

We hope the information contained in this manual will be of use to you. It is based on concrete data and on the best of our current knowledge. Please read this manual carefully, including all warnings and recommendations. No part of this manual may be reproduced or transmitted to a third party without the prior written permission of TETRA PAK HOYER.

Machine

HOYER MIXTURA BATCH

Serial number

**MW**  
**MACHINERY WORLD**

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**1 Identification of the machine**

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**2 General information**

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**3 Description of the machine and technical data**

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## HOYER MIXTURA BATCH

### 1 - IDENTIFICATION OF THE MACHINE

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## 1.1 Introduction

Thank you for having chosen a Tetra Pak Hoyer machine.

We recommend you read this manual carefully, as it contains essential information regarding the installation, checking and maintenance operations required to keep your machine in perfect condition.

The manual contains tables, drawings and diagrams which will allow you to familiarise yourself with all parts of the machine.


Please let us know if any information is missing or is not sufficiently detailed. Your comments will be used to improve this manual.


## 1.2 Identification plate

For maintenance and service operations not described in this manual or for any other problem of a technical nature, our Service Department is at your complete disposal for information or to arrange for the necessary measures to be taken.

When contacting our Service Department, please quote the data given on the identification plate affixed to the machine and shown in Fig. 1.1.

MODEL	
SERIAL N.:	
YEAR OF CONSTRUCTION:	
ELECTRICAL SUPPLY:	V
	kW
	ph Hz
PNEUMATIC SUPPLY:	bar Nlt/min.
REFRIGERANT:	Type Kg.
HEATING GAS:	
THERMAL CAPACITY:	Kcal/h


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**Made in Italy**

**Fig.1.1-Identification plate**

### 1.3 Service Centres

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If you have any requirement or problem that requires our assistance, please contact one of the following service centres, which are authorised to perform maintenance and provide technical service under warranty for Tetra Pak Hoyer machines.

#### **EUROPE and MIDDLE EAST:**

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## **HOYER MIXTURA BATCH**

### **2 - GENERAL INFORMATION**

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## 2.1 Declaration of conformity

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This machine has been manufactured in accordance with international standards and hygiene and sanitary legislation applicable to food processing machinery. In the Declaration of Conformity supplied with the machine, Tetra Pak Hoyer specifically certifies that

the HOYER MIXTURA BATCH machine is designed and manufactured in accordance with the provisions of Directive 89/392/EC (Machinery Directive) and with above-mentioned standards.

## 2.2 Preliminary comments



- The illustrations and drawings of the machine are intended for general reference use only, and are not necessarily accurate in every detail;
- The machine dimensions and specifications given in this Manual are not binding and may be changed without prior notice;
- The drawings and all other documents supplied with this machine remain the property of Tetra Pak Hoyer and must not be passed on to third parties without the written permission of Tetra Pak Hoyer.
- The manual includes instructions for all accessories mounted on the standard machine.
- **This machine is covered by a warranty as laid down in the purchase contract. Any repair work not authorised by Tetra Pak Hoyer carried out during the warranty period will automatically invalidate the warranty.**

## 2.3 General safety rules



- **THESE SAFETY RULES HAVE BEEN DRAWN UP IN YOUR INTEREST.** Strict observance will reduce the risk of injury to yourself or to others.
- **DO NOT** attempt to move, install or operate the machine before reading and assimilating the contents of this manual. Ask your superior in case of doubt.
- Make sure that all guards and safety covers are in position **BEFORE** starting the machine.
- **NEVER** leave tools, mechanical parts or other foreign material on or inside the machine.
- In the event of a malfunction, press the emergency stop button.
- **NEVER PUT YOUR HANDS INSIDE THE MACHINE WHEN IT IS IN OPERATION.**
- Be very careful even when the general switch is set to "OFF", because there is still voltage in the power supply cables.
- Shut off the compressed air supply before disconnecting any pneumatic component.
- **BEFORE** starting up production again after maintenance or repair work, make sure that all guards and protective covers have been replaced correctly.
- Proceed with caution at all times. Remember that you are responsible for your own safety and for that of your colleagues. Make sure that applicable regulations are observed when moving or lifting the machine.



## 2.4 Special warnings

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- All personnel operating the machine must be familiar with the general safety rules and must observe them strictly. Failure to follow these rules may result in personal injury or damage to machine components.
- Maintenance work must be performed with the machine turned off. The general switch must be set to “OFF”, the air valve closed and a “work is in progress” sign affixed to the machine.
- The user must make sure that all instructions given in this manual are observed strictly.
- Some components of the machine become very hot. After turning off the power supply, wait until the machine has cooled down to ambient temperature before beginning work on it.
- Users will be solely responsible for risks caused by tampering with the safety system.
- The safety of machines used in conjunction with this machine, if not supplied directly by Tetra Pak Hoyer, is the responsibility of the customer.
- The pressure, speed, temperature, and voltage limits and all other instructions given are indispensable for correct operation of the machine and must always be complied with by the customer.
- Ambient conditions must be taken into consideration during installation.
- National legislation governing this type of machine must be observed.

## 2.5 Ambient operating limits

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The machine is suitable for operation in the following ambient conditions:

- Temperature : from 4°C to 40°C
- Humidity : from 20% to 95%.



### NOTE:

Tetra Pak Hoyer will accept no responsibility for damage or injury caused by failure to comply with the above warnings.



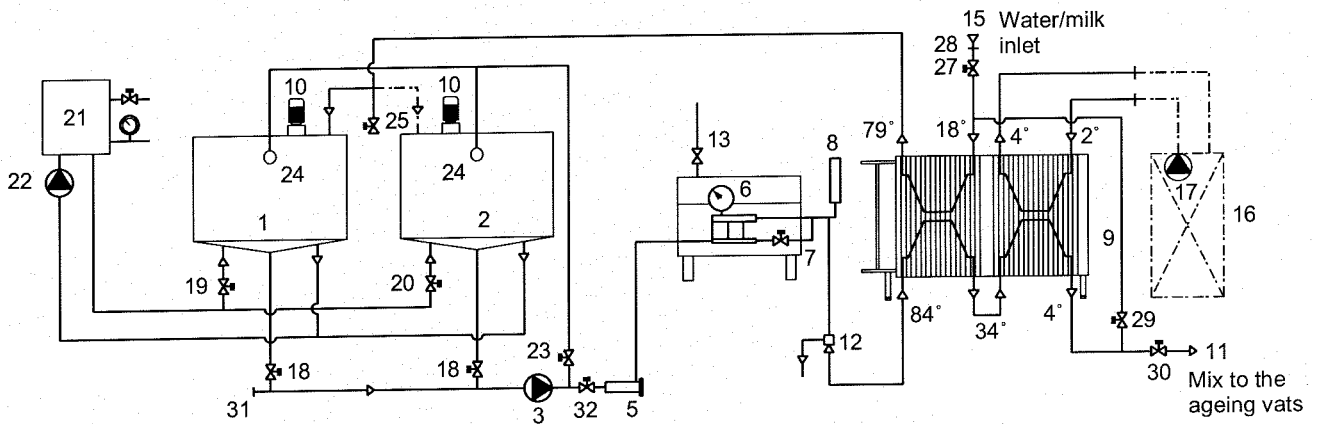
## HOYER MIXTURA BATCH

### 3 - DESCRIPTION OF THE MACHINE AND TECHNICAL DATA

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**Fig. 3.1**

- |           |                                 |           |                                 |
|-----------|---------------------------------|-----------|---------------------------------|
| <b>1</b>  | Mixing tank no. 1               | <b>16</b> | Chilled water tank              |
| <b>2</b>  | Mixing tank no. 2               | <b>17</b> | Chilled water pump              |
| <b>3</b>  | Mix pump                        | <b>18</b> | Mix outlet manual valve         |
| <b>4</b>  | Water/milk inlet into the tanks | <b>19</b> | Heating valve; tank no. 1       |
| <b>5</b>  | Mix filter                      | <b>20</b> | Heating valve; tank no. 2       |
| <b>6</b>  | Homogenizer                     | <b>21</b> | Steam unit or boiler            |
| <b>7</b>  | Bypass of the homogenizer       | <b>22</b> | Hot water pump                  |
| <b>8</b>  | Pressure damper                 | <b>23</b> | Tank washing valve              |
| <b>9</b>  | Plate heat exchanger            | <b>24</b> | Washing spray balls             |
|           | A: Precooling                   | <b>25</b> | Water outlet manual valve       |
|           | B: Final cooling                | <b>27</b> | Water/milk inlet valve          |
| <b>10</b> | Stirrer                         | <b>28</b> | Water/milk flow adjusting valve |
| <b>11</b> | Mix outlet                      | <b>29</b> | Recirculation valve for CIP     |
| <b>12</b> | Safety valve                    | <b>30</b> | Mix outlet valve                |
| <b>13</b> | Compressed air tap              | <b>31</b> | Plug                            |
| <b>15</b> | Water/milk inlet                | <b>32</b> | Mix valve                       |

### 3.1 Description of the plant

---

HOYER MIXTURA BATCH is a plant for the continuous production of ice cream mix. The plant is supplied factory tested with all the equipment fully assembled and the electrical and water systems connected. The plant is therefore ready for immediate use and need only be connected to the electricity, steam (gas), water, ice-cold water and compressed air supplies.

The components are mounted on two independent frames, one of which houses the boiler, enabling it to be located in a different room to the rest of the plant.

The main support frame houses the following equipment:

- two heat-insulated pasteurising tanks with mixers, surrounded by a space filled with water, each of which has a capacity equal to the hourly capacity of the plant. The liquid and solid ingredients are poured into the tanks. Alternate use of the two tanks ensures a continuous production process.
- centrifugal pump for transferring the mix from the balancing tank to the homogeniser. The function of the pump is to feed the homogeniser correctly. Between the pump and the homogeniser is the mixture filter.
- plate heat exchanger with two distinct sections:
  - precooling of the mix coming out of the homogeniser. The cooling fluid is the pasteurised, homogenised mix which is being cooled, while the heating fluid is the water or milk on its way into the pasteurising container; this section therefore operates by recovering heat.
  - final cooling to bring the temperature of the mix down to its ageing temperature of 4°C. The cooling fluid is ice cold water (max. 2°C) which must be supplied from a suitable tank not included in the supply.
- homogeniser with a continuous operating pressure of up to 200 bar.

- centralised electric control cabinet for controlling all equipment and displaying temperatures.

The separate smaller frame housing the steam heated hot water boiler (standard version) includes:

- brazed plate water/steam heat exchanger with condensate drain
- automatic water temperature controller which acts directly on the steam feed.
- shut-off valve and steam bypass
- hot water circulation pump
- hot water expansion tank with breather, feed reducer and safety valve

In order to operate the HOYER MIXTURA BATCH, it must be first connected to the following supplies:

- a. ELECTRICAL POWER SUPPLY.
- b. MAINS WATER, needed for
  - making up the percentage of liquid in the mix when milk is not used
  - filling the boiler circuit
  - washing the machine
  - cooling the homogeniser pistons
- c. STEAM or combustible gas to heat the water required to heat and pasteurise mix in tanks
- d. ICE COLD WATER, required to complete the cooling of the mix in the fourth section of the plate heat exchanger.
- e. COMPRESSED AIR for the homogeniser and pneumatic valves.

## 3.2 Operation

The operating cycle of the HOYER MIXTURA BATCH pasteurising plant is described below and refers to figure 3.1.

The liquid component (water or milk) is fed automatically into the mixing tanks, while the solid ingredients are added separately by hand through the opening on the top of the insulated tanks. The two tanks guarantee continuous production of the mix, in that while the pasteurised mix in one tank is being continuously homogenised, the next batch of mix is being prepared and pasteurised in the empty tank. As soon as the first tank is empty, its outlet valve closes automatically (Pos. 18) and the valve on the other tank (Pos. 18) in which the new mix has been prepared and pasteurised opens, starting a new homogenising and cooling cycle.

When the plant is first started-up cold, the process water or milk is heated to the mixing temperature (79°C) directly in the tank in which hot water produced by the heating system is circulated. In subsequent cycles, Section A is active, in that the heat is recovered for heating water or milk for the next cycle to 79°C.

The hot water or milk enters one of the two tanks where it is mixed with the solid ingredients. The dissolving of the solids causes a reduction in the initial temperature in the tank to produce a mix of around 58°C. The mix is heated from 58°C to 80°C (pasteurising temperature) by hot water circulating in the space surrounding the pasteurising tanks.

A centrifugal pump (Pos. 3) transfers the mix from the pasteurising tank to the homogeniser (Pos. 6), where the mix is homogenised at a pressure of 150 to 250 bar. Pressure may be adjusted using the pressure regulator. The homogeniser increases the temperature of the mix by about 4°C, so that the mix enters the first cooling section at a temperature of 84°C.

A good homogenising process is important for the consistency and quality of the finished ice-cream. During homogenisation, the fats contained in the mix are broken down into minute particles and are uniformly distributed throughout the product.

After homogenising, the mix enters the precooling section (Section A).

The pasteurising temperature is read by a sensor located in each tank and is displayed on the control panel.

Cooling takes place in two stages:

In the first stage (Section A), the mix is cooled from 84°C to around 34°C (depending on the temperature of the incoming water or milk), transferring heat to the water or milk coming into the other tank.

During this stage, the cooling agent is water or milk going into the mixing tank for preparation of mix for the next cycle, which must be heated to a temperature of 79°C.

This means that the heat of the hot mix to be cooled is recovered and used to heat the cold water or milk going into the tank. This system cuts down on the amount of energy used for heating the incoming water or milk and for final cooling of the mix.

In the final cooling, the mix, which has already been cooled as much as possible by the water or milk available, is cooled even further to 4°C in the last part of the heat exchanger (Section B). The cooling agent in this phase is ice cold water from a chilling unit (Pos. 16) which is supplied separately on request.

Finally, the mix arrives at the delivery pipe feeding the vats (Pos. 11).

The plant is equipped with a water boiler (Pos. 21) and pump (Pos. 22) to provide the required heat by circulating hot water in the space around the insulated tanks.

### **NOTE:**

The temperature values indicated in the functional diagram (Fig. 3.1) are the temperatures applicable to a mix of 40% solid ingredients with fats placed in the mixing vats in a liquid state and process water at 18°C.

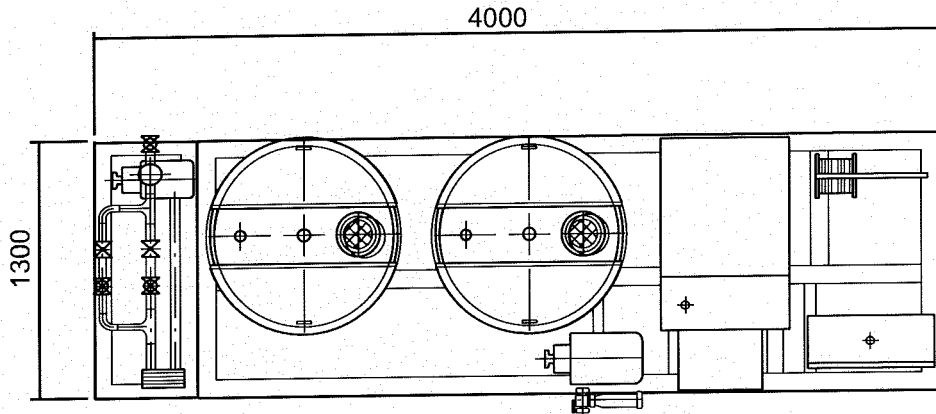
The heat exchanger has also been designed to operate correctly with:

- fats added in their solid state (introduced in small pieces in order not to deform the blades of the mixer);
- process water with temperatures up to 30°;
- milk at 4°C.

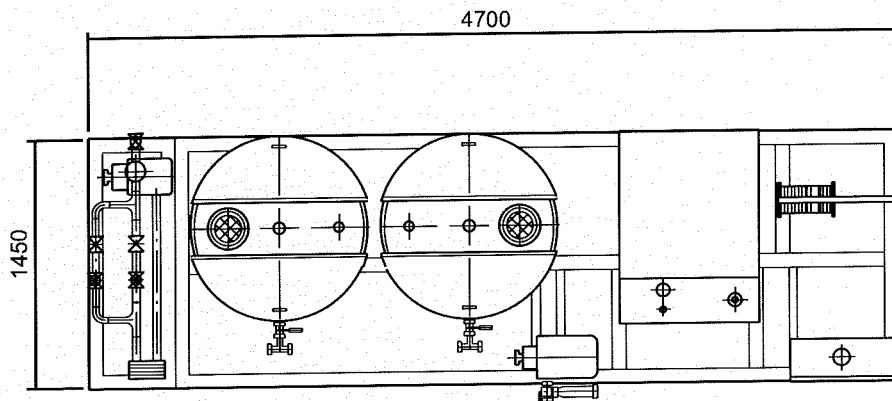
In these cases, the intermediate temperatures will have different balancing values to those described above, while still maintaining values of +84°C for pasteurising and +4°C for sending to the ageing vats.

### 3.3 Technical data

HOYER MIXTURA BATCH	300	600
Net weight (model with steam unit)	1200	1500



**Hoyer Mixtura 300 BATCH - Fig. 3.2**



**Hoyer Mixtura 600 BATCH - Fig. 3.3**

#### 3.3.1 Reference mix

Water	60-68%
Total solids	32-40%
Sugars	15-21%
Fats	8-12%
Non-fat milk solids	8-12%
solids	1-5%

**NOTE:**

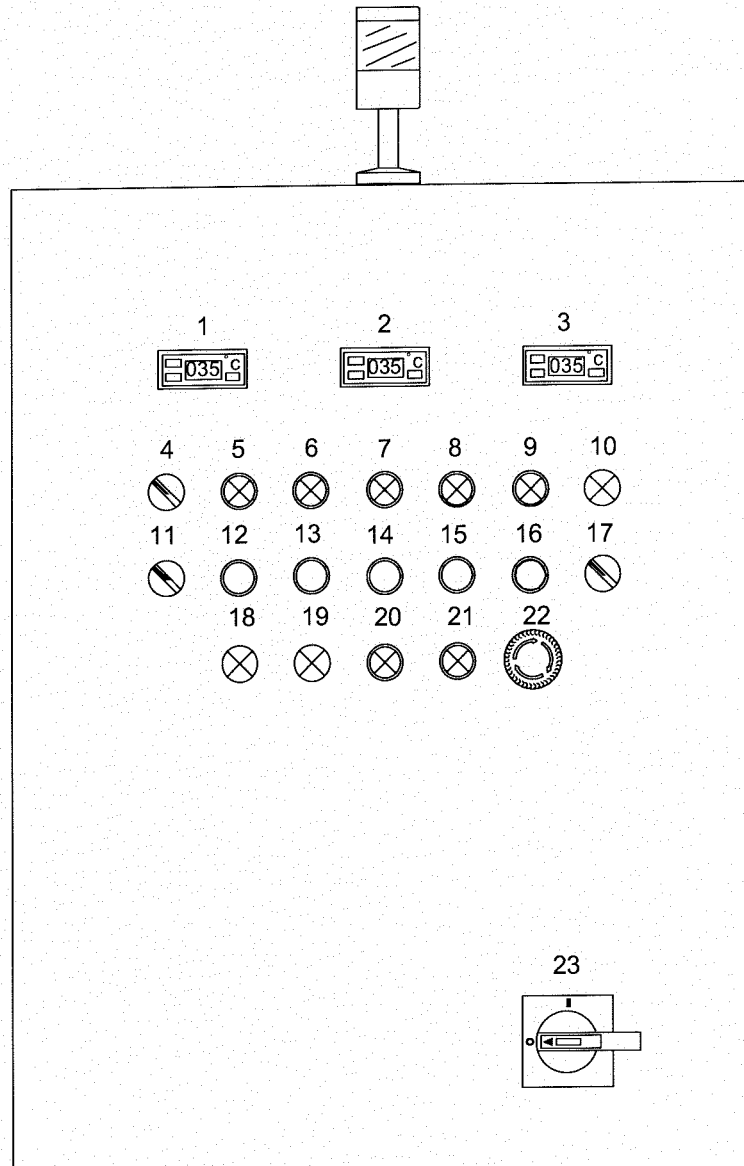
The maximum working pressure of the heat exchanger is 6 bar.

Consequently, do not use stabilisers such as potato flour which create excessive viscosity at low temperatures.

### 3.3.2 Services

Hoyer MIXTURA BATCH	Unit	300	600	NOTES
<b>Mix:</b> - Outlet fitting to the ageing vats:	clamp	1"	1"	
<b>Mix preparation</b> (60% liquid): - Water/milk inlet connection: - Water flow (*): - Milk flow: - Minimum inlet pressure:	clamp lt/h lt/h bar	¾" 215 196 1.5	¾" 425 392 1.5	(* ) Drain or recover the excess hot water at 79°C.
<b>Heating capacities:</b> Pasteurization: - Heating capacity during the cycle:  First heating from cold condition. - Heating capacity at start-up while using (*): - H <sub>2</sub> O 18°C: - H <sub>2</sub> O 30°C:	kW  kW kW kW	7  22 19 24	14  44 38 48	(* ) The heating time is 55 minutes if water is being used in the mix recipe; in case of use of milk the heating time is 60 minutes.
<b>Heating by steam</b> (standard version): - Inlet connection (flange DIN 2673): - Maximum steam consumption (*): - Minimum inlet pressure (gauge): - Maximum inlet pressure (gauge): - Condensate drain connection: - Water connection:	DN Kg/h bar bar bar	15 40 1 5 ½" ½"	15 80 1 5 ½" ½"	(* ) Saturated steam at 1 bar gauge for the first heating from cold condition of milk at 4°C (worst case).
<b>Heating by natural gas CH<sub>4</sub></b> (*) (on request): - Inlet gas connection: - Maximum consumption (**): - Minimum inlet pressure:  - Exhaust diameter to the chimney: - Water connection:	m <sup>3</sup> /h mbar  mm bar	¾" 2.7 20  180 ½"	¾" 5.4 20  200 ½"	(* ) The boiler can run with other gases. Refer to the boiler manual. (**) First heating from cold condition of milk at 4°C.
<b>Cooling by chilled water:</b> - Inlet and outlet connections: - Maximum inlet temperature: - Requested water flow: - Pressure drop: - Maximum cooling capacity: - Approx. outlet temperature (*): - Recommended TPHoyer chilled water tank: (power of compressor)	 °C lt/h bar kW °C kW	 2 4300 0.4 14.5 5 5.5	 2 7300 0.4 26.5 5 11	(* ) Depending on the temperature of the inlet water or milk which is being used in the recipe of the mix.
<b>Electrical data</b> (400/3/50) (*): - Total installed power: split as: - Homogenizer main motor fan - Mix pump nr 3 - Stirrer (each) - Hot water pump - Controls	kW  kW kW kW kW kW kW	9.7  5.5 --- 1.1 2.2 0.37 0.5	11.8  7.5 0.10 1.1 2.2 0.37 0.5	(* ) Other mains voltage are available on request.
<b>Compressed air:</b> - Inlet connection: - Air consumption: - Minimum inlet pressure: - Maximum inlet pressure:	 Nl/min bar bar	¼" 50 5 8	¼" 50 5 8	
<b>Tap water to the homogenizer:</b> - Inlet connection: - Water consumption:	 lt/h	½" 70	½" 100	

### 3.4 Control panel



**Fig. 3.4**

- |           |                                     |           |                               |
|-----------|-------------------------------------|-----------|-------------------------------|
| <b>1</b>  | Heating temperature                 | <b>13</b> | Tank 1 mixer – stop           |
| <b>2</b>  | Pasteurising tank no. 1 temperature | <b>14</b> | Tank 2 mixer – stop           |
| <b>3</b>  | Pasteurising tank no. 2 temperature | <b>15</b> | Mix pump - stop               |
| <b>4</b>  | Tank no. 1/2 heating switch         | <b>16</b> | Homogeniser – stop            |
| <b>5</b>  | Circulation - start                 | <b>17</b> | Homogeniser pressure switch   |
| <b>6</b>  | Tank 1 mixer - start                | <b>18</b> | Power on indicator light      |
| <b>7</b>  | Tank 2 mixer - start                | <b>19</b> | Overload warning light        |
| <b>8</b>  | Mix pump - start                    | <b>20</b> | Alarm and no air reset button |
| <b>9</b>  | Homogeniser pump – start            | <b>21</b> | Reset button                  |
| <b>10</b> | No water indicator light            | <b>22</b> | Emergency button              |
| <b>11</b> | Heater switch                       | <b>23</b> | General switch                |
| <b>12</b> | Circulation – stop                  |           |                               |



## HOYER MIXTURA BATCH

### 4 - INSTALLATION

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## **4.1 Unpacking and checking the contents**

---

The machine is delivered in a wooden crate. The crate should be unpacked as close to the location of installation as possible; it may be transported with a forklift.

When the crate has been positioned correctly, proceed with unpacking as follows:

- a. Extract the nails from the top of the crate and remove the top. Repeat this operation for the sides of the crate. Watch out for the wooden spacers positioned between the sides of the crate.
- b. Remove the box of spare parts and other components from the crate.
- c. Extract the nails from the wooden blocks used to secure the machine in transit and remove the protective cellophane.
- d. Check that the contents of the packages correspond to the items indicated in the shipping documents.
- e. Check that the top and side panels of the crate were correctly fixed and that no parts have come loose in transit.
- f. Visually inspect all electrical components, looking for signs of damage.
- g. If a part/component is missing, stop unpacking the machine and notify Tetra Pak Hoyer immediately.
- h. If the machine has been damaged in transit, notify the insurance company immediately and do not proceed further with unpacking until authorised to do so by the insurance company.

## **4.2 Positioning and installation**

---

After unpacking and checking the contents, place the plant in its working position.  
Level the frame by adjusting the feet.

## **4.3 Electrical connection**

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Check that the local electricity supply corresponds to the data on the machine's identification plate.  
Connect the electricity supply to the electric panel.  
Check that the motors rotate in the direction indicated by the arrows, especially on the homogeniser.

## **4.4 Pneumatic connection**

---

Connect the compressed air supply (minimum pressure 5 bar) to the air inlet connection on the machine.

## 4.5 Water connection

---

The mains water must be connected to the homogeniser and the water boiler.

Homogeniser connection:

- connect the mains water to the appropriately marked connection on the homogeniser.  
The cooling water drain outlet must be connected to a pipe which in turn is connected to the drainage system. The water is not re-used.

Hot water boiler connection

- connection to the mains is necessary for operation of the machine, regardless of the type of water heater installed.  
The connection is made to the appropriate connection point on the boiler mounting frame.  
A manual shut-off valve is fitted downstream of the connection.

If the mix recipe requires the use of water, connect the process water system:

- a process liquid connection is provided behind the heat exchanger for liquid which passes through the recovery section before being sent to the pasteurising vat.

A manual shut-off valve is mounted immediately after the connection. The diameters of the pipes vary according to the size of the plant and are reported in the table in **CHAPTER 3 - DESCRIPTION OF THE MACHINE AND TECHNICAL DATA.**

## 4.6 Connection to plants with gas-fired boilers

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Connect the gas pipe to the gas inlet fitting (see boiler instructions). The dimensions of the pipe are indicated in **CHAPTER 3 - DESCRIPTION OF THE MACHINE AND TECHNICAL DATA.**

In long pipe runs, the diameter of the pipe must be increased accordingly. For LPG supplies, it is advisable to provide the plant with a bank of gas bottles connected to a single header, which in turn is connected to the boiler by a single pipe.

If such a system is installed in the correct manner, the plant will have a good supply of gas with a few spare bottles connected and ready for switching-in. **The installation of the gas supply must be entrusted to suitably qualified personnel and must comply with current safety standards.**

## 4.7 Connection to chilled water tank

---

Connect the heat exchanger connections to the water inlet/outlet using the appropriate fittings.

## 4.8 Inspecting the homogeniser

---

Before start-up:

1. check the oil level in the sump: normally supplied full.
2. check the direction of rotation: start up the homogeniser for a couple of seconds and check that it rotates in the direction indicated by the arrow.



### **WARNING:**

If the homogeniser motor is turning in the wrong direction, the lubrication system will not function and the machine may be damaged.

3. check that the cooling water for the pumping pistons is flowing correctly from the nozzles to ensure that the pistons are cooled in the proper manner.

## **HOYER MIXTURA BATCH**

### **5 - Set-up and product changeover procedures**

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## 5.1 Set-up

---

The set-up procedure is as follows.

1. Close all the guards.
2. Release the emergency button.
3. Turn the main switch
4. Open the air supply
5. Check that the mixers and powder mixer pump rotate in the direction shown by the arrows.
6. Check that the machine works properly with a small amount of water (about 150 lt).
7. Start up the boiler pump.
8. Heat up water in the tanks to test the machine.
9. Open vat cock.
10. Start up the pump which transfers mix from the vat to the homogeniser.
11. Start up the homogeniser.
12. Check that the homogeniser reaches operating pressure.
13. Supply chilled water to the second section (after having previously started up the water tank).
14. Check the outlet from the second section.

## 5.2 Product changeover

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The product changeover procedures are as follows:

1. Carry out the end of production and pipe emptying procedure described in section **6.3 – Start-up – Production cycle.**
2. Wash the machine as described in section **7.1 – Machine washing procedures.**
3. Start production with the new product as described in sections **6.1 – Preliminary checks and 6.2 – Dry run with hot water.**

## **HOYER MIXTURA BATCH**

### **6 - OPERATING PROCEDURES**

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## 6.1 Preliminary checks

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Before starting up the machine, check that:

1. All connections have been made and all valves are in their working positions.
2. The machine has been thoroughly washed and cleaned. (It is advisable to clean the machine thoroughly before first use; refer to **CHAPTER 7 – CLEANING AND MAINTENANCE**).

 **NOTE:**

Start up the chilled water tank sufficient time beforehand in order to have water available at the correct temperature (max. 2°C) when required for plant operation.

3. Check that air pressure is between 5 and 8 bar.
4. Check that the emergency button works (*Fig. 3.4, Pos. 22*)



**WARNING:**

If the emergency button does not work correctly, contact technical service immediately.



**WARNING:**

Never start up the machine production cycle without first checking once again that the machine is safe.

## 6.2 Dry run with hot water

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This procedure is recommended both as a dry run test for new plants and as a daily operation to carry out prior to starting production. The procedure will remove any traces of washing solution left in the plant.

- Switch on the heater switch (*Fig. 3.4, Pos. 11*) and hot water pump switch (*Fig. 3.4, Pos. 5*), and position the switch (*Fig. 3.4, Pos. 4*) on tank 1.
- Ensure that the chilled water circuit is closed. Open valve (*Fig. 3.1, Pos. 29*) and close valve (*Fig. 3.1, Pos. 30*). Place the pipe to the ageing vats in the drain position.
- Position the pipe (*Fig. 3.1, Pos. 4*) on the tank (1), open the water inlet valve and wait until tank (1) contains about 150 to 300 litres of water (depending on the size of the tank).

- Wait until the water temperature reaches about 80°C, reading the temperature on the control panel (*Fig. 3.4, Pos. 2*).
- Start up the pump (*Fig. 3.1, Pos. 3*). The water will start to flow into the homogeniser and then through the exchanger. Open the exchanger bypass valve (*Fig. 3.1, Pos. 7*).
- After a few seconds of bypass flow through the second pipe, the pipe itself can be repositioned on the constant level tank.
- After a few minutes, open valve (*Fig. 3.1, Pos. 30*), close valve (*Fig. 3.1, Pos. 29*) and drain the water into the ageing vats..

### 6.3 Starting - Production cycle

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Most of the production cycle of the BATCH pasteurising plant is automatic.

Start the production cycle as follows (Fig. 3.1):

1. Start up the chilled water tank.
2. Start up the hot water pump (22), and turn on the heating by starting the boiler (refer to the boiler operating manual).
3. Position the pipe (4) on the tank (1) and make sure that the mix outlet valves (18) are closed.
4. Open valve (27). Water or milk will begin to flow into tank (1).
5. When the liquid in tank (1) completely covers the blades of the mixer, start the mixer motor using push-button (Fig. 3.4, Pos. 6).
6. Add the ingredients required to prepare the mix to tank (1).
7. Open valve (18) of tank (1) and start up the mix feed pump (3) by pressing button (Fig. 3.4, Pos. 8). Pasteurised mix from tank (1) is removed and pumped into the homogeniser.
8. Start up the homogeniser (6) by pressing button (Fig. 3.4, Pos. 9). Make sure that the homogeniser bypass valve (7) is closed (switch Fig. 3.4, Pos. 17).
9. As the mix flows through the exchanger, it is cooled down in two stages until it reaches the valve (30) and exits the machine through the ageing vat delivery pipe (11).

 **NOTE:**

While the cooling cycle is beginning for mix in tank (1), ingredients for preparation of new mix are fed into tank (2). This ensures continuous production and permits Section "A" of the exchanger to work correctly, recovering heat from pasteurised mix in tank (1), which must be cooled down, and using it to heat water or milk used to prepare new mix in tank (2).

10. Position pipe (4) on tank (2) and wait until the mix outlet valve (18) closes.
11. Water or milk flow is factory set to feed precisely the amount required into tank (2) in the amount of time required to empty tank (1).
12. Add solid ingredients required to prepare mix to tank (2), just as you did for tank (1).
13. It is now time to begin pasteurising mix in tank (2). To begin a new cycle, open the mix outlet valve (32) and continue through the steps described in the points above.

 **NOTE:**

The mixer must be kept in rotation throughout the entire cycle. The mixer, in fact, can only be stopped when there is very little mix left in the tank and the blades are almost completely exposed.



## **6.4 Turning off - end of production and emptying pipes**

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To interrupt or end the production cycle, proceed as follows (Fig. 3.1):

1. When carrying out the last pasteurising cycle at the end of the shift, move the inlet pipe (4) into the empty tank and pasteurise the mix in the full tank.
2. When the latter tank is empty, close its mix outlet valve and open the valve on the other tank containing hot water.
3. Start the homogeniser (*push button Fig. 3.4, Pos. 9*) without pressure and with the bypass valve (7) open (*switch Fig. 3.4, Pos. 17*).
4. When the pasteurised mix has been emptied from the tank, wait approximately 2 minutes and divert the vat delivery pipe to the drain.
5. When water also starts to come out of this pipe, the plant is completely empty of mix and it is therefore possible to proceed with the end of production cleaning operations.

## HOYER MIXTURA BATCH

### 7 - CLEANING AND MAINTENANCE

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## 7.1 Machine washing procedures

The plant is equipped with a semi-automatic washing program for cleaning the pasteurising tanks, cooling units and all pipes up to connection with the ageing vats. The washing operations are carried out as follows (see Fig. 7.1 - 7.2):

1. Pre-wash the mixing tanks by hand and open valves (18) located on the tank bottoms.
2. Dismantle, pre-wash and replace the filters.
3. Start up the boiler.
4. Close valve (30) and open valve (29) so that the solution can be sent through the bypass pipe and not to the ageing vats.
5. Divert the pipe delivering mix to the ageing vats to the drain; the wash cycle will also wash this pipe in the direction of the ageing vats.
6. Position pipe (4) on tank (1) and open the water inlet valve. Water will begin running into tank (1). Shut off the water when the level in the tank has reached about ½ of the total capacity. Prepare the detergent washing solution in tank (1), then open the appropriate valve (18) to circulate the water through the machine.

7. Start pump (3) and start the homogeniser without pressure and with bypass valve (7) open.
8. The solution is recirculated between the heated tank, the homogeniser (6) and the two sections of the heat exchanger (see Fig. 7.1). For the first few seconds, open valve (30) and close valve (29) in order to drain the last of the mix left in the plant or the washing solution of the previous cycle and to allow a small amount of solution to leave the plant to wash the vat delivery pipe.
9. Allow the solution to circulate for 10 to 15 minutes to ensure that all the PHE plates through which the mix passes are thoroughly washed.
10. Close valve (32) at the mix filter inlet to allow the detergent solution to circulate. Be careful not to start up the homogeniser without fluid.
11. Now wash tanks (1) and (2). Open valve (23) and valves (18). Pump (3) will then pump the washing solution through the tanks in a closed circuit through the wash diffusers (see Fig. 7.2).
12. Switch off pump (3) and drain the washing solution from the circuit by removing plug (31).
13. Repeat the cycle using fresh water to rinse out the system.

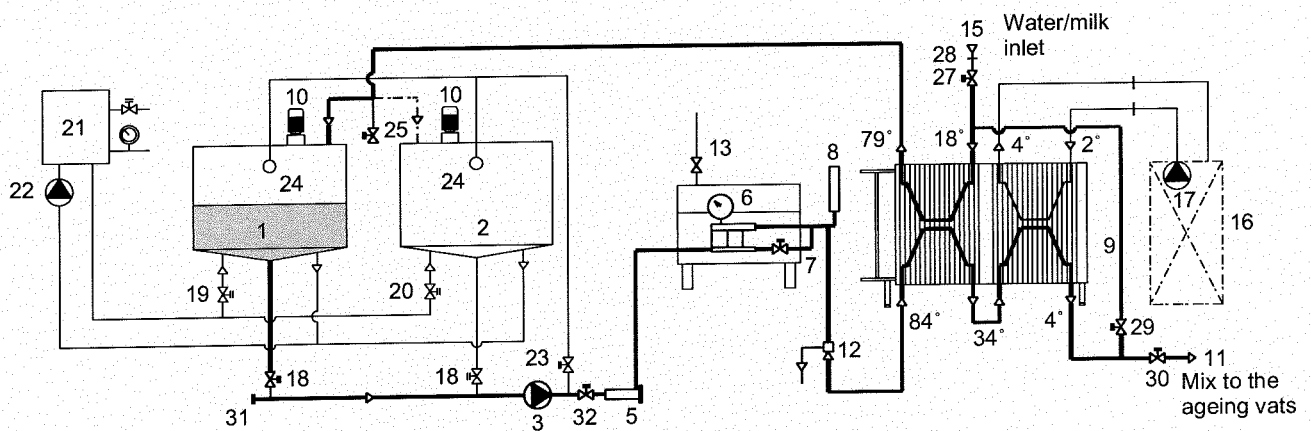
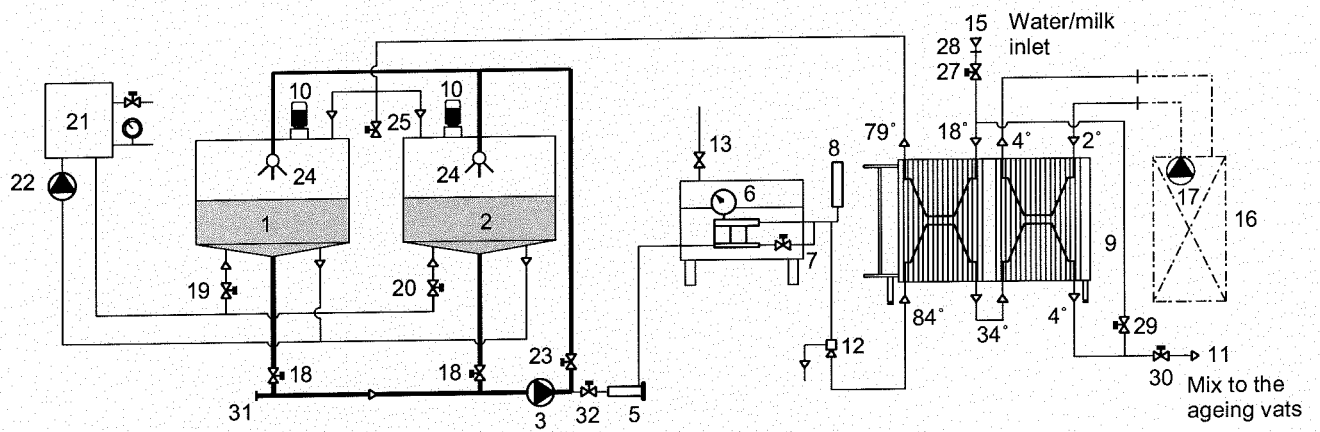


Fig. 7.1

14. Carry out a descaler wash followed by a rinse, repeating the cycle.
15. Carry out a disinfecting cycle followed by a rinse, repeating the cycle.



**Fig. 7.2**

### **7.1.1 Detergent wash**

To perform a detergent wash, select and use a detergent (concentration about 1%, temperature 60°C) which is alkaline and non-foaming, and contains a mix of suitable sequestering, descaling and suspensive agents.

### **7.1.2 Descaler wash**

To perform a descaler wash, use buffered phosphoric acid (concentration 0.5 – 1%), temperature 60°C).

### **7.1.3 Disinfectant wash**

To perform a disinfectant wash, use a chlorine-free disinfectant.

## 7.2 Washing programme

### 7.2.1 Internal washing programme

- a. Prewash with hot water (50°C).
- b. Detergent wash. Use an alkaline non-foaming detergent containing a mixture of sequestering, descaling and suspensive agents in a concentration of 1.25 to 1.6%, depending on the amount of dirt and the hardness of the water.
- c. Rinse with water. Wait 5 minutes before rinsing thoroughly to remove all traces of dirt.
- d. Descaler wash. Use an acidic low viscosity descaler containing a mixture of wetting and emulsifying agents in a concentration of 0.5% to 1%. The recommended minimum contact time is 10 to 15 minutes.
- e. Rinse with water.
- f. Disinfectant wash. Use a suitable disinfectant diluted in water in a concentration of 0.3% to 1%. The recommended minimum contact time is 10 to 15 minutes.
- g. Rinse with water
- h. At the end of the daily or weekly wash, fill the homogeniser and the heat exchanger with an aldehyde-type disinfectant (Gluteraldehyde). Wash with water the next morning.



**WARNING:**

Do not use products containing chlorine, which could damage homogeniser components.

Wash phases	Recommended products	% in water	°C	Min.	Notes
Prewash	Water	100	50	5	not recirculated
Detergent wash (Use a caustic alkaline non-foaming detergent containing a mixture of sequestering, descaling and suspensive agents.)	SU559 (Diversey Lever) P3-N 421 (Henkel Ecolab)	1.2-1.6	65-70	15	recirculated
Rinse	Water	100	20	5	not recirculated
Descaler wash (Use buffered phosphoric acid)	SU475 (Diversey Lever) P3-PE4 Spezial A (Henkel Ecolab)	0.5-1	60-70	10	recirculated
Rinse	Water	100	20	5	not recirculated
Disinfectant wash (Use chlorine-free disinfectant)	DIVOSAN GA (Diversey Lever) P3-OXONIA AKTIV (Henkel Ecolab)	1 0.3	20	10-15	recirculated
Rinse	Water	100	20	10	not recirculated
At the end of the daily or weekly wash, fill the homogeniser and heat exchanger with an aldehyde type disinfectant (Gluteraldehyde). Wash with water the next morning.					

### 7.2.2 External washing programme and manual pre-washing of vats and mixer hopper

- a. Prewash with hot water (50°C).
- b. Detergent wash. Use an alkaline foaming detergent or a gel detergent with strong fat emulsifying properties. The required concentration varies from 2% to 10%, depending on the amount of dirt and the hardness of the water.
- c. Rinse with water. Wait 10 minutes before rinsing thoroughly to remove all traces of dirt.
- d. Descaler wash. Use an acidic low viscosity descaler containing a mixture of wetting and emulsifying agents in a concentration of 2% to 3%. The recommended minimum contact time is 15 to 20 minutes.
- e. Rinse with water.
- f. Disinfectant wash. Use a suitable disinfectant diluted in water in a concentration of 1% to 1.2%. The recommended minimum contact time is 15 to 20 minutes.
- g. Rinse with water.



**WARNING:**

- Do not use high pressure water jets.
- Do not use products containing chlorine, which could damage homogeniser components.

Wash phases	Recommended products	% in water	°C	Min.	Notes
Prewash	Water	100	50	5	not recirculated
Detergent wash (Use an alkaline foaming detergent or gel detergent with high fat emulsifying power.)	SU928 (Diversey Lever) SU616 (Diversey Lever) P3-topax 17 (Henkel Ecolab)	2-10	60	15	recirculated
Rinse	Water	100	20	5	not recirculated
Descaler wash (Use an acidic low viscosity descaler containing a mixture of wetting and emulsifying agents)	P3-topax 52 (Henkel Ecolab)	2-3	50-60	15-20	recirculated
Rinse	Water	100	20	5	not recirculated
Disinfectant wash	P3-topax 99 (Henkel Ecolab)	1-1.2	60	10-15	recirculated
Rinse	Water	100	20	10	not recirculated

**HOYER MIXTURA BATCH**

**8 - TROUBLESHOOTING**

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## 8.1 Troubleshooting

PROBLEM	PROBABLE CAUSE	REMEDY
<b>Light (Pos. 18, Fig. 3.4) lit.</b>	<ul style="list-style-type: none"> <li>- Main switch faulty</li> <li>- Main switch on position "0"</li> <li>- Bulb 14HL4 blown</li> <li>- Switches 12QF8,12QF9 open</li> <li>- Transformer (12T8) faulty</li> <li>- Short circuit</li> </ul>	<ul style="list-style-type: none"> <li>- Replace</li> <li>- Rotate to position "1"</li> <li>- Replace</li> <li>- Reset switches</li> <li>- Check and replace if necessary</li> <li>- Identify the fault and repair the circuit</li> </ul>
<b>Overload light (Pos. 19, Fig. 3.4) on.</b>	<ul style="list-style-type: none"> <li>- One or more switches open</li> <li>- One or more switches faulty</li> </ul>	<ul style="list-style-type: none"> <li>- Reset the switches</li> <li>- Check and replace if necessary</li> </ul>
<b>Light SB6 on.</b>	<ul style="list-style-type: none"> <li>- Reducer-filter unit incorrectly adjusted</li> <li>- Air supply disconnected</li> <li>- Pressure switch 16SP5 faulty</li> <li>- Relay 16KA5 faulty</li> </ul>	<ul style="list-style-type: none"> <li>- Regulate the pressure to approx. 6-7 bar</li> <li>- Connect.</li> <li>- Check and replace if necessary (regulate pressure to 4 bar)</li> <li>- If the above checks are OK and light HL2 is still lit, check the electrical connections and replace relay if necessary</li> </ul>
<b>The mix temperature does not rise or rises too slowly.</b>	<p>a) With bottled gas unit:</p> <ul style="list-style-type: none"> <li>- bottles half-empty, insufficient number or too small</li> <li>- poor combustion due to insufficient flue drawing;</li> <li>- thermostat or probe defective.</li> </ul> <p>b) With steam unit:</p> <ul style="list-style-type: none"> <li>- steam pressure lower than pre-set value;</li> <li>- steam filter blocked;</li> <li>- condensate drain dirty.</li> </ul>	<ul style="list-style-type: none"> <li>- Refill, increase the number of bottles or use larger bottles.</li> <li>- Refer to boiler manual.</li> <li>- Replace.</li> <li>- Check steam unit.</li> <li>- Clean.</li> <li>- Clean.</li> </ul>

<b>PROBLEM</b>	<b>PROBABLE CAUSE</b>	<b>REMEDY</b>
	c) With electric boiler: - Heater elements burnt out.	- Replace.
<b>Homogeniser flow lower than normal.</b>	- Blocked mix filter  - Homogeniser	- Dismantle and clean if necessary.  - Refer to homogeniser manual.
<b>Mix leaking from mix pump.</b>	- Rotary seal worn. - Gasket dry or worn.	- Replace. - Lubricate or replace.
<b>Mix leaking from plate heat exchanger.</b>	- Passage through the plates obstructed by solidified milk  - Heat exchanger gaskets worn	- Dismantle and clean (refer to attached heat exchanger manual).  - Replace (refer to attached heat exchanger manual).
<b>The temperature of the mix leaving the heat exchanger is too high.</b>	- Chilled water tank  - Pre-chilled water valve closed.  - Insufficient flow of pre-chilled water.	- Check that the thermostat is set at 1-2°C. - Open the valve.  - The flow must be approx. 4300 l for Hoyer Mixtura 300 BATCH, or 7300 l for 600 BATCH.
<b>Mix temperature does not rise.</b>	- Air in the hot water system. - Thermo-regulators 14TRL10, 14TRL14 incorrectly adjusted.	- Slacken fitting and release air. - Adjust.
<b>The boiler will not start up.</b>	- Safety thermo-regulator on boiler has tripped.	- Reset.