

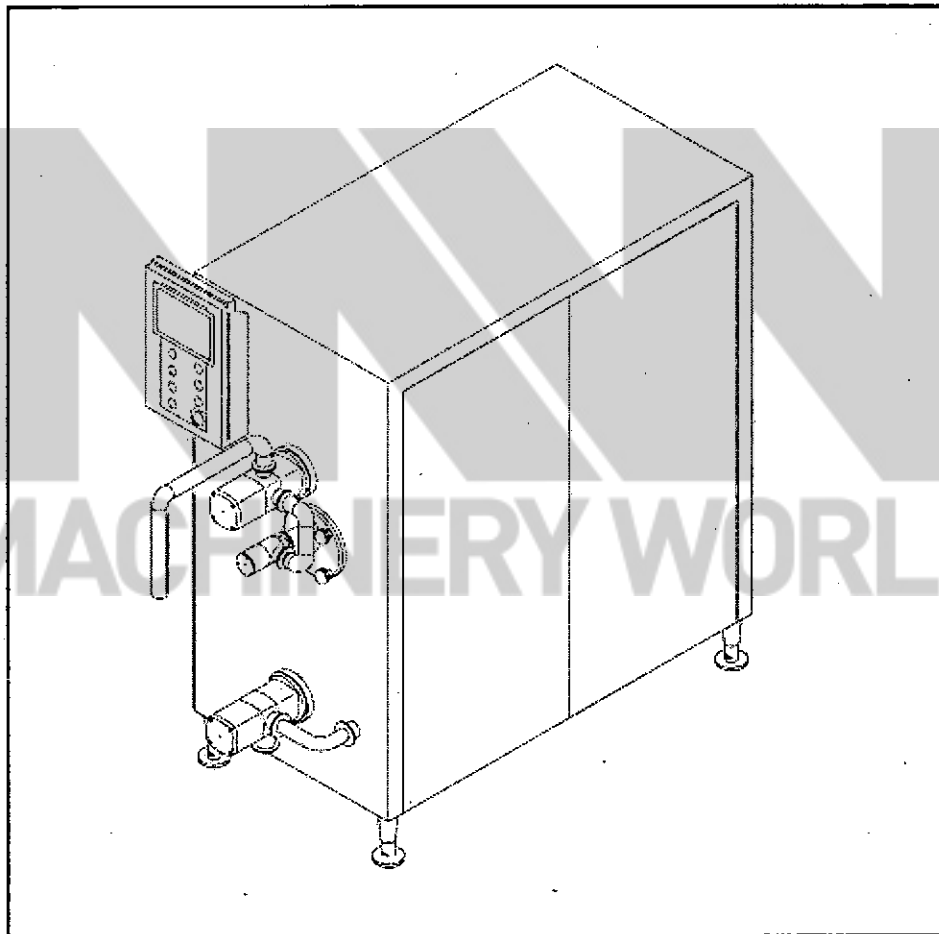
# TeM

## Technical Manual

### Hoyer Frigus SF 1200 N1

Z1381040-01en

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**!** **WARNING**

Read and follow all safety precaution instructions throughout this manual and on safety signs attached to this equipment.  
Failure to follow all safety precaution instructions could result in death or serious injury.

 **Tetra Pak**

Doc. No. TEM-Z1381040-01en

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The content of this manual is in accordance with the design and construction of the machine or equipment at the time of publishing. Tetra Pak reserves the right to introduce design modifications without prior notice.

The English version of this document is the original language version.

This document was produced by:

**Tetra Pak Food Machinery (Shanghai) Co., Ltd.**

*Business Unit Ice Cream*

201 East Kang Qiao Road

201315 Shanghai

P.R. China

Additional copies can be ordered from Tetra Pak. When ordering additional copies, always provide the document number.

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Issue 2010-06

This manual is valid for:

Series No./ Machine No.                      Sign.

# TeM

## Technical Manual

Hoyer Frigus SF 1200 N1  
Z1381040-01en

- i Introduction
- ii Safety Precautions
- 1 Installation Instruction
- 2 Maintenance Instruction
- 3 Task list
- 4 Spare parts Catalogue

TechPub\_2614345\_0105 - TeM\_Z1381040\_01en

Machine or equipment configurations that this manual is valid for are described on the next page.

Doc. No. TEM-Z1381040-01en

Issue 2010-06

 **Tetra Pak**

**Tetra Pak Food Machinery (Shanghai)  
Co., Ltd.**

Valid for:

# Update Log for Doc. No. TEM-Z1381040-01en

This table shows all changes made to this manual, including installed rebuilding kits, added or removed pages. Page numbering on added pages begins with UP.

Date	Installed Kit	Added Pages (Doc. No.)	Removed Pages	Signature

Date	Installed Kit	Added Pages (Doc. No.)	Removed Pages	Signature

# i Introduction

TechPub\_2614345\_0103 - OM-Introduction.fm

General informations about Introduction section

This chapter contains basic information about this manual and related Tetra Pak equipment.



<b>i.1</b>	<b>About the introduction chapter</b> .....	<b>1 - 5</b>
<b>i.2</b>	<b>Abbreviations and Terminology</b> .....	<b>1 - 6</b>
<b>i.3</b>	<b>Manual information</b> .....	<b>1 - 7</b>
i.3.1	Delivered Manuals .....	1 - 7
i.3.2	Page Layout .....	1 - 8
i.3.3	Page Numbering .....	1 - 9
i.3.4	Typographical Conventions .....	1 - 9
i.3.5	Symbols .....	1 - 9
<b>i.4</b>	<b>Machine Introduction</b> .....	<b>1 - 10</b>
i.4.1	Intended use of the machine or equipment. ....	1 - 10
i.4.2	Manufacturer .....	1 - 10
i.4.3	Service .....	1 - 10
<b>i.5</b>	<b>Identification</b> .....	<b>1 - 11</b>
i.5.1	CE classification .....	1 - 11
i.5.2	Machine plate .....	1 - 11
<b>i.6</b>	<b>Orientation</b> .....	<b>1 - 12</b>
<b>i.7</b>	<b>Hygiene</b> .....	<b>1 - 13</b>
<b>i.8</b>	<b>How to Use This Operation Manual</b> .....	<b>1 - 14</b>
	Purpose of the operation manual .....	1 - 14
	Operator workflow .....	1 - 14
	Preparation cycle .....	1 - 14
	Production cycle .....	1 - 14
	Care .....	1 - 14

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TechPub\_2614345\_0103 - OMI-Introduction.fm

## i.1 About the introduction chapter

Risk of serious personal injury. To ensure maximum safety, always read the chapter “Safety precautions” before operating or servicing the machine or equipment.

This chapter contains basic information about this manual and related Tetra Pak equipment.

## i.2 Abbreviations and Terminology

Abbreviation/ Terminology	Meaning	Translation
CIP	Cleaning In Place	
MFC	Mass Flow Controller	
SPC	Spare parts catalogue	

## i.3 Manual information

Tetra Pak recommends that delivered documentation should be studied carefully and always kept available to those who will operate the machine or equipment.

It is important to keep the manual for the life of the machine or equipment and pass the manual on to any subsequent holder or user.

Tetra Pak will not be held responsible for any damage to the machine or equipment caused by not following the instructions given in this manual.

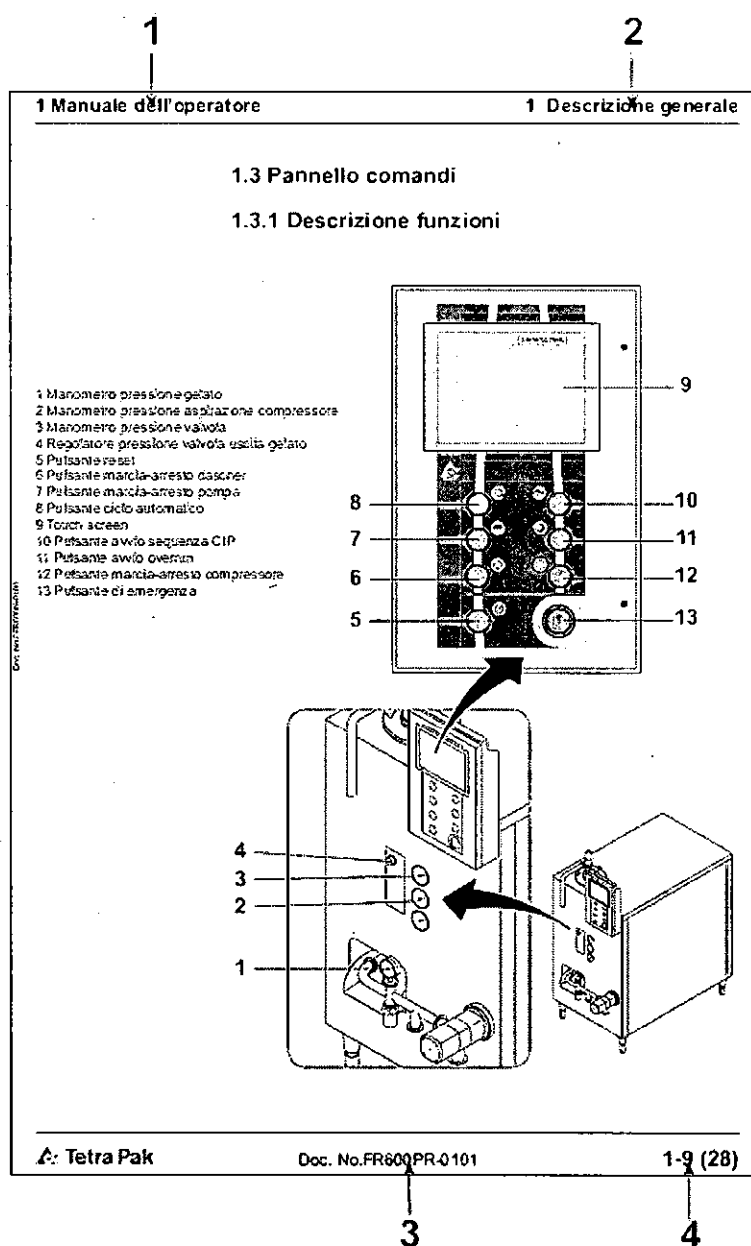
### i.3.1 Delivered Manuals

The documents delivered with this machine or equipment include:

- Operation Manual (OM)  
The purpose of this manual is to provide the operator with information on how to handle and operate the machine or equipment before, during, and after production
- Spare Parts Catalogue (SPC)  
The purpose of this manual is to provide necessary information for ordering spare parts from Tetra Pak
- Technical Manual (TEM)  
The purpose of this manual is to provide necessary information required for installation, service and maintenance

### i.3.2 Page Layout

Every main page in a manual contains a header and a footer. The page header contains the section name (2) and the chapter name (1). The page footer contains the manual's document number (3), and the page number(4). See also the section Page Numbering.



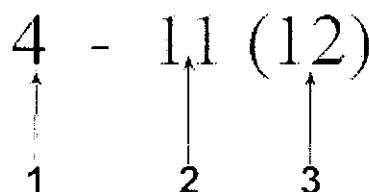
- 1 Section name
- 2 Chapter name
- 3 Document number
- 4 Page number

TechPub\_2614345\_0103 - OM-Introduction.fm

### i.3.3 Page Numbering

A page number has three parts:

- chapter number (1)
- consecutive page number (2) within the chapter
- total number of pages (3) in the chapter.



- 1 Chapter number
- 2 Consecutive page number
- 3 Total number of pages

### i.3.4 Typographical Conventions

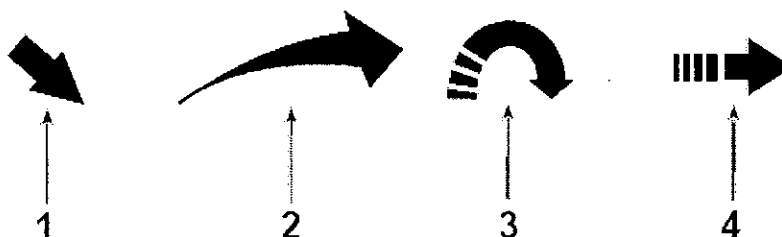
Controls on the operator panel, emergency stop devices, and program steps are printed in CAPITAL LETTERS.

Cross-references are underlined.

### i.3.5 Symbols

The following symbols are used in illustrations:

- A pointer arrow (1) indicates the position of an object.
- A zoom arrow (2) indicates that an object view is enlarged. The arrow points towards the enlarged view of the object
- A rotation movement arrow (3) indicates rotational movement of an object. The arrow points in the direction of rotation
- A straight movement arrow (4) indicates movement of an object. The arrow points in the direction of movement.



- 1 Pointer arrow
- 2 Zoom arrow
- 3 Rotation movement arrow
- 4 Straight movement arrow

## i.4 Machine Introduction

### i.4.1 Intended use of the machine or equipment

The intended use of this Tetra Pak machine or equipment is to inject fruit pieces, nuts, candies and other free flowing granulates into ice cream or similar products.

All other use is prohibited! Tetra Pak will not be held responsible for injury or damage if the machine or equipment is used for any other purpose.

### i.4.2 Manufacturer

This Tetra Pak machine or equipment has been manufactured by:

**Tetra Pak Food Machinery (Shanghai) Co., Ltd.**  
*Business Unit Ice Cream*  
201 East Kang Qiao Road, Pudong  
Shanghai 201315  
P.R.China

### i.4.3 Service

If problems are encountered when operating this machine or equipment, contact the nearest Tetra Pak centre or market company.

Contact this mail address, if you have any questions regarding the documentation:

[ProductDocumentationBUIC@tetrapak.com](mailto:ProductDocumentationBUIC@tetrapak.com)



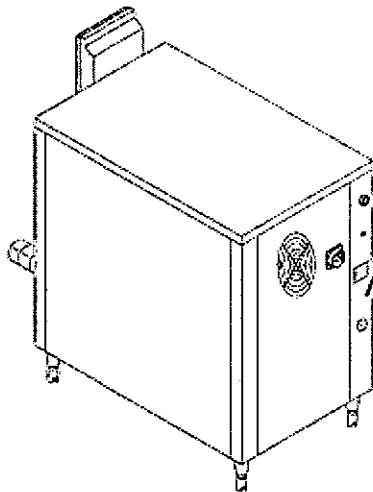
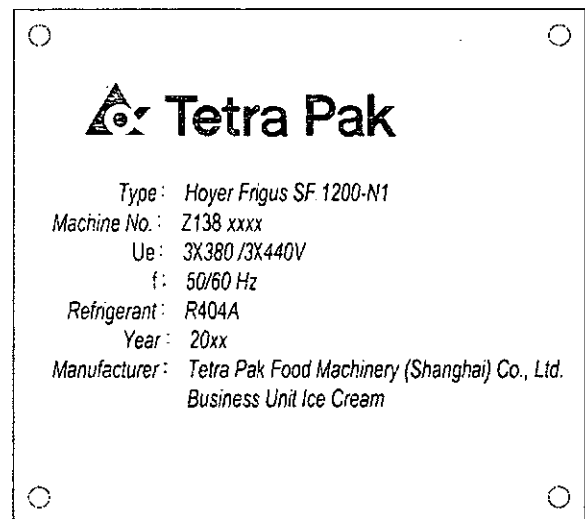
## i.5 Identification

### i.5.1 CE classification

This equipment complies with the basic health and safety regulations of the European Economic Area (EEA).

### i.5.2 Machine plate

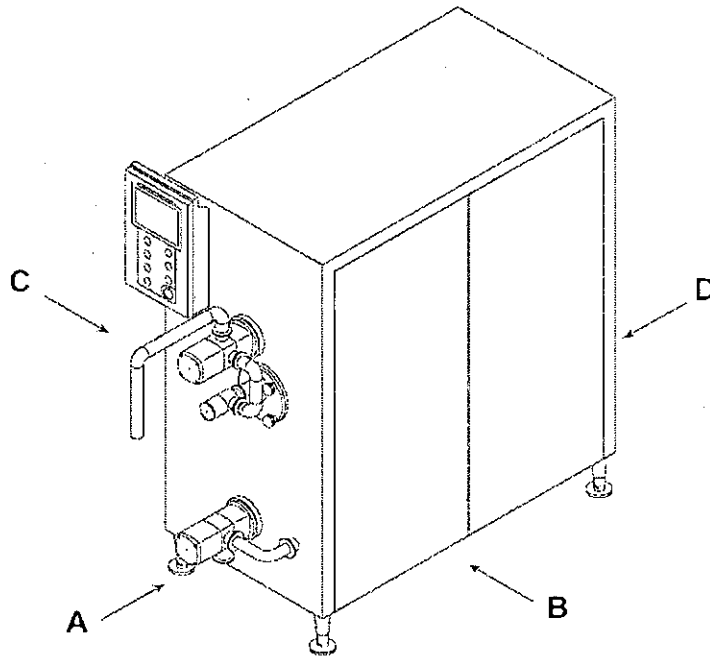
The below illustration shows an example of the machine plate and its location on the machine or equipment. The machine plate carries data needed when contacting Tetra Pak concerning this specific machine or equipment.



- 1 Machine type
- 2 Machine serial number
- 3 Year of manufacture
- 4 Manufacturer

## i.6 Orientation

The illustration below shows the orientation of the equipment. This orientation information will be used throughout this manual.



- A Front
- B Right-hand side
- C Left-hand side
- D Back

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## i.7 Hygiene

Avoid microbiological pollution of the parts in contact with the product:

- Never clean the floors or the equipment in the work room (area) when the equipment is in production.
- Compressed air used for cleaning purposes is to be used only for cleaning filters.
- Disinfect your hands before touching anything that may come into contact with the product.
- Keep your hands and gloves clean.
- Always wear hair protection (cap or hairnet) and clean clothes (preferably white).
- Do not wear watches, rings, necklaces, earrings, or any other jewellery.

## i.8 How to Use This Operation Manual

### Purpose of the operation manual

The operation manual provides operators with information on handling and operating the equipment before, during, and after production.

### Operator workflow

Beginning with Chapter 1, the content is structured to follow the operator workflow, as described below.

### Preparation cycle

a) Preparation

### Production cycle

b) Start

c) Change of Product

d) Stop

### Care

e) care and cleaning

# ii Safety Precautions

TechPub\_2614345\_0103 - Safety.fm

TechPub\_2614345\_0103 - Safety.fm

**ii.1 Read the safety precautions. . . . . 1 - 5**

**ii.2 Safety Messages Description. . . . . 1 - 6**

**ii.3 Personnel requirements . . . . . 1 - 7**

    ii.3.1 Skilled person. . . . . 1 - 7

    ii.3.2 Instructed person. . . . . 1 - 7

**ii.4 Safety signs . . . . . 1 - 8**

    ii.4.1 Safety Signs. . . . . 1 - 8

    ii.4.2 Location of safety signs . . . . . 1 - 9

**ii.5 Protective devices . . . . . 1 - 10**

    ii.5.1 Emergency Stop. . . . . 1 - 10

    ii.5.2 Emergency stop push buttons . . . . . 1 - 10

**ii.6 Personal protection. . . . . 1 - 11**

    ii.6.1 Hearing Protection. . . . . 1 - 11

    ii.6.2 Risk of entanglement. . . . . 1 - 11

**ii.7 Hazardous materials . . . . . 1 - 12**

    ii.7.1 Products for cleaning and sterilization. . . . . 1 - 13

    ii.7.2 Personal Protective Equipment. . . . . 1 - 14

    Handling . . . . . 1 - 15

**ii.8 Supply systems . . . . . 1 - 17**

    ii.8.1 Electrical cabinet . . . . . 1 - 17

    ii.8.2 Water supply. . . . . 1 - 18

    ii.8.3 Air Supply . . . . . 1 - 19

TechPub\_2614345\_0103 - Safety.fm

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TechPub\_2614345\_0103 - Safety.fm



## ii.1 Read the safety precautions

All persons operating, servicing, adjusting or otherwise working with or near this machine or equipment must carefully read and follow all safety instructions in this manual and warning signs on the machine or equipment itself. Failure to do so could result in death, serious injury, and damage to the machine or equipment.

Call for medical attention immediately in case of an accident.

## ii.2 Safety Messages Description

A safety message is always accompanied by a safety alert symbol and a signal word.



This is the “safety alert” symbol. It is used to alert about potential personal injury hazards. Obey all safety messages that follow this symbol to avoid death or injury.

The following safety alert symbols and “signal words” are used in this manual and on the machine or equipment itself to inform the user of hazards.



indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

### CAUTION

(without the safety alert symbol) indicates a potentially hazardous situation which, if not avoided, may result in property damage.

## ii.3 Personnel requirements

**Note!** Personnel includes all persons performing work on or near the machine or equipment.

Only skilled or instructed persons are allowed to work with the machine or equipment.

### ii.3.1 Skilled person

A skilled person must have relevant education and experience to enable him or her to identify hazards, analyze risks, and avoid hazards which electricity, mechanics, chemicals, and supply systems can create.

Skilled persons must meet local regulations, such as certifications and qualifications for working with electricity, mechanical systems, and so on.

### ii.3.2 Instructed person

An instructed person must be adequately advised or supervised by a skilled person to enable him or her to identify hazards, analyze risks, and avoid hazards which electricity, mechanics, chemicals, and supply systems on the machine or equipment can create.

## ii.4 Safety signs

### ii.4.1 Safety Signs

**⚠ WARNING**



Hazards without safety signs drastically increase the risk of death or serious injury.

Replace all missing or damaged safety signs immediately.

There are two types of safety sign

- ISO signs are used in most markets
- ANSI signs are used in the US market only

The table below shows all safety signs that are located on this machine/equipment.

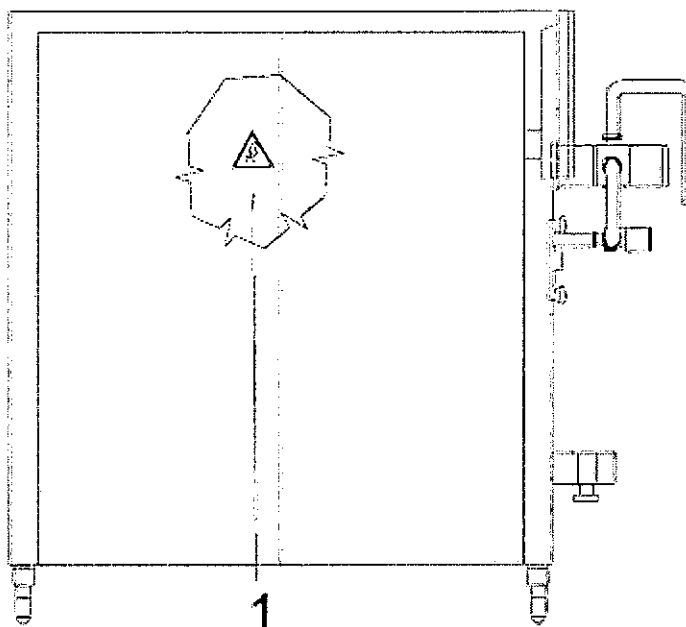
Pos.	ISO signs	ANSI signs
1		
	<p><b>Hazardous voltage with power supply disconnecter switched off.</b> Can shock, burn, or cause death. Do not touch.</p>	

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### ii.4.2 Location of safety signs

**Note!** Always ensure that all safety signs on the machine or equipment are undamaged and in their correct position after installation and maintenance.

The illustration below indicates where the safety signs are located.



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## ii.5 Protective devices



**Unshielded hazards. Never inch or run the machine or equipment if any component of the safety system is inoperative. All inoperative components of the safety system must be changed immediately.**

**Note!** Activating a safety device, such as an EMERGENCY STOP, or opening an interlocked safeguard does not switch off the power supply to the machine or equipment.

### ii.5.1 Emergency Stop

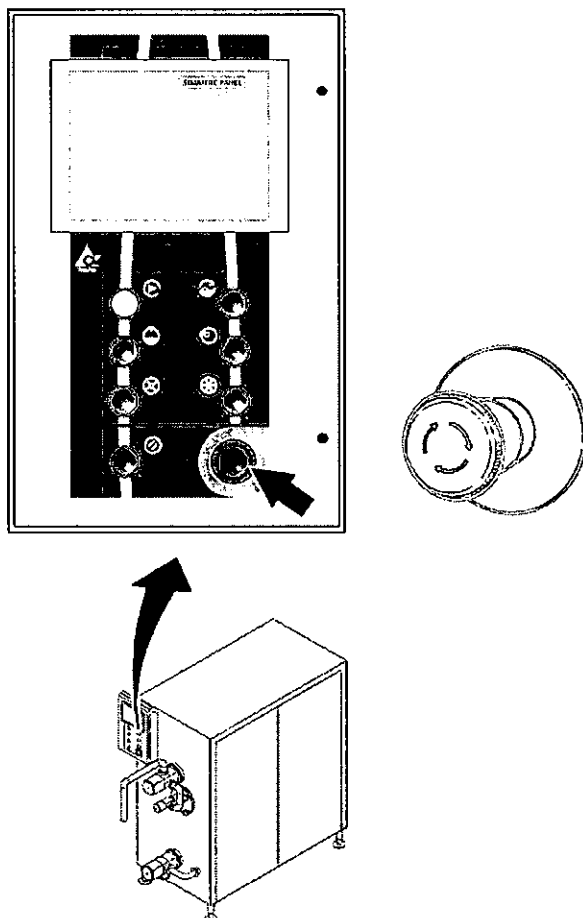
Learn the positions of the EMERGENCY STOP devices in order to stop the machine or equipment immediately in case of an emergency situation.

To stop production the normal way, see the *operation manual*.

### ii.5.2 Emergency stop push buttons

Push one of the EMERGENCY STOP push buttons to stop the machine or equipment immediately.

The illustration below shows an emergency stop push button. Arrow(s) indicates where to find them on the machine or equipment.



## ii.6 Personal protection

**Note!** Personal protection required when handling hazardous materials is specified for each substance, see the section "Hazardous materials".

### ii.6.1 Hearing Protection

 **WARNING**

Hazardous noise level. Risk of impaired hearing. Wear hearing protection.

 **CAUTION**

Hazardous noise level. Risk of impaired hearing. Hearing protection is recommended.

### ii.6.2 Risk of entanglement

 **WARNING**

Risk of entanglement. No jewellery such as rings, watches, bracelets, or necklaces may be worn when performing work on or near the machine or equipment.

## ii.7 Hazardous materials

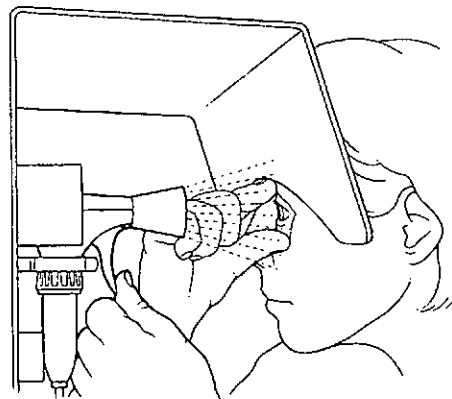
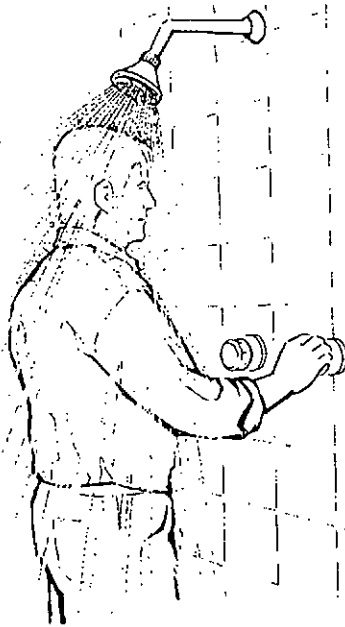
**!** **WARNING**

Contact with chemicals can cause injury and illnesses. Always follow the manufacturer's instructions when handling chemical products.

Always make sure that

- the showers work
- an eyewash device, movable or wall-mounted, is available and operational
- additional washing facilities are nearby

**Note!** Learn the positions of all washing facilities in order to act without delay in case of an accident.



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### ii.7.1 Products for cleaning and sterilization

The cleaning of the machine and its components previews to use of chemical products. The following table indicates the various type of recommended products.

Detergent	Descaler	Disinfectant
SU928 (Diversey Lever)	P3-topax 99 (60°C) (Henkel Ecolab)	P3-topax 99 (60°C) (Henkel Ecolab)
SU616 (Diversey Lever)	SU475 (Diversey Lever)	SU330 (Diversey Lever)
SU157 (Diversey Lever)	P3-PE4 Spezial a (Henkel Ecolab)	P3-Dix forte (Henkel Ecolab)
P3-N421 (Henkel Ecolab)		P3-Oxjsan (Henkel Ecolab)



#### WARNING

**Corrosive chemical. Wear personal protective equipment. Consult the instructions on the label of the tank/container, or on the security card of product.**

In both liquid and gas states, products for cleaning and sterilization may cause irritation or damage if it comes into contact with skin, mucous membranes, eyes, or clothes. Call for medical attention immediately if there is an accident.

#### Emergency Procedures

If there is an accident involving the products for cleaning and sterilization, rinse the affected area as soon as possible with large amounts of water. If the products for cleaning and sterilization is swallowed

- do not attempt to cause vomiting
- drink large amounts of lukewarm water to dilute the peroxide call for medical attention immediately.

If splashes or vapour from products for cleaning and sterilization come in contact with the eyes

- wash the eyes thoroughly with lukewarm water for 15 minutes (keep eyelids wide apart)
- call for medical attention immediately.

If products for cleaning and sterilization comes into contact with skin or clothes

- rinse immediately with plenty of water
- call for medical attention immediately if skin burns appear
- thoroughly wash the clothes before wearing them again.

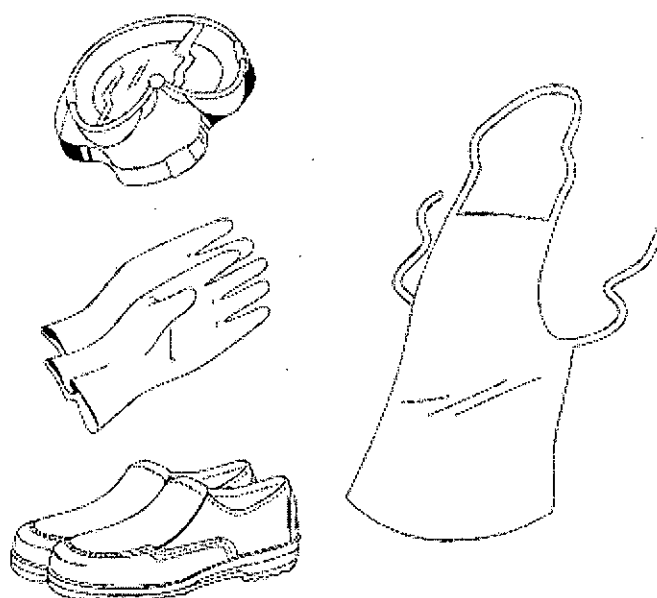
If irritation or pain is experienced due to having inhaled products for cleaning and sterilization vapour

- leave the affected area and get some fresh air
- call for medical attention if the symptoms get worse.

### ii.7.2 Personal Protective Equipment

The personal protective equipment for products for cleaning and sterilization is

- safety goggles.
- protective gloves made of neoprene.
- apron
- shoes made of PVC, PE plastic, or rubber.



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## Handling



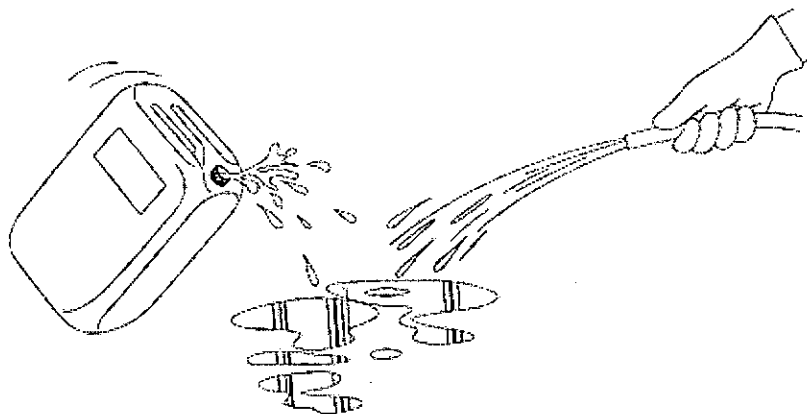
### WARNING

**Sudden and violent chemical reaction. Avoid any contamination of products for cleaning and sterilization.**

The products for cleaning and sterilization they can react suddenly and violently with many compounds or if it is contaminated.

Ensure that equipment used for handling and diluting the products is clean before it comes in contact with the products. Pumps or other equipment used for handling the products must be used for this purpose only and must be manufactured from appropriate materials, such as stainless steel 316 L, glass, polyethylene, or teflon. After use, make sure that all product residue is rinsed away.

If products for cleaning and sterilization is spilled, dilute it with large amounts of water and flush it into a drain.



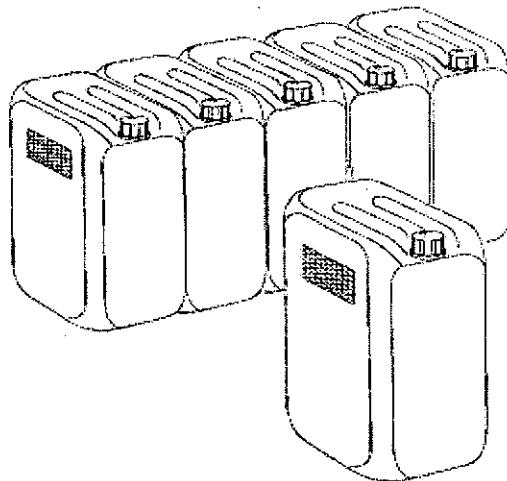
### Storage

The products for cleaning and sterilization must be stored in the original container delivered by the supplier.

Keep the container upright and fitted with its proper cap.

Make sure that the area used for storage of products for cleaning and sterilization is:

- cool, clean, and well ventilated
- shielded from direct sunlight
- kept free from combustible materials.



## ii.8 Supply systems

### ii.8.1 Electrical cabinet



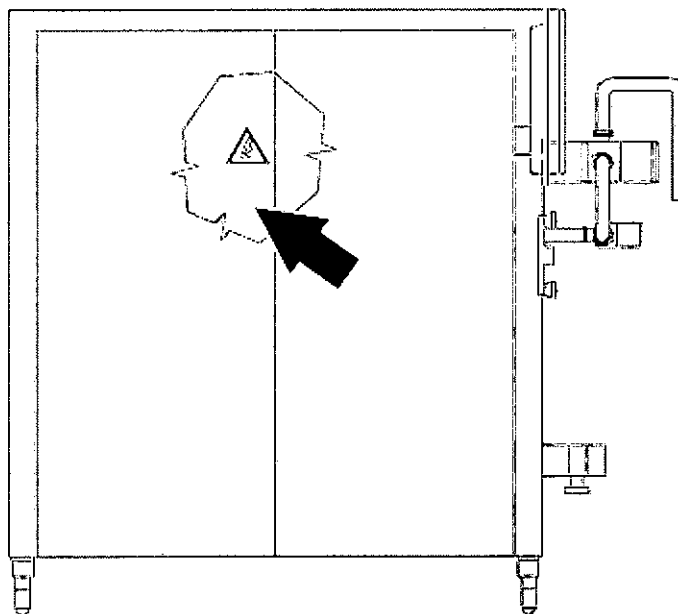
Hazardous voltage. Electric shock will cause death or serious injury.

The power supply disconnecting device must be turned OFF and secured with a lock before any service is carried out inside the electrical cabinet

**Note!** The key to the lock must be removed by the service technician or the electrician, and retained in his/her possession until all work is completed.

Make sure that the electrical cabinet doors are locked after performing any work in the electrical cabinet.

An arrow in the illustration below indicates the location of an electrical cabinet.



ii.8.2 Water supply



**WARNING**

**Water Under Pressure**

Certain maintenance procedures may require water supply systems to be on.

These exceptions are clearly stated in the Maintenance Manual.

## ii.8.3 Air Supply

**WARNING**

Compressed air. Close the main air valve before any maintenance.

Certain maintenance procedures may require the air supply systems to be on. These exceptions are clearly stated in the Maintenance Manual.

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# 1 Installation Instructions

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<b>1.1</b>	<b>Technical Data</b> .....	<b>1 - 5</b>
1.1.1	Installation Drawings .....	1 - 6
1.1.2	Weights .....	1 - 7
1.1.3	Connection .....	1 - 7
1.1.4	Noise .....	1 - 7
<b>1.2</b>	<b>Moving and unpacking</b> .....	<b>1 - 8</b>
1.2.1	Crate handling .....	1 - 8
1.2.1.1	Crate data .....	1 - 8
1.2.1.2	Crate lifting .....	1 - 8
<b>1.3</b>	<b>Unpacking</b> .....	<b>1 - 9</b>
<b>1.4</b>	<b>Positioning and Connections</b> .....	<b>1 - 10</b>
1.4.1	Moving .....	1 - 10
1.4.2	Positioning .....	1 - 11
1.4.3	Levelling .....	1 - 11
1.4.4	Connections .....	1 - 12
1.4.4.1	Cooling water connection .....	1 - 12
1.4.4.2	Ice cream intake and outlet connection .....	1 - 13
1.4.4.3	Compressed air connection .....	1 - 14
1.4.4.4	Electrical connection .....	1 - 14
1.4.5	Installation check .....	1 - 15
<b>1.5</b>	<b>Disposal</b> .....	<b>1 - 16</b>
	<b>Electrical Drawings</b> .....	<b>1 - 17</b>

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## 1.1 Technical Data

### Nominal Output

Nominal Output	400-1200 l/h	105-316 gals/h
Temperature inlet of mix	+ 5°C	41°F
Temperature outlet of ice cream	-5°C	+23°F
Overrun	100%	100%

Nominal output figures are based on the following conditions and standard mix recipe.

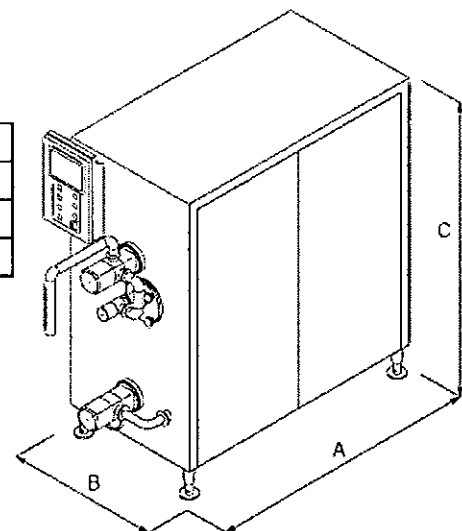
Ingredients	%
Fat (HCO)	10,0
Skimmed milk powder	10,5
Sugar (sucrose)	12,0
Glycose sirup	5,0
Stabilizer/emulsifier	0,5
Total Solids	38,0
Water	62,0
TOTAL	100,0

Upon receipt of the actual mix recipe a more precise capacity and outlet temperature can be determined.

### Refrigeration plant

Refrigerating gas R404A	5,2 Kg	11,4 lbs
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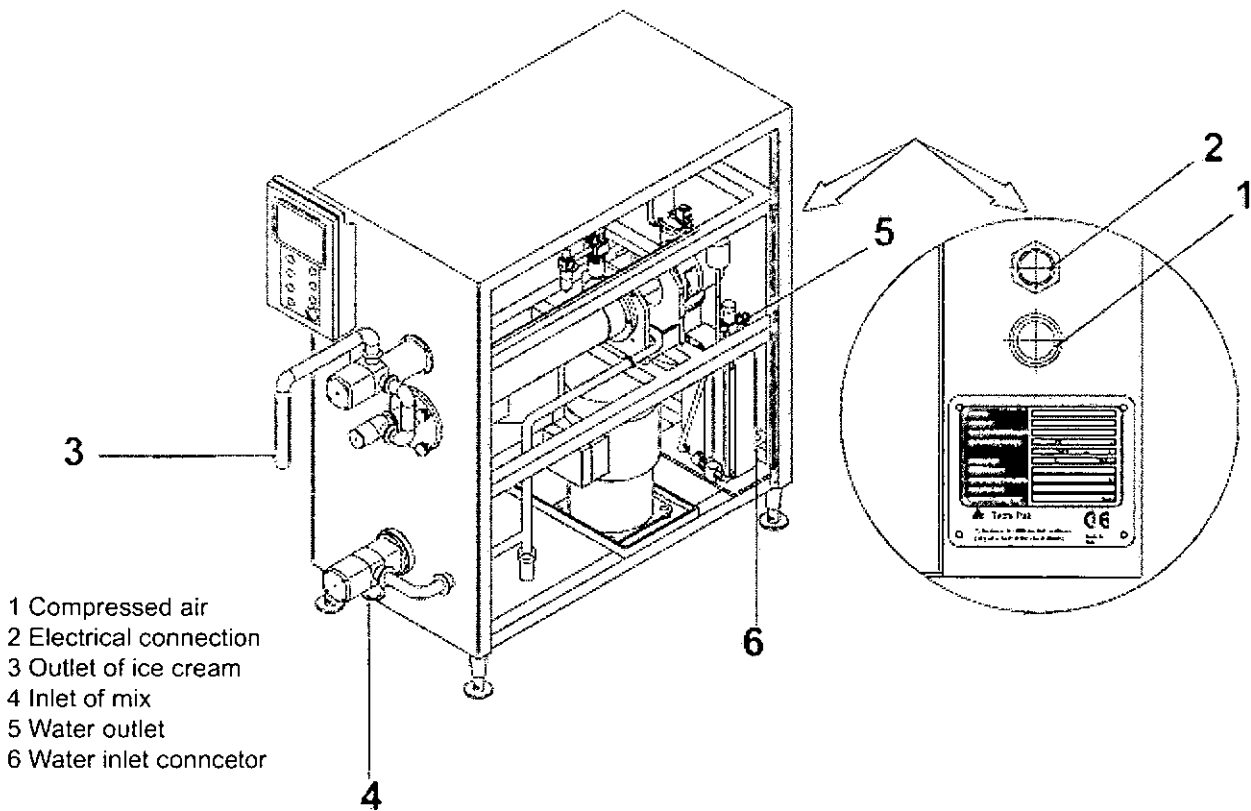
Dimensions	mm	in
A	1930	76
B	840	33,1
C	1800 ± 25	70,9 ± 1



### 1.1.1 Installation Drawings

Connection Data

- 1 Compressed air (1/2" Gas- female).
- 2 Electrical connection.
- 3 Outlet of ice cream (connection clamp 1 1/2" Gas).
- 4 Inlet of mix (connection clamp 1" Gas).
- 5 Water outlet connector (1" Gas- female).
- 6 Water inlet connector (1" Gas- female).



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### 1.1.2 Weights

Net weight	1200 Kg	2647 lbs
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### 1.1.3 Connection Compressed Air

Compressed air		
Operating pressure	4-8 bar	4-8 bar
Consumption (max)	20 NI/min	566,34 cu.ft
Filtering degree	A0	A0
Connector	1/2" female gas	1/2" female gas

### Electrical specifications

Dasher motor:	9,2 KW
Pump motor:	0,75 KW
Refrigerator compressora:	20 KW
Auxiliaries:	1,25 KW
Total installed power:	31 KW

Electromagnetic compatibility:

Conforms to VDE 0843/IEC801; wiring in accordance with EN55011

### Condensation water

Mains water	+15°C - 2000 l/h	59 °F - 529 gals/h
Tower water	+28°C - 6000 l/h	82,4 °F - 1585 gals/h
Water inlet connector	1" gas female	1" gas female
Water outlet connector	1" gas female	1" gas female

### 1.1.4 Noise

A-weighted equivalent sound pressure level at 1 metre:  $Leq(A) = 70.5 \text{ dB(A)}$

Max. C-weighted instantaneous sound pressure level at working positions:  
Less than 130 dB/20uPa

Max. non-weighted sound pressure level at working positions: Less than 140 dB/20uPa



## 1.2 Moving and unpacking

The machine is packed in wooden crates. Unpacking must be done close to the installation position.

### 1.2.1 Crate handling

#### 1.2.1.1 Crate data

List of the contents

Frigus SF 1200 N1

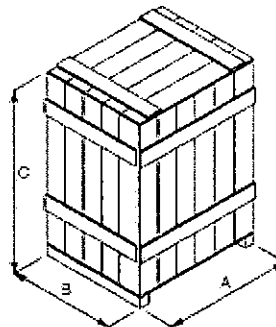
Standard equipment

Adjustable feet

Startup kit( if included in the supply)

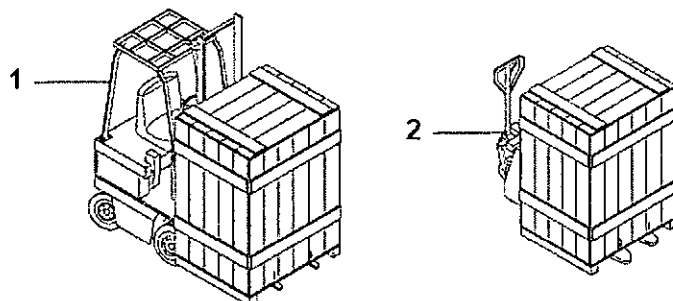
Dimension	mm	in
A	1600	63
B	950	37,4
C	1950	76,8

Weight	1450Kg	3196 lbs
Volume	5m <sup>3</sup>	1,765cu.ft



#### 1.2.1.2 Crate lifting

The crate may be easily transported by a lift truck (1) or an transpallets (2).



## 1.3 Unpacking

When the crate is positioned in the place of installation, proceed to remove the machine from its packaging as follows:

Unnail the top cover (1) and remove it. Do the same with the side panels (2) and the front panel (3). Take care with the wooden spacers between the walls of the crate.

Remove the standard equipment from the crate (4).

Unnail the wooden blocks that hold the machine in place during transport and remove the protective cellophane.

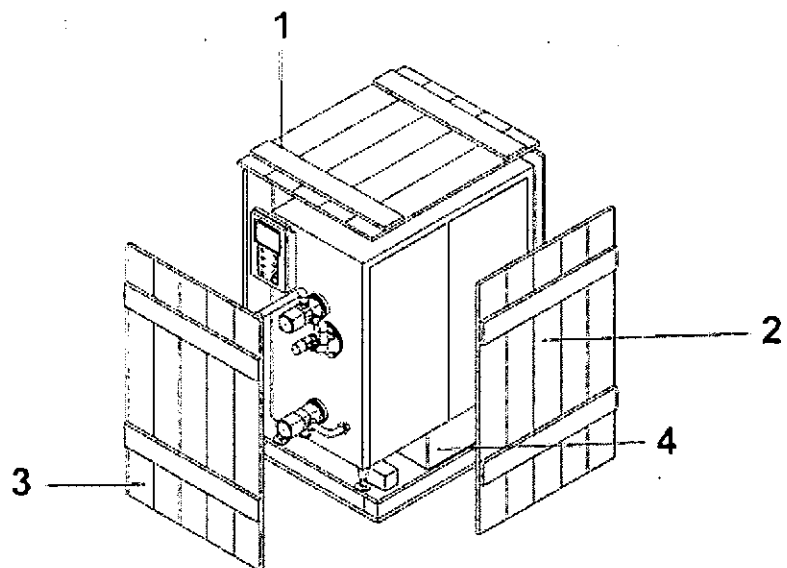
Check that the content of the package corresponds to the shipping documents.

Make sure that all covers and panels are correctly fastened in place and there are no loose parts.

Visually inspect all electrical components to make sure they are in perfect condition.

If any part or component is missing, notify Tetra Pak Hoyer immediately.

- 1 Top cover
- 2 Side panels
- 3 Front panel
- 4 Standard equipment



## 1.4 Positioning and Connections

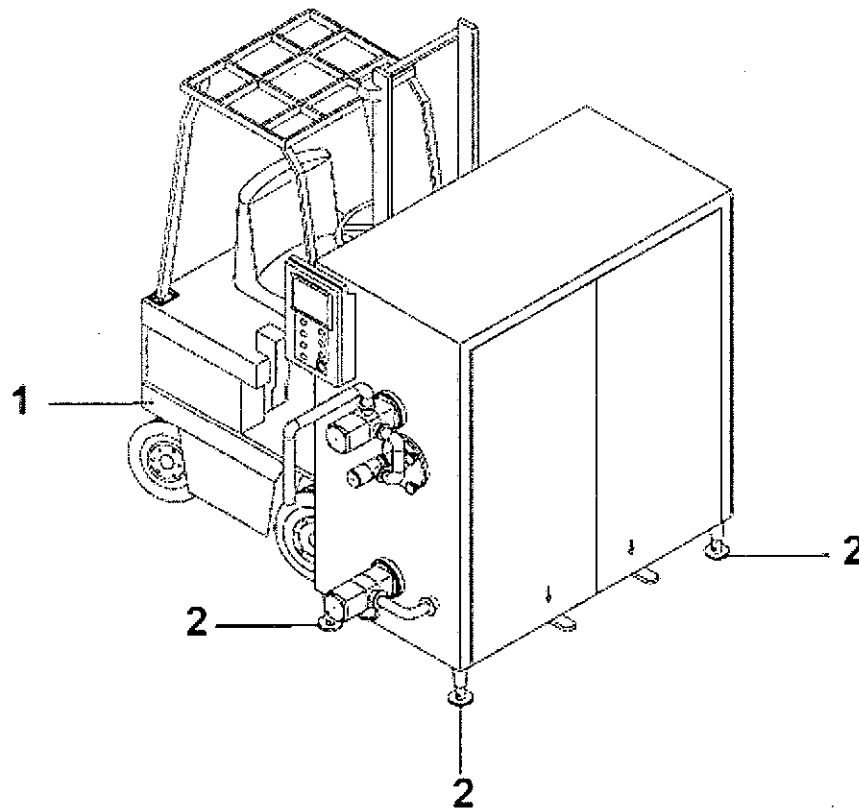
The machine is fully tested and regulated in the factory prior to shipment to the customer. Installation simply involves connecting up the pipes for the condenser cooling water supply, ice cream mix intake and outlet, compressed air supply and electric power supply.

There is no need for internal adjustments to the machine; we recommend that factory settings not be changed.

### 1.4.1 Moving

The machine may be easily transported by a lift truck (1) or an transpallets.

When the machine is raised remove the adjustable feet (2) from the crate and mount them.



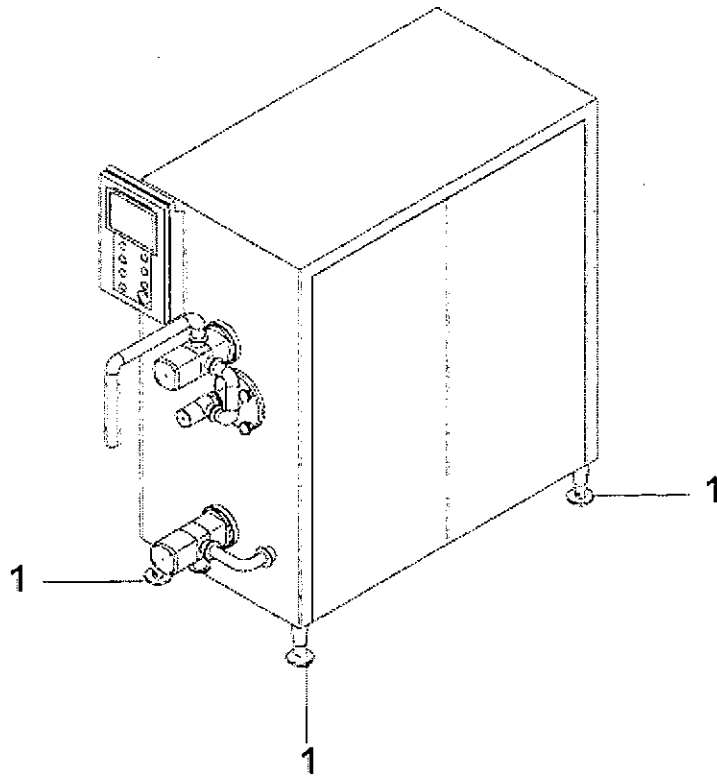
- 1 Lift truck
- 2 Adjustable feet

### 1.4.2 Positioning

Position the machine in its operating position and check the plate data to make sure that the machine is compatible with the site's electrical power supply.

### 1.4.3 Levelling

Level the machine with a spirit level by means of the adjustable feet (1)



1 Adjustable feet

TechPub\_2614345\_0105 - Tem\_Z1381026-installation.fm

## 1.4.4 Connections

### 1.4.4.1 Cooling water connection

Connect up the supply of condenser cooling water, taking care to get the direction of water flow correct: water must flow in through the connection at the bottom (1) and out through the connection at the top (2). It is recommended that two on/off taps be installed close to the machine, as well as a small drain tap close to the bottom connection; it is also a good idea to connect up these two taps with the machine through two pipe unions (threepiece connectors) to make it easy to separate the freezer from the installation.

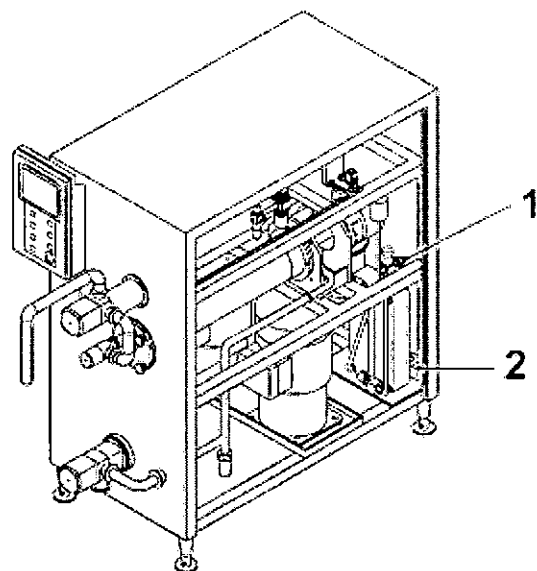
The machine is fitted with a pressure valve which controls the flow of water in inverse proportion to its temperature to obtain constant cooling (constant condensation pressure on the coolant side);

this makes it possible to use water supplies with widely varying temperatures for cooling the condenser. The water flow varies as a result, from about 2000 litres/hour at 15°C to 6000 litres/hour at 28°C (average values for machine in operation at maximum production rate).

Pipe diameter depends on pipe length and the pumps available, and must never be less than the diameter of the connections, which is 1" gas.

It is essential to wash out the pipes BEFORE connecting them to the machine by flushing them with water to eliminate any particles or dirt. If the water that flows out of the pipes continues to be dirty, it will be necessary to install a filter with a filtering capacity and size appropriate to the type and amount of dirt conveyed at the intake (1) (the bottom connection).

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1 Bottom  
2 Top

1.4.4.2 Ice cream intake and outlet connection

Connect the mix supply pipe to the mix pump inlet connection (1) on the front of the machine. The machine has a CIP washing programme permitting thorough, safe washing of the machine without dismantling its parts; it will therefore be necessary to prepare the required connections between the CIP washing pump and solutions and the mix pipe.

Make sure that the mix flows “spontaneously” to the machine connection (1), and does not need to be suctioned by the freezer pump; this may be done by simply positioning the ageing vats higher than the freezer (check that the spontaneously flowing supply is sufficient even when the mix level in the containers is low), or by installing a suitable centrifugal pump close to the vats.

Take care to ensure that there is no air getting into the pipes, which could pollute the product and result in fluctuation of ice cream overrun.

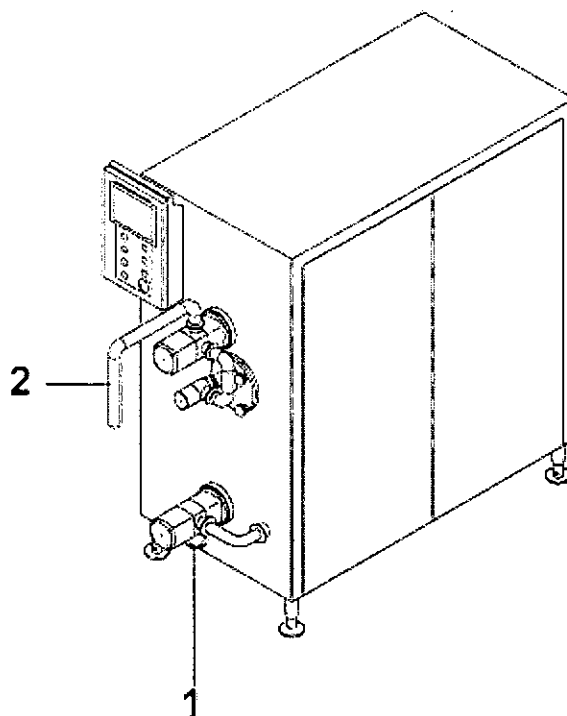
Connect up the ice cream outlet (2) to the utility. Use the shortest possible pipe, with as few curves as possible, and use a pipe which is shiny inside; the pipe does not need to be insulated. Make sure that ice cream pressure in the cylinders does not exceed 12 bar (the absolute maximum permitted value); if this should occur, move the freezer closer to the ice cream utility and/or use hot gas to produce softer ice cream.

**CAUTION**

The connected input piping has to be of higher sizes and has to be designed by the purchaser to give the peak flow rate.

*(Cont'd)*

- 1 Connection
- 2 Cream outlet



(Cont'd)

**CAUTION**

Pipes must be dismantled and washed thoroughly after completing this procedure to ensure that no hard solid particles are conveyed toward the freezer mix pump. This is very important as solid particles such as metal burr or welding residues could severely damage the freezer pump and will invalidate the guarantee.

**1.4.4.3 Compressed air connection**

Connect the compressed air supply pipe to the connection on the rear of the machine; it is recommended that an easily removable tap and connection be assembled close to the machine connection.

The supply pressure measured on the machine must never drop below 4 bar. It is strongly recommended that the compressed air supply in the place of installation be fitted with an air drying system and A0 filters to remove oil vapours and residual fine particles.

Remove the cartridge of the sterilizing filter from the standard equipment and insert it in the body of the filter.

**1.4.4.4 Electrical connection****CAUTION**

**Electrical connection must be made exclusively by competent technicians who are familiar with safety legislation and authorised to perform and certify electrical installations.**

Check the identification plate to make sure that the machine is compatible with the site's power supply. Connect the machine's power supply to the site's distribution panel and protect it with a suitable device, complying with all regulations for correct electrical installation in effect in the place of installation.

We recommend installing an automatic circuit breaker on the distribution panel, complying with local regulations.

Great care must be taken to ensure correct connection with the earth, as incorrect connection could cause severe damage to the machine's electronic parts and injury or death to the operator.

The section of the power supply cable must be determined on the basis of its length and the voltage used during testing prior to shipment; if this cable is not long enough, it must be replaced in its entirety, without making any connections.

The machine's electrical installation includes a device for checking that phase sequence is correct to ensure that the motors turn in the right direction; if the machine does not work after connection, but the touch screen light comes on, two of the three wires in the machine's cable must be reversed on the distribution panel which supplies the machine.

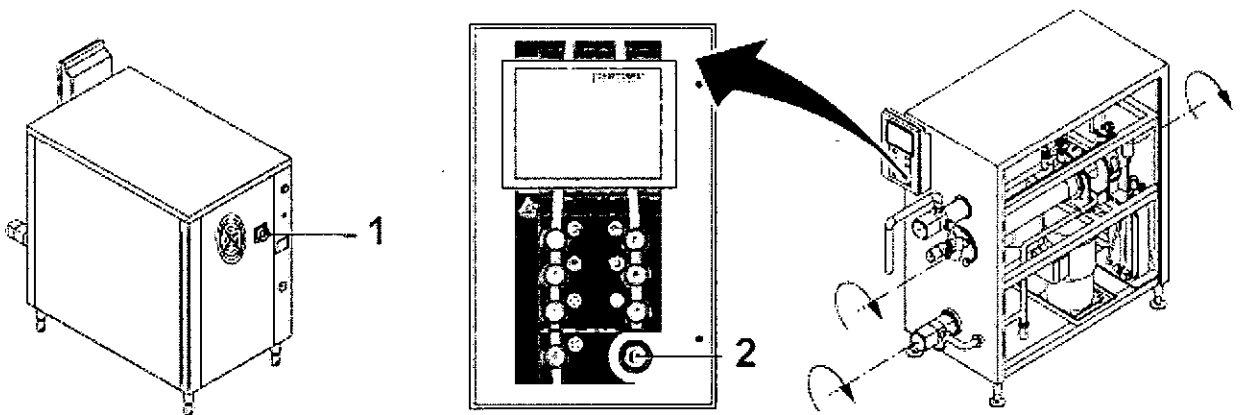
### 1.4.5 Installation check

Check that connections have been made correctly:

- a. Slowly open the cooling water intake tap and check that there are no leaks. Open the outlet tap and check that water can flow freely and that any air in the circuit has been expelled (this involves turning on the machine's cooling compressor because of the pressure valve which blocks the flow of water - see below).
- b. Turn on the compressed air supply tap and check that there is no leakage and that pressure is between 6 and 10 bar. If the installation does not have a drier, bleed condensation from the line before turning on the tap on the machine.
- c. Turn on the main switch on the machine's rear panel (1) position. Release the emergency button (2). Make sure that the panel switches on.

In case of the alarm message: "phase seq. not correct", change the rotation direction of the phases by switching the positions of two wires in the machine's power supply cable on the distribution panel (refer to installation instructions); all motors will then turn correctly in the direction indicated by the arrows in figure.

- 1 Main switch  
2 Emergency button





## 1.5 Disposal

If the machine must definitely be demolished, carry out the following operations:

- a) Contact personal qualified for the disposal/recovery of the R404A refrigerant gas.
- b) Unload the oil from the boxes of the gears. Eliminate the oil following the instructions of the producer.
- c) Disassemble completely the machine and separate the following materials:
  - stainless steel
  - aluminium
  - rubber (estates, O-ring, etc.)
  - PET and PVC
  - electric cables
  - pneumatic pipes
  - electric components
- d) The recycle or the disposal of the materials, groups and components has to be in conformity with the local norms.

# Electrical Drawings

TechPub\_2614345\_0105 - Tech\_Z1381026-Installation.fm



# Frigus 1200 N1

图纸号:

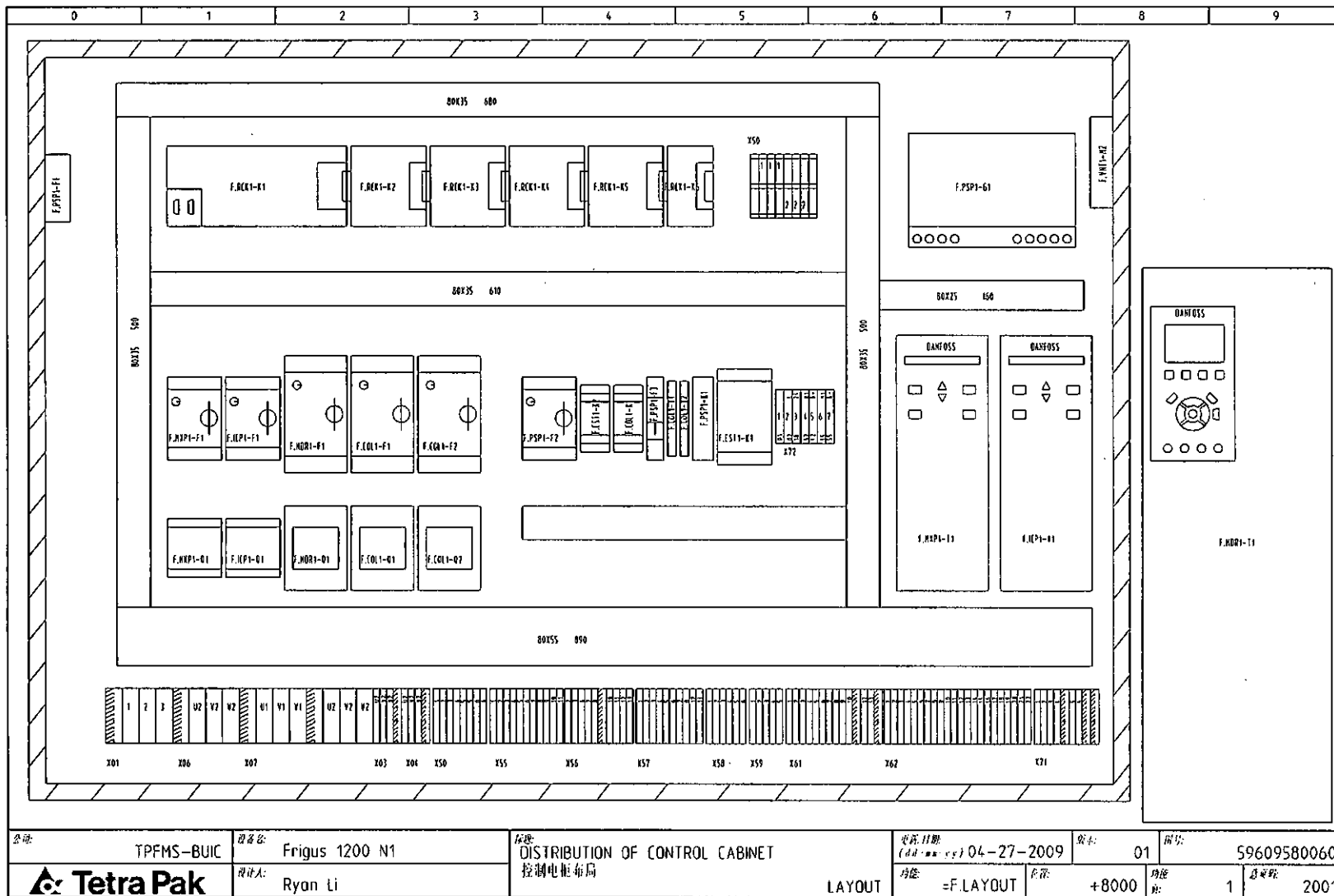
## 59609580060

本图纸号包括以下机器:

	机器名称	机器号码	功能代码
1	XX	XX	XX
2	XX	XX	XX
3	XX	XX	XX
4	XX	XX	XX
5	XX	XX	XX
6	XX	XX	XX
7	XX	XX	XX
8	XX	XX	XX
9	XX	XX	XX
10	XX	XX	XX

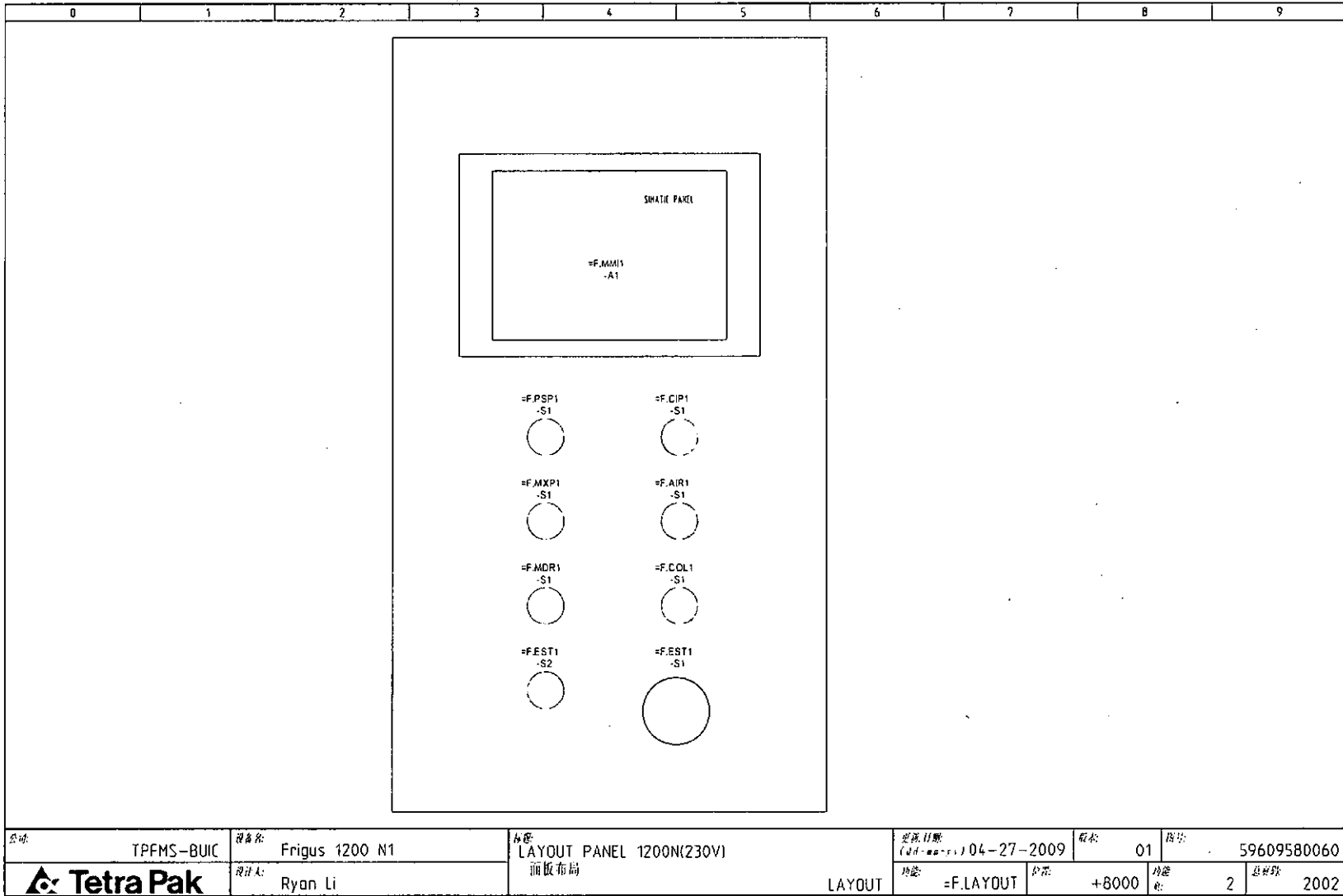
主要电气数据,请参考机器铭牌

11年11月 4/27/2009

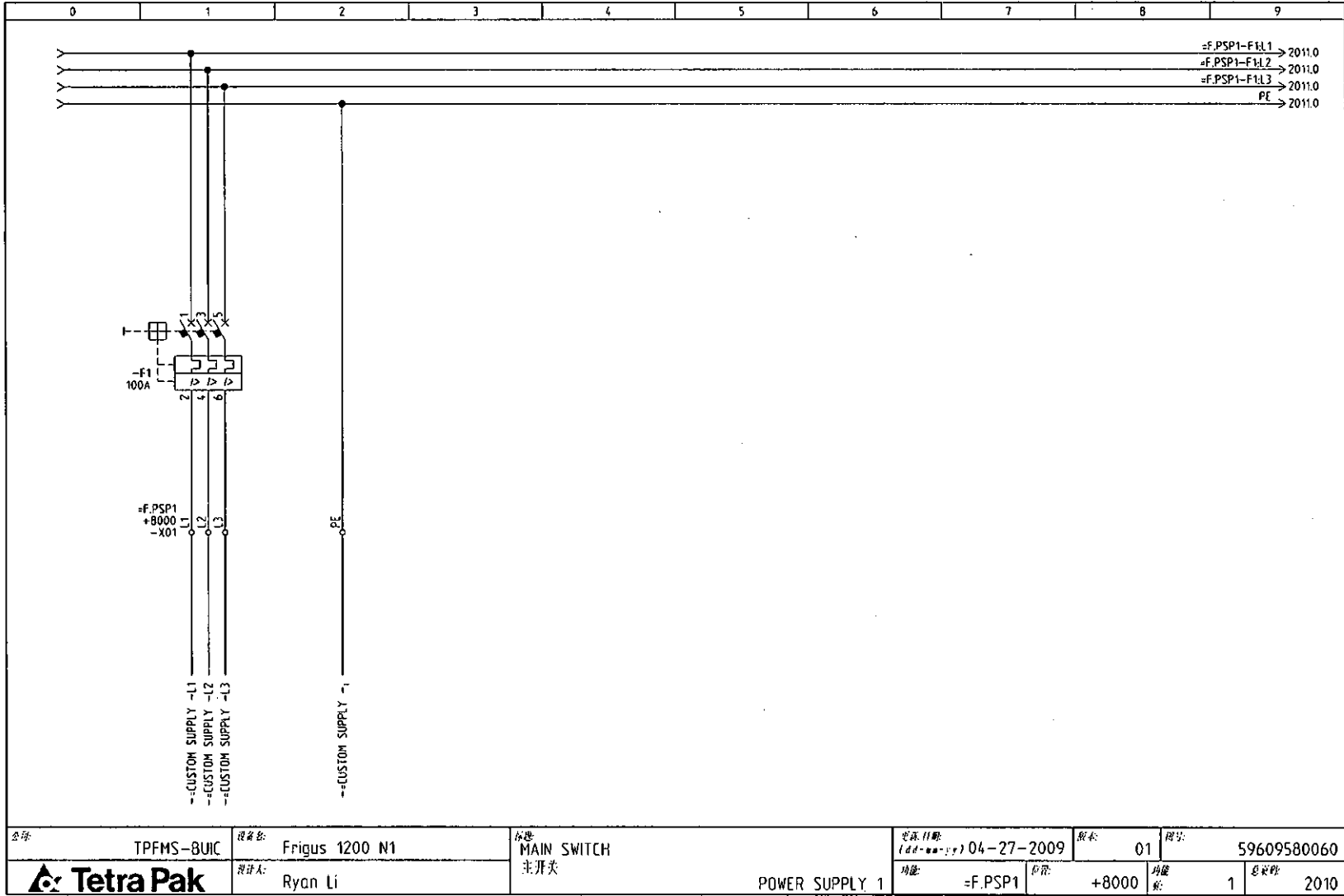


名称: TPFMS-BUIC	设备名: Frigus 1200 N1	位置: DISTRIBUTION OF CONTROL CABINET 控制柜布局	日期: 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	LAYOUT	均德: -F.LAYOUT	尺寸: +8000	功能: 1 数量: 2001

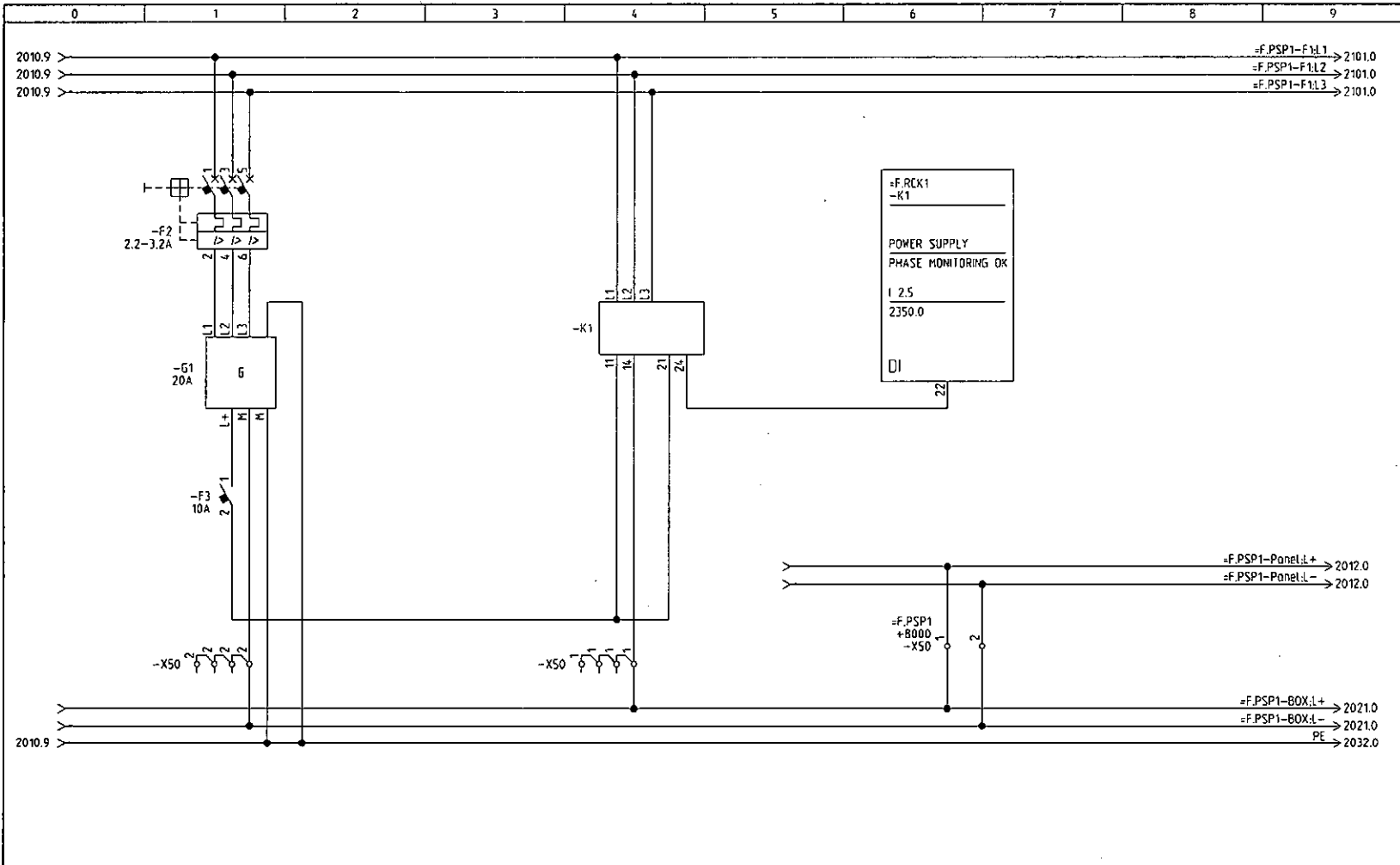
日期: 4/27/2009



日期: 4/27/2009

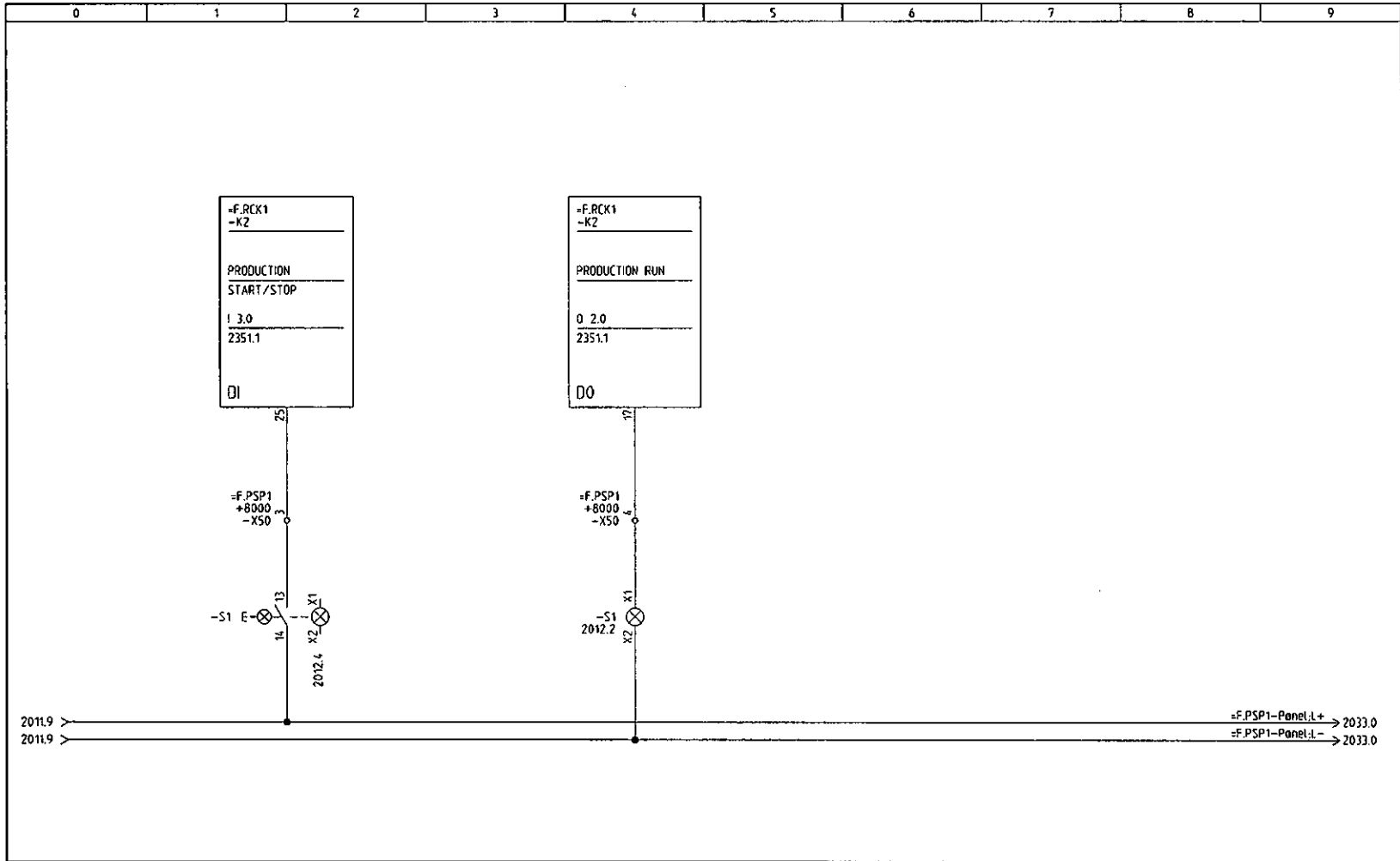


打印日期: 4/27/2009



公司:	TPFMS-BUIC	设备名:	Frigus 1200 N1	装置:	PHASE SEQUENCE RELAY-24VDC POWER 相序继电器-电源	设备日期: (dd mm yy) 04-27-2009	版本:	01	编号:	59609580060			
	<b>Tetra Pak</b>	设计人:	Ryan Li		POWER SUPPLY 1	功能:	=F.PSP1	功率:	+8000	数量:	2	日期:	2011

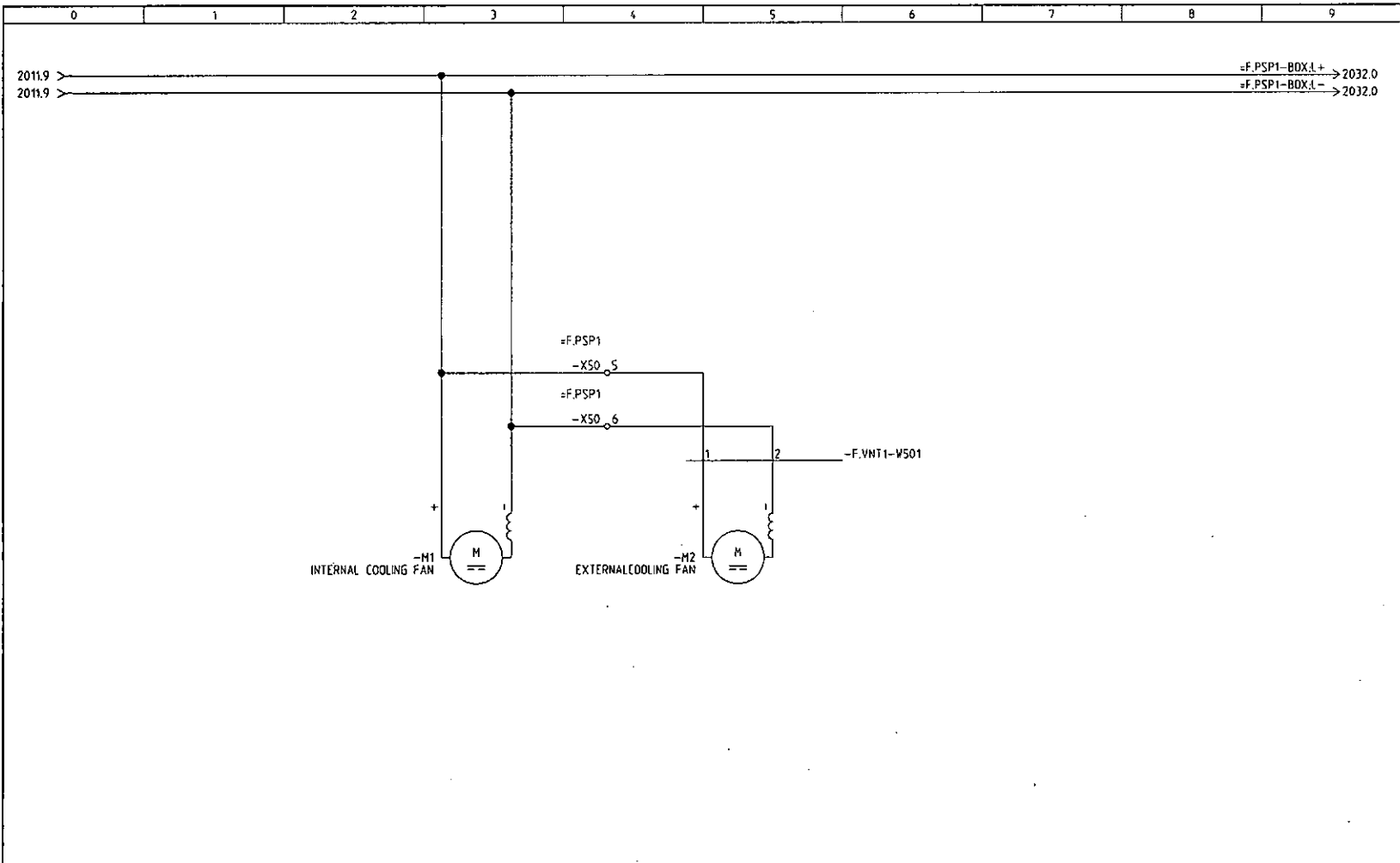
打印日期: 4/27/2009



公司: TPFMS-BUIC	设备名: Frigus 1200 N1	设备: PLC INPUT/OUTPUT PLC 输入/输出	更新日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	POWER SUPPLY 1	功能: =F.PSP1	电压: +8000	功能数: 3 总图号: 2012

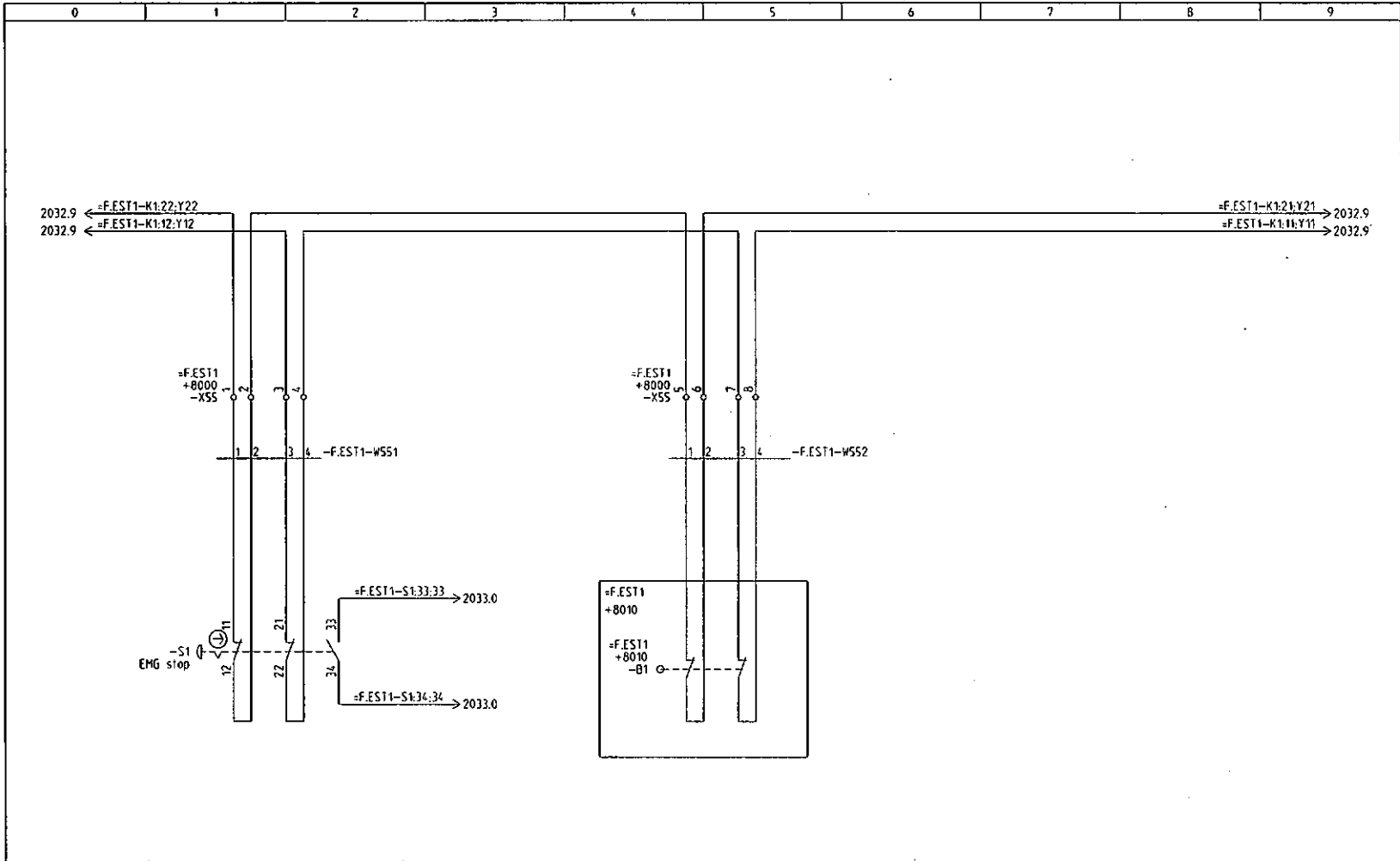
发布日期: 4/27/2009





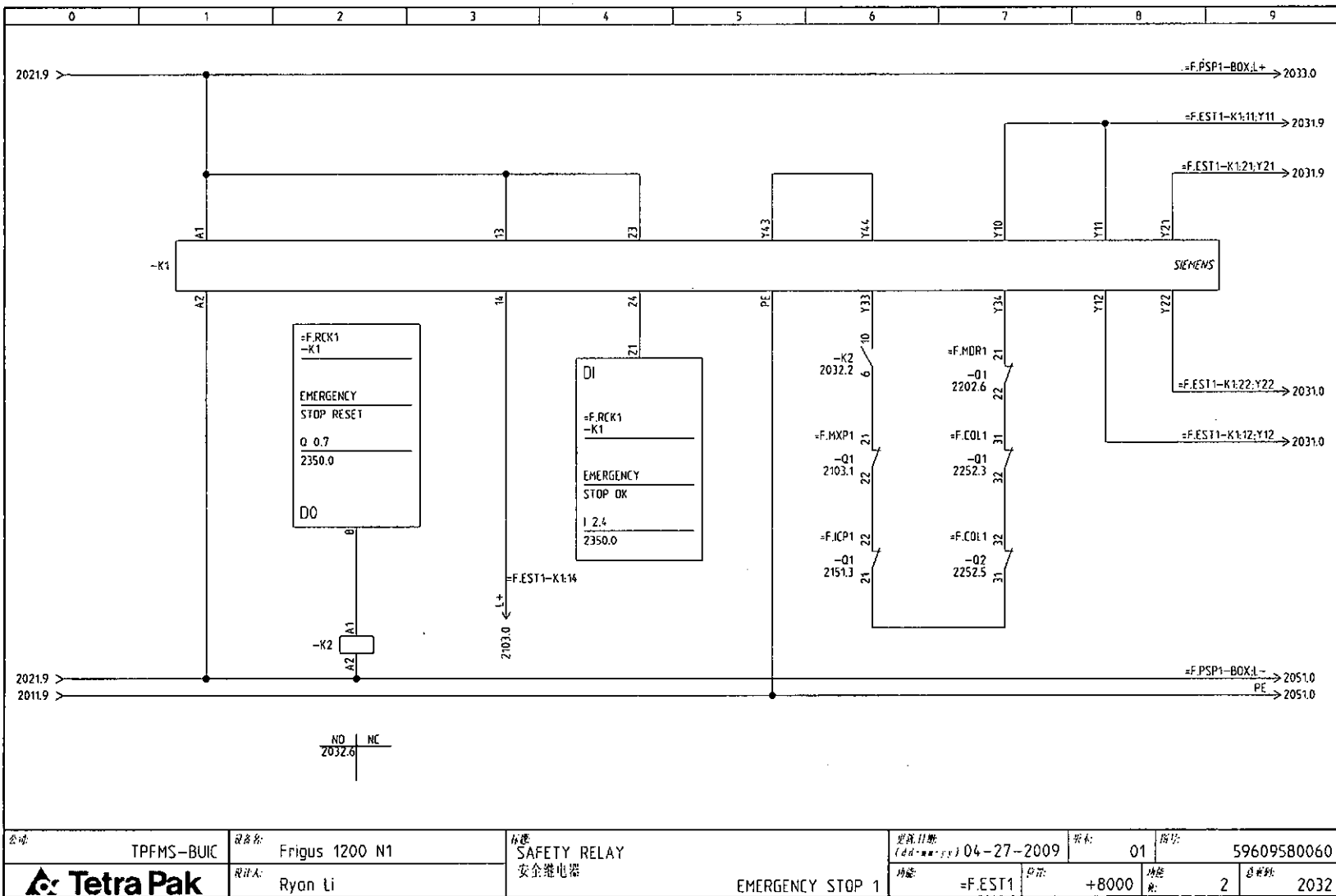
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设计人: Ryan Li		功能: =F.VNT1	功率: +8000	数量: 1	年份: 2021

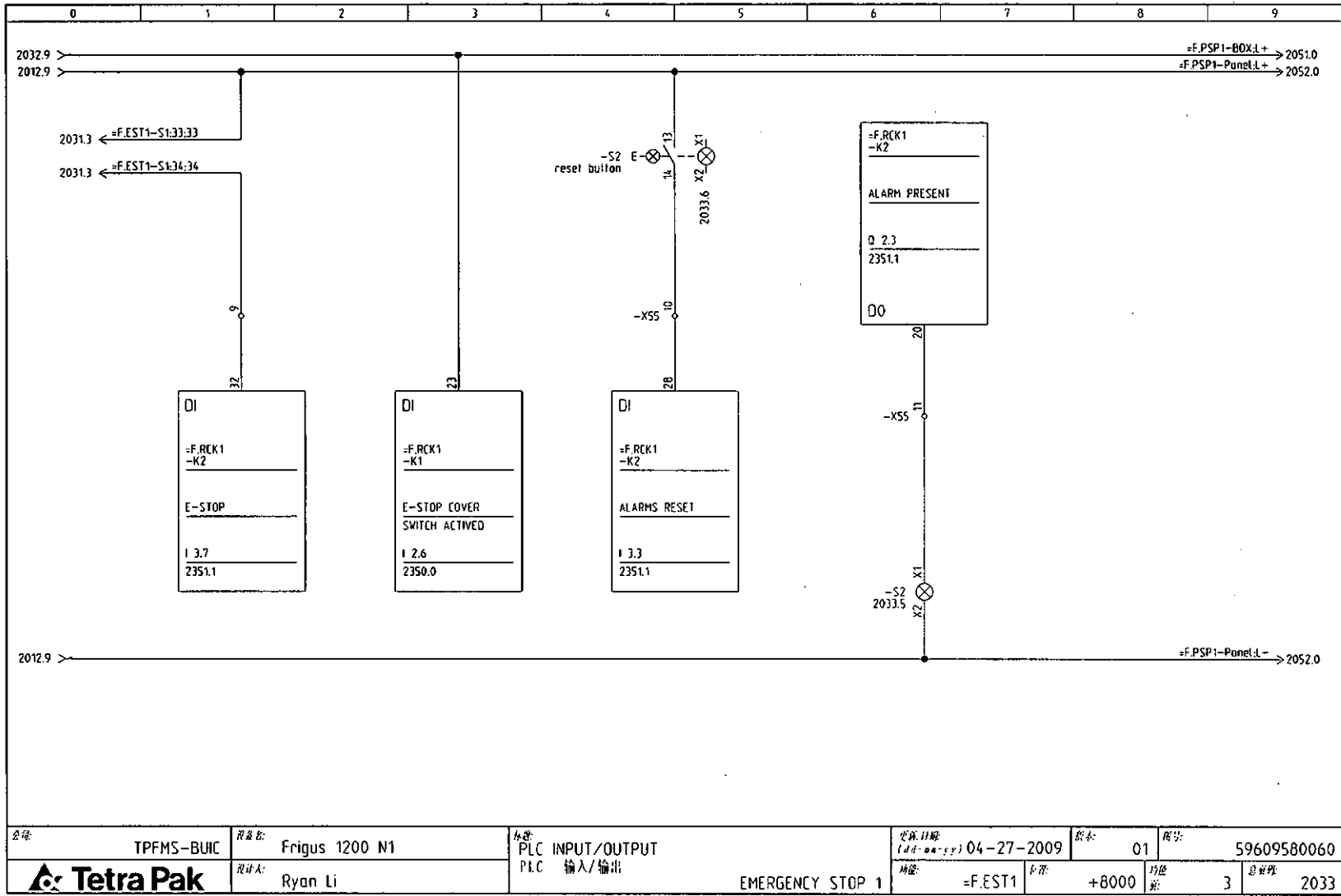
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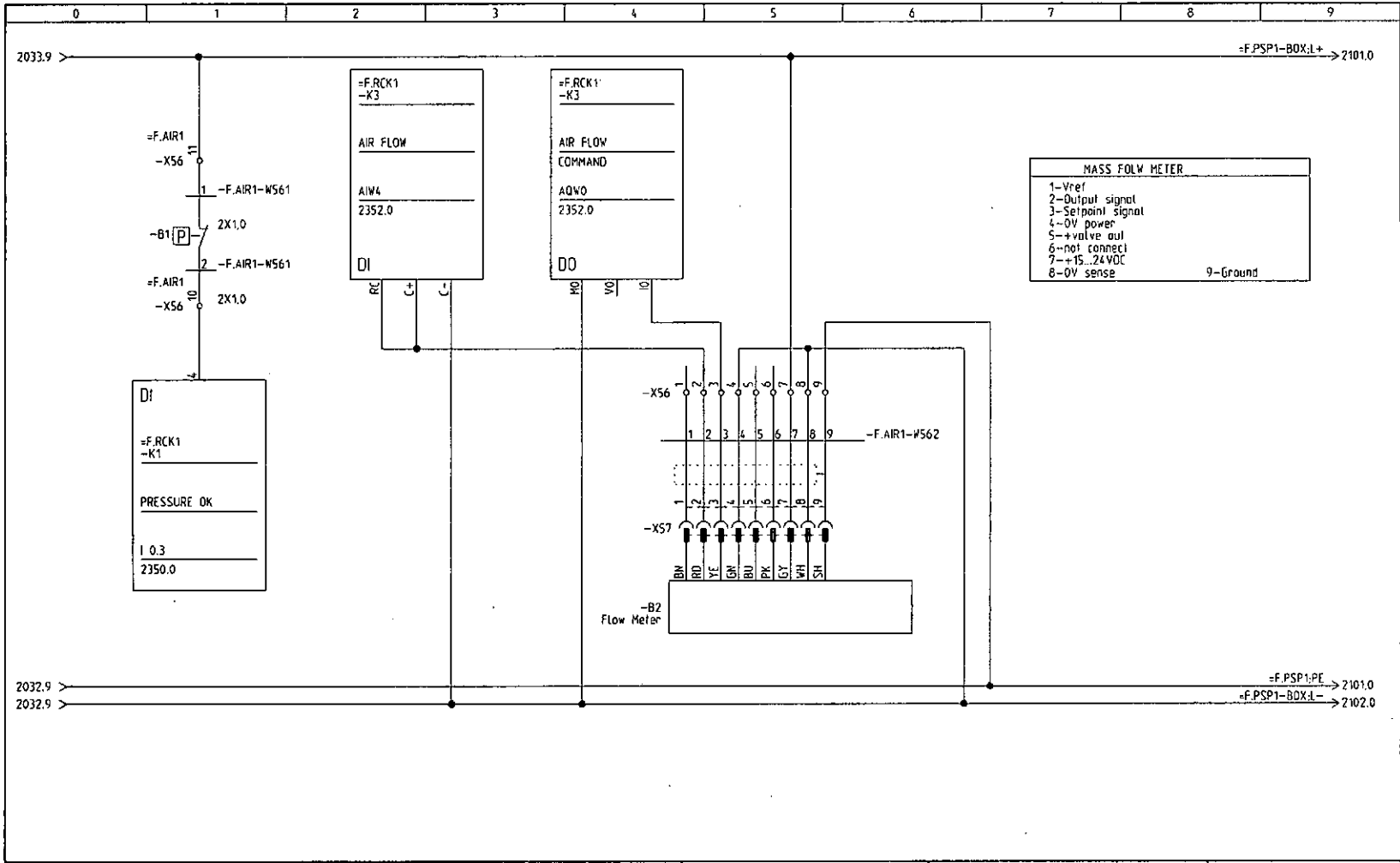


公司: TPFMS-BUIC	设备名: Frigus 1200 N1	位置: EMERGENCY STOP 急停回路	安装日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	EMERGENCY STOP 1	功能: =F.EST1	料号: +8000	功能号: 1 总页数: 2031

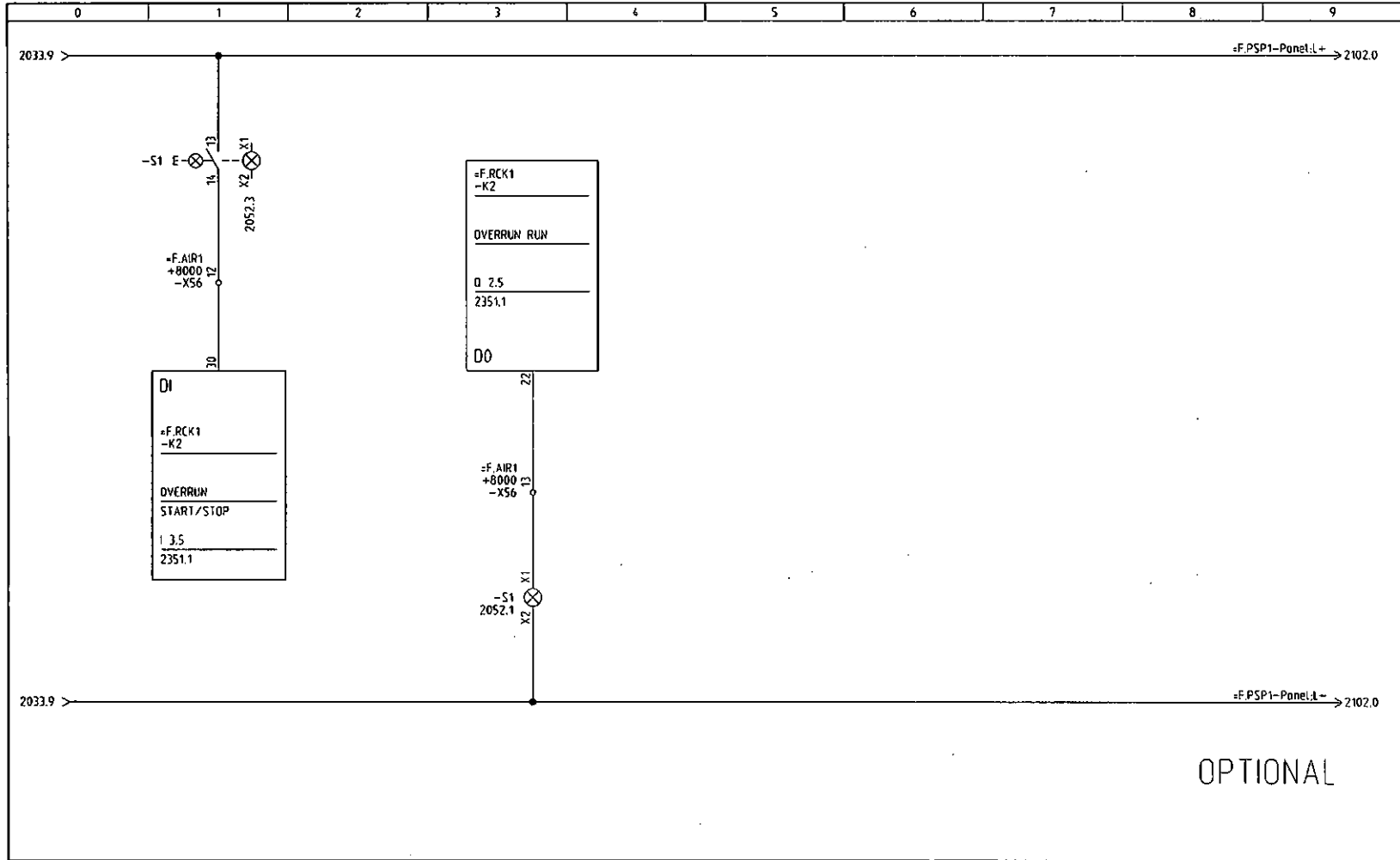
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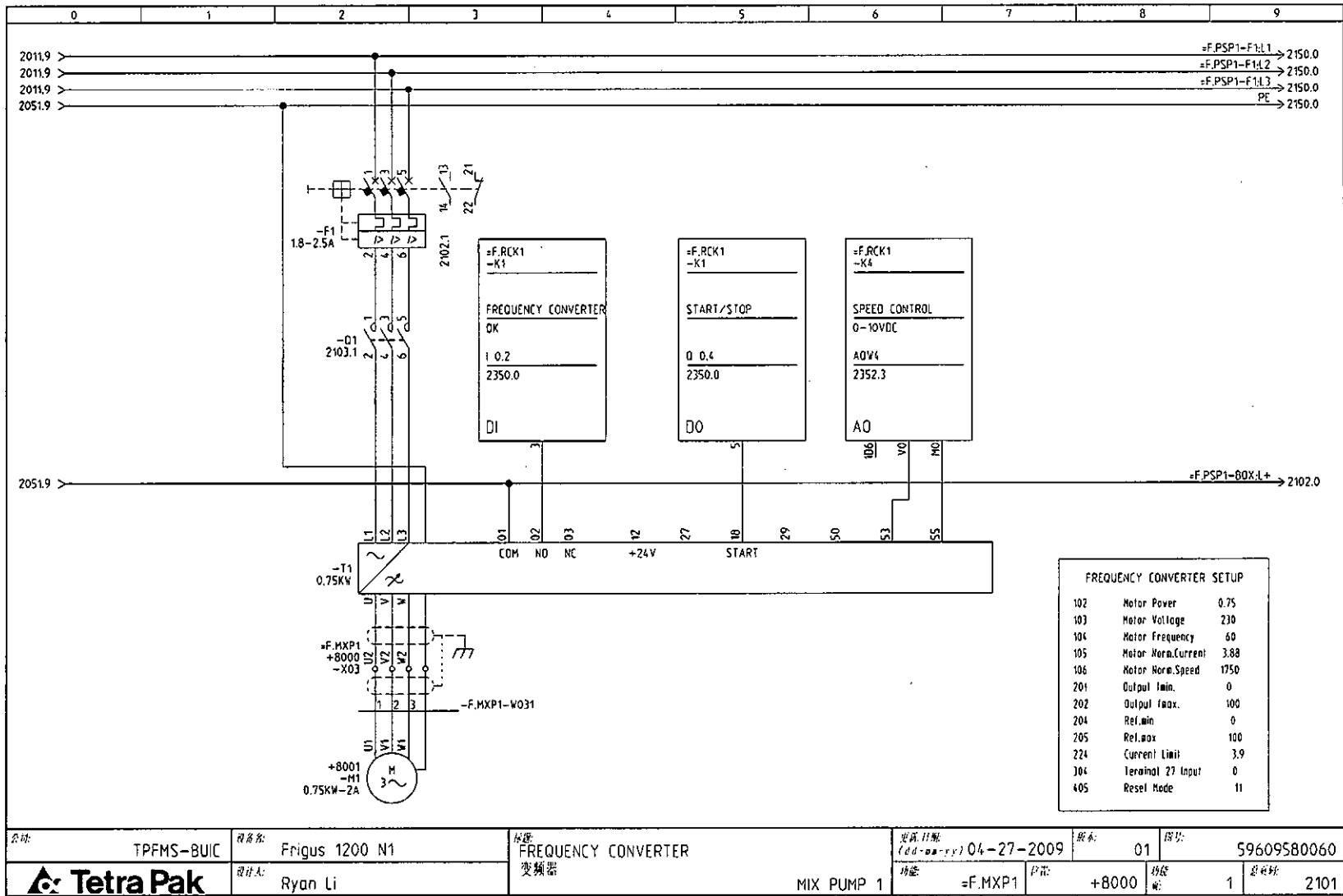
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<b>Tetra Pak</b>	设计人: Ryan Li	气源	功能: =F.AIR1	功率: +8000	数量: 1
日期: 4/27/2009		AIR SUPPLY 1			零件号: 2051



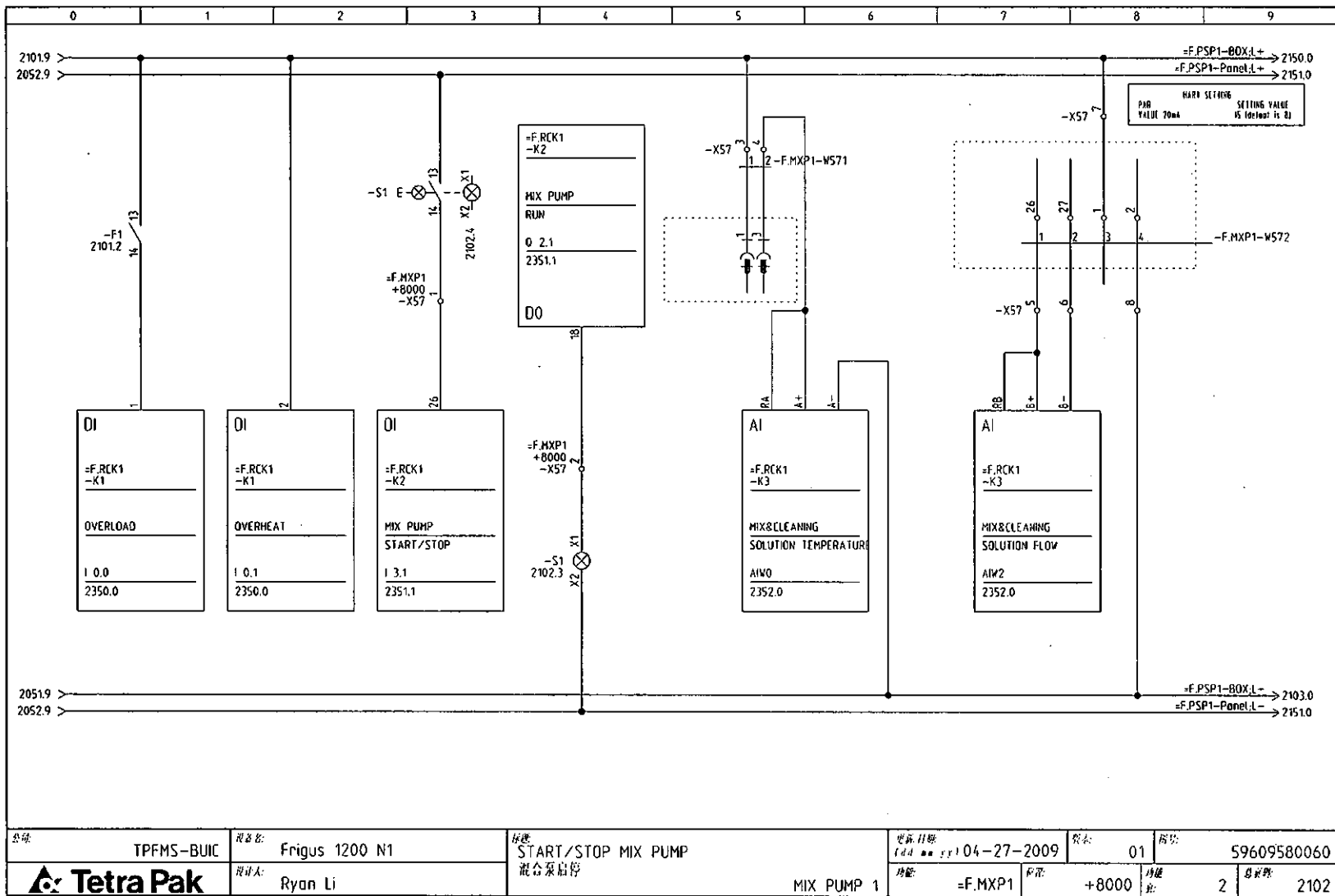
OPTIONAL

名称	TPFMS-BUIC	设备名	Frigus 1200 N1	库位	OVERRUN	安装日期 (dd-mm-yy) 04-27-2009	版本	01	图号	S9609580060			
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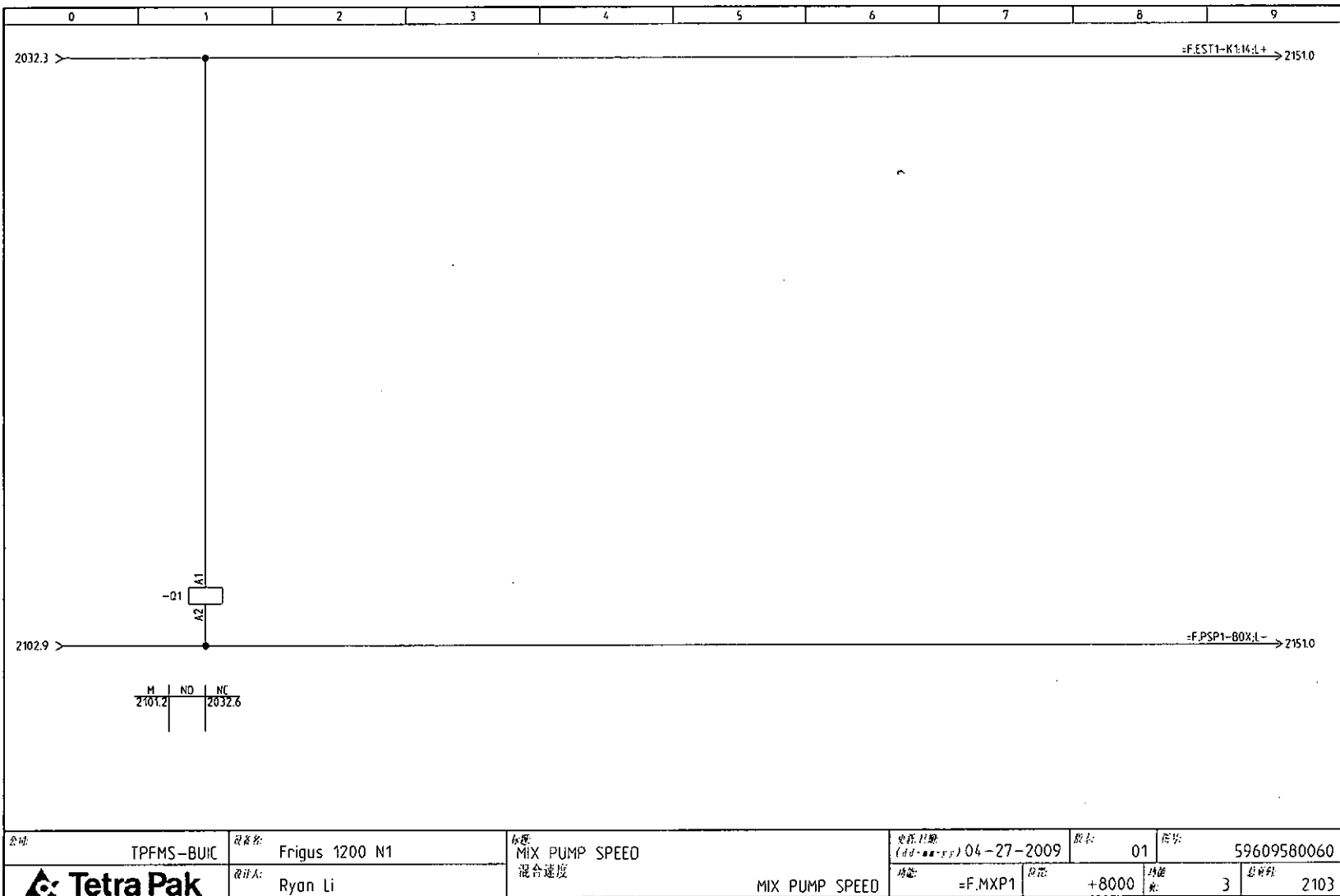
打印日期 4/27/2009



名称: TPFMS-BUIC	设备名称: Frigus 1200 N1	设备: FREQUENCY CONVERTER	规格/日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	变频器	功能: =F.MXP1	功率: +8000	图例: 1, 总图号: 2101
打印日期: 4/27/2009		MIX PUMP 1			

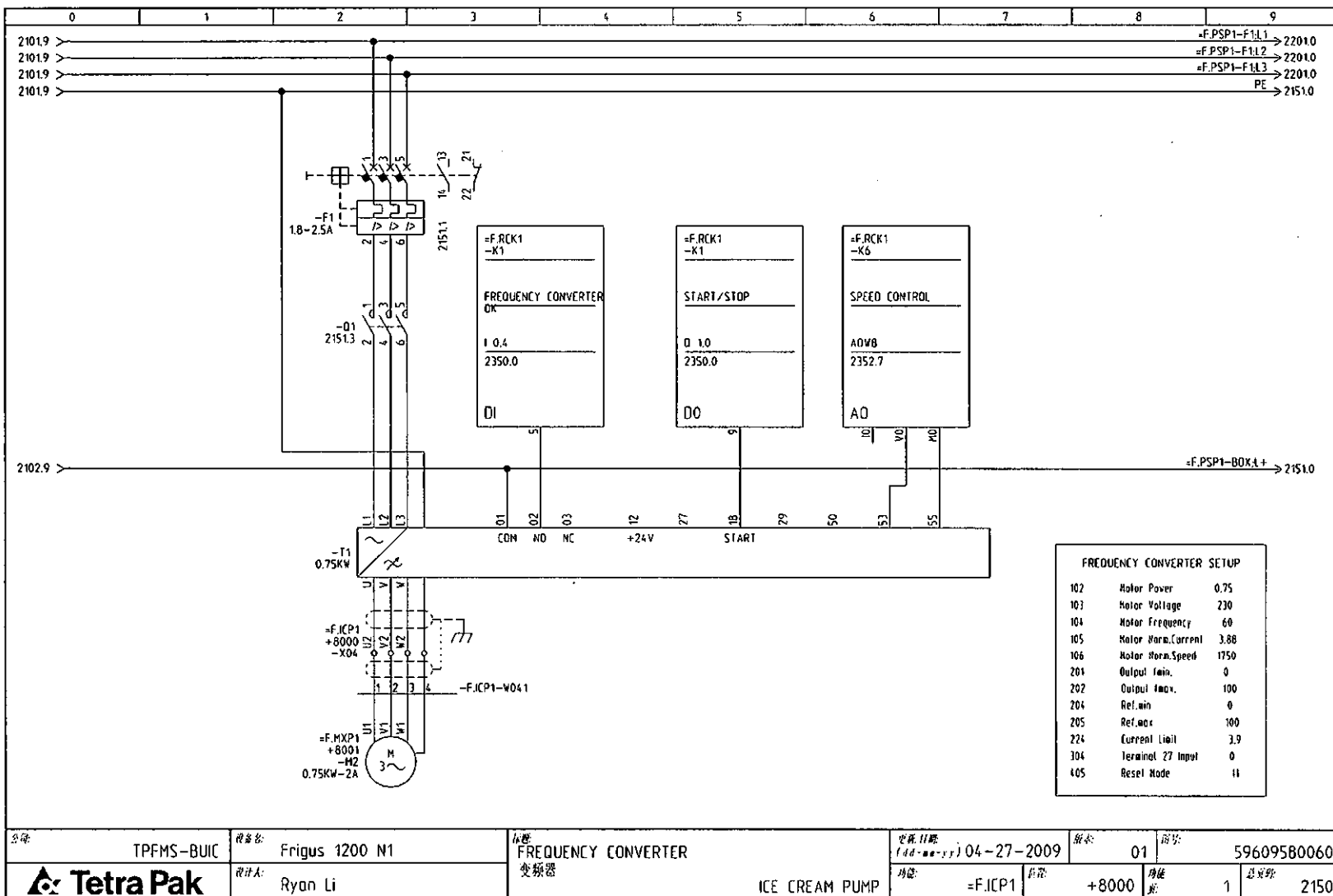






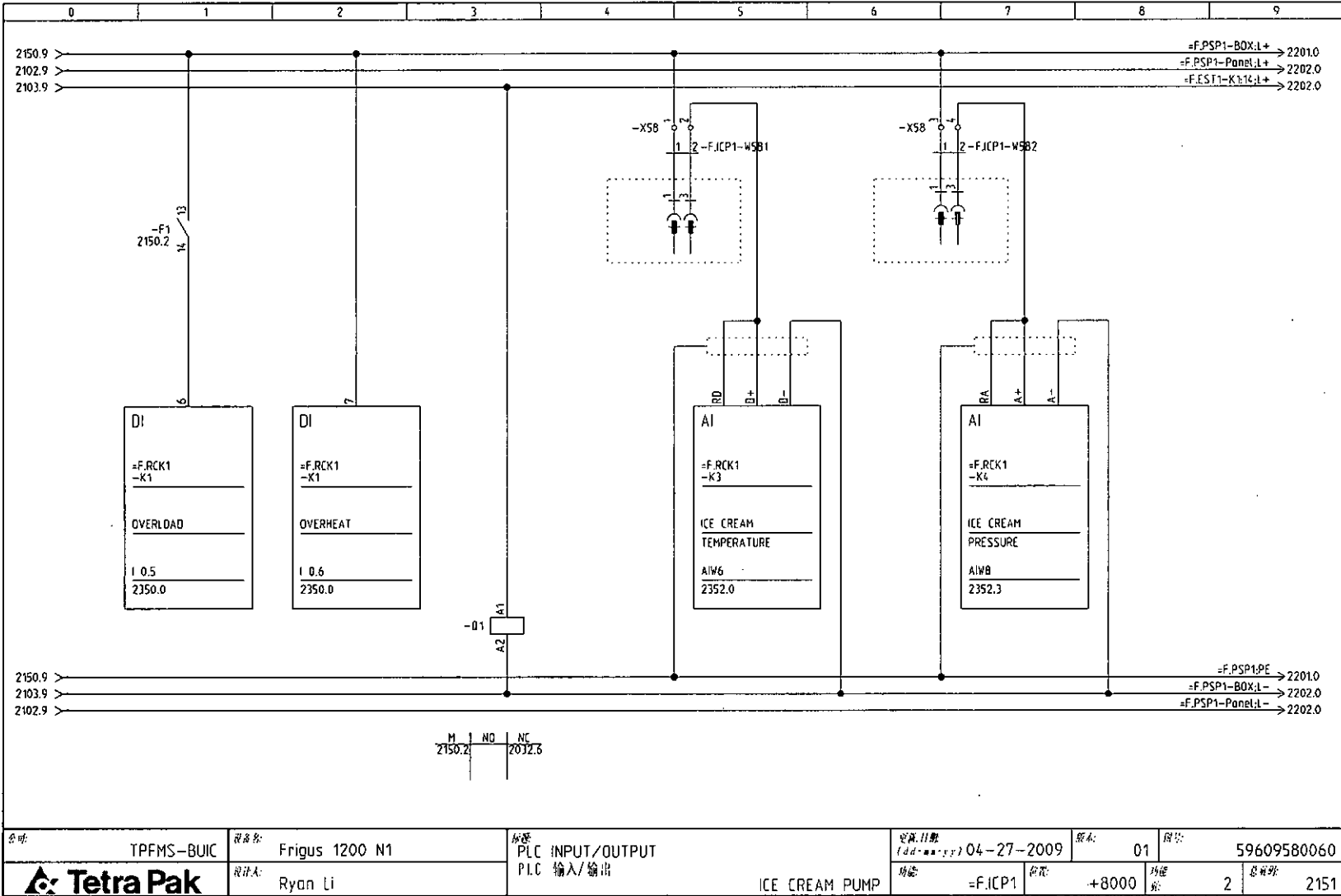
公司:	TPFMS-BUIC	设备名:	Frigus 1200 N1	标题:	MIX PUMP SPEED 混合速度	变更日期:	(dd-mm-yy) 04-27-2009	版本:	01	图号:	59609580060
	<b>Tetra Pak</b>	设计人:	Ryan Li		MIX PUMP SPEED	设备:	=F.MXP1	电压:	+8000	数量:	3

打印日期: 4/27/2009

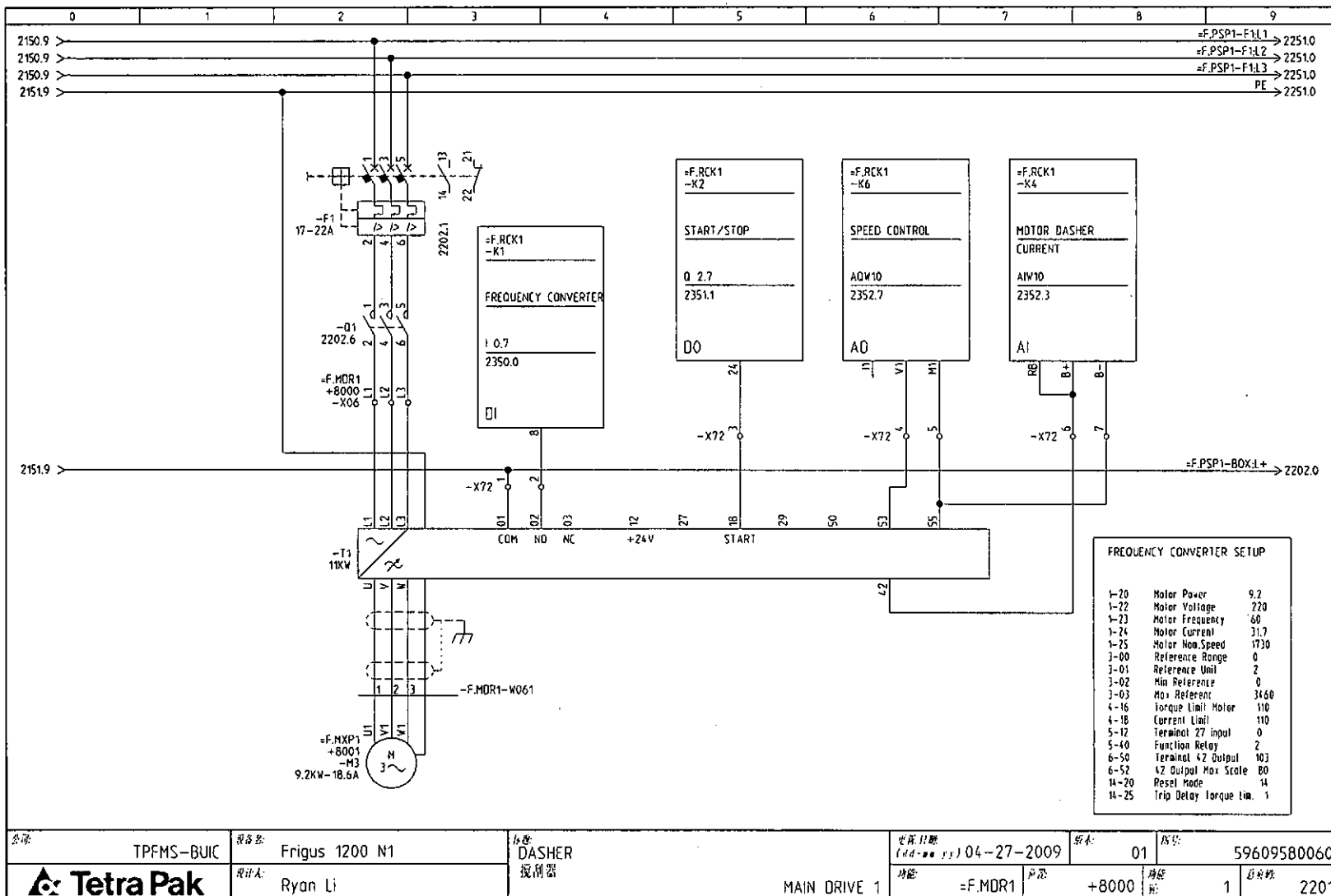


公司: TPFMS-BUIC	设备名: Frigus 1200 N1	位置: FREQUENCY CONVERTER 变频器	安装日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	ICE CREAM PUMP	功能: -F.ICP1	数量: +8000	数量: 1 总数量: 2150

打印日期: 4/27/2009

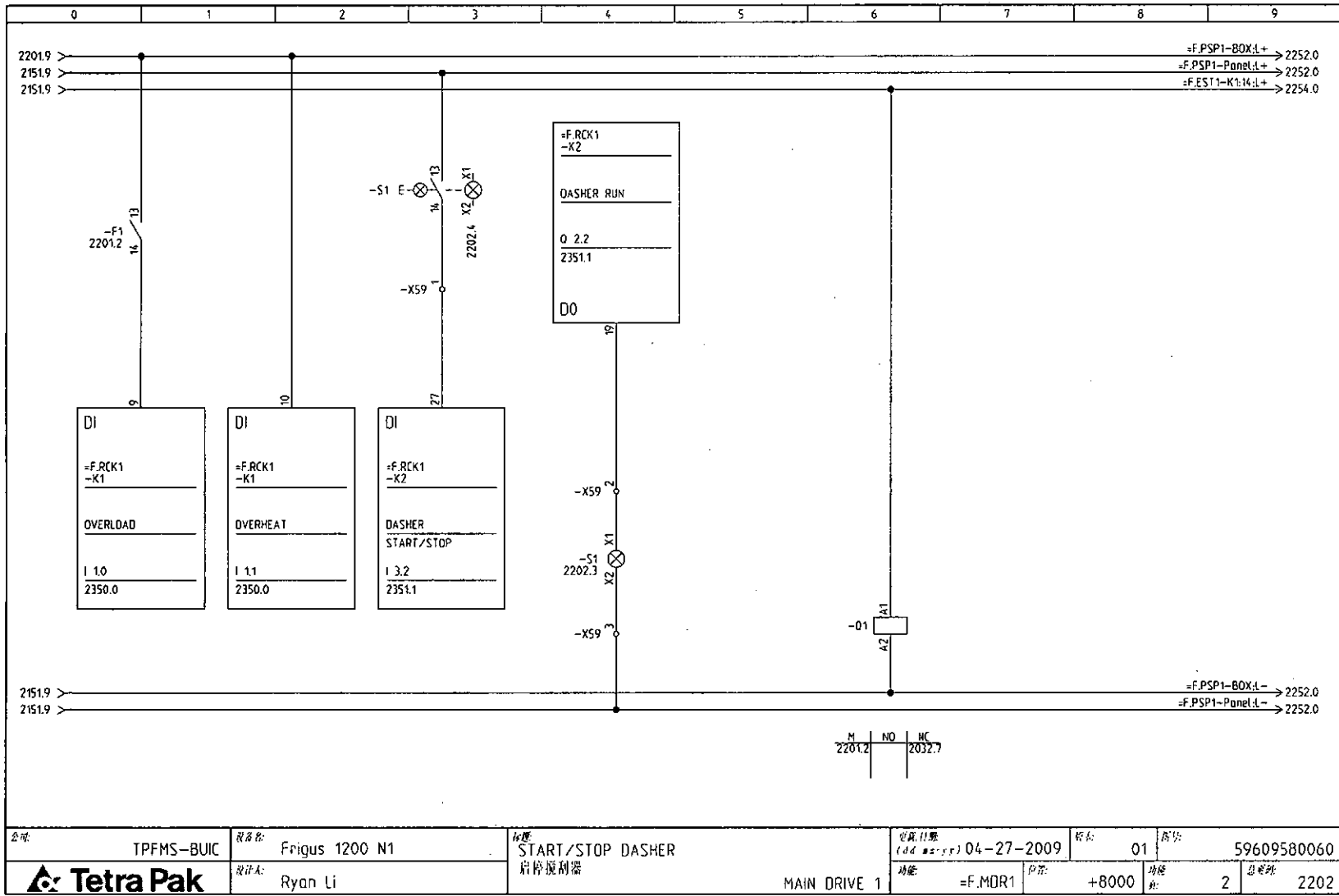


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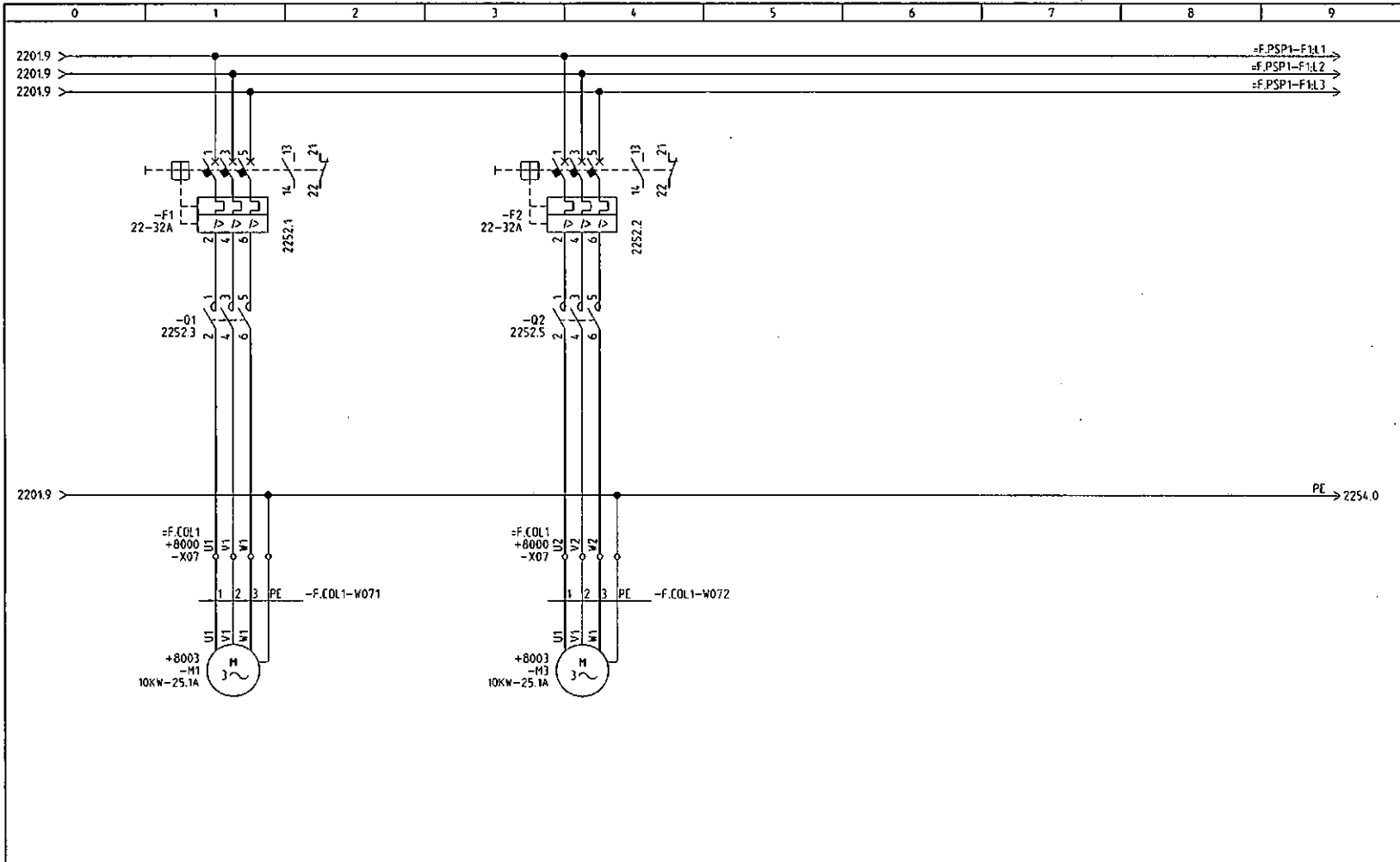
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打印日期: 4/27/2009

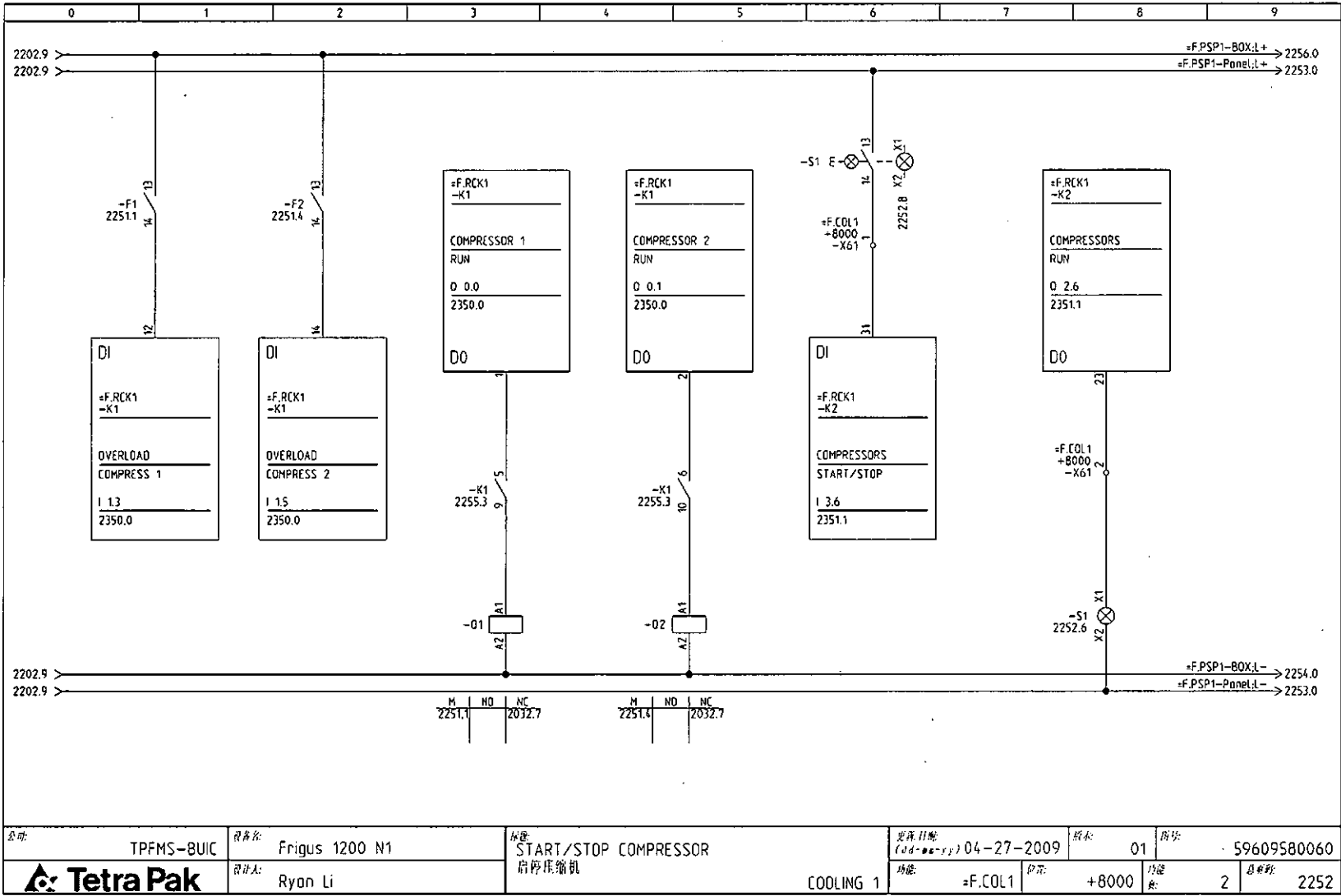


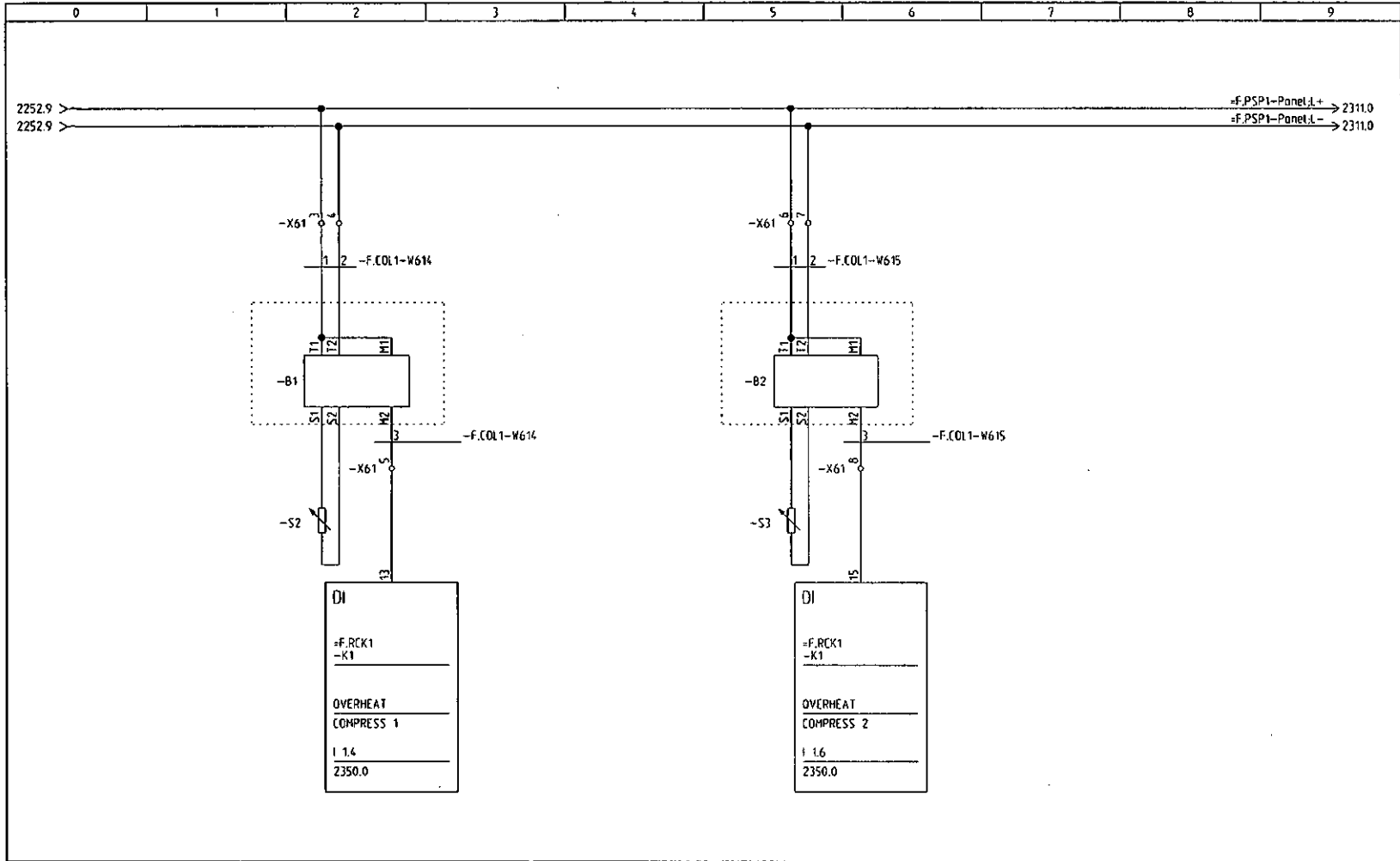
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<b>Tetra Pak</b>	设计人: Ryan Li	功能: 启动/停止器	功能: =F.MDR1	功率: +8000	图号: 2 物料号: 2202

打印日期: 4/27/2009



公司 TPFMS-BUIC	设备名 Frigus 1200 N1	设备 COMPRESSOR 压缩机	设备日期 (dd-mm-yy) 04-27-2009	版本 01	图号 59609580060
<b>Tetra Pak</b>	设计人 Ryan Li	功能 COOLING 1	功能 =F.COL1	功率 +8000	数量 1
日期 4/27/2009					图号 2251

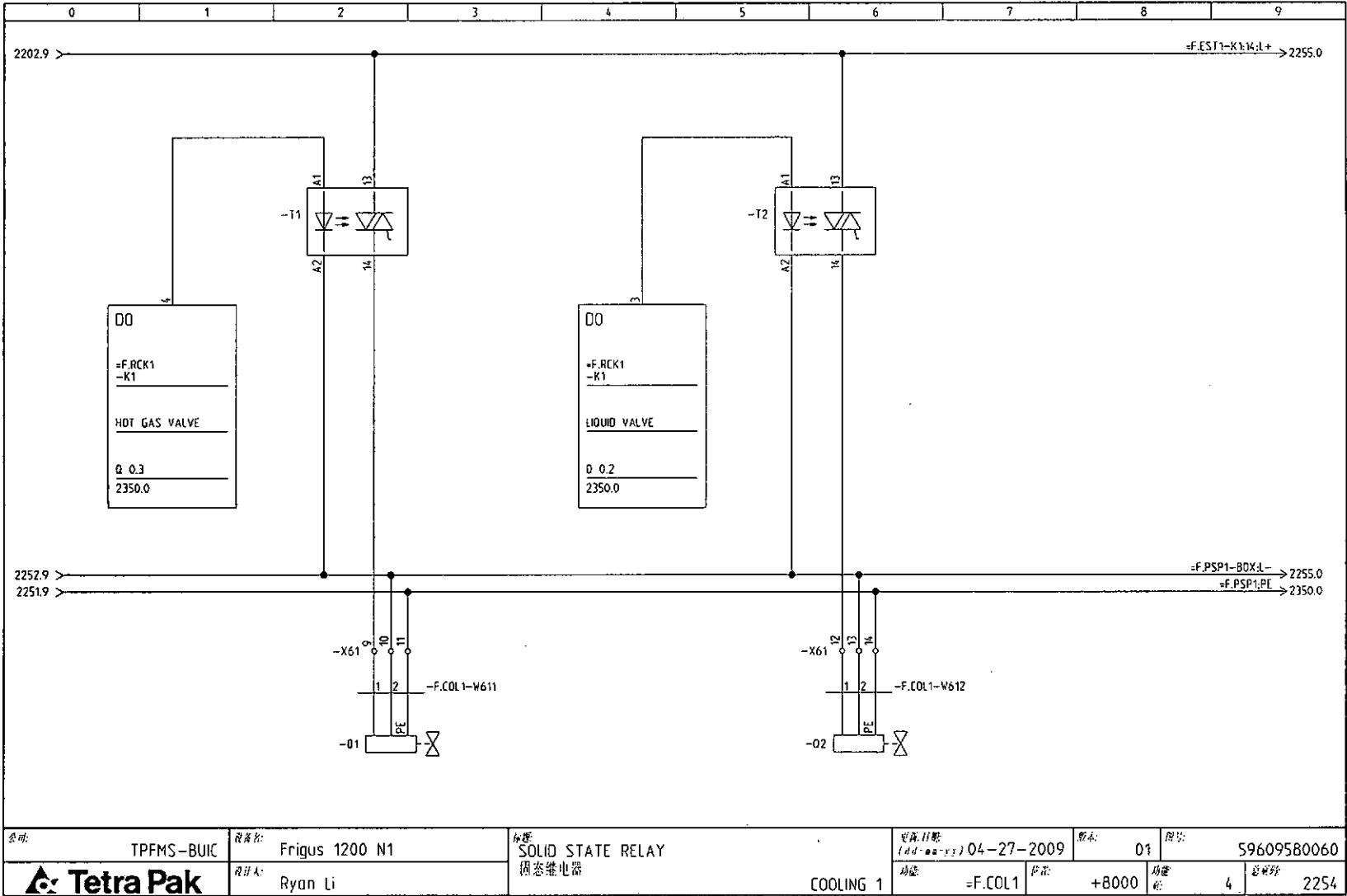


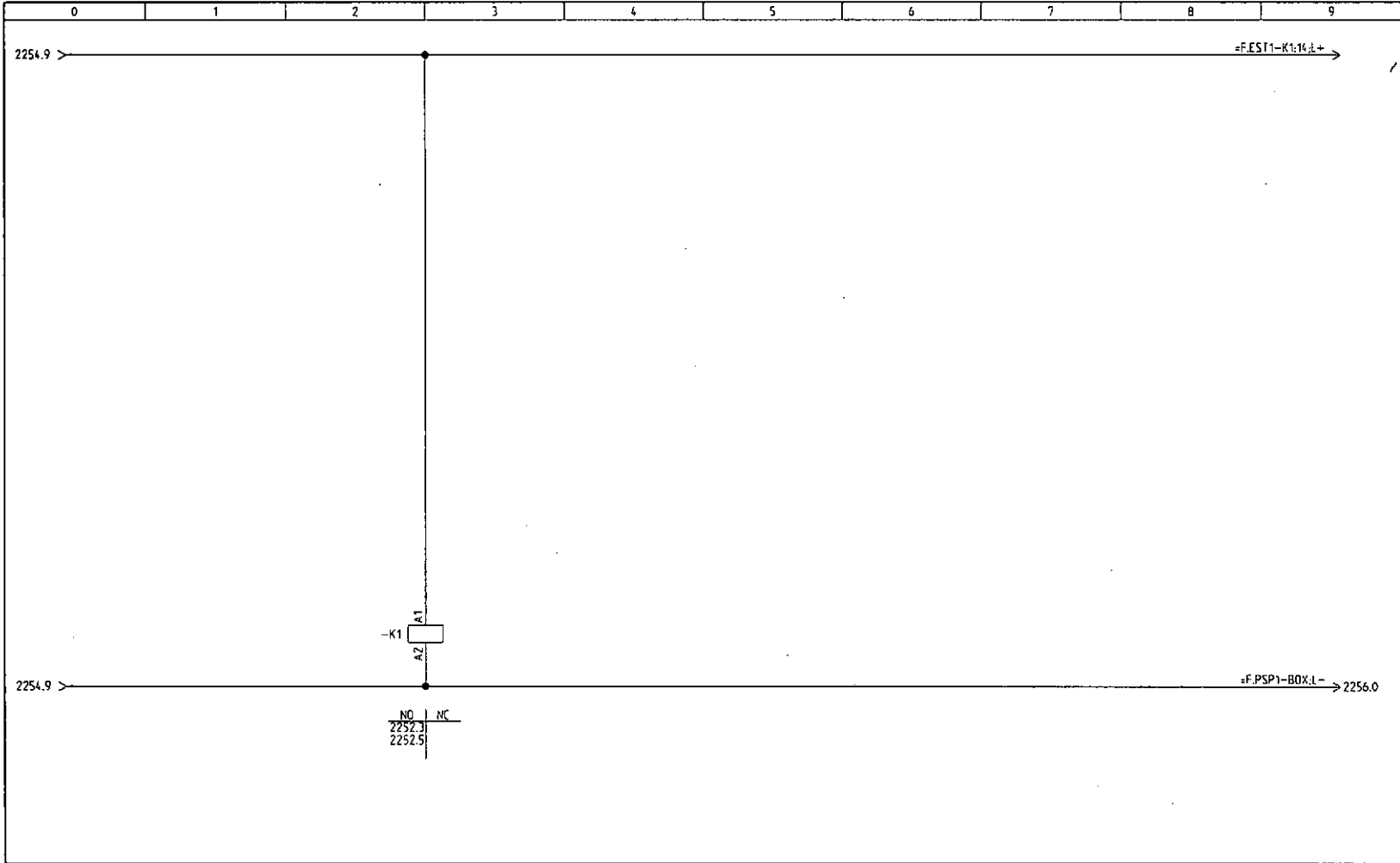


公司	TPFMS-BUIC	设备名	Frigus 1200 N1	标题	COMPRESSOR PROTECTION 压缩机保护	版本/日期	(dd-mm-yy) 04-27-2009	图号	01	图号	59609580060
	<b>Tetra Pak</b>	设计人	Ryan Li			功能	=F.COL1	容量	+8000	页数	3
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打印日期: 6/27/2009

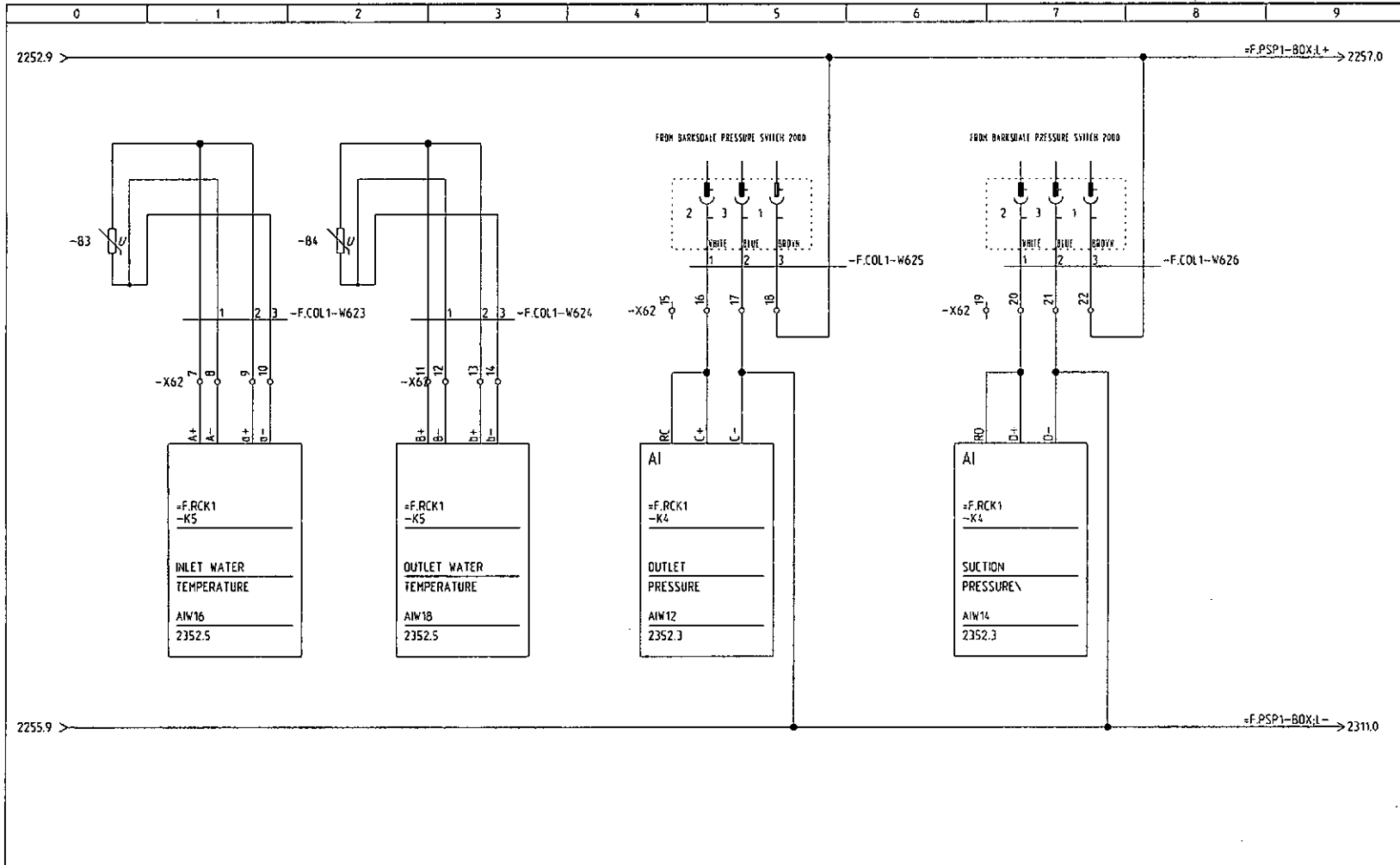






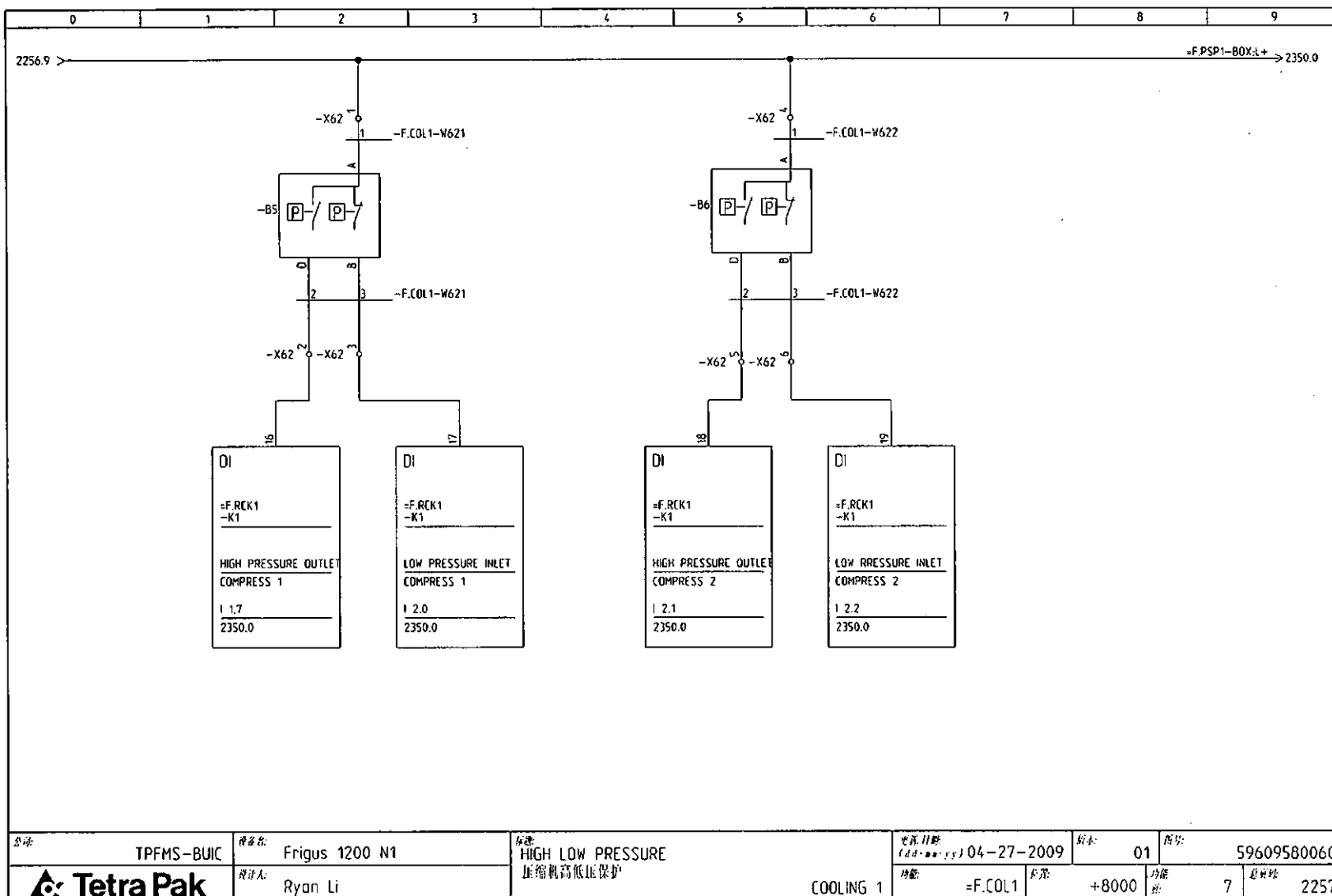
公司: TPFMS-BUIC	设备名: Frigus 1200 N1	标题: AUXILIARY CIRCUIT 辅助电路	发布日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	COOLING 1	功能: =F.COL1	功率: +8000	图页数: 5 图号: 2255

日期: 4/27/2009

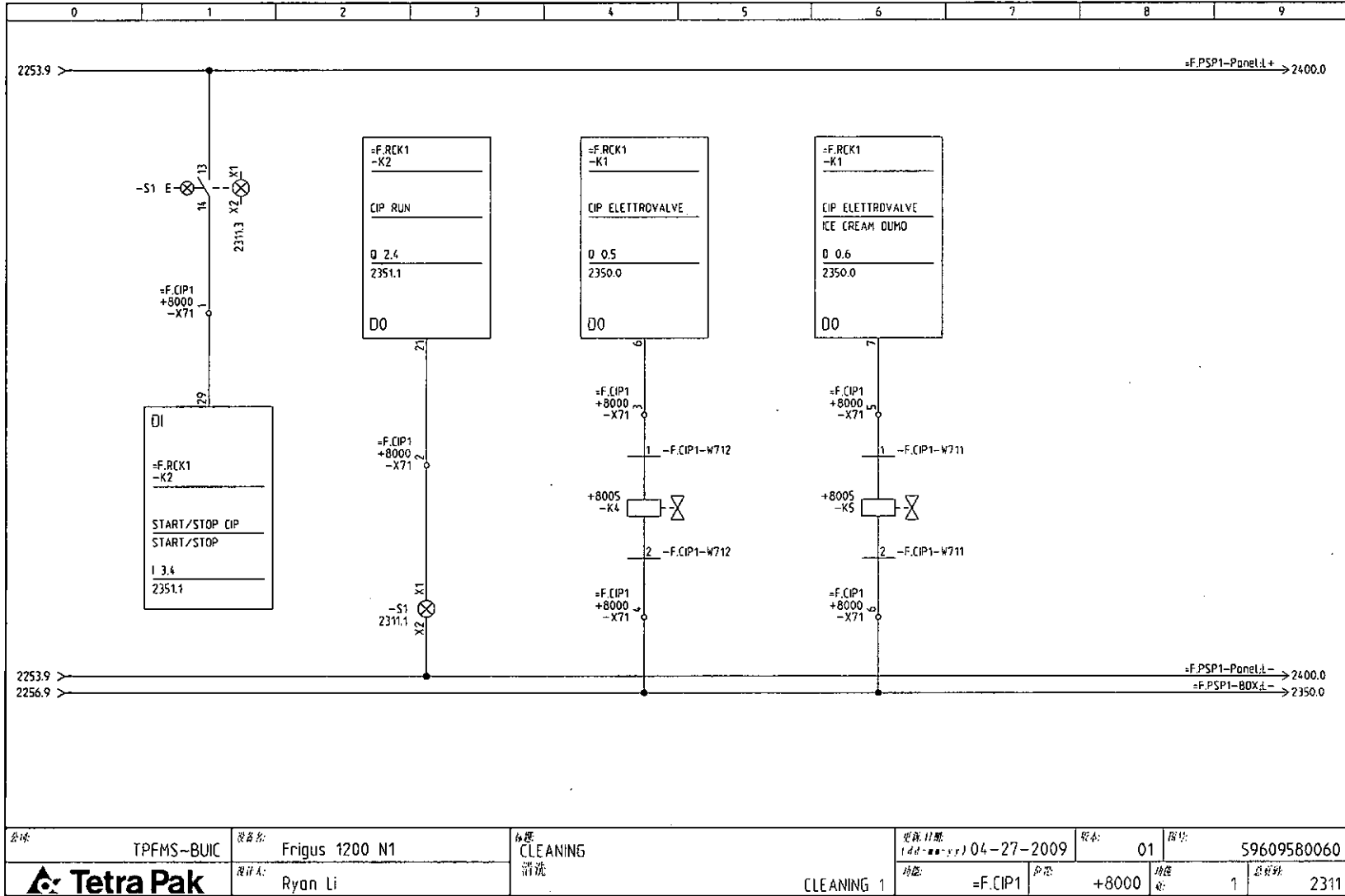


公司: TPFMS-BUIC	设备名: Frigus 1200 N1	品牌: ANALOG INPUT PLC 输入/输出	设计日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
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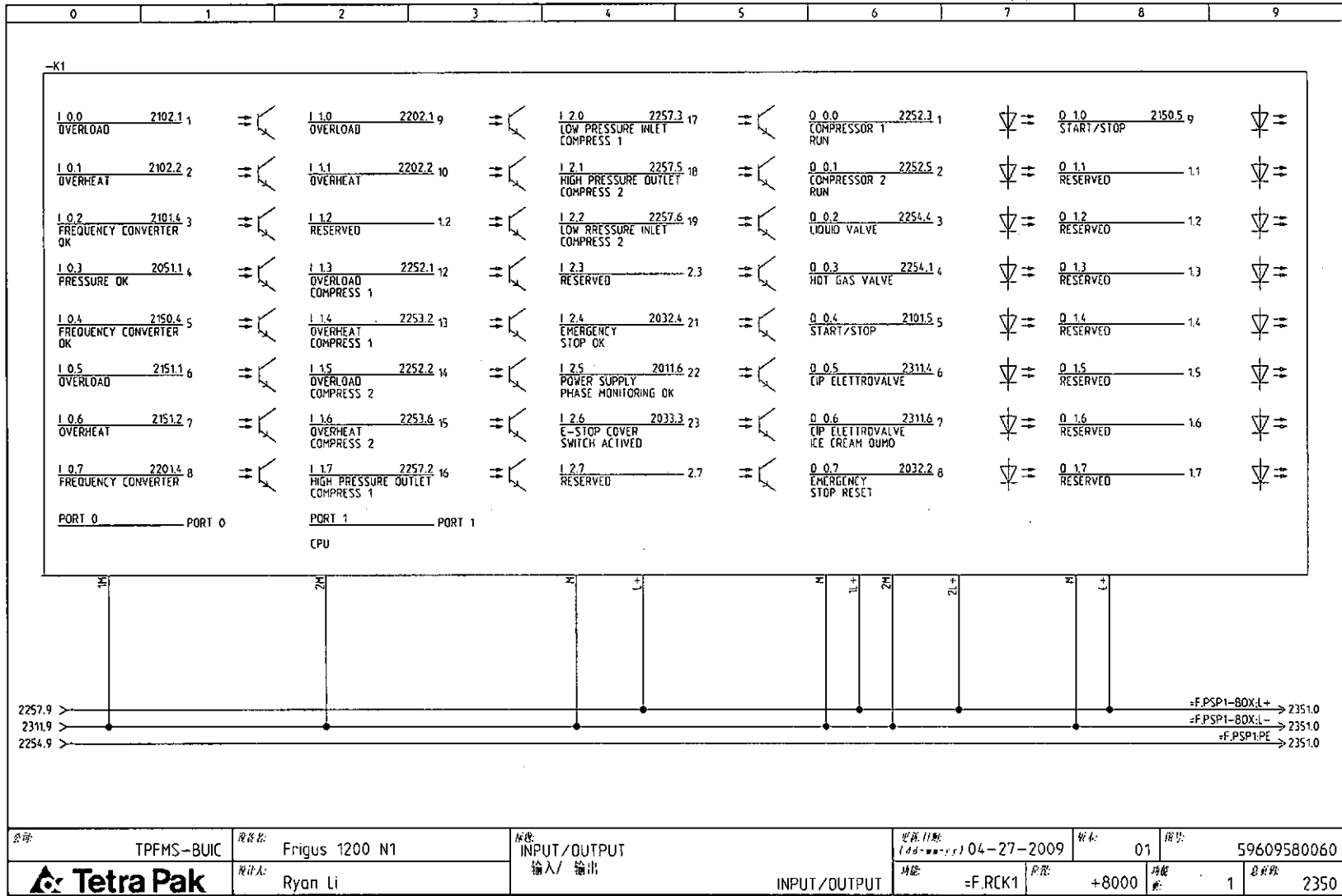
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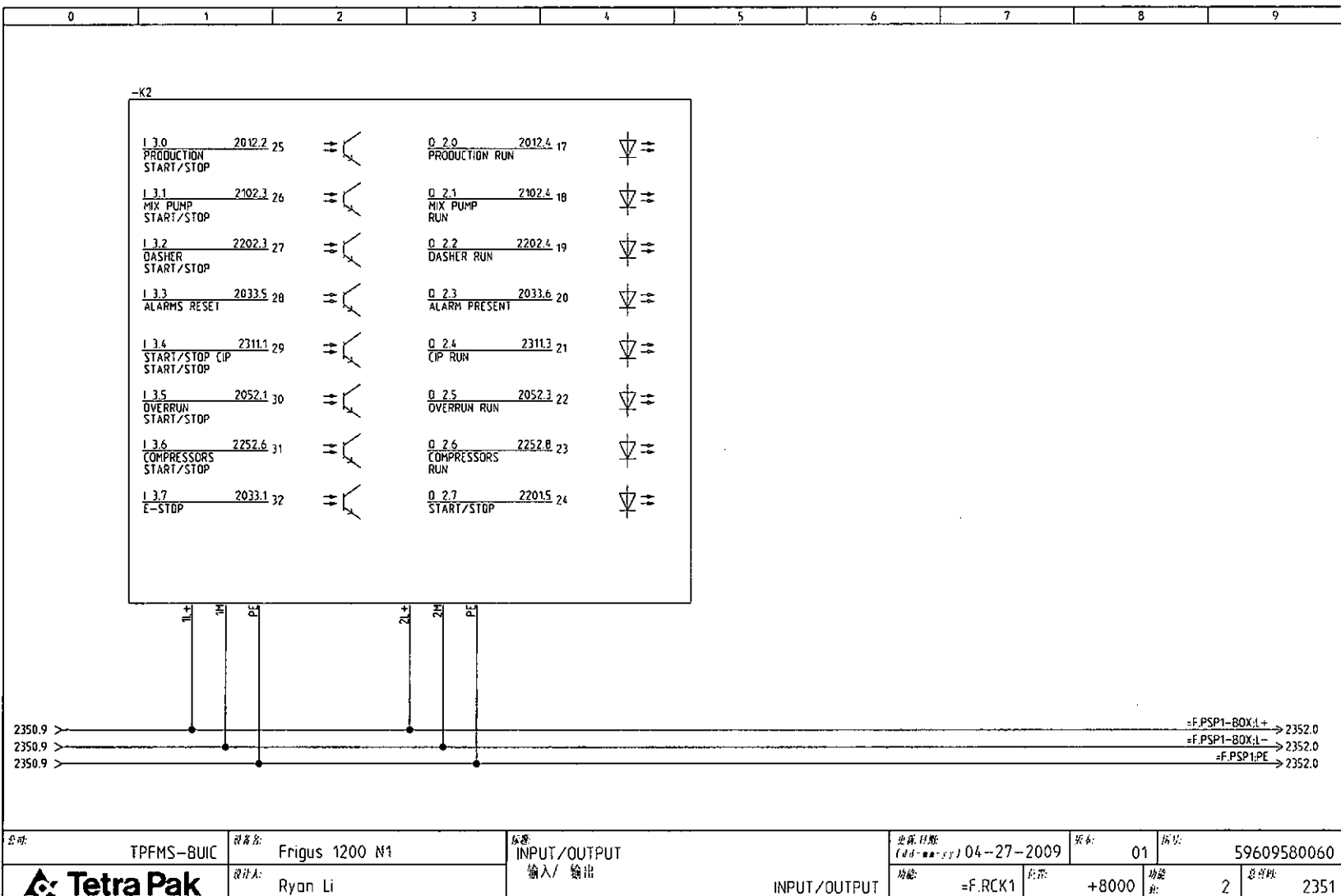
日期: 4/27/2009

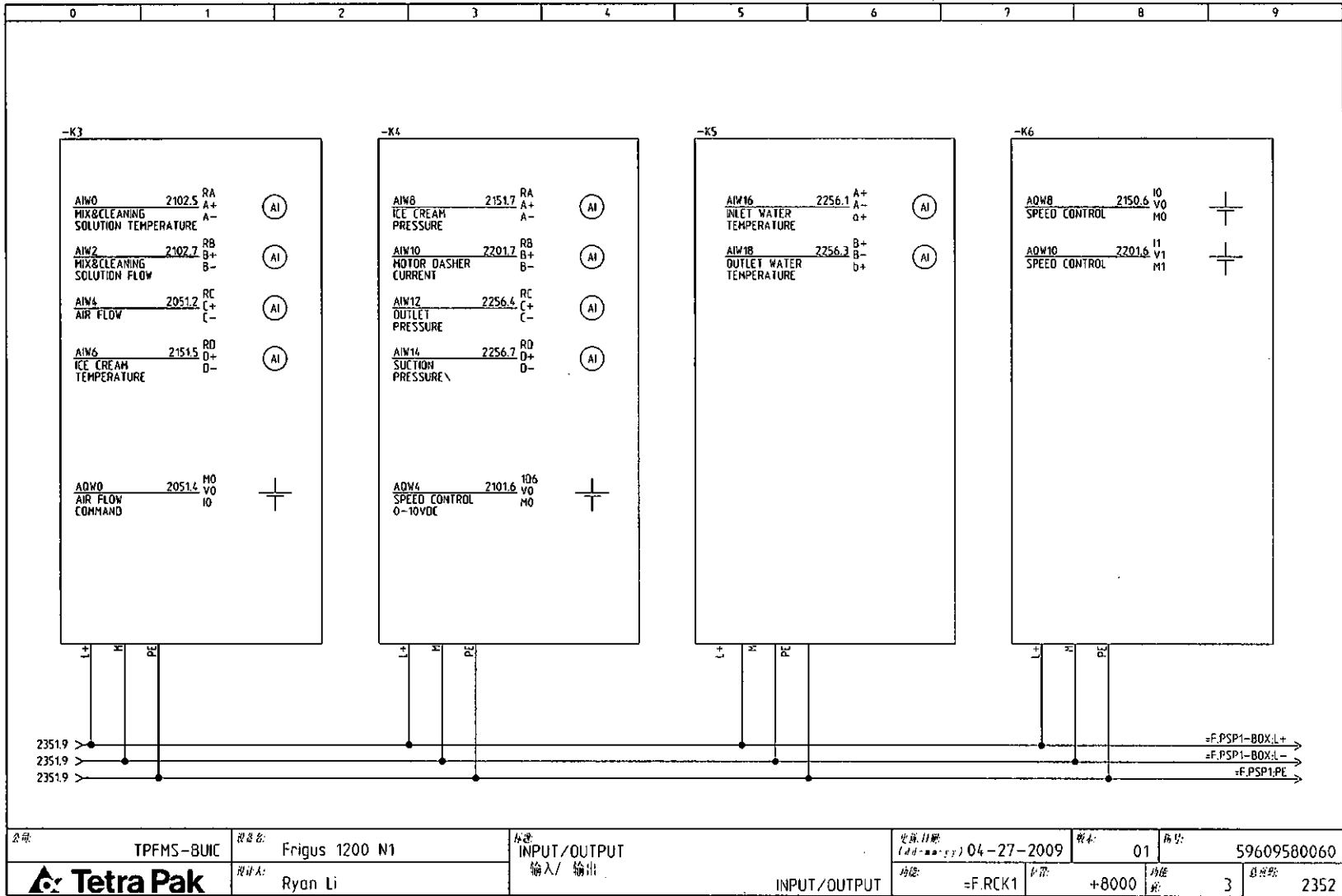


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	<b>Tetra Pak</b>	设计人:	Ryan Li	内容:	清洗	功能:	=F.CIP1	电压:	+8000	功能:	1
订单日期:	4/27/2009									总页数:	2311

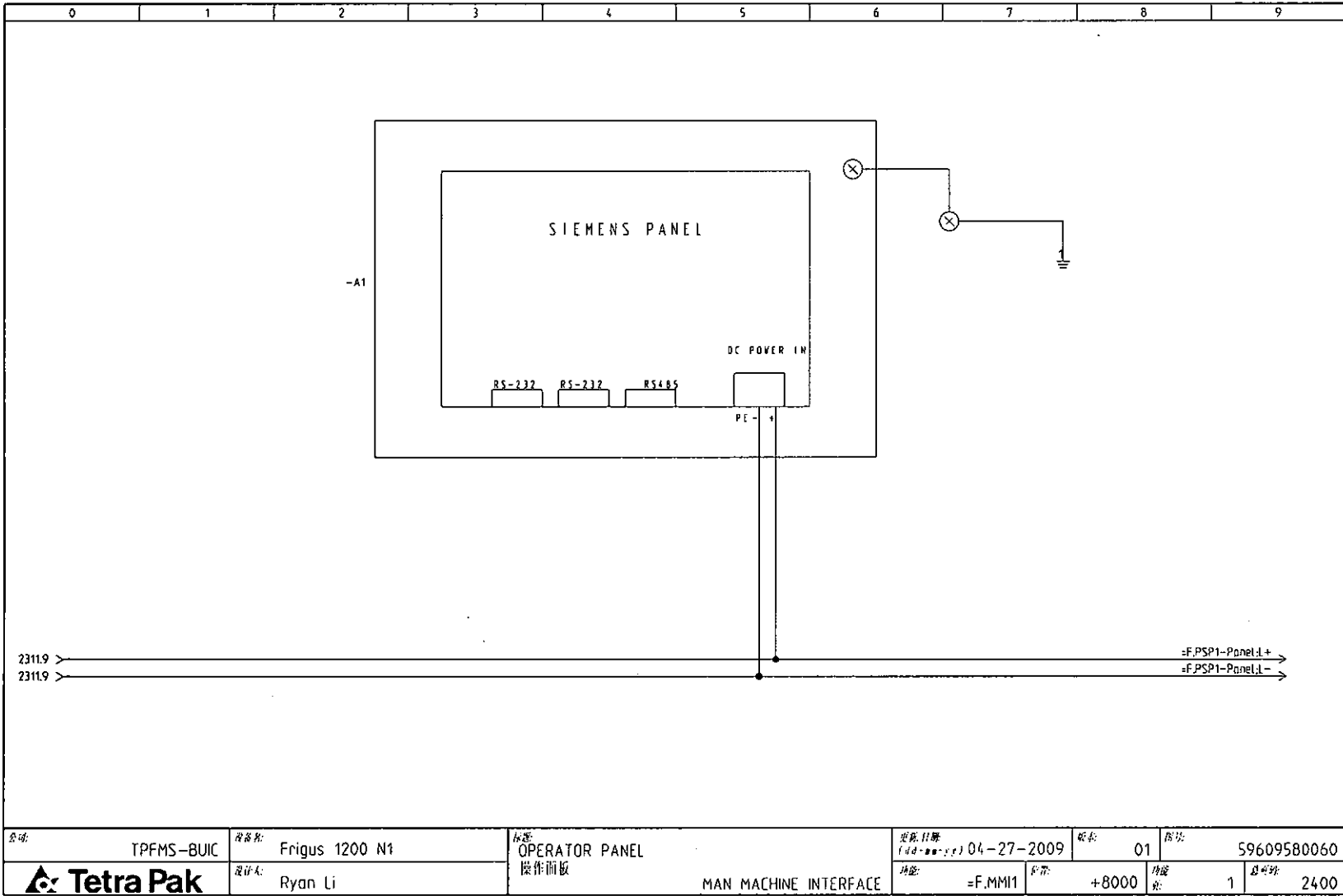


名称: TPMS-BUIC	设备名: Frigus 1200 N1	用途: INPUT/OUTPUT	日期: (dd-mm-yy) 04-27-2009	版本: 01	图号: 59609580060
<b>Tetra Pak</b>	设计人: Ryan Li	输入/输出	功能: =F.RCK1	功率: +8000	页数: 1
打印日期: 4/27/2009					总页数: 2350










订单日期: 4/27/2009

List of Documents

Function (=)	Global Shee	Kind of Document	Description	
	1	Circuit diagrams		
	2	List of Documents		
	3	List of Documents		
=F.LAYOUT	2001	Circuit diagrams	DISTRIBUTION OF CONTROL CABINET	A A
=F.LAYOUT	2002	Circuit diagrams	LAYOUT PANEL 1200N(230V)	~F ~
=F.PSP1	2010	Circuit diagrams	MAIN SWITCH	
=F.PSP1	2011	Circuit diagrams	PHASE SEQUENCE RELAY-24VDC POWER	W A - -
=F.PSP1	2012	Circuit diagrams	PLC INPUT/OUTPUT	PLC A / A
=F.VMT1	2021	Circuit diagrams	INTERNAL VENTILATION	A
=F.EST1	2031	Circuit diagrams	EMERGENCY STOP	
=F.EST1	2032	Circuit diagrams	SAFETY RELAY	<
=F.EST1	2033	Circuit diagrams	PLC INPUT/OUTPUT	PLC A / A
=F.AIR1	2051	Circuit diagrams	AIR SUPPLY	<° -
=F.AIR1	2052	Circuit diagrams	OVERRUN	W
=F.MXP1	2101	Circuit diagrams	FREQUENCY CONVERTER	A A A
=F.MXP1	2102	Circuit diagrams	START/STOP MIX PUMP	∞ - A
=F.MXP1	2103	Circuit diagrams	MIX PUMP SPEED	∞
=F.ICP1	2150	Circuit diagrams	FREQUENCY CONVERTER	A A A
=F.ICP1	2151	Circuit diagrams	PLC INPUT/OUTPUT	PLC A / A
=F.MDR1	2201	Circuit diagrams	DASHER	<
=F.MDR1	2202	Circuit diagrams	START/STOP DASHER	< <
=F.COL1	2251	Circuit diagrams	COMPRESSOR	
=F.COL1	2252	Circuit diagrams	START/STOP COMPRESSOR	<
=F.COL1	2253	Circuit diagrams	COMPRESSOR PROTECTION	
=F.COL1	2254	Circuit diagrams	SOLID STATE RELAY	<
=F.COL1	2255	Circuit diagrams	AUXILIARY CIRCUIT	i
=F.COL1	2256	Circuit diagrams	ANALOG INPUT	PLC A / A
=F.COL1	2257	Circuit diagrams	HIGH LOW PRESSURE	
=F.CIP1	2311	Circuit diagrams	CLEANING	>.. -
=F.RCK1	2350	Circuit diagrams	INPUT/OUTPUT	A / A
Company: TPFMS-BUIC		Machine: Frigus 1200 N1	Title:	Rev. date: (dd-mm-yy) 04-27-2009
		Designer: Ryan Li		Revision: 01
				Drawing no.: 59609580060
				Global sheet: 2

Print date: 4/27/2009





# 2 Maintenance Instructions

TechPub\_2614345\_0105 - TeM\_Z1381026-Maintenance.fm

TechPub\_2614345\_0105 - Tech\_Z1381026-Maintenance.fm

<b>2.1.1</b>	<b>Frigus</b> .....	<b>2 - 5</b>
2.1.1.1	Frigus-Adjust blades .....	2 - 5
2.1.1.2	Frigus - Change Gasket .....	2 - 6
2.1.1.3	Frigus - Change blades .....	2 - 7
<b>2.1.2</b>	<b>Dasher</b> .....	<b>2 - 8</b>
2.1.2.1	Dasher - Adjust Rotating seal .....	2 - 8
2.1.2.2	Dasher - Check Eccentric .....	2 - 9
2.1.2.3	Dasher - Change Bushings .....	2 - 11
2.1.2.4	Dasher - Change Rotating Seal, Spring and Gasket .....	2 - 12
2.1.2.5	Dasher - Change Elastic Ring .....	2 - 13
<b>2.1.3</b>	<b>Cylinder</b> .....	<b>2 - 14</b>
2.1.3.1	Cylinder - Check Ring .....	2 - 14
2.1.3.2	Cylinder - Change the Ring and the Gasket ....	2 - 15
2.1.3.3	Cylinder - Change Shutter .....	2 - 16
2.1.3.4	Cylinder - Change Gasket .....	2 - 17
2.1.3.5	Cylinder - Change Gasket .....	2 - 18
2.1.3.6	Dasher motor drive - Change Bearings .....	2 - 19
2.1.3.7	Dasher motor drive - Change Gasket .....	2 - 20
2.1.3.8	Dasher motor drive - Change Seeger and Key ..	2 - 21
2.1.3.9	Dasher motor drive - Change Shaft .....	2 - 22
<b>2.1.4</b>	<b>Pump</b> .....	<b>2 - 23</b>
2.1.4.1	Pump - Change Impeller, Wheel and Cover ....	2 - 23
2.1.4.2	Pump - Change Gasket, Bushing and Screw ...	2 - 24
2.1.4.3	Pump - Adjustment of pump .....	2 - 25
<b>2.1.5</b>	<b>Refrigerating plant</b> .....	<b>2 - 26</b>
2.1.5.1	Refrigerating plant - Clean condenser .....	2 - 26
<b>2.1.6</b>	<b>Pneumatic system</b> .....	<b>2 - 28</b>
2.1.6.1	Pneumatic system - Change filter .....	2 - 28
<b>2.2</b>	<b>Maintenance of the electrical system</b> .....	<b>2 - 29</b>
<b>2.3</b>	<b>Maintenance of the refrigerating plant</b> .....	<b>2 - 30</b>
<b>2.4</b>	<b>Maintenance of the pneumatic system</b> .....	<b>2 - 33</b>

2.5 Lubricating list..... 2 - 34

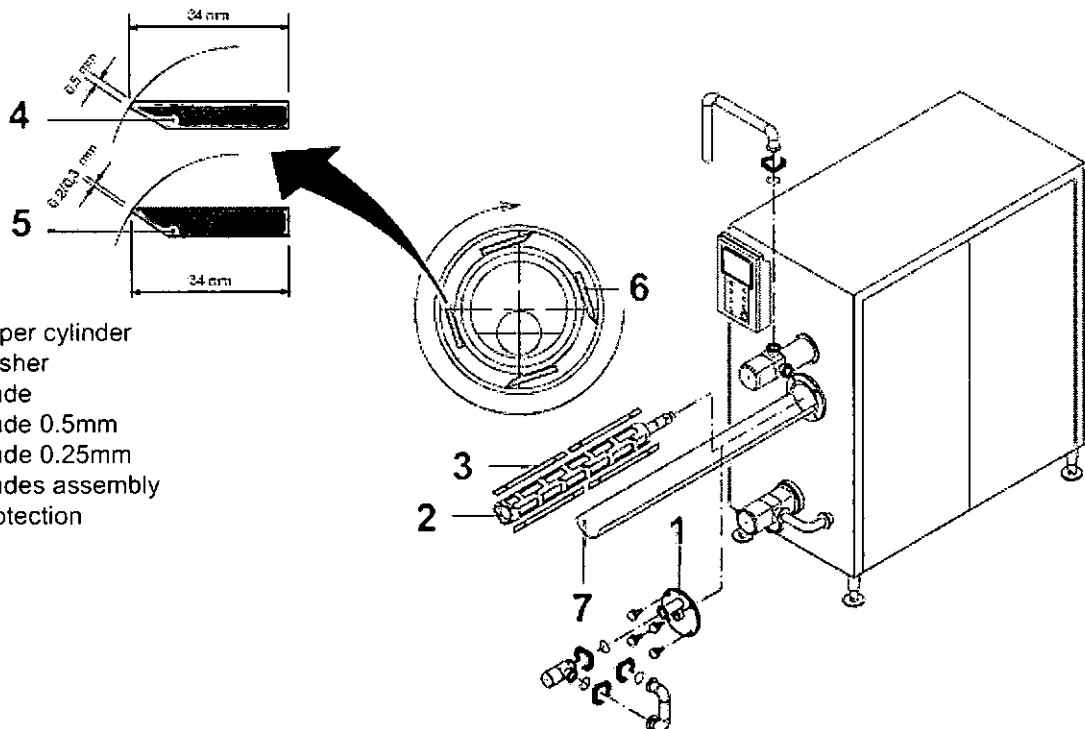
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2.1.1 Frigus  
2.1.1.1 Frigus-Adjust blades

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
SPC reference	59609580001

- a) Dismantle the cover cylinder (1).
- b) Remove the dasher (2) and the blades (3).
- c) If the edge of the blade is not in perfect condition it may be sharpened.
- d) This requires use of a special machine. The blade needs sharpening if the width of the cutting end exceeds 0.5 mm. (4).
- e) After sharpening the thickness of the cutting edge must be minimum 34 mm. (5). If the width is lower it is necessary to replace the blades.
- f) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- g) It is important to assemble the blades as shown (6). To prevent blows that could damage the freezer cylinder, a "shaft protection" is supplied. The protection (7) must be positioned on the cylinder as shown in the figure.
- h) h) Reassemble the dasher (2), paying attention not to damage the bottom of cylinder, and the cover cylinder(1).



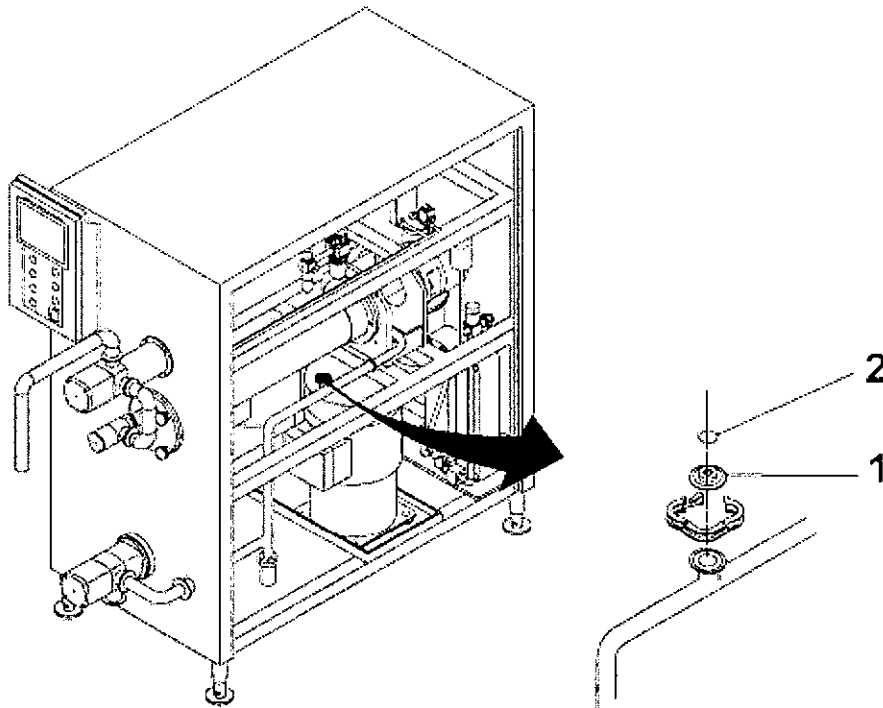
- 1 Upper cylinder
- 2 Dasher
- 3 Blade
- 4 Blade 0.5mm
- 5 Blade 0.25mm
- 6 Blades assembly
- 7 Protection

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## 2.1.1.2 Frigus - Change Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580001

- a) Dismantle the non return valve (1).
- b) Remove the gasket (2) and change.
- c) Reassemble the non return valve (1).



1 Non return valve  
2 Gasket

2.1.1.3 Frigus - Change blades

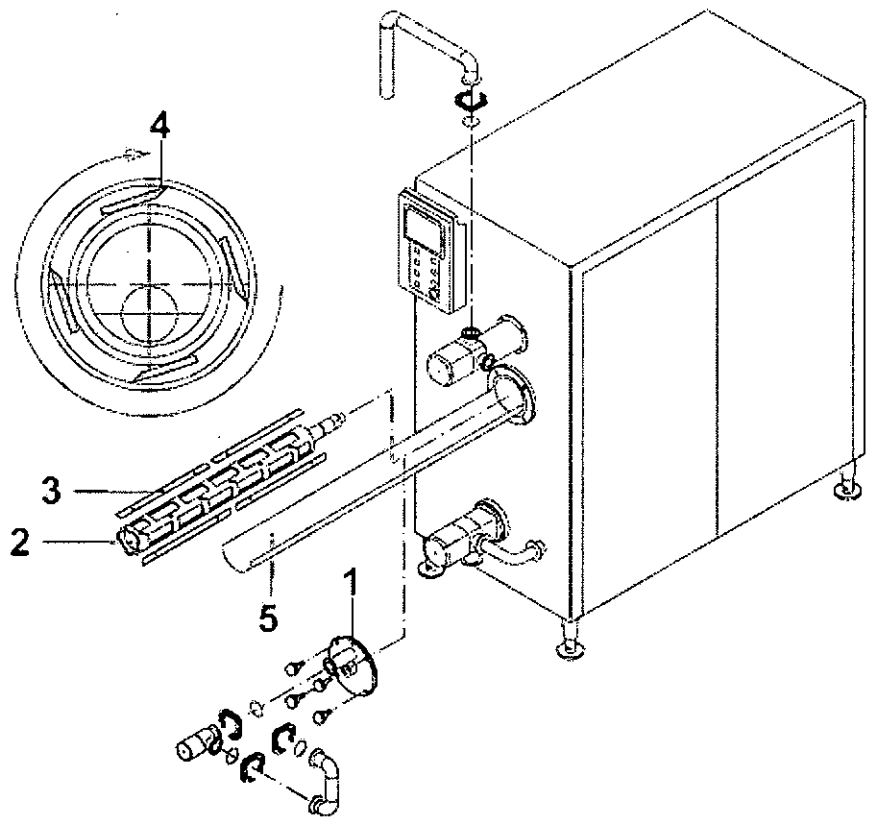
Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
SPC reference	59609580001

- a) Dismantle the cover cylinder (1).
- b) Remove the dasher (2) and the blades (3).
- c) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- e) It is important to assemble the blades as shown (4).

To prevent blows that could damage the freezer cylinder, a “shaft protection” is supplied. The protection (5) must be positioned on the cylinder as shown in the figure.

- f) Reassemble the dasher (2), paying attention not to damage the bottom of cylinder, and the cover cylinder (1).

- 1 Upper cylinder
- 2 Dasher
- 3 Blade
- 4 Blades assembly
- 5 Protection



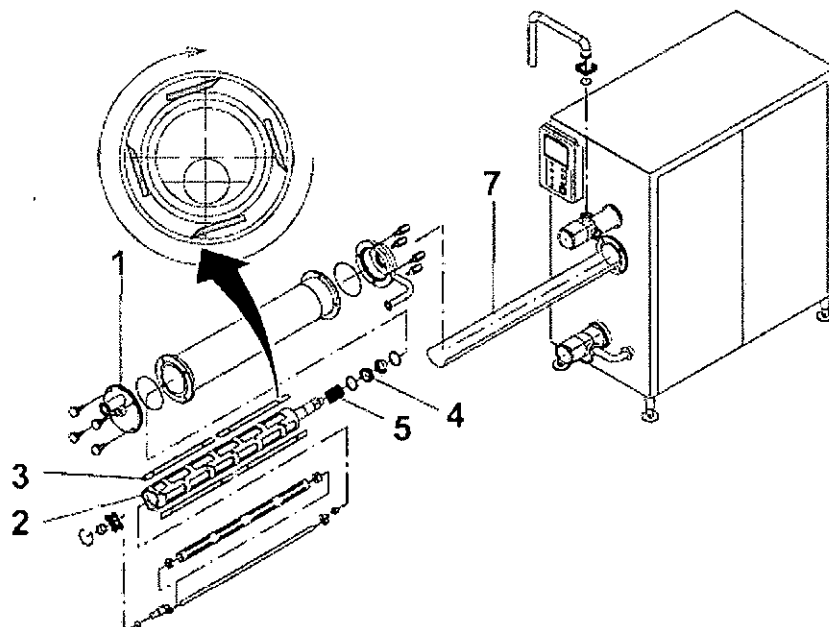
## 2.1.2 Dasher

### 2.1.2.1 Dasher - Adjust Rotating seal

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
SPC reference	59230200067

- a) Dismantle the cylinder cover (1).
- b) Remove the dasher (2) and the blades (3).
- c) Remove the rotating seal (4).
- d) The rotating seal (4) has a housing made of hard metal which, under pressure from the spring (5), rotates against the bush.
- e) Check that the surface of the housing has no scratches which could affect its hold.
- f) Use fine emery paper to polish the surface. Rub them first against a very hard surface (glass), then against one another.
- g) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- h) It is important to assemble the blades as shown (6). To prevent blows that could damage the freezer cylinder, a "shaft protection" is supplied. The protection (7) must be positioned on the cylinder as shown in the figure.
- i) Reassemble carefully in inverse order, paying attention not to damage the bottom of cylinder.

- 1 Cylinder cover
- 2 Dasher
- 3 Blade
- 4 Rotating seal
- 5 Spring
- 6 Blades assembly
- 7 Protection



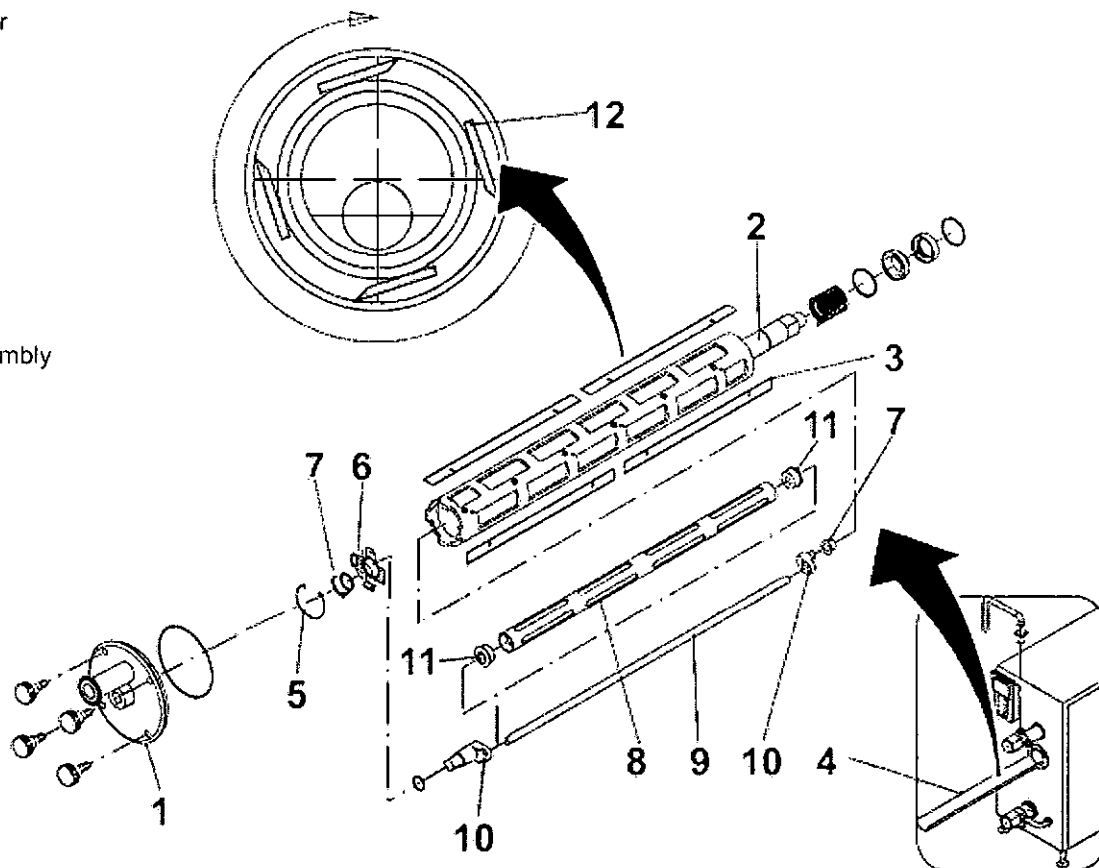
2.1.2.2 Dasher - Check Eccentric

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
Consumables	Atomic T 4938 Longlife grease EP low temp.
SPC reference	59230200067

- a) Dismantle the cylinder cover (1).
- b) Remove the dasher (2) and the blades (3).
- c) Check that the eccentric (4) turns freely inside the dasher. (2).
- d) If this is not the case, dismantle the elastic ring (5) and remove the support (6) and the eccentric (4) from the dasher (2) and check the condition of the bushings (7).
- e) Check that the internal pipe (8) freely rotates around the rod (9)
- f) If it does not happen, dismantle the pins (10), the rod (9) and check the status of the bushings (11).
- g) Lubricate the bushings before reassembling the dasher.

(Cont'd)

- 1 Cylinder cover
- 2 Dasher
- 3 Blade
- 4 Eccentric
- 5 Elastic ring
- 6 Support
- 7 Bushing
- 8 Internal pipe
- 9 Rod
- 10 Pins
- 11 Bushings
- 12 Blades assembly
- 13 Protection



*(Cont'd)*

h) The blades must be assembled in their pins so that they can tilt when the dasher rotates.

i) It is important to assemble the blades as shown (12).

To prevent blows that could damage the freezer cylinder, a “shaft protection” is supplied. The protection (13) must be positioned on the cylinder as shown in the figure.

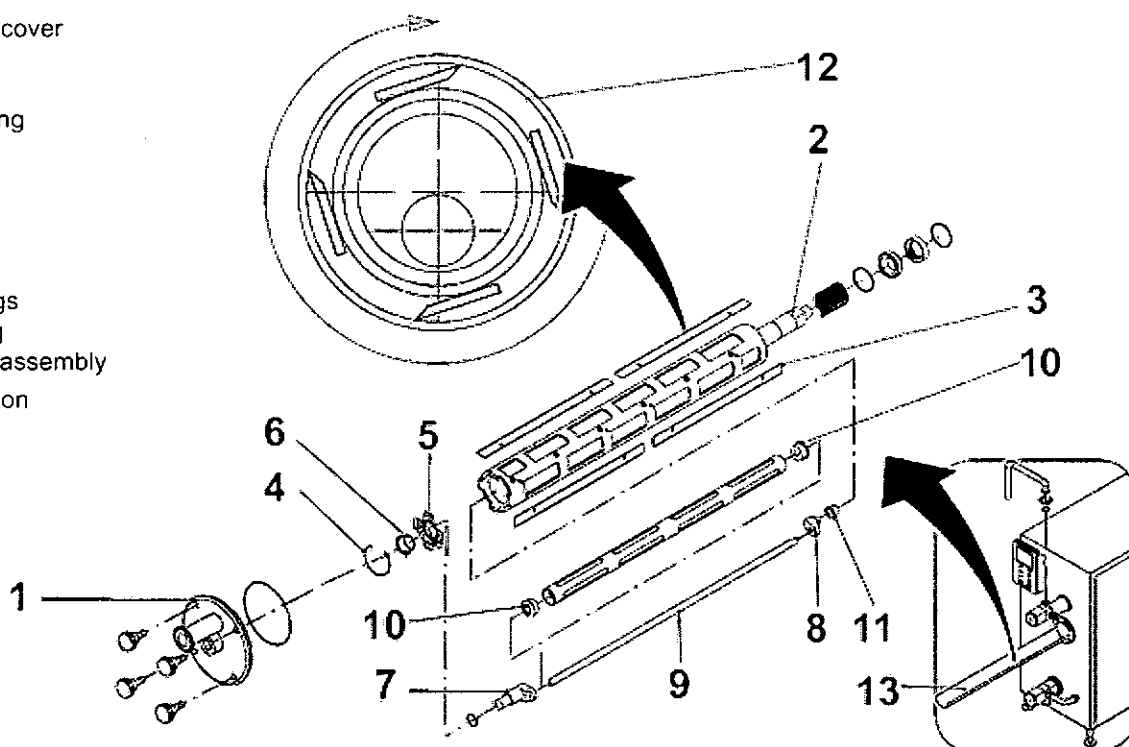
l) Reassemble carefully in inverse order, paying attention not to damage the bottom of cylinder.

### 2.1.2.3 Dasher - Change Bushings

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
Consumables	Atomic T 4938 Longlife grease EP low temp.
SPC reference	59230200067

- a) Dismantle the cover cylinder (1).
- b) Remove the dasher (2) and the blades (3).
- c) Dismantle the elastic ring (4) and remove the support (5), the bushings (6), the pins (7)-(8), the rod (9), the bushings (10) and the bushing (11) from the dasher (2).
- d) Change the bushings (6)-(10)-(11).
- e) Lubricate the bushings before reassembling the dasher.
- f) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- g) It is important to assemble the blades as shown (12). To prevent blows that could damage the freezer cylinder, a "shaft protection" is supplied. The protection (13) must be positioned on the cylinder as shown in the figure.
- h) Reassemble carefully in inverse order, paying attention not to damage the bottom of cylinder.

- 1 Cylinder cover
- 2 Dasher
- 3 Blade
- 4 Elastic ring
- 5 Support
- 6 Bushing
- 7 Pin
- 8 Pin
- 9 Rod
- 10 Bushings
- 11 Bushing
- 12 Blades assembly
- 13 Protection



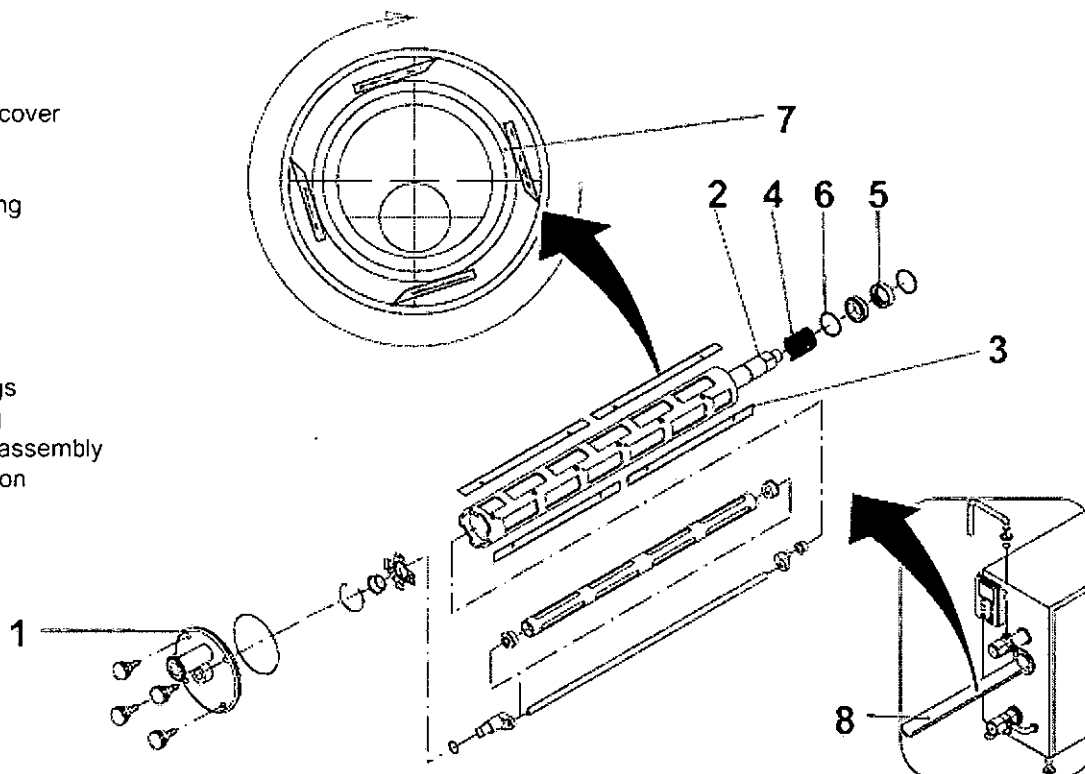
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### 2.1.2.4 Dasher - Change Rotating Seal, Spring and Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
SPC reference	59230200067

- a) Dismantle the cylinder cover (1).
- b) Remove the dasher (2) and the blades (3).
- c) Remove the spring (4) the rotating seal (5) and the gasket (6).
- d) Change the rotating seal (5).
- e) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- f) It is important to assemble the blades as shown (7). To prevent blows that could damage the freezer cylinder, a “shaft protection” is supplied. The protection (8) must be positioned on the cylinder as shown in the figure.
- g) Reassemble carefully in inverse order, paying attention not to damage the bottom of cylinder.

- 1 Cylinder cover
- 2 Dasher
- 3 Blade
- 4 Elastic ring
- 5 Support
- 6 Bushing
- 7 Pin
- 8 Pin
- 9 Rod
- 10 Bushings
- 11 Bushing
- 12 Blades assembly
- 13 Protection



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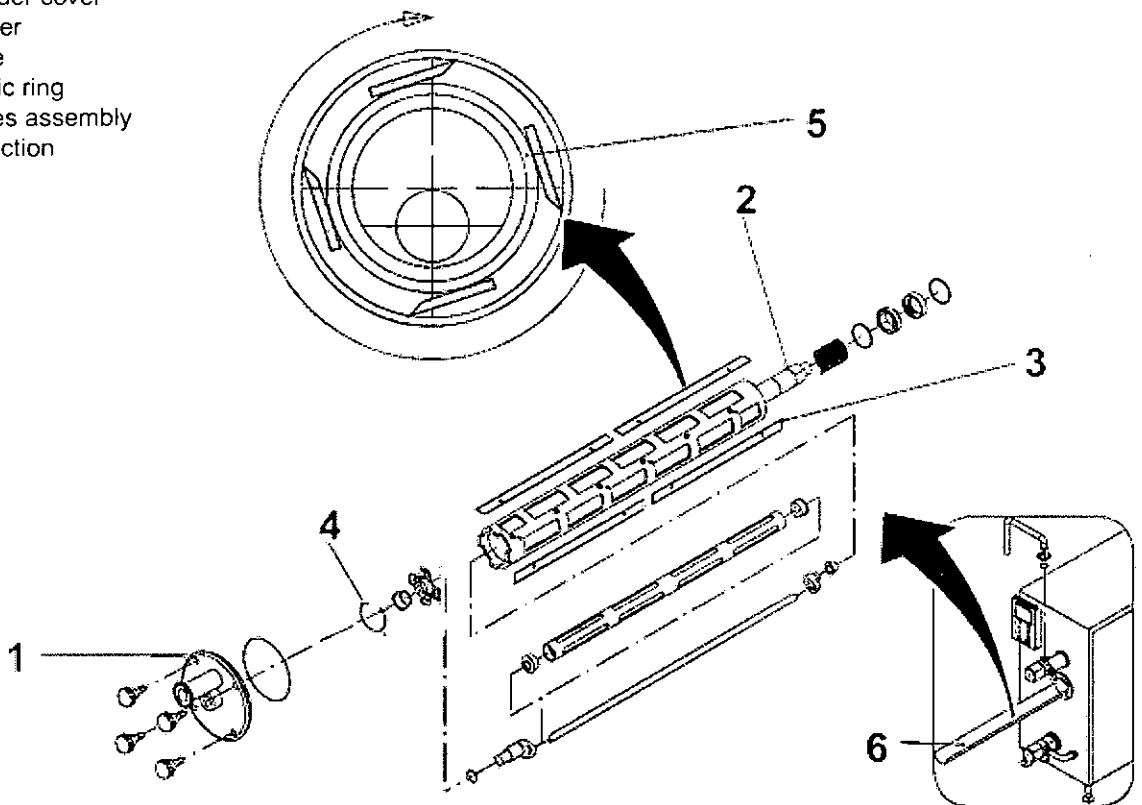


2.1.2.5 Dasher - Change Elastic Ring

Machine status	Power supply disconnecting device OFF Air valve OFF
Special equipment	Protective gloves
SPC reference	59230200067

- a) Dismantle the cylinder cover (1).
- b) Remove the dasher (2) and the blades (3).
- c) Remove the elastic ring (4).
- d) Change the elastic ring (4).
- e) The blades must be assembled in their pins so that they can tilt when the dasher rotates.
- f) It is important to assemble the blades as shown (5). To prevent blows that could damage the freezer cylinder, a "shaft protection" is supplied. The protection (6) must be positioned on the cylinder as shown in the figure.
- g) Reassemble carefully in inverse order, paying attention not to damage the bottom of cylinder.

- 1 Cylinder cover
- 2 Dasher
- 3 Blade
- 4 Elastic ring
- 5 Blades assembly
- 6 Protection



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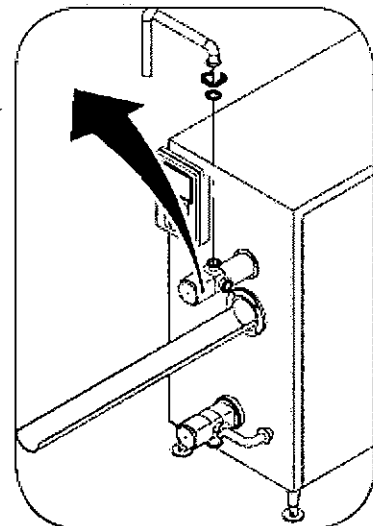
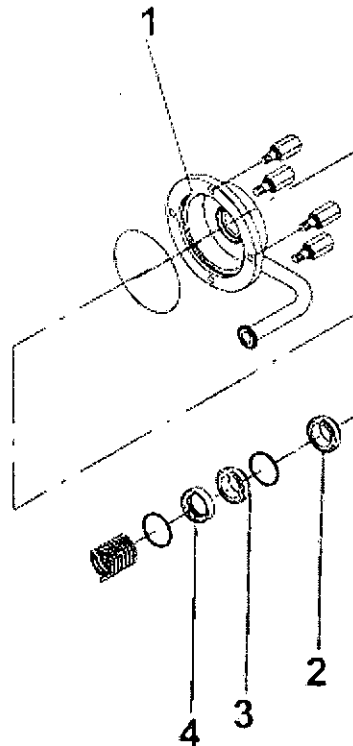
## 2.1.3 Cylinder

### 2.1.3.1 Cylinder - Check Ring

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the connecting pipe between bottom and pump.
- b) Remove the bottom (1).
- c) Unscrew the ring nut (2) and remove the ring (3).
- d) Check that the surface of the housing has no scratches which could affect its hold.
- e) Use fine emery paper to polish the surface. Rub them first against a very hard surface (glass), then against rub them one against the other the ring (3) and rotary gasket of dasher (4).
- f) Reassemble carefully in inverse order.

- 1 Bottom
- 2 Ring nut
- 3 Ring
- 4 Rotary gasket

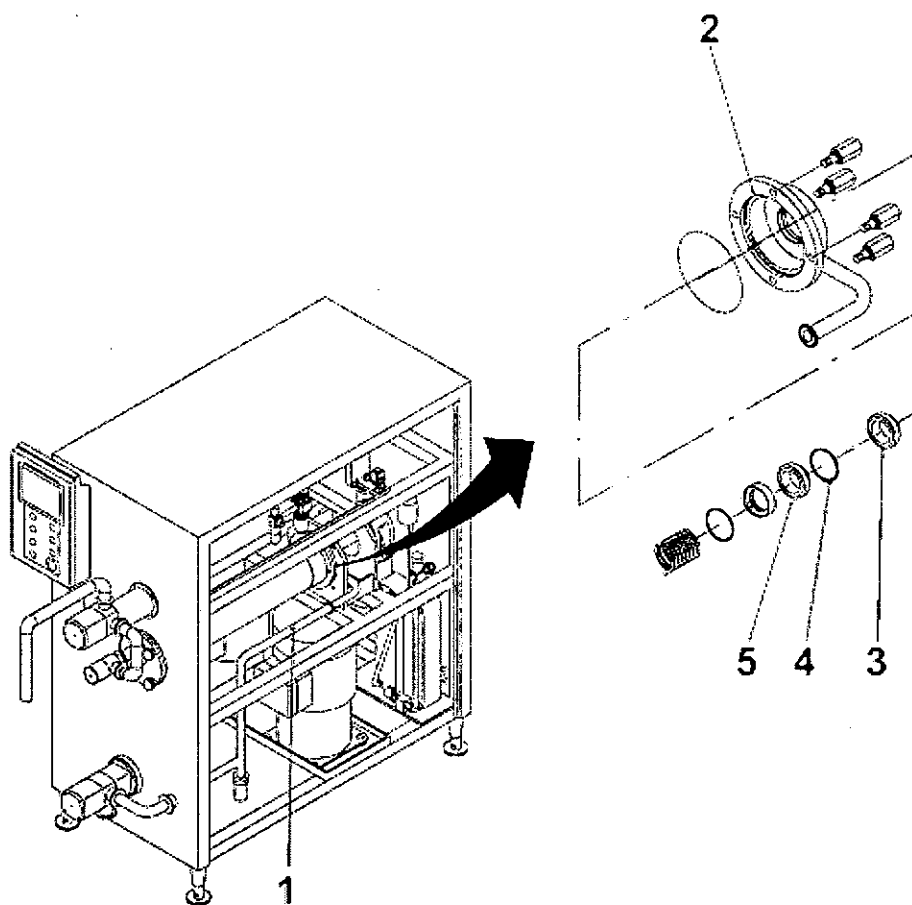


### 2.1.3.2 Cylinder - Change the Ring and the Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the connecting pipe (1).
- b) Remove the bottom (2).
- c) Unscrew the ring nut (3) and remove the ring (4) and the gasket.
- d) Change the ring (4) and the gasket (5).
- e) Reassemble carefully in inverse order.

- 1 Connecting pipe
- 2 Bottom
- 3 Ring nut
- 4 Ring
- 5 Gasket



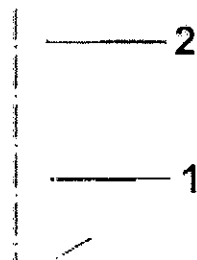
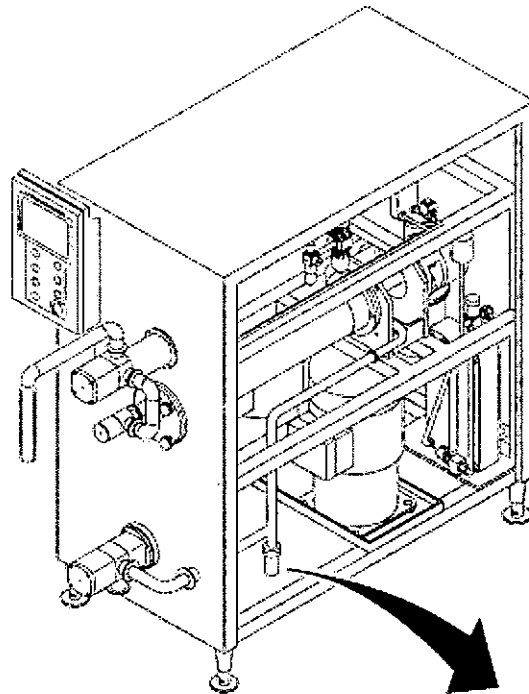
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## 2.1.3.3 Cylinder - Change Shutter

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the cup (1).
- b) Remove the shutter (2).
- c) Change the shutter (2)
- d) Reassemble carefully in inverse order.

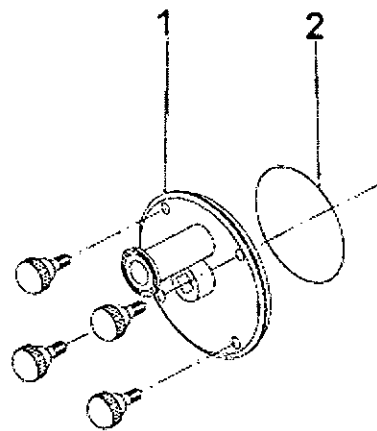
1 Cup  
2 Shutter



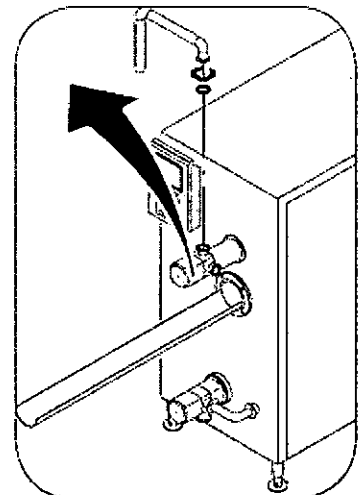
### 2.1.3.4 Cylinder - Change Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the cylinder cover (1).
- b) Remove the gasket (2).
- c) Change the gasket (2)
- d) Reassemble carefully in inverse order.



1 Cylinder cover  
2 Gasket

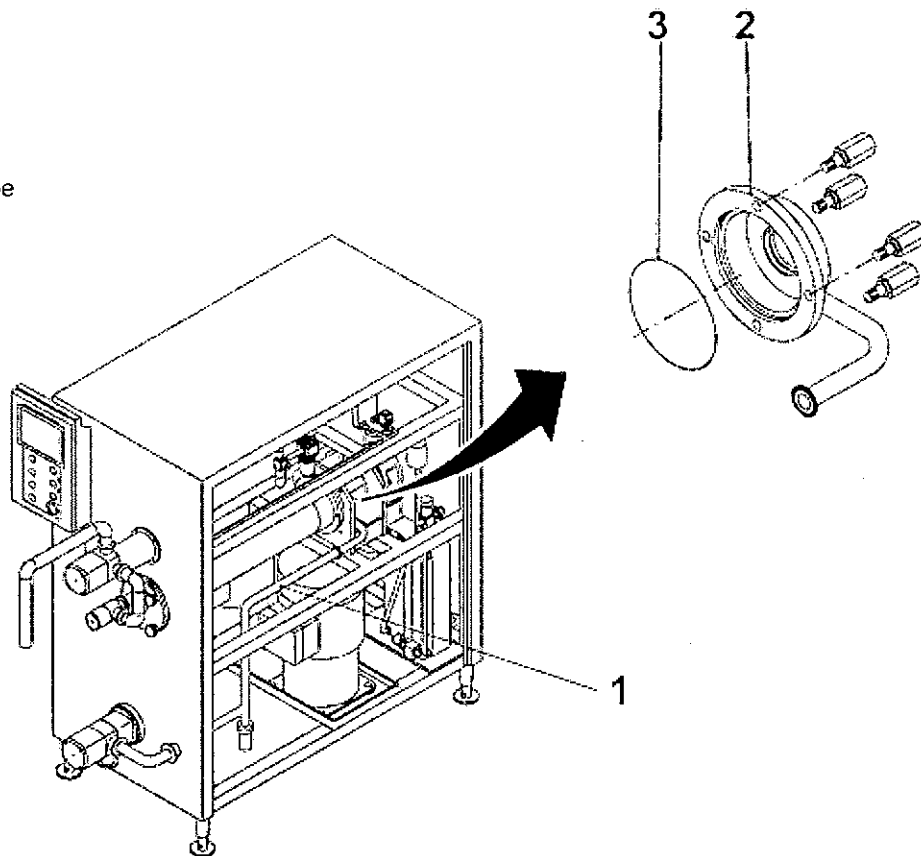


## 2.1.3.5 Cylinder - Change Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the connecting pipe (1).
- b) Remove the bottom (2).
- c) Remove the gasket (3).
- d) Change the gasket (3)
- e) Reassemble carefully in inverse order.

1 Connecting pipe  
2 Bottom  
3 Gasket

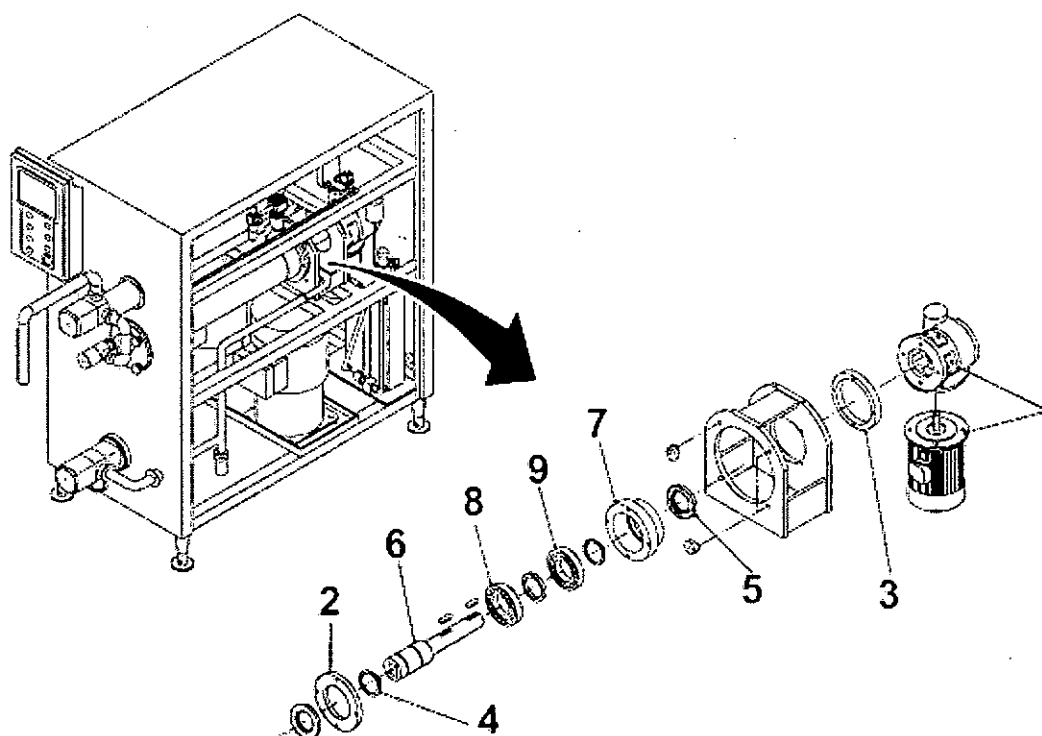


### 2.1.3.6 Dasher motor drive - Change Bearings

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the motor and the reducer (1).
- b) Dismantle the cover (2) and the centering ring (3).
- c) Dismantle the seeger (4) and the gasket (5).
- d) Remove the bearing holder bushing (7) and the shaft (6) from the side of the reducer.
- e) Remove the bearings (8) (9).
- f) Change the bearings (8) (9).
- g) Reassemble carefully in inverse order.
- i) Check that the shaft (6) correctly rotates.

- 1 Motor and reducer
- 2 Cover
- 3 Centering ring
- 4 Seeger
- 5 Gasket
- 6 Shaft
- 7 Bearing holder bushing
- 8 Bearing
- 9 Bearing



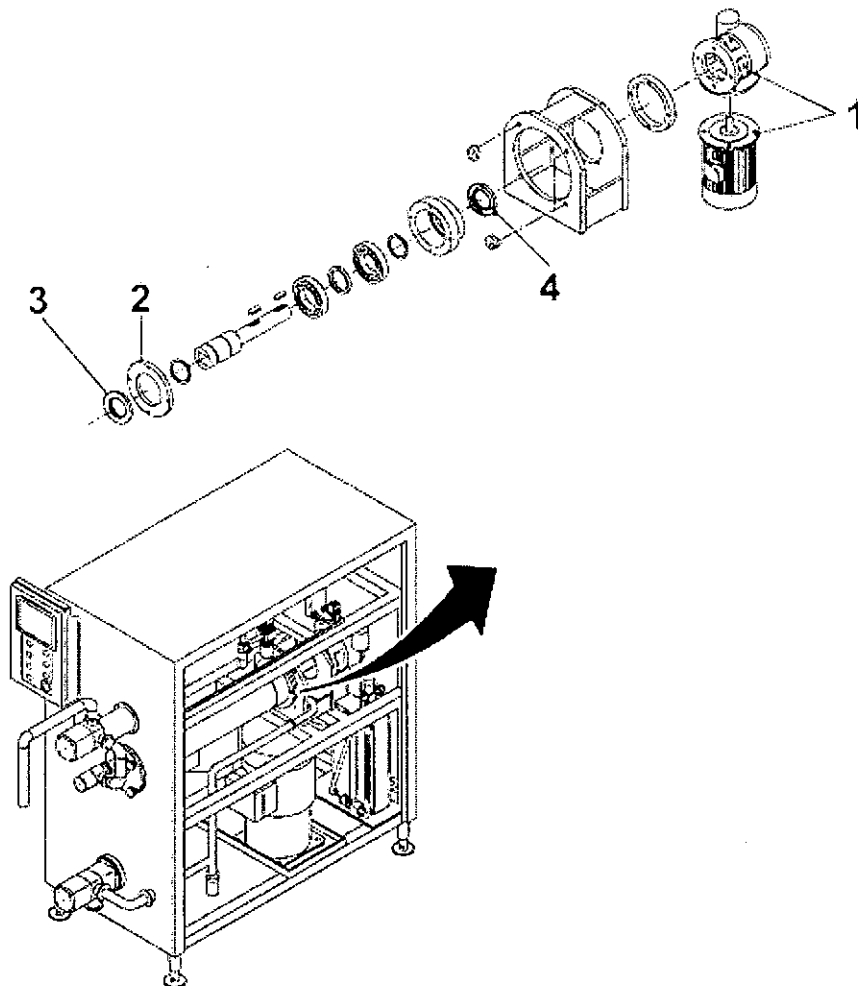
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## 2.1.3.7 Dasher motor drive - Change Gasket

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the motor and the reducer (1).
- b) Remove the ring (2).
- c) Remove and change the gasket (3) from the ring(2).
- d) Remove the gasket (4).
- e) Replace the gasket (4).
- f) Reassemble carefully in inverse order.

- 1 Motor and reducer
- 2 Ring
- 3 Gasket
- 4 Gasket

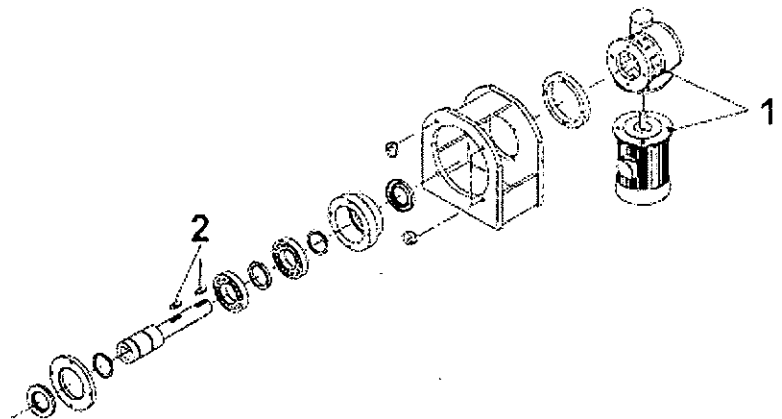




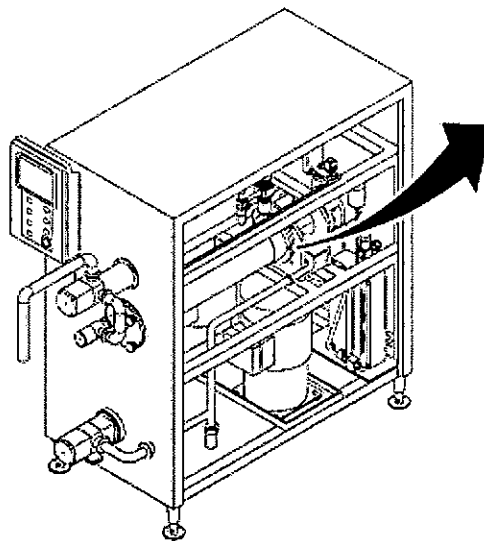
### 2.1.3.8 Dasher motor drive - Change Seeger and Key

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the motor and the reducer (1).
- b) Remove the keys (2).
- c) Change the keys (2).



1 Motor and reducer  
2 Keys



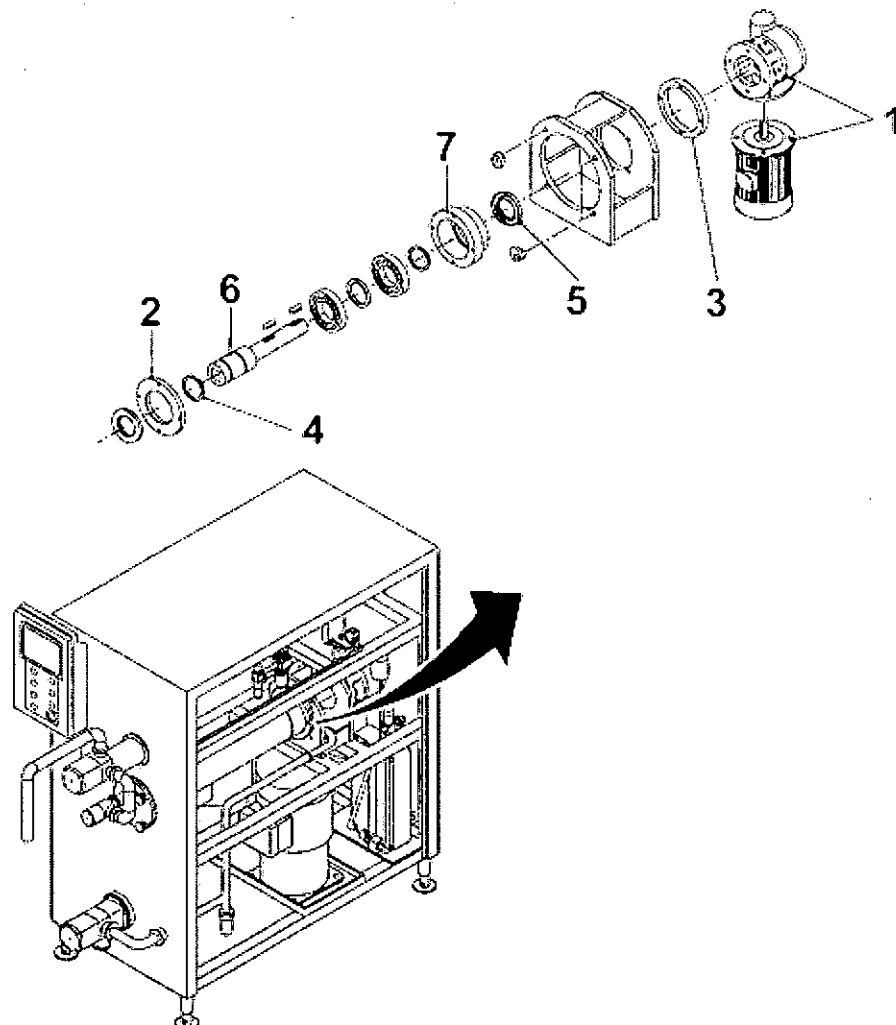
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## 2.1.3.9 Dasher motor drive - Change Shaft

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580500

- a) Dismantle the motor and the reducer (1).
- b) Unscrew the cover (2) and centering ring (3)
- c) Remove the seeger (4) and the gasket (5).
- d) Extract the bearing holder bushing (7) and the shaft (6) from the side of the reducer.
- e) Change the shaft (6).
- f) Reassemble carefully in inverse order.
- i) Check that the shaft (6) correctly rotates.

- 1 Motor and reducer
- 2 Cover
- 3 Centering ring
- 4 Seeger
- 5 Gasket
- 6 Shaft
- 7 Bearing holder bushing

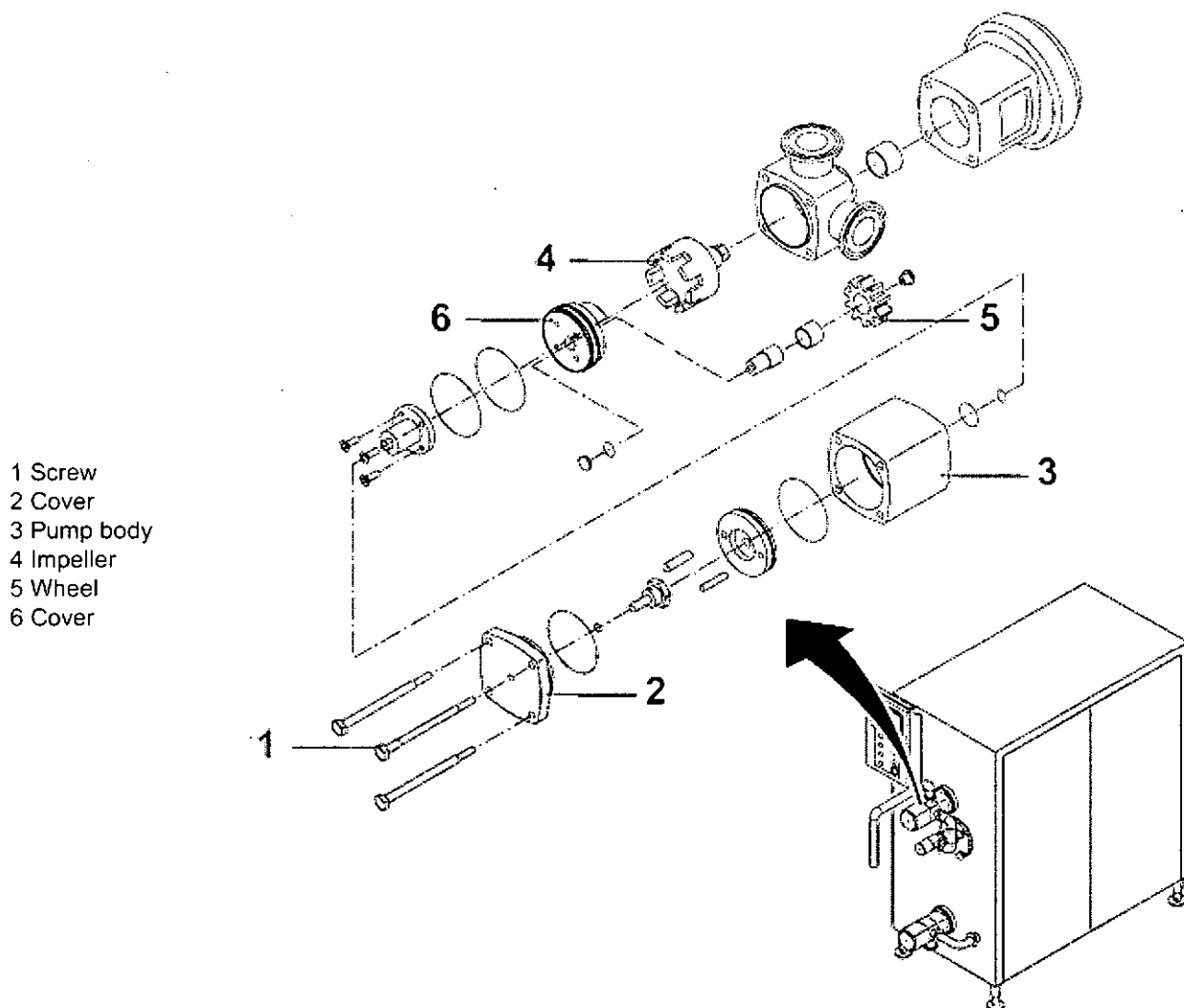


## 2.1.4 Pump

### 2.1.4.1 Pump - Change Impeller, Wheel and Cover

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59613020004

- a) Unscrew the screw (1) and dismantle the cover (2) and the pump body (3).
- b) Remove the impeller (4), the wheel (5) and the cover (6).
- c) Change the impeller (4), the wheel (5) and the cover (6).
- d) Reassemble carefully in inverse order.

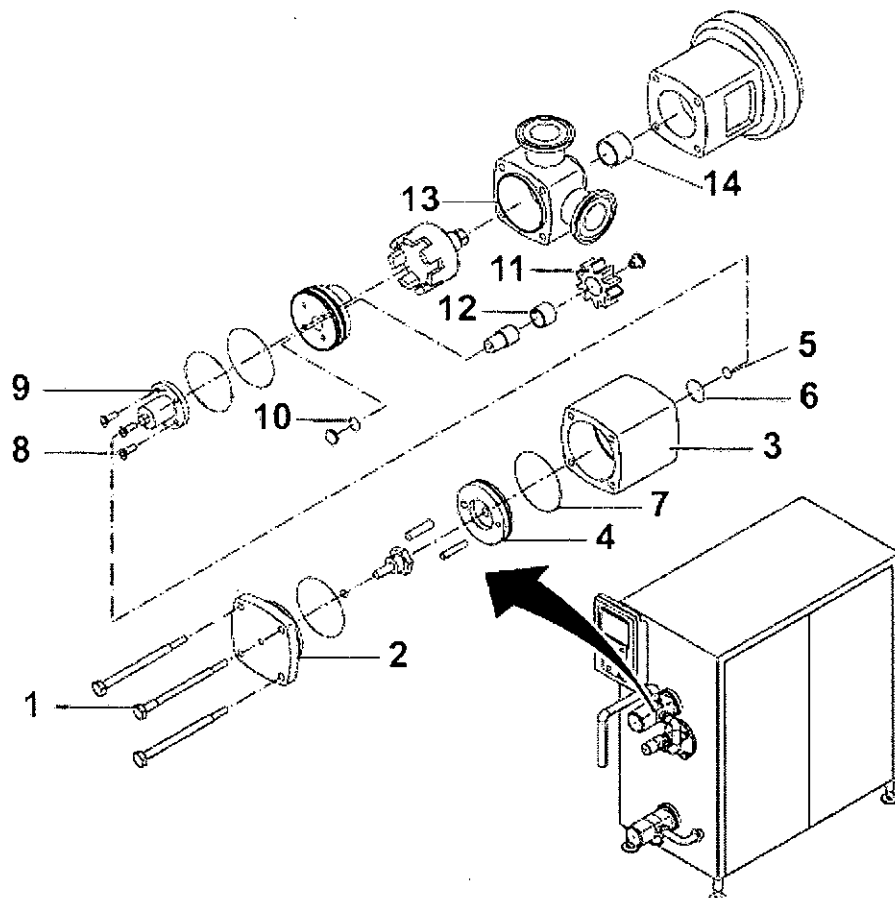


## 2.1.4.2 Pump - Change Gasket, Bushing and Screw

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59613020004

- a) Unscrew the screw (1) and dismantle the cover (2) and the pump body (3).
- b) Remove the piston (4).
- c) Remove the gaskets (5)-(6)-(7).
- d) Unscrew the screws (8) and remove the rod (9).
- e) Remove the gasket (10).
- f) Remove the wheel (11).
- g) Remove the bushing (12).
- h) Remove the pump body (13).
- i) Remove the bushing (14).
- j) Change the gasket (5)-(7)-(6)-(10), the bushing (12)-(14) and the screw (8).
- k) Reassemble carefully in inverse order.

- 1 Screw
- 2 Cover
- 3 Pump body
- 4 Piston
- 5 Gasket
- 6 Gasket
- 7 Gasket
- 8 Screw
- 9 Rod
- 10 Gasket
- 11 Wheel
- 12 Bushing
- 13 Pump body
- 14 Bushing

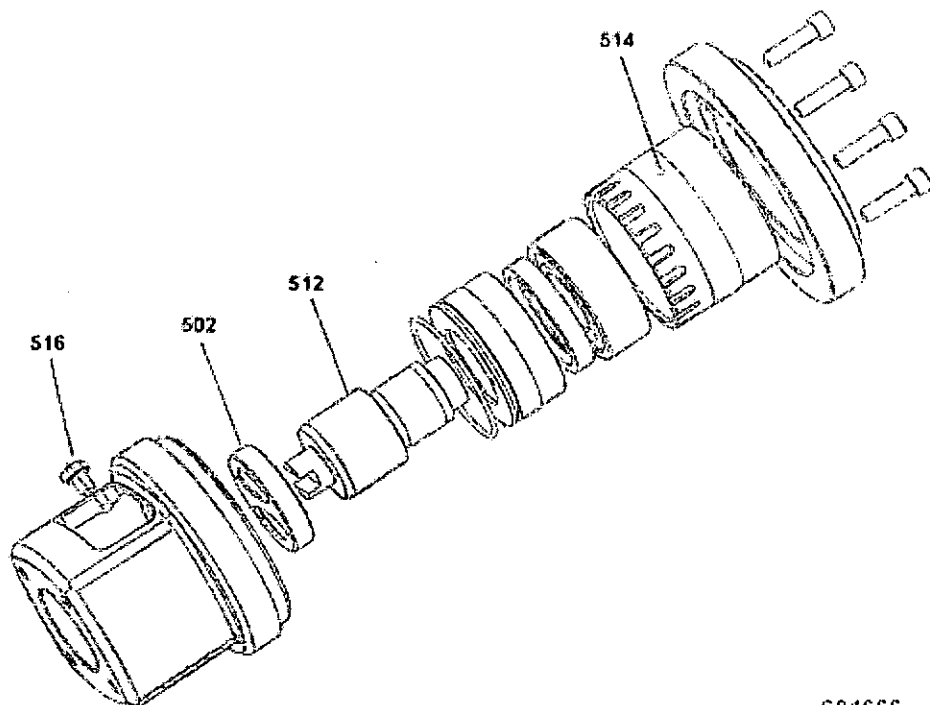


### 2.1.4.3 Pump - Adjustment of pump

Adjustment of the pump is limited to adjusting the clearance between the impeller and the pump cover.

When the below adjustment procedure is performed, CIP pumps must be in operating position and the compressed air pressure must be 8 bar. See below figure.

- a) Release the lock screw, pos. 516, just enough to permit the cylindrical bearing wheel, pos. 514, with the drive shaft to be easily turned in the thread.
- b) Turn the bearing housing until the clearance sensors, pos. 502 are secured. Then turn back the bearing housing to a position where it is just possible to move the clearance sensor radially but not axially.
- c) Screw the lock screw into the nearest groove in the bearing housing, pos. 514.
- d) Verify again that the clearance sensor can be moved as described in step 2. If this is not the case, repeat the above adjustment procedure.



601666

## 2.1.5 Refrigerating plant

### 2.1.5.1 Refrigerating plant - Clean condenser

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580350

- a) When condensation temperature is excessive for the conditions of operation in effect, it is time to clean the condenser.
- b) The condensation temperature must be between 28°C and 36°C. If the water temperature is less than or equal to 28°C; about 6000 litres/hour of water will be required at a temperature of 28°C.
- c) Check that these conditions are met and that all the rest is working properly before deciding that the condenser needs cleaning.
- d) If the condenser does need cleaning, contact a qualified refrigerator technician who has the equipment required to carry out chemical cleaning.



#### CAUTION

**Do not disassemble the condenser and disconnect it from the coolant pipes for cleaning.**

- e) The Frigus is fitted with two connections for cleaning the condenser: one inside the machine, at the top of the condenser near the dasher motor. This connection is normally closed off (washing solution intake). The other connection is normally used for condensing inlet water (washing solution outlet).
- f) Turn off the cooling water intake and outlet taps.
- g) Use a closed washing circuit consisting of a container and a centrifugal pump as shown in the figure; connect the pump delivery to the washing solution intake (top inside) through a plastic hose. Connect another plastic hose to the washing solution outlet (halfway on the outside) to return solution to the container.
- h) First let water run through to get rid of any solid particles in the condenser.
- i) Then prepare a suitable buffered solution (such as Henkel P3 T288) according to the manufacturer's instructions and put it in the container. Flush it through, following the instructions for use, until the solution's indicator (colour change, pH, etc.) indicates that scale has been removed. This may take a few hours.



#### CAUTION

**Under no circumstances should strong inorganic acids such as hydrochloric acid, nitric acid, or sulphuric acid be used for any reason.**

**These acids are very dangerous and could cause irreparable damage to the condenser in only a few minutes.**

l) Passivate and rinse according to the instructions; remove pipes and close connections up again. Open the cooling water intake and outlet taps again, and check that water is circulating normally with no leakage.

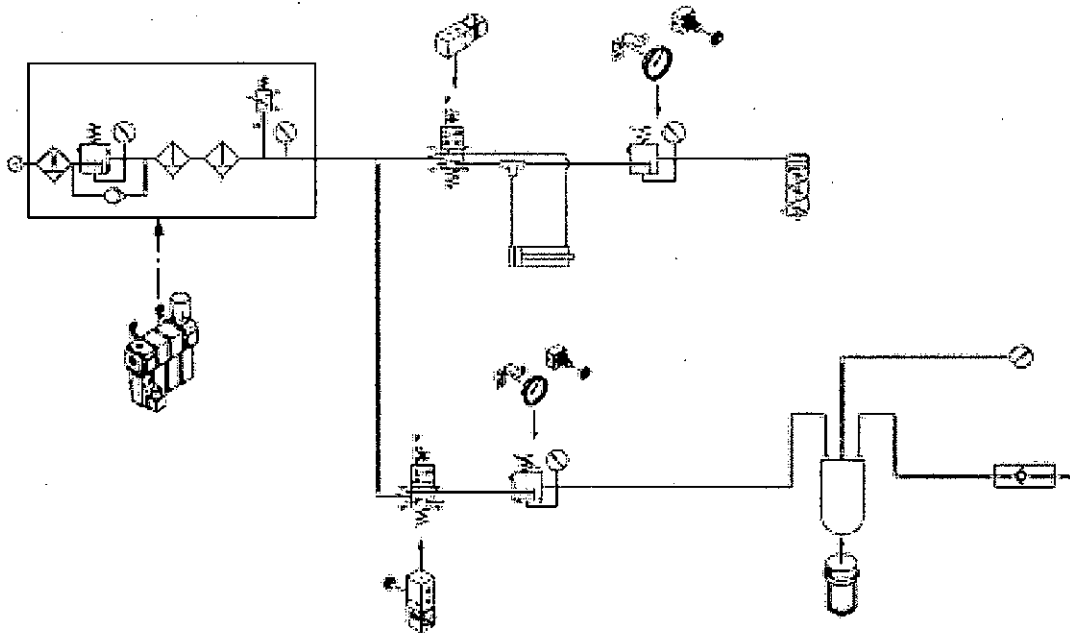
## 2.1.6 Pneumatic system

### 2.1.6.1 Pneumatic system - Change filter

Machine status	Power supply disconnecting device OFF Air valve OFF
SPC reference	59609580450

The sterilizing filter cartridge has a duration of 6 months both if the machine is used or not used.

At the maturity time change the sterilizing cartridge.





## 2.2 Maintenance of the electrical system

The electrical system is conceived, designed and developed to provide maximum protection for the continuous freezer components.

When a motor shuts down due to overload, the alarm page on the touch-screen signals an alarm message due to a tripped thermal.

If the thermal is tripped again when it is reset, the problem or short circuit persists and it will be necessary to inspect the electrical system and possibly block mechanical components.

If the motor compressors on the refrigerating plant shut down, check the pressure switches and electronic protections (located in the terminal boards above the motor compressors). These must be done before working on the electrical system. Pay careful attention to the wiring diagram.

The numbered terminal board appearing in the diagram mirrors the board installed on the freezer to make it easy to control it.

Maintenance and repair operations should be performed by a qualified electrician.

## 2.3 Maintenance of the refrigerating plant

### CAUTION

All repairs and inspections of the refrigerating plant must be performed exclusively by a qualified refrigerator technician.

#### Condensation

Coolant exiting the refrigerator compressor is condensed in the plate condenser by water, which may come from the water supply (or a well, or a circuit with a cooling tower). The Frigus has condensers with pressure valves which are factory set and keep condensation pressure at the optimal value (1-4 bar). If water from a cooling tower is used, it should be kept at the same temperature at all seasons, if possible (with a fan in the tower controlled by a thermostat) so as to keep the performance of the refrigerating plant uniform.

The condenser must be kept clean to ensure correct, efficient operation of the machine. All heat taken out of the ice cream mix and all energy consumed by the compressor to transfer this heat are transferred out of the system (in the cooling water) through the condenser. If the condenser is dirty, it will be difficult to get rid of the heat, and the freezer may not cool down sufficiently and may consume excess energy.

Decreased efficiency of the condenser is normally due to the combined action of particles of dirt in the flow of water and substances which have separated from the water (present even in very clean water).

Dirt particles, if large, will obstruct the passage of water; substances which separate from water and deposit on the exchange surfaces will obstruct the passage of heat.

#### Preventing soiling of the condenser

Prevent problems caused by dirt by keeping dirt out of the condenser. If cooling water comes from a circuit in which it is impossible to prevent entry of foreign particles (such as leaves, blades of grass or tiny insects in water from a tower or sand in well water), it will be necessary to decant and separate out these particles.

As specific protection for the freezer, one or more filters, periodically cleaned, may be installed at the water intake to stop all particles over 1 mm (largest dimension). The size and type of filter must be determined according to the amount and type of dirt in the water.

To prevent efficiency from being decreased by substances separating out of the water, first analyse the water to determine what treatment would be best. All waters tend to corrode or scale the surfaces with which they come into contact; it is very difficult to achieve and maintain a balanced condition in which there is neither corrosion nor scaling.

The trend to corrode or scale depends on the type and amount of substances dissolved in water, the acidity of the water and the temperature at which it is used. It is recommended that users contact a specialist firm capable of

recommending and supplying batching devices, substances, and procedures suited to the specific cooling water system in use.

This is particularly important in the case of water towers, where temperature, evaporation and continual ventilation with air in the environment can generate waters which are particularly polluted (by solid particles, algae, mineral salts, micro-organisms, gases, etc.) and damaging for the entire plant and the condenser in particular.

#### Thermostatic expansion valve

This valve is factory set during final testing to optimise the dependability and performance of the refrigerating plant.

The factory setting should not be changed for any reason. If the machine is not working properly, all parameters affecting performance should be checked, such as the temperature of incoming mix, wear on the scraper blades, and correct circulation of condensation water.

- If the refrigerating plant is not working as well as it should do, the reason may be:
  - insufficient condensation,
  - inefficient thermostat valve,
  - dirty or blocked up filter on the line,
  - hot gas solenoid valve blocked up or open,
  - liquid solenoid valve blocked up or closed,
  - low coolant level.
- Insufficient condensation may be caused by:
  - insufficient water coming from water supply: check that all taps (on the line that conveys water to the freezer) are open and water is flowing to the freezer properly.
  - optional pressure valve setting needs adjustment: adjust using the knob on its top.
- If the optional water valve is set correctly, the temperature of the water (flowing out of the outlet with the system in operation) should have a temperature of 28/35°C.
- If the thermostat valve is faulty, it will stay closed, stopping the flow of coolant.
- If the line filter is blocked up, it will get covered with frost which will block the flow of coolant. Dismantle and replace it. It must always be replaced whenever the cooling circuit is opened.
- If the solenoid valve which controls the flow of hot gas stays open, it will compromise the performance of the refrigerating plant considerably. Check the solenoid valve and replace if necessary.
- The liquid solenoid valve automatically closes the liquid line every time the refrigerator compressor stops.

- If the valve does not open, the refrigerating plant will tend to idle, and the vacuum pressure gauge will drop below  $-35^{\circ}\text{C}$ . If this occurs, check that the power is on to the solenoid valve coil. If so, replace the coil.
- If the electrical system is working properly and you have checked all the above, poor performance may be due to low coolant level in the refrigerating plant. This will result in formation of gas bubbles which may be detected by the indicator.

When the coolant level is low in the refrigerating plant, identify the cause of the leakage before adding more coolant.



### CAUTION

**Do not add coolant to the refrigerator circuit unless absolutely necessary. The refrigerating plant will not work properly with too much gas in it.**

## 2.4 Maintenance of the pneumatic system

Periodically check the efficiency of the pneumatic system and check whether the filters are obstructed.

- Check that pneumatic connections are tight and the absence of leakages.
- Check that mix does not flow back from the pump.
- Check the efficiency of the valves.
- If air flow is insufficient, replace filter cartridges; if not, refer to the table of work listed in the section on preventive maintenance.



### CAUTION

Do not open filters, especially the sterilised filter, unless there are problems with the pump's air supply.

## 2.5 Lubricating list

Component	Supplier	Type
1-pump reducer	Agip	Blasia 320 (ISO 3448)
2-Compressor*	Mobil	EAL Arctic 22 CC ICI Emkarate RL 32 CF
3-Bearings	NILS	Atomic T 4938 Longlife grease EP Low temp.
4-Bushings	NILS	Atomic T 4938 Longlife grease EP Low temp.

\* Quantity: 4 litres

Life-long lubrication.

The compressor guarantee will remain valid only if one of the two oils specified above is used. The compressor works only with these two specific oils. Ester oils must never be mixed with mineral oils and/or alkylic-benzene oils. Do not use mineral oils on cooling circuit components.



# 3 Task List

TechPub\_2614345\_0105 - TeW\_Z1381026-Task list.fm



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TechPub\_2614345\_0105 - TeM\_Z1381026-Task list.fm

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- 3.1 Introduction to TPMS . . . . . 3 - 5
- 3.2 Contents of the Task List . . . . . 3 - 6
  - 3.2.1 Description of the spare part location. . . . . 3 - 7
  - 3.2.2 Description of the service work to be performed 3 - 8
  - 3.2.3 Description of the spare part in question . . . . . 3 - 9
- 3.3 How to read a Task List. . . . . 3 - 10
- 3.4 Tetra PlantCare™ Agreement . . . . . 3 - 11
  - Task List . . . . . 3 - 12

TechPub\_2614345\_0105 - Tetra\_Z1381026-Task list.fm

TechPub\_2614345\_0105\_TeM\_21381026-Task list.fm

## 3.1 Introduction to TPMS

A modern industry for processing different types of products on a highly complex installation requires maintenance.

Professional maintenance makes it possible to keep up the high standards of reliability, hygiene and consistent quality, which is required when working with sensitive products. Minimal downtime and high equipment availability have an immediate, positive impact on the profitability of the plant.

By systematically applying maintenance routines, production downtime can be kept to a minimum. Through the Tetra Pak Maintenance System we can share all the experience we have acquired, and together with you achieve a common goal - a reliable production plant.

The core of Tetra Pak Maintenance System (TPMS) is a preventive maintenance model and evolves in a variety of technical services, well suited to a modern maintenance management.

The principle of TPMS is to ensure maximum performance of a production line and to minimise the number of unpredicted stops. This is achieved by providing carefully prepared maintenance recommendations from your Tetra Pak supplier.

Experiences gained from utilizing the recommendations and the system can feed back to the Tetra Pak supplier, where it will be used as input for further improvements. The functions, features and tools included in the TPMS system reflect your requirements and are continuously updated and supplemented to meet these expectations.

Task List is the displayed name of the Tetra Pak Maintenance System recommendations.

## 3.2 Contents of the Task List

### Example of a Task List

Tetra Pak Hopec Equipment													
Friqus KF4000-F1, Preventive maintenance recommendations. ProductNo: Z1191105, IssueDate: 38411													
Pre maintenance checks													
WARNING! Before starting any service work, read the safety precaution in the corresponding TeM (Technical Manual)													
Daily/Weekly checks - Have they been carried out? If not carry them out before starting the service.													
At any interval - Check - Leaks, Noise, Vibrations, Pressures and Temperatures													
Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
24		00960096	Pump Fp-3-b With Cip			5	1000	Change		00103678	Bearing Bush, Cart	1	
1		00960096	Pump Fp-3-b With Cip			5	1000	Check		00310331	Impeller	1	
1		00960096	Pump Fp-3-b With Cip			15	6000	Change		00310331	Impeller	1	
30		00960096	Pump Fp-3-b With Cip			3	500	Check		00320160	Feeler Gauge	1	
8002		00960096	Pump Fp-3-b With Cip			0	0	Drawing		00320181	Pump With Clip	0	
25		00960096	Pump Fp-3-b With Cip			5	1000	Change		51240054	O-ring	1	
35		00960096	Pump Fp-3-b With Cip			5	1000	Change		51245708	O-ring	1	
24		00960097	Fp-4 Cip Pump Clamp			5	1000	Change		00103678	Bearing Bush, Cart	1	
1		00960097	Fp-4 Cip Pump Clamp			5	1000	Check		00310331	Impeller	1	
1		00960097	Fp-4 Cip Pump Clamp			15	6000	Change		00310331	Impeller	1	
25		00960097	Fp-4 Cip Pump Clamp			10	1000	Check		00320051	Pump Housing Fp-	1	
30		00960097	Fp-4 Cip Pump Clamp			3	500	Check		00320160	Feeler Gauge	1	
8002		00960097	Fp-4 Cip Pump Clamp			0	0	Drawing		00320181	Pump With Clip	0	
25		00960097	Fp-4 Cip Pump Clamp			5	1000	Change		51240054	O-ring	1	
35		00960097	Fp-4 Cip Pump Clamp			5	1000	Change		51245708	O-ring	1	
8001		11061010	AIRSYSTEMKF.XC CUSTOMER			0	0	Drawing		10922649	CUSTOMERLIST	0	
825		11061010	AIRSYSTEMKF.XC CUSTOMER			30	24000	Change		53549060	Membrane	1	
871		11061010	AIRSYSTEMKF.XC CUSTOMER			10	1000	Check		53549145	FILTER ELEMENT	1	
871		11061010	AIRSYSTEMKF.XC CUSTOMER			15	3000	Change		53549145	FILTER ELEMENT	1	
870		11061010	AIRSYSTEMKF.XC CUSTOMER			10	1000	Check		53549147	PRE-FILTER ELEM	1	
870		11061010	AIRSYSTEMKF.XC CUSTOMER			15	3000	Change		53549147	PRE-FILTER ELEM	1	
931		11061010	AIRSYSTEMKF.XC CUSTOMER			5	1000	Check		54549067	Regulating Device	1	
931		11061010	AIRSYSTEMKF.XC CUSTOMER			30	6000	Change		54549067	Regulating Device	1	
1092		11081077	ASSEMBLY COOLINGSYSTEMXC DC			0	0	Drawing		10921013	Cooling System	0	
212		11081077	ASSEMBLY COOLINGSYSTEMXC DC			10	6000	Clean		11021030	Filter	1	

G02548

The Task List can be divided into three sections:

- Description of the spare part location on the machine
- Description of the recommended service work to be performed
- Description of the spare part in question

### 3.2.1 Description of the spare part location

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty
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G02546



#### Pre maintenance checks

**WARNING!** Before starting any service work , read the safety precaution in the corresponding TeM (Technical Manua Daily/Weekly checks - Have they been carried out? If not carry them out before starting the service.

At any interval - Check - Leaks, Noise, Vibrations, Pressures and Temperatures

Label	Class	Article No.	Denomination	Type
24		00960096	Pump Fp-3-b With Cip	
1		00960096	Pump Fp-3-b With Cip	

G02549

Label	In the spare parts catalogue (SPC) the label will be shown as the position of the spare part.
Class	Material main classes with its subordinate classes for internal Tetra Pak use.
Article No.	Displays the main article number, on which it is recommended that service is performed.The drawing of the item can be found in the spare parts catalogue.
Denomination and type	Description and functionality of the article number.

TechPub\_2614345\_0105 - TeM\_Z138102E-Task list.fm

### 3.2.2 Description of the service work to be performed

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty
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G02547



Doc No Reference	Work time	Interval Normal	Action	Description
	5	1000	Change	
	5	1000	Check	

G02550

Doc No Reference	Displays the number of the spare part work instruction.
Work time	This is the estimated required working time for this action displayed in minutes.
Interval normal	The information displays the production hours for the service inspection. The interval must be seen as a guideline, as some might change due to the production of the equipment (None, Normal or Hard).
Action	An action describes the recommended actions to be taken on the spare part, e.g. Check.
Description	Description and functionality of the article number.

TechPub\_2614345\_0105 - TeM\_Z1381026-Task list.fm

### 3.2.3 Description of the spare part in question

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty
-------	-------	-------------	--------------	------	------------------	-----------	-----------------	--------	-------------	---------------	--------------	-----

G02553



SparePart No.	Denomination	Qty
00103678	Bearing Bush, Carbon	1
00910331	Impeller	1

G02551

Spare part number, denomination and quantity are displayed.

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### 3.3 How to read a Task List

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty
24	1	00960096	Pump Fp-3-b With Cip			5	1000	Check		009103176	Bearing Bush Carbon	1
1	1	00960096	Pump Fp-3-b With Cip			5	1000	Check		009103311	Impeller	1
1	1	00960096	Pump Fp-3-b With Cip			15	3000	Change		009103311	Impeller	1
1	1	00960096	Pump Fp-3-b With Cip			3	5000	Check		00920181	Feet'r Gauge	1
8002	1	00960096	Pump Fp-3-b With Cip			0	0	Drawing		00920181	Pump With Cip	0
25	1	00960096	Pump Fp-3-b With Cip			5	1000	Change		51240054	O-ring	1
26	1	00960096	Pump Fp-3-b With Cip			5	1000	Change		51240066	O-ring	1

G02552

The following is an example of how to read the above illustrated Task List, which is maintenance recommendations for the impeller on Pump Fp-3-b with CIP.

On the assembly drawing number 00920181 the item can be located on which the action is recommended to be taken. This drawing can be found in the spare parts catalogue.

It is recommended that the impeller, spare part number 00910331, with position number 1 on the drawing is checked every 1000 production hours and the estimated working time is 5 minutes.

It is recommended that the impeller is changed after 6000 production hours and the estimated working time for this job is 15 minutes.

Maintenance procedures can be found in the maintenance manual.

TechPub\_2614345\_0105 - FeM\_Z1381026-Task list.fm

## 3.4 Tetra PlantCare™ Agreement

Tetra PlantCare is a maintenance service tool aiming at securing a high level of plant performance, food hygiene and safety.

### Application

Pre-planned preventive maintenance of individual machines as well as complete production lines. The actual scope of delivery is tailor-made individually in close co-operation with you and Tetra Pak technical management.

### Advantages

- Realistic maintenance costs on budget
- Comprehensive machine history (protocol)
- Less unexpected production stops
- The right spare parts in stock
- Improved overall equipment effectiveness
- Food safety
- Environmental performance
- Customer training

### Scope of services

- Project management
- Logistics management
- Maintenance work and supervision on site
- Supply of parts
- I/O check and functional test
- Supervision of production start-up after service
- Service protocol

### How to get started

Please contact your local Tetra Pak Hoyer representative for further information and detail conditions in your area.

[www.tetrapak.com](http://www.tetrapak.com)

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# Task List

TechPub\_2614345\_0105 - TeM\_Z1381026-Task list.fm

Tetra Pak Food Machinery (Shanghai) Co.,Ltd. Frigus SF 1200 N1 R404A, Preventive maintenance recommendations. ProductNo:

IssueDate: 2008/06/29

## Pre maintenance checks

WARNING! Before starting any service work , read the safety precaution in the corresponding TeM (Technical Manual)  
Daily/Weekly checks - Have they been carried out? If not carry them out before starting the service.

At any interval - Check - Leaks, Noise, Vibrations, Pressures and Temperatures

Label	Class	Article.No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
		59609580150	Mix Flow System			5	6000	Change		59609420504	Cup for Safety Valve	1	
		59609580150	Mix Flow System			5	250	Check		59630902005	O-ring	1	
		59609580150	Mix Flow System			5	1000	Change		59630902005	O-ring	1	
		59609580150	Mix Flow System			5	250	Check		59630903069	Gasket	10	
		59609580150	Mix Flow System			5	1000	Change		59630903069	Gasket	10	
		59609580150	Mix Flow System			5	250	Check		59630903070	Gasket	6	
		59609580150	Mix Flow System			5	1000	Change		59630903070	Gasket	6	
		59609580350	Refrigeration Group			5	3000	Check		59630501025	Thermostatic Element	1	
		59609580350	Refrigeration Group			5	1000	Check		59630501039	Coil for Solenoid Valve	2	
		59609580350	Refrigeration Group			5	6000	Change		59630501039	Coil for Solenoid Valve	2	
		59609580350	Refrigeration Group			5	3000	Check		59854198002	Dryer	1	
		59609580350	Refrigeration Group			5	6000	Change		59854198002	Dryer	1	
		59609580350	Refrigeration Group			5	3000	Check		59854198003	Orifice Assembly	1	
		59609580350	Refrigeration Group			5	1500	Clean		59854578001	Condensor	2	
		59609580450	Pneumatic System			5	1000	Change		59609421211	Cartridge	1	
		59609580450	Pneumatic System			5	3000	Check		59853548008	Air Filter	1	
		59609580450	Pneumatic System			5	6000	Change		59853548008	Air Filter	1	
		59609580450	Pneumatic System			5	3000	Check		59853548009	Air Filter	1	
		59609580450	Pneumatic System			5	6000	Change		59853548009	Air Filter	1	
		59609580450	Pneumatic System			5	3000	Check		59853549060	ESSICCATORE AIR DRYER	1	
		59609580450	Pneumatic System			5	6000	Change		59853549060	ESSICCATORE AIR DRYER	1	
		59609580500	Freezing Cylinder Group			5	3000	Change		59603570212	Spring	1	
		59609580500	Freezing Cylinder Group			5	1000	Check		59609500021	Blades	8	
		59609580500	Freezing Cylinder Group			5	3000	Change		59609500021	Blades	8	
		59609580500	Freezing Cylinder Group			5	250	Check		59609520305	Bush	2	
		59609580500	Freezing Cylinder Group			5	1000	Change		59609520305	Bush	2	
		59609580500	Freezing Cylinder Group			5	250	Check		59609520306	Rotating Seal	1	

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
		59609580500	Freezing Cylinder Group			5	3000	Change		59609520306	Rotating Seal	1	
		59609580500	Freezing Cylinder Group			5	250	Check		59612020416	Bush	1	
		59609580500	Freezing Cylinder Group			5	1000	Change		59612020416	Bush	1	
		59609580500	Freezing Cylinder Group			5	250	Check		59612020417	Bush	1	
		59609580500	Freezing Cylinder Group			5	1000	Change		59612020417	Bush	1	
		59609580500	Freezing Cylinder Group			5	250	Check		59612020445	Stationary seal	1	
		59609580500	Freezing Cylinder Group			5	3000	Change		59612020445	Stationary seal	1	
		59609580500	Freezing Cylinder Group			5	250	Check		59630903077	O-ring	1	
		59609580500	Freezing Cylinder Group			5	1000	Change		59630903077	O-ring	1	
		59609580500	Freezing Cylinder Group			5	3000	Change		58851178002	Lock Ring	2	
		59609580500	Freezing Cylinder Group			5	250	Check		59851240031	O-ring	1	
		59609580500	Freezing Cylinder Group			5	3000	Change		59851240031	O-ring	1	
		59609580500	Freezing Cylinder Group			5	250	Check		59851248018	O-ring OR 8625	2	
		59609580500	Freezing Cylinder Group			5	1000	Change		59851248018	O-ring OR 8625	2	
		59609580500	Freezing Cylinder Group			5	250	Check		59851248019	O-ring	3	
		59609580500	Freezing Cylinder Group			5	1000	Change		59851248019	O-ring	3	
		59609580500	Freezing Cylinder Group			5	250	Check		59851268013	Gasket Corteco	2	
		59609580500	Freezing Cylinder Group			5	1000	Change		59851268013	Gasket Corteco	2	
		59609580500	Freezing Cylinder Group			5	3000	Check		59855018002	Bearing	2	
		59609580500	Freezing Cylinder Group			5	3000	Change		59855018002	Bearing	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851229056	Gasket	4	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851240014	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851242166	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851039002	Pin	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851246064	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851242157	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851242165	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59400103823	Bushing	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59400103673	Bushing	2	
		59611021160	Rotary Pump(1.5")			5	1000	Change		59851240053	O-ring	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910309	Impeller	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910309	Impeller	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59852272646	Machine Screw	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59852272646	Machine Screw	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910377	Washer	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910377	Washer	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910407	Piston	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910407	Piston	2	

Label	Class	Article No.	Denomination	Type	Doc No Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
		59611021160	Rotary Pump(1.5")			5	3000	Check		59630202003	Blot	6	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59630202003	Blot	6	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400920185	Indicator	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400920185	Indicator	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400920007	Plate	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400920007	Plate	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400920177	Pump Body	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400920177	Pump Body	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910303	Piston Rod	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910303	Piston Rod	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59852272636	Machine Screw	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59852272636	Machine Screw	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910382	Cover	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910382	Cover	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910306	Lock nut	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910306	Lock nut	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59630202004	Bolt	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59630202004	Bolt	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59851039000	Pin	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59851039000	Pin	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910408	Haulm	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910408	Haulm	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59400910409	Haulm	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59400910409	Haulm	2	
		59611021160	Rotary Pump(1.5")			5	3000	Check		59852272643	Machine screw	2	
		59611021160	Rotary Pump(1.5")			5	6000	Change		59852272643	Machine screw	2	
		59613020005	Bracket Assembled			10	1000	Check		59630901071	Bearing	2	
		59613020005	Bracket Assembled			10	3000	Change		59630901071	Bearing	2	
		59613020005	Bracket Assembled			10	1000	Check		59630903025	O-ring	2	
		59613020005	Bracket Assembled			10	3000	Change		59630903025	O-ring	2	
		59613020005	Bracket Assembled			10	1000	Check		59630903039	O-ring	2	
		59613020005	Bracket Assembled			10	3000	Change		59630903039	O-ring	2	
		59613020005	Bracket Assembled			10	1000	Check		59630903085	Seal	2	
		59613020005	Bracket Assembled			10	3000	Change		59630903085	Seal	2	
		59613020005	Bracket Assembled			10	1000	Check		59851248006	O-ring	2	
		59613020005	Bracket Assembled			10	3000	Change		59851248006	O-ring	2	
		59613020005	Bracket Assembled			10	3000	Check		59400920164	Shaft	2	
		59613020005	Bracket Assembled			10	6000	Change		59400920164	Shaft	2	

Label	Class	Article No.	Denomination	Type	Doc No. Reference	Work time	Interval Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
		59613020005	Bracket Assembled			10	3000	Check		59400920159	Nut	2	
		59613020005	Bracket Assembled			10	6000	Change		59400920159	Nut	2	
		59613020005	Bracket Assembled			10	3000	Check		59400920149	Bolt	2	
		59613020005	Bracket Assembled			10	6000	Change		59400920149	Bolt	2	
		59613020005	Bracket Assembled			10	3000	Check		59400920224	Nut	2	
		59613020005	Bracket Assembled			10	6000	Change		59400920224	Nut	2	
		59613020005	Bracket Assembled			10	3000	Check		59400920160	Circle	2	
		59613020005	Bracket Assembled			10	6000	Change		59400920160	Circle	2	

Spare Part No.	Denomination	Qty	Is part of BOM-list
59630902005	O-ring	1	59609580150
59630903069	Gasket	10	59609580150
59630903070	Gasket	6	59609580150
59609421211	Cartridge	1	59609580450
59609520305	Bush	2	59609580500
59612020416	Bush	1	59609580500
59612020417	Bush	1	59609580500
59630903077	O-ring	1	59609580500
59851248018	O-ring OR 8625	2	59609580500
59851248019	O-ring	3	59609580500
59851288013	Gasket Corteco	2	59609580500



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Item No.	Label	Article No.	Denomination	SparePart No.	Denomination	Qty	Doc No.	Rev.
59609580150	Mix Flow System			59609420504	Cup for Safety Valve	1		
59609580150	Mix Flow System			59630902005	O-ring	1		
59609580150	Mix Flow System			59630903069	Gasket	10		
59609580150	Mix Flow System			59630903070	Gasket	6		
59609580350	Refrigeration Group			59630501039	Coil for Solenoid Valve	2		
59609580350	Refrigeration Group			59854198002	Dryer	1		
59609580450	Pneumatic System			59609421211	Cartridge	1		
59609580450	Pneumatic System			59853548008	Air Filter	1		
59609580450	Pneumatic System			59853548009	Air Filter	1		
59609580450	Pneumatic System			59853549060	Essiccatore Air Dryer	1		
59609580500	Freezing Cylinder Group			59603570212	Spring	1		
59609580500	Freezing Cylinder Group			59609500021	Blades	8		
59609580500	Freezing Cylinder Group			59609520305	Bush	2		
59609580500	Freezing Cylinder Group			59609520306	Rotating Seal	1		
59609580500	Freezing Cylinder Group			59612020416	Bush	1		
59609580500	Freezing Cylinder Group			59612020417	Bush	1		
59609580500	Freezing Cylinder Group			59612020445	Stationary Seal	1		
59609580500	Freezing Cylinder Group			59630903077	O-ring	1		
59609580500	Freezing Cylinder Group			59851178002	Lock ring	2		
59609580500	Freezing Cylinder Group			59851240031	O-ring	1		
59609580500	Freezing Cylinder Group			59851248018	O-ring OR 8625	2		
59609580500	Freezing Cylinder Group			59851248019	O-ring	3		
59609580500	Freezing Cylinder Group			59851288013	Gasket Corteco	2		
59611021160	Pump(1.5")			59400910309	Impeller	2		
59611021160	Pump(1.5")			59851228056	Gasket	4		
59611021160	Pump(1.5")			59851240014	O-ring	2		
59611021160	Pump(1.5")			59851240053	O-ring	2		
59611021160	Pump(1.5")			59851242157	O-ring	8		
59611021160	Pump(1.5")			59851242165	O-ring	2		
59611021160	Pump(1.5")			59851242166	O-ring	2		
59611021160	Pump(1.5")			59851245709	O-ring	2		
59611021160	Pump(1.5")			59851246064	O-ring	2		
59613020005	Bracket Assembled			59630903025	O-ring	2		
59613020005	Bracket Assembled			59630903039	O-ring	2		
59613020005	Bracket Assembled			59630903085	Seal	2		
59613020005	Bracket Assembled			59851248006	O-ring	2		

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Sign:



# 4 Spare Parts Catalogue

TechPub\_2614345\_0103 - Z1381039spe-01en.fm

TechPub\_2614345\_0103 - Z1381039spc-01en.fm

<b>4.0</b>	<b>Information about spare parts</b> . . . . .	<b>4 - 5</b>
4.0.1	General . . . . .	4 - 5
4.0.2	How to order spare parts . . . . .	4 - 5
<b>4.1</b>	<b>Frigus SF 1200 N1</b> . . . . .	<b>4 - 6</b>
4.1.1	Assembly drawing No. 59609580008. . . . .	4 - 6
4.1.1.1	Bom No.59609580008. . . . .	4 - 6
<b>4.2</b>	<b>Cylinder</b> . . . . .	<b>4 - 10</b>
4.2.1	Assembly drawing No. 59609580500 . . . . .	4 - 10
4.2.1.1	Bom No.59609580500 . . . . .	4 - 10
<b>4.3</b>	<b>Check valve</b> . . . . .	<b>4 - 14</b>
4.3.1	Assembly drawing No. 59613020407 . . . . .	4 - 14
4.3.1.1	Bom No.59613020407 . . . . .	4 - 14
<b>4.4</b>	<b>Dasher Unit</b> . . . . .	<b>4 - 16</b>
4.4.1	Assembly drawing No. 59230200067. . . . .	4 - 16
4.4.1.1	Bom No.59230200067 . . . . .	4 - 16
<b>4.5</b>	<b>Ice Cream pump</b> . . . . .	<b>4 - 18</b>
4.5.1	Assembly drawing No. 59611021160. . . . .	4 - 18
4.5.1.1	Bom No.59611021160 . . . . .	4 - 18
<b>4.6</b>	<b>Mix pump</b> . . . . .	<b>4 - 22</b>
4.6.1	Assembly drawing No. 59613020005 . . . . .	4 - 22
4.6.1.1	Bom No.59613020005 . . . . .	4 - 22
<b>4.8</b>	<b>Bracket for pump</b> . . . . .	<b>4 - 26</b>
4.8.1	Assembly drawing No. 59613020005 . . . . .	4 - 26
4.8.1.1	Bom No.59613020005 . . . . .	4 - 26
<b>4.8</b>	<b>Pneumatic Plant</b> . . . . .	<b>4 - 28</b>
4.8.1	Assembly drawing No. 59609580450 . . . . .	4 - 28
4.8.1.1	Bom No.59609580450 . . . . .	4 - 28

4.9 Refrigeration Plant . . . . . 4 - 30

    4.9.1 Assembly drawing No. 59609522350 . . . . . 4 - 30

        4.9.1.1 Bom No.59609262350 . . . . . 4 - 30

4.10 Control Panel. . . . . 4 - 34

4.11 Electrical cabinet . . . . . 4 - 38

TechPub\_2614345\_0103 - Z1381039spe-01en.fm

## 4.0 Information about spare parts

### 4.0.1 General

During the lifetime of this Hoyer ice cream equipment the plant will require spare parts, service and maintenance in order to maintain its high performance.

Using genuine Hoyer spare parts from Tetra Pak guarantees the reliable, efficient and safe operation of the Hoyer ice cream equipment.

All generic parts are in stock ready for immediate delivery. Special parts not in stock will be manufactured in our own workshops based on original documentation and all parts are covered by a one-year guarantee. Genuine Hoyer spare parts from Tetra Pak save you money by increasing uptime and avoiding damage due to inferior quality of non-original parts.

Tetra Pak Technical Sales and Service is equipped to give the ultimate help and service to secure a correct and expedient handling of spare parts orders.

The global supply chain network secure fast and traceable handling of shipments throughout the world.

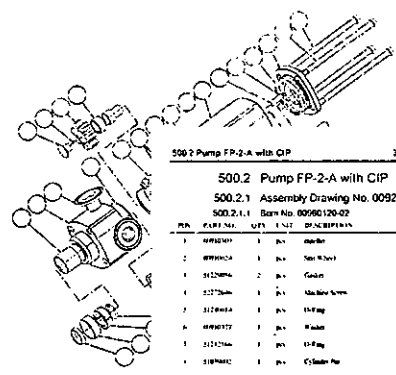
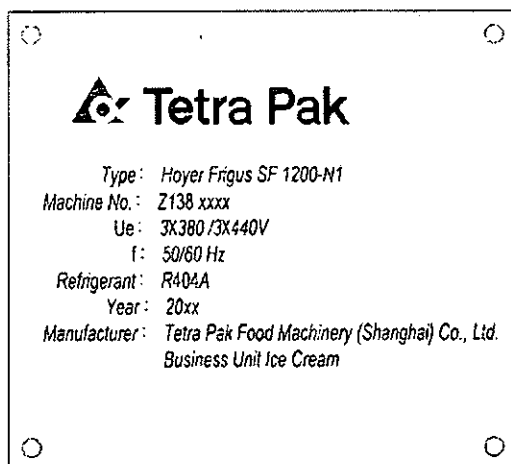
### 4.0.2 How to order spare parts

In order to deliver the correct parts there are 4 critical points of information, which enable the delivery of the right parts

- Customer name and plant
- Machine type and number (Zxxx xxxx)
- Description of spare part
- Spare part number

The type and serial number is always found on the machine identification plate.

TechPub\_2614345\_0103 - Z1381039spc-01ten.lin



500.2 Pump FP-2-A with CIP 3 Spare Parts Catalogue

500.2 Pump FP-2-A with CIP  
500.2.1 Assembly Drawing No. 00920181-01  
500.2.1.1 Item No. 00960120-02

PA	PART No.	QTY	UNIT	DESCRIPTION
1	00960101	1	pc	Motor
2	00960102	1	pc	Shaft (Key)
3	31220004	2	pc	Gasket
4	31220006	1	pc	Machine screw
7	31220010	1	pc	O-Ring
8	00960103	1	pc	Flange
9	31220005	1	pc	O-Ring
10	31220007	1	pc	O-Ring
11	00960104	1	pc	Flange
12	31220008	1	pc	O-Ring
14	00960105	1	pc	Motor 1 to CIP
15	31220009	1	pc	O-Ring
16	00960106	1	pc	Unit Case CIP

If you want to know more about Hoyer spare parts from Tetra Pak - or about any other service products - contact your nearest Tetra Pak Service representative.

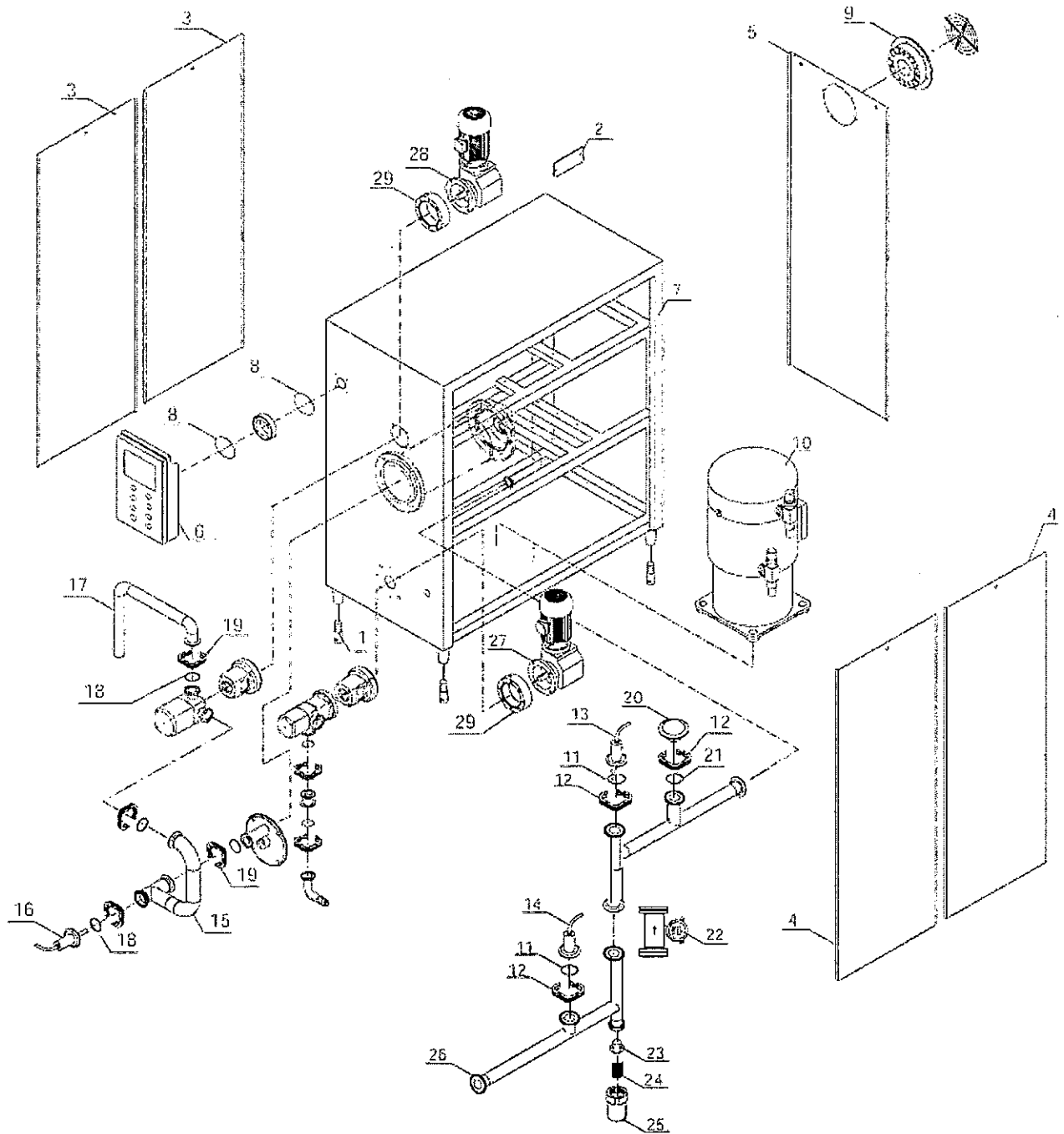
## 4.1 Frigus SF 1200 N1

## 4.1.1 Assembly drawing No. 59609580008

## 4.1.1.1 Bom No.59609580008

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59609420104	4	pcs	Foot
2	59609420107	1	pcs	Plate
3	59612020010	2	pcs	Left panel
4	59612020012	2	pcs	Right panel
5	59220200032	1	pcs	Rear panel
6	59609580720	1	pcs	Control panel
7	59609580100	1	pcs	Frame
8	59630902044	2	pcs	O-ring
9	59854587001	1	pcs	Fan
10	59617020029	2	pcs	Compressor
11	59630903069	2	pcs	Gasket
12	59631003004	3	pcs	Clamp
13	59854457002	1	pcs	Temperature Transducer
14	59857067004	1	pcs	Pressure Transducer
15	59220200059	1	pcs	Connecting pipe
16	59854458001	1	pcs	Temperature Transducer
17	59612020047	1	pcs	Ice cream outlet pipe
18	59630903069	4	pcs	Gasket
19	59630903070	4	pcs	Gasket
20	59630202012	1	pcs	Nonreturn valve
21	59630902005	1	pcs	O-ring
22	59857367002	1	pcs	Flowmeter

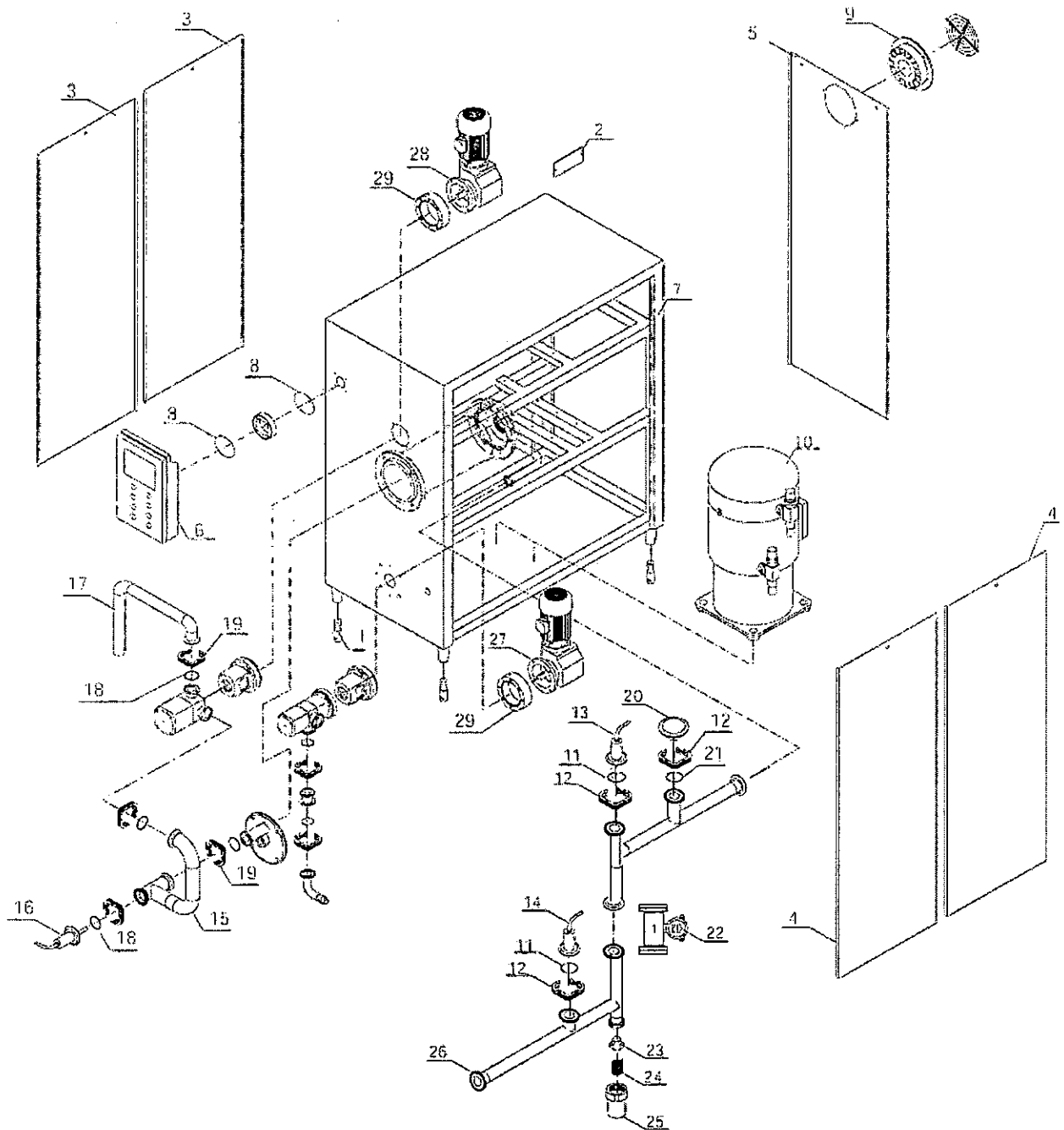




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POS.	PART NO.	QTY	UNIT	DESCRIPTION
23	59609420504	1	pcs	Seal
24	59603570176	1	pcs	Spring
25	59609420503	1	pcs	Safe valve body
26	59612020437	1	pcs	Hose
27	59854528011	1	pcs	Gear motor
28	59854528012	1	pcs	Gear motor
29	59612020446	1	pcs	Motor assembly flange



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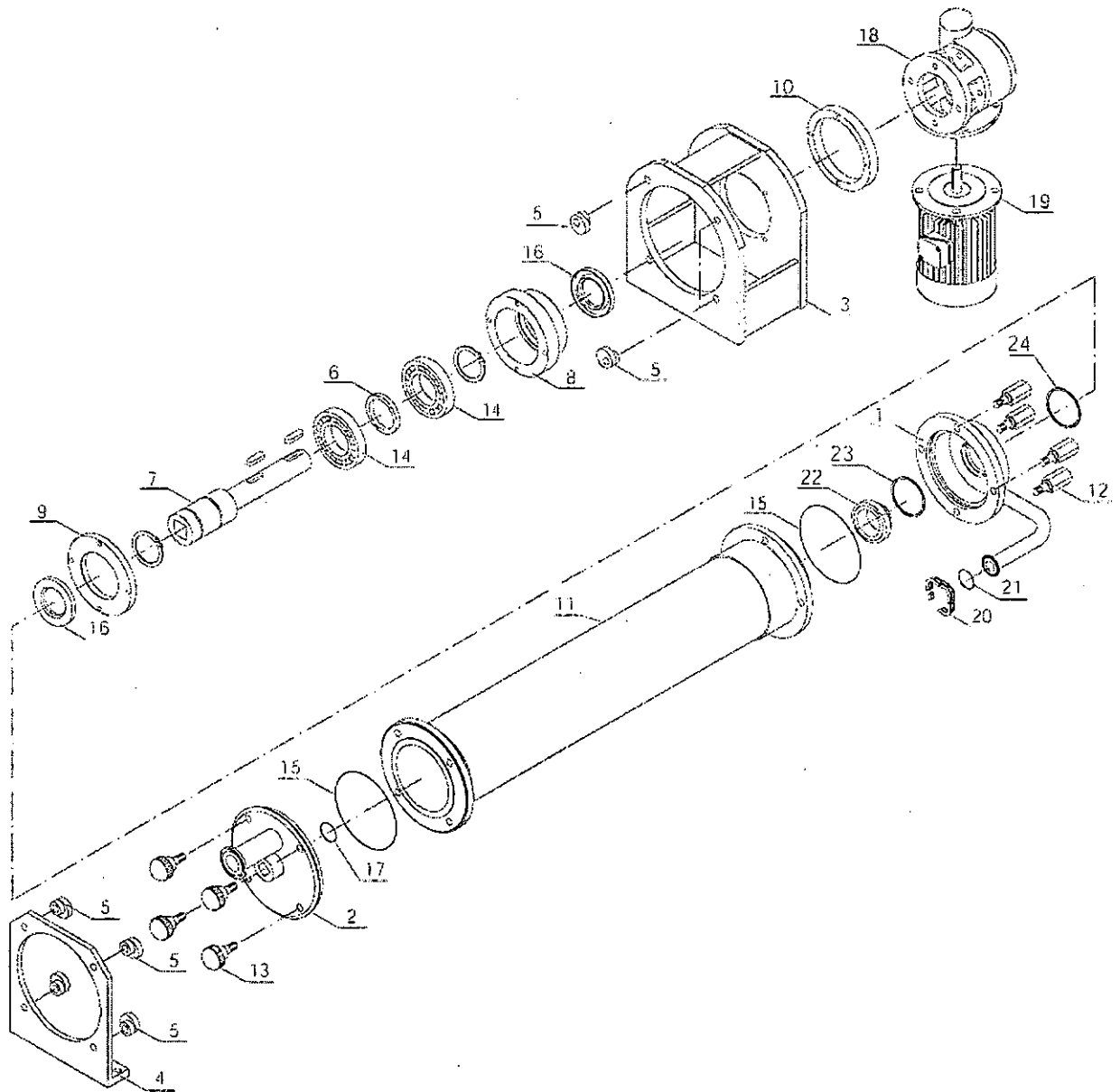
1/1 - 59609580007

## 4.2 Cylinder

### 4.2.1 Assembly drawing No. 59609580500

#### 4.2.1.1 Bom No.59609580500

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59609520097	1	pcs	Rear endpiece
2	59609520098	1	pcs	Cover
3	59609520095	1	pcs	Rear support
4	59609520096	1	pcs	Front support
5	59612020038	8	pcs	Cylinder bracket
6	59612020039	1	pcs	Spacer
7	59612020040	1	pcs	Shaft
8	59612020041	1	pcs	Bush
9	59612020042	1	pcs	Bearing cover
10	59612020043	1	pcs	Reduction gear centring
11	59220200099	1	pcs	Cylinder
12	59609520501	4	pcs	Endpiece fixing pin
13	59609520502	4	pcs	Cover knob
14	59855018002	2	pcs	Bearing
15	59851248018	2	pcs	O-ring
16	59851288013	2	pcs	Corteco seal
17	59630903077	1	pcs	O-ring
18	59603570164	1	pcs	Reduction gear
19	59854518004	1	pcs	Motor
20	59631003004	2	pcs	Clamp lockup
21	59630903069	2	pcs	Clamp gasket with edge
22	59612020444	1	pcs	Ring



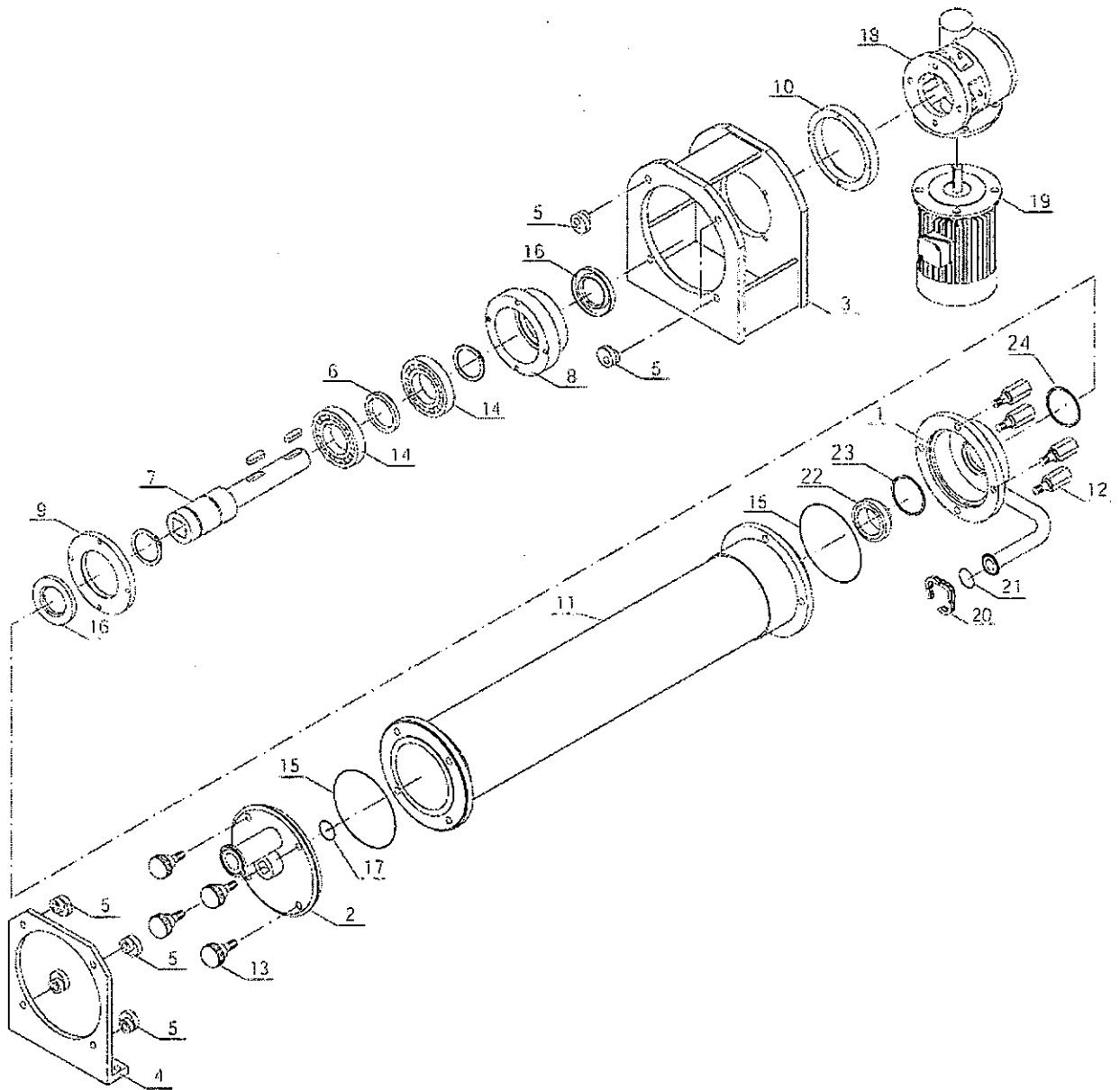
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POS.	PART NO.	QTY	UNIT	DESCRIPTION
23	59851248019	1	pcs	Seal
24	59612020445	1	pcs	Ring nut

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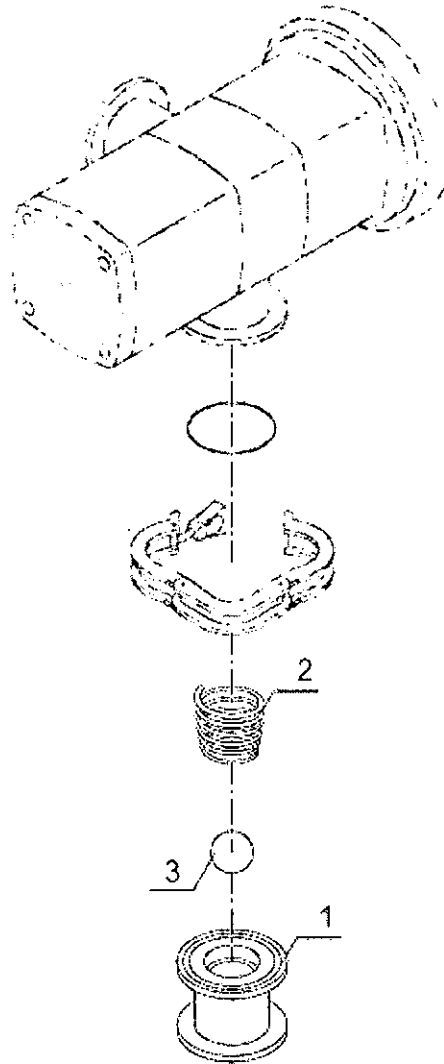
### 4.3 Check valve

4.3.1 Assembly drawing No. 59613020407

4.3.1.1 Bom No.59613020407

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59612040710	1	pcs	Holder for spring
2	59612040711	1	pcs	Spring
3	59630901104	1	pcs	Ball





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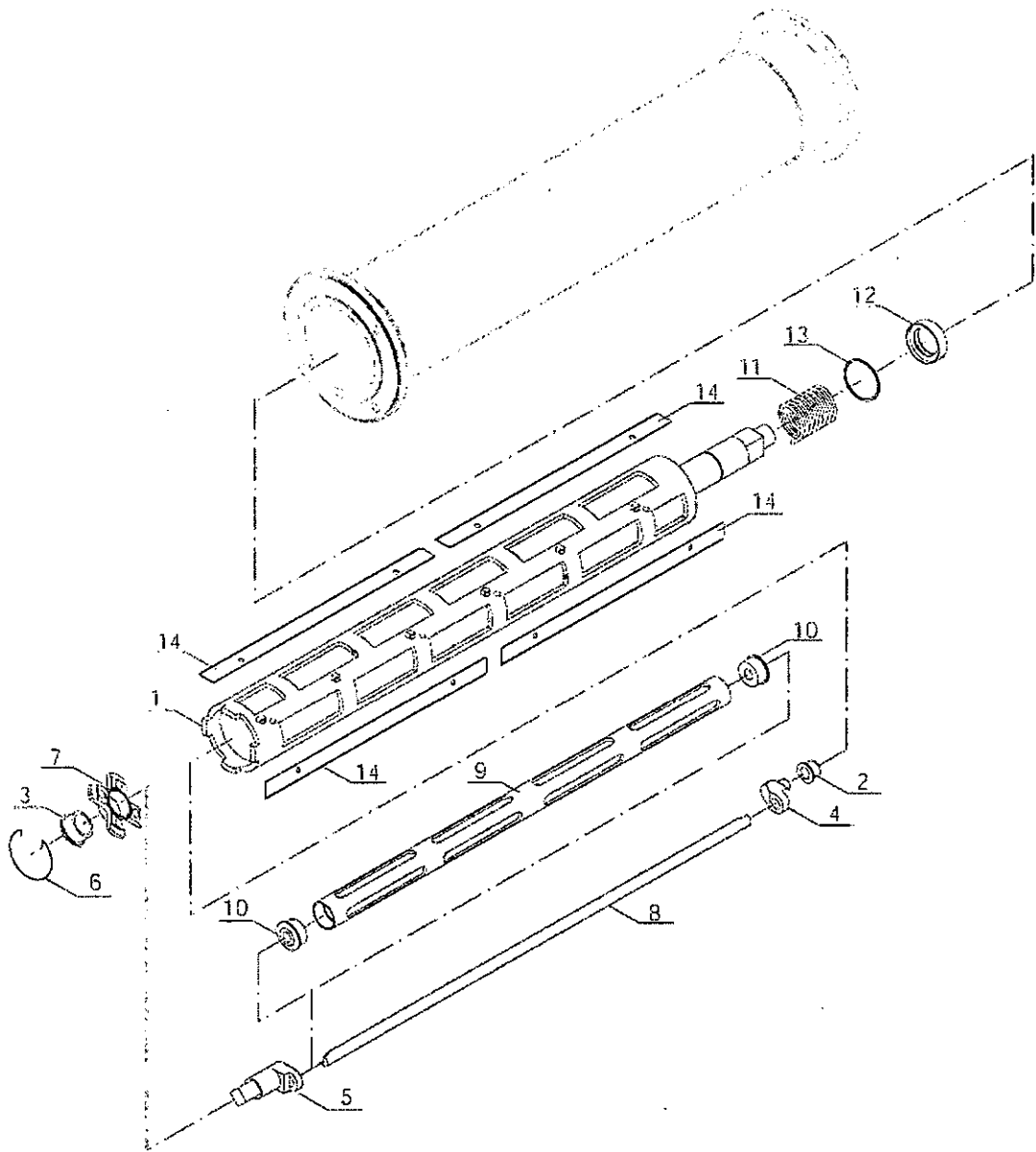
1/1 - 59613020407

## 4.4 Dasher Unit

### 4.4.1 Assembly drawing No. 59230200067

#### 4.4.1.1 Bom No.59230200067

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59612020449	1	pcs	Shaft
2	59612020416	1	pcs	Bushing
3	59612020417	1	pcs	Bushing
4	59612020451	1	pcs	Low eccentric support
5	59612020452	1	pcs	Pin
6	59609520301	1	pcs	Stop spring
7	59609520302	1	pcs	Eccentric guide support
8	59609520303	1	pcs	Rod for tube
9	59609520304	1	pcs	Internal tube
10	59609520305	1	pcs	Bushing
11	59603570212	1	pcs	Spring
12	59609520306	1	pcs	Seal ring
13	59851240031	1	pcs	O-ring
14	59609500021	8	pcs	Scraper blade



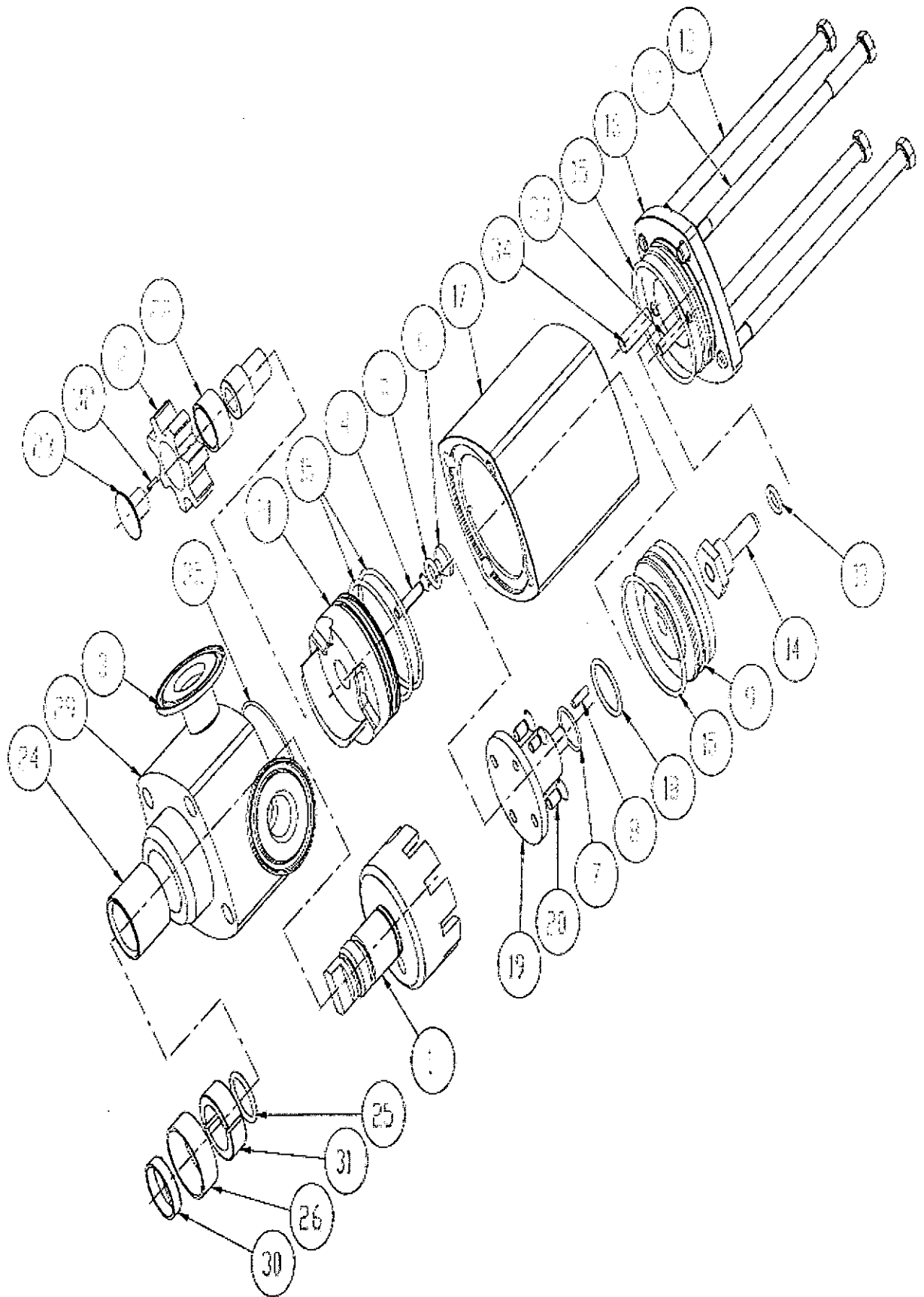
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## 4.5 Ice Cream pump

### 4.5.1 Assembly drawing No. 59611021160

#### 4.5.1.1 Bom No.59611021160

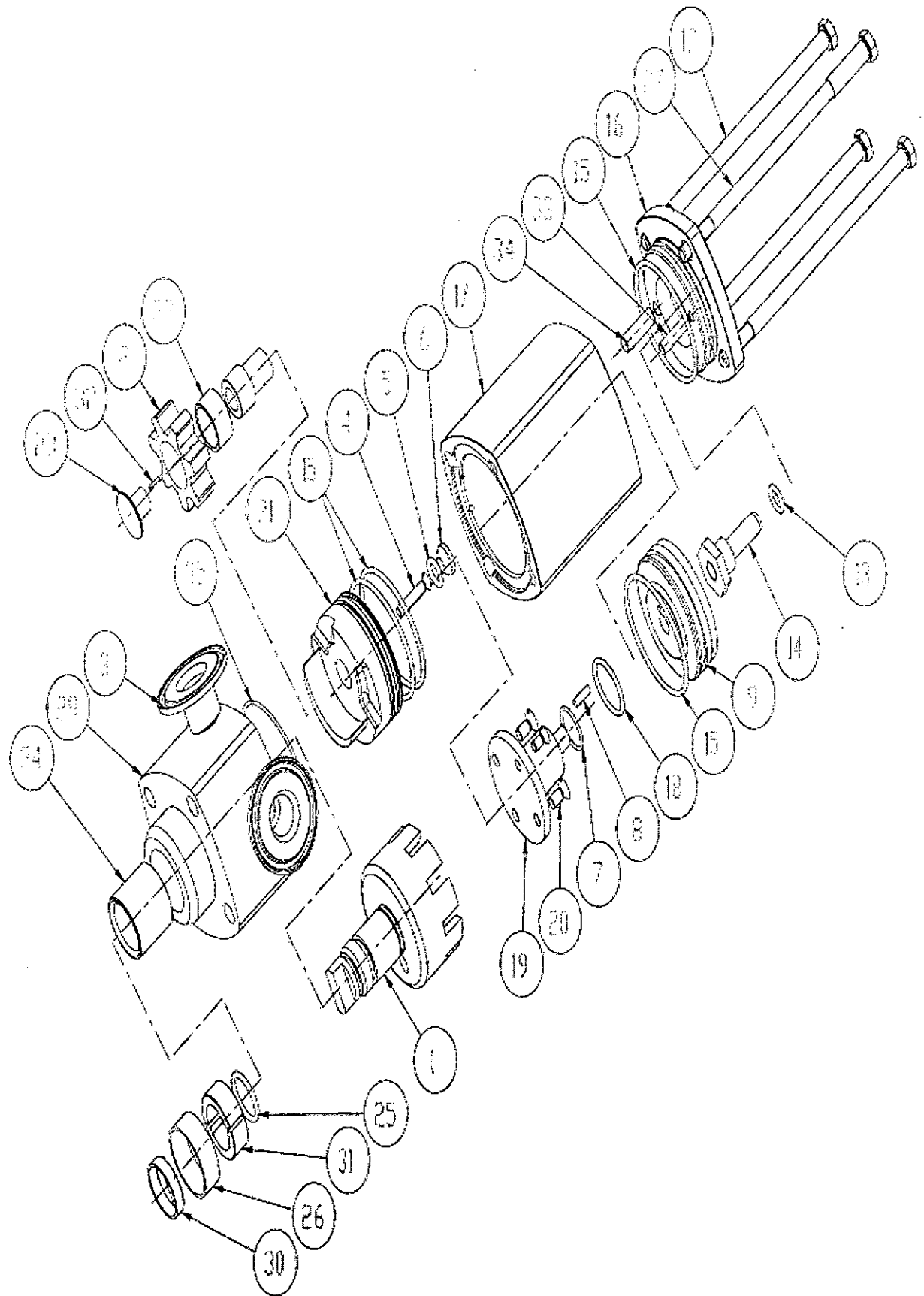
Pos.	PART NO.	QTY	UNIT	DESCRIPTION
1	59600910309	1	pcs	Impeller
2	59600910024	1	pcs	Star wheel
3	59651229056	2	pcs	Gasket
4	59652272646	1	pcs	Machine screw
5	59651240014	1	pcs	O-ring
6	59600910377	1	pcs	Washer
7	59651242166	1	pcs	O-ring
8	59651039002	1	pcs	Cylinder pin
9	59600910407	1	pcs	Piston
13	59600910310	3	pcs	Bolt
13	59651246064	1	pcs	O-ring
14	59600920185	1	pcs	Indicator for CIP
15	59651242157	4	pcs	O-ring
16	59600920007	1	pcs	End cover CIP
17	59600920177	1	pcs	Cylinder
18	59651242165	1	pcs	O-ring
19	59600910303	1	pcs	Piston rod
20	59652272636	1	pcs	Machine screw
21	59600910382	1	pcs	Cover
22	59600103823	1	pcs	Bearing bush, carbon
23	59600910306	1	pcs	Lock nut
24	5960013673	1	pcs	Bearing bush, carbon



TechPub\_2614345\_0103 - Z1381039spc-01.en.fm

POS.	PART NO.	QTY	UNIT	DESCRIPTION
25	59651240053	1	pcs	O-ring
26	59600910371	1	pcs	Lock ring
29	59600910311	1	pcs	Bolt
29	59600920047	1	pcs	Pump housing FP-2-A CIP
30	59600920160	1	pcs	Feeler gauge
31	59600910404	1	set	Stop ring
32	59651039000	1	pcs	Cylinder pin
33	59600910408	0	pcs	Guide rod
34	59600910709	0	pcs	Guide rod
35	59651245709	1	pcs	O-ring
	59600960092	0	pcs	Set of gaskets FP-2 CIP

TechPub\_2614345\_0103 - Z1381039spc-01en.fm



## 4.6 Mix pump

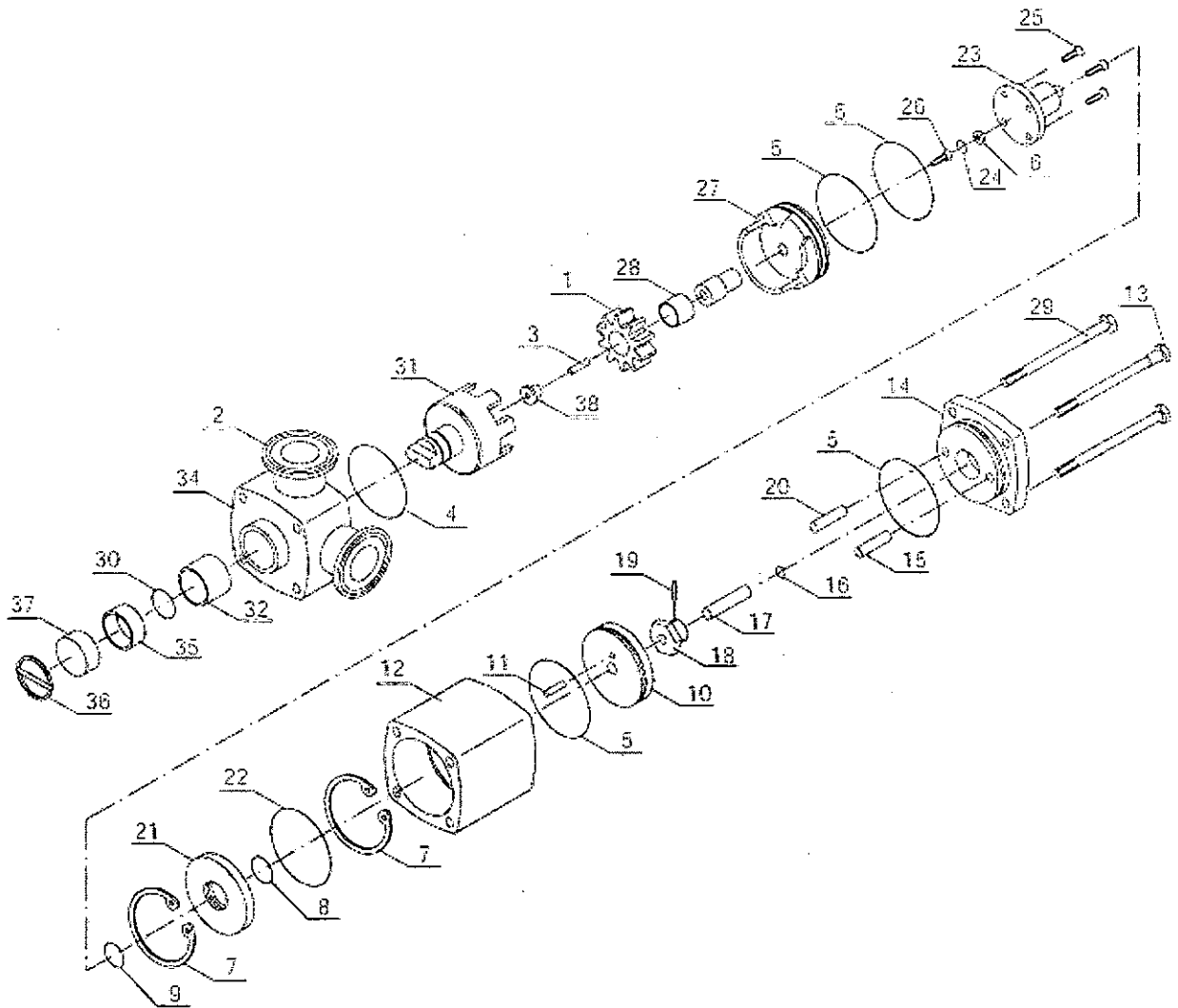
## 4.6.1 Assembly drawing No. 59613020445

## 4.6.1.1 Bom No.59613020445

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59400910024	1	pcs	Rear endipiece
2	59851229056	2	pcs	Cover
3	59851039000	1	pcs	Rear support
4	59851245709	1	pcs	Front support
5	59851242157	4	pcs	Cylinder bracket
6	59400910377	1	pcs	Spacer
7	59851179053	1	pcs	Shaft
8	59851242165	1	pcs	Bush
9	59851242166	1	pcs	Bearing cover
10	59400910407	1	pcs	Reduction gear centring
11	59851039002	1	pcs	Cylinder
12	59400920177	1	pcs	Endpiece fixing pin
13	59630202003	3	pcs	Cover knob
14	59400920007	1	pcs	Bearing
15	59400910408	1	pcs	O-ring
16	59851246064	1	pcs	Corteco seal
17	59400920009	1	pcs	O-ring
18	59400920008	1	pcs	Reduction gear
19	59851079004	1	pcs	Motor
20	59400910409	1	pcs	Clamp lockup
21	59400910300	1	pcs	Clamp gasket with edge
22	59851242167	1	pcs	Ring

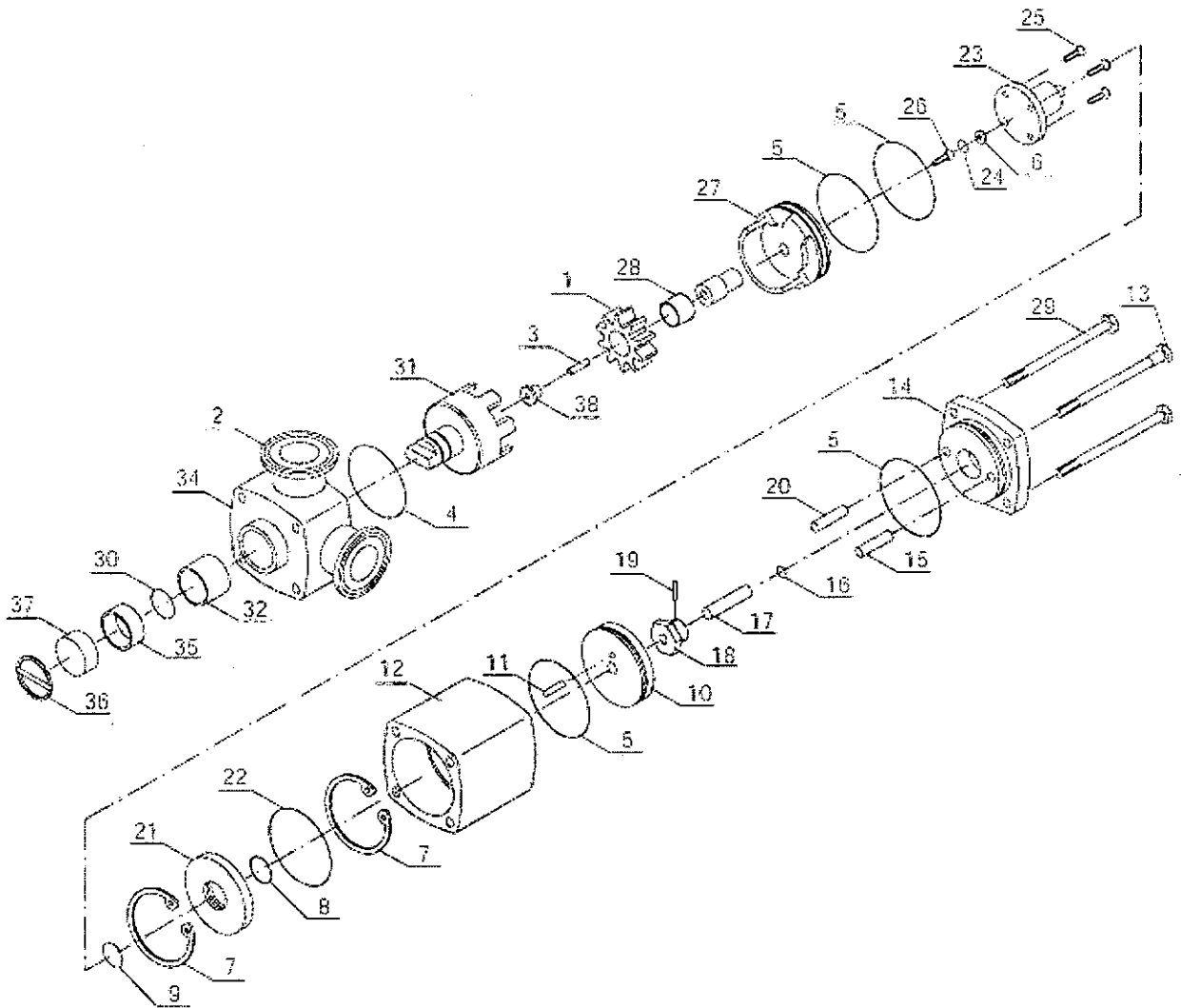


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Pos.	PART NO.	QTY	UNIT	DESCRIPTION
23	59400910303	1	pcs	Seal
24	59851240014	1	pcs	Ring nut
25	59852772636	3	pcs	O-ring
26	59852272646	1	pcs	Corteco seal
27	59400910382	1	pcs	O-ring
28	59400103823	1	pcs	Reduction gear
29	59630202004	1	pcs	Motor
30	59851240053	1	pcs	Clamp lockup
31	59400910309	1	pcs	Clamp gasket with edge
32	5940013673	1	pcs	Ring
34	59400920045	1	pcs	Ring nut
35	59400910404	1	pcs	O-ring
36	59400910372	1	pcs	Corteco seal
37	59400910371	1	pcs	O-ring
38	59400910306	1	pcs	Reduction gear

TechPub\_2614345\_0103 - Z1381039spc-01en.fm



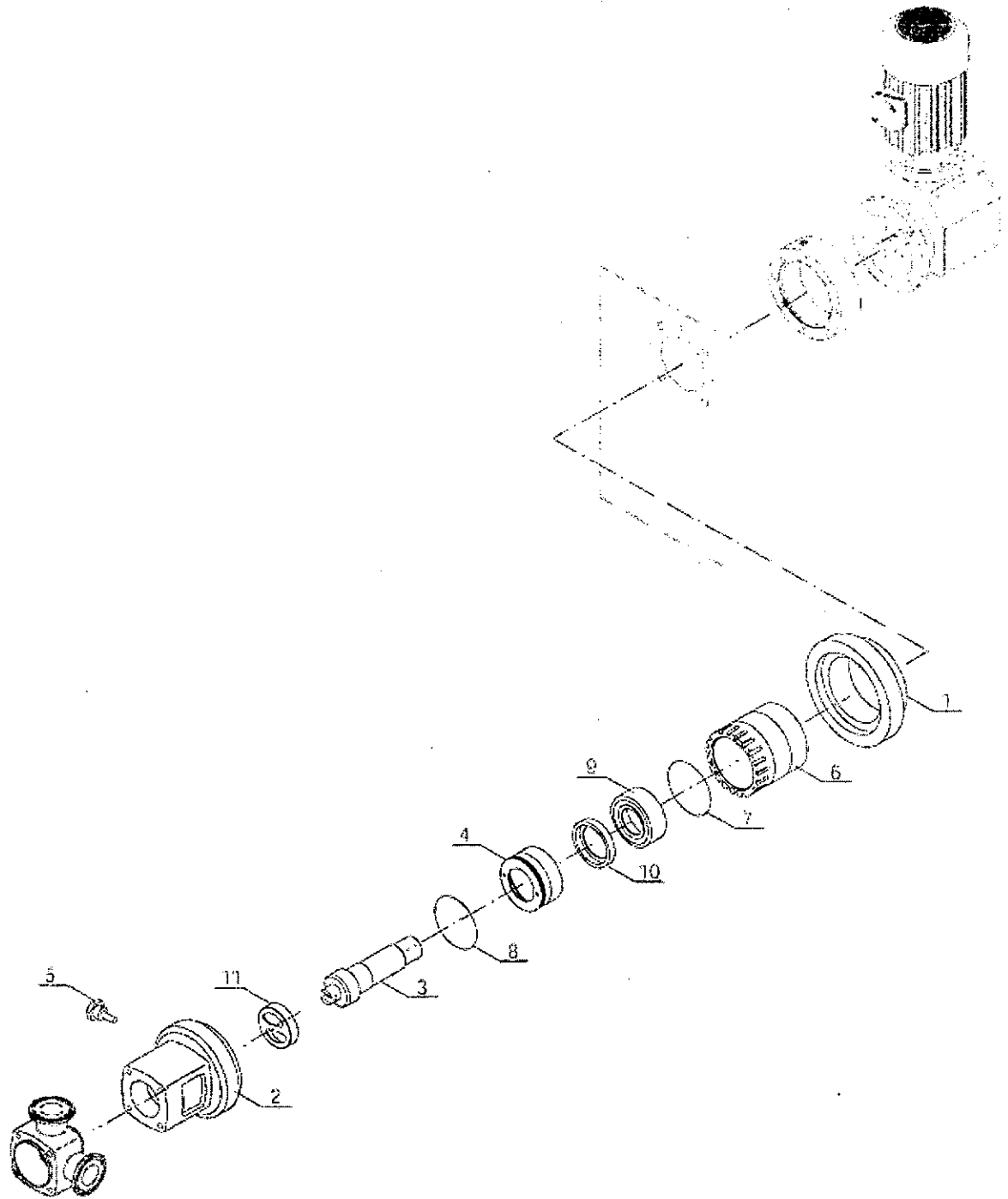
## 4.7 Bracket for pump

## 4.7.1 Assembly drawing No. 59613020005

## 4.7.1.1 Bom No.59613020005

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59600920110	1	pcs	Ring
2	59600920162	1	pcs	Body
3	59600920164	1	pcs	Shaft
4	59600920159	1	pcs	Ring nut
5	59600920149	1	pcs	Bolt
6	59600920224	1	pcs	Ring nut
7	59851248006	1	pcs	Seal
8	59630903039	1	pcs	O-ring
9	59630901071	1	pcs	Bearing
10	59630903085	1	pcs	Corteco seal
11	59608060407	1	pcs	Ring

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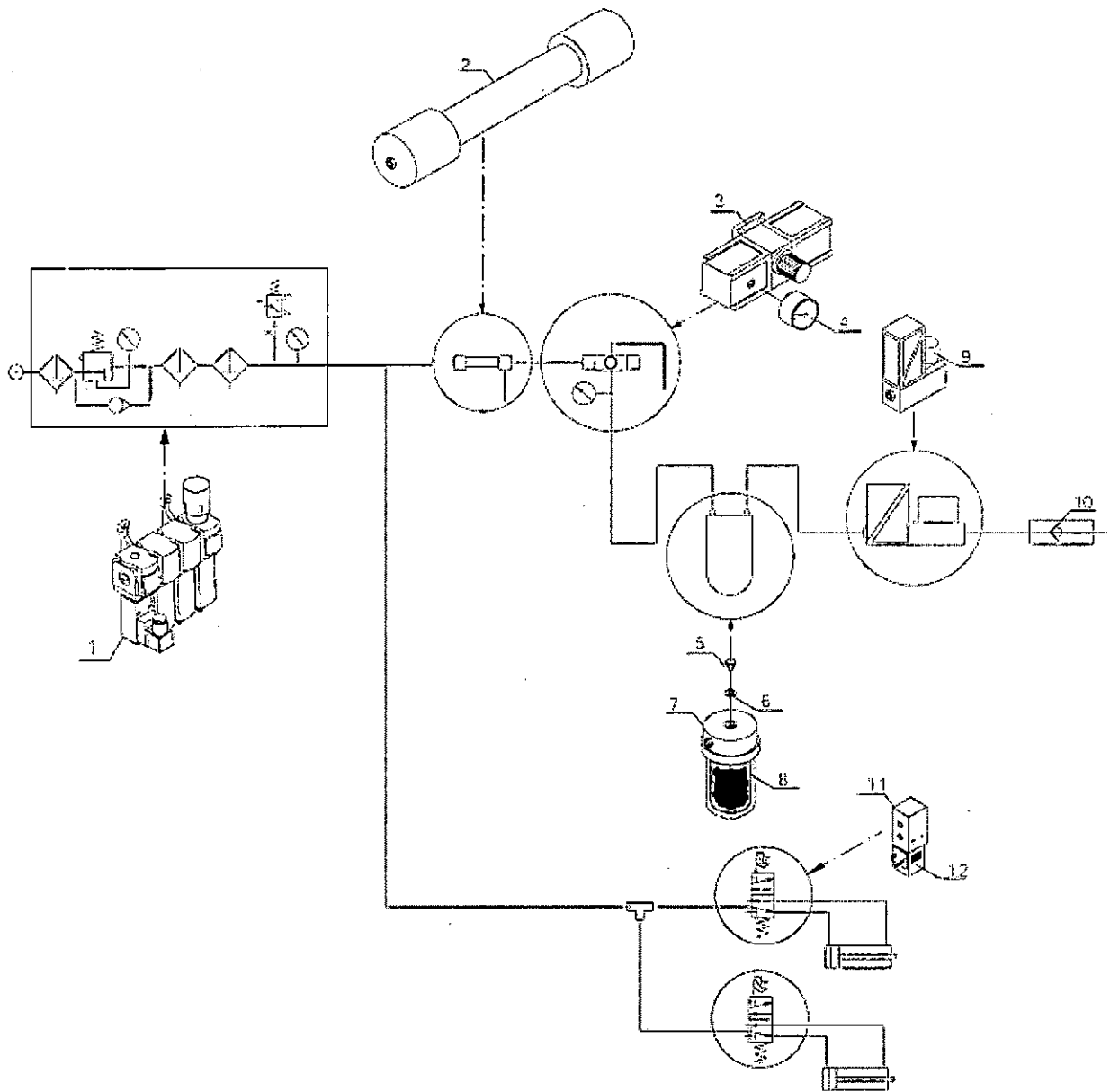
1/1 - 59613020005

## 4.8 Pneumatic Plant

### 4.8.1 Assembly drawing No. 59609580450

#### 4.8.1.1 Bom No.59609580450

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59617020269	1	pcs	Filter group
2	59853549060	1	pcs	Air Dryer
3	59630702162	1	pcs	Air booster
4	59630602028	1	pcs	Manometer
5	59630702005	1	pcs	Cap
6	59609421210	1	pcs	Washer
7	59609481202	1	pcs	Filter
8	59609421211	1	pcs	Cartridge
9	59617020260	1	pcs	Air controller
10	59633004114	1	pcs	Check valve
11	59630702001	2	pcs	Valve
12	59630404014	2	pcs	Connector



TechPub\_2614345\_0103 - Z1381039spr-01en.fm

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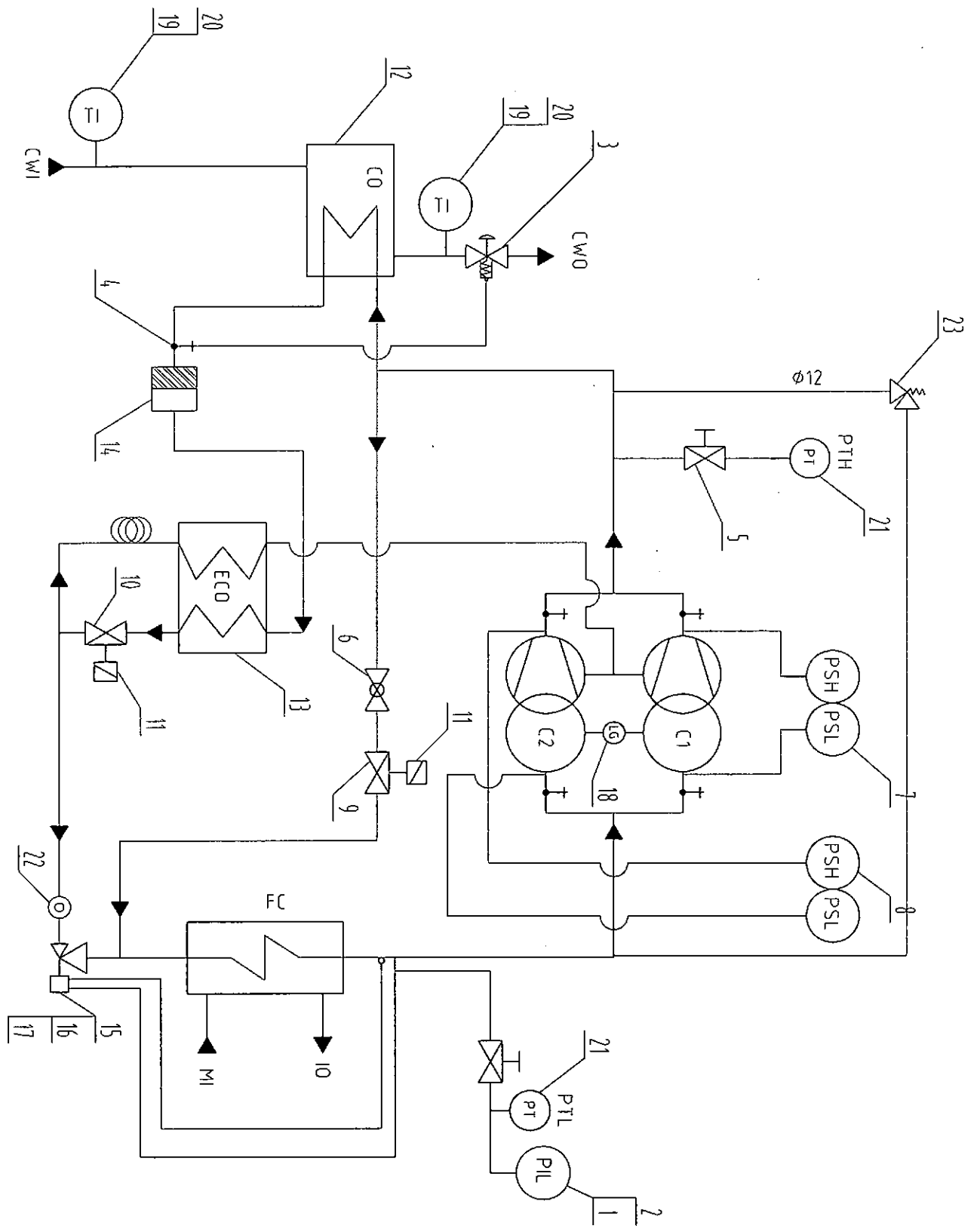
## 4.9 Refrigeration Plant

### 4.9.1 Assembly drawing No. 59609522350

#### 4.9.1.1 Bom No.59609262350

POS.	PART NO.	QTY	UNIT	DESCRIPTION
1	59854438001	1	pcs	Vacuum pressure gauge
2	59854498001	1	pcs	Bracket
3	59854038016	1	pcs	Water valve
4	59854048001	1	pcs	Cock
5	59854098001	2	pcs	Cock
6	59830501037	1	pcs	Cock
7	59857067006	2	pcs	Pressure switch
8	59857067007	2	pcs	Pressure switch
9	59630501003	1	pcs	Solenoid valve body
10	59854198001	1	pcs	Body valve
11	59630501039	2	pcs	Coil
12	59854578004	1	pcs	Condenser
13	59617020249	1	pcs	Economizer
14	59854198002	1	pcs	Filter
15	59854198003	1	pcs	Orifice unit
16	59630501025	1	pcs	Thermostat element
17	59617020271	1	pcs	Expansion body valve
18	59617020254	1	pcs	Pilot light
19	59617088070	2	pcs	Sensor holder for PTC
20	59603513068	2	pcs	Probe
21	59857067003	2	pcs	Pressure transducer
22	59854498004	1	pcs	Humidity indicator





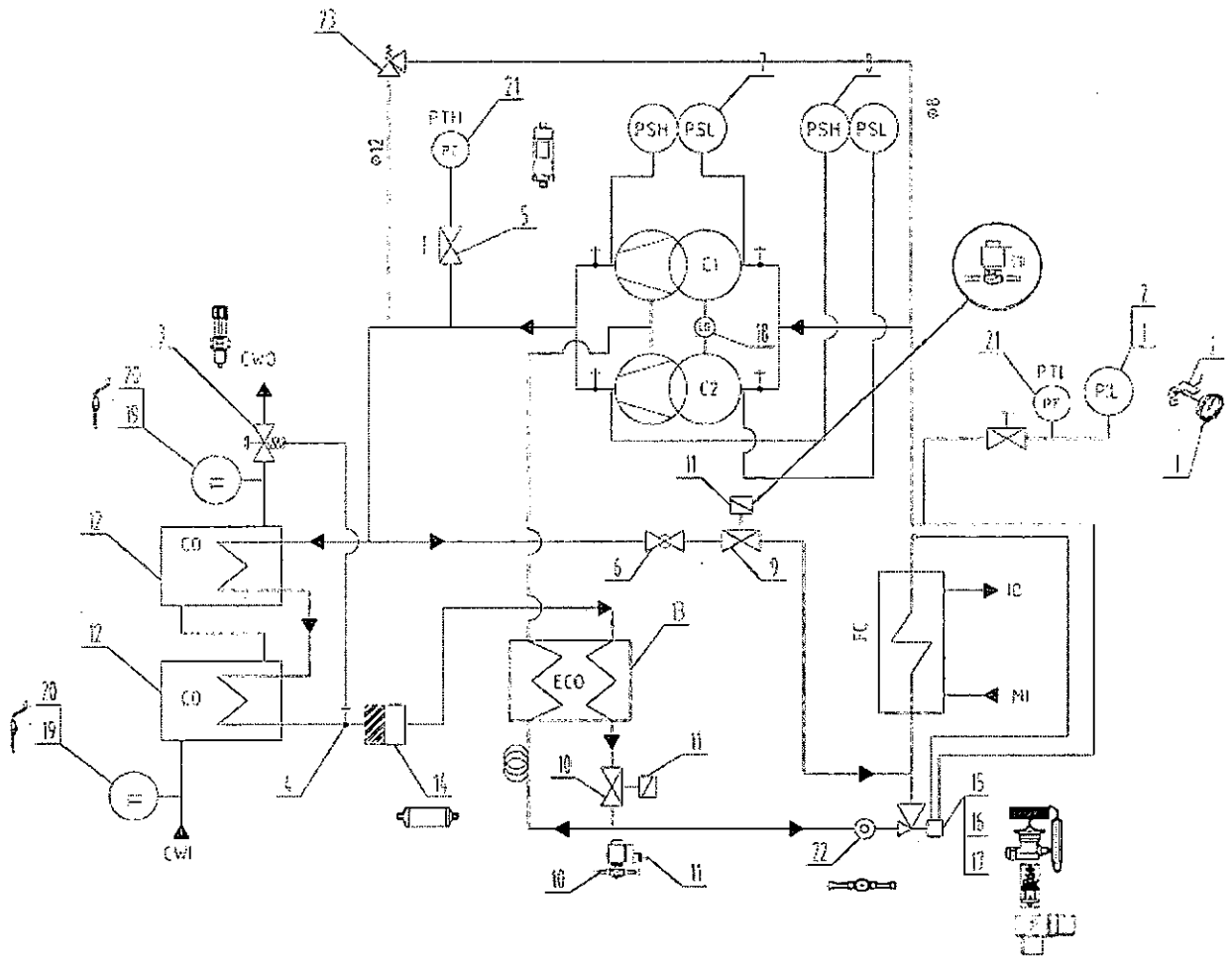
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POS.	PART NO.	QTY	UNIT	DESCRIPTION
23	59854037012	1	pcs	Safety valve

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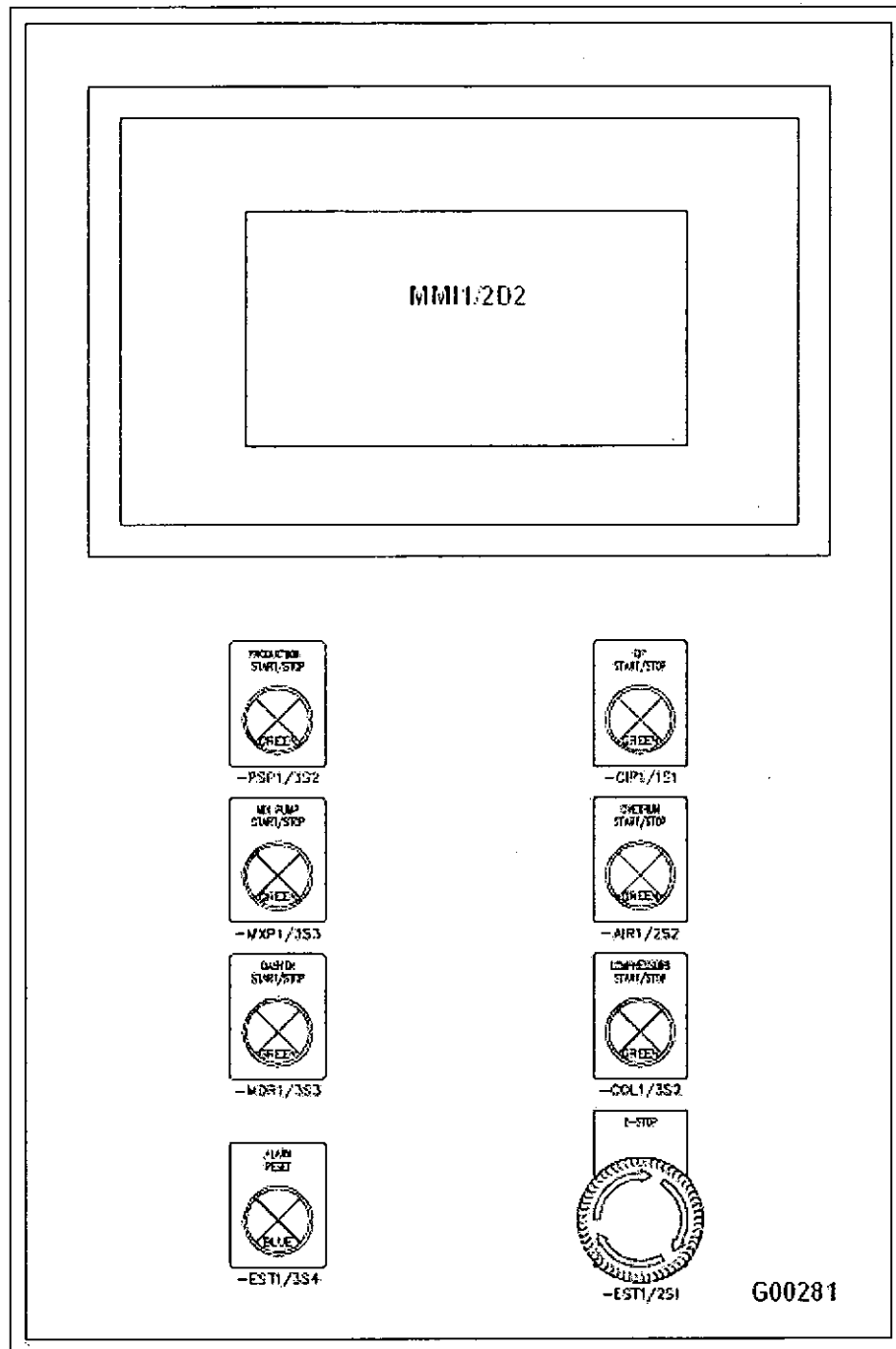


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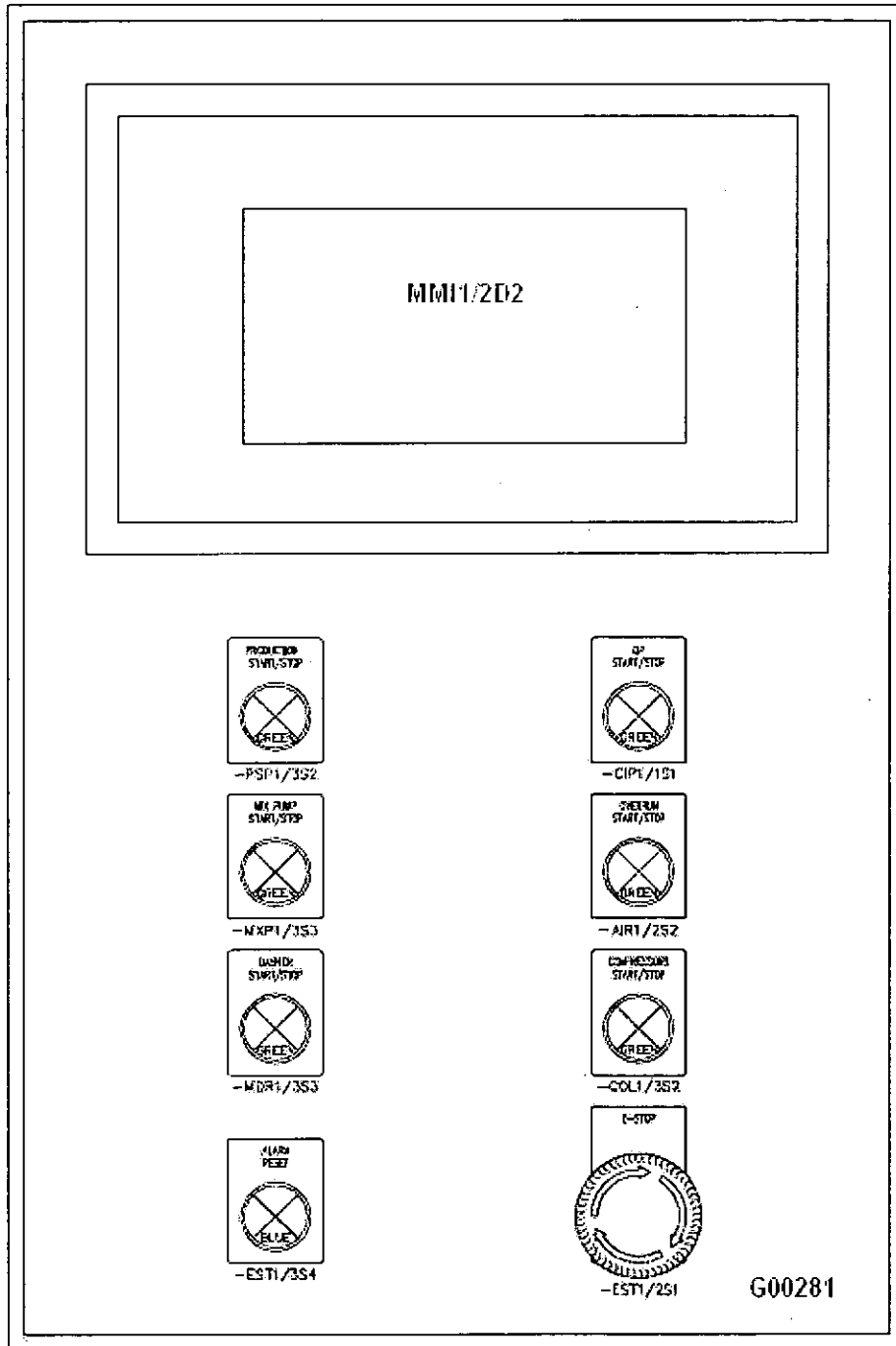
## 4.10 Control Panel

Pos.	PART No.	QTY	UNIT	DESCRIPTION
MMI1/2D2	59630409108	1	pcs	Control panel
	59630406101	1	pcs	9-way plug
	59630406102	1	pcs	9-way socket
	59630406103	2	pcs	9-way hood
PSP1/3S2	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
CIP1/1S1	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
MXP1/3S3	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
AIR1/2S2	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob



TechPub\_2614345\_0103 - Z13810395pc-01en.fm

Pos.	PART No.	QTY	UNIT	DESCRIPTION
MDR1/3S3	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
COL1/3S2	59630403202	1	pcs	Lamp socket
	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
EST1/3S4	59630401282	1	pcs	Lamp LED
	59630403088	1	pcs	Actuator with 1 NO
	59630401203	1	pcs	Accessories
	59630401201	1	pcs	Actuator illuminated knob
	59630401204	1	pcs	Push button
EST1/2S1	59630403094	2	pcs	1 NC block
	59630401203	1	pcs	Accessories
	59630401162	1	pcs	Emergency stop button
	59630403088	1	pcs	Actuator with 1 NO



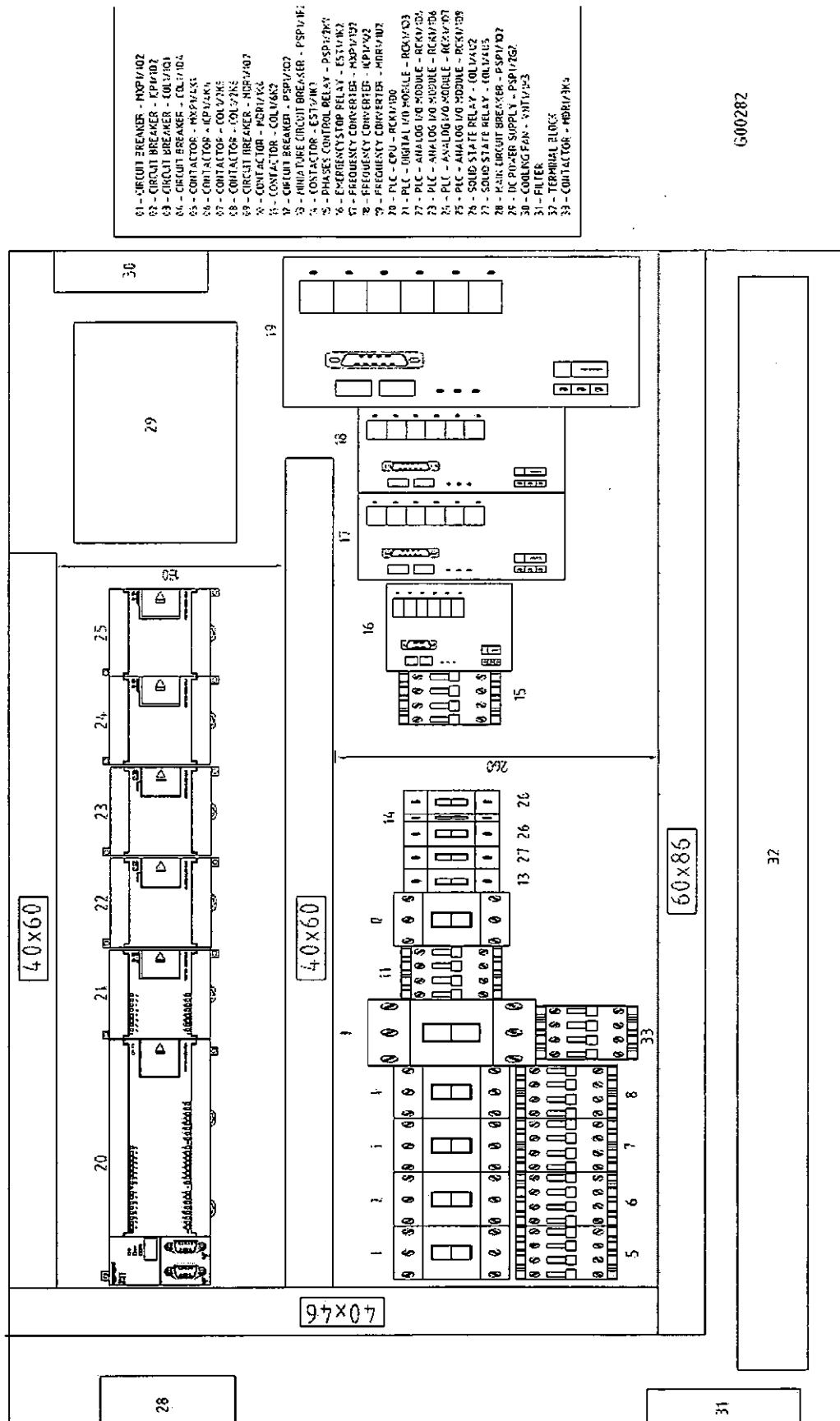
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## 4.11 Electrical cabinet

PSP1/1Q2	59857178008	1	pcs	Main control switch
RCK1/1D0	59630409051	1	pcs	PLC module
RCK1/1D3	59630409064	1	pcs	Digital I/O module
RCK1/1D5	59630409026	1	pcs	Analog I/O module
RCK1/1D6	59630409026	1	pcs	Analog I/O module
RCK1/1D7	59657772006	1	pcs	Analog input module
RCK1/1D9	59630409061	1	pcs	Analog output module
PSP1/2G2	59630405057	1	pcs	Power supplier
VNT1/1M5	59630303029	1	pcs	External cooling fan
MXPI/1Q2	59630403085	1	pcs	Circuit breaker
	59630403087	1	pcs	Auxiliary switch
ICP1/1Q2	59630403085	1	pcs	Circuit breaker
	59630403087	1	pcs	Auxiliary switch
MDR1/1Q2	59630401136	1	pcs	Circuit breaker
	59630403087	1	pcs	Auxiliary switch
COL1/1Q1	59630401202	1	pcs	Circuit breaker
	59630403087	1	pcs	Auxiliary switch
COL1/1Q4	59630401202	1	pcs	Circuit breaker
	59630403087	1	pcs	Auxiliary switch
PSP1/2Q2	59657179066	1	pcs	Circuit breaker
EST1/1K7	59630403010	1	pcs	Socket
	59630403039	1	pcs	Relay
COL1/6K2	59630403010	1	pcs	Socket
	59630403039	1	pcs	Relay



TechPub\_2614345\_0103 - Z1381039spe-01en.fm



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PSP1/2F2	59630401270	1	pcs	Switch
COL1/4U2	59630403196	1	pcs	Relay
COL1/4U5	59630403196	1	pcs	Relay
PSP1/2K7	59630403218	1	pcs	Phase relay
EST1/1K2	59657049149	1	pcs	Safety relay
MXP1/4K1	59630403154	1	pcs	Contactora
ICP1/3K4	59630403154	1	pcs	Contactora
MDR1/3K4	59630403102	1	pcs	Contactora
	59630403207	1	pcs	1 NC+ 1 NO block
COL1/2K5	59630403102	1	pcs	Contactora
	59630403198	1	pcs	2 NC+ 2 NO block
COL1/2K6	59630403102	1	pcs	Contactora
	59630403198	1	pcs	2 NC+ 2 NO block
MXP1/1U2	59857017002	1	pcs	Frequency converter
ICP1/1U2	59857017002	1	pcs	Frequency converter
MDR1/1U2	59857017004	1	pcs	Frequency converter



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