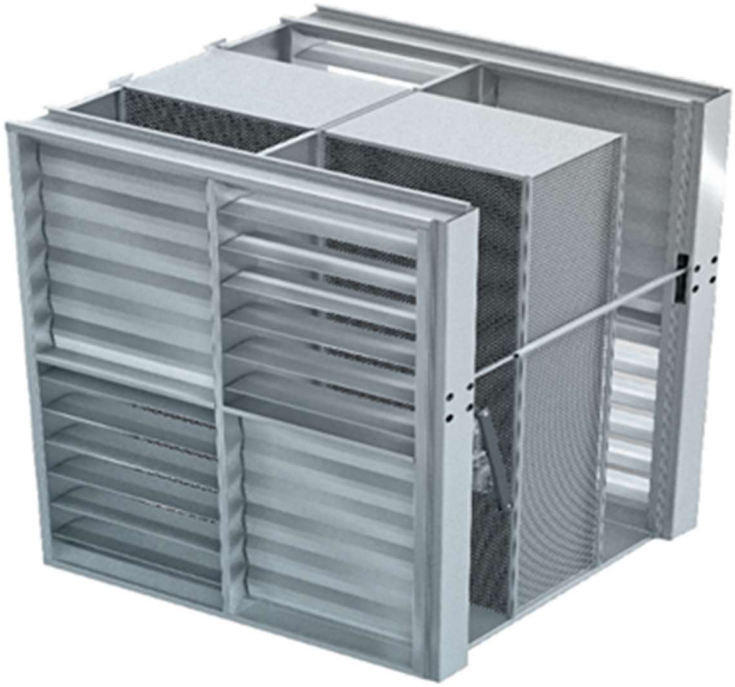
Rev 4_2023

ACCUBLOC

ENERGY RECOVERY SYSTEM



INSTALLATION AND OPERATION MANUAL

1385, Lionel-Boulet Blvd, Varennes, Québec J3X 1P7 • Toll free: 1 888 514-8007 • Tel: 438 338-1101 • www.nagasinnovation.com

CAUTION!

This instruction manual should be kept with the device and kept legible.

Hazard and risk identification is the first step in risk assessment, please read carefully:

	**DANGER !**	Indicates a situation of imminent risk that, if not avoided, will result in death or serious injury.
	**WARNING !**	Indicates a potentially risky situation that, if not avoided, could result in death or serious injury.
	**CAUTION !**	Indicates a potentially risky situation that, if not avoided, can result in bodily injury or property damage.
	**NOTICE !**	Indicates special instructions for installation, operation or maintenance that are important but are not related to bodily injury or property damage.

- **Before you begin installing the device, read, understand and follow all the instructions given in this manual, including all safety precautions and warnings.**
- **This device is connected to high voltages and contains parts that can move unexpectedly.**
- **Never open the access doors to the device while it is running.**
- **The unit must be securely and properly grounded.**
- **An electric shock, serious injury or death could occur if the instructions given in this manual are not followed.**
- **Always unplug and lock the power supply before maintaining this equipment. All work must be done by a qualified technician.**
- **<u>DO NOT BYPASS LOCK OR SAFETY SWITCHES UNDER ANY CIRCUMSTANCES.</u>**

SUMMARY

NOTICE: The features, characteristics, illustrations, and description of this document were, to the best of our knowledge, accurate at the time of printing. We reserve the right to modify or stop offering certain features as well as to stop producing a given model without notice or commitment on our part. For more information, please contact.

1. CODE AND REGULATION

This product is intended for installation by original equipment manufacturers (OEM) of listed HVAC equipment. This recovery unit is designed for industrial or commercial use only. The installation must comply with the latest laws, regulations, and electrical code C22.1/ NFPA 70. All inside and outside electrical installation must comply with the unit's electrical diagrams.

The electrical and air flow ratings are described on the rating plate applied on the unit. Following these rating is mandatory for a safe usage and performance of the unit.

- Installation, alteration, setting or improper maintenance can cause property damage, injury, or death. Carefully read the installation, start-up, and maintenance instruction before installing or repairing the unit.

2. GENERAL INFORMATION

2.1. INTRODUCTION

This manual has been made to simplify the installation, maintenance, and the operation of this equipment. The strict application of these instructions will ensure the conformity of the installation to **Nagas Innovation Inc.** recommendations**.**

The application of the instructions given in this manual is one of the conditions of the warranty, however it does not guarantee at any time conformity with the applicable laws, rules, codes, and regulations of the country of destination of the equipment installed.

2.2. RESPONSIBILITY

This equipment must be used expressly for the purpose for which **Nagas Innovation Inc.** has designed and manufactured it. Any contractual liability of **Nagas Innovation Inc.** is therefore excluded in case of injury to persons, animals or damage caused to goods, following errors in installation, settings, maintenance, or inappropriate use.

Nagas Innovation Inc. is responsible for the conformity of the device to the codes and standards of construction in force at the time of sale. Knowledge and respect for the legal provisions as well as the standards inherent in the design, implantation, installation, commissioning, or maintenance are exclusively the responsibility of the installer or integrator.

Be advised that this manual does not cover all possibilities, situations, or eventualities. Regular service is necessary to ensure proper and safe operation of this equipment. If you have any doubts about performing these tasks yourself, you should hire a qualified specialist. Negligence in maintenance can cause failure of the

equipment, property damage and/or harm to the building occupants and will void the warranty of the equipment.

2.3. RECEPTION & STORAGE

Immediately upon receipt of the equipment, check the crating and contents for any damage that may have occurred during the shipment. Inspect protective covers for perforations or other signs of damage. Remove protective covers and check for external damage.

All the units that leave our factory are tested and carefully inspected immediately prior to shipping to ensure that they are in good operating condition at that time. Check the packing slip to make sure that all loose parts for field installation were received. If damages are found or parts are missing, please contact your local authorized distributor or call factory.

If the equipment is to be stored prior to assembly in an HVAC unit or installation on site, you must observe the following precautions:

- Store in a well-drained and dry area that will not accumulate surface water to prevent damage by moisture from wet ground, dew, or rain.
- Do not store where the equipment could be physically damaged.
- Make sure that all protective coverings that were provided for shipping are not damaged and are properly installed over the equipment.
- The entire perimeter and any full height cross members of the unit must be supported by a level surface and the supporting surface must be adequate for supporting the entire weight of the unit.
- Do not stack split unit sections one over the other for storage purpose.

2.4. LIMITED GENERAL WARRANTY

Subject to the terms and conditions hereof, we will warrant against any defect in material or workman ship:

a) During a period of twelve (12) months from the date the Accubloc product (the "**Product**") begins to be used (the "**Product's Date of First Use**"), or eighteen (18) months from the date the Product has been delivered by **Nagas Innovation Inc.**'s factory (the "**Product's Date of Delivery**"), whichever occurs first, the full value of any component part(s) of our Product.
b) For a period of two (2) years, the proportionate value of all electrical part(s) of our Product.
c) For a period of five (5) years, the proportionate value of all moving part(s) of our Product.
d) For a period of ten (10) years, the proportionate value of the heat bank of our Product.

The proportionate value found in paragraph b), c) and d) above shall be calculated over a period begin at the expiry date of a period of twelve (12) months from the Product's Date of First Use, or of eighteen (18) months from the Product's Date of Delivery, whichever occurs first (the "**Start Date**"). The proportionate value will be prorated based upon the number of years that will have elapsed between the Start Date and the date on which a claim is submitted to **Nagas Innovation Inc.**, divided by the maximum warranty period found in paragraph b), c) and d) above. There are no proportional calculations for partial years.

We will supply you with any part(s) of our Product and for the period found in paragraphs a) to d) above on which a credit corresponding to the value under warranty will be granted. Replacement part(s) supplied under a full value warranty will be warranted for the balance of our Product's original warranty. Replacement part(s) supplied under a proportionate value warranty will be warranted for the duration of our Product warranty effective at the time. The part(s) to be replaced must be available in exchange for the replacement part(s). Any labor, material, transportation, freight, or other charges incurred in connection with the performance of this

warranty will be the responsibility of the owner at the hourly rates and prices then in force. This limited warranty is only applicable to new and unused Products purchased from us or from our authorized distributors, provided that our user instructions contained in our user guide have been adhered to. You recognize and understand that our obligation is limited to replacing the part found to be defective and that you have no further recourse against us.

THIS WARRANTY DOES NOT COVER

(a) damages caused by accident, abuse, negligence, misuse, riot, fire, flood or Acts of God; (b) damages caused by operating the Product in a corrosive atmosphere; (c) damages caused by any unauthorized alteration or repair of the system affecting the Product's reliability or performance; (d) damages caused by improper matching or applications of the Product or the Product's components; (e) damages caused by failing to provide routine and proper maintenance or service to the Product; (f) expenses incurred for erecting, disconnecting or dismantling the Product; (g) parts used in connection with normal maintenance, such as filters or belts; (h) Products no longer at the site of the original installation; (i) Products installed or operated other than in accordance with the printed instructions, with the local installation or building codes or with good trade practices; (j) Products lost or stolen.

No one is authorized to change this WARRANTY or to create for us or on our behalf any other obligation or liability in connection with our Product(s). There is no other representation, warranty, or condition in any respect, expressed or implied, made by or binding upon us other than the above, nor will we be liable in any way for incidental, consequential, or special damages, however caused, such as but not limited to: loss of productivity, damages caused by delays, loss of profits and management time.

RETAIN THIS WARRANTY IN YOUR FILES FOR FUTURE REFERENCE

This warranty is expressly given and accepted in lieu of all other warranties, expressed or implied, including without any limitation any warranty of merchantability or fitness for a particular purpose. Some states/provinces do not allow for the disclaimers, limitations and exclusions identified above; as a result, they may not apply to you.

2.5. PARTS, REPAIRS AND MAINTENANCE

Any replacement part must be the same as or an approved alternate to the original part supplied. The replacement part must meet the original's specification in terms of functionality including certifications, timing, input and output range, accuracy, and operation. Failure to replace parts or components with equivalent parts can cause equipment failure, equipment damage, injury, or death, and can void the warranty of the equipment.

When contacting **Nagas Innovation Inc.** customer service (or an authorized distributor) for parts, repairs or service please be ready to provide the Model Number, Serial Number, Date of installation and/or Nature of failure along with the description of the parts required. Be advised that some parts may not be stocked items, that these parts must be made or ordered; variable delays can be expected depending on the nature of the equipment damage or defective part.

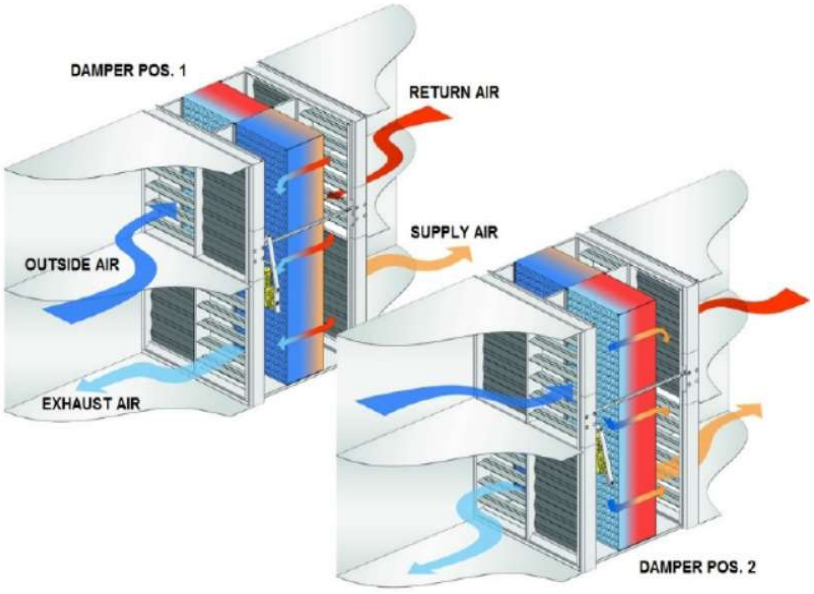
DANGER !

Always unplug the power supply before working on or near this equipment. Lock and label the disconnect switch or circuit breaker to prevent accidental power on.

When servicing the unit, the internal components may be hot. Allow time for cooling before maintenance.

3. OPERATING PRINCIPLE

Accubloc is a high efficiency energy recovery system with heat banks that store and discharge energy between the two airstreams in a cyclical manner, either with over/under or side-by-side arrangements. At all time half the dampers is closed, the other half is opened. All dampers move at once according to the following steps.

Example: Winter operation – Over/Under ducting installation	
<u>Damper position #1 :</u> The heat bank on the left is being discharged with heat. The outside air coming from the top-left damper on the front of recovery unit is heated up to the supply air duct. The heat bank on the right is being loaded with heat by the return air from the upper right damper. Return air is cooled and exits through the exhaust duct. <u>Damper position #2 :</u> The two heat banks reverse their functions and outside air is now coming from the top right damper of the recovery unit.	 (Image shown for reference only)

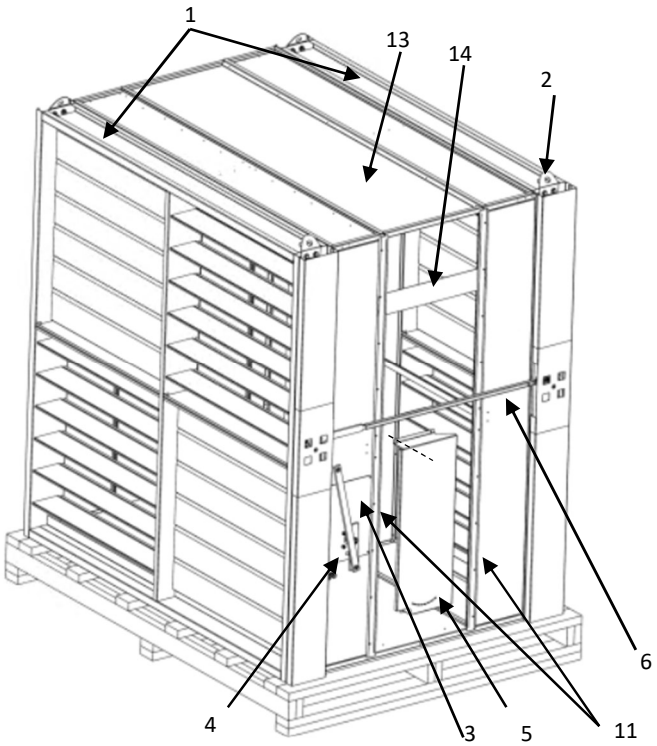
A control system changes the damper positions following different mode and modulation signal. The action is fast (<1 second approx.) but the time between the two positions can vary from 20 to 120 seconds in maximum recovery mode or 60 minutes steady in minimum recovery mode. (See sequence of operation section 12)

WARNING !

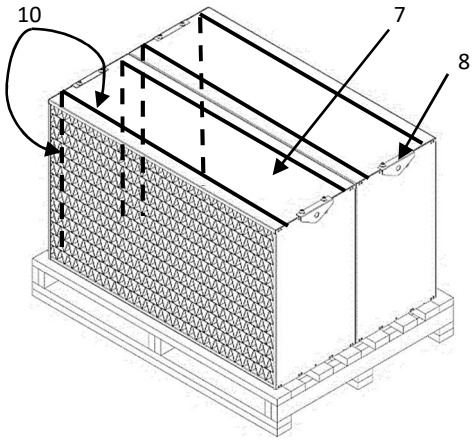
The motor, linkage and dampers can move suddenly without notice. Injury or death can result from crushing. Always keep a safe distance with the unit and close electrical power when servicing.

4. UNIT DESCRIPTION

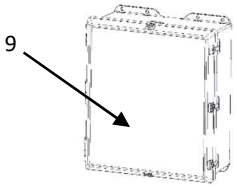
Unit casing



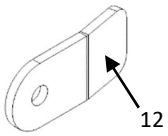
Heat banks



Control panel



part K1093



1. 2x Walls made of 4 dampers each.
2. 4x Unit lifting lugs. Can be removed if necessary.
3. 1x Motor support plate. Clockwise rotation if the motor is on the left side panel. Reverse the rotation if it is located on the right side. Supplied with 15 feet of power cables.
4. 1x Damper position sensor. Must be at 4 mm gap distance for optimal sensing. Supplied with 15-feet cable.
5. 1x protective guard. To be removed for inspection or maintenance only.
6. 1x Linkage rod. Mechanical link between the two dampers.
7. Heat banks. Quantity and size vary with each unit design.
8. 2x Heat bank lifting lugs. One set in each unit. Multiple use.
9. 1x Control Panel 16”x14”x6”. Install in controls section of OEM unit or in mechanical room.
10. Seals installed by others on 2 sides only. (supplied as a roll).
11. 2x Sealing tabs (1 on each side).
12. 2x Part K1093 To make the heat banks flush with the structure if they protrude from the structure.
13. 1x Top middle panel.
14. 1x Temporary front panel (temporary during cube installation only).

WARNING !

Do not use the casing lifting lugs after the heat banks are installed. They cannot support the additional weight of the heat banks.

5. INSTALLATION INSTRUCTIONS

5.1. GENERAL

.. WARNING !

The unit must be handled and assembled with care on a level floor. Improper handling or misalignment can cause premature wear or mechanical damage

- Both inlet and outlet air ducts must have a removable access panel. These panels shall be sized to permit inspection of the unit at start-up and on routine inspection.
- Allow 2 inches free space on the top and in front of unit facing for wirings routing.

5.2. UNPACKING

Prior to installation and before you start operating the equipment, you must remove packaging and shipping materials; it may include but are not limited to:

- Heat shrink protective film
- Wooden crate
- Lashing bolts, corner covers.

Always dispose of shipping and packaging materials in accordance with the respective local regulations so that they cannot cause any damage and/or pollution.

Make sure that all shipped-loose accessories for the installation are available. Make sure that all necessary equipment, tools, and manpower are available at the installation site.

5.3. LIFTING

The unit is built with removable lifting lugs (item #2 on page 9) specifically located to help proper lifting of the unit. Use lifting bars if necessary to maintain a vertical position of the slings and keep them away from the unit casing to prevent *scratches*, surface blemishes or other structural damages, especially to the aluminium core of the heat bank because it is very fragile and cannot be repaired. The lifting lugs are designed to be lifted vertically. The maximum angle allowed from a vertical lift is 15 degrees. All lifting lugs must be used at to distribute load properly and the equipment must be lifted simultaneously by all the lifting lugs.

NOTICE !

DO NOT use forklift to move on unit casing or unit floor. It can be easily damaged. Only lifting lugs are safe to handle the unit from the pallet.

CAUTION !

DO NOT HANDLE the unit by attaching hooks, jacks, slings, or chains to any component or parts protruding outside of the unit casing or base frame (except lifting lugs for vertical lifting only) otherwise it may result in equipment damage, incorrect system operation or personal injury.

WARNING !

Injury or death can result from incorrect rigging and lifting. These maneuvers must be performed by qualified crane operator with proper equipment using appropriate and approved safety precautions.

The unit CANNOT be handled once assembled with the heat banks. This would result in damages and a high risk of injury

5.4. MOUNTING

WARNING !

This equipment must be MOUNTED LEVEL AND SECURED TO THE FLOOR to avoid operational problems. Make sure, beforehand, that the structure under the cubes is reinforced. A DEFLECTION OF THE FLOOR COULD HAVE A NEGATIVE IMPACT ON THE PROPER FUNCTIONING OF THE DAMPER BLADE.

5.5. CONTROL PANEL CONNECTION

A remote-control panel is supplied with the unit. The damper motor and sensor have a 15-feet long cables to connect the control panel remotely installed in the OEM's unit and in a controlled environment section.

All penetrations through the unit walls must be sealed to prevent air and/or water from entering/leaving the unit.

NOTICE !

DO NOT install ANYTHING that will interfere with access to equipment or specification labels.
The required voltage is listed on the specification label.
Follow the wiring diagram supplied with the equipment.
Field wiring by a qualified electrician is indicated by dotted lines on the wiring diagram. Solid lines indicate factory wiring.

5.6. ELECTRICAL INSTALLATION

The unit must be electrically grounded, and all wiring must be installed by a qualified electrician in accordance with the National Electrical Code (ANSI/NFPA-70) and/or the Canadian Electric Code (CSA C22.1) and to the approval of the authorities having jurisdiction.

Field wiring diagrams and internal wiring diagrams are included in the control cabinet. The power requirements are indicated on the rating label.

NOTICE !

When connecting to a three-phase power supply, check for the correct rotation of the damper motor. If the rotation is incorrect, reverse the rotation at the incoming power only. Follow the label arrow on the motor plate. All electrical conduit outlets in the control panel must be sealed to prevent moist building air from migrating to the control panel.

WARNING!

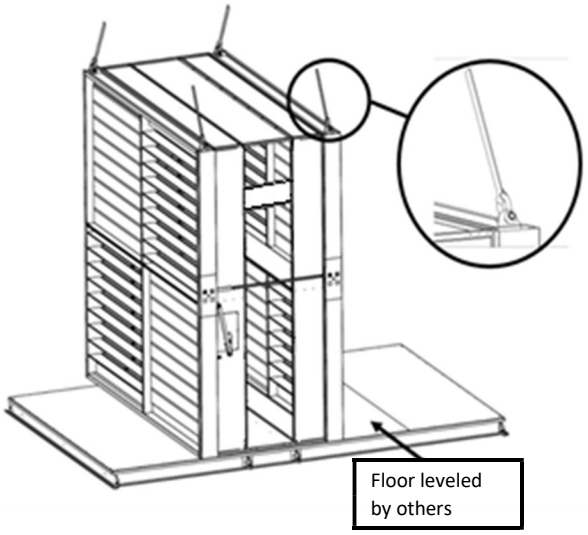
No unspecified and unapproved external load shall be added to the control transformer circuit or to the main power circuit without the written consent from Nagas Innovation Inc. or the warranty will be void.

6. ENERGY RECOVERY UNIT

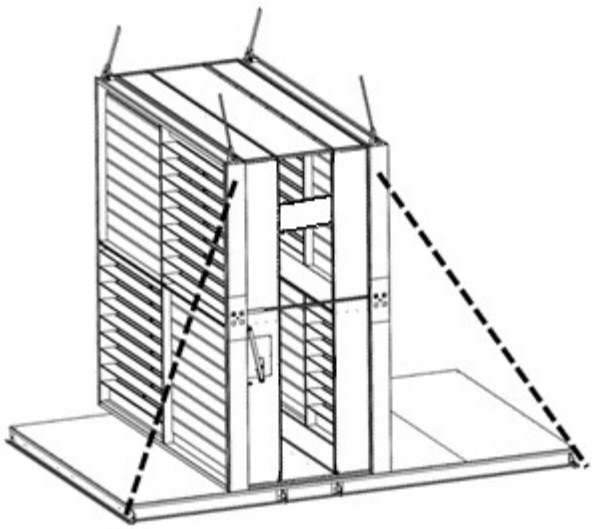
DANGER !

Improper installation, adjustment, alteration can cause serious injury, death, or property damages.

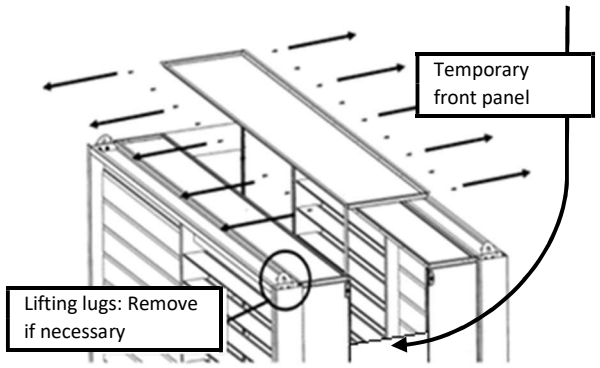
1. Install the casing on the level floor of the OEM unit (by others). Use lifting lugs for handling and installation.



2. Temporarily secure the shutter walls to stiffen the enclosure before removing the top panel.

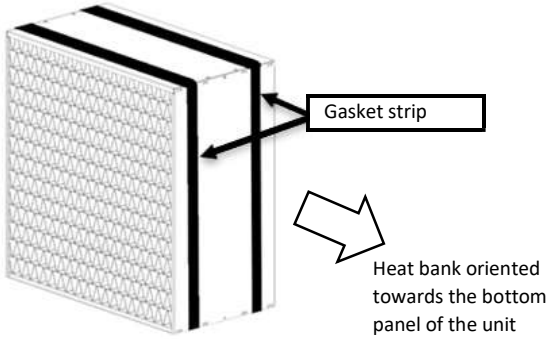


3. Remove the upper center panel and the two sealing tabs.

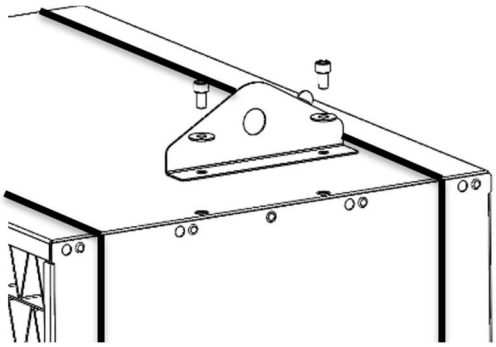


4. Lay the gasket strip on the 2 sides of the heat bank along the fold line.

<u>Note</u> : - Be careful not to stretch the gasket strip.

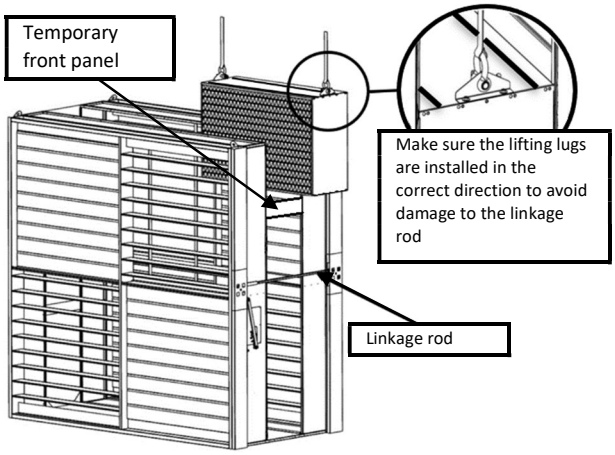


5. **Use the heat bank lifting lugs for installation into the enclosure (use the same assembly for all heat bank).**

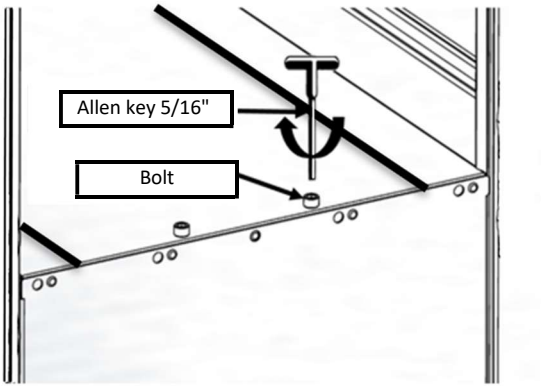


6. **Insert the heat bank, with the gasket strips sideways toward the back panel, through the front opening above the temporary front panel. Install the bottom row first.**

<u>Notes</u> : - If a heat bank protrudes forward, use part K1093 (see image on page 9) with the fold inwards to make it flush with the structure of the unit.
- You can use lubricant on the gaskets to make it easier to install the heat bank.

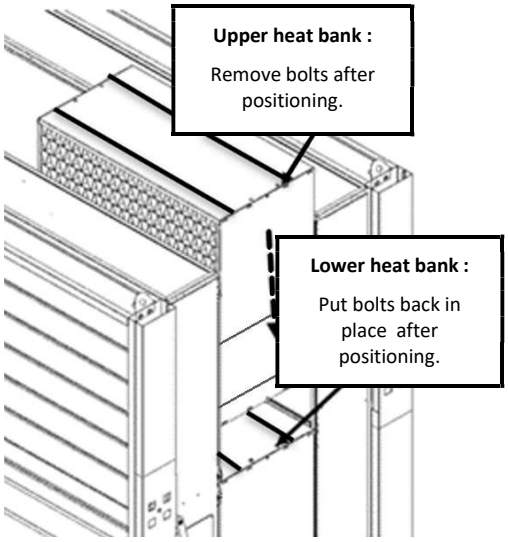


7. **Remove the lifting lugs and replace ONLY the bolts in place.**



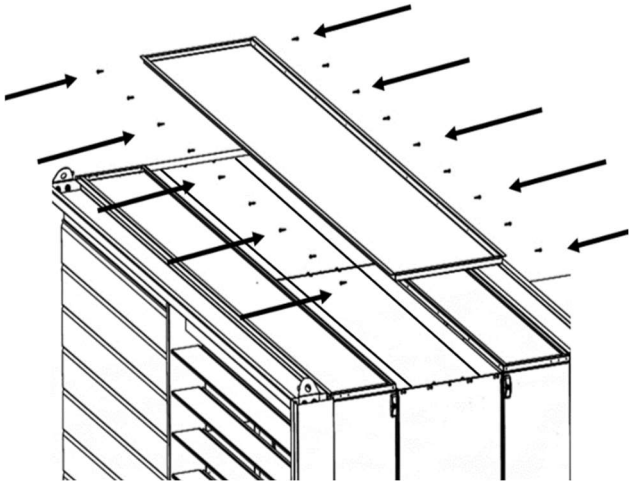
8. **Make sure the lifting bolts of the lower heat bank fit into the grooves underneath the upper heat bank. This will align the top heat banks and prevent movement during transport.**

<u>Note</u> : If a heat bank protrudes forward, use part K1093 (see image on page 9) with the fold inwards to make it flush with the structure of the unit.

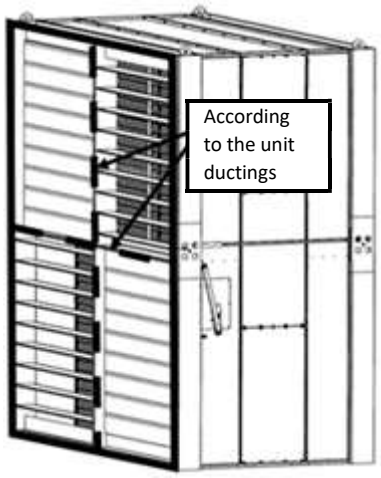


9. **Reinstall the upper center panel first and remove the temporary front panel afterwards. Install the two sealing tabs on each side to finish.**

<u>Note</u> : Keep the temporary front panel in case you need it in the future.

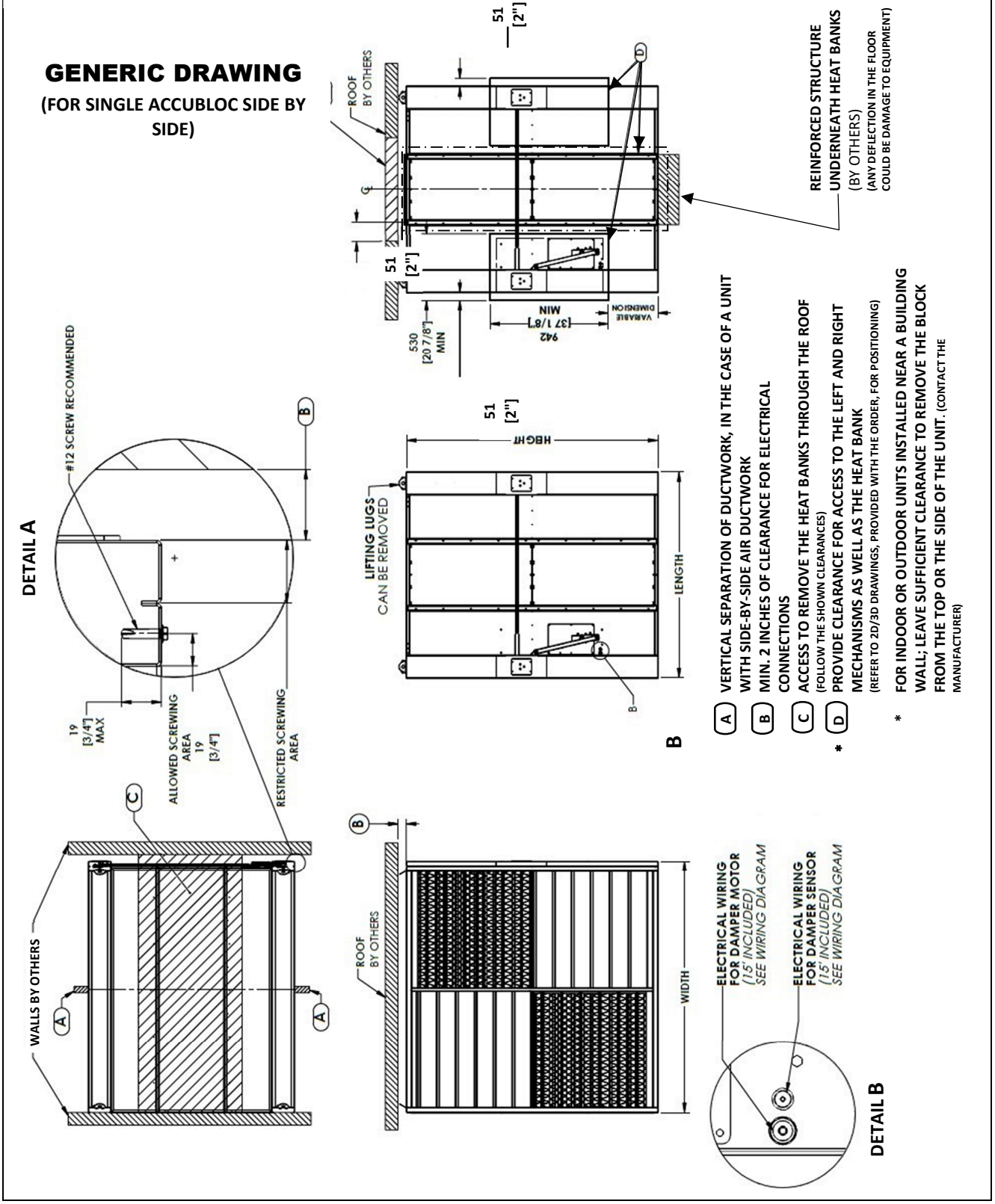


10. **Install a gasket (by other) on the outer frame and the middle frame according to the layout of the ducts (by other) or wall (by others)**



11. When constructing walls around the unit, follow the recommendations on this generic drawing for clearances and access doors. (Clearance for unit walls only)

*** For indoor or outdoor units installed near a building wall; leave sufficient clearance to remove the block from the top or the side of the unit (Contact the manufacturer.**



12. To remove the heat bank, follow the steps in the reverse order of assembly.

7. ELECTRICAL CONTROLS

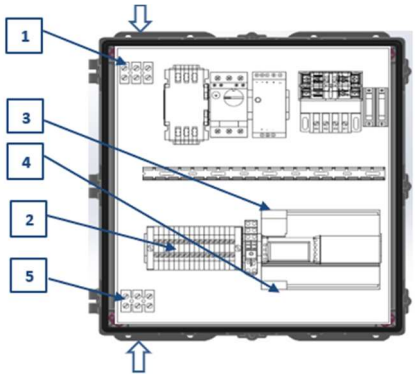
WARNING !

All electrical connections must be performed by a qualified electrician in accordance with the electrical diagram provided with the unit following applicable local laws and regulations. Also refer to Electrical codes CSA C22.1 for Canada and ANSI/NFPA #70 for the United States. The operating sequence described by the wiring diagrams or in the PLC should never be changed without the approval of the manufacturer.

Always use copper wires of the appropriate gauge and suitable for the application.

The unit is already pre-wired at the factory. Refer to the wiring diagram for the connections to be made at the installation:

Position #	Description of connections (by others)
1	Main power supply (see wiring diagram for current). **IMPORTANT**: *Always validate the motor rotation direction following the label on motor*
2	ON/OFF contact for recovery demand. It is recommended to wire the contact with an air proving switch to stop the unit when not necessary. Do not cycle this contact.
2	On/Off contact for minimum recovery mode. One cycle every 60 minutes for cleaning.
2	Dry contact for alarm feedback.
2	2-10 VDC modulation signal. See figure #1 in section 12 for more details.
3	Selectable BACnet IP communication (if used).
4	Selectable BACnet MS/TP communication (if used).
5	Damper motor from recovery unit.
2	Damper position sensor from recovery unit.



- The controller encloser must be mounted with screws within reach of the motor and sensor cable/lead. Pre-wiring cable is 15-feet long. For greater length, use equivalent wire specifications and an appropriate terminal block.
- For safety and maintenance purposes, provide an easy access circuit breaker switch.

8. START-UP INSTRUCTIONS

DANGER !

The following information should only be used by a qualified technician (with qualification cards) with knowledge in electricity and ventilation.

This unit is connected to high voltages and contains moving parts that can start unexpectedly. Electrical shock, severe injury or death could occur if instructions given in this manual are not followed. Always disconnect and lock out power before servicing this equipment. All work should be done by a qualified technician. DO NOT BYPASS ANY INTERLOCK OR SAFETY SWITCHES UNDER ANY CIRCUMSTANCES.

Proper commissioning of this equipment is the responsibility of the installing contractor. It is recommended that an air balance be completed before the unit start up by a certified air balancing contractor to ensure that the air volume being sent downstream of the unit into the ventilation system matches the unit rating label.

RECOMMENDED TOOLS

- Voltmeter
- 0-10 Vdc generator

Prior to delivery, all Accubloc systems are factory tested.
In order to perform a function test after installation, follow these steps:

- Make sure the control panel is completely wired with the correct input voltage (refer to wiring diagram).
- You can temporarily remove the protection panel (see section 4) in order to see the movement of the links and to inspect.

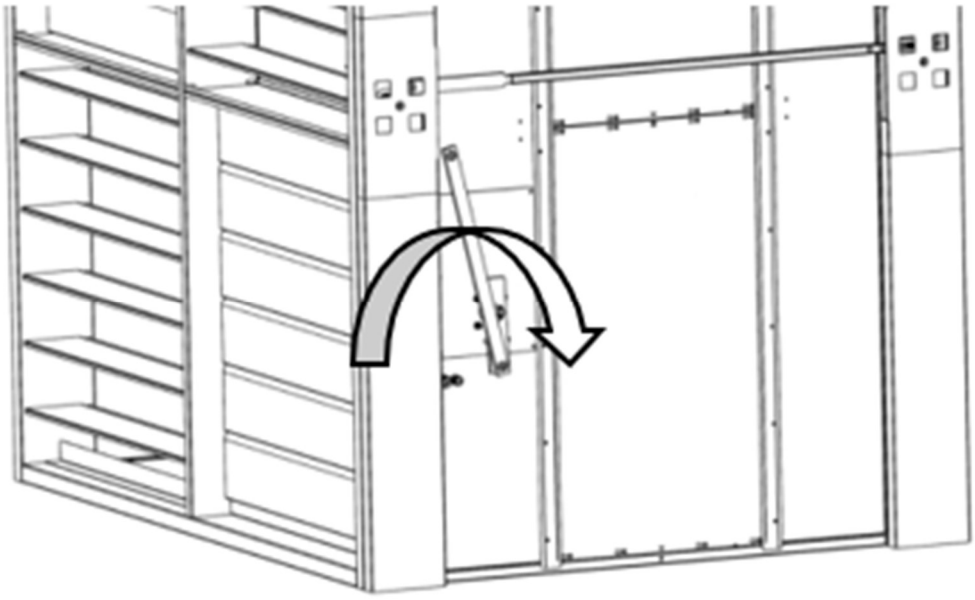
WARNING !

Always stand clear of the mechanism when the unit is powered. Spontaneous movements of components may occur. Reinstall panel before commissioning.

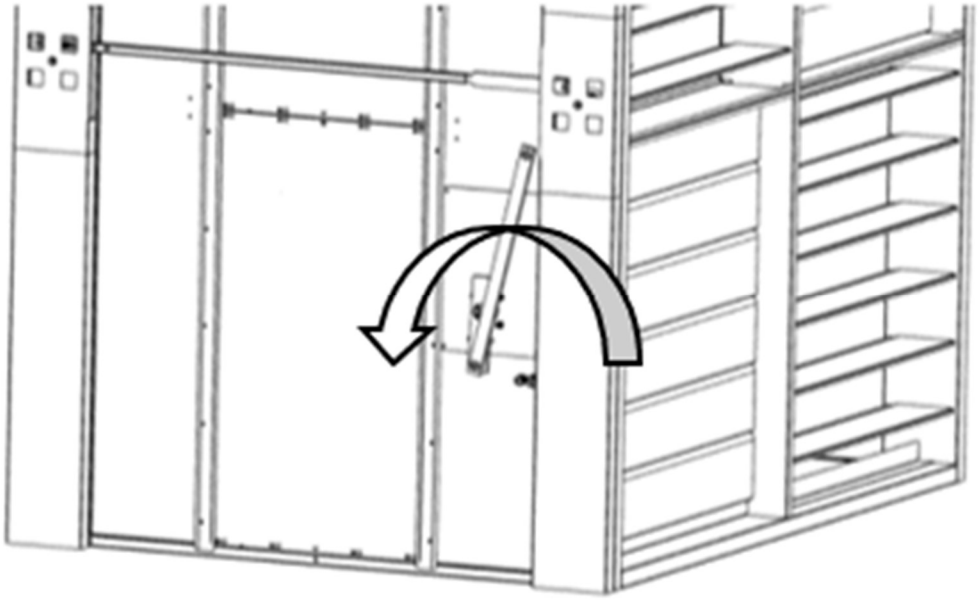
- Activate the ON/OFF contact with the OEM control system or with a jumper wire.
- Send a 0 Vdc modulating signal with the OEM unit controls or disconnect the 2-10Vdc signal wire to simulate 0 Vdc. The unit will operate with a 20 second cycle. A warning will be displayed, but the unit will continue to operate in safe mode.
- Observe the movement of damper blades and linkages. They must not interfere with the interior frame of the ventilation unit.
- Pay attention to mechanical noises and noises of lack of tightening. Always turn device OFF before tightening loose bolts as needed.

NOTICE !

Check for correct motor rotation, clockwise if the motor is on the left side of the unit or counterclockwise if it is on the right side. A sticker shows rotation direction. If it does not rotate in the correct direction, reverse two phases of the motor power supply.



Left-hand side motor



Right-hand side motor

9. UNIT SHUTDOWN

EXTENDED SHUTDOWN

When the unit is shutdown for a long period of time, it is recommended to shut off the power supply. A complete inspection of the installation and the unit is recommended to ensure that everything is in order.

EMERGENCY SHUTDOWN

When the unit shuts down in an emergency, the main electrical connection must be turned OFF before the full inspection.

10. UNIT MAINTENANCE

Performing the following checks at the prescribed frequency is necessary to keep the device in good working order. Do not limit the inspection to this list, as some environmental conditions may require further inspections or more frequent inspections.

Checklist	Maintenance frequency			
	Weekly	Monthly	½ Year	Yearly
Inspect the air handler filters. Replace if necessary.	•			
Ensure nothing is blocking the air inlet and outlet of the device.	•			
Ensure the dampers open and close completely.		•		
Ensure nothing is loose on the dampers, motor plate or linkages. Re-tighten if necessary.			•	
Ensure the heat bank are clean and free of debris. *				•

*When efficient air filters are used, the heat banks should not need to be cleaned. Alternating airflow should blow away debris during operation. In the event that cleaning is required, the best method is either a vacuum cleaner or pressurized air. It is not recommended to use detergent or solvent on the heat banks as this could damage the surfaces of the heat exchanger surfaces.

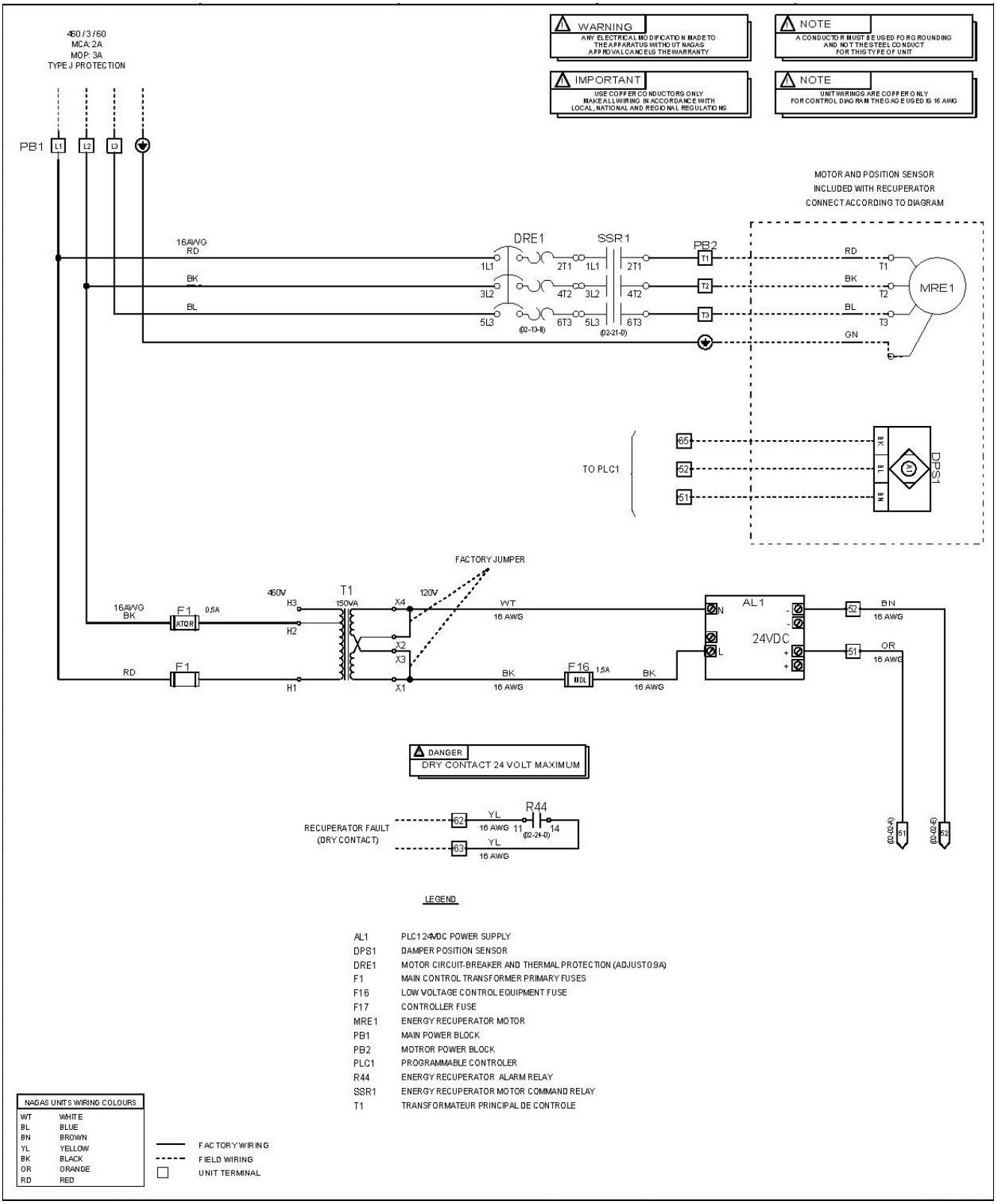
DANGER !

Motor, linkage and dampers may move suddenly without notice. Injury or death can result from being crushed. Always keep a safe distance from the device . Shut off and lock out power supply when servicing.

WARNING !

- **NEVER OPERATE THE MACHINE WITHOUT FILTERS**
- **Use only filters recommended by the UL 900 approved manufacturer. Poor filter quality could affect the warranty of the unit.**
- **Use only filters with a minimum efficiency equivalent to MERV-8 upstream of the Accubloc module in the outdoor air and return air ducts.**
- **Make sure that the filters are supported on all four sides and cannot be sucked towards the exchanger dampers. This could damage the unit and affect the warranty.**

11. TYPICAL WIRING DIAGRAM

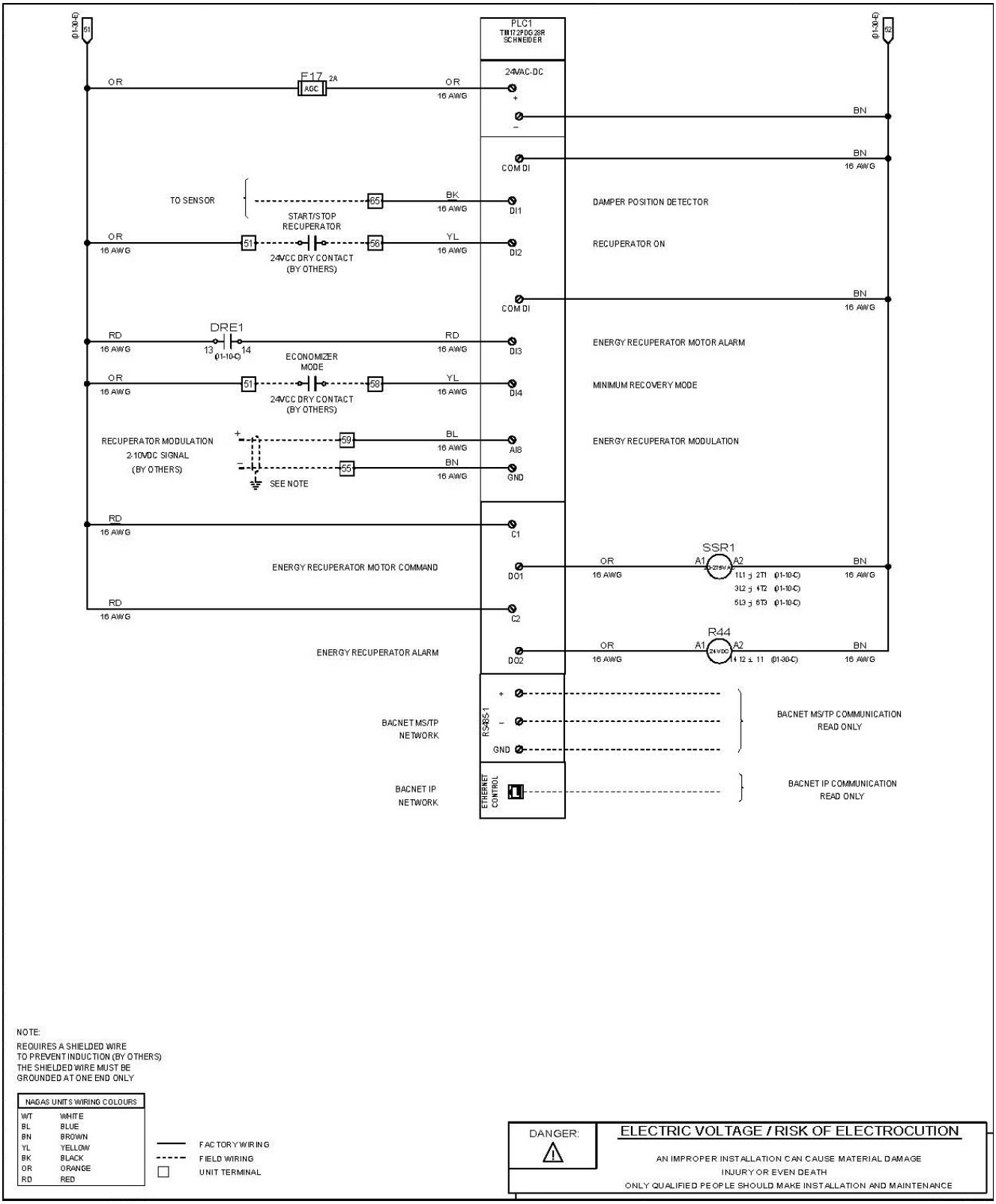


LEGEND

AL1	PLC1 24VDC POWER SUPPLY
DPS1	DAMPER POSITION SENSOR
DRE1	MOTOR CIRCUIT-BREAKER AND THERMAL PROTECTION (ADJUST 0.9A)
F1	MAIN CONTROL TRANSFORMER PRIMARY FUSES
F16	LOW VOLTAGE CONTROL EQUIPMENT FUSE
F17	CONTROLLER FUSE
MRE1	ENERGY RECUPERATOR MOTOR
PB1	MAIN POWER BLOCK
PB2	MOTROR POWER BLOCK
PLC1	PROGRAMMABLE CONTROLER
R44	ENERGY RECUPERATOR ALARM RELAY
SSR1	ENERGY RECUPERATOR MOTOR COMMAND RELAY
T1	TRANSFORMATEUR PRINCIPAL DE CONTROLE

NAGAS UNITS WIRING COLOURS	
WT	WHITE
BL	BLUE
BN	BROWN
YL	YELLOW
BK	BLACK
OR	ORANGE
RD	RED

FACTORY WIRING
FIELD WIRING
UNIT TERMINAL



NOTE:
REQUIRES A SHIELDED WIRE
TO PREVENT INDUCTION (BY OTHERS)
THE SHIELDED WIRE MUST BE
GROUNDED AT ONE END ONLY

NAGAS UNITS WIRING COLOURS	
WT	WHITE
BL	BLUE
BN	BROWN
YL	YELLOW
BK	BLACK
OR	ORANGE
RD	RED

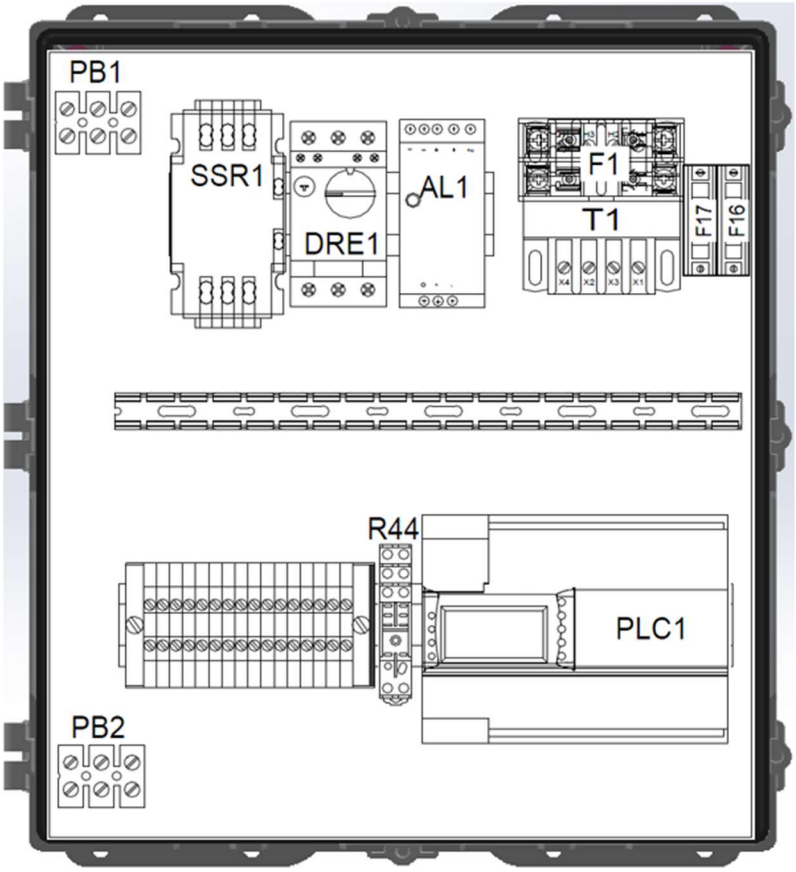
FACTORY WIRING
FIELD WIRING
UNIT TERMINAL

DANGER:

ELECTRIC VOLTAGE / RISK OF ELECTROCUTION

AN IMPROPER INSTALLATION CAN CAUSE MATERIAL DAMAGE
INJURY OR EVEN DEATH
ONLY QUALIFIED PEOPLE SHOULD MAKE INSTALLATION AND MAINTENANCE

TYPICAL CONTROL PANEL



AL1	PLC 24VDC POWER SUPPLY
DPS1	DAMPER POSITION SENSOR
DRE1	MOTOR CIRCUIT-BREAKER AND THERMAL PROTECTION (ADJUST 0.8A)
F1	MAIN CONTROL TRANSFORMER PRIMARY FUSES
F16	LOW VOLTAGE CONTROL EQUIPMENT FUSE
F17	PROGRAMMABLE CONTROLER FUSE
MRE1	ENERGY RECUPERATOR MOTOR
PB1	MAIN POWER BLOCK
PB2	MOTROR POWER BLOCK
PLC1	PROGRAMMABLE CONTROLER
R44	ENERGY RECUPERATOR ALARM RELAY
SSR1	ENERGY RECUPERATOR MOTOR COMMAND RELAY
T1	MAIN CONTROL TRANSFORMER

12. CONTROL FOR ACCUBLOC

12.1. OPERATION MODE, ALARMS & TROUBLESHOOTING

– Normal – Mode		
Modes	**Conditions**	**Comments**
1- Stop - OFF	Dry contact open (terminals 51 and 56)	Unit stopped. No damper rotation.
2- Running - ON	Dry contact closed (terminals 51 and 56)	The unit will authorize rotation of the dampers according to one of the following three modes:
Cycling function	Modulation signal - 2 to 10Vdc. (terminals 55 and 59)	Unit operates according to modulation signal. Low voltage increases cycling time, reducing recovery. (see ***Figure 1*** below*)
Minimum recovery Mode	Dry contact closed (terminals 51 and 58)	Unit cycles once every 60 minutes for cleaning purposes only.
Manual operation Mode	Selection through HMI	Manual cycling of dampers for verification purposes.

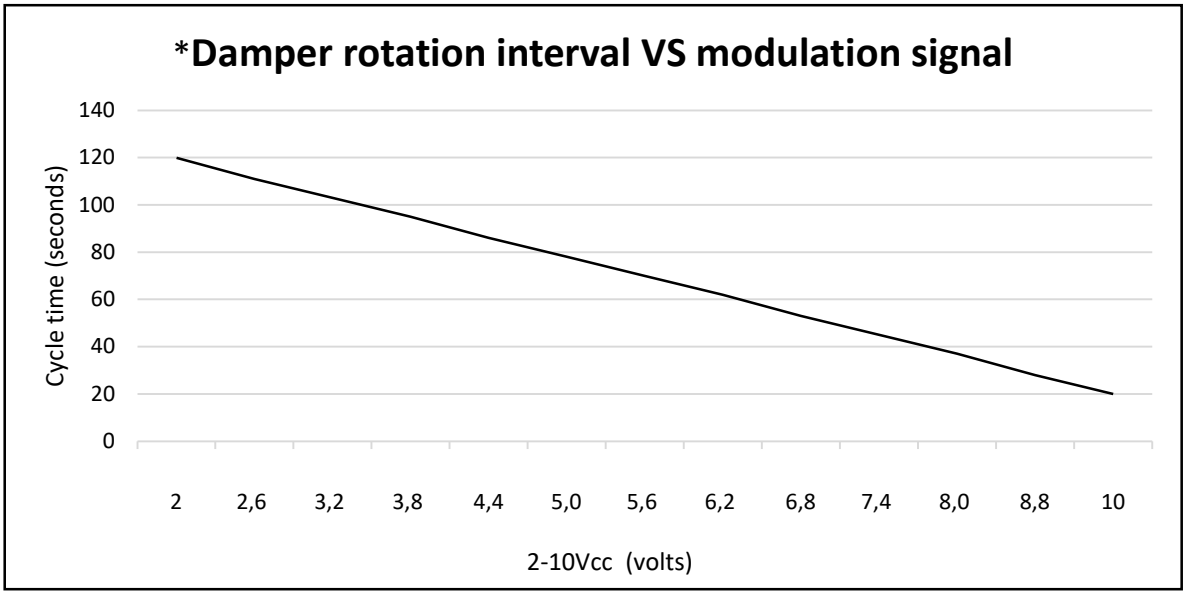


Figure 1 : Damper rotation interval VS modular signal

NOTE : If the signal is lower than 2Vdc (warning code 4), the dampers cycle every 20 seconds.

– Warning and alarm – Mode				
Mode	**Code**	**Condition**	**Reaction**	**Comments**
Alarm	Code 1	Faulty motor breaker	Relay 44 Alarm contact closes (terminals 62 and 63). PLC **Red** light flashes.	Unit is OFF.
	Code 2	Sensor error Signal missing or bad (more than 4mm gap)		Dampers cycle continuously for 3 seconds then the unit turns OFF with the loss of signal.
Warning	Code 4	Expected 2-10Vdc Modulating signal is less than 1.8Vdc	Relay 44 Alarm contact closes (terminals 62 and 63). PLC **Orange** light flashes.	Unit stays ON and operates damper at 20-second cycles (maximum recovery).
		Loss of 2-10Vdc Modulating signal		

NOTE : Alarms must be corrected and reset through HMI to restart unit. An alarm will be automatically displayed on HMI and be reset from the HMI screen. The alarm log is available via the HMI (see Alarms and Alarm log).

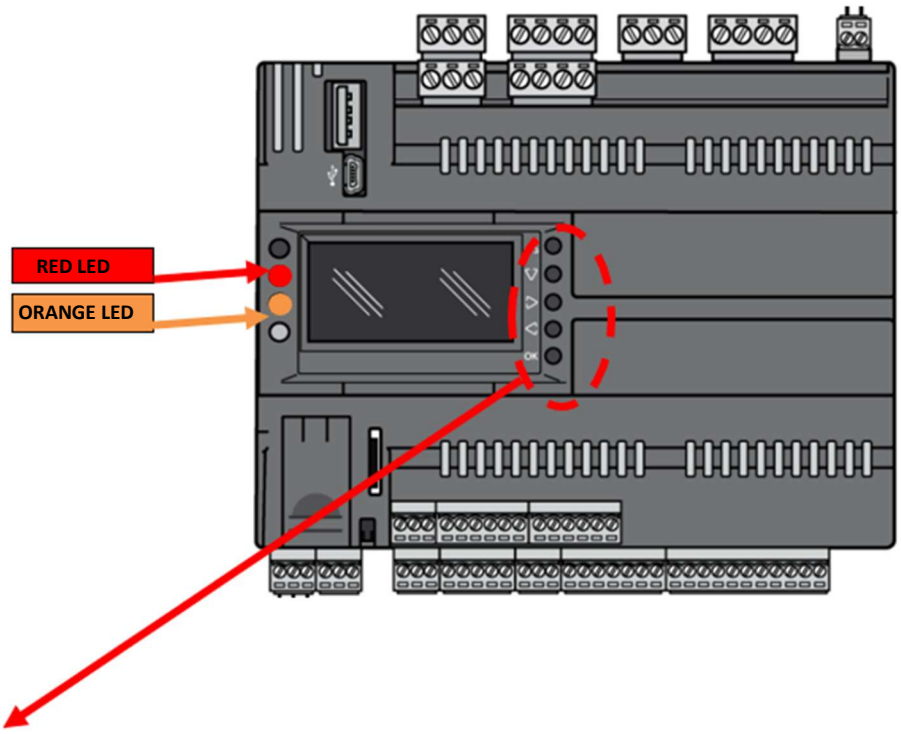
WARNING !

Only a qualified electrician is authorized to do electrical maintenance on unit. Safety rules must be followed.

Troubleshooting :

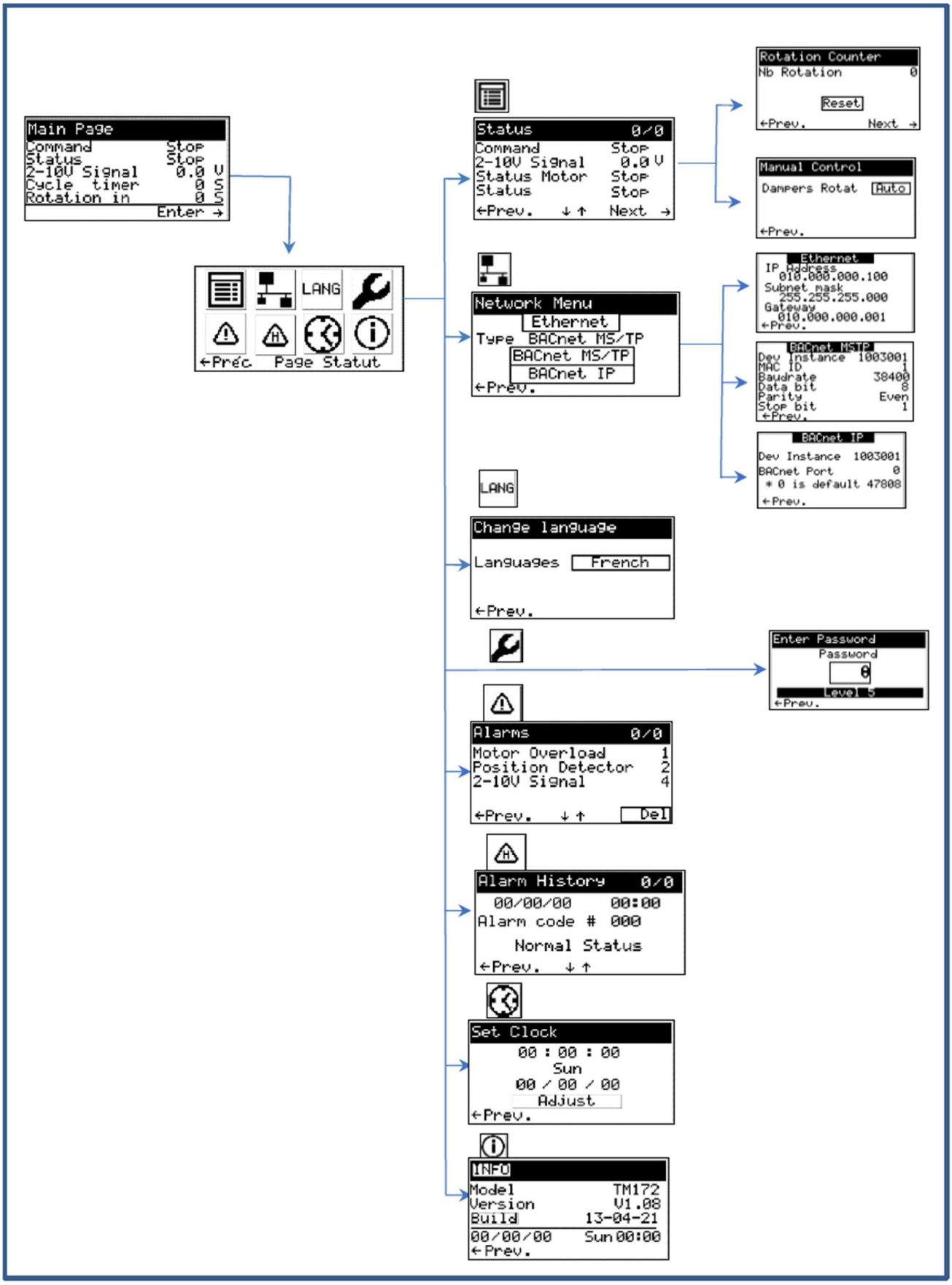
Fault description	***Message***	***Recommended corrective actions***
No damper rotation	None	1- 1- Check voltage at terminals L1, L2 et L3. 2- Check fuses F1, F16 et F17. 3- Check voltage at terminals 51 and 52 (24Vcc). 4- Check that contact at terminals 51 and 56 is closed.
	Motor overload Code 1	1- 1- Check motor. 2- Check motor wiring. 3- Check connections.
	Position detector Code 2	1- 1 Check position sensor. Need to be 4 mm gap detection. 2- Check sensor wiring. 3- Check connections.
Rotation of the dampers every 20 seconds	Warning Code 4	Modulation signal is less than 2 Vdc. 1- Check modulation signal at terminals 59 and 55. 2- Check modulation signal wiring.

12.2. HUMAN MACHINE INTERFACE (HMI) NAVIGATION



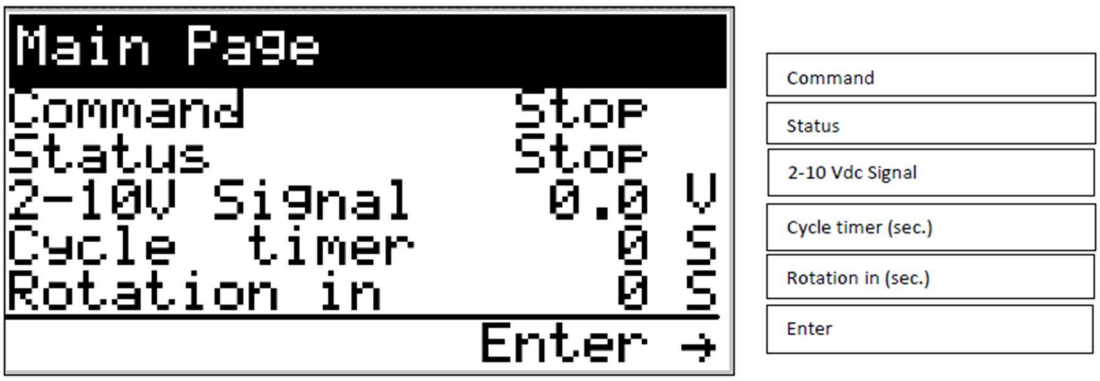
△	Arrow to increase the value of the selected parameter or move up to select the parameter.
▽	Arrow to decrease the value of the selected parameter or move down to select the parameter.
▷	Arrow to go to the next page or move on the icons of the navigation page.
◁	Arrow to go to the previous page or move on the icons of the navigation page.
OK	Enter a selected parameter or save the change in value.

12.2.1. HMI STRUCTURE



12.2.2. MAIN PAGE

Display base unit parameters



Command :

- Stop : The unit has not received a start command (dry contact open, terminals 51 et 56).
- On : The unit has received a start command (dry contact closed, terminals 51 et 56).

Status :

- Stop : The unit is Off.
- Standb : The motor is stopped while waiting for the rotation signal.
- Rotat : The motor is running
- MinRec : The unit is in MINIMUM RECUPERATION mode.
- Warnin : The unit is in WARNING mode (loss of 2-10Vdc signal)
- Fault : The unit is in ALARM mode.

2-10V Signal :

- Displays modulation signal (volts) (terminals 55 and 59).

Cycle Timer :

- Displays cycle time (seconds) between dampers movement associated with 2-10Vdc modulation signal.

Rotation in :

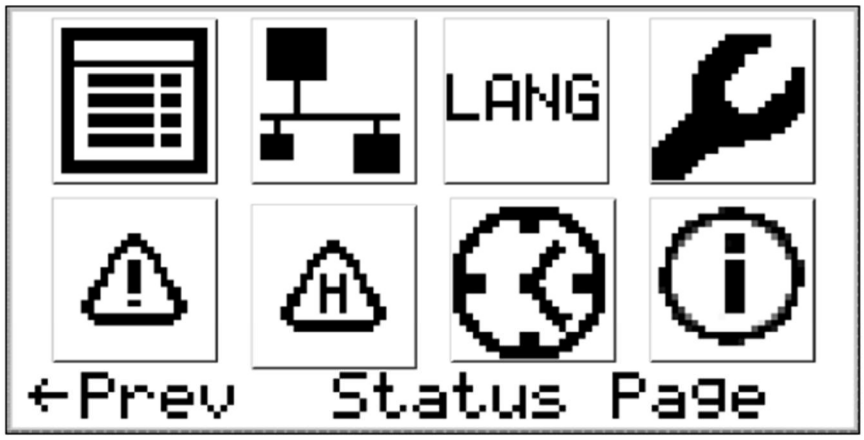
- Displays remaining time (seconds) before damper rotation.

Enter :

By pressing the right arrow → for 3 seconds, the screen switches to the « Navigation » page.

12.2.3. PAGE NAVIGATION PAGE

Page to access unit's menu



Status page

Network page

Language selection page

Setting page (qualified personnel only)

Alarms page

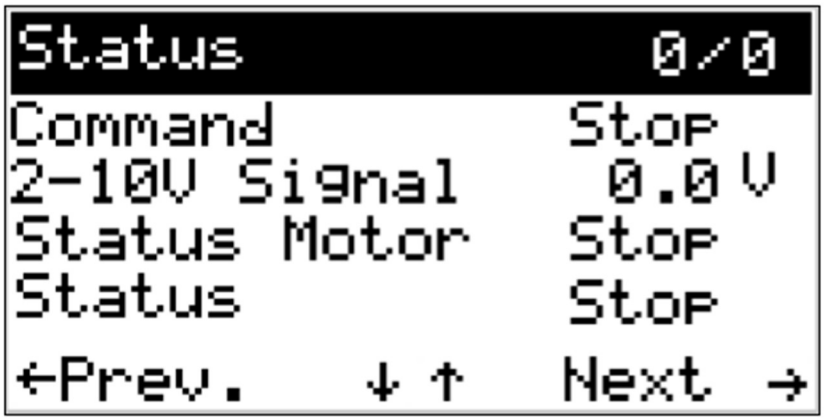
Alarm History

Set clock page

Information Page

12.2.4. STATUS PAGE

Opens unit status menu



NOTICE !

- **There are 2 unit's status pages. To access other states, press the down button ↓. To return to the first page, press the up button ↑.**
- **If after 10 minutes none of the buttons have been pressed, the main page is then displayed.**

Page 1

Command :

- Stop: The unit has not received the start command (dry contact open, terminals 51 and 56).
- Active: The unit has received the start command (dry contact closed, terminals 51 and 56).

Signal 2-10V :

Displays the modulation signal (volts) (terminals 59 and 55).

Status Motor : Displays motor status

- Stop : The motor is Off.
- On : The motor is Running.

Status :

- Stop : The unit is Off.
- Standb : The motor is stopped waiting for the rotation signal.
- Rotat : The motor is running.
- RecMin : The unit is MINIMUM RECUPERATION mode.
- Warning : The unit is in WARNING mode (loss of 2-10Vdc signal)
- Fault : The unit is in ALARM mode.

Page 2

Cycle time :

- Displays the cycle time (second) based on the 2-10Vdc modulation signal.

Rotation in :

- Displays the remaining time (second) before next damper rotation.

Préc :

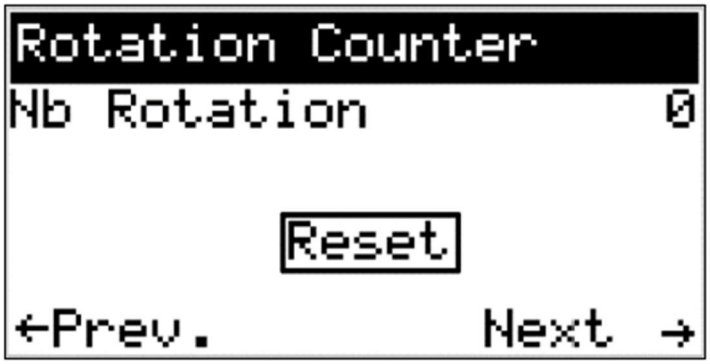
- By pressing the left arrow ← for 3 seconds, the screen switches to the « Navigation » page.

Suiv :

- By pressing the right arrow →, the screen switches to the « Rotation counter » page.

12.2.5. ROTATION COUNTER PAGE

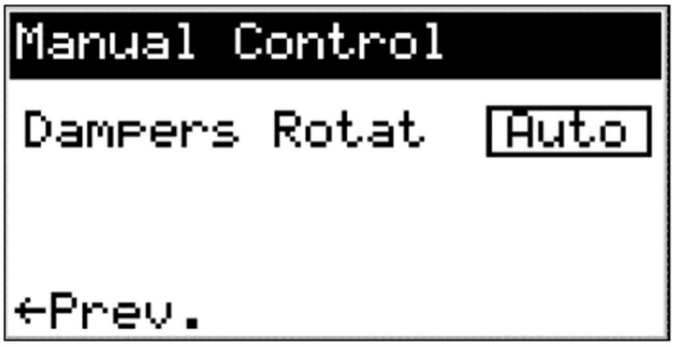
Displays the rotation counter made by the DAMPERS and also allows to reset the counter



a) Press the « OK » button to reset the counter.
b) To return to the « Navigation » page, press the left arrow button ← for 3 seconds.
c) To go to the « Manual control » page, press the right arrow button →.
d) To return to the status page, press the left button ←.
e) If after 10 minutes none of the button s have been pressed, the Main page is then displayed

12.2.6. MANUAL CONTROL PAGE

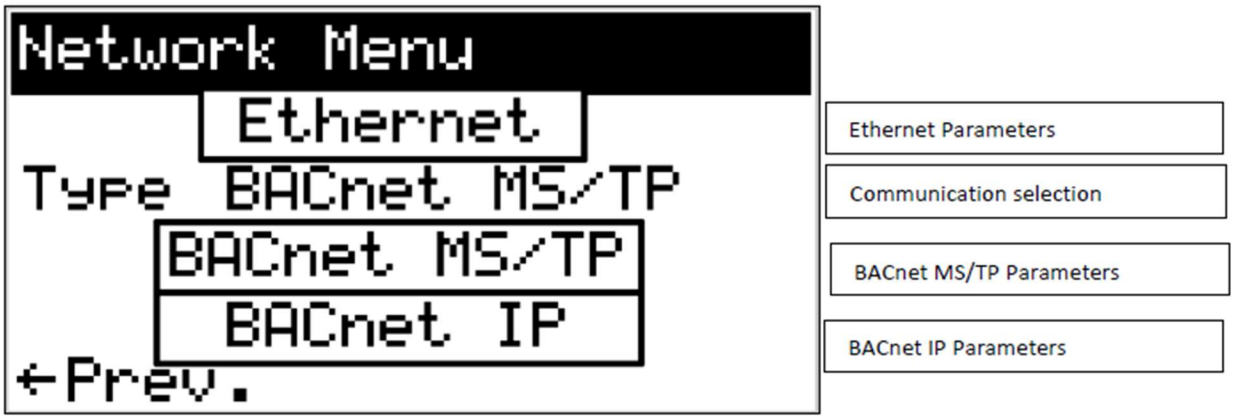
Unit manual mode selection (1 damper rotation)



a) To select the manual mode (1 rotation of the damper), press the « OK » button
b) The AUTO window will blink.
c) Use the down arrow button ↓ to switch to « MAN » (manual mode).
d) Press the « OK » button.
e) The dampers will move once (they will make one rotation) and the screen will return to « AUTO »
f) To return to the damper rotation counter page, press the left arrow button ←.
g) If after 10 minutes none of the buttons have been pressed, the Main page is then displayed.

12.2.7. NETWORK MENU PAGE

Opens the network page, allows you to activate the type of communication (BACnet, MS/TP or IP)



Ethernet : Ethernet Settings Page
Type : Communication protocal selection
- BACnet MS/TP
- BACnet IP

BACnet MS/TP : BACnet MS/TP Settings Page
BACnet IP : BACnet IP settings page
Prev : By pressing the left arrow ← for 3 seconds, the screen switches to the « Navigation » page.

NOTICE !

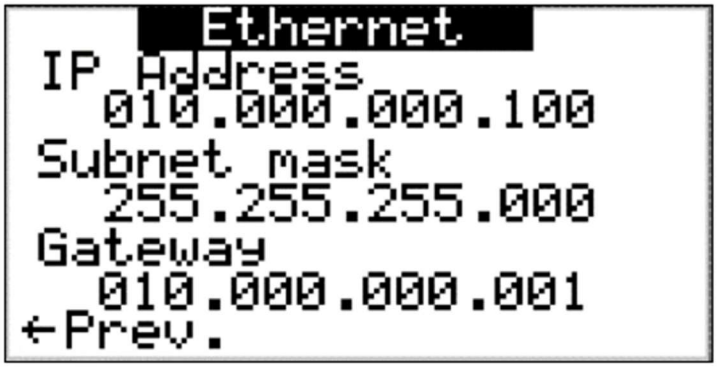
- **There are 2 unit status pages. To access other states, press the down button ↓. To return to the first page, press the up button ↑.**
- **If after 10 minutes none of the buttons have been pressed, the main page is then displayed**

Parameters change procedure

a) Use the down arrow button ↓ to scroll through parameters.
b) To modify a parameter, press the « OK » button.
c) Modify the parameter using the down ↓ and up ↑ arrows buttons.
d) Press the « OK » button to validate the change.
e) By pressing the left arrow ← for 3 seconds the screen goes to the « Navigation » page.

12.2.8. ETHERNET PAGE

Selecting Ethernet Settings



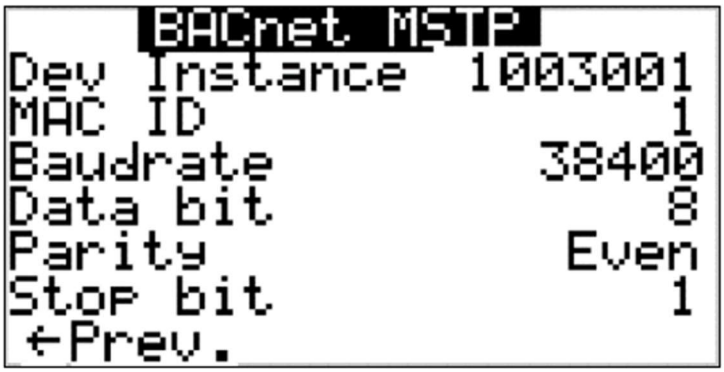
IP Address (default 10.0.0.100)

Subnet Mask (default 255.255.255.000)

Gateway (default 10.0.0.1)

12.2.9. BACnet MS/TP PAGE

Selecting MS/TP Settings



Dev Instance (default 1003001)

MAC ID (default 1)

Baudrate (default 34800)

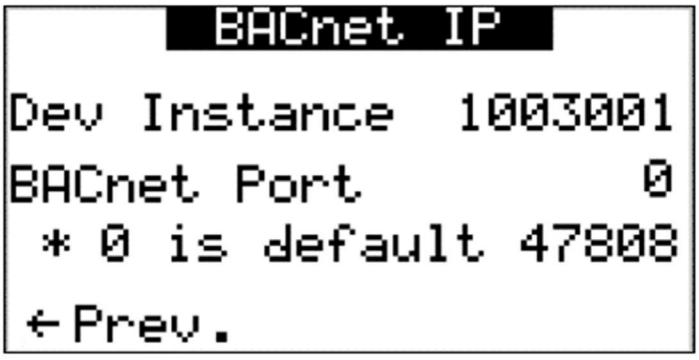
Data Bit (default 8)

Parity (default Even)

Stop bit (default 1)

12.2.10. BACnet IP PAGE

Selecting IP Settings

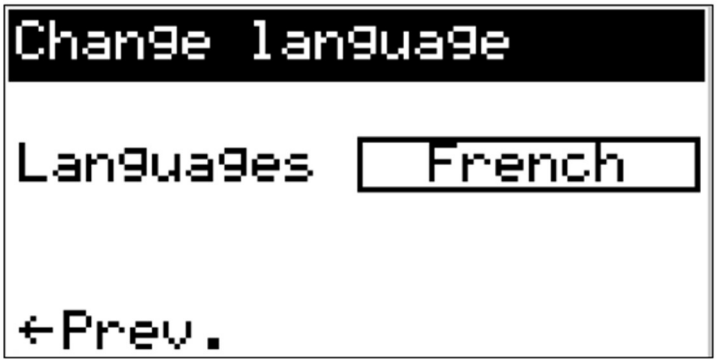


Dev Instance (default 1003001)

BACnet Port (default =0 ou BAC0)

12.2.11. CHANGE LANGUAGE PAGE

Display language change page (English/French)



Language change procedure:

a) Press the « OK » button, a line below “English” will appear.
b) Press the down ↓ or up ↑ arrow button to choose language.
c) Press « OK » to save the change.
d) By pressing the left arrow ← for 3 seconds, the screen switches to the « Navigation » page.

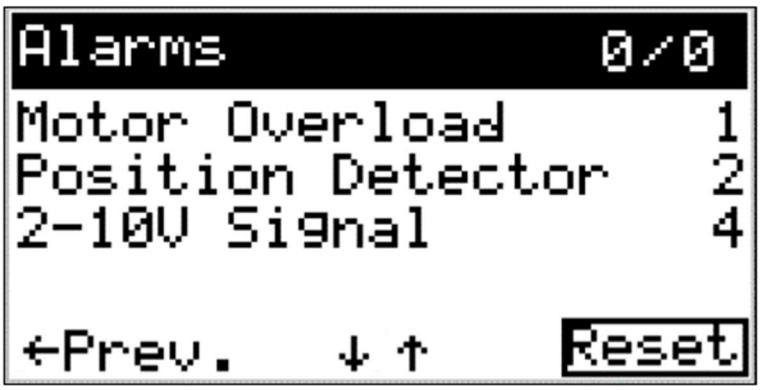
12.2.12. SETTING PAGE

Opens the Advanced Settings page (Qualified personnel only and password required

a) Access to the settings page requires a level 5 password.
b) Only for qualified personnel.
c) By pressing the left arrow button ← or 3 seconds, the screen switches to the « Navigation » page.

12.2.13. ALARM PAGE

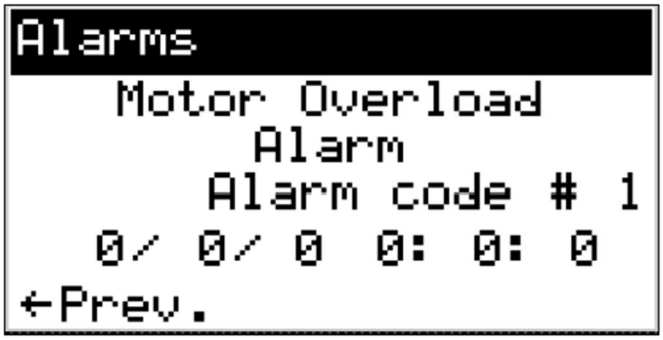
Opens the Advanced Settings page (Qualified personnel only and password required



Alarm reset procedure :

a) Go to the Alarms page
b) Press « OK », a line below « Reset » will appear.
c) Press the down arrow button ↓, the Active text will change to « OK ».
d) Press « OK » to reset non-active alarms
e) By pressing the left arrow button ← for 3 seconds, the screen switches to the « Navigation » page.

Example of a displayed alarm code :



Alarms :

In case of an alarm, the unit stops immediately

Motor circuit breaker: *alarm code 1.*

Faulty position detector: *alarm code 2.*

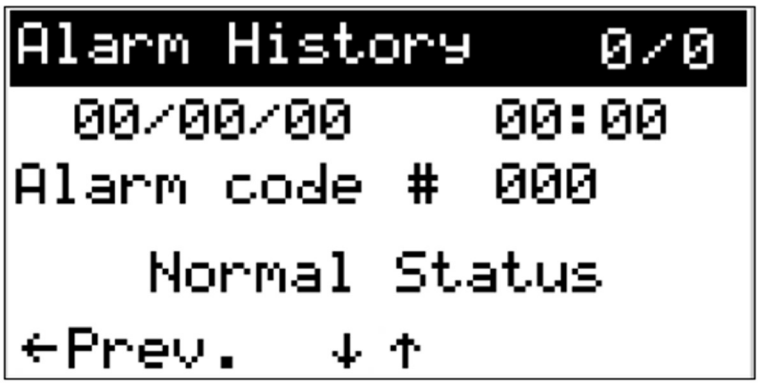
WARNING !

In case of Warning, the unit continues to operate cycling every 20 seconds.

2-10Vdc input signal lower than 1.8Vdc: alarm code 4.

12.2.14. ALARMS HISTORY PAGE

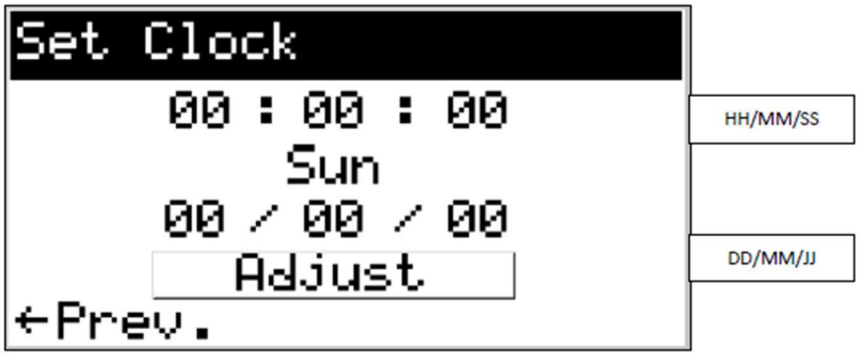
Allows to view the alarm history



a) To move through the alarm history, use the up ↑ or down ↓ arrows buttons.
b) By pressing the left arrow button← for 3 seconds, the screen switches to the « Navigation » page.

12.2.15. CLOCK SET PAGE

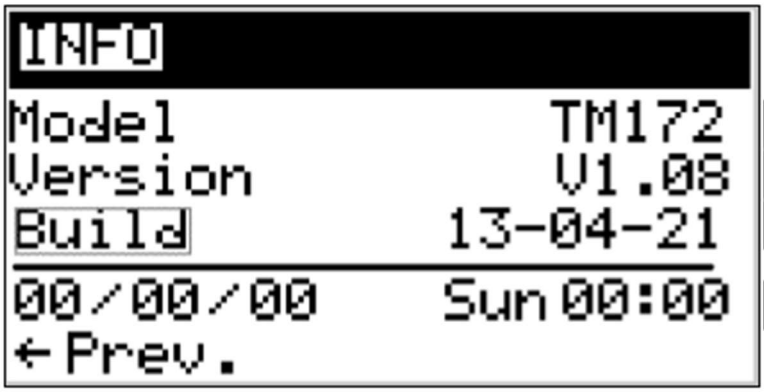
Allows to set the date and time in the PLC



a) To move through the alarm history, use the up ↑ or down ↓ arrow buttons.
b) Press the « OK » button to enter the selection.
c) An underscore below the number which can be changed with the up ↑ down ↓ buttons will appear.
d) If necessary to modify the second digit, use to move the button with the left arrow ← or the right arrow→.
e) Press the « OK » button to save the value change
f) Scroll down to the « Set » box with the down arrow ↓ button and press « OK ».

12.2.16. INFORMATION PAGE

Displays PLC program, date and time information



- Press the left arow button ← for 3 seconds to go to the « Navigation » page.

12.2.17. LISTE BACnet

BACnet TAG NAME	OBJECT NAME	Value	Min	Max	Description	Units	Mode
Device Name	1003001						
Analog Value-0	2-10V_CMD_Signal						
Analog Value-1	Cycle_start_Timer				2-10 Volt Signal	Volt	READ
Analog Value-2	Cycle_Count				Damper rotation cycle time based on 2-10Vdc input signal	Sec.	READ
Analog Value-3	Cycle_Start_Countdown				Damper rotation count		READ
Binary Value-0	Motor_On				Remaining time until next rotation	Sec.	READ
Binary Value-1	Unit_ON	0	0	1	0= Motor OFF, 1= Motor ON		READ
Binary Value-2	Recovery_Min_ON	0	0	1	0= Unit OFF, 1= unit ON		READ
Binary Value-3	Sensor_Alarm	0	0	1	0= Recovery_Min Mode OFF, 1= Recovery_Min Mode ON		READ
Binary Value-4	Motor_Alarm	0	0	1	0= Sensor OK, 1= Sensor in alarm		READ
Binary Value-5	2-10V_MOD_Alarm	0	0	1	0= Motor OK, 1= Motor in alarm		READ
Binary Value-6	Unit_Alarm	0	0	1	0= Signal 2-10 OK, 1= Signal 2-10V in alarm		READ
Binary Value-7	Unit_Warning	0	0	1	0= Normal, 1= Alarm		READ

13. START-UP RAPPORT

Unit Tag: _____

Company: _____ Project: _____

Technician: _____ Project manager: _____

Contractor: _____ Address: _____

Phone: _____ Email: _____

MANUFACTURER INFOS

Model number: _____ Serial number: _____

INSPECTION

Unit casing: ☐ Linkage: ☐ Damper position sensor (4mm gap): ☐

Dampers: ☐ Control panel installed (by others): ☐

Problematic noise: ☐ OEM unit filters (by others): ☐

Motor rotation direction: ☐ Air flow: ☐

Note: _____

START-UP

Control signal: _____ VDC Unit CFM: _____ Fresh air _____ Exhaust air

ADJUSTMENTS

Start-up completed: ☐ If no, why? (or others):

_____

_____

_____

_____

Note:

_____

_____

_____

_____

_____

Signature: _____ Date: _____