

HAMOO



Hamoo

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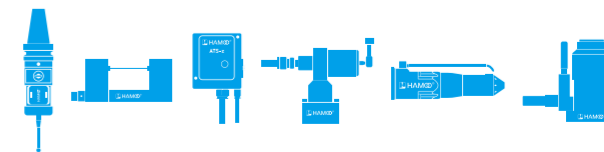
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National-Level High-Tech Enterprise

Jiangsu Private Technology-Based Enterprise

Holder of Fifty National Patents

HAMOO

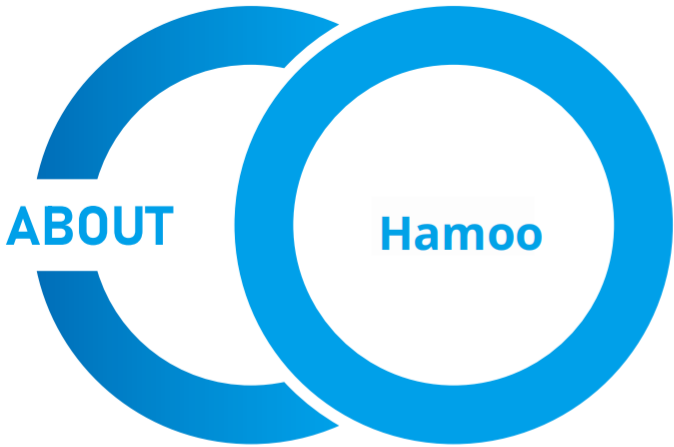
Hamoo empowers intelligent manufacturing through advanced in-machine measurement solutions.

HamooIn-Machine Measurement Specialist

CR360 Technology

Hamoo Measurement Technology (Suzhou) Co., Ltd.

HAMOO Measurement Technology (suzhou) Co., Ltd



Hamoo Measurement Technology (Suzhou) Co., Ltd.

Hamoo Measurement Technology (Suzhou) Co., Ltd. is a comprehensive high-tech enterprise specializing in the research and development, design, sales, and training of in-machine measurement systems. The Hamoo brand was registered in 2015, with a proprietary manufacturing facility spanning 3,000 square meters. Hamoo's innovative product portfolio includes the AMP40 series machine tool probes, MT series milling machine tool setters, LT series lathe tool setters (equipped with shrink covers), LAT series laser tool setters, ATS-z laser broken tool detection systems, and other high-precision instruments.

The products are primarily utilized in automated component manufacturing across machining centers, drilling and tapping machines, gantry machine tools, and turn-mill centers.

Hamoo has undertaken extensive product enhancements and rigorous industry customer testing over the years. In collaboration with multiple universities and industry associations, Hamoo has contributed to the development of numerous in-machine measurement technology application standards, securing fifty-two national technology and software patents. The company also possesses extensive experience in CNC system installation and integration. Hamoo delivers stable and reliable measurement technology solutions, earning commendations and recognition from its partners.

Hamoo's in-machine measurement system products are extensively applied in CNC machine tool automation for automatic alignment correction, error-proofing verification, dimensional comparison, mold CAD/CAM surface measurement comparison and compensation, machine tool repeatability accuracy compensation, and impeller blade machining.

For machine tool users, Hamoo's in-machine measurement products facilitate automatic tool setting, workpiece alignment, in-process measurement, and post-process measurement on CNC milling machines, machining centers, CNC lathes, and turn-mill centers. They enable rapid dimensional measurement and compensation, improving production efficiency and reducing scrap rates.

Hamoo's in-machine measurement system solutions can reduce auxiliary time by 90% and enhance NC machining process control.

Our objective is to consistently deliver superior products, prompt and professional services, and specialized customized solutions, aspiring to be your long-term partner.



Cross-Industry Application Areas

Hamoo In-Machine Measurement Solutions Empower Intelligent Manufacturing

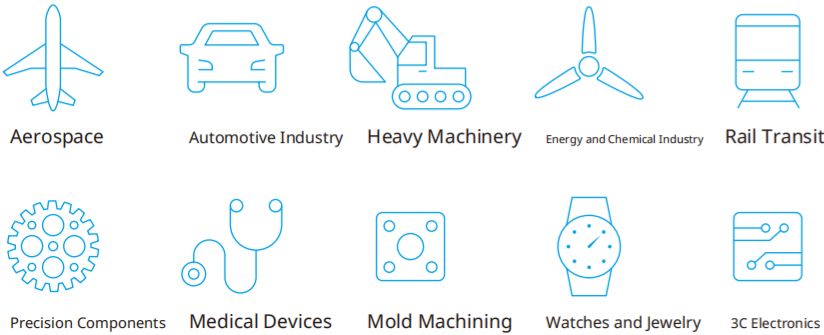
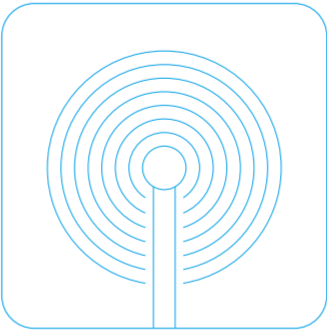
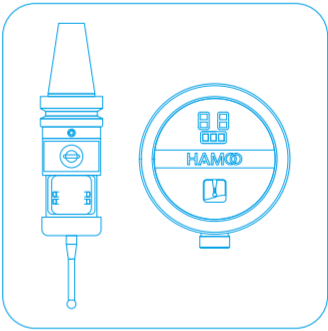
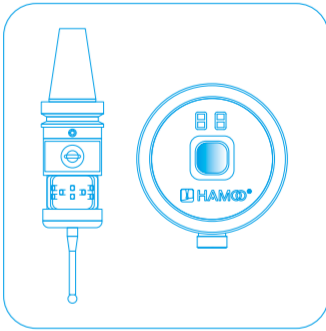
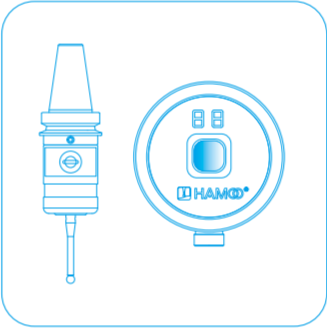
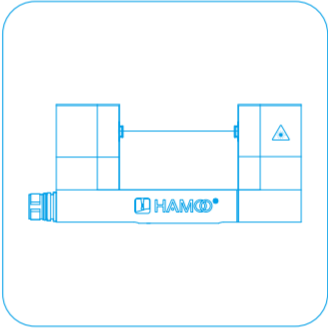
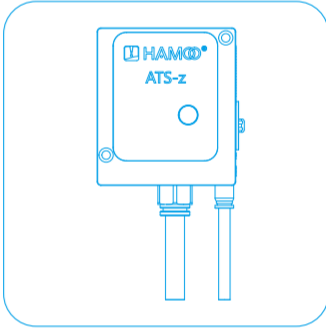
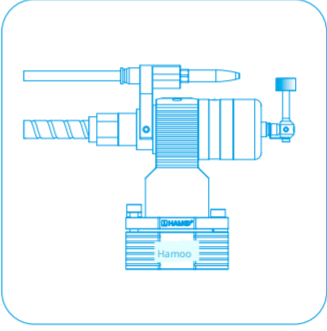
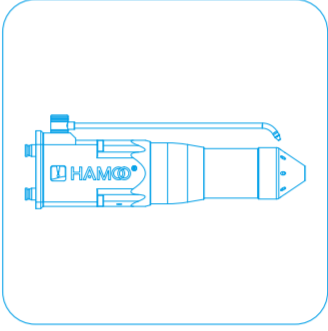
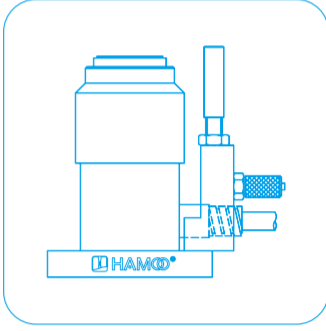
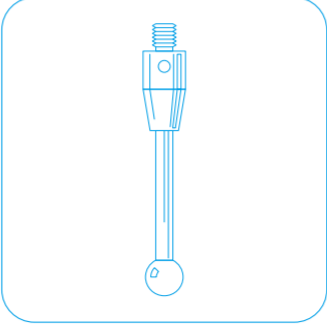
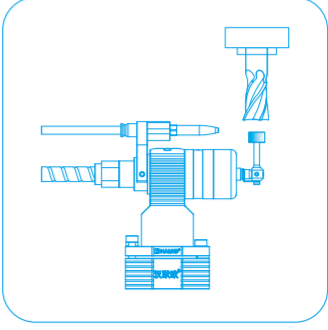
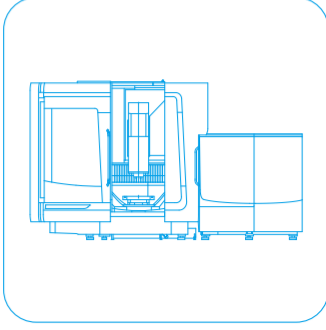


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Hamoo

Overview of In-machine Measurement Systems

In-machine measurement and intelligent correction technology not only accurately acquires data but also performs mathematical calculations, geometric evaluations, and process optimizations based on this data, thereby achieving closed-loop quality control throughout the machining process. This technology incorporates intelligent concepts into the CNC machining process; it constitutes the fundamental capability for realizing intelligent machining and provides a closed-loop foundation for future intelligent manufacturing.

The tool setting system enables automatic tool setting, tool length and diameter measurement, and tool breakage detection, effectively improving the automation level of intelligent manufacturing.

Prior to machining, determine the position and size of machining elements through tool setting, workpiece centering, and reference measurement operations.

In Process Utilize tool breakage detection, workpiece process dimension measurement, and automatic cutting compensation calculation to allow the machine tool to adapt to changes and actual machining conditions.

Post-Processing Perform finished product inspection through key dimension measurement operations, and support optimization of machining processes based on machine tool status.

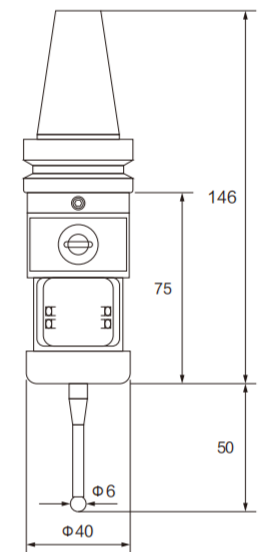
Primary Product Applications

- Rapid and precise alignment of workpiece position (centering, single-side, etc.), with automatic establishment or correction of the workpiece coordinate system;
- Rapid and accurate alignment of fixture position, reducing manual adjustment time, simplifying fixture design, and lowering fixture costs;
- In-process Tool Breakage Detection with correction of tool offset based on measurement results;
- Tool breakage detection implemented with real-time process control to ensure the yield rate of batch-produced workpieces;
- Enable automation of in-machine measurement during CNC machining, enhancing efficiency and increasing production safety.
- Implement low-manpower or unmanned intelligent machining to reduce production costs and improve production efficiency.

AMP40.1

AMP40.1 (AMP40) Radio Communication Probe

- Stylus Trigger Directions: $\pm X$, $\pm Y$, $+Z$
- Stylus Trigger Protection Stroke in All Directions: $XY \pm 15^\circ$, $Z +5mm$
- Stylus Trigger Force in All Directions (Factory Settings): $XY = 0.9N$, $Z = 6N$
- Stylus arbitrary unidirectional trigger repeatability (2σ) accuracy: $\leq 1\mu m$
- Radio signal transmission range: $\geq 10m$
- Operating days with new battery (5% usage rate per shift): 200 days
- Protection rating: IP68



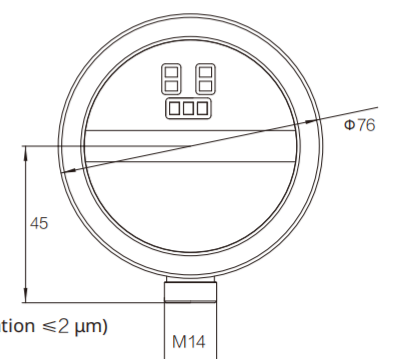
- CR360 Technology
- Long transmission distance
- Compact size
- High precision
- Customizable

HMI-10

HMI-10 Wireless Communication Receiver

- The receiver and probe communicate via radio wave signals, achieved through stylus triggering
- Probe and receiver FHSS communication with strong anti-interference capability
- Probe Activation Method: Automatic Power-on Activation
- Receives three types of radio wave signals: Measurement, Long On, and Low Voltage
- Probe ball center adjustment function: By adjusting the connection structure between the probe body and shank, the center of the stylus ball can be aligned with the probe spindle centerline (deviation $\leq 2\mu m$)
- Indicator light status: Power supply normal, Measurement, Low voltage
- Protection rating: IP68
- Secondary Development: Various functions can be customized according to the PLC

- Long transmission distance
- Multi-Channel Interface (FHSS)
- Use the International Common Channel
- Customizable



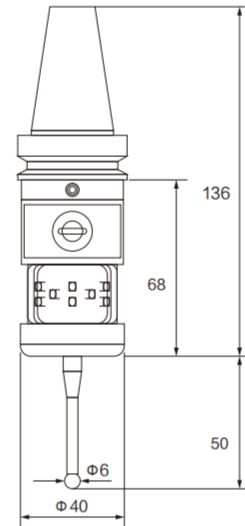


AMP40.2



AMP40.2 Optical Communication Probe

- Activation Method: Automatic On/Off
- Protection: Equipped with Spindle Protection Function
- Detection Function: Equipped with Battery Voltage Alarm
- Probe Stylus Omnidirectional Trigger Protection Travel: XY $\pm 15^\circ$, Z +5.0 mm
- Probe Stylus Omnidirectional Trigger Force (Factory Default Settings): XY = 0.9 N, Z = 6.0 N
- Stylus arbitrary unidirectional trigger repeatability (2 σ) accuracy: $\leq 1 \mu\text{m}$
- Optical Signal Transmission Range: Three Levels - 1 m / 3 m / 5 m
- Operating Duration with New Battery (5% Usage per Shift): 300 Days
- Protection rating: IP68



CR360 Technology



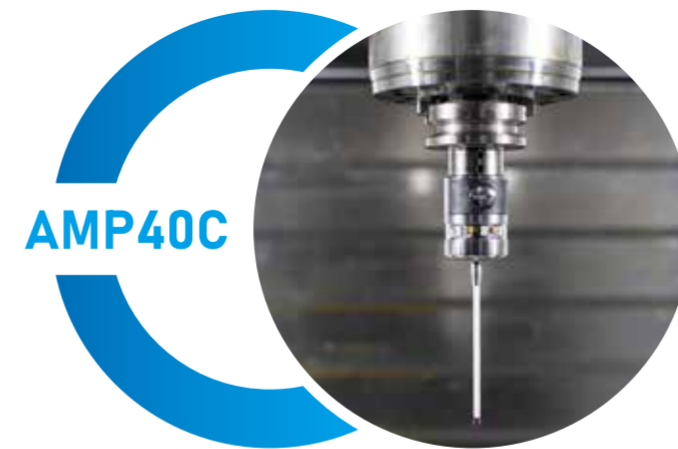
Excellent interchangeability.



Compact size



High precision

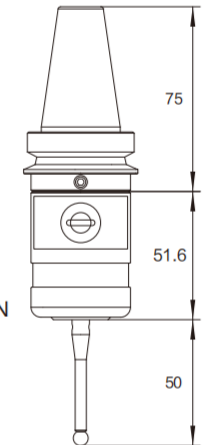


AMP40C



AMP40C Probe (Economical Model)

- Activation Method: Automatic On/Off
- Protection: Equipped with Spindle Protection Function
- Detection Function: Equipped with Battery Voltage Alarm
- Probe Stylus Omnidirectional Trigger Protection Travel: XY $\pm 15^\circ$, Z +5.0 mm
- Probe Stylus Omnidirectional Trigger Force (Factory Default Settings): XY = 0.9 N, Z = 6.0 N
- Stylus arbitrary unidirectional trigger repeatability (2 σ) accuracy: $\leq 1 \mu\text{m}$
- Optical signal transmission range: two levels, 1 m / 3 m.
- Operating duration with a new battery (5% usage per shift): 500 days.
- Protection rating: IP68



CR360 Technology



Two-level adjustable transmission distance.



Compact size



High precision



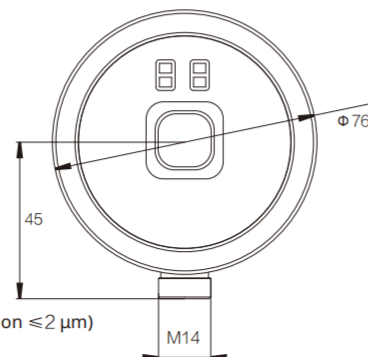
HMI-20



Excellent interchangeability enabled by infrared modulation technology.

HMI-20 Optical Communication Receiver

- The Receiver and Probe Employ Optical Modulated Signal Communication, Activated by Probe Stylus Triggering
- Infrared optical communication between the probe and receiver, featuring a wide in-machine reception range.
- Probe Activation Method: Automatic Power-on Activation
- Receives three types of optical modulation signals: Measurement, Long On, and Low Voltage.
- Probe ball center adjustment function: By adjusting the connection structure between the probe body and shank, the center of the stylus ball can be aligned with the probe spindle centerline (deviation $\leq 2 \mu\text{m}$)
- Indicator light status: Power supply normal, Measurement, Low voltage
- Protection rating: IP68
- Secondary Development: Various functions can be customized according to the PLC



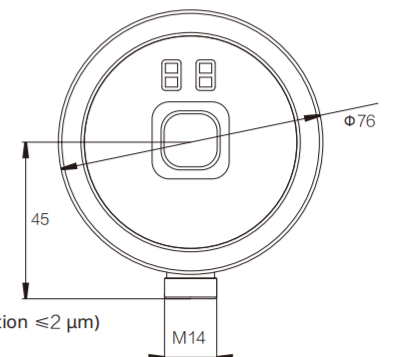
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LAT Series Laser Tool Setter System

The Hamoo Laser Tool Setter delivers superior measurement accuracy, owing to its focused laser beam design. Standard standalone design, available in multiple LAT versions depending on the laser beam design length (25mm (miniature version), 60, 90, 170, 300, or 500 mm). We also offer customization based on the customer's specific requirements.

Technical Specifications

Repeatability	2σ≤0.1μm Focused Laser Beam
Minimum Measurable Diameter	≥0.03mm
Protection rating	IP67
Optical Device Protection	1. Mechanical Shutter, 2. Air Blowing System

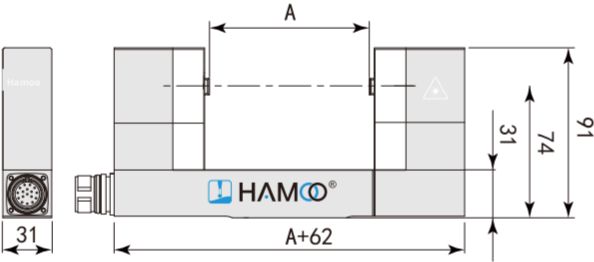
Pneumatic Specifications

Clean Air / Tool Cleaning	Pressure	3-6 bar (or 1-2 bar below air lock pressure)
	Filtration Rating	0.01μm*
	At 3 bar pressure Air Consumption	0 L/min (clean closed) Max. 85 L/min (clean open)
Activate Shutter	Pressure	0.2-0.3 bar
	Filtration Rating	5μm*

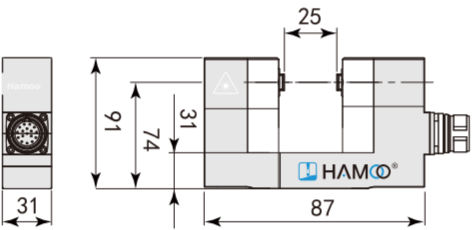
Electrical Specifications

Power Supply	12-24 VDC ±20%	
Current	250mA max	
Input*	Power Supply	5-pin / 24 VDC
	Type	Opto-isolators (光耦式)
	Signal	Laser Enable 
		Speed Selection
		Dynamic signal active 
		Tool breakage
		Contour measurement
		Trigger enable
Output*	Type	SSR (Solid State Relay) 50V, 100mA maximum
	Signal	20-100 ms pulse period
		G31 measurement signal 
		Laser OK

Dimension Drawing



Laser Tool Setter LAT Series



Laser Tool Setter LAT25

Tool Setter model	Dimension A value
LAT25	A=25
LAT60	A=60
LAT90	A=90
LAT170	A=170
LAT300	A=300
LAT500	A=500

LAT25 Laser Tool Setter



LAT60 Laser Tool Setter



LAT90 Laser Tool Setter



LAT170 Laser Tool Setter



LAT300 Laser Tool Setter



LAT500 Laser Tool Setter



* = 1/0 Special functions configurable via software.▲ = Mandatory signals for complete installation.



ATS-z Laser Tool Breakage Detection System

The ATS-z is a single-sided, non-contact device employing laser technology for Tool Breakage Detection. It performs high-speed, non-contact Tool Breakage Detection on solid tools across various models of vertical and horizontal Machining Centers, Gantry Machining Centers, and multifunction machine tools.

This single device can be installed outside the machine tool's machining area, thereby conserving valuable machining space. Identify the optimal installation position of the ATS-z within the machine tool to ensure the cutting tool efficiently passes through the laser beam emitted by the ATS-z between cutting and tool change operations. When a broken tool is detected, the machining process will halt, or the spare tool will be automatically replaced via the tool changer.

With ATS-z, the objective of reducing defect rates can be effortlessly achieved, while process control efficiency is substantially enhanced.

Product Advantages

Non-contact identification and breakage detection of solid tools. The ATS-z system reliably and economically performs ultra-fast tool inspection. Unlike traditional non-contact tool breakage detection systems, the ATS-z determines tool condition without relying on obstruction of the laser beam.

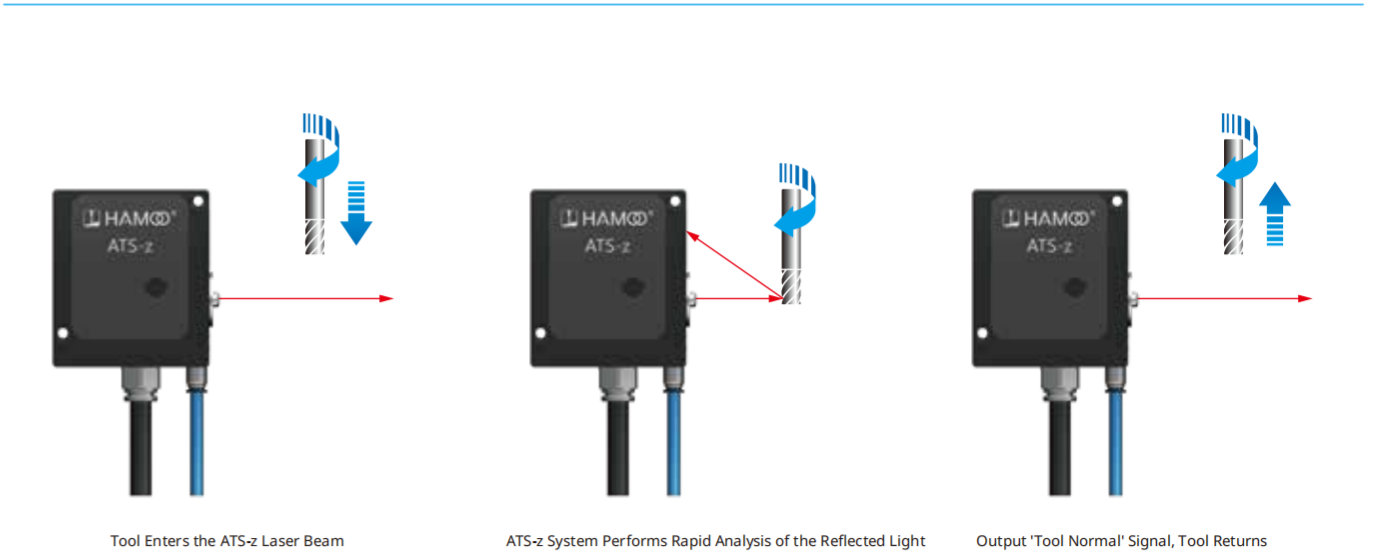
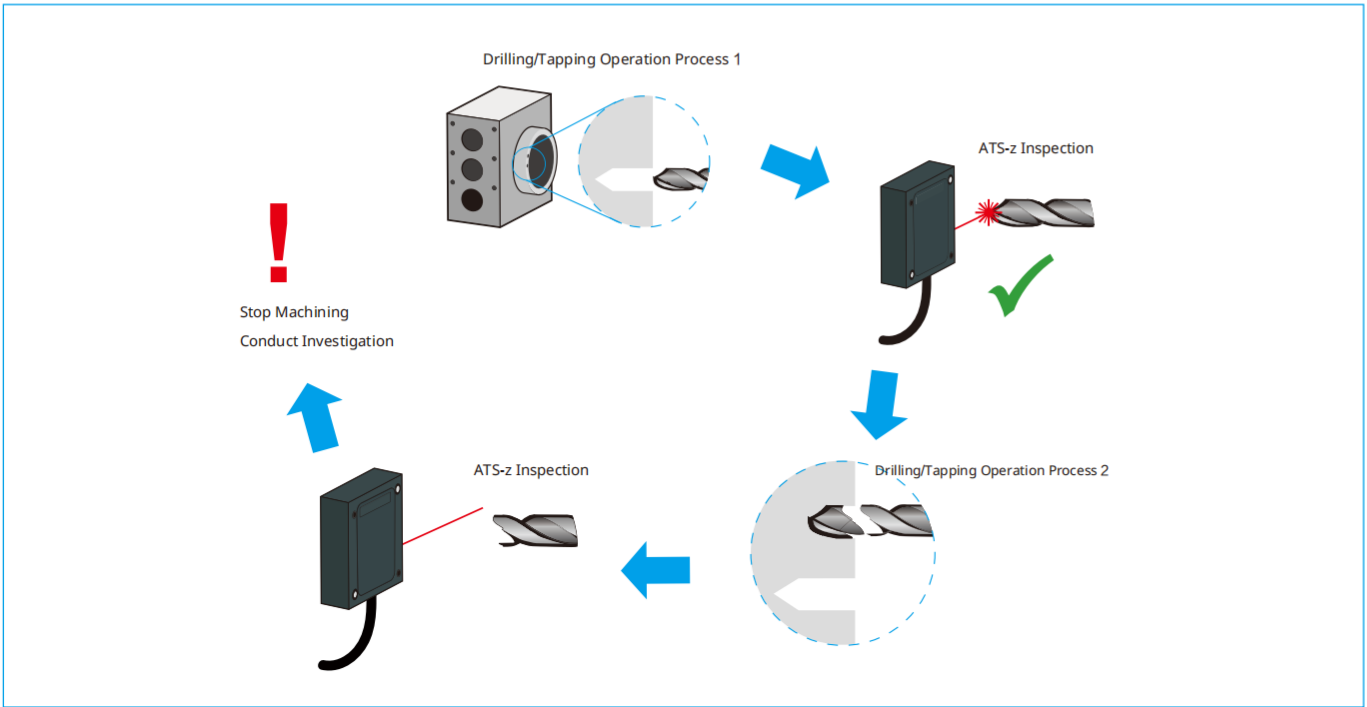
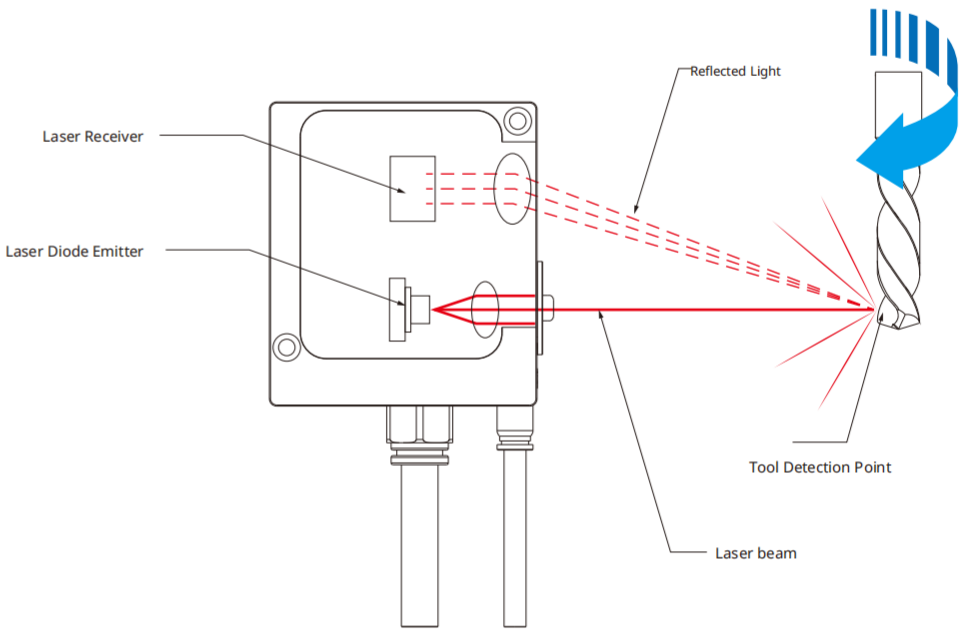
- Enhance process reliability and strengthen manufacturers' process control capabilities;
- Enable advance prediction and reduce cycle times;
- Minimize non-productive time and defect rates, thereby improving production efficiency and profitability.

Technical Principle of the ATS-z Laser Tool Breakage Detection System

The principle of non-contact tool breakage detection technology closely resembles that of non-contact tool setting technology, however, there are distinctions in their usage and configuration.

The laser emitter and receiver of the ATS-z system are integrated within a single device, enabling detection of tool breakage by monitoring the laser beam reflected from the tool. In operation mode, the laser beam emitted by the device is reflected by the rotating tool—typically at a position 3 mm above the tool tip—and subsequently returns to the receiver. The intensity of the laser reflection varies according to the tool's rotational state,

which may result in repetitive optical waveforms. The unique ATS-z (TS) tool identification technology within ATS-z analyzes this optical waveform, enabling rapid determination of the tool's condition and thereby confirming whether the machining cycle can proceed. If the tool is not detected within the user-defined time limit, a 'tool breakage' alarm is issued, permitting the activation of a backup tool.

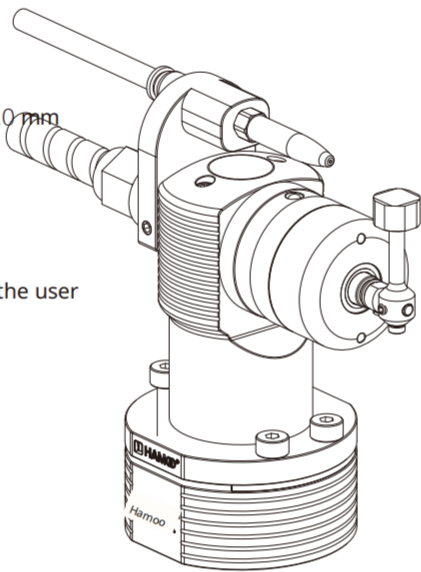
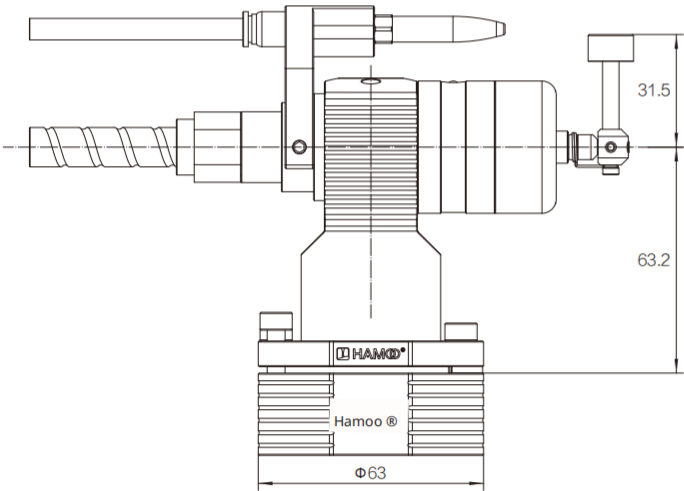




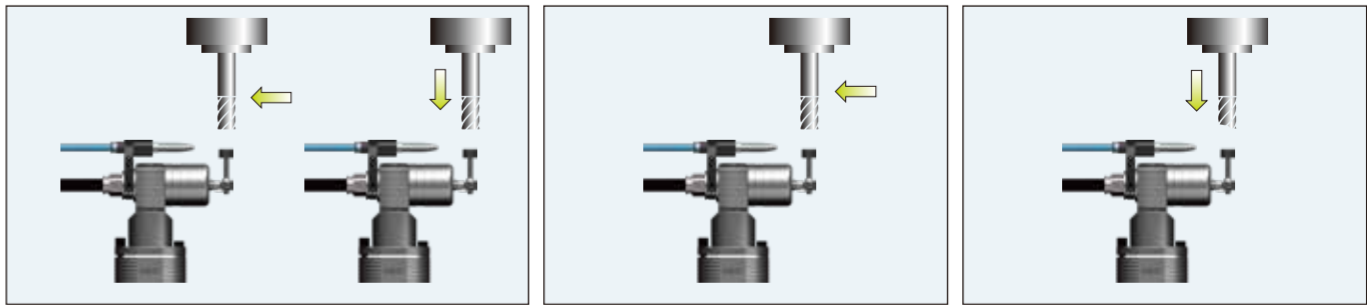
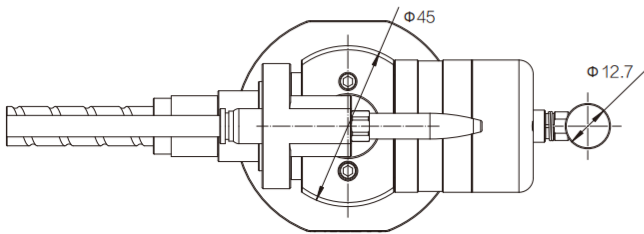
- CR360 Technology
- Equipped with Protective Function
- High precision

MT5-SE Tool Setter

- Probe stylus diameter: $\Phi 12.7$ mm
- Probe stylus multi-directional trigger protection travel: $XY \pm 12.5$ degrees, $Z \pm 5.0$ mm
- Probe stylus multi-directional trigger force (Factory Default Settings): 1.5 N
- Probe stylus unidirectional trigger repeatability (2σ) accuracy: $1\mu\text{m}$
- Designed service life > 10 million cycles
- Protection Level: IP68 (100% waterproof and oil-proof sealing)
- Customization Supported: Can be tailored to meet the actual requirements of the user



Note: CR360 technology = solution for circumferential convex corner issues
MT = initial serial number for wired Tool Setter



Measures tool length and radius with the spindle stationary or rotating
Measures individual cutting edges, such as inspecting indexable inserts
(Not suitable for high-hardness brittle cutting edges)
Tool Breakage Detection

MT5-SE Tool Setter Product Advantages

- Installed within the machine tool, it automatically measures the tool in the spindle. The system stores the tool length and radius values in the tool table. During machining, tool inspection enables rapid measurement of tool wear or damage, preventing scrap or rework. If out of tolerance or damaged, the system issues an alarm or automatically selects a backup tool.
- Fully automatic tool length measurement, capable of stationary operation;
 - Measurement or rotational (reverse) measurement;
 - Fully automatic tool diameter measurement;
 - Broken tool detection.

MT5-SE Tool Setter Specification Sheet

Primary Applications		Tool setting and tool breakage detection implemented on various models of vertical and horizontal machining centers, as well as various gantry machining centers
Transmission Type		Hardwired transmission
Compatible Interfaces		Hamoo IF40 dedicated control board
Recommended Probe Stylus		Integrated disc-shaped probe stylus (tungsten carbide, 75 HRC) or square probe stylus (ceramic tip, 75 HRC)
Weight (including disc-shaped probe stylus)		375 g (excluding bracket and base)
Cable (to interface)	Specifications	Diameter 4.5 mm, 4-core shielded cable, each core 0.3 mm
	Length	8 meters
	Electrical Connection	Cable outlet at the device end
Sensing direction		$\pm X$ 、 $\pm Y$ 、 $+Z$
Unidirectional repeatability		$1.00\mu\text{m}$ (2σ)
Probe stylus measuring force		0.90 N to 2.20 N, 95 gf to 225 gf (depending on sensing direction)
Protection rating		IP68
Installation		M12 T-shaped bolt (provided) with integrated MT base ensures precise repositioning
Operating temperature		+5°C to +60°C

Note 1: Performance indicators are obtained using a 35mm probe stylus at a standard test speed of 480 mm/min. Speed can be significantly increased depending on the application.
Note 2: Measurement force refers to the force exerted by the probe stylus on the workpiece at probe trigger, which is critical in certain applications. The maximum applied force occurs after the trigger point (i.e., overtravel). The magnitude of the force depends on relevant variables, including measurement speed and machine tool deceleration.
Note 3: These are factory default settings and cannot be manually adjusted.
For further information and optimal application and performance support, please contact Hamoo or visit www.hmprobe.com.



Robust and durable

Capable of operating in extremely harsh machining environments

Performing tool measurement

Customization required according to machine tool specifications

LT35 Lathe Tool Setter (with Automatic Protective Cover)

The LT35 Tool Setter features a compact and robust design, specifically engineered to endure the extremely harsh machining environments of lathes and multi-tasking machine tools. The LT35 Tool Setter incorporates multiple innovative design features that ensure precise and reliable tool measurement, contributing to reduced defect rates, enhanced quality, and increased productivity.

Product Features

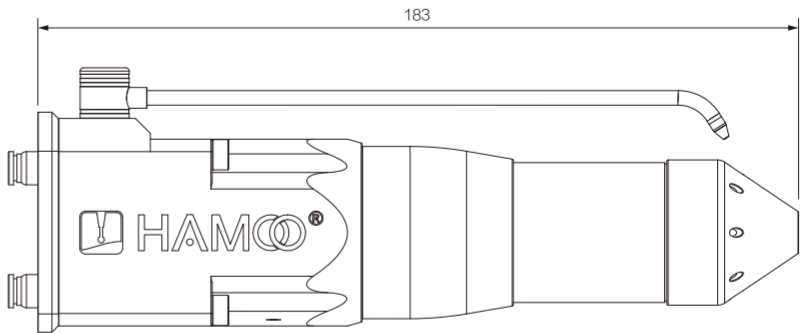
- Rapid measurement of turning tools, cutoff tools, grooving tools, threading tools, and boring bars;
- The pneumatic protective cover provides comprehensive protection for the probe stylus when not in use;
- The pneumatic protective cover extends via pneumatic action (LT35) and retracts by pneumatic or spring action. Spring retraction reduces the need for one M code in the CNC controller;
- The stainless steel tool setter body is robust, durable, compact in design, and offers flexible installation;
- The integrated air blowing system removes chips from the probe stylus, ensuring measurement accuracy and reliability (includes air blowing ports for convenient tool cleaning).

Product Advantages

- By increasing the level of measurement automation, human errors are minimized, thereby reducing the defect rate.
- Through rapid sequence control (measuring without removing the workpiece from the chuck), productivity is enhanced, and machine downtime is reduced.
- Product quality is enhanced by compensating for tool wear and thermal deformation.

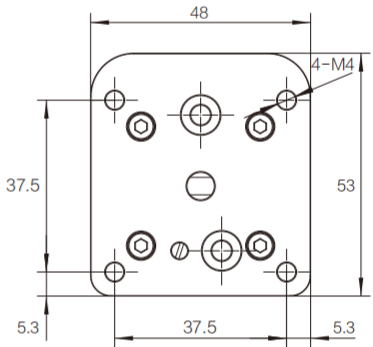


Product dimension drawing



	
Probe stylus over-travel limit	
± X/± Y	± Z
5	5

Dimensions: mm



Should the above dimensions be revised, the company will not issue separate notifications. We appreciate your understanding.

Technical specification sheet

Transmission Type	Hardwired connection	
Compatible Interfaces	Hamoo IF35 control board	
Weight	850g	
Cable length	10 meters	
Sensing direction	± X、± Y、+Z	
Unidirectional repeatability	2.00 μm 2σ(see notes)	
Probe stylus measuring force	XY plane (low measuring force)	0.49 N, 50.25 gf
	XY plane (high measuring force)	0.90 N, 92.21 gf
	+Z direction	6.79 N, 692.88 gf
Air supply (operating pressure)	Maximum 6.0 bar, minimum 4.5 bar	
Pneumatic connector	Three units (extension, retraction, and optional blowing assembly)	
Installation	M4×50 mm length	
Protection rating	IP68	

Note: Performance indicators were measured at a standard test speed of 500 mm/min. Speed can be significantly increased depending on the application.



T20



Automatic Tool Setting



Broken Tool Detection

T20 Unidirectional Tool Setter

- Repeat positioning accuracy: 0.002 mm; testing speed: 50-200 mm/min
- Designed service life: over 5 million cycles
- Maximum tool diameter for setting: 20 mm
- Tool Setter height: 80 mm
- Total travel of Tool Setter: 5 mm
- Rated voltage of Tool Setter: DC 24 V $\pm$ 10%, 20 mA (max)
- Tool Setter Air Blowing Function: Available
- Protection Level: IP67 (Fully Waterproof and Oil-proof Sealing Performance)
- Base Mounting Dimensions: 2 Holes, Hole Center Distance: 40 $\times$ 50 mm
- 6-core Signal Cable Length: 500 cm, Cable Protection Tube Length: 100 cm



T30



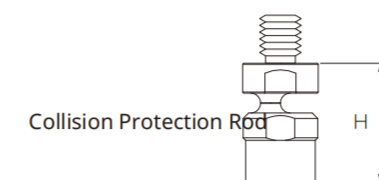
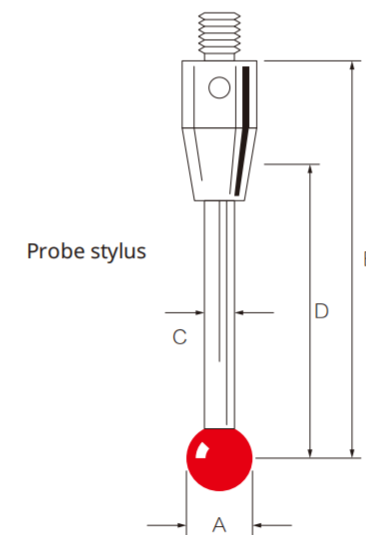
Automatic Tool Setting



Broken Tool Detection

T30 Unidirectional Tool Setter

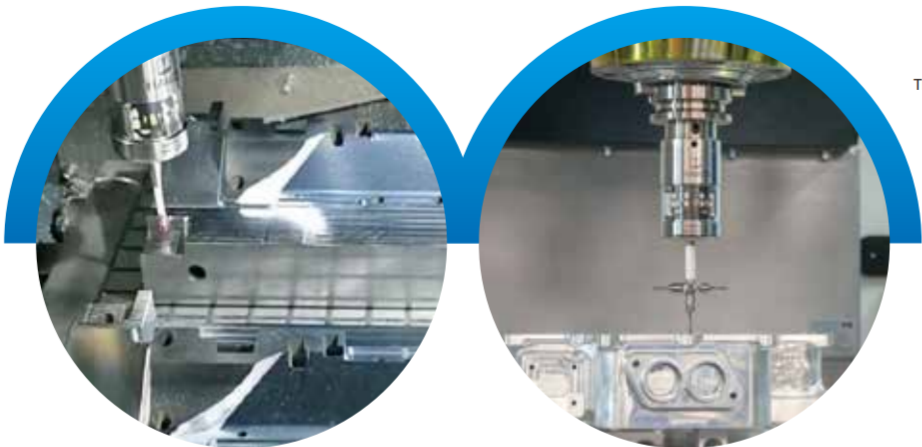
- Repeat positioning accuracy: 0.002 mm; testing speed: 50-200 mm/min
- Designed service life: over 5 million cycles
- Maximum Tool Setting Diameter: 30 mm
- Tool Setter height: 80 mm
- Total travel of Tool Setter: 5 mm
- Rated voltage of Tool Setter: DC 24 V $\pm$ 10%, 20 mA (max)
- Tool Setter Air Blowing Function: Available
- Protection Level: IP67 (Fully Waterproof and Oil-proof Sealing Performance)
- Base Mounting Dimensions: 2 Holes, Hole Center Distance: 40 $\times$ 50 mm
- 6-core Signal Cable Length: 500 cm, Cable Protection Tube Length: 100 cm



Probe Stylus Series

The surface of the ruby probe stylus is exceptionally smooth, exhibiting very high compressive strength and wear resistance. Selecting an appropriate probe stylus is fundamental to ensuring measurement accuracy. The range of probe stylus includes: straight probe stylus, star-shaped probe stylus, disc-shaped probe stylus, cylindrical probe stylus, probe stylus extension rods, pointed probe stylus, ceramic probe stylus, specialized probe stylus for tool grinding machines, articulated probe stylus, as well as custom-made probe stylus of various types according to specifications.

Hamoo
Product Application Cases



Plastic Mold Surface Measurement Application In-Machine Measurement Application for New Energy Battery Compartments



Engine Positioning Measurement Application Turn-Mill Center Tool Setting and Broken Tool Detection In-Machine Measurement Applications for 3C Industry Filters



Vertical Lathe and Rotary Center Measurement Applications Machining Center Tool Diameter and Tool Length Measurement, and Broken Tool Detection Economical Tool Setter for Tool Length Setting and Broken Tool Detection

Product Selection Recommendations (Based on Equipment Machining Range)

This guide assists in identifying the most suitable probes and Tool Setters for your application.

Remarks
AMP = Initial number for machine tool probe Automatic Milling Probe
ATS = Initial number for wireless tool setter Automatic Tool Setting
LAT = Initial number for laser tool setter Laser Tool Setting
MT5 = Initial number for multi-directional tool setter Multi Direction Tool Setting

Machine Tool Type		Machine Tool Size	Radio Frequency / Optical Probes	Application Purpose
Vertical CNC Machining Center		Small Size	AMP40.2	Enable in-machine measurement of workpiece dimensions and machining references to ensure dimensional consistency of machined parts and enhance workpiece processing yield. Enable automatic correction of coordinate and machining parameters to ensure the stability of CNC machining; Implement in-machine measurement of machining dimensions to support the requirements of automated production; Meet the demands of unmanned intelligent workshops.
		Medium Size	AMP40.1/AMP40.2	
		Large Size	AMP40.1	
Horizontal CNC Machining Center		Small Size	AMP40.1	
		Medium Size		
		Large Size		
CNC Turn-Mill Center		All	AMP40.1	
CNC Engraving and Milling		All	AMP40.2/AMP40C	
Center-High-Speed Machine / Grinding Machine		All	AMP40C	
Machine Tool Type		Machine Tool Size	Tool Setter	Application Purpose
Machining Center		All	MT5-SE/LAT60	Tool length measurement and correction; Automatic tool setting; Broken tool protection; Measurement and correction of tool profile dimensions.
Engraving and Milling Center		All	MT5-SE/LAT25	