

**SPECIFICATIONS:**

<b>DC POWER SUPPLY REQUIREMENTS:</b>	+/- 15 VDC minimum with suffix AAA = 100
The maximum dc power supply voltage is +/- 30 volts DC. The positive and negative power supplies must deliver a minimum of 40 ma.	

<b>AC POWER SUPPLY REQUIREMENT:</b>	24 volts ac with suffix AAA = 24A 115 volts ac with suffix AAA = 111
The ac power is single phase, 47 to 62 Hz. Plus or minus 10%, at 1 volt amp (VA), maximum.	

<b>TRANSDUCER POWER SUPPLY:</b>	+/- 4.990 to 5.010 volts dc at 5 ma., maximum.
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<b>INPUT SIGNAL VOLTAGE RANGE:</b>	+/- 5 volts dc with suffix BBB = 050 +/- 10 volts dc with suffix BBB = 100
All models will withstand up to plus and minus 100 volts without damage.	

<b>INPUT SIGNAL IMPEDANCE:</b>	100K ohms with all BBB suffix identifiers.
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<b>OUTPUT TYPE:</b>	Open collector, type NPN transistors, the emitters are connected internally to the system common (0 volt) potential.
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<b>OUTPUT CURRENT (ON STATE):</b>	500 ma. maximum with suffix CCC = 501
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<b>OUTPUT VOLTAGE DROP (ON STATE):</b>	1 volt maximum at 500 ma. sink current.
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<b>OUTPUT BLOCKING VOLTAGE (OFF STATE):</b>	60 volts dc, minimum
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<b>OUTPUT LEAKAGE CURRENT (OFF STATE):</b>	5 ma. maximum at 60 volts dc.
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<b>OUTPUT UNCLAMPED INDUCTIVE LOAD ENERGY:</b>	25 mJ., maximum.
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<b>OUTPUT TRANSFER TIMES:</b>	The outputs will turn on or off within 10 usec with a 500 ma., 30 volt resistive load applied.
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<b>OUTPUT STATUS INDICATORS:</b>	The red LED for each output will turn on when the corresponding output transistor is conducting.
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<b>TRIP POINT ADJUSTMENT RANGE:</b>	1% to 100% of the rated input signal.
The trip point adjustments use the center position (0 volts) as a reference. One of the trip points can be set for clockwise rotation, the other for c'clockwise rotation, of the input drive shaft as it is moved away from the center position in either direction	

<b>TRIP POINT DROPOUT HYSTERESIS:</b>	Approximately .5% of the rated input voltage signal or 2 degrees of potentiometer shaft rotation.
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<b>CENTER POSITION INDICATOR RANGE:</b>	Approximately 1% of the rated input voltage signal or 4 degrees of potentiometer shaft rotation.
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<b>OPERATING TEMPERATURE RANGE:</b>	- 40 degrees C to + 65 degrees C.
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**GENERAL DESCRIPTION:**

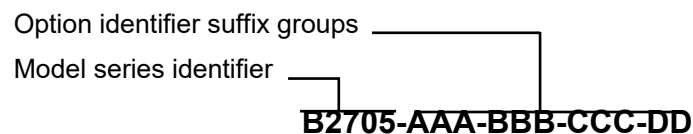
This solid state limit switch module is designed to be used with the model series C2699 Geared Potentiometer to provide an output whenever the input drive shaft rotation exceeds the setpoint. The circuit board is designed to fit inside the standard potentiometer enclosure. Solid state outputs are provided for both the clockwise and c'clockwise setpoints from the center position. This device is typically used to set the end of travel limits for on-off type position or level controllers.

This industrial grade module includes a stable bipolar reference to maintain the preset trip points within 1%, as the input power supply and the ambient temperature are varied over the rated operating range. Both of the output pickup points can be adjusted from 1% to 100% of the potentiometer travel away from the center position. Both of the outputs include a small amount of hysteresis to prevent false output transistions due to noisy or slowly changing input signals.

Adjustments are included on the board to set the trip points. Either of the outputs can be selected to be either normally on or normally off, whenever power is applied to the module. Visual indicators are provided to show the state of both outputs. In addition, an indicator is included to display the center position of the potentiometer. The solid state outputs are open collector type NPN transistors and are capable of sinking up to 500 ma. This module requires an AC or bipolar 15 to 30 volt DC power supply for operation.

All external wiring to the module is made to clearly marked plug in type terminal blocks.

**PART NUMBERING SYSTEM:**



PART NUMBER SUFFIX GROUP EXPLANATION	
SUFFIX	DESCRIPTION
AAA	Minimum power supply voltage
BBB	Maximum input signal voltage
CCC	Maximum output current
DD	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.

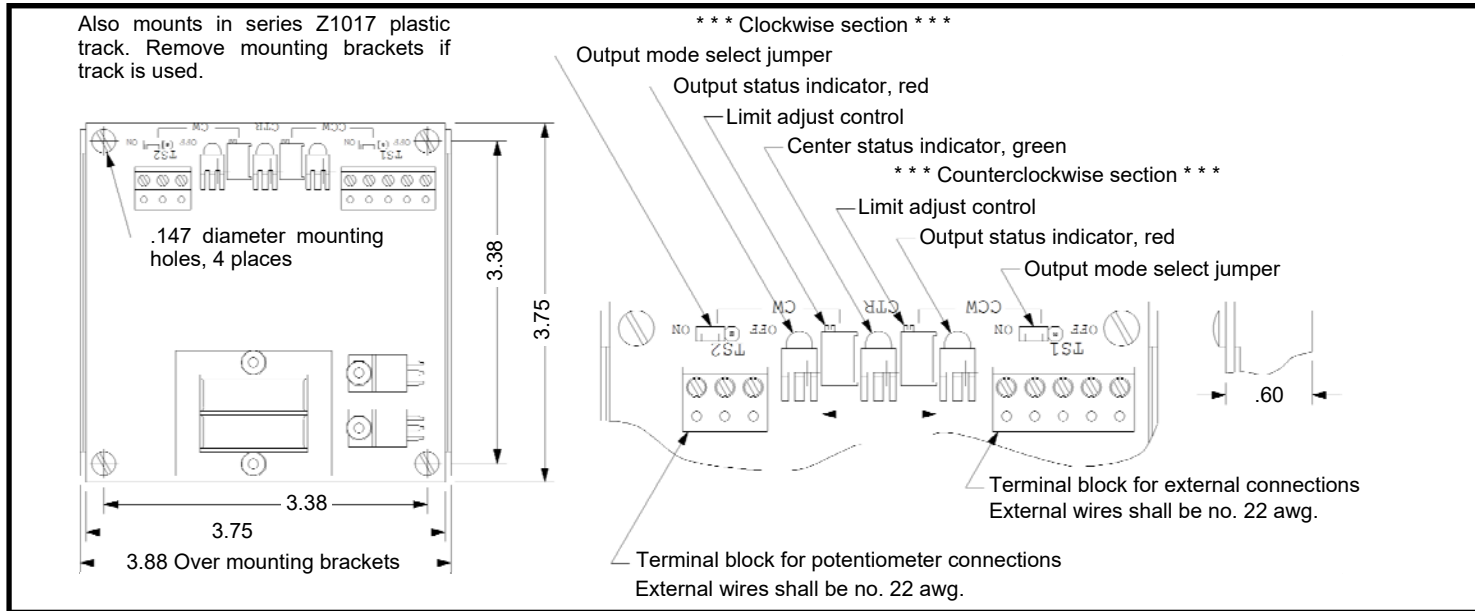
**ORDERING INFORMATION:**

Refer to the B2705 model series selection sheet for a complete listing of the currently available models.

# DATA SHEET FOR DATATRAN B2705 SOLID STATE LIMIT SWITCH MODULE

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

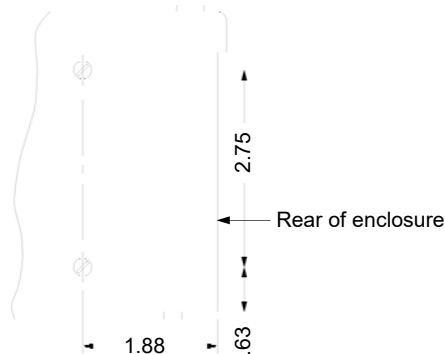
## OUTLINE DIMENSIONS AND COMPONENT LOCATIONS:



## INSTALLATION IN THE MODEL SERIES C2699 GEARED POTENTIOMETER:

The instructions below assume that the model series C2699 Geared Potentiometer assembly was originally supplied without the Solid State Limit Switch module installed. **The procedure below is not recommended as a field modification.** It is strongly suggested that the user either order a new Geared Potentiometer assembly with the Solid State Limit Switch installed or return the existing potentiometer to the factory for the installation of the Solid State Limit Switch.

- 1) In the Geared Potentiometer assembly is installed and operating, remove the power.
- 2) Remove the cover from the enclosure and disconnect any external wires connected to the terminal block.
- 3) Drill the four mounting holes for the Solid State Limit Switch on the sides of the enclosure as shown on the figure to the right. The mounting holes are .147 inch diameter (No. 26 drill).
- 4) Directly above the mounting holes, cut out the flange on the top of the enclosure so that the Solid State Limit Switch board can be inserted in the enclosure. Note, depending on the fitting used, the conduit hole may have to be relocated to the rear surface of the enclosure.
- 5) Remove any burrs from the inside surface where the mounting holes were drilled. Remove any metal chips that may have accumulated inside the enclosure.
- 6) On the circuit board, set the "OUTPUT MODE" select jumpers for the desired normally open or normally closed operation.
- 7) Slide the circuit board with the mounting brackets into the enclosure. **The components on the board must be facing towards the rear of the enclosure.**
- 8) **Check the fit, the mounting brackets must contact the side of the enclosure over their entire length and the circuit board must be clear of the potentiometer gear cover.**
- 9) Fasten the circuit board assembly inside the enclosure with four number 6-32 X 1/4 inch long binding head machine screws and shakeproof washers.
- 10) Connect the wires from the three position terminal block on the circuit board to the three position terminal block on the gear housing in accordance with the schematic on the next page.
- 11) After reading the external wiring instructions, connect the external power supply and output signal wires to the five position terminal block on the circuit board in accordance with the schematic on the next page. The potentiometer wiper signal, available at terminal number 2 on the gear housing terminal block, may be extended with the balance of the external connections, if required.
- 12) Install the Geared Potentiometer on the equipment. Leave the cover off. This completes the Solid State Limit Switch installation procedure. Proceed with the calibration instructions on the following page.



## APPLICATION INFORMATION:

**OUTPUT MODE SELECT JUMPERS:** These are three position pin headers with shorting bars. One each is supplied for the clockwise and c'clockwise open collector output signals. With the jumper placed in the "ON" position the output will be on as long as the potentiometer signal is below the trip point. It will be off when the potentiometer position is equal to or greater than the trip point. When placed in the "OFF" position the output signal action will be the opposite of that described for the "ON" position.

**SETTING THE POTENTIOMETER CENTER POSITION:** *The potentiometer must be centered before the trip points can be set.* With the potentiometer input drive shaft disconnected from the equipment and the power on, center the connected load. Rotate the potentiometer drive shaft until the green "CTR" LED illuminates. This is the potentiometer center position. Connect the input drive shaft to the connected load.

**ROTATION OF THE POTENTIOMETER BEYOND THE RATED TRAVEL RANGE:** This is a bad thing, don't let it happen! As the potentiometer rotates beyond the rated travel range, in either direction from the center position, the output trip points will reverse and the signal outputs will switch. The trip points will remain reversed until the input drive shaft is returned to the rated travel range zone.

**EXTERNAL WIRING:** External signal wiring to the Solid State Limit Switch should be twisted and shielded cable. All wiring should be number 22 awg, or larger. The shield should be terminated at the power supply common (0 volt) point only. Do not expose or connect at any other point in the wire run. This cable should be routed away from all non-signal wiring in order to minimize the effects of electrical noise pickup that could possibly cause variations in the trip point setting.

## OUTPUT TRIP POINT ADJUSTMENT:

The potentiometer centering operation must be completed and both of the output mode select jumpers placed in the correct position ( ON or OFF) prior to adjustment of the output signal trip points.

- 1) Set both of the trip point adjustment controls to their maximum clockwise positions (twenty five turns).
- 2) Apply the input power to the circuit board. With the potentiometer connected to the external load, move the load to the desired clockwise trip point position.
- 3) Slowly, adjust the "CW" trip point adjustment control until the "CW" indicator changes state.
- 4) Move the external load to the desired c'clockwise trip point position.
- 5) Slowly, adjust the "CCW" trip point adjustment control until the "CCW" indicator changes state.
- 6) This completes the trip point adjustment, if the circuit board is installed in the model series C2699 enclosure, replace the cover. The Solid State Limit Switch is now ready for operation.

## FUNCTIONAL DIAGRAM AND SIMPLIFIED SCHEMATIC:

