

**B-Track BTc examples:**



**How to Select**

- Step 1:** Determine what type of control function is needed.
- Step 2:** Compare control function needed with the different controls and control capabilities described on the following pages (pgs. 38-45).
- Step 3:** If your choice is a simple switch box control, order the control as a separate part number, including connecting cables as needed.
- Step 4:** If you are selecting an integrated control feature with a B-Track actuator, insert applicable BTc control function into the selected actuator model configuration scheme as shown below.

**B-Track BTc Configurator**



Note: See control pages for full listing of model numbers.

When ordering a BTc control with a B-Track actuator, insert BTc model prefix after the base actuator model number, such as K2 P1.1 or K2xP1.1.

# Simple and Basic Controls

## SBC-DC & SBC-AC Simple Switch Box Controls



### DC Switch Box SBC-DC

- Easy to use with 12, 24 and 48 vdc actuators.
- Comes with 20 ft. power connecting cable, two-way momentary toggle switch, dust tight abs enclosure and output connector with 10 inch lead.
- 10 ft. and 8 ft. connecting cables available (switch box to actuator).



### AC Switch Box SBC-AC

- Easy to use with 90 vdc motors converting 115/230 vac to 90 vdc.
- Comes with AC to DC converter in weather tight polycarbonate enclosure.
- Two way momentary toggle switch, and weather tight output connector, with 10 inch lead.
- 10 ft. and 8 ft. connecting cables available (switch box to actuator).
- 3 ft. plug in power cord also available.

When ordering, order part numbers:

SBC-DC	DC Switch box
SBPC-DC-10 or 8	DC Power cable
SBC-AC	AC Switch box, order with or without power cord
SBPC-AC-10 or 8	AC Power cable

## BTc – PQS, P1 & P2 Basic Position Controls



*BTc control*



*A-Track with sensors*

- M-Track and A-Track actuators are available with onboard potentiometer outputs and adjustable limit switches for use with control schemes provided by the actuator user.
- B-Track actuators are available with digital electronics integrated into the actuator referred to as BTc or B-track controls.

- Electronic Stroke Limit Control (ESL) is an integrated motor mounted control which uses rugged long life non-contact hall effect switches mounted inside the actuator. The switches are magnetically triggered turning power off to the actuator until power is reversed. Options include outputs for PLC interface or indicator lights. Control is potted for rugged environments.

- Quick Stop Control (QS) is a bi-directional current limit control which is motor mounted. This control is set to turn off power to the actuator when a set current level is reached. A different current setting is possible for each direction. The current settings are factory set and the control is potted for rugged environments.
- A Digital Position Feedback Control is also offered. It is motor mounted and uses pulse signals from two inductive sensors integrated into the B-track actuator. Digital pulses are converted to an analog output voltage of 0 to 10 volts relative to the position of the extension rod. The control provides electronic end stroke function, dynamic electronic braking, current limit protection and is potted for rugged environments. Optional end of stroke output signals are available for use with PLC's and to power indicator lights.

When ordering, order by inserting selected model into the actuator configuration as shown on page 37.



## BTc – P3 & P4 Advanced Microprocessor Controls

Many applications that use electric actuators also need some form of actuator control that is more than a simple switch to extend and retract the actuator.

Often, actuators are used in applications where they need to go to variable positions, or go to a position and then retract, or where two actuators are used together and must remain in synchronous position with each other. A common example is in raising or lowering large lids on containers or commercial mixers.

For these types of control needs, please contact your Warner Linear representative or consult with our technical specialists for assistance in selecting the right actuator control to suit your need. Warner Linear offers a number of microprocessor-based control capabilities to choose from such as:

- **Twin Trac Control:** Control that keeps two actuators in synchronous position.
- **Quick Switch Control:** Provides push button open/close reversing function.
- **Auto Reverse:** Position selectable to automatically reverse direction when a selected position is reached.
- **Programming Pendant:** Hand held programming box used to select control variables such as:
  - Extend limit
  - Retract limit
  - Extend current limit
  - Retract current limit
  - Length of stroke
  - Also provides position readout and end of stroke LED's



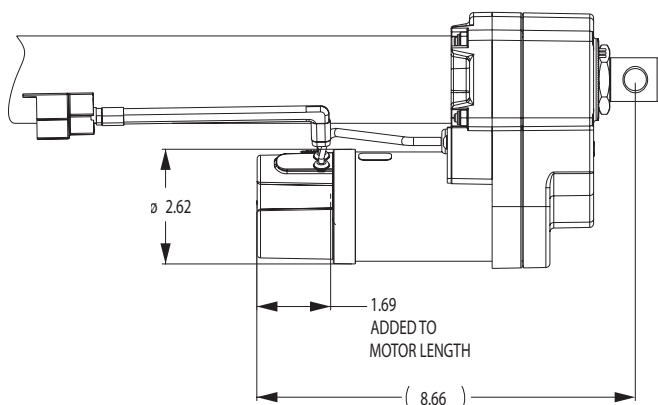
## P1-DC Electronic Stroke Limit Control



The P1-DC Control provides end of stroke stopping by turning off power to the motor via an on board relay. Input power polarity must be reversed for the actuator to move again. The control uses solid-state hall effect sensors in combination with electronic dynamic braking to accurately stop at the end of stroke travel. The sensors are non-adjustable and are mounted inside the actuator cover tube for protection where they are switched via a non-contact magnet attached to the rod. The switches are sealed for life and will never wear out.

### Specifications

- Supply Power: 12 or 24 vdc versions available
- Maximum Current: 25 Amps @ 12 vdc/12.5 Amps @ 24 vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F



### Features

- **Motor Power:** Switched by on board relay. The relay allows power to the motor as long as the actuator is not being commanded to go past the end limits.
- **End Limits:** Integrated end of stroke hall effect sensors trigger the control to turn power off to the motor until input power is reversed. Position is factory set.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy (electrical) environments.

### Options

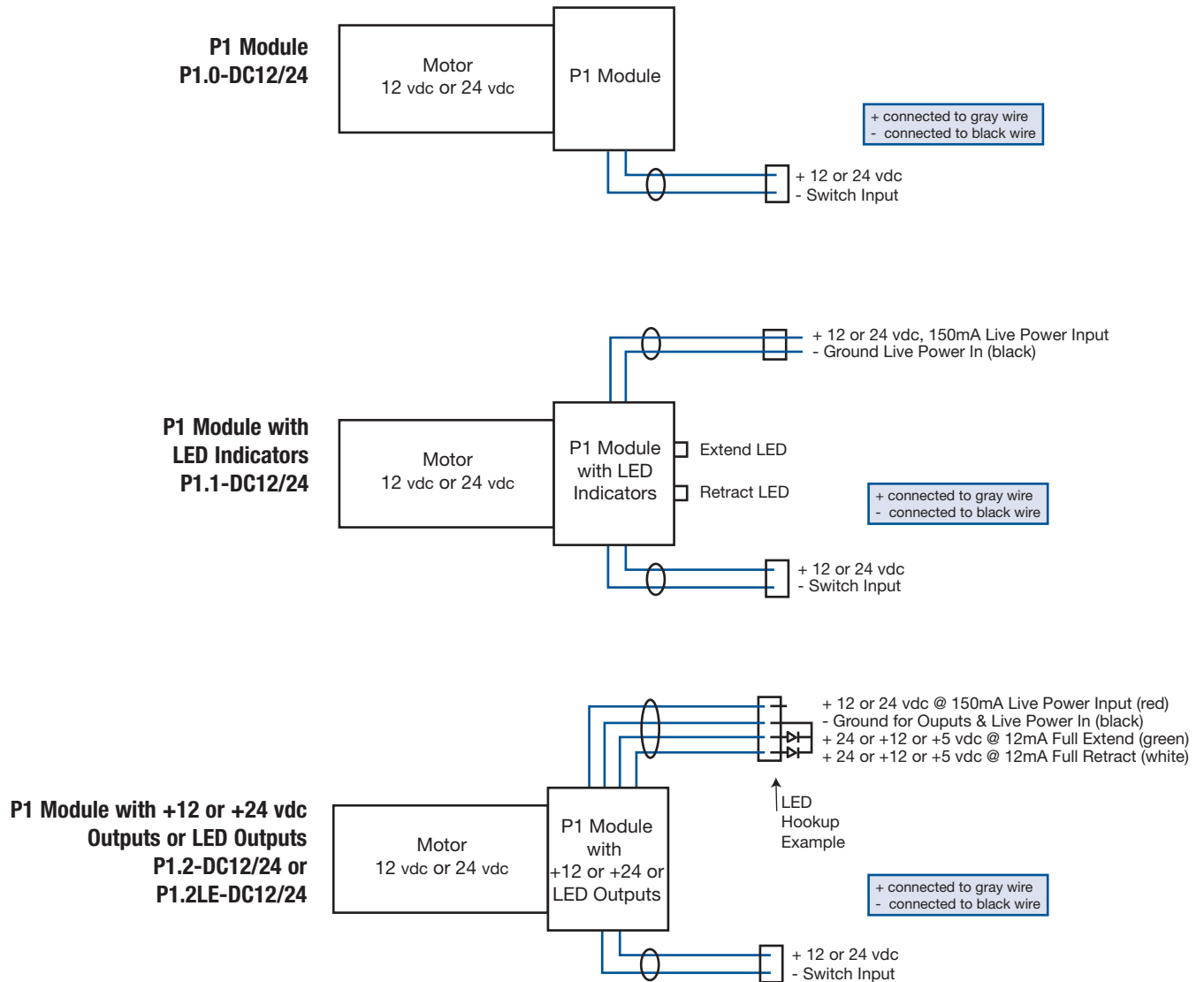
- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. Included with the LED's is a live power input that can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **+12V Outputs:** Two +12 volt, 12mA outputs plus a ground to indicate when the end of stroke is reached. This output can signal a relay, lamp, or isolated PLC input. Included with the outputs is a live power input which can be used to keep the outputs on when switch power is off. 12/24vdc, 150mA is needed.
- **LED Outputs:** Two +5 volt, 25mA outputs plus a ground to indicate when the end of stroke is reached. This output can be used to light an LED. Included with the outputs is a live power input that can be used to keep the outputs on when switch power is off. A 12/24vdc, 150mA supply is needed.

## P1 Electronic Stroke Limit Control

### Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
P1.0-DC12	12	25	Base = Electronic Stroke Limit with Electronic Dynamic Braking
P1.0-DC24	24	12.5	Base = Electronic Stroke Limit with Electronic Dynamic Braking
P1.1-DC12	12	25	Base & LED Indicators on Housing
P1.1-DC24	24	12.5	Base & LED Indicators on Housing
P1.2-DC12	12	25	Base & +12 vdc Outputs
P1.2-DC24	24	12.5	Base & +24 vdc Outputs
P1.2LE-DC12	12	25	Base & LED Outputs +5 vdc
P1.2LE-DC24	24	12.5	Base & LED Outputs +5 vdc

### Wiring Diagrams



## PQS-DC Quick Stop Control



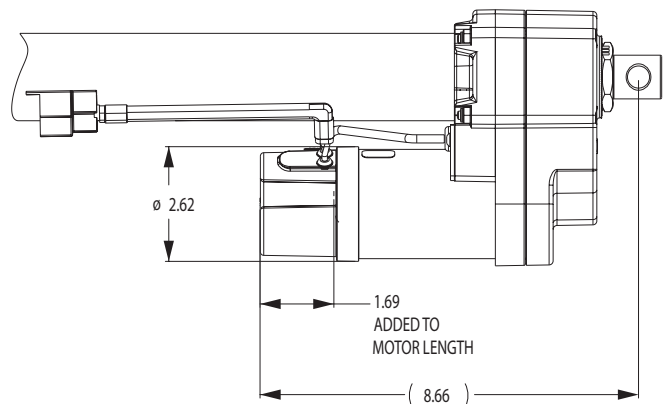
The PQS-DC is a bi-directional current limit control which monitors current during actuator motion and quickly stops the actuator if an object gets in the way causing an over limit current draw. Input power polarity must be reversed for the actuator to move again. The precise current limit can be set via potentiometers accessible from the side of the control housing. The current limit can be adjusted for each direction independently for those applications that need a lighter setting in one direction only.

### Features

- **Quick Stop:** Adjustable current limits can be set in either direction. Current limits are set via potentiometers accessible from the side of the control housing.
- **Motor Power:** Switched by on board relay. The relay allows power to the motor as long as the actuator is not being commanded to go past the end limits.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy (electrical) environments.

### Specifications

- Supply Power: 12 or 24 vdc
- Maximum Current: 25 Amps @ 12vdc or 12.5 Amps @ 24vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F

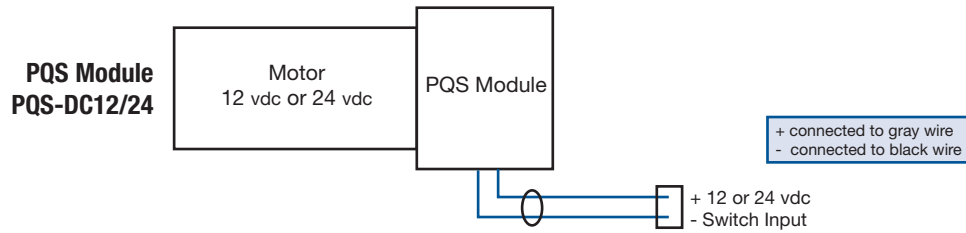


## PQS-DC Quick Stop Control

### Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
PQS-DC12	12	25	Base = Electronic Stroke Limit with Mid-stroke Current Limit and Electronic Dynamic Braking
PQS-DC24	24	12.5	Base = Electronic Stroke Limit with Mid-stroke Current Limit and Electronic Dynamic Braking

### Wiring Diagrams



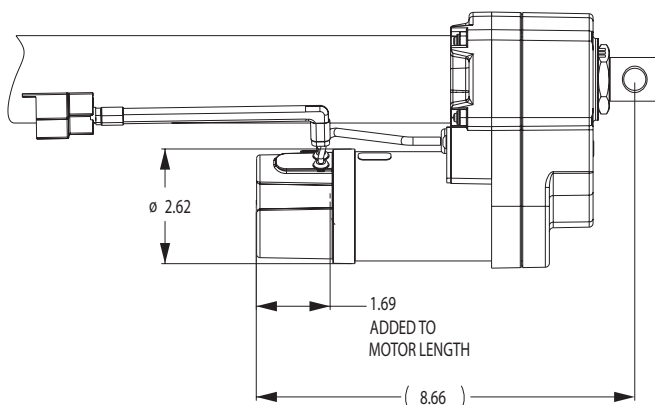
## P2-DC Position Feedback Control



The P2 DC is a microprocessor position feedback control providing a 0 -10 volt analog output throughout actuator travel. The control uses two inductive pulse count sensors and a counting wheel to accurately determine position. A third sensor at the full retract position serves as the home or zero position. Factory set end limits turn power off to the motor via a relay until power polarity is reversed. All sensors are non-contact and sealed for life. They are integrated inside the B-Track actuator to protect them from the environment.

### Specifications

- Supply Power: 12 or 24 vdc
- Maximum Current: 25 Amps @ 12vdc or 12 Amps @ 24vdc (at 25% duty cycle)
- Operating Temperature: -20° to 140° F



### Features

- **Motor Power:** Switched by on board relay. The relay allows power to the motor until the end of stroke is reached.
- **End Limits:** Factory programmed location of .125" from either end. Power is removed from the motor until input polarity is reversed.
- **Faster Stopping:** Electronic dynamic braking, (EDB) is applied after every move for accurate and fast stops.
- **Enclosure:** Attaches to back of motor or other surface and is potted to work in harsh environments.
- **Protection:** Zener diode suppression on the input and output for extra protection in noisy environments.
- **Reset Function:** When the input is grounded, the actuator goes to its full retract position, or home sensor, and this location is set to zero. While performing this function the 0-10 volt output does not change. This feature is useful on initial startup and after service to home the actuator.
- **Analog Output:** 0-10 volt signal throughout the stroke length of the actuator while power is provided to the motor. The output is 0 volts at full retract position and 10 volts at full extend position. The output is 16 bit with a resolution of .15mV. The stop position is remembered when power is removed via on-board memory. A live power input is provided to keep the output on when switch power is off. A 12/24vdc, 150mA supply is needed.
- **Bi-Directional Current Limit:** Set to turn off power to the actuator when a current level is reached.

### Options

- **LED Indicators:** Two LED's on the outside of the control module to indicate when the end of stroke is reached. The LED's will remain lit until the actuator is moved from the end of stroke position.
- **+12VDC Outputs:** Two +12 volt, 12mA outputs plus a ground to indicate when the end of stroke is reached. This output can signal a relay, lamp, or isolated PLC input. The outputs will remain on until the actuator is moved from the end of stroke position.
- **LED Outputs:** Two +5 volt, 25mA outputs plus a ground to indicate when the end of stroke is reached. This output can be used to light an LED. The outputs will remain on until the actuator is moved from the end of stroke position.

## P2-DC Position Feedback Control

### Model Selection

Model No.	Input Voltage (vdc)	Maximum Output Current (Amps)	Features
P2.0-DC12	12	25	Base = Electronic Stroke Limits with 0 to + 10V Analog Output and EDB
P2.0-DC24	24	12.5	Base = Electronic Stroke Limits with 0 to + 10V Analog Output and EDB
P2.1-DC12	12	25	Base & LED Indicators on Housing
P2.1-DC24	24	12.5	Base & LED Indicators on Housing
P2.2-DC12	12	25	Base & + 12 vdc Outputs
P2.2-DC24	24	12.5	Base & + 12 vdc Outputs
P2.2LE-DC12	12	25	Base & LED Outputs + 5 vdc
P2.2LE-DC24	24	12.5	Base & LED Outputs + 5 vdc

### Wiring Diagrams

