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1. INTRODUCTION

The following is intended to provide the basic instructions for installation, operation and maintenance of the Akron Brass Style 9327 Navigator Mini Valve Controller. The Style 9327 is compatible with the Navigator Electric Actuator. IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY, NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS, AND CAUTIONS. USE THIS PRODUCT CORRECTLY, AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE, OR PERSONAL INJURY, AND WILL INVALIDATE THE WARRANTY!

2. PRODUCT RATINGS

Operating Voltage: 10 – 32VDC; 10V minimum required at the valve for proper operation.

Operating Current: 2-10A @ 12VDC, 1-5A @ 24VDC (depends on valve type)

Weight: 0.2 lbs. [0.1 kg]

Operating Temperature: -40°C - 70°C Storage Temperature: -40°C - 85°C Ingress protection: IP56 equivalent

J1939 CAN networked

3. TOOLS REQUIRED FOR INSTALLATION

• 5/32 Allen key

• 3/8 wrench

4. PRODUCT WARNINGS



- Indicates a hazardous situation which, if not avoided, WILL result in death or serious injury.
- Indicates a hazardous situation which, if not avoided, COULD result in death or serious injury.
- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
- Addresses practices not related to personal injury.

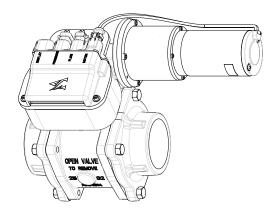


5. OVERVIEW

The Style 9327 Navigator Mini controller allows the user to control an Akron Brass Navigator electric valve. The Style 9327 is a control interface only. The Navigator Mini system communicates via J1939 CAN protocol and is a distributed system. The 9327 is strictly a user interface that allows the user to view information and send commands to the valve. The motor driver on the electric actuator is the unit that interprets commands from the 9327 and drives the valve.



Style 9327 Navigator Mini



Navigator Electric Valve

6. SYSTEM INSTALLATION

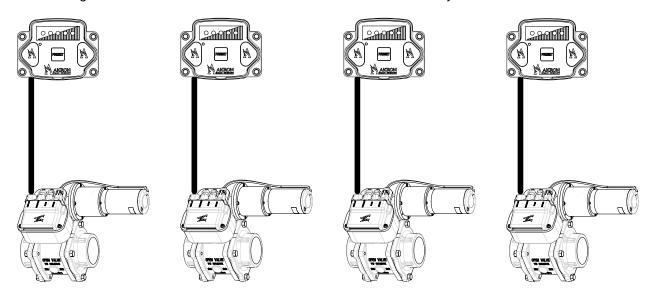
The style 9327 controller can be installed in a number of different system configurations and has been designed to provide the installer with flexibility during installation. Refer to ACCESSORIES, section 12 for additional details on connector and harness part numbers.



6.1 System Configurations

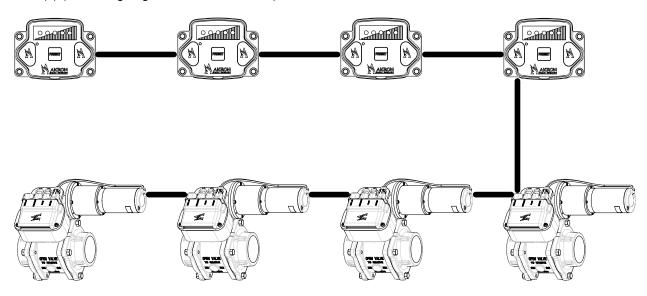
6.1.1 One to One Installation

The Navigator Mini system can be installed so that there is one 9327 and one valve connected directly with nothing else on the network. Harnesses are available from the factory.



6.1.2 Network Installation

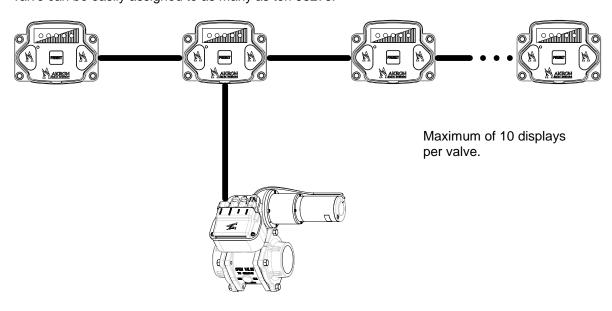
The Navigator Mini system can also be installed in a networked configuration. Since the system operates on a CAN protocol, as long as the valve is on the network, it can be associated with the appropriate 9327(s) (see Assigning a Valve, section 7.1).





6.1.3 Auxiliary Displays

The Navigator Mini system can be easily setup with multiple 9327s controlling one valve. As long as the 9327 is on the same CAN network as the valve it is controlling, the valve can be assigned to it. A single valve can be easily assigned to as many as ten 9327s.



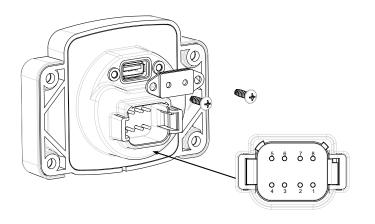
6.2 Electrical Installation

6.2.1 Voltage Requirements

The system will operate on 12VDC or 24VDC systems. It will operate properly if the voltage is between 10VDC and 32VDC at the valve. System voltage is not an adequate measurement to determine if the voltage is appropriate at the valve. To avoid excessive voltage drop and undesired operation, the wire gauge should be 14 AWG or larger and the distance from power source to the valve should be no more than 20 feet.



6.2.2 Navigator Mini Wiring



Pin	Function	
1	No Function	
2	CAN High	
3	Ground Out	
4	Ground In	
5	Battery Voltage In	
6	Battery Voltage Out	
7	CAN Low	
8	No Function	

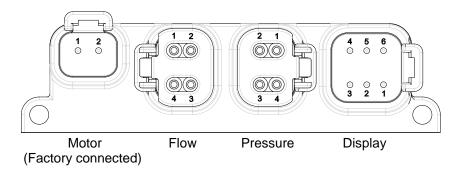
The pinout for the Navigator Mini connector is shown in the table above. This connector mates with Deutsch Connector DT06-08SA-EP08 & W8S.

NOTICE

Pins 4 and 5 are the power being supplied to the Navigator Mini. Pins 3 and 6 can be used to supply power to the valve (connect to pins 3 and 4 of the 6 pin Display connector on the valve) or to additional Navigator controllers.



6.2.3 Valve Wiring



The pinout for the valve Motor connector is shown in the table below. The motor connector mates with Deutsch Connector DT06-2S and W2S.

Pin	Function
1	Motor A
2	Motor B

The pinout for the valve Display connector is shown in the table below. The display connector mates with Deutsch Connector DT06-6S and W6S.

Pin	Function	
1	CAN High	
2	Shield	
3	Ground	
4	Battery Voltage	
5	No Function	
6	CAN Low	



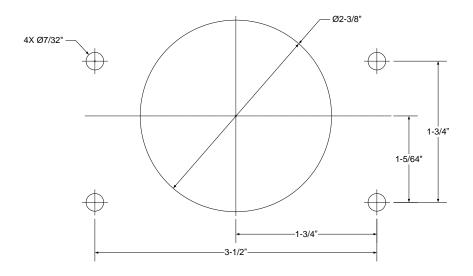
The valve Flow Connector and Pressure connector are not applicable to the Style 9327. Leave these plugged with included plugs.



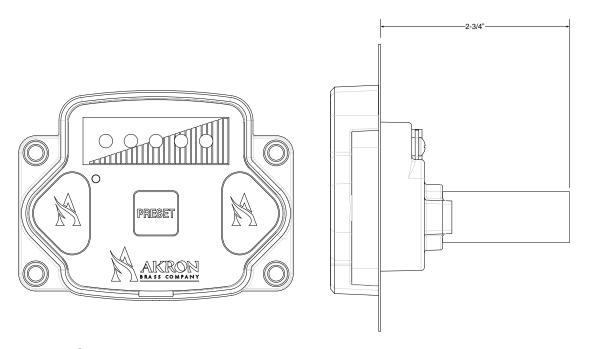
6.3 Mechanical Installation

The Navigator Mini is attached to the panel using 4, 10-24 socket-head, cap-screws. An installation torque of 6-8 in-lbs. should be applied when installing to prevent damage to the enclosure. Appropriate mounting hardware is included with all Navigator controllers. Panel inserts or other means of securing screws can be used.

6.3.1 Panel Cutout



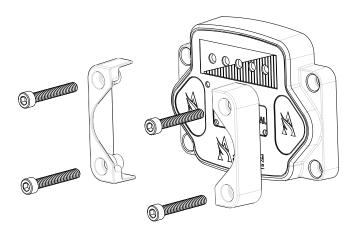
6.3.2 Required Clearance Behind Panel





6.3.3 Optional Color Indicator Installation

Assemble the color indicators below the mounting bolts. Follow the torque requirements listed in the "Mechanical Installation" instructions.



NOTICE

The Navigator Mini is a sealed unit. <u>Disassembly of the unit will void any warranty</u>. There are no user serviceable parts in the Navigator Mini or motor driver. If service is required, the unit should be returned to the factory.



7. INITIAL SETUP FOR A NEW SYSTEM - MINIMUM SETUP

Upon installation of a new system, several items need to be configured before the system will operate properly. The items that must be configured for proper operation are:

- · Assignment of controller to valve
- Valve calibration

Other options, such as LED brightness, factory defaults, etc., can be configured at any time via the Setup Menu, but are not required for proper system operation during initial installation.

7.1 Assigning a Valve

Before controlling a valve, the Style 9327 Navigator Mini must be assigned to a valve. This step tells the 9327 what valve it is controlling. In order for the assignment to take place, the desired valve must be powered and connected to the Navigator Mini via a CAN network (see SYSTEM INSTALLATION, section 6 for wiring instructions). Valve assignment will only need to be performed once and can be changed at a later time via the Setup Menu if required. There are two ways to assign a valve; automatically or manually. If there is only one valve installed on the CAN network, a 9327 on the network in its factory default configuration will automatically be assigned to that valve. If the 9327 has been previously assigned to a valve, the new valve will need to be assigned manually using the Setup Menu (see Valve Assignment, section 8.2).

If there are multiple valves on the network, the additional valves must be temporarily removed from the network until after the intended valve has been assigned.



The Navigator Mini cannot be assigned to more than one valve and will remember its assigned valve even when the power is off.

Once the Navigator Mini has been successfully assigned to a valve, the top row of LEDs will indicate the position of the valve. The Navigator Mini can now be used to open and close the valve. However, valve calibration must be performed in order to display valve position accurately.

7.2 Calibrating a Valve

The valve must be calibrated to ensure the position of the valve is accurate. Navigate to the Valve Calibration setup code 1-2 (for details on accessing and navigating the setup, see Setup Menu Navigation, section 8.1). After you have verified that the valve is properly installed to the motor, and there is no danger of damage due to water or pressure in the line, press RED to start the calibration process.

The valve will fully open and close several times to calibrate the valve position sensor. During the valve calibration, the top row of LEDs will indicate the position of the valve. After the calibration is complete, the LEDs will return to the Valve Calibration setup. Press the PRESET key to exit Setup and return to normal operation.

Initial setup is now complete.



8. CONFIGURING YOUR SYSTEM

8.1 Setup Menu Navigation

The Setup Menu provides access to the Navigator Mini settings and options. The setup options are as shown in the table below.

Setup Menu Option	Setup Code
Valve Assignment	1-1
Valve Calibration	1-2
LED Bright Level	1-3
Firmware Revision	1-8
Factory Default Configuration	1-9

To access the Setup Menu during normal operation, press and hold the ◀RED and ▶GREEN buttons for 5 seconds. The 3 yellow LEDs will begin flashing to indicate the Setup Start. When at the Setup Start, the ▶GREEN button can be used to advance the Setup Code. The Setup Code is indicated by the middle yellow LED flashing the first digit count of the setup code, followed by flashing the second digit count of the setup code on the right adjacent yellow LED. After a short pause, the setup code is repeated. The Setup Menu will remain on the current setup code until it is advanced again using the ▶GREEN button. After the last Setup Code is advanced, the Setup Start will be indicated again.

When at the Setup Start indication, pressing the ◀RED button will exit the Setup Menu and return to Manual operation. Alternately, at any time while in the Setup Menu, the ■ PRESET button may be pressed to exit the Setup Menu. When using the ■ PRESET button to exit the Setup Menu, the valve will not move to the Preset position.

When in the Setup Menu and flashing a Setup Code, The ◀RED button is used to change or initiate the function of that Setup Code. The red and green LEDs on the top row are used to indicate the status of a Setup Menu Option.



The menu can only be advanced using the Green button. Pressing the Red button will change the settings and will <u>not</u> go to the previous menu option.

8.2 Valve Assignment

Setup Start → Setup code 1-1

The Valve Assignment option is used to reassign a valve to the Navigator Mini controller. Once in setup menu 1-1, press the ◀RED button to assign a new valve. Only a single valve may be connected to the controller to be successfully associated. The green LED will flash momentarily and then turn to solid green when the valve is successfully associated.

When the RED button is pressed the controller will query all devices on the CAN network and if only one valve is found, it will be assigned to the controller. If more than one valve is found, the controller red LED will indicate the Multiple Valves Assignment error code 2-5 (see TROUBLESHOOTING, section 10 for error code descriptions). If no valves are found, the controller red LED will indicate the Valve Offline error code 2-3. If a new valve is not successfully associated with the controller, the original valve association will be retained.





After a valve is successfully associated with the 9327, additional valves may be reconnected to the CAN network. The preferred method of temporarily removing valves from the 9327 CAN network is to disconnect the "Display" connector from the valve, which removes the valve power.

If the controller is in its default configuration without any valve associated, the red LED will be on for this setup option.

Press the PGREEN button to advance to next setup code or PRESET to exit setup menu.

8.3 Valve Calibration

Setup Start → Setup code 1-2

The Valve Calibration option is used to calibrate the valve position. Once in setup menu 1-2, press the ◀ RED button to calibrate the valve. A valve must be associated and connected to the controller to be successfully calibrated.

The valve will fully open and close several times to calibrate the valve position sensor. During the valve calibration, the LEDs will indicate the position of the valve. After the calibration is complete, the LEDs will return to the Valve Calibration setup and the green LED will be on. If the associated valve is not connected to the controller, the controller red LED will indicate the Valve Offline error code 2-3 (see TROUBLESHOOTING, section 10 for error code descriptions).

If a valve calibration cannot complete or has been interrupted, the red LED will be on for this setup option.

Press the ▶GREEN button to advance to next setup code or ■PRESET to exit setup menu.

8.4 LED Bright Level

Setup Start → Setup code 1-3

The LED Bright Level option is used to select one of three brightness levels for the controller LEDs. Once in setup menu 1-3, press the ◀RED button to cycle through the three available brightness settings. The green LED is on when the LED bright level is at 100%. The red LED is on when the LED bright level is at either of the two lower levels.

The LED bright level will remain at the configured setting until changed again. The factory default configuration for LED Bright Level is 100%.

Press the GREEN button to advance to next setup code or PRESET to exit setup menu.

8.5 Firmware Version

Setup Start → Setup code 1-8

The Firmware Version option is used to display the current version of controller firmware. Once in setup menu 1-8, press the ◀RED button to display the firmware version. The green LED will flash a two digit



code to indicate the version number. The first digit count will flash, followed by a short delay and then the second digit count will flash.

After indicating the firmware version, the Setup Menu will return with the red LED on. Pressing the RED button again will repeat the process of flashing the firmware version code one time. This may be repeated as many times as necessary.

Press the ▶GREEN button to advance to next setup code or ■PRESET to exit setup menu.

8.6 Factory Default Configuration

Setup Start → Setup code 1-9

The Factory Default Configuration option is used to return the controller options to the factory settings. The factory settings will <u>not</u> be restored until the Setup Menu is exited. Once in setup menu 1-9, press the ◀RED button to toggle this option on. The green LED will flash momentarily and then remain on to indicate that factory settings will be restored. Press the ◀RED button again to toggle this option off. When the red LED is on, the factory settings will not be restored after leaving the setup menu.

To complete the factory settings reset, exit the setup menu with the green LED on. After a brief delay the controller will reset. When the controller returns from reset, the factory default configuration will be restored.



The Navigator Mini will lose its valve association when factory defaults are restored. If only one valve is on the connected CAN network when the factory defaults are restored, the controller will automatically associate with that valve. Otherwise, the controller will not have an associated valve until a single valve is connected to it.



9. OPERATIONAL FEATURES

The Style 9327 Navigator Mini Controller is easy to use and intuitive. Once configured, the operation is simple. Basic operation of the controller is described below.

9.1 Opening and Closing the Valve

To open the valve, press the ▶GREEN button. To close the valve, press the ◀RED button. As soon as the button is released, the valve will stop moving. Hold the button to continue opening or closing the valve. If the Open and Close buttons are pressed simultaneously, the valve will stop moving.

9.2 Valve Position Indicators

Valve position is indicated on the top row of LEDs as shown in the following table.

Valve Position	Red	Yellow	Yellow	Yellow	Green
Closed	ON	OFF	OFF	OFF	OFF
1% to 33% Open	OFF	ON	OFF	OFF	OFF
34% to 66% Open	OFF	ON	ON	OFF	OFF
67% to 99% Open	OFF	ON	ON	ON	OFF
Open	OFF	ON	ON	ON	ON

9.3 Storing a Valve Position Preset

To store a predetermined valve position, follow these simple steps:

- 1. Move the valve to the position to be stored.
- 2. Press and hold the PRESET button at least 5 seconds.
- When the green LED at the right of the top row of LEDs flashes momentarily, the preset valve position has been successfully stored.

Storing a preset position can be done as often as required and the stored position will be retained while the 9327 power is removed.

9.4 Moving the Valve to the Preset Position

To have the valve move automatically to the preset position, simply press and release the ■PRESET button.



The automatic valve movement may be <u>interrupted</u> by pressing the ► GREEN or ◀RED button at any time.



10. TROUBLESHOOTING

10.1 Error Indicator

The Navigator Mini will diagnose and indicate common errors that prevent normal operation. The error conditions are as shown below.

Error Condition	Error Code
Valve Offline	2-3
Multiple Valves Assignment	2-5

Error conditions are indicated on the red LED located at the left of the top row of LEDs. The error code is indicated with a two digit code. The first digit count will flash, followed by a short delay and then the second digit count will flash. After a two second delay, the error code will be repeated. The code will continue to be displayed until the error condition is corrected.

10.2 Valve Offline

Error Code 2-3

This error condition indicates that the assigned valve cannot be detected on the 9327 CAN network. Make sure the assigned valve is powered and connected to the 9327. If replacing the valve, refer to Valve Assignment, section 8.2.

When associating a new valve, this error condition will also be indicated if no valve is detected on the 9327 CAN network during the assignment.

To clear this error, make sure that the assigned valve is connected to the 9327 and has power. To associate a new valve, refer to Valve Assignment, section 8.2.

10.3 Multiple Valves Assignment

Error Code 2-5

This error condition indicates that an attempt was made to associate a valve while multiple valves are connected to the CAN network. Make sure that only the valve to be associated is connected to the 9327 CAN network during the valve assignment setup.

To clear this error, make sure that only the valve to be associated with the 9327 is powered. Refer to Valve Assignment, section 8.2.



The preferred method of temporarily removing valves from the 9327 CAN network is to disconnect the "Display" connector from the valve, which removes the valve power.



11. SOFTWARE UPDATES

The controller contains custom software that can be updated in the field. There are two methods for updating the software.

- USB port on the back of the controller. See section 11.2.
- Connect to the controller via CAN network with Akroview. See section 11.3.

11.1 Obtaining the Latest Software

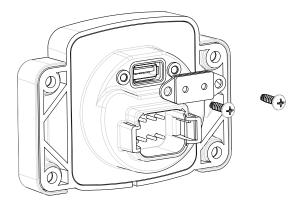
The latest software file can be found at the 9327 product page on the website. They will be located under the "Download / Updates" tab. Only one file is required to update the 9327. The software used in the 9327 is the same software as used in the Style 9330 Navigator Mini tank fill controller. The file will be named 93300001 RX-X.ABS", where X-X is replaced with the desired revision number.

The appropriate software file can also be obtained by contacting Akron Brass Customer Service or Technical Support.

11.2 Software Update via USB

Located on the back of the display is a USB port that is used for software updates. Once the appropriate Navigator Mini software file has been obtained, follow this procedure to update the software.

- 1. Load a USB drive (customer provided) with the Navigator Mini software file. The file should be saved in the root directory of a USB drive that has been formatted with the FAT32 file system. The file must be the only file in the root directory with an .ABS extension.
- 2. Turn off power to the Navigator Mini.
- 3. Gain access to the back of the display.
- 4. Remove the two screws holding the cover over the USB port, as shown below. Set the screws and cover aside to be reinstalled after the software update is complete.



- 5. Insert the USB drive containing the file into the USB port on the back of the Navigator Mini.
- 6. Turn on power to the Navigator Mini.
- 7. The top row of LEDs on the Navigator Mini will sequence from left to right as the software is updating. The entire update process should take less than one minute.
- 8. When the green LED located at the right of the top row of LEDs turns on, the software update is complete. If the red LED is flashing, an error occurred during the update and the Navigator Mini was not changed. The file named "9330.log" on the USB drive can be opened to see details



about the error. If an error occurs, the power to the Navigator Mini may be cycled to try again and/or contact Akron Brass Technical Support for assistance.

- 9. Turn off power to the Navigator Mini.
- 10. Remove the USB drive from the USB port.
- 11. Replace the cover on the USB port using the USB cover screws.
- 12. Turn on power to the system and test all functions to ensure proper operation.

11.3 Software Update via Akroview

The most recent version of Akroview may be obtained from the 6046 product page on the website. It is located under the "Software / Multimedia" tab. Refer to the Akroview Diagnostics Software Installation and Operations Manual for installation and connecting to the Navigator Mini CAN network. Once the appropriate Navigator Mini software file has been obtained and the Akroview software is connected to the system as described in the Akroview Installation and Operations Manual, follow these steps to update it using Akroview.

- 1. Select the Navigator Mini device on the Akroview main screen.
- 2. On the Navigator Mini device screen, press the Enter Firmware Download Mode button.
- 3. Within the Firmware Download window, select the Sys area (shown as Step 1).
- 4. Press the Choose file button (shown as Step 2) and open the Navigator Mini software file.
- 5. Press the Start download button (shown as Step 3) and wait for the file to download.
- 6. Press the Flash to memory button (shown as Step 4). When the Navigator Mini green LED located at the right of the top row of LEDs turns on, the software update is complete.
- 7. Cycle power to the system and test all functions to ensure proper operation.

12. ACCESSORIES

Refer to the table below for Navigator Mini accessory descriptions and part numbers.

Description	Part Number
Main Harness - 10ft. – One to One Installation	721618
Main Harness - 15ft One to One Installation	721619
Main Harness - 20ft. – One to One Installation	721620
Display CAN Network Harness	721615
Valve CAN Network Harness	721617
CAN Extension Harness - 6in.	721659
CAN Extension Harness - 3ft.	721572
CAN Extension Harness - 5ft.	721573
CAN Extension Harness - 10ft.	721574
CAN Extension Harness - 20ft.	721570
CAN Extension Harness - 40ft.	721575
CAN Network Tee	758306
CAN Network Terminators (set of 2)	123734

Contact Akron Brass Customer Service or Technical Support for more details or for assistance configuring and ordering your system.