KAVIDOORS USA

PULSE Direct Drive DC Door Operators with Battery Backup





PULSE 300 SERIES

Commercial Direct Drive Door Operator for Balanced Sectional Doors. Installation Manual and Setup/User Instructions

U.S. Patent No. 11105138

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GENERAL OVERVIEW

Thank you for purchasing this Pulse 300 Series Direct Drive Door Operator. This dependable operator is designed for medium-cycle duty of your Commercial or Residential Door. Quick and easy to install, this operator helps extend the life of your counter-balanced door with its integrated soft-start/soft-stop capability.

It features adjustable opening speeds of up to approximately 24" per second, a patented battery backup system that can operate the door in case of power failure, and adjustable auto-reversing force monitoring, along with a variety of other helpful programmable functions.

FULLY COMPLIANT with UL 325:2023 REQUIREMENTS

This Pulse Operator is provided with a Polarized Reflective Photo-Eye (Thru-Beam on 1 HP & '-WP' models). This must be installed to meet UL325 requirements. Once the Close button is activated, the operator verifies that the Photo-Eye is connected and functional, is not bypassed by means of a jumper, and it continues to monitor the sensor as the door closes.

These operators are also compatible with monitored reversing devices. The 'R2' input terminal is dedicated for connection to a monitored reversing device.

This operator also has adjustable Force Monitoring on the open and close cycle to act as a secondary safety/reversing entrapment protection feature.

This operator will initiate Push/Hold to CLOSE protocols should the photo-eye be misaligned/ blocked or is otherwise compromised. Note that during Push/Hold to Close protocols, the door will reverse should it not fully reach the closed limit per UL 325.

BOX INVENTORY

Before beginning installation, please verify that all components are accounted for:

1. Motor Assembly: Motor, Gearbox, Encoder, Multi-Conductor Cable (all pre-assembled)
2. Control Panel
3. Limit Brackets and Hardware (Angle Brackets for Stop Limit to mount on door tracks)
4. Torque Arm, Mounting Bolts, Mounting Brackets
5. Shaft Collar and Shaft Key
6. Reversing Device – Reflective Photo-eye (Thru-Beam Sensor included on 1 HP & '-WP' Models)
7. Two 12V, 9Ah Lead-Acid Rechargeable Batteries (pre-mounted behind board).

In case any of the above items is missing, please contact KAVIDOORS and provide us with details of the missing part(s), as well as the serial number of your operator.

OPERATOR TECHNICAL OVERVIEW

Motor

HORSEPOWER:	Pulse 300-050 = 1/2 HP		Pulse 300-075 = 3/4 HP		Pulse 300-100 = 1 HP
SPEED:	1750 RPM				
CURRENT (FLA):	1/2 HP = 5A		3/4 HP = 7.6A		1 HP = 10A
OUTPUT TORQUE:	Pulse 300-050-1:	30:1=55.3Nm	40:1=73.7Nm	50:1=92.2Nm	60:1=110.5Nm
	Pulse 300-075-1:	30:1=55.2Nm	40:1=73.6Nm	50:1=92.0Nm	60:1=110.5Nm
	Pulse 300-075-1.25:	30:1=55.3Nm	40:1=73.7Nm	50:1=92.1Nm	60:1=110.5Nm
	Pulse 300-100-1:	30:1=73.6Nm	40:1=98.2Nm	50:1=122.7Nm	60:1=147.3Nm
	Pulse 300-100-1.25:	30:1=73.7Nm	40:1=98.2Nm	50:1=122.8Nm	60:1=147.4Nm

Electrical

SUPPLY VOLTAGE:	110-130 or 208-240Vac, 1ph Input
BATTERIES:	2 x 9.0Ah, 12Vdc
CONTROL VOLTAGE:	24Vdc, 1.2A Power/Connections supplied for activation and reversing devices
AUX RELAY:	1 SPDT Programmable Relay (factory default to activate on Open Limits)

Safety

PHOTO-EYE SENSOR:	Polarized Photo-eye Sensor/Reflector with Bracket provided with unit as non-impact reversing device protection (Thru-Beam on 1 HP & '-WP' models)
POWER OUTAGE	Battery Backup to open/close the door in case of power-outage.
OPERATION:	3/8" ratchet socket for manual crank open/close as added redundancy. Chain Hoist also available as an add-on option.

IMPORTANT

WARNING – These instructions are intended for experienced personnel trained for service and installation of sectional doors and operators. All safety precautions and local codes must be followed.

1. READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

2. Have qualified service personnel make necessary repairs to ensure door is operating smoothly without any unusual noise. Install operator only on a smoothly operating and well balanced door.

3. Remove all pull ropes and remove locks (unless mechanically and/or electrically interlocked to the power unit) connected to the door before installing the operator.

4. A commercial/industrial door operator that has exposed moving parts capable of causing injury to persons or employs a motor deemed indirectly accessible by clause 10.6 by virtue of its location above the floor shall include:
   a. Install the door operator at least 2.44m (8 ft) or more above the floor: or
   b. If the operator must be installed less than 2.44m (8ft) above the floor, then exposed moving parts must be protected by covers or guarding; or
   c. Both a. and b.

5. Do not connect the operator to the supply power until instructed to do so.

6. Locate the push button station: (a) within sight of the door, and (b) at a minimum height of 1.53m (5 ft) above floors, landings, steps, or any other adjacent walking surface and (c) away from all moving parts.

7. Install an Entrapment Warning Placard next to the control station in a prominent location.

PRE-INSTALLATION ASSEMBLY REQUIREMENTS

BEFORE INSTALLATION, ENSURE THAT YOUR DOOR IS PROPERLY BALANCED AND RUNNING SMOOTHLY. ALSO ENSURE THAT THE LIMIT BRACKETS (SUPPLIED) ARE INSTALLED AND SECURED PROPERLY. BUMPER/PUSHER SPRINGS MAY BE USED IN PLACE OF, OR IN ADDITION TO LIMIT BRACKETS FOR PULSE OPERATORS, BUT MUST BE INSTALLED PRIOR TO OPERATION.

Operator Mounting Requirements

Pulse 300 Series operators are mounted directly anywhere on the door shaft. Before installing the operator, please ensure following criteria is met:

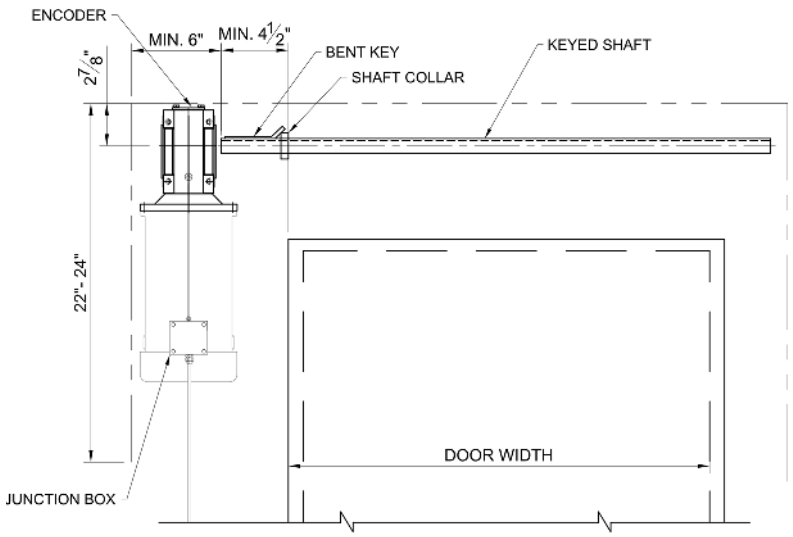
The door must be well balanced, and have been tested for smooth functioning without any unusual noises or snags.

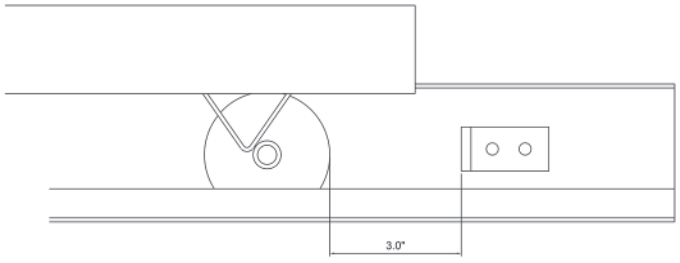
Provided Limit Brackets are installed 3" min. past door's desired open position, and within allowable maximum cable height, to prevent the doors from over-travel. Bumper or Pusher Springs are acceptable as an alternate.

The door has a solid keyed shaft with a minimum recommended exposed length of 4.5” on the operator side.

Clearance of at least 6” from end of shaft, and 18” vertically below the shaft. There is adequate structural support surface to securely install the torque arm mounting bracket/torque arm. For more details, see mounting installation instructions.

Mounting space for the control panel: Min. 5 ft. from ground level, within clear sight of the door but far enough away as to prevent users from coming into contact with moving parts.

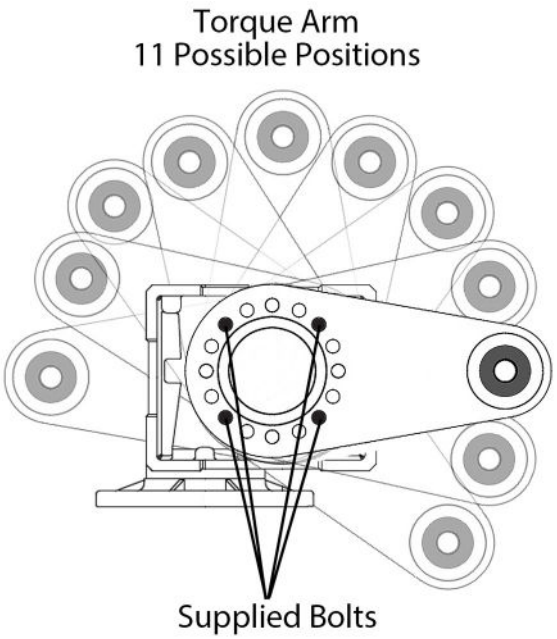




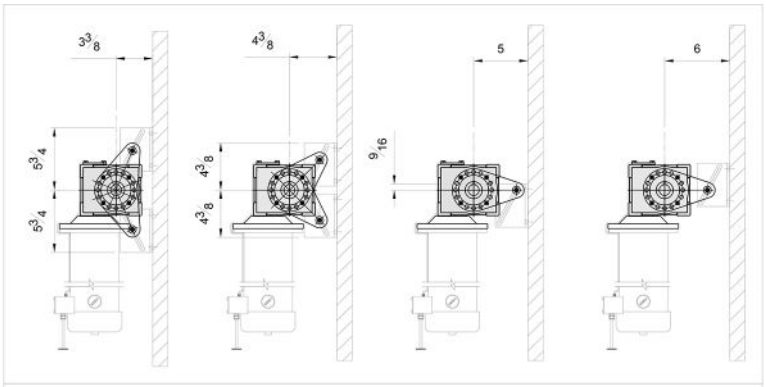
Set Open Limit so that Roller is at least 3" from Limit Bracket.

Assembling Torque Arm to Gearbox
The torque arm can be assembled onto either side of the gearbox using the enclosed 4 bolts. There are 6 possible angle positions for the torque arm, and its optimal mounting position should be pre-determined prior to assembly. Tighten bolts appropriately. THE TORQUE ARM IS AN INTRINSIC COMPONENT OF THE OPERATOR'S SAFETY AND FUNCTIONALITY AND MUST BE INSTALLED SECURELY.

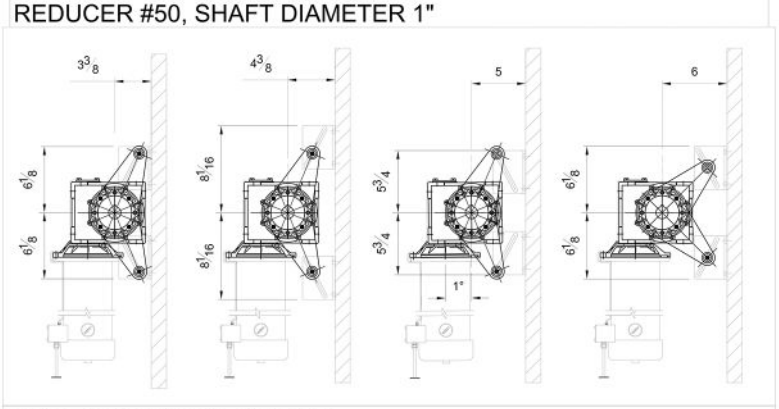
See below for recommendations on how to mount Torque Arm to Operator/ Mounting Bracket in relation to Shaft Off-set.



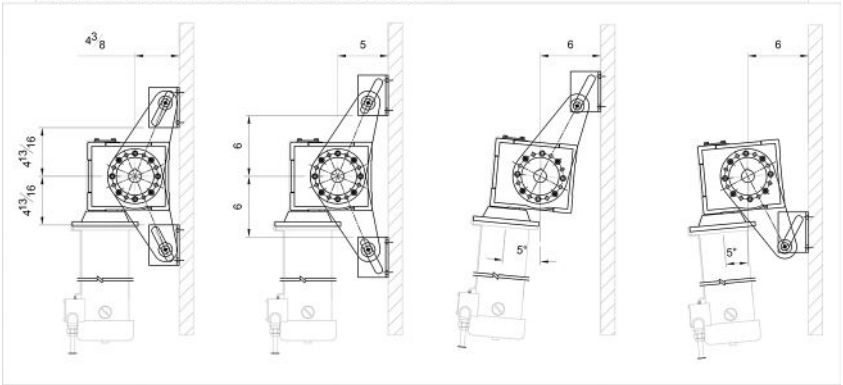
TORQUE ARM POSITION IN RELATION TO OPERATOR



PULSE OPERATOR MODELS:
REDUCER #50, SHAFT DIAMETER 1"



PULSE OPERATOR MODELS:
REDUCER #63, SHAFT DIAMETER 1"



PULSE OPERATOR MODELS:
REDUCER #75, SHAFT DIAMETER 1 1/4"

MOUNTING INSTALLATION INSTRUCTION

WARNING

- **TO REDUCE THE RISK OF PERSONAL INJURY OR DEATH, DO NOT CONNECT ELECTRICAL POWER UNTIL OPERATOR MOTOR, CONTROL PANEL AND PHOTO-EYE ARE INSTALLED, SECURED AND PROTECTED PER FOLLOWING INSTRUCTIONS.**
- **ENSURE THAT AREA IS CLEAR OF PERSONNEL AND CORDONED OFF TO ACCESS WHILE INSTALLING OPERATOR.**
- **USE PROPER SAFETY PROTOCOLS ACCORDING TO INTERNAL, LOCAL AND FEDERAL REQUIREMENTS.**

MANDATORY FIRST STEP - Limit Bracket Installation

If your door is not already equipped with bumper/pusher springs, it is mandatory to install the supplied Limit Brackets. Mount one bracket to the top of each track (See Figure 1A) to prevent over-travel of the door, and enable automatic encoder recalibration prior to setting limits (and possibly after an extended power-loss). These should be mounted inside the door-tracks at the door's maximum allowable travel point, and are required to be located at the same exact position on both tracks so that the top rollers of the door rest against them in a level position.

To install, manually open the door to the uppermost opening position allowable by the cables, clamp the door in place, and secure the brackets to the track as shown Figure 1A using the top rollers as the reference points for the brackets.

IN THE ABSENCE OF BUMPER/PUSHER SPRINGS, INSTALLATION OF LIMIT BRACKETS IS MANDATORY PRIOR TO OPERATOR INSTALLATION. WITHOUT PHYSICAL LIMITS, THE DOOR CAN RUN OUT OF ITS TRACKS AND CAUSE SEVERE PERSONAL INJURY AND/OR CAUSE SEVERE DAMAGE TO THE DOOR. FURTHERMORE, YOU WILL BE UNABLE TO SET THE LIMITS.

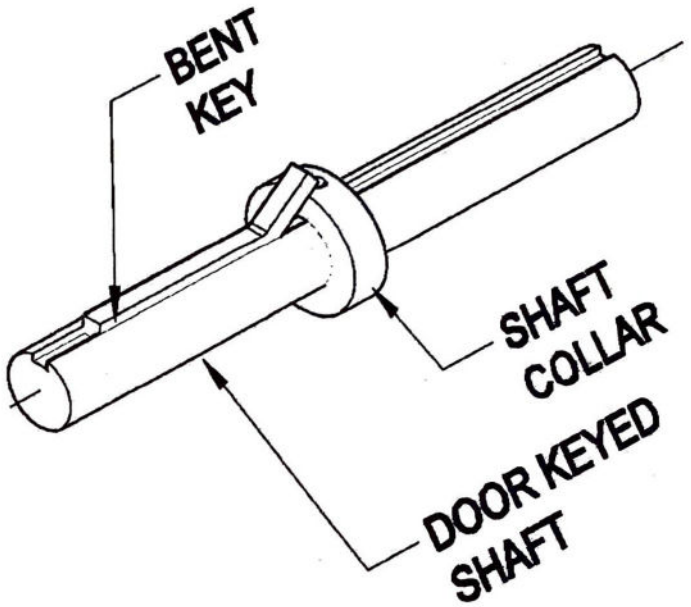
Shaft Collar/Bent Key Installation

The Shaft Collar serves as an end-stop for the bent shaft key to prevent it from back-travel out of the keyed shaft and from rubbing on the bearing plate. It needs to be mounted in conjunction with the key as shown in diagram.

Adjust the door so that the shaft keyway is facing up (you may have to open/wedge/clamp the door open slightly to achieve this).

Loosen the Shaft Collar set screw and slide the collar over the shaft close to the bearing plate, but not so close as to touch it. Firmly tighten the set screw.

Insert the 3 inch bent shaft key (provided with operator) into the door shaft keyway with the bent end facing the installed shaft collar.



Operator Installation

WARNING

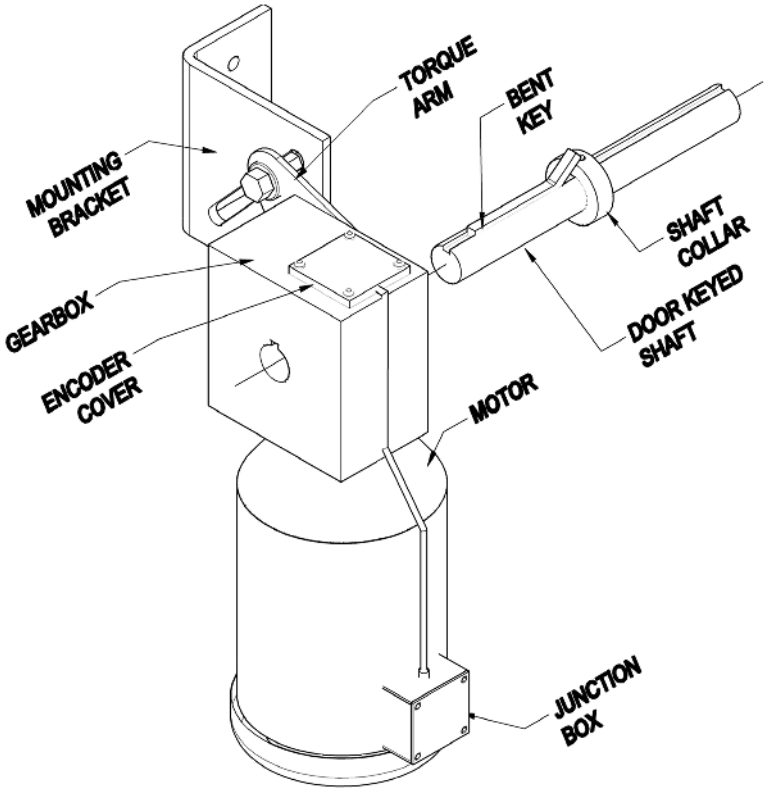
WARNING: THE OPERATOR ASSEMBLY IS HEAVY AND CAN CAUSE SERIOUS INJURY OR DEATH SHOULD IT BE DROPPED DURING INSTALLATION. TAKE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID DROPPING THE OPERATOR (I.E. TETHER/TIE DOWN) PRIOR TO ATTEMPTING INSTALLATION. SCAFFOLDING OR SCISSOR-LIFTS/ PLATFORM-LIFTS ARE ADVISED FOR OPERATOR INSTALLATION. NEVER ATTEMPT TO INSTALL AN OPERATOR ABOVE EYE-LEVEL OR FROM A LADDER.

ENSURE THAT PREVIOUS STEPS FOR SHAFT COLLAR/BENT KEY INSTALLATION HAVE BEEN PROPERLY FOLLOWED BEFORE PROCEEDING.

Align the keyway of the gearbox with the pre-mounted bent key (see Key Shaft Collar/Key Installation on previous page) located on the mounting side of the shaft. Bent section of key should face the shaft collar as noted in previous instructions.

Adjust the keyway of the hollow gearbox so that it is facing upwards (use a 3/8" ratchet placed in the bottom entry of the operator to move to rotate the hollow gearbox). Slide the gearbox onto the shaft until it makes contact with the bend radius of the key.

Fasten the torque arm to structural support by means of the supplied bolt, locking nut and washers. The supplied bracket may be required. If the torque arm does not align with structural support, you may try adjusting the torque arm position on the gearbox (see Assembling Torque Arm to Gearbox) accordingly or use the provided Torque Arm Bracket.



If the Torque Arm Bracket is needed, pre-assemble the bracket to the Torque arm using the provided fasteners prior to sliding on the operator (NOTE: DO NOT TIGHTEN THE NUT FULLY). Locate the proper position for the bracket on solid structural support (i.e. wall), mark the mounting holes, and install anchors as required (you may need to remove the operator to do this). Fasten the bracket to the support, then tighten the Torque Arm Bolt.

FAILURE TO SECURELY FASTEN TORQUE ARM COULD RESULT IN DAMAGE, SERIOUS INJURIES OR DEATH AND WILL VOID THE WARRANTY.

Control Panel Mounting

The control panel should be securely mounted at or around eye level (minimum 5 ft. from floor) on the same side as the operator/junction box. Ensure that the control panel is mounted far enough away from the door as to avoid user contact with the door while in operation, but close enough that the user has clear view of the door at all times. Four (4) control mounting brackets are provided to facilitate mounting. See Fig: 8

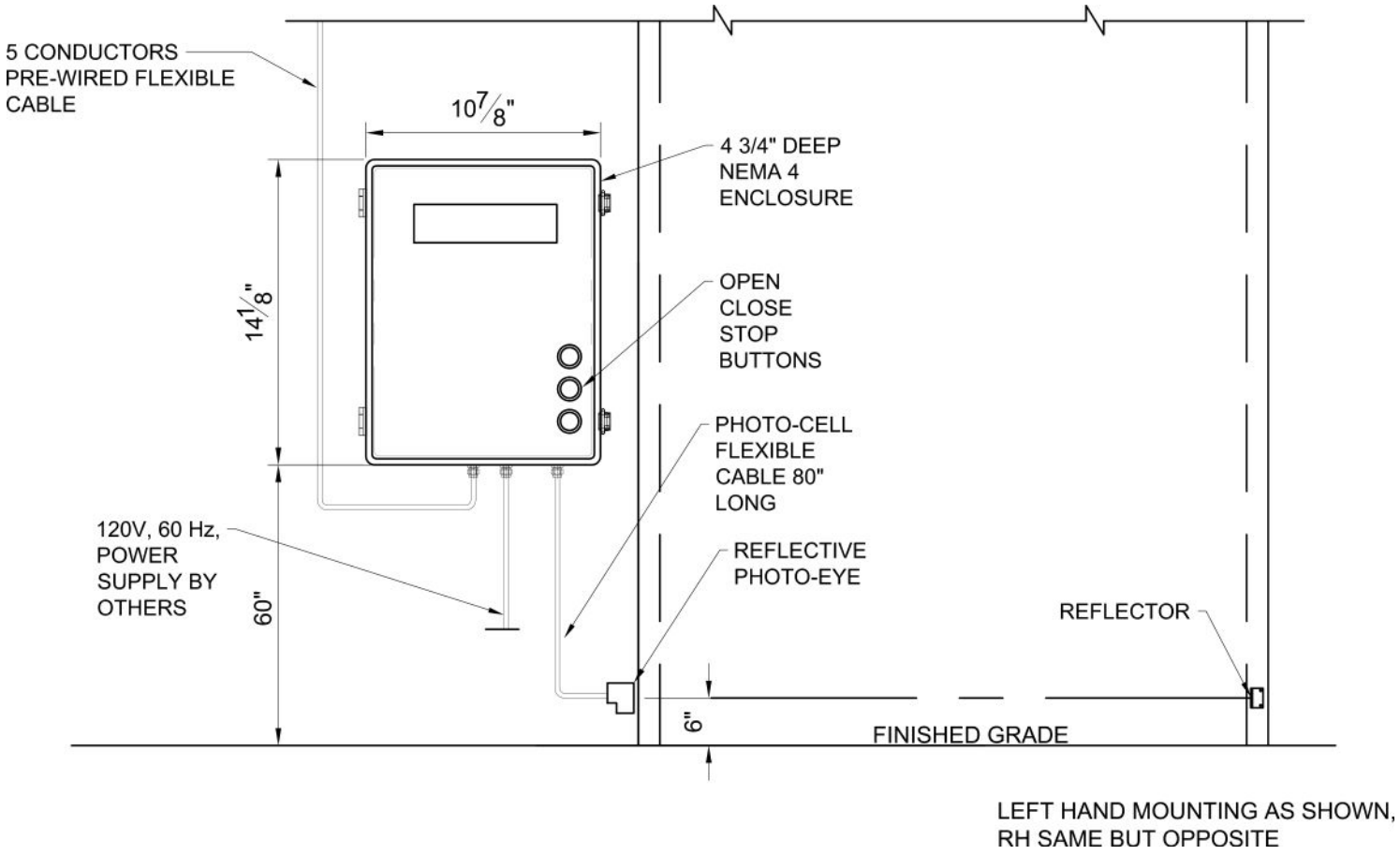


FIGURE: 8

Photo-Eye or Thru-Beam Sensor Mounting

The included reflective photo-eye or optional thru-beam sensor should be mounted so that it scans area that spans the entire width of the door at a height of no more than 6 inches from the ground. The sensor (reflective photo-eye) or receiver (thru-beam) should be mounted on the operator side (as it will be wired into the control panel), while the reflector or transmitter should be mounted on the opposite side of the door, facing the sensor/receiver so that its center meets the beam. Use the included mounting bracket(s) to secure to either the door tracks or the wall. Refer to the specific mounting details provided with the sensor. For final alignment of the sensor, apply power to the sensor (after completing WIRING – see page 10/11 for additional wiring info). Once properly aligned the indicator will light up in confirmation.

WIRING INSTRUCTIONS

WARNING

TO REDUCE THE RISK OF PERSONAL INJURY OR DEATH, ENSURE THAT THE FOLLOWING PRECAUTIONS HAVE BEEN FOLLOWED PRIOR TO MAKING ELECTRICAL CONNECTIONS:

1. Disconnect power at fuse box/source and follow proper lockout/tag-out procedures per national and local electrical codes.
2. Ensure that all electrical connections are made by qualified electricians/technicians only and meet national and local electrical codes, and that the unit is properly grounded.
3. All wiring should be on a dedicated circuit and properly protected.

MOTOR CONNECTIONS

The Pulse 300 Series Operators are supplied with a 5 conductor 16AWG cable that is pre-wired to the junction box of the motor. This cable needs to be connected into terminals located inthe control panel. All Control Panel connections, including power, motor and peripherals should be performed by an installation professional.

Run cable from Motor to the Control Panel in accordance with local and national regulations. Then wire as follows:

1. Motor Wires: Connect Black wire to M1, Red wire to M2 and Green wire to GND (Ground) terminals in control panel. Do not reverse polarity or motor will operate in the opposite of its intended direction.
2. Encoder Wires. Connect to Orange wire to E1 and White wire to E2 terminals in control panel. Do not reverse polarity or encoder will not work, and could suffer damage on power up.

POWER CONNECTIONS (110-130Vac or 208-240Vac Single Phase)

1. **ENSURE POWER IS DISCONNECTED!**
2. Run power wires into control panel in accordance with local and national regulations.
3. Connect incoming power to L,L1 and N,L2, and GND (Ground).

DO NOT POWER UP UNIT UNTIL INSTALLATION IS COMPLETED FULLY AND YOU ARE PREPARED TO ALIGN PHOTO EYE AND SET LIMITS.

REFLECTIVE PHOTO EYE SENSOR

1. Once mounted, run the cable for the sensor into the control panel and connect wires as follows: Brown wire to P+, Black wire to R1, Blue wire to COM on the Reversing Inputs Terminals.

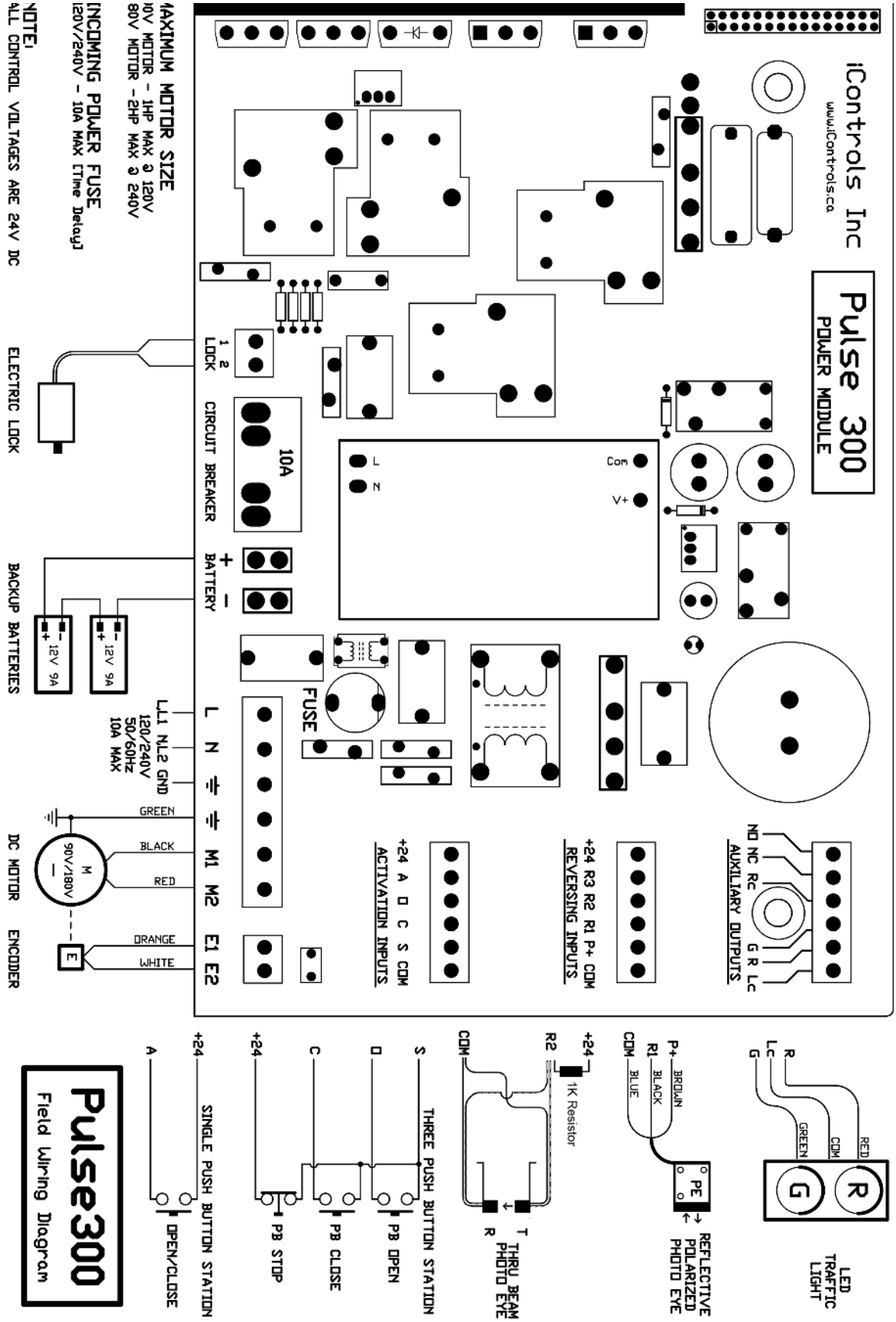
Wiring of Peripherals

The Pulse 300 Series Operators can accomodate added 24Vdc reversing devices (Photo-Eyes, Light Curtains, Reversing Edges, Etc.) and added 24Vdc activation devices (Remote Push Buttons, Remote Radio, Floor Loop, Pull Cord, Motion Detector, Photo Eye, Etc.). As well, there is an on board relay for interlocking or external communication for signalling devices, security systems, fire systems, etc. Furthermore, terminals for the addition of a 3rd party 24V dc electric lock are provided as well as connections for a separately powered closed warning light.

NOTE: It is required to drill holes into the control panel enclosure for wire access for peripherals. When doing so, DO NOT DRILL INTO THE PRINTED CIRCUIT BOARD OR BATTERIES, CLEAN ALL SHAVINGS/ DEBRIS FROM INSIDE THE PANEL and USE APPROPRIATE CONNECTOR FOR CABLE ENTRY.

Battery Connections
The Pulse 300 Series come standard with Built-In Battery Backup that provides 24Vdc/9Ah of power for power-outage situations (mounted behind the board). Plug in the battery leads with female connectors extending from the board to the exposed terminals on the batteries (Red to +, Blue to -).

WIRING DIAGRAM



STARTUP PROCEDURE

CAUTION! **Before applying power to the Pulse operator, ensure that the unit is firmly in positioned on the door shaft and securely fastened to the torque arm/bolt. Also that Limit brackets are in place and that the encoder is properly fastened on the gearbox.**

POWERING UP

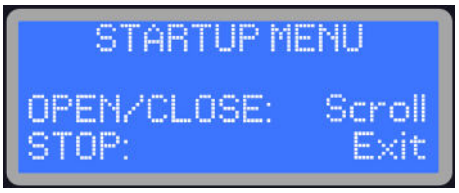
Turn power on at source. The Control Panel LED Screen should light up and run a self-diagnostic. If LCD screen is not lit, refer to Trouble Shooting on Page 21. Once it has run through its self-diagnostic, the screen will read 'Pulse 300 Series - Press Open to Start'. THIS IS A DEFAULT MESSAGE FOR POWERUP DURING REGULAR USAGE - DO NOT OPERATE THE DOOR AFTER INITIAL POWER UP - LIMITS MUST BE SET.



Once powered on, check Photo-Eye alignment - the Green LED indicates that power is on and the Amber LED on top of the Photo-Eye indicates proper alignment with the reflector. If it is not properly aligned, adjust until the Amber LED is lit. Once Photo-Eye is functional, move on to Menu Settings. DO NOT OPEN THE DOOR AFTER INITIAL POWER UP - ACCESS STARTUP MENU ONLY!(see below instructions).

STARTUP MENU & ACCESSING ALL MENU SELECTIONS

NOTE THAT ALL FACTORY MENU SETTINGS ARE RECOMMENDED FOR SECTIONAL DOORS ONLY.



For access to the STARTUP MENU press and hold the **STOP BUTTON FOR 10 SECONDS** - do not release until the words 'STARTUP MENU' appear on the screen. Once accomplished, you can scroll between the various STARTUP MENU options by pressing the OPEN and CLOSE buttons. Once you have reached a selection that you would like to modify, press the STOP button. Use the OPEN and CLOSE buttons to scroll/toggle between options within the selection, and then press STOP to save your selection and return to the STARTUP MENU.

DOOR TYPE



This operator has factory presets for both Sectional and Rolling Steel Doors. If you are installing this operator on a sectiional door, this the the factory default, and you can continue to the next menu option (verify selection before proceeding).

If you have a Rolling Steel installation, press the STOP button to change this setting. Toggle so that 'Rolling' appears as the 'Set as' value and press STOP to save this selection. You will now be prompted to toggle to the minimum diameter of the roll (with door in closed position), and can select from options from 8-12". Press STOP to save your selection, and now select the maximum roll diameter from 12-24" (when door is in open position) and press the STOP to save and return to the STARTUP MENU.



VOLTAGE RANGE

NOTE: USING AN INCORRECT VOLTAGE SETTING COULD LEAD TO THE DOOR OPERATING AT AN UNSAFE SPEED.



This operator is designed to work with **SINGLE PHASE** voltages from 110-240Vac (for 3 phase voltage, use optional external transformer). There are 2 available settings, 110-130V or 208-240V, and proper selection for your installation **MUST** to be made prior to operation. Failure to do so could result in damage to the operator and door. To access this option, toggle between menu options using the OPEN or CLOSE buttons until VOLTAGE SETUP appears on the screen. Then press the STOP button to select. Press OPEN or CLOSE to toggle between Voltage Selections. Press STOP to Save and return to the STARTUP MENU.



DOOR LIMITS

NOTE: PROGRAMMING OF LIMITS SHOULD BE PERFORMED BY TRAINED PERSONNEL ONLY. THE ENCODER WILL RETAIN THESE LIMITS UNTIL RE-PROGRAMMED.



Access the DOOR LIMITS selection from the STARTUP MENU and press the STOP button. Once selected, DOOR LIMITS heading will appear with a prompt to 'Push OPEN to Start'. Push the OPEN button, and the door will open to the fully open position against the Limit Brackets (or bumper/pusher springs). ENSURE THAT THE TOP ROLLERS OF THE DOOR ARE RESTING AGAINST THE LIMIT BRACKETS. The Open Limit now needs to be set.



SET OPEN LIMIT

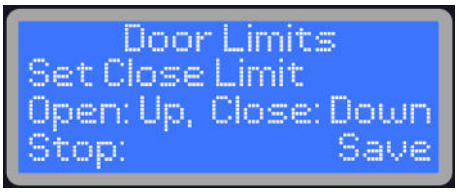
Press CLOSE (OPEN functional should you overshoot desired position) to jog the door to the desired Open Limit height. **The Open Limit Setting Should be a minimum offset of 3" from the Limit Bracket or Compressed Pusher Spring**. Press STOP button to save Open Limit and advance to SET CLOSE LIMIT.



SET CLOSE LIMIT

From the Open Limit, jog to the desired Close position, using the CLOSE button (OPEN available for fine tuning). Ensure that the door is properly sealed at the bottom.

Press STOP button to save and return to STARTUP MENU.



SETTING DOOR SPEEDS

On initial set up please use the factory default medium speed of '3' or slower. As noted below the Motor, Door and Drum size may affect the opening speed of the door and this may be all that is required. Adjust speeds upwards only after having tested at lower speeds.

Please note that the Pulse has been developed with the same technology that is used in High Speed Door Operators. While we have limited the maximum opening speed to ~24" per second for sectional doors (this is dependent on the type of door, gearbox and drum used) and maximum closing speed to ~16" per second, we recommend that you set the speed to accommodate both your requirement, and the hardware of the door. To get the longest life out of your door, and to maximize your allowable speed, we recommend Stainless Steel cables and nylon rollers be installed if they are not already standard on your door.

OPENING SPEED

To access the Open Speed Settings, ensure you are in STARTUP MENU (see above instructions), then toggle between options using the OPEN or CLOSE buttons until Open Speed appears on the screen. Then press the STOP button to access and macke changes.



The Pulse operator is factory equipped with 5 options of open speed settings, designated as 1 (slowest) to 5 (fastest). Toggle between these 5 options by using the OPEN and/or CLOSE buttons, and press the Stop button once the desired selection appears on the screen to save and return to the STARTUP MENU.

CLOSING SPEED

To access the Closing Speed Settings, ensure you are in STARTUP MENU (see above instructions), then toggle between options using the OPEN or CLOSE buttons until Close Speed appears on the screen. Then press the STOP button to select.



The Pulse operator is factory equipped with 5 options of close speed settings, from 1(slowest) to 5 (fastest). Toggle between these 5 options by using the OPEN and/or CLOSE buttons, and press the Stop button once the desired selection appears on the screen to save and return to the STARTUP menu.

CLOSING FORCE (LOAD SENSING)

If the door is obstructed from closing (ie. due to obstruction, jam, etc.) this safety feature will stop and reverse the door to prevent damage or serious injury. The sensitivity of this monitoring can be changed in this setting, or the feature can be turned off entirely (not recommended). There are separate settings for operation under AC power and Battery Backup power. Ensure that your batteries are connected to the system before proceeding in order to set both parameters.



Once this menu option is selected (by pressing the STOP button), you will be prompted to select the sensitivity for operation under AC power. Select between values from 1 (most sensitive) to 20 (least sensitive) or turn it off completely. Once chosen, press the STOP button to save the selection.



Now set the desired sensitivity under Battery Backup and press the STOP button to save the selection. You will now be prompted to turn off the power and test the sensitivity under battery power to ensure that it is set for safe and reliable operation.

OPENING FORCE

If the door is obstructed from opening (ie. due to ice buildup, the door latch is engaged, etc.) this safety feature will immediately stop the door to prevent further damage to the door. There are separate settings for operation under AC power and Battery Backup power and the sensitivity of this monitoring can be changed in this menu option, or the feature can be turned off entirely.



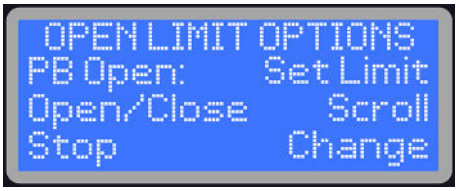
Upon selection of this menu option (by pressing the STOP button), you will be prompted to select the desired sensitivity for operation under AC power. Select between values from 1 (most sensitive) to 20 (least sensitive) or turn it off completely. Once chosen, press the STOP button to save the selection.



Now set the desired sensitivity under Battery Backup and press the STOP button to save the selection. You will now be prompted to turn off the power and test the sensitivity under battery power to ensure that it is set for safe and reliable operation.

OPEN LIMIT OPTIONS for PUSH BUTTONS, ACTIVATORS & REMOTES

This setting allows the user to choose between the SET LIMIT or the FULLY OPEN Limit (approximately 1" from the limit brackets) for all activation devices including the Control Panel Push Buttons, External Push Buttons, Alternate Activation Devices and Remote Controls.



Once selected from the STARTUP MENU, you will be prompted to make your selection for all 'OPEN' Push Buttons - the OPEN button on the control panel, and the 'O' connection on the Activation Input Terminals. Toggle between selections (SET LIMIT or FULLY OPEN) and once chosen, press the STOP button to save.



The next prompt is for alternate Activation Devices that are connected to the 'A' terminal in the Activation Inputs. Toggle between choices, make your selection and press STOP to save.

The final prompt is for the optional Plug-In Remote Radio module (designed specifically for 300 Series Pulse Operators). Toggle between choices, make your selection and press STOP to save and exit to the STARTUP MENU.



BALANCE CHECK-UP



Once selected from the menu, the door will automatically run through one full close/open cycle (after an encoder reset). It will then report on the screen values representing the force required to open and to close the door. The difference in these numbers represents the imbalance, and adjustments to the spring tension should be made accordingly. Run this feature again to verify proper adjustment.

JOG MODE



To access the Jog Mode Setting, ensure you are in STARTUP MENU (see above instructions), then toggle between options using the OPEN or CLOSE buttons until Jog Mode appears on the screen. Then press the STOP button to begin using.



Jog Mode enables manual control of the door using the OPEN and CLOSE buttons. During Jog Mode, all limits are de-activated, and push-hold protocols are initiated. This selection can be used to test door functionality without the encoder, ensure proper door balance, or as a method to operate the door under power should the encoder malfunction. The door will travel in each direction at the set OPEN SLOW SPEED and CLOSE SLOW SPEED (see next), for safe operation.

CLOSING TIMER

IT IS NOT RECOMMENDED TO SET THE CLOSING TIMER UNTIL AFTER THE UNIT HAS BEEN FULLY TESTED.



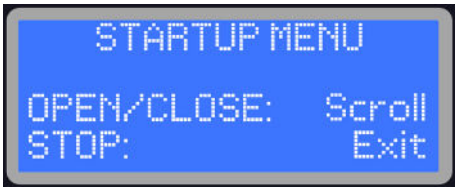
The Closing Timer will automatically close the door after opening by the preset number of seconds that have been programmed using this STARTUP MENU option.



Once you have accessed this option, use the OPEN and CLOSE buttons to increase or decrease the closing timer value in 1 second intervals. If it is not required, ensure that the Closing Timer is set to OFF. If it is required, set it to any number of seconds from 1 to 99. Remember that this is the number of seconds that the door will remain open before automatically closing. Press the STOP button to save the value and return to the SETUP MENU.

The Closing Timer will de-activate in the event that a reversing device fails, and manual Push and Hold to Close protocols will apply to door closing operations.

EXITING STARTUP MENU - CALIBRATION & TESTING



To exit from the STARTUP MENU, toggle through the menu until STARTUP MENU appears on the LCD and press STOP. If you have made changes to the Limits, Open or Close Speed or Voltage Range, you will be required to do a quick system calibration. Screen prompts will provide real-time instructions.

Once Calibration prompts are finished, the door will be in the closed position. Calibration will be completed on the next open cycle, at which time the screen will run through a quick diagnostic before resuming normal operation.

BEFORE OPERATING THE DOOR, ENSURE THAT THE DOOR LIMIT BRACKETS (OR PUSHER SPRINGS OR LIMIT SWITCH) ARE IN PLACE, AND DOOR LIMITS HAVE BEEN SET.

Testing of the door is now required. Observe whether the door is running smoothly and is stopping at the appropriate limits. Ensure that the door is moving at desired speed, and test each reversing and activation device to confirm functionality.

ADVANCED MENU

NOTE: THESE FEATURES SHOULD BE ACCESSED ONLY BY A TRAINED TECHNICIAN AFTER INITIAL SET UP AND TESTING, ONLY IF REQUIRED.



For access to the ADVANCED MENU options press and hold the **STOP BUTTON FOR 10 SECONDS** while on the STARTUP MENU screen. Do not release until ADVANCED MENU appears on the screen.

FACTORY RESET

This setting allows for a reset of all menu options to the factory default recommended for sectional doors. These are the Factory Settings:

STARTUP MENU

Voltage Range: 208V-240V
Door Limits Setup: ..... 4 Rotations - Must be Re-Programmed by Installer
Opening Speed: 3
Closing Speed: 2
Closing Force: AC:5 BB:5
Opening Force: AC:10 BB:10
Open Limit Options - Push Button: ..... Set Limit
Open Limit Options - Activators: ..... Set Limit
Open Limit Options - Remote Radio: ..... Set Limit
Closing Timer: ..... OFF



ADVANCED SETUP MENU

Motion Detect Time 100ms
PWM Frequency: ..... 12 kHz
Lock Output: ..... OFF
Remote Radio Mode: ..... Open/Close
Output Relay: ..... Energized When Open
Advanced Red: ..... OFF
Red Flashing: ..... OFF
Close Ramp-Up Time ..... 1.0 Seconds
Open Slow Speed: ..... Normal
Close Slow Speed: ..... Normal
Open Rampdown: ..... Auto(1.75)
Close Rampdown: ..... Auto(0.50)
Last Battery Cycle: ..... Opened

After performing factory reset (if deemed necessary), adjust settings as required and re-program limit settings.

MOTION DETECT TIME

As an added safety feature, the encoder monitors the rotation of the shaft. Should it detect no motion where there should be motion, the system will halt the cycle command, and show a fault display of 'NO MOTION DETECTED'. The allowable delay before this fault is recognized by the system can be adjusted from 50ms to 200ms, but should not be altered from the Factory Default setting of 100ms unless instructed to do so by technical support personnel.



PWM FREQUENCY

This Setting allows the user to change the operating frequency for the motor between 2.4 kHz, 12kHz and 20kHz. Certain frequencies can interfere with third-party accessories, and adjustment may be necessary. Factory default is set to 12kHz. Do not alter this setting unless advised by Technical Support.



LOCK OUTPUT



To access the Lock Output Setting, ensure you are in STARTUP MENU (see previous instructions), then toggle between options using the OPEN or CLOSE buttons until Lock Output appears on the screen. Then press the STOP button to alter Setting.

The Lock Output function is needed to be activated only when a 3rd party 24Vdc powered lock is connected to the Lock+ and Lock- terminals. This will allow for engagement and disengagement of the lock device when the door is closed and prior to opening. The delay time for door movement (to accomodate for lock release) is adjustable between 50-500ms (Factory Default is 'OFF'). Note that the batteries must be connected to enable lock output functionality.

REMOTE RADIO MODE



This setting allows two options for how the remote operates if it is pressed while the door is opening.

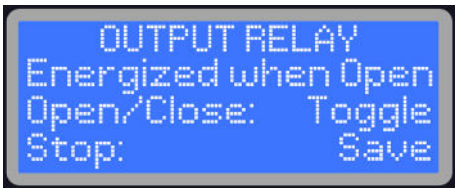
In 'Open/Close' mode when pressing the remote button from the Closed position, the door will open to the chosen limit setting (see Open Limit Options on page 14). Pressing the remote again during its travel will have no effect. Once it reaches the Open position, pressing the remote will command the door to close.



In 'Open/Stop/Close' mode pressing the remote button when the door is closed, the door will open to the chosen limit setting. Should you press the remote again during the Open cycle, the door wil stop. If it is pressed again, it will close from the stopped position.

In either mode, if the remote is pressed while the door is closing, it will reverse.

OUTPUT RELAY OPTIONS



The Output Relay is used for signalling/interlocking with other devices such as a dock leveller, security equipment, other doors, etc. There is one NO and one NC contact available that can be energized at either the open or closed limit, or while the door is in motion, as chosen by the user in this setting.

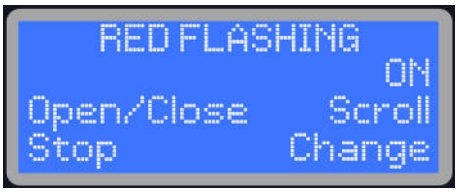
The Factory setting for this feature is ENERGIZED WHEN OPEN.

ADVANCED RED



Used in conjuction with the CLOSING TIMER (Page 18), this safety feature turns on the red light (or flashing red light if this setting has been enabled) of an attached LED Stop & GO light in advance of the door closing by a programmed number of seconds. Note that should you choose a value that is greater than the CLOSING TIMER pre-set, it will begin at the same time. Factory Default is the 'OFF' setting, with options for 1-9 seconds of ADVANCED RED.

RED FLASHING



Set this feature to ON if you prefer the red light of an attached LED Stop & Go Light to flash while the Advanced Red timer is active.

CLOSE RAMP-UP TIME



On the Close cycle, from the open position, you can adjust the amount of time that it takes the door to accelerate from its resting position to its full speed. This is particularly beneficial when using standard lift doors and/or large drums, or when the unit is mounted on a balanced rolling steel door. This can be adjusted in 0.5s increments from 0.5 to 3.0 Seconds. Factory Default is 1.0s

OPEN SLOW SPEED

When the door is approaching open limit and decelerates down to slow speed before the stop (Soft Stop), added force/speed may be required to complete opening. While this is indcative of an improperly balanced door, this feature can be used to compensate. This setting should only be changed from the NORMAL to the HIGH setting if door **becomes** unbalanced over time and does not completely travel to Open limit. If it is a new installation, changing the spring tension for proper balance is a required first step. Factory default is 'NORMAL'.



CLOSE SLOW SPEED

When the door is approaching Close Limit and decelerates down to slow speed before the stop (Soft Stop), added force/speed may be required to complete closing. While this is indcative of an improperly balanced door, this feature can be used to compensate. This setting should only be changed from the NORMAL to the HIGH setting if door **becomes** unbalanced over time and does not completely travel to Close limit. If it is a new installation, changing the spring tension for proper balance is a required first step. Factory default is 'NORMAL'.



OPEN RAMPDOWN DISTANCE

This setting is used to change the point where the door begins to decelerate to slow speed as it approaches the Open Limit. The user can choose between auto (which is configured by the system) or the desired number of shaft rotations (between 0.5 turns and 3 turns in half rotation increments).

The Factory setting for this feature is AUTO. This should not be changed unless recommended by Pulse Technical Support.



CLOSE RAMPDOWN DISTANCE

This setting is used to change the point where the door begins to decelerate to slow speed as it approaches the Close Limit. The user can choose between auto (which is configured by the system) or the desired number of shaft rotations (between 0.5 turns and 3 turns in half rotation increments).

The Factory setting for this feature is AUTO. This should not be changed unless recommended by Pulse Technical Support.



LAST BATTERY CYCLE

During a power outage, should the batteries diminish to 75% of their capacity, the door will stop continuing to autmatically run under battery power to conserve energy (peripherals will be shut off and the operator will work only from the panel with push and hold protocols in place). This setting determines whether the last automatic cycle leaves the door opened or closed. Factory default is 'Opened'.



EXITING ADVANCED MENU - CALIBRATION & TESTING

To exit from the ADVANCED MENU, press and release the STOP button while ADVANCED MENU appears on the LCD. This will bring you back to the STARTUP MENU. Press and release the STOP button again to exit all menus and to test the settings that you have changed. If, while you were in the ADVANCED MENU and have saved changes to the PWM Frequency, Open Rampdown or Close Rampdown you will be required to do a quick system calibration. Screen prompts will provide real-time instruction on calibration requirements.



Once Calibration is completed or if it was not required, the system will run a quick diagnostic before resuming normal operation.

MANUAL CALIBRATION

Changes in spring tension, weather and termperature can negatively affect Force Monitoring causing it to activate erratically. A simple manual calibration should solve this issue. With the door in the open position, press and hold the close button on the control panel until the door is fully closed and stops. This will recalibrate the door, and should alleviate common Force Monitoring issues.

BATTERY BACKUP - POWER OUTAGE OPERATION

The Pulse 300 Series is factory equipped with a battery backup system that is automatically activated during a power outage (provided batteries are in place and connected).

If power fails, the included batteries takeover for continued door function. The door will operate normally, but at a reduced speed, until power is restored or the batteries reach low power. At low power, regular door function is aborted to conserve battery life, and the door stays in the pre-selected 'Last Battery Cycle' position, working only via the panel push buttons with push and hold protocols initiated. A built-in trickle charger ensures that the batteries are always charged and ready. If the batteries become fully drained or go missing, a crackshaft socket is provided for mechanical backup. If your operator should reach low battery mode, simply push and hold the OPEN button in order to open the door, and push and hold the CLOSE button in order close the door – the door will respond accordingly, but note that speeds will be reduced. Limits are not active, and it is important to release the button as soon as the door reaches the appropriate position. All safety devices will also be disabled during low battery backup operation and any personnel operating the door should maintain a clear line of sight with the doorway in order to reduce the risk of possible door impact with personnel or equipment, and to ensure the door operates safely.

NOTE: WHEN USING BATTERY BACKUP WITH PUSH TO HOLD PROTOCOLS (LOW BATTERY MODE), LIMITS ARE NOT ENGAGED. YOU MUST RELEASE THE BUTTON AT THE APPROPRIATE TIME, OR RISK TRIGGERING THE CIRCUIT BREAKER. DO NOT HOLD THE OPEN OR CLOSE BUTTON ANY LONGER THAN NECESSARY.

To enable/test battery backup functionality when the power is available, disconnect power to the operator.

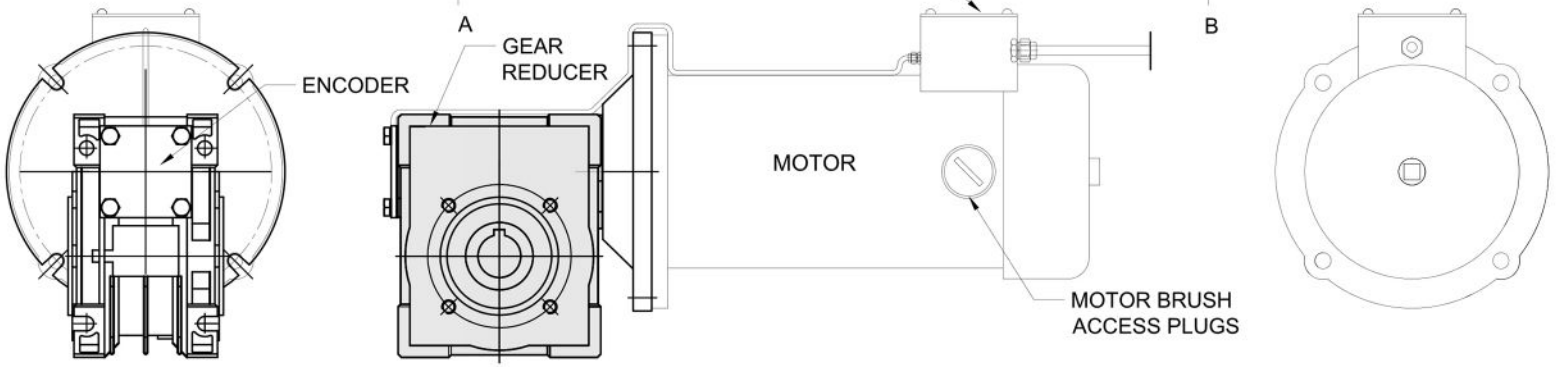
In case the batteries are fully drained or missing, the base of the motor is also equipped with a 5/16" socket entry. TURN OFF POWER TO THE OPERATOR (even if the power seems out), secure a crankshaft, socket wrench or power drill equipped with a 5/16" ratchet head (not included) inside the entry at the bottom of the motor and rotate it in the appropriate direction in order to open or close the door. This is also an easy way to align your gearbox keyway with the shaft keyway. Turn on the power once manual operation is no longer required.

NOTE ON BATTERIES

Provided lead-acid batteries are 2 x 12V, 9Ah, connected in series to provide 24Vdc. The controller provides a monitored trickle charger in order to maintain the batteries' life. Should the batteries be fully drained and no longer accept a charge, please replace them with equivalent batteries, and dispose of the expired units according to local environmental regulations. NEVER remove the provided jumper between the batteries unless in the process of replacement, and be sure to re-connect in the event battery replacement is required.

WEATHER-RESISTANT APPLICATIONS

recommend an available upgrade for all Weather Resistant applications. Standard Pulse Operator Motors are rated IP44, and could be vulnerable to water ingress. Furthermore, reflective photo-eye sensors have a tendency to be detrimentally affected by condensation on the reflector, preventing reliable operation in such conditions. iControls offers a cost-effective weather-resistant upgrade that seals ingress points on the motor junction box, and includes a NEMA 4X thru-beam sensor in place of a reflective photo-eye.



VIEW: A

ELEVATION

VIEW: B



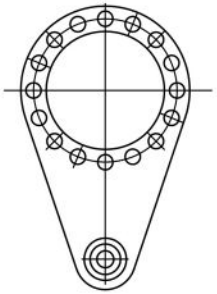
(1) SHAFT COLLAR



(1) BENT KEY



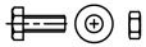
(4) ¼ x 20 HEX HD BOLTS, F/WASHERS, LOCK NUTS



(1) TORQUE ARM



(4) M8 BOLTS



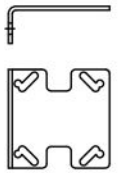
(1) $\frac{3}{8}$" DIA. BOLT, (2) WASHERS, (1) NUT



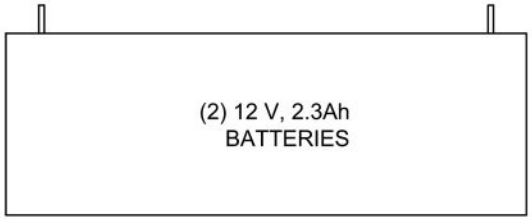
(1) REFLECTOR



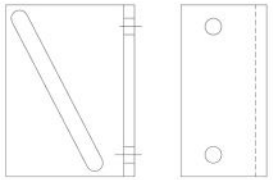
(1) REFLECTIVE PHOTO EYE



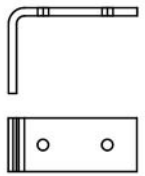
(1) PHOTO EYE BRACKET.



(2) 12 V, 2.3Ah BATTERIES



(1) TORQUE ARM BRACKET



(2) OPEN/STOP TRACK ANGLE

OPERATOR: SERIES 100

iControls®

Richmond Hill, Ontario.

TROUBLE SHOOTING GUIDE

The following are common user experienced problems that are easily diagnosed and quickly resolved during installation and operation of a Pulse 300 Series operator.

If, after reviewing the trouble shooting guide you are unable to resolve whatever issue you may be experiencing, please call our toll-free technical support line for assistance.

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
NO DISPLAY AT THE LCD PANEL	**NO POWER**	Check power is on at circuit breaker, disconnect switch is on, and ensure unit is plugged in.
		Check power fuse in panel (6.3A Time Delay, beside power connections in lower left corner).
DOOR STOPS AT RANDOM POSITION DURING OPENING AND LCD READS 'MOTOR OVERCURRENT'	**OPENING FORCE IS TOO SENSITIVE**	Adjust the Opening Force setting in the SETUP MENU. 1 is most sensitive, and 30 is least sensitive.
	OBSTRUCTION/DOOR JAMMED	Check that there is nothing external interfering with door operation causing Opening Force to activate.
DOOR REVERSES BEFORE REACHING CLOSE POSITION OR AS SOON AS THE CLOSE BUTTON IS RELEASED	**PHOTO-EYE/REFLECTOR MISALIGNED OR OBSTRUCTED**	Clean, re-align and/or clear obstruction in front of the sensors/reflector. Confirm yellow LED on Photo Eye is on.
	CLOSING FORCE IS TOO SENSITIVE OR OFF	Adjust the Closing Force setting in the SETUP MENU. 1 is most sensitive, and 30 is least sensitive.
	THIRD PARTY REVERSING DEVICES MALFUNCTIONING	Disconnect third party reversing devices and test again. If working, reconnect reversing devices one at a time to isolate the defective device or miswiring.

TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
'DOOR IS STOPPED' MESSAGE ON LCD PANEL (WITHOUT DEPRESSING STOP BUTTON)	**OBSTRUCTION OR DOOR JAMMED DUE TO OBSTRUCTION.**	Remove obstruction or free up the door, turn "OFF" the AC power and cycle test the door under battery power.
	PUSHER SPRINGS OR LIMIT BRACKETS MAY BE PREVENTING DOOR FROM REACHING THE OPEN LIMIT.	Reset OPEN limit so that Pusher Springs are not significantly engaged or that rollers are at least 3 inches from the limit brackets at set limit.
	DOOR NO LONGER BALANCED PROPERLY	Run 'BALANCE CHECK' in SETUP MENU and make required balance adjustment.
DOOR MOVES FEW INCHES AFTER OPEN/CLOSE COMMAND AND STOPS	**THIRD PARTY PUSH BUTTON DOES NOT HAVE AN NC (NORMALLY CLOSED) CONTACT FOR THE STOP BUTTON.**	Replace the push button station (or the contact for the STOP button) for one that has an NC contact on the STOP button. Wired unit from factory is compliant.
	THIRD PARTY PUSH BUTTON STATION WIRED INCORRECTLY.	Check and correct wiring as necessary.
DOOR DOES NOT CLOSE ON REMOTE OR CLOSE TIMER	**PUSHER SPRINGS MAY BE PREVENTING DOOR TO OPEN FULLY TO THE OPEN LIMIT (SCREEN READS 'DOOR IS STOPPED') .**	Reset Open Limit so that it does not engage pusher springs.
	CLOSING TIMER NOT SET OR NOT SET APPROPRIATELY.	Enter Menu, and ensure that Closing Timer is set for desired delay.
	PHOTO EYE IS BLOCKED, MISALIGNED OR DAMAGED.	Check that the LED light on the Photo-Eye is on. If not, Clean Photo-Eye and Reflector. If still not on, Check Alignment. If still not on, check for damage to Photo-Eye or Photo-Eye Cable.
'NO MOTION DECTECTED' MESSAGE ON LCD PANEL	**DOOR IS OBSTRUCTED OR JAMMED.**	Ensure that door latch is disengaged. Check for obstruction or that door is jammed in tracks. Turn off power and cycle test the door under battery power while monitoring for physical snags/obstructions.

TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
DOOR DOES NOT WORK ON BATTERY POWER	BATTERY CIRCUIT BREAKER MAY BE TRIGGERED	Depress the button on the circuit breaker.
	BATTERIES MAY BE DRAINED OR DEAD	Check batteries voltage, if low let it charge for 24 hours with AC power ON. Replace batteries if still not charged.
	DOOR IMPROPERLY BALANCED	Run 'BALANCE CHECK' in STARTUP MENU and make required balance adjustment.
	MAIN POWER STILL BE ON	Disconnect power and test.
FORCE MONITORING NOT WORKING	CLOSING/OPENING FORCE IS NOT SET PROPERLY OR OPERATOR HAS NOT BEEN CALIBRATED	Adjust the Closing and/or Opening Force. Directions are shown on Page 14.Increase or decrease based on door weight/size, door type/age and door hardware. Perform manual Calibration.

PULSE OPERATOR REPLACEMENT PARTS

MOTOR
MOTOR BRUSH SET
GEARBOX
CONTROL ENCLOSURE
CONTROL LCD BOARD
MAIN POWER BOARD
ENCODER
REMOTE RECEIVER
REMOTE TRANSMITTER
PUSH BUTTONS
TORQUE ARM
TORQUE ARM BRACKET
LIMIT STOPS/HARDWARE KIT
SHAFT COLLAR/KEY
BATTERIES
PHOTO-EYE SENSOR/BRACKET
PHOTO-EYE REFLECTOR

Should you require any of the above, our team will provide you with part numbers and direct you to the nearest distrubutors that can provide you with the items as quickly as possible.