Magnescale

SPEED X PRECISION

Magnescale Co., Ltd.

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Magnescale

SPEED X PRECISION

Leading Edge Technology
for Leading Edge Manufacturing

Digital Gauge

Digital Gauge General Catalog

Magnescale Co., Ltd.

摺動力。 The power of superior engineering design

Legendary reliability, quality and Magnescale technology are all part of the Digital Gauge products.

The Magnescale Digital Gauge products use a high-grade magnetic recording
and detecting principle which has been developed over 50 years.
The Digital Gauge products embody the reliability and quality that Magnescale is known for.
Magnescale Digital Gauges feature high resolution and high accuracy, along with environmental,
shock and vibration resistance that are a unique feature to our magnetic detecting principle.
Sub-micron repeatability and improved torsion resistance comes from an innovative spindle design that enables
environmental protection up IP67, allowing for a wide range of applications.

Detection Principle
MR Sensor

- Unique magnetic detecting principle
- High speed sampling (20MHz)
- No thermal drift

Spindle Design
Ball Spline Spindle Construction

- 250 Million cycles in testing
- 5 times greater radial load strength
- High shock and vibration resistance

National measurement standards
Traceability

- Accuracy inspection and calibration to national standards completed on certified equipment.
- Calibration certificates issued on-site

- Wide variety of PLC fieldbus interfaces avaiable
- USB interface gauge with free software
- Wide product lineup for various applications
- Nationwide service & support network
- Excellent resistance to harsh environments **IP67 versions available**

The magnetic technology of the Digital Gauge makes it highly resistant to water, oil and condensation.

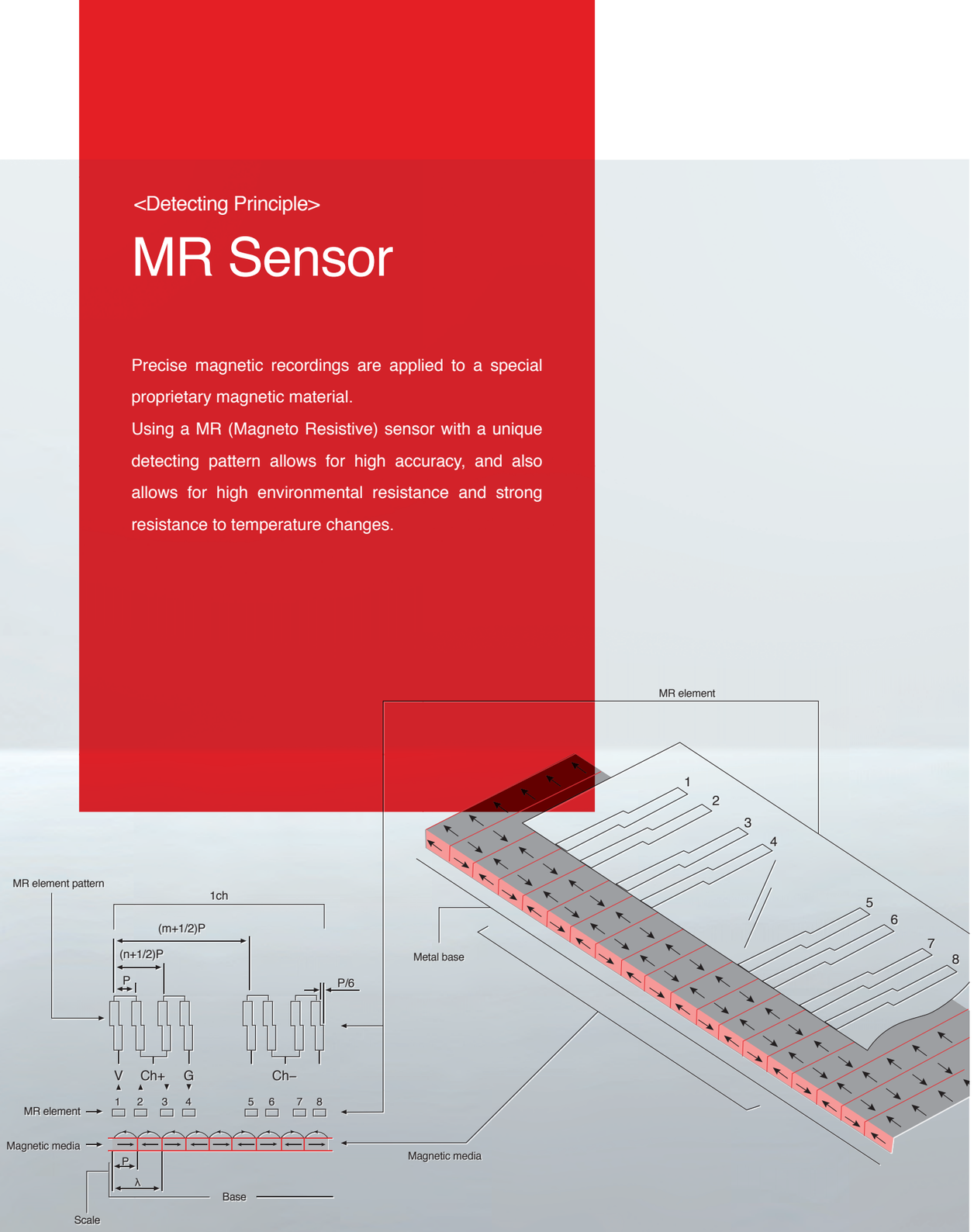
Leading Edge Technology
for Leading Edge Manufacturing

Digital Gauge

<Detecting Principle>

MR Sensor

Precise magnetic recordings are applied to a special proprietary magnetic material.
Using a MR (Magneto Resistive) sensor with a unique detecting pattern allows for high accuracy, and also allows for high environmental resistance and strong resistance to temperature changes.



Using a magnetic detecting principle allows for both high accuracy and high environmental resistance.

High Response Speed	▶ Over 20 million readings per second No tracking errors with high speed sampling
Repeatability of ±0.1µm or better (2σ)	▶ Uses a continuous processing circuit A quadrature signal (sine/cosine) from the sensor and processing via a proprietary sequential processing circuit fulfills 0.1µm resolution and ±0.1µm repeatability.
No Calibration	▶ Digital signal processing The signal is processed digitally, which does not require signal calibration like an differential transformer method.
No warm up time	▶ Excellent temperature characteristics There is no required warm-up time or stand-by time. The Digital Gauge can be used immediately upon power-up.

<Spindle Design>

Ball Spline Spindle Construction

The Digital Gauge has been improved with both repeatability and spindle performance due to the ball spline spindle construction. Long operational life, with excellent shock and vibration resistance help reduce overall maintenance costs.
(As of May 2019, the gauges have reached 270 million strokes in an on going evaluation.)

Improved performance to 250 million cycles

High Durability

▶ Lower lifetime cost

The number of cycles has reached 270 million,
with a theoretical value of 250 million cycles.
High durability, excellent vibration and shock resistance,
along with the ball spline spindle construction contribute
to a long operational life for a wide variety of applications.

Lower the fluctuation of spindle resistance

▶ Improve high repeatability by stable spindle resistance

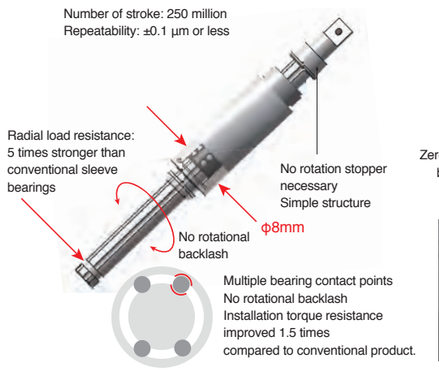
Repeatability has reached ±0.1μm or better due to the ball spline spindle design with optimized pre-load control and precision cut groove.

Strength against radial loads

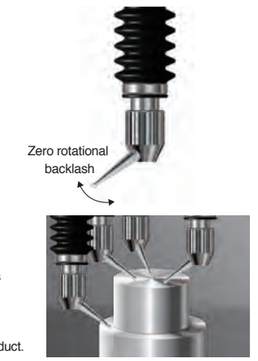
▶ The bearing structure strengthens the entire spindle

Due to the multiple points where the bearings come into contact with the spindle splines, the radial load capability is 5 times stronger than linear bush type, and allows for accurate measurements even at an angle and installation torque resistance improved 1.5 times.

Ball spline structure

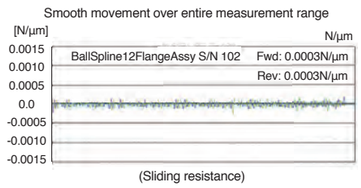


Strong resistance to shock and vibration



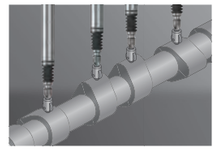
Off-center feeler used in a tight measurement space

Sliding resistance chart



(Sliding resistance)

Application

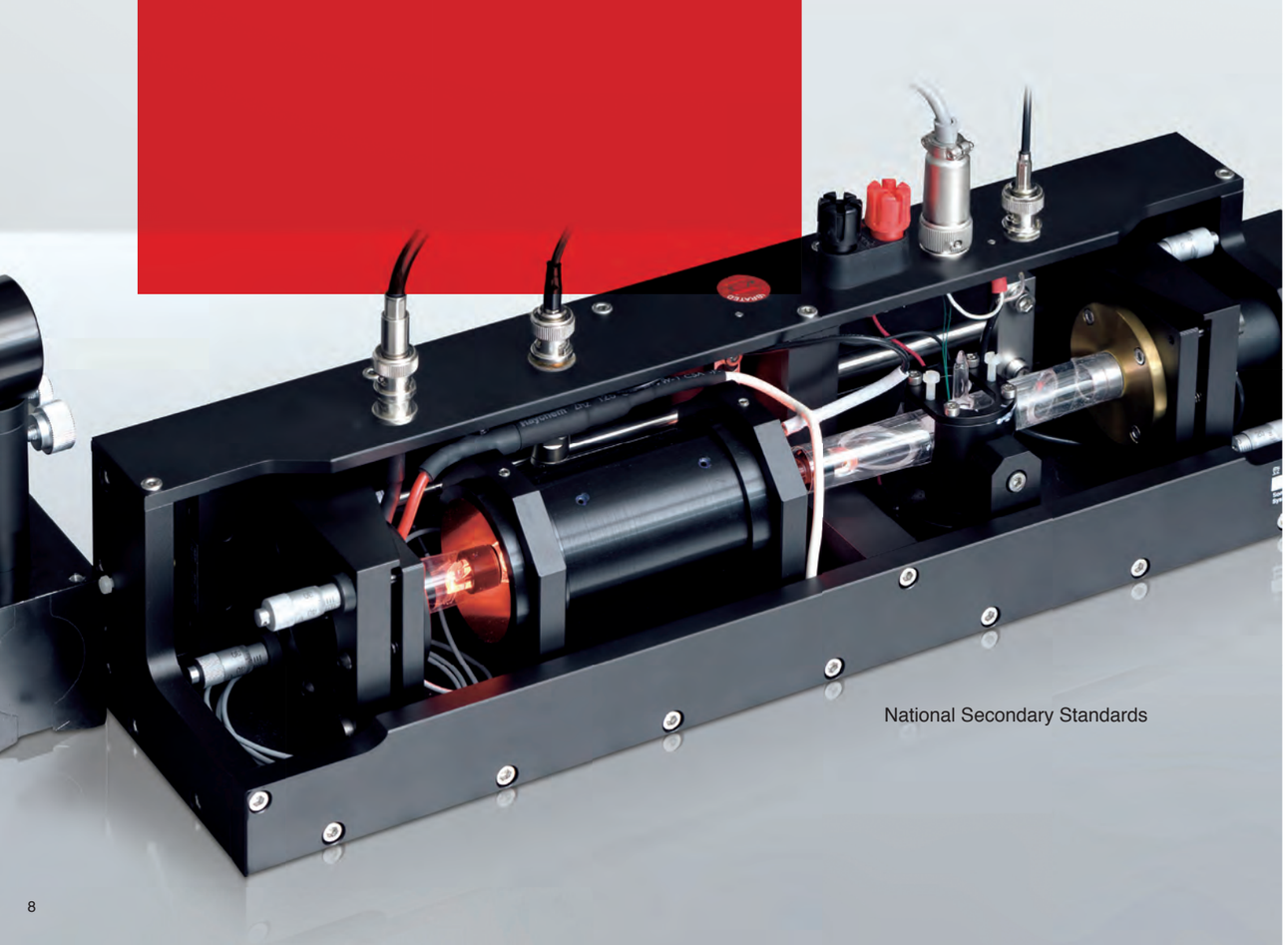


Cam shaft run-out
and shape measurement

<National measurement standards>

Traceability

Magnescale Co., Ltd. is an authorized calibration contractor. An accuracy chart is attached with every product. Measurement data is generated by equipment traceable to national standards. Magnescale can also issue a calibration certificate after a products ships.



National Secondary Standards

All Magnescale Digital Gauges are traceable to national measurement standards

All Magnescale measuring and inspection equipment is calibrated to national measurement standards

▶ Inspection and calibration traceable to the national measurement standards

Magnescale Co., Ltd. performs regular accuracy inspections and calibrations to ensure compliance.

Accuracy measurement during manufacturing

▶ Each product is shipped with an accuracy chart

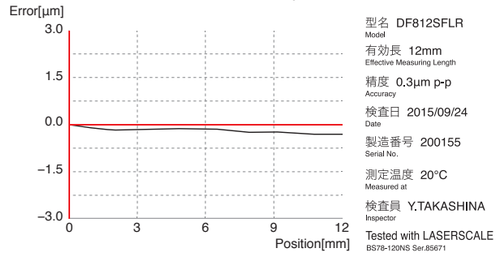
All Digital Gauge products are shipped with an individual accuracy chart. If a customer loses a chart, we can re-issue it based on serial number information.

Product calibration certificates generated on-site

▶ Calibration certificates are also available after the product has shipped

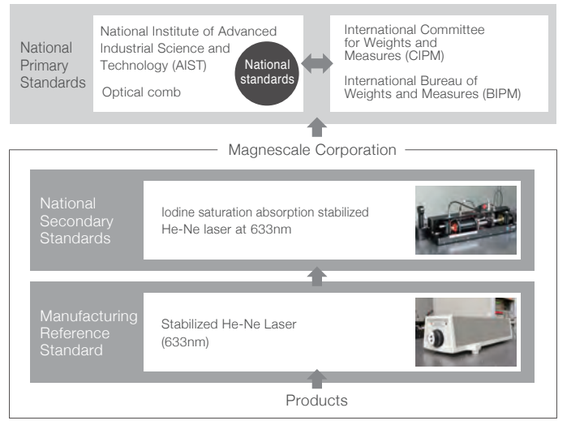
An accuracy chart is included with each shipment. Product calibration certificates required for ISO certifications are created on-site. Calibration certificates are also available after the product has shipped.

Product Accuracy Chart



Certificate of Calibration

Length traceability system

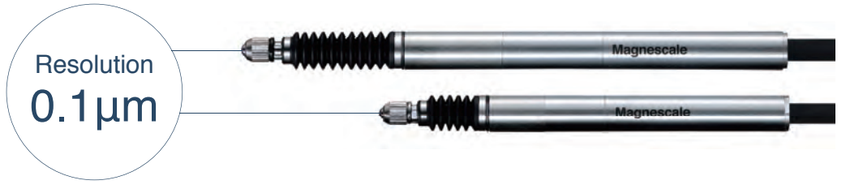


A diverse lineup of gauges for a range of applications

High Resolution

Using high-precision measurements, we improve the accuracy of post process assembly.
Slim and compact, and offering 0.1 micron maximum resolution,
these gauges also feature a highly durable mechanical structure capable of more than 270 million strokes.

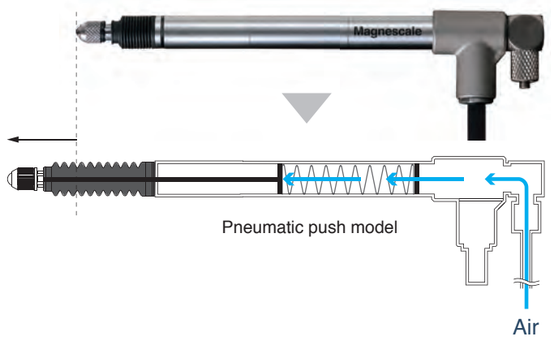
- DS800S series
- DF800S series
- DK800S series



Air-driven

Using air allows for measurements to be tailored to the measurement piece and the application.

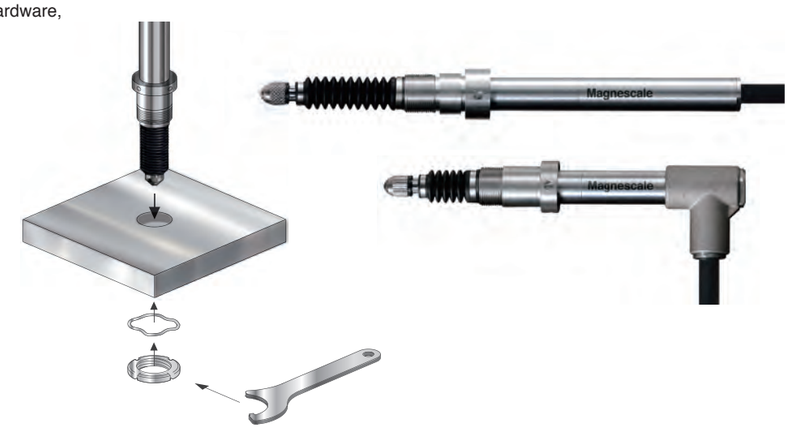
- DK800S series
- DF800S series
- DS800S series
  V model : Pneumatic push
  L model : Vacuum suction
- DT series



Flange Mount

Reduces the cost for custom mounting hardware,
and lowers installation time.

- DS800S series
- DF800S series
- DK800S series
  F Type

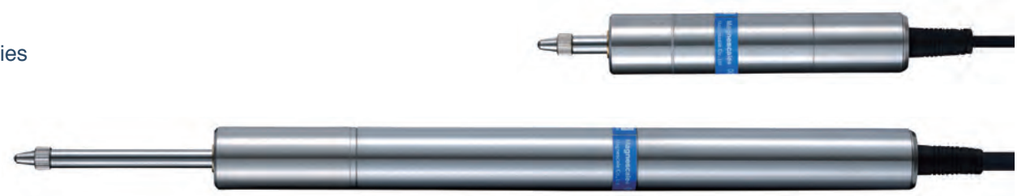


The ideal measurement solution for every application

Robust, long measurement range

Long measurement ranges allow for objects of various sizes (205mm maximum).
The robust structure creates superior environmental resistance and rigidity, and is able to be used in a wide range of applications.

- DK series



General Purpose

The general purpose models can be used in simple applications, such as assembly checks and dimensional measurements.
Lower cost, but still applicable to a wide range of applications.

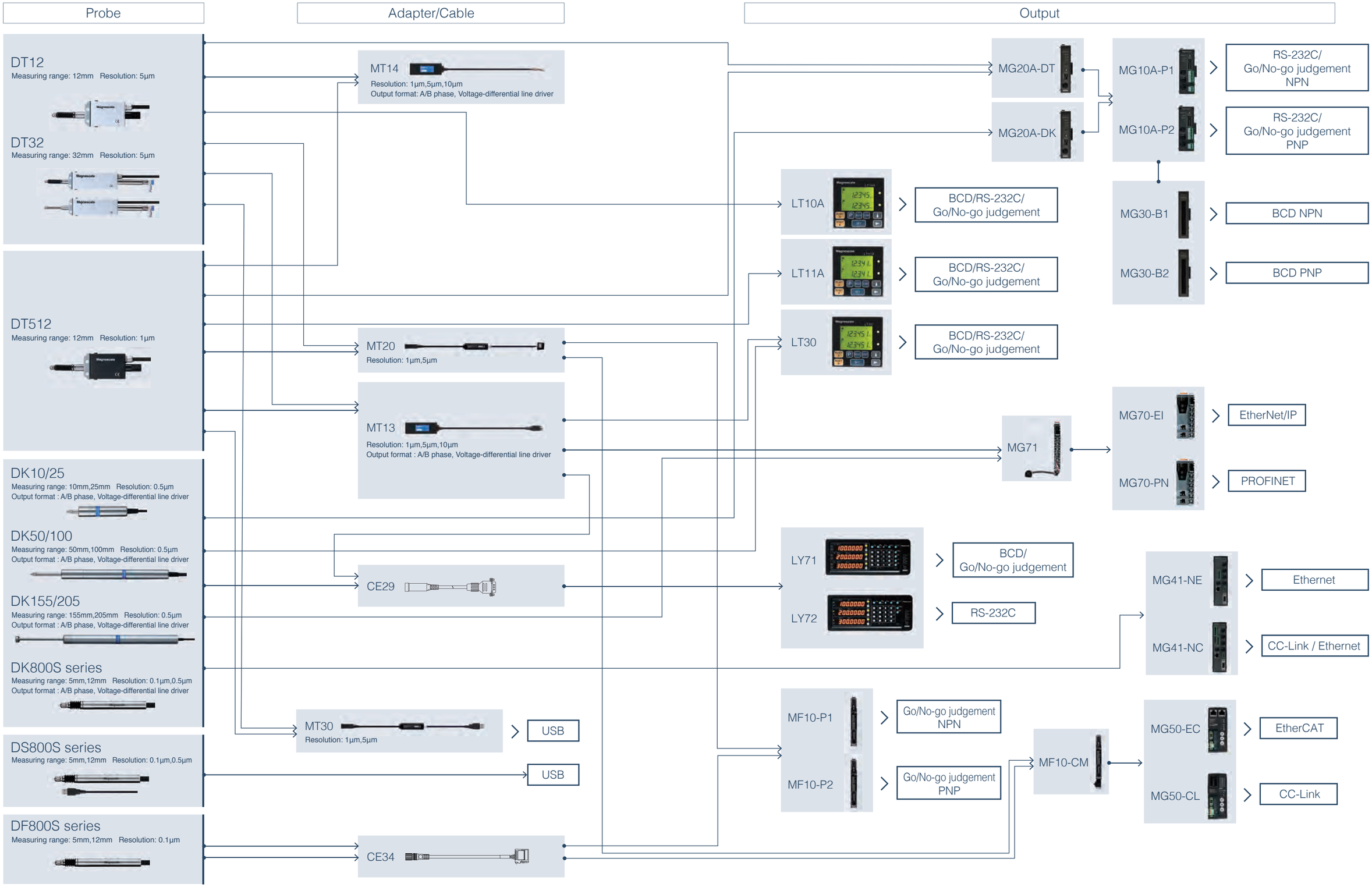
- DT series

USB Connection

Able to be directly connected to a computer via USB, enabling simple data acquisition.
Perfect for post-process inspection.

- DS800S series

Connection diagram



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Details of digital gauge models

DS8○○S△△R□

- [Resolution]
  - No symbol : 0.1µm
  - 5 : 0.5µm
- [Structure]
  - No symbol: Straight
  - L : Right angle
  - F : Straight flange
  - FL : Right angle flange
  - V : Pneumatic push
- [Measurement range]
  - 05 : 5mm
  - 12 : 12mm

DF○○S△△R

- [Structure]
  - No symbol: Straight
  - L : Right angle
  - F : Straight flange
  - FL : Right angle flange
  - V : Pneumatic push
- [Measurement range]
  - 05 : 5mm
  - 12 : 12mm

DK8○○S△▲□R★

- [Stroke]
  - 05 : 5mm
  - 12 : 12mm
  - 30 : 30mm
- [Resolution]
  - No symbol : 0.1µm
  - 5 : 0.5µm
- [With reference point]
- [Structure]
  - No symbol : Straight
  - L : Right angle
  - V : Pneumatic push
- [Stem shape]
  - No symbol : φ8 straight
  - F : Flange type
- [Minimum phase difference]
  - No symbol : DK830 series (50ns)
  - A : 50ns
  - B : 100ns
- [Ball spline type]
- [Stem diameter]
  - φ8mm

DK○○○□R5

- [Resolution]
  - 5 : 0.5µm
- [With reference point]
- [Protection grade]
  - N : IP50
  - P : IP64
- [Measurement range]

*Please refer to the Specifications Table for the DK110 series.

DT○○○△▲

- [Spindle drive system]
  - No symbol : Spring push
  - V : Pneumatic push (DT32 only)
- [Protection grade]
  - N : IP50
  - P : IP64
- [Measurement range]
  - 12 : 12mm
  - 32 : 32mm
  - 512 : 12 mm high-precision type

DS800S series

Directly connect to a PC or hub via USB.
Communications and measurement software is also available.

DS805S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : S/SF/SL*/SFL* type
  IP64 : SL/SFL type
- High-durability (Ball spline structure)
- Output: USB

* When using the supplied hose elbow and a ϕ4mm tube

5mm stroke

DS812S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : S/SF/SV/SL*/SFL* type
  IP64 : SL/SFL type
- High-durability (Ball spline structure)
- Output: USB

* When using the supplied hose elbow and a ϕ4mm tube

12mm stroke

High-speed sampling (Maximum speed: 1 ms*1)

Recommended operating environment

CPU: Intel Core i3 or higher
RAM: 1 GB or higher
OS: Windows 7 / Windows 10
(32 bit / 64 bit edition)

- For details of commands, please contact the Magnescale Sales Department.

*Windows and ActiveX are registered trademarks or trademarks of Microsoft Corporation in the United States and in other countries. Intel and Intel Core are registered trademarks or trademarks of Intel Corporation in the United States and in other countries.

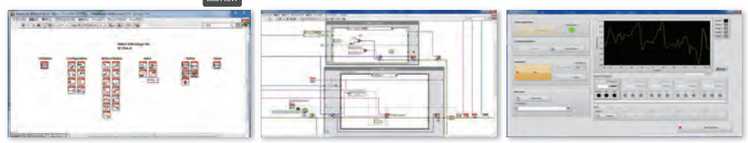
- USB2.0SF-compatible digital gauges are capable of USB port-powered operation.
- A multi-axis configuration can be employed using a general-purpose USB hub.
  (Depending on the number of axes, the hub will require an external power supply).
- Operation verification software and sample programs are available free of charge from the Magnescale website.
- Functions can be executed via commands in the dedicated ActiveX Control provided by Magnescale.

Standard software necessary for the display of measurement values is provided free of charge

Standard software
MGS USB Gauge Monitor

An original Magnescale application provided with a wide range of display functions, including current value, maximum value, minimum value, P-P value, and judgment functions.

LabVIEW-compatible communications software available



Importing data into Excel, VBA (OCX) and CSV makes it easy to create custom software solutions.

*1 MGS sampling data when 1 axis is connected. Results may vary depending on specifications and environment.

*2 Please contact our sales about the maximum number of axes.

DF800S series

Connects to digital tolerance indicator
MF10 and compatible with various field bus

DF805S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : S/SF/SL*/SFL* type
  IP64 : SL/SFL type
- High-durability (Ball spline structure)
- Output: Dedicated serial communications protocol

* When using the supplied hose elbow and a ϕ4mm tube

5mm stroke

DF812S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : S/SF/SV/SL*/SFL* type
  IP64 : SL/SFL type
- High-durability (Ball spline structure)
- Output: Dedicated serial communications protocol

* When using the supplied hose elbow and a ϕ4mm tube

12mm stroke

DK800S series

Connects to LT30 series counters and MG20A, MG40 and MG70 series interface units
A/B quadrature signal connects to PLC counter cards.

DK805S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : SA/SAF/SB/SBF/SAL*/SAFL*/SBL*/SBFL* type
  IP64 : SAL/SAFL/SBL/SBFL type
- High-durability (Ball spline structure)
- Output: A/B/ reference point

* When using the supplied hose elbow and a ϕ4mm tube

5mm stroke

DK812S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : SA/SAF/SB/SBF/SAV/SBV/SAF*/SAFL*/SBL*/SBFL* type
  IP64 : SAL/SAFL/SBL/SBFL type
- High-durability (Ball spline structure)
- Output: A/B/ reference point

* When using the supplied hose elbow and a ϕ4mm tube

12mm stroke

DK830S

High resolution 0.1μm | General purpose 0.5μm | Spring push | Pnuematic push | Flange mount | Straight body | Right angle body | Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP67 : SL*/SV* type
  IP53 : S/SL/V type
- High-durability (Ball spline structure)
- Output: A/B/ reference point

* When the bellows set (optional accessary) is mounted

30mm stroke

Long stroke / General-purpose resolution•Robust type

DK series

Connects to LT30 series counters and MG20A, MG40 and MG70 series interface units

DK10/25

High resolution 0.1μm	General purpose 0.5μm	Spring push	Pnuematic push*	Flange mount	Straight body	Right angle body	Reference point function

- Stem: ϕ20
- Protection grade (probe section)
  IP64 : P/PL type
  IP50 : N/NL type
- Output: A/B phases

*When using the air lifter DZ174 (accessory)

10mm stroke

25mm stroke

DK50/100

High resolution 0.1μm	General purpose 0.5μm	Spring push	Pnuematic push (DK50 only*)	Flange mount	Straight body	Right angle body	Reference point function

- Stem: ϕ20
- Protection grade (probe section)
  IP64 : P type
  IP50 : N type
- Output: A/B phases

*When using the air lifter DZ174 (accessory)

50mm stroke

100mm stroke

DK155/205

High resolution 0.1μm	General purpose 0.5μm	Spring push	Pnuematic push	Flange mount	Straight body	Right angle body	Reference point function

- Stem: ϕ32
- Protection grade (probe section): IP64
- Output: A/B phases

155mm stroke

205mm stroke

Small / General-purpose

DT series

Connects to LT10A (DT12/DT32) / LT11A (DT512) counters and MG20A interface units

DT512/12

High resolution 0.1μm	General purpose 1μm 5μm	Spring push	Pnuematic push*	Flange mount	Straight body	Right angle body	Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP64 : P type

*When using the air lifter DZ176 (accessory)

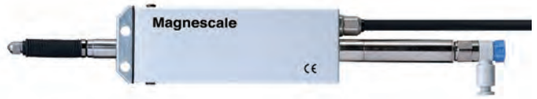
12mm stroke

DT32

High resolution 0.1μm	General purpose 5μm	Spring push	Pnuematic push	Flange mount	Straight body	Right angle body	Reference point function

- Stem: ϕ8
- Protection grade (probe section)
  IP64 : P/PV type

32mm stroke



DT gauge (DT12N/P, DT32N/NV/P/PV, DT512N/P) compatible interpolators

Interpolator

Combine with DT gauges, to convert measurement data into various outputs

MT13

- Resolution : 1 μm, 5 μm, 10 μm
- Output signal : A/B phase (The output becomes high impedance during an alarm)
- Output format : Voltage-differential line driver output (compliant with EIA-422)

MT14

- Resolution : 1 μm, 5 μm, 10 μm
- Output signal : A/B phase, alarm (The output does not become high impedance during an alarm)
- Output format : Voltage-differential line driver output (compliant with EIA-422)

MT20

- Resolution : 1 μm, 5 μm, 10 μm
- For MF10 only

MT30

- Resolution : 1 μm, 5 μm, 10 μm
- USB2.0

MG70/71

Interface units for DK series digital gauges

Allow measurement data to be transferred to a PLC via EtherNet/IP or PROFINET fieldbuses.
Can also be connected to DT series general-purpose digital gauges using the MT13 interpolator.
Maximum number of length measurement unit connections: 85 axes
(Up to a maximum of 250 axes when a power supply module is employed)
MG70-EI : EtherNet/IP
MG70-PN : PROFINET

Communications EtherNet/IP
Communications PROFINET

MG70-EI MG71-CM
MG70-PN

MG40 series

Interface units for DK series digital gauges

Interface units for DK series digital gauges
Allow measurement data to be transferred to a computer or PLC via Ethernet or CC-Link.
Maximum number of length measurement unit connections: 100 axes

Communications Ethernet
Communications CC-Link

MG41-NC MG41-NE MG42

MG50

Interface units for DF series digital gauges

Interface units for DF series digital gauges
Allow DF805S/DF812S series measurement data to be transferred to a PLC via EtherCAT or CC-Link fieldbuses.
Can also be connected to DT series general-purpose digital gauges using an MT20-01/05 interpolator.
Maximum number of length measurement unit connections:
MG50-EC: 30 axes
MG50-CL: 16 axes

Communications EtherCAT
Communications CC-Link

MG50-CL MF10-CM

MG50-EC MF10-CM

MG10A/20A/30

Interface units for DK and DT series digital gauges

Standard RS-232C output, allowing measurement data to be transferred to a computer or PLC.
Maximum number of length measurement unit connections: 16 axes (Up to a maximum of 64 axes using link cable)

Output BCD
Output RS-232C
Output Go/no-go Judgement

MG30 MG10A MG20A-DK MG20A-DT

MF10

Compact display unit for DF series

Various mode displays
(preset, tolerance setting, Go/NoGo display, output reversal function)*
Two types of tolerance settings and four setting methods can be selected
Preset function allows arbitrary setting of origin point position

Output Go/no-go Judgement

MF10-P1 : NPN output type
MF10-P2 : PNP output type
MF10-CM : MG50 only

*Output reversal function : MF10-P1/P2 only

MF10-CM MF10-P1
MF10-P2

LT30 series (For DK and DK-S)

Display unit for DK series

Equipped with functions necessary for measurement
and judgment of tolerances, including preset,
judgment output, external reset, latch, 2-axis addition,
and P-P measurement

Output BCD | Output RS-232C | Output Go/no-go Judgement

LT11A series (For DT512)

Display unit for DT512

Equipped with functions necessary for measurement
and judgment of tolerances, including preset, judgment output,
external reset, latch, 2-axis addition, and P-P measurement

Output BCD | Output RS-232C | Output Go/no-go Judgement

LT10A series (For DT12/32)

Display unit for DT12/DT32

Equipped with functions necessary for measurement
and judgment of tolerances, including preset, judgment output,
external reset, latch, 2-axis addition, and P-P measurement

Output BCD | Output RS-232C | Output Go/no-go Judgement

LY71

High-function measurement display unit able to be connected to up to two axes

Fitted with general-purpose input/output terminals allowing selection of function
Addition of expansion board enables BCD and comparator output

Output BCD | Output Go/no-go Judgement

LY72

High-function display unit able to be connected to up to three axes

RS-232C fitted as standard, allowing operation by command

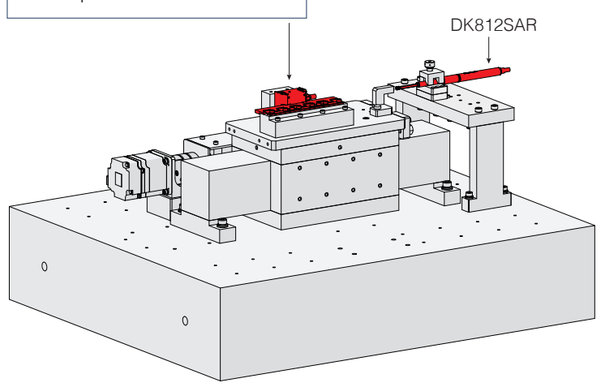
Output RS-232C

DK812SAR repeatability

The result determined from measurements conducted five times each at various points between 1 mm and 12 mm from the reference position (DK812SAR spindle fully extended) using a Magnescale laser scale was 2 σ.

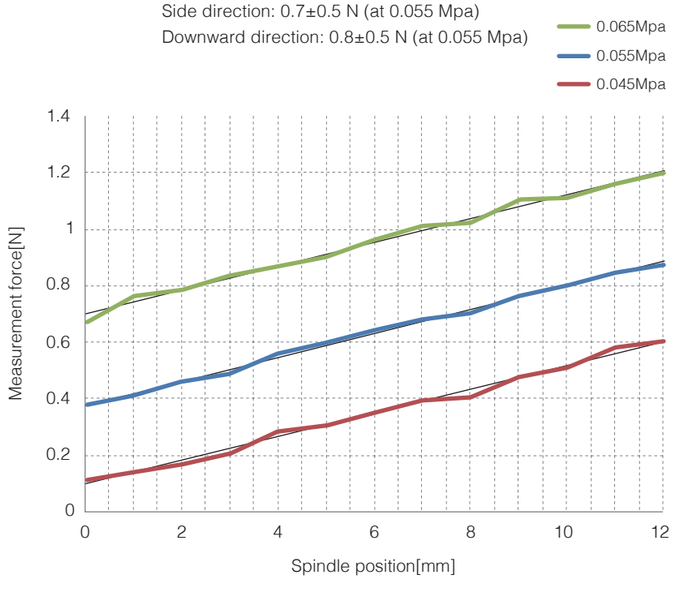
Measurement position	2σ(μm)
1mm	0.068
2mm	0.066
3mm	0.056
4mm	0.039
5mm	0.038
6mm	0.048
7mm	0.052
8mm	0.029
9mm	0.038
10mm	0.018
11mm	0.031
12mm	0.027

Reference laser scale: BS78
Resolution: Approx. 8.6 nm
Accuracy: 0.04 μm
Temperature: 20±0.5°C



Relationship between DK812SAVR (pneumatic push type) air pressure and measurement force

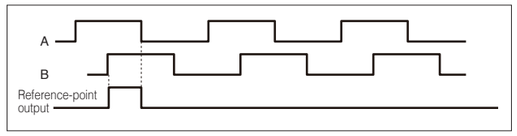
Product specifications: Upward direction: 0.6±0.5 N (at 0.055 Mpa)
Side direction: 0.7±0.5 N (at 0.055 Mpa)
Downward direction: 0.8±0.5 N (at 0.055 Mpa)



Measurement results and approximation lines
for air pressure = 0.045 Mpa, 0.055 Mpa, and 0.065 Mpa and side direction.

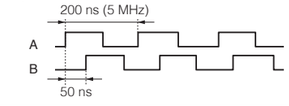
DK Series measuring unit output signals

The signal output from these measuring units are A/B quadrature and reference point signals, voltage differential line driver output compliant with EIA-422.

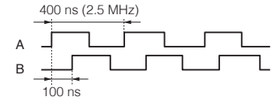


The reference point is the synchronized reference point that is at Hi level when the signal A and signal B are at the Hi level.

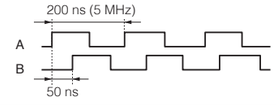
DK800SA output signal at maximum response speed (at approx. 80 m/min)



DK800SB output signal at maximum response speed (at approx. 42 m/min)



DK10/25/50/100/155/205 output signal at maximum response speed (at approx. 250 m/min)

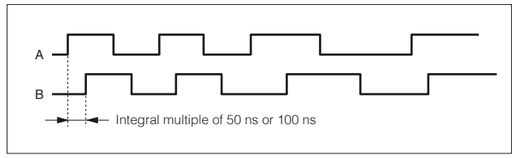


The A/B quadrature output signal by measuring unit is 5 MHz maximum with a minimum phase difference of 50 ns for DK800SA and is 2.5 MHz maximum with a minimum phase difference of 100 ns for DK800SB. The counter or control devise capable of processing these signals should be used.

For DK the A/B quadrature output signal by measuring unit is 5 MHz maximum with a minimum phase difference of 50 ns . The counter or control devise capable of processing these signals should be used.

Output Signal Phase Difference

Moving length of the measuring unit is detected every 50 ns for the DK800SA/DK and every 100 ns for the DK800SB, and the phase difference proportional to the amount traveled is output. The amount of phase difference changes in integer multiples of 50 ns or 100 ns. Also, the minimum phase difference for the phase A and B is 50 ns for the DK800SA/DK and 100 ns for the DK800SB.

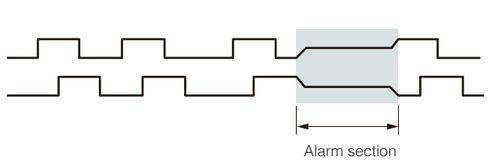


In the standard specifications, the minimum phase difference is fixed at 50 ns for the DK800SA and 100 ns for the DK800SB, however, the minimum phase differences in the following table below are available as special specifications.

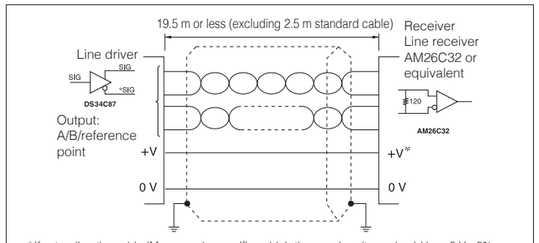
Phase A/B Minimum phase difference	Phase A single cycle	Counter's permissible frequency	Maximum response speed		Remarks
			Resolution 0.1 μm	Resolution 0.5 μm	
50ns	200ns	5MHz	80m/min	250m/min	DK800SA standard product
100ns	400ns	2.5MHz	42m/min	100m/min	DK800SB standard product
300ns	1.2μs	833kHz	14m/min	33m/min	Special specifications
500ns	2μs	500kHz	8.4m/min	20m/min	Special specifications

Output Signal Alarm

If the response speed is exceeded, the phase A/B output from this measuring unit changes to high impedance state for about 400 ms as an alarm.



Receiver



*If extending the cable (Magnescale-specific cable), the supply voltage should be +5 V ±5% at the extension destination. *For an extension cable with spread-out end, use the CE22 Series.

DK Series operating cautions

- For the pneumatic push type, use of the pneumatic circuit shown in Fig. 1 enables the feeler to be air driven. Pressure regulation is required depending on the usage condition. A precision pressure regulator (e.g., SMC IR2010 or equivalent) should be used.
- For the vacuum suction type, use of the pneumatic circuit shown in Fig. 2 enables the feeler to be air driven.

Fig. 1 Pneumatic circuit (pneumatic push)

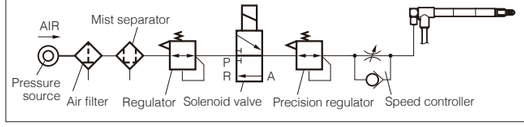
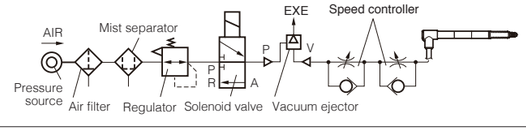
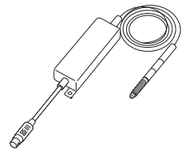
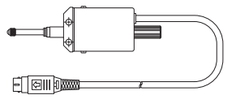
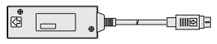
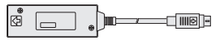
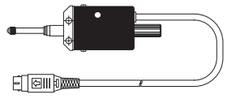
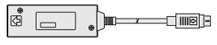
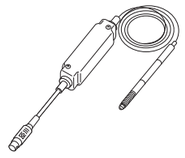
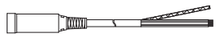
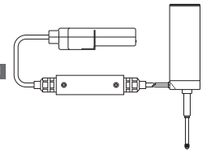
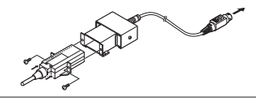
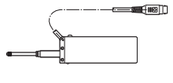


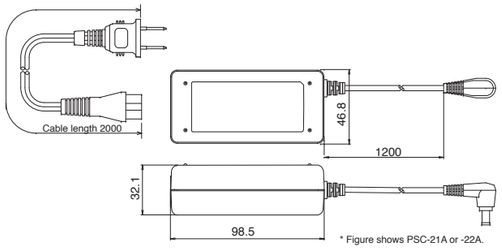
Fig. 2 Pneumatic circuit (vacuum suction)

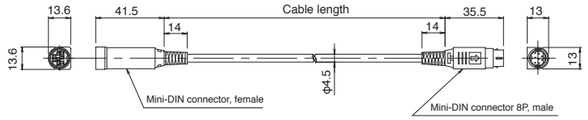


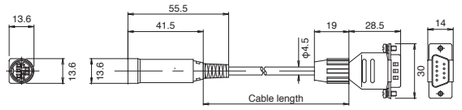
Compatibility with discontinued products

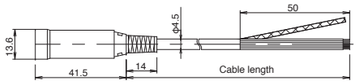
Digital gauge	Adapter/conversion cable Note 1: MT12/13 is interpolator.	Counters	Interface unit	Old counters	External device	Extension cables
DK800A/B Series Discontinued DK800S Series DK10/25/50/100/110/155/205 Series 	Unnecessary	LT30 Series	**MG20A-DK** MG41-NE/NC MG42			CE08-1(1 m) -3(5 m) -5(5 m) -10(10 m) -15(15 m) * Total cable length is 20 m or less. CK-T12(1 m) -T13(3 m) -T14(5 m) -T15(10 m) -T16(15 m) * High-flex cable/total cable length is 20 m or less. CE27-01(1 m) -03(3 m) -05(5 m) -10(10 m) * High-flex cable/large-dia. cable/total cable length is 30 m or less.
	CE29 Series Cable length: 0.3/1/3/5/10 m	LH71A/72 LY71/72				
	(Open-end cable)				○ : connectable A/B reference point (Differential line receiver input)	CE22-01(1 m) -03(3 m) -05(5 m) -10(10 m) * High-flex cable/open-end/total cable length is 20 m or less. CE26-01(1 m) -03(3 m) -05(5 m) -10(10 m) * High-flex cable/open-end/large-dia. cable/total cable length is 30 m or less. CE27-01(1 m) -03(3 m) -05(5 m) -10(10 m)(extension cable for CE26) * High-flex cable/large-dia. cable/total cable length is 30 m or less.
DG Series (with HA13) Discontinued * Model with no “B” assigned	SZ05-T01	LH71A/72 LY71/72				Without extension cable
	SZ05 + SZ51-MS01			LY51/52 Discontinued		
	Unnecessary			LY100/110 LH20, etc. Discontinued		
DT12/32 Series 	Unnecessary	LT10A Series	MG20A-DT	LT10 Series Discontinued		CE08-1(1 m) -3(5 m) -5(5 m) -10(10 m) -15(15 m) * Total cable length is 20 m or less. CK-T12(1 m) -T13(3 m) -T14(5 m) -T15(10 m) -T16(15 m) * High-flex cable/total cable length is 20 m or less.
	MT12-05/10 Note 1 	LT20A Series		LT20 Series Discontinued		
	MT13-05/10 Note 1 	LT30 Series				
DT512 Series 	Unnecessary	LT11A Series	MG20A-DT	LT11 Series Discontinued		
	MT13-01 Note 1 	LT30 Series				
DK800 Series Discontinued * Models with no “A/B” assigned to model 	Unnecessary	LT30 Series	MG20A-DK			CE27-01(1 m) -03(3 m) -05(5 m) -10(10 m) * High-flex cable/large-dia. cable/total cable length is 10 m or less. * When CE08-1(1 m) -3(3 m) or CK-T12(1 m) -T13(3 m) is used, the total cable length is 5 m or less.
	CE29 Series Cable length: 0.3/1/3/5/10 m	LH71A/72 LY71/72				
	(Open-end cable) 				○ : connectable A/B reference point (Differential line receiver input)	CE22-01(1m) -03(3 m) * High-flex cable/open-end/total cable length is 5 m or less. CE26-01(1 m) -03(3 m) * High-flex cable/open-end/large-dia. cable/total cable length is 10 m or less. CE27-01(1 m) -03(3 m) -05(5 m)(extension cable for CE26) * High-flex cable/large-dia. cable/total cable length is 10 m or less.
DG-B Series Discontinued	DZ51 + SZ70-1	LH71A/72 LY71/72				Without extension cable
	Unnecessary	LT20A Series	MG20A-DG	LT20 Series Discontinued		
	DZ51			LY51/52 Discontinued		
DE12BR/DE30BR Discontinued 	SZ70-2 	LT30 Series				Without extension cable
	SZ70-1	LH71A/72 LY71/72				
	Unnecessary			LY51/52 Discontinued		
DL310B/DL330B DL10BR/DL30BR/DL60BR Discontinued  DL30BR	Unnecessary	LT20A Series	MG20A-DG	LT20 Series Discontinued		Without extension cable * Cable may be manufactured to specified length on a production by order basis. Total cable length: 10 m or less
	DZ51 + SZ70-1	LH71A/72 LY71/72				
	DZ51			LY51/52 Discontinued		

	DS	DF	DK-S	DK20φ	DT	LY	LT	MG	MF
PSC (AC adapter) PSC-21A (for Japan only: 100 V) PSC-22A (for the US only: 120 V) PSC-23A (for Europe and other countries : 220 to 240 V) Please contact our sales for corresponding region.	—	—	—	—	—	●	—	—	—
CE (Extension cable) CE08-1 (1m) CE08-3 (3m) CE08-5 (5m) CE08-10 (10m) CE08-15 (15m)	—	—	●	●	●	—	●	●	—
(Conversion cable for LH70/LY70 Series) CE29-003 (0.3m) CE29-01 (1m) CE29-03 (3m) CE29-05 (5m) CE29-10 (10m)	—	—	●	●	—	●	—	—	—
Extension cable, flying leads CE22-01 (1m) CE22-03 (3m) CE22-05 (5m) CE22-10 (10m)	—	—	●	●	—	—	—	—	—
(Output cable) CE34-005 (0.5m) CE34-02 (2m) CE34-05 (5m) CE34-10 (10m) CE34-15 (15m) CE34-20 (20m)	—	●	—	—	—	—	—	—	●
(Extension cable) CE38-01 (1m) CE38-02 (2m) CE38-04 (4m)	●	—	—	—	—	—	—	—	—

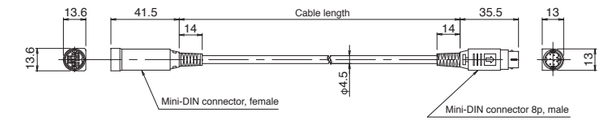


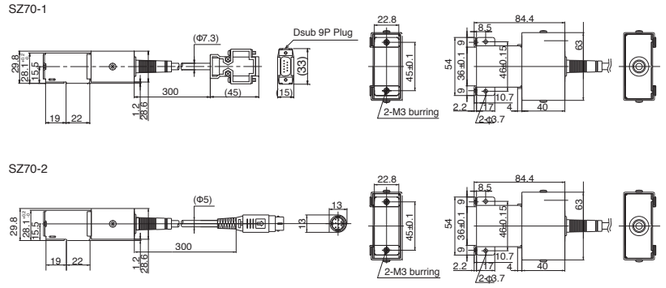


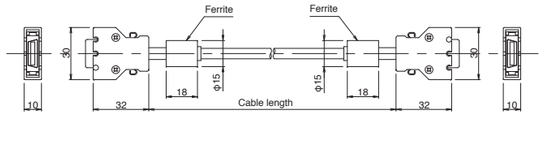




	DS	DF	DK-S	DK20φ	DT	LY	LT	MG	MF
CK (High-flex extension cable) CK-T12 (1m) CK-T13 (3m) CK-T14 (5m) CK-T15 (10m) CK-T16 (15m)	—	—	●	●	●	—	●	●	—
SZ (Conversion cable) SZ70-1 (for LY71 and 72) SZ70-2 (for LT30)	—	—	—	—	—	●	●	—	—
MZ (Link cable) MZ41-R5 (0.5m) MZ41-01 (1m) MZ41-02 (2m) MZ41-05 (5m) MZ41-10 (10m)	—	—	—	—	—	—	—	MG41	—



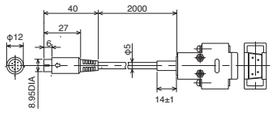




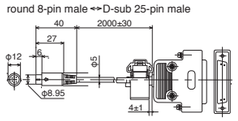
DZ

DZ252
DZ253A
DZ254
DZ174-010
DZ174-025
DZ174-050
DZ176
DZ830BL
DZ830BV
DZ-5100
DZ830F
DZ-123
DZ-121
DZ-191
DZ-122
DZ-100
DZ-161
DZ-181
DZ-521
DZ811

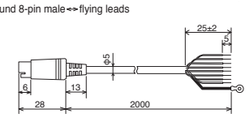
DZ252 Cable for RS232C (For LT and MG10A Series)
round 8-pin male ↔ D-sub 9-pin female



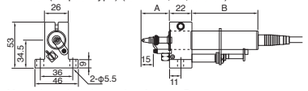
DZ253A Cable for RS-232C (For LT and MG10A Series)
round 8-pin male ↔ D-sub 25-pin male



DZ254 Cable for RS-232C (For LT and MG10A Series)
round 8-pin male ↔ flying leads

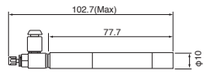


DZ174-010/DZ174-025/DZ174-050
Air Lifter (Air push type) (for DK10, 25, and 50)

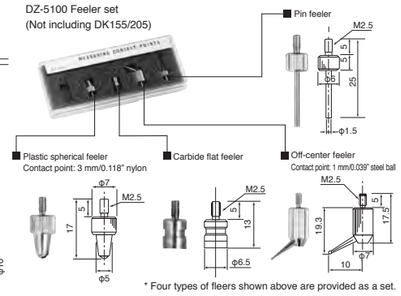


Measuring units to be used	A	B
DK10NR5, PR5	32.5	75.5
DK10PLR5	32.5	56
DK25NR5, PR5	47.5	118
DK25NLR5, PLR5	47.5	98.5
DK50NR5/PR5	72	200

DZ176 air lifter
(Air push type)
(For DT512, 12)



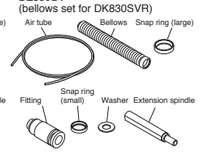
DZ-5100 Feeler set
(Not including DK155/205)



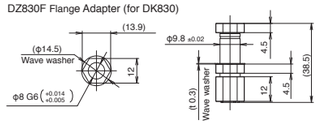
* Four types of fleers shown above are provided as a set.

DZ830BL
(bellows set for DK830SLR)

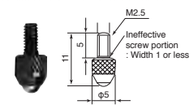
DZ830BV
(bellows set for DK830SVR)



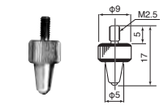
DZ830F Flange Adapter (for DK830)



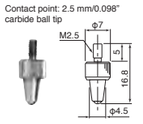
DZ-123 Feeler (not for DK155/205)
Contact point: 3 mm/0.118" carbide ball tip



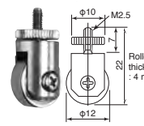
DZ-121 Feeler (for DK100)
Contact point: 2.5 mm/0.098" carbide ball tip



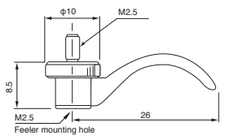
DZ-122 Feeler
(for DK10, 25, and 50)
Contact point: 2.5 mm/0.098" carbide ball tip



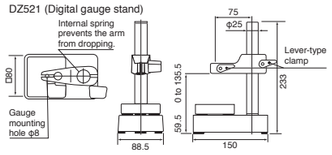
DZ-100 Roller feeler
(not for DK155/205)



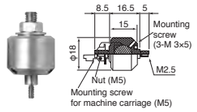
DZ-161 lift lever



DZ521 (Digital gauge stand)

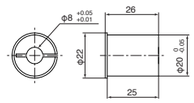


DZ-191 Coupling



DZ-181 Magnetic feeler (for DK155/205)

DZ811 Set bush (for DZ501)



DS800S series

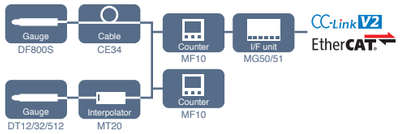
DS805S/DS812S

Model	High-resolution models	General-purpose resolution models	High-resolution models		General-purpose resolution models	
	DS805SR, DS805SLR, DS805SFR, DS805SFLR	DS805SR5, DS805SLR5, DS805SFR5, DS805SFLR5	DS812SR, DS812SLR, DS812SFR, DS812SFLR	DS812SVR	DS812SR5, DS812SLR5, DS812SFR5, DS812SFLR5	DS812SVR5
Measuring range	5mm		12mm			
Maximum resolution	0.1μm	0.5μm	0.1μm		0.5μm	
Accuracy(At 20°C)	1μm p-p	1.5μm p-p	1μm p-p		1.5μm p-p	
Repeatability	±0.1μm or less					
Measuring force	Upward: 0.35±0.25N Horizontal: 0.40±0.25N Downward: 0.45±0.25N		Upward: 0.40±0.30N Horizontal: 0.50±0.30N Downward: 0.60±0.30N	Upward: 0.60±0.50N Horizontal: 0.70±0.50N Downward: 0.80±0.50N	Upward: 0.40±0.30N Horizontal: 0.50±0.30N Downward: 0.60±0.30N	Upward: 0.60±0.50N*1 Horizontal: 0.70±0.50N*1 Downward: 0.80±0.50N*1
Maximum response speed	80m/min					
Reference point	Position at spindle movement of 1mm±0.5mm					
Reference point response speed	40m/min or less					
Output	USB2.0FS					
Spindle drive system	Spring push Vacuum suction: SL/SFL		Spring push Vacuum suction: SL/SFL	Air driving (Pneumatic push)	Spring push Vacuum suction: SL/SFL	Air driving (Pneumatic push)
Protection grade*2	IP67 (S/SF/SV), IP64 (SL/SFL), IP67 (SL/SFL) *3					
Vibration resistance	100 m/s^2 (20~2000 Hz)					
Impact resistance	1000 m/s^2 (11 ms)					
Operating temperature and humidity range	0~+50 °C (No condensation)					
Storage temperature and humidity range	−20~+60 °C 90%RH or less					
Power supplay	DC 5 V ±5 %					
Power consumption	120mA Max.					
Mass*4	Approx. 30g					
Output cable length	Measuring unit ⇔ Interpolation box : 2m Interpolation box ⇔ USB : 0.5m					
Feeler	Carbide ball tip, Mounting screw M2.5	Steel ball tip, Mounting screw M2.5	Carbide ball tip, Mounting screw M2.5		Steel ball tip, Mounting screw M2.5	
Accessories	Spanner, Instruction Manual, Supplement Manual, +P M4×5 screw(2) SL/SFL only : Hose elbow, SF/SFL only : Tightening nut, Wave washer, Pin, Clamp spanner		Spanner, Instruction Manual, Supplement Manual, +P M4×5 screw(2) SL/SFL only : Hose elbow, SF/SFL only : Tightening nut, Wave washer, Pin, Clamp spanner DS812SF/SFL only : 2 mm collar for adjustment	Spanner, Instruction Manual, Supplement Manual, +P M4×5 screw(2)	Spanner, Instruction Manual, Supplement Manual, +P M4×5 screw(2) SL/SFL only : Hose elbow, SF/SFL only : Tightening nut, Wave washer, Pin, Clamp spanner DS812SF/SFL only : 2 mm collar for adjustment	Spanner, Instruction Manual, Supplement Manual, +P M4×5 screw(2)

*1 Air pressure : 0.055MPa *2 Not including interpolation box and connector *3 When using the supplied hose elbow and a ϕ4mm tube *4 Not including cable and interpolation box

*Magnescale reserves the right to change product specifications without prior notice.

DF800S series



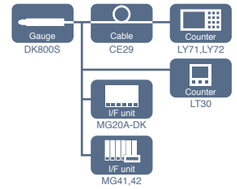
DF805S/DF812S

Model	DF805SR, DF805SFR	DF805SLR, DF805SFLR	DF812SR, DF812SFR	DF812SLR, DF812SFLR	DF812SVR
Measuring range	5mm		12mm		
Maximum resolution	0.1μm				
Accuracy(At 20°C)	1μm p-p				
Repeatability	±0.1μm or less				
Measuring force	Upward: 0.35±0.25N Horizontal: 0.40±0.25N Downward: 0.45±0.25N		Upward: 0.4±0.3N Horizontal: 0.5±0.3N Downward: 0.6±0.3N		Upward: 0.6±0.5N*1 Horizontal: 0.7±0.5N*1 Downward: 0.8±0.5N*1
Maximum response speed	80 m/min				
Reference point	Position at spindle movement of 1±0.5 mm				
Reference point response speed	80 m/min				
Output	Serial communication protocol				
Spindle drive system	Spring push				Air driving (Pneumatic push)
Protection grade*2	IP67(S/SF/SV),IP64(SL/SFL),IP67(SL/SFL)*3				
Vibration resistance	100 m/s^2 (20 ~ 2000 Hz)				
Impact resistance	1000 m/s^2 (11 ms)				
Operating temperature and humidity range	0~+50°C (No condensation)				
Storage temperature and humidity range	−20~+60°C 90%RH or less				
Power supplay	DC+10~+30 V				
Power consumption	1.2 W or less				
Mass*4	Approx. 30 g (Not including cable and interpolation box)				
Output cable length	2 m				
Feeler	Carbide ball tip, Mounting screw M2.5				
Accessories	Instruction Manual, Spanner DF8**S*L* only : Hose elbow DF8**S*F** only : Tightening nut, Clamp spanner, Wave washer, Pin				

*1 Air puressure: 0.055MPa *2 Excluding the interpolation box *3 When Hose elbow and ϕ4mm tube is connected *4 Excluding cable section and interpolation box

*Magnescale reserves the right to change product specifications without prior notice.

DK800S series



DK805S/DK812S

Model	High-resolution models		General-purpose resolution models		High-resolution models		General-purpose resolution models	
	DK805SAR DK805SALR DK805SAFR DK805SAFLR	DK805SBR DK805SBLR DK805SBFR DK805SBFLR	DK805SAR5 DK805SALR5 DK805SAFR5 DK805SAFLR5	DK805SBR5 DK805SBLR5 DK805SBFR5 DK805SBFLR5	DK812SAR DK812SALR DK812SAFR DK812SAFLR DK812SAVR	DK812SBR DK812SBLR DK812SBFR DK812SBFLR DK812SBVR	DK812SAR5 DK812SALR5 DK812SAFR5 DK812SAFLR5 DK812SAVR5	DK812SBR5 DK812SBLR5 DK812SBFR5 DK812SBFLR5 DK812SBVR5
Measuring range	5 mm				12 mm			
Maximum resolution	0.1 μm		0.5 μm		0.1 μm		0.5 μm	
Accuracy(At 20°C)	1 μm p-p		1.5 μm p-p		1 μm p-p		1.5 μm p-p	
Repeatability	±0.1μm or less							
Measuring force	Upward: 0.35±0.25N Horizontal: 0.40±0.25N Downward: 0.45±0.25N				Upward: 0.4±0.3N 0.6±0.5N(Pneumatic push type) Horizontal: 0.5±0.3N 0.7±0.5N(Pneumatic push type) Downward: 0.6±0.3N 0.8±0.5N(Pneumatic push type) Air puressure: 0.055MPa			
Maximum response speed	80 m/min	42 m/min	250 m/min	100 m/min	80 m/min	42 m/min	250 m/min	100 m/min
Reference point	Position at spindle movement of 1mm±0.5mm							
Reference point response speed	Sames as the noted maximum response speed							
Output	A/B/Reference point Voltage-differential line driver output (conforming to EIA-422)							
Spindle drive system	Spring push Vacuum suction (DK805SALR/SAFLR/SBLR/SBFLR/SALR5/SAFLR5/SBLR5/SBFLR5)				Spring push Air driving (Pneumatic push)(DK812SAVR/SBVR/SAVR5/SBVR5) Vacuum suction (DK812SALR/SAFLR/SBLR/SBFLR/SALR5/SAFLR5/SBLR5/SBFLR5)			
Protection grade*1	IP67(SA/SAF/SAV/SB/SBF/SBV), IP64(SAL/SAFL/SBL/SBFL), IP67(SAL/SAFL/SBL/SBFL)*2							
Vibration resistance	100 m/s^2 (20~2000 Hz)							
Impact resistance	1000 m/s^2 (11 ms)							
Operating temperature	0~+50 °C							
Sotrage temperature	−20~+60 °C							
Power supplay	DC 5 V ±5 %							
Power consumption	1 W							
Mass*3	Approx. 30g							
Output cable length	2.5 m							
Feeler	Carbide ball tip Mounting screw M2.5		Steel ball tip Mounting screw M2.5		Carbide ball tip Mounting screw M2.5		Steel ball tip Mounting screw M2.5	
Accessories	Instruction Manual +P M4 x 5 screw(2pc) tightening nut, Clamp spanner, wave washer, mounting pin 1 each(DK8**S*F** only) Hose elbow 1 pc(DK8**S*L** only) one spanner							

*1 Excluding the interpolation box and connector *2 When ϕ4mm tube is connected for right-angle model *3 Excluding cable and interpolation box

*Magnescale reserves the right to change product specifications without prior notice.

DK830S

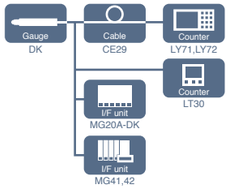
Model	Straight type	Right-angle type	Pneumatic push type
	DK830SR	DK830SLR	DK830SVR
Measuring range	30 mm		
Maximum resolution	0.1 μm(0.5 μm resolution can also be selected as special specifications.)		
Accuracy(At 20°C)	1.3 μm p-p		1.7 μm p-p
Repeatability	±0.1μm or less		
Measuring force	Upward: 0.5±0.35N Horizontal: 0.6±0.35N Downward: 0.7±0.35N		Air pressure 0.07 Mpa: 1.9N or less in all directions Air pressure 0.09 Mpa: 2.6N or less in all directions
Maximum response speed	80 m/min		
Reference point	Position at spindle movement of 1mm±0.5mm		
Reference point response speed	Same as the noted maximum response speed		
Output	A/B/Reference point Voltage-differential line driver output (conforming to EIA-422)		
Spindle drive system	Spring push		Air driving (Pneumatic push)
Protection grade*1	IP53	IP53/IP67*2	
Vibration resistance	100 m/s^2 (20~2000 Hz)		
Impact resistance	1000 m/s^2 (11 ms)		
Operating temperature	0 °C~+50 °C		
Sotrage temperature	−20 °C~+60 °C		
Power supplay	DC +5 V ±5 %		
Power consumption	1 W		
Mass*3	Approx. 70g		Approx. 80g
Output cable length	2.5 m		
Feeler	Carbide ball tip, Mounting screw M2.5		
Accessories	Spanner Instruction Manual Supplement +P M4 x 5 screw(2pc)		

*1 Excluding the interpolation box and connector *2 When the bellows set(optional accessary) is mounted *3 Excluding cable section and interpolation box

*Magnescale reserves the right to change product specifications without prior notice.

Specifications

DK series



DK10/25/50/100

Model	Standard model	Protected type model		Standard model	Protected type model	Standard model	Protected type model	Standard model	Protected type model	Standard model	Protected type model
	DK10NR5	DK10PR5	DK10PLR5	DK25NR5	DK25PR5	DK25NLR5	DK25PLR5	DK50NR5	DK50PR5	DK100NR5	DK100PR5
Measuring range	10 mm			25 mm				50 mm		100 mm	
Maximum resolution	0.5 μm										
Accuracy(At 20°C)	2 μm p-p									4 μm	
Measuring force	Upward: 0.3±0.25N Horizontal: 0.6±0.3N Downward: 0.8±0.35N	4.9N or less		Upward: 0.4±0.3N Horizontal: 0.7±0.35N Downward: 1±0.4N	4.9N or less	Upward: 0.4±0.3N Horizontal: 0.7±0.35N Downward: 1±0.4N	4.9N or less	Upward: - Horizontal: 0.9±0.4N Downward: 1.3±0.5N	6.2N or less	Upward: - Horizontal: 1.8±0.65N Downward: 2.7±0.55N	9.3N or less
Maximum response speed	250 m/min										
Reference point	Position at the spindle movement of 1mm										
Reference point response speed	Sames as the noted maximum response speed										
Output	A/B/Reference point Voltage-differential line driver output(conforming to EIA-422)										
Spindle drive system	Spring push										
Protection grade*1	IP50	IP64	IP50	IP64	IP50	IP64	IP50	IP64	IP50	IP64	
Vibration resistance	150 m/s^2 (10~2000 Hz)										
Impact resistance	1500 m/s^2 (11 ms)										
Operating temperature	0~+50 °C										
Sotrage temperature	–20~+60 °C										
Power Supply	DC 5 V±5 %										
Power consumption	1 W										
Mass*2	Approx. 230g			Approx. 300g				Approx. 360g		Approx. 630g	
Output cable length	2.5 m										
Feeler	Carbide ball tip, Mouting screw M2.5										
Accessories	Instruction manual +P M4×5 screw(2pc)										

*1 Excluding interpolation box and connector *2 Excluding cable secion and interpolation box *Magnescale reserves the right to change product specifications without prior notice.

DK155/205

Model	DK155PR5	DK205PR5
Measuring range	155 mm	205 mm
Maximum resolution	0.5 μm	
Accuracy(At 20°C)	5 μm p-p	6 μm p-p
Maximum response speed	250 m/min	
Reference point	Position at the spindle movement of 5mm	
Reference point response speed	Sames as noted maximum response speed	
Output	A/B/Reference point Voltage-differential line driver output(conforming to EIA-422)	
Spindle drive system	None	
Protection grade*1	IP64	
Vibration resistance	150 m/s^2 (10~2000 Hz)	
Impact resistance	1500 m/s^2 (11 ms)	
Operating temperature	0~+50 °C	
Storage temperature	–20~+60 °C	
Power Supply	DC 5 V±5 %	
Power consumption	1 W	
Mass*2	Approx. 1100g	Approx. 1300g
Output cable length	2.5 m	
Feeler	DZ-181	
Surface to be measured	Soft magnetic material	
Magnetically attachable feeler	Magnetic attraction: 10N, Resistance against horizontal slip: 2.7N	
Spindle*3	ϕ8 mm, radial swing: 0.04mm max	
Accessories	Instruction manual +P M4 x 5 screw(2pc)	

*1 Excluding the interpolation box and connector *2 Excluding cable section and interpolation box *3 The spindle weighs about 400g. * Magnescale reserves the right to change product specifications without prior notice.

DT series

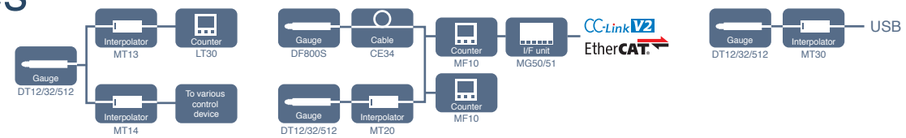
DT12/32/512

Model	Standard model	Protected type model	Standard model	Protected type model	Standard model		Protected type model	
	DT512N	DT512P	DT12N	DT12P	DT32N	DT32NV	DT32P	DT32PV
Measuring range	12 mm				32 mm			
Maximum resolution	1 μm		5 μm					
Accuracy(At 20°C)	6 μm p-p		10 μm p-p					
Measuring force	Upward: 0.7±0.5N Horizontal: 0.8±0.5N Downward: 0.9±0.5N	1.7N or less in all direction	Upward: 0.7±0.5N Horizontal: 0.8±0.5N Downward: 0.9±0.5N	1.7N or less in all direction	*1 Upward: 1.1±0.8N Horizontal: 1.3±0.8N Downward: 1.5±0.8N		2.9N or less in all direction	9N or less in all direction*2
Maximum response speed	Depending on unit to be connected							
Reference point	None							
Spindle drive system	Spring push					Air driving (Pneumatic push)	Spring push	Air driving (Pneumatic push)
Protection grade	—	IP64 or equivalent*1	—	IP64 or equivalent*1	—		IP64 or equivalent*3	
Operating temperature	0~+50 °C							
Storage temperature	–10~+60 °C							
Mass	Approx. 75g*2	Approx. 80g*2	Approx. 75g*2	Approx. 80g*2	Approx. 120g*4	Approx. 140g*4	Approx. 120g*4	Approx. 140g*4
Output cable length	2 m							
Feeler	Steel ball tip, Mouting screw M2.5							
Accessories	Instruction manual							

*1 At input air pressure of 1.96 x 10^5 Pa with speed controller open(DT32NV) *2 At input air pressure of 2.35 x 10^5 Pa with speed controller open *3 Excluding the connector *4 Excluding cable section

*Magnescale reserves the right to change product specifications without prior notice.

MT series



MT13/14

Model	MT13-01	MT13-05	MT13-10	MT14-01	MT14-05	MT14-10
Compatible mesuring units	DT512/DT12/DT32					
Maximu response speed	100 m/min					
Resolution	1 μm	5 μm	10 μm	1 μm	5 μm	10 μm
Power voltage	DC5 V ±4 %					
Power consumption	1.2 W (When output load of 120Ω is connected)					
Output format	A/B Voltage-differential line driver					
Operating temperature and humidity range	0~+50 °C (No condensation)					
Storage temperature and humidity range	–10~+60 °C (20 to 90 %RH)					
Mass	Approx. 90g					

*Magnescale reserves the right to change product specifications without prior notice.

MT20

Model	MT20-01	MT20-05
Compatible mesuring units	DT512 series	DT12/DT32 series
Maximu response speed	150 m/min	
Resolution	1 μm	5 μm
Power voltage	DC+10~+30V	
Power consumption	1.2 W or less	
Operating temperature and humidity range	0~+50 °C (No condensation)	
Storage temperature and humidity range	–10~+60 °C (90%RH or less)	
Mass	Approx. 50 g	

*Magnescale reserves the right to change product specifications without prior notice.

MT30

Model	MT30-01	MT30-05
Compatible mesuring units	DT512 series	DT12/DT32 series
Maximu response speed	150 m/min	
Resolution	1 μm	5 μm
Power voltage	DC5V ±5 %	
Power consumption	120mA Max	
Operating temperature and humidity range	0~+50 °C (No condensation)	
Storage temperature and humidity range	–10~+60 °C (90%RH or less)	
Mass	Approx. 50 g	

*Magnescale reserves the right to change product specifications without prior notice.

MG70

Interface
▲ MG70-EI : EtherNet/IP
▲ MG70-PN : PROFINET RT

Compatible with DK series

Model		Main module		Counter module
		MG70-EI	MG70-PN	MG71-CM
Communication		EtherNet/IP	PROFINET RT	Data transferred to main module by dedicated protocol
Data transfer speed		10 / 100 Mbps	100 Mbps	-
Node address setting method		Set with hexadecimal rotay switch	Set with hexadecimal rotay switch	-
Node address range		D×DD–D×FF		-
Maximum connectable measuring unit	Counter module	85 units*1		-
	Measuring unit	-		1 units
Cable length (Communication distance)		Segment length: Max. 100m between two station		-
Mounting method		35mm DIN rail mounting		
Power supply voltage		DC24 V (DC20.4~28.8 V)		
Power consumption		2W or less	2.5W or less	1.01W or less
Operating temperature and humidity range		Horizontal use: –25~+60°C Vertical use: -25~+50°C		
Storage temperature and humidity range		–40~+85°C		
Mass		Approx. 150g		Approx. 80g

*1 This is the maximum number of connections when supplying power by one power supply module. Maximum of 250 units of MG71-CM can be connected by adding power supply modules.
*Magnescale reserves the right to change product specifications without prior notice.

MG50

Interface
▲ MG50-EC : EtherCAT
▲ MG50-CL : CC-Link (Compatible with iQSS)

Compatible with DF/DT series

Model		Main module		Distribution module
		MG50-EC	MG50-CL	MG51
Communication		EtherCAT	CC-Link (Compatible with iQSS)	Data transferred to main module by dedicated protocol
Data transfer speed		100 Mbps	Maximu downlink speed of 10Mbps	-
Node address setting method		Set with decimal rotary switches or software	Set with decimal rotary switches	-
Node address range		000~192	Max. 64	-
Maximum connectable measuring unit	Counter module	30 units	16 units	10 units
	Distribution module	8 units	8 units	-
Cable length		Maximum cable length between main module and distribution module: 30m		
Mounting method		35mm DIN rail mounting		
Power supply voltage		DC24 V (DC20.4 ~26.4 V)		
Power consumption / Consumption current		2.4 W or less 100 mA or less (DC24V)		2W or less 80 mA or less (DC24V)
Operating temperature and humidity range		1-2 units are installed side by side: 0~+55°C 11-16 units are installed side by side: 0~+45°C 3-10 units are installed side by side: 0~+50°C 17-30 units are installed side by side: 0~+40°C 25~85%RH (No condensation or icing)	1-2 units are installed side by side: 0~+55°C 3-10 units are installed side by side: 0~+50°C 11-16 units are installed side by side: 0~+45°C 25~85%RH (No condensation or icing)	0~+55°C 25~85%RH (No condensation or icing)
Storage temperature and humidity range		–30~+60°C 25~85%RH (No condensation or icing)		–30~+70°C 25~85%RH (No condensation or icing)
Mass		Approx. 95g	Approx. 80g	Approx. 40 g

*Magnescale reserves the right to change product specifications without prior notice.

MG40

Interface
▲ MG41-NC : CC-Link/Ethernet
▲ MG41-NE : Ethernet

Compatible with DK series

Model		Main unit		Hub unit
		MG41-NC	MG41-NE	MG42-4
Communication		CC-Link / Ethernet	Ethernet	Data transferred to main module by dedicated protocol
Maximum connectable measuring unit	Measuring unit (Entire system)	100 unit(Connection of 101th unit and later disabled)		
	Measuring unit (Each unit)	4 units		
	Hub unit	24 units		-
Cable length		Total cable length between main unit and hub unit: 0.5 / 1 / 2 / 5 / 10 m (Connection cable MZ41(Optional)) Total cable length between the hub units: 0.5 / 1 / 2 / 5 / 10 m (Connection cable MZ41(Optional)) Total cable length from Main units: Max. 30m (Max. current: 4A or less)		
Output resolution*1	Input resolution*2 at resolution of 0.1μm	0.1 / 0.5 / 1 / 5 / 10 μm		
	Input resolution*2 at resolution of 0.5μm	0.5 / 1 / 5 / 10 μm		
Measuring unit data capture ability (Communication 10Mbps)		Maximum 10000 data/sec (When 100 axes are connected)*3		
Output data	Single axis	Recalculation of peak value is started by start function		
	At addition and subtraction	Current, maximum, minimum, and peak-to peak values for each axis		
Function		Comparator, Reset, Preset, Datum poins setting function*4, Reference point*4, Master calibration*5, Measuring unit product information, Command setting		
Mounting method		35mm DIN rail mounting		
Power supply voltage (Terminal board)		DC12~24 V (DC11~26.4 V)*6		
Power consumption		System total (Max. current 4A)*7		
Operating temperature and humidity range		0~+50°C (No condensation)		
Storage temperature and humidity range		–10~+60°C (20~90 %RH)		
Mass		300 g		250 g

*1 Settable output data resolution and display resolution. *2 Measuring units resolution. *3 The data for one axis is counted as one data. *4 When master calibration function is not used
*5 Addition / subtraction axis is not possible *6 Use a power supply with a current that is 4 A or higher for every six MG42 hub units
*7 When the maximum current is exceeded, the connection can be enabled by providing a power supply to the MG42 hub units that come later in the connection.
*Magnescale reserves the right to change product specifications without prior notice.

MG10A/20A/30

Interface
▲ MG10A-P1 : RS-232C(Conforming to EIA-232C)
▲ MG10A-P2 : RS-232C(Conforming to EIA-232C)

Compatible with DK/DT Series

Main module specifications

Model		MG10A-P1	MG10A-P2
Power source	Power supply	DC12~24 V (11~26.4 V) Start up time: 100ms or less	
	Power consumption	2.0W + total power consumptioin for coneected modules*1	
	Inrush current(10 ms)	10A or less (When the maximum numboer of modules are connected)	
	Power supply protection	Fues (5-A fues is built in)	
Communication	Communication I/F	RS-232C (EIA-232C or equivalent)	
	Baud rate setting	2400/9600/19200/38400 bps (set with DIP switch)	
	Data length	7/8 bit (set with DIP switch)	
	Stop bit	1/2 bit (set with DIP switch)	
	Parity	NONE/ODD/EVEN (set with DIP switch)	
	Delimiter	CR/CR+LF (set with DIP switch)	
Linkage function	Maximum number of linkages	16 (Total of counter modules: 64)	
	Maximum number of linking cable	10m	
I/O	Input format	Source input(+COM)	Sink input(-COM)
		Photocoupler insulation, exeternal power:5-24V DC	
	Output format	Open collector output sink type(-COM)	Source input(+COM)
		Photocoupler insulation, external power: 5-24V DC	
	Input signal	Reset, Pause, Start, Latching, and Data out trigger to whole channel	
	Output signal	Intergrated alarm	
Connectable modules	Counter modules	MG20A–DK, MG20A–DG, MG20A–DT (Available for mixed use, up to 16 modules)*1	
	Interface modules	MG30- B1, MG30-B2 *1	

*1 Total power of modules connected to MG10A should not be over 54W(at 12 VDC input) or 108W(at 24 VDC input)
*Magnescale reserves the right to change product specifications without prior notice.

Counter module specifications

Model		MG20A-DK	MG20A-DT
Power consumption		1W + power consumption for connected measuring unit	0.8 W
Measuring unit input	Corresponding mesuring unit	DK Series (Voltage differential A/B quadrature input)	DT Series
	Allowable resolution setting*2	10/5/1/0.5/0.1 μm	5 μm (DT12/32) 1 μm (DT512)
		set with DIP switch	
	Maximum response speed	Subject to the specification of connected measuring unit	1m/s
	Maximum response accelration	Subject to the specification of connected measuring unit	2400m/s²
	Reference point	REF-LED(reference point loaded) shows on the display after the reference point is detected Set "0" or preset value on the counter when the reference point is detected	—
Others	Alarm	S-ALM LED activates by excess speed/acceleration of measuring unit C-ALM LED activates by excess speed of the internal circuit of counter	
		The alarm display is cancelled by reset command from MG10A or with the reset button of main unit	

*2 Set the resolution value of the connected mesuring unit
*Magnescale reserves the right to change product specifications without prior notice.

Interface module specifications

Model		MG30-B1	MG30-B2
Power consumption		1W	
I/O	Input format	Source input(+COM) Counterpart output circuit : Current sink input(-COM)	Current sink input(-COM) Counterpart output circuit: Source type(+COM)
		Photocoupler insulation, external power: 5-24V DC	
	Output format	Open collector output sink type(-COM) Source type(+COM)	Source type(+COM) Counterpart output circuit(+COM): Source type(-COM)
		Photocoupler insulation, external power: 5-24V DC	
	Input signal	DRQ, channel address, Measuring mode shifting, Comparator shifting, Reset, Start, Pause, Reference-point loaded	
	Output signal	BCD data(6 digits) READY GO GO/No-go output Alarm referene point	
Output setting		Timer(1 to 128ms) OUT/OR Polarity (Set with internal DIP switch)	

All models	Operation temperature and humidity range	0~+50 °C (No condensation)
	Storage temperature and humidity range	–10~+60 °C (20~90%RH)

*Magnescale reserves the right to change product specifications without prior notice.

MF10

Digital tolerance indicator / Counter module

Model	Digital tolerance indicator		Counter module
	MF10-P1	MF10-P2	MF10-CM
Function	NPN output (current sink)	PNP output (current source)	Counter module for MG50
I/O	Number of Go/No Go judgement output 2, Number of external inputs 1		-
Minimum display unit	0.1μm		
Cable length	input/output, power cable 2m		-
Power supply	+10–30V DC including ripple (p-p) 10%		
Power supply voltage / Power cousumption	2.1W or less / 85A or less (DC24V)		
Operating temperature and humidity range	When lining up 1 or 2 digital tolerance indicators: 0°C to +55°C 35% to 85% RH (with no condensation)		1 to 2 amplifies connected : 0–55°C 3 to 10 amplifies connected : 0–50°C 11 to 16 amplifies connected : 0–45°C 17 to 30 amplifies connected : 0–40°C 35–85%RH(No condensation)
Storage temperature and humidity range	–10°C ~ +60°C (with no icing or condensation)		
Mass	Approx. 75g		

*Magnescale reserves the right to change product specifications without prior notice.

LT30

For DK, DK-S

Model		LT30-1G	LT30-1GB	LT30-1GC	LT30-2G	LT30-2GB	LT30-2GC
Number of input axes		1 axis			2 axes		
Input resolution		0.1 / 0.5 / 1 / 5 / 10 μm (parameter setting for each axis)					
Number of display axes		1 axis			2 axes		
Display data		Current, max., min., peak-to-peak values (=max. value - min. value)			current, max., min., peak-to-peak values (=max. value - min. value), additional/subtraction value		
Direction		Switchable					
Alarm display		Alarm display, Addition and subtraction function (Except LT30-1**), Peak hold function, Restart, Hold (latch and pause), Comparator, Reset, Preset, Master calibration, Reference point, Key lock					
Input/output	I/O connector	○	○	○	○	○	○
	BCD output	-	○	-	-	○	-
	RS-232C	-	-	○	-	-	○
	RS-TRG	-	-	○	-	-	○
	Comparator judgement	○	○	○	○	○	○
Power supply		DC10.8~26.4 V					
Power consumption		5 W	5.5 W	5 W	8.5 W	9 W	8.5 W
Operating temperature and humidity range		0~+40°C					
Storage temperature and humidity range		–10~+50°C					
Mass		Approx. 200 g	Approx. 230 g	Approx. 220 g	Approx. 210 g	Approx. 270 g	Approx. 230 g

*Magnescale reserves the right to change product specifications without prior notice.

LT11A/LT10A

For DT512 (LT11A)
For DT12/32 (LT10A)

Model		LT10A-105/LT11A-101	LT10A-105B/LT11A-101B	LT10A-105C/LT11A-101C	LT10A-205/LT11A-201	LT10A-205B/LT11A-201B	LT10A-205C/LT11A-201C
Number of input axes		1 axis			2 axes		
Input resolution		1/ 5 / 10 μm (parameter setting for each axis) (1μm resolution is available only for 11A)					
Number of display axes		1 axis			2 axes		
Display data		Current, max., min., peak-to-peak values(=max. value - min. value)			Current, max., min., peak-to-peak values (=max. value - min. value), additional/subtraction value		
Direction		Switchable					
Maximum response speed		100 m/min			80 m/min		
Function		Alarm display, Addition and subtraction function (Except LT10A-105** anf LT11A-101), peak hold function, restart, hold(latch and pause), comparator, reset, preset, master calibration, reference point, key lock					
Input/output	I/O connector	○	○	○	○	○	○
	BCD	-	○	-	-	○	-
	RS-232C	-	-	○	-	-	○
	RS-TRG	-	-	○	-	-	○
	Comparator judgement	○	○	○	○	○	○
Power supply		DC9~26.4 V					
Power consumption		1.8 W	2.9 W	2.0 W	2.3 W	4.0 W	2.5 W
Operating temprature and humidity range		0~+40°C					
Storage temperature and humidity range		–10~+50°C					
Mass		Approx. 200 g	Approx. 230 g	Approx. 220 g	Approx. 210 g	Approx. 270 g	Approx. 230 g

*Magnescale reserves the right to change product specifications without prior notice.

LY71/LY72

Compatible with DK series
*Compatbile with GB-ER series(Magnescale), PL20 series(Digiruler)

Model		LY71	LY72*1	
			When axis label A, B, and C are selected	When axis label X, Y, and Z are selected
Number of input axis		1axis or 2 axes(by parameter setting)	1 axis, 2 axes, or 3 axes(by parameter setting)	
Input resolution		Linear standard : 0.1 / 0.5 / 1 / 5 / 10 μm (Expanded linear: 0.05/2/20/25/50/100 μm) Angle : 1 s / 10 s / 1 min / 10 min (Expanded angle : 1 degree)		
Number of display axes		3 axes(Axes A, B and C)*1	3 axes(Axes A, B and C)	3 axes (Axes X, Y and Z)
Display data		Current, max., min., and peak-to-peak values (=max. value - min. value) of each axis or current, max., min., and peak-to-peak values(=max. value - min. value) of 2 axis addition and subtraction*2	Current, max., min., and peak-to-peak values (=max. value - min. value) of each axis	Current value of each axis
Direction		Switchable		
Function		Alarm display, addition and subtraction*3, peak hold, restart, hold(latch and pause), comparator*5, positining, reset, preset, master calibration, Datum point/reference point, keylock, data storage, scaling, linear compensation	Alarm display, peak hold(When using axes A, B and C), restart(When using axes A, B and C), hold(latch and pause), reset, preset, master calibration(When using axes A, B and C), Datum point/reference point, keylock, data storage, scaling, linear compensation	Alarm display, hold(latch and pause), reset, preset datum point/reference point, keylock, data storage, scaling linear compensation
Input/ Output	BCD output*4	○	-	
	RS-232C	-	○	
	Comparator judgement function*5	○	-	
Power supply		Optional PSC-21A/22A/23A adapter is used		
Power consumption		32 VA max.(When optional AC adapter is used)		
Operating temperature and humidity range		0~+40°C(No condensation)		
Storage temperature and humidity range		–20~+60°C(No condensation)		
Mass		Approx. 1.5 kg		

*1 LY72 can select whether to use ABC or XYZ in the axis label lamp on the left side of counter display.
ABC is mainly used when using measurement unit. XYZ is mainly used when using scale measurement unit.
*2 Available only 1 axis (A axis display) when LZ71-KR is used. Only comparator display when showing B-axis and C-axis.
*3 Addition / subtraction display is not availlable when using two LZ71-B.
*4 Available only when LZ71-B is used
*5 Available only when LZ71-KR is used
*Magnescale reserves the right to change product specifications without prior notice.

LZ71-B

Model	LZ71-B
BCD output	7-digit parallel data (4 bits ×7 digits) Sign (1bit) READY signal (1bit)
Output logic	Positive and negative logic can be selected individually for data and sign READY signal: Negative logic
Electrical specifications	Photocoupler output V_{CE}: Recommended DC+12-24V Ic: Maximum 15mA /terminal;TOTAL:300mA Output connector: 36 pin micro-ribbon connector
Output data at power ON and during alarm	Data output and alarm status (all OFF) can be selected (Via initial settings)
Output data	Current (1st-axis, 2nd-axis, addition axis), max., min., and peak-to-peak values
Latch	Selectable from BCD-only latch and BCD and display latch
Input signal	DRQ1-3 (Photocoupler:12-24V)
Output selection	3 DRQ input signals: DRQ 1-3; output data is assigned via settings. Ex.) DRQ1: Current value; DRQ2: Maximum value; DRQ3: Minimum value
Output modes	Constant output: Output irrespective of DRQ; prohibited when refreshing data Latch: BCD data-only latch Latch: BCD data and display latch Request output: Output with DRQ input only. Otherwise, OFF can be selected
Operating temperature and humidity range	0~+40 °C (with no condensation)
Storage temperature and humidity range	–20~+60 °C (with no condensation)

*Magnescale reserves the right to change product specifications without prior notice.

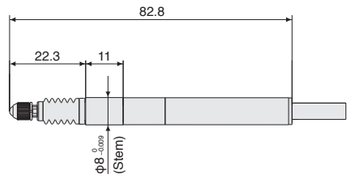
LZ71-KR

Model	LZ71-KR
Comparator function	Setting of comparator values 1 = 4 and judgment of magnitude of data
Comparable data	Current, max., min., and peak-to-peak values (Depends on setting)(For 1st-axis or Addition axis)
Combination of upper and lower values	With comparator values 1-4 as one group, data for 16 groups are selectable Selection method: Key operation or external contact input
Output data	5-terminal signal output Photocoupler (Withstand voltage: 24V) Ic=15mA 5-terminal contact output DC24V AC120V 0.3A
External contacts	Photocoupler: 12-24V
Positioning function (One terminal)	Setting of positioning data, output signal ON for 0.5 sec when set value matches current value
Data to which position can be assigned	Current values only (In relation to 1st axis and additional axes)
Types of position value	Positioning values: With one terminal as one group, data for 16 groups are selectable Selection method: Same as comparator function
Operating temperature and humidity range	0~+40 °C (with no condensation)
Storage temperature and humidity range	–20~+60 °C (with no condensation)

*Magnescale reserves the right to change product specifications without prior notice.

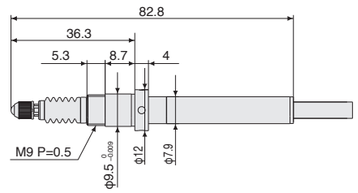
Dimensions DK800S, DF800S, DS800S

DK805SAR/DK805SAR5/DK805SBR/DK805SBR5
DS805SR/DS805SR5
DF805SR

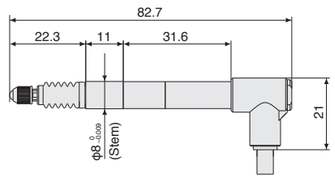


*Upon installation, clamp the stem

DK805SAFR/DK805SAFR5/DK805SBFR/DK805SBFR5
DS805SFR/DS805SFR5
DF805SFR



DK805SALR/DK805SALR5/DK805SBLR/DK805SBLR5
DS805SLR/DS805SLR5
DF805SLR



*Upon installation, clamp the stem

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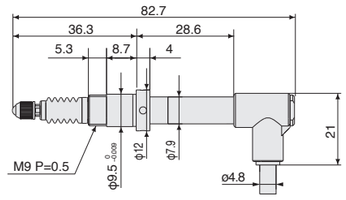
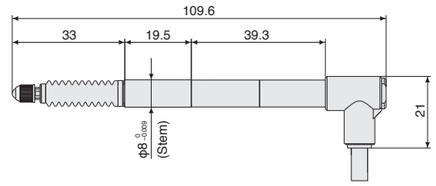
DS805SFLR/DS805SFLR5
DF805SFLR

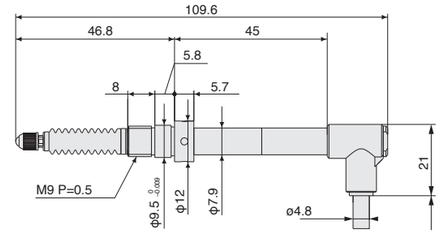


DK812SALR/DK812SALR5/DK812SBLR/DK812SBLR5
DS812SLR/DS812SLR5
DF812SLR

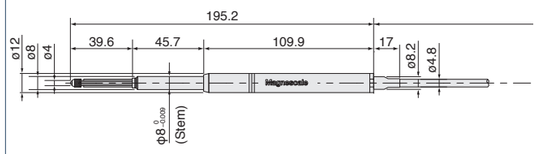


*Upon installation, clamp the stem

DK812SAFLR/DK812SAFLR5/DK812SBFLR/DK812SBFLR5
DS812SFLR/DS812SFLR5
DF812SFLR

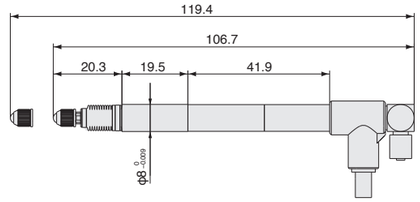


DK830SR



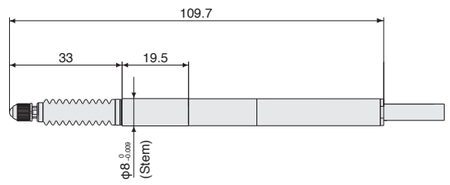
*Upon installation, clamp the stem

DK812SAVR/DK812SAV5/DK812SBVR/DK812SBV5
DF812SVR
(Pneumatic push type)



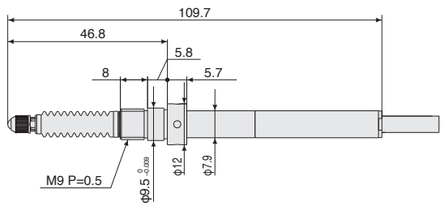
*Upon installation, clamp the stem

DK812SAR/DK812SAR5/DK812SBR/DK812SBR5
DS812SR/DS812SR5
DF812SR

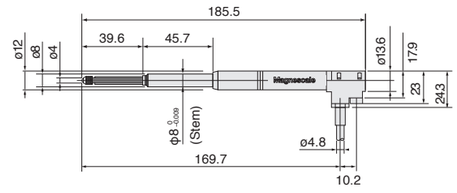


*Upon installation, clamp the stem

DK812SAFR/DK812SAFR5/DK812SBFR/DK812SBFR5
DS812SFR/DS812SFR5
DF812SFR

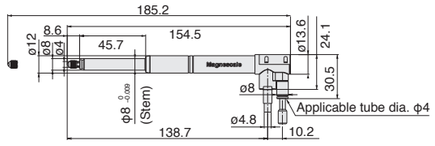


DK830SLR

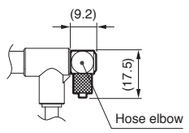


*Upon installation, clamp the stem

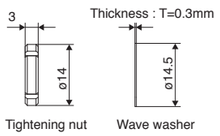
DK830SVR



DK/DF/DS 8**S*L** only

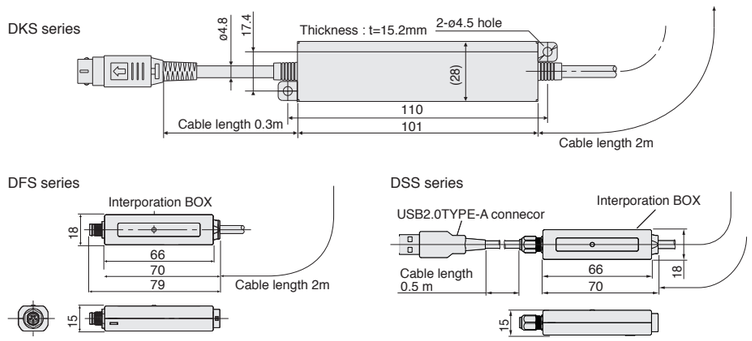


DK/DF/DS 8**S*F* only



Unit: mm

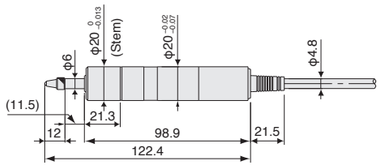
Interporation box



Unit: mm

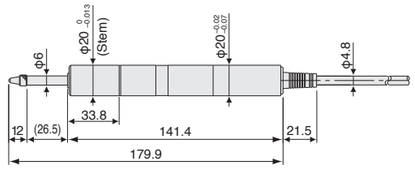
Dimensions DK10/25/50/100/155/205; DT512/12/32; MT13/14/20/30

DK10NR5/PR5



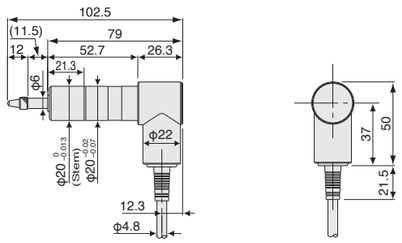
*Upon installation, clamp the stem

DK25NR5/PR5



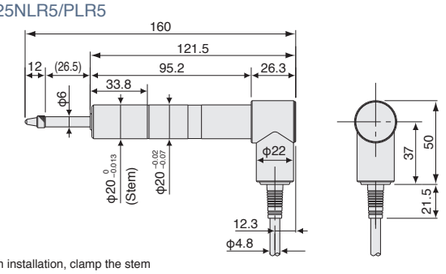
*Upon installation, clamp the stem

DK10PLR5



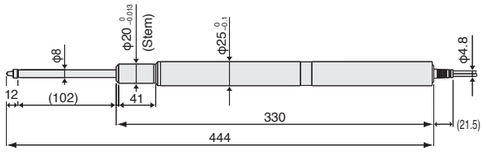
*Upon installation, clamp the stem

DK25NLR5/PLR5



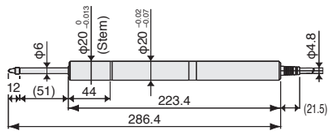
*Upon installation, clamp the stem

DK100NR5/PR5



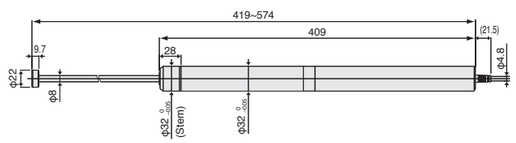
*Upon installation, clamp the stem

DK50NR5/PR5



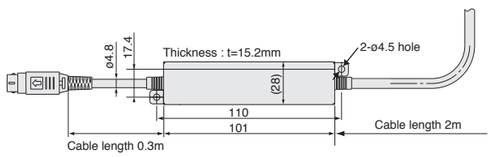
*Upon installation, clamp the stem

DK155PR5

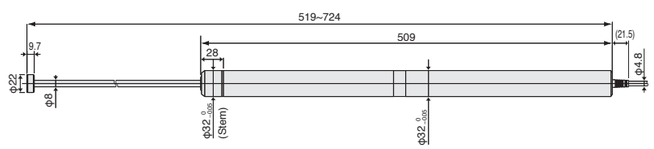


*Upon installation, clamp the stem

DK series interpolation box

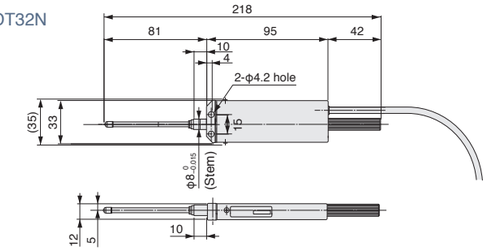


DK205PR5



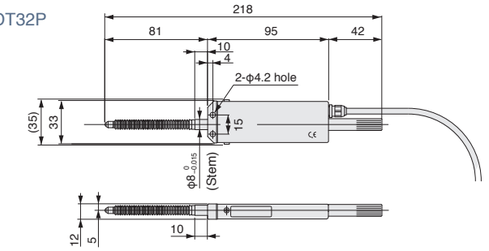
*Upon installation, clamp the stem

DT32N



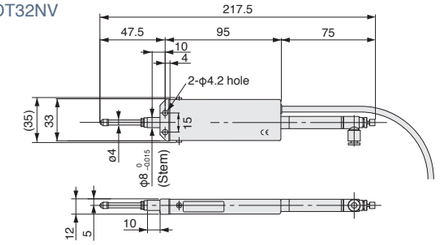
*Upon installation, clamp the stem

DT32P



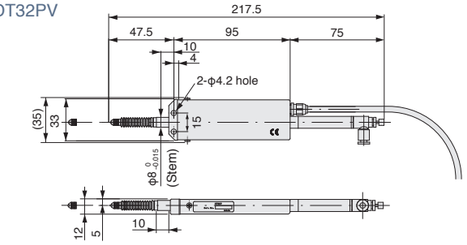
*Upon installation, clamp the stem

DT32NV



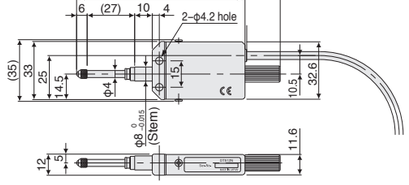
*Upon installation, clamp the stem

DT32PV



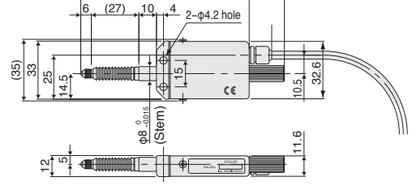
*Upon installation, clamp the stem

DT512N/12N



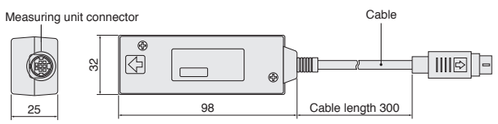
*Upon installation, clamp the stem

DT512P/12P



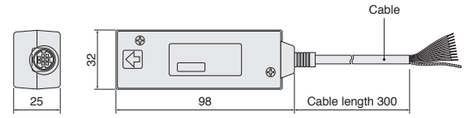
*Upon installation, clamp the stem

MT13



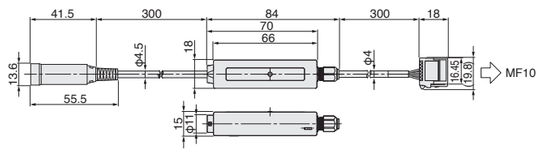
*Connection of the DT Series enables A/B phase output.

MT14

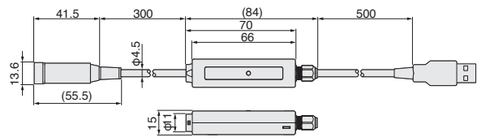


*Connection of the DT Series enables A/B phase output.

MT20



MT30

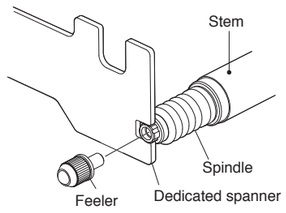


Unit: mm

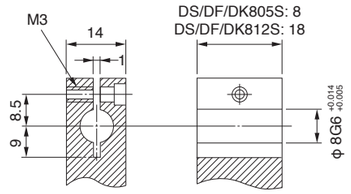
Installation

DS805S/812S, DF805S/812S, DK805S/812S installation cautions

Feeler installation/removal method



Mounting holder dimenstions and tolerance

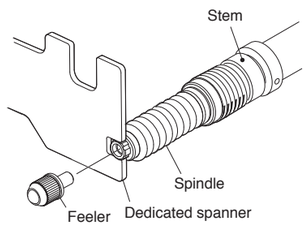


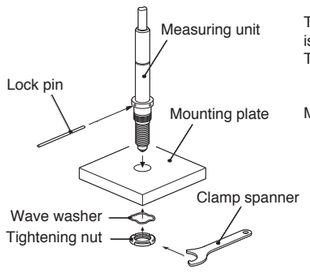
Clamp spanner : 0.6 N•m
Material: In case of SUS 303

Unit: mm

DS805SF/812SF, DF805SF/812SF, DK805SF/812SF installation cautions

Feeler installation/removal method

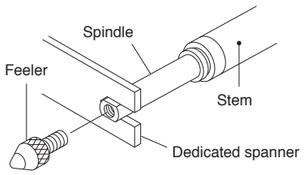




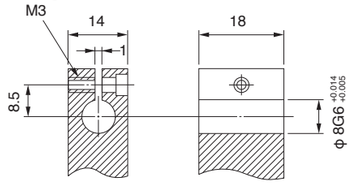
The recommended value of measuring unit mounting hole is ϕ9.7±0.15mm
The mouting thickness is as follows:
DS/DF/DK805SF : 7~11 mm
DS/DF/DK812SF : 9~11 mm
Mouting parallelism affects measurement accuracy
Adjust the squareness to the surface
to be measured or parallelism with respect to traveling
to 0.02mm/14mm or less

DK830 installation cautions

Feeler installation/removal method



Mounting holder dimenstions and tolerance

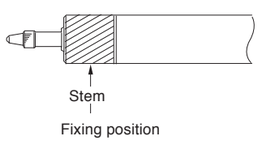


Clamp spanner : 0.6 N•m
Material: In case of SUS 303

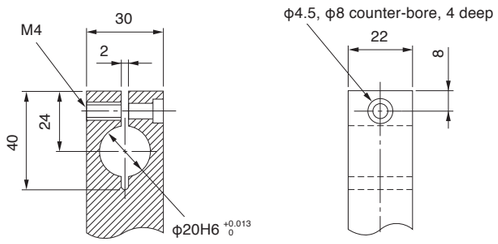
Unit: mm

DK10/25 installation cautions

Mounting /fixing position



Mounting holder dimenstions and tolerance

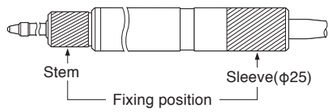


Tighening torque: 4 N•m
Hex. Socket head bold M4 is used

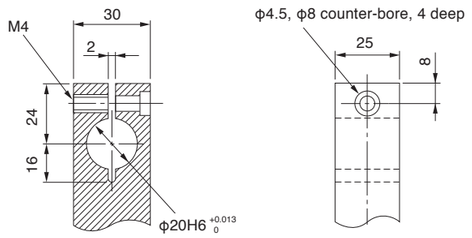
Unit: mm

DK50/100 installation cautions

Mounting/fixing position



Mounting holder dimenstions and tolearance

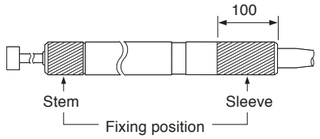


Tightening Torque: 4 N•m
Hex. Socket head bold M4 is used

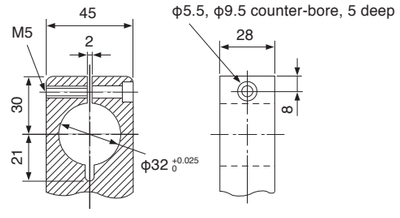
Unit: mm

DK155/DK205 installation cautions

Mouting/fixing position



Mouting holder dimenstions and tolearance

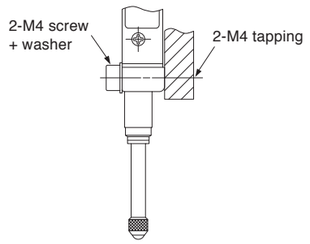


Tightening Torque: 6 N•m
Hex. Socket head bold M5 is used

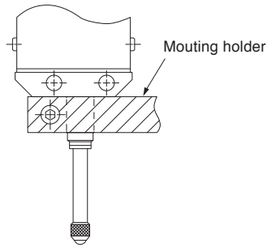
Unit: mm

DT12/512/32 installation cautions

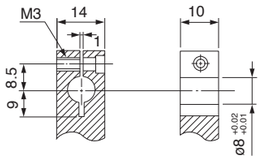
Mouting method using hounting hole



Moutning method using holder



Moutint holder dimension



Tightening Torque: 0.18~0.23 N•m
Material: In case of S45C

Unit: mm

Dimensions MG/LT/LY

Main unit MG41-NC
(CC-Link, Ethernet)

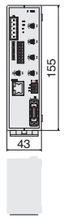
Main unit MG41-NE
(Ethernet)

Hub unit MG42
*common to MG41-NC
and MG41-NE

MG10A-P1/P2

MG20A-DK/DT

MG30-B1/B2



MZ41-R5(0.5 m), MZ41-01(1 m), MZ41-02(2 m),
MZ41-05(5 m), MZ41-10(10 m)

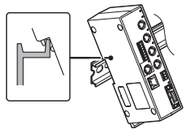
Unit: mm

Installation

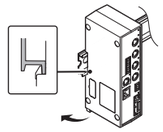
Mounting of MG10A/20A/30/41/42 main unit

The MG series main unit can be mounted to a DIN rail in an electrical panel
Please note that the DIN rail lock is in the "locked" position from the factory.
FIN rail specifications: 35mm

1. Match the upper side of groove on the back of the MG41 main unit with the upper side of DIN rain

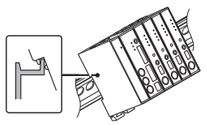


2. Push and install the MG41 main unit until a click is heard so that the lower side of groove on the back of the MG41 main unit is fit into the DIN rail.

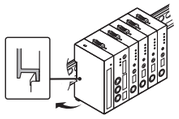


Note: Check that the entire unit is mouted to the DIN rail.

Mounting to DIN rail
1.Match the upper side of groove on the back of the unit with the upper side of DIN rail



2.Puch and instal the unit until a click is heard so that the lower side of groove on the back of the unit is fit into the DIN rail



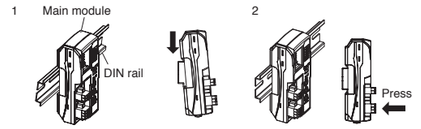
MG50 installation cautions

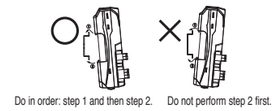
Installation
1. Place the top part of the module onto the DIN rail.

2. Press the bottom part of the module onto the DIN rail.

3. Remove the protective cap from the right side of the Main module. Then, slide on the counter module, align the connector with the Main module, and press the modules together until you hear them lock into place.

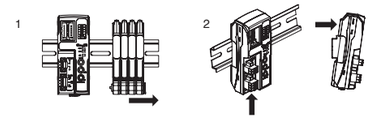
4. Secure the enclosed DIN rail Fixing brackets onto the ends so that there is no space between them and the modules. Finally, attach the protective cap you removed in step 3 to the Counter module on the far right end.
After you have completed above procedure, check to make sure that the MG50-** is mounted securely into place.



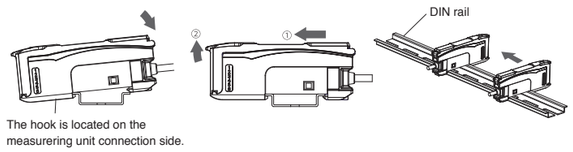


Do not reverse the order of steps.
Doing so may reduce the mounting strength on the DIN rail.

Removal Procedure
1. Slide the counter modules apart to separate them from the main module.
2. Press in on the Main module toward the DIN rail and lift up to remove it.



MF10 installation cautions



*Up to 30 digital tolerance indicators can be installed in a row.

LT10A/11A/30 installation cautions

When mounting in a panel

1. Cut out an opening to match the dimensions shown (Fig. 2).
2. Insert the counter unit into the cut-out opening in the panel from the front.
3. Attach the supplied counter stopper from the rear.
4. Press in the counter stopper until it touches the panel.

Note: When attaching the counter stopper to the counter unit, leave enough space (min. 30 mm/1,18") between the top and bottom. (Fig. 3)

Fig.1

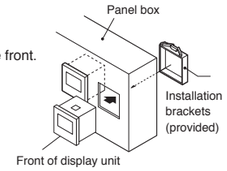


Fig.2

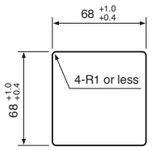
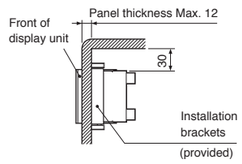
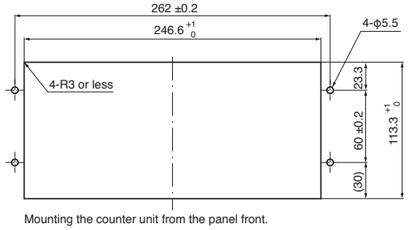


Fig.3



LY71/72 installation cautions

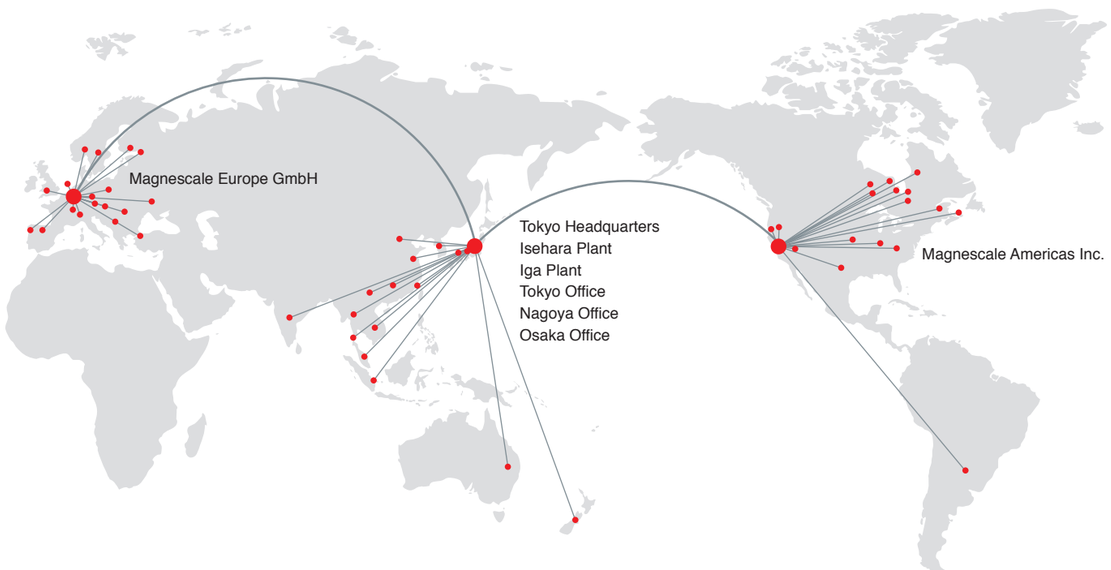
Panel cut-out diagram



Mounting the counter unit from the panel front.

Unit: mm

Global Network



Offices

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Agency

34 countries in the world 81 agencies

Europe

- Germany
- Czech Republic
- Finland
- Spain
- Italy
- Norway
- Ukraine
- Portugal
- Romania
- United Kingdom
- Sweden
- Bulgaria
- Denmark
- France, 2 companies
- Hungary
- Netherlands
- Poland
- Turkey, 2 companies
- Switzerland
- Austria, 2 companies

Asia · Oceania

- China, 3 companies
- Hong Kong
- Taiwan
- Korea
- Vietnam
- Indonesia, 2 companies
- Singapore
- Australia
- Thailand, 2 companies
- Malaysia
- India, 2 companies
- Philippines
- New Zealand

America

- America, 33 companies
- Mexico, 3 companies
- Canada, 3 companies
- Argentina

Safety

Magnescale has established a comprehensive support system enabling us to provide superior products.

Magnescale has established a comprehensive support system enabling us to provide superior products.
We offer a wide range of sales and servicing support for Magnescale products and technologies throughout Japan.

Deploying a global-standard production system, from quality control to environmental protection, Magnescale is thoroughly committed to delivering high-precision products.

We have established a total quality control system that oversees our processes from design to manufacture, ensuring that we are able to supply products with an unwaveringly high level of safety, quality, and reliability, offering our customers 100% satisfaction. As one example, we obtained certification for length calibration that is compliant with the system of traceability stipulated by Japan's Measurement Act. In addition to this, we have obtained ISO9001 certification, enabling us to create a quality management system that satisfies our customers' needs. We are also responding to the problem of noise, which is a subject of regulation throughout the world, by introducing electromagnetic environment compatibility (EMC) testing equipment of the highest standard, focusing all of our energies on quality management.

ISO 9001 JACO QC10J0039

Magnescale holds ISO9001 quality management system certification.

ISO 14001 BUREAU VERITAS Certification

UKAS MANAGEMENT SYSTEMS 008

Always aware that our products are incorporated in a wide range of devices and used throughout the world, we have obtained certification in CE Marking, UL, and other international standards.

We comply with the following standards:

- CE Marking (EMC Directive) EMI : EN61000-6-4 EMS : EN61000-6-2
- FCC standard FCC Part 15 Subpart B Class A

In the case of products with built-in AC power supplies, we also comply with the following standards:
- UL61010-1
- EN61010-1

In the case of products that use lasers, we comply with the following standards:
- DHHS(21CFR1040.10)
- IEC60825-1

*When using a device to which IEC Directive EN60204-1 (Safety of machinery) applies, please use the device only after taking steps to comply with the standard.
*Depending on the product, applicable standards may differ, or the product may not be certified. Please inquire before purchase if considering export, etc.