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|---------------------------|------------------------------|------------------------------------------------------------------------------------|
| 1023351                   | <b>DATA SHEET</b>            |  |
| valid from:<br>01.04.2020 | <b>ÖLFLEX® SERVO 3D 7DSL</b> |                                                                                    |

## Verwendung

ÖLFLEX® SERVO 3D 7DSL cables for one cable systems are highly flexible, screened, oil resistant and low capacitive servo motor cables with polyurethane outer sheath for use on European and North American market. All of the motor's feedback signals are transmitted by just one integrated data pair. The additional control pair can be optionally used to connect e.g. the electromagnetic break.

They are designed for use in high-dynamic industrial robotic applications with simultaneous bending and torsional stress with torsion angles up to  $\pm 180^\circ$  as well as for static use with medium mechanical load. They are among others designed for use in dry, damp and wet conditions. They are suitable for outdoor use if the indicated temperature range is observed.

They are increased oil resistant and at room temperature widely resistant to acids and alkaline solutions. The outer sheath is resistant to high mechanical load, particularly to abrasion and rubbing, cut resistant, microbe-proof and hydrolysis resistant. The screening of spiralized tinned copper wires protects against interference from electrical fields, the control and DSL data pair are individually screened.

Application range:

Connecting cable between servo controller and motor for increased requirements in robots or moving machine parts, for use in assembling- & pick-and-place machines, machine tools and transfer lines, for assembly lines or production lines in all kind of machines. The maximum tensile load is  $15 \text{ N/mm}^2$  of conductor cross-section during installation and operation.

Compulsory guidance is not permitted.

Use acc. to UL: PUR sheathed cable for external interconnection of electronic equipment.

Use acc. to cRUus: PUR sheathed cable for external interconnection of electronic equipment with or mechanical load conditions.

## Design

|                     |                                                                                                                                                                                                                                                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Design              | acc. to UL AWM 758, Style 21223, CSA C22.2 No. 210-15 and in compliance to EN 50525-2-51 resp. VDE 0285-525-2-51                                                                                                                                                                                                                        |
| Approvals           | UL AWM 758, Style 21223 (File No. E63634)<br>cRUus AWM I A/B II A/B (File No. E63634)                                                                                                                                                                                                                                                   |
| Conductor           | extra-fine wire strand of tinned copper acc. to IEC 60228 resp. EN 60228, class 6                                                                                                                                                                                                                                                       |
| Core insulation     | Power cores and control pair: Polypropylen-based compound<br>DSL data pair: Fluoropolymer-based compound                                                                                                                                                                                                                                |
| Core identification | Power cores: black with white marking U/L1/C/L+; V/L2; W/L3/D/L- and GN/YE<br>Control pair: black, white<br>DSL data pair: blue, white                                                                                                                                                                                                  |
| Pair screen         | Control pair: Special tape wrapping,<br>Spiralized tinned copper wires, coverage $\geq 90\%$ (nominal value)<br>Special tape wrapping<br>DSL data pair: Special tape wrapping,<br>Spiralized tinned copper wires, coverage $\geq 90\%$ (nominal value)<br>Aluminium metallized textile tape wrapping<br>Inner sheath of special polymer |
| Stranding           | 4 power cores stranded together with control pair and data pair as well as filler cords                                                                                                                                                                                                                                                 |
| Screen              | Spiralized tinned copper wires, coverage $\geq 90\%$ (nominal value)                                                                                                                                                                                                                                                                    |
| Outer sheath        | Polyurethane compound TPU acc. to EN 50363-10-2<br>UL AWM 758, CSA AWM C22.2 No. 210-15<br>Colour: black, similar RAL 9005                                                                                                                                                                                                              |

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## Electrical properties at 20 °C

|                 |                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal voltage | Power cores and control pair:<br>VDE U <sub>0</sub> /U: 600 V/1000 V<br>UL/CSA: 1000 V<br>DSL data pair:<br>VDE U <sub>0</sub> /U 300 V/300 V<br>UL/CSA: 600 V |
| Test voltage    | Power cores and control pair: C/C 4000 V AC<br>C/S 2000 V AC<br>DSL data pair: C/C 2000 V AC<br>C/S 1000 V AC                                                  |

## Mechanical, thermal and chemical properties

|                           |                                                                                                                                                                                                                                                        |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature range         | flexing (VDE): -40 °C up to +80 °C max. conductor temp.<br>flexing (UL/CSA): up to +80 °C max. conductor temp.<br>fixed installation (VDE): -50 °C up to +80 °C max. conductor temp.<br>fixed installation (UL/CSA): up to +80 °C max. conductor temp. |
| Min. bending radius       | flexing: up from 10 x cable diameter<br>fixed installation: 5 x cable diameter                                                                                                                                                                         |
| Torsion load              | max. torsion angle: ± 180 °/m                                                                                                                                                                                                                          |
| Flammability              | acc. to IEC 60332-1-2 resp. VDE 0482-332-1-2<br>UL & CSA: Vertical flame test VW-1 resp. FT1                                                                                                                                                           |
| UV resistance             | According to EN 50525-1 (VDE 0285-525-1) all cables with black outer sheath are suitable for permanent outdoor use. UV resistant according to ASTM-D-2565-16                                                                                           |
| Ozone resistance          | acc. to EN 50396 resp. VDE 0473-396, method B                                                                                                                                                                                                          |
| Oil resistance            | acc. to EN 50363-10-2 resp. VDE 0207-363-10-2                                                                                                                                                                                                          |
| Tests                     | acc. to EN 60811, EN 50395, EN 50396, UL 1581 and CSA C22.2                                                                                                                                                                                            |
| EU Directives             | The cable is conform to the EU-Directive 2014/35/EU (Low Voltage Directive)                                                                                                                                                                            |
| Environmental information | The cable meets substance-specific requirements of EU Directive 2011/65/EU (RoHS)                                                                                                                                                                      |

## Dynamic performance in power chains

|                                                     |                                                                                                                                     |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Max. pulling force                                  | ≤ 15 N/mm <sup>2</sup>                                                                                                              |
| Max. acceleration                                   | 30 m/s <sup>2</sup>                                                                                                                 |
| Max. velocity                                       | 4 m/s                                                                                                                               |
| Max. travel (horizontal)                            | 20 m                                                                                                                                |
| Bending cycles and power chain operation parameters | See selection table A2-1 in online catalogue appendix<br>For use in power chains: Please comply with assembly guideline appendix T3 |

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