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G-202-P06

SELF-CONTAINED CONTROL BLOCK
MAINTENANCE AND REPAIR MANUAL

REFRIGERATION UNITS ORIENTED VERSION

*For Program Version **01, 02, 03***

We kindly request that you study this manual carefully PRIOR to connecting and starting up any of our equipment. Should you have any queries or doubts, please contact us between 8 a.m. and 4 p.m. Any comments e-mailed will be appreciated.

Note !!! The date of the last update is given at the bottom of the consecutive pages, while information regarding the consecutive changes in the programme version and operation method are given at the end of page XII.

Please, use only the most recent version of our manual. You will receive this version free, by post, after prior order.

I. GENERAL CHARACTERISTICS

The self-contained control block, hereafter called G-202, constitutes a modern, convenient and easy-to-use equipment and has been made using microprocessor techniques with the application of automatic surface assembly process.

Owing to the twin part case and revolutionary technical design, the G-202-P06 can be applied to any refrigerated counters, where may be required to maintain a constant humidity setpoint . The safe voltage operated control panel (5 V) may be installed in any place, without the necessity of cutting any additional openings or running a number of power supply cables far away from the equipment being controlled.

The G-202 has been equipped with two temperature sensors, one humidity sensor, which provides for the capability of connecting to the actuating module, which are safe voltage operated (5 V), as well as four outputs allowing direct connecting of the 230 V operated equipment, with loading ability as summarized in table 1.

If the G-202 is used in refrigeration chambers, it stabilizes the temperature, humidity (in special mode), as well as controls automatic defrosting, the period of which may be adjusted to specific surrounding parameters; it is also equipped with a pushbutton for activating manual defrosting. G-202-P06 has also been equipped with humidity control system switch.

No special maintenance measures are required for these thermostats; the keyboard has been made from the special kind of foil, high temperatures resistant as well as resistant to most chemicals. However, cleaning this foil with sharp objects is not allowed. Instead, use the damp cloth and clean the front panel with it from time to time.

II. DENOTATION METHOD AND TECHNICAL DATA

Denotation:	**G-**	**2**	**0X**	**–P**	**06K**	**0**	**X**	**–**	**M**	**XXXX**	**H**
Position:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**

1- Thermostat “Geco”.
2- Cooling reason.
3- Case type: 2- mini panel
4- P
5- Software version.
6- K
7- (not available in this version).
8- Sound: B – with sound, 0 – without sound.
9- M
10- Relays, details below
11- Humidity sensor.

Additional outputs denotation method:

Number means that relay is mounted, 0- without relay:

1 – compressor relay- have to be
2 – humidity control relay
3 – fan relay
4 - heater/valve relay

Operating Voltage	-	230V +10% -15%
Ambient Temperature	-	+5°C to +40°C
Humidity	-	20% to 80%
Ip Protection	-	IP65 on the front panel of the control panel

Table 1 – Relays Denotation and Outputs Loads

Output	Load		
P1 – compressor	8A	2HP	1500W
P2 – humidity control / drying heater / humidifier	4A	-	750W
P3 – fan	4A	1HP	750W
P4 – defrost heater / valve	8A	-	1500W

Note !!!

- **Currents as specified in the Table are currents consumed by particular equipment during normal operation and include starting currents of this equipment !!!**
- **The aggregate current consumed simultaneously may not exceed 10A !!!**

- **Heater power must be chosen so that in case of failure of G-202 or contactor and switching then on permanently, there was no possibility of fire or damage to equipment.**

If heaters are used in high power should be strictly applied safety thermostat on evaporator, the thermostat should operate in a different way, eg mechanical thermostat !!!

III. ORDERING METHOD

The following parameters need to be given in the order, namely:

1. Controller type, e.g. G-202-P06K0B-M1234H
2. The length of tape linking the actuating module and keyboard panel
3. Temperature sensors lengths
4. Humidity sensor length

IV. OPERATION METHOD

A - General Information

1. Having turned the equipment on, the three-second starting procedure is activated, during which the display will show two dashes, for the period of two seconds, and then for the period of one second, the version of the controller program will be displayed, as well as two to dashes. No activation of the equipment under control takes place then.
2. Following the completion of the starting procedure, two horizontal dashes signalling the energizing status will light up on the central segments of the display - if the unit has not been in "on" mode before!!!. The unit will be activated after pressing the pushbutton ⏻. The display will show the temperature value of the chamber sensor.
3. Having pressed and held down the pushbutton for the period of a half second, the display will start blinking and showing the ***evaporator*** temperature, while after the consecutive five seconds, the G-202 will automatically re-enter the chamber temperature readout mode. ***Note!!!*** This function is also activated during the defrosting time, when the display shows the „*dF*" symbol.
4. The compressor activation is signalled by the small red diode in the right, bottom corner of the display showing the temperature. This allows easier check of possible damage and malfunction to the system.
5. If the compressor should have turned on, but the compressor has not been turned on due to the activation of any of the protection systems (see points 6, 7, and 8), the dot signalling the compressor's operation will be blinking. When the protection system preset time preset elapses, the daughter will stop blinking and will be lit permanently, while the compressor will be activated .
6. The delay in turning the compressor on **after its activation temperature is reached** (user set temperature minus bottom value of the hysteresis) is equal to 30 seconds. If the temperature drops again during this time. The condition of exceeding 30 seconds will be verified again. This is designed to protect the compressor against unnecessary activation due to e.g. articles placement, droughts, etc.
7. After every reaching of the preset temperature (user set temperature minus bottom value of the hysteresis), as well as following any power failure or voltage drops below 175 volts, the G-202 will make impossible for the compressor to be activated for the period as specified by the 'c2' parameter. If, however, 'c2'=0min, the protection time will last 60 seconds following any power failure.
8. Having turned the equipment on using the ⏻ pushbutton, the 5-second delay will appear in the compressor activation. This is to cancel the power failure protection from point 7 – this will also pertain to the time specified by the 'c2' parameter, following the compressor's prior deactivation. This allows faster compressor operation check.
9. The controller has been equipped with alarm features, providing information regarding sensor's damage. Depending on the sensor(s)' status, the controller performance will be different.
   - The malfunction of the chamber temperature sensor will make the display show the **A1** symbol. The controller will activate the compressor in the time cycle (clock-based control) in accordance with times specified in 'c8' i 'c9' parameters. The defrosting process will function as usual.
   - If the evaporator sensor is damaged, the display will show the **A2** symbol. **The manual and automatic defrosting is blocked then!!!** The only possibility of defrosting the unit is to press the pushbutton ⏻ in order to turn off the unit, and then wait for the ice to thaw.
   - The malfunction of the humidity sensor will make the display show the **A3** symbol.

- If more than one sensor has been damaged, only the **A1** symbol will be displayed. Having repaired the chamber sensor, the **A2** symbol will start to be displayed**.** Having repaired the evaporator sensor, the **A3** symbol will start to be displayed**.**

10. If the buzzer has been installed in the controller – see *p. II*, the buzzer will signal any pressing of any button. If the controller is turned off (two horizontal dashes on the display are seen then), the buzzer will signal only if the following pushbutton is pressed, namely: .
11. The humidity control system activation and deactivation will take place after pressing the %H pushbutton. This will be signalled by the green LED.
12. Having pressed and held down the pushbutton for the period of 0,5s , the display will start showing the measured ***humidity*** (without blinking), while after the consecutive five seconds, the G-202 will automatically re-enter the chamber temperature readout mode.
13. When controller is in on-mode also fans are activated.
14. When controller is in off-mode (two horizontal dashes on display) compressor, fan and heaters are deactivated.

B - Defrosting

1. If the necessity for the additional defrosting occurs, due to difficult operating conditions, press the pushbutton. This will *make the green LED light constantly on the pushbutton*, while the „*dF*" symbol will appear on the display, rather than temperature measurement symbol, and this is where the unit will enter the defrosting cycle.
2. If the defrosting occurs, and the temperature on the evaporator is higher than set in the 'd2' parameter, the unit, after some 10 seconds, will enter the defrosting exiting mode, to resume the operation when the said mode terminates.
3. If the defrosting occurs, and the temperature on the evaporator is lower than set in the 'd2' parameter, the G-202 will activate the defrosting process.

I. Normal work mode:

'r1' = 00 - defrosting with heater
Defrost heater - on, compressor – off, drying heater – off, fans – on.
After reaching the temperature as specified in the 'd2' parameter, **the unit will enter the defrosting exiting mode.**

'r1' = 01 - defrosting with hot couples
Valve - on, compressor – on, drying heater – off, fans – on.
After reaching the temperature as specified in the 'd2' parameter, **the unit will enter the defrosting exiting mode.**

II. Drying work mode:

'r1' = 00 - defrosting with heater
Defrost heater - off, compressor – off, fans – on.
After reaching the temperature as specified in the 'd2' parameter, **the unit will exit defrosting mode.**

‘r1’ = 01 - defrosting with hot couples
Valve - on, compressor – on, fans – on.
After reaching the temperature as specified in the ‘d2’ parameter, **<u>the unit will enter the defrosting exiting mode.</u>**

4. Exiting the defrosting mode is followed with deactivated compressor and heater for the period of time set in ‘c3’ parameter (the green LED blinking on the pushbutton).., The procedure of exiting the defrosting mode is terminated with turning off the „*dF*” symbol on the display and turning off the green LED blinking on the pushbutton .
5. The defrosting process will be terminated *following the achieving of the evaporator temperature as preset in the ‘d2’ parameters, or if the time preset by the ‘c1’ parameter has been exceeded.*
6. Having turned off the „*dF*” symbol and terminated the defrosting process, the display will show the temperature as stored right before the defrosting commencement, for the period of time as specified by the ‘c7’ parameter – this is intended for preventing claims with respect to “violent temperature fluctuations in the unit”.
7. The unit performance is the same as in the case of manual and automatic defrosting.
8. Turning on or turning off The Humidity Control System when in defrosting mode does not change defrosting procedure.

C –User Parameters Programming

- To enter programming mode the controller should be turned on.
- Press the P pushbutton. This status is signaled by the green LED on P pushbutton, while the display will show the ‘t1’ per one second. Then, the most recently programmed temperature for Normal Work Mode will be shown.
- Enter the required settings, using the pushbuttons, any longer pushbutton holding time causing the data “fast rewinding/forwarding”.
- Press P, in order to approve the data entered. The display will show the ‘t2’ per one second. Then, the most recently programmed temperature for Humidity Control Mode will be shown.
- Press P, in order to approve the data entered. The display will show the ‘rH’ per one second. Then, the most recently programmed humidity for Humidity Control Mode will be shown.
- Press P, in order to approve the data entered.
- After that the green LED on P pushbutton will go off, and G-202 will end programming mode and start working with new program.
- If in programming mode none of pushbuttons will be pressed for 5 seconds, G-202 will automatically go out of this mode. In that case the value of changed parameter will not be saved.
- The temperature T1 for Normal Work Mode is set in the range of ‘d0’ parameter and ‘d1’ parameter, and the temperature T2 for Humidity Control Mode is set in the range of T1+1 and ‘d5’ parameter.

D –Humidity Control

After turning on Humidity Control Mode the temperature T2 (set by user) is stabilized in the chamber. Humidity control is realised by turning on/off drying heater (‘r2’=0) or humidifier (‘r2’=1), based on the measurement of the humidity sensor. Sensor measures humidity in range from 10% to 99%. Measured humidity is shifted by the value of ‘d6’ parameter.

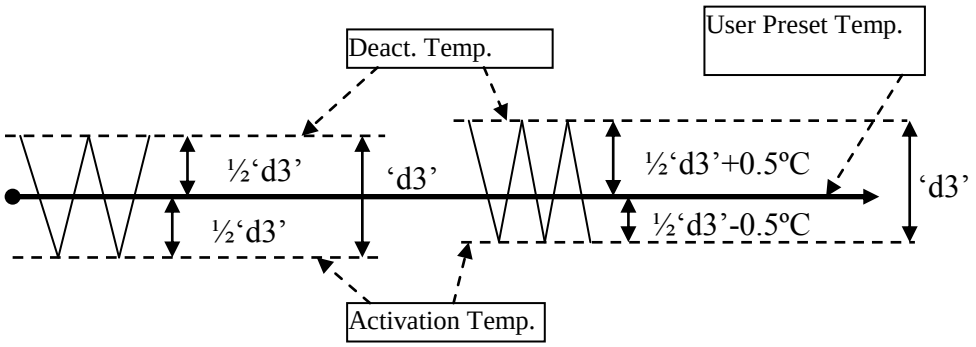
PROGRAM VERSION 01: Humidity is stabilised with 2% hysteresis.
In drying work mode humidity can be set in range from 10% to 99%.
PROGRAM VERSION 02: Humidity is stabilised with ‘d9’ parameter hysteresis.
In drying work mode humidity can be set in range from ‘d7’ parameter to ‘d8’ parameter.
PROGRAM VERSION 03: Humidity is stabilised with ‘d9’ parameter hysteresis.
In humidity control mode humidity can be set in range from ‘d7’ parameter to ‘d8’ parameter.

The malfunction of the humidity sensor will make the display show the **A3** symbol and G-202 starts to operate heater/humidifier relay in the time cycle (clock-based control) in accordance with times specified in ‘c4’ i ‘c6’ parameters.

E –Hysteresis

When programming the‘d0’ i ‘d1’ parameters (the minimal and maximal user preset temperature) attention should be paid to the fact that the ‘d3’ hysteresis value causes additional shifting of the temperature to higher or lower values with relation to the user preset temperature level.
This is particularly significant with regard to the so-called “plus” equipment which should always be operated at the temperatures above 0°C.

Symmetric hysteresis for ‘d3’ **even values**	Symmetric hysteresis for ‘d3’ **odd values**
Example No. 1. The ‘d3’ hysteresis it set at, for example 2ºC For this hysteresis value, the parameters should be set as follows: ‘**d0**’ at 3ºC and‘**d1**’ at 9ºC	Example No. 3. The ‘d3’ hysteresis it set at, for example 3ºC For this hysteresis value, the parameters should be set as follows: ‘**d0**’ at 3ºC and‘**d1**’ at 8ºC
Example No. 2. The ‘d3’ hysteresis it set at, for example 4ºC For this hysteresis value, the parameters should be set as follows: ‘**d0**’ at 4ºC and ‘**d1**’ at 8ºC	Example No. 4. The ‘d3’ hysteresis it set at, for example 5ºC For this hysteresis value, the parameters should be set as follows: ‘**d0**’ at 4ºC and ‘**d1**’ at 7ºC

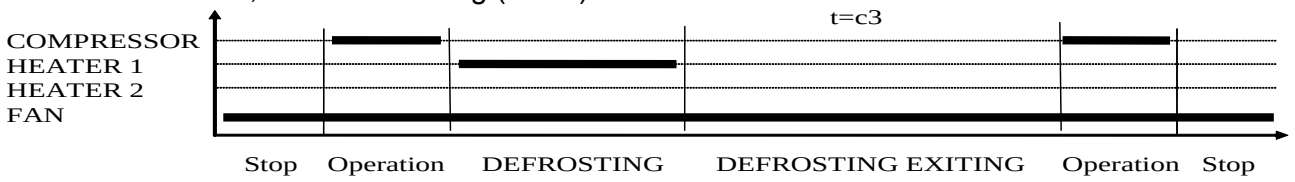


V. UNIT PARTICULAR COMPONENTS ACTIVATION GRAPHS

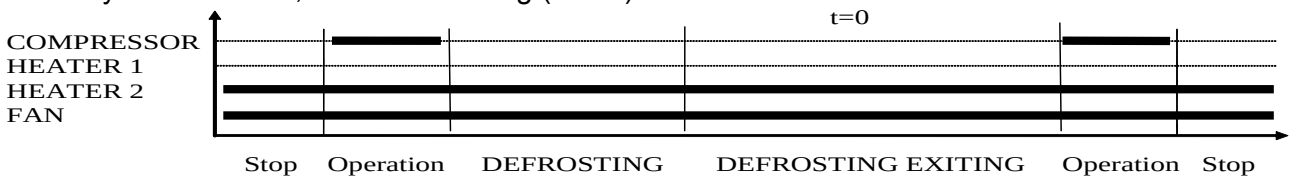
A thick line denotes **activation,** while the dashed one means **deactivation** of the particular equipment. The "**Stop**" field denotes **deactivation**, while the "**Operation**" field denotes the compressor's **activation** due to exceeding the preset temperature, taking account of the "d3' preset hysteresis value.

IF ERRONEOUS PARAMETERS ARE SET, THE UNIT WILL FAIL TO OPERATE PROPERLY !!!

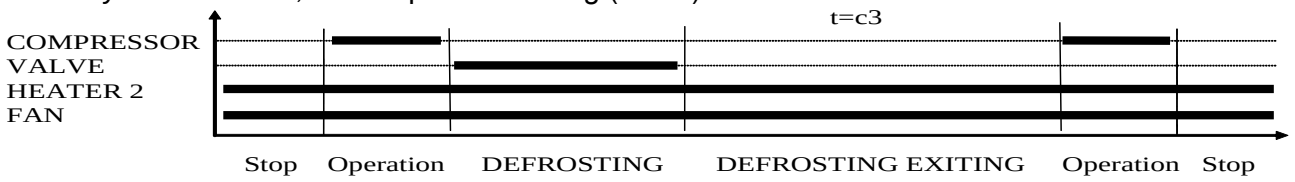
1. Normal work mode, heater defrosting ('r1'=0)



2. Humidity control mode, heater defrosting ('r1'=0)



3. Humidity control mode, hot couples defrosting ('r1'=1)



Heater 1 – defrost heater
Heater 2 – drying heater

VI. SYSTEM PARAMETERS PROGRAMMING

Having activated and checked the unit operation (standard settings are factory set), start entering system parameters to the G-202 unit.

For this purpose, turn off the unit by pressing the pushbutton. ***Then press the buttons and , depress and hold, at the same time press the pushbutton.*** All the three pushbuttons need to be depressed and held for at least the period of 3 seconds. If any of these buttons has been released during the said time, the unit will abandon the programming mode. When the unit has assumed the programming mode, the LEDs on the and pushbuttons will start to blink, while the display will show the 'c0' per one second. Then, the value of this parameter most recently programmed will be shown. Enter the required settings, using the pushbuttons, any longer pushbutton holding time causing the data "fast rewinding/forwarding". Then press , in order to approve the data entered and start entering the next parameter.

Partial entering of the settings is also possible. If any alteration of the particular setting is not required, simply press the pushbutton and the G-202 unit will assume the next parameter setting mode.

Note !!!

The refrigeration unit Manufacturer may block access to a portion of or even to all parameters available from the keyboard, by means of the computer programming unit. If this is the case, and the alteration of any of the blocked parameters is attempted, the display will show the 'bL' symbol for the period of 1 second.

Table 2: Parameters Denotation

Para-Meter	Description	Min	Max	Step	Factory setting
c0	The defrosting frequency. Note***!!!*** *If this parameter is set to "0"only manual defrosting will be available, while* ***any*** *automatic defrosting will be unavailable!!! If this parameter is set to"-01",* ***neither manual nor automatic defrosting will be available****!!!*	00 -01	24	1h	6h
c1	Maximal defrosting time if the evaporator has not reached the preset temperature (d2 parameter) ***Note!!!*** *If this parameter is set to „00"or „-01"* ***no time limit will be available***	00 -01	99	1min	30min
c2	Minimal compressor stopping time	00	15	1min	3min
c3	Evaporator thawing time	00	15	1min	2min
c4	Drying heater/humidifier stopping time if humidity sensor has been damaged.	01	99	1min	20min
c5	Maximal compressor operation time 0 – denotes the absence of test	00	99	1min	40min
c6	Drying heater/humidifier operation time if humidity sensor has been damaged.	01	99	1min	10min
c7	Time for which the temperature measured directly prior to the defrosting commencement will be shown after the defrosting completion ('c4' parameter).	00	60	1min	5min
c8	Compressor operation time if controlling sensor has been damaged	01	99	1min	25min
c9	Compressor stopping time if controlling sensor has been damaged	01	60	1min	5min
d0	User set minimal temperature	-40	20	1°C	1°C
d1	User set maximal temperature	d0+1	40	1°C	10°C
d2	Evaporator temperature at which the defrosting terminates	0	40	1°C	5°C
d3	Temperature sensor hysteresis value	1	10	1°C	2°C
d4	Chamber sensor rescaling with relation to actually measured temperature	-10	10	1°C	0°C
d5	User set maximal temperature in Humidity Control Mode	d1+1	40	1°C	20°C
d6	Humidity sensor rescaling with relation to actually measured humidity	-99	99	1%	0%
d7	User set minimal humidity (only in program version: 02, 03)	10	80	1%	10%
d8	User set maximal humidity (only in program version: 02, 03)	d7+1	90	1%	90%
d9	Humidity sensor hysteresis value (only in program version: 02, 03)	1	50	1%	1%
r1	Evaporator defrosting method, the parameter set as follows: 00 – defrosting through the heater 01 – warm vapour defrosting	00	01	1	00
r2	Humidity control method, the parameter set as follows: 00 – drying 01 – humidifying	00	01	1	00

VII. PROBLEMS AND THEIR REMOVAL

defect symptoms	**check**
1. Display is not lit although G-202 is connected to mains	Check: - if there is voltage 230V on feeding clamps L and N
2. Compressor does not switch on although it is signalled that it is on: red diode	Check: - if there is voltage 230V on clamps P2 and N – If there is, check the compressor
3. Defrosting heater does not switch on	Check: - if there is voltage 230V on clamps as described on the casing of the controller - if there is, check the heater
4. Drying heater does not switch on	Check: - if there is voltage 230V on clamps as described on the casing of the controller - if there is, check the heater
5. Error of temperature indication	Check: - connection of sensors to connectors - the value of parameter ‘d4’ - if the sensor is fixed correctly - the condition of the cable of the sensor: the cable cannot have **<u>any</u>** defects - in detail the lookout of external surface of sensor shell to see whether it has not been damaged mechanically.
6. impossible to set the required temperature	Check: the value of parameters ‘d0’ , ‘d1’ (d0<d1), and ‘d5’ (d1<d5)
7. dots on the display flash, no possibility to switch it on	Check : - the value of feeding voltage - condition of feeding connectors - whether feeding connectors are tightened up
8. ‘’abnormal’, ‘strange’ operation of the unit	Check: - if there is voltage 230V on feeding clamps L and N - condition of feeding connectors - ‘zeroing’ of cooling unit - condition of electric system and the number of units connected to one phase - if the type of thermostat is right (label with description of outlets) for the unit - whether the thermostat was not wetted by water or other liquid - if thermostat is not exposed to humidity or sudden changes of temperature

10. The appliance does not reach the set temperature and does not cool	Check: - what temperature was programmed by the user - set values of particular parameters, in particular ‘c2’, ‘c5’, ‘d0’, ‘d1’, ‘d5’ - item 9 – *Problems with defrosting of the unit.* If the unit does not defrost itself fully, it won’t reach the programmed temperature!!! - the method and place of fixing of the chamber sensor - whether side panels were not uninstalled from the rack or whether moving panes were not uninstalled from the display - WHETHER THE UNIT STANDS IN A DRAFT OR IN SUNLIGHT!!! - whether ventilators or air conditioning are installed on the ceiling or nearby - cleanliness of the condenser - temperature in the shop (each producer defines maximal operating temperature of an appliance) - the quantity of gas, ventilators, evaporator heater, hose that carries away water from the evaporator
11. malfunction of humidity sensor	Check: - the value of parameter ‘d6’ - connection of sensor to connector

VIII. RETURNS FOR REPAIR

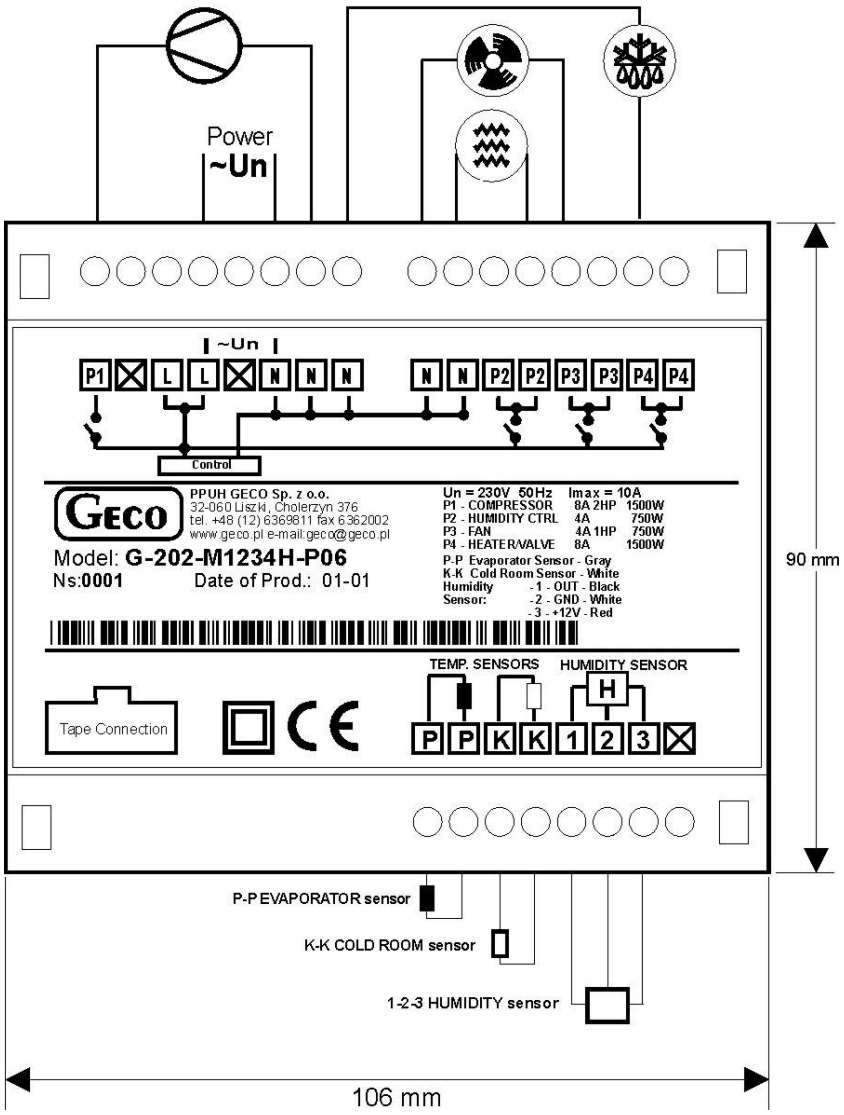
PPUH ‘GECO’ reserves the right to refuse a free repair of the unit, if the seals are broken !!!

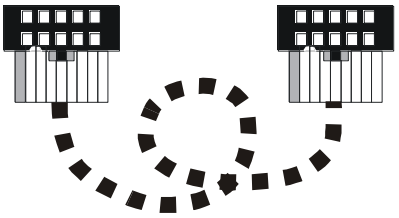
P.P.U.H. ‘Geco’ Sp. z o. o. is not responsible for loses and damages resulting from provision of information on the method of making changes in the system data of G-202 by the producer or its service to the final client, incorrect or non-professional assembly and for loses caused by defective operation of the appliance.

IX. CHANGES IN THE CONTROL

1. 17.03.2003: Program version 02. Added 3 service parameters: D7, D8, D9.
2. 12.11.2003: Program version 03. Added 2 service parameters: R1, R2.

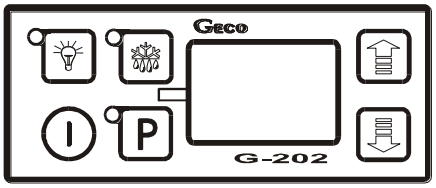
X. SCHEME OF CONNECTIONS. ACTUATOR (EXECUTIVE MODULE) VIEW. THE METHOD OF CONNECTION OF THE EXECUTIVE MODULE WITH A CONTROL PANEL USING THE TAPE.



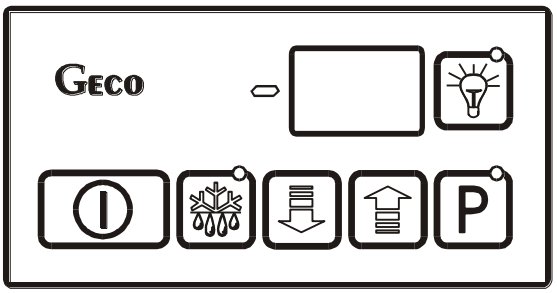


THE DIAGRAM SHOWS TAPE CONNECTIONS FROM THE INPUT HOLES VIEW. DIAGRAM SHOWS ALSO THEIRS PLACEMENT BETWEEN EACH OTHER, AND ALSO AFTER CORRECT REALIZATION OF THE CONNECTION.

G 202 CONTROL PANEL FRONT VIEW



G 203 CONTROL PANEL FRONT VIEW



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