



## Type 2RK

- Shaft Encoder -  $\varnothing$  58 mm
- Shaft:  $\varnothing$  1/4" to  $\varnothing$  10 mm
- Resolution up to 12.500 ppr
- Standard IP 65 (IP 67 options)

### Electrical Specifications

|                               |                                                                                                                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Code:</b>                  | Incremental                                                                                                                                                                                                                |
| <b>Resolution:</b>            | 1 to 12.500 ppr (pulses per revolution)                                                                                                                                                                                    |
| <b>Supply Voltage:</b>        | 4,5 Vdc min. to 30 Vdc max. (35 mA max. - no load) **                                                                                                                                                                      |
| <b>Output Voltage:</b>        | Low: 500 mV max. at 10 mA<br>High: ( $V_{in} - 0,6$ ) at -10 mA<br>( $V_{in} - 1,3$ ) at -25 mA                                                                                                                            |
| <b>Output Current:</b>        | 30 mA max. load per output channel **                                                                                                                                                                                      |
| <b>Frequency Response:</b>    | 300 kHz max. **                                                                                                                                                                                                            |
| <b>Output Format:</b>         | Two channel (A, B) quadrature with Index (Z) and optional complementary (A-, B-, Z-) outputs                                                                                                                               |
| <b>Phase Sense:</b>           | A leads B clockwise (CW) from the mounting end of the encoder                                                                                                                                                              |
| <b>Index:</b>                 | Gated with Channels A and B high                                                                                                                                                                                           |
| <b>Accuracy:</b>              | +/- 0,8 arc-min.                                                                                                                                                                                                           |
| <b>Outputs:</b>               | ASIC Push pull and Differential<br>OL7272 Push-pull and Differential<br>Line Driver<br>26C31 Differential Line Driver<br>5V output (with 5V input)                                                                         |
| <b>Electrical Protection:</b> | Reverse polarity and output short circuit protected                                                                                                                                                                        |
| <b>Noise Immunity:</b>        | Tested to EN61000-6-2 : 2005 (industrial environments)<br>Electromagnetic compatibility (EMC) and EN 61000-6-3 : 2007 (residential, commercial, and light-industrial environments) for Electromagnetic compatibility (EMC) |

### Mechanical Specifications

|                                |                                                                              |
|--------------------------------|------------------------------------------------------------------------------|
| <b>Material:</b>               | Housing: Aluminum<br>Cap: Aluminum<br>Shaft: Stainless steel AISI 303        |
| <b>Weight:</b>                 | Encoder: ~ 190 gr (6,7 oz)<br>Cable: 60 gr / meter (2,12 oz / meter)         |
| <b>Bearing Life:</b>           | > $1,9 \times 10^{10}$ revolutions at rated load                             |
| <b>Shaft Speed:</b>            | 4.500 rpm (max. sustained) IP 65<br>3.000 rpm (max. sustained) IP 66 / IP 67 |
| <b>Starting Torque:</b>        | < 0,02 Nm (2,83 oz-in) at 25° C                                              |
| <b>Mass Moment of Inertia:</b> | 6,0 gcm <sup>2</sup> ( $8,5 \times 10^{-5}$ oz-in-sec <sup>2</sup> )         |
| <b>Shaft Loads:</b>            | Axial: 150 N (33,75 lbs) max.<br>Radial: 250 N (56 lbs) max.                 |

### Environmental Specifications

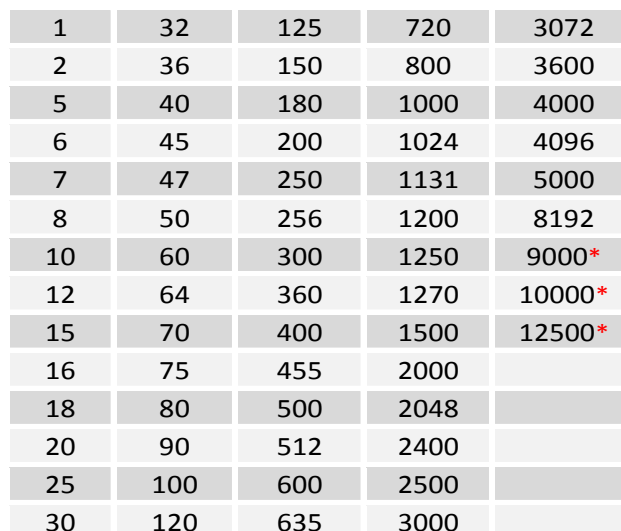
|                         |                                                             |
|-------------------------|-------------------------------------------------------------|
| <b>Operating Temp.:</b> | -40° to +85° C                                              |
| <b>Storage Temp.:</b>   | -40° to +85° C                                              |
| <b>Shock:</b>           | 100 G / 11 ms                                               |
| <b>Vibration:</b>       | 10-2000 Hz / 10 G                                           |
| <b>Bump:</b>            | 10 G / 16 ms (1000 x 3 axis)                                |
| <b>Humidity:</b>        | 98 % RH without condensation                                |
| <b>IP Rating:</b>       | IP 65 / Nema 5 (approx.)<br>IP 67 / Nema 6 (approx.) option |

### Connection Options

|                   |                                                                    |
|-------------------|--------------------------------------------------------------------|
| <b>Cable:</b>     | 8 leads (0,14 mm <sup>2</sup> , 26 AWG)<br>twisted pairs; shielded |
| <b>Connector:</b> | 5-pin M12<br>8-pin M12<br>9-pin M23<br>12-pin M23                  |

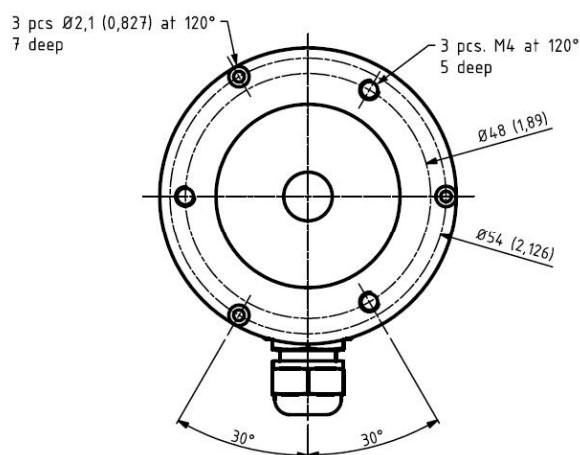
\*\* = It is recommended user not to combine max. values for all 3 parameter

### Disk Resolutions (Pulses per revolution)

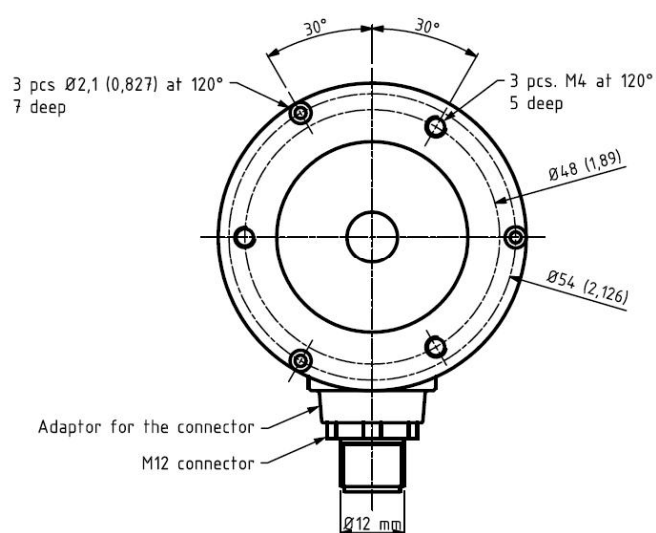
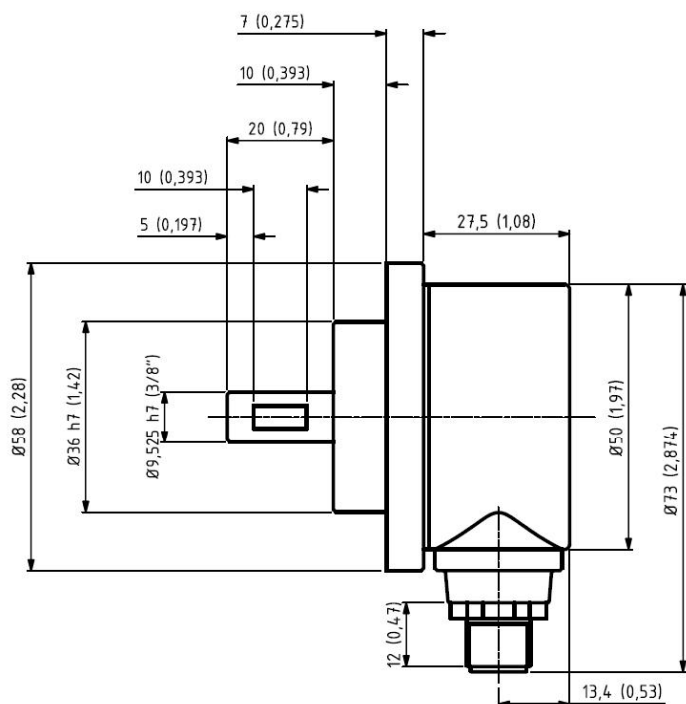


**Other options on request**  
Pulses per revolution,  
min. 1 – max. 12.500

## Mechanical Dimensions

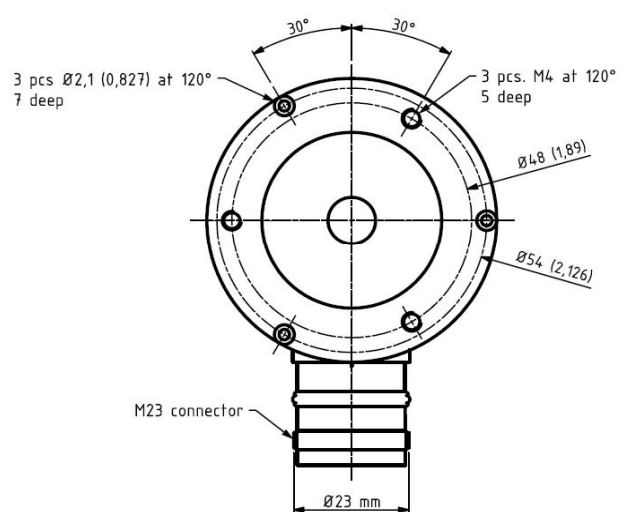
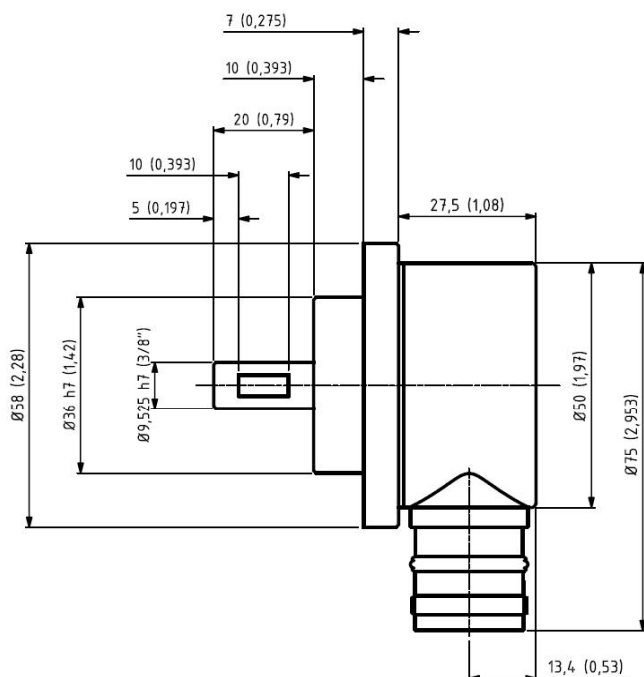


mm (inches)



M12 Connector

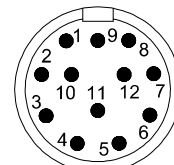
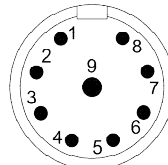
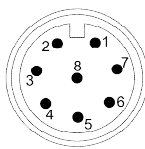
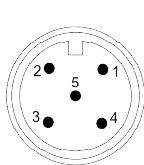
mm (inches)



M23 Connector

mm (inches)

## Output Terminations



|         | Standard Cable  |                     |
|---------|-----------------|---------------------|
|         | Standard Output | Differential Output |
| Channel | Wire Color      |                     |
| A       | Pink            | Pink                |
| A -     | Gray*           | Gray                |
| B       | Green           | Green               |
| B -     | Yellow*         | Yellow              |
| Z       | White           | White               |
| Z -     | Brown*          | Brown               |
| Vsup    | Red             | Red                 |
| GND     | Blue            | Blue                |

GND = Circuit Ground

\* Internally connected as GND

|     | M12<br>5 - pin  | M12<br>8 - pin      | M23<br>9 - pin  | M23<br>9 - pin      | M23<br>12 - pin | M23<br>12 - pin     |
|-----|-----------------|---------------------|-----------------|---------------------|-----------------|---------------------|
|     | Standard Output | Differential Output | Standard Output | Differential Output | Standard Output | Differential Output |
| Pin | Channel         | Channel             | Channel         | Channel             | Channel         | Channel             |
| 1   | Vsup            | A                   | A               | A                   | GND             | B -                 |
| 2   | B               | Vsup                | B               | B                   | NC              | NC                  |
| 3   | GND             | A -                 | Z               | Z                   | Z               | Z                   |
| 4   | A               | B                   | GND             | A -                 | GND             | Z -                 |
| 5   | Z               | B -                 | GND             | B -                 | A               | A                   |
| 6   |                 | Z                   | GND             | Z -                 | GND             | A -                 |
| 7   |                 | GND                 | Vsup            | Vsup                | NC              | NC                  |
| 8   |                 | Z -                 | GND             | GND                 | B               | B                   |
| 9   |                 |                     | Shield          | Shield              | Shield          | Shield              |
| 10  |                 |                     |                 |                     | GND             | GND                 |
| 11  |                 |                     |                 |                     | NC              | NC                  |
| 12  |                 |                     |                 |                     | Vsup            | Vsup                |

GND = Circuit Ground

Shield = Case Ground

## Ordering Code

Example: 2RK- 1024 - D - 8 - 20 - 65 - 01 - S - 00

|                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|------------------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|-----------------|--------------------------------|-------------|---------------------|-----------|------------------------------------------|-----------|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|--------------|-----------|--|
| <b>2RK</b>                               | -                            | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -                   | -                                  | -                                                                               | -                                                                                                                                            | -                | -            |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          | <b>Pulses per Revolution</b> | <b>Output</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Shaft Dia.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Shaft Length</b> | <b>IP Rating</b>                   | <b>Cable Length</b>                                                             | <b>Takeout</b>                                                                                                                               | <b>Connector</b> |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          | See table                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     | IP 65 <b>65</b><br>IP 67 <b>67</b> |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    | Standard is 1 meter <b>01</b><br>Specify length <b>XX</b><br>No Cable <b>00</b> |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Standard</td><td style="text-align: right;"><b>N</b></td></tr> <tr><td>Standard – Open Collector NPN</td><td style="text-align: right;"><b>NON</b></td></tr> <tr><td>Standard – Open Collector PNP</td><td style="text-align: right;"><b>NOP</b></td></tr> <tr><td>Differential</td><td style="text-align: right;"><b>D</b></td></tr> <tr><td>26C31 Line Driver 5V / 5V only</td><td style="text-align: right;"><b>L</b></td></tr> <tr><td>OL 7272 Line Driver</td><td style="text-align: right;"><b>M</b></td></tr> <tr><td>26C31 Line Driver * 9 to 30V in / 5V out</td><td style="text-align: right;"><b>5L</b></td></tr> </table> | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>N</b>            | Standard – Open Collector NPN      | <b>NON</b>                                                                      | Standard – Open Collector PNP                                                                                                                | <b>NOP</b>       | Differential | <b>D</b>        | 26C31 Line Driver 5V / 5V only | <b>L</b>    | OL 7272 Line Driver | <b>M</b>  | 26C31 Line Driver * 9 to 30V in / 5V out | <b>5L</b> |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| Standard                                 | <b>N</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| Standard – Open Collector NPN            | <b>NON</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| Standard – Open Collector PNP            | <b>NOP</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| Differential                             | <b>D</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| 26C31 Line Driver 5V / 5V only           | <b>L</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| OL 7272 Line Driver                      | <b>M</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| 26C31 Line Driver * 9 to 30V in / 5V out | <b>5L</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              | *Only side takeout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 | <u><b>Cable</b></u><br>Side radial <b>S</b><br>Back Axial <b>B</b><br><u><b>Connector</b></u><br>Side radial <b>S</b><br>Back Axial <b>B</b> |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
|                                          |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1/4" mm x 20 mm</td><td style="text-align: right;"><b>1/4</b></td><td style="text-align: right;"><b>- 20</b></td></tr> <tr><td>8 mm x 20 mm</td><td style="text-align: right;"><b>8</b></td><td style="text-align: right;"><b>- 20</b></td></tr> <tr><td>3/8" mm x 20 mm</td><td style="text-align: right;"><b>3/8</b></td><td style="text-align: right;"><b>- 20</b></td></tr> <tr><td>10 mm x 20 mm</td><td style="text-align: right;"><b>10</b></td><td style="text-align: right;"><b>- 20</b></td></tr> </table> | 1/4" mm x 20 mm     | <b>1/4</b>                         | <b>- 20</b>                                                                     | 8 mm x 20 mm                                                                                                                                 | <b>8</b>         | <b>- 20</b>  | 3/8" mm x 20 mm | <b>3/8</b>                     | <b>- 20</b> | 10 mm x 20 mm       | <b>10</b> | <b>- 20</b>                              |           |  |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>M12 5-pin</td><td style="text-align: right;"><b>P5</b></td></tr> <tr><td>M12 8-pin</td><td style="text-align: right;"><b>P8</b></td></tr> <tr><td>M23 9-pin</td><td style="text-align: right;"><b>C9</b></td></tr> <tr><td>M23 12-pin</td><td style="text-align: right;"><b>C12</b></td></tr> <tr><td>No Connector</td><td style="text-align: right;"><b>00</b></td></tr> </table> | M12 5-pin | <b>P5</b> | M12 8-pin | <b>P8</b> | M23 9-pin | <b>C9</b> | M23 12-pin | <b>C12</b> | No Connector | <b>00</b> |  |
| 1/4" mm x 20 mm                          | <b>1/4</b>                   | <b>- 20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| 8 mm x 20 mm                             | <b>8</b>                     | <b>- 20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| 3/8" mm x 20 mm                          | <b>3/8</b>                   | <b>- 20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| 10 mm x 20 mm                            | <b>10</b>                    | <b>- 20</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| M12 5-pin                                | <b>P5</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| M12 8-pin                                | <b>P8</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| M23 9-pin                                | <b>C9</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| M23 12-pin                               | <b>C12</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |
| No Connector                             | <b>00</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                    |                                                                                 |                                                                                                                                              |                  |              |                 |                                |             |                     |           |                                          |           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |           |           |            |            |              |           |  |

Other options on request:  
Please contact Scancon A/S

See Accessories for drawings