INSTRUCTION & MAINTENANCE MANUAL

EDMUNDS SINGLE HEAD GAGE BLOCK COMPARATOR

#5011014

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INTRODUCTION

This precision external comparator has been designed for high accuracy comparative measurement of lengths or diameters to known master or gage block stacks. It is normally used with an Edmunds Model E8000/E80124/E8005 column which has a last digit resolution of .000001" of .0001MM. The "zero" adjustment "pot" on the face of the column module readout provides fast, accurate calibration. This conventional column type comparator includes the following unique features:

- The choice of various anvils to accommodate the measurement of gage blocks, or lengths, diameters and roundness of piece parts.
- A diamond tip contact directly above the anvil completes a caliper arrangement and provides the most stable and rugged measuring location.
- Rugged reed mounted LVDT transducer transfers electronic signal from intermediate diamond contact.
- Specially configured electronics to eliminate timely manual adjustment of the contact position. Position the contact using the upper head adjustment screw and zero the readout.

SPECIFICATIONS

Comparator:
Gaging Contact to Anvil (Max) ..... 4.75"

Throat Depth ..... 2.68"

Anvil ..... 1.5" x 3.75"

Gage Contact (Diamond Tip) ..... .12" radius

Gaging Pressure ..... 60 grams

Overall Height ..... 18.75"

Bench Space .....10.00" x 10.00"

Weight ..... 50 lbs.

Readout:
Size .....21.25"H x 2.5"W x 9.00"D

Weight ..... 9.75 lbs.

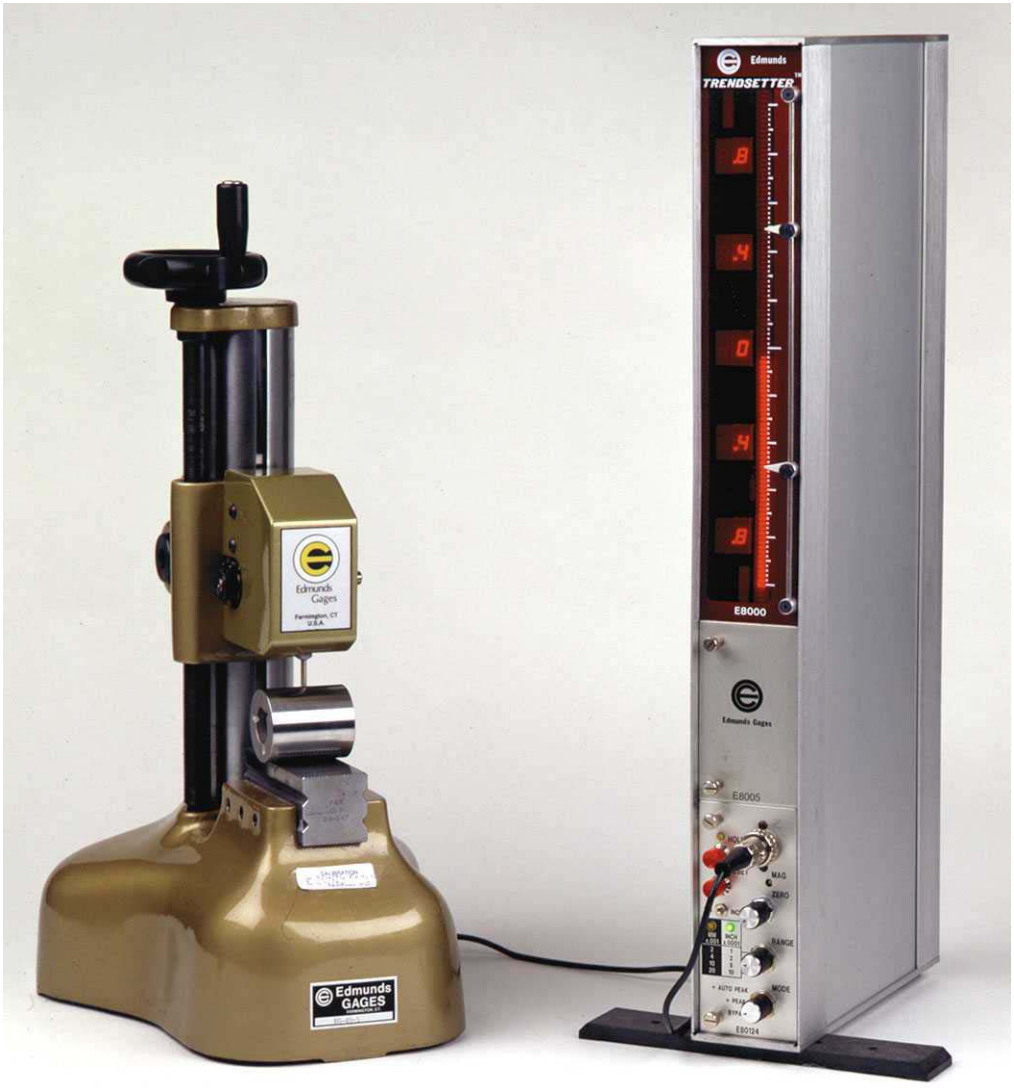
Display ..... 101 point LED bargraph

Range/Resolution

Inch	**Metric**
.001000"/.000010"	.0200mm/.0002mm
.000500"/.000005"	.0100mm/.0001mm
.000200"/.000002"	.0040mm/.00004mm
.000100"/.000001"	.0020mm/.00002mm

Electrical:

Line Voltage ..... 100-240 VAC @ 50-60Hz



High Magnification Comparator

INSTALLATION

Carefully unpack the comparator stand and the readout. Remove the protection pad from the gaging tip by loosening the head clamp knob and turning the elevating screw clockwise to raise the head. Connect 120 VAC power to the rear of the readout column and plug the LVDT connector for the head into the proper receptacle. Turn the power switch on. The display will turn on and the LED indicators will all go on.

1) Select the "Bypass" setting on the readout column.
2) Slowly lift the gage tip with your finger and observe the digital display indicator go from minus readings to plus.

CALIBRATION

Select two gage blocks .001" apart, for example .100" and .101". Note their calibration errors. Put the readout to "Bypass". Wring the .100 block to the anvil under the contact tip. Bring the head down onto the block. When the contact touches the block, slightly tighten the head clamp knob to put a slight drag on the elevating screw. Slowly continue down until the readout is approximately zero and tighten the head clamp. Turn the "Zero" knob on the display until the bargraph reads zero. Remove the .100" block and insert the .101" block. The readout should read the total actual difference between the blocks. If the display does not read the correct value, the "MAG" screw needs to be adjusted. Adjust the magnification screw until the readout reads the correct value. Go back to the .100" block and re-zero. Repeat the procedure until both blocks give the correct spread.

OPERATION

For optimum certifiable readings, the comparator should be operated in a clean, 68◦F constant temperature, humidity controlled environment. The unit should be allowed to stabilize in the gaging environment for 24 hours before use. The master gage blocks and the blocks to be inspected should be stabilized to the same temperature. For best results, gloves should be worn, a breath shield should be utilized and insulated tongs used to keep temperature variations to a minimum.

The basic procedure for setup is to wring the block stack together. Note the block deviations and decide upon the actual stack height deviation. Set the readout to normal gage. Wring the block stack on the anvil under the contact tip and bring the contact down onto the block stack, slightly tighten the head clamp and bring the readout as close to zero as possible. It is helpful to have the display set to the coarsest scale and observe its movement toward its mid point. Move the blocks in and out once or twice to confirm the reading, tighten the clamp knob and with the master in position adjust the zero knob to fine tune. NOTE: for sensitive work, allow the master or block stack to soak in to temperature as shown by no more change of the digital readout.

Insert the part to be measured. If a diameter, put the meter sensitivity on high and roll the part under the contact, observe the meter rise to a peak and return down as the part moves through its true diameter. Carefully observe this approaching peak and stop at it.

Observe the digital readout and its peak. Care must be taken not to hold the part too long during gaging to avoid size changes due to temperature. The entire procedure should preferably be done with one pass through the gage.

Additional "Peak" type settings can be selected on the readout display to make this process easier. See readout display instruction manual, E80124 module section.

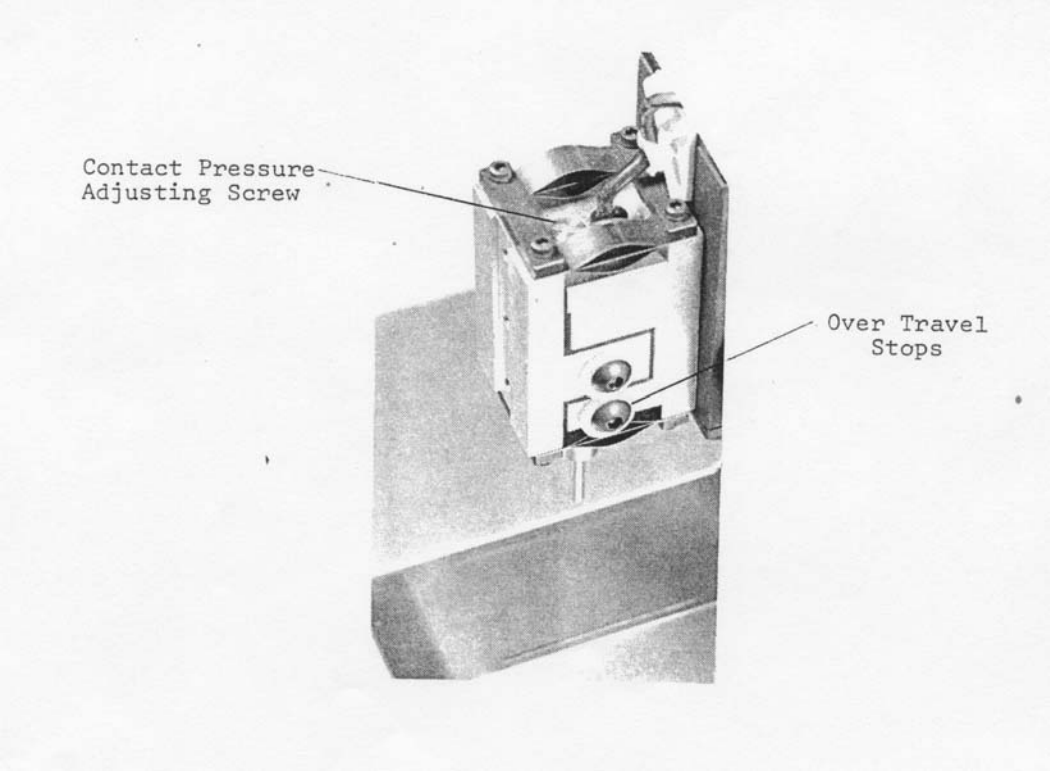
If the gage is being used on production diameter measurement, a back stop is preferred on the anvil. This must be positioned with a cylindrical master in the gage. See anvils and accessories list.

UPPER HEAD ADJUSTMENTS

The over travel stop and pickup is set via the two nylon eccentric discs. This is set by removing the upper head cover with the readout in "Bypass" and the zero at midsetting.

With the head free from contacting, loosen the screw on the nylon discs and rotate to a position where the display is just over ranging in the minus direction or a little over -.002".

The contact pressure should be set to about 60 grams by the use of a force gage under the upper tip. Adjust the screw until desired pressure is achieved.



TRENDSETTER MAINFRAME

The E8000 Main Frame Assembly is the focal point for the various plug in modules associated with the Trendsetter system.

The Main Frame provides mechanical support, interface wiring, I/O connections, power supplies and a bargraph readout. The Main Frame measures 21.25" high, 2.50" wide, 9.00" deep. Cabinet construction is aluminum.

An internal power supply generates +/-15 VDC regulated at +/-1 Amp and +% VDC at 3.0 amps. These voltages drive the display board electronics, and any combination of plug in modules.

The power supply is of the universal type, in that it automatically adjusts to any line voltage from 100 VAC to 240 VAC, 50/60 Hz.

Power consumption is 35 watts maximum. Fifteen watts is more typical and will drive a full compliment of plug in modules.

A 10 inch, 101 point bargraph display is the primary means of readout. The 101 points give a readable resolution of 1%. Digital scale readouts are placed along side the bargraph display for ease of interpreting scales. Range switches on various modules, have encoding logic which supplies range information to a numeric display library.

Additionally a 10 position dip switch, located inside the rear panel and adjacent to the I/O connectors, provides a simple means for enabling any lower bay high level output signal to reach the 10 line analog buss. The dip switch numbers correspond to user programmable lines 1-10.

TRENDSETTER

Rear Panel 25 Pin I/O Connector Assignments

Pin Number	Input Connector	Output Connector
1	Analog Output 1	"
2	Analog Output 2	
3	Analog Output 3	
4	Analog Output 4	
5	Analog Output 5	
6	Analog Output 6	
7	Analog Output 7	
8	Analog Output 8	
9	Analog Output 9	
10	Analog Output 10	
11	Analog Common	
12	High Output Comparator	
13	Good Output Comparator	
14	Low Output Comparator	
15	Write/Disable	
16	Reset	
17	NC	
18	NC	
19	NC	
20	TIR Reset	
21	NC	
22	NC	
23	NC	
24	Isolated Common	
25	NC	High Level Output

NC = No Connection

Mode Switch
Selects one of the three operating modes:

Bypass - Allows the signal conditioning circuitry to bypass the peak hold function, useful in piece setup, calibration or when used in conjunction with other upper bay modules.

+ Peak - Captures the most positive excursion of the signal conditioner's output. The HOLD and RESET switches become active for signal analysis.

+ Auto Peak - Identical to + Peak with the addition of an adjustable timer which automatically resets the peak detector. The HOLD and RESET switches will override the timer setting.

Range Switch
Provides four measurement ranges:

.001"/.02MM Full Scale - 10μ inch resolution
.0005"/.01MM Full Scale - 5μ inch resolution
.0002"/.004MM Full Scale - 2μ inch resolution
.0001"/.002MM Full Scale - 1μ inch resolution

Unit Switch
Provides Inch/Metric mode selection.

Zero Control
Allows the electrical zeroing of the module to an arbitrary nominal size. Utilized in the BYPASS mode for calibration and setup.

MAG Control
Provides adjustment to the modules amplification when setting to known reference standards. Utilized in the BYPASS mode for calibration.

Reset Switch
Controls the operation of the onboard peak detector in both + PEAK and + AUTO PEAK modes. Clears the peak detector to the initial condition. Overrides the Time Select function.

Hold Switch
Controls the operation of the onboard peak detector in both + PEAK and + AUTO PEAK modes. Prevents any further data from being accumulated by the peak detector.

Time Select
Using the internal jumper, selects the time interval the peak detector will hold the measured results before automatically resetting. Selectable from 1, 2, 3, or 5 second intervals or user programmable by resistor selection. ($TIME_{sec} = R_{ohms} \times 1 \times 10^{-6}$)

Polarity Select
Controls polarity of the data collector RST pulse. STD position provides a positive going pulse. REV position provides a negative going pulse.

OUTPUT JUMPER MATRIX

Selectable by using the internal jumpers.

STD - Outputs the high speed conditioned signal to the 10 line user interface of the TrendSetter.

+PK - Outputs the peak detector to the user interface.

RST - Outputs a polarity selectable, TTL compatible, 0.375 second strobe pulse to the user interface. This pulse is compatible with the foot switch inputs of many popular data collectors and is properly timed to strobe the + Peak detector data to these devices.

Anvils :

.125" wide, chrome plated flat	p/n 27830
.188" wide, chrome plated flat	p/n 27831
.500" wide, chrome plated serrated	p/n 5001204
3.000"wide, chrome plated serrated	p/n 5001203
.500" wide, chrome plated, flat w/carbide insert one side	p/n 5001251
1.500" wide, chrome plated, flat w/carbide insert one side	p/n 5001250
3.000" wide, chrome plated, flat w/carbide insert one side	p/n 5001257
1.500" wide, chrome plated, 120 deg "vee" carbide insert, .125" to .500" diameter cap.	p/n 5001252
1.500" wide, chrome plated, 120 deg "vee" carbide insert, .500" to 1.00" diameter cap.	p/n 5001253
1.500" wide, chrome plated, 120 deg "vee" carbide insert, 1.000" to 2.000" diameter cap.	p/n 5001254
1.500" wide, chrome plated, 90 deg "vee" carbide insert, .125" to .500" diameter cap.	p/n 5001255
1.500" wide, chrome plated, 90 deg "vee" carbide insert, .500" to 1.000" diameter cap.	p/n 5001256

Backstops

.500" wide anvil, carbide	p/n 20759
1.500" wide anvil, chrome plated	p/n 5001210
1.500" wide anvil, carbide	p/n 5001211
3.000" wide anvil, chrome plated	p/n 5001212
3.000" wide anvil, carbide	p/n 5001213

Spindles

.062" radius, carbide (1.21" long)	p/n 5001305
.062" radius, diamond (1.21" long)	p/n 5001353
.125" radius, diamond, (1.28" long)	p/n 5001359
.125" radius, diamond, (1.84" long)	p/n 5001363