Pumped Expansion Pressurization System User Manual

Tanpera®

Project	:
Customer	:
Serial No	:
Year	:

The information in this document is based on the most up-to-date data and production materials available at the time of publication. Therefore, due to rapid developments in this field, we are not responsible for any changes in technical specifications that may affect the content of this document.

Copyright

All rights reserved by TANPERA A.Ş. No part of this document may be reproduced or distributed without the prior written permission of TANPERA A.Ş.

Index

1. Liability and Warranty Terms — 4

2. Safety — 5

3. Operating Principle — 6

4. Device Components — 7

5. Product Label — 8

6. Scope of Delivery — 9

7. Installation and Connections — 10
7.1. Inspection of Delivery Scope — 10
7.2. Preparations — 10
7.3. Hydraulic Connections — 10
7.3.1. Positioning — 10
7.3.2. Weight Sensor Installation — 11
7.3.3. Electrical Connection of the Drain Valve — 11
7.3.4. Weight Sensor Installation — 11
7.3.5 Fixing the Tanks — 11
7.3.6 Expansion Tank Connections — 12
7.3.7 Control Unit Connections — 12
7.3.8 System Connections of the Control Unit — 13
7.3.9 Installation of the Dynamic Pressure Balancing Tank — 13
7.3.10 Installation of the Pressure Sensor — 14
7.4. Electrical Connections — 15
7.4.1 Main Power Supply Connection — 14
7.4.2 Communication, Weight Sensor, and Pressure Sensor Connections — 14

8. Commissioning — 16
8.1. Screen Description and Completing Initial Settings — 17
8.1.2 Language Selection — 17
8.1.3 Date-Time Settings — 17
8.1.4 Adjusting the Set Pressure — 17
8.1.5 Clearing Possible Error Codes — 17

9. Error Codes — 18

9. Diagram — 19

1. Liability And Warranty Terms

- Responsibility begins with the delivery of the device to the facility.
- Before Delivery: Read the Installation and Operation Manual carefully.
- The manual must be visible and kept close to and visible from the control unit.
- Ensure environmental conditions comply with the provisions outlined in Section 5 (Transport, Storage, Placement).
- Ensure mechanical and electrical installation tasks are performed by authorized personnel or firms with expertise, as noted in Section 6 (Environmental and Accessory Conditions).

1.1. Under Non-Warranty Conditions

- Improper usage, commissioning, maintenance, repair, or installation.
- Non-compliance with the instructions in this manual.
- Operating the device with damaged or improperly installed safety equipment.
- Missing maintenance on time.
- Use of unapproved spare parts or accessories.

1.2. Warranty Duration

- The warranty is valid for 2 years from the invoice date.
- For commissioning and annual maintenance procedures, contact Tanpera Service Center.

2. Safety

- The sign "Electricity" warns to follow safety instructions. Otherwise it may result in electric shock, death, or severe (irreversible) injuries.
- The "Danger" sign indicates immediate danger; ignoring safety instructions may result in death or severe (irreversible) injuries.
- The "Hot Surface" sign warns that contact surfaces exceed 60°C; ignoring safety instructions may cause severe (irreversible) injuries.

Together with the **"electric"** symbol, it indicates that failure to comply with safety information will result in electric current, death or serious (irreversible) injuries.

The symbol of **"danger"** , together with the word, indicates an imminent dangerous key; Failure to comply with safety information indicates that death or serious (irreversible) injuries will result.

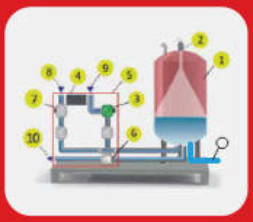
The symbol **"hot surface"**, together with the word, indicates that the surface to be contacted is over 60°C and that failure to comply with safety information will result in severe (irreversible) injuries.

Take general safe precautions against extreme heat during commissioning or maintenance of the device.

Notes

- Always implement general occupational safety measures during commissioning or maintenance.
- The device operates with high-pressure hot water during use. Ensure the device is off and the system is depressurized before maintenance or disassembly.
- Device components are heavy. Use proper safety precautions during transportation and handling.
- The device is designed for use in only one system.
- The device is not suitable for outdoor usage.
- The device is not suitable for flammable environments or using with minerals.
- Operate the device only with clean utility water free of particles.
- During subsequent epoxy, screed, or similar floor coating applications following commissioning, the load cell (weight sensor) and control unit feet located at the base of the tank must be properly protected to prevent them from coming into contact with the coating material.

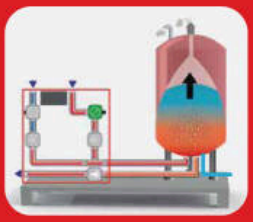
3. Operating Principle



1. Heating and Expansion of Installation Water:

1. Expansion Tank
2. Air Vent (Purge Valve)
3. Solenoid Valve
4. Control and Command Panel
5. Hydraulic Unit
6. Pump
7. Flow Meter
8. Network Connection Port
9. System Inlet Connection Port
10. System Outlet Connection

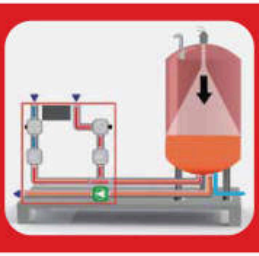
The Pumped Expansion System filled with installation water contains a small amount of water. The system is ready to operate.



2. Heating and Expansion of Installation Water: As the temperature of the water increases, the water begins to expand, and the pressure rises.

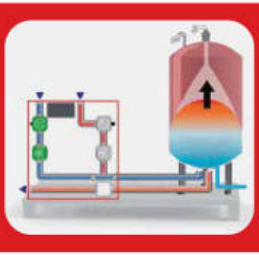
The Pumped Expansion Automation System evaluates this information, opens the motorized valve, and transfers the expanding water to the tank. In this way, the installation pressure is kept constant. The drainage valve located at the bottom of the tank discharges excess water into the drainage line in case of overfill.

3. Control of Installation Water Temperature and Pressure: When the water temperature stabilizes and till reaches maximum load, the installation pressure is kept constant through the pressure control of the Pumped Expansion System.



4. Cooling and Contraction of Installation Water: Due to operating conditions, the installation water begins to cool and contract, and its pressure decreases.

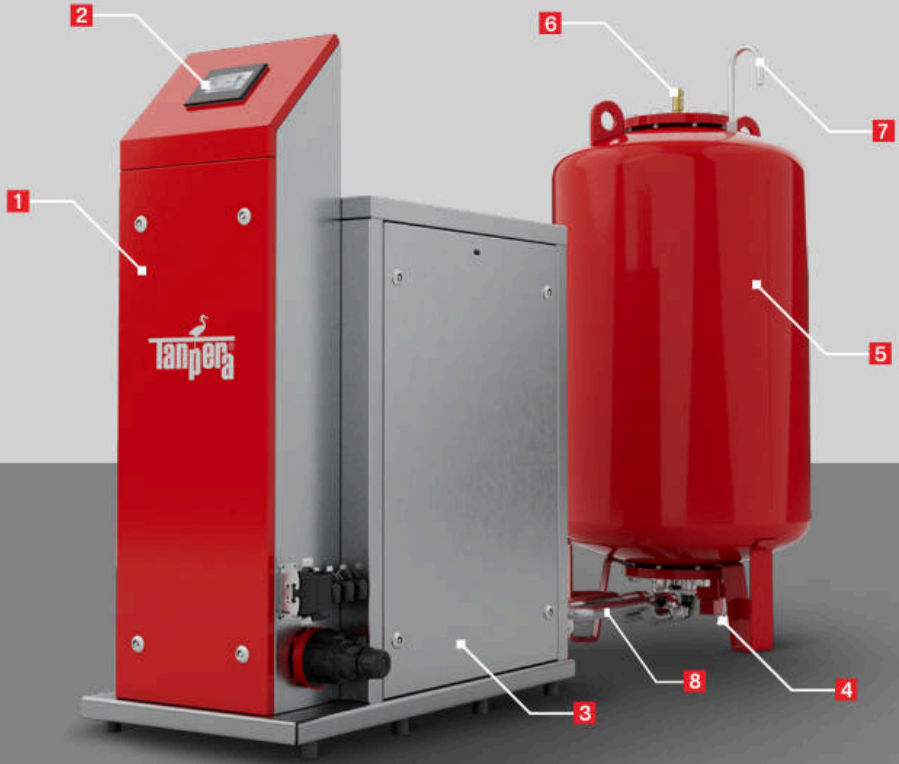
The water stored in the Expansion Tank is pumped back into the system as the pump activates, re-pressurizing the installation to the desired pressure and keeping the installation pressure constant. When the installation pressure reaches the desired level, the pump deactivates.



5. Installation Water Loss: The integrated flow automation system and flow meter on the Pumped Expansion System measure the amount of decreased water, and water is automatically supplied to the installation from the supply. With automatic water supply, the installation pressure is kept constant.

4. Device Components

1. Safety Switch
2. Control and Command Panel
3. Hydraulic Unit
4. Water Level Sensor
5. Expansion Tank
6. Purge Valve
7. Air Siphon
8. Connection Hoses



5. Product Label

Tanpera®

POMPALI GENLEŞME / BASINÇLANDIRMA SİSTEMİ
PUMP-CONTROLLED PRESSURISATIONS SYSTEM

Model	TPG/P 1Tx2000/10-2PxP1-50		
Seri No Serial No	TPG0001		
Üretim Yılı Year of Production	2021	Çalışma Sıcaklığı Working Temperature	90°C
Dizayn Basıncı (Bar) Design Pressure	10	Test Basıncı (Bar) Test Pressure	15
Hacim (lt) Volume	2000		

Part & Services
Yedek Parça ve Servis İçin
www.tanpera.com.tr
servis@tanpera.com.tr

6. Scope of Delivery

The scope of delivery is described in the dispatch document. Immediately after receiving the device, check the materials for accuracy and damage. Please report any transport damage to us immediately.

On the pallet

- Control Unit
- Pressure Sensor and Connection Cable
- Weight Sensor and Connection Cable
- 2 x 1" 50 cm Tank Connection Hoses

Additionally

- Expansion Tank(s)
- Dynamic Pressure Balancing Tank

Transport

During transport, ensure the products are handled in a way that prevents tipping, crushing, or getting wet. When unloading the products from the vehicle, ensure they do not fall or tip over; use appropriate handling equipment when necessary to transport them to the storage or installation location.

Storage

- Store products in a dry and ventilated environment.
- Take precautions to prevent products from tipping due to earthquakes or other causes.
- Do not place any load on the products or prevent objects to fall on them.
- Protect products from water damage or getting wet from above or sides.

7. Installation and Connections

7.1. Inspection of Delivery Scope

The device is carefully inspected and packaged before delivery. Damage during transportation is possible.

- Inspect the delivery upon receipt.
- Check for completeness.
- Inspect for potential damage caused during transportation.
- Report any damage (if present).

7.2. Preparations

Condition of the Shipped Device:

- Check all screw connections of the device to ensure it is securely seated, tighten if necessary.

Preparations for Installation

- Unauthorized personnel are not allowed to interfere.
- Ambient temperature conditions: 0 to 45°C (storage conditions are also the same).
- Flat and sufficiently load-bearing surface.
- Ensure the control unit and tanks are placed on the same floor level.
- Provide the possibility of water addition for the Automatic Water Supply function.
- Ensure an outlet for the drainage line.
- If desired, provide suitable connections for communication.

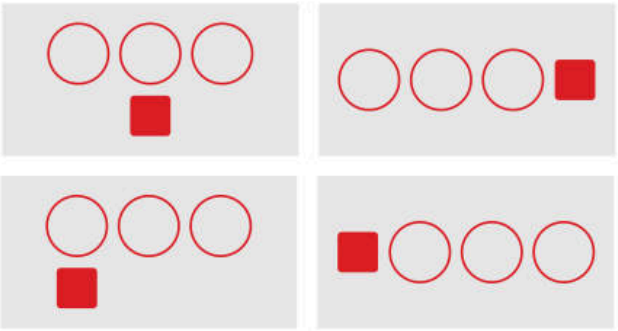
7.3. Hydraulic Connections

Follow these steps for installation:

1. Locate the device.
2. Locate the main tank and optional additional tanks.
3. Ensure the water connections between the Control Unit and the system.
4. Ensure the water connections between the Control Unit and the tanks.

7.3.1. Positioning

- Determine the location of the control unit and tanks.
- The control unit can be located in front, to the left, or to the right of the tank(s).



7.3.2. Weight Sensor Installation

A weight sensor is included in the delivery scope and sent with the control unit. One leg of the expansion tanks is left short for this sensor. Install the sensor as shown in the following photo.

Preparations for Installation

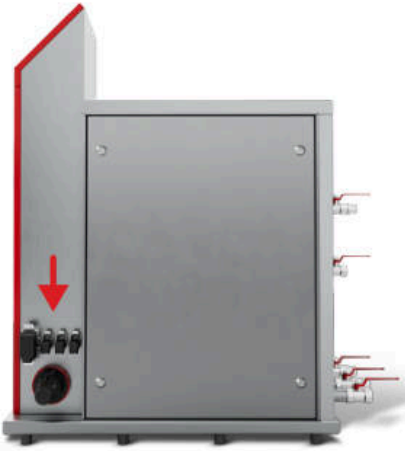
- M16x2 Bolt Nut
- M16 Washer
- Mounting Plate
- Load Cell
- Load Cell Support Leg
- M16 Washer
- M16x70x2 Screw

After the device is activated;

- Adjust the Load Cell Support Leg with a screwdriver.
- Set the "Filling Ratio" value displayed on the screen to zero.

7.3.3. Electrical Connection of the Drain Valve

The cable of the drain valve located at the bottom of the tank is sent with a socket for connection to the hydraulic unit.



7.3.4. Weight Sensor Installation

A weight sensor is included in the delivery scope and sent with the hydraulic unit. One leg of the expansion tanks is left short for this sensor. Install the sensor as shown in the following photo.

7.3.5. Fixing the Tanks

- Locate the tanks with enough place on the sides and top.
- Ensure the tanks are positioned perpendicular and free-standing.
- Use additional tanks with the same type and dimensions.
- Ensure the proper functioning of the weight sensor.
- Place the control unit at the same level as the tanks.
- The holes in the tank feet are only for transport safety. Do not secure the tanks to the ground.

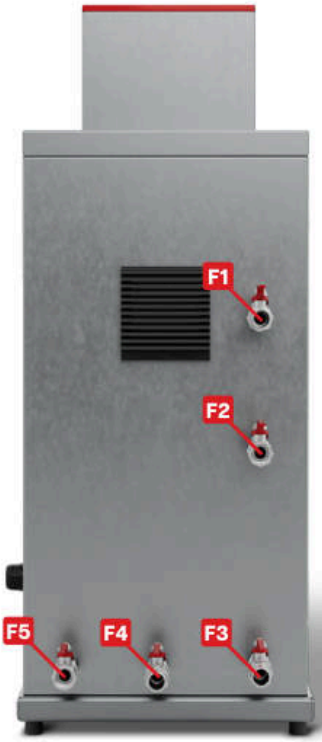
7.3.6. Expansion Tank Connections

There are 4 connections under the expansion tank:

- Connection 1 must be connected to the F3 output on the Control Unit.
- Connection 2 must be connected to the F4 output on the Control Unit.
- Connection 3 is for connecting additional tanks if there are multiple tanks.
- Connection 4 is for connecting the drain valve. It must be connected to the system drainage line.

7.3.7. Control Unit Connections

There are 5 connection points on the back of the Control Unit:



Connection Point 1:

- Pressure Relief (Expansion) Line
- Connect to the return line of the heating system.
- Do not use a shut-off valve; if used, ensure unauthorized personnel cannot operate it.
- Up to 5 m: R1", up to 15 m: R1 ¼", consult the company for longer or complex situations.

Connection Point 2:

- Supply Water Connection
- Conditioned water according to heating system standards.
- Minimum pre-pressure: 1 bar, Maximum pressure: 10 bar.
- Connection size: R ½".

Connection Point 3:

- Connect to port 1 of the membrane tank mounted nearby using the 1"-50 cm flexible connection set.
- Optionally, this distance can be increased by consulting the company.

Connection Point 4:

- Connect to port 2 of the membrane tank mounted nearby using the 1"-50 cm flexible connection set.
- Optionally, this distance can be increased by consulting the company.

Connection Point 5:

- System Pressurization (Contraction) Line
- Connect to the return line of the heating system.
- Do not use a shut-off valve; if used, ensure unauthorized personnel cannot operate it.
- Up to 5 m: R1", up to 15 m: R1 ¼", consult the company for longer or complex situations.

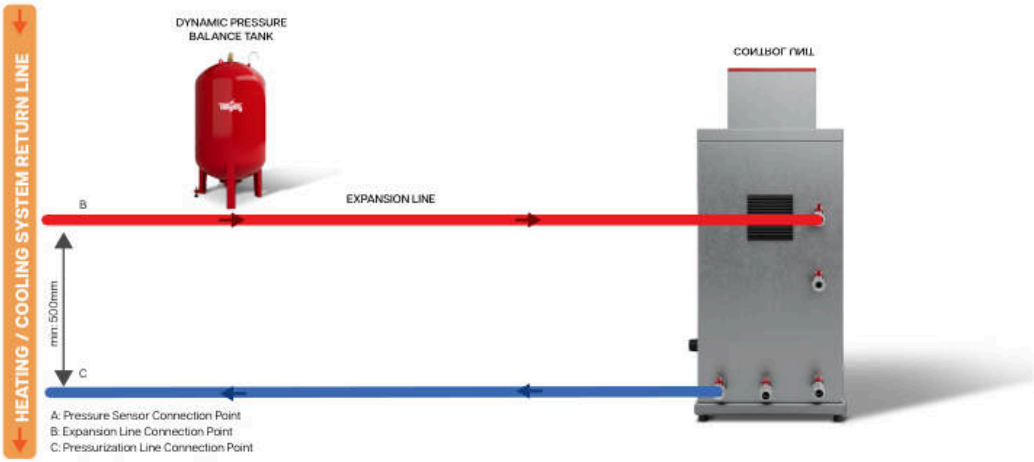
7.3.8. System Connections of the Control Unit

When making system connections, the following diagram must be considered.

There are 4 connections under the expansion tank:

- F1 Connection is shown with a red line.
- F5 Connection is shown with a blue line.

Unless otherwise specified, the system must be connected to the return collector. According to the system flow direction, the expansion line (F1) should be installed first, followed by the pressurization line (F5) with a minimum distance of 500 mm.

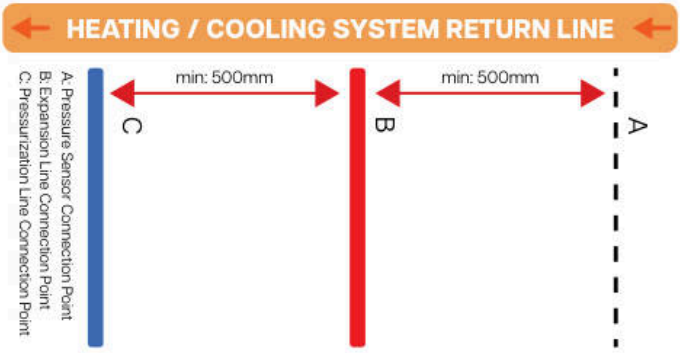


7.3.9. Installation of the Dynamic Pressure Balancing Tank

One 50, 100, or 200-liter closed expansion tank is supplied in the delivery scope. This tank should be connected in a T-shaped manner to the expansion line (red line) to absorb sudden pressure changes. The connection method is indicated in the diagram above.

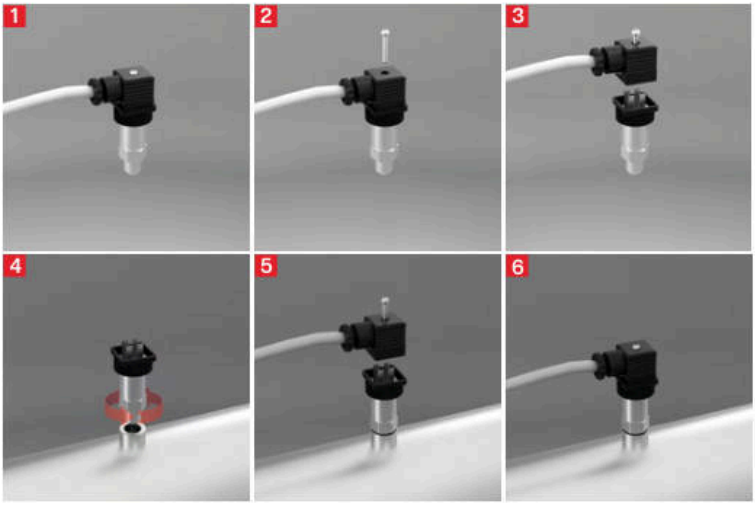
7.3.10. Installation of the Pressure Sensor

One pressure sensor is supplied with the delivery. This sensor, with an R1/4 connection size, should be installed on the collector during system connections (6.3.7). It can be installed before or after the pipe connections, ensuring a minimum distance of 500 mm.



To install the sensor on the collector, follow these steps:

1. Unpack the pressure sensor cable.
2. Remove the screw on the sensor.
3. Open an inlet on the collector.
4. Mount the sensor cable on the collector according to the provided instructions.
5. Plug in the sensor.
6. Tighten the screws on the sensor.



7.4. Electrical Connections

The device requires connections to:

- The main power supply.
- Communication connections, if needed.

WARNING

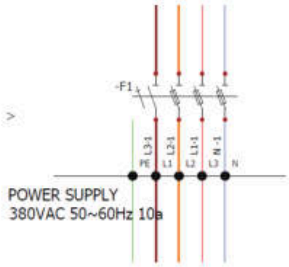
- Contacting components with current can result in life-threatening injuries.
- Ensure the power supply line to the device is de-energized and secured against reactivation.
- Make sure the system cannot be restarted by others.
- Ensure that the electrical installation work is carried out only by an electrical technician and in accordance with local electrical codes.

The following descriptions pertain to standard installations and are limited to the necessary connections required by the customer.

7.4.1. Main Power Supply Connection

The device should be powered with a cable of 5x1.5 mm² cross-section based on its power needs. Power inputs are made from the side of the Control Unit as shown below.

1. Disconnect the plug.
2. Make the electrical connection as show.

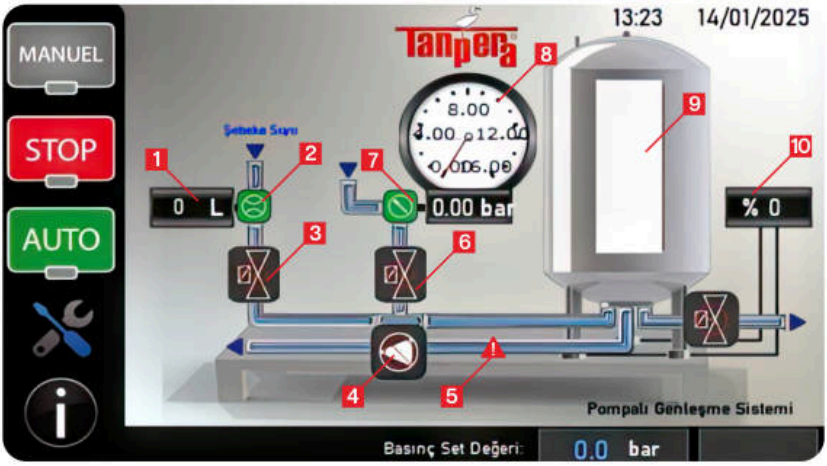


7.4.2. Communication, Weight Sensor, and Pressure Sensor Connections

Three sockets located above the main power input are for device communication, weight sensor, and pressure sensor connections. Attach the sockets as shown below.

8. Commissioning

8.1. Screen Description and Completing Initial Settings



1 Flowmeter Indicator
2 Flowmeter
3 Solenoid Valve
4 Pump
5 Fault Indicator
6 Solenoid Valve
7 Pressure Gauge
8 Pressure Gauge Indicator
9 Filling Status
10 Filling Ratio Indicator

The device's control panel includes a 4.3-inch touch screen. The functions of the icons on the screen are described below.

Manual Mode: Allows individual operation of components (solenoid valve, motorized valve, and pump) as per the user's preference. Clicking on a component once will turn its icon green and activate it. Clicking again will turn the icon gray and deactivate it.

Auto Mode: Automatically manages pressure relief and pressurization operations based on the working pressure settings.

Stop Mode: Safely shuts down all components on the device, putting it in standby mode.

Settings Screen: Provides access to device settings.

8.1.2 Language Option

You can change the language option from the settings screen as shown below.

8.1.3 Date-Time Settings

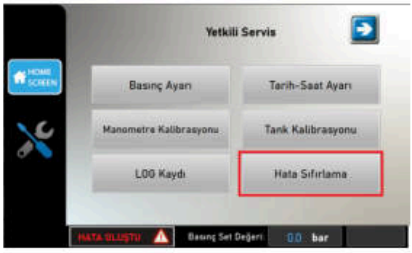
Set the date and time during the initial setup from the settings screen.

8.1.4 Adjusting the Set Pressure

The set pressure is calculated based on system conditions. Enter the calculated set pressure value in the relevant section of the settings screen.

8.1.5 Clearing Possible Error Codes

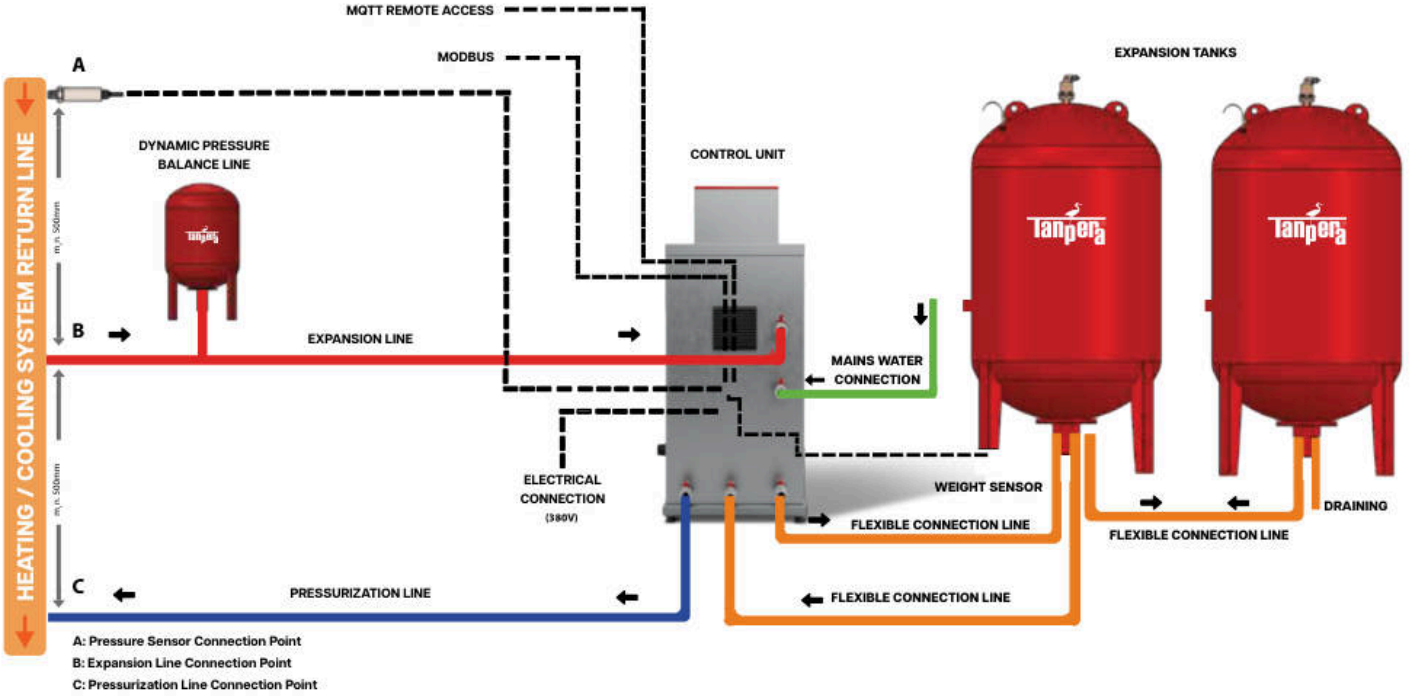
The system provides information to the user with 11 error codes. If an error occurs during operation, it will be displayed on the screen. After taking the necessary actions, you can clear the error code from the screen.



9. Error Codes

BIT NO	ERROR NAME	DESCRIPTION	SOLUTION
0	Load Cell Error	The load cell is showing a calibration error.	The load cell should be inspected. It should be recalibrated and reported to the service department.
1	Load Cell Max Error	The tank's fill level has risen above 95%.	The drain valve should be checked. This should be reported to the service department.
2	Load Cell Minimum Error	The tank level has dropped below 15%.	The automatic fill valve should be inspected. This should be reported to the service department.
3	Load Cell Disconnection Error	The load cell is not sending the correct data.	The load cell should be inspected. This should be reported to the service department.
4	Pressure Sensor Error	The pressure sensor is not providing accurate data.	The pressure sensor should be checked. This should be reported to the service department.
5	Water Meter Error	The water meter is not providing accurate data.	The water meter and automatic fill valve should be checked. This should be reported to the service department.
6	Pump-1 MPS Error	The Pump-1 motor protection switch is tripping.	The MPS should be set to the closed position. If the issue recurs, it should be reported to the service department.
7	Pump-2 MPS Error	The tank's fill level has risen above 95%.	The MPS should be set to the closed position. If the issue recurs, it should be reported to the service department.
8	Expansion Valve Error	The load cell is showing a calibration error.	The expansion valve should be inspected. Report this to the service department.
9	Automatic Fill Valve Error	The automatic fill valve has opened, but the tank fill level is not increasing, or no signal is being received from the water meter.	The water level in the supply line and the connecting pipes should be checked.
10	Drain Valve Malfunction	The drain valve has been opened, but the tank level is not decreasing.	The drain valve and piping should be inspected.
11	Phase Monitoring Error	There is an error in the phase, or the phase is out of sync.	Check if there are three phases. Make the appropriate phase adjustment. Notify the service department.
12	"Pump Running, Pressure Not Increasing" Error	The pump is running, but the pressure isn't building up.	The pump's operation and air in the pump system should be checked. Globe valves should be checked. This should be reported to maintenance.
13	Automatic Fill Valve Closed, Water Meter Increase Error	The automatic fill valve is closed, but water is still flowing through the water meter.	The automatic fill valve should be inspected. This should be reported to the service department.
14	High Pressure Error	A value higher than the set pressure is displayed.	The system should be checked. This should be reported to the service department.
15	Controller Disconnection Error	The RS485 cable has come loose.	The RS485 cable must be replaced. This should be reported to the service department.

TANPERA DUAL TANK EXAMPLE INSTALLATION DIAGRAM



Tanpera A.Ş.

+90 850 308 01 14

info@tanpera.com.tr
www.tanpera.com.tr

Şeyhli Mh. Ankara Cd. No: 380/C
Pendik, İstanbul, Turkey

Tanpera GmbH

+49 1590 41388428

info@tanpera.de
www.tanpera.de

Hermann-Essig-Str. 36 71701
Schwieberdingen, Stutgart, Germany

Tanpera®

Experience the changes...