KEYENCE

NEW **Universal Inkjet Printer**

MK-U6000 Series

The Next Step in Inkjet Printing Technology

Universal Inkjet Printer

MK-U6000

A Combination of Intuitive Maintenance and Advanced Quality Control

An Inkjet Printer That Optimizes Production:

Easy to Use Human Interface

Field Replaceable Parts Without the Need for Any Tools

Unmatched Combination of Speed, Quality and Reliability

Stable Operation Though Efficient Design

The KEYENCE Advantage

01 STABLE OPERATION
No clogging or unstable printing

To achieve continuously flawless printed text, we have reformed the monitoring functions and maintenance mechanisms within the head. This enables stable and perfect printed text, regardless of who uses the device.

02 USER-PERFORMED MAINTENANCE
Minimized down time

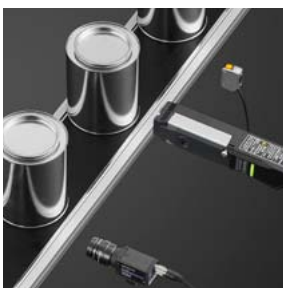
The ability of anyone on-site to perform maintenance quickly, minimizes line stoppages and reduces running costs.
We have created our system so that this kind of impromptu maintenance is possible.

03 EASY OPERATION
Usable by anyone

No matter how advanced a product is, it's meaningless if no one can fully take advantage of its features.
We have created an interface that is easy to use, even for first-time operators of the system.

04 INTEGRATED INSPECTION
Easy inspection of printed text

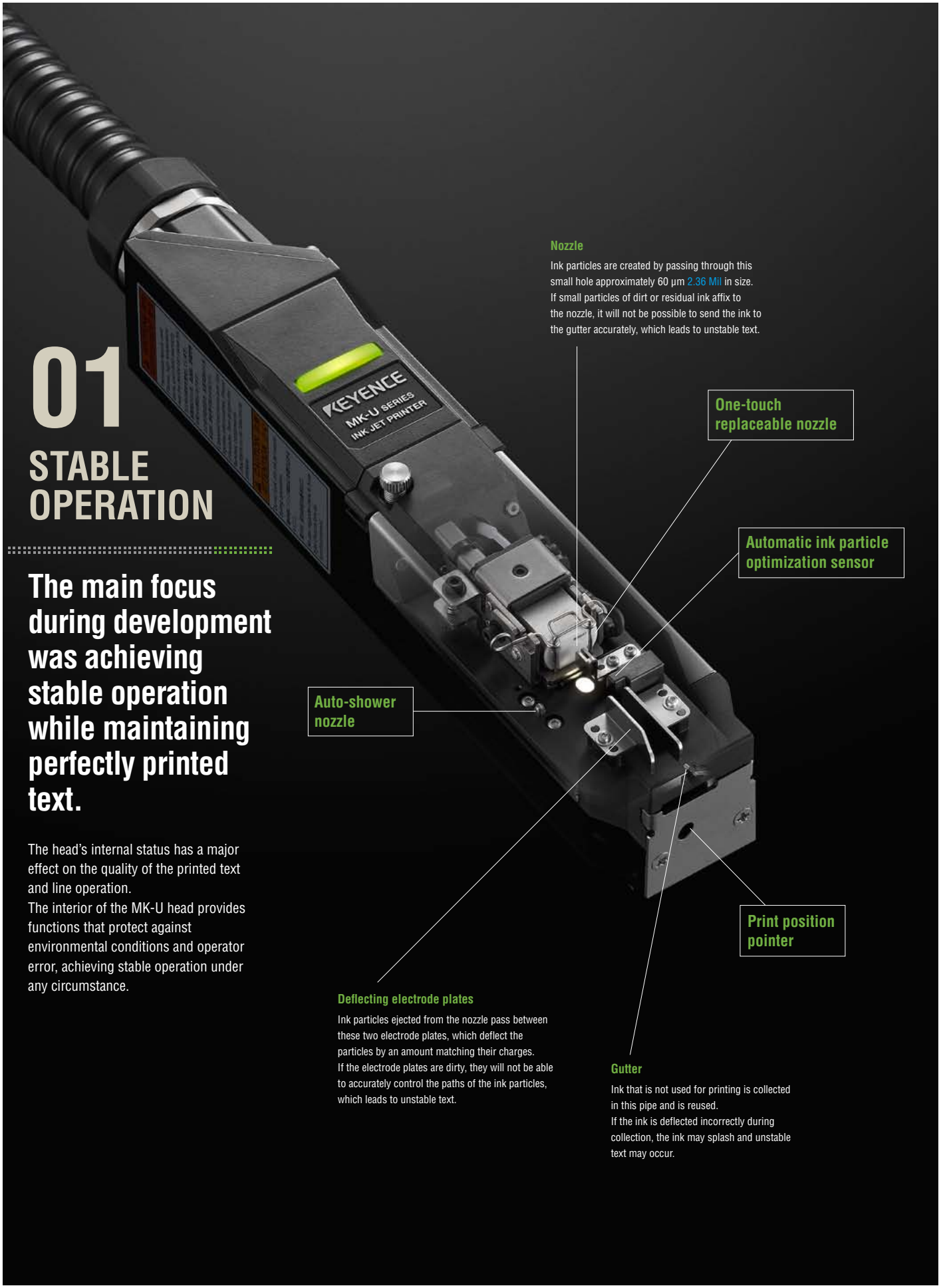
KEYENCE has seen increasing demand for systems that make printing inspection simple. To that end, the printer can be linked to an image sensor with just one cable. This system offers peace of mind through a unique combination of stable printing and reliable inspection.



01
STABLE OPERATION

The main focus during development was achieving stable operation while maintaining perfectly printed text.

The head's internal status has a major effect on the quality of the printed text and line operation.
The interior of the MK-U head provides functions that protect against environmental conditions and operator error, achieving stable operation under any circumstance.



Advanced Technology That Enables Stable Operation

Preventing Ink Path Problems

World's first Auto-shower cleaning

Conventional automatic cleaning only used solvent to clean the ink paths. With the newly installed auto-shower function the MK-U is able to clean the ink path, nozzle, electrode plates, and gutter all at once. This reduces disassembly for maintenance, and enables stable printing by proactively sustaining the print head components.

Conventional automatic cleaning

Only the ink paths are cleaned with solvent. Separate manual cleaning is required for any other dirty parts.

Auto-shower cleaning

In addition to the cleaning of the ink paths, the key parts of the head are also subject to high-pressure cleaning. This negates the need for manual cleaning.

Automatic ink particle optimization

The optimum ink particle status for printing is always fluctuating due to the ambient temperature and ink thickness (viscosity).
The MK-U Series senses the ink particles 10 times per second, which enables it to always maintain the optimum ink particle status.
This maintains perfectly printed text at all times, regardless of the environment.

Dirt within the print head

Unstable text

If the optimum ink particle status is not maintained, the inside of the head becomes dirty and unstable text occurs.

Conventional model (Reactive)

It's necessary to make adjustments for the ink viscosity and temperature of the environment while visually checking the particle status.

× Errors are not noticed until unstable text occurs.
× It's difficult to recognize the optimum status, and making adjustments requires time and effort.

MK-U Series (Proactive)

Ink particles are read and adjustments are automatically made to ensure the optimum particle status.

◎ Flawless printed text can always be achieved with minimal time and effort required.

Preventing Ink Dilution

* Not available for MK-U2000/MK-U2000SA

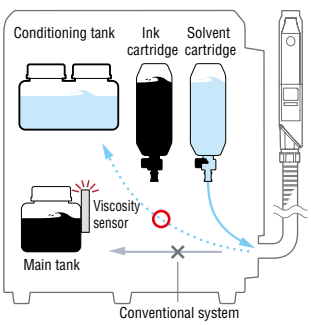
Conditioning tank system

The device is equipped with a specialized tank (the conditioning tank) and a viscosity sensor for use in collecting the solvent after cleaning.
This prevents ink dilution, stabilizing viscosity and therefore maintaining print quality.

[Three Main Advantages]

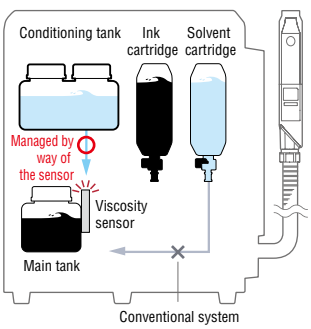
Powerful cleaning	Cleaning can be performed without any concerns regarding ink dilution.
Dark printed text	Ensures dark and distinct printed text.
Draining unnecessary	Wasteful draining due to ink dilution is prevented. This creates efficient expenditure of consumables.

During automatic cleaning



After automatic cleaning, the solvent is routed directly to the conditioning tank. This alleviates over-dilution of the ink stored in the main tank.

During viscosity management



The ink dilution in the main tank is measured using the viscosity sensor. Based on this reading solvent is supplied to the main tank from the conditioning tank. Nothing is wasted because priority is given to the conditioning tank.

02

USER-PERFORMED MAINTENANCE

Easy maintenance reduces line stoppages to an absolute minimum.

Time spent replacing parts.
Time spent being unsure about operations.
Time spent waiting for servicing.
Simplifying maintenance creates great savings in terms of time and cost, increasing productivity.

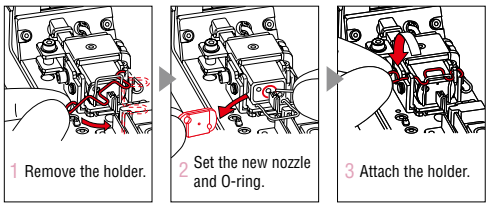
Replacement of consumable parts requiring no user's manual or tools

Consumable parts such as filters and pumps that require periodic replacements can all be replaced without using a user's manual or tools.
The user needs only to follow the illustrated instructions that are outlined in the software, so replacements can be performed easily and accurately even by users who have never performed these operations before.

Maintenance and Recovery Performable by Users

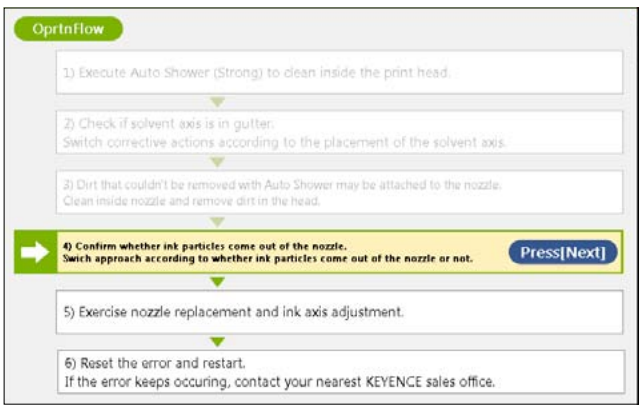
One-touch nozzle replacement

The main cause of problems with inkjet printers is clogging of the nozzle.
With the MK-U Series, the nozzle can be replaced without using any tools. This reduces downtime in the event that a nozzle replacement is required.



Maintenance guide

If an error does occur, the solution (workflow) can be viewed on the touch panel.
Because the operation procedure is displayed the user has no concern about incorrect troubleshooting.
Even for previously unseen errors, smooth and accurate maintenance can be performed without requiring any time or effort.



Sleep mode and path recovery

The device is equipped with a function that performs automatic cleaning periodically, even when it is stopped. This ensures that the device will always start smoothly, even after long periods of being dormant.
In the event that the internal paths have hardened, the device is equipped with a function that can clean and recover the paths with the press of a button. These functions provide peace of mind, even in the rare event that a problem occurs.

Periodically fluid is run through the paths to automatically clean the controller and maintain the viscosity of the ink.

With the press of one button, the internal paths and valves are cleaned, eliminating hardened ink.

03 EASY OPERATION

A touch panel that is easy to use and understand.

Devices with high functionality are difficult to use, and the functionality of simple devices is not sufficient. KEYENCE has designed an intuitive interface that makes all of the system's functionality accessible to the most novice users.

Operation screen

Easily forgettable items, such as the cartridge levels and the remaining life of each part, are displayed in an easy-to-understand manner. This screen displays the internal status of the device at a glance, which provides the user with peace of mind.

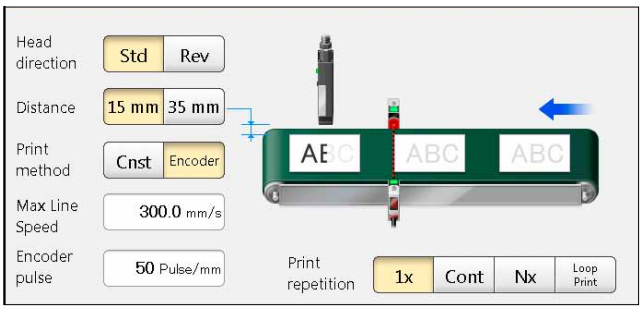
Convenient touch panel

The touch panel easily attaches to and detaches from the controller. This makes it easy to perform operations while checking the product.

Simple Operation

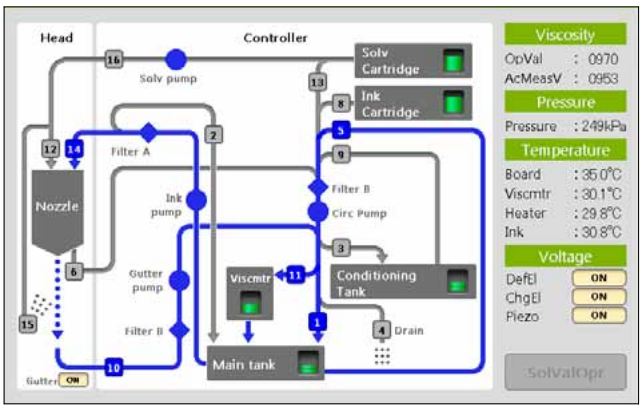
Line adjustment

Entering accurate line conditions was one of the most troublesome operations for inkjet printers in the past.
Now, our device provides a visual aid of the line so that measurements are easily understood and recorded accurately.



Path check

The monitor can be used to check not only the open/closed status of the solenoid valves, but also the optimum ink viscosity for the current temperature.
Because sensors are used to check information in real time errors can be detected immediately, which greatly contributes to proactive maintenance.



Operator lock

Passwords can be used to lock the functions that are not used on a daily basis.
This prevents incorrect operations and contributes to reductions in time spent managing the device.
This feature is essential in eliminating human error.

04
INTEGRATED INSPECTION

Our experience as a comprehensive manufacturer of automation equipment makes linking devices easy.

Printing → inspection.
Because KEYENCE has experience with both printers and image sensors, we can provide a system that is both easy to use and reliable.

Self-contained
CMOS Laser Sensor
LR-Z Series
TRIGGER

Universal Inkjet Printer
MK-U6000 Series
PRINT

Intuitive, Auto-Teaching,
Machine Vision System
CV-X100 Series
VERIFY

Trigger sharing

Printing and image capturing can be performed with a single trigger.

Single cable

Simply connect the printer (MK-U) and the image sensor (CV-X) with a single LAN cable to enable easy use without any external devices.

Screen linking the MK-U and CV-X

The MK-U touch panel displays both the message and the judgment results.

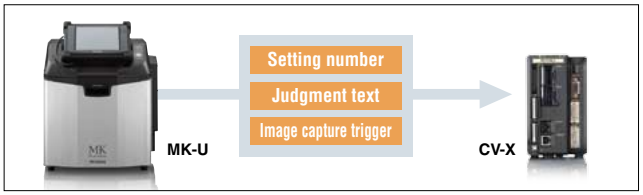
Linking Function: Tying Separate Devices Into One System

Linking with a [CV-X Series] Vision System

* Not available for MK-U2000/MK-U2000SA

Confirmation of printed text (character recognition)

The MK-U and CV-X can easily be linked just by connecting them with a single LAN cable.
Both the MK-U and CV-X can be operated from the MK-U touch panel. The MK-U is equipped with many useful functions, such as a function that synchronizes the print settings and inspection settings. The OCR dictionary has been prepared in advance with the MK-U's specialized fonts, so no further settings are required after installation. In addition, no external devices are required, so anyone can easily perform inspections of printed text.



When the setting number or message is switched on the MK-U, the inspection settings on the CV-X are also switched automatically.

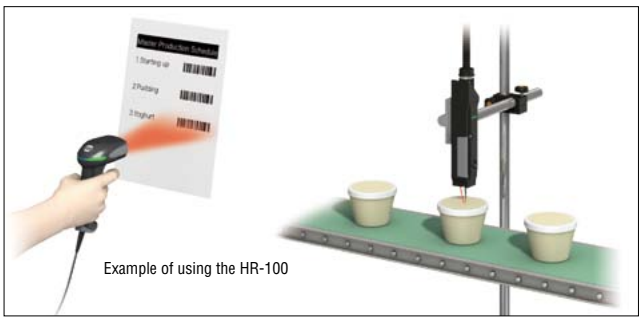
The MK-U touch panel can be used to perform all CV-X operations. There is no need to prepare a separate monitor.

Connecting to the CV-X automatically develops OCR for use with the MK-U. No bothersome dictionary registration is required.

Linking with an [HR Series] Code Reader

Barcode assignment

Registering the barcode of a product in advance makes it possible to easily switch between product types just by reading the barcode. With KEYENCE barcode readers, there is no need to bother with writing programs.
The only requirement is that the barcode reader is connected to the MK-U. This function prevents human error when handling a large variety of product types.



Example of using the HR-100

Linking Multiple [MK-U Series] Inkjet Printers

Batch control of multiple units

The MK-U can be used to change the messages on and control multiple units at the same time from a single touch panel.
This is useful when printing the same content on both sides of cardboard boxes and in similar situations.

Features Designed With Working Conditions In Mind

IP55 Rating

The MK-U is IP-55 rated, indicating excellent dustproof and watertight properties. This indicates that the device can even be used confidently in harsh environments. From the heavy moisture of a food packaging facility, to excess oil mist from auto-manufacturing, the MK-U can be operated in multiple environments.

* The print head does not support this ingress protection rating.

Cartridges

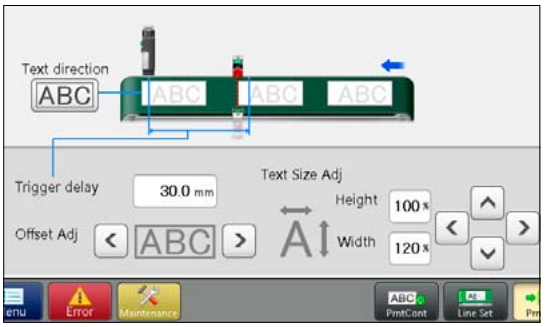
Cartridges are used to replenish the ink and solvent. These cartridges can be used cleanly, without any risk of the user's hands getting dirty. Also, the MK-U is equipped with dedicated sensors that ensure that the ink and solvent are always used to the last drop.

LED pointer

The MK-U is equipped with an LED pointer that indicates the print location. This makes it easy to align the print position on the line. This feature is extremely useful for lines that undergo retooling and/or product changeover

Position adjustment

Fine adjustments to the print position, character height, and character width can be made from the operation screen. This makes it easy to perform fine adjustments, such as shifting the text slightly to the right or making the text slightly smaller.



Head direction switching

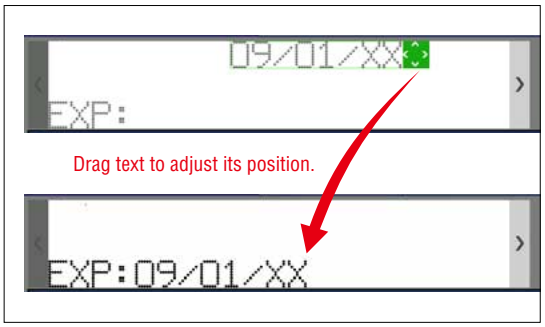
The direction of the head cable can be changed by 90 degrees. This removes the inconvenience in cable routing, and makes it easy to install the device in a wide variety of lines.

Long-distance mode

Printing can be performed with the print head located up to 35 mm 1.38" away from the target. The long-distance mode can be used to reduce variations in character size. This is useful when printing on bags and other workpieces that present varying print distances.

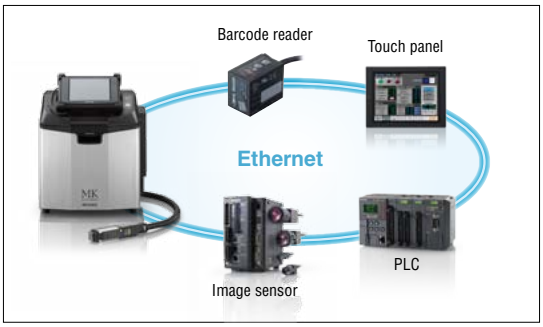
Layout adjustment

When setting the message, the layout can be adjusted by dragging characters. Even for complex messages that use multiple sections, the spatial settings can be configured easily and in a short period of time.



Equipped with Ethernet interface

This feature increases the speed with which peripherals are connected and reduces the amount of wiring required during these connections. It can also be used to operate on-site devices and check messages from a remote location. Time synchronization over the Internet is also supported.

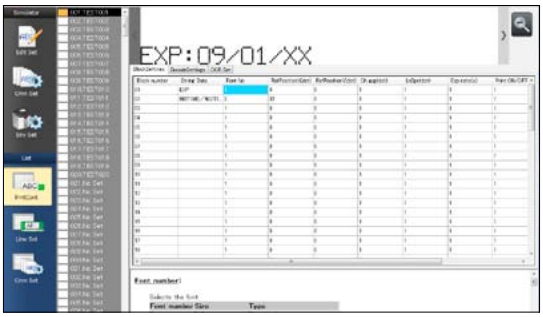


Printer status monitoring software

Establishing an Ethernet connection to the MK-U makes it possible to easily monitor the operating statuses of multiple devices from an office or location that is removed from the site. This provides peace of mind even for automated lines in which no operators are present.

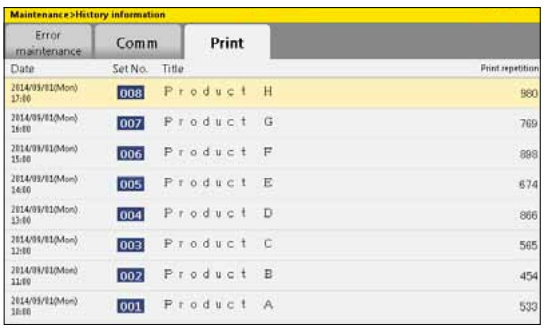
PC setup software

The print settings can be edited and saved from a computer in the same manner as the touch panel. Settings can also be copied to and from spreadsheets, which is extremely useful when creating multiple settings.



Print history management function

The print history includes, what product was printed on, how many products were printed on, and the time and date printing was performed. This function can be used to minimize the cost incurred when constructing systems, and to strengthen traceability.



USB interface

Commercially available USB memory devices can be used. Settings can be backed up and various histories can be saved, which provides storage when expanding lines or reinstating lost data.

A Rich Variety of Ink Variations

Standard ink (MK-10)

This is a standard type of industrial ink that can be used for general purposes in a variety of industries.

Super-adhesive ink (MK-13)

This ink adheres securely to objects for which ink traditionally has rubbed off easily such as PP/PE-films, bottles, and glass.

Solvent (MK-20, MK-21)

MK-20	Used with the MK-10, MK-13, and MK-12 inks
MK-21	Used only with the MK-14 ink

Chrome free ink (MK-12)

Chrome is not included in the ink components, which means that this ink can be used in accordance with environmental directives. This is the optimum ink to use in endeavors such as sustainable procurement and CSR.

MEK free ink (MK-14)

MEK is not included in the ink components, which reduces bothersome smell, and provides an alternative ink for compliance with certain safety standards.

Printing examples (actual size)

Specifications

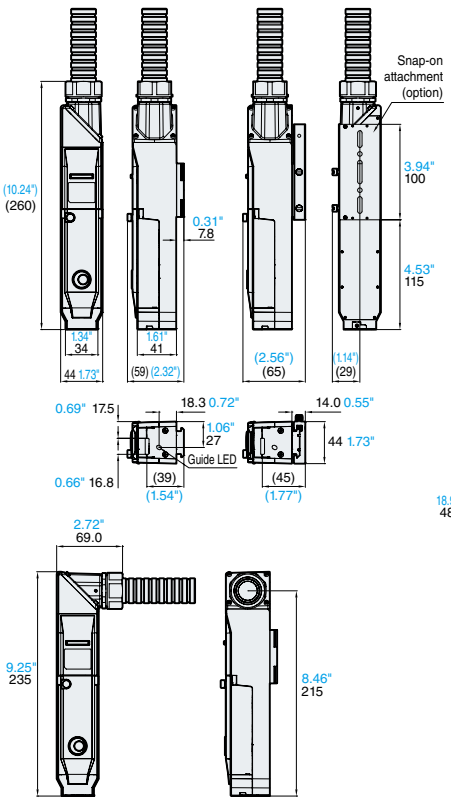
Model	Controller	MK-U6000	MK-U6000SA	MK-U6000CF	MK-U6000MF	MK-U2000	MK-U2000SA
	Touch panel console	MK-P4					
	PC software*1	MK-HB2 (MK-BUILDER2)					
Character height		1 to 12 mm 0.04" to 0.47"					
Ink model		MK-10	MK-13	MK-12	MK-14	MK-10	MK-13
Ink color		Black					
Maximum number of printable lines		6					
Dot configuration (vertical)		5, 7, 9, 10, 12, 14, 16, 24, 32 dots					
Font		Original, Mincho, Gothic					
Character types		Alphabetic characters, numbers, katakana, hiragana, symbols, kanji (JIS levels 1 and 2), Chinese (GB2312), Latin characters, logotypes, custom characters (fonts created by users)					
Barcodes		CODE39, ITF, NW7 (CODABAR), 2of5, CODE128, JAN/UPC, check digit addition function (except for 2of5)					
2D codes		QR code models 1 and 2, micro QR, DataMatrix (ECC200)					
Head distance		15 mm 0.59" (24 dots or less), 20 mm 0.79" (25 dots or more), 35 mm 1.38"					
Head direction		All directions					
Positioning guide		Guide printing, guide beam emission					
Max. printing speed*2		2525 characters/s			2349 characters/s	2525 characters/s	
Print data registration		500 settings					
Memory card		USB memory device*3					
Functions		Automatic calendar, expiration date, hold printing for desired time, automatic counter, 2- to 36-number system counter, automatic operation, character direction setting (90, 180, 270 degrees), double-width character, logo creation, font creation, character height and width adjustment, sensor pass filter, workpiece-stop alarm, constant number setting at input, barcode comparison setting switch, automatic setting switch at print completion (group printing), terminal block monitor, communication buffer, error level change					
Maintenance functions		Automatic nozzle cleaning, ink draining, internal cleaning, jet operation (nozzle and gutter suction, intermittent spraying), error display, error history, maintenance history, internal path monitor, maintenance guidance, error clearing guidance, auto-shower, sleep mode, path recovery					
Input (NPN/PNP)		Printing start, encoder (A, B), setting number selection, setting number switching, printing start disabling, printing stop, printing direction switching, counter/group reset, counter increase (startup), counter decrease (shut down), error clearing					
Output (NPN/PNP)		Error, caution, printing ready, setting switch ready, busy (printing), printing complete, counter complete (image capture trigger), service power supply (24 V)					
Console display language		English, Japanese, Chinese, Portuguese, Spanish					
Interface		RS-232C, Ethernet (100Base-TX/10Base-T)					
Print head cable length		4 m 13.1'					
Console cable length		4 m 13.1'					
Ratings	Power supply voltage	100 to 240 VAC ±10%, 50/60 Hz					
	Power consumption	190 VA					
Environmental resistance	Ambient storage temperature	-10 to 60°C 14 to 140°F (no condensation)					
	Ambient operating temperature	0 to 45°C 32 to 113°F		5 to 40°C 41 to 104°F	5 to 35°C 41 to 95°F	0 to 45°C 32 to 113°F	
	Ambient operating humidity	0 to 90% RH					
Housing		Stainless steel					
Enclosure rating		IP55*4					
Weight	Controller	30.4 kg				30.2 kg	
	Console	1.9 kg					
Dimensions		465 × 388 × 499 mm 18.31" x 15.28" x 19.65" (W × D × H)					

*1 Supported OS: Windows XP/Vista/7/8 (Windows is a registered trademark of Microsoft Corporation.) *2 5-dot character, 1-line printing with 1-dot character spacing
*3 Usable size: 65 × 25 × 18 mm 2.56" x 0.98" x 0.71" (W × D × H) max. *4 The print head does not support this ingress protection rating. For details on its installation, see the instruction manual.

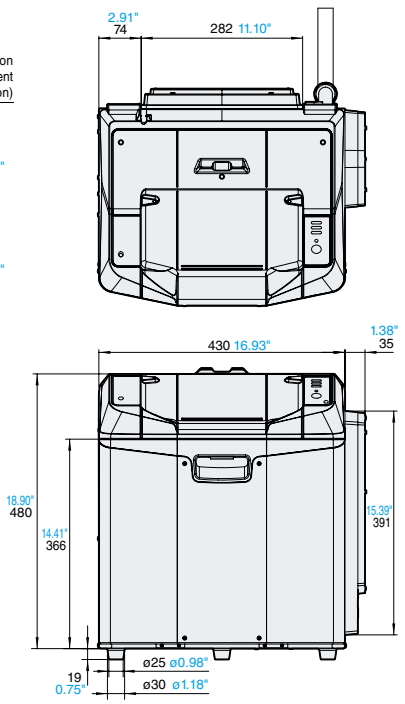
Dimensions

Unit: mm inch

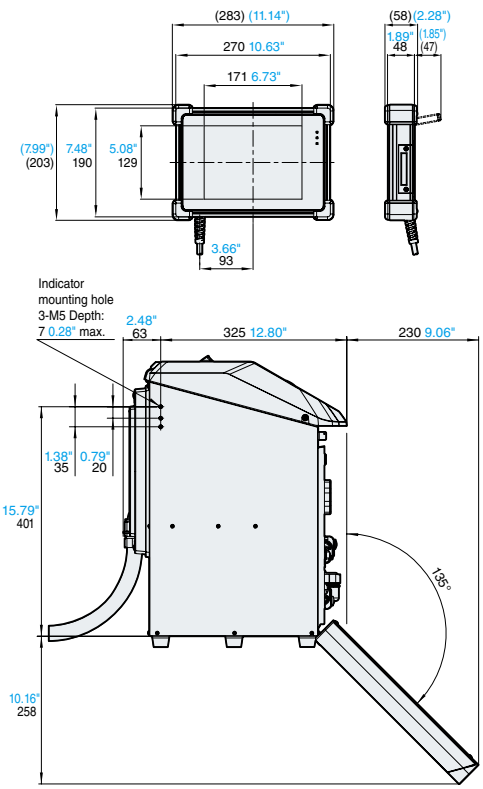
Print head



Controller



Console MK-P4



KEYENCE

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www.keyence.com

SAFETY INFORMATION
Please read the instruction manual carefully in order to safely operate any KEYENCE product.

KEYENCE CORPORATION OF AMERICA

Corporate Office 669 River Drive, Suite 403, Elmwood Park, NJ 07407 PHONE: 888-539-3623 FAX: 855-539-0123 E-mail: keyence@keyence.com

Sales & Marketing Head Office 1100 North Arlington Heights Road, Suite 210, Itasca, IL 60143 PHONE: 888-539-3623 FAX: 855-539-0123

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KEYENCE CANADA INC.

Head Office PHONE: 905-366-7655 FAX: 905-366-1122 E-mail: keyencecanada@keyence.com
Montreal PHONE: 514-694-4740 FAX: 514-694-3206

KEYENCE MEXICO S.A. DE C.V.

PHONE: +52-81-8220-7900 FAX: +52-81-8220-9097
E-mail: keyencemexico@keyence.com

KA1-1024

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MKU6000-KA-C-US 1074-1 611866 Printed in Japan

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