

OPERATING INSTRUCTIONS

CO2 Backup with G216-P01 Controller

ARCTIKO

TABLE OF CONTENTS

1. INTRODUCTION	3
1.1. GRAPHIC SYMBOLS.....	3
1.2. KEYBOARD AND FUNCTION	3
2. GENERAL CHARACTERISTICS	4
3. TECHNICAL DATA.....	5
4. ELECTRICAL SYSTEM AND CONNECTION RULES.....	5
5. QUICK START	6
5.1. STANDBY SCREEN	6
5.2. THE CONTROLLER MAIN SCREEN	6
6. G216-P01 OPERATION	7
6.1. CONTROLLER WORKING.....	7
6.2. ALARM STATES	7
6.3. MENU	9
6.4. PARAMETERS	9
6.5. STATISTICS	10
6.6. EVENT HISTORY	11
6.7. SETTINGS	12
6.7.1. DATE AND TIME	12
6.7.2. LANGUAGE.....	13
6.7.3. COMMUNICATION	14
7. ENTRY MENU EMERGENCY MODE FUNCTION.....	15
8. CONNECTION OUTPUT DEVICE TO CONTROLLER G216-P01.....	16
9. INSTALLATION OF SHIP LOOSE CO2 BACK-UP.....	17
10. WIRING-DIAGRAM	26
11. IF THE APPLIANCE DOES NOT WORK	27
12. INFORMATION REGARDING THE LABELING AND DISPOSAL OF WASTE ELECTRONIC AND ELECTRICAL EQUIPMENT	27

1. INTRODUCTION

1.1. Graphic symbols

Symbols intended to indicate and at the same time emphasize the importance of text containing information that warns against dangerous situation have the following graphic forms:



Warning

This symbol is used when it is necessary in described instructions to follow the sequence of carried out operations. The unit may be damaged or destroyed in case of any error or proceeding in discord with the description.



Important!

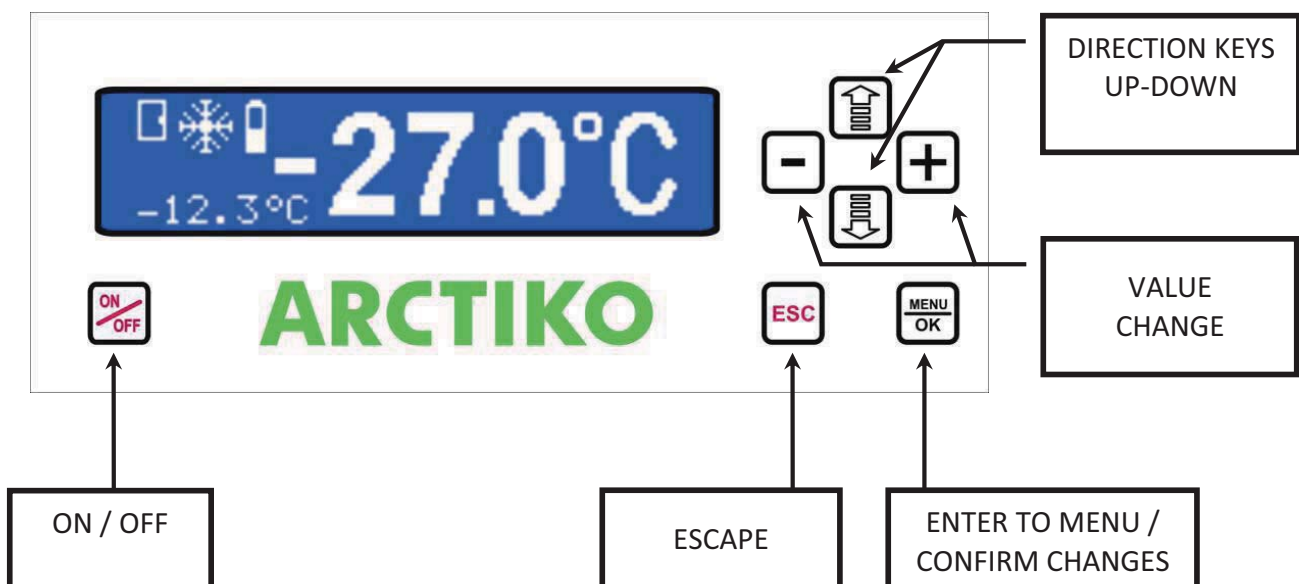
This symbol indicates information of particular importance.



Reference

This symbol indicates occurrence of additional information in a chapter.

1.2. Keyboard and function



2. GENERAL CHARACTERISTICS

The G216-P01 Controller is a microprocessor-based device manufactured using the Surface Mount Technology (SMT).

Control parameters can be adjusted to the current operating conditions. The Controller includes a system protecting it from power outages and various other disturbances.

The G216-P01 Controller is fitted with:

- inputs:
 1. to control chamber temperature (Pt1000 sensor),
 2. to control cylinder temperature (NTC sensor – option),
 3. door open sensor (two-state sensor – option),
 4. CO₂ in the room sensor (two-state sensor - option),
- output:
 5. bistable/monostable CO₂ valve,
 6. alarm (voltage-free output).

If your electrical grid dont have a lightning protection system then



***IT IS ABSOLUTELY NECESSARY TO DISCONNECT
THE CONTROLLER FROM THE MAIN DURING THUNDER STORMS***

3. TECHNICAL DATA

Working voltage	100-230VAC +10% -15%
Working frequency	50/60Hz
Working temperature	from +5°C to +40°C
Humidity	from 20% to 80% RH
Fan protection	3,15A
Sensor type	NTC 2,2kohm Pt1000
Temp. sensor operating range	NTC: 0°C / +100°C
	Pt1000: -99°C / +50°C

4. ELECTRICAL SYSTEM AND CONNECTION RULES

1. Room should be equipped with 100-230V, 50/60Hz electrical system according to applicable regulations.
2. Electrical system (regardless of its type) should end with a plug-in socket equipped with protective contact. Using a socket without connected protective contact may result in electric shock !!!
3. The controller needs to be connected to a separate power supply line protected with a properly selected quick fuse and differential current switch (anti-electric shock). It is forbidden to connect any other equipment to this line !!!



**THE CONTROLLER IS POWERED FROM 100-230V, 50/60HZ MAINS
ANY REPAIRS MAY BE CARRIED OUT ONLY WITH POWER SUPPLY
CUT OFF AT THE FUSE**

Important safety and installation notes – read fully before commencing installation

Liquid CO₂ is extremely dangerous, like other pressurised gases. Only suitably experienced and qualified personnel must undertake installation or maintenance of this equipment.

Failure to use a CO₂ tank with a liquid extraction dip tube will result in CO₂ gas, not liquid, being injected into the freezer. This will cause the freezer to warm rapidly instead of cool. CO₂ is an asphyxiant, so the room where the backup system is installed must be adequately ventilated at all times, to allow fresh air in and the CO₂ to escape. We strongly recommend the use of a CO₂ monitoring system in such an area.

Never allow liquid CO₂ to be exposed to your skin or clothes.

5. QUICK START

5.1. Standby screen

As soon as the device is connected to the mains 100-230V AC the controller goes to Standby mode and followed screen appears:



**THE STARTUP SCREEN DISPLAYS
CONTROLLER TYPE, ITS SOFTWARE VERSION
AND ACTUAL DATE AND TIME**

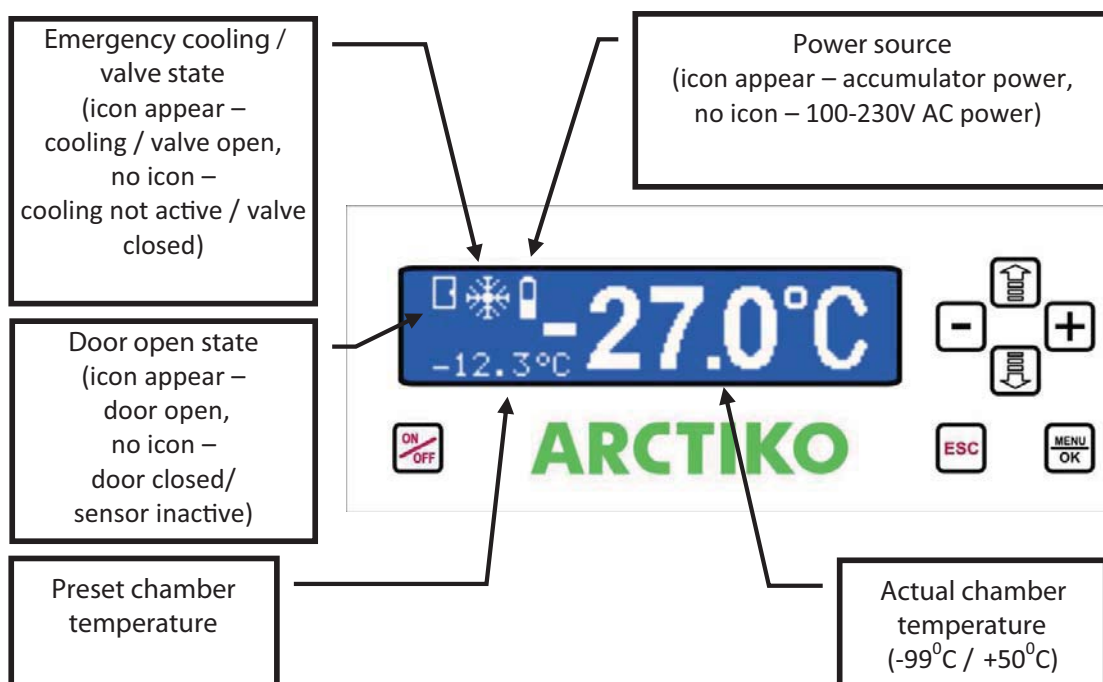
Functions of  button in STANDBY mode:

button	function
	- Pressing for less time than 1 second - move to the main screen - to AUTO mode the controller; - If the power supply is OFF, holding the button for 10 seconds will result switch off the controller completely, restart the controller will be after switch on the power supply;

5.2. The controller main screen

As soon as the device is connected to 100-230V network and push-button  is pressed, the controller will switch to the main screen and remain in AUTO operation mode.

The following information may be displayed on the main screen depending on controller settings:



6. G216-P01 OPERATION

6.1. Controller working

The G216-P01 controller regulates the cooling process by using electrovalve connected to a CO₂ cylinder based on readings from the sensors. If the cooling is realized at the time the valve remains open, and while cooling temperature is reached, the valve will be closed and the cooling function is inactive to time temperature increases beyond the hysteresis.

In the system settings the controller we can choose the type of control valve on the CO₂ factor monostable or bistable.

Monostable valve requires continuous control signal. After releasing the control valve returns to the starting position.

Bistable valve is an element of the two states of stable positions: off valve and opening the flow of requiring only a control impulse to transition from one state to another.

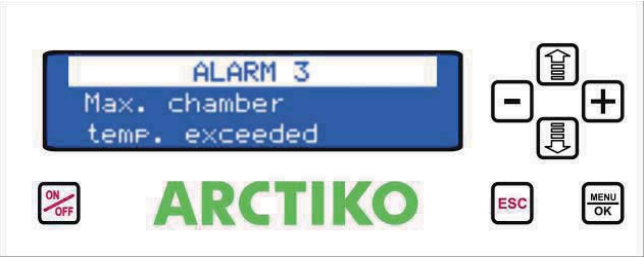
6.2. Alarm states

The Controller uses 8 different alarms. In each alarm condition, the controller displays the alarm number. In case of alarm the controller starts emergency cooling (CO₂ valve open).

Entrance to the ALARMS screen may be from any screens, if the controller is in AUTO or FAILURE mode and will be a new alarm notification. Notification of a new alarm is indicated the beep buzzer. If several alarms is reported, the information about each of them is displayed cyclically, each for 3 seconds. When there is no alarm 1, and all other existing alarms will be approved by ESC button or cease to exist the reasons for their indication, it will return to the main screen.

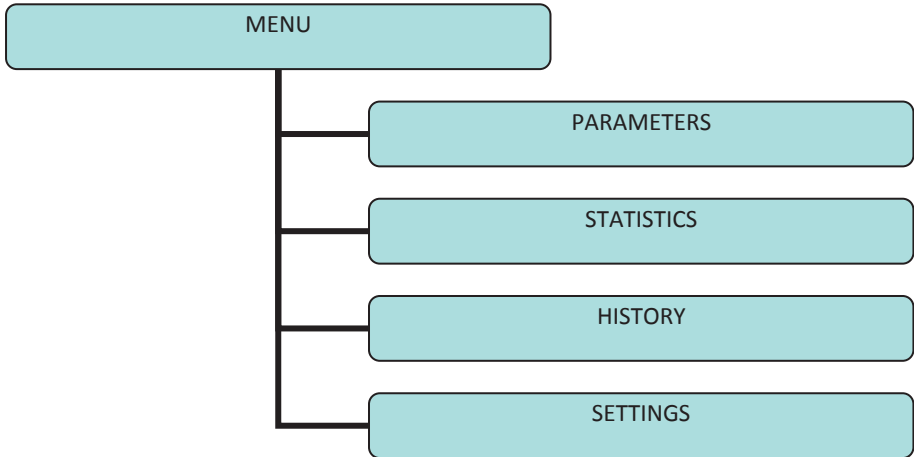
Alarms

No.	DISPLAYED TEXT	SCREEN
ALARM 1	Chamber temperature sensor failure	

ALARM 2	Cylinder temperature sensor failure	
ALARM 3	Max. chamber temp. exceeded	
ALARM 5	Max door open time exceeded	
ALARM 6	Low battery level	
ALARM 7	Power supply failure	
ALARM 8	High CO2 concentration in the room	

6.3. MENU

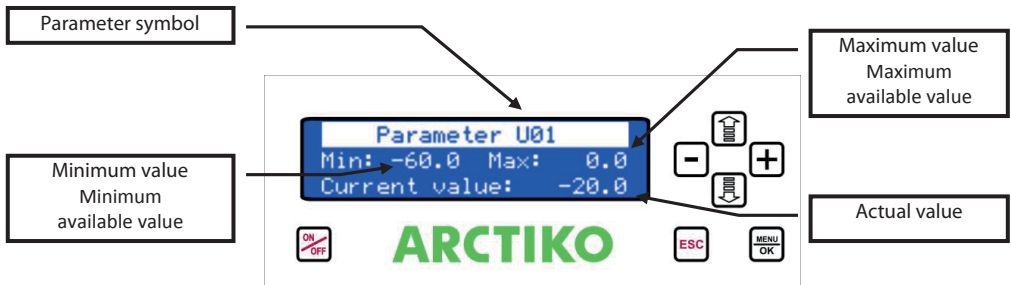
Press  button to enter controller menu:



Press  button to exit menu and go back to main screen.

6.4. Parameters

Parameters screen appears as below:



On this screen user can see actual values of the controller parameters.

Press  and  buttons to go to next/previous parameter.

Press  button to highlight actual value, it is possible to change the value within a designed range by pressing  and  buttons

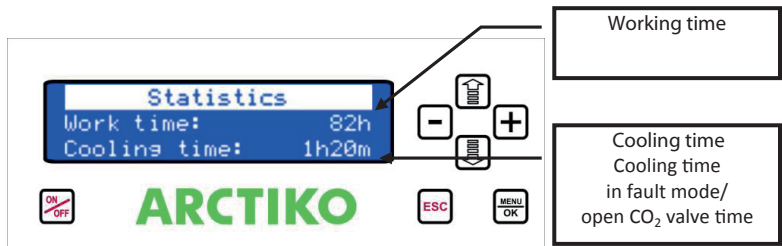
Parameters chart

Parameter	Parameter description	Min	Max	Step	Default value
U1	Preset chamber temperature	-60.0	0.0	0.5°C	-20°C
U2	Temperature hysteresis for valve control	0	10	0.5°C	3°C
U3	Alarm temperature	-60	1	1°C	0°C
S1	Temperature offset	-10	10	0.5°C	0°C
S2	Valve type: 1 – bistable, 2 – monostable	1	2	1	1
S3	Door sensor presence and type: 0 – no sensor, 1 – NO, 2 – NC	0	2	1	1
S4	CO ₂ sensor presence and type: 0 – no sensor, 1 – NO, 2 – NC	0	2	1	0
S5	Cylinder temperature sensor presence and type: 0 – no sensor, 1 – NTC	0	1	1	0
S6	Max door open time above which AL6. If S6=0 then alarm AL6 not present.	2	250	1s	15s
S7	Time of triggering the bistable valve in AUTO mode. If S7=0 then triggering only before entering into AUTO mode.	0	600	10s	0s
S8	Cooling time in FAULT mode. If S8=0 then no chamber cooling in FAULT mode.	0	600	1s	0s
S9	Standby time in FAULT mode.	10	900	10s	360s

Press  button to exit Parameters. The controller will go back to Main menu without saving changes.

6.5. Statistics

Statistics screen appears as below:



On this screen user can see actual statistics:

- Controller working time,
- Alarm cooling time (CO₂ valve open).

Press  button to exit statistics. The controller will go back to Main menu.

6.C. Event history

The screen History appear as below:



On this screen user can see history of events, which were registered by the controller in its working time. Every event has its own code, which allows to easily identify it. Event codes are listed on the chart below:

Event chart

Event	Code
Alarm 1	A01
Alarm 2	A02
Alarm 3	A03
Alarm 4	A04
Alarm 5	A05
Alarm 6	A06
Alarm 7	A07
Alarm 8	A08
CO ₂ valve closed	V00
CO ₂ valve opened	V01
Turning controller to STANDBY mode	O00
Turning controller to AUTO mode	O01
AC 230V power failure	S00
AC 230V power back	S01
POWERUP state	S02
Door closed	D00
Door opened	D01

Press  and  buttons to scroll the event list.

The controller records last 99 events. Occurrence of a new event deletes the oldest one.

Press  button to exit Event history. The controller will go back to Main menu.

6.T. Settings

The Settings screen appears as below:



On this screen, we can choose whether we want to enter a new date and time, change the controller language or set communication parameters with an external device. Press **ESC** button to exit settings. The controller will go back to Main menu.

6.T.1. Date and time

Date and time screen appears as below:



On this screen, user can enter the current date and time. Press **MENU OK** button to go to next/previous values that we want to change. Press **+** and **-** button change the value. After going through all the values, each next press **MENU OK** button will save changes and go to the Settings screen. Press **ESC** button to exit date and time. The controller returns to the Settings screen without saving changes.

6.T.2. Language

Language screen appears as below:



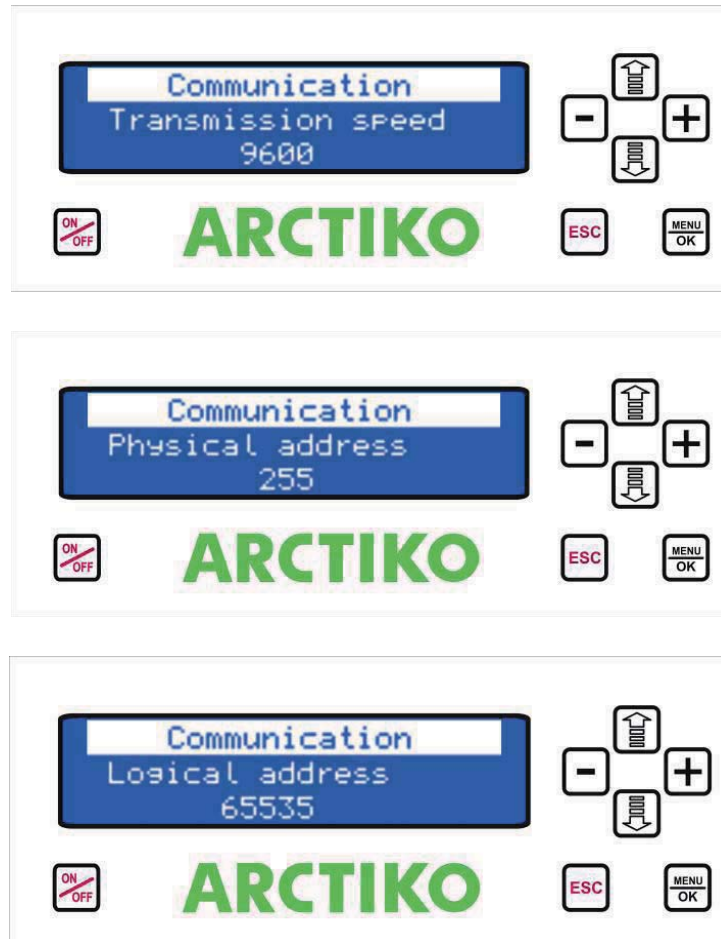
On this screen user can change the interface language of the controller.

Press  and  buttons we move between successive languages. Press  button approve the selection.

Press  button to exit Language. The controller returns to the Settings screen without saving changes.

6.7.3. Communication

Communication screens appears as below:



The communication screens allow you to set communication parameters with an external device (eg. GSM module):

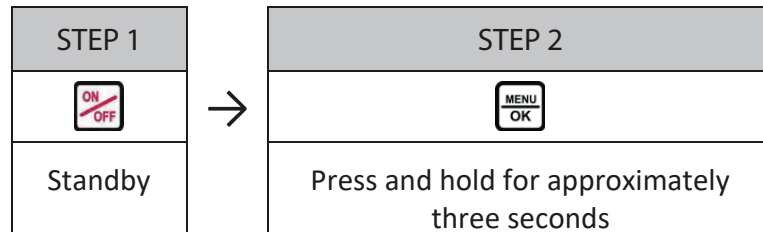
- Transmission speed from the following: 2400, 4800, 9600, 19200, 38400, 57600, 115200;
- Physical address from the range 0 ÷ 255;
- Logical address from the range 0 ÷ 65535;

User can edit and approve the edited parameter values by pressing the  button. Press  and  buttons to go to next/previous communication parameter. Press  and  button change the value. Pressing the  button will be exit to the settings screen.

7. ENTRY MENU EMERGENCY MODE FUNCTION

Controller G216-P01 was equipped of the controller entry menu emergency mode function. This mode is use in out of ordinary accident, when user make changes in controller parameters which one preclude regular right work of controller.

Below schema describe how to entry to the menu by emergency mode:



After edition user can exit the screen by Press  or .

8. CONNECTION OUTPUT DEVICE TO CONTROLLER G216-P01

CONNECTOR			
01	Chamber temperature sensor	RS 485	
02	Chamber temperature sensor	09	+ 12VDC
03	CO ₂ in the room sensor	10	GND
04	CO ₂ in the room sensor	11	A
05	Door open sensor	12	B
06	Door open sensor		
07	Cylinder temperature sensor		
08	Cylinder temperature sensor		
13	Alarm output		
14	Alarm output		



Picture. 1 Describe connection output device and sensors to controller G216-P01.



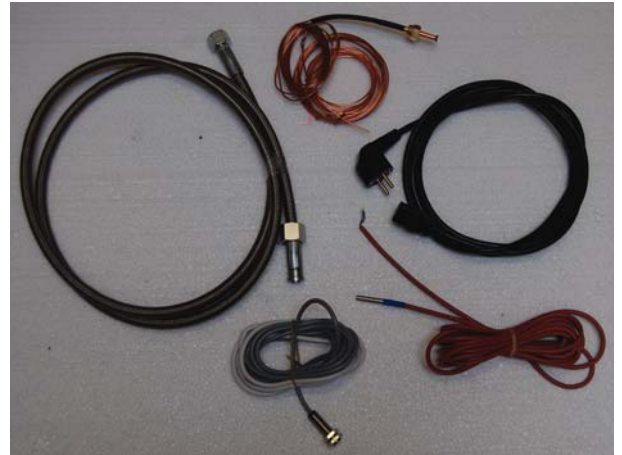
**CONNECTION OF ADDITIONAL DEVICES TO THE G-216-P01 CONTROLLER
MAY ONLY BE PERFORMED BY LICENCED ELECTRICIANS**

9.1 INSTALLATION OF STAND ALONE CO2 BACK-UP – UPUL AND ULUF

When installing the G-216 be sure that you have received all the component you need.

The system consists of:

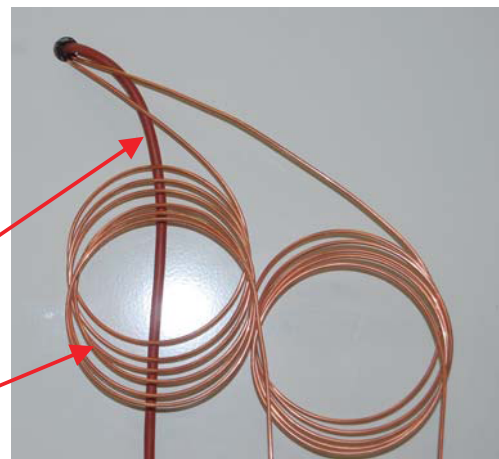
Controller G-216
Capillary tube split in two.
Safety door switch
Stainless CO2 hose
Temperature sensor
Main cable



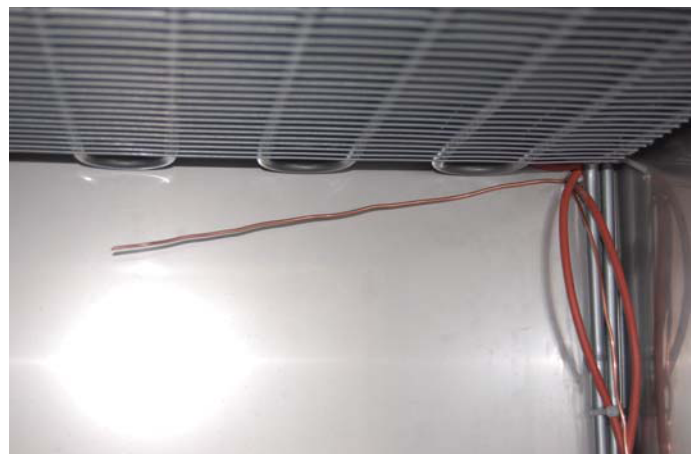
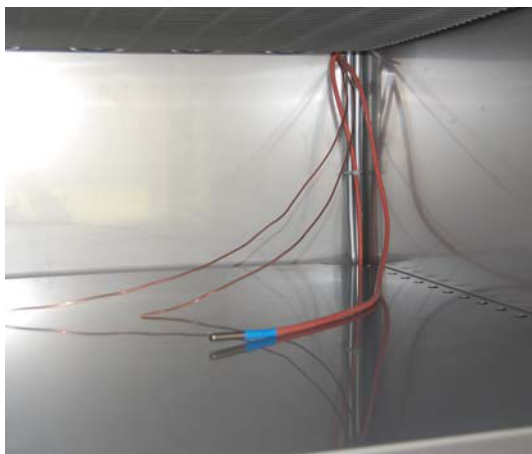
- The capillary tube and the temperature sensor must be installed from the back of the unit.

Temperature sensor

Split capillary tube



- Carefully remove the seal and carefully put in the temperature sensor and the split capillary tube.



- Mount the temperature sensors carefully together with the temperature sensors already installed (the sensor from the controller)



- Mount the split capillary. One injection tube in compartment no. 1 and one in compartment no. 3

- Locate the ends of the capillary in top of the shelves.



- Mount the safety door switch on the front of the unit.



- Make sure that the sensor is located precisely above the magnet in the door.



Connect the temperature sensor, capillary, and Safety door switch at the back of the controller. After proper installation continue with chapter 8.

9.2 INSTALLATION OF STAND ALONE CO2 BACK-UP - ULF

When installing the G-216 be sure that you have received all the components you need!

The system consists of:

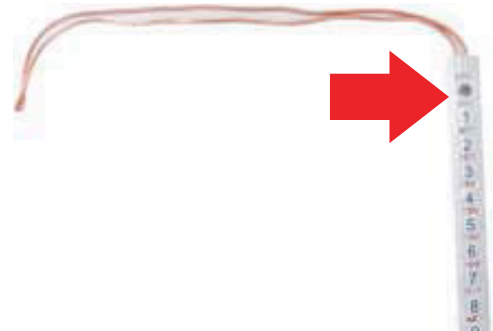
Controller G-216
Capillary tube split in two.
Safety door switch
Stainless CO2 hose
Temperature sensor
Main cable



- Introduction of capillary tube:
Remove the plastic cover placed on the back and inside of the freezer and introduce the tube into the cabinet.



- Loosen the aluminum fitting by removing the four screws.



- Remove two shelves from the freezer to loosen the aluminum fitting.



- Introduce the capillary tube into the aluminum fitting. Mount the two shelves in the freezer.



- Dismount the plate protecting the temperature probe inside the freezer.



- Introduce the temperature probe into the hole on the back of the freezer. Connect the probe to the temperature probe of the freezer using two cable ties. Mount the plate which protects the temperature probe inside the freezer. Cover the hole on the back of the freezer with putty and mount the plastic cover. Secure the probe and capillary tube with adhesive tape.



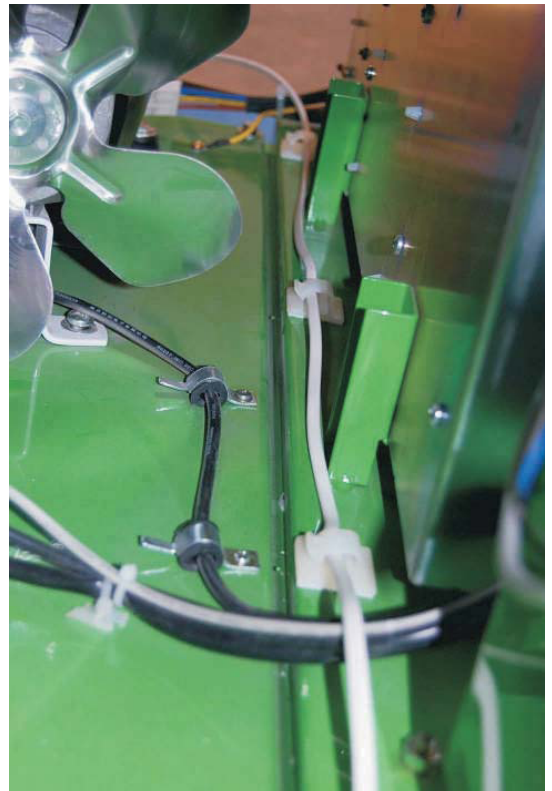
- Connect the door switch cable to the door switch on the freezer.



- Secure the cable in the motor compartment using four pcs. cable mounting devices



- Pull out the cable on the back of the freezer and attach it to the main cable of the freezer using a cable tie.



9.3 INSTALLATION OF STAND ALONE CO2 BACK-UP - ULTF

When installing the G-216 be sure that you have received all the component you need.

The system consists of:

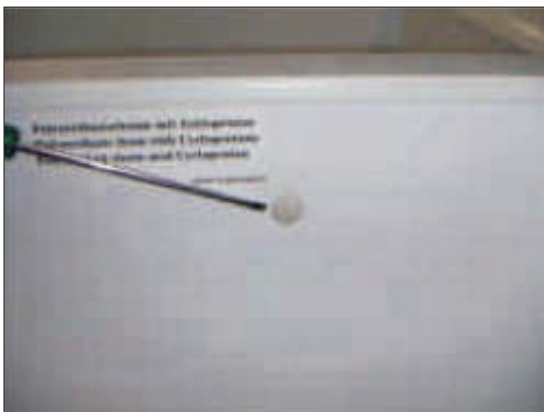
Controller G-216
 Capillary tube split in two.
 Safety door switch
 Stainless CO2 hose
 Temperature sensor
 Main cable



Mounting of CO2 Back-Up in ULTF/LTF Box

Find the hole for the CO2 capillary on the back of the freezer and inside the cabinet

Remove the plugs



Make a small hole in the insulation. Do **NOT** use the capillary.

Mount the capillaries carefully and split them.



Mount the capillary cover. Remember to seal behind the cover



Place the temp sensor in bottom of the unit.
Access through the compressor room



Carefully take the wire from the sensor out from the compressor room



Mount the safety door switch.



Mount the magnet and the switch.



Connect the temperature sensor, capillary, and Safety door switch at the back of the controller.

After proper installation continue with chapter 8.

9.4 INSTALLATION OF STAND ALONE CO2 BACK-UP - MUF40

When installing the G-216 be sure that you have received all the components you need.

The system consists of:

- Controller G-216
- Capillary tube split in two.
- Safety door switch
- Stainless CO2 hose
- Temperature sensor
- Fitting for door switch
- Door magnet
- Cable ties (3 pcs.)
- Main cable



Mounting of CO2 Back-up in MUF40

Find the hole for the CO2 capillary on the back of the freezer and inside the cabinet.

Remove the plugs.

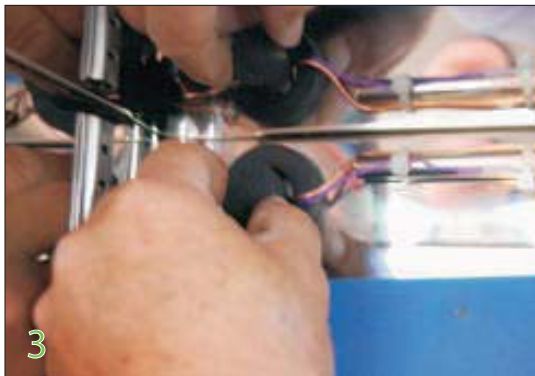


Carefully put in the temperature sensor and the split capillary.

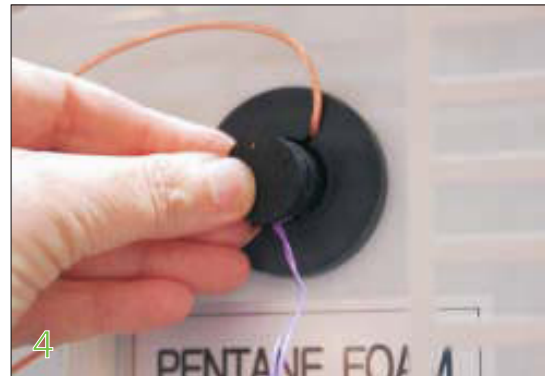


Mount the temperature sensor carefully together with the temperature sensor already installed. Fasten with cable ties.

Reinsert the plugs.



Inside the cabinet.



On the back of the MUF40.

Safety door switch with fittings and door magnet.



Mount the safety door switch on the left side of the MUF40.



Mount the door magnet.

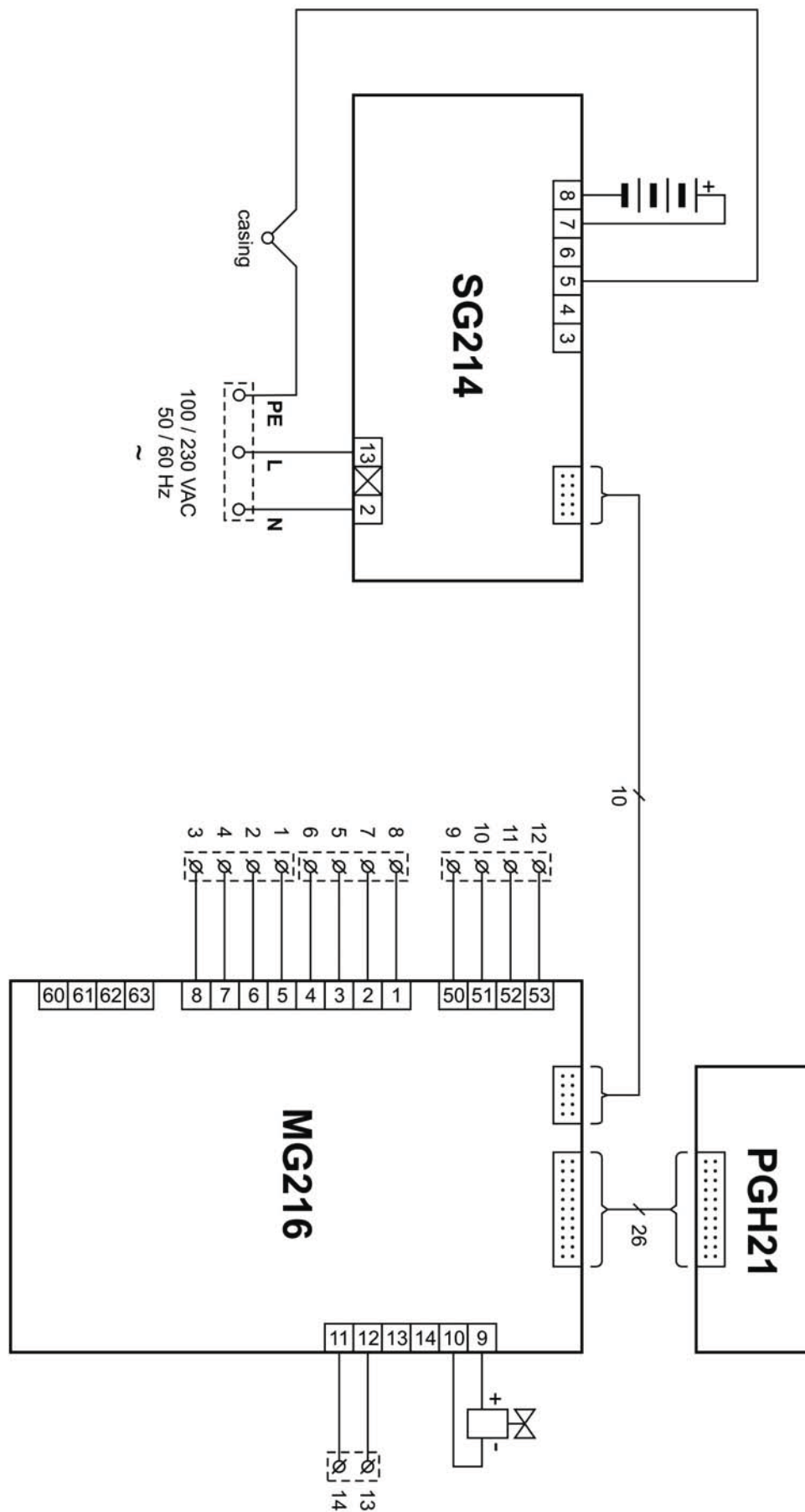


Make sure that the magnet at the door is located precisely apposite the sensor.

Connect the temperature sensor, capillary and safety door switch at the back of the controller.

After proper installation continue with chapter 8.

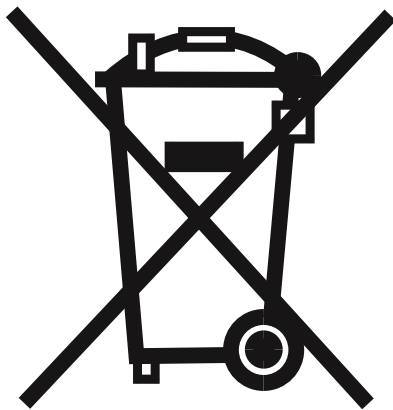
10. WIRING-DIAGRAM



11. IF THE APPLIANCE DOES NOT WORK:

Contact the distributor for service !

12. INFORMATION REGARDING THE LABELING AND DISPOSAL OF WASTE ELECTRONIC AND ELECTRICAL EQUIPMENT



Warning!

This symbol on the product or on its packaging indicates separate collection of waste electrical and electronic equipment. This means that the product should not be disposed of with other household waste. Proper disposal of old and used electrical and electronic equipment will help prevent potential negative effects on the environment and on human health. For more information about where you can drop off your waste for recycling, please contact your local authority, or where you purchased your product.



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