

# Contracer CV-3100 / CV-4100

## SERIES 218 — Contour Measuring Instruments



CV-3100S4 with personal computer system and software

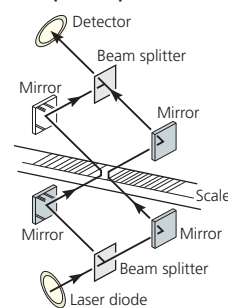
### FEATURES

- Dramatically increased drive speed (X axis: 80 mm/s, Z2 axis: 20 mm/s) further reduces total measurement time.
- In order to maintain the traverse linearity specification for an extended period of time, Mitutoyo has adopted highly rigid ceramic guides that combine the characteristics of smallest secular change and remarkable resistance to abrasion.
- With the support for a wide range of optional peripherals designed for use with the CNC models enables simplified CNC measurement.
- The drive unit (X-axis) and column (Z2-axis) are equipped with a high-accuracy linear encoders (ABS type on Z2-axis). This improves reproducibility of continuous automatic measurement of small holes in the vertical direction and repeated measurement of parts which are difficult to position.
- X axis accuracy:  $\pm(0.8+0.01L)\mu\text{m}$   
Z1 axis accuracy:  $\pm(0.8+0.5H/25)\mu\text{m}$ \*  
Designed to handle workpieces calling for high accuracy.

\*CV-4100S4, H4, W4 types,  
L = Drive length, H = Measurement height (mm)

- The detector unit of CV-4100 series is equipped with a Laser Hologage detector giving excellent narrow/wide range accuracy and resolution in the Z axis (vertical).

#### Principle of Operation



Mitutoyo's innovative Laser Hologage technology provides near interferometer-grade accuracy using the interference phenomenon of diffracted light, coupled with a resolution of  $0.05\mu\text{m}$  over the entire detecting range of 50mm.

### Automatic Measuring Function

- A wide range of optional peripherals are available to support quick and easy CNC operation.



Y-axis Table



Rotary Table 01



Rotary Table 02

### Technical Data

#### X-axis

Measuring range: 4" (100mm) or 8" (200mm)  
Resolution:  $1.97\mu\text{m}$  ( $0.05\mu\text{m}$ )  
Measurement method: Reflective-type linear encoder  
Drive speed: 3.15"/s (80mm/s) and manual  
Measuring speed: 0.0008 - 0.08"/s (0.02 - 2mm/s)  
Measuring direction: Push/Pull  
Traverse linearity:  $32\mu\text{m}/4"$ ,  $80\mu\text{m}/8"$   
\*with the X axis in horizontal orientation  
Linear displacement:  $(40+10L)\mu\text{m}$   
 $\pm(1+0.01L)\mu\text{m}$  (CV-3100S4, H4, W4)  
 $\pm(0.8+0.01L)\mu\text{m}$  (CV-4100S4, H4, W4)  
 $(40+20L)\mu\text{m}$   
 $\pm(1+0.02L)\mu\text{m}$  (CV-3100S8, H8, W8)  
 $(32+20L)\mu\text{m}$   
 $\pm(0.8+0.02L)\mu\text{m}$  (CV-4100S8, H8, W8)  
\* L = Drive length (mm)  
Inclining range:  $\pm 45^\circ$

#### Z2-axis (column)

Vertical travel: 10" (300mm) or 20" (500mm)  
Resolution:  $39.4\mu\text{m}$  ( $1\mu\text{m}$ )  
Measurement method: ABSOLUTE linear encoder  
Drive speed: 0 - 0.79"/s (0 - 20mm/s) and manual

#### Z1-axis (detector unit)

Measuring range:  $\pm 1"$  ( $\pm 25\text{mm}$ )  
Resolution:  $7.87\mu\text{m}$  ( $0.2\mu\text{m}$ ) (CV-3100 series),  
 $1.97\mu\text{m}$  ( $0.05\mu\text{m}$ ) (CV-4100 series)  
Measurement method: Linear encoder (CV-3100 series),  
laser hologage (CV-4100 series)  
Linear displacement:  $\pm(80+140H)\mu\text{m}$   $\pm(2+14H/100)\mu\text{m}$   
(CV-3100 series)  
 $\pm(32+120H)\mu\text{m}$   $\pm(0.8+12H/100)\mu\text{m}$   
(CV-4100 series)  
\*H: Measurement height from the horizontal position (mm)

#### Stylus up/down operation: Arc movement

Face of stylus: Upward/downward  
Measuring force: 30mN  
Traceable angle: Ascent:  $77^\circ$ , descent:  $87^\circ$   
(using the standard stylus provided and depending on the surface roughness)

#### Stylus tip

Base size (W x H): Radius:  $25\mu\text{m}$ , carbide tip  
 $29.5" \times 23.6"$  (750 x 600mm) or  
 $39.4 \times 17.7$  (1000 x 450mm)

#### Base material:

Granite or cast iron  
Mass  
Main unit: 309 lbs (140kg) (S4),  
331 lbs (150kg) (H4), 342 lbs (155kg) (W4)  
320 lbs (145kg) (S8),  
342 lbs (155kg) (H8), 353 lbs (160kg) (W8)

#### Controller Unit:

Remote Control Box: 2 lbs (0.9kg)  
Power supply: 100 - 240VAC  $\pm 10\%$ , 50/60Hz  
Power consumption: 400W (main unit only)

### Collective Calibration Function

- A dedicated calibration gage enables the user to calibrate the instrument for Z-axis gain, symmetry, stylus-tip radius, etc, in a single procedure.



Calibration Kit:  
12AAG160



the standard in world  
metrology software  
**FORM**

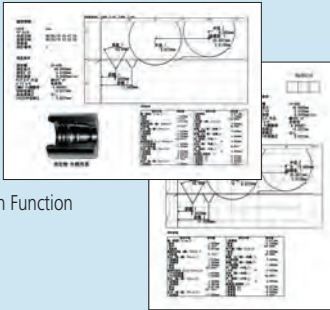
### Optional Software FORMTRACEPAK V5



Measurement  
Control Screen

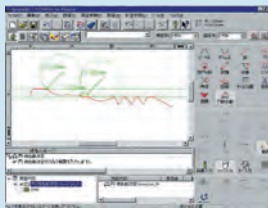


Profile Analysis  
Screen

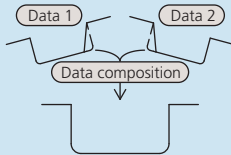


Report Creation Function

### Automatic Circle/Line Application Function



### Data Composition Function



# Contracer CV-3100 / CV-4100

## SERIES 218 — Contour Measuring Instruments

### SPECIFICATIONS

Model No.	CV-3100S4	CV-3100H4	CV-3100W4
Order No. (inch)	<b>218-431A</b>	<b>218-432A</b>	<b>218-433A</b>
Model No.	CV-4100S4	CV-4100H4	CV-4100W4
Order No. (inch)	<b>218-471A</b>	<b>218-472A</b>	<b>218-473A</b>
X1-axis measuring range	4" (100mm)	4" (100mm)	4" (100mm)
Vertical travel	12" power column	20" power column	20" power column
Granite base size (WxD)	23.6 x 17.7" (600 x 450mm)	23.6 x 17.7" (600 x 450mm)	39.4 x 17.7" (1000 x 450mm)
Dimensions (main unit, WxDxH)	29.2 x 17.7 x 35.6" (741 x 450 x 905mm)	29.2 x 17.7 x 43.5" (741 x 450 x 1105mm)	44.0 x 17.7 x 43.7" (1118 x 450 x 1111mm)
Mass (main unit)	309 lbs (140kg)	331 lbs (150kg)	342 lbs (155kg)

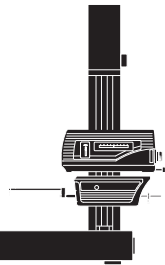
Model No.	CV-3100S8	CV-3100H8	CV-3100W8
Order No. (inch)	<b>218-436A</b>	<b>218-437A</b>	<b>218-438A</b>
Model No.	CV-4100S8	CV-4100H8	CV-4100W8
Order No. (inch)	<b>218-476A</b>	<b>218-477A</b>	<b>218-478A</b>
X1-axis measuring range	8" (200mm)	8" (200mm)	8" (200mm)
Vertical travel	12" power column	20" power column	20" power column
Granite base size (WxD)	23.6 x 17.7" (600 x 450mm)	23.6 x 17.7" (600 x 450mm)	39.4 x 17.7" (1000 x 450mm)
Dimensions (main unit, WxDxH)	30.2 x 17.7 x 35.6" (767 x 450 x 905mm)	30.2 x 17.7 x 43.5" (767 x 450 x 1105mm)	45.0 x 17.7 x 43.7" (1144 x 450 x 1111mm)
Mass (main unit)	320 lbs (145kg)	342 lbs (155kg)	353 lbs (160kg)

### A variety of models available for measuring requirements

#### CV-3100S4 / CV-4100S4

Traverse range: 4" (100mm)  
Vertical travel: 12" (300mm)  
Base size (W x D): 23.6 x 17.7"  
(600 x 450mm)

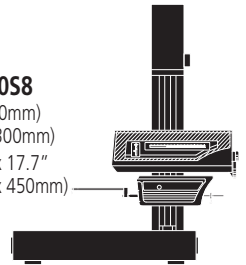
Base material: Granite



#### CV-3100S8 / CV-4100S8

Traverse range: 8" (200mm)  
Vertical travel: 12" (300mm)  
Base size (W x D): 23.6 x 17.7"  
(600 x 450mm)

Base material: Granite



#### CV-3100H4 / CV-4100H4

Traverse range: 4" (100mm)  
Vertical travel: 20" (500mm)  
Base size (W x D): 23.6 x 17.7"  
(600 x 450mm)

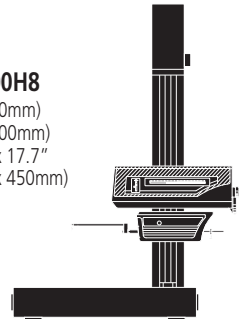
Base material: Granite



#### CV-3100H8 / CV-4100H8

Traverse range: 8" (200mm)  
Vertical travel: 20" (500mm)  
Base size (W x D): 23.6 x 17.7"  
(600 x 450mm)

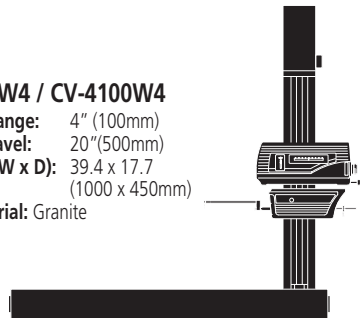
Base material: Granite



#### CV-3100W4 / CV-4100W4

Traverse range: 4" (100mm)  
Vertical travel: 20" (500mm)  
Base size (W x D): 39.4 x 17.7"  
(1000 x 450mm)

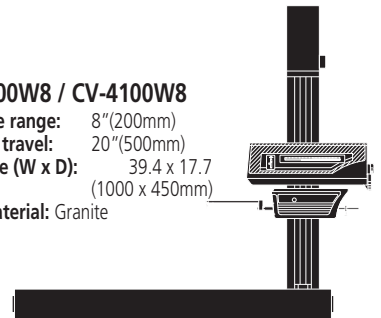
Base material: Granite



#### CV-3100W8 / CV-4100W8

Traverse range: 8" (200mm)  
Vertical travel: 20" (500mm)  
Base size (W x D): 39.4 x 17.7"  
(1000 x 450mm)

Base material: Granite



**Mitutoyo**