Handy Type Model : H350

Wavelength 408／650 | WD (mm) ~300 | Beam diameter (mm) φ1～6 | Resolution 8sec.* | Measurement range ±0.5 | ±1.0 | ±1.75

*It might be different based on model and beam diameter.

*H350R-C050+When connected processing unit.

Features

Reasonable and compact size.

High performance and compact size

High quality is condensed in a compact size.
Working distance is as same as standard model (H499 series).

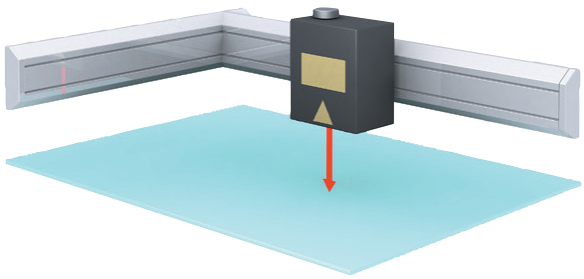
Switchable outgoing beam radius

Can be switched the beam radius by pin hole in a compact body.
φ1,2,6 as standard. φ3 and 4 is option.
※H350R-C175 is for φ1,2 and 5

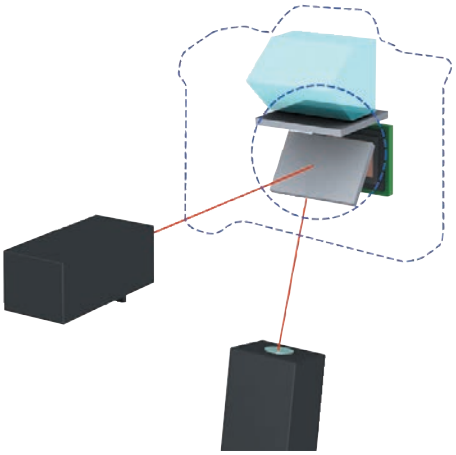
Equipped with red LD

H350R series equipped with red LD, H350B has blue LD for pick up.

Application



built-in system (Glass parallelism measurement)



Mirror angle measurement for digital single-lens reflex

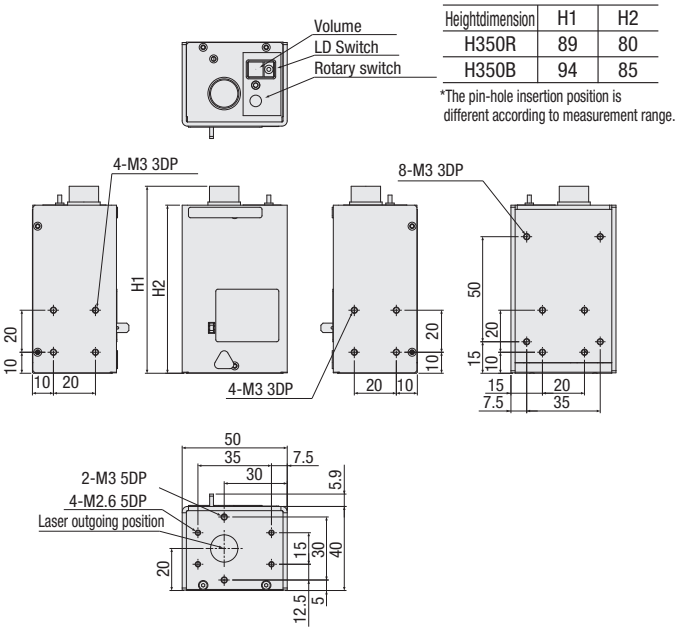
SPEC

	Red LD-mounted model			Blue LD-mounted model	
Model	**H350R-C050**	**H350R-C100**	**H350R-C175**	**H350B-C050**	**H350B-C100**
Measurement range	±0.5 deg.	±1.0 deg.	±1.75 deg.	±0.5 deg.	±1.0 deg.
Resolution*	8 sec.	15 sec.	27 sec.	8 sec.	15 sec.
Measurement wavelength	650±10nm			408±10nm	
Inbuilt light source wavelength	Semiconductor laser 650±10nm (with ON/OFF switch)			Semiconductor laser 408±10nm (with ON/OFF switch)	
Laser output	1.0mW or less (Class 2)				
Outgoing beam diameter	φ1, 2, 6mm＊＊：Selected depending on the pin-hole (φ3, pin-hole for 4mm are sold separately)				
Using The measurement object distance φ1, 2, 3mm	0～300mm	0～200mm	0～120mm	0～300mm	0～200mm
Using The measurement object distance φ4, 5, 6mm**	0～200mm	0～160mm		0～200mm	0～160mm
Output	NTSC method video output, dedicated cable(1.5m) BNC connection				
Weight	0.2kg (Without AC adaptor)				
Electrical power (Included AC adaptor)	Input:AC100-240V 50/60Hz Output:DC6V 1,000mA		Input:AC100-240V 50/60Hz Output:DC12V 500mA	Input:AC100-240V 50/60Hz Output:DC6V 850mA	
Head size (Not include protruding part)	W40×D50×H80mm		W40×D50×H99mm	W40×D50×H85mm	
Standard features	LD switch, C ontroled LD light level, CCD sensitivity calibration, switching beam diameters, available mounted at 4 any position				
Accesarry	Video cable, AC adaptor, Pin-hole (for φ1, 2mm), Instruction manua				
Compatible tilt stage	HB10				

＊Pixel resolution at connected to the processing unit. ＊＊H350R-C175 is φ1, 2, 5, 6mm.

External dimensins

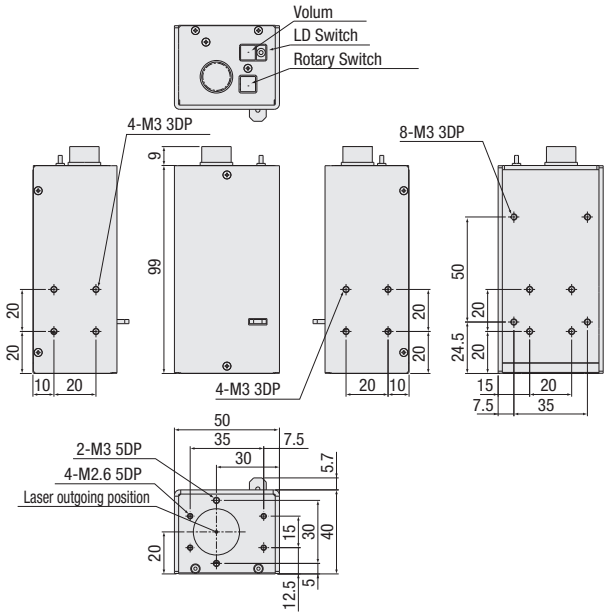
H350∗-C050, C100



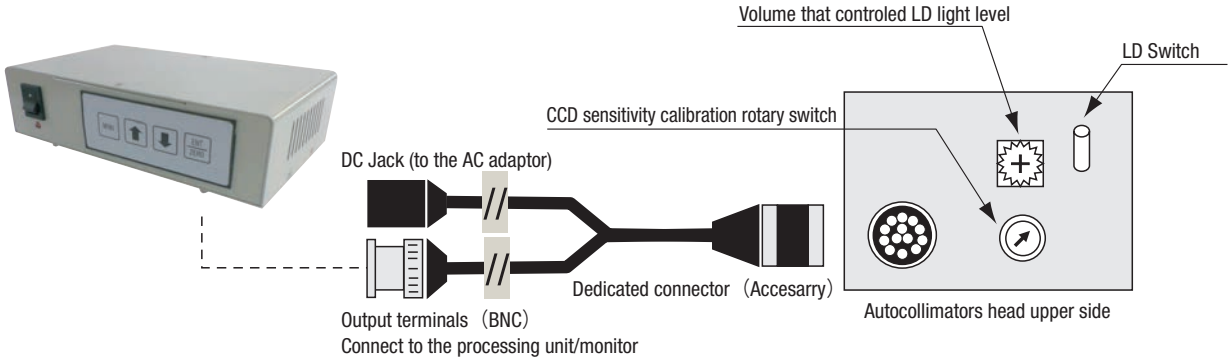
Heightdimension	H1	H2
H350R	89	80
H350B	94	85

*The pin-hole insertion position is different according to measurement range.

H350R-C175



Switch・Connector



Model

H350R-C175/F12E

1 2 3 4

1 Inbuilt light source wavelength

Model	Wavelength λ
R	650nm
B	408nm

2 Measurement range ／Resolution※1

Model	Standard(Measuring reflection)	Type（External incidence）
C050	±0.50 deg. 8 sec.	±1.00 deg. 15 sec.
C100	±1.00 deg. 15 sec.	±2.00 deg. 30 sec.
C175※2	±1.75 deg. 27 sec.	±3.50 deg. 53 sec.

※1 The resolution in the case of the set including the processing unit.
※2 Only H350R

4 Incident light

Model	Factory setting
Unshown	Standard(Measuring reflection)
E	External incidence measurement

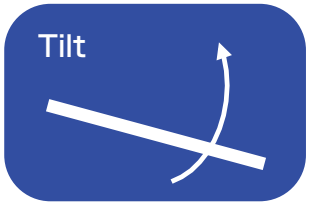
3 Set format

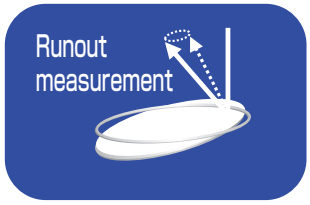
Model	Product name	Laser autocollimator	Processing unit	LCD monitor	Monitor bracket	Tilt stage	Stand	Accesarry	
／F12	Full-set1200	H350∗	HIP-1200	VCM-562HIP	HA10-MB	HB10	HA10	H350-AP	—
／F55	Full-set550		HIP-550	VCM-562HIP	HA10-MB	HB10	HA10	H350-AP	—
／M12	Monitor and HIP set 1200		HIP-1200	VCM-562HIP	—	—	—	—	—
／M55	Monitor and HIP set 550		HIP-550	VCM-562HIP	—	—	—	—	—
／H12	HIP set 1200		HIP-1200	—	—	—	—	—	—
／H55	HIP set 550		HIP-550	—	—	—	—	—	—
／D - H	Half set（Display deg.）		—	VCM-562P	HA10-MB	HB10	HA10	H350-AP	Degree displayed film
／M - H	Half set（Display min.）		—	VCM-562P	HA10-MB	HB10	HA10	H350-AP	Minute displayed film
／D	Monitor set（Display deg.）		—	VCM-562P	—	—	—	—	Degree displayed film
／M	Monitor set（Display min.）		—	VCM-562P	—	—	—	—	Minute displayed film
Unshown	Laser autocollimator		—	—	—	—	—	—	—

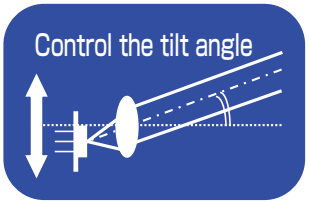
Measurable angle and tilt without contact

Laser Autocollimator

The angle measurement system measuring tilt and run out.







Features

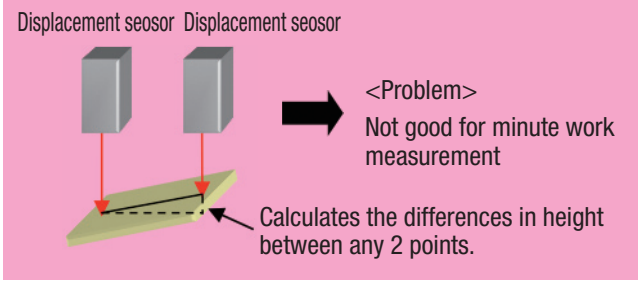
- An angle is measured instantaneously with non-contact and one point measurement.
- Long working distance. (Max. 350mm)*
- High resolution. (0.0008 degree)*

*That differes depending on the product.

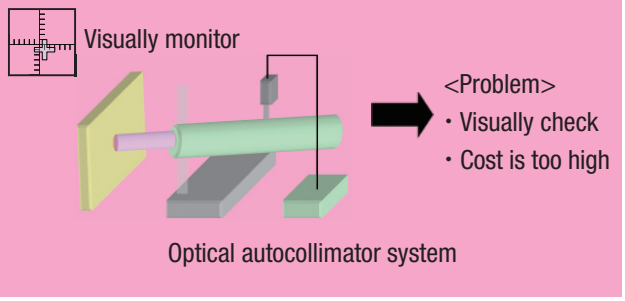
<Measurement comparison>

Conventional system

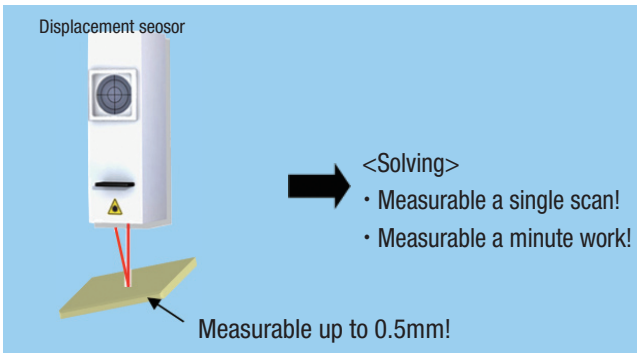
①Displacement seosor system

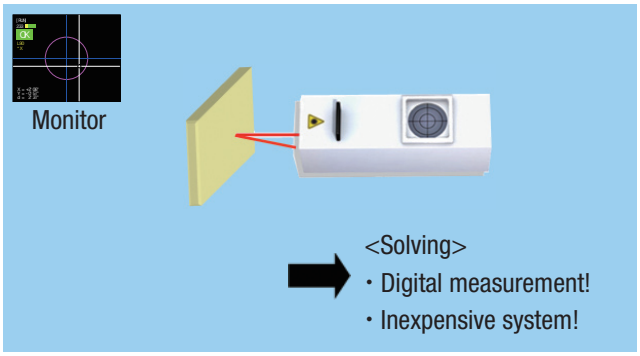


②Optical autocollimator system



Laser autocollimator system





Every tilt of objects is measured for the easy way

(Laser specular reflection is required when measuring)

Laser autocollimator

Configuration of Laser Autocollimator

Measurable tilt with only an autocollimator.

■Appearance

※Full set model

■Standard

Laser autcollimator (LAC)
・Lineup:25models

Processing unit (HIP)
・Display tilt digitally

LCD
・5.6 inch LCD
・Cable length:1.5m
・Connect only NTSC

Tilt stage
・2-axis tilt mechanism (with lock)

Monitor bracket
・Pole and monitor are fixed.

Stand
・Set up any optical sensor.

Set models

■Digital measurement

Full set

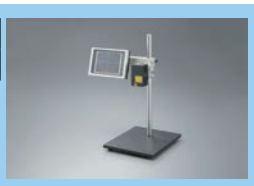
HIPset

High rigidity set

Monitor&HIPset

■Visual measurement

Units	min.(M)
	deg.(D)



Half set

Units	min.(M)
	deg.(D)

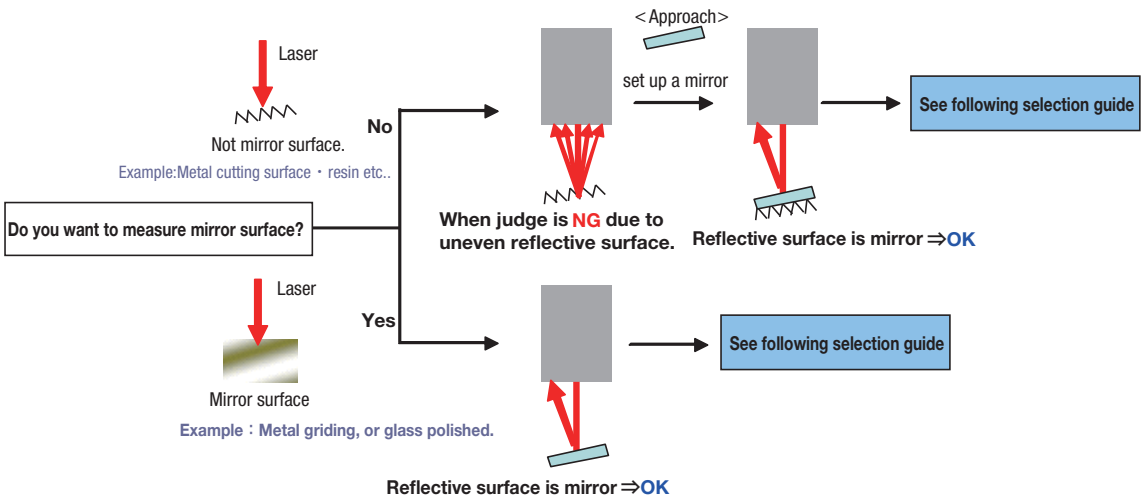
Monitor set

With stand (This is cross-compatible across development, preproduction and manufacturing.)

Without stand (Especially corresponds to manufacturing)

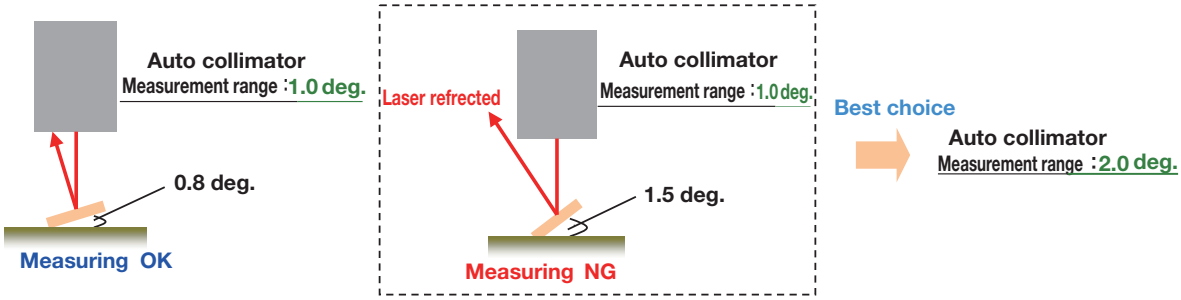
How to Select

[Before use]



【Selection guide】

①Measurement range



②Pixel resolution

Measurement range（deg.）		± 0.16	± 0.25	± 0.3	± 0.35	± 0.5	± 1.0	± 1.5	± 1.75	± 2.0
Pixel resolution	Processing unit（sec.）	3	4	5	6	8	15	23	27	30

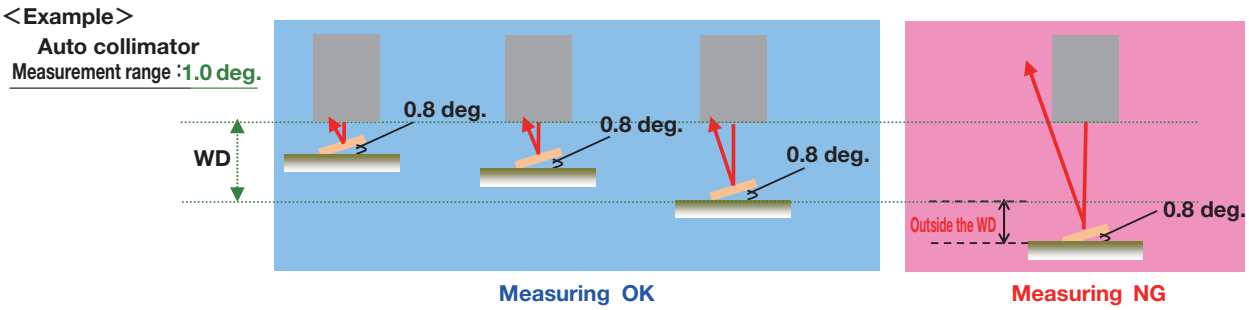
※Resolution of half and monitor set is one tenth that of the measurement range.
※We would like to recommend H900 when you need pixel resolution in less than 3 seconds.
P.5-017

③Wavelength

Wavelength	Measurement objects
● 650 nm（Red）	Mirror、Pure glasses
● 405 nm（Blue）	Not available red LD due to refrection coating and IR cutting filter.

④The measurement object distance

Confirmed the measurement object distance due to model type.



Processing Unit : HIP Series

RoHS

Tilt of work is displayed in numeric value by connecting with laser autocollimator.
High performance reflected light gravity analysis function is improved the measurement accuracy.

Features

Displays angle as numeric values

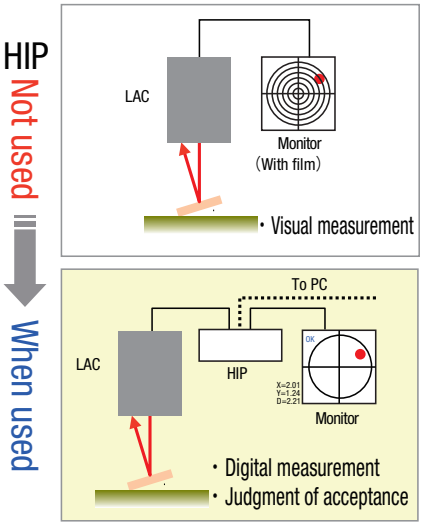
Tilt of work that is detected on the autocollimator, is displayed as numeric values on the XY two dimension coordinates.

Judgment of acceptance

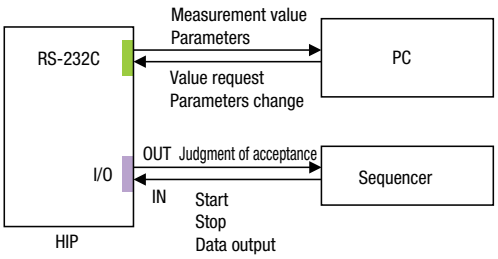
Easily perform judgment of acceptance without depending on any operators.

A satisfying external interface

It is suitable for automation with sirial communication and I/O for control.

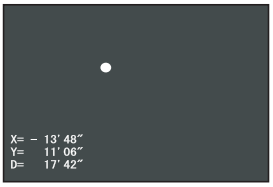


Interface

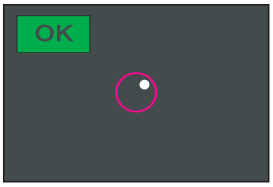


Application

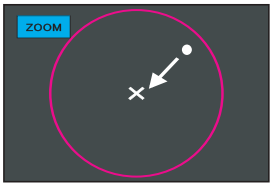
This processing unit can be supported productivity improvement.



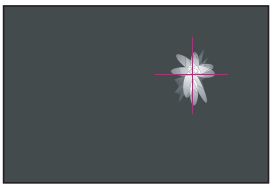
Display up to 1/3600 degree(1 sec.)



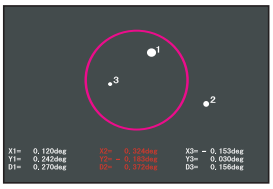
Quick judgment



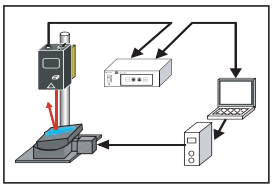
Centering zoom function



High performance spot analysis



Overall or individual PASS/FAIL result of



Automation data collection

HIP Comparison

HIP Type		HIP-550	HIP-1200
Single measurement		○	○
Multi measurement		×	○
Communication speed		30Hz	5Hz
Runout, axis analysis		×	○
Interface	Serial	○	○
	Parallel	○	○

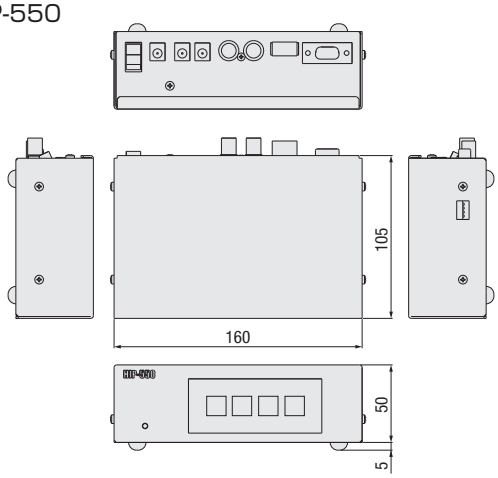
SPEC

		Typical type	High performance type
		HIP-550	HIP-1200
Angular measurement mode	Single measurement	○	○
	Multi measurement	×	○
Measurement application	Off-set tilt measurement	○	○
	3 beam measurement	×	○
	Runout measurement	×	○
Centroid analysis	Center of area	○	○
	Luminance centroid	○	○
	Luminance peak	×	○
	Averaging	×	○
External in and output	I/O for control	○	○
	Communication interface	○	○

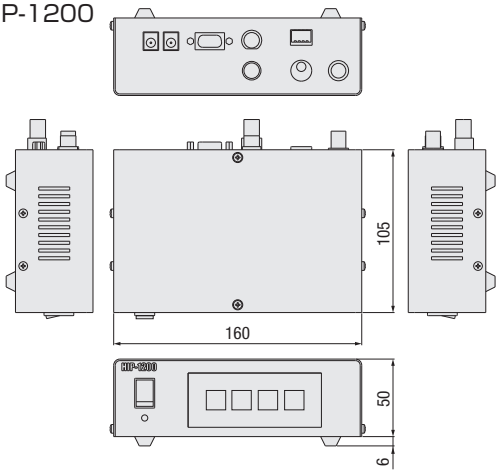
※HIP-500/HIP-1000 has stopped being produced. Please contact us for maintenance.

Dimensional outline drawings

HIP-550

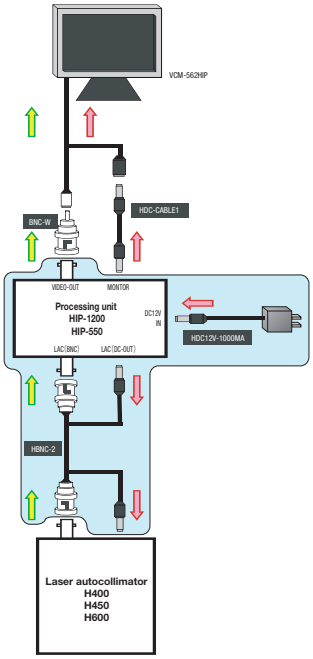


HIP-1200

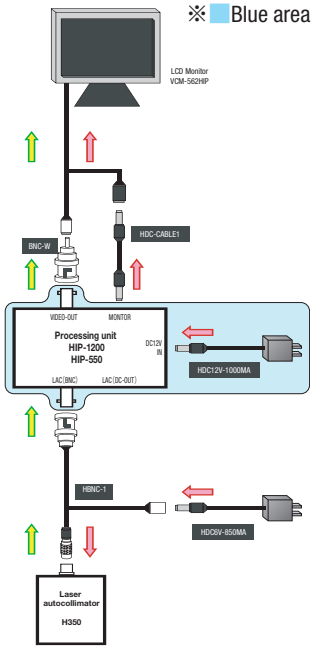


Switch・Connector・Connection

※ Blue area is included a unit model.



Laser autocollimator
H400/H450/H600



Laser autocollimator
H350

Model

HIP-1200/016-PE

1 2 3 4

Model number shows for product-specific sale. When purchase with autocollimator, please specify set-model number. P.5-049
It is shipped with standard calibration when purchase a processing unit in product-specific sale.

1 Processing unit

Model	Type
HIP-550	Typical type
HIP-1200	High performance type

HIP-550

HIP-1200

2 Laser autocollimator Measurement range

Model	Factory setting
016	±0.16°
020	±0.20°
025	±0.25°
030	±0.30°
035	±0.35°
050	±0.50°
100	±1.00°
150	±1.50°
175	±1.75°
200	±2.00°

3 Laser autocollimator type

Model	Type
Unshown	H400, H600
P	H350
V	H450

4 Incidence light

Model	Factory setting
Unshown	Reflection light measurement
E	External incidence measurement

※HIP-500/HIP-1000 has stopped being produced. Please contact us for maintenance.

※Important point
①May need angle calibration if you purchase in product-specifica sale. What is angle calibration?⇒P.5-074
②We will calibrate at the factory shipping if you purchase it with autocollimator. What is set⇒P.5-024

Processing Unit : HIP-1200

RoHS

Multi -spot | 3 mode Centroid analysis | OPU 3 beam Measuremen | Runout measurem | Zoom x4、8、16 | Controll/O | 101101... Serial communication

Features

Multi spots measurement

Several spots are analysed by multi spot reflection at the same time.

3 kinds of applications

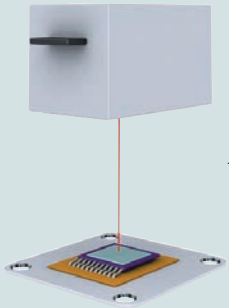
Runout measurement:Analys the tolerance range of tilt and runout.
3 beam measurement:For optical pick up grating.
Off set tilt:This function is useful when measuring the initial angle followed by relative angle in reference to the initial position.

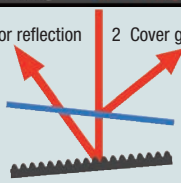
Automation

I/O for control and serial inter face are equiped as standard.

Application

Digital cameras



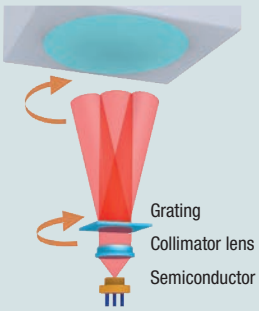


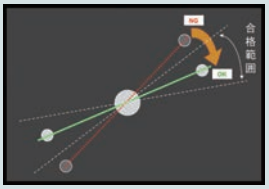
1 Image sensor reflection
2 Cover glass reflection

Tilt measurement of image sensor for cameras.

Reflection of cover glass surface and element surface are captured at the same time.
Distinguish the sizes are sorted from the smallest shows tilt of element surface.
It is possible to judgment of acceptance for standard values.(Element surface can not take a reflection or it might be taking other reflection depending on the imager.)
Optical pick up

Optical pick up

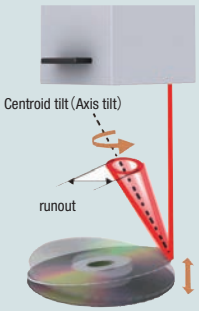


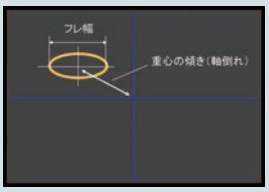


Measure sub-beam (±primary light) of optical pick up

Detect a diffraction light by grating, and then measure the angle different to the direction of rotation.
It is possible to judgment of acceptance for standard values.
Presicion Motors/Optical disc

Presicion Motors/Optical disc





Measure runout and tilt of presicion motors and optical disc.

Runout and tilt is measured in the axial trace of reflection.
It is possible to judgment of acceptance for standard values.

SPEC				
Model※1		**HIP-1200/＊＊＊-P**	**HIP-1200/＊＊＊**	**HIP-1200/＊＊＊-V**
Compatible autocollimator		H350	H400/H600	H450
Basic specifications	Image output	NTSC signal（BNC）		
	Seriall／F	RS-232C（D-sub 9P male）		
	Parallel I／F	Insulated type I/O, in:3port, out:1port		
	Control	Membrane switch・Serial command control・I/O control		
	Power source（Included AC adaptor）	AC100～240V±10% 50/60Hz / DC12V 1A or less		
	Size、Weight	160（W）× 50（H）× 105（D）mm、600g		
	Communication speed	5Hz		
Accesarry	Connecting cable	Nothing※2	HBNC-2	HBNC-2
	AC adaptor	HDC12V-1000MA	HDC12V-1000MA	HDC12V-1000MA

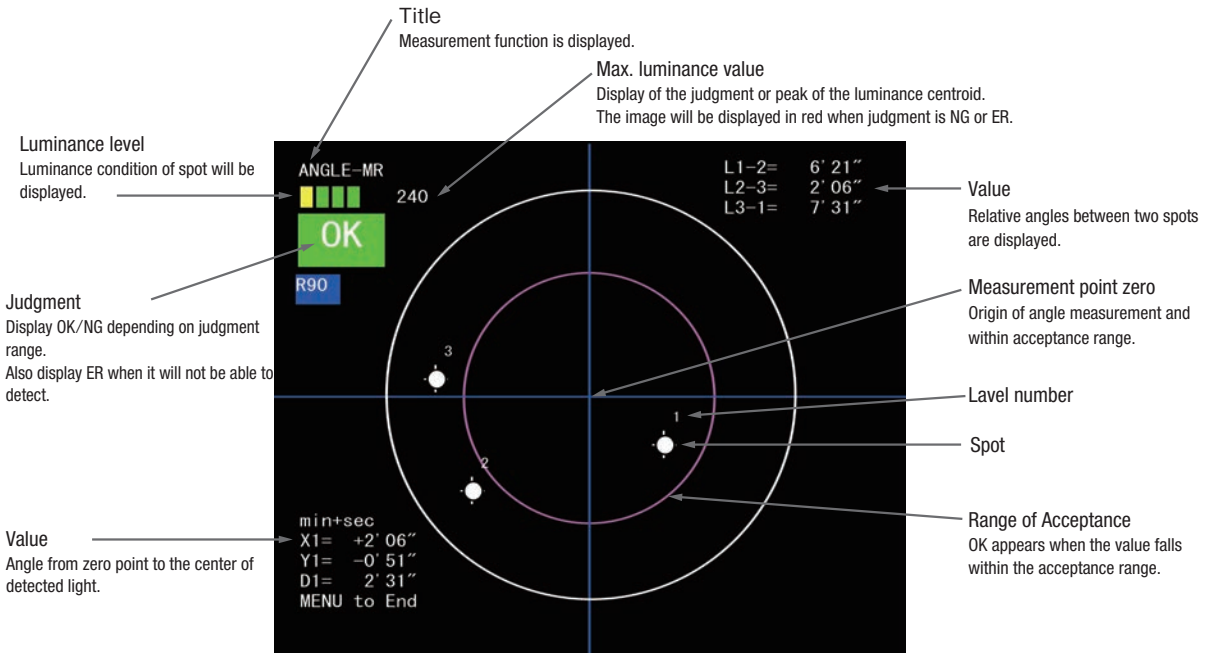
※1 See ▶P.5-040 for compatible type.
※2 Connect with H350 attachment cable.

Function

Model		HIP-1200	HIP-1000※
		The latest modeol	End-of-life model
Angle measurement	Single measurement	○	×
	Multi measurement	○	○
	（Lavel ordering）	Sizing/angle size from the center of measurement	Labeling from upper left
Application function	Off-set tilt measurement	○	×
	3 beam measurement	○	×
	Runout measurement	○	○
Angle analysis	Center of area	○	○
	Luminance centroid	○	○
	Luminance peak	○	×
User-friendly function	Display the luminance value	○	×
	Zoom function	○	×
	Image rotation（XY axis switching）	○	×
	Reversed a mark	○	×
	Averaging	○	×
Admission decision Range of Acceptance	Circle	○	○
	Square（Rad/Tan）	○	○
Admission decision Judgment condition	Offset judgment	○	×
	Multi measurement Selected points	○	×
	Multi measurement All points	○	—
Serial communication	Command control	○	—

※HIP-500/HIP-1000 has stopped being produced. Please contact us for maintenance.

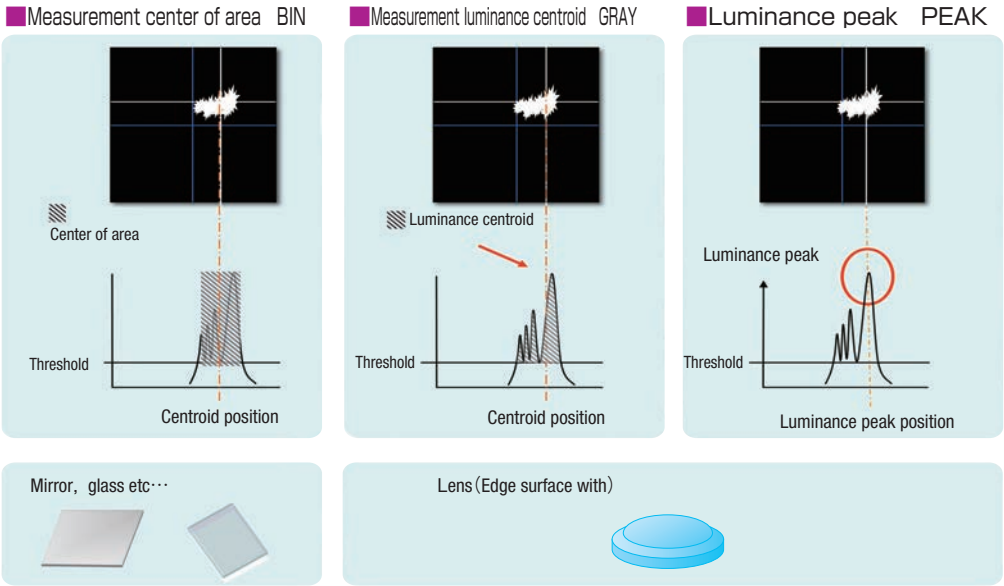
The display (Multi relative measurement MULTIR.)



Processing Unit : HIP-1200

■A wide range of centroid analysis.

There are 3 kinds of centroid analysis at when measure the angle.（Center of area, Luminance Centroid, Luminance Peak）
Center of area measurement, ideal for specular reflection such as mirrors or glasses. Luminance centroid measurement is good for measuring skew angle such as lens edge surface. Also HIP-1200 has measured luminance peak.

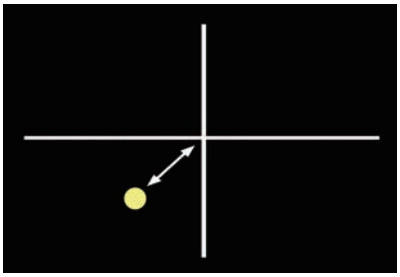


■Single measurement

Measuring only one spot reflection.
Display the angle it calculated all of luminance information on the screen when the several refractors is measured with a single measurement on the luminance centroid mode. (A single measurement that is center of area of specified label.)

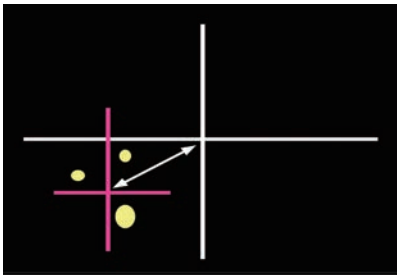
Single measurement SINGLE

One spot



Single measurement SINGLE

Several spots

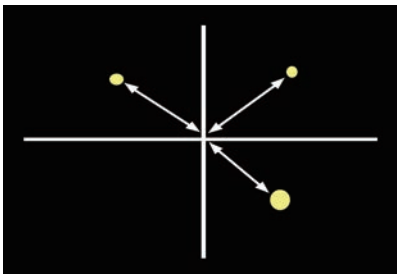


(When selecte luminance centroid mode)
Angle display a centroid that included all of luminance on the screen

■Multi measurement

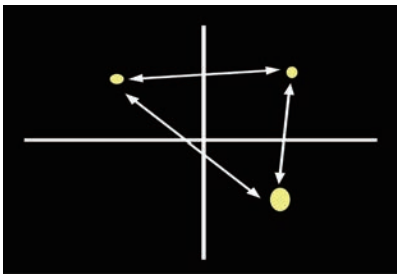
Selectable from 2 kinds of measurements depending on your opinion.
MULTIA: Several spots are detected at the same time.
MULTIR: Angle difference of several spots are detected.

Multi measurement MULTI A



Measure an angle of several spots at the same time.

Multi relative measurement MULTI R

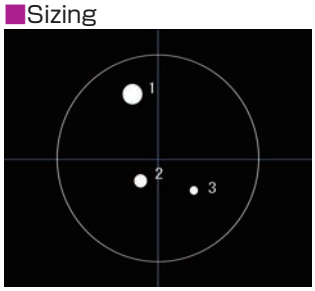


Measure an angle difference between spots.

Labeling function

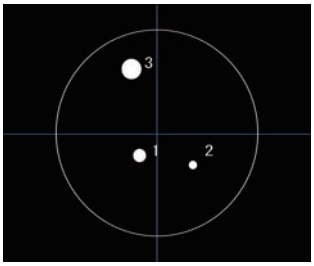
The arrangement of the label number is set.
Spots are numbered starting with the spot having the largest area (in the descending order of area).
Spots are numbered starting with the spot having the largest angle from the center of measurement (in the ascending order of angle).

Sizing



Detect a size of spot, and make a label to be ordered from largest.

Order from smallest

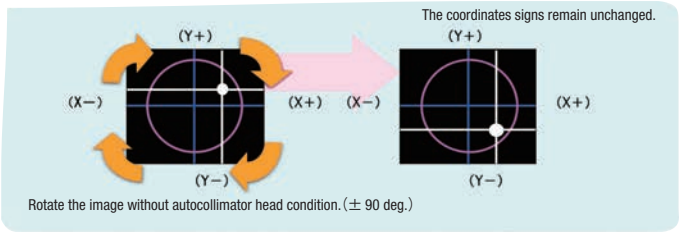


Spot is numbered 1 from smallest(near center of measurement). Label should be changed when spot is switched.

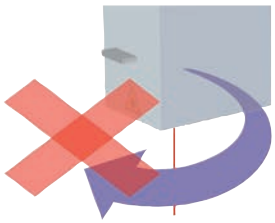
Centroid analysis Mode		Single measurement		Multi measurement	
	Setting code	Labeling	Centroid analysis	Labeling	Centroid analysis
Center of area	BIN	Label	Center of area for a specified label	Label	Center of area for a specified label or Each center of area for all the labels
Luminance centroid	GRAY	Unlabel	Luminance centroid of all of the luminanance in the screen	Label	Luminance centroid of one point of specified label or Each luminance centroid for all the labels.
Luminance peak	PEAK	Unlabel	Max.luminance position of all of the luminance on the screen.	It can not be used	

User-Friendly function

Function 1 Rotation

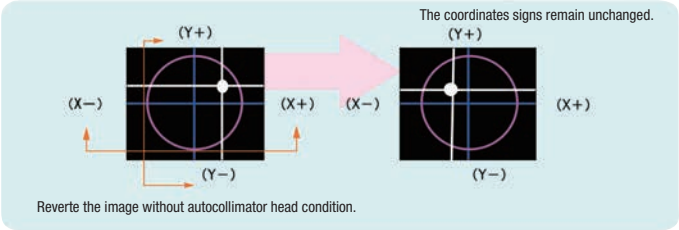


Rotate the image without autocollimator head condition.(± 90 deg.)



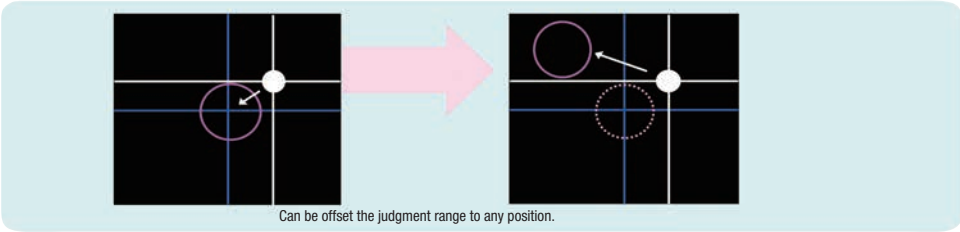
Freely attachable the image.
Reduce your strange feeling easily.

Function 2 Mirroring



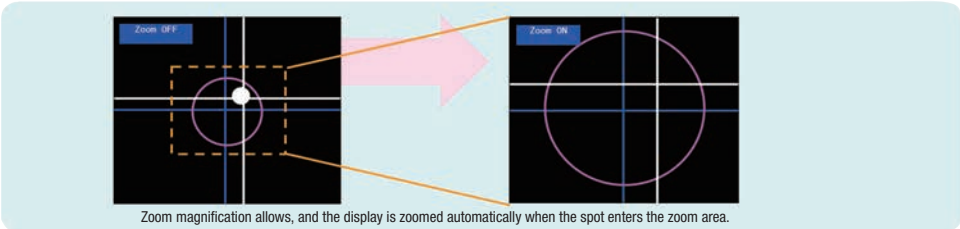
Reverte the image without autocollimator head condition.

Function 3 Offset judgment



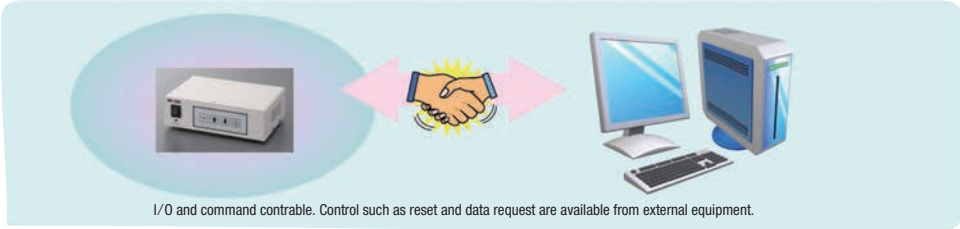
Can be offset the judgment range to any position.

Function 4 Zoom



Zoom magnification allows, and the display is zoomed automatically when the spot enters the zoom area.

Function 5 External interface



I/O and command contrable. Control such as reset and data request are available from external equipment.

Laser Autocollimator Set Type

Features

6 kinds of setting types

Allows combination of multiple units for your need.

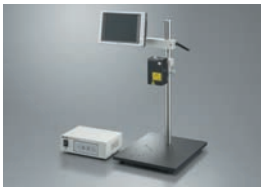
Included everything what you want.

Set model is included all what you need.

Accurate calibration

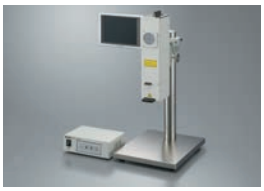
We are trying sensitive calibration for each our set model.

Application



【Full set】 See page P.5-051 for details.

Autocolli	HIP	Monitor	Monitor bracket	Tilt	Standard stand



【High rigidity set】 See page P.5-053 for details.

Autocolli	HIP	Monitor	Monitor bracket	Tilt	High rigidity stand

【monitor&HIP set】 See page P.5-055 for details.

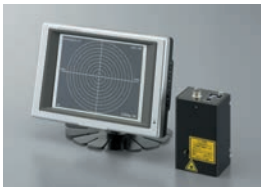
Autocolli	HIP	Monitor	Monitor bracket	Tilt	Standard stand

【HIP set】 See page P.5-057 for details.

Autocolli	HIP	Monitor	Monitor bracket	Tilt	Standard stand

【Half set】 See page P.5-059 for details.

Autocolli	HIP	Monitor	Monitor bracket	Tilt	Standard stand



【Monitor set】 See page P.5-061 for details.

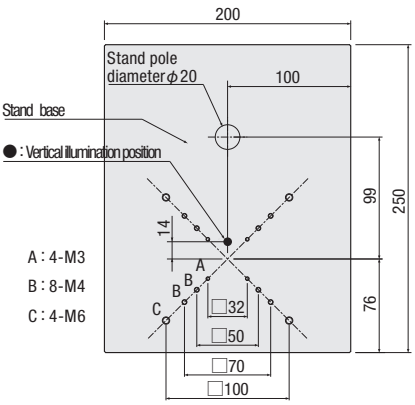
Autocolli	HIP	Monitor	Monitor bracket	Tilt	Standard stand

※See autocollimator accessory if purchase separately. See P.5-063
Common accessories P.5-067

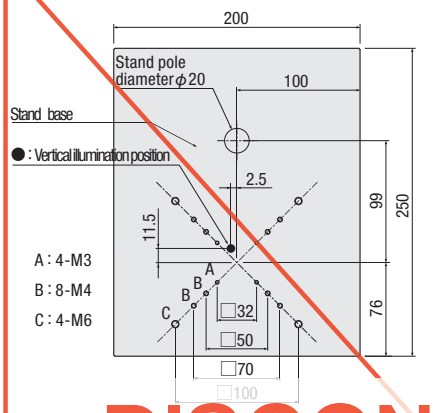
Vertical illumination position(e.g. Full-set or Half-set model)

※Please contact us about high rigidity model

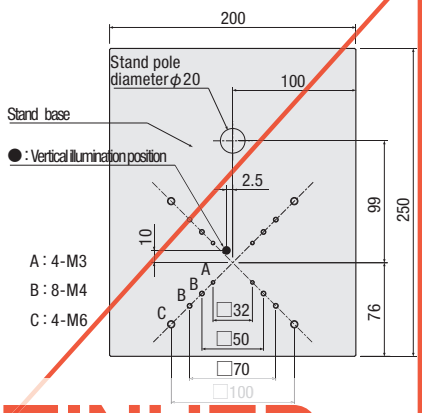
H350R



H400-C

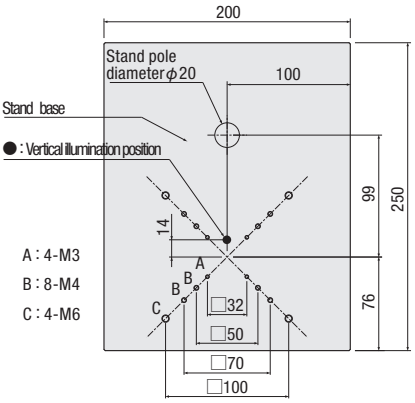


H400-CS

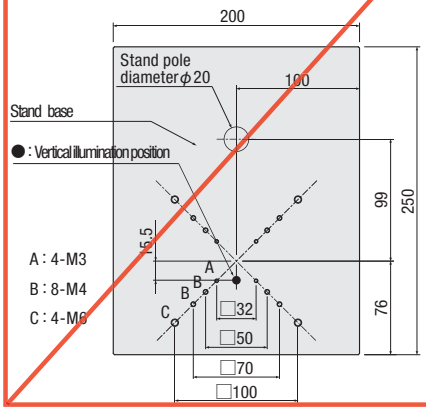


DISCONTINUED

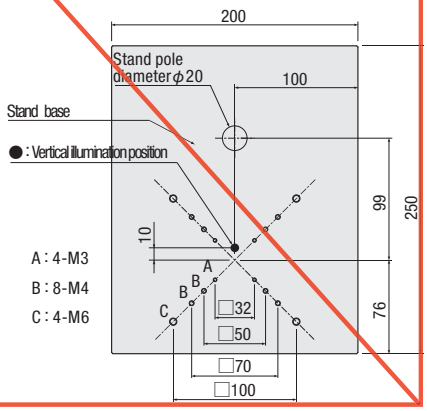
H350B



H450



H600



Model

H400-C025S/F12

1 2

1 Laser autocollimator model

Model	Product name
H350✳-C✳✳✳	Compact type
H400 -C✳✳✳	General-purpose type
H400 -C✳✳✳S	High resolution Two-visual-field
H450✳-C✳✳✳	Ghost cancel type
H600✳ -C✳✳✳S	Dual-wavelength type

2 Set model

Model	Product name	Autocollimator	Processing unit	LCD monitor	Monitor bracket	Tilt stage	Stand	Accesarry
/ F 1 2	Full-set 1200	○	HIP-1200	○	○	○	HA10	—
/ F 5 5	Full-set 550	○	HIP-550	○	○	○	HA10	—
/ K 1 2	High rigidity set 1200	○	HIP-1200	○	○	○	HA11N	—
/ K 5 5	High rigidity set 550	○	HIP-550	○	○	○	HA11N	—
/ M 1 2	Monitor and HIP set 1200	○	HIP-1200	○	—	—	–	—
/ M 5 5	Monitor and HIP set 550	○	HIP-550	○	—	—	–	—
/ H 1 2	HIP set 1200	○	HIP-1200	—	—	—	–	—
/ H 5 5	HIP set 550	○	HIP-550	—	—	—	–	—
/ D - H	Halfrset (Degree display)	○	–	○	○	○	HA10	Degree displayed film
/ M - H	Halfrset (Minute display)	○	–	○	○	○	HA10	Minute displayed film
/ D	Monitorset (Degree display)	○	–	○	—	—	–	Degree displayed film
/ M	Monitorset (Minute display)	○	–	○	—	—	–	Minute displayed film
Unshown	Laser autocollimator	○	–	—	—	—	–	—

Full Set

Autocolli | HIP | Monitor | Monitor bracket | Tilt | Standard stand

■Features

■Select the standard model to help you decide

This model covers everything for measurement with autocollimator.

Satisfy multiple and diverse users' needs.

■Easy to use and accurate measurement

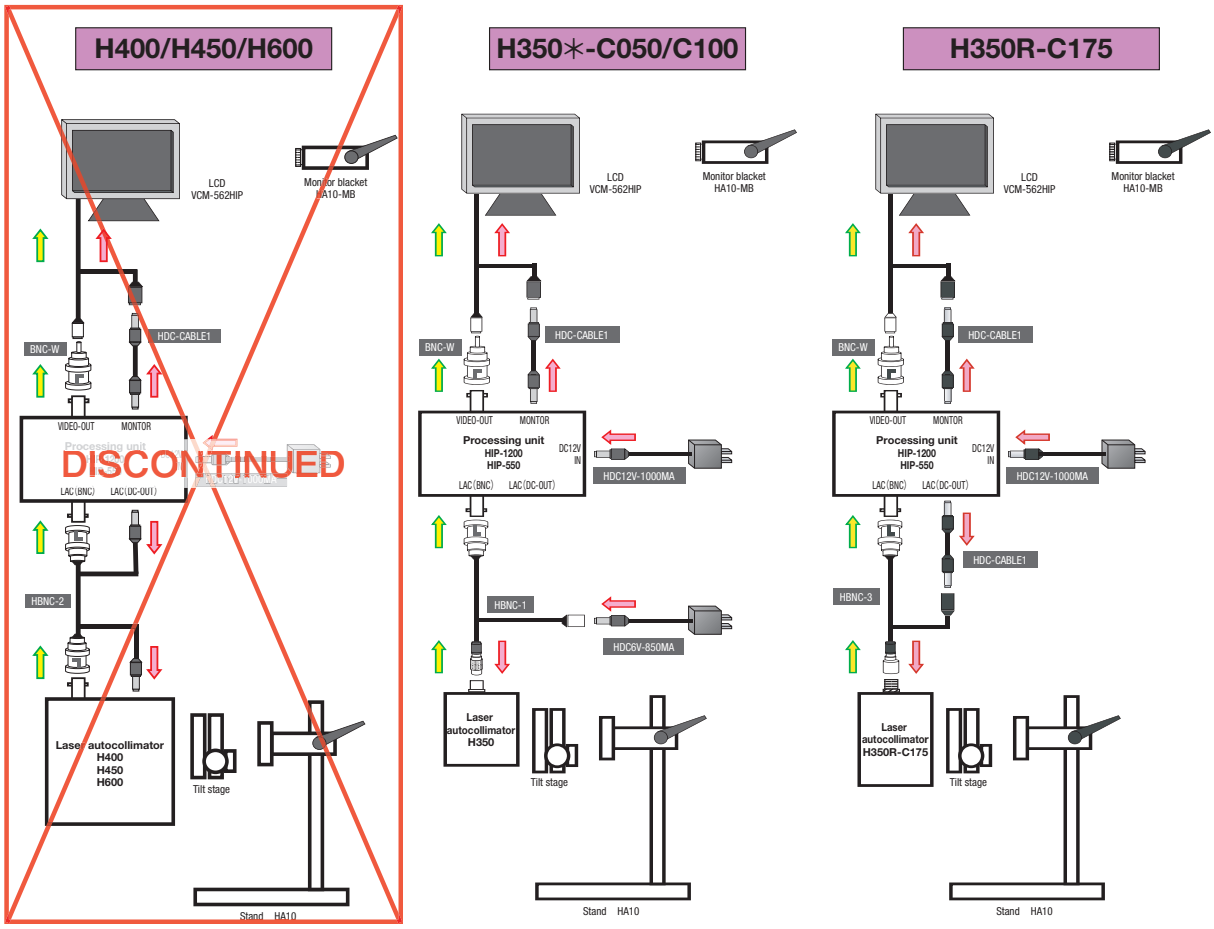
Tilt of work that is detected on the autocollimator by using processing unit, is displayed as numeric values on the XY two dimension coordinates.

■Two types processing unit

HIP-1200 is focused on the high performance, HIP-550 is placed especially for the price.

Selectable from both of our high grade processing units.

■Switch・Conecter・conection



※See autocollimator accessory if purchase separately. See ▶ P.5-063
Common accessories ▶ P.5-067

Set list

※Not included optical elements such as parallel mirror, wedge substrate etc..

Reflection measurement (Standard): Measure an angle of the object using an internal light source of laser

Product name	Model	Measurement range/Resolution		Weight	Product lineup: Autocollimator	Processing unit	LCD monitor	Monitor bracket	Tilt stage	Stand
Compact laser autocollimator full-set 1200	H350R-C050/F12	±0.50 degrees	8 seconds	4.0kg	H350R-C050	HIP-1200/050-P	VCM-562HIP	HA10-MB	HB10 (With H350-AP)	HA10
	H350R-C100/F12	±1.00 degrees	15 seconds	4.0kg	H350R-C100	HIP-1200/100-P				
	H350R-C175/F12	±1.75 degrees	27 seconds	4.0kg	H350R-C175	HIP-1200/175-P				
	H350B-C050/F12	±0.50 degrees	8 seconds	4.0kg	H350B-C050	HIP-1200/050-P				
	H350B-C100/F12	±1.00 degrees	15 seconds	4.0kg	H350B-C100	HIP-1200/100-P				
Laser autocollimator full-set 1200 (DISCONTINUED)	H400-C016S/F12	±0.16 degrees	3 seconds	5.4kg	H400-C016S	HIP-1200/016	VCM-562HIP	HA10-MB	HB11	HA10
	H400-C025S/F12	±0.25 degrees	4 seconds	5.4kg	H400-C025S	HIP-1200/025				
	H400-C035S/F12	±0.35 degrees	6 seconds	5.4kg	H400-C035S	HIP-1200/035				
	H400-C050/F12	±0.50 degrees	8 seconds	4.7kg	H400-C050	HIP-1200/050	VCM-562HIP	HA10-MB	HB10	HA10
	H400-C100/F12	±1.00 degrees	15 seconds	4.7kg	H400-C100	HIP-1200/100				
	H400-C150/F12	±1.50 degrees	23 seconds	4.7kg	H400-C150	HIP-1200/150				
	H400-C200/F12	±2.00 degrees	30 seconds	4.7kg	H400-C200	HIP-1200/200				
Ghost cancellation type laser autocollimator full-set 1200 (DISCONTINUED)	H450R-C050/F12	±0.50 degrees	8 seconds	5.1kg	H450R-C050	HIP-1200/050-V	VCM-562HIP	HA10-MB	HB11	HA10
	H450R-C100/F12	±1.00 degrees	15 seconds	5.1kg	H450R-C100	HIP-1200/100-V				
	H450R-C150/F12	±1.50 degrees	23 seconds	5.1kg	H450R-C150	HIP-1200/150-V				
	H450B-C050/F12	±0.50 degrees	8 seconds	5.1kg	H450B-C050	HIP-1200/050-V				
	H450B-C100/F12	±1.00 degrees	15 seconds	5.1kg	H450B-C100	HIP-1200/100-V				
	H450B-C150/F12	±1.50 degrees	23 seconds	5.1kg	H450B-C150	HIP-1200/150-V				
Dual wavelength correspondence laser autocollimator full-set 1200 (DISCONTINUED)	H600-C020S/F12	±0.20 degrees	3 seconds	5.3kg	H600-C020S	HIP-1200/020	VCM-562HIP	HA10-MB	HB11	HA10
	H600-C030S/F12	±0.30 degrees	5 seconds	5.3kg	H600-C030S	HIP-1200/030				
Internal two wavelength laser autocollimator full-set 1200 (DISCONTINUED)	H600B-C020S/F12	±0.20 degrees	3 seconds	5.3kg	H600B-C020S	HIP-1200/020				
	H600B-C030S/F12	±0.30 degrees	5 seconds	5.3kg	H600B-C030S	HIP-1200/030				
Compact laser autocollimator full-set 550	H350R-C050/F55	±0.50 degrees	8 seconds	3.8kg	H350R-C050	HIP-550/050-P	VCM-562HIP	HA10-MB	HB10 (With H350-AP)	HA10
	H350R-C100/F55	±1.00 degrees	15 seconds	3.8kg	H350R-C100	HIP-550/100-P				
	H350R-C175/F55	±1.75 degrees	27 seconds	3.8kg	H350R-C175	HIP-550/175-P				
	H350B-C050/F55	±0.50 degrees	8 seconds	3.8kg	H350B-C050	HIP-550/050-P				
	H350B-C100/F55	±1.00 degrees	15 seconds	3.8kg	H350B-C100	HIP-550/100-P				
Laser autocollimator full-set 550 (DISCONTINUED)	H400-C016S/F55	±0.16 degrees	3 seconds	5.2kg	H400-C016S	HIP-550/016	VCM-562HIP	HA10-MB	HB11	HA10
	H400-C025S/F55	±0.25 degrees	4 seconds	5.2kg	H400-C025S	HIP-550/025				
	H400-C035S/F55	±0.35 degrees	6 seconds	5.2kg	H400-C035S	HIP-550/035				
	H400-C050/F55	±0.50 degrees	8 seconds	4.5kg	H400-C050	HIP-550/050	VCM-562HIP	HA10-MB	HB10	HA10
	H400-C100/F55	±1.00 degrees	15 seconds	4.5kg	H400-C100	HIP-550/100				
	H400-C150/F55	±1.50 degrees	23 seconds	4.5kg	H400-C150	HIP-550/150				
	H400-C200/F55	±2.00 degrees	30 seconds	4.5kg	H400-C200	HIP-550/200				
Ghost cancellation type laser autocollimator full-set 550 (DISCONTINUED)	H450R-C050/F55	±0.50 degrees	8 seconds	4.9kg	H450R-C050	HIP-550/050-V	VCM-562HIP	HA10-MB	HB11	HA10
	H450R-C100/F55	±1.00 degrees	15 seconds	4.9kg	H450R-C100	HIP-550/100-V				
	H450R-C150/F55	±1.50 degrees	23 seconds	4.9kg	H450R-C150	HIP-550/150-V				
	H450B-C050/F55	±0.50 degrees	8 seconds	4.9kg	H450B-C050	HIP-550/050-V				
	H450B-C100/F55	±1.00 degrees	15 seconds	4.9kg	H450B-C100	HIP-550/100-V				
	H450B-C150/F55	±1.50 degrees	23 seconds	4.9kg	H450B-C150	HIP-550/150-V				
Dual wavelength correspondence laser autocollimator full-set 550 (DISCONTINUED)	H600-C020S/F55	±0.20 degrees	3 seconds	5.1kg	H600-C020S	HIP-550/020	VCM-562HIP	HA10-MB	HB11	HA10
	H600-C030S/F55	±0.30 degrees	5 seconds	5.1kg	H600-C030S	HIP-550/030				
Internal dual wavelength laser autocollimator full-set 550 (DISCONTINUED)	H600B-C020S/F55	±0.20 degrees	3 seconds	5.1kg	H600B-C020S	HIP-550/020				
	H600B-C030S/F55	±0.30 degrees	5 seconds	5.1kg	H600B-C030S	HIP-550/030				

External incidence measurement (E type) ：Turn off the internal light source, measuring laser light axis tilt when object is emitted.

Product name	Model	Measurement range/Resolution		Weight	Product lineup: Autocollimator	Processing unit	LCD monitor	Monitor bracket	Tilt stage	Stand
Compact laser autocollimator full-set 1200-E type	H350R-C050/F12E	±1.00 degrees	15 seconds	4.0kg	H350R-C050	HIP-1200/050-PE	VCM-562HIP	HA10-MB	HB10 (With H350-AP)	HA10
	H350R-C100/F12E	±2.00 degrees	30 seconds	4.0kg	H350R-C100	HIP-1200/100-PE				
	H350R-C175/F12E	±3.50 degrees	53 seconds	4.0kg	H350R-C175	HIP-1200/175-PE				
	H350B-C050/F12E	±1.00 degrees	15 seconds	4.0kg	H350B-C050	HIP-1200/050-PE				
	H350B-C100/F12E	±2.00 degrees	30 seconds	4.0kg	H350B-C100	HIP-1200/100-PE				
Laser autocollimator full-set 1200-E type (DISCONTINUED)	H400-C016S/F12E	±0.32 degrees	5 seconds	5.4kg	H400-C016S	HIP-1200/016-E	VCM-562HIP	HA10-MB	HB11	HA10
	H400-C025S/F12E	±0.50 degrees	8 seconds	5.4kg	H400-C025S	HIP-1200/025-E				
	H400-C035S/F12E	±0.70 degrees	11 seconds	5.4kg	H400-C035S	HIP-1200/035-E				
	H400-C050/F12E	±1.00 degrees	15 seconds	4.7kg	H400-C050	HIP-1200/050-E	VCM-562HIP	HA10-MB	HB10	HA10
	H400-C100/F12E	±2.00 degrees	30 seconds	4.7kg	H400-C100	HIP-1200/100-E				
	H400-C150/F12E	±3.00 degrees	45 seconds	4.7kg	H400-C150	HIP-1200/150-E				
	H400-C200/F12E	±4.00 degrees	60 seconds	4.7kg	H400-C200	HIP-1200/200-E				
Dual wavelength correspondence laser autocollimator full-set 1200-E type (DISCONTINUED)	H600-C020S/F12E	±0.40 degrees	6 seconds	5.3kg	H600-C020S	HIP-1200/020-E	VCM-562HIP	HA10-MB	HB11	HA10
	H600-C030S/F12E	±0.60 degrees	9 seconds	5.3kg	H600-C030S	HIP-1200/030-E				
Internal two wavelength laser autocollimator full-set 1200-E type (DISCONTINUED)	H600B-C020/F12E	±0.40 degrees	6 seconds	5.3kg	H600B-C020S	HIP-1200/020-E				
	H600B-C030/F12E	±0.60 degrees	9 seconds	5.3kg	H600B-C030S	HIP-1200/030-E				
Compact laser autocollimator full-set 1200-E type	H350R-C050/F55E	±1.00 degrees	15 seconds	3.8kg	H350R-C050	HIP-550/050-PE	VCM-562HIP	HA10-MB	HB10 (With H350-AP)	HA10
	H350R-C100/F55E	±2.00 degrees	30 seconds	3.8kg	H350R-C100	HIP-550/100-PE				
	H350R-C175/F55E	±3.50 degrees	53 seconds	3.8kg	H350R-C175	HIP-550/175-PE				
	H350B-C050/F55E	±1.00 degrees	15 seconds	3.8kg	H350B-C050	HIP-550/050-PE				
	H350B-C100/F55E	±2.00 degrees	30 seconds	3.8kg	H350B-C100	HIP-550/100-PE				
Laser autocollimator full-set 550E type (DISCONTINUED)	H400-C016S/F55E	±0.32 degrees	5 seconds	5.2kg	H400-C016S	HIP-550/016-E	VCM-562HIP	HA10-MB	HB11	HA10
	H400-C025S/F55E	±0.50 degrees	8 seconds	5.2kg	H400-C025S	HIP-550/025-E				
	H400-C035S/F55E	±0.70 degrees	11 seconds	5.2kg	H400-C035S	HIP-550/035-E				
	H400-C050/F55E	±1.00 degrees	15 seconds	4.5kg	H400-C050	HIP-550/050-E	VCM-562HIP	HA10-MB	HB10	HA10
	H400-C100/F55E	±2.00 degrees	30 seconds	4.5kg	H400-C100	HIP-550/100-E				
	H400-C150/F55E	±3.00 degrees	45 seconds	4.5kg	H400-C150	HIP-550/150-E				
	H400-C200/F55E	±4.00 degrees	60 seconds	4.5kg	H400-C200	HIP-550/200-E				
Dual wavelength correspondence laser autocollimator Full-set 550-E type (DISCONTINUED)	H600-C020S/F55E	±0.40 degrees	6 seconds	5.1kg	H600-C020S	HIP-550/020-E	VCM-562HIP	HA10-MB	HB11	HA10
	H600-C030S/F55E	±0.60 degrees	9 seconds	5.1kg	H600-C030S	HIP-550/030-E				
Internal two wavelength laser autocollimator Full-set 550-E type (DISCONTINUED)	H600B-C020/F55E	±0.40 degrees	6 seconds	5.1kg	H600B-C020S	HIP-550/020-E				
	H600B-C030/F55E	±0.60 degrees	9 seconds	5.1kg	H600B-C030S	HIP-550/030-E				

Model

H350R-C050/F12E

1 2 3

1 Laser autocollimator model

Model	Product name
H350∗-C∗∗∗	Compact type
H400 -C∗∗∗	General-purpose type
H400 -C∗∗∗S	High resolution Two-visual-field
H450∗-C∗∗∗	Ghost cancel type
H600∗ -C∗∗∗S	Dual-wavelength type

(DISCONTINUED)

3 Incidence light

Model	Factory setting
Unshown	Standard (Measuring reflection)
E	External incidence measurement

※Not be selected external incident measurement "E" in H450

2 Set model

Model	Product name	Autocollimator	Processing unit	LCD monitor	Monitor bracket	Tilt stage	Stand
/ F 1 2	Full-set 1200	○	HIP-1200	○	○	○	HA10
/ F 5 5	Full-set 550	○	HIP-550	○	○	○	HA10

Monitor and HIP Set

Autocolli | HIP | Monitor | Monitor bracket | Tilt | Standard stand

■Features

■For embeded equipment

They seem to be a set; a laser autocollimator for measurement, a processing unit for analysis and then a LCD for display. You can also easily set up on production line or equipment integration with optional jig.

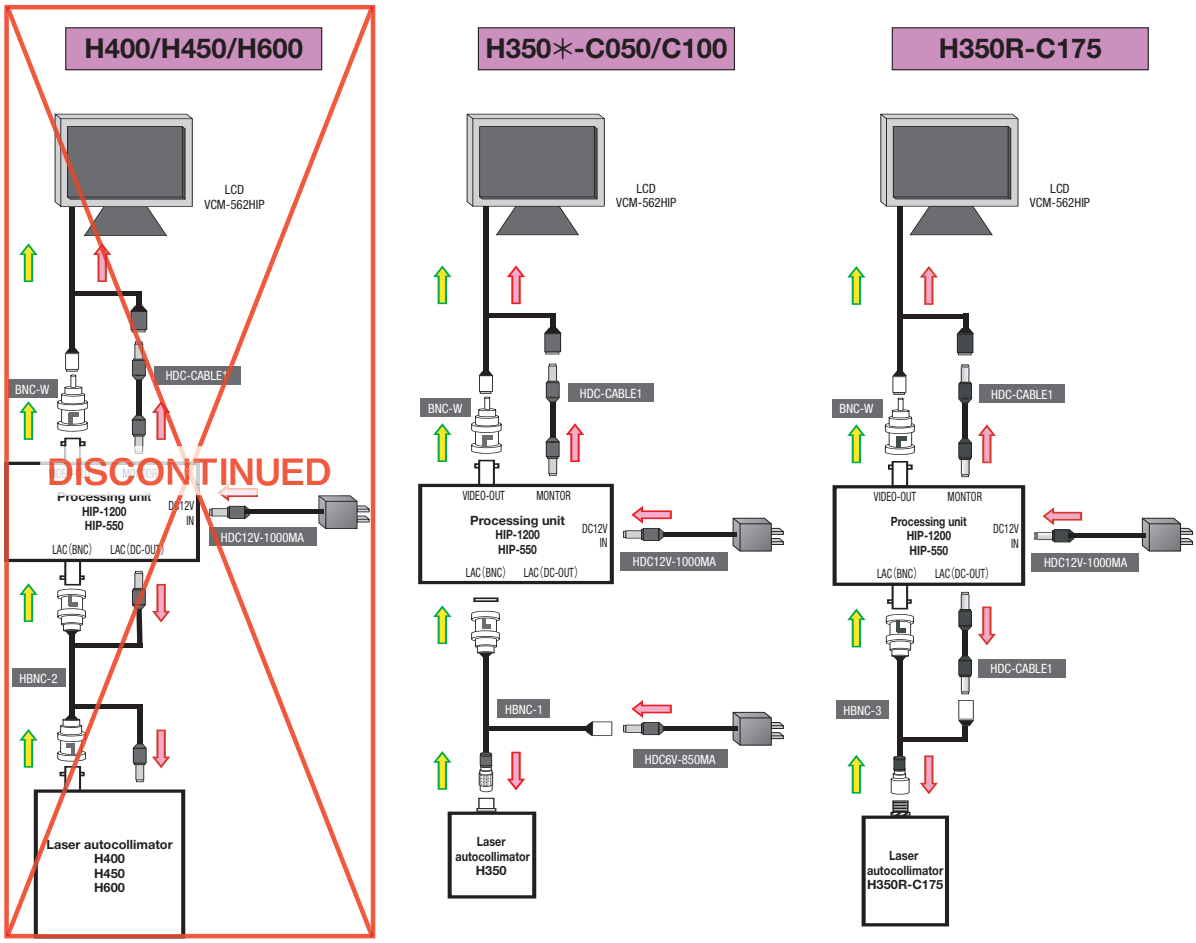
■Easily & Accurately

Display a numeric value on the XY, 2D coordinate workpiece tilt that is detected by laser autocollimator of processing unit.
Can be judged angle result without dependence operator.

■2 types of processing unit

Selectable from theHIP set 1200 focusing on the function and an emphasis cost performance the HIP set 550.
Both of 2 types have a communication interface as standard, correspond with the automation.

■Switchi・Connector・Connection



※See autocollimator accessory if purchase separately. See ▶ P.5-063
Common accessories ▶ P.5-067

Set list

※Not included optical elements such as parallel mirror, wedge substrate etc..

Reflection measurement (Standard): Measure an angle of the object using an internal light source of laser

Product name	Model	Measurement range	Resolution	Weight	Product lineup: Autocollimator	Processing unit	LCD monitor	Processing unit	Tilt stage	Stand
Compact laser autocollimator Monitor and HIP set 1200	H350R-C050/M12	±0.50 degrees	8 seconds	1.1kg	H350R-C050	HIP-1200/050-P	VCM-562HIP	—	—	—
	H350R-C100/M12	±1.00 degrees	15 seconds	1.1kg	H350R-C100	HIP-1200/100-P				
	H350R-C175/M12	±1.75 degrees	27 seconds	1.1kg	H350R-C175	HIP-1200/175-P				
	H350B-C050/M12	±0.50 degrees	8 seconds	1.1kg	H350B-C050	HIP-1200/050-P				
	H350B-C100/M12	±1.00 degrees	15 seconds	1.1kg	H350B-C100	HIP-1200/100-P				
Laser autocollimator Monitor and HIP set 1200	H400-C016S/M12	±0.16 degrees	3 seconds	2.3kg	H400-C016S	HIP-1200/016	VCM-562HIP	—	—	—
	H400-C025S/M12	±0.25 degrees	4 seconds	2.3kg	H400-C025S	HIP-1200/025				
	H400-C035S/M12	±0.35 degrees	6 seconds	2.3kg	H400-C035S	HIP-1200/035				
	H400-C050/M12	±0.50 degrees	8 seconds	1.8kg	H400-C050	HIP-1200/050	VCM-562HIP	—	—	—
	H400-C100/M12	±1.00 degrees	15 seconds	1.8kg	H400-C100	HIP-1200/100				
	H400-C150/M12	±1.50 degrees	23 seconds	1.8kg	H400-C150	HIP-1200/150				
	H400-C200/M12	±2.00 degrees	30 seconds	1.8kg	H400-C200	HIP-1200/200				
Ghost cancel typeLaser autocollimator Monitor and HIP set 1200	H450R-C050/M12	±0.50 degrees	8 seconds	2.0kg	H450R-C050	HIP-1200/050-V	VCM-562HIP	—	—	—
	H450R-C100/M12	±1.00 degrees	15 seconds	2.0kg	H450R-C100	HIP-1200/100-V				
	H450R-C150/M12	±1.50 degrees	23 seconds	2.0kg	H450R-C150	HIP-1200/150-V				
	H450B-C050/M12	±0.50 degrees	8 seconds	2.0kg	H450B-C050	HIP-1200/050-V				
	H450B-C100/M12	±1.00 degrees	15 seconds	2.0kg	H450B-C100	HIP-1200/100-V				
	H450B-C150/M12	±1.50 degrees	23 seconds	2.0kg	H450B-C150	HIP-1200/150-V				
Dual wavelength correspondence laser autocollimator Monitor and HIP set 1200	H600-C020S/M12	±0.20 degrees	3 seconds	2.2kg	H600-C020S	HIP-1200/020	VCM-562HIP	—	—	—
	H600-C030S/M12	±0.30 degrees	5 seconds	2.2kg	H600-C030S	HIP-1200/030				
Internal two wavelength laser autocollimator Monitor and HIP set 1200	H600B-C020S/M12	±0.20 degrees	3 seconds	2.2kg	H600B-C020S	HIP-1200/020				
	H600B-C030S/M12	±0.30 degrees	5 seconds	2.2kg	H600B-C030S	HIP-1200/030				
Compact laser autocollimator Monitor and HIP set 550	H350R-C050/M55	±0.50 degrees	8 seconds	0.9kg	H350R-C050	HIP-550/050-P	VCM-562HIP	—	—	—
	H350R-C100/M55	±1.00 degrees	15 seconds	0.9kg	H350R-C100	HIP-550/100-P				
	H350R-C175/M55	±1.75 degrees	27 seconds	0.9kg	H350R-C175	HIP-550/175-P				
	H350B-C050/M55	±0.50 degrees	8 seconds	0.9kg	H350B-C050	HIP-550/050-P				
	H350B-C100/M55	±1.00 degrees	15 seconds	0.9kg	H350B-C100	HIP-550/100-P				
Laser autocollimator Monitor and HIP set 550	H400-C016S/M55	±0.16 degrees	3 seconds	2.1kg	H400-C016S	HIP-550/016	VCM-562HIP	—	—	—
	H400-C025S/M55	±0.25 degrees	4 seconds	2.1kg	H400-C025S	HIP-550/025				
	H400-C035S/M55	±0.35 degrees	6 seconds	2.1kg	H400-C035S	HIP-550/035				
	H400-C050/M55	±0.50 degrees	8 seconds	1.6kg	H400-C050	HIP-550/050	VCM-562HIP	—	—	—
	H400-C100/M55	±1.00 degrees	15 seconds	1.6kg	H400-C100	HIP-550/100				
	H400-C150/M55	±1.50 degrees	23 seconds	1.6kg	H400-C150	HIP-550/150				
	H400-C200/M55	±2.00 degrees	30 seconds	1.6kg	H400-C200	HIP-550/200				
Ghost cancel typeLaser autocollimator Monitor and HIP set 550	H450R-C050/M55	±0.50 degrees	8 seconds	1.8kg	H450R-C050	HIP-550/050-V	VCM-562HIP	—	—	—
	H450R-C100/M55	±1.00 degrees	15 seconds	1.8kg	H450R-C100	HIP-550/100-V				
	H450R-C150/M55	±1.50 degrees	23 seconds	1.8kg	H450R-C150	HIP-550/150-V				
	H450B-C050/M55	±0.50 degrees	8 seconds	1.8kg	H450B-C050	HIP-550/050-V				
	H450B-C100/M55	±1.00 degrees	15 seconds	1.8kg	H450B-C100	HIP-550/100-V				
	H450B-C150/M55	±1.50 degrees	23 seconds	1.8kg	H450B-C150	HIP-550/150-V				
Dual wavelength correspondence laser autocollimator Monitor and HIP set 550	H600-C020S/M55	±0.20 degrees	3 seconds	2.0kg	H600-C020S	HIP-550/020	VCM-562HIP	—	—	—
	H600-C030S/M55	±0.30 degrees	5 seconds	2.0kg	H600-C030S	HIP-550/030				
Internal two wavelength laser autocollimator Monitor and HIP set 550	H600B-C020S/M55	±0.20 degrees	3 seconds	2.0kg	H600B-C020S	HIP-550/020				
	H600B-C030S/M55	±0.30 degrees	5 seconds	2.0kg	H600B-C030S	HIP-550/030				

External incidence measurement (E type) ：Turn off the internal light source, measuring laser light axis tilt when object is emitted.

Product name	Model	Measurement range	Resolution	Weight	Product lineup: Autocollimator	Processing unit	LCD monitor	Processing unit	Tilt stage	Stand
Compact laser autocollimator Monitor and HIP set 1200-E type	H350R-C050/M12E	±1.00 degrees	15 seconds	1.1kg	H350R-C050	HIP-1200/050-PE	VCM-562HIP	—	—	—
	H350R-C100/M12E	±2.00 degrees	30 seconds	1.1kg	H350R-C100	HIP-1200/100-PE				
	H350R-C175/M12E	±3.50 degrees	53 seconds	1.1kg	H350R-C175	HIP-1200/175-PE				
	H350B-C050/M12E	±1.00 degrees	15 seconds	1.1kg	H350B-C050	HIP-1200/050-PE				
	H350B-C100/M12E	±2.00 degrees	30 seconds	1.1kg	H350B-C100	HIP-1200/100-PE				
Laser autocollimator Monitor and HIP set 1200-E type	H400-C016S/M12E	±0.32 degrees	5 seconds	2.3kg	H400-C016S	HIP-1200/016-E	VCM-562HIP	—	—	—
	H400-C025S/M12E	±0.50 degrees	8 seconds	2.3kg	H400-C025S	HIP-1200/025-E				
	H400-C035S/M12E	±0.70 degrees	11 seconds	2.3kg	H400-C035S	HIP-1200/035-E				
	H400-C050/M12E	±1.00 degrees	15 seconds	1.8kg	H400-C050	HIP-1200/050-E	VCM-562HIP	—	—	—
	H400-C100/M12E	±2.00 degrees	30 seconds	1.8kg	H400-C100	HIP-1200/100-E				
	H400-C150/M12E	±3.00 degrees	45 seconds	1.8kg	H400-C150	HIP-1200/150-E				
	H400-C200/M12E	±4.00 degrees	60 seconds	1.8kg	H400-C200	HIP-1200/200-E				
Dual wavelength correspondence laser autocollimator Monitor and HIP set 1200-E type	H600-C020S/M12E	±0.40 degrees	6 seconds	2.2kg	H600-C020S	HIP-1200/020-E	VCM-562HIP	—	—	—
	H600-C030S/M12E	±0.60 degrees	9 seconds	2.2kg	H600-C030S	HIP-1200/030-E				
Internal two wavelength laser autocollimator Monitor and HIP set 1200-E type	H600B-C020/M12E	±0.40 degrees	6 seconds	2.2kg	H600B-C020S	HIP-1200/020-E				
	H600B-C030/M12E	±0.60 degrees	9 seconds	2.2kg	H600B-C030S	HIP-1200/030-E				
Compact laser autocollimator Monitor and HIP set 550-E type	H350R-C050/M55E	±1.00 degrees	15 seconds	0.9kg	H350R-C050	HIP-550/050-PE	VCM-562HIP	—	—	—
	H350R-C100/M55E	±2.00 degrees	30 seconds	0.9kg	H350R-C100	HIP-550/100-PE				
	H350R-C175/M55E	±3.50 degrees	53 seconds	0.9kg	H350R-C175	HIP-550/175-PE				
	H350B-C050/M55E	±1.00 degrees	15 seconds	0.9kg	H350B-C050	HIP-550/050-PE				
	H350B-C100/M55E	±2.00 degrees	30 seconds	0.9kg	H350B-C100	HIP-550/100-PE				
Laser autocollimator Monitor and HIP set 550-E type	H400-C016S/M55E	±0.32 degrees	5 seconds	2.1kg	H400-C016S	HIP-550/016-E	VCM-562HIP	—	—	—
	H400-C025S/M55E	±0.50 degrees	8 seconds	2.1kg	H400-C025S	HIP-550/025-E				
	H400-C035S/M55E	±0.70 degrees	11 seconds	2.1kg	H400-C035S	HIP-550/035-E				
	H400-C050/M55E	±1.00 degrees	15 seconds	1.6kg	H400-C050	HIP-550/050-E	VCM-562HIP	—	—	—
	H400-C100/M55E	±2.00 degrees	30 seconds	1.6kg	H400-C100	HIP-550/100-E				
	H400-C150/M55E	±3.00 degrees	45 seconds	1.6kg	H400-C150	HIP-550/150-E				
	H400-C200/M55E	±4.00 degrees	60 seconds	1.6kg	H400-C200	HIP-550/200-E				
Dual wavelength correspondence laser autocollimator Monitor and HIP set 550-E type	H600-C020S/M55E	±0.40 degrees	6 seconds	2.0kg	H600-C020S	HIP-550/020-E	VCM-562HIP	—	—	—
	H600-C030S/M55E	±0.60 degrees	9 seconds	2.0kg	H600-C030S	HIP-550/030-E				
Internal two wavelength laser autocollimator Monitor and HIP set 550-E type	H600B-C020/M55E	±0.40 degrees	6 seconds	2.0kg	H600B-C020S	HIP-550/020-E				
	H600B-C030/M55E	±0.60 degrees	9 seconds	2.0kg	H600B-C030S	HIP-550/030-E				

Model

H400-C100/M55E

1 2 3

1 Laser autocollimator model

Model	Product name
H350∗-C∗∗∗	Compact type
H400 -C∗∗∗	General-purpose type
H400 -C∗∗∗S	High resolution Two-visual-field
H450∗-C∗∗∗	Ghost cancel type
H600∗ -C∗∗∗S	Dual-wavelength type

3 Incident light

Model	Factory setting
Unshown	Standard (Measuring reflection)
E	External incidence measurement

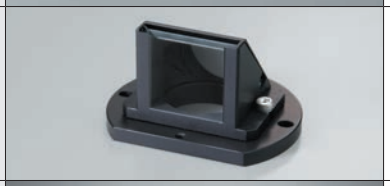
※Not be selected external incident measurement "E" in H450

2 Set model

Model	Product name	Autocollimator	Processing unit	LCD monitor	Processing unit	Tilt stage	Stand
/ M 1 2	Monitor and HIP set 1200	○	HIP-1200	○	—	—	—
/ M 5 5	Monitor and HIP set 550	○	HIP-550	○	—	—	—

Accesorry for Autocollimator

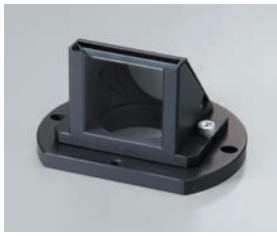
Abailable accessaries for each types such as beam split adaptor, 90degree folded adaptor or additional items.

Accessaries index for each type		Screen type H100 series	Compact type H350 series	General-purpose type H400-C series	High rigidity two-visual-field type H400-CS series	Ghost cancel type H450 series	Dual-wavelength type H600 series	High speed high resolution type H900 series	Processing unit type HIP series
Pin-hole P.5-065		●	●	●	●	●	●		
Beam split 90 degree folded adaptor P.5-064		●	●*1	●	●		●		
ND filter P.5-065		Please contact us	Please contact us	Please contact us	●		●	Please contact us	
ND filter folder P.5-065		Please contact us	Please contact us	Please contact us	●		●	Please contact us	
Adaptor plate P.5-064			●						
Power source P.5-066		●	●	●	●	●	●		●
Image cable P.5-066			●	●	●	●	●		●
Conector, cable ,mouse for processing unit P.5-066									●
Accessaries for high rigidity H900 P.5-066								●	

*1 Extra plate for attachment of HT(for H350) is required. P.5-064

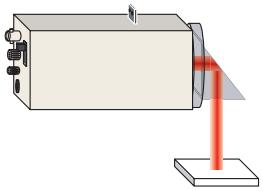
Common accessories P.5-067	Tilt stage	Stand	Rod bracket
LCD monitor	Monitor bracket	Mirror	Wedge substrate

Beam Split•90 Degree Folded Adaptor

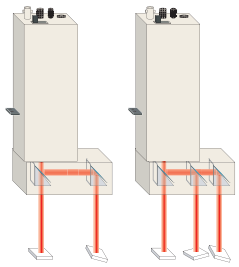


90 degree folded adaptor

3 beam split adaptor



Folded 90 degree optical axis of autocollimator



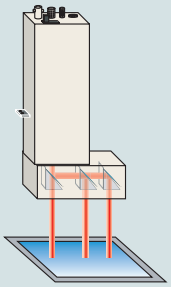
Multi spot measurement is available with splitting an optical axis 2 or 3.

Product name	Model	Weight	Remark
90 degree folded adaptor	HT-90	0.04kg	Folded 90 degree optical axis of autocollimator. ※1 ※3
2 beam split adaptor	HT-20	0.24kg	Split two the autocollimator beam ※2 ※3 ※4
3 beam split adaptor	HT-30	0.25kg	Split three the autocollimator beam ※2 ※3 ※4

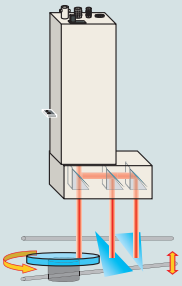
※1 The folded direction can be changed as required.
※2 Minimum split 14mm, maximum split 55.5mm between 2 beams
※3 Extra plate for attachment of HT(for H350:350-HTP) is required.
※4 Beam power variation occurs due to installation direction. (Contact our support team)

【Split adaptor application guide】

Ex1: Simple inspection of a planar mirror



Ex2: Optical disc drive assembly



Adaptor Plate

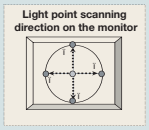
The plate for changing installation direction is used to mount the tilt stage on side of H350.
The plate for installation direction (H350-AP) is supplied with the full-set and half-set.
HT installation plate is used to mount the split or folded adaptor.

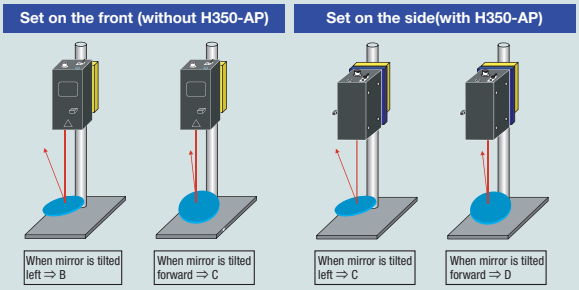
Plate for changing position(for H350 setting)

Product name	Model	Weight
Plate for changing position(for H350)	H350-AP	0.10kg
Plate for HT mounting(for H350)	H350-HTP	0.10kg

【Mounted surface and display direction】

How to use the plate for changing position(for H350AP)

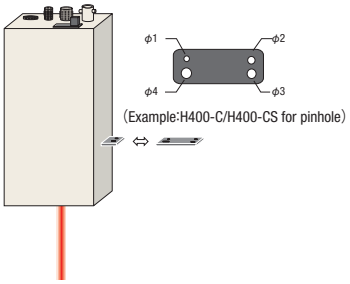


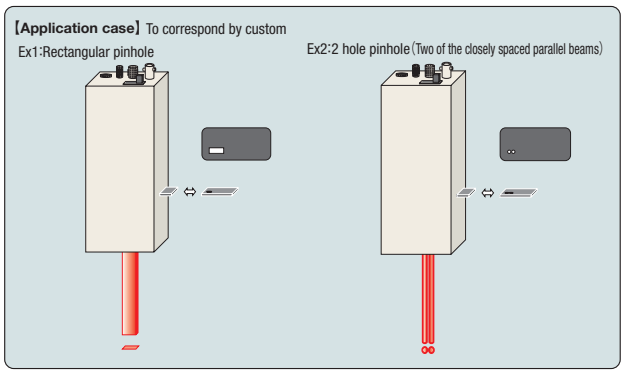


※ Autocollimator series other than H350 doesn't need an adaptor plate.
※ Note that H350 is different of installation and display direction other than autocollimator.

Pinhole

The pinhole for changing the outgoing beam of autocollimator. (As a standard).We provide φ0. 5 type※3 of micro region measurement.





Product name	Model	Weight	Attached as standard ※1
Pinhole for H100 (φ 1, 2, 3, 4)	**H100-P**	0.02kg	H100
Pinhole for H350B/R-C100/C175 (φ 0.5)	**H350-C100-P05**	0.01kg	
Pinhole for H350B/R-C050 (φ 1, 2)	**H350-C050-P12**		H350 ✳ -C050
Pinhole for H350B/R-C100/C175 (φ 1, 2)	**H350-C100-P12**		H350 ✳ -C100
Pinhole for H350B/R-C050 (φ 3, 4)	**H350-C050-P34**		
Pinhole for H350B/R-C100/C175 (φ 3, 4)	**H350-C100-P34**		
Pinhole for H400-C/H400-CS (φ 1, 2, 3, 4)	**H400-P**	0.02kg	H400-C/H400-CS
Pinhole for H400-C (old type) (φ 1, 2, 3, 4) ※2	**H400-C-P**		
Pinhole for H450 (φ 1, 2, 5, 7)	**H450-P**		H450
Pinhole for H600 (φ 1, 2, 3, 4)	**H600-P**		H600
Pinhole for H400-C/H400-CS (φ 0.5)	**H400-P05**		
Pinhole for H450 (φ 0.5)	**H450-P05**		
Pinhole for H600 (φ 0.5)	**H600-P05**		

※1 Equippped it as standard at the factory shipping.
※2 H400-C upper connecting plate White(old type)/Black(new type)
※3 Φ0.5 type : Not available H350B/R-C050.

ND Filter

The ND filter for controlling light volume when measure external incident light.

ND filter (For H400-CS, H600)	
Size : φ 30	
S73-30-1	Transmittance : 0.1% or less
S73-30-1P	Transmittance : 1%
S73-30-3	Transmittance : 3%
S73-30-13	Transmittance : 13%
S73-30-25	Transmittance : 25%
S73-30-50	Transmittance : 50%

※Not available reflection measurement in using internal light source

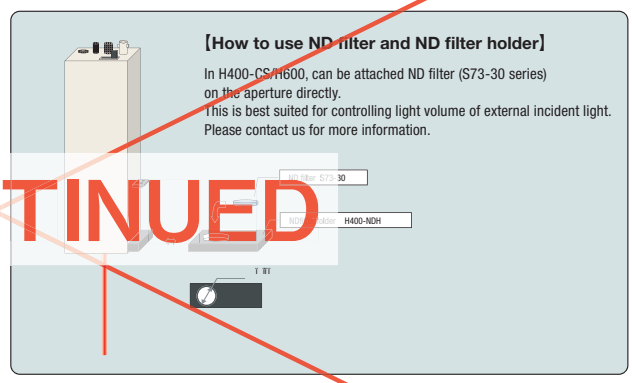
ND Filter Holder

DISCONTINUED

For H400-CS and H600-CS.

ND filter folder (For H400-CS/H600)	
H400-NDH	0.04kg

※Available φ30ND



Electrical Power


HDC6V-1000MA


HDC12V-500MA


HDC12V-1000MA


HDC-CABLE1

Product name	Model	Weight	Remark
AC adapto r DC6V 1000mA	**HDC6V-1000MA**	0.08kg	For H350 (except H350R-C175)
AC adapto r DC12V 500mA	**HDC12V-500MA**	0.07kg	For H100, H400, H450, H600, H350R-C175
AC adapto r DC12V 1A	**HDC12V-1000MA**	0.10kg	For HIP-550, HIP-1200, ProCo, O-PIAS, VCM-562
DC power cable	**HDC-CABLE1**	0.01kg	Available power supply to LCD from HIP-550/HIP-1200

Electrical Power


HBNC-1


HBNC-2

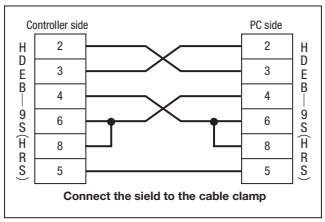

BNC-3C2V-2M

Product name	Model	Weight	Remark
Video cable for H350＊-C050/C100	**HBNC-1**	0.06kg	BNC-POutput
Video cable for H400/H450/H600	**HBNC-2**	0.08kg	BNC-POutput
Video cable for H350R-C175	**HBNC-3**	0.06kg	BNC-POutput
BNC cable (2m)	**BNC-3C2V-2M**	0.15kg	BNC-P/BNC-P
Video cable for H350 (HIP500	**H350-HIP**	0.10kg	Connector for HIP-500

Connector Cable for Processing Unit


HIP-R03-PB5M

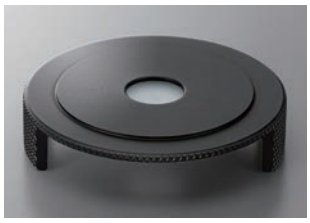

HIP-MOUSE



D100-R9-2

Product name	Model	Weight	Remark
I/O Connector	**HIP-R03-PB5M**	0.02kg	Compatible HIP-1200
Mouse for HIP-1000/2000/2400	**HIP-MOUSE**	0.15kg	D-Sub with a conversion connector
RS-232C Cross cable (9 Pin)	**D100-R9-2**	0.15kg	

Accessaries for High Rigidity H900(HRAD)


H900-CAP

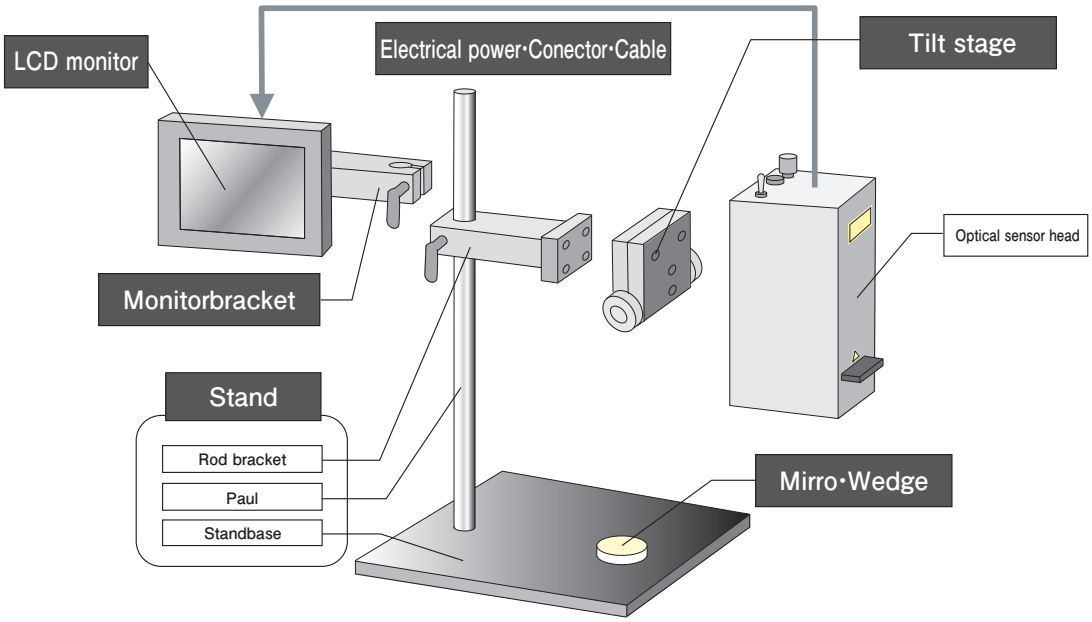

H900-CABLE1


H900-CRING

Product name	Model	Weight	Remark
Cap for adjustment of optical axis	**H900-CAP**	0.01kg	Common H900
Sensor head cable (2m)	**H900-CABLE1**	0.22kg	Common H900
Ring for C mount	**H900-CRING**	0.01kg	For H900-P017

Configuration of The Common Accessory

This is the common accessory for laser autocollimator, ProCo and O-PIAS.
We have also laser autocollimator set model included the common accessory.⇒ Set format ▶ P.5-049

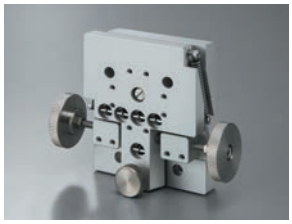


Tilt Stage

RoHS

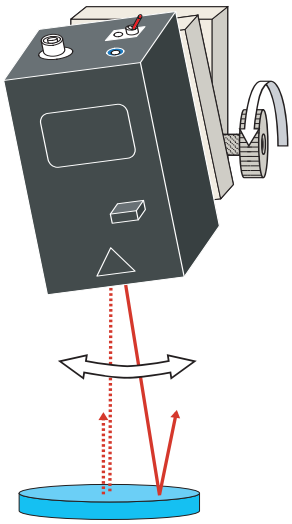
This is good for controlling of light axis tilt.
This is useful for 2-axis tilt adjustment and lock mechanism.


HB10


HB11


HB12

SPEC			
	2-axis small-sized tilt stage	2-axis middle-sized tilt stage	2-axis big-sized tilt stage
Model	**HB10**	**HB11**	**HB12**
Load capacity	1kgf	2kgf	5kgf
Tilt angle	2 dgrees	2 dgrees	5 dgrees
Material - finished	Aluminum-Almite finish, Stainless		
Weight	0.2kg	0.4kg	0.5kg

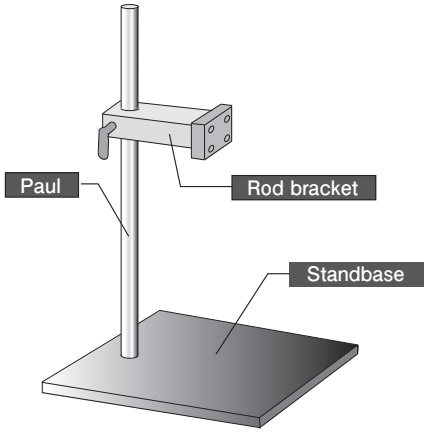


Compatible optical sensor	H100	○		
	H350	○		
	H400-C	○		
	H400-CS	×	○	
	H450	×	○	
	H600	×	○	
	H900（HRAD）	×		○
	O-PIAS	×		○
Compatible stand	HA10	○		×
	HA10L	○		○
	HA11N	○		×
	HA12S	×		○
	HA12	×		○
	HA12L	×		○
Compatible rod bracket	HB10-RB20	○		×
	HB10-RB38	○		×
	HB12-RB20	×		○
	HB12-RB38	×		○

Stand

RoHS

Can be installed any optical sensors.
It consists of stand base, pole and rod bracket.




HA10


HA11N


HA12


HA10L


HA12S


HA12L

SPEC

	Stand (Aluminum base)	Stand (Aluminum long-base)	High rigidity stand (S45C-made base)	High rigidity stand (S45C-made long base)	High rigidity stand (S45C-made base)	Large High rigidity stand (S45C-made long base)
Model	**HA10**	**HA10L**	**HA11N**	**HA12S**	**HA12**	**HA12L**
Weight	2.4kg	3.0kg	9.2kg	9.2kg	11.4kg	19.1kg

Compatible tilt stage	HB10	○	○	○	×	
	HB11	○	○	○	×	
	HB12	×	○	×	○	

■Configuration

Paul	Model	A42-400		HA11-P38L355	HA12-P38L600	
	Diameter	φ20 (g6)		φ38 (g6)	φ38 (g6)	
	Length	L=400mm		L=355mm	L=600mm	
	Material	Stainless		Stainless	Stainless	
Stand base	Model	HA10-BASE	HA10L-BASE	HA11N-BASE		HA12L-BASE
	Size	W200×D250	W200×D350	W200×D250		W280×D412
	Material - finished	Aluminum-Almite finish		S45C electroless nickel plating		
Rod bracket	Model	HB10-RB20	HB10-RB20 (With plate)	HB10-RB38	HB12-RB38	

Rod Bracket

RoHS

The rod bracket for installation tilt stage to the pole.
There are two kinds of radius φ20 and φ38. Also available 2kinds of tilt stages for HB10 and HB12.(A rod bracket is included in a stand)


HB10-RB20


HB10-RB38


HB12-RB20


HB12-RB38

SPEC

	φ20 Rod bracket	φ38 Rod bracket	φ20 Rod bracket	φ38 Rod bracket
Model	**HB10-RB20**	**HB10-RB38**	**HB12-RB20**	**HB12-RB38**
Material - finished	Aluminum-Almite finish, Resin			
Weight	0.1kg	0.2kg	0.2kg	0.3kg

Compatible pole diameter		φ20 (g6)	φ38 (g6)	φ20 (g6)	φ38 (g6)
Compatible tilt stage	HB10	○		×	
	HB11	○		×	
	HB12	×		○	

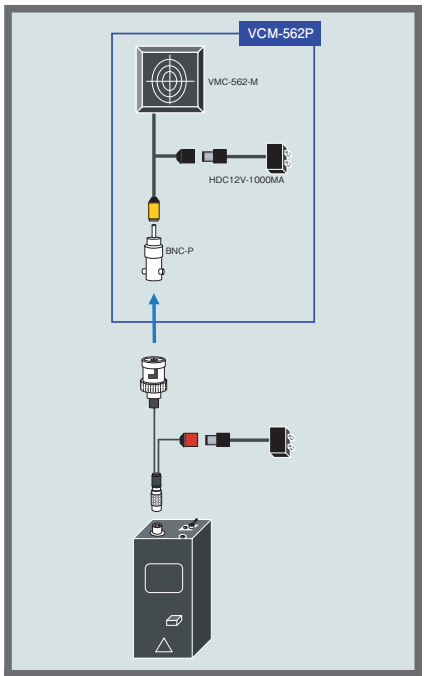
LCD Monitor

RoHS

5.6 inch LCD.Note that it is different model according to connect optical sensor directly and via processing unit.

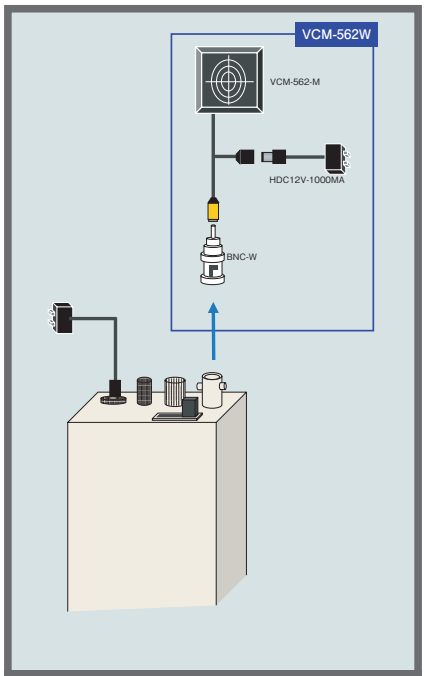
(Include dedicated stand in LCD)

Connect to H350 directly (visual observation-based)



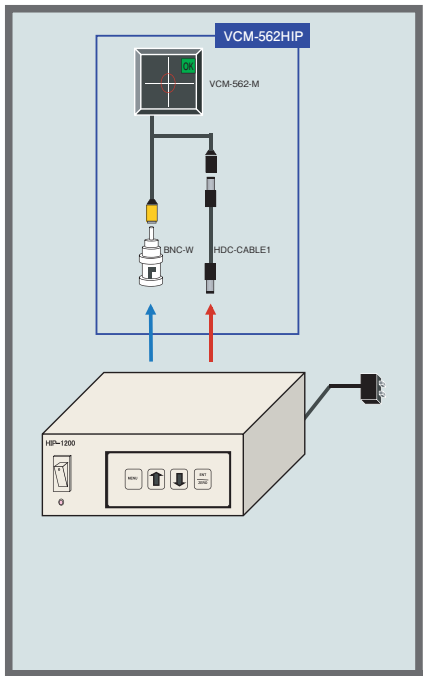
VCM-562P

Connect to H400/H450/H600 directly (visual observation-based)



VCM-562W

Connect to HIP-550/HIP1200



VCM-562HIP

SPEC

	LCD monitor		
Model	**VCM-562P**	**VCM-562W**	**VCM-562HIP**
Screen size	5.6 inch		
Pixel number	320(W)×3(RGB)×234(H)		
power consumption	420mA(DC12V)、5.0W		
Input system	AUTO(NTSC/PAL)		
External dimension	163(W)×112(H)×30(D)		
Image cable length	1.5m		
Weight (except AC adaptor)	320g		

Configuration

LCD monitor Mainbody	VCM-562-M		
BNC - RCA Conversion connector	BNC-P	BNC-W	
Power source	HDC12V-1000MA		HDC-CABLE1
Accesarry	Stand (self-supporting)		

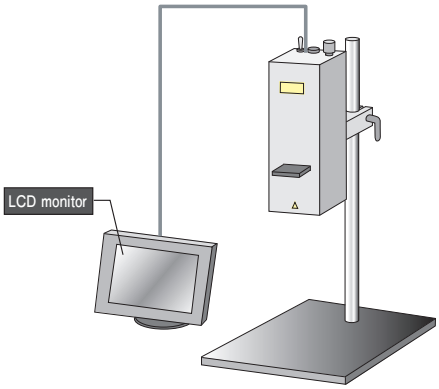
Connect a monitor	H350	○		
	H400-C		○	
	H400-CS		○	
	H450		○	
	H600		○	
	HIP-550			○
	HIP-1200			○
	O-PIAS		○	

※The product and product specifications are sugject to change without notice for modification.

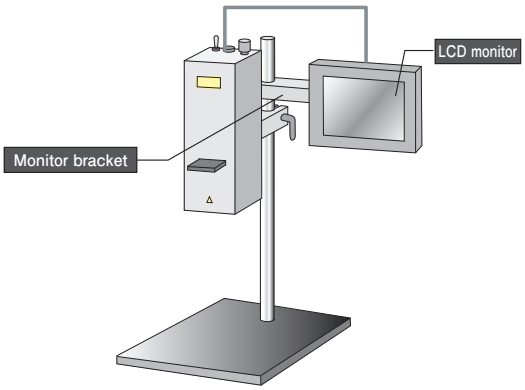
Monitor Bracket

RoHS

Can be fixed the monitor to monitor bracket on ϕ20 and ϕ38 pole.
(Include monitor bracket in laser autocollimator full-set, half-set and high rigidity-set)



With stand



With monitor bracket

SPEC			
		ϕ20 Monitor bracket	ϕ38 Monitor bracket
Model		**HA10-MB**	**HA11-MB**
Material - finished		Aluminum-Almite finish、Resin	
Weight		0.3kg	0.4kg
Compatible pole dimeter		ϕ20(g6)	ϕ38(g6)
Compatible stand	HA10	○	×
	HA10L	○	×
	HA11N	×	○
	HA12S	×	○
	HA12	×	○
	HA12L	×	○

Electrical Power•Conector• Cable

HDC12V-1000MA

HDC-CABLE1

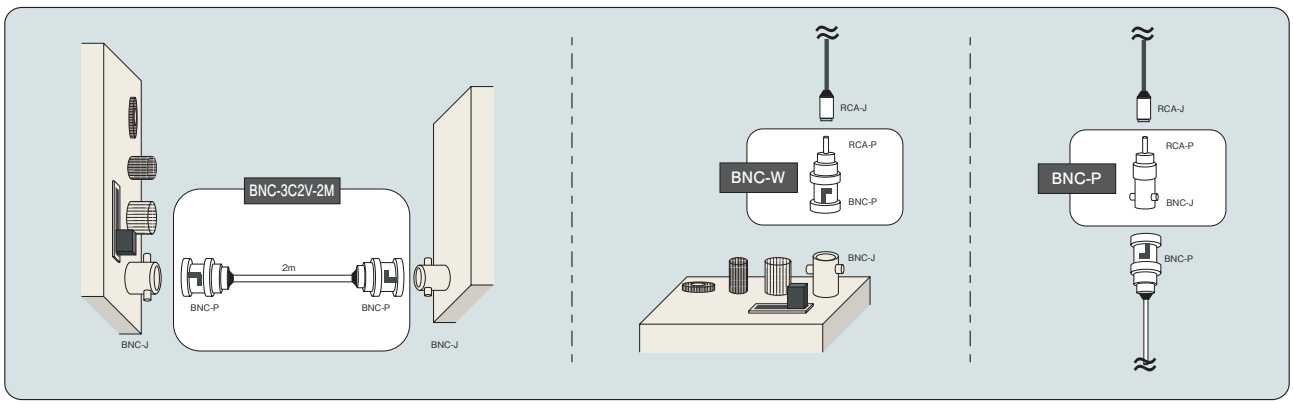
SPEC		
	AC adaptor DC12V1A	DC power source cable
Model	**HDC12V-1000MA**	**HDC-CABLE1**
Input	AC100～240V 50/60Hz	DC12V
Output	DC12V 1A	DC12V
Remark	For LCD(VCM-562)	Available supplying power to LCD from processing unit
Weight	0.10kg	0.01kg

BNC-3C2V-2M

BNC-W

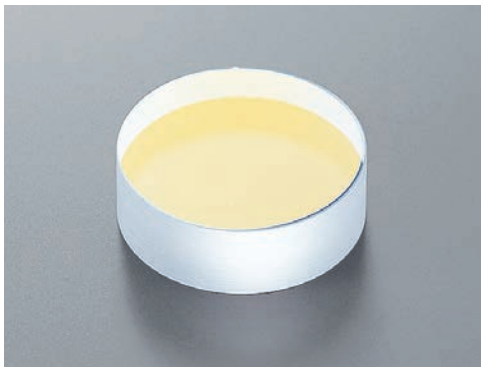
BNC-P

SPEC			
	BNC Cable(2m)	BNC-RCA Conversion connector	
Model	**BNC-3C2V-2M**	**BNC-W**	**BNC-P**
Specification	BNC-P/BNC-P	RCA-P/BNC-P	RCA-P/BNC-J
Weight	0.15kg	0.05kg	0.05kg



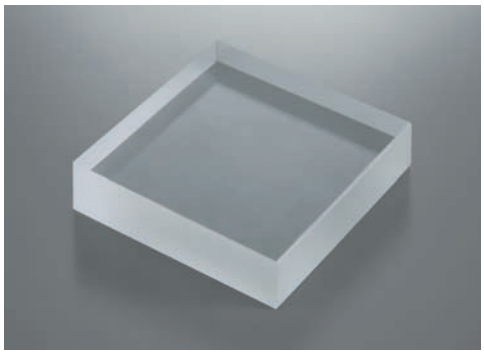
Mirror

For setting an optical sensor in vertically on the reference face.



SPEC	
	Parallel mirror
Model	**HS-0**
Material	BK7
External dimension	ϕ30+0/−0.1mm
Thickness	10±0.1mm
Parallelization	Less than 5 seconds
Surface accuracy	Duplex reflective wavefront λ/10
Polishing effective diameter	Center over ϕ27mm circle
film forming specification	Dielectric multilayer film
Incident angle	θ=0°
Refractance	R650±20nm≧99%
Film effective diameter	Center over ϕ28mm circle

Wedge Substrate/Wedge Mirror



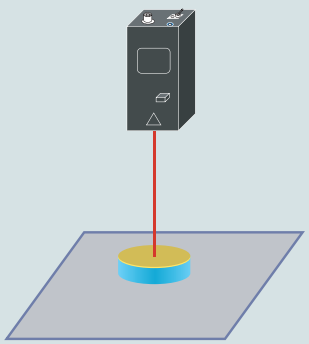
Wedge substrate

Wedge millor

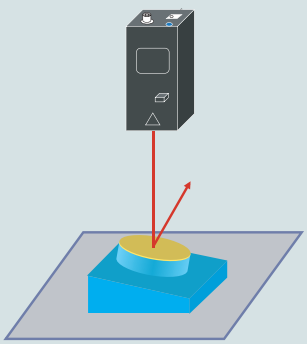
Wedge substrate and Wedge mirror with micro angle.

SPEC		
	Wedge substrate	Wedge mirror
Material	BK7	BK7
External dimension	40±0.1×40±0.1mm	40±0.1×40±0.1mm
Thickness	10mm	10mm
Wedge tolerance	±10 seconds	±10 seconds
Surface accuracy	Duplex reflective wavefront λ/4	Duplex reflective wavefront λ/4
Surface accuracy measurement wave length	λ=632.8nm	λ=632.8nm
Polishing effective diameter	Center over ϕ36mm circle	Center over ϕ36mm circle
Film forming specification	N/A	AL+MgF2

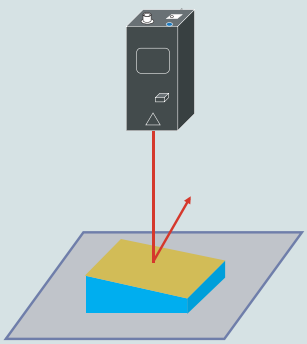
	Wedge substrate	Wedge mirror
Angle	**Model**	**Model**
1 degree	**HS-100**	**HS-100AL**
0.5 degrees	**HS-050**	**HS-050AL**
0.25 degrees	**HS-025**	**HS-025AL**
0.2 degrees	**HS-020**	**HS-020AL**
0.1 degrees	**HS-010**	**HS-010AL**



【Parallel mirror】
Set it so that an optical axis becomes vertical to a datum level.



【Wedge substrate】
Use for processing unit calibration. When you use the wedge board, please use a parallel mirror in the top.



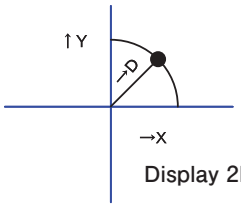
【Wedge mirror】
Use for processing unit calibration. You don't need to put the parallel mirror on it.

Laser Autocollimator Technical Guide

■What is a Laser autocollimator?

Laser autocollimator

- Measure instantaneously the angle in a single location.
- θxθy 2 dimension coodinates display
- Long width
- High resolution 8 sec.
  (Measurement range ±0.5 degree)
- Changeable measurement beam radius.

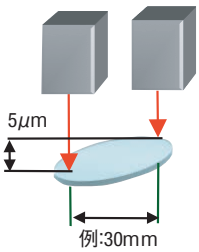


Display 2D angle coordinates

Measuring object is only regular reflection of mirror and glass surface.
See our catalog ▶ P5-026 for scatter reflections such as resin or metal.

Length measurement system

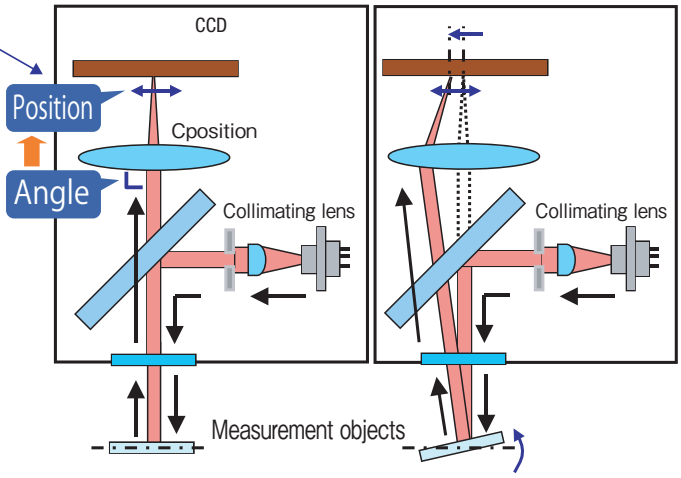
Calculates the differences in height between any 2 points with a length measurement sensor.



Resolution is =Atan(0.005/30)=34sec in 5μm change.θ=Atan（0.005／30）=34second

■Angle measurement principle

When the parallel light incidents to the collecting lens, it will be converted to the position information on the focal plane depending on the incidence angle.Irradiation of parallel laser beam to the measurement object using this principle, the tilt value of the object will be measured by collecting reflection light on the CCD.

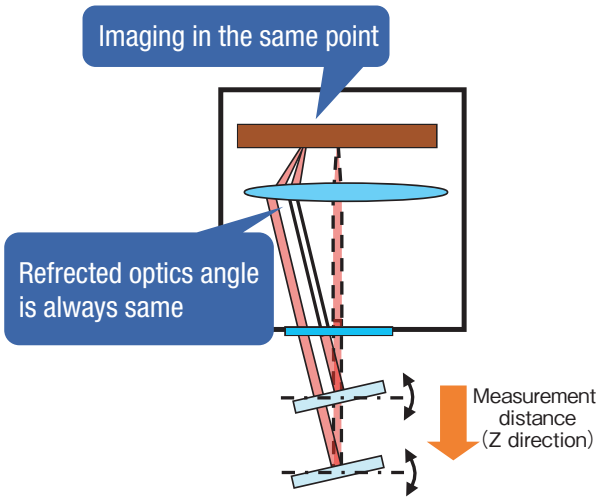


Left drawing:If the object is perpendicular to the irradiation beam, the reflection light returns to vertical, and light will be collected in the center.

Right drawing:In case of the object is tilted, the reflection light will tilt to the left, and also collecting area will move to the left.
Can be known the tilt by measuring the different between the reflection light and collecting area.

■Unchanged the measurement result, even the measurement distance is changed.

The measurement result that is gotten by using an autocollimator as an angle is measured directly even if the distance between the object is changed.Available for pitching and yawing measurement of the up and down drive unit.

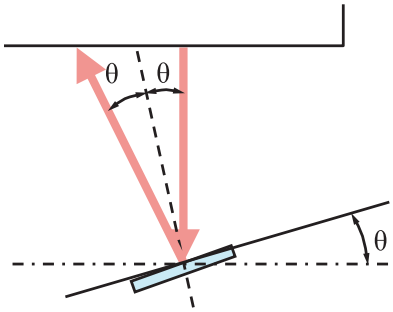


■Specialized usage: External light source incidence measurement

Normal (The reflection measurement)

Normally an autocollimator is used in the reflection measurement. (Left drawing)When the object tilt is θ degree, the reflection light returns 2θ degree angle.Autocollimator shows tilt angle θ degree of the object.

(e.g.) When the object tilts 0.1-degree, 0.2-degree tilted reflection light returns to an autocollimator, but measurement value is displayed 0.1-degree.



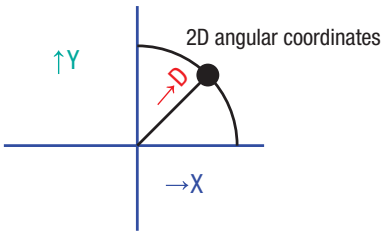
Measure the external light source

Can be measured laser beam tilt that is emitted from the object light source by turning off the semiconductor laser (LD) in the autocollimator.

■Display the angle

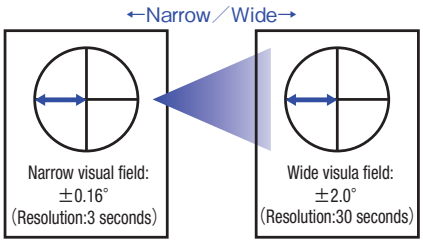
Display the spot position that is imaged on a screen and CCD on the 2D angular coordinates.
CCD built-in type (H350/H400/H450/H600) displays X・Y・D in digital by using the optional processing unit (monitor).
The D value shall be calculated as follows.
Selectable angular unit from degree, minute or second.

$$D=\sqrt{(X^2+Y^2)}$$



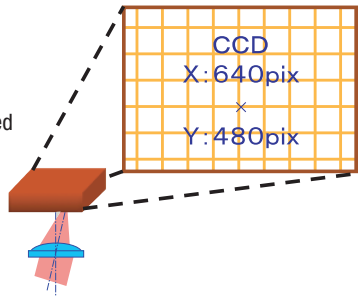
■Viewing range

Measurement range (viewing) of laser autocollimator is decided by the designed value of optics.
We have a variety of range ±0.16～±2 as belows
"H***-C16" in the model number shows ±0.16°



■Pixel resolution

Pixel resolution is decided by the number of CCD pixels in CCD built-in type (H350/H400/H450/H600).
Visual field range ±0.5 degree (e.g.H400-C50)
±0.5°=1°（Range）
1÷480=0.002083°
=0.125 minute
=7.5 seconds
≒8 seconds
Below decimal point rounded

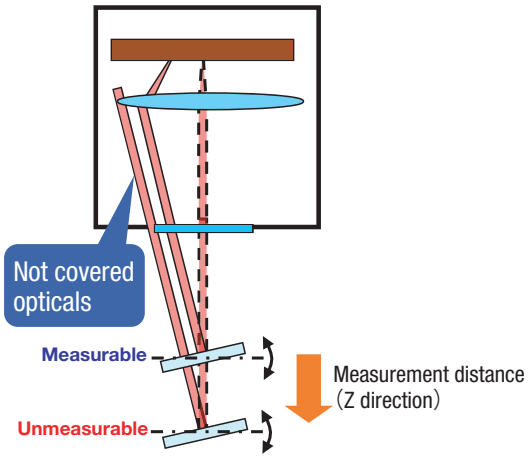


Available higher resolution measurement of the sub-pixel processing in the centroid analysis mode of processing unit.

Laser Autocollimator Technical Guide [Notice]

■Object measurement distance

Using it move away from measurable area, measurement range cannot be covered whole area due to reflection through the outside of aperture.
Please use the product as specified within the data.



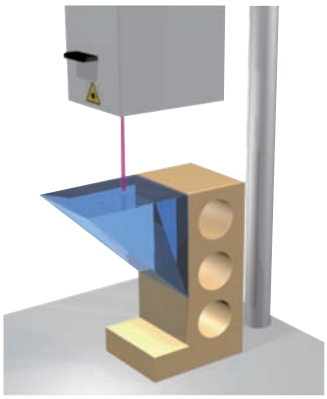
■About semiconductor laser life

LD that is internal semiconductor is consumable. Life gurantee is a year (8760 hours) under recommended environment.

Laser Autocollimator Technical Guide [Measurement Technique]

■Measurement of right-angle prism

Absorb the vertical plane of the right-angle prism, and the measurement of the right angle measures the horizontal surface with laser autocollimator.

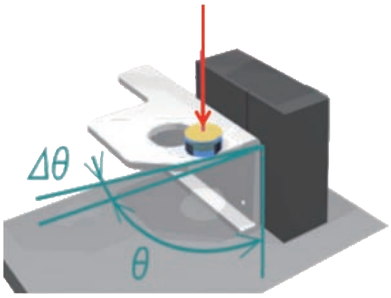


No limit setting direction of the main autocollimator.
Can be measured the vertical plane of the right-angle prism in the horizontal setting.

■Measurement of scattering reflector (resin or metal)

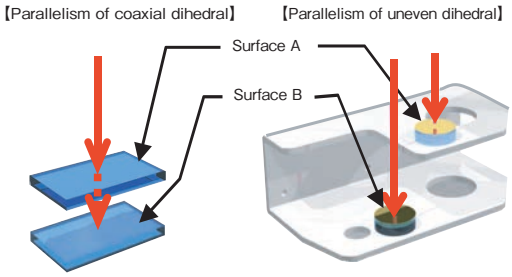
Laser autocollimator cannot be measured directly due to a collectible the reflection on the scattering and curvature surface.

Can be measured the objective tilt with a parallel mirror on the measurement surface.

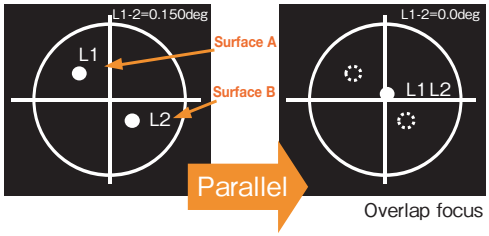


■Simultaneous measurement of dihedral parallelism

It is possible to compare the angle even if the object height or position is different.

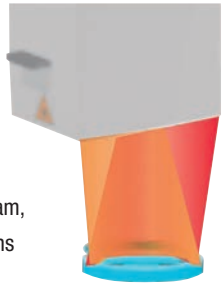


《Right》Measure parallelism between the dihedral on coaxial by transmitting a laser beam.
《Left》 Measure parallelism of uneven dihedral by using 2 beam branch adaptor (optional).
Both reflection spot might be overlapped a point if it is parallelism.

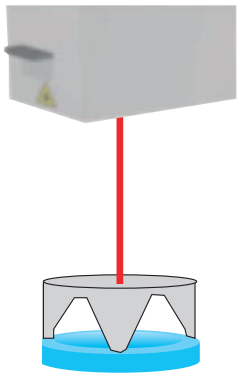


■Lens measurement

Lens is measured by focussing laser beam to the edge.
Problem:
Narrow the edge.
Not easy to measure due to the ghost refrection.
<Problem solving>
Optical system H450 (▶5-035) will be irradiated whole lens (max.φ8) beam, then measures only flat surface that returns from the edge.



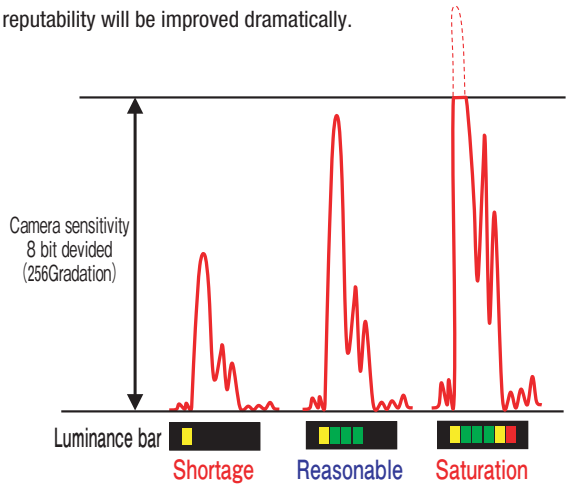
Problem：
The edge is rough and not mirror surface.



<Problem solving>
Changeable lens aperture by using the jig for receiving the edge of the lens.

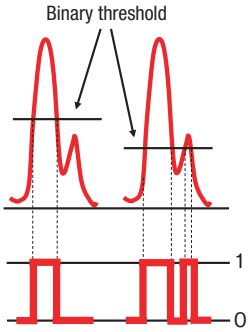
■Centroid analysis tip

The luminance centroid mode is good for measuring the tilt of lower flatness such as the lens edge.
Compared with the area centroid mode, measurement linearity and reputability will be improved dramatically.



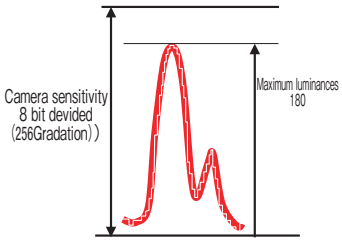
Use when the luminance centroid mode is within the appropriate range constantly checking the luminance bar for enhanced measurement accuracy.

■Glossary: Binarization threshold



The standard for changing the light detected by the autocollimator optical system from grayscale image to a binary image.
Binarization processing is the image processing method. When the pixel is 1 (white) that over standard the luminance value, the other is 0 (black).
This standard (Minimum blights for being white) is called Birarization.
※Note: Set up with area centroid mode.

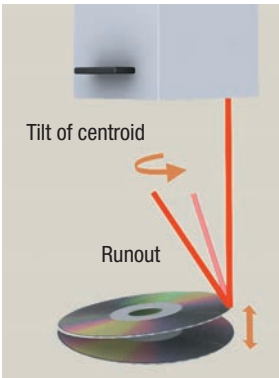
■Glossary: 256 steps

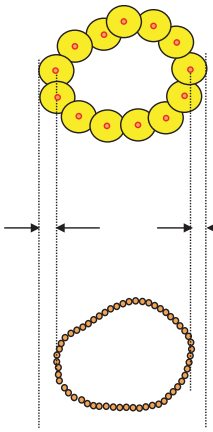


The luminance that is detected by the autocollimator optical system will be displayed in 8 bits grayscale image.
The grayscale image centroid is calculated by luminance centroid analysis.
Compared with the area centroid analysis with binarization processing, can be analyzed accurately.
※Note: Threshold must be set in the luminance centroid mode due to avoid basing noise.

■Runout measurement of presicion motor and optical disc drive

Selectable from HIP-1200 (cost-sensitive) ▶5-041 and HARD H900 (accuracy-oriented ▶5-017 for runout analyzing of precision motor and optical disc drive.





Measure the runout① HIP-1200+H350/H400

Features
High cost performance with laser autocollimator H350 or H400.

Expantion error may occur due to analysis system

Measure the runout② HRAD (H900) Motor mode

Features
Actually measurement time is so short by sampling accurately. Can be measured runout accurately could cause a numerical comparison of centroid coordinates.

■Optical disc drive assembling

This makes it easier to control the optical disc drive in HIP-1200.
(▶5-041) Drive the reflection of main or sub axis at the center of tilt of the motor runout measurement.Switchable easier runout and angle measurement by using I/O control.Reflect an offset skew value is controlled by a serial command.