the warehouse.

The remote control system send to the well water pump cabinet the information send by the Level Switch High of the buffer tank 8 to start or stop the pump. There is around 1,20 m. between the level start and the level stop.

For all informations see the manual REMOTE CONTROL TECHNOLOGY

5_ TANKS

All the tanks should be cleaned once two year with high pressure and disinfected before restarting. Do not forget the external level with transparent pipe.

Aération, sedimentation and buffer will probably need to be cleaned earlier. These three tanks and especially the sedimentation tank will need probably to be cleaned earlier. It is necessary to drain frequently the sedimentation tank with a great priority.

Disinfection of the storage tanks should be done when filling with filtered water added of chlorine 2mg/l The level of chlorine need to decrease to 0,5 mg/l before distribution.

6_ AERATION

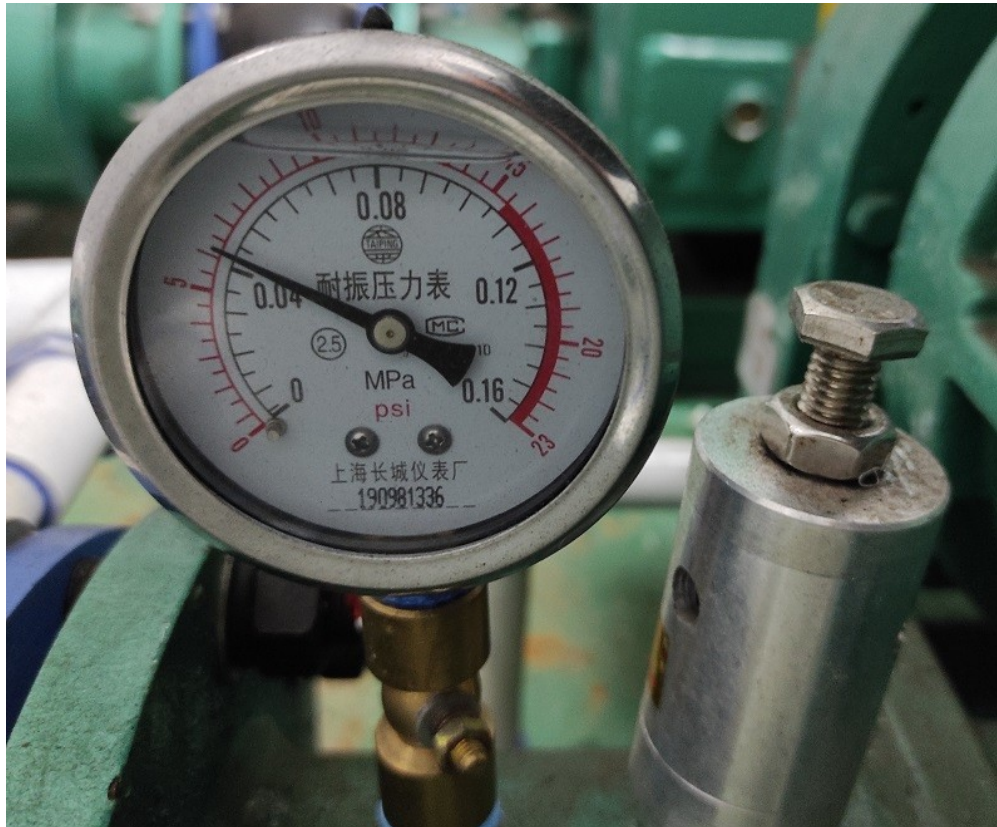
Aeration is composed of two blowers XINHUADONG HDSR 125, two metallic pipes with gooseneck and PVC pipes at the bottom of the tank with fine bubble diffusers

Maintenance of the blowers : refer to the document HDSR THREE LOBES ROOT BLOWER

Main recommendations ;

- oil has to be drained and changed at 200 hours and after according to the instruction of the manufacturer.
- without water cooling the lifetime service will be consequently shortened
- check the pressure at the outlet of the blowers and verify the evolution. You will have information about the condition of the aeration tank (leakage ; loss of efficiency of the diffusers)

When restarting the aeration tank after cleaning, check the efficiency of aeration with diffusers recovered with 20 cm water. Fix leakage if existing.

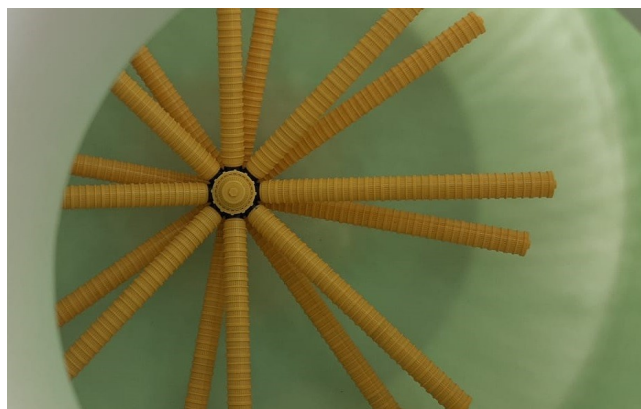
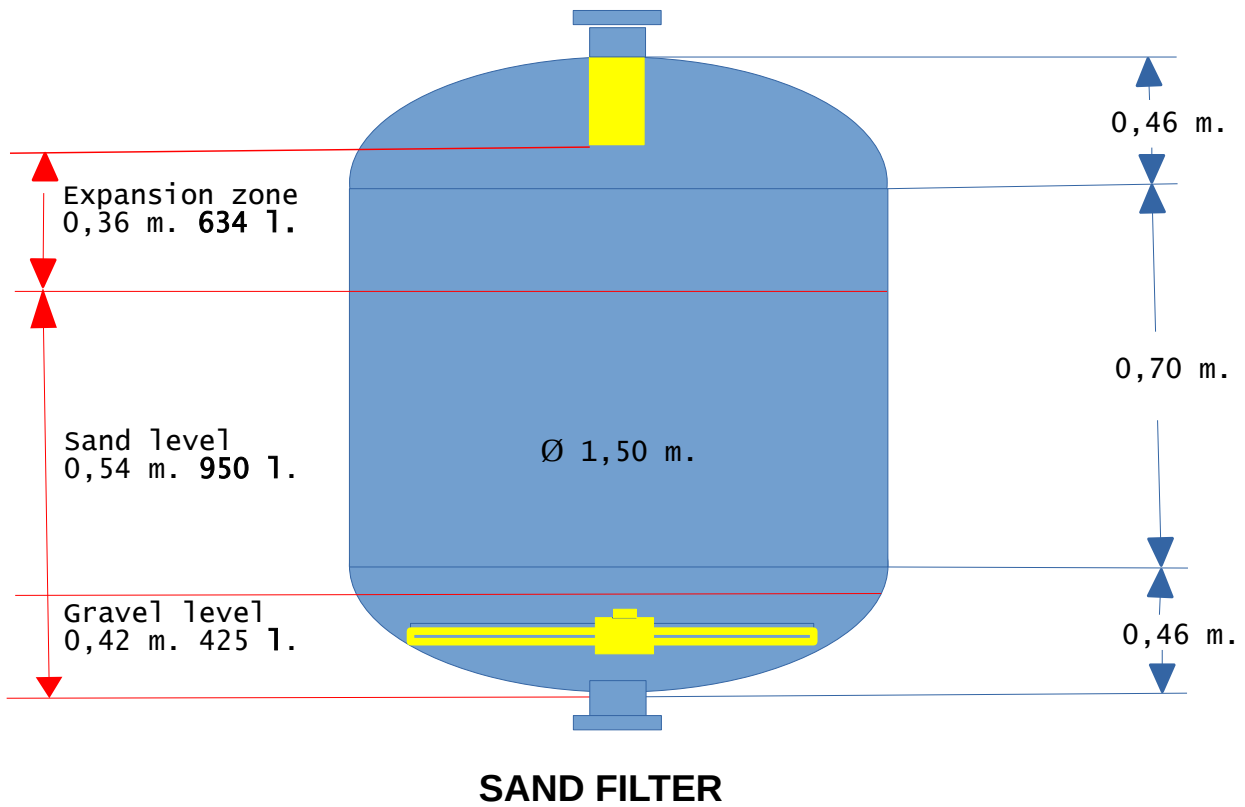


REFERENCE PRESSURE 0,042 MPa

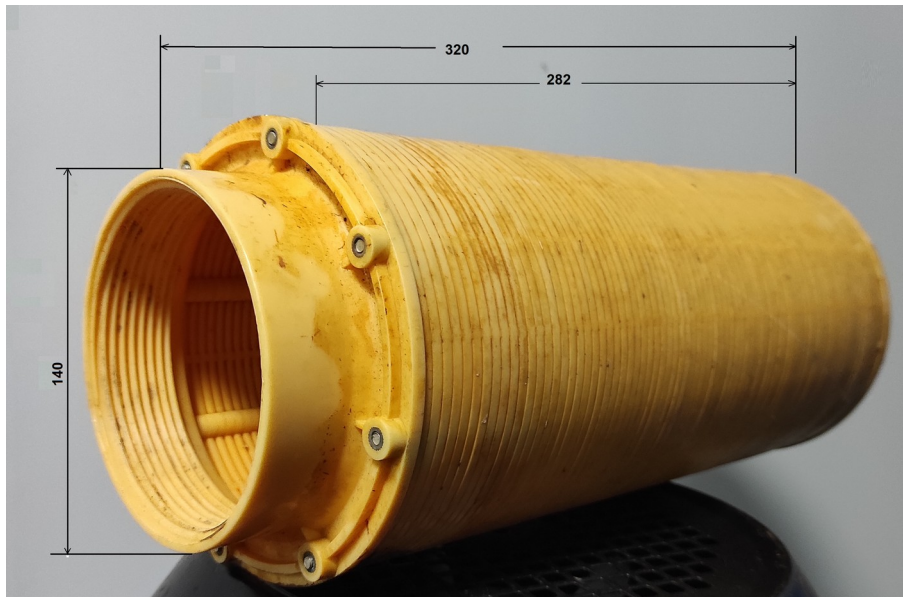


BLOWERS BELT

7_FILTERS WTP1 and WTP2



Strainer at the bottom of filter



Strainer at the top of filter

When change sand filter materials

When the sand filter being polluted, they warped by pollutants so that they don't have effective filtration, so change them.

When change active carbon filter materials

Chlorine residue will decompose RO membrane, shorten its using life, and so check the content of chlorine residue everyday.

When the chlorine reach 0.1ppm, change the active carbon

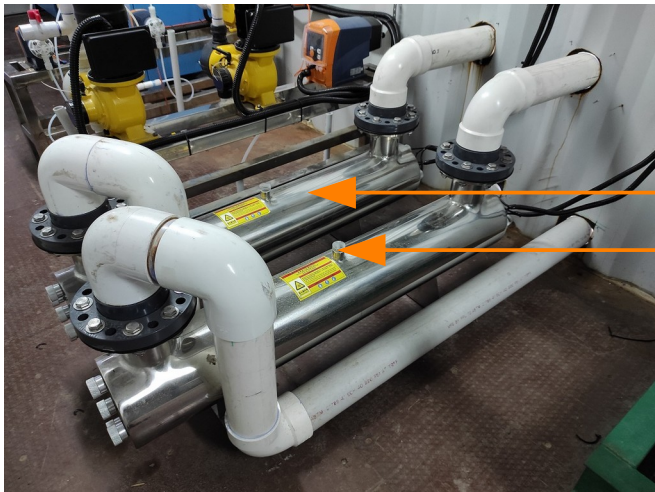
Filling of the activated carbon filters

- Gravel 0,42 m. 425 l.
- Manganese sand d 1,7 0,12 m 211 L.
- Activated carbon (china) 0,53 m. 650kg

8_RO System

This system is not working. Be care no water go inside the system and keep all the valves at the inlet and the outlet closed.

9_UV DISINFECTION



Transparent sight glass

Each reactor is equipped at the bottom with transparent sight glasses who allows to see the UV lights.
Check each lamp separately and replace if some is not working.
Every year lamps have to be replace.

Stock necessary should be for 1 year.

10_PURE WATER SUPPLY SYSTEM



Pressure indicator

ORP sensor

Electronic pressure sensor

System is working automatically and work usually auto position. The working pressure setted on the screen of each cabinet Pure water 5 and 100 m³.h⁻¹ is 0.3 MPa.

It is recommended to set the air pressure in the bladder balloon 0.02-0.03 Mpa under the working pressure fixed at 0.3 MPa. The pressure is decreasing over time this pressure has to be checked and maintained if necessary every 6 months. The checking has to be done ballon poured of water.

Pumps are protected by a float switch LLS in the storage tank 7 who stop the pump when it is discovered. This float switch is relayed in the cabinet WTP2 who has to stay powered. An independant power supply for this relays is recommended.

11_DOSING PUMPS

Before working on dosing pumps you have to take all equipments recommended for working on chemical products

12_ELECTRICAL CABINETS

12.1 Chlorine pumps

Dosage chlorine in raw and product water:

Dosage is adjusted by the operating staff.

All indications on this products are given in the manuals Prominent.

- Prominent operating instructions BT4b-EN

Starting of the chlorine dosing pumps :

Actually these pumps start manually. When an information coming from a counter or a flow meter located on the well water will be available the auto starting will have to be wired according to the instructions of the manual. A cable is ready to send an information coming from the dosing pump cabinet to the pump.

The chlorine dosing pump will have also to be wired when a flow meter or a counter will be installed on the product water.

12.2 Flocculant pump

Dosage flocculant in raw water:

Dosage is adjusted by the operating staff.

All indications on this products are given in the manuals Prominent.

- Prominent operating instructions DFXa-EN

Starting the Flocculant dosing pump :

Actually this pump start manually. As soon as an information coming from a counter or a flow meter located on the product water will be available, the auto starting will have to be wired according to the instructions of the manual. A cable is ready to send an information coming from the dosing pump cabinet to the pump.

An other cable controlling a leakage on the pump will have also to be wired at this moment.

12.3 Blowers cabinet

Actually the blowers start manually. The frequency on the frequency converter can be setted between 25 and 50 Hz.

12.4 RO system WTP1 & WTP 2

WTP2 cabinet has to stay powered the supply of the floating switch relays is attached at this cabinet.

Booster pumps can be setted between 25 & 50 Hz.

RO system should be started and stopped manually.

12.5 Pure water O system WTP1 & WTP 2

The system works automatically and maintain a pressure setted at 0.3 MPa.

13_INSTRUMENTATION

Refer to instructions on the chinese manuals.

14_SECURITY

Safety at work is a very important subject. The risks on water treatment water treatment are varied and must be controlled by all the stakeholders.

In any case follow all security instructions applicable on the GYSBI shorebase.

CONFINED AREA

All the tanks (10) are confined area. No intervention can be made without a work permit who will define the conditions of the intervention. (refer to Gysbi occupational safety service who will help you to prepare the work permit)

CHEMICAL RISKS

A chemical products storage area exists on the WTP

We can find in big quantities:

Sodium hypochlorite

Caustic soda

Muriatic acid

and other products:

Potassium bicarbonat

etc...

Some of this products are incompatible chemicals.

Muriatic acid + Sodium hypochlorite produce a deadly gas.

Pour water or caustic soda in acid will produce a lot of heat and spatter

Every operator of the WTP has to read the Safety data sheets of the products to have a perfect knowledge of the risks.

All interventions where chemical products can be encountered: storage tanks, pipes, hoses, pumps needs to wear a suitable protection for head, eyes and face, body
Keep always eye washer available and safety shower in working order.

When you have a risk with chemical product remember you will not be able to go to the shower by yourself so you cannot work alone.

Recommendation:

When you open or close a valve you have to be sure exactly what you are doing, if you are not sure refer to a person who has the knowledge this can avoid an accident.

If you have any contact with chemical product, you have to rinse immediately with potable water during 20 minutes or more to prevent sequelae.

Emergency eye/face wash are located near the storage of chemical products and near the dosing pumps

ELECTRICAL RISKS

Please if you are not qualified don't touch inside the cabinet, the job has to be done by qualified operators.

PRESSURE RISKS

Two air pressured vessels are installed at the outlet of the pure water pumps. Settings of the commissioning have to be maintained and not increased.

The tanks must be checked regularly according to the local regulation.

15_ANNEXES

- 16.1** PID
- 16.2** Remote control system
- 16.3** Electrical circuit drawing Pure water under constant pressure
- 16.4** Electrical circuit drawing Aeration
- 16.5** Electrical circuit drawing Dosing system
- 16.6** Electrical circuit drawing RO 35 m3/h
- 16.7** Electrical circuit drawing
- 16.8** Electrical drawing Pure water under constant pressure 10 m3h
- 16.9** 35 m3/h Reverse osmosis Pure water system
- 16.10** JYX-HY-(5m3h° Pure water supply under constant pressure
- 16.11** JYX-HY-(100m3h° Pure water supply under constant pressure.l
- 16.12** Dosing system
- 16.13** Aeration system
- 16.14** CDMC CDMF Pumps (50-60Hz). Instructions manual V180901
- 16.15** 70 m3h ROWPU System Detaied drawing 20200523.dwg
- 16.16** Conductivity meter instructions manual
- 16.17** Dosing pumps instruction manuel
- 16.18** Eectrical circuit drawing 20200523
- 16.19** Online Detector Cl instructions manual
- 16.20** Online Turbidity meter instructions manual
- 16.21** PH ORP Meter Instructions manual
- 16.22** Pressure Transmitters instructions manual
- 16.23** Reverse osmosis membrane instructions manual (not printed
- 16.24** Soft starter instructions manual
- 16.25** Solenoid vave instructions manual
- 16.26** Supension solid meter Instruction manual
- 16.27** UV steriizer instructions manual
- 16.28** Vector inverter instructions manual
- 16.29** Prominent BT4B manual instructions
- 16.30** Prominent DFXa manual instructions
- 16.31** Description electricity instrumentation
- 16.32** Floating switches informations
- 16.33** Flow rate well water pump
- 16.34** Plow rate booster pump
- 16.35** Pumps caracteristics
- 16.35** WTP maintenance questionnaire