MERLIN NX

COMPACT VAV CONTROLLER CLMEVA423B24N

INSTALLATION INSTRUCTIONS

Fig. 1. CLMEVA423B24N

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TRADEMARK INFORMATION

Sylk™ is a trademark of Honeywell International Inc.
BACnet® is a registered trademark of ASHRAE Inc.

PRODUCT DESCRIPTION

The CLMEVA423B24N controller is part of the MERLIN NX family. The CentraLine MERLIN NX (CLMEVA423B24N) family of unitary controllers provide flexible, freely programmable, demand-led control that delivers tangible benefits to reduce energy spends while driving new levels of functionality and efficiency in today's buildings. These scalable and freely programmable BACnet MS/TP-based unitary controllers utilize smart engineering and commissioning tools and Sylk™ bus technology. Multiple flexible configurations can be achieved to address specific applications with the Arena NX (Niagara) tool. CLMEVA423B24N and replacement parts are described in Table 1 and Table 2 on pg.2.

SAFETY INSTRUCTIONS

- While performing any work (installation, mounting, startup), all instructions given by the manufacturer and the safety instructions provided in this document must be followed.
- The CLMEVA423B24N compact VAV controller must be installed and mounted only by authorized and trained personnel.
- If the unit is modified in any way, except by the manufacturer, all warranties concerning operation and safety become invalid.
- Make sure that applicable local standards and regulations are always observed.
- Use only CentraLine supplied or approved accessories.
- Before the system is dismantled, disconnect the power supply by either removing the power terminal block from the controller, or by means of local isolation. Read the following caution note carefully.

CAUTION

Disconnect the power supply before installing the CLMEVA423B24N controller. Do not reconnect the power supply until you have completed the installation.

Table 1. Ordering Information

Controller Model	Housing	Power supply	UIs	AOs	DOs	Total no. of I/Os	Air flow sensor	Integrated Actuator / Declutch	Remarks
CLMEVA423B24N	**MERLIN NX Compact VAV with integrated actuator**	24 VAC	4	2	3	9	1	Yes	72 hours data retention[(a)]

Table 2. Replacement Parts

Device Model	Housing	Power supply	UIs	AOs	DOs	Total no. of I/Os	Air flow sensor	Integrated Actuator / Declutch	Remarks
CLMEV423B24N	**MERLIN NX Compact VAV Controller only**	24 VAC	4	2	3	9	1	No	72 hours data retention[(a)]
COVA	**MERLIN NX Compact VAV actuator only**	24 VAC	-	-	-	-	-	-	-
32351465-001	**Anti-rotation bracket**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

(a) The controller includes a supercapacitor to power the built-in real time clock for 72 hours. In case of power failure, the super capacitor retains the time set in controller for 72 hours. After 72 hours, the time will reset to default factory time until user perform BACnet Time Sync.

DIMENSIONS

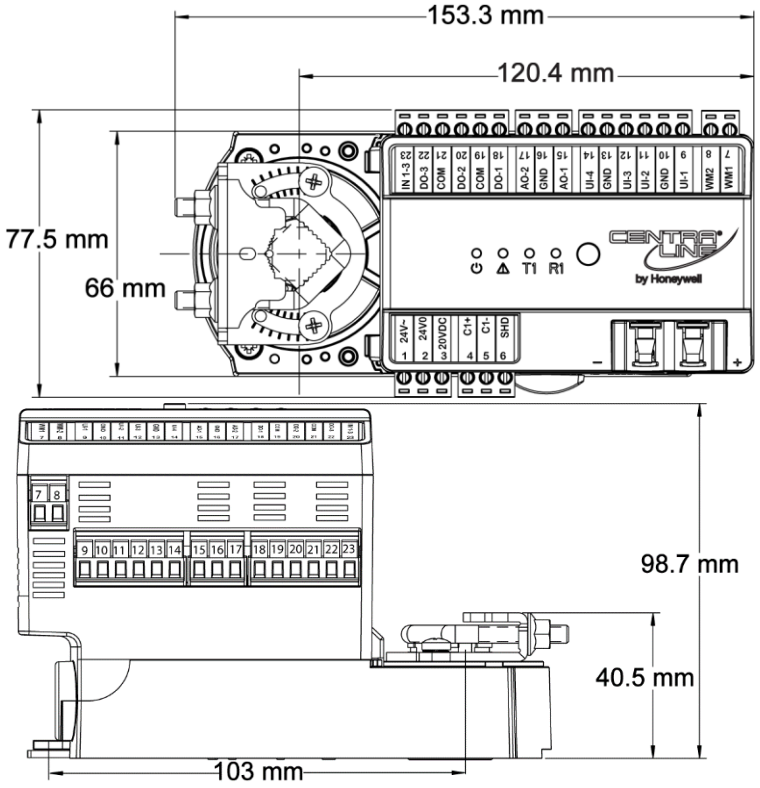


Fig. 2. CLMEVA423B24N controller dimension.

SPECIFICATIONS

General

For a complete list of all terminals and their description of their functions, see Table 4 on pg.4.

NOTE:

All terminal blocks capable of carrying either low voltage or line voltage are orange-colored.

The product package includes a plastic bag containing additional, removable terminal blocks.

Power Supply Terminals

Power is supplied to the controller via a removable terminal plug (Color coded grey, terminal 1 and 2).

CAUTION

Do not mix-up power terminal block (terminal 1 to 3, grey color) with BACnet MS/TP terminal block (terminal 4 to 6, black color) located adjacent to each other. Interchanging the terminals will damage the controller.

See also section "Power supply" on pg. 8

Power Supply	20-30 VAC at 50/60 Hz, Class 2 transformer
Power Consumption	Controller and Actuator Load (nothing connected to IOs): 9VA maximum Maximum load including external loads: 100 VA maximum
Auxiliary Output	20 VDC ± 10% at 75 mA

Ambient Environmental Limits

Storage	-40° C to 66° C (-40° F to 150° F)
Operation	0° C to 50° C (32° F to 122° F)
Humidity	5% to 95% RH., non-condensing

Differential Pressure Sensor

Bi-Directional
Operating Range: ±2.0 in. H_2O (±500 Pa).

Actuator Specifications

Rotation Stroke	95° ± 3° for CW or CCW opening dampers
Torque Rating	44 in-lbs. (5 Nm)
Runtime for 90° rotation	108 seconds at 50 Hz
	90 seconds at 60 Hz

Real Time Clock

Operating Range: 24 hour, 365 day, multi-year calendar including day of week.
Power Failure Backup: 72 hours.
Accuracy: ±3.5 minute per month at 25 °C (77 °F)

Digital Relay Outputs (DO)

Voltage Rating: 24 VAC at 50/60Hz
Current Rating: 1.5 A continuous, and 3.5 A (AC RMS) for 100 milliseconds per DO channel.

Analog Outputs (AO)

Analog outputs can be individually configured for current or voltage.

Analog Current Outputs

Current Output Range: 4.0 to 20.0 mA DC
Output Load Resistance: 550 Ω maximum

Analog Voltage Outputs

Voltage Output Range: 0.0 to 10.0 VDC
Maximum Output Current: 10.0 mA DC

Universal Inputs (UI) Circuits

See table below for the UI circuit specifications.

Table 3: Universal inputs types and characteristics

Input Type	Sensor Type	Operating Range
Room/Zone Discharge Air Outdoor Air Temperature	20k Ω NTC	-40 °C to 93 °C (-40 °F to 199 °F)
Outdoor Air Temperature	PT1000 (IEC751 3850)	-40 °C to 93 °C (-40 °F to 199 °F)
Resistive Input	Generic	100 Ω to 100K Ω
Voltage Input	Transducer Controller	0-10 VDC
Current Input	External 499Ω resistor required between UI and GND	0-20 mA DC
Discrete Input	Closed Contact	≤100Ω
	Open Contact	≥100KΩ
Pulse Input[(b)]	Counter/Meter	Maximum Frequency: 15 Hz Minimum Pulse Width: 33 ms.

[(b)]One Universal Input (UI-1) on the CLMEVA423B24N is user selectable as a fast digital pulse meter.

Terminals

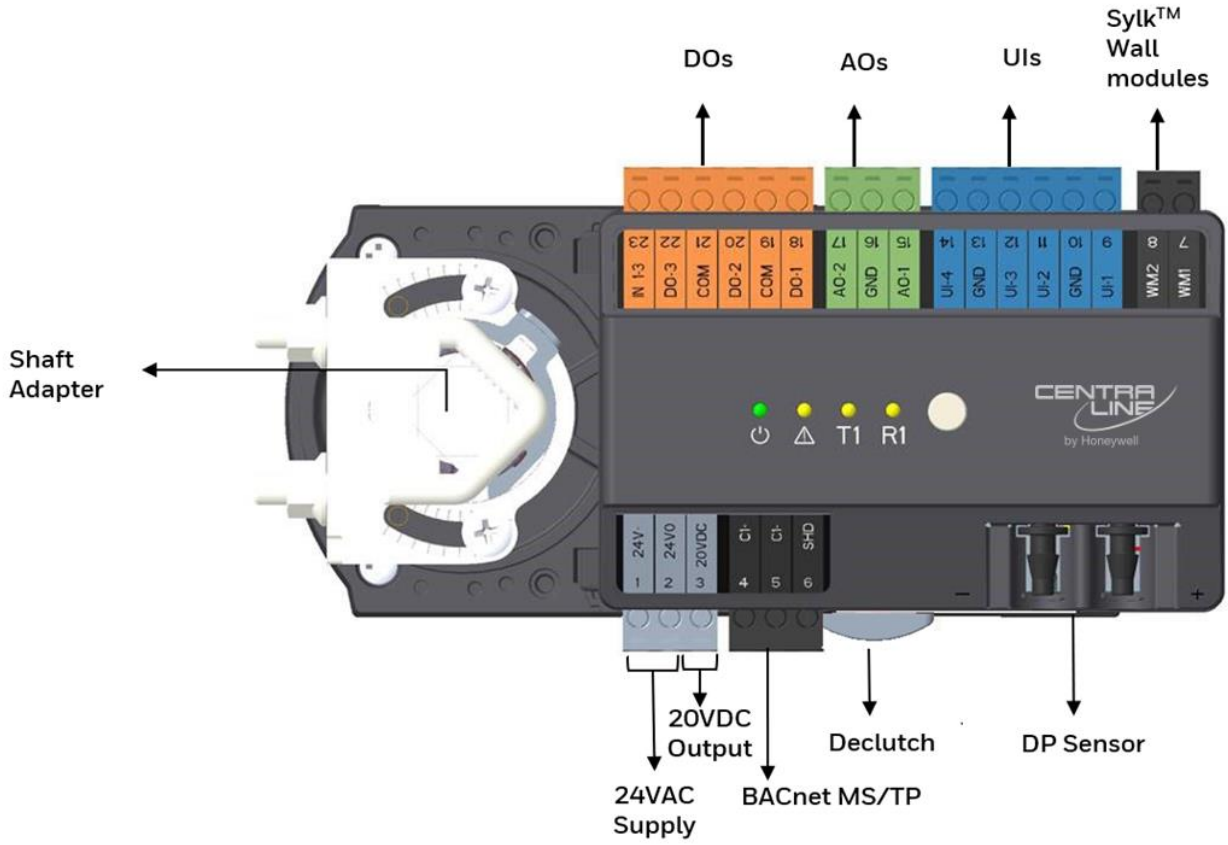


Fig. 3. CLMEVA423B24N: Overview of terminals and functions

Table 4. CLMEVA423B24N: Overview of the terminals and functions

Terminal	Printing	Details
1	24 V~	Supply Voltage (24 V)
2	24 V0	Supply Voltage (GND), internally connected with terminal 10, 13 & 16
3	20 VDC	20 VDC power out
4,5	C1+, C1-	Removable BACnet MS/TP interface
6	SHD	Shield for external wiring support. It is not connected internally.
7,8	WM1, WM2	Removable interface for Sylk™ bus
9	UI-1	Universal Input 1
10	GND	Ground
11	UI-2	Universal Input 2
12	UI-3	Universal Input 3
13	GND	Ground
14	UI-4	Universal Input 4
15	AO-1	Analog Output 1
16	GND	Ground
17	AO-2	Analog Output 2
18	DO-1	Digital Output 1
19	COM	Supply voltage common terminal for DO. It is internally connected to terminal 21 but not to the controller's GND terminal.
20	DO-2	Digital Output 2
21	COM	Supply voltage common terminal for DO. It is internally connected to terminal 19 but not to the controller's GND terminal.
22	DO-3	Digital Output 3
23	IN 1-3	24V AC/DC input for DOs 1-3

INSTALLATION

Before mounting the controller on damper shaft, review the power, inputs and output specification on pg.3 before installing the controller.
Hardware driven by the analog current outputs must have a maximum resistance of 550 Ω.

IMPORTANT

Avoid mounting in areas where acid fumes or other deteriorating vapors can harm the metal parts of the controller, or in areas where escaping gas or other explosive vapors are present.

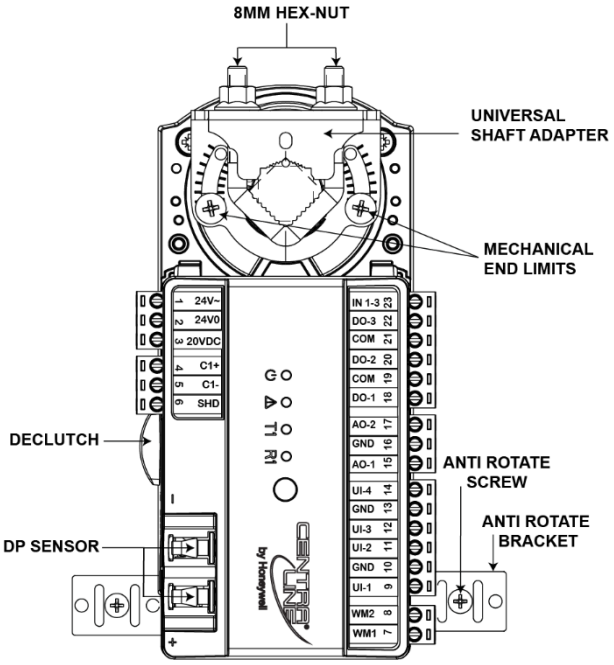


Fig. 4. CLMEVA423B24N controller

Before Mounting Actuator onto the Damper Shaft

CLMEVA423B24N controller includes the direct-coupled actuator with Declutch mechanism, which is shipped hard-wired to the controller.
Before mounting the CLMEVA423B24N onto the VAV damper shaft, do the following:

1. Ensure that the diameter of the damper shaft is within the allowed limits:

Square shaft	6-13 mm ($^{15}/_{64}$ – $^{33}/_{64}$ in.)
Round shaft	8-16 mm ($^{5}/_{16}$ – $^{5}/_{8}$ in.)

2. Ensure that the damper shaft has a length of at least 44 mm. (1 $^{47}/_{64}$ in).

3. Determine the direction in which the damper shaft rotates to open the damper (CW or CCW) (see Fig. 5). Typically, there is an etched line on the end of the damper shaft that indicates the position of the damper. In Fig. 6, the indicator shows the damper open in a CW direction.

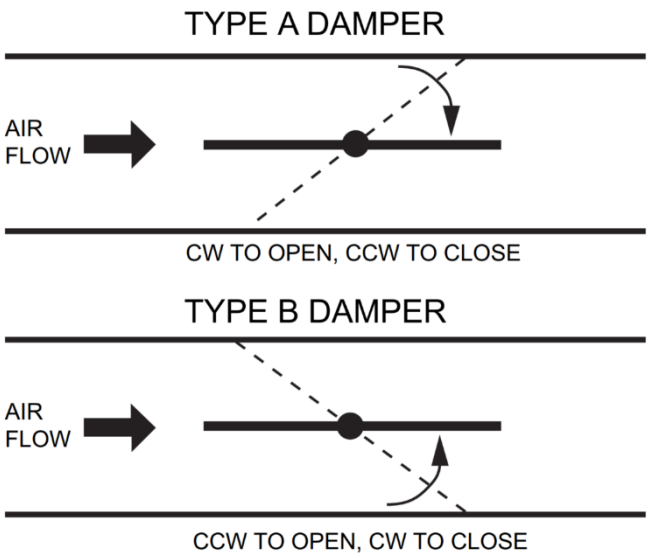


Fig. 5. Determining the rotation direction (CW or CCW)

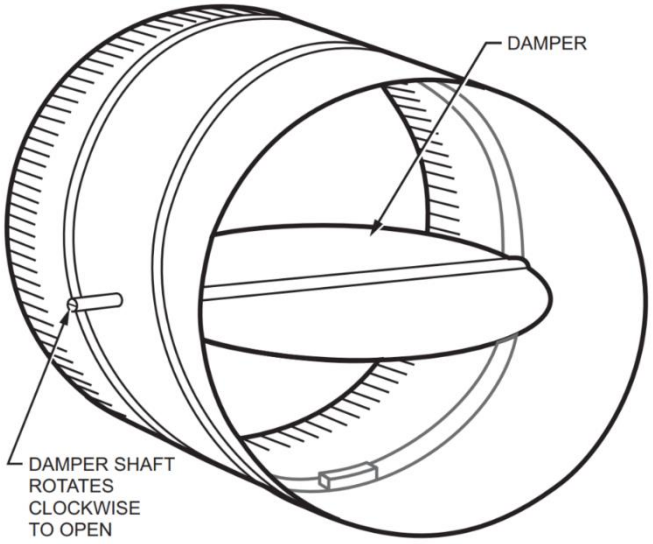


Fig. 6. Damper with 90 degree CW rotation to open

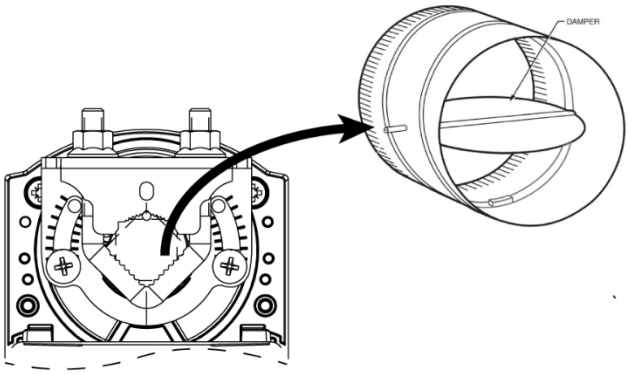
IMPORTANT

Mount actuator flush with damper housing or add a spacer between the actuator mounting surface and damper box housing.

4. Determine the damper full opening angle (45, 60, or 90 degrees). In Fig. 6, the damper is open to its fully open position of 90 degrees.

Mounting Actuator onto Damper Shaft

CLMEVA423B24N compact VAV controller can be mounted in any orientation but should be mounted in a position that allows clearance for wiring, servicing, removal, connection of the BACnet connector and access to the service button.



* The Controller can be mounted in any position, depending on VAV boxes and position of the damper shaft.

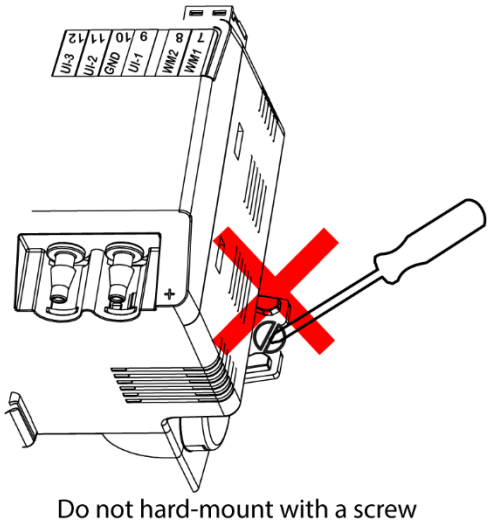
Fig. 7. Mounting an actuator

IMPORTANT

- The controller is not position sensitive and can be mounted sideways or upside down also.
- The MERLIN NX compact VAV controller's integral actuator does not float inside the housing therefore it should be installed with a floating mount to allow for non-concentric travel, which can occur with damper shaft that are out-of-round and/or have asymmetrical damper shaft mounts.
- If the actuator does not allow any wobble, then it is likely to bind. To prevent this, when installing the MERLIN NX compact VAV controller, install it over the damper shaft and then slide the anti-rotation bracket underneath and into the mounting slot but not at the very end of the slot (leave a little wiggle room).
- Screw the anti-rotation bracket using two screws on the sides of the controller.
- The anti-rotation bracket is designed to be bent as needed (it has built-in bend-it-easy slots) to accommodate difficult installation locations.

CAUTION

Do not hard-mount the MERLIN NX compact VAV controller with a screw directly into the anti-rotation slot.



Do not hard-mount with a screw into anti-rotation slot.
Always use anti-rotation bracket.

Fig. 8. Do not hard-mount the controller

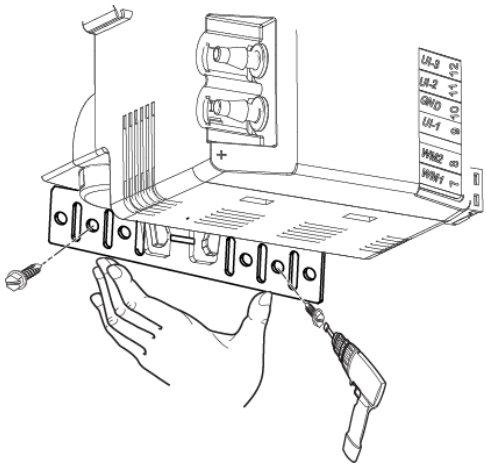


Fig. 9. Always use Anti-rotate bracket

Tools required:

- Phillips #2 screwdriver for end-limit set screw adjustment
- 8 mm wrench for centering clamp

The actuator mounts directly onto the VAV box damper shaft and has up to 5 Nm (44 in-lb.) torque, 90-degree stroke, and 108 second timing at 50 Hz and 90 second timing at 60 Hz.
The actuator is shipped with two mechanical end-limit set screws to control the amount of rotation from 12° to 95°. These set screws must be securely fastened in place. To ensure tight closing of the damper, the shaft adapter has a total rotation stroke of 95°.

NOTES:

- The actuator is shipped with the mechanical end-limit set screws set to 95 degrees of rotation. Adjust the two set screws closer together to reduce the rotation travel. Each “hash mark” indicator on the bracket represents approximately 6.5° of rotation per side.
- The Declutch button, when pressed, allows you to rotate the universal shaft adapter.

The unit is shipped with the actuator set to rotate open in the clockwise (CW) direction to a full 95 degrees. The extra 5 degrees ensures a full opening range for a 90º damper. The installation procedure varies depending on the damper opening direction and angle:

1. If the damper rotates clockwise (CW) to open, and the angle of the damper open-to-closed is 90 degrees:

1.1. Manually open the damper fully (rotate clockwise).

1.2. Using the Declutch button, rotate the universal shaft adapter fully clockwise.

1.3. Mount the actuator to the VAV damper box and shaft.

1.4. Tighten the two bolts on the centering clamp (8 mm wrench; 8 Nm. [70 lb.-in] torque). When the actuator closes, the damper rotates CCW 90 degrees to fully close.

2. If the damper rotates clockwise (CW) to open, and the angle of the damper open-to-closed is 45 or 60 degrees:

2.1. Manually open the damper fully (rotate clockwise).

2.2. The actuator is shipped with the mechanical end limits set at 95 degrees. Adjust the two mechanical end-limit set screws to provide the desired amount of rotation. Adjust the two set screws closer together to reduce the rotation travel.

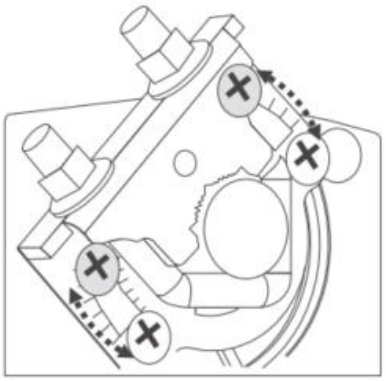


Fig. 10. Setting the mechanical end limits

2.3. Tighten the two mechanical end-limit screws (Phillips #2 screwdriver; (3.0-3.5 Nm [26.5 -31 lb.-in.] torque).

2.4. Using the Declutch button, rotate the universal shaft adapter fully clockwise.

2.5. Mount the actuator to the VAV damper box and shaft.

2.6. Tighten the two bolts on the centering clamp (8 mm wrench; 8-10 Nm [70 lb. in.] torque).

2.7. When the actuator closes, the damper rotates CCW either 45 or 60 degrees to fully close.

3. If the damper rotates counterclockwise (CCW) to open, and the angle of the damper open-to-closed is 90 degrees:

3.1. Manually open the damper fully (rotate counterclockwise).

3.2. Using the Declutch button, rotate the universal shaft adapter fully counterclockwise.

3.3. Mount the actuator to the damper box and shaft.

3.4. Tighten the two bolts on the centering clamp (8 mm wrench; 8Nm [70 lb.-in.] torque). When the actuator closes, the damper rotates CW 90 degrees to fully close.

4. If the damper rotates counterclockwise (CCW) to open, and the angle of the damper open-to-closed is 45 or 60 degrees:

4.1. Manually open the damper fully (rotate counterclockwise).

4.2. The actuator is shipped with the mechanical end limits set at 95 degrees. Adjust the two mechanical end-limit set screws to provide the desired amount of rotation. Adjust the two set screws closer together to reduce the rotation travel.

4.3. Tighten the two mechanical end-limit screws (Phillips #2 screwdriver; (3.0-3.5 Nm [26.5-31 lb.-in.] torque).

4.4. Using the Declutch button, rotate the universal shaft adapter fully counter-clockwise.

4.5. Mount the actuator to the VAV damper box and shaft.

4.6. Tighten the two bolts on the centering clamp (8 mm wrench; 70 lb.-in. [8Nm] torque).

4.7. When the actuator closes, the damper rotates CW either 45 or 60 degrees to fully close.

PIPING

Connect the air flow pickup to the two restrictor ports on the controller.

Note:

- Use 6 mm ($^{15}/_{64}$ in.) outside diameter, with a 1 mm ($^{3}/_{64}$ in.) wall thickness, plenum-rated 1219 FR (94V-2) tubing.
- Always use a fresh cut on the end of the tubing that connects to the air flow pickups and the restrictor ports on the controller.

It is recommended (not compulsory) to connect the high pressure or upstream tube to the plastic restrictor port labeled (+), and the low pressure or downstream tube to the restrictor port labeled (-). See labeling in Fig. 11. When twin tubing is used from the pickup, split the pickup tubing a short length to accommodate the connections.

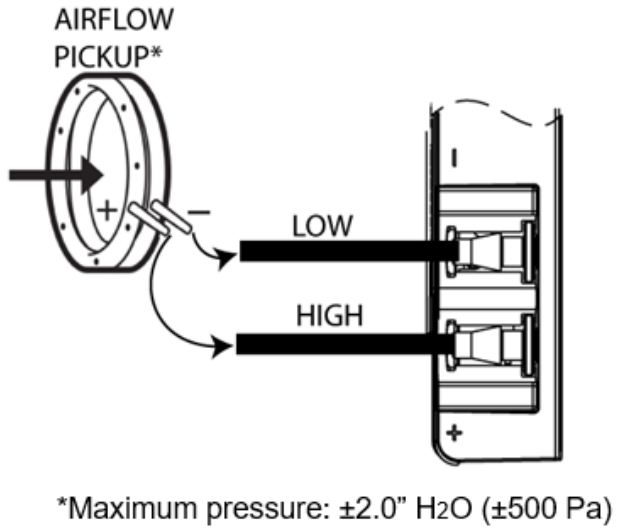


Fig. 11. Airflow pickup connections

NOTES:

- If controllers are mounted in unusually dusty or dirty environments, an inline, 5-micron disposable air filter (use 5-micron filters compatible with pneumatic controls) is recommended for the high-pressure line (marked as +) connected to the air flow pickup.
- The tubing from the air flow pickup to the controller should not exceed three feet (0.914 m). Any length greater than this will degrade the flow sensing accuracy.
- Use caution when removing tubing from a connector. Always pull straight away from the connector or use diagonal cutters to cut the edge of the tubing attached to the connector. Never remove by pulling at an angle.

Best practice for zero calibration of air flow sensor
The controller must be powered up for a minimum of 1 hour before performing the zero calibration for the air flow sensor.

NOTICE

Dust particle contamination may be present in some applications. Ensure appropriate measures are taken to minimize the effect of particulate contamination.

The sense element is in parallel to the airstream and tends to direct the dust particles in the airflow stream past the sense element away from the sense bridge.
The sense element is a microstructure-based device and the bridge portion of the sense element structure is made up of two platinum sense elements and a heater. The heater tends to repel dust particles via a thermophoretic effect past the heater and tends to keep most dust off the bridge structure. The heat affect, along with a simple filter, can help to keep the dust from causing output shifts in the output of the device.
Although the sensor naturally repels dust, some dust and contamination can still collect on the microstructure. Dust adherence to chip edges and channel surfaces can be prevented by using a simple filter. A disposable five micron filter used in series on the upstream side of the airflow divide will provide adequate filtering in most applications. See Table 5 for recommended filter suppliers.

Table 5. Recommended Filter Suppliers

Pall Corporation www.pall.com	
Acro 50	The filter may be used at a common mode pressure of 0.17 MPa (24.6 psi) at a temperature of 80 °C [176 °F] May be used with swag lock compression fittings Approximate pressure drop is 5 kPA at 1 SLPM of flow
Acro cap	May be used at an operating temperature of 55 °C [131 °F] and common mode pressure of 30 psi Sensors connections are1/4 barb fittings General Gas filter Pressure drop is 1 psi with a flow of 15 SLPM Fittings are 1/8 barbed tubing
Parker Balston www.balstonfilters.com	
Model 9933-05	US and EMEA only sales offices. May be used at common mode pressures up to 125 psi and operating temperature to 135 °C [275] °F Sensor connections are 1/4 tube
MAHLE https://catalog.mahle-aftermarket.com/eu/product.xhtml?eid=184	
MAHLE KL13	Automotive filter

POWER SUPPLY

General Information

To prevent a risk of injury due to electrical shock and/or damage to device due to short-circuiting, low-voltage and high-voltage lines must be kept physically separate from one another. Further, to prevent a risk of short-circuiting and damage to your unit, do not reverse the polarity of the power connection cables, and avoid ground loops (i.e., avoid connecting one field device to several controllers).

Before wiring the controller, determine the input and output device requirements for each controller used in the system. Select input and output devices compatible with the controller and the application. Consider the operating range, wiring requirements, and the environment conditions when selecting input/output devices. The Actuator, COVA must be used in combination with CLMEVA423B24N. See product data 31-00330M for individual part model numbers.

Determine the location of controllers, sensors, actuators and other input/output devices and create wiring diagrams for illustrations of typical controller wiring for various configurations.

The application engineer must review the control job requirements. This includes the sequences of operation for the controller, and for the system as a whole. Usually, there are variables that must be passed between the controller and other MERLIN NX controllers that are required for optimum system wide operation. Typical examples are the TOD, Occ/Unocc signal, the outdoor air temperature, the demand limit control signal, and the smoke control mode signal.

It is important to understand these interrelationships early in the job engineering process, to ensure proper implementation when configuring the controllers.

NOTES:

- All wiring must comply with applicable electrical codes and ordinances. Refer to job or manufacturers' drawings for details. Local wiring guidelines (for example, IEC 364-6-61 or VDE 0100) may take precedence over recommendations provided in these installation instructions.
- To comply with CE requirements, devices having a voltage of 50-1000 VAC or 75-1500 VDC but lacking a supply cord, plug, or other means for disconnecting from the power supply must have the means of disconnection incorporated in the fixed wiring. This type of disconnection must have a contact separation of at least 3 mm at all poles.

Wiring

All wiring must comply with applicable electrical codes and ordinances, or as specified on installation wiring diagrams. Controller wiring is terminated to the screw terminal blocks located on the device.

NOTES:

- For multiple controllers operating from a single transformer, the same side of the transformer secondary must be connected to the same power input terminal in each controller. Controller configurations will not necessarily be limited to three devices, but the total power draw, including accessories, cannot exceed 100 VA when powered by the same transformer (U.S. only).
- All loads on the controller must be powered by the same transformer that powers the controller itself. A controller can use separate transformers for controller power and output power.

The 24 VAC power from an energy limited Class II power source must be provided to the controller. To conform to Class II restrictions (U.S. only), the transformer must not be larger than 100 VA. Fig. 12 depicts a single controller using one transformer

IMPORTANT

- Power must be off prior to connecting to or removing connections from the 24 VAC power (24 V~/24 V0), and 20 VDC power (20 VDC) terminals.
- Use the heaviest gauge wire available, up to 0.8 mm^2 (18 AWG), with a minimum of 0.3 mm^2 (22 AWG), for all power wiring.

More than one controller can be powered by a single transformer. Fig. 13 shows power wiring details for multiple controllers.

CAUTION

Controller configurations are not necessarily limited to three devices, but the total power draw, including accessories, cannot exceed 100 VA when powered by the same transformer (U.S. only)

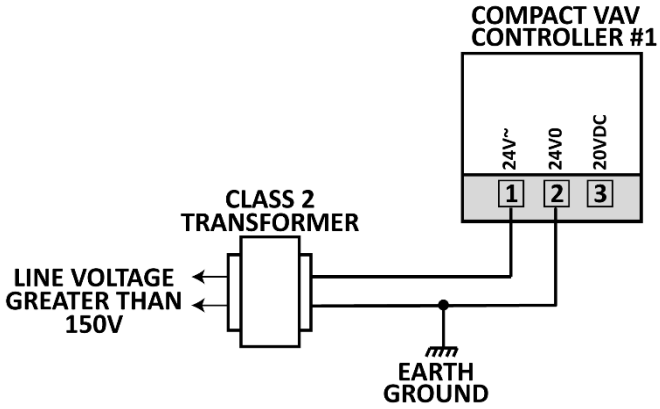


Fig. 12. Power wiring details for one controller per transformer.

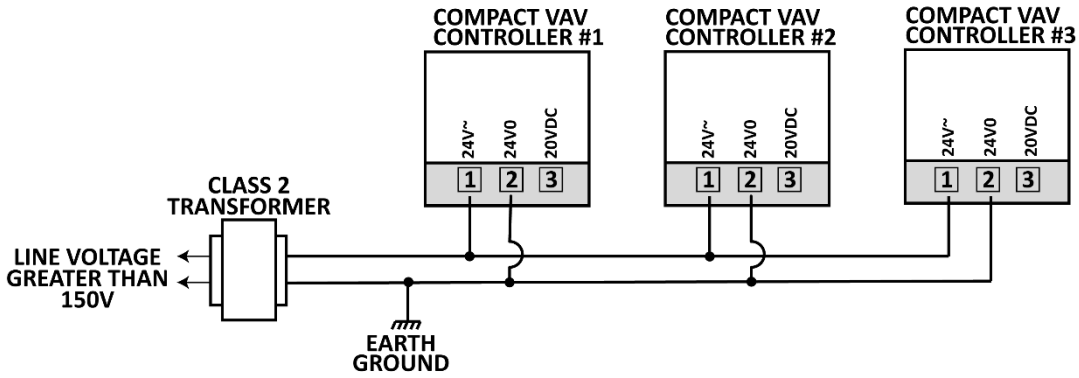


Fig. 13. Power wiring details for two or more controllers per transformer

COMMUNICATION

BACnet MS/TP Interface

The controller features an isolated RS485 interface (terminals 4, 5, and 6) suitable for BACnet MS/TP communication. The terminal block containing it is black. The cable length affects the baud rate (See Table 6 below)

Table 6. Baud rate vs. Maximum cable length

Baud rate	Maximum cable length (L)
9.6, 19.2, 38.4, 57.6, and 76.8 kbps	1200 m (4000 ft)

The controller supports auto-baud rate adaption for BACnet MS/TP communication at all of the aforementioned baud rates (default: 38.4 kbps). For information on wire gauge, maximum permissible cable length, possible shielding and grounding requirements, and the maximum number of devices which can be connected to a bus, refer to standard EIA-485.

IMPORTANT

- This controller is insensitive to bias voltages because of failsafe chip-set inside and can share the BACnet bus with other devices with or without bias voltages.

Connecting to BACnet MS/TP Buses

The controller communicates via its BACnet MS/TP interface with other BACnet MS/TP-capable devices (for example, other room controllers or MS/TP controllers). In doing so, the following considerations should be taken into account.

- Maximum BACnet MS/TP bus length (= "L" in Fig. 14). (See Table 6 above).
- Twisted-pair cable, for example,
  - AWG 18
  - J-Y(ST)Y 4 x 2 x 0.8 mm^2 or a special RS485 cable.
  - CAT 5,6,7 cable – use only one single pair for one bus
  - Belden 9842 or 9842NH and
  - Daisy-chain topology.

- Must conform to EIA-RS485 cabling guidelines and ANSI/ASHRAE Standard 135-2010.
- There are two limitations regarding the number of controllers per BACnet MS/TP channel:

1. Physical limitation:
32 loads as per TIA/EIA-485 standard. One MERLIN NX controller represents $^{1}/_{8}$ load. The physical limitation is important in case 3rd party devices representing a full load are connected.

2. AutoMAC limitation:
We have tested with a maximum of 64 for maxMaster. A maxMaster of 64 means we support a maximum of 62 MERLIN NX controllers, one supervisor, and one BACnet client (tool) per BACnet MS/TP channel. The default value for maxMaster is 64 devices which can be changed by the user. Refer to the Niagara IRM Engineering Tool – User Guide (EN2B-0414GE51) for more information on how to do this.

Thus, depending upon your actual performance needs and required communication rates, it is recommended to connect a smaller number of BACnet MS/TP devices per channel.

NOTE 1:

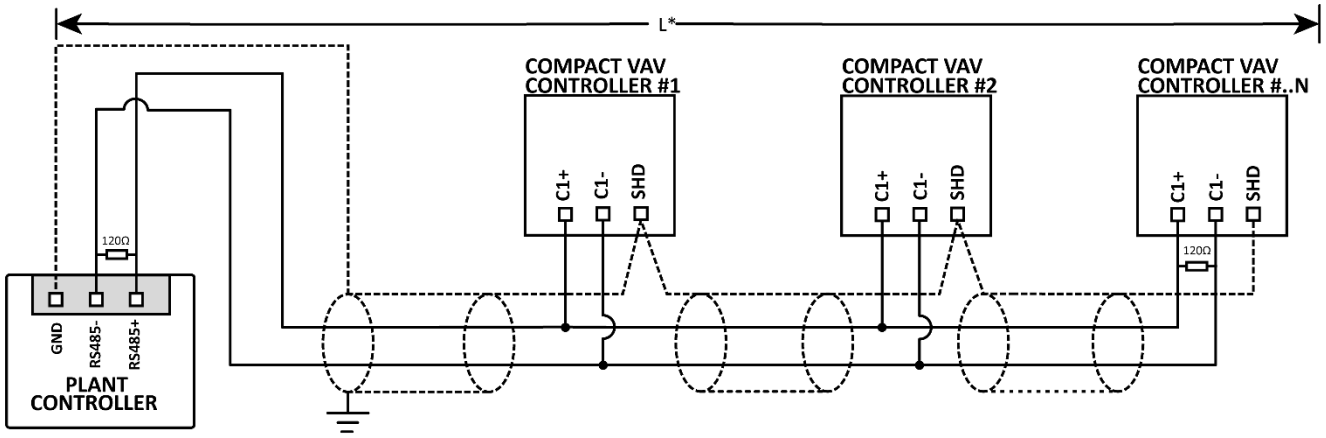
- If any of the devices are electrically isolated, it is recommended that those devices be connected to signal ground.

NOTE 2:

- Matched terminating resistors are required at each end of a segment bus wired across (+) and (-). Use matched precision resistors rated $^{1}/_{4}$ W ±1% / 80 - 130 Ω. Ideally, the value of the terminating resistors should match the rated characteristic impedance of the installed cable. For example, if the installed MS/TP cable has a listed characteristic impedance of 120 Ω, install 120 Ω matched precision resistors.

NOTE 3:

- Following proper MS/TP cabling shield grounding procedures is important to minimize the risk of communication problems and equipment damage caused by capacitive coupling. Capacitive coupling is caused by placing MS/TP cabling close to lines carrying higher voltage. If shielding is used, the shielding of each individual bus segment should be separately connected at one end to earth.



*for Maximum BACnet MS/TP bus length refer table Baud rate vs. Maximum cable length

Fig. 14. Connection to a BACnet MS/TP Bus

Sylk Bus™

Sylk™ Bus capable wall modules such asTR40x / T42x can be connected to the controller's Sylk™ Interface (terminals 7 and 8).

- The Sylk™ Bus is single pair, and polarity-insensitive.
- Maximum current provided at the Sylk™ Bus interface: 96 mA.
- The maximum number of wall modules depends on the following wall module specific information:
    1. Sylk™ bus power consumption
    2. Number of parameters used
    3. Total config file size

The IRM NX tool has an inbuilt resource calculator to calculate the number of Sylk™ wall modules.

WALL MODULES

A variety of wall modules can be used in conjunction with the controller.

Wall Modules Supported for Sylk Interface

The following wall module types are supported for connection to the controller's Sylk interface:

- CLCMTR40, CLCMTR40-H, CLCMTR40-H-CO2, and CLCMTR40-CO2
- CLCMTR42, CLCMTR42-H, CLCMTR42-H-CO2, and CLCMTR42-CO2
- CLCMTR71, CLCMTR71-H, CLCMTR75, and CLCMTR75-H
- CLCMTR120 (TR75E) and CLCMTR120-H (TR75-HE).

Wall Modules Supported for I/Os

The following wall module types are supported for connection to the controller's respective I/Os:

- CLCM1C155A and CLCM4C155A;
- CLCM1T11N, CLCM2T11N, CLCM4T111, CLCM5T111, and CLCM6T111.

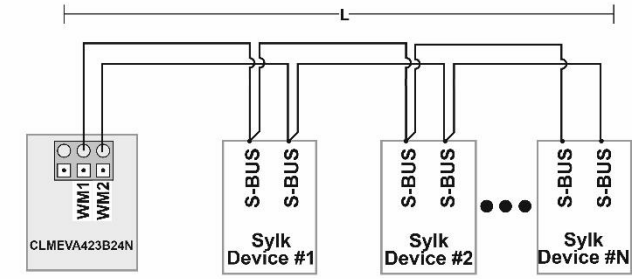
NOTE 1:

- The CLCMTR42x Wall Module must be version 1.00.3 or higher.

NOTE 2:

- TR70 Wall Modules are not supported.

Daisy-chaining Multiple Sylk™ Devices



Home-running Multiple Sylk™ Devices

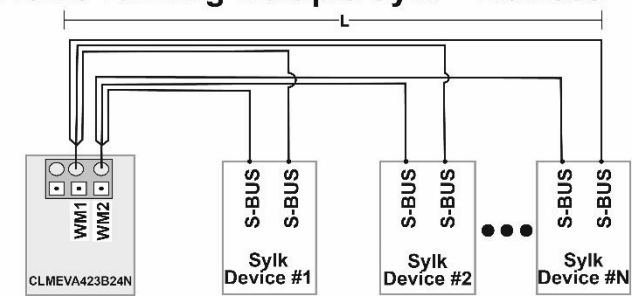


Fig. 15. Sylk™ Wiring Topologies

Single twisted pair, Non-Shielded, Stranded or Solid [a]		**Standard non-twisted thermostat wire shielded or Non-Shielded, Stranded or Solid** [b,c]
0.33 to 0.82 mm^2 (18 - 22 AWG)	0.20 mm^2 (24 AWG)	0.20 to 0.82 mm^2 (18 - 24 AWG)
150 m (500 ft)	120 m (400 ft)	30 m (100 ft)

[a] As a rule of thumb, single twisted pair (two wires per cable, only), thicker gauge, non-shielded cable yields the best results for longer runs.
[b] The 100 ft (30 m) distance for standard thermostat wire is conservative but is meant to reduce the impact of any sources of electrical noise (incl. but not limited to VFDs, electronic ballasts, etc.). Shielded cable recommended only if there is a need to reduce the effect of electrical noise.
[c] These distances apply also for shielded twisted pair.

The TIA/EIA-485 Standard

According to the TIA/EIA-485 standard (TIA/EIA-485: "Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems"), only one driver communicating via an RS485 interface may transmit data at a time. Further, according to U.L. requirements, each RS485 interface may be loaded with a max. of 32 unit loads. For example, if a controller utilizes as little as $^1/_8$ unit load each, up to 256 devices can be connected.

BACnet connections to the RS485 interfaces must comply with the RS485 standard. Thus, it is recommended that each end of every bus should be equipped with a termination resistor (not included in shipment) having a resistance equal to the cable impedance (120 Ω; the wattage should be in the range of 0.25 – 0.5 W).

RS485 systems frequently lack a separate signal ground wire. However, the laws of physics still require that a solid

ground connection be provided for in order to ensure error-free communication between drivers and receivers – unless all of the devices are electrically isolated, and no earth grounding exists.

IMPORTANT

A separate signal ground wire must be used. Failing to obey this requirement can lead to unpredictable behavior if other electrically non-isolated devices are connected and the potential difference is too high.

TIA-EIA 485 Cable Specifications

The following cable specification is valid for all EIA 485 buses (BACnet MS/TP).

Table 7. TIA/EIA 485 cable specifications

Maximum length	1200 m (9.6–78.8 kbps) or 800 m (115.2 kbps).
Cable type	Twisted pair shielded (foil or braided shields are acceptable)
Characteristic impedance	100-130 Ω
Distributed capacitance between conductors	Less than 100 pF per meter (30 pF per foot)
Distributed cap. between conductors and shield	Less than 200 pF per meter (60 pF per foot)

The following cables fulfill this requirement:

- AWG 18
- Shielded, twisted pair cable J-Y-(St)-Y 4 x 2 x 0.8 mm^2.
- CAT 5,6,7 cable - use only one single pair for one bus
- Belden 9842 or 9842NH.

Wiring Method

NOTES:

- When attaching two or more wires to the same terminal, other than 14 AWG (2.0 mm^2), be sure to twist them together. Deviation from this rule can result in improper electrical contact (see Fig. 16).

Each terminal can accommodate the following gauges of wire:

- Single wire: from 22 AWG to 18 AWG solid or stranded
- Multiple wires: up to two 18 AWG stranded, with 1/4 watt wire-wound resistor

Prepare wiring for the terminal blocks, as follows:

- Strip $^1/_2$ in. (13 mm) insulation from the conductor.
- Cut a single wire to $^3/_{16}$ in. (5 mm). Insert the wire in the required terminal location and tighten the screw.
- If two or more wires are being inserted into one terminal location, twist the wires together a minimum of three turns before inserting them (see Fig. 16.
- Cut the twisted end of the wires to $^3/_{16}$ in. (5 mm) before inserting them into the terminal and tightening the screw.
- Pull on each wire in all terminals to check for good mechanical connection.

NOTES:

- Do not overtighten the terminal screws to avoid deformation and damage of the terminal block. The maximum torque for the terminal screws 4.4 lb.-in. (0.5 Nm).

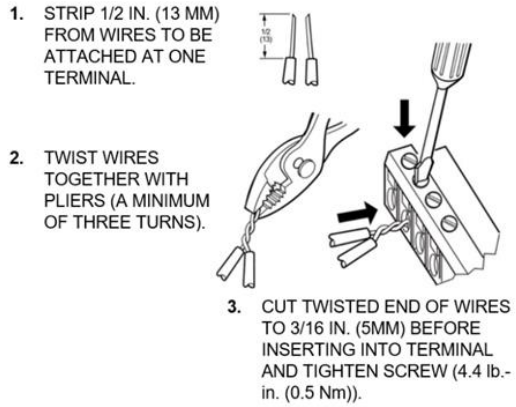


Fig. 16. Attaching two or more wires at terminal blocks

COMMISSIONING

Automatic MAC Addressing

In contrast to other controllers the CLMEVA423B24N controller features automatic MAC addressing.

The MAC addresses which the individual CLMEVA423B24N controllers in the BACnet MS/TP channel assign to themselves are not assigned in sequential order.

Rather, they assign those numbers (MAC Address) in the range of min MAC to max MAC (these are exposed as the proprietary properties id 1028 (min MAC) and 1029 (maxMAC) under device object) currently not in use by another device in the BACnet MS/TP channel (the MAC Address of "0" is reserved by default for the router / plant controller, itself).

All CLMEVA423B24N controllers are BACnet MS/TP masters. Every master performs periodic polling for the possible appearance of new masters. Each master "knows" the identity of the "next" master (i.e., that CLMEVA423B24N controller with the next-highest MAC Address) on the BACnet MS/TP bus and to which it must therefore pass the token. The polling process includes a search for new masters which might have MAC addresses lying between its own MAC address and that of the "next" master.

The property maxMaster specifies the highest-allowable address for master nodes. The maxMaster is set to 64 by default, thus guaranteeing that, on a BACnet MS/TP bus with, for example, 35 CLMEVA423B24N controllers, all of the other CLMEVA423B24N controllers will be found.

Following properties are writeable and can be changed:

- maxMaster
- min MAC
- max MAC

- MAC address.

NOTE: You should not attempt to program a MAC Address outside the range of min MAC and max MAC (1 to 60).

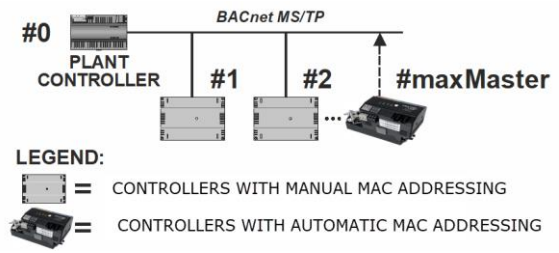


Fig. 17. Automatic MAC addressing

In the scenario depicted in Fig. 17, some of the controllers in the BACnet MS/TP channel do not feature automatic MAC addressing; rather, their MAC addresses were assigned manually. Thus, when a new CLMEVA423B24N is added to the channel, its automatic MAC addressing function is triggered, it will assign itself an available (unused) MAC address within the range of min MAC and max MAC values (1 to 60).

During the automatic MAC addressing process, LED behavior #7 (See Table 9 on pg. 14) is displayed.

OPERATOR INTERFACES

LEDs

The controller features the following LEDs:

Table 8. Description of LED behaviors

Symbol	Color	Function
⏻	green	Power LED indicating firmware problems, hardware problems, etc.
⚠	yellow	Status LED indicating firmware problems, hardware problems, etc.
T1	yellow	LED indicating transmission of communication signals via the BACnet MS/TP interface. In case of no communication LED will be off.
R1	yellow	LED indicating reception of communication signals via the BACnet MS/TP interface. In-case of no communication LED will be off.

Table 9. Status LED and power LED behaviors

#	Mode	Power LED (green)	Status LEDs (yellow)
1	Power failure	OFF	OFF
2	Device error*	ON	ON
3	Firmware Download	ON/OFF (1 Hz)	ON/OFF (1 Hz)
4	No application	ON/OFF (0.5 Hz)	ON/OFF (0.25 Hz)
5	Broken sensor	ON/OFF (0.25 Hz)	Stays ON
6	Short-circuiting	ON/OFF (0.5 Hz)	Stays ON
7	Auto-MAC	ON/OFF (1 Hz)	ON/OFF (0.5 Hz)
8	Unacknowledged alarm	ON/OFF (2 Hz)	ON/OFF (2 Hz)
9	Normal operation	ON/OFF (0.5 Hz)	Stays OFF

*Please return the controller for repair. Contact CentraLine Customer Care for assistance.

The ON/OFF frequencies listed in Table 9 above can be converted from "Hz" (i.e., "ON/OFF per second") to "ON/OFF per minute" by multiplying them by 60.

Service Button

The Service Button is used to trigger dedicated events. It is important to distinguish different controller behaviors which are elicited depending upon whether the Service Button is pressed when the controller is powering up or when it is in normal operation. See the following dedicated events.

Pressing Service Button during Power-Up

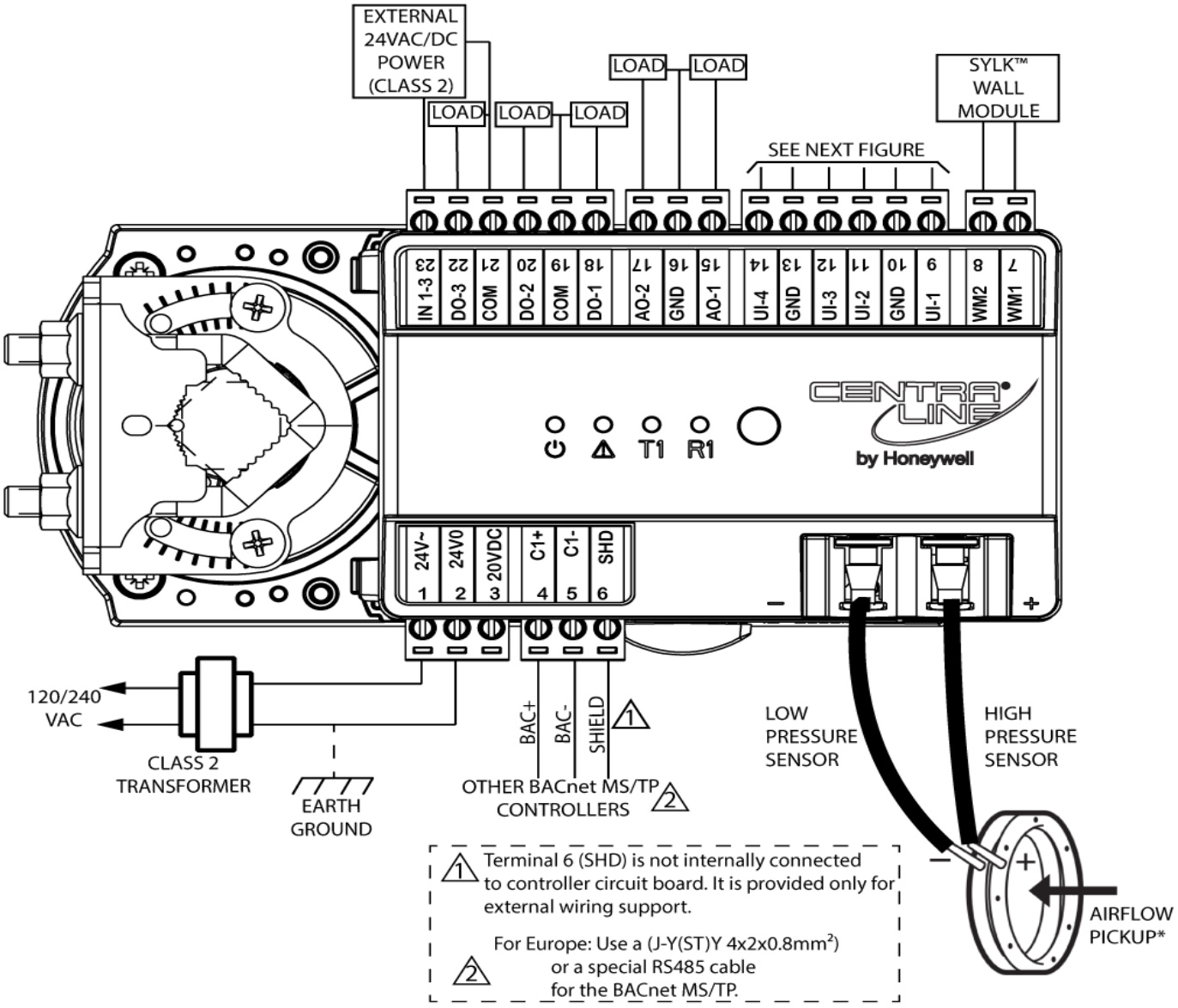
If the service pin is pressed and then the controller is switched on (while the service pin is still pressed), a reset to factory delivery is performed. The service button has to be pressed until the green power LED goes out at least twice and is switched on again. Factory defaults are as follows:

- The application is cleared from the controller.
- The MAC address will be set to 0xFF, meaning that the controller will now search for a new mac address (Auto-MAC will be automatically triggered after controller power-up).
- The maxMaster setting will revert to its default value of 64.
- The Max info frames will revert to 10.
- The device instance will revert to its default of 4194302.
- The device name will revert to CLME-[ModelName].
- The values of Auto MAC, Min MAC and Max MAC will be reset to 1 and 60, respectively.

Pressing Service Button during Normal Operation

During normal operation of the controller, a short press (< 1 sec) of the Service Button will cause a Service Pin Message (BACnet WhoAmI as a Private Transfer (SerialNo. = 130)) to be sent.

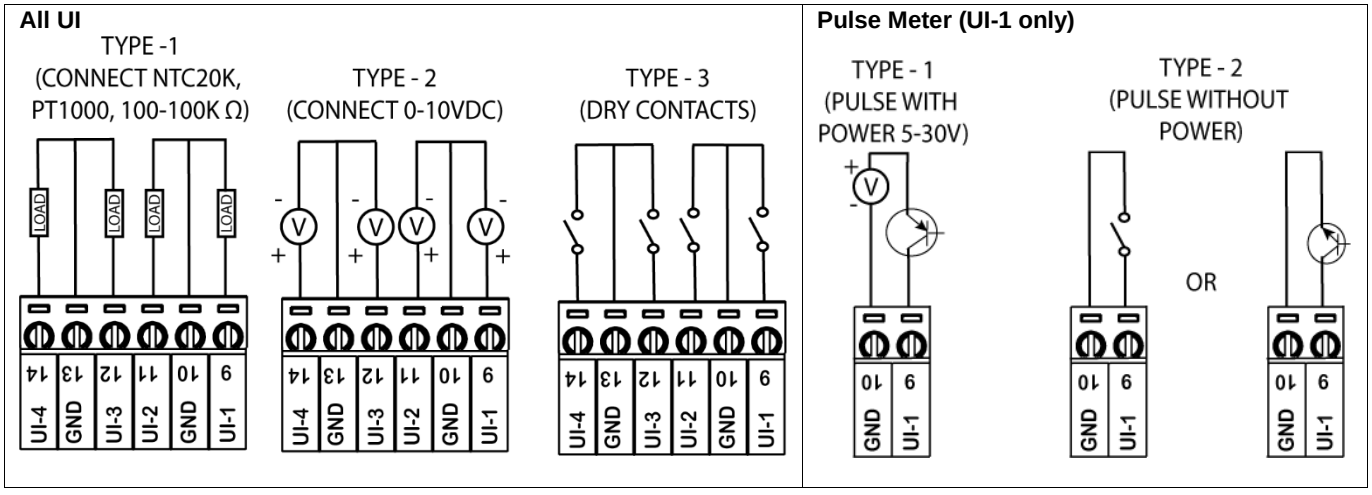
SCHEMATIC DIAGRAM



Use wiring up to 18 AWG (0.8mm²) with a minimum of 22 AWG (0.3mm²)

Fig. 18. Schematic diagram for CLMEVA423B24N

UI wiring

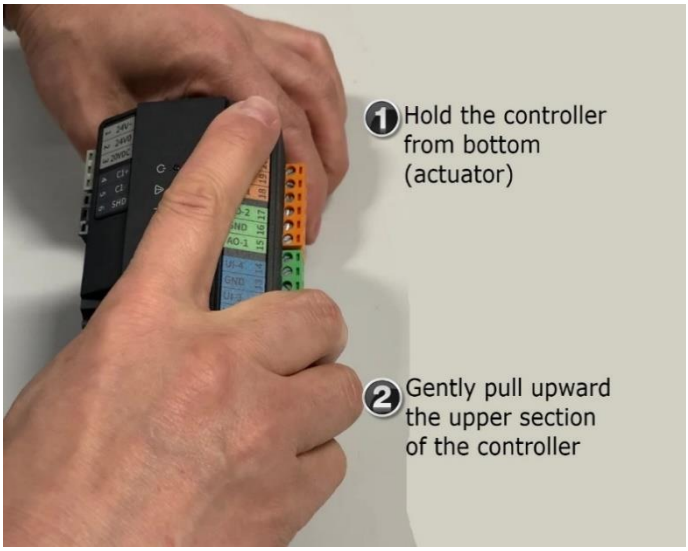


REPLACING ACTUATOR

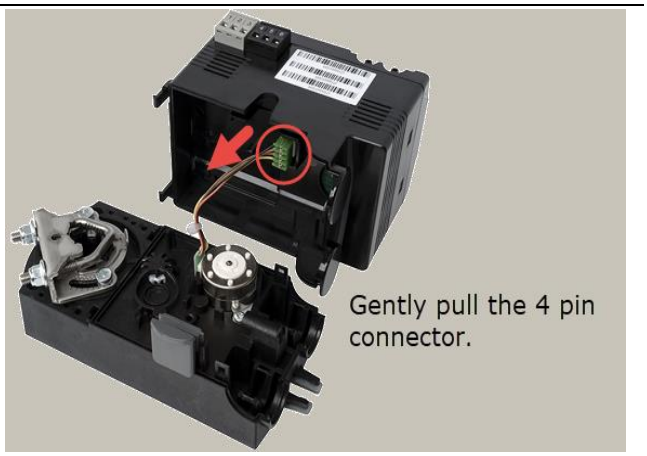
The integrated actuator of compact VAV can be replaced.
To replace the actuator, follow the steps mentioned below.

1. Remove the screw on the side of the controller.

2. Separate the controller from the actuator by gently pulling them apart.



3. Remove the 4-pin connector that links the actuator to the controller, by pulling away from the actuator circuit board.



4. Replace the actuator.

APPENDIX

Sensor Input Accuracy

The controller's internal sensor inputs support NTC20 kΩ sensors. The following table lists the typical minimum accuracies of the hardware and software for these temperature sensors.

Table 10. Accuracies of internal NTC20kΩ sensor inputs of the controller

Range	Measurement error (excluding sensor characteristics)
-40 to -20 °C (-40 to -4 °F)	±5.0 K
-20 to -1 °C (-4 to 30.2 °F)	± 2.8 K
-1 to 10 °C (30.2 to 50 °F)	± 1.1 K
10 to 32 °C (50 to 89.6 °F)	± 0.5 K
32 to 43 °C (89.6 to 109.4 °F)	± 1.1 K
43 to 73 °C (109.4 to 163.4 °F)	± 2.8 K
73 to 93 °C (163.4 to 199 °F)	± 5.0 K

NOTE:

- This is the accuracy of the internal sensor input (hardware + software [linearization]), only. This table does not include the characteristics of the sensors, themselves (see section “Sensor Characteristics below). If a different sensor or sensor accuracy is required, one may instead use the inputs of, such as a connected Panel I/O module.

Recognition of Sensor Failure of Sensor Inputs

The thresholds at which sensor failures – i.e., sensor breaks (SB) and short-circuits (SC) – are recognized depends upon the given sensor type. In the event of a recognized sensor failure, the sensor assume the safety values configured in CARE. Table 11 lists the measurement ranges and the corresponding thresholds for the recognition of sensor failure for the various different sensor types:

Table 11. Thresholds for short-circuit (SC) and sensor-break (SB) recognition

I/O configuration	Measurement range	Recognition thresholds
2to10 V	2to10 V / 4to20 mA (without pull-up)	SC: < 1.5 V / 3 mA; SB: no recognition
NTC20kΩ	-50 to +150 °C (-58 to +302 °F)	SC: < 20 Ω; SB: < -- 70 °C (94 °F)
PT1000	-30 to + 400 °C (-22 to +752 °F)	SC: < 775 Ω; SB: > 409 °C (768 °F)

NOTE:

In the case of temperatures lying *outside* the aforementioned ranges, the lowest/highest value *within* the range, instead, will be communicated. Thus, a temperature of -51 °F will be communicated as “-50 °F.”

Sensor Characteristics

The characteristics (resistance in relation to temperature) of the sensors and the resultant voltage are listed on the following pages. The stated values do not include failures due to sensor failures; wiring resistance or wiring failures; misreading’s due to a meter connected to measure resistance or voltage at the input.

RELATED TECHNICAL LITERATURE

Table 12. Related Technical Literature

Title	Product Literature no.
MERLIN NX COMPACT VAV Controller CLMEVA423B24N - Installation Instructions	31-00332 (EN1Z-1061GE51)
MERLIN NX COMPACT VAV Controller CLMEVA423B24N – Mounting Instruction	31-00331M (MU1Z-1061GE51）
MERLIN NX COMPACT VAV Controller CLMEVA423B24N – Migration Guide	(EN2Z-1061GE51)
Niagara IRM Engineering Tool – User Guide	EN2B-0414GE51
CLCMTR40x/TR42x – Specification Data	EN0Z-0990GE51
CLCMTR40x/TR42x – Installation Instruction	EN1Z-0990GE51

NTC 20 kΩ

Temp. [°C]	Resistance [kΩ]	Terminal voltage [V]
-50	1659	9.759
-49	1541	9.757
-48	1432	9.755
-47	1331	9.753
-46	1239	9.751
-45	1153	9.748
-44	1073	9.746
-43	1000	9.743
-42	932	9.74
-41	869	9.737
-40	811	9.734
-39	757	9.73
-38	706	9.726
-37	660	9.723
-36	617	9.718
-35	577	9.714
-34	539	9.709
-33	505	9.704
-32	473	9.699
-31	443	9.693
-30	415	9.687
-29	389	9.681
-28	364	9.674
-27	342	9.667
-26	321	9.66
-25	301	9.651
-24	283	9.643
-23	266	9.634
-22	250	9.625
-21	235	9.615
-20	221	9.605
-19	208	9.594
-18	196	9.582
-17	184	9.57
-16	174	9.558
-15	164	9.544
-14	154	9.529
-13	146	9.516
-12	137	9.499
-11	130	9.484
-10	122	9.465
-9	116	9.449
-8	109	9.428
-7	103	9.408
-6	97.6	9.388
-5	92.3	9.367
-4	87.3	9.344
-3	82.6	9.32
-2	78.2	9.295
-1	74.1	9.27
0	70.2	9.243
1	66.5	9.215
2	63	9.185
3	59.8	9.155
4	56.7	9.123
5	53.8	9.09
6	51.1	9.056
7	48.5	9.02
8	46	8.982
9	43.7	8.944
10	41.6	8.905
11	39.5	8.863
12	37.6	8.821
13	35.7	8.775
14	34	8.73
15	32.3	8.681
16	30.8	8.633
17	29.3	8.582
18	27.9	8.529
19	26.6	8.476
20	25.3	8.418
21	24.2	8.365
22	23	8.302
23	22	8.246
24	21	8.184
25	20	8.118
26	19.1	8.053
27	18.2	7.984
28	17.4	7.917
29	16.6	7.845
30	15.9	7.777
31	15.2	7.704
32	14.5	7.626
33	13.9	7.554
34	13.3	7.477
35	12.7	7.395
36	12.1	7.306
37	11.6	7.227
38	11.1	7.143
39	10.7	7.072
40	10.2	6.977
41	9.78	6.892
42	9.37	6.804
43	8.98	6.716
44	8.61	6.626
45	8.26	6.537
46	7.92	6.445
47	7.6	6.354
48	7.29	6.26
49	7	6.168
50	6.72	6.075
51	6.45	5.98
52	6.19	5.884
53	5.95	5.791
54	5.72	5.697
55	5.49	5.599
56	5.28	5.506
57	5.08	5.413
58	4.88	5.315
59	4.69	5.219
60	4.52	5.129
61	4.35	5.035
62	4.18	4.938
63	4.03	4.848
64	3.88	4.756
65	3.73	4.659
66	3.59	4.566
67	3.46	4.476
68	3.34	4.391
69	3.21	4.295
70	3.1	4.211
71	2.99	4.125
72	2.88	4.036
73	2.78	3.952
74	2.68	3.866
75	2.58	3.777
76	2.49	3.695
77	2.41	3.621
78	2.32	3.534
79	2.24	3.455
80	2.17	3.385
81	2.09	3.302
82	2.02	3.228
83	1.95	3.152
84	1.89	3.086
85	1.82	3.007
86	1.76	2.937
87	1.7	2.867
88	1.65	2.806
89	1.59	2.733
90	1.54	2.67
91	1.49	2.607
92	1.44	2.542
93	1.4	2.489
94	1.35	2.423
95	1.31	2.368
96	1.27	2.313
97	1.23	2.257
98	1.19	2.2
99	1.15	2.142
100	1.11	2.084
101	1.08	2.039
102	1.05	1.994
103	1.01	1.933
104	0.98	1.887
105	0.95	1.84
106	0.92	1.792
107	0.9	1.76
108	0.87	1.712
109	0.84	1.663
110	0.82	1.63
111	0.79	1.58
112	0.77	1.546
113	0.75	1.512
114	0.73	1.478
115	0.7	1.426
116	0.68	1.391
117	0.66	1.356
118	0.64	1.32
119	0.63	1.303
120	0.61	1.267
121	0.59	1.23
122	0.57	1.194
123	0.56	1.175
124	0.54	1.138
125	0.53	1.119
126	0.51	1.082
127	0.5	1.063
128	0.49	1.044
129	0.47	1.006
130	0.46	0.986
131	0.45	0.967
132	0.43	0.928
133	0.42	0.909
134	0.41	0.889
135	0.4	0.869
136	0.39	0.849
137	0.38	0.829
138	0.37	0.809
139	0.36	0.789
140	0.35	0.769
141	0.34	0.749
142	0.33	0.728
143	0.32	0.708
144	0.32	0.708
145	0.31	0.687
146	0.3	0.667
147	0.29	0.646
148	0.29	0.646
149	0.28	0.625
150	0.27	0.604

PT 1000

Temp. [°C]	Resistance [Ω]	Terminal voltage [V]
-50	803	1.602
-49	807	1.608
-48	811	1.615
-47	815	1.622
-46	819	1.628
-45	823	1.635
-44	827	1.641
-43	831	1.648
-42	835	1.655
-41	839	1.661
-40	843	1.668
-39	847	1.674
-38	851	1.681
-37	855	1.687
-36	859	1.694
-35	862	1.699
-34	866	1.705
-33	870	1.712
-32	874	1.718
-31	878	1.725
-30	882	1.731
-29	886	1.738
-28	890	1.744
-27	894	1.751
-26	898	1.757
-25	902	1.764
-24	906	1.77
-23	910	1.776
-22	914	1.783
-21	918	1.789
-20	922	1.795
-19	926	1.802
-18	929	1.807
-17	933	1.813
-16	937	1.819
-15	941	1.826
-14	945	1.832
-13	949	1.838
-12	953	1.844
-11	957	1.851
-10	961	1.857
-9	965	1.863
-8	969	1.869
-7	973	1.876
-6	977	1.882
-5	980	1.887
-4	984	1.893
-3	988	1.899
-2	992	1.905
-1	996	1.911
0	1000	1.918
1	1004	1.924
2	1008	1.93
3	1012	1.936
4	1016	1.942
5	1020	1.948
6	1023	1.953
7	1027	1.959
8	1031	1.965
9	1035	1.971
10	1039	1.977
11	1043	1.983
12	1047	1.989
13	1051	1.995
14	1055	2.001
15	1058	2.006
16	1062	2.012
17	1066	2.018
18	1070	2.024
19	1074	2.03
20	1078	2.036
21	1082	2.042
22	1086	2.048
23	1090	2.054
24	1093	2.058
25	1097	2.064
26	1101	2.07
27	1105	2.076
28	1109	2.082
29	1113	2.088
30	1117	2.094
31	1121	2.1
32	1124	2.104
33	1128	2.11
34	1132	2.116
35	1136	2.122
36	1140	2.128
37	1144	2.133
38	1148	2.139
39	1152	2.145
40	1155	2.149
41	1159	2.155
42	1163	2.161
43	1167	2.167
44	1171	2.173
45	1175	2.178
46	1179	2.184
47	1182	2.188
48	1186	2.194
49	1190	2.2
50	1194	2.206
51	1198	2.211
52	1202	2.217
53	1205	2.221
54	1209	2.227
55	1213	2.233
56	1217	2.238
57	1221	2.244
58	1225	2.25
59	1229	2.255
60	1232	2.26
61	1236	2.265
62	1240	2.271
63	1244	2.277
64	1248	2.282
65	1252	2.288
66	1255	2.292
67	1259	2.298
68	1263	2.303
69	1267	2.309
70	1271	2.314
71	1275	2.32
72	1278	2.324
73	1282	2.33
74	1286	2.335
75	1290	2.341
76	1294	2.346
77	1297	2.35
78	1301	2.356
79	1305	2.361
80	1309	2.367
81	1313	2.372
82	1317	2.378
83	1320	2.382
84	1324	2.387
85	1328	2.393
86	1332	2.398
87	1336	2.404
88	1339	2.408
89	1343	2.413
90	1347	2.418
91	1351	2.424
92	1355	2.429
93	1358	2.433
94	1362	2.439
95	1366	2.444
96	1370	2.449
97	1374	2.455
98	1377	2.459
99	1381	2.464
100	1385	2.469
101	1389	2.475
102	1393	2.48
103	1396	2.484
104	1400	2.489
105	1404	2.495
106	1408	2.5
107	1412	2.505
108	1415	2.509
109	1419	2.515
110	1423	2.52
111	1427	2.525
112	1430	2.529
113	1434	2.534
114	1438	2.539
115	1442	2.545
116	1446	2.55
117	1449	2.554
118	1453	2.559
119	1457	2.564
120	1461	2.569
121	1464	2.573
122	1468	2.578
123	1472	2.584
124	1476	2.589
125	1479	2.593
126	1483	2.598
127	1487	2.603
128	1491	2.608
129	1494	2.612
130	1498	2.617
131	1502	2.622
132	1506	2.627
133	1510	2.632
134	1513	2.636
135	1517	2.641
136	1521	2.646
137	1525	2.651
138	1528	2.655
139	1532	2.66
140	1536	2.665
141	1539	2.669
142	1543	2.674
143	1547	2.679
144	1551	2.684
145	1554	2.688
146	1558	2.693
147	1562	2.698
148	1566	2.703
149	1569	2.707
150	1573	2.712
151	1577	2.717
152	1581	2.722
153	1584	2.725
154	1588	2.73
155	1592	2.735
156	1596	2.74
157	1599	2.744
158	1603	2.749
159	1607	2.754
160	1610	2.758
161	1614	2.762
162	1618	2.767
163	1622	2.772
164	1625	2.776
165	1629	2.781
166	1633	2.786
167	1636	2.789
168	1640	2.794
169	1644	2.799
170	1648	2.804
171	1651	2.808
172	1655	2.812
173	1659	2.817
174	1662	2.821
175	1666	2.826
176	1670	2.831
177	1674	2.835
178	1677	2.839
179	1681	2.844
180	1685	2.849
181	1688	2.852

Temp. [°C]	Resistance [Ω]	Terminal voltage [V]
182	1692	2.857
183	1696	2.862
184	1699	2.865
185	1703	2.87
186	1707	2.875
187	1711	2.88
188	1714	2.883
189	1718	2.888
190	1722	2.893
191	1725	2.896
192	1729	2.901
193	1733	2.906
194	1736	2.909
195	1740	2.914
196	1744	2.919
197	1747	2.922
198	1751	2.927
199	1755	2.932
200	1758	2.935
201	1762	2.94
202	1766	2.944
203	1769	2.948
204	1773	2.953
205	1777	2.957
206	1780	2.961
207	1784	2.965
208	1788	2.97
209	1791	2.973
210	1795	2.978
211	1799	2.983
212	1802	2.986
213	1806	2.991
214	1810	2.995
215	1813	2.999
216	1817	3.003
217	1821	3.008
218	1824	3.011
219	1828	3.016
220	1832	3.02
221	1835	3.024
222	1839	3.028
223	1843	3.033
224	1846	3.036
225	1850	3.041
226	1854	3.045
227	1857	3.049
228	1861	3.053
229	1865	3.058
230	1868	3.061
231	1872	3.066
232	1875	3.069
233	1879	3.074
234	1883	3.078
235	1886	3.081
236	1890	3.086
237	1894	3.09
238	1897	3.094
239	1901	3.098
240	1905	3.103
241	1908	3.106
242	1912	3.11
243	1915	3.114

Temp. [°C]	Resistance [Ω]	Terminal voltage [V]
244	1919	3.118
245	1923	3.123
246	1926	3.126
247	1930	3.13
248	1934	3.135
249	1937	3.138
250	1941	3.142
251	1944	3.146
252	1948	3.15
253	1952	3.154
254	1955	3.158
255	1959	3.162
256	1962	3.165
257	1966	3.17
258	1970	3.174
259	1973	3.177
260	1977	3.182
261	1980	3.185
262	1984	3.189
263	1988	3.194
264	1991	3.197
265	1995	3.201
266	1998	3.204
267	2002	3.209
268	2006	3.213
269	2009	3.216
270	2013	3.221
271	2016	3.224
272	2020	3.228
273	2024	3.232
274	2027	3.236
275	2031	3.24
276	2034	3.243
277	2038	3.247
278	2042	3.252
279	2045	3.255
280	2049	3.259
281	2052	3.262
282	2056	3.266
283	2060	3.271
284	2063	3.274
285	2067	3.278
286	2070	3.281
287	2074	3.285
288	2077	3.289
289	2081	3.293
290	2085	3.297
291	2088	3.3
292	2092	3.304
293	2095	3.307
294	2099	3.312
295	2102	3.315
296	2106	3.319
297	2110	3.323
298	2113	3.326
299	2117	3.33
300	2120	3.333
301	2124	3.338
302	2127	3.341
303	2131	3.345
304	2134	3.348
305	2138	3.352

Temp. [°C]	Resistance [Ω]	Terminal voltage [V]
306	2142	3.356
307	2145	3.359
308	2149	3.363
309	2152	3.366
310	2156	3.371
311	2159	3.374
312	2163	3.378
313	2166	3.381
314	2170	3.385
315	2173	3.388
316	2177	3.392
317	2181	3.396
318	2184	3.399
319	2188	3.403
320	2191	3.406
321	2195	3.41
322	2198	3.413
323	2202	3.417
324	2205	3.42
325	2209	3.424
326	2212	3.427
327	2216	3.431
328	2219	3.434
329	2223	3.438
330	2226	3.441
331	2230	3.445
332	2234	3.45
333	2237	3.452
334	2241	3.456
335	2244	3.459
336	2248	3.463
337	2251	3.466
338	2255	3.47
339	2258	3.473
340	2262	3.477
341	2265	3.48
342	2269	3.484
343	2272	3.487
344	2276	3.491
345	2279	3.494
346	2283	3.498
347	2286	3.501
348	2290	3.505
349	2293	3.508
350	2297	3.512
351	2300	3.515
352	2304	3.519
353	2307	3.522
354	2311	3.526
355	2314	3.528
356	2318	3.532
357	2321	3.535
358	2325	3.539
359	2328	3.542
360	2332	3.546
361	2335	3.549
362	2339	3.553
363	2342	3.556
364	2346	3.56
365	2349	3.562
366	2353	3.566
367	2356	3.569

Temp. [°C]	Resistance [Ω]	Terminal voltage [V]
368	2360	3.573
369	2363	3.576
370	2367	3.58
371	2370	3.583
372	2373	3.585
373	2377	3.589
374	2380	3.592
375	2384	3.596
376	2387	3.599
377	2391	3.603
378	2394	3.606
379	2398	3.609
380	2401	3.612
381	2405	3.616
382	2408	3.619
383	2412	3.623
384	2415	3.625
385	2419	3.629
386	2422	3.632
387	2426	3.636
388	2429	3.639
389	2432	3.641
390	2436	3.645
391	2439	3.648
392	2443	3.652
393	2446	3.655
394	2450	3.658
395	2453	3.661
396	2457	3.665
397	2460	3.668
398	2463	3.67
399	2467	3.674
400	2470	3.677

APPROVALS, CERTIFICATIONS, ETC.

- UL916 certified
- SASO
- BTL-listed, B-AAC profile
- Industry Canada (IC) certified
- CE-approved
- FCC part 15B-compliant
- RoHS Conformity.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WEEE DIRECTIVE

WEEE: Waste Electrical and Electronic Equipment Directive	
	▪ At the end of the product life, dispose of the packaging and product in an appropriate recycling center. ▪ Do not dispose of the device with the usual domestic refuse. ▪ Do not burn the device.

ARTICLE 33 COMMUNICATION

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006

Concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

CentraLine takes compliance with REACH very seriously.

According to Article 33 “Duty to communicate information on substances in articles”:

1. Any supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0,1 % weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.

2. On request by a consumer any supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0,1 % weight by weight (w/w) shall provide the consumer with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance. Our duty is to inform you that the substance(s) listed below may be contained in these products above the threshold level of 0.1% by weight of the listed article.

Product / Part Name	Substance Name
CLMEVA423B24N / PWBA	Lead (Pb)

We confirm that our products do not use any other REACH restricted materials during the manufacturing, storage or handling process.

Manufactured for and on behalf of the Connected Building Division of Honeywell Products and Solutions SARL, Z.A. La Pièce, 16, 1180 Rolle, Switzerland by its Authorized Representative:

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