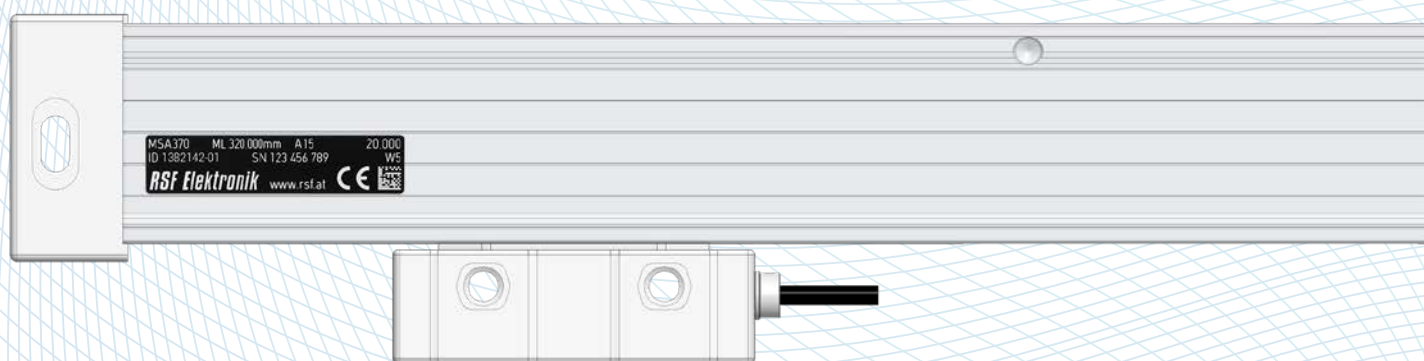




# ***RSF Elektronik***

[www.rsf.at](http://www.rsf.at)

## **MSA 370 SEALED LINEAR ENCODERS WITH LARGE CROSS-SECTION**



MSA370 ML 320 000mm A15 20.000  
ID 1382142-01 SN 123 456 789 W5  
**RSF Elektronik** [www.rsf.at](http://www.rsf.at)

# MSA 370 - TECHNICAL DATA

## READING HEAD AE MSA 370

| Model                            | MSA 370<br>1V <sub>pp</sub>                                                                                                                                                         | MSA 370<br>1V <sub>pp</sub>         | MSA 370<br>~11µA <sub>pp</sub>      | MSA 370<br>TTLx1 | MSA 370<br>TTLx1 | MSA 370<br>TTLx5 | MSA 370<br>TTLx5 | MSA 370<br>TTLx10 | MSA 370<br>TTLx10 | MSA 370<br>TTLx25 |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|
| Interface                        | ~ 1 V <sub>pp</sub>                                                                                                                                                                 | ~ 1 V <sub>pp</sub>                 | ~ 11 µA <sub>pp</sub>               | TTLx1            | TTLx1            | TTLx5            | TTLx5            | TTLx10            | TTLx10            | TTLx25            |
| Measuring step                   | Depending on external interpolation                                                                                                                                                 | Depending on external interpolation | Depending on external interpolation | 10 µm            | 5 µm             | 2 µm             | 1 µm             | 0.5 µm            | 0.25 µm           | 0.1 µm            |
| Signal period                    | 20 µm                                                                                                                                                                               | 10 µm                               | 20 µm                               | 40 µm            | 20 µm            | 40 µm            | 20 µm            | 20 µm             | 10 µm             | 10 µm             |
| Integrated interpolation         | --                                                                                                                                                                                  | --                                  | --                                  | Times 1          | Times 1          | Times 5          | Times 5          | Times 10          | Times 10          | Times 25          |
| Max. traversing speed            | 1 m/s                                                                                                                                                                               | 1 m/s                               | 1 m/s                               | 1 m/s            | 1 m/s            | 1 m/s            | 1 m/s            | 1 m/s             | 1 m/s             | 0.96 m/s          |
| Max. output frequency            | 100 kHz                                                                                                                                                                             | 100 kHz                             | 100 kHz                             | --               | --               | --               | --               | --                | --                | --                |
| Edge separation a <sub>min</sub> | --                                                                                                                                                                                  | --                                  | --                                  | 6.6 µs           | 3.3 µs           | 0.8 µs           | 0.8 µs           | 0.3 µs            | 0.3 µs            | 0.2 µs            |
| Electrical connection            | Cable: 3 m with D-sub connector 15-pin (TTL, 1 V <sub>pp</sub> ) or M23 connector 9-pin (11 µA <sub>pp</sub> )                                                                      |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Voltage supply                   | <ul style="list-style-type: none"> <li>1 V<sub>pp</sub>: +5 V ±10 %</li> <li>~11,5 µA<sub>pp</sub>: +5 V ±5 %</li> <li>TTL: +5 V ±5 %</li> </ul>                                    |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Power consumption max.           | <ul style="list-style-type: none"> <li>1 V<sub>pp</sub>: 825 mW (without load)</li> <li>~11,5 µA<sub>pp</sub>: 660 mW (without load)</li> <li>TTL: 825 mW (without load)</li> </ul> |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Current consumption max.         | <ul style="list-style-type: none"> <li>1 V<sub>pp</sub>: 150 mA (without load)</li> <li>~11,5 µA<sub>pp</sub>: 120 mA (without load)</li> <li>TTL: 150 mA (without load)</li> </ul> |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Vibration 40 Hz – 2000 Hz        | 150 m/s <sup>2</sup>                                                                                                                                                                |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Shock 8 ms                       | 3000 m/s <sup>2</sup>                                                                                                                                                               |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Operating temperature            | 0 °C to 50 °C                                                                                                                                                                       |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Storage temperature              | -20 °C to 70 °C                                                                                                                                                                     |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |
| Mass                             | <ul style="list-style-type: none"> <li>Reading head: 245 g (without cable)</li> <li>Cable: 30 g/m, D-sub connector: 28 g, M23 connector: 75 g</li> </ul>                            |                                     |                                     |                  |                  |                  |                  |                   |                   |                   |

## SCALE UNIT

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model                                 | MSA 370                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Mounting version                      | Fixed end blocks left and right                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Standard measuring lengths (ML): [mm] | 70, 120, 170, 220, 270, 320, 370, 420, 470, 520, 620, 720, 820, 920, 1040, 1140, 1240, 1340, 1440, 1540, 1640, 1740, 1840, 2040, 2240                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Graduation carrier                    | Glass scale (α <sub>therm</sub> ≈ 8.5 x 10 <sup>-6</sup> K <sup>-1</sup> ), grating period: 40, µm, 20 µm, 10 µm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Accuracy grades (at 20 °C)            | Dependent on interface and grating period <ul style="list-style-type: none"> <li>±5 µm/m</li> <li>±10 µm/m</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Location of the reference mark (RI):  | <ul style="list-style-type: none"> <li>Distance-coded reference marks (K): After travelling max. 20 mm the absolute position is available</li> <li>One reference mark in the middle of measuring length               <ul style="list-style-type: none"> <li>Up to measuring length 920 mm, 35 mm from both ends of measuring length</li> <li>From measuring length 1040 mm, 45 mm from both ends of measuring length</li> </ul> </li> <li>Optional:               <ul style="list-style-type: none"> <li>One reference mark at any location</li> <li>Additional reference marks can be selected by distances of n x 50 mm</li> </ul> </li> </ul> |
| Required moving force                 | <ul style="list-style-type: none"> <li>With standard sealing lips: &lt; 3.0 N</li> <li>With low drag sealing lips: &lt; 0.2 N</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Protection EN 60529                   | IP 53 (with standard sealing lips)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Mass                                  | Scale spar (approx.): 3 kg/m (ML)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

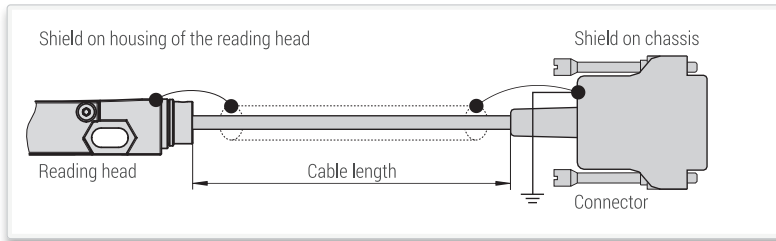
## CONFORMITIES AND CERTIFICATIONS

|                        |                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| CE                     | <ul style="list-style-type: none"> <li>RoHS: 2011/65/EU, 2015/863/EU</li> <li>EMV: 2014/30/EU</li> </ul>              |
| UKCA                   | <ul style="list-style-type: none"> <li>SI 2012/3032 RoHS Regulations</li> <li>SI 2016/1091 EMC Regulations</li> </ul> |
| Product-Certifications | UL, CSA, EN, IEC 61010-1                                                                                              |



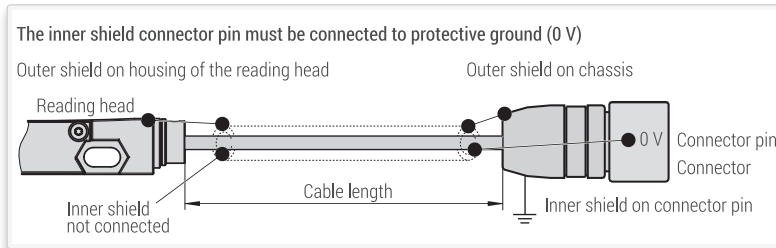
## SHIELDING

SIGNALS: TTL, 1 V<sub>pp</sub>



| Cable    | Material                            | Cycles                                              | Bending radius |
|----------|-------------------------------------|-----------------------------------------------------|----------------|
| Ø 4.3 mm | Shielded PUR cable                  | Drag chain:<br>> 5.000.000<br>Torsion:<br>> 300.000 |                |
| Ø 7.3 mm | Shielded PUR cable with metal armor |                                                     |                |

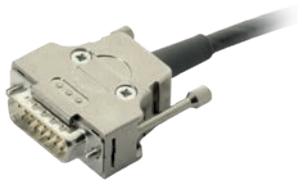
SIGNALS: 11 µA<sub>pp</sub>



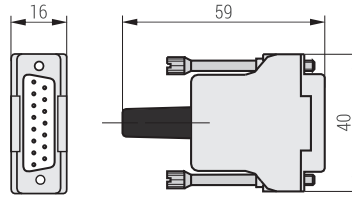
| Cable    | Material                            | Cycles | Bending radius |
|----------|-------------------------------------|--------|----------------|
| Ø 4.4 mm | Double-shielded high flexible cable |        |                |

## MALE CONNECTORS, PIN ASSIGNMENTS

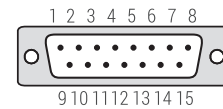
D-sub connector, 15-pin



Dimensions (male, 15-pin, mass: 28 g)



Pin assignment (View on pins)



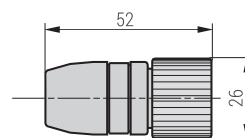
| Pin                                          | 1        | 2          | 3        | 4   | 5   | 6   | 7         | 8  | 9   | 10 | 11 | 12  | 13  | 14  | 15 |
|----------------------------------------------|----------|------------|----------|-----|-----|-----|-----------|----|-----|----|----|-----|-----|-----|----|
| Sinusoidal voltage signals 1 V <sub>pp</sub> | Occupied | 0 V Sensor | Occupied | RI- | A2- | A1- | V+ Sensor | V+ | 0 V | nc | nc | RI+ | A2+ | A1+ | nc |
| TTL-signals                                  | Occupied | 0 V Sensor | US       | RI  | T2  | T1  | V+ Sensor | V+ | 0 V | nc | nc | RI  | T2  | T1  | nc |

- Sensor: the sensor pins are bridged in the chassis with the particular power supply.
- Shield is connected with the chassis.
- Pins or wires marked "occupied" or "nc" must not be used by the customer.

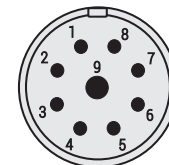
M23 connector, 9-pin



Dimensions (male, 9-pin, mass: 75 g)



Pin assignment (View on pins)



| Pin                                                  | 1   | 2   | 3  | 4   | 5    | 6    | 7   | 8   | 9            |                         |
|------------------------------------------------------|-----|-----|----|-----|------|------|-----|-----|--------------|-------------------------|
| Sinusoidal micro-current signals 11 µA <sub>pp</sub> | 0°+ | 0°- | V+ | 0 V | 90°+ | 90°- | RI+ | RI- | Inner shield | Outer shield on chassis |

Date 07/2024 ■ Doc.No. D1400658-00-A-01 ■ Technical adjustments in reserve!

