

# SLS320 LINEAR DISPLACEMENT SENSOR

The SLS320 range is designed to provide maximum performance benefits within a body diameter of 32mm, with stroke lengths from 250 to 1600mm. With a choice of mounting options and accessories, this sensor is ideally suited to a wide range of heavier duty industrial applications, for medium to long stroke linear position sensing.

## PERFORMANCE

|                            |            |                                                                                                   |             |             |             |             |             |             |             |             |             |             |             |             |             |
|----------------------------|------------|---------------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Electrical stroke E        | mm         | <b>250</b>                                                                                        | <b>300</b>  | <b>350</b>  | <b>400</b>  | <b>450</b>  | <b>500</b>  | <b>550</b>  | <b>600</b>  | <b>650</b>  | <b>700</b>  | <b>750</b>  | <b>800</b>  | <b>850</b>  | <b>900</b>  |
| Resistance $\pm 10\%$      | k $\Omega$ | 10                                                                                                | 12          | 14          | 16          | 18          | 20          | 22          | 24          | 26          | 28          | 30          | 32          | 34          | 36          |
| Power dissipation at 20°C  | W          | 5.0                                                                                               | 6.0         | 7.0         | 8.0         | 9.0         | 10          | 11          | 12          | 13          | 14          | 15          | 16          | 17          | 18          |
| Electrical stroke E        | mm         | <b>950</b>                                                                                        | <b>1000</b> | <b>1050</b> | <b>1100</b> | <b>1150</b> | <b>1200</b> | <b>1250</b> | <b>1300</b> | <b>1350</b> | <b>1400</b> | <b>1450</b> | <b>1500</b> | <b>1550</b> | <b>1600</b> |
| Resistance $\pm 10\%$      | k $\Omega$ | 38                                                                                                | 40          | 42          | 44          | 46          | 48          | 50          | 52          | 54          | 56          | 58          | 60          | 62          | 64          |
| Power dissipation at 20°C  | W          | 19                                                                                                | 20          | 21          | 22          | 23          | 24          | 25          | 26          | 27          | 28          | 29          | 30          | 31          | 32          |
| Independent linearity      |            |                                                                                                   |             |             |             |             |             |             |             |             |             |             |             |             |             |
| guaranteed                 | $\pm\%$    | 0.15                                                                                              |             |             |             |             |             |             |             |             |             |             |             |             |             |
| typical                    | $\pm\%$    | 0.05                                                                                              |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Applied voltage - maximum  | Vdc        | 74                                                                                                |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Electrical output          |            | Minimum of 0.5% to 99.5% applied volts                                                            |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Resolution                 |            | Virtually infinite                                                                                |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Hysteresis (repeatability) | mm         | Less than 0.01                                                                                    |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Operational temperature    | °C         | -30 to +100                                                                                       |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Output smoothness          |            | To MIL-R-39023 grade C 0.1%                                                                       |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Insulation resistance      |            | Greater than 100M $\Omega$ at 500Vdc                                                              |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Operating mode             |            | Voltage divider only - see Circuit Recommendation below                                           |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Wiper circuit impedance    |            | Minimum of 100 x track resistance or 0.5M $\Omega$ (whichever is greater)                         |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Operating force - maximum  |            |                                                                                                   |             |             |             |             |             |             |             |             |             |             |             |             |             |
| sealed                     | gf         | 2000 in horizontal plane (break-out force 5000gf)                                                 |             |             |             |             |             |             |             |             |             |             |             |             |             |
| unsealed                   | gf         | 1500 in horizontal plane (break-out force 2000gf)                                                 |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Life at 250mm per second   |            | Typically in excess of 100 million operations (50 x 10 <sup>6</sup> cycles) at 25mm stroke length |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Dither life                |            | 200 million operations (100 x 10 <sup>6</sup> cycles) at $\pm 0.5$ mm, 60Hz                       |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Sealing                    |            | IP50 standard - IP66 see options                                                                  |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Shaft seal life            |            | 20 million operations (10 x 10 <sup>6</sup> cycles) - replaceable                                 |             |             |             |             |             |             |             |             |             |             |             |             |             |
| Shaft velocity - maximum   | m/s        | 10                                                                                                |             |             |             |             |             |             |             |             |             |             |             |             |             |

## CIRCUIT RECOMMENDATION

Hybrid track potentiometers feature a high wiper contact resistance, therefore operational checks should be carried out only in the voltage divider mode. Hybrid track potentiometers should be used only as voltage dividers, with a minimum wiper circuit impedance of 100 x track resistance or 0.5M $\Omega$  (whichever is greater). Operation with wiper circuits of lower impedance will degrade the output smoothness and affect the linearity.

## OPTIONS

|                             |                                                                         |
|-----------------------------|-------------------------------------------------------------------------|
| Compact shaft               | Compact shaft will reduce dimension D by 50mm                           |
| Integral shaft seal - IP 66 | Designed to accept integral shaft seal to give IP66 rating              |
| Cabled socket               | 1m or 10m cabled socket assemblies available                            |
| Mounting                    | Body clamp or flange mounting kits can be supplied                      |
| Protective sleeve           | For all stroke lengths - self aligning bearings only. See ordering code |

## ACCESSORIES

|               |                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------|
| Mounting kits | <div> <div></div> <div>Body clamp kit - SA59661</div> </div> <div> <div></div> <div>Flange kit - SA59660</div> </div> |
|---------------|-----------------------------------------------------------------------------------------------------------------------|

Protective sleeve - SA202988/...../.....

|  |                                                          |
|--|----------------------------------------------------------|
|  | Shaft L = long, C = compact                              |
|  | Electrical stroke (select to match SLS320 sensor)        |
|  | Not available as a spare part for 1150 to 1600mm strokes |

## AVAILABILITY

All standard configurations can be supplied rapidly from the factory - check with your local supplier for more details

## ORDERING CODES

SLS320/...../...../...../...../.....

Electrical stroke

Shaft L = long, C = compact

Protective sleeve N = None, P = Fitted

Cabled socket 00 = None 01 = 1m 10 = 10m

Sealing 50 = IP50, 66 = IP66

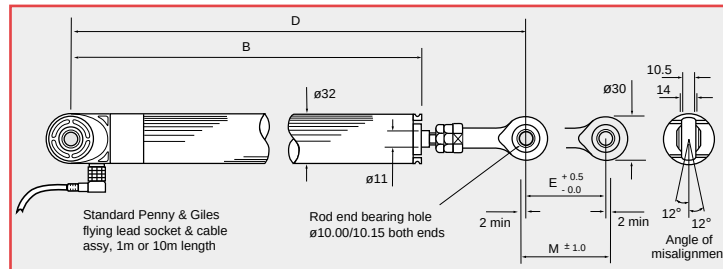
## DIMENSIONS AND MOUNTING OPTIONS

Note: drawings not to scale

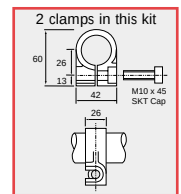
### Mounting recommendations

For units 1150 to 1600mm stroke, we recommend the use of body clamp or flange mounting kits to support the sensor when horizontally mounted. Alternatively, use the protective sleeve kit with the self aligning bearing mountings to provide increased rigidity.

### SELF ALIGNING BEARING MOUNTING

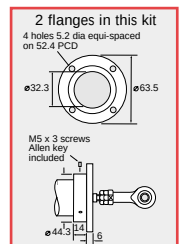


### MOUNTING OPTIONS

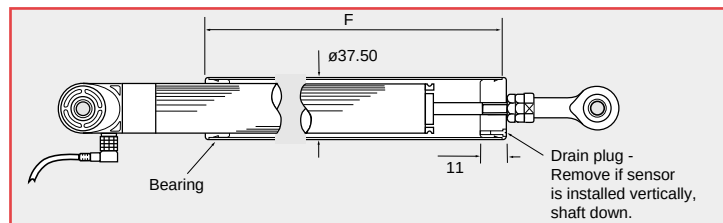


**Body clamp**  
SA59661

**Flange mounting**  
SA59660



### PROTECTIVE SLEEVE OPTION - P



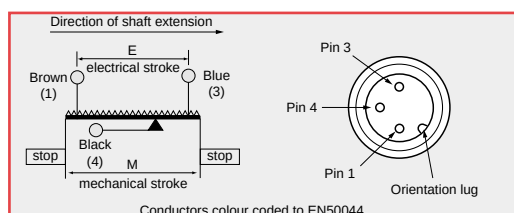
|                                |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Electrical stroke E            | mm | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  | 850  | 900  |
| Mechanical stroke M            | mm | 255  | 305  | 355  | 405  | 455  | 505  | 555  | 605  | 655  | 705  | 755  | 805  | 855  | 905  |
| Body length B                  | mm | 366  | 416  | 466  | 516  | 601  | 651  | 701  | 751  | 801  | 851  | 901  | 986  | 1036 | 1086 |
| Between centres D              |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | mm | 480  | 530  | 580  | 630  | 710  | 760  | 810  | 860  | 910  | 960  | 1010 | 1095 | 1145 | 1195 |
| compact shaft sensor (C)       | mm | 430  | 480  | 530  | 580  | 660  | 710  | 760  | 810  | 860  | 910  | 960  | 1045 | 1095 | 1145 |
| Sleeve length F                |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | mm | 372  | 422  | 472  | 522  | 607  | 657  | 707  | 757  | 807  | 857  | 907  | 992  | 1042 | 1092 |
| compact shaft sensor (C)       | mm | 322  | 372  | 422  | 472  | 557  | 607  | 657  | 707  | 757  | 807  | 857  | 942  | 992  | 1042 |
| Weight approximate (no sleeve) |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | g  | 590  | 673  | 756  | 839  | 922  | 1005 | 1088 | 1171 | 1254 | 1337 | 1420 | 1503 | 1586 | 1669 |
| compact shaft sensor (C)       | g  | 555  | 638  | 721  | 804  | 887  | 970  | 1053 | 1136 | 1219 | 1302 | 1385 | 1468 | 1551 | 1634 |
| Electrical stroke E            | mm | 950  | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | 1550 | 1600 |
| Mechanical stroke M            | mm | 955  | 1005 | 1055 | 1105 | 1155 | 1205 | 1255 | 1305 | 1355 | 1405 | 1455 | 1505 | 1555 | 1605 |
| Body length B                  | mm | 1136 | 1186 | 1236 | 1286 | 1371 | 1421 | 1471 | 1521 | 1571 | 1621 | 1671 | 1721 | 1771 | 1821 |
| Between centres D              |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | mm | 1245 | 1295 | 1345 | 1395 | 1480 | 1530 | 1580 | 1630 | 1680 | 1730 | 1780 | 1830 | 1880 | 1930 |
| compact shaft sensor (C)       | mm | 1195 | 1245 | 1295 | 1345 | 1430 | 1480 | 1530 | 1580 | 1630 | 1680 | 1730 | 1780 | 1830 | 1880 |
| Sleeve length F                |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | mm | 1142 | 1192 | 1242 | 1292 | 1377 | 1427 | 1477 | 1527 | 1577 | 1627 | 1677 | 1727 | 1777 | 1827 |
| compact shaft sensor (C)       | mm | 1092 | 1142 | 1192 | 1242 | 1327 | 1377 | 1427 | 1477 | 1527 | 1577 | 1627 | 1677 | 1727 | 1777 |
| Weight approximate (no sleeve) |    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| standard sensor (L)            | g  | 1752 | 1835 | 1918 | 2000 | 2095 | 2190 | 2285 | 2380 | 2475 | 2570 | 2665 | 2760 | 2855 | 2950 |
| compact shaft sensor (C)       | g  | 1717 | 1800 | 1883 | 1965 | 2060 | 2155 | 2250 | 2345 | 2440 | 2535 | 2630 | 2725 | 2820 | 2915 |

## ELECTRICAL CONNECTIONS

### Right angled, cabled socket

E series M12 to IEC 60947-5-2 PUR jacket.

Conforms to DIN/VDE 0660 part 208A2



### Cabled Socket

1 metre long No. x61-169-001

10 metres long No. x61-169-010

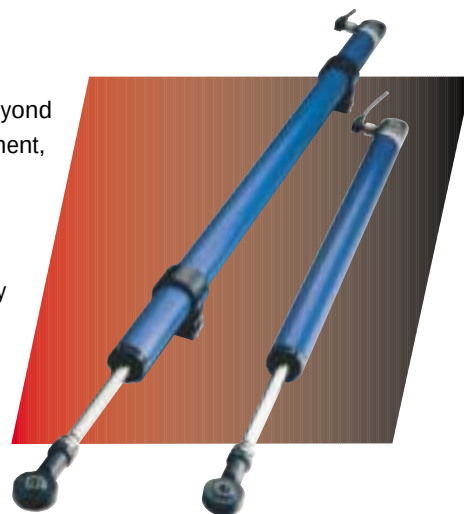
# SPECIALISED DESIGNS

We have considerable experience in solving specific application problems by developing our standard designs to suit individual requirements. Custom-designed solutions are also provided where standard equipment does not fully meet our customer's needs.

## SLS320 for heavy duty-cycle dynamic applications

A number of specialist applications have demanded an enhanced operating life beyond that capable from the standard SLS320 sealed linear sensor. To meet this requirement, we have developed a special version of the SLS320, which provides optimum lubrication for the track and sliding mechanism for increased operating life.

Typically the sensors are mounted parallel to actuators fitted to hydraulic motion bases operating leisure ride cabins at amusement parks around the world. Typically the motion bases run a three minute cycle time for up to 12 hours per day. This sensor is ideally suited to similar applications subject to heavy duty dynamic movements.



### SPECIFICATION SUMMARY

Refer to page 14 and 15 for full performance specification and dimensions

|                                 |            |                                                             |
|---------------------------------|------------|-------------------------------------------------------------|
| <b>Electrical stroke E</b>      | <b>mm</b>  | 150 to 1600mm only                                          |
| <b>Sealing</b>                  |            | IP66 or IP50                                                |
| <b>Shaft seal life</b>          |            | 20 million operations (10 x 10 <sup>6</sup> ) - replaceable |
| <b>Shaft velocity - maximum</b> | <b>m/s</b> | 10                                                          |

### OPTIONS

|                          |                                                                       |
|--------------------------|-----------------------------------------------------------------------|
| <b>Compact shaft</b>     | Compact shaft will reduce dimension D (page 15) by 50mm               |
| <b>Cabled socket</b>     | 1m or 10m cabled socket assemblies available                          |
| <b>Mounting</b>          | Self aligning rod ends standard. Body clamp and flange kits available |
| <b>Protective sleeve</b> | For 250 to 1600mm stroke lengths - self aligning bearings only.       |

### ACCESSORIES

|               |                          |
|---------------|--------------------------|
| Mounting kits | Body clamp kit - SA59661 |
|               | Flange kit - SA59660     |

Protective sleeve - SA202988/...../.....

Shaft L = long, C = compact  
Electrical stroke (select to match SLS320 sensor)  
Not available as a spare part for 1150 to 1600mm strokes

Clamp sleeve (to allow SLS320 to replace Penny+Giles HLP350 in existing installations) - P200863 (2 per sensor)

### AVAILABILITY

All standard configurations can be supplied rapidly from the factory - check with your local supplier for more details

### ORDERING CODES

D46273/...../...../...../...../.....

|                             |                                          |
|-----------------------------|------------------------------------------|
| Electrical stroke           | Protective sleeve N = None, P = Fitted   |
| Shaft L = long, C = compact | Cabled socket 00 = None 01 = 1m 10 = 10m |
|                             | Sealing 50 = IP50, 66 = IP66             |