

Nolatron

TB-2 Series

TB-2E TB-2M TB-2W
Two-Hand Start Bar
Anti-Tiedown Switch Monitor
Owner's Manual



The Start Bar is an ergonomic starting system. The internal anti-tiedown control monitors both start sensors for concurrent operation. The output utilizes redundant positive guided relays which are monitored to ensure proper operation.



This product meets the OSHA 1910.217(b)(13) definition of "Control Reliability".

Introduction:

The Nolatron Two-Hand Start Bar has been tested to meet requirements regarding safety devices. Before installing, refer to ANSI B11.1, B11.19, and OSHA 1910.217.

ANSI Standard B11.19-1990 gives the following definition: 2.60 Two-Hand Trip. A device that requires concurrent operation of the trip controls or levers by the operator's hands to initiate the machine cycle.

Each Nolatron hand control is protected against unintended operation and arranged by design, construction, and separation so the concurrent use of both hands is required to initiate the machine cycle.

The Nolatron Start Bar incorporates an anti-repeat feature and is designed to require the release of all operator's hand controls before an interrupted machine cycle can be resumed.

Safety:

The Nolatron Start Bar is not intended for use without adequate “point of operation” safety guards, which must be provided following OSHA regulations and ANSI standards to protect the operator. The operator must ensure the bar is properly installed, inspected and operated. Failure to comply could result in serious bodily injury and/or property damage.



When properly installed, the Nolatron Start Bar meets all OSHA requirements for a two-hand trip device.

Note: The information contained in this manual is for reference purposes only. The user must determine the compatibility and safety of the Start Bar’s wiring for each particular machine application.

Do not connect the output from the Start Bar to an input of any other control device unless it is of a control reliable design. General purpose programmable controllers (PLCs) are not intended for such an application. Please call Nolatron at 717-564-3398 for technical assistance on how a PLC can be configured to operate in conjunction with the Start Bar.

Warning!



This product may cause substantial personal injury or property damage if it is not installed, maintained and used in accordance with the manufacturer’s instructions and in accordance with regulations of the Occupational Safety and Health Administration Part 1910.217, the procedures prescribed by the American National Standards Institute B11.1 and B11.19, and all other applicable regulations, procedures, and codes. The manufacturer shall not be responsible nor liable for any injury or damage resulting from use of the product in any such applications or the failure to comply with any such regulation, procedure, or code.

Warning!



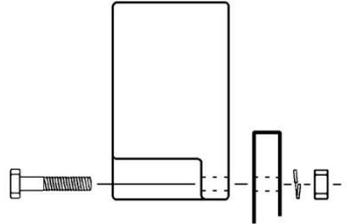
It is necessary to locate and install the Start Bar in accordance with OSHA machine guarding distance calculations which can be found in 29 CFR 1910.217. Users must also install point of operation guarding devices, compliant with OSHA regulations, ANSI standards, and any other machine safety standard that applies to the specific industry such as light curtains, pressure mats, etc. to fully protect personnel from accessing the machine during cycle operations.

Installation:

The Start Bar can be mounted to the back or to the bottom using the mounting holes in the housing. Do not add additional mounting holes by drilling into the center chamber that contains the anti-tie-down control. Metal shavings, caused by drilling, may cause an internal electrical short circuit. This chamber is sealed to keep out contaminants such as oil, drilling additional holes may allow these contaminants to enter the chamber and damage the anti-tie-down control circuit.

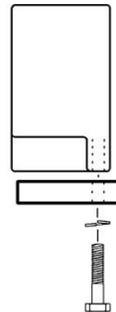
Mounting to the back:

When mounting to the back use a bolt or screw with a diameter of 1/4". The mounting flange is 1/2" thick. The holes are 19 1/2" apart measured from center to center. The use of a lock washer or locknut is recommended. Be sure that the wiring hole on the back of the Start Bar is not blocked.



Mounting to the bottom:

When mounting to the bottom use a bolt with a diameter of 1/4" and 20 TPI (1/4-20). The mounting flange is tapped to a depth of 1/2". The holes are 17" apart measured from center to center. The use of a lock washer and thread-locking fluid is recommended.



Operation:

The Start Bar will perform a system test before every machine cycle. The test cycle will require approximately one second to complete. Then the Ready indicator will light and a machine cycle can be started.

In order to begin a machine cycle, both hand switches must be touched concurrently within a half a second. The load will remain energized* until one or both hand switches are released or the optional Reset switch is opened.

If the optional Hold switch is used, it will allow the load to remain energized even after the hand switches are released. The Hold switch should stay closed for the rest of the machine cycle. To end the machine cycle, the Reset switch is opened momentarily.

Both hand switches must be released and the Reset switch must be closed before another machine cycle can be started.

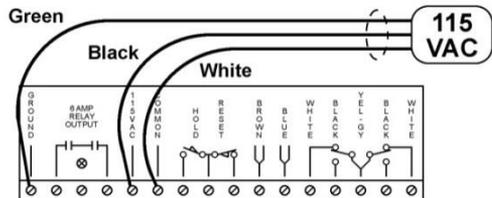
* An optional load timer can be used to limit how long the load will receive power. The TB-2 is reset after the time cycle is completed. See parts list.

Wiring the Start Bar:

After mounting the Start Bar, remove the eight screws from the front panel. Lift off the front panel to access the wiring terminal strip. All wiring must enter and exit through the 3/4" hole in the back of the Start Bar. This hole will accommodate a 3/8" liquid-tight conduit connector. The seven terminals on the right side of the terminal strip are used for the hand switches. **DO NOT MAKE ANY CONNECTIONS TO THESE TERMINALS!**

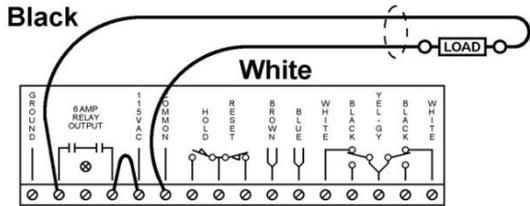
Wiring to the supply:

Connect a green ground wire to the terminal identified as "GROUND". This wire must be connected to the main ground terminal of the machine and must not be fused. Connect a black (hot) wire to the terminal identified as "115 VAC". It is a good practice to fuse this wire (8A max.). Connect a white (neutral) wire to the terminal identified as "COMMON".



Wiring to matched voltage load:

Install a jumper wire between the terminal marked "115 VAC" and the output contact which is the next terminal to the left. Connect a black load wire to the other output contact terminal. Connect a white load wire to the terminal marked "COMMON".



Inductive loads will require an additional load suppressor (such as Nolatron part no. 30165) that will greatly increase the life of the relay load contacts. The suppressor should be installed in parallel with the load.

Warning!



Never install a suppression device across output contacts. If a suppressor should fail, the load may unexpectedly become energized.

Wiring the output to other types of loads:

The output can be used to switch other voltages or can be treated as a "dry contact". To configure the output this way, do not install the jumper wire from the terminal marked "115 VAC" and the output contact as indicated above.

Warning!

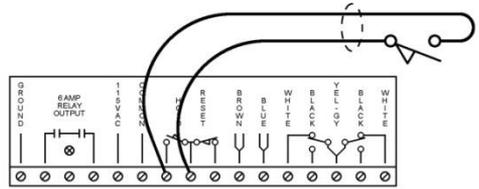


Do not connect the output of the Start Bar to the input of any other control device. General purpose programmable controllers and electronic controls are not intended for safety related applications. Please call Nolatron for technical assistance on how other control devices can be configured to operate in conjunction with the Start Bar.

No other circuitry capable of supplying power to the load should be wired into the load circuit. If an additional power relay is required, it must be of a self-monitoring, control reliable design. Normally, this requires a pair of positive guided relays. The normally closed contacts of the relays must be monitored by the ATD control. Please call Nolatron for technical assistance on how these relays are configured to operate in conjunction with the Start Bar.

Wiring the Hold switch:

An optional Hold switch can be used to allow the load to remain energized after the hand switches are released. This feature is useful for applications that have long machine cycles.



The Hold switch is normally open and must not be closed until the operator can no longer reach into the point of operation. Once the Hold switch is closed, it should remain closed for the rest of the machine cycle. The Hold switch circuit does not become functional until the machine cycle has begun.

The Hold switch is connected to terminals marked "HOLD". The terminal to the right is also used by the Reset circuit. Do not remove the reset jumper wire unless you are installing the optional Reset switch as described below.

Warning!

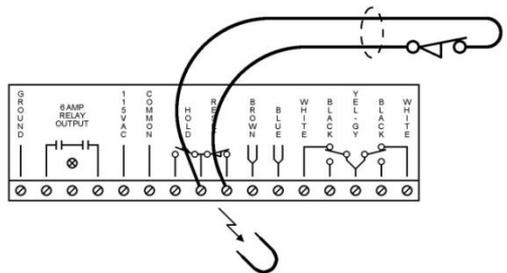


The Hold switch must be mounted on the machine so that it cannot close until the point of operation is no longer hazardous.

Wiring the Reset switch:

An optional switch can be used to reset the Start Bar when a machine cycle is completed.

Remove the jumper wire from the terminals marked "RESET" prior to installing the wires connected to the reset switch. The left terminal also shared with the optional Hold switch (if installed).



The Reset switch is normally closed and will reset the control when it is opened. This switch must be closed before a machine cycle can be started.

Safety Testing Procedure:

After the Start Bar is installed, an initial safety test must be performed by a qualified person who is appointed by the employer. This testing procedure is used to ensure that the Start Bar has been wired and is functioning properly. The testing procedure should be carried out periodically and the machine must not be used if the Start Bar ever fails the test. A copy of the test results should be placed on or near the machine.

1. Prepare the machine for normal operation. Be sure that all maintenance and setup work was completed and that all point of operation guards are in place before proceeding with this test.
2. Turn on the power to the Start Bar.
3. Verify that the Ready light is on and that the Output light is off.
4. Activate the left start switch. Verify that the Ready light is off.
5. Wait for at least a second, then activate the right start switch.
6. Verify that the Ready and Output lights are off.
7. Release both start switches and verify that the Ready light is on.
8. Activate the right start switch. Verify that the Ready light is off.
9. Wait for at least a second, then activate the left start switch.
10. Verify that the Ready and Output lights are off.
11. Release both start switches and wait for a second.
12. Activate both start switches simultaneously.
13. Verify that the Ready light is off and that the Output light is on.
14. Release both start switches.

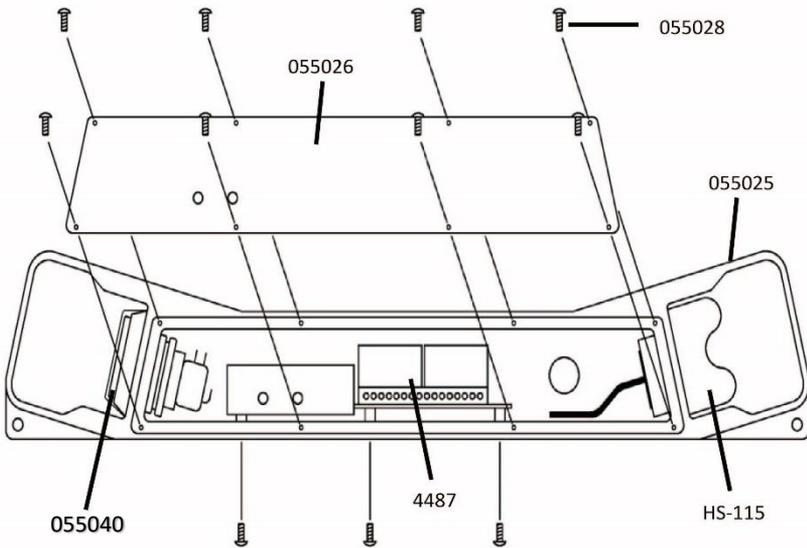
Note: The Start Bar uses neon indicator light bulbs. By nature, this type of light bulb may have a slight glow when off and may flicker when on. These characteristics are not an indication of the reliability of the Start Bar.

Specifications:

Physical Size	50cm (20") long, 9cm (3.75") high, 5.5cm (2.15") deep
Mounting Holes	2 vertical ¼-20 thread / 2 horizontal, 1/4" diameter
Weight	3 kg (6.5 lbs)
Power Supply	115 VAC, 50/60 Hz, TB-2xx
Power Consumption	1 watt standby, 8 watts output energized
Output	2 positive guided relay contacts in series, 8 Amps @ 120VAC (resistive load) Life: 50 million cycles (mechanical) 500,000 cycles (electrical @ 120VAC / 8 amps)
Concurrency Timer	Factory set at 0.5 sec.
Terminal Strip	Accepts 14-22 gauge stranded wire
Environmental	0 – 50° C (32 - 120° F) ambient temp.
Origin	Made in USA
Start Switches	
Model TB-2E	Electronic infrared photo sensors approximately 80 millisecond response time
Model TB-2M	Mechanical switches with polyurethane cover. 8oz. actuation force

Warranty:

Nolatron, LLC. warrants the Start Bar against defects in material and workmanship under normal and proper use for a period of one year from the date of shipment. Nolatron's obligation under this warranty is limited to furnishing, without charge and at our discretion, either replacement or repair of any defective part. This warranty does not apply when the Start Bar has been: (1) damaged due to excessive vibration (2) sustained contact damage due to load transients (3) subjected to abuse or has otherwise been tampered with. The foregoing warranty is exclusive and in lieu of all other warranties of quality whether written, oral or implied. Nolatron is not liable for any damage or injury which may result from the use of its products.



Parts List for TB-2

4487	anti-tiedown control
HS-115	optical hand sensor (model TB-2E)
055025	cast aluminum housing
055026	front access plate with gasket
055028	3/8" 6-32 black Phillips head screws (8pcs)
055031	5/8" 6-32 socket head screws (3pcs)
055040	mechanical hand switch assembly (model TB-2M)

Optional parts not shown

30165	load transient suppressor.
30502	adjustable 0.5 to 5.0 second load timer

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