ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

RH/RP Displacement Sensor Analog Output

Technical Characteristics

- Rugged and fully enclosed design.
- Non-wear, non-contact measurement method.
- Easy to use, standard analog signal output.
- No need to return to zero, absolute position output.
- Easy diagnosis, LED real-time condition monitoring.
- Stable and reliable, using digital analog technology.
- Low power consumption design effectively reduces system heating.
- The start and end position of the measurement can be adjusted in full scale.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Product Parameters-Analog Output

• Input

Measurement data	Position magnet ring
Stroke length	25～5500 mm，customized according to customer needs
Number of measurements	1

• Output

Current	4 ～ 20mA or 20 ～ 4mA(min/max load 0/5002)
Voltage	0 ～ 10Vdc or 0～5Vdc（min load resistance ≥10K）
Resolution	16-bit D/A or 0.0015% of full scale (min 1um)
Nonlinearity	＜±0.01% of full scale, min±50um
Repetition accuracy	＜±0.001% of full scale, min ±1um
Hysteresis	＜10um
Update time	1KHz (range ≤ 1m), 500Hz (1m < range ≤ 2m), 333Hz (2m < range ≤ 3m), customizable
Temperature coefficient	＜30ppm/℃

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67 RH Stainless Stell Rod /IP65 RP Aluminum profile
Operating temperature	-40℃ ～ +85℃
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 100g(6ms)
Vibration index	GB/T2423.10 20g/10～2000Hz
EMC test	GB/T17626.2/3/4/6/8，Grade 4/3/4/3/3， Class A，CE Certification

• Structure and Materials

Failure indication		Displayed by the LEDs on the rear cover of the electronic compartment
RH Series	Electronic bin	Aluminum alloy
	Measuring rod	304 stainless steel
	Outer tube pressure	35MPa（continuous）/70MPa（peak）or 350bar（continuous）/ 700bar（peak）
	Position magnet	Standard magnet ring and various ring magnets
RP Series	Electronic bin	Aluminum alloy
	Measuring rod	Aluminum alloy
	Position magnet	Slider magnet, square magnet, sector magnet
Mounting thread form		M18×1.5、M20×1.5、3/4"-16UNF-3A（customizable）
Installation direction		Any direction
Outgoing mode		Cable outlet or Connector

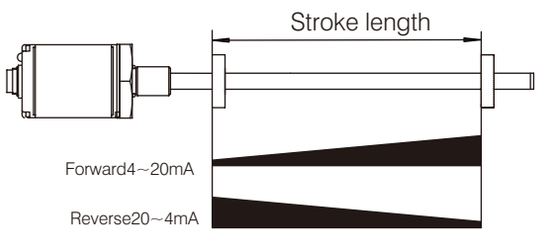
• Electrical Connections

Input voltage	+24Vdc±20%
Operating current	＜80mA (varying with range)
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	＞10MΩ
Insulation strength	500V

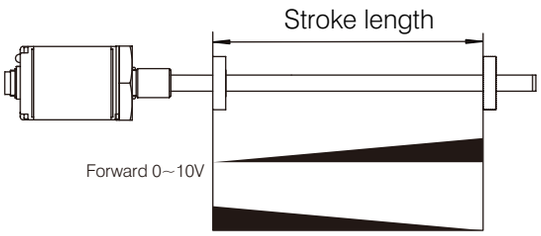
ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Application environment

- The measurement accuracy of analog output magnetostrictive displacement sensor depends on the number of bits of built -in D/A module. Displacement signals can be directly output to external controllers, such as analog input of PLC.
- The sensor transforms the absolute position of the vernier magnet into a standard analog signal in real time, that is, 0～20A (or reverse), 4～20mA (or reverse) DC current or 0～5V (or reverse),-5～+5V (or reverse), 0～10V (or reverse),-10～+10 (or reverse) DC voltage, etc. The change trend of the output value is linear with the movement direction of the magnet ring, which can be set as forward and reverse output according to needs. As shown in the following figure:



Current output includes: 0～20mA (or reverse), 4～20mA (or reverse)

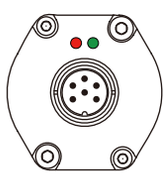


Voltage output includes：0～5V （or reverse), -5～+5V(or reverse),0～10V(or reverse), -10～+10V(or reverse)

LED Real-time State Monitoring and Diagnosis

- Red and green LED indicator built into the sensor head cover provide sensor working condition and diagnostic function.

Green light	ON	ON	ON	Flash
Red light	OFF	Flash	ON	ON
Function	Normal work	Magnet leaves Stroke length range	Magnet not detected	Programming status



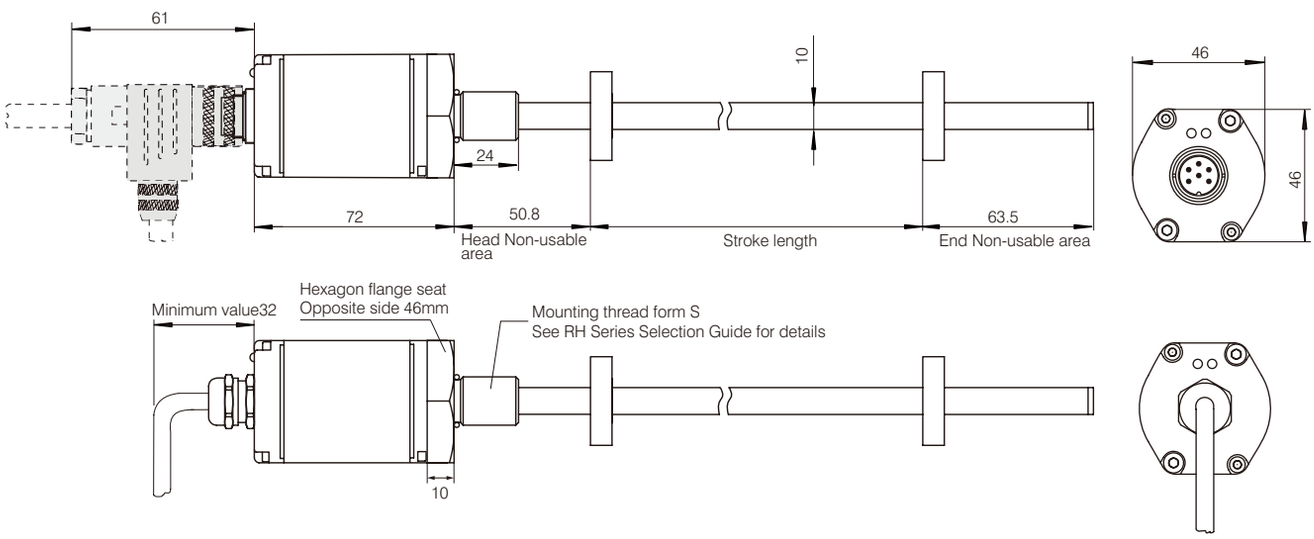
ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Installation Instructions-Analog Output

Analog output magnetostrictive displacement sensor, suitable for real-time and precise measurement of moving parts stroke, it can measure the absolute displacement or stroke of vernier magnet, expressed in the form of standard analog quantity, including: 0～20MA (or reverse), 420MA (or reverse) DC current or 0～5V (or reverse),-5～+5V (or reverse), 0～10V (or reverse),-10～+10V (or reverse) DC voltage, etc. Sensors have built-in and external two different installation methods, built-in type is suitable for the built-in installation of hydraulic cylinders, compact structure; the external type adopts aluminum profile, which is installed outside the moving parts and convenient to use.

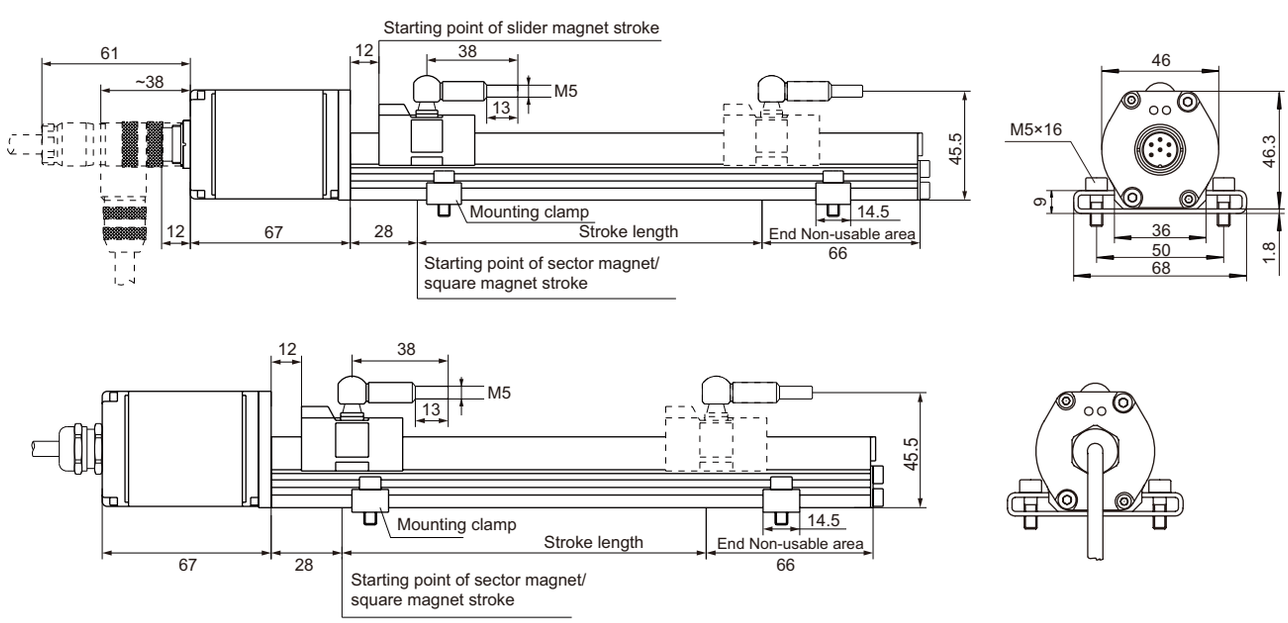
- **Dimensions and installation guidance of RH pressure-resistant rod sensor**

RH series pressure-resistant rod shell, built-in installation design for hydraulic system, pressure-resistant 35MPa continuous, flexible and simple installation mode. Mounting thread form M18×1.5 or M20×1.5 or 3/4"-16UNF-3A.
Note: The measurement Non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The default values of the first and last measurement Non-usable areas of this product are 50.8mm and 63.5mm respectively. The value of the measurement Non-usable area can be appropriately modified according to the needs of customers, please pointed out when ordering.



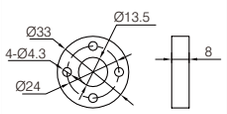
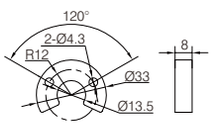
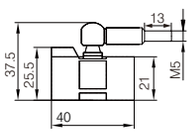
Dimensions and installation guidance of RP aluminum profile sensor

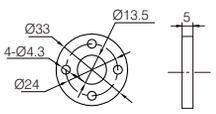
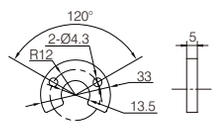
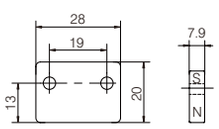
RP Series aluminum profile provides flexible and simple external installation mode, which is suitable for stroke or position detection of linear motion mechanism, and can also be used for external position detection of hydraulic cylinder.

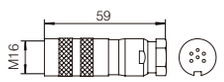
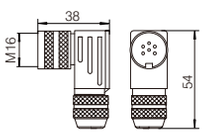


ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Common Accessories - Analog Output

Model	Dimensions
Standard magnet ring Order No.: 211501	
Sector magnet Order No.: 211502	
Slider magnet Order No.: 211503	

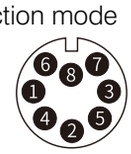
Accessory name/ model	Dimensions
Magnetic isolation gasket	
Sector magnetic isolation gasket	
Square magnet Order No.: 211508	

Accessory name/ model	Dimensions
6-pin Female Connector Order No.: 312701	
6-pin 90 Female Connector Order No.: 312702	

Note: Please refer to "Magnet ring Selection" for details of magnet ring kit and other models.

Wiring mode

When the sensor is a connector output, refer to the pin definition in the following table for wiring mode; when the sensor is cable outlet output, refer to the line color definition in the following table for connection mode



- 6-pin male connector arrangement (facing the sensor head)

Pin	Line color 1*	Line color 2*	Pin/wire function definition
1	Blue	Grey	No. 1 magnet ring position signal(+)
2	Green	Pink	No. 1 magnet ring position signal(-)
3	Yellow	Yellow	Reservation
4	White	Green	Reservation
5	Red	Brown	+24Vdc power supply (-20%～+20%)
6	Black	White	0 Vdc（power supply circuit）

Note: * Line color 1: cable PUR sheath, orange, -20～90℃
* Line color 2/3: cable PVC sheath orange,-20～105℃

- 8-pin male connector arrangement (facing the sensor head)

Pin	Line color 3*	Pin/wire function definition
1	Yellow	Current output
2	Grey	0Vdc(Current/Voltage Loop)
3	Pink	Reservation
4	-	Reservation
5	Green	0...10V
6	Blue	0 Vdc（power supply circuit）
7	Brown	+24Vdc power supply（-20%～+20%）
8	White	Reservation

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Selection Guide - Analog Output

R □ □ – M □ □ □ □ □ – □ □ – □ □ □ □ – □ □ □ □ □ – □ □

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19

01 - 02

RH	Pressure-resistant rod (internal or external)
RP	Aluminum profile (external only)

03 - 07 Measuring range

Four digits, less than four digits are preceded by zero, M means metric system, unitmm

08 - 09 Magnet ring type / mounting thread form

Only for RH series	S1	M18×1.5, measuring rod diameter 10mm, 304 material
	S2	M20×1.5, measuring rod diameter 10mm, 304 material
	S3	3/4"-16UNF-3A, measuring rod diameter 10mm, 304 material
Only for RP series	C1	Sector magnet
	C2	Slider magnet
	C3	Square magnet

10 - 13 Connection form

10 - 11 Cable outlet mode

DH	PUR sheath, orange,-20~90℃, end scattered, line color 1
DU	PVCsheath, orange, -20~105℃, end scattered, line color 2
DB	PVC sheath, orange,-20~105℃, end scattered, line color 3
DI	PUR sheath, orange,-20~90℃, end with 6-pin connector
DV	PVC sheath, orange,-20~105℃, end with 6-pin connector
DC	PVC sheath, orange,-20~105℃, end with 8-pin connector

12 - 13 Cable outlet mode: cable length, 01~99 meters

Note: For supporting cables, please refer to Analog/Start-Stop Cable Accessories Selection

10 - 13 Connector mode

PH60	M16 male connector (6-pin)
PB80	M16 male connector (8-pin)

14 - 17 Signal output mode

14 - 15 Output form and direction

A0	Current output，4 ~ 20mA
A1	Current output，20 ~ 4mA
A2	Current output，0 ~ 20mA
A3	Current output，20 ~ 0mA
V0	Voltage output，0 ~ 10V
V1	Voltage output，10 ~ 0V
V2	Voltage output，-10 ~ +10V
V3	Voltage output，+10 ~ -10V
V4	Voltage output，0 ~ 5V
V5	Voltage output，5 ~ 0V
V6	Voltage output，-5 ~ +5V
V7	Voltage output，+5 ~ -5V

16 Number of magnet rings

1	Single magnet ring

17 No magnet ring state

A	Keep the original value
B	Maximum value
C	Minimum value

18 - 19 Non-usable area at head and end, customizable

S0	50.8mm+63.5mm
B0	30mm+60mm
S1	28mm+66mm（used in RP series）

- Note:The forward output of the sensor means that when the magnet ring moves away from the electronic bin, the output value increases and decreases when the magnet ring moves in the reverse direction.
- Selection example : RH-M0800-S1-DH02-A01C-S0

  Indicates: the ordered product model is RH structural displacement sensor, the measuring range is 800mm, and the mounting thread form is M18×1.5; the diameter of the measuring rod is 10mm, and the material is 304; cable ouelet connection, 2m long PUR orange cable end scattered; 4~20mA current output; no magnet ring display value is the minimum value; single magnet ring; the non-usable area of the first end is 50.8mm, and the non-usable area of the end is 63.5mm.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Selection of Analog/Start-Stop Cable Fittings

A	S	T	–	M				–			
01	02	03		04	05	06	07		08	09	10

01 - 03	
A S T	Analog/Start-Stop interface

04 - 07	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m

08 - 10	Cable type and outlet mode
H 0 1	One end of 6-pin (M16) female connector, and one end scattered
H 0 3	One end of 6-pin (M16) right angle female connector, and one end scattered
U 0 1	One end of 6-pin (M16) female connector, and one end scattered
U 0 2	One end of 8-pin (M16) female connector, and one end scattered
U 0 3	One end of 6-pin (M16) right angle female connector, and one end scattered
U 0 4	One end of 8-pin (M16) right angle female connector, and one end scattered
Note	H： cable type, PURsheath, orange, -20～90℃
	U：Cable type, PVCsheath, orange, -20～105℃

- Selection example: AST-M005-H01

  Indicates: Analog or Start-Stop interface cable, cable length 5 meters, PURsheath, orange, -20～90°C, one end of the cable is 6-pin (M16) vcvfemale connector, and one end scattered.

- Selection example:AST-M010-U04

  Indicates: Analog or Start-.Stop interface cable, cable length 10 meters, PVC sheath, orange, -20～105C, one end of the cable is an 8-pin (M16) right angle female connector, and one end scattered.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

RH/RP Displacement Sensor SSI Output

Technical Characteristics

- Rugged and fully enclosed design
- Non-wear, non-contact measurement method
- Linear measurement, absolute output
- High resolution, up to 0.1μm
- Easy diagnosis, LEDs real-time condition monitoring
- Repeatability is less than 0.001%FS
- Digital technology, stable and reliable
- Real-time induction and synchronous measurement
- Direct SSI signal output can directly replace encoder

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Product Parameters - SSI Output

• Input

Measurement data	Position magnet ring
Stroke length	25～5500 mm， customized according to customer needs
Number of measurements	1

• Output

Interface	SSI Synchronous Serial Interface
Data Format	Binary or Gray code
Data length	24/25/26bit
Resolution	0.1/0.5 / 1 / 2 / 5 / 10 / 20 / 40/ 50 / 100 μm
Nonlinearity	＜±0.01% of full scale, minimum ±50μm
Repetition accuracy	＜±0.001% of full scale, minimum ±1μm
Transmission rate	50KBD～1MBD line length＜3 ＜50 ＜100 ＜200 ＜400 (m) Rate 1000 ＜400 ＜300 ＜200 ＜100 (KBD)
Update time (High update rate)	Stroke: 300 750 1000 2000 5000 mm Frequency: 3.7 3.0 2.3 1.2 0.5 kHz
Update time (general)	1KHz (range ≤ 1m) 500Hz (1m < range ≤ 2m) 250Hz (2m < range ≤ 3m), customizable
Hysteresis	＜10μm
Temperature coefficient	＜15ppm/℃

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67RH Stainless Stell Rod/IP65RP Aluminum profile
Operating temperature	-40℃ ～ +85℃
Humidity/ dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 100g(6ms)
Vibration index	GB/T2423.10 20g/10～2000Hz
EMC Test	GB/T17626.2/3/4/6/8，Grade4/3/4/3/3，Class A，CE Certification

• Structure and Materials

Failure indication		Electronic bin coverwith LEDs display
RH Series	Electronic bin	Aluminum alloy
	Measuring rod	304 stainless steel
	Outer tube pressure	35MPa (continuous)/70MPa (peak) or 350bar continuous)/700bar (peak)
	Position magnet	Standard magnet ring and various ring magnets
RP Series	Electronic bin	Aluminum alloy
	Measuring rod	Aluminum alloy
	Position magnet	Slider magnet, square magnet, sector magnet
Mounting thread form		M18×1.5, M20×1.5, 3/4"-16UNF-3A（customizable）
Installation direction		Any direction
Outgoing mode		Cable outlet or Connector

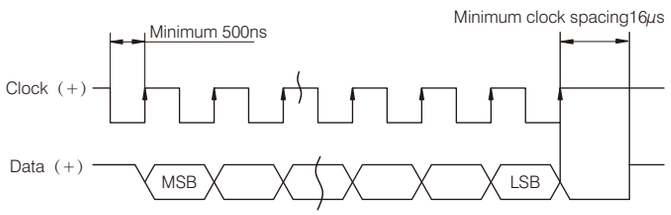
• Electrical Connections

Input voltage	+24Vdc±20%
Operating current	＜80mA（varying with range）
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	＞10MΩ
Insulation strength	500V

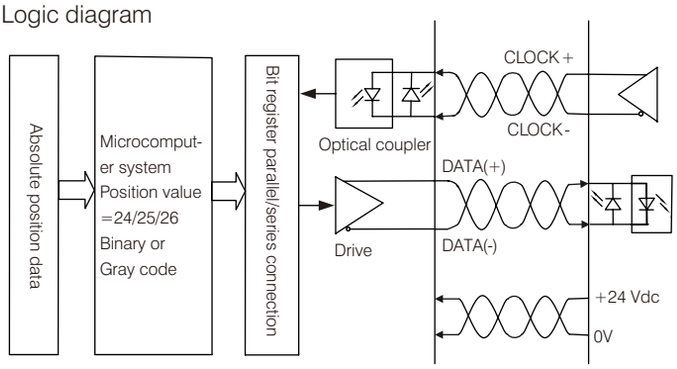
Output Characteristics-SSI Output

SSI output magnetostrictive displacement sensor can provide Synchronized Serial Interface (SSI), which can convert the real-time position of vernier magnet into 24-bit, 25-bit or 26-bit (binary or Gray code) serial data format, and transmit the data to the controller by serial communication after receiving the clock signal provided by the controller. The format of SSI output data is identical to absolute output encoder, and it can be directly connected with PLC function modules (such as SM338 or SM138 of Siemens), which can be conveniently used to replace absolute encoder.

Timing diagram



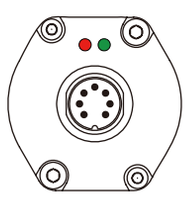
Logic diagram



LED Real-time State Monitoring and Diagnosis

Red and green LEDs built into the sensor head cover provide sensor working condition and diagnostic function.

Green light	ON	ON	Flash
Red light	OFF	ON	ON
Function	Normal work	The magnet leaves the Stroke length range or the magnet cannot be detected	Programming state



ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

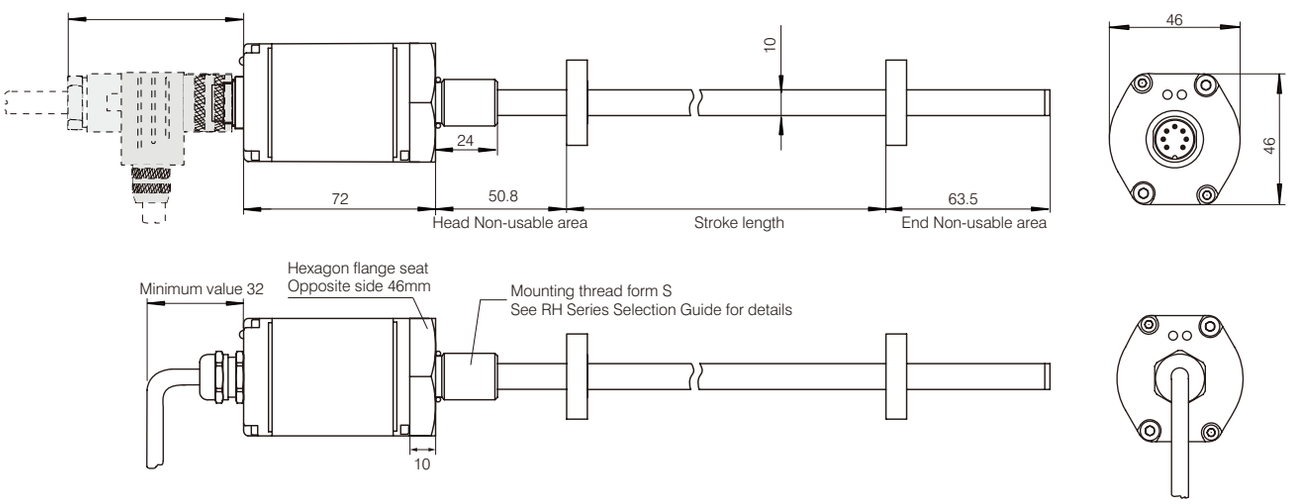
Installation Instructions SSI Output

SSI output magnetostrictive linear displacement sensor provides synchronous serial signal output, which can convert the real-time position of vernier magnet into 24, 25 or 26-bit (binary or Gray code) data form, and transmit the data to the controller by serial communication after receiving the clock signal provided by the controller. The data format of SSI output is identical with absolute output encoder, and it can be connected directly with the function module of PLC, so it can be conveniently used to replace absolute encoder.

Dimensions and installation guidance of RH pressure-resistant rod sensor

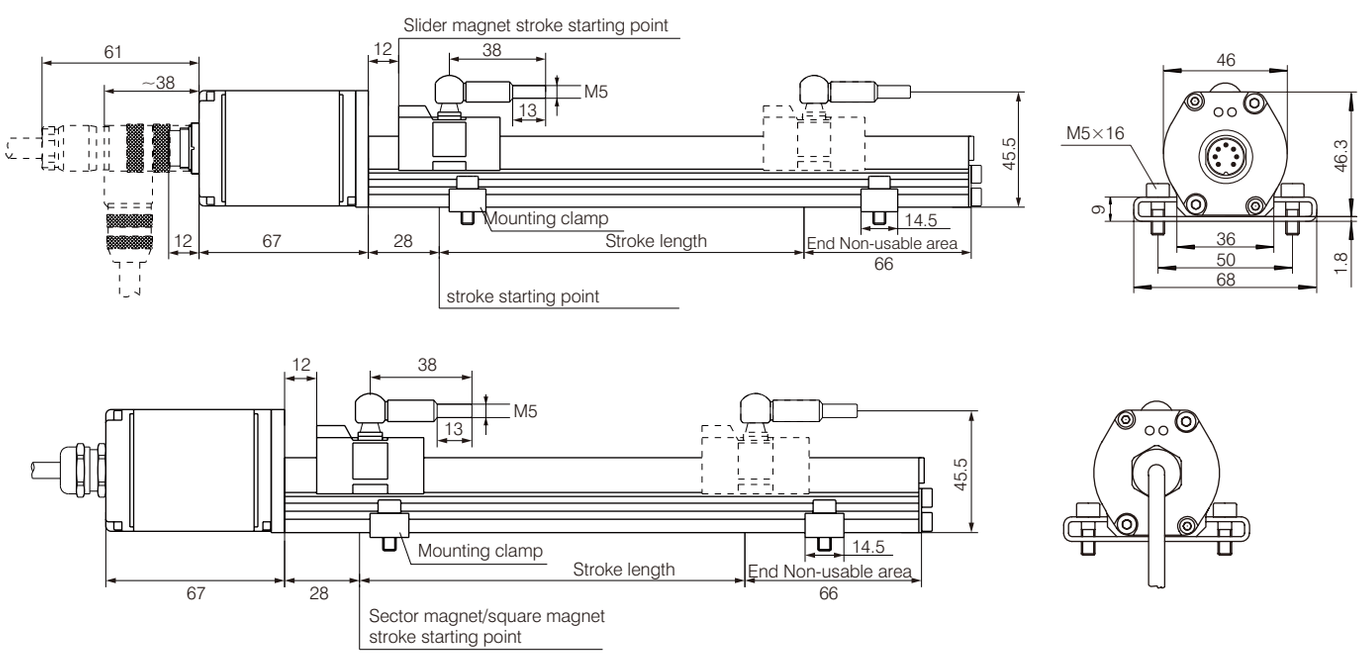
RH series pressure-resistant rod shell, built-in installation design for hydraulic system, pressure-resistant 35MPa continuous, flexible and simple installation mode, mounting thread form M18×1.5 or M20×1.5 or 3/4"-16UNF-3A.

Note: The measurement non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The default values of the first and last measurement non-usable areas of this product are 50.8mm and 63.5mm respectively. The value of the measurement non-usable area can be appropriately modified according to the needs of customers, please pointed out when ordering.



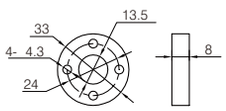
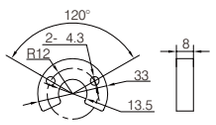
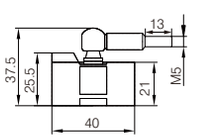
Dimensions and installation guidance of RP aluminum profile sensor

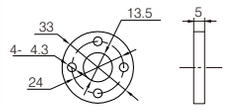
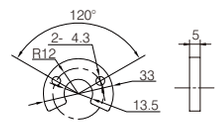
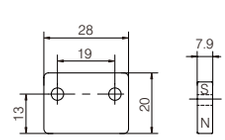
RP Series aluminum profile provides flexible and simple external installation mode, which is suitable for stroke or position detection of linear motion mechanism, and can also be used for external position detection of hydraulic cylinder.

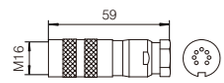
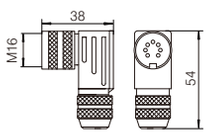


ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Common Accessories - SSI Output

Accessory name/ model	Dimensions
Standard Magnet ring Order No.: 211501	
Sector magnet Order No.: 211502	
Slider magnet Order No.: 211503	

Accessory name/ model	Dimensions
Magnetic isolation gasket	
Sector magnetic isolation gasket	
Square magnet Order No.: 211508	

Accessory name/ model	Dimensions
7-pinFemale Connector Order No.: 312703	
7-pin 90 Female Connector Order No.: 312704	

Note: Please refer to "Magnet ring Selection" for details of magnet ring kit and other models.

Wiring mode

When the sensor is connector output, refer to the pin definition in the following table for wiring mode; when the sensor is cable outlet output, refer to the line color definition in the following table for connection mode

• 7-pin male connector arrangement (facing the sensor head)			
Pin	Line color 1*	Line color 2*	Pin/wire function definition
1	White	Grey	Data (-)
2	Yellow	Pink	Data (+)
3	Blue	Yellow	Clock (+)
4	Green	Green	Clock (-)
5	Red	Brown	+24Vdc power supply (-20%~+20%)
6	Black	White	0 Vdc
7	-	-	Do not connect

• 8-pin male connector arrangement (facing the sensor head)		
Pin	Line color 3*	Pin/wire function definition
1	Yellow	Clock (+)
2	Grey	Data (+)
3	Pink	Clock (-)
4	-	Reservation
5	Green	Data (-)
6	Blue	0 Vdc (power supply circuit)
7	Brown	+24Vdc power supply (-20%~+20%)
8	White	Reservation

Note: * Line color 1: cable PUR sheath, orange, -20~90℃
* Line color 2/3: Cable PVC sheath, orange,-20~105℃

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Selection Guide-SSI Output

R □ – M □ □ □ □ – □ □ – □ □ □ □ – S □ □ □ □ □ – □ □

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21

01 - 02

RH	Pressure-resistant rod (internal or external)
RP	Aluminum profile (external only)

03 - 07 Measuring range

Four digits, less than four digits are preceded by zero, M means metric system, unitmm

08 - 09 Magnet ring Type / Mounting Thread Form

Only for RH series	S1	M 18×1.5, measuring rod diameter 10mm, 304 material
	S2	M20×1.5, measuring rod diameter 10mm, 304 material
	S3	3/4 "-16UNF-3A, measuring rod diameter 10mm, 304 material
Only for RP series	C1	Sector magnet
	C2	Slider magnet
	C3	Square magnet

10 - 13 Connection form

10- 11 Cable outlet mode

DH	PUR sheath, orange,-20～90℃, end scattered, line color 1
DU	PVC sheath, orange,-20～105℃, and one end scattered, line color 2
DB	PVC sheath, orange,-20～105℃, and one end scattered, line color 3
DI	PUR sheath, orange,-20～90℃, end with 6-pin connector
DV	PVC sheath, orange,-20～105℃, end with 6-pin connector
DC	PVC sheath, orange,-20～105℃, end with 8-pin connector

Note: See SSI cable accessories selection for supporting cables

12 - 13 Cable outlet mode: cable length, 01～99 meters

10 - 13 Connector mode

PH70	M16 male connector (7-pin)
PB80	M16 male connector (8-pin)

14 - 19 Signal output mode

15 Data length

1	24-bit	2	25-bit	3	26-bit*

*26-bitis parity bits and 25-bitis status bits

16 Data Format

B	Binary	G	Gray code

17 Resolution

1	0.1mm	2	0.05mm
3	0.02mm	4	0.01mm
5	0.005mm	6	0.002mm
7	0.001mm	8	0.04mm
9	0.0005mm	0	0.0001mm

18 Direction

0	Forward	1	Reverse

19 Mode

0	Regular	1	Synchronization	2	High update rate

20 - 21 Non-usable area at head and end, customizable

S0	50.8mm+63.5mm
B0	30mm+60mm
S1	28mm+66mm（used in RP series）

- Note: The forward output of the sensor means that when the magnet ring moves away from the electronic bin, the output value increases and decreases when the magnet ring moves in the reverse direction.
- Selection example: RH-M0500-S1-PH70-S2B700-S0

  Indicates: The ordered product model is RH series displacement sensor, the measuring range is 500mm, the mounting thread form is M18×1.5, the measuring rod diameter is 10mm, 304 material, 7-pin M16 connector connection, no cable, SSI output (data bit length is 25-bit, output format is binary, resolution is 0.001mm, forward output, asynchronous mode), and the head non-usable area is 50.8mm and the end non-usable area is 63.5mm.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

SSI Cable accessories selection Guide

S	S	I	–	M				–			
01	02	03		04	05	06	07		08	09	10

01 - 03	
S S I	SSI interface

04 - 07	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m

08 - 10	Cable type, outlet mode
H 0 1	One end of 7-pin (M16) is female connector, and one end scattered
H 0 3	One end of 7-pin (M16) right angle female connector, and one end scattered
U 0 1	One end of 7-pin (M16) is female connector, and one end scattered
U 0 2	One end of 8-pin (M16) is female connector,and one end scattered
U 0 3	One end of 7-pin (M16) right angle female connector, and one end scattered
U 0 4	One end of 8-pin (M16) right angle female connector, and one end scattered

Note	
	H: Cable type, PURsheath, orange, -20～90℃
	U: Cable type, PVC sheath, orange,-20～105℃

- Selection example: SSI-M005-H01

  Indicates: SSI interface cable, cable length 5 meters, PURsheath, orange, -20～90℃, one end of the cable is 7-pin (M16) female connector, and one end scattered.

- Selection example: SSI-M010-U04

  Indicates: SSI interface cable, cable length 10 meters, PVC sheath, orange, -20～105℃, one end of the cable is an 8-pin (M16) right angle female connector, and one end scattered.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

RH/RPDisplacement Sensor Profibus-DP Bus Output

Technical Characteristics

- Rugged and fully enclosed design
- Non-wear, non-contact measurement method
- Linear measurement, absolute output
- High resolution, up to 5μm
- Easy diagnosis, LEDs real-time condition monitoring
- Repetition accuracy is less than 0.001% F.S
- Digital technology, stable and reliable
- Direct Profibus-DP signal output
- Supports simultaneous measurement of multiple magnet ring positions

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Product parameters - Profibus-DP bus output

• Input

Measurement data	Position magnet ring
Stroke length	25～5500 mm，customized according to customer needs
Number of measurements	1～9

• Output

Interface	Profibus-DP System，ISO74498
Data format	Profibus-DP（EN-50170)
Transmission speed	Maximum 12Mbit/s
Resolution	1 / 5 / 10 / 20 / 50 / 100 μm
Nonlinearity	＜±0.01% of full scale, minimum ±50μm
Repetition accuracy	＜±0.001% of full scale, minimum ±1μm
Update time	1KHz（range≤1m） 500Hz（1m＜range≤2m） 250Hz（2m＜range≤3m），customizable
Hysteresis	＜10μm
Temperature coefficient	＜15ppm/℃

• Operating conditions

Magnet velocity	Arbitrary
Protection level	IP67RH Stainless Stell Rod/IP65RP Aluminum profile
Operating temperature	-40℃ ～ +85℃
Humidity/dew point	Humidity 90%, no condensation
Shock index	GB/T2423.5 100g(6ms)
Vibration index	GB/T2423.10 20g/10～2000Hz
EMC test	GB/T17626.2/3/4/6/8，Grade 4/3/4/3/3，Class A，CE Certification

• Structure and Material

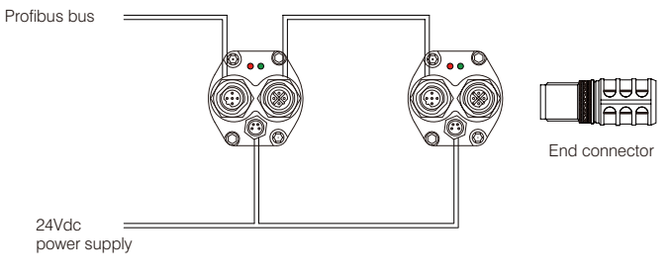
Failure indication		Electronic bin coverwith LEDs display
RH Series	Electronic bin	Aluminum alloy
	Measuring rod	304 stainless steel
	Outer tube pressure	35MPa(continuous)/70MPa(peak)or 350bar(continuous)/700bar (peak)
	Position magnet	Standard magnet ring and various ring magnets
RP Series	Electronic bin	Aluminum alloy
	Measuring rod	Aluminum alloy
	Position magnet	Slider magnet, square magnet, sector magnet
Mounting thread form		M18×1.5、 M20×1.5、3/4"-16UNF-3A（customizable）
Installation direction		Any direction
Outgoing mode		Cable outlet or Connector

• Electrical connection

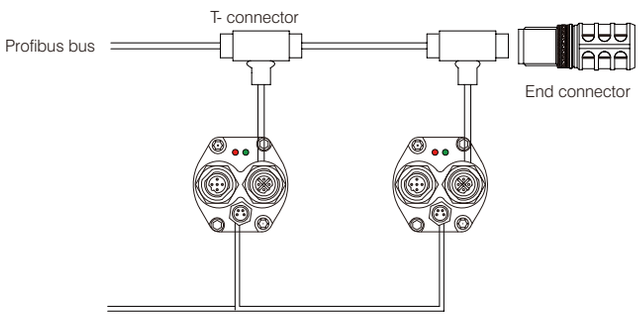
Input voltage	+24Vdc±20%
operating current	＜80mA（varying with range）
Polarity protection	Max.-30Vdc
Overvoltage protection	Max.36Vdc
Insulation resistance	＞10MΩ
Insulation strength	500V

Output Characteristics-Profibus-DP Bus Output

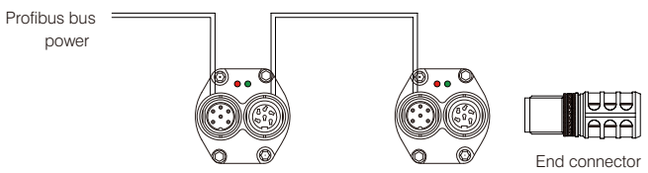
- Connection by 5-pin connector (series connection): The power supply cable is separate from the bus connection.



- Connection by 5-pin connector (parallel connection): a standard T connector with cable for bus connection, the power supply cable is separate. When any sensor on the line is disconnected, the sensors on other lines keep working.



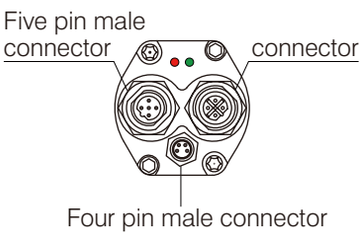
- Connection with a 6-pin connector (series connection)



LED Real-time State Monitoring and Diagnosis

- The integrated LEDs (red or green) provide the basic status feedback and troubleshooting function of the sensor.

Green light	ON	ON	Flash	Flash
Red light	OFF	ON	OFF	ON
Function	Normal work	Magnets not detected or incorrect number	Waiting for host parameters	Programming state



ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Installation and Use Instructions - Profibus-DP Bus Output

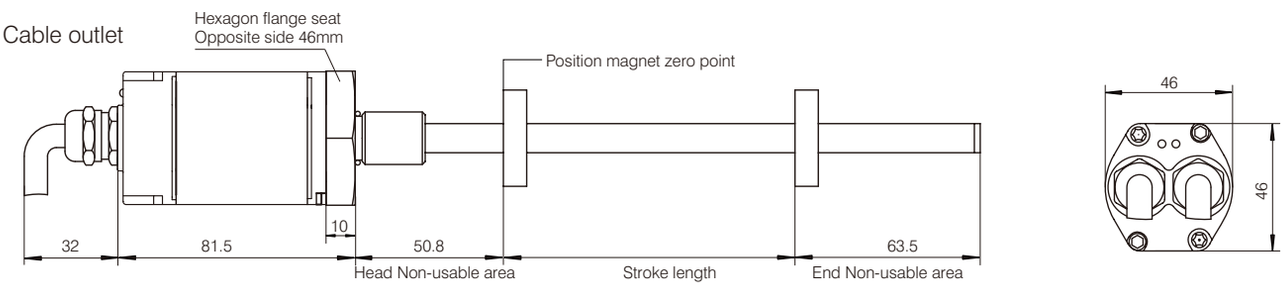
The DP output magnetostrictive sensor meets the Profibus-DP (EN 50 170) protocol. The sensor transmits the absolute position data of the magnet ring to the controller in the form of RS-485 standard serial asynchronous, and the maximum transmit rate can reach 12Mbps. The Profibus-DP interface provides powerful diagnostic and setting functions in the form of GSD data sheets.

- Dimensions and installation guidance of RH pressure-resistant rod sensor

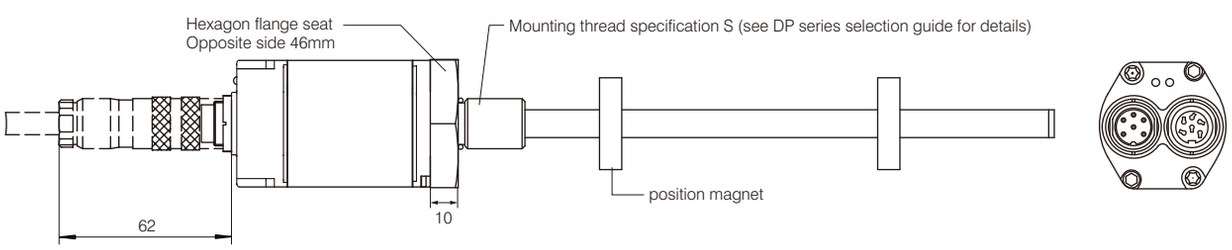
RH series pressure-resistant rodshell, built-in installation design for hydraulic system, pressure-resistant 35MPa continuous, flexible and simple installation mode, mounting thread form M18×1.5 or M20×1.5 or 3/4"-16UNF-3A.

Note: The measurement Non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The default values of the first and last measurement Non-usable areas of this product are 50.8mm and 63.5mm respectively. The value of the measurement Non-usable area can be appropriately modified according to the needs of customers, please pointed out when ordering.

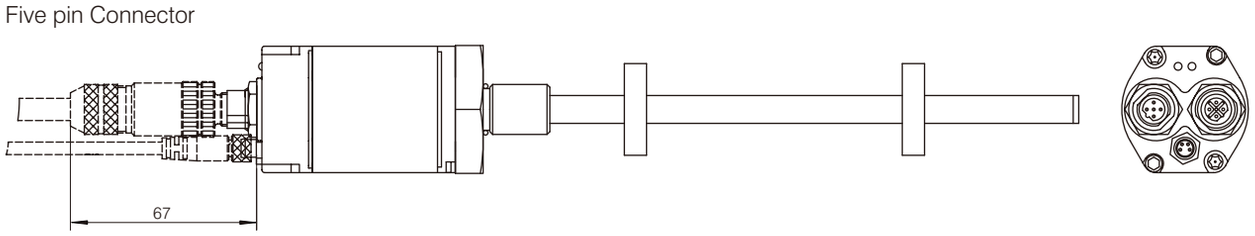
Cable outlet



Six pin Connector



Five pin Connector



ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

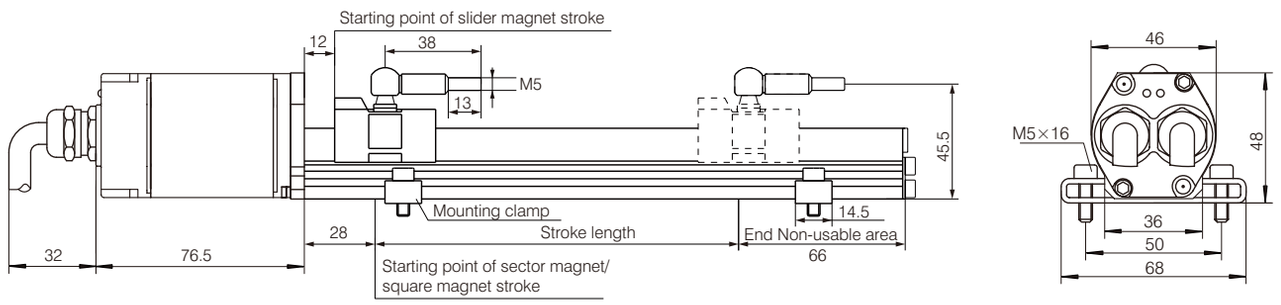
Installation Instructions - Profibus-DP Bus Output

• Dimensions and installation guidance of RP aluminum profile sensor

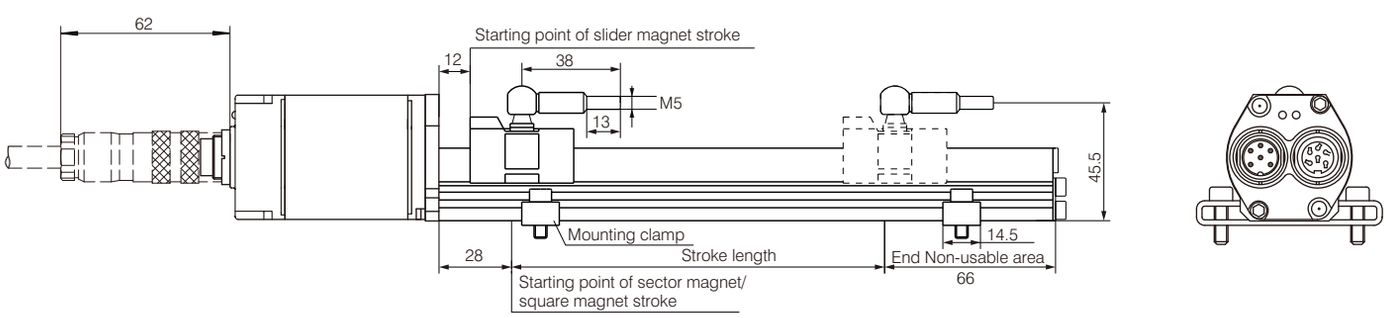
RP Series aluminum profile provides flexible and simple external installation mode, which is suitable for stroke or position detection of linear motion mechanism, and can also be used for external position detection of hydraulic cylinder.

Note: The measurement Non-usable area shown in the figure indicates that the output value of the sensor in this area is zero or unreliable. The default value of the measurement Non-usable area at the head and end is 28mm and 66mm respectively. The value of the measure - ment Non-usable area can be modified appropriately according to the customer's needs, please pointed out when ordering.

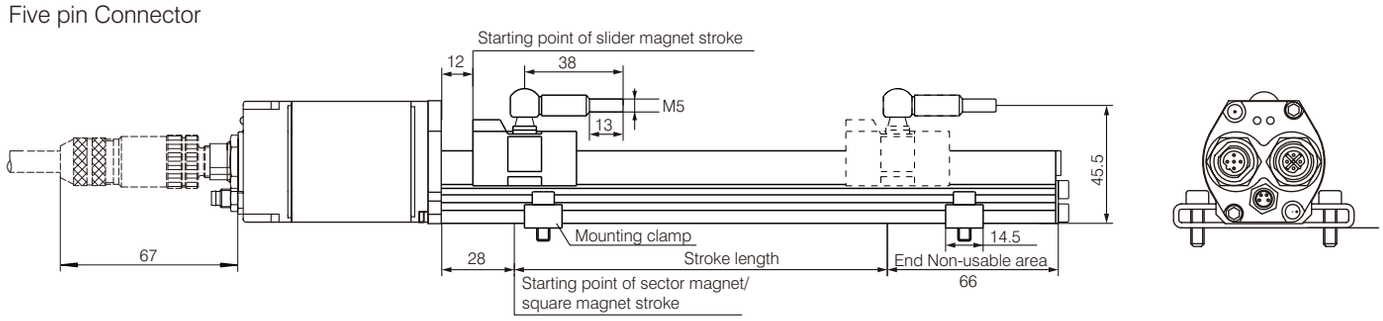
Cable outlet



Six pin Connector

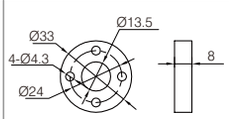
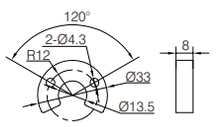
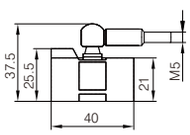


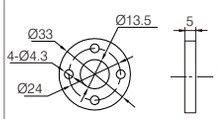
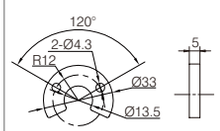
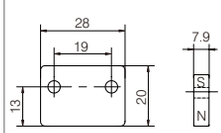
Five pin Connector

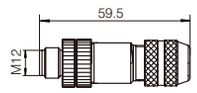
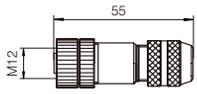
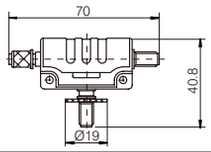


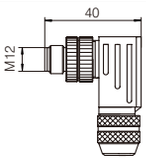
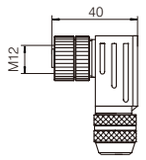
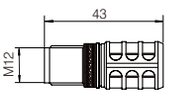
ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

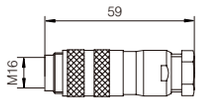
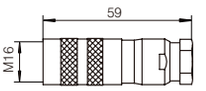
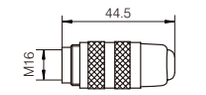
Common Accessories - Profibus-DP Bus Output

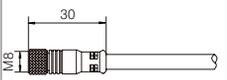
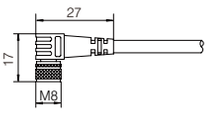
Accessory name/ model	Dimensions
Standard Magnet ring Order No.: 211501	
Sector magnet Order No.: 211502	
Slider magnet Order No.: 211503	

Accessory name/ model	Dimensions
Magnetic isolation gasket	
Sector magnetic isolation gasket	
Square magnet Order No.: 211508	

Accessory name/ model	Dimensions
5-pin connector male head（B code） Order No.: 312706	
5-pin female connector（B code） Order No.: 312707	
5-pin T-shaped male connector Order No.: 312708	

Accessory name/ model	Dimensions
5-pin 90° Connector male Order No.: 312709	
5-pin 90° female connector Order No.: 312710	
5-pin end connector Order No.: 312705	

Accessory name/ model	Dimensions
6-pin Connector male Order No.: 312714	
6-pin female connector Order No.: 312701	
6-pin end male c onnector Order No.: 312715	

Accessory name/ model	Dimensions
4-pin Female Connector（For power supply） Order No.: 522000-XX xx-cable length in m	
4-pin 90° female connector（For power supply） Order No.: 522001-XX xx-cable length in m	

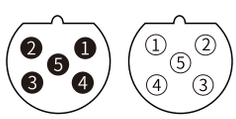
Note: Please refer to "Magnet ring Selection" for details of magnet ring kit and other models.

• Wiring mode

When the sensor is connector output, refer to the pin definition in the following table for wiring mode; when the sensor is cable outlet output, refer to the line color definition in the following table for connection mode

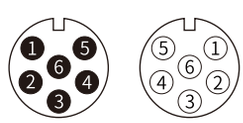
4-pin connector socket (for power supply)

• 4-pin male connector pin arrangement (facing the sensor head direction)		
Pin	Line color	Pin/wire function definition
1	Brown	+24Vdc power supply (-20%+20%)
2	White	Do not connect
3	Blue	0Vdc(power supply circuit)
4	Black	Do not connect



• 5-pin male connector, female connector pin arrangement (facing the direction of the sensor head)		
Pin	Line color	Pin/wire function definition
1	-	VP+5N(applicable to end wiring only) *
2	Green	RxD/TxD-N(Bus)
3	-	DGnd(end connection only) *
4	Red	RxD/TxD-P(Bus)
5	Shielded wire	Ground the cable shield

Note: * Only applicable to signal connection of sensor female connector



• 6-pin male connector, female connector pin arrangement (facing the direction of the sensor head)		
Pin	Line color	Pin/wire function definition
1	Green	RxD/TxD-N(bus)
2	Red	RxD/TxD-P(bus)
3	-	DGnd(for end wiring only) *
4	-	VP+5N(for end wiring only) *
5	Black	+24Vdc power supply (-20%+20%)
6	Blue	0 Vdc (power supply circuit)

Note: * Only applicable to signal connection of sensor female connector

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Selection Guide-Profibus-DP Bus Output

R	□	–	M	□	□	□	□	–	S	□	–	□	□	□	□	–	D	□	□	–	□	□
01	02		03	04	05	06	07		08	09		10	11	12	13		14	15	16		17	18

01 - 02	Sensor shell form
R H	Pressure-resistant rod (internal or external)
R P	Aluminum profile (external only)

03 - 07	Measuring range
	Four digits, less than four digits are preceded by zero, M means metric system, unitmm

08 - 09	Magnet ring type/mounting thread form	
Only for RH series	S 1	M18×1.5, measuring rod diameter 10mm, 304 material
	S 2	M20×1.5, measuring rod diameter 10mm, 304 material
	S 3	3/4"-16UNF-3A, measuring rod diameter 10mm, 304 material
Only for RP Series	C 1	Sector magnet
	C 2	Slider magnet
	C 3	Square magnet

10 - 13	Connection form
10 - 11	Cable outlet mode
D A	Single cable outlet, PUR sheath, cyan,-20～80C, end scattered
D B	Double cable outlet, PUR sheath, cyan,-20～80°C, end scattered
D C	Double cable outlet, PUR sheath, cyan, -20-～80°C, M16, 6-pin, end with a male connector and a female connector
12 - 13	Cable outlet: cable length, 01 to 99 meters
10 - 13	Connector mode
P D 5 3	One set of 5-pin male connector (M12), one set of 5-pin female connector (M12), One set of 4-pin male connectors (M8)
P D 6 3	One set of 6-pin male connectors (M16), one set of 6-pin female connectors (M16)

Note: See SSI cable accessories selection for supporting cables

14 - 16	Signal output mode
14	Profibus Protocol
15	Number of magnet rings (1～9 optional)
16	0-single magnet B-single/multiple magnet rings

17 - 18	Non-usable area at head and end, customizable
S 0	50.8mm+63.5mm
B 0	30mm+60mm
S 1	28mm+66mm（used in RP series）

- Note: The forward output of the sensor means that when the magnet ring moves away from the electronic bin, the output value increases and decreases when the magnet ring moves in the reverse direction.
- Selection example:RH-M0300-S1-PD53-D10-S0

  Indicates:The ordered product model is RH structure displacement sensor, with a measuring range of 300mm, mounting thread form of M18×1.5 (metric system), measuring rod diameter of 10mm, 304 material, 5-pin Connector connection, Profibus signal output, single magnet ring, head end Non-usable area of 50.8mm and end Non-usable area of 63.5mm.

ATOM METRIC
FINEST MEASUREMENTS, HIGHEST PRECISION

Profibus - DP Cable Accessories Selection

D	P	–	M				–			
01	02		03	04	05	06		07	08	09

01 - 02	Type
D P	Profibus-DP interface

03 - 06	Cable length
M * * *	Less than 3 digits are preceded by zeros, and M means metric system, unit m

07 - 09	Cable type、utlet mode
H 0 1	One end of 5-pin (M12) female connector, and one end scattered
H 0 2	One end of 5-pin (M12) female connector, and one end scattered
H 0 3	One end of 5-pin (M12) right angle female connector, and one end scattered
H 0 4	One end of 5-pin (M12) right angle maleconnector, and one end scattered
Z 0 5	One end of 6-pin (M16) female connector, and one end scattered
Z 0 6	One end of 6-pin (M16) female connector, and one end scattered
Z 0 7	One end of 6-pin (M16) right angle female connector, and one end scattered
H 1 2	One end of 5-pin (M12) female connector; One end of 5-pin (M12) female connector
H 3 4	One end of 5-pin (M12) right angle male connector; One end of 5-pin (M12) right angle female connector
Z 5 6	One end of 6-pin (M16) male connector and one end of 6-pin (M16) is female connector
Note	H：Cable type, PUR sheath, purple, 2 cores,-20～80℃
	Z：Cable type, PUR sheath, cyan, 5-pin,-20～80C℃

- Selection example：DP-M020-H01

  Indicates: Profibus-DP interface cable, 20 meters long, PUR sheath, purple, 2 cores,-20～80 ℃, 5-pin (M12) at one end of the cable are female connector, and the other end is scattered.

- Selection example： DP-M015-Z56

  Indicates: Profibus-DP interface cable, with a length of 15m, PUR sheath, cyan, 5 cores,-20～80 ℃, with 6-pin (M16) at one end male connector and 6-pin (M16) at the other end female connector.

ADDRESS: Unit 2/12B Exchange Dr, Pakenham VIC 3810
WEBSITE: atommetricsensors.com