

**SPECIFICATIONS:**

**POWER SUPPLY REQUIREMENTS:** + 10 VDC minimum with suffix AAA = 100  
 The maximum power supply voltage is + 30 volts DC. The positive supply must deliver a minimum of 15 ma. plus the output valve coil current requirement. The power supply compliance voltage must be capable of maximum current.

**EXTERNAL COMMAND SIGNAL:** + 5 volts dc with suffix BBB = 050 + 10 volts dc with suffix BBB = 100  
 + 12 volts dc with suffix BBB = 120 + 24 volts dc with suffix BBB = 240

**INPUT IMPEDANCE:** 9.5K ohms with suffix BBB = 050 19K ohms with suffix BBB = 100  
 23K ohms with suffix BBB = 120 48K ohms with suffix BBB = 240

**RATED OUTPUT CURRENT:** + 250 ma. with suffix CCC = 251 + 500 ma. with suffix CCC = 501  
 + 1000 ma. with suffix CCC = 102 + 1500 ma. with suffix CCC = 152 + 2000 ma. with suffix CCC = 202  
 The absolute output current must not exceed 8 amps under any operating condition.

**OUTPUT CURRENT LIMIT:** The exact current limit value is dependant upon the valve coil inductance and the switching frequency. In general, the current limit will be approximately 150% of the rated output current as defined by suffix CCC.

**PWM SWITCHING FREQUENCY:** 100 Hz. with suffix D = 1 200 Hz. with suffix D = 0  
 400 Hz. with suffix D = 2 1000 Hz. with suffix D = 3 2200 Hz. with suffix D = 4  
 The pulse width modulated (PWM) switching frequency tolerance is plus and minus 20% of the value shown.

**MINIMUM CURRENT ADJUSTMENT RANGE:** 0% to 40% of the rated output current.

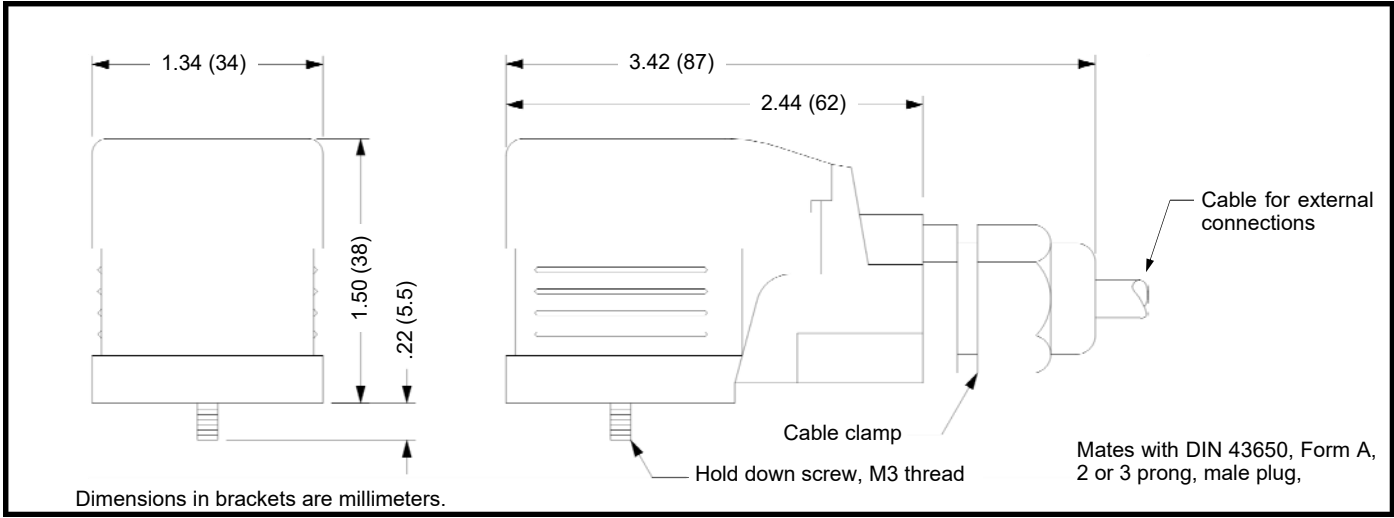
**MAXIMUM CURRENT ADJUSTMENT RANGE:** 75% to 110% of the rated output current.

**STABILITY AND DRIFT:** Better than 2% of maximum after warmup and power supply change < 10%.

**CONSTRUCTION:** DIN 43650, Form A female plug. Black plastic body with clear plastic cover. Gasketed cover, waterproof cable clamp and base plate. Sealed against dirt and hose down conditions. Vibration proof via locking center screw.

**OPERATING TEMPERATURE RANGE:** - 20 degrees C to + 55 degrees C.  
 Extended temperature range operation is available, contact Datatran's Sales Department for availability and price.

**OUTLINE DIMENSIONS:**



**GENERAL DESCRIPTION:**

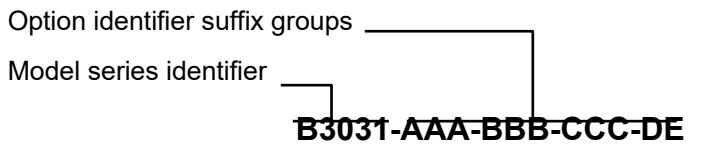
This pulse width modulated valve driver module is packaged in a standard DIN plug. It is designed to be used for open loop pressure, position and speed control systems. The output is a unipolar current signal and will drive all proportional and servo valves that have coil current requirements up to 2 amps. The user supplied command signal can be derived from either a potentiometer or external voltage source. The DIN plug construction allows all of the electronics to be mounted directly on the valve and thus eliminates the need for a separate control panel.

This industrial grade module is a true high performance current regulator. It incorporates current loop feedback and a fixed frequency dither signal to maintain the output signal to the valve coil within 2% of the setpoint as the load impedance, input voltage, and ambient temperature are varied over the specified operating range. Pulse width modulated switching provides high efficiency as the output current is varied from minimum to maximum. The module will mate with all valves that have a two or three position DIN 43650, Form A male connector for the solenoid.

Each valve driver module includes a regulated plus 5 volts dc power supply for use with an external command potentiometer as well as multi turn potentiometers to set the minimum and maximum valve coil current. Also included is a signal line that can be connected to the power supply common to disable the output. This feature allows the unit to operate in reversing applications by switching between two solenoids with a single pole, double throw switch. Models are available for external voltage command signals from 5 to 24 volts. A positive 10 to 30 volt DC power supply is required for operation.

The circuit board is solder masked and conformal coated. All external power and signal wiring is made to a color coded, five conductor cable.

**PART NUMBERING SYSTEM:**



PART NUMBER SUFFIX GROUP EXPLANATION	
SUFFIX	DESCRIPTION
AAA	Minimum power supply voltage
BBB	Maximum input signal voltage
CCC	Maximum output current to valve coil
D	Pulse width modulated switching frequency
E	Factory installed option identifier

Parts shipped from the factory will have the correct alphanumeric option identifier in place of the suffix letters indicated in the table above.

**ORDERING INFORMATION:**

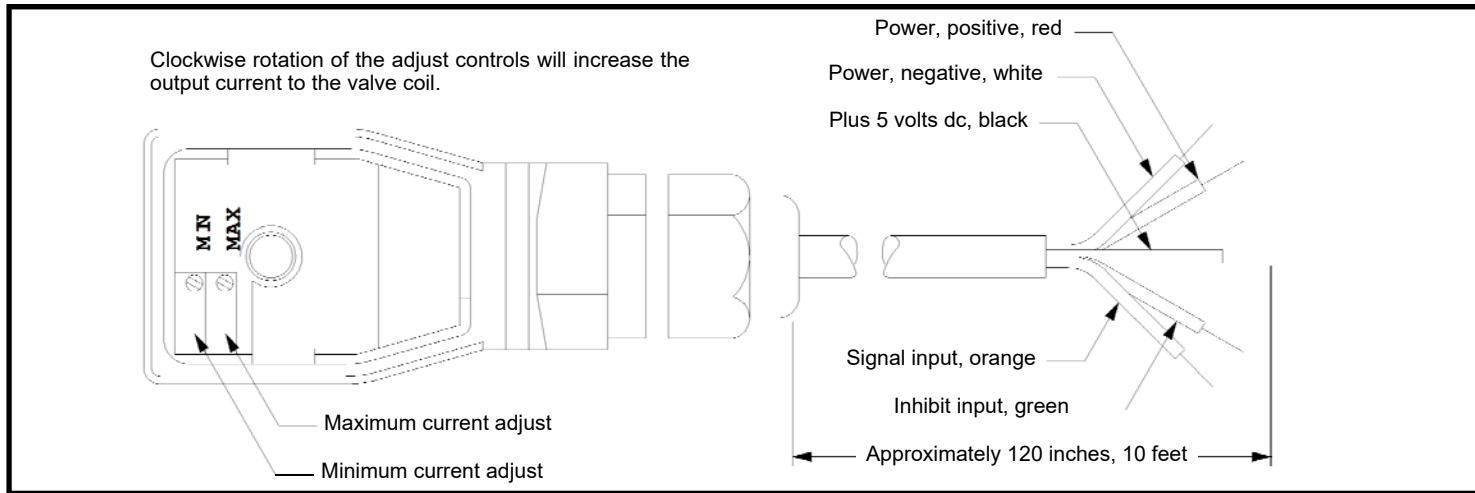
Refer to the B3031 model series selection sheet for a complete listing of the currently available models.

**DATA SHEET  
 FOR  
 DATATRAN  
 B3031  
 PULSE WIDTH  
 MODULATED VALVE  
 DRIVER MODULE  
 (DIN 43650 PLUG)**

FOR TECHNICAL ASSISTANCE CONTACT  
 CONIC SYSTEMS INC.  
 11 REBEL LANE, PORT JERVIS, NY 12771  
 TEL: (845) 856-4313 FAX (845) 858-2824  
 www.conicsystems.com

**INSTALLATION INFORMATION:**

The flat gasket should be installed over the male pins on the solenoid. The valve driver should be plugged in and held in position with the supplied screw. External wiring connections are made to the supplied cable. The minimum and maximum coil currents are set with the potentiometers on the circuit board. The cable location, wire colors and the adjustment control locations are shown in the illustration below.



**APPLICATION INFORMATION:**

**EXTERNAL VOLTAGE COMMAND SIGNAL:** The valve driver is capable of following an external voltage signal. This signal should be connected to the orange wire. The common (0 volts) side of the signal must be connected to the negative side of the power supply. The valve driver does not provide signal isolation.

**EXTERNAL COMMAND POTENTIOMETER:** The valve driver can be used with a remote command potentiometer. User supplied external command potentiometers should have a linear taper with a value of 5000 ohms and be rated .5 watt, minimum. Refer to the wiring diagrams on the opposite page for connection information.

**INTERNAL REFERENCE VOLTAGE:** A nominal +5 volts DC is available on the black wire for powering external loads. The maximum output current from this supply must be limited to 10 ma.

**EXTERNAL INHIBIT SIGNAL:** The valve coil current will be zero when the green wire is connected to the negative side of the power supply. This feature allows a double solenoid valve to be controlled with a single pole, double throw switch. For single solenoid valves, the green wire is normally left unconnected.

**MINIMUM AND MAXIMUM OUTPUT ADJUST CONTROLS:** The minimum control will set the pilot coil current value with the command signal at zero volts. The maximum control will set the coil current when the command signal at it's maximum value. Clockwise rotation will increase the output.

**PULSE WIDTH MODULATED SWITCHING FREQUENCY:** The switching frequency is specified by the number inserted at suffix D. Standard switching frequencies of 100, 200, 400 1000 and 2200 Hz. are available. Generally, the proportional valve manufacturer will specify the pulse width modulated switching frequency for a specific valve. If you require a switching frequency that is not listed as standard you must specify the required frequency on your purchase order. In this case, a special part number will be assigned to the valve driver module. Datatran can supply this module with switching frequencies from 100 to 10,000 Hz. There is no additional charge for this modification.

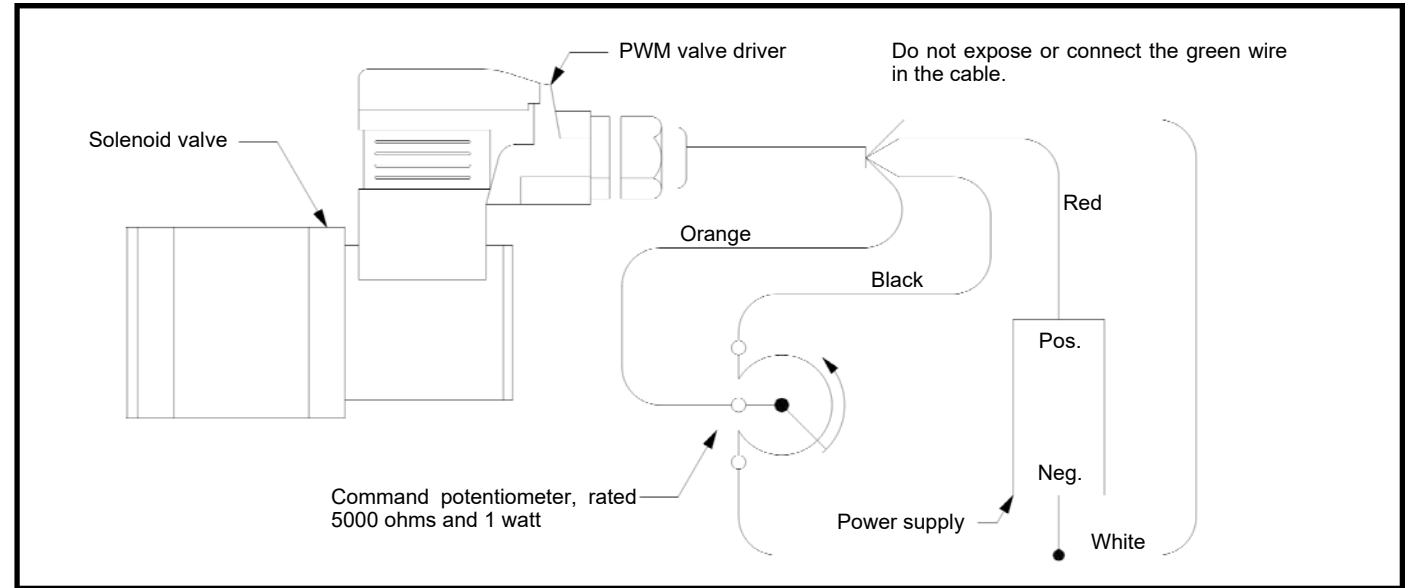
If you do not know the required switching frequency you should specify 2200 Hz. (suffix D = 0). This frequency will provide adequate performance with almost all proportional solenoids.

**INTRINSICALLY SAFE VALVE COILS:** These devices typically contain zener diodes in order to limit the maximum voltage applied to the coil to safe values. The pulse width modulated valve driver is a current regulator and will always apply the full power supply voltage to the coil. In order to provide proper operation and to prevent failure of the internal zener diodes the power supply output must be limited to the rated voltage of the coil used. In general, Datatran's unregulated power supplies are not suitable for this application. Additional information can be obtained from Datatran's engineering department.

**DROPPING RESISTOR:** When the command signal is derived from a **5000 ohm potentiometer** connected across a power supply voltage greater than the rated input signal, a **1/2 watt dropping resistor** must be installed in series with the positive power supply connection to the potentiometer. The value of this resistor can be determined from the formula below.

$$\text{Dropping resistor value, in ohms} = \left[ \frac{\text{Power supply voltage} - \text{Rated signal voltage (suffix)}}{\text{Rated signal voltage (suffix BBB)}} \right] * 5000$$

**SINGLE SOLENOID VALVE WIRING DIAGRAM:**



**!!!!!! WARNING !!!!!**  
 Verify the cable connections prior to applying power to the valve driver. Improper connections or reversed polarity will damage or destroy the valve driver module. This damage may cause the full power supply voltage to be applied to the connected load.

**DUAL SOLENOID VALVE WIRING DIAGRAM:**

