INSTALLATION AND MAINTENANCE INSTRUCTIONS

ELECTRIC CONDENSATE RECOVERY UNIT

ECRU

CONTENTS

GENERAL

- These instructions must be carefully read before any work involving products supplied by VALSTEAM ADCA ENGINEERING S.A. is undertaken.
- The installation procedure is a critical stage in a life of the equipment and care should be taken to avoid damage to the equipment.
- Current regional safety regulations should be taken in to account and followed, while doing the installation and maintenance work.
- Handling, installation and maintenance work must be carried out by trained personnel. A supervisor must follow and check all activities.
- For the problems that cannot be solve with the help of this instructions, please contact the supplier or the manufacturer.
- The equipment may still contain some residual water from functional tests.

1. SAFETY NOTES

- All work must be carried out by a suitable competent person, and a supervisor must follow and check all activities. Installation and operating personnel should be trained to properly use this equipment according to this Installation and Maintenance Instructions – IMI. Where a formal “Permits to Work” system is implemented it must be complied with.
- Do not remove the nameplate attached to the equipment. Serial number and other useful information are stamped on it.
- Under normal operation conditions the equipment will have hot external surfaces and will contain hot fluid at a temperature higher than 70ºC, it is therefore advisable to isolate all tubes and equipment to avoid the risk of burns.
- For more information regarding the equipment’s that forms the unit, please see the corresponding IMI and Information Sheet (IS) available in our website.
- Adequate lighting should be ensured, particularly where detailed work is required.
- Before starting work, ensure that all suitable tools and/or consumables are available. Use only genuine ADCA replacement parts.
- Do not touch the equipment without appropriate protection during working operation because it may conduct heat if the used fluid is at high temperature.
- Before starting maintenance be sure the equipment is not pressurized or hot. Even if upstream and downstream isolating valves have been closed, care should be taken since fluid under pressure may be trapped between them.
- Correct installation of the equipment is full responsibility of the contractor.

2. INTENDED USE

- This equipment is intended to be used exclusively in industrial installations, and is not prepared for use in domestic applications.

- Provisions should be taken to avoid unauthorized personnel to enter in contact with the equipment.

- This equipment is designed to work within the working temperature and pressure limit conditions stated in the name-plate and Information Sheet (IS). Check if the product is suitable for the application, to avoid failures.

- If malfunction of any other equipment or system operation failure may result in a dangerous overpressure, over temperature or even vacuum condition, a safety device must be included in the system to prevent such situations.

- The equipment is not intended to withstand external stresses that may be inducted by the system to which it is being connected to. The installer should assess the risks of the stresses and possible hazardous environment around the equipment (e.g. temperature, explosion risk areas) and take adequate precautions to minimize them.

- The complete system (before and after the equipment) should be assessed as well as the different stages of functioning (e.g. closing of some isolation valves) to ensure this will not bring additional risk to the persons and equipment.

- This product has been designed for use with hot condensate, if required to work with other liquid, factory should be contacted to ensure compatibility.

3. GENERAL INFORMATION

3.1 Description

The ADCAMAT ECRU series electric condensate recovery units are recommended in the transfer of high-temperature water such as hot condensate, to a higher elevation or pressure. This condensate is usually used as boiler feed water. The standard models are prepared for flows up to 20m^3/h, or higher on request.

The units are composed by:

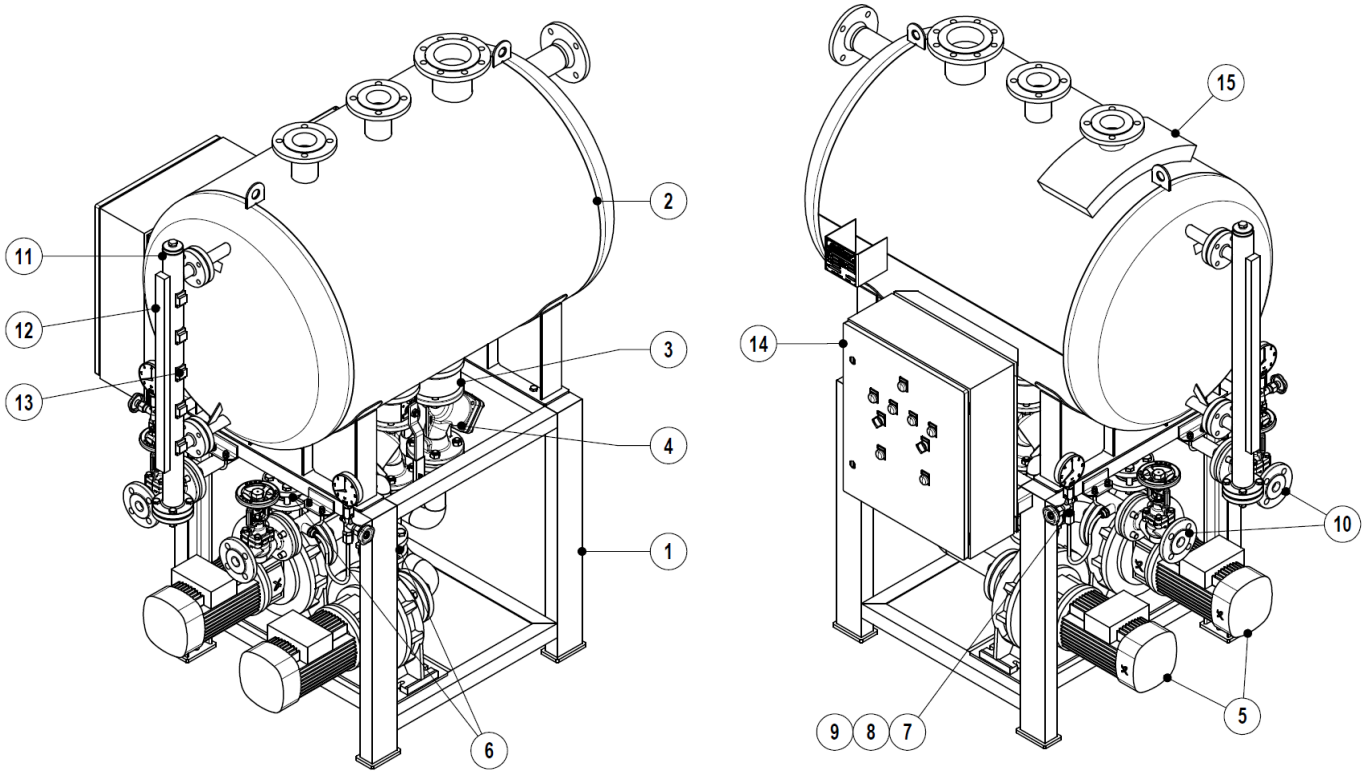
- **Condensate vessel:**
  Completely manufactured from AISI316 stainless steel, with inlet connections, overflow, air vents, drain, pump feeding outlets and a magnetic level indicator with bi-stable switches (alternatively it can be fitted with a glass level gauge and conductive type probes). It is designed to work at atmospheric pressure, and so, it is out of the scope of Pressure Equipment Directive. The standard connections are flanged PN16, with exception for the drains that are supplied screwed BSP.

- **Metal frame:**
  Manufactured from carbon steel, sandblasted and painted. It is designed only to withstand the weight of the filled vessel, and should not be subject to any other external forces.

- **Electric pumps:**
  Manufactured from stainless steel or carbon steel capable of handling hot condensate up to 98ºC and design for low NPSH.

- **Valves and ancillaries:**
  Includes full-bore stainless-steel ball valves at the pump suction ports, manual regulating valves for system head regulation at the pumps discharge pipework's, strainers and pressure gauges.

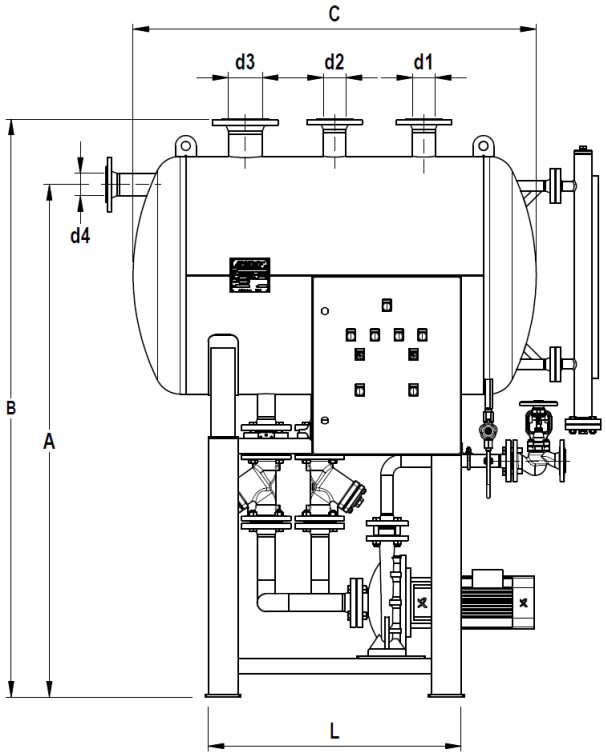
- **Control panel:**
  Metal enclosure rated to IP65 or higher. Features alternating and cascading (simultaneity) functions, pump fault (trip) indication for each pump, low and high-level alarms, pump dry run inhibitor, operating mode selector switch and volt-free telemetry terminals for remote stats.

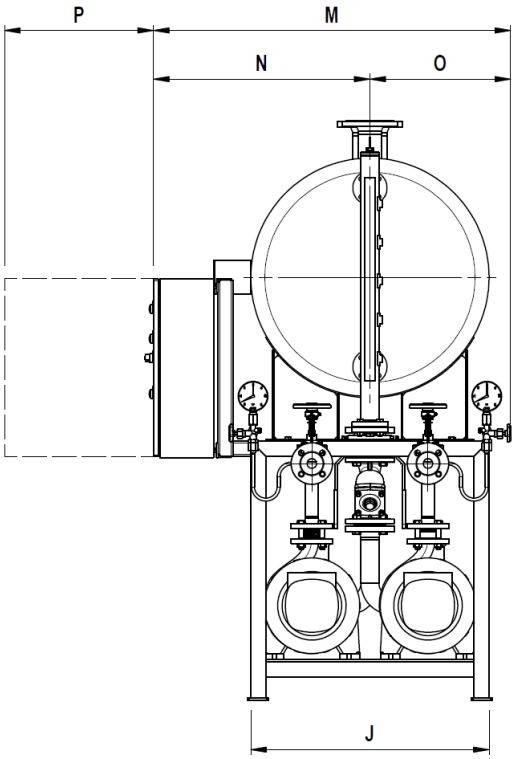


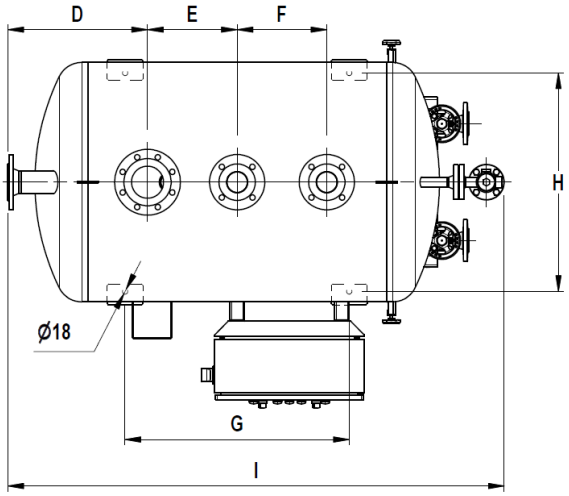
MATERIALS		
POS. Nº	**DESIGNATION**	**MATERIAL***
1	Metal frame	S235JR / 1.0038 AISI304 / 1.4301
2	Vessel	AISI 316 / 1.4401 P235GH / 1.0325
3	Ball valve	ADCA M3I / MWS1
4	Strainer	ADCA IS16F
5	Electric pump	-
6	Check valves	ADCA RD40
7	Pressure gauge	ADCA MAN100
8	Siphon	ADCA GSU
9	Gauge cock	ADCA GC400
10	Globe manual reg. valve	ADCA VF20
11	Magnetic level indicator	ADCA MLI
12	Indicator	ADCA MLI
13	Level switch	ADCA MS
14	Electrical panel	-
15	Thermal insulation	Rock-wool / Aluminium

*References shown are indicative and can be changed without notice.

Fig. 1 – Components/material list







CONNECTIONS SIZE				
Model	**d1**	**d2**	**d3**	**d4**
EC255	DN50	DN50	DN80	DN50
EC600	DN65	DN65	DN100	DN65
EC850	DN100	DN100	DN100	DN100

DIMENSIONS (mm)															
Model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**L**	**M**	**N**	**O**	**P**
EC255	1450	1645	1236	423	300	300	680	430	1577,5	500	780	827	577	250	500
EC600	1725	1945	1354	467	300	300	750	730	1660,5	800	850	1200	727	473	500
EC850	1700	1945	1854	617	400	400	1000	730	2160,5	800	110	1200	727	473	500

Fig. 2 – General dimensions

Note 1: If a tailor-made version was requested contact the manufacturer for the specific IMI.

ORDERING CODES ECRU										
Model	**EC**	**255**	**S**	**S**	**2T10**	**S**	**S**	**X**	**X**	**E**
ECRU Electric Condensate Recovery Unit	**EC**									
Vessel capacity										
225 liters		**255**								
600 liters		**600**								
850 liters		**850**								
Vessel material										
Carbon steel			**S**							
Stainless steel AISI316 / 1.4401			**I**							
Number of electrical pumps										
Single pump (non standard)				**S**						
Two pumps				**D**						
Maximum flow rate and delivery head in metres at the mentioned flow										
2 m3/h at 10 metres (with 225 l vessel)					**2T10**					
4 m3/h at 10 metres (with 225 l vessel)					**4T10**					
10 m3/h at 10 metres (with 600l vessel)					**10T10**					
10 m3/h at 20 metres (with 600l vessel)					**10T20**					
20 m3/h at 10 metres (with 600l vessel)					**20T10**					
20 m3/h at 20 metres (with 600l vessel)					**20T20**					
30 m3/h at 10 metres (with 850 l vessel)					**30T10**					
30 m3/h at 20 metres (with 850 l vessel)					**30T20**					
Metal frame										
Fabricated carbon steel						**S**				
Fabricated stainless steel						**I**				
Piping connections										
Carbon steel							**S**			
Stainless steel							**I**			
Control panel										
Without control panel								**X**		
Control panel, magnetic level indicator, bi-stable switches and wiring								**E**		
Thermal insulation										
Without thermal insulation									**X**	
Thermal insulation with aluminium external protection									**T**	
Extras										
Full description or additional codes have to be added in case of non-standard combination										**E**

Fig. 3 – Ordering codes

3.2 Function

The standard control system includes a main incoming (isolator) switch, contactors and overloads for each pump. The front of the control panel includes a 'Power On' LED indicator, pump 'Running', pump 'Trip' LED indicators for each pump and a selector switch for alternating between automatic, off, and manual operation. Pump operation itself is controlled via 'Start' and 'Stop' buttons that are separate for each pump.
Also included are two LED indicators that light up in case of a 'Low water level' or 'High water level' alarm. Volt-free telemetry terminals are included for remote stats: 'Low water level', 'High water level' alarm and pump fault ('Trip') alarms.

The 'Low water level' and 'High water level' alarms (both visual indicators and volt-free terminals) are cleared out automatically when the condensate level is between normal levels. Consider normal levels every time the water level is above the 'Lower water level' and below the 'High water level'.

Level measurement is performed by means of bi-stable magnetic reed switches installed on a magnetic level indicator or conductive level probes installed on top of the vessel. Both versions share the same control features. The version which includes conductive level measurement is fitted as standard with a level gauge.

The control system features an alternating relay, which alternates the duty of each pump at the end of every cycle. Each pump will start its duty when the 'Pump start level' is reached and will stop as soon as the water level drops below the 'Pump stop level'. In case of a peak demand, although one of the pumps will start working when the level reaches 'Pump start level', the water level will continue rising and, in that case, as soon as it reaches the 'Pump cascade level', both pumps will run simultaneously to relieve this peak demand. The pumps will stop running as soon as the water level drops below the 'Pump stop level'. In the next cycle, the system will resume in alternating mode. The pump 'Running' LED indicators will light up each time a pump starts running, and will turn off as soon as it stops.

Manual operation can be selected at any time by turning the operating mode selector switch to the 'Manual' position. Pumps can be turned off using the same switch or alternatively by pressing the respective 'Stop' buttons. 'Automatic' is the standard operation mode for normal operating conditions.

Pumps are prevented from dry running in both manual and automatic operating modes, and will only work when the 'Low water level' is surpassed.

In case of a pump 'Trip' (which happens in case of a current overload) the respective LED indicator will light up and that pump will be prevented from working. The pump which is operational will start operating as soon as the 'Pump cascade level' is achieved, and on the following cycles, it will always work between the 'Pump stop level' and 'Pump cascade level'. When the issue is resolved, by human intervention, the system will resume in alternating mode.

3.3 Certification

This product has been designed for use with hot condensate, if required to work with other liquid, factory should be contacted to ensure compatibility.

It is designed to operate exclusively at atmospheric pressure and therefore is outside the scope of the European Pressure Equipment Directive. It complies with the European Machinery Directive and therefore carries the CE mark.

When supplied with an integrated control panel the compliance with the Low Voltage Directive and the Electromagnetic Compatibility Devices Directive is also ensured.

A declaration of conformity is delivered with the equipment according with the relevant Directives in use.

4. TRANSPORT, HANDLING AND STORAGE

ATTENTION

- Handling and lifting of materials should be made with adequate equipment's and following the indications on this instruction.
- The manufacturer doesn't assume the responsibility of damaged equipment due to inappropriate handling during the transportation and storage.

- The equipment should only be moved or lifted after draining all the fluid from inside, and from the pipping.
- Do not damage the paint job. It protects against corrosion during transportation and storage. Equipment's should be protected from impacts and forces during transportation and storage.
- The eyebolt placed on top of the receiver are exclusively intended for its lifting and transport, and not for lifting and transport of the whole unit.
- For lifting and transportation of the complete unit use a suitable forklift truck underneath the frame with the forks positioned according to the Figure 4.
- If the equipment is to be shut off for a long period of time, care should be taken to avoid exposure to low critical temperatures. It should also be isolated from dust accumulation.
- If the equipment has been in use, follow the shut-down instructions before storage.

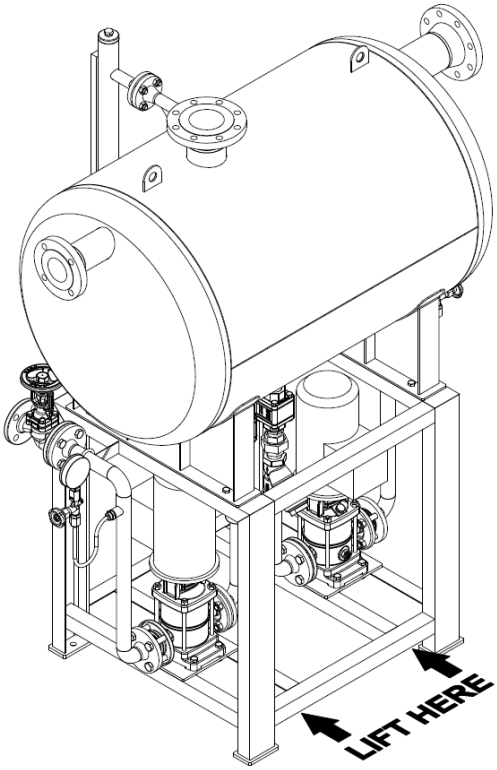


Fig. 4 – Example of fork positioning

5. ASSEMBLY, INSTALLATION AND CONNECTION

ATTENTION

- Account for over pressure conditions, according with the local laws or standards.
- The ADCAMAT ECRU must not be used with other purpose than the one it was built for.
- The ECRU series electric condensate recovery units should not be installed in any system where pressure and temperature conditions can exceed the limits given on the name plate.
- For the problems that cannot be solve with the help of these instructions, please contact the supplier or the manufacturer.

5.1 Assembly

- As standard the equipment is supplied completely assembled and is only required to do the connection to the main energy sources (fluid piping's and electricity).
- Under normal operation conditions the equipment will have hot external surfaces and will contain hot fluid at a temperature higher than 70ºC, it is therefore advisable to isolate all tubes and the tank to avoid the risk of burns. This can be achieved by thermal insulation with rock-wool (80mm or 100mm thickness) and cladding.

5.2 Installation area requirements

- The installation area should have easy access and provide enough space for maintenance and removing operations.
- The installation area should have the necessary firing system to prevent damage of the equipment due to over temperature/pressure caused by fire.
- The installer should analyze the transfer of vibration to the system generated by the place where it is being installed in.
- The equipment should be fixed to the floor using the holes in the supports. Ensure that the ground is levelled and that the adequate fixing elements are use according to the type of concrete.
- The installer should analyze the transfer of vibration to the system generated by the place where it is being installed in, and apply anti-vibrated rubbers if required.

5.3 Pipping connection

- Remove any protective covers/plugs which may have been fitted to the various connections on the unit.
- Pipework connected to the equipment should be free from all stresses such as, caused by expansion and inadequate support. Expansion joints, bends or flexible connections should be fitted to allow for safe thermal expansion.
- During the assembly work, apply protective measures against dirt.
- When connecting flanges, the bolts should be mounted from the counter flange side with the hexagon nuts from the valve side and it must exist a perfect match between the connection flanges.
- Tighten flange connection bolts uniformly in a diagonal sequence.
- The lines should be maintained to the design pressure of the ECRU and under no circumstance exceed the pressure stamped on the name plate.
- The unit is designed for open vented operation and must be installed with an unrestricted open vent. The vent must be installed in such a way that no backpressure is induced. It is expected that some flash steam and hot condensate droplets can be emitted from the vent, thus It must also be guaranteed that the vent is piped away to a safe high-level location, making sure that no harm can be caused to any person or equipment.
- An appropriate syphon shaped pipe ("U" water seal) must be connected to the overflow outlet connection on the receiver. The pipe should be at least the same size as the overflow connection on the receiver. The pipe should be connected to a safe drain point or gutter.

- Before installing and connecting the condensate inlet pipes upstream of the receiver and outlet pipes downstream of the pumps, make sure that all foreign matter or installation debris are flushed out.
- Strainers should be installed upstream of the condensate receiver in case there is a potential for debris to carry over into it. The strainer screens should be cleaned regularly.
- The installer must check, to ensure, that there are no foreign bodies inside the pipes, and that the piping where the equipment will be connected also does not contain any foreign bodies.
- It is recommended the isolation of the equipment and accessories to prevent accidents by burns. In specific applications, integral devices should be fitted to limit the highest surface temperature.

5.4 Compressed air supply

- If a pneumatic control valve and other pneumatic equipment is installed a suitable air supply will be required. 3 - 6 bar may be required, depending upon the actuator selected or equipment (revert to the specific datasheet/IMI of equipment included). Air filter regulators must be used to ensure the correct pressure is supplied to each valve/equipment.

5.5 Electric supply and specifications

ATTENTION

- It should be granted equipotentiality of the metal parts (of devices and tubes) and earthing. The structure is supplied with an earthing connection point that if not connected, should be connected during installation. If thermal isolation is present the electrical resistance value between parts should be verified.
- Electrical connection of the equipment should only be carried out by qualified and experienced personnel, and must comply with the current regional electric regulations and standards.

- Before connecting the power supply to the ECRU control panel, check voltage, frequency and electric cable section to make sure that the electrical supply meets the specifications stated on the control panel and wiring diagram, supplied inside the control panel.
- Connect power supply into the control panel through a suitable protection isolation switch and in accordance with the wiring diagram supplied with the unit. Mains supply is connected to the DIN rail terminals. Protective earth ‘PE’ must be appropriately connected to the respective terminal.
- After commissioning into service make sure the control panel enclosure is properly closed.
- It is recommended that an electrical safety check is performed before commencing the start-up procedure. Carry out tests on any alarms or protective devices.

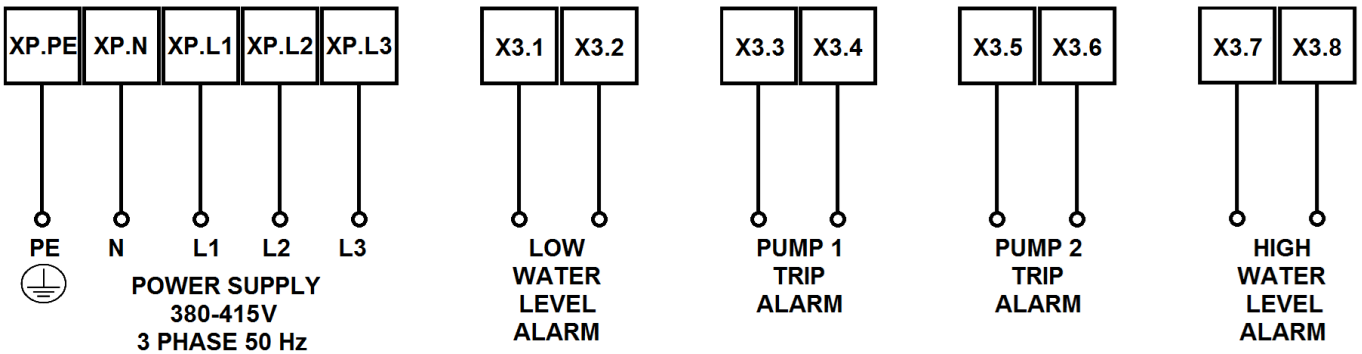


Fig. 5 – Customer connections

6. START-UP

- Current regional safety regulations should be taken in to account and followed.
- Protective insulation and warning notices may be required.
- Until start-up of an existing or a new plant, the following must be checked:
  - All works are completed.
  - The equipment is correctly installed.
  - All the necessary safety devices have been installed.

- During start up, the presence of small particles in the motive fluid (dirt, scale, weld splatters, joint particles, remains of Teflon tape, etc) may cause anomalies. If this occurs, proceed to an accurate cleaning.
- If the operating mode selection switch of 'Pump 1' is set to 'Automatic', then the selection switch of 'Pump 2' must also be set to 'Automatic', otherwise the system will stall.

6.1 Start-up procedure

1. Ensure the pump operating mode selection switch is set to 'Off' and turn the power supply on, by rotating the incoming isolator switch to the respective position. The 'Power on' LED indicator should light up.

2. If level measurement is performed by means of bi-stable magnetic reed switches, slide a permanent magnet with radial polarity besides the magnetic switches, from the top, down. The contact of the switches should be all open at this point. In case of any doubt use a multimeter set to continuity and check each one. Note: If this operation is not performed, the switching function risks to become faulty and may engage a false position of a contact during process control.

3. Fully open all isolating valves and allow the receiver to fill up with condensate.

4. Ensure that there are no leaks. Open pump isolating valves slowly to safeguard pump mechanical seals and discharge valves.

5. It is important to check that each pump has been fully flooded with condensate by opening the air vents on the pump casing. Consult the pump manufacturer's operation manual for further details on this procedure.

6. Switch the pump operating mode to 'Automatic' by rotating both selection switches to the respective positions. Press both pumps 'Start' button's (LED indicators should light up). Pumps should start running in alternating mode to discharge the condensate from the receiver.

7. Check that both pumps work satisfactorily between the 'Pump start level' and 'Pump stop level'. Note: With three phase pumps, check that the direction of pump operation is correct.

8. Check that each pump switches 'Off' automatically at the end of their respective cycle (as soon as the water drops below the 'Pump stop level').

9. All ECRU units include manual regulating valves which are installed downstream of the pumps. These valves may require adjustment to ensure the correct duty point on the H-Q pump characteristic curve is achieved, thus reducing possible cavitation and noise.

6.2 Periodical checking:

- 24 hours after the start up, it is recommended to check pipe connections for leaks and retighten the connections if necessary.
- Re-check operation of the pumps.

7. SHUTDOWN

If the equipment will be shut down for a long period of time, care should be taken to avoid exposure to low critical temperatures. It should also be isolated from dust accumulation.

7.1 Shut down procedure

- Press both pump's 'Stop' buttons, the 'Start' illuminated buttons LED indicators should turn off. Turn off the electrical power supply and ensure the incoming isolator switch is set to the 'Off' position. If the unit is being taken out of service disconnect power cables from the control panel. Ensure that the cables are not live. This procedure must be performed by qualified and experienced personnel, and must comply with the current regional electric regulations and standards.
- Close-up the isolation valves to prevent incoming and outgoing hot water to enter the unit and allow the water inside to cool down.
- Allow the fluids to cool down to a safe temperature bellow 25 ºC.
- Drain down all water accumulated inside the receiver to a safe drain point, by opening the drain outlet on the bottom of the receiver.
- Drain down all water inside the pump's casings through the drain port possibly located on its bottom. Consult the pump manufacturer's operation manual for further details on this procedure.
- If the system will be shut off during a large period of time it is recommended to completely drain all the condensate and water from the system.

8. MAINTENANCE

ATTENTION

- Before executing any maintenance, work read the 'Safety notes' in section 1.
- For maintenance of individual components of the ECRU please see the relevant product IMI.
- We recommend the package to be serviced as necessary. The packaged components should be checked periodically (at least yearly), to verify if they are operating correctly and to verify the wear of internal parts (where applicable).
- Before starting maintenance be sure that the equipment is not pressurized or hot. Even if upstream and downstream isolating valves have been closed care should be taken since fluid under pressure may be trapped between them.
- Strainers should be cleaned.
- When reassembling, make sure all gasket faces are clean and always use a new gasket. Tighten cover bolts uniformly in a diagonal sequence.
- Pour quality water or corrosive fluids will compromise the lifetime of the equipment's and can lead to premature failure. We recommend the wall thickness examination using appropriate inspection devices ate least yearly depending on the corrosion conditions or according to regional regulations.
- To avoid any dust deposits the external surfaces of the package equipment's must be regularly cleaned.

- Before executing any maintenance operation, it should be ensured that all equipment's are discharged of electrostatic charges
- It should be re-checked that there does not exist any dangerous potential differential between materials
- Precautions should be taken to avoid the entrance of foreign bodies during maintenance service.
- Before starting work ensure that all suitable tools and/or consumables are available. Use only genuine ADCA replacement parts.

8.1 Maintenance procedure

- Follow the shutdown procedure described on these instructions.
- Remove the equipment's to assess.
- Execute the maintenance work.
- Reinstall the equipment's on the correct positions, confirming the fluid directions on the drawing (Don't forget to replace the gasket and PTFE seals where applicable).
- Follow the start-up procedure.

8.2 Safety device testing

The safety devices should be tested regularly to ensure its correct operation. Current regional safety regulations should be taken in to account and followed

8.2.1 Low water level and high-water level alarms

- To perform this test, start by setting the pump operating mode to the 'Off' position. Allow water to fill up the vessel until it is discharging from the overflow. The 'High water level' alarm LED indicator should light up and the respective volt-free terminal should change its state.
- Close all isolating valves feeding water to the tank and set the pump operating mode to 'Manual'. Press 'Start' in one or both pumps. The pumps will start working and the tank should start to empty. As soon as the water drops below the 'Low water level' the respective alarm should light up and the volt-free terminal should change its state.
- The pumps should stop working automatically as soon as this level is reached. If the pump's do not stop automatically the test is considered to be failed and the pump's operating mode should be set to the 'Off' position immediately, to avoid the pumps from dry running. They should stop working immediately.

8.2.2 Pump trip test and RCCB functionality test

- Tests should be performed to the pump motor overloads by manually operating the test button located on it while they are on the 'On' position to check if they automatically trip. A functionality test should be performed on the RCCB (Residual Current Circuit Breaker) by pressing the test button usually marked by the letter 'T'.

9. TROUBLESHOOTING

- For the problems that cannot be solve with the help of these instructions, please contact the supplier or the manufacturer.

TROUBLESHOOTING CHART

FAULT	POSSIBLE REASON	SOLUTION
Pump fails to run.	1) Main power supply is switched off. 2) Pump overload tripped. 3) Motor winding damage or loss of a phase. 4) Level measuring input fault.	1) Switch power supply on. Check the 'Power on' LED indicator as it should light up. 2) Check pump overloads trip current. Adjust trip current potentiometers to meet the pump load specifications. 3) Consult manufacturer or supplier. 4) Consult the manufacturer's dedicated instructions for the measuring devices (Magnetic switches or conductive type probes).
Low capacity.	1) Suction valve partially closed. 2) Delivery valve partially closed. 3) Incorrect direction of rotation.	1) Open valve fully. 2) Adjust valve by the required amount to prevent cavitation. 3) Check electrical wiring connections. Consult the pump manufacturer dedicated wiring instructions.
Cavitation.	1) Excessive condensate temperature. 2) Insufficient pump discharge head.	1.1) Check if the condensate temperature at the pump inlet port is higher than the one specified. 1.2) Check and if necessary execute maintenance on faulty (leaking) steam traps. 2) Adjust delivery manual regulating valve to achieve correct duty point on the H-Q pump characteristic curve.

10. DISPOSAL

Once the unit has reached the end of their working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

During its disposal, pay special attention to the rubbers, resins and polymers used in its construction (PVC, PTFE, PP, PVDF, viton, etc.).

For further information, please contact Valsteam ADCA Engineering SA.

11. PRODUCTS RETURNING

- Information regarding any hazards and precautions to be considered because of contaminating fluids and residues or mechanical damage that may represent a health, safety or environmental risk, must be provided in writing by the distributors and costumers when returning products to Valsteam ADCA engineering.
- Health and safety data sheets regarding substances identified as hazardous or potentially hazardous must be provided with the information mention above.

- **LOSS OF WARRANTY: Total or partial disregard of above instructions involves loss of any right to warranty.**

12. DECLARATION OF CONFORMITY

DECLARAÇÃO UE DE CONFORMIDADE
EU DECLARATION OF CONFORMITY

VALSTEAM ADCA ENGINEERING, SA
Zona Ind. da Guia, Pav.14 - Brejo
3105-467 GUIA PB – PORTUGAL

A **VALSTEAM ADCA ENGINEERING, SA** com Sistema de Gestão da Qualidade segundo ***NP EN ISO 9001*** garante e declara que o equipamento sob pressão;
VALSTEAM ADCA ENGINEERING, SA *with Quality Management System according to* ***NP EN ISO 9001,*** *ensures and declares that the pressure equipment:*

UNIDADE ELÉTRICA DE RECUPERAÇÃO DE CONDENSADO
ELECTRICAL CONDENSATE RECOVERY UNIT
ECRU

com as seguintes características:
with the following characteristics:

N.º de serie *(serial N.º.)*		Ano de fabrico *Year of Manufacture)*	
Pressão Máxima Admissível (PS) *(Maximum allowable pressure)*	bar	Temperatura Máxima Admissível (TS) *(Maximum allowable temperature)*	ºC
Normas Harmonizadas utilizadas *(Harmonized Standards)*		EN61439-1; IEC 60204-1; EN 61000-6-1; EN 61000-6-2; EN 61000-6-4 ; EN ISO12100:2010	
Especificações Técnicas utilizadas *(Used Technical specifications)*		IT03; IT05; IT06; IT10; IT20; IT21	
Outras Normas/regulamentos utilizadas *(Other used Standards/regulations)*		EN1092-1; EN10028-2; EN10216-2; ISO15614-8 ; AD-Merkblatt 2000	

satisfaz os requisitos das *Diretivas Europeias* que lhe são aplicáveis:
satisfies the requirements of the Directives which apply:

Directiva Máquinas *Machinery Directive*	**2006/42/CE**
Directiva Compatibilidade electromagnética *Electromagnetic Compatibility Directive*	**2014/30/EU**
Directiva Baixa tensão *Low Voltage Directive*	**2014/35/EU**

Equipment according to Electromagnetic Compatibility Directive and/or Low Voltage Directive

Equipment	**2014/30/EU Directive**	**2014/35/EU Directive**
Electrical Panel	A	A
Electric pumps	A	A

A – Applicable; N/A – Not applicable

Administrador da VALSTEAM ENGINEERING, SA
Pombal, xx / xx / xxxx

RG-126.00 de 2018.07.23

A declaration of conformity is delivered with the equipment according with the relevant Directives in use.