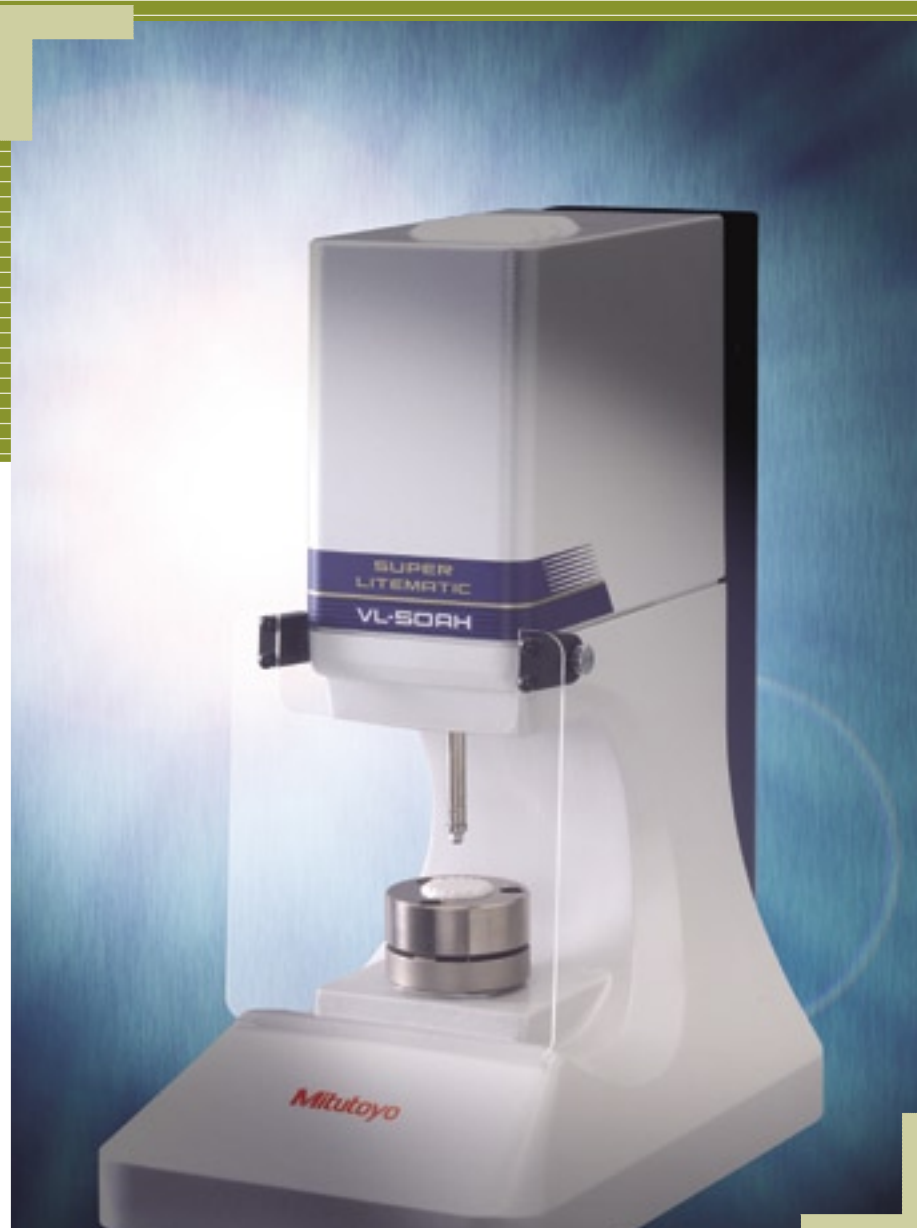


# High-resolution Digimatic Measuring Unit **LITEMATIC**

Bulletin No. 1829



**Combines ultra-low measuring force  
and superb resolution for high-accuracy  
inspection of easily deformed or delicate  
workpieces**

**Mitutoyo**

High accuracy and low measuring force

# Litematic



Super Litematic  
VL-50AH



Litematic  
VL-50A

**Mitutoyo**

## FEATURES Super Litematic VL-50AH

### Superior precision

- Equipped with a laser hologage.
- The structural design employs Abbe's principle to guarantee the best accuracy possible.
- The design uses low thermal expansion materials to minimize the effect of temperature variation during use.
- Newly employed smoothing effect enables stable reading.



Accuracy down to 0.15µm!

## FEATURES VL-50AH/A/AS

Patent registered (Japan), Patent pending (Japan)

### Low and constant measuring force

- With a measuring force of only 0.01N (1 gram), the Litematic is ideal for measuring easily deformed or high-accuracy components.
- The Litematic's motor-driven spindle drives downwards until the contact point touches the workpiece, at which point the display stabilizes for reading.

### Measurement with high accuracy

- Ultra-high resolution of .0000005" (0.01µm) combined with the wide measuring range of 0-2" (0-50mm) provides outstanding versatility.
- Corrosion-proof ceramic measuring table for low maintenance.
- The spindle is made from a low thermal expansion material to minimize the effect of temperature variation on accuracy during use.

### SEPARATE COMPONENTS

- The measuring unit and the display unit are separate so that they can be integrated into the user's measurement system. An optional stand is available.

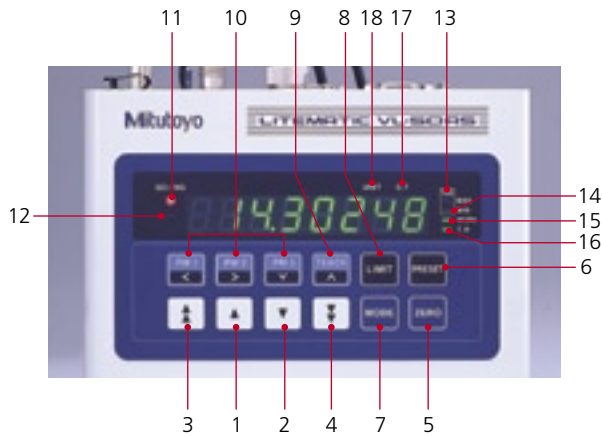
### VL-50AS Litematic Head



NOTE: Shown with optional stand (957460)

# Functions

## Control panel/Display

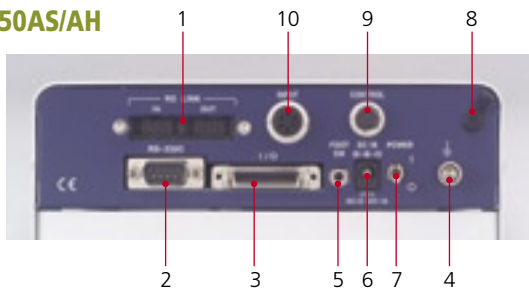


Key functions	
Key	Function
1) Up	Moves the spindle up while the key is pressed. Used to retract the contact point from the workpiece after making a measurement.
2) Down	Moves the spindle down while the key is pressed. Used to bring the contact point into contact with the workpiece to make a measurement.
3) Rapid Up	Moves the spindle up rapidly while the key is pressed. Used to move quickly from one position to another.
4) Rapid Down	Moves the spindle down rapidly while the switch is pressed. Used to move quickly from one position to another.
5) ZERO	Sets the origin at the current position of the contact point and zeros all display values for runout measurements. This key can also be used to clear an error.
6) PRESET	Sets the origin at the height value entered relative to the current position of the contact point. Standard workpieces or gauge blocks are often used with this function.
7) MODE	Selects and sets one of various measurement modes such as MAX/MIN measurement.
8) LIMIT	Enters the size limits for a GO/NG tolerance judgment measurement.
9) TEACH	Sets up the position memory.
10) PM1 to PM3	Moves the spindle to an arbitrary position that has been stored with a single keystroke.

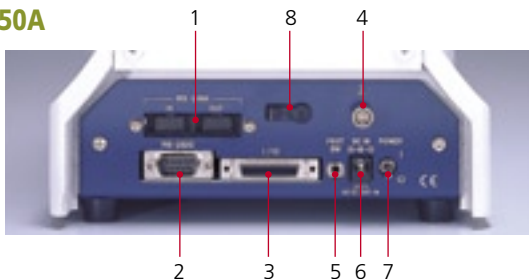
Indicator functions		
Indicator	Function	
11) GO/NG	The result of a GO/NG measurement is being displayed.	
12) Sign	Indicates a minus value.	
13) MAX	Maximum value mode.	Both lights are on while in runout mode.
14) MIN	Minimum value mode.	
15) WORK	Shows that a workpiece is being measured.	
16) T.H.	Measured value is held in display after measurement has been completed.	
17) C.T.	User compensation is set to ON. (Lights while the position memory is active.)	
18) UNIT	The display value unit is inches. (Lights in the external HOLD mode.)	

## Rear panel (switches and connectors)

### VL-50AS/AH



### VL-50A



1) Measured data output connector (OUT) RS-LINK connector (IN / OUT)	Outputs measured data to a Digimatic mini-processor, etc. Connects multiple devices and can output measurement data from one RS-232 port.
2) RS-232C connector	For communication with a PC, etc.
3) External control connector	Used to connect this instrument to an external device for remote control.
4) GND terminal	—
5) Input connector for foot switch	Foot switch (optional) for controlling measurement operation is connected here.
6) DC IN	Input connector to receive power from the AC mains adapter.
7) Power switch	—
8) AC adapter cord clamp	Prevents AC adapter cord from pulling out.
9) CONTROL connector: for VL-50AS only	Gage head connector.
10) INPUT connector: for VL-50AS only	Gage head connector.

# RS-232C Communication Function

RS232C output enables PC processing of measurement data. RS-232C communication also allows computer control of all operations. SENSORPAK (data capture software) **545AA622** — optional.

**Direct data entry to EXCEL**

**Color display of tolerance value**

**Easy-to-read indication meter**

**Tolerance limit setting with PC is possible**

**Operating environment**

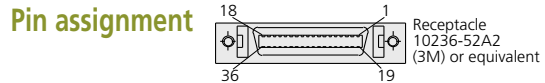
- CPU: 2GHz or more is recommended
- OS: Windows 2000/ XP (Excel 2000/XP)
- RS-232C cable: Null Modem

**RS-232C**

# I/O Connector Terminal Format

Enables remote control via external signal.

**Applicable plug:** No. **02ADB440**  
(with cover) Optional accessory



Pin No.	Signal name	Input/Output	Description (purpose)																		
1	COM	—	Common terminal to input and output circuits (internally connected to GND)																		
2	COM	—																			
3	L1	OUT	Tolerance judgment output terminal																		
4	L2	OUT	A related judgment terminal only outputs "L" at error occurrence																		
5	L3	OUT	L1, L5: Outputs "L"																		
6	L4	OUT	L2, L3, L4: Outputs "H"																		
7	L5	OUT																			
10	NOM	OUT	Outputs "L" in the count mode.																		
21	ULIMIT	OUT	Outputs "L" at the topmost travel point of the spindle																		
22	WORK	OUT	Outputs "L" upon detection of a workpiece.																		
25	SET1	IN	Specifies peak selection/motor speed in combination with SET.																		
26	SET2	IN																			
28	MODE	IN	Peak selection: In combination with SET. <table border="1" style="font-size: small;"> <tr> <td>Peak Mode</td> <td>SET2</td> <td>SET1</td> </tr> <tr> <td>Current value</td> <td>H</td> <td>H</td> </tr> <tr> <td>MAX</td> <td>H</td> <td>L</td> </tr> <tr> <td>MIN</td> <td>L</td> <td>H</td> </tr> <tr> <td>TIR</td> <td>L</td> <td>L</td> </tr> </table>	Peak Mode	SET2	SET1	Current value	H	H	MAX	H	L	MIN	L	H	TIR	L	L			
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Current value	H	H																			
MAX	H	L																			
MIN	L	H																			
TIR	L	L																			
30	UP	IN	Motor control: Specifies a spindle ascent speed along with SET. <table border="1" style="font-size: small;"> <tr> <td>Speed</td> <td>SET2</td> <td>SET1</td> </tr> <tr> <td>VL-50AH</td> <td>VL-50A/AS</td> <td></td> </tr> <tr> <td>.20*/s (5mm/s)</td> <td>.31*/s (8mm/s)</td> <td>H H</td> </tr> <tr> <td>.12*/s (3mm/s)</td> <td>.16*/s (4mm/s)</td> <td>H L</td> </tr> <tr> <td>.08*/s (2mm/s)</td> <td>.08*/s (2mm/s)</td> <td>L H</td> </tr> <tr> <td>.04*/s (1mm/s)</td> <td>.04*/s (1mm/s)</td> <td>L L</td> </tr> </table> When changing the spindle speed, stops the spindle once and allows 50ms or more before change.	Speed	SET2	SET1	VL-50AH	VL-50A/AS		.20*/s (5mm/s)	.31*/s (8mm/s)	H H	.12*/s (3mm/s)	.16*/s (4mm/s)	H L	.08*/s (2mm/s)	.08*/s (2mm/s)	L H	.04*/s (1mm/s)	.04*/s (1mm/s)	L L
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31	DN	IN	Motor control: Specifies a spindle descent speed along with SET. <table border="1" style="font-size: small;"> <tr> <td>Speed</td> <td>SET2</td> <td>SET1</td> </tr> <tr> <td>VL-50AH</td> <td>VL-50A/AS</td> <td></td> </tr> <tr> <td>.20*/s (5mm/s)</td> <td>.31*/s (8mm/s)</td> <td>H H</td> </tr> <tr> <td>.12*/s (3mm/s)</td> <td>.16*/s (4mm/s)</td> <td>H L</td> </tr> <tr> <td>.08*/s (2mm/s)</td> <td>.08*/s (2mm/s)</td> <td>L H</td> </tr> <tr> <td>.04*/s (1mm/s)</td> <td>.04*/s (1mm/s)</td> <td>L L</td> </tr> </table> When changing the spindle speed, stops the spindle once and allows 50ms or more before change.	Speed	SET2	SET1	VL-50AH	VL-50A/AS		.20*/s (5mm/s)	.31*/s (8mm/s)	H H	.12*/s (3mm/s)	.16*/s (4mm/s)	H L	.08*/s (2mm/s)	.08*/s (2mm/s)	L H	.04*/s (1mm/s)	.04*/s (1mm/s)	L L
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.04*/s (1mm/s)	.04*/s (1mm/s)	L L																			
32	FSW	IN	Motor control: Same function as that of the foot switch.																		
34	HOLD	IN	The display value is held during input. An error is cleared at the leading edge of this signal.																		
35	P.SET	IN	Executes presetting. Peak clear: The peak value is cleared upon input of the signal during the HOLD signal input in the Peak mode.																		
	N.C.	—	Unconnected terminals (8, 9, 11, to 20, 23, 24, 27, 29, 33 and 36 pin terminals)																		

## Printer

**Digimatic mini processor DP-1VR**  
No. **264-504-5A**  
Prints the digimatic output from Litematic.  
Connecting cable 1m (No. **936937**)



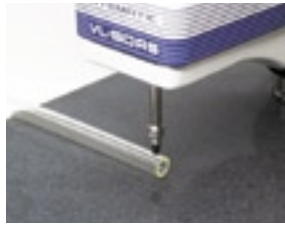
## Digimatic Data Transmission to PC Spreadsheet

**Input Tool IT-005D**  
No. **264-005** (for keyboard port [PS/2])

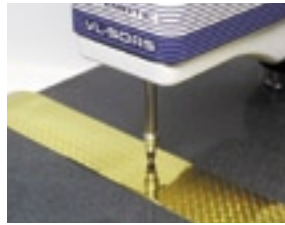
**Input Tool IT-012U**  
No. **264-012-10** (for USB port)  
Converts the digimatic output from Litematic into keyboard signals and transfers to the PC.  
Connecting cable 1m (No. **936937**)



## Example measurement applications



Diameter of resin pipe



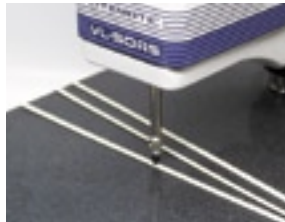
Thickness of sheet



Thickness of disc



Contour of lens



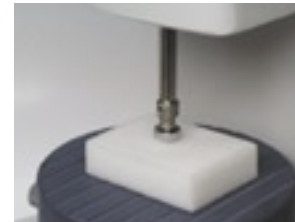
Thickness of dried noodle



Dimension of machine part



Diameter of photosensitive drum



Thickness of urethane foam



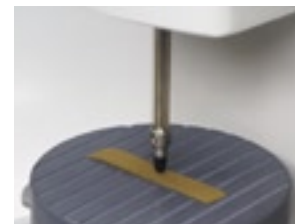
Height of resin container



Height of spacer



Dimension of resin part



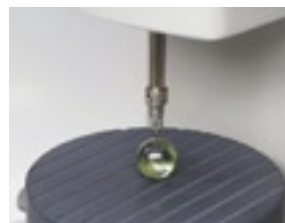
Thickness of rubber strip



Dimension of dust-proof cap



Thickness of gasket



Diameter of glass sphere



Diameter of light bulb



Diameter of ceramics



Dimension of pill



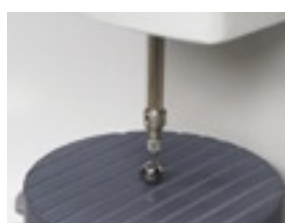
Dimension of machine part



Diameter of precision shaft



Diameter of bearing



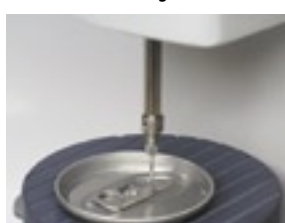
Diameter of carbide ball



Contour of blade tip



Depth of key groove



Pressed contour of can lid



Dimension of sheet metal



Height of connector pin

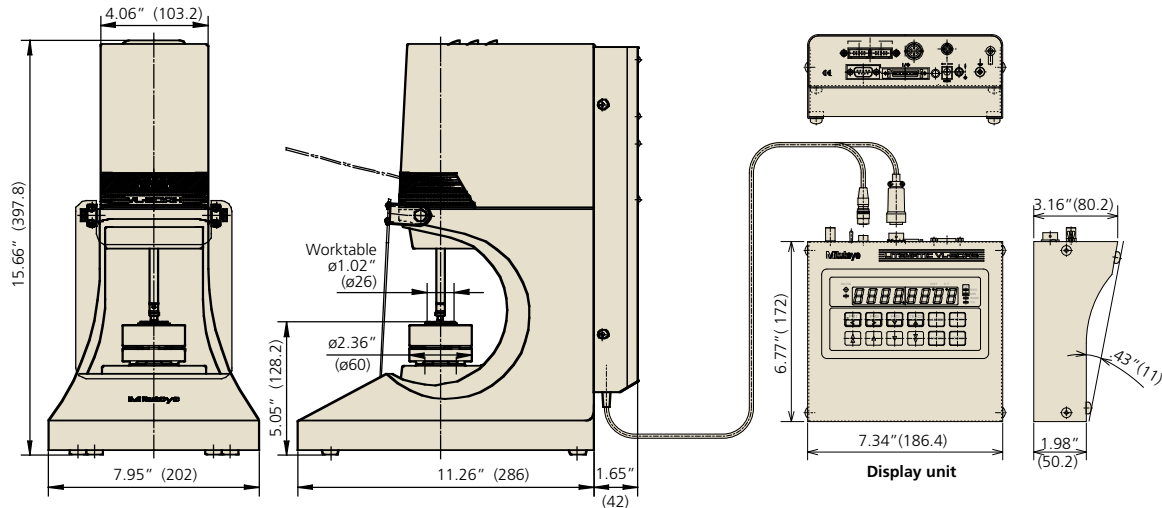


Dimension of electronic part

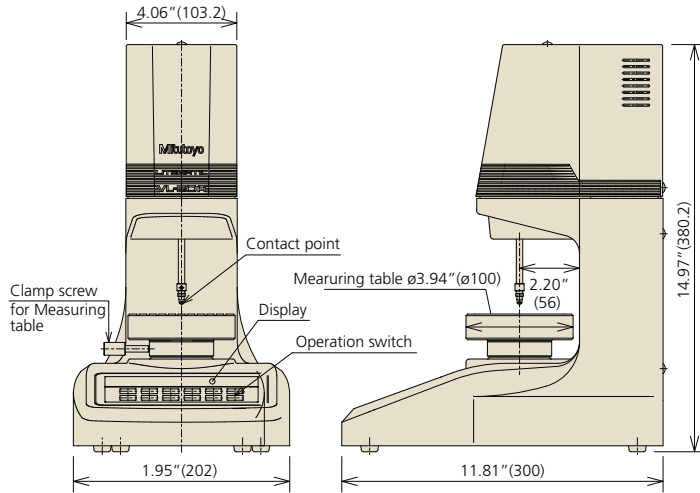
# Dimensions

Unit: Inch (mm)

## Litematic VL-50AH

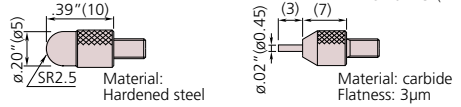


## Litematic VL-50A

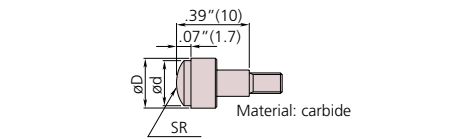


### Interchangeable contact points

Unit: Inch(mm)



Order No.	Measuring force	Order No.	Measuring force
101118	0.02N	120066	0.01N



Order No.	Measuring force	D	d	SR
120059	0.03N	0.30" (7.5)	0.26" (6.5)	.28" (7)
120060	0.06N	0.41" (10.5)	0.37" (9.5)	.39" (10)

## Litematic Head VL-50AS

