Precision, Triple Output Transducer Power Supply

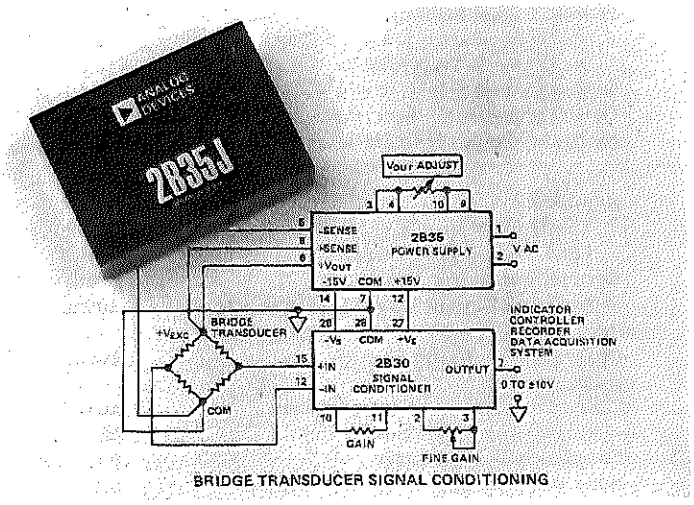
MODEL 2B35

FEATURES

- Resistor Programmable Voltage or Current Output
  - Voltage: +1V dc to +15V dc @ 125mA max
  - Current: 100μA to 10mA (V_{COMPL} = +10V)
- Dual Fixed Output: ±15V dc @ ±65mA max
- Excellent Regulation: Line ±0.01% max; Load ±0.02% max
- Low Drift: 0.006%/°C max (2B35K)
- No Derating Over -25°C to +71°C Operating Range

APPLICATIONS

- Measurement and Control Instruments and Systems
- Excitation Source For:
  - Strain Gages, Pressure Transducers, Load Cells, Torque Transducers, RTD's



BRIDGE TRANSDUCER SIGNAL CONDITIONING

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GENERAL DESCRIPTION

The 2B35 is a triple output modular power supply designed to provide regulated excitation to a wide variety of transducers as well as ±15V power for amplifiers and other analog circuits of an instrumentation system. The single-resistor programmable transducer excitation output may be operated in two modes: constant voltage, providing a +1V to +15V output or a constant current, adjustable from 100μA to 10mA.

The programmable output in the voltage mode features current rating of 0 to 125mA, suitable to excite four 350Ω transducers at 10V. Current limiting protects the output against accidental overload and remote sensing corrects for the transducer cable resistance variations. In the constant current mode, externally set 100μA to 10mA output offers a 0 to +10V compliance voltage range. The ±15V outputs feature 0.5% tracking accuracy and current rating of 0 to ±65mA max.

Two accuracy selections are available offering guaranteed low temperature coefficient; 2B35K: 0.006%/°C max and 2B35J: 0.05%/°C max. Line and load regulation are also guaranteed; 2B35K: 0.01% and 0.02%, and 2B35J: 0.08% and 0.1%, max, respectively.

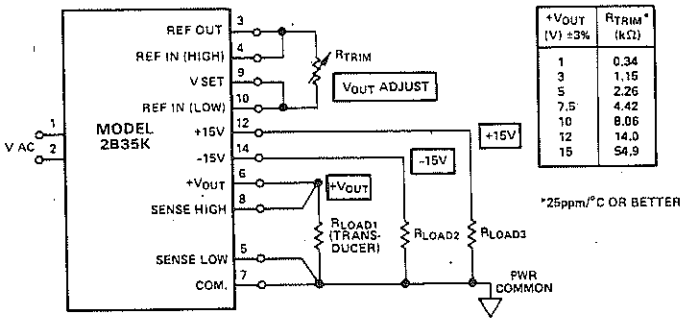
APPLICATIONS

The 2B35 is designed for ac powered signal conditioning instrumentation applications used for data acquisition, control, indication or recording. This compact module may be applied as a power source for the model 2B30 strain gage transducer/RTD signal conditioner in a high accuracy transducer interface application. Some typical applications involve strain gages for stress/strain measurements, pressure transducers, load cells, torque transducers and RTD's.

OPERATION

Figure 1 illustrates operation of the 2B35K providing an adjustable voltage output and dual 15V dc outputs. The resistor programmable output (+V_{OUT}) is set between +1V to +15V by the R_{TRIM}. R_{TRIM} may be determined by using either the table shown in Figure 1 or the graph shown in Figure 2. For example, to provide an adjustable range from +1V to +6V, R_{TRIM} should be a 5kΩ pot.

The remote sensing inputs (pins 5 and 8) are connected at the transducer (load) to the voltage output (SENSE HIGH to +V_{OUT} and SENSE LOW to COMMON).



+VOUT (V) ±3%	RTRIM* (kΩ)
1	0.34
3	1.15
5	2.26
7.5	4.42
10	8.06
12	14.0
15	54.9

*25ppm/°C OR BETTER

Figure 1. Model 2B35K Connection Diagram for Dual 15V dc and Adjustable +1V to +15V Output

For optional input voltage ranges, see note 1, next page.

SPECIFICATIONS (typical @ +25°C and 115V ac 60Hz unless otherwise noted)

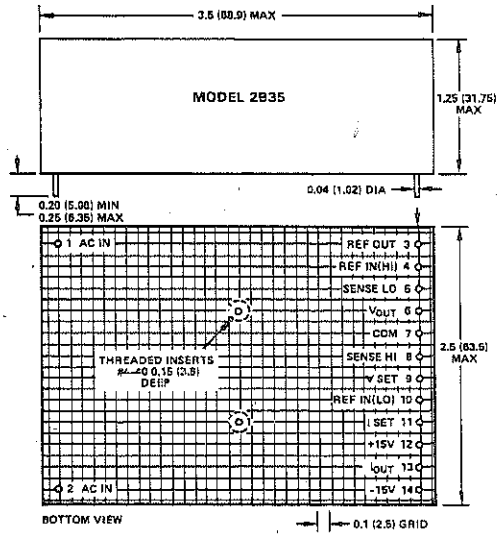
Model	2B35J	2B35K
INPUT		
Input Voltage Range[1]	105V ac to 125V ac	*
Input Frequency Range	50Hz to 400Hz	*
ADJUSTABLE OUTPUT		
Voltage Mode		
Output Voltage Range	+1V to +15V dc	*
Output Voltage Stability		
vs. Temperature – % V_{OUT}/°C max	±0.05	±0.006
vs. Time – % V_{OUT}/month	±0.01	*
Output Current (–25°C to +71°C)[2]	0 to 125mA max	*
Output Impedance – @ dc, max	0.1Ω	*
Noise and Ripple (dc to 1MHz) – mV p-p max	1	*
– mV rms max	0.25	*
Regulation		
Line (full range) – % V_{OUT} max	±0.08	±0.01
Load (no load to full load) – % V_{OUT} max	±0.1	±0.02
Remote Sensing Impedance	30kΩ	*
Short Circuit Current Limit[3] (–25°C to +71°C)	200mA	*
Current Mode		
Output Current Range	100µA to 10mA	*
Output Current Stability		
vs. Temperature – % I_{OUT}/°C max	±0.05	±0.006
vs. Time – % I_{OUT}/month	±0.01	*
Compliance Voltage Range	0 to +10V	*
Noise and Ripple (dc to 1MHz) –µA p-p	0.1	*
Line Regulation (full range) – % I_{OUT} max	±0.08	±0.01
DUAL FIXED OUTPUTS		
Output Voltage	±15V dc	*
Voltage Error – mV max	–0, +300	*
Accuracy Tracking (–15V Ref to +15V) – % max	±0.5	*
Stability vs. Temperature – %/°C max	±0.02	±0.006
Output Current[4]	0 to ±65mA max	*
Output Impedance – @ dc, max	0.1Ω	*
Noise and Ripple (dc to 1MHz) – mV p-p	1	*
– mV rms	0.25	*
Regulation		
Line (full range) – % max	±0.08	±0.01
Load (no load to full load) – % max	±0.1	±0.02
Short Circuit Current Limit[3] (–25°C to +71°C)	±180mA	*
INPUT TO OUTPUT ISOLATION		
Breakdown Voltage – Continuous, ac or dc	±500V pk max	*
Isolation Resistance	50MΩ	*
TEMPERATURE RANGE		
Operating, Rated Performance	–25°C to +71°C	*
Storage	–25°C to +85°C	*
MECHANICAL		
Case Dimensions – Inches	2.5 x 3.5 x 1.25	*
Weight – Grams	550	*
Mating Socket	AC1212	*

NOTES
*Specifications same as model 2B35J.
[1] Optional input voltage ranges: "E" Option; 205-240V ac, 50 to 400Hz
"F" Option; 90-110V ac, 50 to 400Hz
"H" Option; 220-260V ac, 50 to 400Hz
Order option desired as a suffix to model number.
[2] Maximum output current available over the entire output voltage and temperature range without derating.
[3] Output protected for continuous short circuit over the temperature range.
[4] Unbalanced load operation is permissible for any combination of $+I_O$ and $-I_O$ which does not exceed a total of 130mA.

Specifications subject to change without notice.

OUTLINE DIMENSIONS

Dimensions shown in inches and (mm).



MATING SOCKET: AC1212

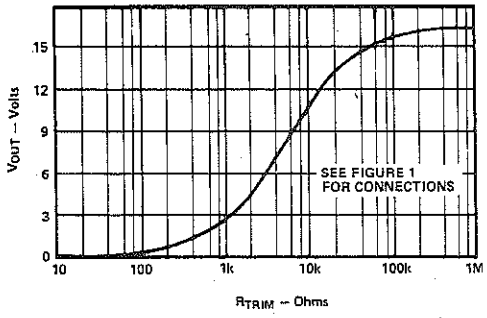


Figure 2. Voltage Output vs. R_{TRIM}

ADJUSTABLE CURRENT OUTPUT WITH DUAL 15V dc OUTPUTS

Pin connections to provide dual 15V dc and a constant current output are shown in Figure 3. The current output is adjusted from 100µA to 10mA via R_{TRIM}. The value of programming resistor R_{TRIM} may be calculated from the relationship: $R_{TRIM} = 2.46/I_{OUT}$ where R_{TRIM} is in kΩ and I_{OUT} in mA.

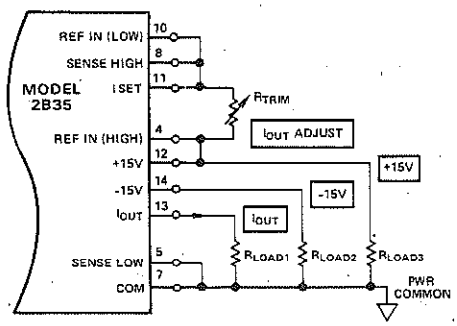


Figure 3. Model 2B35 Connection Diagram to Provide Dual 15V dc and Adjustable 100µA to 10mA Current Output