MDS

Advanced Monitoring & Diagnostics System

Service Manual

ACC Climate Control • 22150 Challenger Blvd. • Elkhart IN • 46514   (574) 264-2190

Advanced Monitoring & Diagnostics System (MDS)

Service Manual. Version 2

Allows to control, monitor, & diagnose two any configuration HVAC systems simultaneously

An HVAC system electronic controller is a micro processed device, designed to control/operate, diagnose, test, and maintenance mobile/vehicle heating, ventilating, and air conditioning system. System can consist with one compressor, one condenser and one evaporator, or one compressor and two condensers and evaporators, or two compressors, condensers and evaporators as well as one or two heaters. It obtains temperature, pressure and voltage information. The controller eliminates the need to attach gauges to check system pressure and performance. The device is equipped with a control panel that is installed on driver's panel or wherever the design requires. One or two substations and one or two relay boards. (Please see Diagram in the attachment). The control has outputs to the blower, heating valve and compressor to reach the desired temperature level within the vehicle. Eliminate the need to attach gauges to check system pressure and performance. All additional features are listed in this manual.

BRIEF SUMMARY.

Control Features & Display Information

- *EVENT RECORDING*
- *DISPLAYS ACTUAL HIGH & LOW PRESSURE*
- *CONDENSER FAN CONTROL*
- *AUTOMATIC OR MANUAL BLOWER CONTROL*
- *EQUIPPED WITH SYSTEM TEST MODE*
- *DISPLAYS:*
    - *Date & Time*
    - *Voltage*
    - *Ambient Temperature*
    - *Interior Temperature*
    - *Set Temperature*
    - *Blower/Condenser Fan Speed*
    - *Failure Codes*
    - *Operation Mode*
    - *Relative Humidity*

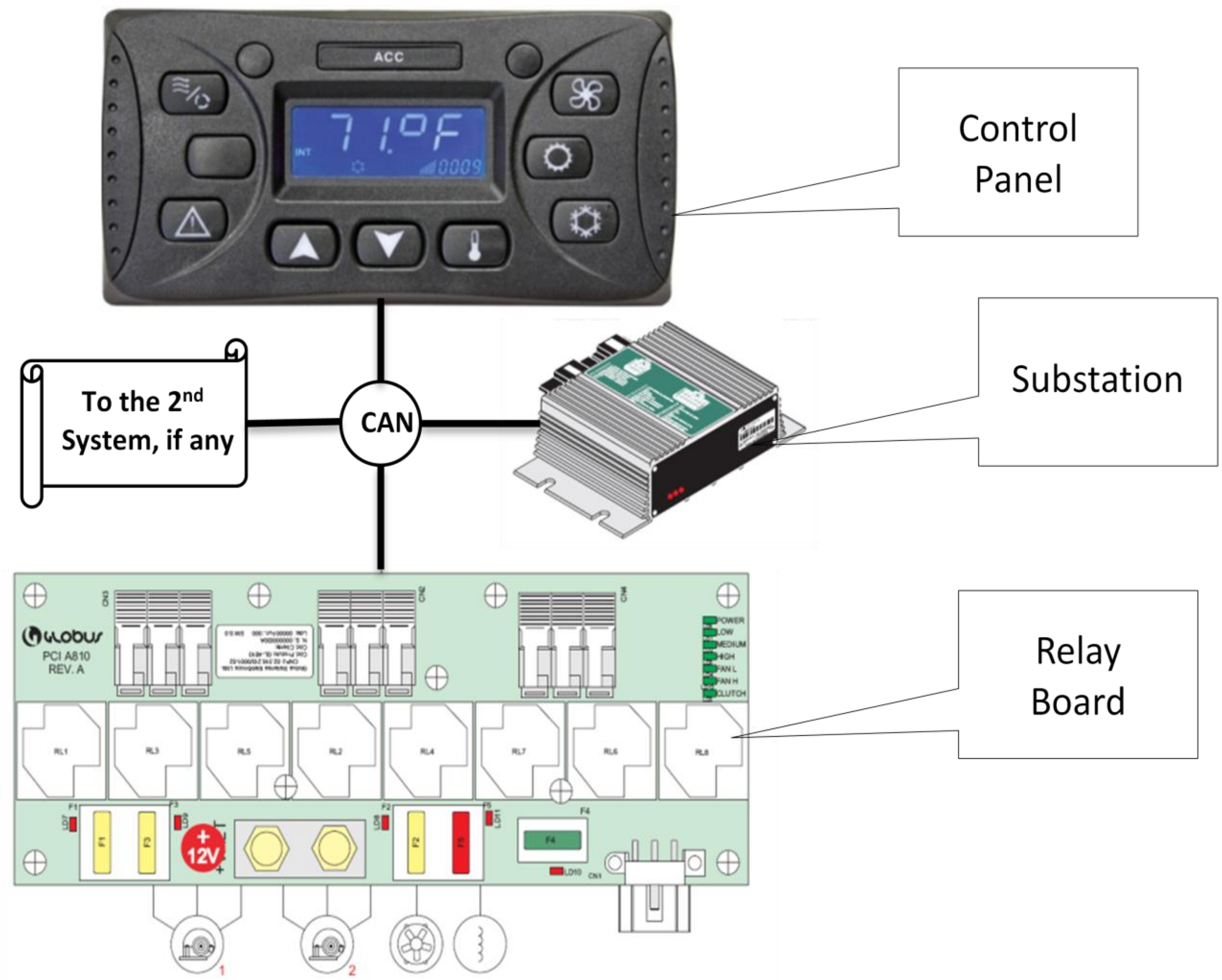
INPUTS:

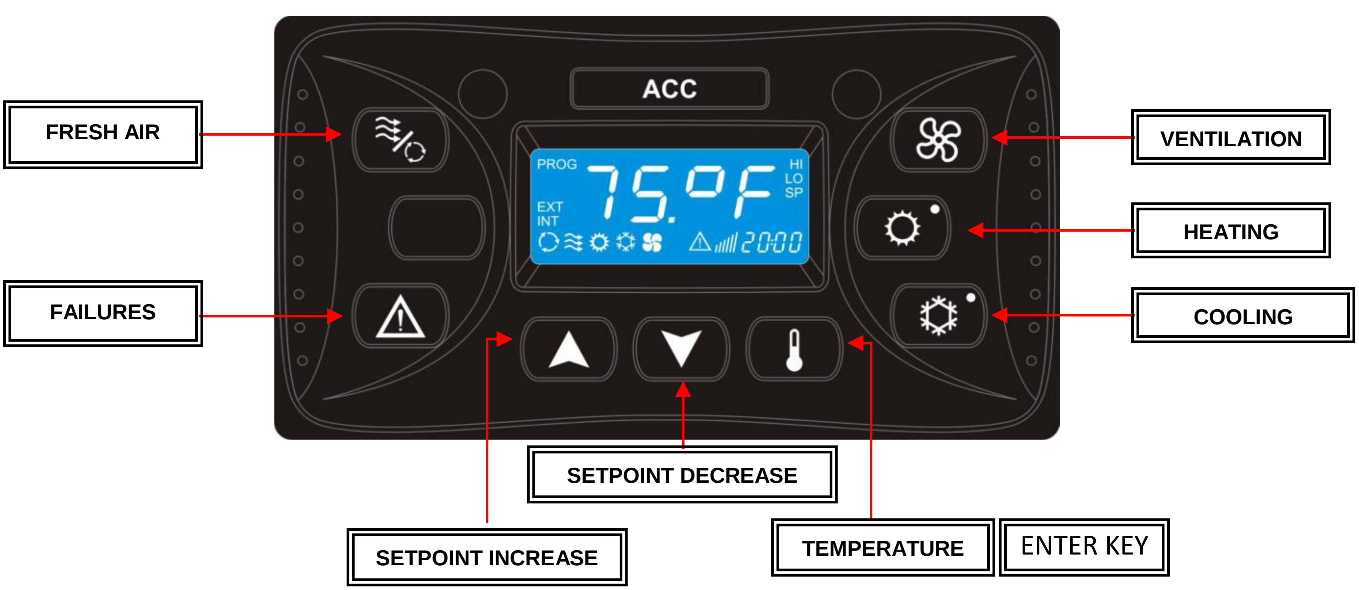
- *12/24VDC*
- *GND*
- *INTERNAL TEMPERATURE SENSOR*
- *EXTERNAL TEMPERATURE SENSOR*
- *FRESH AIR (OPTIONAL)*
- *CAN BUS*
- *PRESSURE SWITCH*
- *SUCTION PRESSURE SWITCH*
- *SUCTION PRESSURE TRANSDUCER - ANALOG*
- *DISCHARGE PRESSURE SWITCH*
- *USB PORT*
- *DISCHARGE PRESSURE TRANSDUCER – ANALOG*
- *OPERATING VOLTAGE MONITOR – ANALOG*
- *OBSTRUCTED FILTERS*

OUTPUTS:

- *BLOWER SPEED 1*
- *BLOWER SPEED 2*
- *BLOWER SPEED 3*
- *CLUTCH*
- *CONDENSER FAN LOW SPEED*
- *CONDENSER FAN HIGH SPEED*
- *HEATING (OPTIONAL)*

MDS Diagram


ACC
Control Panel
To the 2nd System, if any
CAN
Substation
PCI A810
REV. A
Relay Board
12V


ACC
PROG
75°F
HI
LO
SP
EXT
INT
FRESH AIR
FAILURES
VENTILATION
HEATING
COOLING
SETPOINT DECREASE
SETPOINT INCREASE
TEMPERATURE
ENTER KEY

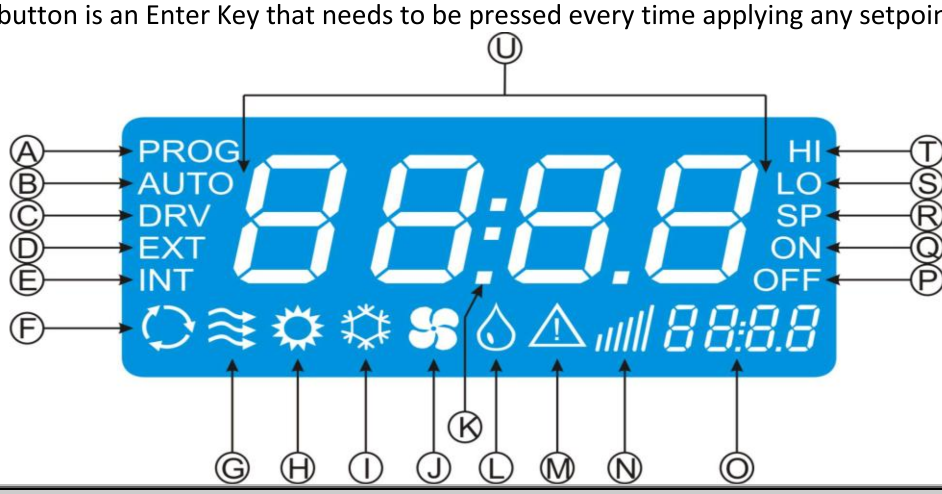
I. CONTROL OPERATION

1. **Date and time adjustment**. When the controller is turned ON for the first time, the software version is shown in the display. After that, the date and time should be adjusted (see paragraph 4 below):

2. **Control panel** (See picture on the previous page)
3. **Backlight Panel** has backlight luminosity control with intensity set by parameters **P205** and **P206** (night & day backlight, Table 1). Set the parameters **P207** and **P208** to determine the time of the beginning and end of the night (both 24 hours military time, Table 1).
4. **Date and time adjustment.** When installed for the first time, the operator should adjust time and date when the panel is turned ON. Every time the product is turned OFF from battery and turned ON again, the system requires adjustment again. If the operator does not want to adjust these parameters, the parameter P218 should be changed to 0. Date and time adjustment can be set through password **1224**. To access it, press , and simultaneously for 3 seconds, and insert password.
   a. If operator doesn't want to set date and time, it's possible to press 5 times to skip it.
   b. It's advisable to bypass ignition while powered control and connect control directly to battery. It will keep date, time and event data (see below) stored in the control memory.

   Note: Control standby current does not exceed 20 mA.
5. **Numerical Display**. (See next page for diagram) At the beginning the display shows software version and then setpoint value (with parameter **P200 = Int**). It also shows schedule, alarms, clock, failures and indication signals. With parameter **P200 = SP**, display shows setpoint; with parameter **P200 = Int**, display shows internal temperature. To see internal/external temperature, press *).

   *) button is an Enter Key that needs to be pressed every time applying any setpoint changed.



Index	Indication
A	Controller is in programming.
D	Indicated when visualizing the external temperature.
E	Indicated when visualizing the internal temperature.
F	Closed fresh air.

G	Open fresh air.
H	Indicated when the heating will be activated.
I	Indicated when the refrigeration will be activated.
J	Indicates manual ventilation activated.
K	Indicates compressor is activated in refrigeration mode or valve when in heating mode.
M	Indicated when the controller is in any failure.
N	Indicates the evaporator speed. Speed should be counted each two lines.
O	Visualization of the programming values, product clock and failure description.
R	Indicated when it will be adjusting or visualization of the setpoint value.
S	Indicated when any value reaches the minimum adjustable.
T	Indicated when any value reached the maximum adjustable.
U	Visualization of the internal temperature, external temperature, parameters value, failures code, auxiliary data, etc.

Ps.: The symbols **B**, **C**, **L**, **P** and **Q** are not used in this product.

6. **Setpoint.** Setpoint is the desired temperature within vehicle. To adjust it, press ▲ or ▼. Maximum and minimum values are defined by parameters **P100** and **P101**. Whenever setpoint value is changed, it will be recorded. To see a setpoint alteration, press ⚠ and **E000** will show in display:

- After that, press 🌡;

New setpoint

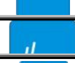
6.1. **Temperature Sensors.** System temperature sensor measures internal temperature and external temperature. Default display shows setpoint temperature. Reading temperature range is between -40°F to +176°F. To see Internal temperature (symbol "int" in the display), press 🌡 once, the display will show average between two probes (if two system under control) or just internal temperature (if one HVAC system). To visualize the external temperature (symbol "ext" in the display); press the key 🌡 one more time.

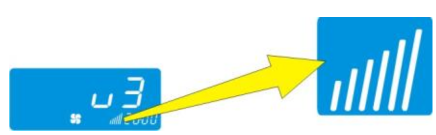
7. **Ventilating.**

Mode	Control
1	Blowers on low speed
2	Blowers on medium speed
3	Blowers on high speed

a. **Manual Ventilating**

The ventilation function is activated by ❀. There are three speeds. To change the fan's speed the ventilation function must be selected, press ▲ or ▼ to adjust it. To turn OFF, press ❀ twice. Ventilation operation is shown through display Bar Graphs.

Speed	Bar Graph
u0	
u1	
u2	
u3	



b. **Automatic Ventilating.** Automatic ventilation is controlled by setpoint and parameters **P400** (temperature above setpoint to blower speed change: adjustable from 2°F to 9°F, Table 1) & **P401** (tolerance to blower speed change: adjustable from 2°F to 5°F, Table 1).

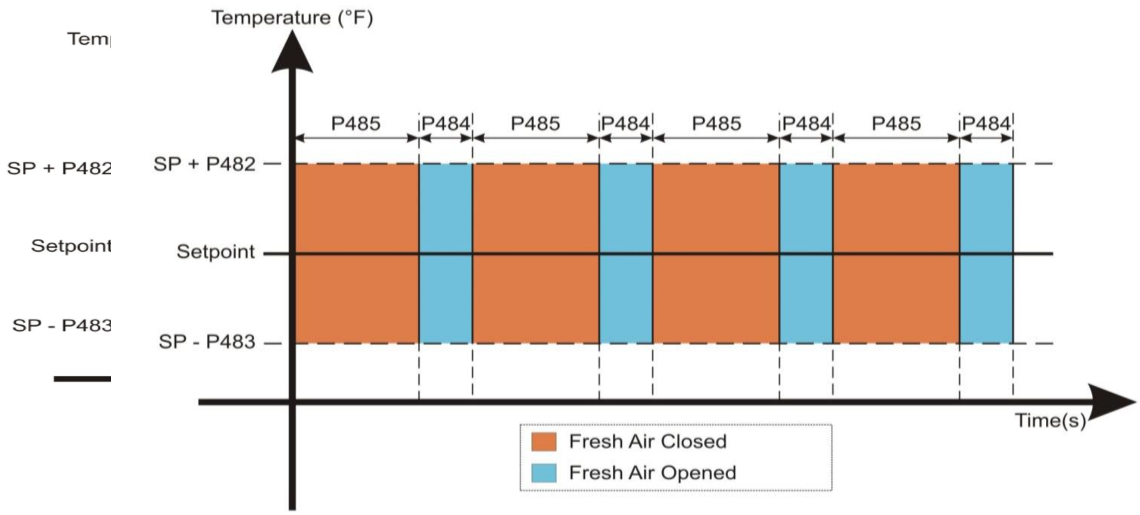
8. **Cooling**. If press with internal temperature above **setpoint + P300**, where **P300** is the compressor actuation tolerance (adjustable from 2°F to 7°F, Table 1), the compressor's clutch engages and the compressor turns ON.

   When the system starts in cooling mode, the blower's fans start in AUTO mode. If is pressed, the blowers' speed can be change manually. Thirty (30) seconds will elapse until the compressor starts up again, when it has been turned OFF or to turn it OFF when it is ON.

9. **Heating**. The heating system starts if one presses with internal temperature above (**setpoint - P601- P600**). Here parameter **P601** is the heater system dead zone (adjustable from 0°F to 14°F, Table 1) and the parameter **P600** is heater actuation tolerance (adjustable from 2°F to 14°F, Table 1). The system works on an ON/OFF valve. For example, if the setpoint is 60°F, P601 = 2°F and P600 = 4°F, then heater will start, the valve will open @ 54°F (60°F - 2°F - 4°F). The heater will shut off and the valve close @ 58°F (60°F - 2°F).
   Note: Switching from Heating to Cooling mode or vice versa is not automatic. Every time it's needed to press appropriate Heating or Cooling button.
10. **Pressure Transducers, Pressure Switches**. If parameter **P223 = 1** (Table 1), the control monitors pressure by pressure transducers (discharge and suction transducers). If parameter **P223 = 0** (Table 1), the control works with pressure switches.
    a. **Discharge transducer.** The discharge transducer monitors the compressor output's pressure. The system engage and disengage pressures are setting by parameters **P360** - pressure to engage compressor (adjustable from 180 psig to 250 psig, Table 1) and parameter **P359** - pressure to disengage compressor (adjustable from 400 psig to 250 psig, Table 1).
    b. **Condenser fan(s) speed.** The condenser speed is controlled by a discharge transducer that switches the condenser fan speed from high to low and vice versa by setting parameters **P363** - pressure to switch from Low to High speed (adjustable from 200 psig to 350 psig, Table 1) and parameter **P364** - pressure to switch from High to Low speed (adjustable from 300 psig to 150 psig, Table 1).
    c. **Suction transducer.** The suction transducer monitors the compressor input's pressure. The system engage and disengage pressures are setting by parameters **P361** - pressure to disengage compressor (adjustable from 0 psig to 50 psig, Table 1) and parameter **P362** - pressure to engage compressor (adjustable from 20 psig to 70 psig, Table 1).
11. **Fresh Air (optional).**

Fresh Air	
	Closed / Recirculation Mode
	Open

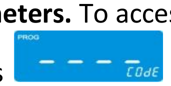
a. **Manual fresh air.** Press with No Cooling or Heating buttons ON, fresh air actuator will be open. Press again and fresh air will be closed.
b. **Automatic fresh air.** When the system is on cooling or heating mode, the fresh air is controlled automatically according to the diagram below:



Where, the parameter **P482** is the temperature above setpoint (SP) to open fresh air in automatic mode (adjustable from 2°F to 18°F, Table 1) and parameter **P483** is the temperature below setpoint (SP) to close fresh air in automatic mode (adjustable from 18°F to 2°F, Table 1). Close/open intervals are adjusted by parameter **P485** (fresh air to be close in automatic mode, adjustable from 1 to 300 minutes, Table 1) and parameter **P484** (fresh air to be open in automatic mode, adjustable from 0 to 600 seconds, Table 1).

While cooling or heating mode, fresh air can be turned ON manually and keeps open on time set by parameter **P480** (from 0 to 60 minutes, Table 1). It backs to automatic cycle after this time. When the external temperature is lower than internal temperature, fresh air will always be open.

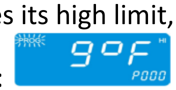
II. CONTROL PARAMETERS

1. **Access Parameters.** To access control parameters, press , and simultaneously for 3 seconds; Display shows . Put password first digit and press to confirm (password: **XXXX**, *can be provided per special request*), the display shows

Repeat this procedure 3 times for 2nd to 4th digits.

- After insert the key, press to access the parameters options;
- The display will show the parameters options, being **"nod 0"** for the Control Panel, **"nod 1"** for the Substation 1 (without GND in the pin 4 CN1) and **"nod 2"** for the Substation 2 (with GND in the pin 4 CN1);
- After choose which **nod** will be shown and/or replaced, press to access;
- The first parameter to appear depends on the option chosen above;

2. **View/Change Parameters.**
   - To change parameter's value, press ; parameter value is displayed on lower right corner: 
   - While parameter is changed, *PROG* flashes on display left corner and parameter's value shows on display:

   - When the parameter reaches its high limit, the display shows ***HI*** on upper right corner and ***LO*** when the parameter reaches its low limit:  or .

3. **Navigation through Parameters.**
   - To switch from one parameter to another, press or . While switching between parameters, the parameter's value is shown on the lower right corner of the display. If one press again after the last parameter is shown, the first parameter will appear.

- To access the others **nod**, press , choose the nod and press to access it;
- To exit, press or wait 30 seconds.

4. **Exiting from Control Parameters Mode.** To exit, press or wait 1 min.

Table 1. List of Control Parameters.

System Parameters “nod 0” – Control Panel

Parameter	Function	Def	Min	Max
P100	Setpoint minimum value	64°F	50°F	68°F
P101	Setpoint maximum value	82°F	71°F	89°F
P205	Diurnal backlight	10	1	10
P206	Nocturnal backlight	3	1	10
P207	Night beginning hour (hours)	17h	16h	21h
P208	Night end hour (hours)	06h	05h	10h
P209	Hour adjustment (hours)	0h	0h	23h
P210	Minute adjustment (minutes)	0’	0’	59’
P211	Year adjustment	2011	2000	2099
P212	Month adjustment	1	1	12
P213	Day adjustment	1	1	31
P216	Temperature scale selection (Celsius = **°C** Fahrenheit = **°F**)	°F	°C	°F
P218	Enable hour/date adjustment on starting (Disable = **0** Enable = **1**)	1	0	1
P224	Battery voltage (12V = **0**; 24V = **1**)	0	0	1
P255	Defines substation number in the net and the operation system: 1=> Single System (1 Substation and 1 Relay Board) 2=> Double System (2 Substations and 2 Relay Board) 3=> Single/Double System (1 Substation and 2 relay boards)	1	1	3

Note: When **P255 =3**, the control is done based on the average of the two sensors. If either one sensor fails, the control will be done by the other sensor, and if both fail the control assumes 22.

System Parameters “nod 1” – Substation 1 (without GND - pin 4 CN1)

Parameter	Function	Def	Min	Max
P000	External temperature offset *)	0°F	-9°F	+9°F
P001	Internal temperature offset *)	0°F	-9°F	+9°F
P007	Internal temperature offset (sensor 2 when P255=3)	0°F	-9°F	+9°F
P223	Pressure monitoring (Transducer = **1**; Pressure switch = **0**)	0	0	1
P261	Sets mode of operation the evaporators (3 Speeds = **0**; PWM = **1**)	0	0	1
P270	Event generator (compressor)	0h	0h	999h
P271	Event generator (compressor)	0h	0h	999h
P280	Event generator (blower)	0h	0h	999h
P281	Event generator (blower)	0h	0h	999h
P300	Hysteresis of compressor’s actuation	2°F	2°F	7°F
P359	Discharge pressure to compressor turns OFF (Psi)	375P	250P	500P
P360	Discharge pressure to compressor turns ON (Psi)	210P	180P	350P
P361	Suction pressure to compressor turns OFF (Psi)	15P	7P	50P
P362	Suction pressure to compressor turns ON (Psi)	38P	20P	70P
P363	Discharge pressure to speed change (LO-HI) of condenser (Psi)	280P	200P	400P
P364	Discharge pressure to speed change (HI-LO) of condenser (Psi)	230P	150P	350P
P400	Temperature above setpoint to blowers’ speed change	2°F	2°F	9°F
P401	Hysteresis to blowers’ speed change	2°F	2°F	5°F
P402	Blower speed 1	33	10	99

P403	Blower speed 2	66	10	99
P404	Blower speed 3	99	10	99
P480	Fresh air open time in manual mode (minutes)	10′	0′	60′
P482	Temperature above setpoint to fresh air (automatic mode)	5°F	2°F	18°F
P483	Temperature below setpoint to fresh air (automatic mode)	5°F	2°F	18°F
P484	Fresh air open time in automatic mode (seconds)	15′′	0′′	600′′
P485	Fresh air closed time in automatic mode (minutes)	10′	1′	300′
P600	Heating hysteresis	2°F	2°F	14°F
P601	Temperature read and setpoint differential on heating	3°F	0°F	14°F

System Parameters “nod 2” – Substation 2 (with GND - pin 4 CN1)

Parameter	Function	Min	Min	Max
P001	Internal temperature offset *)	0°F	-9°F	+9°F
P223	Pressure monitoring (Transducer = **1**; Pressure switch = **0**)	0	0	1
P261	Sets mode of operation the evaporators (3 Speeds = **0**; PWM = **1**)	0	0	1
P270	Event generator (compressor) **)	0h	0h	999h
P271	Event generator (compressor) **)	0h	0h	999h
P280	Event generator (blower & cond. fans) **)	0h	0h	999h
P281	Event generator (blower & cond. fans) **)	0h	0h	999h
P300	Hysteresis of compressor’s actuation	2°F	2°F	7°F
P359	Discharge pressure to compressor turns OFF (Psi)	375P	250P	500P
P360	Discharge pressure to compressor turns ON (Psi)	210P	180P	350P
P361	Suction pressure to compressor turns OFF (Psi)	15P	7P	50P
P362	Suction pressure to compressor turns ON (Psi)	38P	20P	70P
P363	Discharge pressure to speed change (LO-HI) of condenser (Psi)	280P	200P	400P
P364	Discharge pressure to speed change (HI-LO) of condenser (Psi)	230P	150P	350P
P400	Temperature above setpoint to blowers’ speed change	2°F	2°F	9°F
P401	Hysteresis to blowers’ speed change		2°F	5°F
P402	Blower speed 1		10	99
P403	Blower speed 2		10	99
P404	Blower speed 3		10	99
P600	Heating hysteresis		2°F	14°F
P601	Temperature read and setpoint differential on heating		0°F	14°F

*) Reading temperature will be displayed as an actual temperature + (plus) or – (minus) parameters **P000** or **P001** setpoint offset temperature. Device will use this reading temperature to control environment by turning ON or OFF heating or cooling.

**) This feature can be used for variety of maintenance, parameters checking or other purposes by reminding technician and/or driver to perform some task, e.g., change evaporator filter.

III. TEST MODE

Input/output	Description
ON	Input with signal/output ON
OFF	Input with no signal/ output OFF

1. **Access Test Mode.** Repeat step II.1 from Control Parameters section. Password: **2453.**
   a. The display will show the test mode options, being **“nod 0”** for the Control Panel, **“nod 1”** for the Substation 1 and **“nod 2”** for Substation 2;
   b. After choose which **nod** will be tested, press   to access;
2. **Outputs Test.** First test appears on the display is outputs (**out**)

a. Press to access all outputs (Table 2. below).

b. Press or to switch between outputs.

c. To turn output ON/OFF, press .

d. To return to **OUT** display out, press .

Table 2. Outputs

Test Mode "nod 0" – Control Panel

Output	Description
o700	Backlight Panel
o701	Backlight Display

Test Mode "nod 1" – Substation 1 (without GND - pin 4 CN1)

Output	Description
o000	Low Speed Blower
o001	Medium Speed Blower
o002	High Speed Blower
o005	Speed Blower PWM 50%
o006	Low Speed Condenser
o007	High Speed Condenser
o008	Fresh Air
o103	Gas Charge (High Speed Blower + High Speed Condenser + Compressor) *)
o200	Heating

Test Mode "nod 2" – Substation 2 (with GND - pin 4 CN1)

Output	Description
o000	Low Speed Blower
o001	Medium Speed Blower
o002	High Speed Blower
o005	Speed Blower PWM 50%
o006	Low Speed Condenser
o007	High Speed Condenser
o008	Fresh Air
o103	Gas Charge (High Speed Blower + High Speed Condenser + Compressor) *)
o200	Heating

***)** This function enables operator to run your AC unit without considering ambient conditions (temperature). Let's say an ambient temperature at workshop is about 40F. Somebody can't run compressor to charge refrigerant on the system because it's required to heat temperature sensor in order to enable it. Using this function someone run and charge (if required) system without temperature control. Control is just bypassing pressure devices.

e. To turn ON/OFF an output, press ;

f. Press to return;

g. Press or to test inputs **in**; in

3. **Input Test.** Press to access all inputs (Table 3).

Table 3. Inputs

Test Mode “nod 0” – Control Panel

Input	Description
i101	D+ (Battery)

Test Mode “nod 1” – Substation 1

Digital Input	Description
i040	Address
Analog Input	**Description**
i210	Internal Temperature Sensor 1
i211	External Temperature Sensor
i217	Internal Temperature Sensor 2 (if **P255 = 3**)
i250	Discharge Transducer
i251	Suction Transducer

Test Mode “nod 2” – Substation 2

Input	Description
i040	Address
Analog Input	**Description**
i210	Internal Temperature Sensor 1
i211	External Temperature Sensor
i217	Internal Temperature Sensor 2 (if **P255 = 3**)
i250	Discharge Transducer
i251	Suction Transducer

a. Press ▲ or ▼ to switch between inputs.
b. When parameter **P223** is set to transducer (Table 1, P223 = 1), both inputs **i250** and **i251** will show actual pressure values on display. If **P223** is set to pressure switch (Table 1, P223 = 0), the display will show **n.A.**

4. **Exit.** To exit Test Mode press ⚠ three times. (To return to **out** display, Output Test mode, press ⚠ twice).

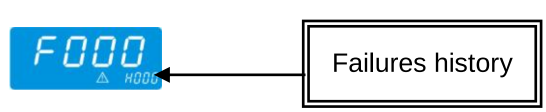
IV. EVENT GENERATOR

For maintenance purpose or other scenarios, the event generator allows operator to select up to four (4) parameters to simulate operation conditions and set event duration time. These are: **P270** & **P271 -** compressor parameters and **P280** & **P281 -** blower parameters (all four parameters are adjustable from 0 to 999 hrs, Table 1). For instance, this feature would be very helpful if operator would like to test the system or a part within a specific period of time and record data.

V. FAILURES AND ALARM CODES

In case of failure, alarm or event conclusion, alert flashes on display until it has been seen (recognized). To see the failure press ⚠. The two modules (indication Substations 1 and 2) options will appear to visualize the failures: **“nod 1”** – Substation 1 and **“nod 2”** – Substation 2.

Choose which substation will show the failure and press 🌡. The failures will be shown as below:



To see when failure happened, press . Display shows date, then the hour when it happened:

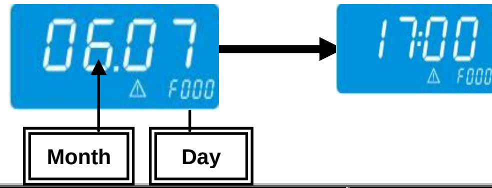


Table 4. Failure Codes.

Code	Failure	Description
F000	Internal temperature sensor 1	In case of internal temperature sensor 1 failure, system defaults to 71°F temperature.
F001	External Temperature Sensor	--------------------------------
F007	Internal temperature sensor 2 (if **P255 = 3**)	In case of internal temperature sensor 1 failure, system defaults to 71°F temperature.
F008	Discharge transducer	In case of discharge transducer failure, product turns OFF compressor and turn ON again after 3 minutes.
F009	Suction transducer	In case of suction transducer failure, product turns OFF compressor and turn ON again after 3 minutes.
F100	D+ (Battery)	In case of D+ failure, product turns OFF all functions.
F104	Battery voltage > **16V (12V)**; Battery voltage > **32V (24V)**	If one of these failures happens, product turns system/control OFF until normal work voltage returns.
F105	Battery voltage < **9V (12V)**; Battery voltage <**18V (24V)**	
F106	Battery voltage >**15V (12V)**; Battery voltage > **30V (24V)**	If one of these failures happens, product keeps control ON and show failure alert on the Control display.
F107	Battery voltage < **10V (12V);** Battery voltage < **19V (24V)**	
F202	High pressure switch or high discharge pressure	If one of these failures happens, product turns OFF compressor and turn ON again after 3 minutes.
F206	Low pressure switch or low suction pressure	If one of these failures happens, product turns OFF compressor and turn ON again after 3 minutes.
F300	Communication	--------------------------------

Table 5. Event Record (Conclusion).

Event	Description
A270	Concluded event's record (compressor)
A271	Concluded event's record (compressor)
A280	Concluded event's record (blower(s) or condenser fan(s))
A281	Concluded event's record (blower(s) or condenser fan(s))
Setpoint	**Description**
E000	Setpoint adjustment record. This is an event generated each time when setpoint is changed. It informs date and time, old and new setpoint(s) values

To delete the fault history should follow the steps below:

- Accesses the failures screen by key ;
- Choose the "nod" to delete the history and press the button to confirm;
- Keep the button pressed for @3s and history will be erased;
- Repeat the same process for the other "nod" if needed.

VI. AUXILIARY DATA VISUALIZATION MODE

1. System equipped with an auxiliary data visualization mode. To access it, press  and  simultaneously for 3 seconds. The list of the visualization parameters are presented in Table 6.

a. Choose which **“nod”** will be visualized, being **“nod 0”** for the Control Panel, **“nod 1”** for the Substation 1 (without GND in the pin 4 CN1) and **“nod 2”** for the Substation 2 (with GND in the pin 4 CN1);

2. After nod is chosen, press the key ;
3. Use  and  to choose indication (to switch between parameters).

Table 6. List of Visualization Mode Parameters

“nod 0” – Control Panel

Indication	Description
A000	**Software version**
A120	Battery voltage
A214	Day of the week

“nod 1” – Substation 1 (without GND pin 4 CN1)

Indication	Description
A001	**Software version**
A050	Boot loader version
A100	Internal temperature 1 (°F)
A101	External Temperature (°F)
A107	Internal Temperature 2 (°F) (if **P255 = 3**)
A140	Discharge pressure (Psi)
A141	Suction pressure (Psi)
A300	Compressor hourmeter *)
A301	Blower hourmeter *)

“nod 2” – Substation 2 (with GND at the pin 4 CN1)

Indication	Description
A001	**Software version**
A050	Boot loader version
A100	Internal temperature (°F)
A140	Discharge pressure (Psi)
A141	Suction pressure (Psi)
A300	Compressor hourmeter *)
A301	Blower hourmeter*)

*) L000 – 1st three digit of hours; H000 – 2nd three digits of hours, e.g. 150 hours will appear as L150, H000; 2,150 hours will be seen as L150, H002.

4. To exit, press  until return to setpoint temperature visualization.

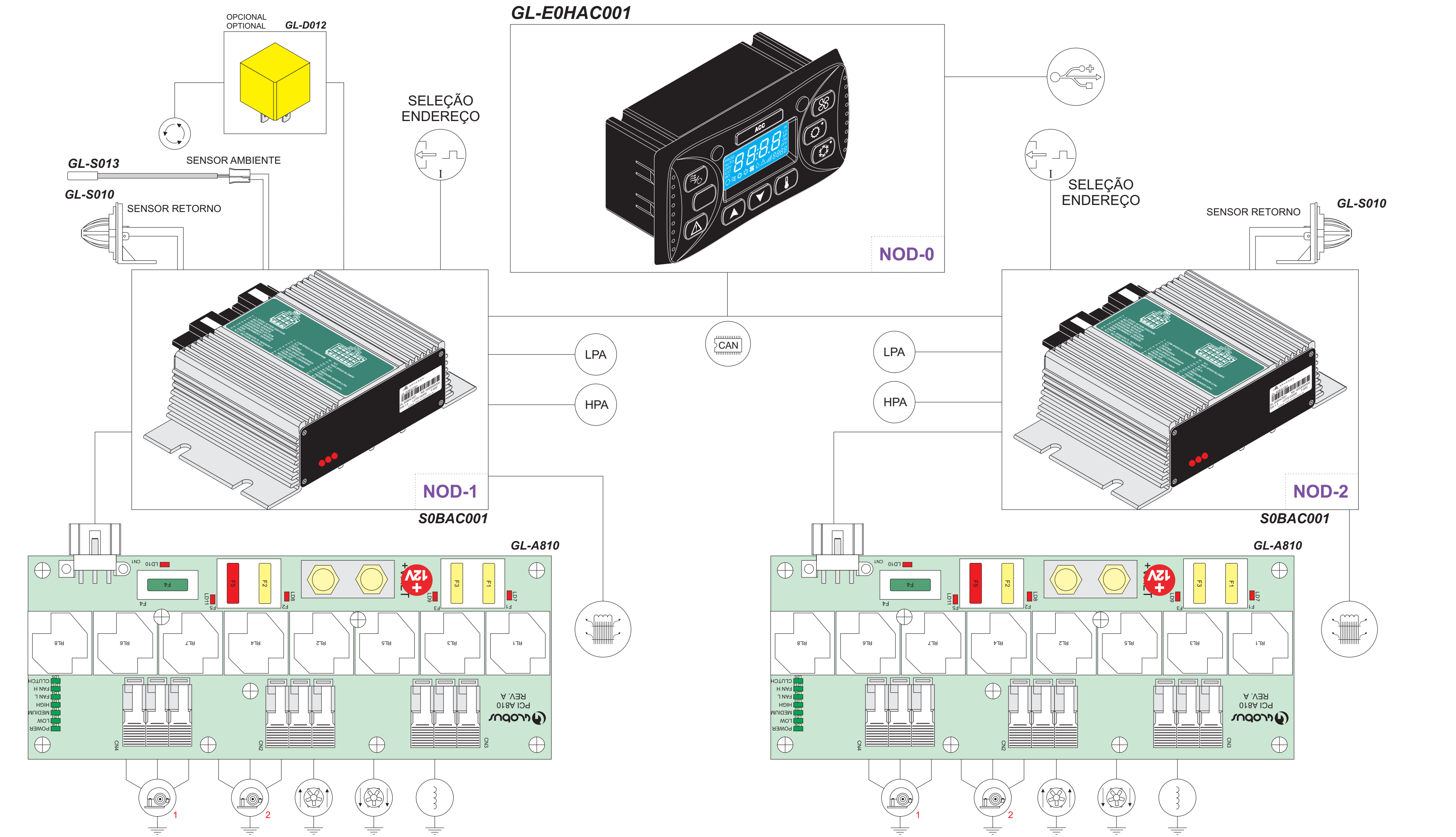
VII. OPERATION SPECIFICATIONS

1. **Operation Conditions.** This control system works in temperatures ranging from –4°F to +184°F.
2. **Power Supply.**
   a. **Voltage.** Controller works with nominal voltage of 12VDC and 24VDC and will continuously work at voltage from 10 VDC to 32 VDC with all functions properly operating.
   b. **Protection.** Control circuit is indefinitely protected against reverse polarity (-12VDC/-24VDC).

POR TRATAR-SE DE EQUIPAMENTO DE CONTROLE ELÉTRICO COM COMUTAÇÃO DE ALTA CORRENTE, É INDISPENSÁVEL QUE ESTEJA INSTALADO EM LOCAL COM VENTILAÇÃO ADEQUADA, NÃO ENCLAUSURADO, LONGE DE TUBULAÇÕES DE COMBUSTÍVEIS E / OU INFLAMÁVEIS, SOB RISCO DE INCÊNDIO / EXPLOSÃO. ESTE EQUIPAMENTO NÃO TEM PROTEÇÃO CONTRA ÁGUA. JATOS E / OU RESPINGOS PODEM DANIFICÁ-LO.

BECAUSE THIS IS AN ELECTRICAL CONTROL EQUIPMENT WITH HIGH COMMUTING CURRENT, IT IS VERY IMPORTANT TO BE INSTALLED AT A VENTILATED, OPEN SPACE, FAR FORM FUEL / FLAMMABLE MATERIAL, PIPELINES UNDER THE RISK OF FIRE / EXPLOSION. THIS EQUIPMENT IS NOT PROTECTED AGAINST WATER. JETS OR SPLASHES OF WATER MAY DAMAGE IT.

ESTE EQUIPO DE CONTROLE ELÉCTRICO TIENE COMUTACIÓN DE ALTA CORRIENTE, POR ESO ES INDISPENSABLE QUE ESTÉ INSTALADO EN LOCAL CON VENTILACIÓN ADECUADA, NO CERRADO, LEJOS DE TUBULACIONES DE COMBUSTIBLES Y / O INFLAMABLES BAJO RIESGO DE INCENDIO / EXPLOSIÓN. ESTE EQUIPO NO TIENE PROTECIÓN CONTRA AGUA; CHORROS Y / O RESPINGOS PUEDEN DAMNIFICARLO.



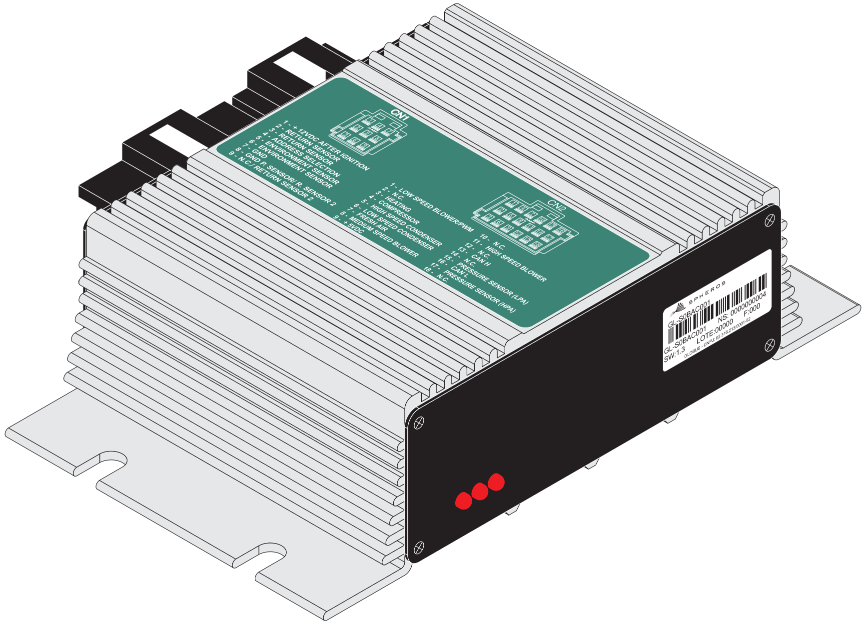
GLOBUS SISTEMAS ELETRÔNICOS LTDA.			
PRODUCT: GL-S0BAC001			
DOC.: BLOCKS DIAGRAM			REV.: 10
DOCUMENT: EL-0965	AUTHOR: GR	FILE: S0BAC001-10PES.CDR	
APPROVED: RS		DATE: 23/10/2012	PAGE: 04 OF 09

POR TRATAR-SE DE EQUIPAMENTO DE CONTROLE ELÉTRICO COM COMUTAÇÃO DE ALTA CORRENTE, É INDISPENSÁVEL QUE ESTEJA INSTALADO EM LOCAL COM VENTILAÇÃO ADEQUADA, NÃO ENCLAUSURADO, LONGE DE TUBULAÇÕES DE COMBUSTÍVEIS E / OU INFLAMÁVEIS, SOB RISCO DE INCÊNDIO / EXPLOSÃO. ESTE EQUIPAMENTO NÃO TEM PROTEÇÃO CONTRA ÁGUA. JATOS E / OU RESPINGOS PODEM DANIFICÁ-LO.

BECAUSE THIS IS AN ELECTRICAL CONTROL EQUIPMENT WITH HIGH COMMUTING CURRENT, IT IS VERY IMPORTANT TO BE INSTALLED AT A VENTILATED, OPEN SPACE, FAR FORM FUEL / FLAMMABLE MATERIAL, PIPELINES UNDER THE RISK OF FIRE / EXPLOSION. THIS EQUIPMENT IS NOT PROTECTED AGAINST WATER. JETS OR SPLASHES OF WATER MAY DAMAGE IT.

ESTE EQUIPO DE CONTROLE ELÉCTRICO TIENE COMUTACIÓN DE ALTA CORRIENTE, POR ESO ES INDISPENSABLE QUE ESTÉ INSTALADO EN LOCAL CON VENTILACIÓN ADECUADA, NO CERRADO, LEJOS DE TUBULACIONES DE COMBUSTIBLES Y / O INFLAMABLES BAJO RIESGO DE INCENDIO / EXPLOSIÓN. ESTE EQUIPO NO TIENE PROTECIÓN CONTRA AGUA; CHORROS Y / O RESPINGOS PUEDEN DAMNIFICARLO.

al GL-S0BAC001



CARACTERÍSTICAS ELÉTRICAS

TENSÃO NOMINAL	12VDC
FAIXA DE TENSÃO DE OPERAÇÃO	9VDC ~ 15VDC
TENSÃO MÁXIMA	17VDC DURANTE 5MIN
CORRENTE MÁXIMA POR SAÍDA	500mA
CURTO-CIRCUITO NAS SAÍDAS	PROTEGIDO
POLARIDADE REVERSA	PROTEGIDO
TEMPERATURA DE OPERAÇÃO	-40ºC ~ +85ºC
GRAU DE PROTEÇÃO IEC 60529	IP30
REVISÃO DO PRODUTO	05
VERSÃO DE SOFTWARE	1.4

ELECTRICAL CHARACTERISTICS

NOMINAL VOLTAGE	12VDC
VOLTAGE RANGE	9VDC ~ 15VDC
MAXIMUM VOLTAGE	17VDC DURING 5MIN
MAXIMUM OUTPUT CURRENT	500mA
OUTPUT SHORT CIRCUIT PROTECTION	PROTECTED
POLARITY REVERSE PROTECTION	PROTECTED
OPERATION TEMPERATURE RANGE	-40ºC ~ +85ºC
PROTECTION DEGREE IEC 60529	IP30
PRODUCT REVISION	05
SOFTWARE VERSION	1.4

CARACTERÍSTICAS ELÉCTRICAS

VOLTAJE NOMINAL	12VDC
FAJA DE VOLTAJE DE OPERACIÓN	9VDC ~ 15VDC
VOLTAJE MÁXIMA	17VDC DURANTE 5MIN
CORRIENTE MÁXIMA POR SALIDA	500mA
CORTOCIRCUITO EN LAS SALIDAS	PROTEGIDO
POLARIDAD REVERSA	PROTEGIDO
TEMPERATURA DE OPERACIÓN	-40ºC ~ +85ºC
GRADO DE PROTECCIÓN IEC 60529	IP30
REVISIÓN DEL PRODUCTO	05
VERSIÓN DE SOFTWARE	1.4

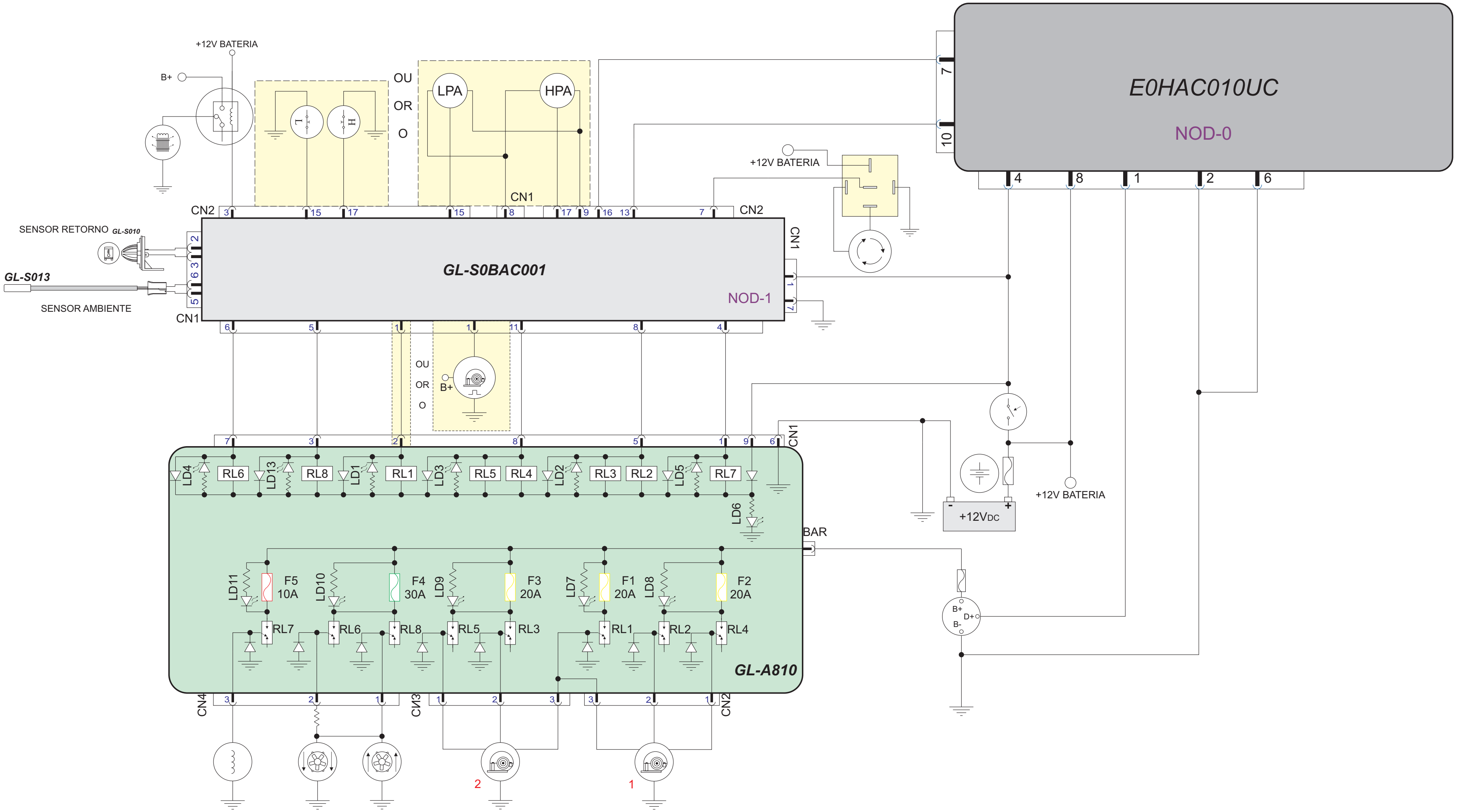
GLOBUS SISTEMAS ELETRÔNICOS LTDA.

PRODUCT:	GL-S0BAC001				
DOC.:	CHARACTERISTICS			REV.:	10
DOCUMENT:	EL-0965	AUTHOR:	GR	FILE:	S0BAC001-10PES.CDR
APPROVED:	RS	DATE:	23/10/2012	PAGE:	01 OF 09

POR TRATAR-SE DE EQUIPAMENTO DE CONTROLE ELÉTRICO COM COMUTAÇÃO DE ALTA CORRENTE, É INDISPENSÁVEL QUE ESTEJA INSTALADO EM LOCAL COM VENTILAÇÃO ADEQUADA, NÃO ENCLAUSURADO, LONGE DE TUBULAÇÕES DE COMBUSTÍVEIS E / OU INFLAMÁVEIS, SOB RISCO DE INCÊNDIO / EXPLOSÃO. ESTE EQUIPAMENTO NÃO TEM PROTEÇÃO CONTRA ÁGUA. JATOS E / OU RESPINGOS PODEM DANIFICÁ-LO.

BECAUSE THIS IS AN ELECTRICAL CONTROL EQUIPMENT WITH HIGH COMMUTING CURRENT, IT IS VERY IMPORTANT TO BE INSTALLED AT A VENTILATED, OPEN SPACE, FAR FORM FUEL / FLAMMABLE MATERIAL, PIPELINES UNDER THE RISK OF FIRE / EXPLOSION. THIS EQUIPMENT IS NOT PROTECTED AGAINST WATER. JETS OR SPLASHES OF WATER MAY DAMAGE IT.

ESTE EQUIPO DE CONTROLE ELÉCTRICO TIENE COMUTACIÓN DE ALTA CORRIENTE, POR ESO ES INDISPENSABLE QUE ESTÉ INSTALADO EN LOCAL CON VENTILACIÓN ADECUADA, NO CERRADO, LEJOS DE TUBULACIONES DE COMBUSTIBLES Y / O INFLAMABLES BAJO RIESGO DE INCENDIO / EXPLOSIÓN. ESTE EQUIPO NO TIENE PROTECIÓN CONTRA AGUA; CHORROS Y / O RESPINGOS PUEDEN DAMNIFICARLO.



ESTE DESENHO É DE PROPRIEDADE DE GLOBUS SISTEMAS ELETRÔNICOS LTDA. E É FORNECIDO COM OBJETIVO ESTRITAMENTE CONFIDENCIAL E NÃO DEVE SER DIVULGADO PARA TERCEIROS, REPRODUZIDO OU USADO COM PROPÓSITO DE FABRICAÇÃO SEM EXPRESSA E ESCRITA PERMISSÃO DA GLOBUS.

THIS DRAWING IS PROPERTY OF GLOBUS SISTEMAS ELETRÔNICOS LTDA. AND IS SUPPLYED WITH STRICTLY CONFIDENTIAL OBJECTIVE, AND CAN'T BE DIVULGATED FOR THIRDPART, REPRODUCED OR USED FOR MANUFACTURE PURPOSE WITHOUT EXPRESSED GLOBUS AUTHORIZATION.

ESTE DISEÑO PERTENCE A GLOBUS SISTEMAS ELETRÔNICOS LTDA. Y ES FORNECIDO CON OBJECTIVO ESTRITAMENTE CONFIDENCIAL Y NO SE DEBE SIVULGARLO A TERCEROS, REPRODUCIRLO O UTILIZARLO A PROPÓSITO DE FABRICACIÓN SIN EXPRESSA Y ESCRITA AUTORIZACIÓN DE GLOBUS.

GLOBUS SISTEMAS ELETRÔNICOS LTDA.					
PRODUCT:	GL-S0BAC001				
DOC.:	ELECTRICAL SCHEME			REV.: 10	
DOCUMENT: EL-0965	AUTHOR: GR	FILE:	S0BAC001-10PES.CDR		
APPROVED: RS		DATE: 23/10/2012	PAGE:	06 OF 09	

NOTE:
1: CIRCUIT PROTECTION PROVIDED BY BUILDER
BATT: 80A PROTECTION
ING: 3A AND/OR 1A AS REQUIRED CIRCUIT PROTECTION

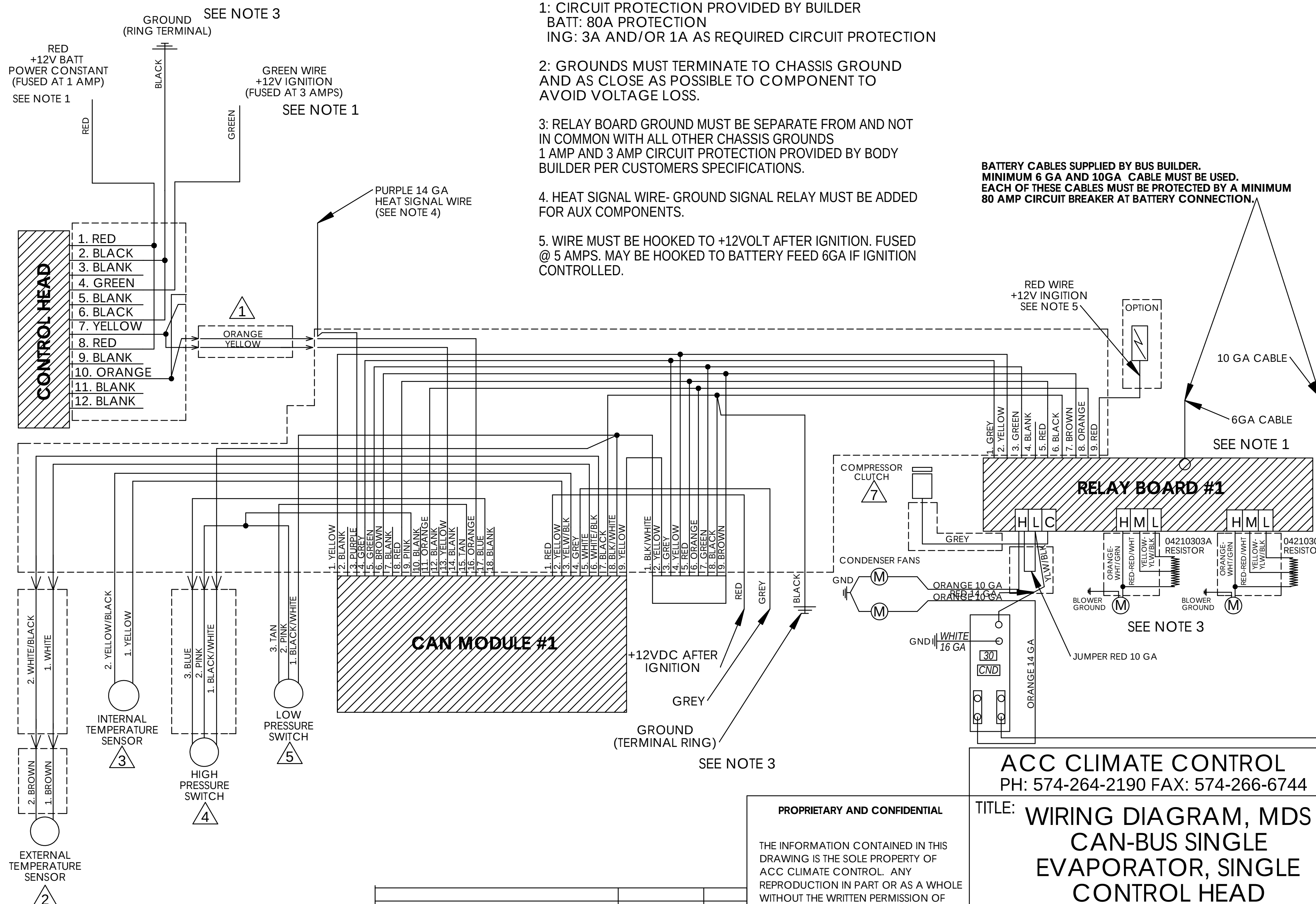
2: GROUNDS MUST TERMINATE TO CHASSIS GROUND AND AS CLOSE AS POSSIBLE TO COMPONENT TO AVOID VOLTAGE LOSS.

3: RELAY BOARD GROUND MUST BE SEPARATE FROM AND NOT IN COMMON WITH ALL OTHER CHASSIS GROUNDS
1 AMP AND 3 AMP CIRCUIT PROTECTION PROVIDED BY BODY BUILDER PER CUSTOMERS SPECIFICATIONS.

4. HEAT SIGNAL WIRE- GROUND SIGNAL RELAY MUST BE ADDED FOR AUX COMPONENTS.

5. WIRE MUST BE HOOKED TO +12VOLT AFTER IGNITION. FUSED @ 5 AMPS. MAY BE HOOKED TO BATTERY FEED 6GA IF IGNITION CONTROLLED.

BATTERY CABLES SUPPLIED BY BUS BUILDER.
MINIMUM 6 GA AND 10GA CABLE MUST BE USED.
EACH OF THESE CABLES MUST BE PROTECTED BY A MINIMUM 80 AMP CIRCUIT BREAKER AT BATTERY CONNECTION.



ACC CLIMATE CONTROL

PH: 574-264-2190 FAX: 574-266-6744

TITLE: WIRING DIAGRAM, MDS CAN-BUS SINGLE EVAPORATOR, SINGLE CONTROL HEAD

REVISIONS	DATE	ECR
---	---	---
	---	---
ADDED +12V BATTERY NOTES + FUSE	10/7/14	---
REMOVED CND LOW SPD, ADDED JUMPER	10/3/14	---
RELEASED	4/29/14	4237

	NAME	DATE
DRAWN	MAR	10/7/14

SIZE: A | DWG. NO. 3104257716ATC | REV

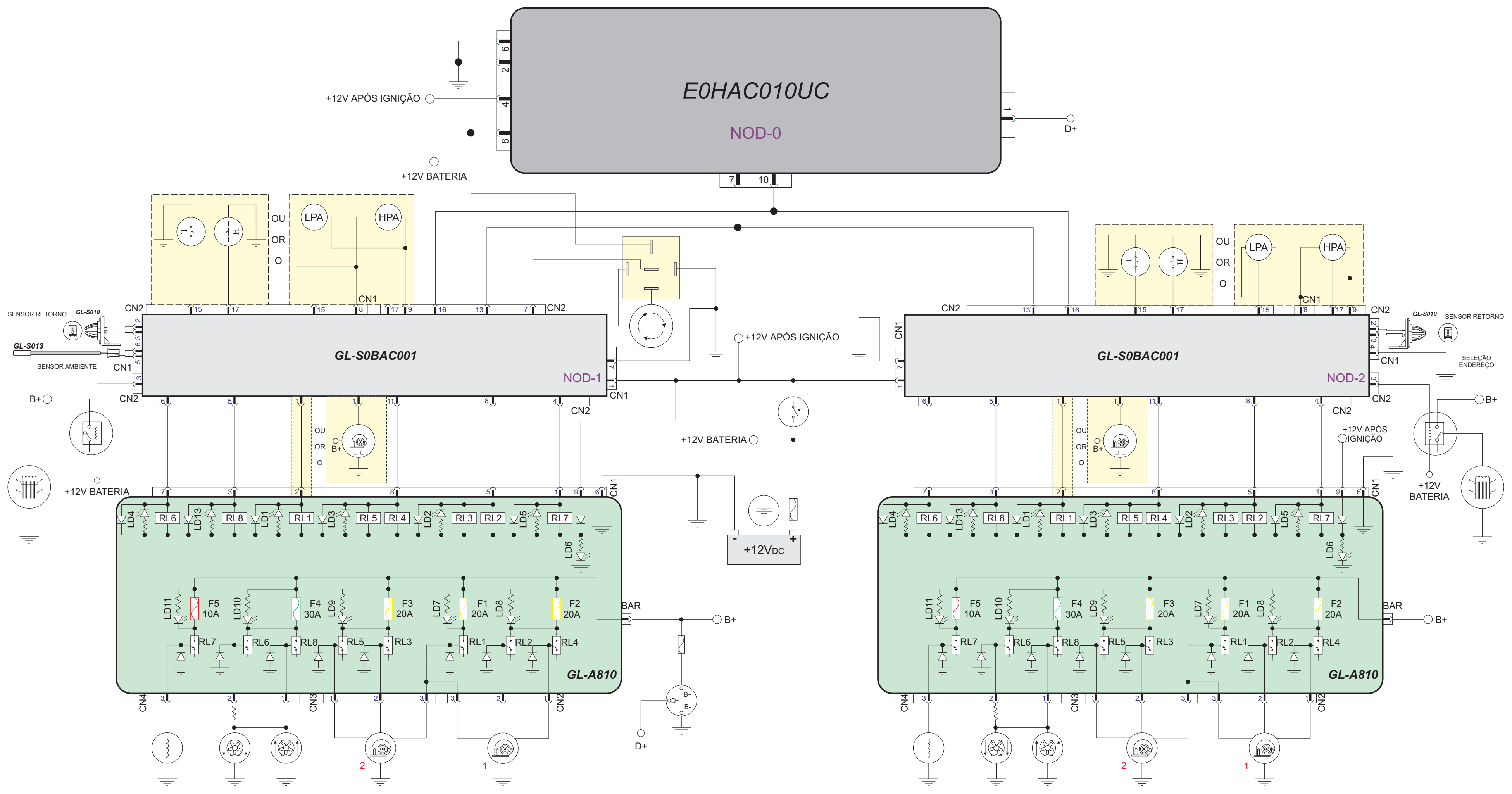
SCALE: NTS | SHEET 1 OF 3

5 4 3 2 1

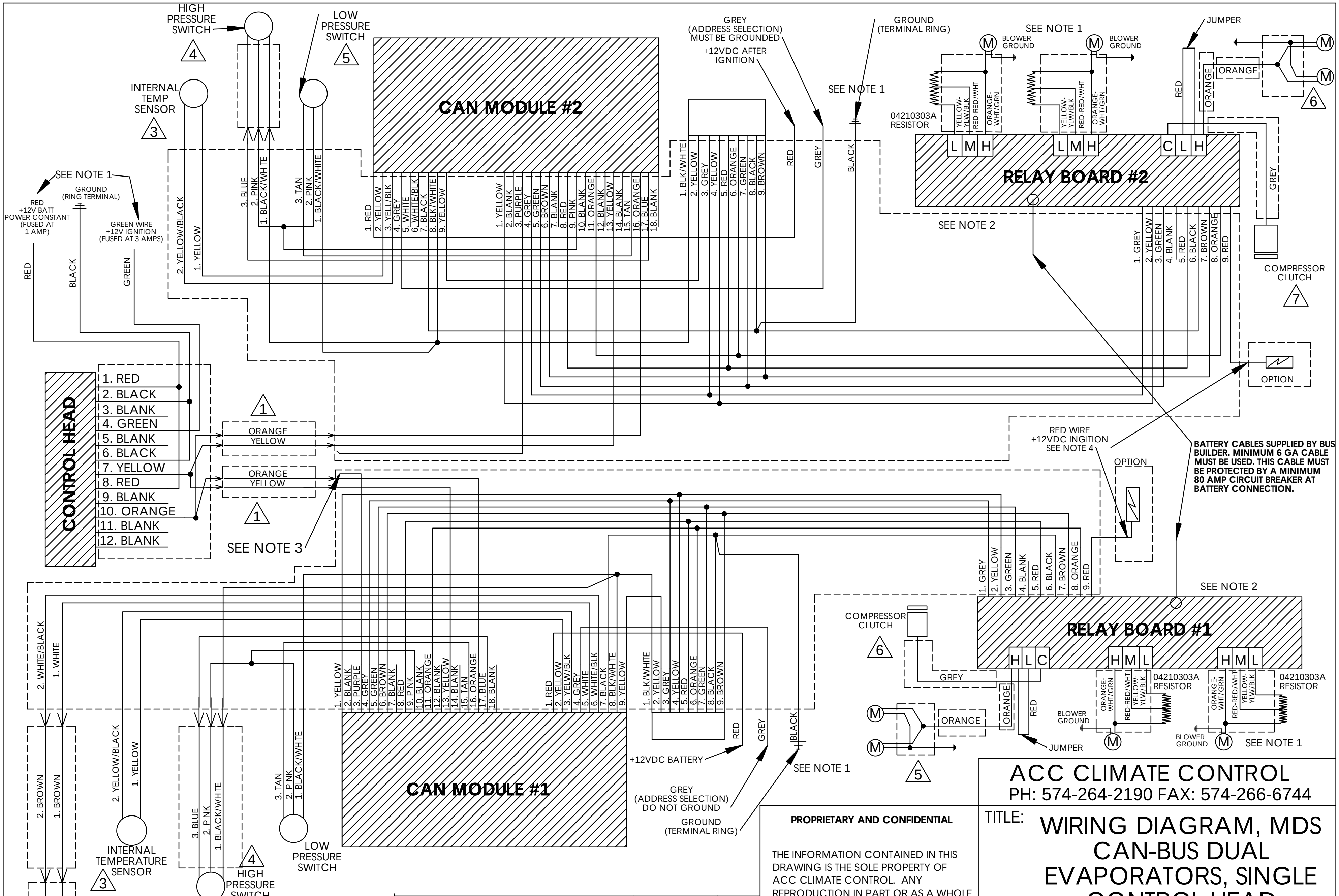
POR TRATAR-SE DE EQUIPAMENTO DE CONTROLE ELÉTRICO COM COMUTAÇÃO DE ALTA CORRENTE, É INDISPENSÁVEL QUE ESTEJA INSTALADO EM LOCAL COM VENTILAÇÃO ADEQUADA, NÃO ENCLAUSURADO, LONGE DE TUBULAÇÕES DE COMBUSTÍVEIS E / OU INFLAMÁVEIS, SOB RISCO DE INCÊNDIO / EXPLOSÃO. ESTE EQUIPAMENTO NÃO TEM PROTEÇÃO CONTRA ÁGUA. JATOS E / OU RESPINGOS PODEM DANIFICÁ-LO.

BECAUSE THIS IS AN ELECTRICAL CONTROL EQUIPMENT WITH HIGH COMMUTING CURRENT, IT IS VERY IMPORTANT TO BE INSTALLED AT A VENTILATED, OPEN SPACE, FAR FORM FUEL / FLAMMABLE MATERIAL, PIPELINES UNDER THE RISK OF FIRE / EXPLOSION. THIS EQUIPMENT IS NOT PROTECTED AGAINST WATER. JETS OR SPLASHES OF WATER MAY DAMAGE IT.

ESTE EQUIPO DE CONTROLE ELÉCTRICO TIENE COMUTACIÓN DE ALTA CORRIENTE, POR ESO ES INDISPENSABLE QUE ESTÉ INSTALADO EN LOCAL CON VENTILACIÓN ADECUADA, NO CERRADO, LEJOS DE TUBULACIONES DE COMBUSTIBLES Y / O INFLAMABLES BAJO RIESGO DE INCENDIO / EXPLOSIÓN. ESTE EQUIPO NO TIENE PROTECIÓN CONTRA AGUA; CHORROS Y / O RESPINGOS PUEDEN DAMNIFICARLO.



GLOBUS SISTEMAS ELETRÔNICOS LTDA.					
PRODUCT:	GL-S0BAC001				
DOC.:	ELECTRICAL SCHEME			REV.: 10	
DOCUMENT: EL-0965	AUTHOR: GR	FILE:	S0BAC001-10PES.CDR		
APPROVED:	RS	DATE: 23/10/2012	PAGE:	05 OF 09	



NOTE:
1.) GROUNDS MUST TERMINATE TO CHASSIS GROUND AND AS CLOSE AS POSSIBLE TO COMPONENT TO AVOID VOLTAGE LOSS. I AMP AND 3 AMP FUSE AND 80 AMP CIRCUIT BREAKER PROTECTION PROVIDED BY BODY BUILDER PER CUSTOMERS SPECIFICATION
2.) RELAY BOARD GROUND MUST BE SEPARATE FROM AND NOT IN COMMON WITH ALL OTHER CHASSIS GROUNDS.
3.) HEAT SIGNAL WIRE- GROUND SIGNAL RELAY MUST BE ADDED FOR AUX COMPONENTS.
4.) WIRE MUST BE HOOKED TO +12VOLT AFTER IGNITION. FUSED @ 5 AMPS. MAY BE HOOKED TO BATTERY FEED 6GA IF IGNITION CONTROLLED.

REVISIONS	DATE	ECR
---	---	---
---	---	---
ADDED +12V BATTERY NOTES + FUSE	10/7/14	---
REMOVED LOW SPD CND FAN JUMPER + RES.	9/30/14	8520
RELEASED	4/29/14	4237

PROPRIETARY AND CONFIDENTIAL

	NAME	DATE
DRAWN	MAR	10/7/14

ACC CLIMATE CONTROL
PH: 574-264-2190 FAX: 574-266-6744

TITLE: WIRING DIAGRAM, MDS CAN-BUS DUAL EVAPORATORS, SINGLE CONTROL HEAD

SIZE: A
DWG. NO. 3104257725A
REV

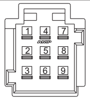
SCALE: NTS

5 4 3 2 1

POR TRATAR-SE DE EQUIPAMENTO DE CONTROLE ELÉTRICO COM COMUTAÇÃO DE ALTA CORRENTE, É INDISPENSÁVEL QUE ESTEJA INSTALADO EM LOCAL COM VENTILAÇÃO ADEQUADA, NÃO ENCLAUSURADO, LONGE DE TUBULAÇÕES DE COMBUSTÍVEIS E / OU INFLAMÁVEIS, SOB RISCO DE INCÊNDIO / EXPLOSÃO. ESTE EQUIPAMENTO NÃO TEM PROTEÇÃO CONTRA ÁGUA. JATOS E / OU RESPINGOS PODEM DANIFICÁ-LO.

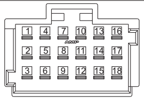
P

CN1



1 - + 12VDC APÓS IGNIÇÃO
2 - SENSOR DE RETORNO
3 - SENSOR DE RETORNO
4 - SELEÇÃO DE ENDEREÇO
5 - SENSOR AMBIENTE
6 - SENSOR AMBIENTE
7 - GND
8 - GND SENSOR PRESSÃO/ SENSOR DE RETORNO 2
9 - GND SENSOR PRESSÃO/ SENSOR

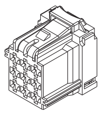
CN2



1 -EVAPORADOR BAIXO/PWM
2 -N.C.
3 -AQUECIMENTO
4 -COMPRESSOR
5 -CONDENSADOR ALTO
6 -CONDENSADOR BAIXO
7 -RENOVAÇÃO DE AR
8 -EVAPORADOR MÉDIO
9 -+5V
10 -N.C.
11 -EVAPORADOR ALTO
12 -N.C.
13 -CAN H
14 -N.C.
15 -SENSOR DE PRESSÃO (LPA)
16 -CAN L
17 -SENSOR DE PRESSÃO (HPA)
18 -N.C.

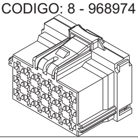
CONECTOR MCP AMP
9 VIAS PARA CABO

CODIGO: 8 - 968971 - 1



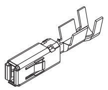
CONECTOR MCP AMP
18 VIAS PARA CABO

CODIGO: 8 - 968974 - 1



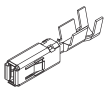
MCP AMP TERMINAL
PARA CABO

CABO (mm²)	PIN CÓD.
1,0	1 - 968851 - 1



MCP AMP TERMINAL
PARA CABO

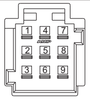
CABO (mm²)	PIN CÓD.
1,0	1 - 968851 - 1



BECAUSE THIS IS AN ELECTRICAL CONTROL EQUIPMENT WITH HIGH COMMUTING CURRENT, IT IS VERY IMPORTANT TO BE INSTALLED AT A VENTILATED, OPEN SPACE, FAR FORM FUEL / FLAMMABLE MATERIAL, PIPELINES UNDER THE RISK OF FIRE / EXPLOSION. THIS EQUIPMENT IS NOT PROTECTED AGAINST WATER. JETS OR SPLASHES OF WATER MAY DAMAGE IT.

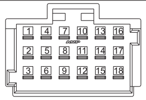
E

CN1



1 - + 12VDC AFTER IGNITION
2 - RETURN SENSOR
3 - RETURN SENSOR
4 - ADDRESS SELECTION
5 - ENVIROMENT SENSOR
6 - ENVIROMENT SENSOR
7 - GND
8 - GND PRESSURE SENSOR/ RETURN SENSOR 2
9 - N.C./ RETURN SENSOR 2

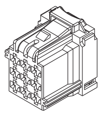
CN2



1 -LOW SPEED BLOWER
2 -N.C.
3 -HEATING
4 -COMPRESSOR
5 -HIGH SPEED CONDENSOR
6 -LOW SPEED CONDENSOR
7 -FRESH AIR
8 -MEDIUM SPEED BLOWER
9 -+5V
10 -N.C.
11 -HIGH SPEED BLOWER
12 -N.C.
13 -CAN H
14 -N.C.
15 -PRESSURE SENSOR (LPA)
16 -CAN L
17 -PRESSURE SENSOR (HPA)
18 -N.C.

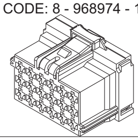
MCP AMP HOUSING
9 WAYS TO CABLE

CODE: 8 - 968971 - 1



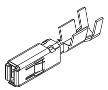
MCP AMP HOUSING
18 WAYS TO CABLE

CODE: 8 - 968974 - 1



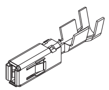
MCP AMP TERMINAL
TO CABLE

CABLE (mm²)	PIN CODE
1,0	1 - 968851 - 1



MCP AMP TERMINAL
TO CABLE

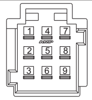
CABLE (mm²)	PIN CODE
1,0	1 - 968851 - 1



ESTE EQUIPO DE CONTROLE ELÉCTRICO TIENE COMUTACIÓN DE ALTA CORRIENTE, POR ESO ES INDISPENSABLE QUE ESTÉ INSTALADO EN LOCAL CON VENTILACIÓN ADECUADA, NO CERRADO, LEJOS DE TUBULACIONES DE COMBUSTIBLES Y / O INFLAMABLES BAJO RIESGO DE INCENDIO / EXPLOSIÓN. ESTE EQUIPO NO TIENE PROTECIÓN CONTRA AGUA; CHORROS Y / O RESPINGOS PUEDEN DAMNIFICARLO.

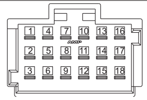
S

CN1



1 - + 12VDC LUEGO IGNICIÓN
2 - SENSOR DE RETORNO
3 - SENSOR DE RETORNO
4 - SELECCIÓN DE LA DIRECCIÓN
5 - SENSOR AMBIENTE
6 - SENSOR AMBIENTE
7 - GND
8 - GND SENSOR DE PRESSIÓN/ SENSOR DE RETORNO 2
9 - N.C./ SENSOR DE RETORNO 2

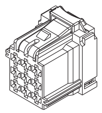
CN2



1 -EVAPORADOR VELOCIDAD BAJA
2 -N.C.
3 -CALENTAMIENTO
4 -COMPRESSOR
5 -CONDENSADOR ALTO
6 -CONDENSADOR BAJO
7 -RENOVACIÓN DI AIRE
8 -EVAPORADOR VELOCIDAD MEDIA
9 -+5V
10 -N.C.
11 -EVAPORADOR VELOCIDAD ALTA
12 -N.C.
13 -CAN H
14 -N.C.
15 -SENSOR DE PRESSIÓN (LPA)
16 -CAN L
17 -SENSOR DE PRESSIÓN (HPA)
18 -N.C.

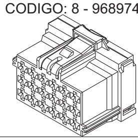
CONECTOR MCP AMP
9 VIAS PARA CABO

CODIGO: 8 - 968971 - 1



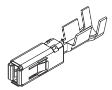
CONECTOR MCP AMP
18 VIAS PARA CABO

CODIGO: 8 - 968974 - 1



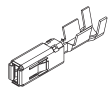
MCP AMP TERMINAL
PARA CABO

CABO (mm²)	PIN CÓD.
1,0	1 - 968851 - 1



MCP AMP TERMINAL
PARA CABO

CABO (mm²)	PIN CÓD.
1,0	1 - 968851 - 1



GLOBUS SISTEMAS ELETRÔNICOS LTDA.

PRODUTO:	GL-S0BAC001		
DOC.:	CONEXÕES/CONNECTIONS/CONEXIONES	REV.:	10
DOCUMENTO: EL-0965	AUTOR: GR	ARQUIVO:	S0BAC001-10PES.CDR
APROVADO:	RS	DATA: 23/10/2012	PÁGINA: 03 DE 09

TODAS AS MEDIDAS ESTÃO EM MILÍMETROS
P - PORTUGUÊS

ALL DIMENSIONS ARE IN MILIMETERS
E - ENGLISH

TODAS LAS DIMENSIONES SON EN MILÍMETROS
S - ESPAÑOL

TABELA DE SÍMBOLOS AUXILIARES ***AUXILIARY SYMBOLS' CHART*** ***TABLA DE SÍMBOLOS AUXILIARES***

P - BATERIA
E - BATTERY
S - BATERÍA

P - ALTERNADOR
E - GENERATOR
S - ALTERNADOR

P - RELÉ EXTERNO
E - EXTERNAL RELAY
S - RELE EXTERNO

P - RELÉ
E - RELAY
S - RELE

P - CONDENSADOR VELOCIDADE ALTA
E - HIGH SPEED CONDENSER
S - CONDENSADOR VELOCIDAD ALTA

P - EVAPORADOR VELOCIDADE ALTA
E - HIGH SPEED BLOWER
S - EVAPORADOR VELOCIDAD ALTA

P - CALEFAÇÃO DE TETO
E - ROOF HEATING
S - CALEFACIÓN DE TECHO

P - SENSOR TEMPERATURA INTERNA
E - INTERNAL TEMPERATURE SENSOR
S - SENSOR TEMPERATURA INTERNA

P - COMUNICAÇÃO 1
E - COMMUNICATION 1
S - COMUNICACIÓN 1

P - CORTINA DE AR
E - AIR FLOW BARRIER
S - CORTINA DE AIRE

P - RESISTOR
E - RESISTOR
S - RESISTOR

P - CONVECTOR VELOCIDADE BAIXA
E - CONVECTOR LOW SPEED
S - CONVECTOR VELOCIDAD BAJA

P - PRÉ-AQUECIMENTO.
E - PRE HEATING
S - CONVECTOR VELOCIDAD BAJA

P - COMUNICAÇÃO RS485
E - RS485 COMMUNICATION
S - COMUNICACIÓN RS485

P - GND
E - GROUND
S - TIERRA

P - DIODO
E - DIODO
S - DIODO

P - CHAVE DE IGNIÇÃO
E - IGNITION SWITCH
S - LLAVE

P - CONTATO DE RELÉ
E - RELAY CONTACT
S - CONTACTO RELE

P - CONDENSADOR VELOCIDADE BAIXA
E - LOW SPEED CONDENSER
S - CONDENSADOR VELOCIDAD BAJA

P - EVAPORADOR VELOCIDADE MÉDIA
E - MEDIUM SPEED BLOWER
S - EVAPORADOR VELOCIDAD MEDIA

P - CONVECTOR
E - CONVECTOR
S - CONVECTOR

P - SENSOR TEMPERATURA EXTERNA
E - EXTERNAL TEMPERATURE SENSOR
S - SENSOR TEMPERATURA EXTERNA

P - COMUNICAÇÃO 2
E - COMMUNICATION 2
S - COMUNICACIÓN 2

P - EDM
E - ENGINE INCREASE RPM
S - EDM

P - DEGELO
E - DEFROST
S - DESHIELO

P - MOTORISTA
E - DRIVER
S - MOTORISTA

P - COMPRESSOR PWM
E - PWM COMPRESSOR
S - COMPRESOR PWM

P - LÂMPADA
E - LAMP
S - LÁMPARA

P - + 12VDC / + 24VDC APÓS IGNIÇÃO
E - + 12VDC / + 24VDC AFTER IGNITION
S - + 12VDC / + 24VDC LUEGO IGNICIÓN

P - LED
E - LED
S - LED

P - PRESSOSTATO DE BAIXA
E - LOW PRESSURE SWITCH
S - LLAVE DE PRESSIÓN BAJA

P - CHAVE
E - SWITCH
S - LLAVE

P - CONDENSADOR VELOCIDADE VARIÁVEL
E - PWM SPEED CONDENSER
S - CONDENSADOR VELOCIDAD VARIABLE

P - EVAPORADOR VELOCIDADE BAIXA
E - LOW SPEED BLOWER
S - EVAPORADOR VELOCIDAD BAJA

P - BOMBA D'ÁGUA
E - WATER PUMP
S - BOMBA DE AGUA

P - SENSOR TEMPERATURA DO DUTO
E - DUCT TEMPERATURE SENSOR
S - SENSOR TEMPERATURA DO DUCTO

P - COMUNICAÇÃO 3
E - COMMUNICATION 3
S - COMUNICACIÓN 3

P - RENOVAÇÃO DE AR (DAMPER)
E - FRESH AIR
S - RENOVACIÓN DE AIRE (DAMPER)

P - CONVECTOR VELOCIDADE ALTA
E - CONVECTOR HIGH SPEED
S - CONVECTOR VELOCIDAD ALTA

P - PASSAGEIRO
E - PASSENGER
S - PASAJERO

P - COMPRESSOR
E - COMPRESSOR
S - COMPRESOR

P - + 12VDC / + 24VDC BATERIA
E - + 12VDC / + 24VDC BATTERY
S - + 12VDC / + 24VDC BATERÍA

P - FUSÍVEL
E - FUSE
S - FUSÍBLE

P - PRESSOSTATO DE ALTA
E - HIGH PRESSURE SWITCH
S - LLAVE DE PRESSIÓN ALTA

P - TERMOSTATO DA SERPENTINA
E - ICE SWITCH
S - TERMOSTATO DE LA SERPENTINA

P - EMBREAGEM
E - CLUTCH
S - EMBRAGUE

P - EVAPORADOR VELOCIDADE VARIÁVEL
E - PWM SPEED BLOWER
S - EVAPORADOR VELOCIDAD VARIABLE

P - VÁLVULA DE AQUECIMENTO
E - HEATING VALVE
S - VALVULA DE CALENTAMIENTO

P - ALÍVIO
E - UNLOADER
S - ALIVIO

P - CORRENTE MÁXIMA
E - MAXIMUM CURRENT
S - MÁXIMA CORRIENTE

P - LÂMPADA DE EXCITAÇÃO
E - EXCITEMENT LAMP
S - LÁMPARA DE EXCITACIÓN

P - VÁLVULA DE LÍQUIDO
E - LIQUID VALVE
S - VÁLVULA DE LÍQUIDO

P - SENSOR TEMPERATURA SERPENTINA
E - ICE TEMPERATURE SENSOR
S - SENSOR TEMPERATURA SERPENTINA

P - CONEXÃO USB
E - USB CONNECTION
S - CONEXIÓN USB

P - ENTRADA ANALÓGICA
E - ANALOG INPUT
S - ENTRADA ANALÓGICA

P - SAÍDA ANALÓGICA
E - ANALOG OUTPUT
S - SALIDA ANALÓGICA

P - SONALARME
E - BUZZER
S - SONALERME

P - MOTOR ELÉTRICO
E - ELECTRIC ENGINE
S - MOTOR ELÉCTRICO

P - IGNIÇÃO MOTOR DIESEL
E - DIESEL ENGINE IGNITION
S - IGNICIÓN MOTOR DIESEL

P - VARISTOR
E - VARISTOR
S - VARISTOR

P - ENTRADA DIGITAL
E - DIGITAL INPUT
S - ENTRADA DIGITAL

P - SAÍDA DIGITAL
E - DIGITAL OUTPUT
S - SALIDA DIGITAL

P - VÁLVULA DO FLAP DO MOTORISTA
E - DRIVER FLAP VALVE
S - VÁLVULA DEL FLAP DEL MOTORISTA

P - PISO SUPERIOR (ZONA 1)
E - HIGHER DECK (ZONE 1)
S - PISO SUPERIOR (ZONA 1)

P - PISO INFERIOR (ZONA 2)
E - LOWER DECK (ZONE 2)
S - PISO INFERIOR (ZONA 2)

P - TERMOSTATO DA ÁGUA
E - ENGINE WATER TEMPERATURE
S - TERMOSTATO DE LA AGUA

P - AQUECIMENTO
E - HEATING
S - CALENTAMIENTO