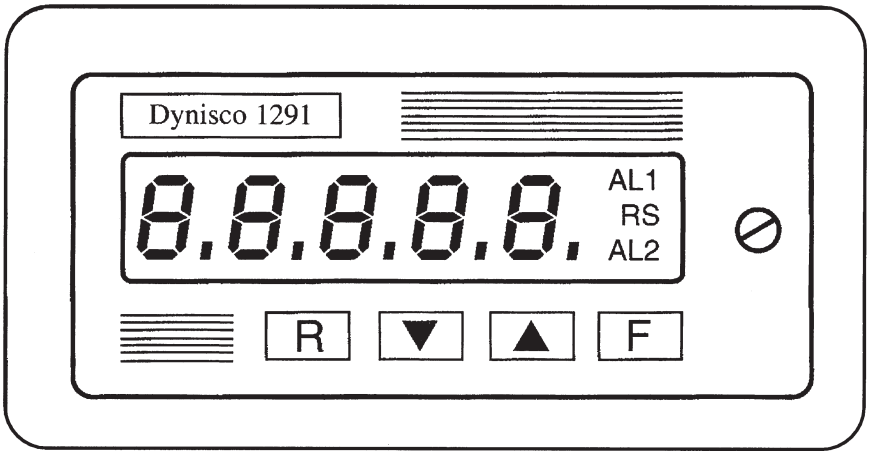
Model 1291 Linear Input Indicator
Installation and Operation Manual



P/N 974070
05/02 Rev. C
ECO # 26785

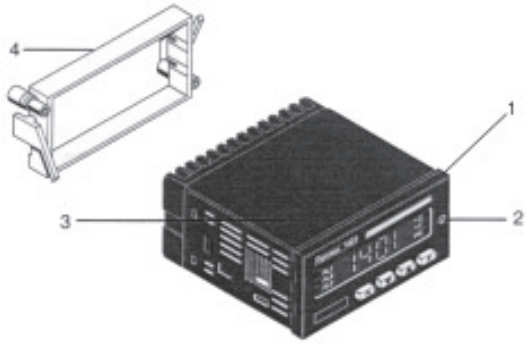
Dynisco
Instruments

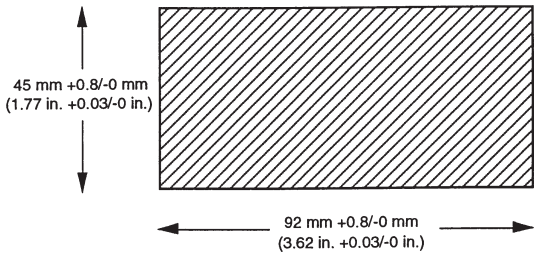
CONTENTS

MODEL 1291-4-3 QUICK START INSTRUCTIONS

1. MOUNTING

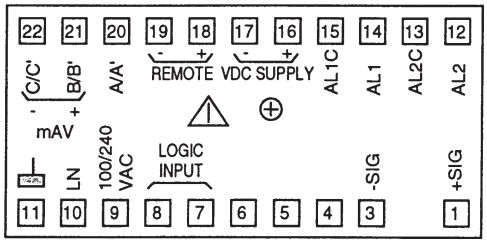
- Prepare panel cutout to dimensions shown below.
- Remove instrument from case by turning captive safety screw (2) counter clockwise.
- Grasp the bezel and slide the instrument out of its case.
- Slide the rubber gasket (1) over the case.
- Slide the instrument case (3) into the panel cutout.
- Slide the panel-mounting bracket (4) on to instrument case until it contacts back of panel.
- Tighten two Phillips screws on panel mounting bracket until case is securely mounted in panel cutout.



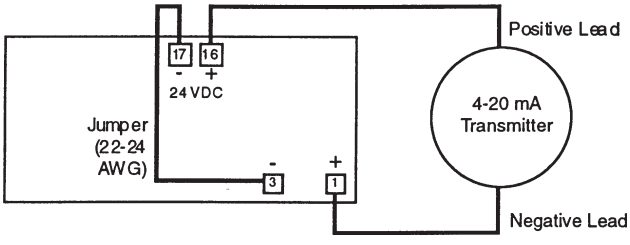


2. WIRING

- Connect wires from transmitter to input terminals 1 and 3 as shown below. If the 1291 indicator is to power a 4-20 mA transmitter, connect the 4-20 mA loop wires through the internal 24 volt Power Supply on terminals 16 and 17 as shown below.
- Connect alarm(s) if applicable. Note that alarm defaults are High, Reverse Acting.
- Connect power to the appropriate terminals as shown below.



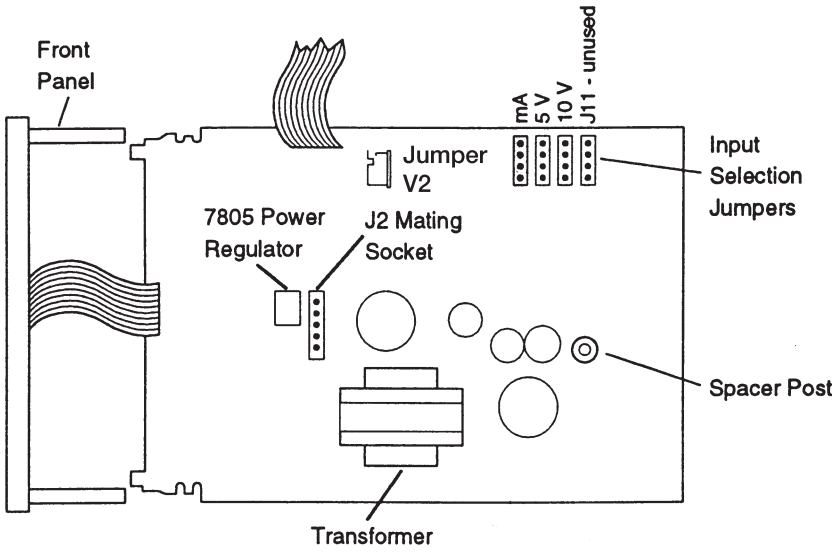
Terminal Diagram



4-20mA loop wiring

3. INSTRUMENT CONFIGURATION

- Locate jumper V2 on Lower Board and place in the open position.
- Locate J11 jumpers and select appropriate input type
- Slide instrument back in case and apply power. Display will now show 1291 then COnF.
- Press the F button twice until In. (Input Type) is displayed.
- Using the UP arrow, select appropriate Input type. (e.g. 4-20mA, 0-10Vdc, etc)
- Press the F button until F.S.U. (Full Scale Value) is displayed.
- Using the DOWN arrow, select the value that matches the full scale of the transducer. Enter with the F button. (If your transducer is 10,000 PSI, no adjustment is necessary.)
- Press the F button until ConF is once again displayed.
- Slide instrument out of case, return jumper V2 to the closed position.
- Slide instrument back into case, secure with safety screw.
- Apply power to instrument.
- To set Alarm 1 and 2 thresholds, press the F button then use the UP or DOWN buttons to adjust the value.
- The system is now ready for use.



PLEASE NOTE:
The preceding Quick Start instructions are the basic settings required to install, wire, and get the indicator operating. Please refer to the complete installation and operation manual for additional functions.

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1. INTRODUCTION

The Dynisco Model 1291 Linear Input Indicator is a flexible, programmable indicator. It can accept 0-20 mA, 4-20 mA, 0-5 V, 1-5 V, 0-10 V, or 2-10 V input. The five-digit, 0.52" LED display provides a precise, readable indication of the measured value.

You can program the 1291 to display in engineering units up to a full-scale value (fsv) of 99990 with an accuracy of ±0.1%. The span value, alarm set points and other constants are stored indefinitely in non-volatile memory.

Two independent SPST alarm relays are another available feature of the 1291. The dual high or low set points are easily programmed from the front keyboard and displayed on the digital display. The low alarms can be set up as low-alarm-masked to inhibit alarm action during start-up. Relay contacts are provided to activate an annunciator or to initiate automatic shutdown if operating conditions exceed preset limits.

A programmable voltage or current retransmission output is available as an option. You can select a voltage output of 0-10 VDC or current outputs of 4-20 mA or 0-20 mA to drive chart recorders or data acquisition equipment.

The Model 1291 can also be supplied with bi-directional and half duplex RS-485 serial communications. All signals are optically isolated and the baud rate is adjustable between 150 and 19,200 baud. The serial communications and analog retransmission output options are mutually exclusive.

Input interruption sensing is provided for those input ranges where a minimum signal value is specified, namely 4-20 mA, 1-5 V, and 2-10 V.

Other features of the 1291 are:

- A peak reading display (high and Low) selected from the front panel.
- A digital filter to reduce the effects of input variations on the display.
- A program lockout feature that disables the front keyboard to prevent unauthorized or accidental changes.
- An input signal that can be configured for either resetting the alarms or triggering hold-on value.
- A digital display that provides operator prompts with messages to show current status or errors.
- A compact, 48 mm by 96 mm (1.89 in. x 3.89 in.), 1/8 DIN enclosure that projects only 144 mm (5.67 in.) behind the panel.

2. SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Case	PC/ABS, Black Self-extinguishing, level V-0, per UL94
Dimensions	48 mm high x 96 mm wide x 144 mm deep (1.89" high x 3.78" wide x 5.67" deep) 1/8 DIN per DIN
Installation	Panel mounted, secured by tie rods
Cut-out	45 mm high x 92 mm wide, +0.8 mm/-0mm (1.77" high x 3.62" wide, +0.03"/-0")
Front Panel	IP 54 protection per IEC 569/CEI 70-1
Rear terminal block	22 screw terminals with safety cover
Display	5 red LED digits, 13.2 mm high 7 segments plus decimal point
Indicators	2 red LEDs for alarm annunciator function 1 red LED for local/remote control
Keyboard	Four pushbuttons
Sampling Time	100 ms typical
Display update time	400 ms
Common mode rejection ratio	120 dB @ 50/60 Hz
Accuracy	±0.1% fsv ± 1 digit @ 25°C
Temperature drift	Less than 200 ppm/(C of fsv
Insulation resistance	Greater than 100 Mohm, per IEC 348
Dielectric strength	1500v RMS, PER IEC 348
Power supply	Switching 85/264 VAC, 50/60 Hz (24 VDC ± 10% factory order option)

Power consumption	100 mA @ 110 VAC maximum
Protection	Internal fuse
Normal mode	60 dB @ 50/60 Hz
Weight	600 g
Operating temperature	0 to 50°C
Storage temperature	-20 to +70°C
Humidity	85% relative humidity, non condensing

2.2 INPUT SPECIFICATIONS

0 - 20 mA	3 ohm input impedance
4 - 20 mA	3 ohm input impedance
0 - 5 VDC	Greater than 200 Kohm input impedance
1 - 5 VDC	Greater than 200 Kohm input impedance
0 - 10 VDC	Greater than 200 Khom input impedance
2 - 10 VDC	Greater than 200 Kohm input impedance
Input selection	Keyboard and internal jumpers
Readout	Keyboard programmable from 10 to 99900
Input resolution	Adjustable by 1 up to 10000 Adjustable by 10 from 10000 to 99900 Decimal point may be set in any position
Open input detection	For 4-20 mA, 1-5V, and 2-10 V inputs only Down scale reading on fault

2.3 SPECIAL SPECIFICATIONS

Display filter	First order digital filter on displayed value, with configurable time constant of 0.4, 1,2,3,4, or 5 seconds.

Peak detection	Automatic detection of maximum and minimum measured value.
Input logic	Driven by dry contacts for manual alarm reset or for hold-on value
Watch dog	Hardware and software for automatic restart
Protection	Internal jumper for calibration and configuration Parameter protection Keyboard lockout

2.4 ALARM SPECIFICATIONS

Quantity	Two independent alarms
Threshold	0% to 100% of readout span Resolution and decimal point position as selected per readout value
Hysteresis	Programmable, 0.1% to 9.9% of readout span
Types of alarms	High or low thresholds Direct or reverse (fail/safe) action Automatic or manual reset Optional low-alarm-startup masking
Alarm output	Two SPST contacts, NO or NC, jumper selectable
Update time	100 ms
Contact rating	2.0 A @ 30 VDC resistive load 0.6 A @ 110 VDC resistive load 0.5 A @ 220 VDC resistive load 0.3 A @ 110 VDC inductive load
Filter	Optional digital filter with the same time constant as chosen for display filter

2.5 SERIAL COMMUNICATION INTERFACE OPTION SPECIFICATIONS

Type	RS-485, opto-isolated from indicator input and output
Protocol	Polling/Selecting, MODBUS, JBUS

Baud Rate	From 150 to 19200 baud
Format	7 bits + parity 8 bits + parity 8 bits without parity
Parity	Even/Odd
Stop bit	One

2.6 ANALOG RETRANSMISSION OPTION SPECIFICATIONS

Output types	0-20 mA, 4-20 mA, maximum load 500 ohms 0-10 V, minimum load 5000 ohms Keyboard and jumper selectable Opto-isolated
Scaling	From 0 to 99990 Resolution and decimal point position are as selected per readout value
Output resolution	Better than 0.05% of output span (scaling can worsen output resolution)
Filter	It is possible to enable a digital filter on the output with the same time constant selected for the display filter
Accuracy	0.2% of output span
Temperature drift	Less than 100 ppm/°C (plus input drift)
Output noise	Less than 0.1% fsv RMS
Update time	100 ms

NOTE: The analog retransmission and serial communication interfaces are mutually exclusive.

2.7 AUXILIARY POWER SUPPLY SPECIFICATIONS

Isolation	Galvanically isolated from instrument input and output
Voltage out	24 VDC
Accuracy	±5%

Maximum power 1.25 Watts

3. UNPACKING

Upon receipt, examine the package for shipping damage. Notify the carrier immediately in the event of any evidence of damage, and retain the shipping materials for their inspection.

3.1 DIMENSIONAL INFORMATION

Dimensions: 48 mm high x 96 mm wide x 144 mm deep
(1.89" high x 3.78" wide x 5.67" deep)
1/8 DIN per DIN

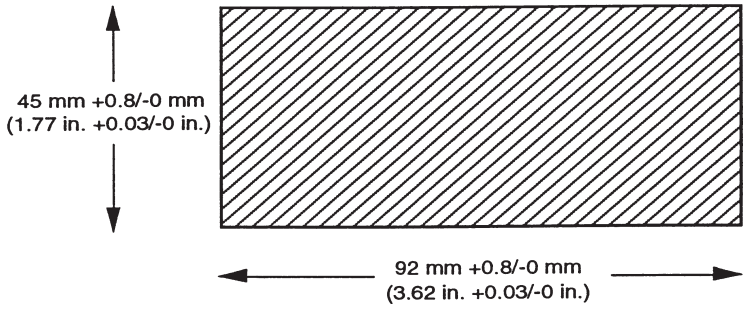
Cutout: 45 mm high x 92 mm wide, +0.8 mm/-0mm
(1.77" high x 3.62" wide, +0.03"/-0")

Weight 600 g

4. MOUNTING

Prepare a panel cutout with the dimensions in Figure 1.

Fig. 1 Dynisco DYN1291 Panel Cutout



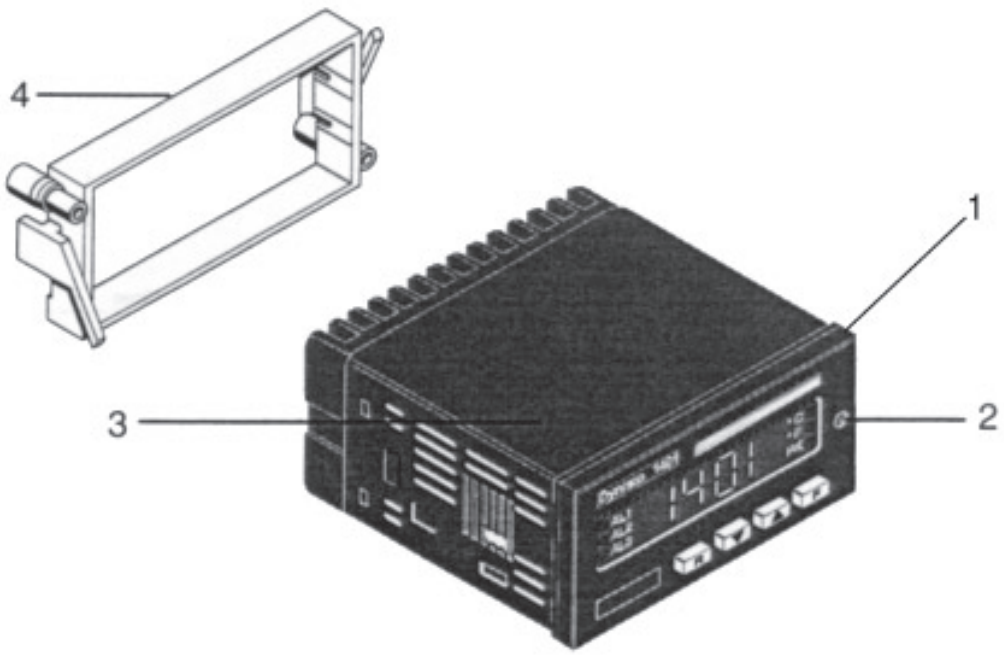
1. Unscrew the captive screw on the face of the unit, and slide the indicator out of the case.
2. Slide the case into the panel cutout, from the front of the panel.
3. Using supplied panel-mounting bracket, slide onto instrument case until it contacts back of panel. Tighten two Phillips screws on panel mounting bracket until case is securely mounted in panel cutout.

NOTE: Before sliding the indicator back into the case, you may want to ensure that the jumpers are

set correctly, and that the Mode Selection Switch is in the proper position. See pages 15-18 for information on disassembling the unit and setting the jumpers. Information on serial communications (option) is contained in a separate supplement.

4. Slide the indicator back into the case, and tighten the captive screw.

Fig. 2 Depiction of DYN1291



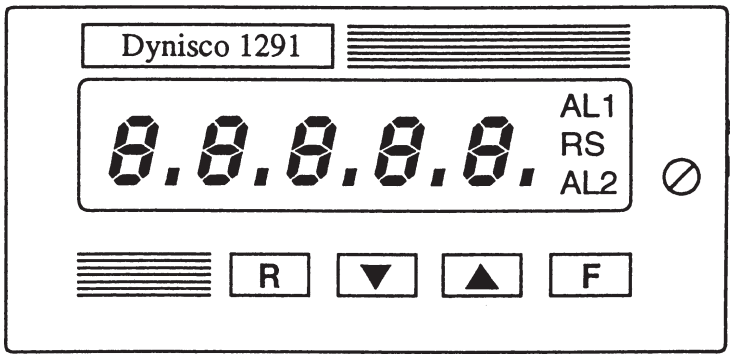
5. SET UP

5.1 FRONT PANEL

The front panel of the Model 1291 is shown in Figure 3. Key items on the front panel are:

- A five digit LED display
- LED indicators AL1 (Alarm 1) and AL2 (Alarm 2)
- LED indicator RS (Remote Status)
- Four pushbuttons protected by silicone rubber, labeled R, ▼, ▲, F. The pushbutton functions are listed in the following page.

Fig. 3 DYN1291 Front View



5.2 PUSH BUTTON FUNCTIONS

Button Sequence	Resulting Operation
▼	Used to step between choices or to decrement a parameter value
▲	Used to step between choices or to increment a parameter value or to display peak high or peak low
F	Used to store the currently displayed parameter value, as modified, and to display the next parameter
R	Used to scroll back to the previous parameter without storing the modified parameter value
R + ▼ or R + ▲	Alarm manual reset (either button sequence with reset both alarms)
R + F	Reset peak high and peak low values
▼ + ▲	Initiate default data loading procedure
▼ + R + F	Used to lock or unlock keyboard for transducer calibration and parameter modification

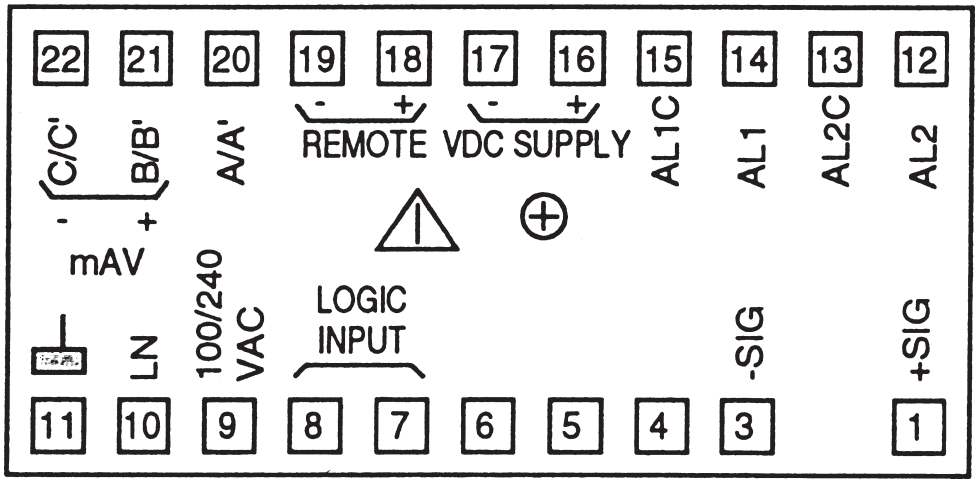
To perform operations requiring two or more pushbuttons, press and hold the first pushbutton, then press and hold the second pushbutton, and then press the third pushbutton, if required.

NOTE: You must follow the push button on sequences exactly as described.

5.3 Real Panel Connections

The electrical connections for the Model 1291 are shown in the table below. The layout of the terminals, as seen from the rear, is shown in Figure 4.

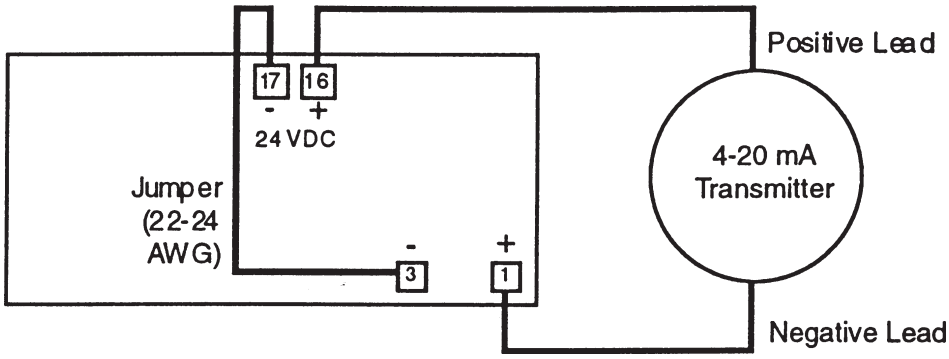
Fig. 4 DYN1291 Rear Terminal Location



Terminal	Connection	Terminal	Connection	
1	Signal +	12	Alarm 2	
	(no terminal)	13	Alarm 2C	
3	Signal -	14	Alarm 1	
4		15	Alarm 1C	
5		16	Aux P/S +	
6		17	Aux P/S -	RS485
7	Logic Input	18		Remote +
8	Logic Input	19		Remote -
9	Line (hot side) or +24 Vdc	20		A/A′
10	Line (neutral) or 0 Vdc	21	V/mA +	B/B′
11	Ground	22	V/mA -	C/C′

The suggested wiring for 4-20 mA loop utilizing the Model 1291 internal 24 VDC power supply is show in Figure 5.

Fig. 5 4 - 20 mA Loop Wiring



6. INTERNAL SETTINGS

The indicator consists of an upper and a lower printed circuit board and a front panel. These are connected by ribbon cables, which are soldered in place.

Caution: Be careful not to twist the ribbon cables during assembly and disassembly.

The internal jumper settings control the following functions

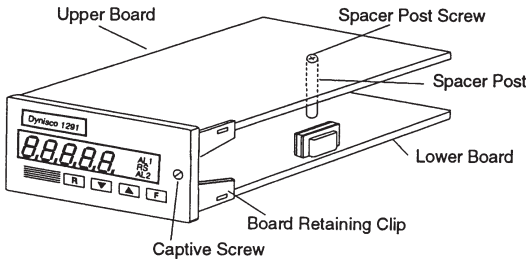
- Input selection (mA or Vdc)
- Retransmission output selection (mA or Vdc)
- Alarm operation

6.1 DISASSEMBLY

1. With a small slotted screwdriver, loosen the captive screw on the right side of the front panel.
2. Slide out the front panel and printed circuit board assembly, and place it on a flat, anti-static work surface. Notice that the circuit boards are held in place by four plastic clips. See Figure 6.

If you are setting the Mode Selection Switch and are not changing the internal jumper settings, skip steps 3 - 5 and proceed directly to page 18.

Fig. 6 DYN1291 Front Panel and Circuit Board Assembly



3. Using your fingers, gently pull the plastic board retaining clips away from both printed circuit boards on one side until they pop free. Then, release the other side.

4. Locate the screw in the middle of the upper printed circuit board, about a quarter of the way from the rear edge, and remove it with a small Phillips head screwdriver.

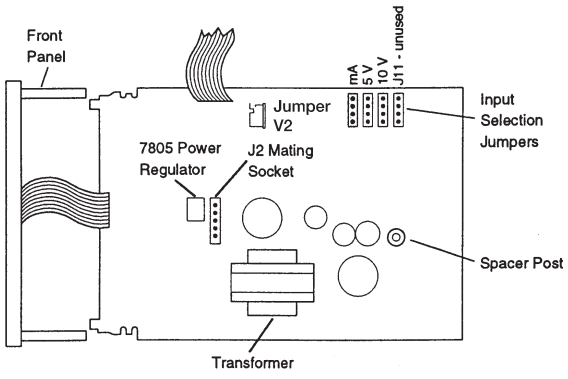
5. Gently pull the two main circuit boards apart and place them with their component sides up on an anti-static surface.

6.2 INPUT SETTINGS

Once the boards have been separated, input type can be selected by the placement of the input jumper on the lower board as shown in Figure 7. The choices available are:

- mA = 0-20 mA; 4-20 mA
- 5V = 0-5V; 1-5V
- 10V = 0-10V; 2-10V

Fig. 7 Lower Circuit Board



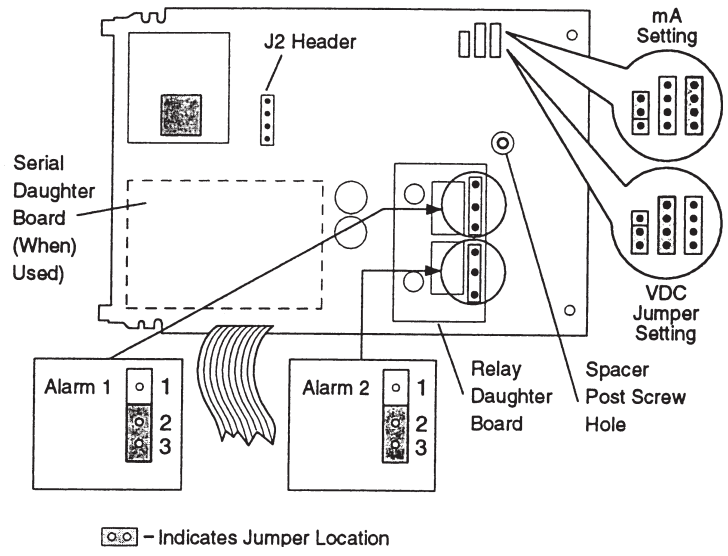
6.3 OUTPUT SETTINGS

Output options are selected by the placement of jumpers (see Figure 8) on the upper circuit board. The choices available are:

- Output for analog retransmission, 0-10 V or 0-20 V; 4-20 mA
- Alarm output contact status. The alarm jumper positions are described in the table below. Each alarm is configured independently.

Caution: Wear an anti-static wristband and work on an anti-static surface when setting jumpers.

Fig. 8 Upper Circuit Board and Jumper Settings



The table below describes the contact status based on the alarm jumper settings as selected from Figure 8 and the state of the Alarm Action settings described in sections G and H of Configurable Parameters.

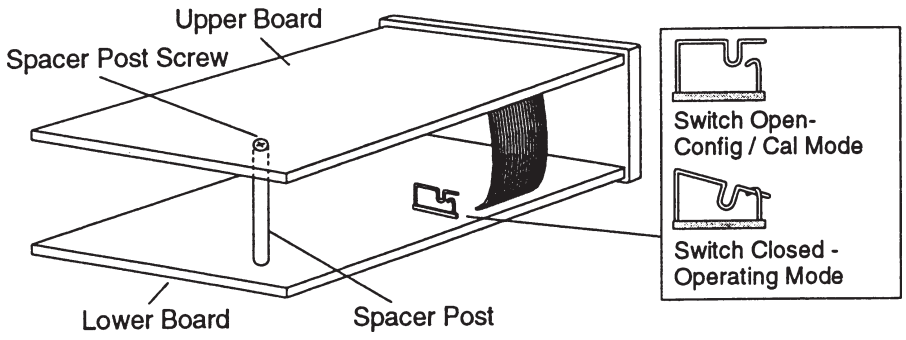
Alarm Action	Alarm Jumper	Contact Status
Reverse (failsafe)	1 - 2 (NO)	Contacts open in alarm or power loss
Direct	1 - 2 (NO)	Contacts closed in alarm
Reverse (failsafe)	2 - 3 (NO)	Contacts closed in alarm or power loss
Direct	2 - 3 (NO)	Contacts open in alarm

6.4 MODE SELECTION

The Model Selection Switch determines whether the indicator will be in configuration/calibration mode or the normal operating mode.

NOTE: The *Configuration/Calibration Mode* is only used when the indicator is first installed, or when reconfiguration of the indicator is required. At all other times, the *Operating Mode* is used.

Fig. 9 Model 1291 Side View, Mode Selection Switch



To access the Mode Selection Switch slide out the front panel and printed circuit board assembly, as instructed by steps 1 and 2 of Disassembly on page 15. Refer to Figure 9 to locate the switch and change the setting. Once the switch is set, go to the following Reassembly procedure. Skip steps 1-5 if the unit was not disassembled.

6.5 REASSEMBLY

To reassemble the Model 1291 follow the steps below.

1. Locate the four-pin header (J102) that extends up approximately one inch on the upper board.

2. Locate the mating socket on the lower board. It is found between the large cylindrical capacitor next to the transformer and the power regulator.

3. Align the two boards so that all the header pins mate with the socket on the lower board, and press the boards together.

4. Line up the screw hole with the spacer post between the two main boards and replace the small Phillips head screw.

5. Line up the corners of the printed circuit boards with the notches in the four front panel board-

retaining clips. Press the boards and the front panel together until all four corners click into place.

6. Slide the front panel and printed circuit board assembly into the indicator case and press it in so the printed circuit board contacts mate with the terminal block in the back of the case. Tighten the front panel captive screw.

7. Perform configuration and calibration (see below) to ensure proper indicator Operation.

7. CONFIGURATION/CALIBRATION MODE

The configuration/calibration mode is enabled by opening the Mode Selection Switch on the left side of the lower board (see Figure 9). A list of all configurable parameters starts in the next section.

When the unit is turned on in configuration/calibration mode, the display will show ***1291*** and ***ConF***.

Press **F** to initiate the configuration procedure, starting at the first parameter.
Press **R** to initiate the configuration procedure, starting at the last parameter.
Press ▲ to toggle the display from ***ConF*** to ***CAL***, initiating the output calibration mode, if required.
Pressing ▼ will display the software version number.

For each parameter you will either select one of several choices or enter a numerical value.

Press ▲ to modify or change the parameter or increase the number displayed.
Press ▼ to modify or change the parameter or decrease the number displayed.
Press **F** to save your changes and step to the next parameter.
Press **R** to step to the previous parameter without saving your changes.

For many parameter settings, the display initially alternates between a code and a numerical value. Once you start to modify the value, however, only the numerical value will be shown.

7.1 CONFIGURABLE PARAMETERS

The following is the complete sequence of configurable parameters. Default values are given in section 9.1.

A. Line Frequency

The display shows ***LF***, (Line Frequency) followed by:
60 for 60 Hz, or
50 for 50 Hz

B. Input Type

The display shows in (Input) followed by:
0.20 for 0 - 20 mA input range
4.20 for 4 - 20 mA input range
0.5 for 0 - 5 V input range
1.5 for 1 - 5 V input range
0.10 for 0 - 10 V input range
2.10 for 2 - 10 V input range

This parameter selection must match the input jumper setting in Figure 7.

C. Decimal Point Position

The display shows:
-----. for no digits after decimal point
----.- for one digit after decimal point
---.-- for two digits after decimal point
--.--- for three digits after decimal point
-.---- for four digits after decimal point

C1. Full Scale Readout

This parameter establishes the display reading at the full input.

The display alternates between ***F.S.U.*** (Full Scale Value) and a numerical value from 10 to 99990. Only the numerical value is shown during modification.

C2. Low Scale Readout

The display will alternate between ***L.S.U.*** (Low Scale Value) and a numerical value from 0 to 99990. This parameter establishes the display reading at the "zero" input (i.e., 4 mA input = 350).

D. Display Filter Time Constant

The display shows ***F.t.c.*** (Filter Time Constant) followed by:
.4 for 400 millisecond filter time constant
1 for 1-second filter time constant
2 for 2 second filter time constant
3 for 3 second filter time constant
4 for 4 second filter time constant
5 for 5 second filter time constant

E. External Contact Function

The display shows ***EC*** (External Contact) followed by:
nr to enable external contact for manual alarm reset, via rear terminals 7 and 8 or
Ho to enable external contact for hold-on-value sampling

E1. Contact Status

The display shows ***C5***. (Contact Status) followed by:
CL if function selected above is performed with contact closed, or
OP if function selected above is performed with contact open.

F. Alarm 1 Operative Mode

The display shows ***A1*** (Alarm 1) followed by:

HA	High alarm with automatic reset
HL	High alarm with manual reset (HighLatched Alarm)
LA	Low alarm with automatic reset
LL	Low alarm with manual reset (Low Latched Alarm)
OFF	for no alarm 1

F1. Alarm Action

This step is skipped if Alarm 1 if ***OFF***.

The display shows ***A1*** (Alarm 1) followed by:
REU for relay energized if no alarm condition (reverse action/fail safe), or
dir for relay energized if alarm condition (direct action).

F2. Alarm 1 Masking Option

This step is skipped if Alarm 1 of ***OFF*** or ***HIGH***.

The display shows ***A1*** (Alarm 1) followed by:
diS for masking option disabled, or
Enb for masking option enabled.

This function masks low alarm conditions during startup until the measured value first becomes greater than the alarm threshold plus hysteresis. The alarm must have been programmed as a low alarm.

F3. Alarm 1 Filter

This step is skipped if alarm 1 is ***OFF***.

The display shows ***FI*** (Filter) followed by:
OFF for no filter on alarm threshold, or
xxx for filter with the time constant chosen in step C above.

F4. Alarm 1 Hysteresis

This step is skipped if alarm if ***OFF***.

The display shows ***HI*** (Hysteresis 1) followed by a value from 0.1 to 9.9.

G. Alarm 2

Follow the same procedure as in steps F-F4 above.

H. Serial Communications Protocol

This step will default to:
OFF if unit does not have the Serial Communications Interface option
ErO if the unit has the Serial Communications Interface option

The device will support the following protocols:
ErO for polling/selecting protocol
NbUS for Modbus protocol
JbUS for Jbus protocol
OFF to disable communications

NOTE: The indicator skips steps H1 through H3 if serial communications is **NOT** implemented (set to OFF).

H1. Serial Communication Device Address

The display shows ***Adr*** (Address) followed by a number ranging from:
1 - 95 for polling/selecting protocol (1-31 being valid addresses)
1 - 225 for Modbus/Jbus protocol (up to 128 devices per multidrop link)

H2. Serial Communication Baud Rate

The display shows ***bd*** (Baud Rate) followed by:
150 for 150 baud
300 for 300 baud
600 for 600 baud
1.20 for 1200 baud
2.40 for 2400 baud
4.80 for 4800 baud
9.60 for 9600 baud
19.2 for 19200 baud

H3. Serial Communication Byte Format

The display shows ***bF*** (Byte Format) followed by:
7E for 7 bits with even parity
7O for 7 bits with odd parity
8E for 8 bits with even parity
8O for 8 bits with odd parity
8 for 8 bits with no parity

NOTE: The indicator skips step I1 to I3 if serial communication is **NOT** implemented.

I. Analog Retransmission (Option)

The display shows ***RO*** (Analog Output) followed by:
0.20 for 0 - 20 mA
4.20 for 4 - 20 mA
0.10 for 0 - 10 V
OFF for retransmission disabled

This parameter selection must match the input jumper setting in Figure 8.

I1. Analog Retransmission Scaling: Low Scale Value

The display alternately shows ***Ar.L.S.U.*** (Analog Retransmission Low Scale Value) and a numerical value. This parameter establishes the lower limit for the analog output; only the numerical value is shown during modification. Resolution and decimal point position are as selected for the readout value.

I2. Analog Retransmission Scaling: Full Scale Value

The display alternates between ***Ar.F.S.U.*** (Analog Retransmission Full Scale Value) and a numerical value. This parameter establishes the upper limit for the analog output; only the numerical value is shown during modification. Resolution and decimal position are as selected for the readout value.

I3. Analog Retransmission Filter

The display shows ***rF*** followed by:
OFF for no filter on retransmitted value, or
xxx for filter having the time constant chosen in step C.

Press **F** to lock in the parameter.

At this point the configuration procedure is complete and the display will return to showing ***ConF***.

When configuration/calibration is complete, remove the unit again, place the Mode Selection switch

in the normal or closed position, and replace the unit. See Mode Selection, page 18. Then, proceed to Operating Mode below.

8. OPERATING MODE

In this mode the Model 1291 monitors the input signal, displays the measured value, and performs alarm functions. You can display high and low peak values, lock and unlock the keyboard, reset alarms, and perform transducer input calibration and alarm threshold settings. It is also possible to load default parameters.

Parameter values listed below can always be viewed, but they can only be modified if the indicator keyboard is unlocked. If anyone attempts to modify the parameters when the indicator is locked, the display will show ***inh***.

8.1 KEYBOARD LOCK/UNLOCK

When the measured value is displayed (normal operating mode), you can lock or unlock the keyboard by holding down the buttons in the following order:

▼+R+F

The display will then show the new desired mode: ***Loc*** or ***UnLoc***.

8.2 ALARM SET POINTS

If the indicator has automatically returned to operating mode you can return to set the alarms by following the procedure.

8.2.1 ALARM 1

Press the **F** key once. The display will alternately show ***Lxxxx*** and the alarm set point, where ***xxxx*** is a code for alarm operation mode. Only the alarm set point is shown during modification. Use the ▲ and ▼ keys to modify this parameter. Resolution and decimal point position are as selected for the readout value. Press **F** to store your change.

The indicator automatically returns to the normal operating mode after 6 seconds if no changes are made.

The codes for the remaining digits in the alarm-operating mode are:

2nd Digit	**3rd Digit**	**4th Digit**	**5th Digit**
H = High Alarm	***A*** = Automatic reset	***d*** = Direct action	***n*** = Low alarm mask
L = Low Alarm	***n*** = Manual reset	***r*** = Reverse action	blank = Not masked

For example, a display of ***LHAr*** would indicate High alarm, automatic reset, reverse action.

8.2.2 ALARM 2

The indicator will automatically enter this parameter after the **F** key is pressed to store the Alarm 1 set point. To enter Alarm 2 from the normal operating mode, press **F** twice.

Programming the Alarm 2 set point is the same as Alarm 1 above, except that the display alternately shows ***2.xxxx*** and the alarm value.

8.3 ALARM RESET FUNCTION

This function can be performed when the indicator is locked; must be in local mode. If the alarm is configured as a latched alarm (manual reset), alarm status is maintained even after the alarm condition stops.

Press **R** + either arrow (▲ or ▼) to reset both Alarm 1 and Alarm 2.

The external contact, if enabled, resets both alarms. The rear terminal connections are 7 and 8. The external contact works even if the indicator is in the remote mode.

8.4 PEAK HOLD FUNCTION

The following actions can be performed when the indicator is locked, and in either local or remote mode.

8.4.1 MONITORING PEAK HIGH AND PEAK LOW

By pressing ▲ while the measured value is displayed, it is possible to monitor the peak high value. The decimal point at the right of the display will be lit steadily.

Press ▲ again to monitor the peak low value. The decimal point at the right of the display will now blink on and off.

Press ▲ to redisplay the measured value (normal operating mode).

Press **R** + **F** to reset the peak high/peak low values and to restart for a new peak detection.

8.4.2 HOLD ON VALUE

The external contact can be used to freeze input signal sampling, holding the last measured value for use on the display, alarms, retransmission etc.

In this mode, the numerical value flashes on the display.

9. DEFAULT DATA LOADING PROCEDURE

In each one of the Indicator's three modes, configuration, calibration and operation, you can load default data to reset all of the parameters for that particular mode.

To load the default data:

Press ▼ + ▲, and once the display shows ***dF off***, press ▲. When the display shows ***dF On***, press **F**. Default data will now be loaded. During data loading time the display will show ***LdRtR***.

The default data for the three modes are shown on the following pages.

9.1 DEFAULT DATA FOR CONFIGURATION PARAMETERS

Step	Parameter	Setting
A	Line Frequency	60 Hz
B	Input Type	4 - 20 mA
C	Decimal Point Position	None
C1	Full Scale Readout	10000
C2	Low Scale Readout	0
D	Display Filter Time Constant	400 mS
E	External Contact Function	Alarm Manual Reset
E1	Contact Status	Close
F	Alarm 1 Operating Mode	High with Automatic Reset
F1	Alarm 1 Action	Reverse
F2	Alarm 1 masking Option	Disable
F3	Alarm 1 Filter	Off
F4	Alarm 1 Hysteresis	0.1%
G	Alarm 2 Operating Mode	High with Automatic Reset
G1	Alarm 2 Action	Reverse
G2	Alarm 2 masking Option	Disable
G3	Alarm 2 Filter	Off
G4	Alarm 2 Hysteresis	0.1%
H	Serial Communication Address	OFF (Disable)
H1	Serial Communication Baud Rate	19200
H2	Serial Communication Byte Format	7 bit, parity even
I	Analog Retransmission Type	OFF (Disable)
I1	Analog Retransmission Low Scale Value	0
I2	Analog Retransmission Full Scale Value	10000
I3	Analog Retransmission Filter	Off

9.2 Default Data for Operating Parameters

Step	Parameter	Setting
1	Alarm 1 threshold setting	40% of readout range
2	Alarm 2 threshold setting	60% of readout range
3	Keyboard status	Unlocked

9.3 Default Data for Calibration Parameters

Default calibration parameters are provided to allow the user to verify that the indicator is working properly. They are not normally used as the final calibration values.

Caution: After default parameter loading, you should perform the proper indicator calibration procedure.

10. Calibration

10.1 Input/Output Calibration

NOTE: Calibration of the input and output of the 1291 has been completed at the factory before shipment and further adjustment should not be necessary. However if after service, the unit appears inaccurate, or it is being used with a sensor whose output cannot be adjusted, it may be desirable to undertake the following calibration procedure.

It is only necessary to perform calibrations on the parameters that match the internal jumper selection (Figure 7) i.e., ***C0*** and ***C1*** when mA input is selected.

To calibrate the analog input, connect a voltage or current signal source, as appropriate, to terminals 1 and 3. First set the signal source to a low scale output, for example 0 mA, and adjust the minimum value parameter. Then set the signal source to a high scale output, for example 20 mA, and adjust the maximum value parameter.

Press ▼ to display the software version number.
Press **F** to initiate the configuration procedure, starting at the first parameter.
Press **R** to initiate the configuration procedure, starting at the last parameter.
Press ▲ to toggle the display from ***ConF*** to ***CAL***, initiating output calibration mode.

When the display shows ***CAL***, you can also load the default parameters, shown in section 9.1.

10.2 Input Calibration Sequence

CO Current input minimum value (0 mA)
C1 Current input maximum value (20mA)
Current input calibration check (display shows 25000)

C2 Voltage input minimum value (0V)
C3 Voltage input maximum value (5V)
Voltage input calibration check (display shows 25000)
C4 Voltage input minimum value (0 V)
C5 Voltage input maximum value (10 V)
Voltage input calibration check (display shows 25000)

10.3 INPUT CALIBRATION

Once in the CAL mode, press the **F** key to select the calibration parameter desired, for example, ***C0***. The display will show ***C0 OFF***. Press the ▲ key once and the display will change to ***C0 On***. While inputting the appropriate value, (in this example 0.0 mA), press the **F** key to calibrate. After the display momentarily goes blank the unit will advance to the next parameter i.e., ***CI OFF***. Repeat the above steps inputting the correct signal level.

10.3 ANALOG OUTPUT CALIBRATION

To calibrate the analog retransmission output, connect a multimeter, set to the proper measurement range, to terminals 21 and 22. Make output adjustments by pressing ▲ or ▼ until the signal output measured by the multimeter reaches the proper value. The display only shows the number of counts for the digital to analog converter.

Press the **F** key to store the value and advance to the next parameter. Only calibrate the output that agrees with the jumper selection in Figure 8.

C6 Retransmission current output minimum value - adjust to 50.0 mA
C7 Retransmission current output maximum value - adjust to 20.00 mA
C8 Retransmission voltage output minimum value - adjust to 0.00 VDC
C9 Retransmission voltage output maximum value - adjust to 10.00 VDC

After the last step, the calibration is complete. The display shows the measured input variable in bits (approximately 1.6 microvolt/bit).

11. ERROR CODES

Diagnostics are performed at indicator startup and during normal mode operation. If a fault condition is detected, the display will show the message Er followed by an error code. The following is a list of possible errors in numerical order.

Er 1

The alarm threshold values are greater than actual readout range or their values in memory are incorrect. The error may appear at instrument start-up in operating mode for 3 seconds. After that, the instrument will reset.

Simultaneously press ▲ and ▼ to load default data. Then set the desired threshold values.

Er 38

Error detected during EAROM read operation. This error may appear at instrument start-up in operating mode. This error message disappears automatically after 3 seconds. After that the instrument will reset. If the error persists, return the instrument to your supplier.

If this error appears during configuration/calibration, press **F** or **R** to restart the procedure and then repeat operations. If the error persists, return the instrument to your supplier.

Er39

Error detected during EAROM write operation. This error may appear in operating mode when storing new alarm threshold values in EAROM. The new values will be enabled but they will be lost when the instrument is powered down. This error message disappears automatically after 10 seconds.

If the error appears during configuration/calibration, press **F** or **R** to restart the procedure and then repeat operations. If the error persists, return the instrument to your suplier.

Er101

The configuration data stores in EAROM is wrong or inconsistent. This error may appear at instrument start-up in operating mode. This error message disappears automatically after 3 seconds. After that the instrument will reset.

If the error persists, enable configuration with the internal switch, load the default configuration data, and then perform a new configuration.

Er201

The calibration data stored in EAROM is wrong. This error may appear at instrument start-up in operating mode. This error message disappears automatically after 3 seconds. After that the instrument will reset.

If the error persists, enable configuration/calibration mode with the internal switch, load the default calibration data, and then perform new calibrations of the input and of the analog retransmission, if present.

Er216

Incorrect input value during calibration. This error appears during calibration when the instrument detects a fault in the input signal. Input signal faults include over range, under range, or input open.

The same error appears during low scale calibration if the input signal is greater than 11 mA (CO parameter) or 2.75 V (C2 parameter) or 5.5 V (C4 parameter).

Er 372

Error during internal auto zero measure for temperature drift compensation. The instrument repeats the check every 3 seconds. The analog retransmission and alarm go into failsafe (low scale)

If the error persists, send the instrument back to your supplier.

Er373

The input calibration span is too great (>22 mA or >5.5V or >11 V) or too small (<0.6mA or <150mV or <300 mV). When this error appears in operative mode, the message persists for 3 seconds. After that, the instrument resets. When the error appears in calibration mode during input check, the instrument does not reset. Verify the signal and redo the calibration with the correct value.

If the error persists, send the instrument back to your supplier.

Er402

The configuration/calibration data, stored in EAROM, are not protected. This error may appear at instrument switch-on, in operative mode, for 3 seconds, after that, the instrument resets.

If the error persists, enable the calibration procedure, then return to operative mode.
This action is sufficient to enable data protection.

°°°°°
Over range indication

This status is displayed when the A/D converter is out of range or the input signal is greater than the full-scale value plus 2% of span, or the displayed value exceeds the display capability (99990).

_°°°°
Under range indication

This status is displayed when the A/D converter is out of range or the input signal is lower than the scale value minus 2% of span.

OPEn

This message is displayed when the instrument detects an input open.
This identification is possible only on 4-20 mA or 1-5 V or 2-10 V input range.
When an input open condition is detected, the alarm, the peak detection and the analog retransmission operate as in underrange status.

12. REPAIR

Questions concerning warranty, repair cost, delivery, and requests for a RA# should be directed to the Dynisco Repair Department, 508-541-9400 or email: repair@dynisco.com. Please call for a return authorization number (RA#) before returning any product. Damaged products should be returned to:

DYNISCO INSTRUMENTS
Attn: RA # _____
38 Forge Parkway
Franklin, MA 02038

For technical assistance please call 800-221-2201 or 508-541-9400 or fax 508-541-9436.

13. WARRANTY

This Dynisco product is warranted under terms and conditions set forth in the Dynisco Web Pages. Go to www.dynisco.com and click on “Warranty” at the bottom of any page for complete details.

NOTES:

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