Blessing of the Earth

A compass using geomagnetism will guide you across the sea even during conditions of zero visibility in dense fog or in a storm with giant waves. Similarly, Magnescale uses magnetic technology to provide precise positioning even in severely harsh environments such as oil, costant, and condensation in machine tools. Magnescale is jam-packed with state-of-the-art technologies, from precise magnetic recording and detection technology to advanced arithmetic processing technology and beyond. And, it's these cutting-edge technologies that are supporting the next generation of global manufacturing.
Advanced technology supports the evolution of high precision and resistance to harsh environments. Magnescale continues its endless evolution to develop scales with the high precision and durability demanded by machine tool applications.

Born from advanced magnetic technology, Magnescale scales utilize a magnetic based operating principle which makes them resistant to oil and condensation inherent to machine tools, thus enabling consistently stable and precise position detection.

**Principle**

**Detection principle**
A thin-film MR element with a high-precision, low-distortion pattern arrangement is used as the detecting element. The resistance value of the MR element changes when the magnetic field acting on the element changes due to an alteration in the relative positions between the element and the magnetic media. This change in resistance value is read electronically to detect the amount of positional change.

**Absolute position detection system**
Adopts the 2-track M-code system. Number of M-code bits: Up to 18 bits (Left figure: Example of 4-bit codes)

**Stability**

**Scale signal**
The raw signal is an exact sine wave

**MR element**
The MR element uses a special pattern to enable stable signal detection with high precision.
The patented detecting head pattern incorporates various technologies that help to achieve a high-precision signal, such as the following:
1) Harmonic distortion components are removed from the detected signal.
2) Stable signal output can be obtained over the entire effective length.
3) Stable signal output can be obtained with respect to temperature variation.
Resistance to Harsh Environments

Protective structure
A diamond-like carbon (DLC) film is formed on the surface of the detecting head (the surface facing the magnetic scale) as a protective film. The detecting head is securely protected against both mechanical and environmental factors by multiple layers of protective film, which includes the DLC film (the world’s first patent pending protective DLC film to be used on a MR element surface).

Impact resistance of 450 m/s²
vibration resistance of 250 m/s²
Magnescale primarily uses tough materials to protect the detector, thereby realizing high vibration and impact resistance characteristics. Furthermore, the SR67A series employs multi-point connection construction and a highly rigid case to achieve top-class vibration and impact resistance.

Thermal expansion
Magnescales have the same linear expansion coefficient as that of cast iron used for the structure of general machine tools. Therefore, the scales exhibit the same thermal behavior as the equipment in which they are installed. This is evident in maintaining extremely stable position even in environments where the temperature is constantly changing. Due to the design structure of the SR series scales, they can be installed in close contact with the equipment while still achieving high positioning accuracy despite large temperature fluctuations.

Resistance to condensation and oil
Magnescale employs a magnetic detection principle that is resistant to the effects of condensation and oil inherent to machine tools. This principle allows for the achievement of high positioning accuracy even in severe environments.

High Precision

Advanced arithmetic processing technology
Use of an arithmetic processing circuit, based on original technology, achieves a higher interpolation accuracy.
Example of multi-arithmetic processing circuit.

High resolution
High performance processing allows for resolutions down to 5µm and 1nm.²

Scale recording method
Optical scale
Master scale
Transcription
Product scale
Copy of master scale
Magnescale
Laser Interferometer
Recording
Each scale could be considered a "master scale".

²For resolution of trans/µm/um, please contact our sales department.
## Lineup

<table>
<thead>
<tr>
<th>Communication system</th>
<th>Type/model name</th>
<th>Output signal</th>
<th>Compatible controllers</th>
<th>Through hole diameter</th>
<th>Maximum resolution</th>
<th>Accuracy</th>
<th>Maximum response speed</th>
<th>Protective design grade</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear encoder</td>
<td>Slim type</td>
<td>SR27A</td>
<td>Absolute serial bidirectional signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>φ96mm</td>
<td>23 bit (8,388,608 pulse/revolution)</td>
<td>±2.5”</td>
<td>5,000 min⁻¹</td>
<td>IP65</td>
</tr>
<tr>
<td>Linear encoder</td>
<td>Robust type</td>
<td>SR67A</td>
<td>Absolute serial bidirectional signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>φ20mm, φ22mm</td>
<td>25 bit (33,554,432 pulse/revolution)</td>
<td>±2.5”</td>
<td>2,000 min⁻¹ (Maximum mechanical revolutions: 3,000 min⁻¹)</td>
<td>IP65</td>
</tr>
<tr>
<td>Linear encoder</td>
<td>Slim type</td>
<td>SR74</td>
<td>A/B/Reference point Line driver signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>-</td>
<td>50 m/min (Resolution: 0.1 μm, Minimum phase difference: ±50 ns)</td>
<td>±2.5”</td>
<td>5,000 min⁻¹</td>
<td>IP65</td>
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<tr>
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<td>Robust type</td>
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<td>A/B/Reference point Line driver signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>-</td>
<td>50 m/min (Resolution: 0.1 μm, Minimum phase difference: ±50 ns)</td>
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<td>5,000 min⁻¹</td>
<td>IP65</td>
</tr>
<tr>
<td>Angle encoder</td>
<td>Exposed type</td>
<td>RS97-1024E</td>
<td>Absolute serial bidirectional signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>φ96mm</td>
<td>23 bit (8,388,608 pulse/revolution)</td>
<td>±2.5”</td>
<td>5,000 min⁻¹</td>
<td>IP65</td>
</tr>
<tr>
<td>Angle encoder</td>
<td>Exposed type</td>
<td>RS97-1024N</td>
<td>Absolute serial bidirectional signal</td>
<td>FANUC, Mitsubishi Electric, SIEMENS</td>
<td>φ180mm</td>
<td>23 bit (8,388,608 pulse/revolution)</td>
<td>±2.5”</td>
<td>5,000 min⁻¹</td>
<td>IP65</td>
</tr>
<tr>
<td>Angle encoder</td>
<td>Enclosed type</td>
<td>RU97-2048</td>
<td>Compliant with DRIVE-CLiQ</td>
<td>SIEMENS</td>
<td>-</td>
<td>25 bit (33,554,432 pulse/revolution)</td>
<td>±2.5”</td>
<td>2,000 min⁻¹ (Maximum mechanical revolutions: 3,000 min⁻¹)</td>
<td>IP65</td>
</tr>
<tr>
<td>Angle encoder</td>
<td>Enclosed type</td>
<td>RU77-4096</td>
<td>Absolute serial bidirectional signal</td>
<td>FANUC, Mitsubishi Electric, Yaskawa Electric, SIEMENS</td>
<td>φ20mm</td>
<td>25 bit (33,554,432 pulse/revolution)</td>
<td>±2.5”</td>
<td>2,000 min⁻¹ (Maximum mechanical revolutions: 3,000 min⁻¹)</td>
<td>IP65</td>
</tr>
</tbody>
</table>

*For resolution of 1 nm (0.001 μm), please contact our sales department. *Magnescale reserves the right to change product specifications without prior notice.
Absolute linear encoder

**Slim type**

**SR27A**

- Slim type allows installation in narrow spaces
- Magnetic system enables use even in environments with condensation, oil, and other adverse conditions
- Supports the communication protocol of each supporting manufacturer
- Same thermal expansion as iron

---

**Specifications**

<table>
<thead>
<tr>
<th>Model name</th>
<th>SR27A - XXX AX</th>
<th>SR27A - XXX BX</th>
<th>SR27A - XXX CX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective length (L, mm)</td>
<td>70 - 2,040</td>
<td>70 - 2,040</td>
<td>70 - 2,040</td>
</tr>
<tr>
<td>Thermal-expansion coefficient</td>
<td>$120 \times 10^{-6} \times T \ Degree{\circ}C$</td>
<td>$120 \times 10^{-6} \times T \ Degree{\circ}C$</td>
<td>$120 \times 10^{-6} \times T \ Degree{\circ}C$</td>
</tr>
<tr>
<td>Accuracty (20°C)</td>
<td>±0.3</td>
<td>±0.3</td>
<td>±0.3</td>
</tr>
<tr>
<td>Reference point</td>
<td>Cable, or user-selected position (at factory shipping)</td>
<td>Fixed to center</td>
<td>Fixed to 10 mm from left end of effective length</td>
</tr>
<tr>
<td>Output signal</td>
<td>Absolute bi-directional signal, compliant with EIA-485</td>
<td>Absolute bi-directional signal, compliant with EIA-485</td>
<td>Absolute bi-directional signal, compliant with EIA-485</td>
</tr>
<tr>
<td>Compatible controllers</td>
<td>FANUC, Siemens Electric</td>
<td>Siemens Electric</td>
<td>Siemens Electric</td>
</tr>
<tr>
<td>Resolution</td>
<td>Selectable from 0.001*, 0.005*, 0.01, 0.05 and 0.1</td>
<td>Selectable from 0.001*, 0.005* and 0.01</td>
<td>Selectable from 0.001*, 0.005* and 0.01</td>
</tr>
<tr>
<td>Maximum response speed</td>
<td>200 m/min</td>
<td>200 m/min</td>
<td>200 m/min</td>
</tr>
</tbody>
</table>

**Functional safety**

Please consult each controller manufacturer regarding support for functional safety.

**Legal compliance**

- FCC Part 15 Subpart B Class A
- IECES-003 Class A Digital Device
- EN50118 Chapter B Value 12
- EN50118 Chapter B Value 12
- EN61496-1:2004 Cat.3
- EN 62061:2005 / IEC 61508:2010
- EN61800-5-2:2007

**Operating temperature range**

0 to +50°C

**Storage temperature range**

-20 to +55°C

**Vibration resistance**

150 m/s² (5 Hz to 3,000 Hz)

**Impact resistance**

350 m/s² (11 ms)

**Protective design grade**

IP54 (Air purge not included), IP66 (Air purge included)

**Power supply voltage range**

- DC+4.75 to ±5.25 V
- DC+17 to ±30.8 V

**Maximum power consumption**

- CH23-***NVF: 1.3W or less (5V) (when controller is connected)
- CH23-***NM: 1.3W or less (4.75V or 5.25V)
- CH23-***NMF: 1.3W or less (4.75V or 5.25V)

**Dimensions**

- Effective length
- Total length
- Mounting pitch
- Number of intermediate/interpolate

**Details of model designation**

- Scale: SR27A - x x x x x
- Number of effective length: (CH23-***NVF + CH23-***NM)
- Maximum cable length: 30 m
- Cable lead direction: can be selected either right or left

**Cables**

- CH23-***NVF: 30 m
- CH23-***NM: 30 m
- CH23-***NMF: 30 m

*Maximum cable length: 30 m*

---

*For details of model designation, please contact our sales department. *Magnetics reserves the right to change product specifications without prior notice.*

---

**Notes**

- The surface indicated by the ▲ marks is the installation surface.
- Screws indicated in the diagram are supplied as standard accessories.
- Movement outside the effective length (L) will damage the scale head. It is recommended that the mechanical movable length (stroke) be set to 10 mm or more to the inside of both ends of the effective length (L).
Absolute linear encoder
Robust type

**SR67A**

- High rigidity provides resistance to shock and vibration
- Magnetic system allows use even in environments with condensation, oil, and other adverse conditions
- Enables direct communication using the protocol of each supporting manufacturer without the requirement of an amplifier
- Same thermal expansion as iron

**Specifications**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective length (L, mm)</td>
<td>140 to 3,640</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal expansion coefficient</td>
<td>12 x 10⁻⁶/°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy at 20°C</td>
<td>(±3+2L/1,000) μm (effective length 140 to 3,040 mm) or (±5+L/1,000) μm (effective length 140 to 3,640 mm); L: Effective length (mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference point</td>
<td>Center, or user-selected position (factory setting) Fixed to center Fixed to 10 mm from left end of effective length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output signal</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485 Compliant with DRIVE-Cliq</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible controllers</td>
<td>FANUC, Mitsubishi Electric, Siemens AG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>Selectable from 0.001°, 0.005°, 0.01°, 0.05° and 0.1°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum response speed</td>
<td>200 mm/min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional safety</td>
<td>Please consult each controller manufacturer regarding support for functional safety.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal compliance</td>
<td>FCC Part15 Subpart B Class A IECES-003 Class A Digital Device EN50151 Op1 Class A, EN61000-6-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to +50°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-30 to +60°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>250 m/s² (10 Hz to 3,000 Hz) 450 m/s² (11 ms)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact resistance</td>
<td>500 m/s² (11 ms)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective design grade</td>
<td>IP54 (Air purge not included), IP65 (Air purge included)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage range</td>
<td>DC+4.75 to +5.25 V DC+17 to +30.8 V 1.75W or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum consumption current</td>
<td>7.1 (SIEMENS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>Approx. 0.9 kg + 5.2 kg/m or less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.05 A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible cables</td>
<td>Selectable from 0.08°, 0.08°, 0.1°, 0.1° and 0.1° μm (Factory set)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum cable length</td>
<td>30 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions**

- **SR67A**
  - Effective length (mm)
    - L: 140 to 1,000
      - L1: 140
      - L2: (140 - L1)
    - L: 1,001 to 3,640
      - L1: 1,000
      - L2: (L - L1)
  - Effective length (mm)
    - L: 1,001 to 3,640
      - L1: 1,000
      - L2: (L - L1)

**Legal compliance**

- FCC Part15 Subpart B Class A
- IECES-003 Class A Digital Device
- EN50151 Op1 Class A, EN61000-6-2

**Cables**

- CH2: Controller interface connector
- CH3: Optional controller interface connector
- CH4: Power supply interface connector
- CH5: Optional power supply interface connector

**Machining**

- The surface indicated by the ▲ marks is the installation surface.
- Movement outside the effective length (L) will damage the scale head. It is recommended that the mechanical movable length (stroke) be set to 10 mm or more to the inside of both ends of the effective length (L).
Incremental linear encoder

**Slim type**

- Slim type allows installation in narrow spaces
- Magnetic system allows use even in environments with condensation, oil, and other adverse conditions
- Same thermal expansion coefficient as iron

**SR74**

*Intermediate foot plate: One location when L ≤ 200 mm, two locations when L ≥ 220 mm*

14 15

### Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>SR74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective length (L, mm)</td>
<td>750-2,040</td>
</tr>
<tr>
<td>Thermal expansion coefficient</td>
<td>12×10^-6/°C</td>
</tr>
<tr>
<td>Accuracy (20°C)</td>
<td>(3+3L/1,000) µm-p or (5+5L/1,000) µm-p L: Effective length (mm)</td>
</tr>
<tr>
<td>Reference point</td>
<td>Center point, Multi point (±40 mm pitch), Signed-type (standard pitch 20 mm), User-selected point (1 mm pitch)</td>
</tr>
<tr>
<td>Output signal</td>
<td>A/B/Reference point line driver signal, compliant with EIA-422</td>
</tr>
<tr>
<td>Resolution</td>
<td>Selectable from 0.05, 0.1, 0.5, and 1 µm (Set at factory shipping)</td>
</tr>
<tr>
<td>Maximum response speed</td>
<td>50 m/min (Resolution: 0.1 µm, Minimum phase difference: at 50 ms)</td>
</tr>
<tr>
<td>Functional safety</td>
<td>—</td>
</tr>
</tbody>
</table>

### Legal compliance

- FCC Part115 Subpart B Class A
- ICES-003 Class A Digital Device
- EN55011 Class A, EN61000-8-2600 V DC or less

### Operating temperature range

-0 to +50°C

### Storage temperature range

-20 to +65°C

### Vibration resistance

150 m/s² (50 Hz to 3,000Hz)

### Impact resistance

350 m/s² (11 ms)

### Protective design grade

- IP54 (Air purge not included), IP65 (Air purge included)

### Power supply voltage range

DC+4.75 to ±6.25 V

### Maximum consumption current

1.0 W or less (4.75V or 5.25V)

### Consumption current

200 mA (5V) (when the controller is connected)

### Mass

Approx. 0.27 kg, 1.34 kg/m or less

### Standard compatible cable

CH33 ~ CH3/E

### Maximum cable length

15 m

**Notes:**

- Screws indicated in the diagram are supplied as standard accessories.
- Movement outside the effective length (L) will damage the scale head. It is recommended that the mechanical movable length (stroke) be set to 10 mm or more to the inside of both ends of the effective length (L).

### Details of model designation

#### Scale

**SR74**

- L: Effective length (mm), cm units
- L indicates the direction and position of the intermediate foot plate.
- Maximum pitch: 0.25 mm
- Effective length (mm)

#### Cable

**CH33**

- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 20)
- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 10)
- [ ](Mounting screw M4 x 10)

#### Dimensions (cable left-loud direction)

<table>
<thead>
<tr>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>N</th>
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<tbody>
<tr>
<td>70</td>
<td>208</td>
<td>185</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0</td>
</tr>
<tr>
<td>120</td>
<td>258</td>
<td>235</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0</td>
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<td>170</td>
<td>308</td>
<td>285</td>
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<td>220</td>
<td>358</td>
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<td>–</td>
<td>–</td>
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<tr>
<td>270</td>
<td>408</td>
<td>385</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0</td>
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<tr>
<td>320</td>
<td>458</td>
<td>435</td>
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<td>–</td>
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<tr>
<td>370</td>
<td>508</td>
<td>485</td>
<td>–</td>
<td>–</td>
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<td>0</td>
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<td>420</td>
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<tr>
<td>470</td>
<td>608</td>
<td>585</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0</td>
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<td>520</td>
<td>658</td>
<td>635</td>
<td>–</td>
<td>–</td>
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<td>570</td>
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<td>720</td>
<td>858</td>
<td>835</td>
<td>417.5</td>
<td>–</td>
<td>–</td>
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</tbody>
</table>

**Unit:** mm

### Machine guide

- Intermediate foot plate: One location when L ≤ 200 mm, two locations when L ≥ 220 mm

### Notes:

- The surfaces indicated by the ▲ marks are the installation surface.  
- Screws indicated in the diagram are supplied as standard accessories.  
- Movement outside the effective length (L) will damage the scale head. It is recommended that the mechanical movable length (stroke) be set to 10 mm or more to the inside of both ends of the effective length (L).
Incremental linear encoder

Robust type

SR84

- High rigidity provides resistance to shock and vibration
- Magnetic system allows use even in environments with condensation, oil, and other adverse conditions
- Same thermal expansion as iron

Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>SR84</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective length (L)</td>
<td>140-3,040</td>
</tr>
<tr>
<td>Thermal expansion coefficient</td>
<td>12μ x 10⁻⁶/°C</td>
</tr>
<tr>
<td>Accuracy (at 20°C)</td>
<td>(3±5L/1,000) μm-p or (5±5L/1,000) μm-p</td>
</tr>
<tr>
<td>Reference point</td>
<td>None, Center point, Multi point, Signed-type, User-selected point (1 mm pitch)</td>
</tr>
<tr>
<td>Output signal</td>
<td>A/B/Reference point line driver signal, compliant with EIA-422</td>
</tr>
<tr>
<td>Resolution</td>
<td>Selectable from 0.05, 0.1, 0.5, and 1 μm (flat at factory shipping)</td>
</tr>
<tr>
<td>Maximum response speed</td>
<td>50m/min (Resolution: 0.1 μm, Minimum phase difference: at 50 ns)</td>
</tr>
</tbody>
</table>

Dimensions (cable left-out direction)

- Dimensions are in millimeters.
- Effective length (L) and L2 are critical for installation and operation. L1 is the total length and L is the effective length.
- The model designation (SR84) is specified in the diagram.

Notes:
- The surface indicated by the ▲ mark is the installation surface.
- Screws indicated in the diagram are supplied as standard accessories.
- Movement outside the effective length (L) will damage the scale head. It is recommended that the mechanical movable length (stroke) be set to 10 mm or more to the inside of both ends of the effective length (L).

Functional safety

- Legal compliance:
  - FCC Part15 Subpart B Class A
  - CE-EN55011 Group 1 Class A
  - EN61000-6-2 Safety standards not applicable (60 V DC or less)

Details of model designation

- The scale and cable are designated separately.
- The scale and cable are designated as a whole.
- The model designation is shown in the diagram.
Absolute angle encoder
Exposed type
RS97-1024E

- Enables direct communication using the protocol of each supporting manufacturer without the requirement of an amplifier
- Magnetic system allows use even in environments with condensation, oil, and other adverse conditions
- 96mm diameter through-hole allows for design and mounting flexibility
- Dual head configuration reduces the effect of axial runout

Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>RS97-1024EGA</th>
<th>RS97-1024EGD</th>
<th>RS97-1024EGZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output wave number</td>
<td>1,024 waves/revolution</td>
<td>1,024 waves/revolution</td>
<td>1,024 waves/revolution</td>
</tr>
<tr>
<td>Through hole diameter</td>
<td>96 mm</td>
<td>96 mm</td>
<td>96 mm</td>
</tr>
<tr>
<td>Accuracy(±20°C)</td>
<td>±2.5°</td>
<td>±2.5°</td>
<td>±2.5°</td>
</tr>
<tr>
<td>Output signal</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485/VDR-CLIQ</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485/VDR-CLIQ</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485/VDR-CLIQ</td>
</tr>
<tr>
<td>Compatible controllers</td>
<td>FANUC</td>
<td>Mitsubishi Electric</td>
<td>SIEMENS AG</td>
</tr>
<tr>
<td>Resolution</td>
<td>23 bits (8,388,608 pulses/revolution)</td>
<td>23 bits (8,388,608 pulses/revolution)</td>
<td>23 bits (8,388,608 pulses/revolution)</td>
</tr>
<tr>
<td>Maximum response revolutions</td>
<td>5,000 min</td>
<td>5,000 min</td>
<td>5,000 min</td>
</tr>
<tr>
<td>Functional safety</td>
<td>Please consult with each controller manufacturer regarding support for functional safety.</td>
<td>Please consult with each controller manufacturer regarding support for functional safety.</td>
<td>Please consult with each controller manufacturer regarding support for functional safety.</td>
</tr>
<tr>
<td>Legal compliance</td>
<td>FCC Part15 Subpart B Class A</td>
<td>EN55011 Group 1 Class A</td>
<td>EN61800-5-2:2007</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to +60°C</td>
<td>0 to +60°C</td>
<td>0 to +60°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-10 to +60°C</td>
<td>-10 to +60°C</td>
<td>-10 to +60°C</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>150 m/s² (50 Hz to 2,000 Hz)</td>
<td>150 m/s² (50 Hz to 2,000 Hz)</td>
<td>150 m/s² (50 Hz to 2,000 Hz)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>1,000 m/s² (11 ms)</td>
<td>1,000 m/s² (11 ms)</td>
<td>1,000 m/s² (11 ms)</td>
</tr>
<tr>
<td>Protective design grade</td>
<td>IP55</td>
<td>IP55</td>
<td>IP55</td>
</tr>
<tr>
<td>Power supply voltage range</td>
<td>DC+4.75 to +5.25 V</td>
<td>DC+17 to +30.8 V</td>
<td>DC+17 to +30.8 V</td>
</tr>
<tr>
<td>Maximum consumption current</td>
<td>2.9W or less (5.25V)</td>
<td>1.3W or less (5.25V)</td>
<td>1.3W or less (5.25V)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Width: 96 mm</td>
<td>Width: 96 mm</td>
<td>Width: 96 mm</td>
</tr>
<tr>
<td>Mass</td>
<td>Approx. 2 kg (motor: 0.2 kg, stator: 1.7 kg)</td>
<td>Approx. 2 kg (motor: 0.2 kg, stator: 1.7 kg)</td>
<td>Approx. 2 kg (motor: 0.2 kg, stator: 1.7 kg)</td>
</tr>
<tr>
<td>Moment of inertia</td>
<td>9x10⁻⁴ kg·m²</td>
<td>9x10⁻⁴ kg·m²</td>
<td>9x10⁻⁴ kg·m²</td>
</tr>
<tr>
<td>Compatible cables</td>
<td>CH23-***NPFFA + CH23-***NPMA + CH23-***NFSP + CH23-***NSFY</td>
<td>CH23-***NPFFA + CH23-***NPMA + CH23-***NFSP + CH23-***NSFY</td>
<td>CH23-***NPFFA + CH23-***NPMA + CH23-***NFSP + CH23-***NSFY</td>
</tr>
<tr>
<td>Maximum cable length</td>
<td>30 m</td>
<td>30 m</td>
<td>30 m</td>
</tr>
</tbody>
</table>

Details of model designation

Scale

Cables

Dimensions:

- Rotor inner diameter: 96 mm
- Cable width: 2.4mm
- Rotor length: 74.5mm
- Rotor width: 6.6mm
- Rotor thickness: 5.6mm
- Rotor material: copper
- Rotor color: silver
- Rotor connection: M8

Components:

- Motor
- Rotor
- Stator
 Absolute angle encoder
 Exposed type
 RS97-1024N

- Enables direct communication using the protocol of each supporting manufacturer without the requirement of an amplifier
- Magnetic system enables use even in environments with condensation, oil, and other adverse conditions
- 180mm diameter through-hole allows for design and mounting flexibility
- Dual head configuration reduces the effect of axial runout

Specifications

- **Model name**: RS97-1024NGA, RS97-1024NGD, RS97-1024NGZ
- **Output wave number**: 1,024 waves/revolution
- **Through hole diameter**: 9.180 mm
- **Accuracy(at 20°C)**: ±2.5°
- **Output signal**: Absolute serial bidirectional signal, compliant with EIA-485
- **Compliant with controllers**: FANUC, Mitsubishi Electric, SIEMENS AG
- **Resolution**: 23 bits (8,388,608 pulses/revolution)
- **Maximum response revolutions**: 5,000 m³/min
- **Functional Safety**: Please consult each controller manufacturer regarding support for functional safety
- **Legal compliance**: FCC Part15 Subpart B Class A, EN55011 Gp1 Class A, EN61000-6-2
- **Operational temperature range**: 0 to +60°C
- **Storage temperature range**: -10 to +60°C
- **Vibration resistance**: 150 m/s² (50 Hz to 2,000 Hz)
- **Impact resistance**: 1,000 m/s² (11 ms)
- **Power supply voltage range**: DC+4.75 to +5.25 V
- **Maximum consumption current**: 3.2W or less (30.8V)
- **Maximum cable length**: 30 m

Details of model designation

- **Scale**: RS97-1024N
- **Communication protocol**: 12 bits
- **Communication protocol**: 12 bits
- **Communication protocol**: 12 bits

Dimensions

- **Exposed type**: RS97-1024N
- **Dimensions**: 23 bits (8,388,608 pulses/revolution)
- **Resolution**: 23 bits (8,388,608 pulses/revolution)
- **Maximum response revolutions**: 5,000 m³/min
- **Functional Safety**: Please consult each controller manufacturer regarding support for functional safety
- **Legal compliance**: FCC Part15 Subpart B Class A, EN55011 Gp1 Class A, EN61000-6-2
- **Operational temperature range**: 0 to +60°C
- **Storage temperature range**: -10 to +60°C
- **Vibration resistance**: 150 m/s² (50 Hz to 2,000 Hz)
- **Impact resistance**: 1,000 m/s² (11 ms)
- **Power supply voltage range**: DC+4.75 to +5.25 V
- **Maximum consumption current**: 3.2W or less (30.8V)
- **Maximum cable length**: 30 m

FANUC | Mitsubishi Electric | SIEMENS
**Specifications**

- **Model name**: RU97-2048AJZ
- **Output wave number**: 2,048 waves/revolution
- **Accuracy (at 20°C)**: ±2.5°
- **Output signal**: Compliant with DRIVE-CLiQ, single turn absolute type
- **Resolution**: 25 bit (33,554,432 pulses/revolution)
- **Maximum response revolutions**: 3,000 min⁻¹
- **Maximum mechanical revolutions**: 3,000 min⁻¹
- **Functional safety**: EN ISO13849-1:2008 Cat.3
- **Legal compliance**: FCC Part15 Subpart B Class A
  - **ICES-003 Class A Digital Device**
  - **EN55011 Gp1 Class A, EN61000-6-2
- **Dimensions**:
  - **Power supply voltage range**: DC+17 to +30.8 V
  - **Maximum consumption current**: 65 mA (24 V) (when the controller is connected)
  - **Moment of inertia**: 9.4×10⁻⁵ kgm² or less
  - **Mass**: 0.08 Nm or less
  - **Approx. 1.2kg or less
- **Compatible cables**: CH22-***NSFY
- **Maximum cable length**: 30 m
- **Compatible cables (types with relay connectors)**: CH22-***NSFF
- **Maximum cable length**: 30 m

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

**Absolute angle encoder**

**Enclosed type**

**RU97-2048**

- Enables direct communication using the SIEMENS DRIVE-CLiQ protocol without the requirement of an amplifier
- Magnetic system enables use even in environments with condensation, oil, and other adverse conditions
- Internal coupling allows for design and mounting flexibility

**Details of model designation**

- **Scale**: RU97-2048
- **Resolution**: 25 bit

**Cables**

- **CH22-***NSFF / CH22-***NSFY**

**Operational**

- **Operating temperature range**: 0 to +60°C
- **Storage temperature range**: -10 to +60°C
- **Vibration resistance**: 150 m/s² (50 Hz to 2,000 Hz)
- **Impact resistance**: 1,000 m/s² (11 ms)
- **Protective design grade**: IP65

**Power**

- **Power supply voltage range**: DC+17 to +30.8 V
- **Maximum consumption current**: 65 mA (24 V) (when the controller is connected)
- **Moment of inertia**: 9.4×10⁻⁵ kgm² or less
- **Mass**: Approx. 1.2kg or less

**Scale**

- RU97-2048AJZ

**Reference mark**

- This is the position at which the absolute position is zero.

**Dimensions**

- **Air purge hole M5**
- **M3 depth 5**
- **Installation Dimensions**
  - Installation cut 25milen to the customer
  - (25milen to the customer)
- **Unit: mm**

**Legal**

- **Made by Phoenix Contact**

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*Specifications are subject to change without notice.*
Absolute angle encoder

**Enclosed type RU77-4096**

- Magnetic system enables use even in environments with condensation, oil, and other adverse conditions
- Enables direct communication using the protocol of each supporting manufacturer without the requirement of an amplifier
- Internal coupling allows for design and mounting flexibility

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>RU77-4096A:B</th>
<th>RU77-4096A:D</th>
<th>RU77-4096A:F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model name</strong></td>
<td>RU77-4096A</td>
<td>RU77-4096B</td>
<td>RU77-4096F</td>
</tr>
<tr>
<td><strong>Output wave number</strong></td>
<td>4,096 waves/revolution</td>
<td>4,096 waves/revolution</td>
<td>4,096 waves/revolution</td>
</tr>
<tr>
<td><strong>Through hole diameter</strong></td>
<td>φ20 mm</td>
<td>φ20 mm</td>
<td>φ20 mm</td>
</tr>
<tr>
<td><strong>Accuracy (at 20℃)</strong></td>
<td>±2.5°</td>
<td>±2.5°</td>
<td>±2.5°</td>
</tr>
<tr>
<td><strong>Output signal</strong></td>
<td>Absolute serial bidirectional signal, compliant with EIA-485</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485</td>
<td>Absolute serial bidirectional signal, compliant with EIA-485</td>
</tr>
<tr>
<td><strong>Compatible controllers</strong></td>
<td>FANUC</td>
<td>Mitsubishi Electric</td>
<td>Yaskawa Electric</td>
</tr>
<tr>
<td><strong>Maximum resolution</strong></td>
<td>2,000 bit (33,554,432 pulse/revolution)</td>
<td>2,000 bit (33,554,432 pulse/revolution)</td>
<td>2,000 bit (33,554,432 pulse/revolution)</td>
</tr>
<tr>
<td><strong>Maximum mechanical revolutions</strong></td>
<td>3,000 min⁻¹</td>
<td>3,000 min⁻¹</td>
<td>3,000 min⁻¹</td>
</tr>
<tr>
<td><strong>Functional safety</strong></td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Legal compliance</strong></td>
<td>FCC Part15 Subpart B Class A and ICES-003 Class A Digital Device</td>
<td>FCC Part15 Subpart B Class A and ICES-003 Class A Digital Device</td>
<td>FCC Part15 Subpart B Class A and ICES-003 Class A Digital Device</td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>0 to +60℃</td>
<td>0 to +60℃</td>
<td>0 to +60℃</td>
</tr>
<tr>
<td><strong>Storage temperature range</strong></td>
<td>-10 to +60℃</td>
<td>-10 to +60℃</td>
<td>-10 to +60℃</td>
</tr>
<tr>
<td><strong>Vibration resistance</strong></td>
<td>150 m/s² (50 Hz to 2000 Hz)</td>
<td>150 m/s² (50 Hz to 2000 Hz)</td>
<td>150 m/s² (50 Hz to 2000 Hz)</td>
</tr>
<tr>
<td><strong>Impact resistance</strong></td>
<td>1,000 m/s² (11 ms)</td>
<td>1,000 m/s² (11 ms)</td>
<td>1,000 m/s² (11 ms)</td>
</tr>
<tr>
<td><strong>Power supply voltage range</strong></td>
<td>DC4.75-5.25 V (with connecting terminal)</td>
<td>DC4.75-5.25 V (with connecting terminal)</td>
<td>DC4.75-5.25 V (with connecting terminal)</td>
</tr>
<tr>
<td><strong>Consumption current</strong></td>
<td>200mA</td>
<td>200mA</td>
<td>200mA</td>
</tr>
<tr>
<td><strong>Moment of inertia</strong></td>
<td>200 mNm or less</td>
<td>200 mNm or less</td>
<td>200 mNm or less</td>
</tr>
<tr>
<td><strong>Standard compatible cable</strong></td>
<td>CE28-***</td>
<td>CE28-***</td>
<td>CE28-***</td>
</tr>
<tr>
<td><strong>Maximum cable length</strong></td>
<td>15 m</td>
<td>15 m</td>
<td>15 m</td>
</tr>
</tbody>
</table>

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

**Dimensions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable length</strong></td>
<td>1000 m⁺⁻⁻⁵</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Installation Dimensions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>4-M3 depth 5</strong></td>
<td>4-M3 depth 7</td>
</tr>
<tr>
<td><strong>4-g3 ±0.1 depth 7</strong></td>
<td>4-Mounting-hole for A4M (when installing from top)</td>
</tr>
<tr>
<td><strong>When scale axis rotates clockwise, addition is performed.</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Scale Details**

- **Scale**: RU77-4096A
- **Cable length**: 1000 m
- **Dimensions**: 4-M3 depth 5, 4-g3 ±0.1 depth 7
- **Installation**: 4-M3 (when installing from top)
- **Reference mark**: This is the position at which the absolute position is zero.
- **Magnetic system enables use even in environments with condensation, oil, and other adverse conditions**

**Legal compliance**

- **FCC Part15 Subpart B Class A and ICES-003 Class A Digital Device**
- **Safety standards not applicable (60 V DC or less)**
- **EN55011 Gp 1 Class A**
- **EN 61000-6-2**
- **FANUC Mitsubishi Electric Yaskawa Electric**

**Power supply**

- **Operating temperature range**: 0 to +60℃
- **Storage temperature range**: -10 to +60℃
- **Vibration resistance**: 150 m/s² (50 Hz to 2000 Hz)
- **Impact resistance**: 1,000 m/s² (11 ms)
- **Power supply voltage range**: DC4.75-5.25 V (with connecting terminal)
- **Consumption current**: 200mA (at 120G termination)
- **Moment of inertia**: 9.4×10⁻⁵ kgm² or less
- **Standard compatible cable**: CE28-***
- **Maximum cable length**: 15 m

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

Absolute linear encoder

<table>
<thead>
<tr>
<th>Type</th>
<th>Mitsubishi Electric</th>
<th>Panasonic</th>
<th>Yaskawa Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR77</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective length:</strong></td>
<td>70,120,170,200,270,320,370,420,470,520,570,620,720,770,820,920,1020,1140,1240,1340,1440,1540,1640,1740,1840,2040 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution:</strong></td>
<td>(3+3L/1,000) μm-p</td>
<td>L:mm</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
<td>(3+3L/1,000) μm-p</td>
<td>1:mm</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum response speed:</strong></td>
<td>200/mi/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective design grade:</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cable
- Effective length: up to 20m
- Cable length: Written by flush right, indication in “m” units, up to 14 m, 1 m pitch
- Note: 15 m or less including RU74 main unit head cable length

Absolute linear encoder robust type

<table>
<thead>
<tr>
<th>Type</th>
<th>Mitsubishi Electric</th>
<th>Panasonic</th>
<th>Yaskawa Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR87</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective length:</strong></td>
<td>140,240,340,440,540,640,740,840,940,1040,1140,1240,1340,1440,1540,1640,1740,1840,2040,2240,2440,2640,2840,3040,3240 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution:</strong></td>
<td>(3+3L/1,000) μm-p</td>
<td>1:mm</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
<td>(3+3L/1,000) μm-p</td>
<td>1:mm</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum response speed:</strong></td>
<td>200/mi/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective design grade:</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cable
- Effective length: up to 20m
- Cable length: Written by flush right, indication in “m” units, up to 14 m, 1 m pitch
- Note: 15 m or less including RU74 main unit head cable length

Incremental linear encoder

<table>
<thead>
<tr>
<th>Type</th>
<th>Mitsubishi Electric</th>
<th>Panasonic</th>
<th>Yaskawa Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SR75</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effective length:</strong></td>
<td>70,120,170,200,270,320,370,420,470,520,570,620,720,770,820,920,1020,1140,1240,1340,1440,1540,1640,1740,1840,2040 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution and direction:</strong></td>
<td>FANUC, Mitsubishi Electric, Panasonic</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
<td>(5+5L/1,000) μm-p</td>
<td>L:mm</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum response speed:</strong></td>
<td>200/mi/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective design grade:</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cable
- Effective length: up to 20m
- Cable length: Written by flush right, indication in “m” units, up to 14 m, 1 m pitch
- Note: 15 m or less including RU74 main unit head cable length

Incremental angle encoder

<table>
<thead>
<tr>
<th>Type</th>
<th>Mitsubishi Electric</th>
<th>Panasonic</th>
<th>Yaskawa Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RU74</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hollow diameter:</strong></td>
<td>ø20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resolution:</strong></td>
<td>Approx.1/1,000”</td>
<td>Approx.1/10,000”</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
<td>±0.5°</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum response revolution:</strong></td>
<td>As the table on the right</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protective design grade:</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cable
- Effective length: up to 20m
- Cable length: Written by flush right, indication in “m” units, up to 14 m, 1 m pitch
- Note: 15 m or less including RU74 main unit head cable length
# List of Adapter Cables

<table>
<thead>
<tr>
<th>Scale</th>
<th>Connector side</th>
<th>Controller side</th>
<th>List of Adapter Cables</th>
<th>Scale side Connector</th>
<th>Maximum cable length</th>
<th>Cable bending radius</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SR27A, SR67A

<table>
<thead>
<tr>
<th>General appearance</th>
<th>Connector side</th>
<th>Controller side</th>
<th>List of Adapter Cables</th>
<th>Scale side Connector</th>
<th>Maximum cable length</th>
<th>Cable bending radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-end</td>
<td></td>
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## RU97

<table>
<thead>
<tr>
<th>General appearance</th>
<th>Connector side</th>
<th>Controller side</th>
<th>List of Adapter Cables</th>
<th>Scale side Connector</th>
<th>Maximum cable length</th>
<th>Cable bending radius</th>
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## SR74, SR84

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## Cables

### CH22

- **Cable length:** 30 m
- **Cable type:** 100% copper, stranded wire, 24 AWG
- **Application:** General purpose, control, interconnection

### CH23

- **Cable length:** 30 m
- **Cable type:** 100% copper, stranded wire, 24 AWG
- **Application:** General purpose, control, interconnection

### CE28

- **Cable length:** 30 m
- **Cable type:** 100% copper, stranded wire, 24 AWG
- **Application:** General purpose, control, interconnection

### CH33

- **Cable length:** 30 m
- **Cable type:** 100% copper, stranded wire, 24 AWG
- **Application:** General purpose, control, interconnection

### Notes

- **Cable length:** Measured in meters (m), unless otherwise specified.
- **Cable type:** 100% copper, stranded wire, 24 AWG, unless otherwise specified.
- **Application:** General purpose, control, interconnection.
Technology

Air purging

If scale is used in a dusty or misty environment, it is recommended that air is introduced into the scale to alleviate any unwanted effects. Attach air nipples to MS holes for air introduction that are provided at both ends of the scale to supply air into the scale. When introducing air into the scale, supply air via an air filter (nominal filtration rating: 5 μm), mist separator (nominal filtration rating: 0.3 μm), and a regulator to remove dust, dirt, and mist. As a guide, the amount of air supplied to the scale is 10-20 l/min.

Safety

No compromise for high-accuracy products

The total quality control system that operates throughout the entire design and production process ensures products with enhanced safety, high quality, and high reliability that match our customers’ requirements. The company is certified for weight calibration in compliance with the traceability system required by the “Weights and Measures Act,” and has been granted ISO 9001 certification, which is the international standard for quality assurance.

Our products comply with CE Marking requirements, have acquired UL certifications and meet other regulations, ensuring safe use the world over.

We have met:
• EMC Directives(CE) EM1 EN 55011 Group 1 Class A / 91 EMS: EN 61000-6-2
• FCC regulation FCC Part 15 Subpart B Class A

for Products with built-in AC power supply:
• UL61010-1 • EN61010-1
• DHHS (21CFR1040.10) • IEC60825-1

*When using our devices with machinery to which the European Machinery Directive applies, please make sure that the devices when installed on the machines fulfill the applicable requirements of the Directive.
* Standards or regulations to be complied with may vary by product.

Traceability

Traceability Flow Chart (Length)

National Primary Standards
National Institute of Advanced Industrial Science and Technology (AIST)

Optical comb
International Committee for Weights and Measures (CIPM)
International Bureau of Weights and Measures (BIPM)

Magnescale Corporation

National Secondary Standards
Iodine saturation absorption stabilized He-Ne laser at 633nm

Manufacturing Reference Standard
Stabilized He-Ne Laser (633nm)

Models that have acquired certification
• Angle encoders RS97-1024EGZ series
• Angle encoders RS97-1024NGZ series
• U997-2048 Z series
• Linear encoders SR27A-AZ series
• SR67A-AZ series

* Consult our sales representative for details.

Functional Safety

Recently, great importance has been placed on human safety around industrial machines and machine tools. In 2010, the European Machinery Directive mandated compliance with functional safety for electrical equipment used in the safety systems of machines subject to the Machinery Directory. These safety demands are anticipated to spread across many additional regions and industries in the future. Magnescale leads the competition with its lineup of feedback scale that have acquired third-party functional safety certification in order to meet global demands for safety.

EN ISO13849-1 Cat. 3 / Pl d
EN61800-5-2

Certification standards

Models that have acquired certification

* Consult our sales representative for details.