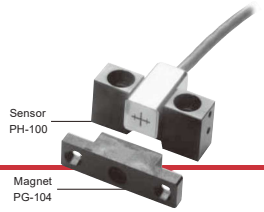
PH PH-100

High-precision, non-contact Magneswitch



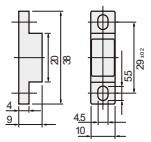
Magnescale

SPEED × PRECISION

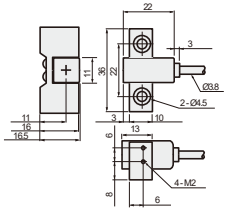
Magnesensor
Magneswitch

Dimensions

Magnet PG-104



Sensor PH-100



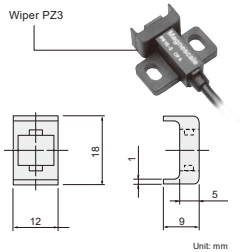
Unit: mm

- A combination of sensor PH-100 and magnet PG-104 that is connected to our interpolator can be used as a reference point for linear scales or rotary scales
- Withstands extreme work conditions
- High precision: ±1µm

Specifications	
Model	PH-100
Repeatability	±1µm (under same conditions)
Magnet	PG-104
Clearance	Max. 3mm
Operating range	−10°C to 50°C
Detection direction	Unidirectional
Cable length	3m

Accessory

Wiper PZ3 (for SET-P15/-P16)

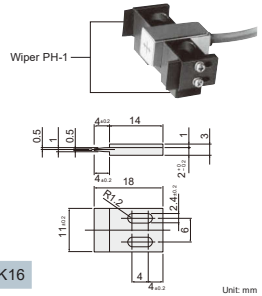


Unit: mm

Magnet mounting block PG-1 (for magnet PG-10/PG-104)

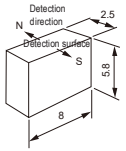
- Magnet (PG-104, PG-10) can be finely adjusted by ±1mm in X direction
- Very useful for setting a reference point

Wiper PH-1 (for magnesensor PH-11, PH-100, or PH-500)



Unit: mm

Magnet PG-9010 (for SET-P15/-P16)



Unit: mm

CE15 Series extension cable for PK16

(Mini-DIN 6-pin plug ↔ mini-DIN 6-pin socket)

Model	Cable length
CE-15 -3	3m
-5	5m
-10	10m
-15	15m
Compatible model	MJ100/110

⚠ To use this product safely, please read the instruction manual carefully and thoroughly prior to usage.

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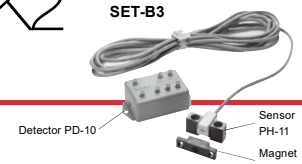
Magnescale Co., Ltd.

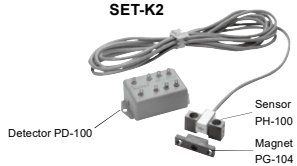
SET SET-B3/SET-K2

High-precision non-contact Magnesensor and Magneswitch

SET-B3

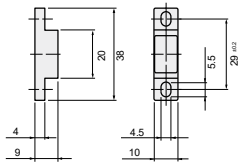


SET-K2

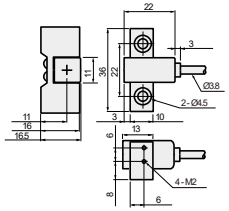


Dimensions

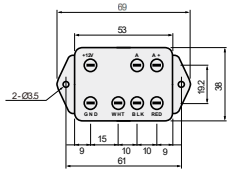
Magnet PG-10/PG-104



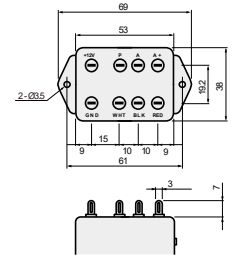
Sensor PH-11/PH-100



Detector PD-10



Detector PD-100



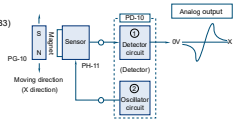
Unit: mm

- Magnesensor SET-B3 can be used as a reference point or to detect small displacements
- Magneswitch SET-K2 can be used as a reference point for Magnescale linear or rotary encoders
- Resistant to oil, dust, vibration, and impact
- Compact and lightweight with a non-contact design
- Repeatability: ±1μm
- Output signal: analog (SET-B3), pulse (SET-K2)
- Power supply: +12V DC

Specifications

Model	SET-B3	SET-K2
Repeatability	±1μm (under same conditions)*1	
Operating range	—	8 ± 1mm (at 0.5mm clearance)*4
Clearance	Max. 2.5mm	Max. 3mm
Max. response frequency	1.7kHz*2	—
Max. delay	—	0.1ms*5
Power supply	12V DC ±5 %	12V DC ±10 %
Current consumption	Max. 40mA	Max. 20mA
Output impedance	3kΩ	12kΩ
Temperature characteristics	0.3μm/°C (zero drift)	0.8μm/°C*6
Voltage characteristics	0.2μm or less/% (zero drift)	8μm/V
Protection grade	IP65 or equivalent for scale section, IP30 or equivalent for interface unit	
Operating temperature	−10°C to 50°C	
Cable length (sensor)	3m (expandable up to 15m by MSK-5000)*3	3m (expandable up to 30m by MSK-5000)*7
Cable length (detector)	Max. 100m by MSK-5100	Max. 20m by MSK-5100

(Magnesensor SET-B3)

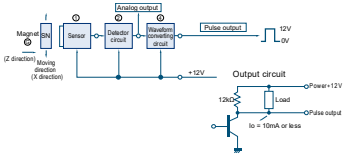


*1 Repeatability
Conditions for ±1μm: temperature change within ±1.2°C, voltage change within ±0.12V, clearance change 3μm or less, and speed change 10mm/s or less

*2 Response speed Response frequency characteristics 1.7kHz
This is the input signal frequency where the relative output level drops by 3dB in the response frequency characteristics. This causes the maximum response speed to be approx. 9m/s if the standard magnet PG10 (PG-9010) is used

*3 Cable extension
Output voltage decreases approx. 2.3%/m by cable extension

(Magneswitch SET-K2)



*1 Repeatability
This indicates the accuracy of the position at which the pulse output goes ON (at 0.5mm clearance)
Conditions for ±1μm: temperature change within ±1.2°C, voltage change within ±0.12V, clearance change 3μm or less, and speed change 10mm/s or less

*4 Clearance
Clearance affects the operating range and repeatability

*5 Response speed
This is a proper time constant of the detector circuit and indicates a max. delay (T) from detection to pulse output rise. The maximum response speed is L/T where L is a practically allowable detection tolerance. When the detector's proper time constant is taken into account during use, the time delay is negligible (e.g., the sensor head and magnet are operated at the same speed). The detector element's maximum response speed is 10 MHz

*6 Pay attention to the temperature characteristics

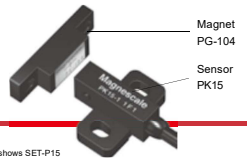
*7 When extending the cable, check the noise caused by external equipment.

Accuracy	1μm	5μm	10μm
Max. res ponsespeed	10mm/s	50mm/s	100mm/s

For position detection at the same speed, maximum speed change is caused.

SET SET-P15/-P16

High-precision, non-contact Magneswitch

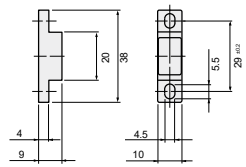


* Photo shows SET-P15

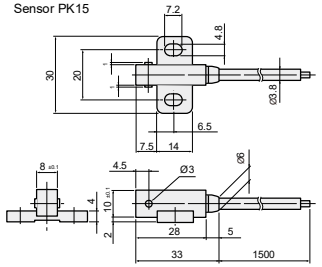
Dimensions

SET-P15

Magnet PG-104

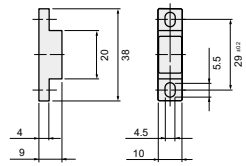


Sensor PK15

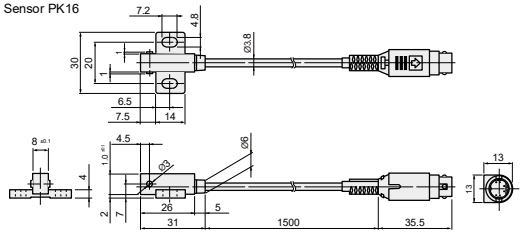


SET-P16

Magnet PG-104



Sensor PK16



Unit: mm

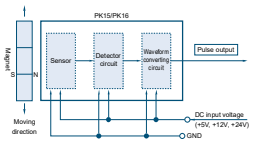
- SET-P15 can be used as a reference point for DIGIRULER or as a limit switch
- SET-P16 can be used as a reference point for DIGIRULER (interpolator MJ100/110 used in combination)
- Resistant to oil, dust, vibration, and impact
- Repeatability: ±3μm
- Max. response frequency: 10kHz
- Built-in circuit for direct connection to a control unit
- Indication lamp (LED) for visual confirmation that the switching action is being made

Specifications

Model		PK15			PK16
		-1	-2	-3	-1
Repeatability		±3μm (under same conditions)*1			
Operating range		7.5 ± 2mm (at 1mm clearance)			
Clearance		Max. 3mm			
Max. response frequency		10kHz			
Output	Circuit	NPN transistor, open collector			
	Operation	Turns ON in proximity			
	Contact capacity	Max. current 30mA, max. voltage 30V			
	Residual voltage	Residual voltage V_{OL} = 0.4V or less at Isink of 30mA			
	Protection circuit	Surge killer, protection against reverse polarity			
Indication lamp		Red LED turns ON when activated			
Power supply		5V DC ±10 %	12V DC ±10 %	24V DC ±10 %	5V DC ±10 %
Current consumption		Max. 10mA			
Protecton grade		IP67 or equivalent			
Insulation resistance		10MΩ 250V DC*2			
Vibration resistance		49m/s², 0 to 500Hz			
Shock resistance		980m/s²			
Operating temperature		−10°C to 60°C			
Storage temperature		−20°C to 80°C			
Cable length		1.5m (expandable up to 30m)			

*1 Repeatability
This is unidirectional repeatability accuracy and indicates the accuracy of the position at which the reference point (stop) pulse output goes ON
Conditions for accuracy ±3μm: temperature change within ±1.2°C, voltage change within ±1 % 5min after the power supply is turned ON, clearance variation 1mm

*2 Provided between molded plastic housing and circuit, and shielded wire and circuit



Specifications

Model name	SR24
Effective length (L)	70 to 2,040mm
Thermal expansion	12 ± 1 × 10^{-6}/°C
Output signal	A/B/Reference point line driver signal, compliant with EIA-422
Minimum phase difference time	Selectable from 50/100/150/200/250/300/400/500/650/ 1000/1250/2500/3000ns (set at time of order)
Accuracy (at 20℃)	(3+3L/1,000)μm p-p or (5+5L/1,000)μm p-p L: Measuring length (mm)
Resolution	Selectable from 0.05/0.1/0.5/1μm (set at factory shipping)
Reference point position	Center point, Multi-point (40mm pitch), User-selected point (1mm pitch)
Power supply voltage	DC 4.75 to 5.25V (at cable connection end)
Consumption current	250mA (with 5V controller connection)
Inrush current	2A or less (when the power supply rise time is 10ms)
Maximum response speed	50m/min (resolution: 0.1μm, Minimum phase difference: at 50ns)
Vibration resistance	150m/s² (50Hz to 3,000Hz)
Impact resistance	350m/s² (11 ms)
Protective design grade	IP54 (air purge not included), IP65 (air purge included)
Power supply protection	In the case of errors such as a reverse-connected power supply or over-voltage, the internal fuse is cut to protect the power supply and wiring.
Product Safety	FCC Part15 Subpart B Class A ICES-003 Class A Digital Device EN/BS 61000-6-2, EN/BS 61000-6-4
Product Environment	EN/BS 63000
Operating temperature	0 to +50°C
Storage temperature	-20 to +55°C
Mass	Approx. 0.39kg + 1.53kg/m or less
Carriage sliding resistance	1N or less
Compatible cables(types without relay connectors) Maximum cable length	CH23-***NV 13m
Compatible cables(types with relay connectors) Maximum cable length	CH23-***NVU + CH23-***NPZW 30m

Model name

SR24 - □ □ □ □ □ □ □ □ □

- Effective length (cm)
- Accuracy grade:
  S: 3+3L/1000μm p-p
  A: 5+5L/1000μm p-p
- Resolution and Polarity:

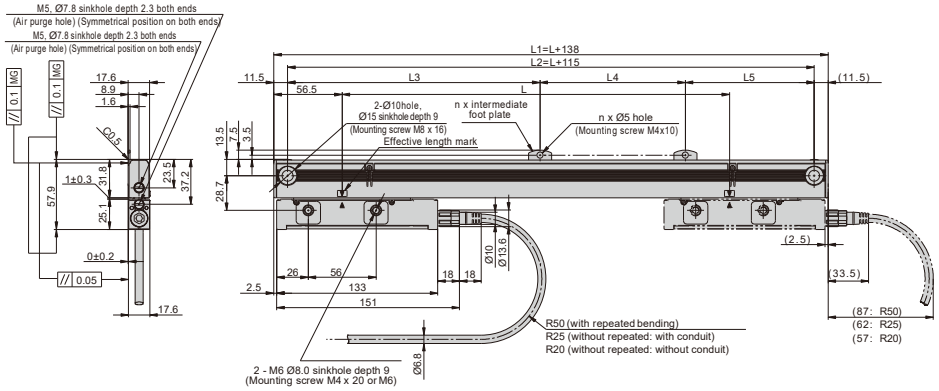
Resolution (μm)	Polarity +	Polarity -
0.05	B	G
0.1	C	H
0.5	D	J
1.0	E	K

- Refference point
  X: Effective length center
  Y: Multipoint
  Arbitrary position can be specified
- Phase difference:

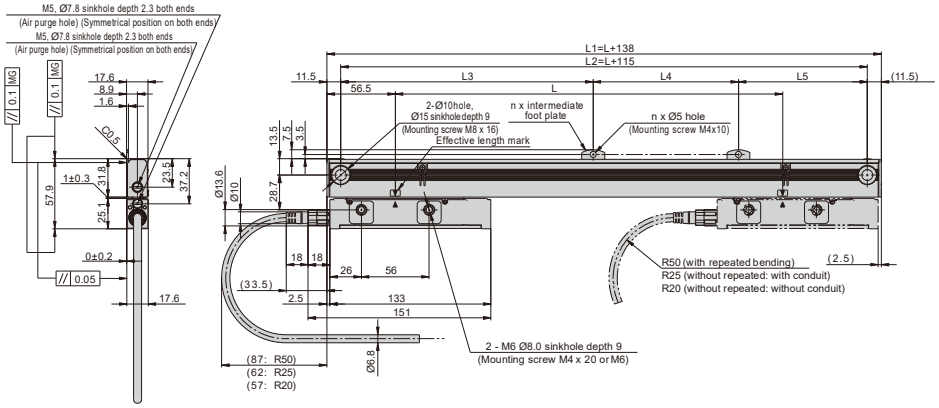
Phase (ns)	
50	A
100	B
150	C
200	D
250	E
300	F
400	G
500	H
650	J
1,000	K
1,250	L
2,500	M
3,000	N

Dimensions

SR24 (cable right out)



SR24 (cable left out)



unit: mm

L	L1	L2	L3	L4	L5	n
70	208	185	-	-	-	0
120	258	235	-	-	-	0
170	308	285	-	-	-	0
220	358	335	-	-	-	0
270	408	385	-	-	-	0
320	458	435	-	-	-	0
370	508	485	-	-	-	0
420	558	535	-	-	-	0
470	608	585	-	-	-	0
520	658	635	-	-	-	0
570	708	685	-	-	-	0
620	758	735	-	-	-	0
670	808	785	392.5	-	392.5	1
720	858	835	417.5	-	417.5	1
770	908	885	442.5	-	442.5	1
820	958	935	467.5	-	467.5	1
920	1,058	1,035	517.5	-	517.5	1
1,020	1,158	1,135	567.5	-	567.5	1
1,140	1,278	1,255	627.5	-	627.5	1
1,240	1,378	1,355	677.5	-	677.5	1
1,340	1,478	1,455	727.5	-	727.5	1
1,440	1,578	1,555	520	520	515	2
1,540	1,678	1,655	550	550	555	2
1,640	1,778	1,755	585	585	585	2
1,740	1,878	1,855	620	620	615	2
1,840	1,978	1,955	650	650	655	2
2,040	2,178	2,155	720	720	715	2

*L: Effective length
*MG: Machine guide
*Intermediate foot plate: One location when L ≥ 670mm, two locations when L ≥ 1,440mm

⚠ To use this product safely, please read the instruction manual carefully and thoroughly prior to usage.

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