

## Section 5.

# Flexible Control Cable



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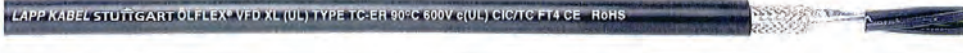


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# Cables for Motors & Drives

## ÖLFLEX® VFD XL, Precision Control VFD UL & CSA TC Approval



**Construction:** Finely stranded tinned copper conductors.

**Insulation:** 3/c with XLPE insulation; plus 1/c ground wire with PVC insulation; barrier tape.

**Jacket:** 100% shielding with foil tape and tinned copper braid (85% coverage), specially formulated PVC black jacket.

### Features:

ÖLFLEX® VFD XL is an extremely oil resistant and robust, shielded motor cable for VFD drives. The jacket is also excellent at low temperatures, passing both the UL -25°C Cold Impact and the -40° Cold Bend tests. The enhanced electrical characteristics of XLPE insulation provide problem free performance where precision control is critical.

### Applications:

VFD drive and motor connections, web presses, HVAC, conveyors, longer length installations, and any on/off applications using a VFD drive and motor.

### Technical Data:

Minimum Bending Radius for flexible use: 7.5 x cable diameter.

|                                                                                                     |                                                                                                         |                                                                                                      |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|  <b>Temperature:</b> |  <b>Rated Voltage:</b> |  <b>Color Code:</b> |
| • -40°C to 90°C (ULTC)                                                                              | • 600V- TC (UL & CSA)                                                                                   | • Three black conductors with white numbers, plus green/yellow ground                                |
| • -40° to 105°C (AWM)                                                                               | • 1000V- AWM                                                                                            |                                                                                                      |
|                                                                                                     | • 1000V- TC Wind Turbine                                                                                |                                                                                                      |

|                                                                                                     |                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Approvals:</b> |   |
| UL:                                                                                                 |   |
| CSA:                                                                                                | • Type TC-ER                                                                                                                                                            |
| Additional:                                                                                         | • -90°C Wet or Dry, Oil Res I & II                                                                                                                                      |
|                                                                                                     | • UL AWM 90°C                                                                                                                                                           |
|                                                                                                     | • Class 1 Div. 2 per NEC Art, 336, 392,501                                                                                                                              |
|                                                                                                     | • Sunlight resistant and direct burial.                                                                                                                                 |
|                                                                                                     | • c(UL) CIC/TC FT4                                                                                                                                                      |
|                                                                                                     | • Conductor Stranding:                                                                                                                                                  |
|                                                                                                     | Class 5 Stranding: 16-8 AWG                                                                                                                                             |
|                                                                                                     | Class K Stranding: 6, 4 & 2 AWG                                                                                                                                         |

| Part Number                            | Number of Conductors includes ground | Norminal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km | SKINTOP® MS-SC (PG) | SKINTOP® MS-M BRUSH (Metric) |
|----------------------------------------|--------------------------------------|--------------------------------|------|-----------------------|------------------------|-------|---------------------|------------------------------|
| 16 AWG / 1.5 mm <sup>2</sup><br>731604 | 4                                    | .508                           | 12.9 | 70                    | 125                    | 186   | 53112240            | 53112676                     |
| 14 AWG / 2.5 mm <sup>2</sup><br>731404 | 4                                    | .581                           | 14.8 | 99                    | 133                    | 198   | 53112250            | 53112676                     |
| 12 AWG / 4.0 mm <sup>2</sup><br>731204 | 4                                    | .649                           | 16.5 | 144                   | 180                    | 268   | 53112250            | 53112676                     |
| 10 AWG / 6.0 mm <sup>2</sup><br>731004 | 4                                    | .700                           | 17.8 | 199                   | 271                    | 403   | 53112260            | 53112677                     |
| 8 AWG / 10.0 mm <sup>2</sup><br>730804 | 4                                    | .887                           | 22.5 | 334                   | 450                    | 670   | 53112260            | 53112678                     |
| 6 AWG / 16.0 mm <sup>2</sup><br>730604 | 4                                    | 1.030                          | 26.2 | 517                   | 617                    | 918   | 53112270            | 53112678                     |
| 4 AWG / 21.0 mm <sup>2</sup><br>730404 | 4                                    | 1.158                          | 29.4 | 726                   | 917                    | 1365  | 53112270            | 53112679                     |
| 2 AWG / 33.7 mm <sup>2</sup><br>730204 | 4                                    | 1.332                          | 33.8 | 1111                  | 1339                   | 1992  | —                   | 53112679                     |

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## ÖLFLEX® VFD Slim, Reduced Diameter VFD Cable with “Lapp Surge Guard” UL & CSA TC Approval

ÖLFLEX® VFD SLIM (UL) TYPE TC-ER 90°C 600V c(UL) CIC/TC FT4 CSA AWM CE MSHA RoHS

**Construction:** Finely stranded tinned copper conductors.

**Insulation:** Specially formulated “Lapp Surge Guard”, barrier tape; 100% shielding with foil tape and tinned copper braid (85% coverage).

**Jacket:** Specially formulated PVC black jacket.

### Features:

ÖLFLEX® VFD Slim is a reduced, diameter shielded motor cable for VFD Drives. It is designed with “Lapp Surge Guard” semi-conductive material to hold up to nonlinear power distortions associated with VFD drives. This special material smooths out the stranded copper and disperses increases in voltage caused by wave reflection, harmonics, in-rush current and spikes preventing conductor and cable failure.

### Applications:

VFD drive and motor connections, Web presses, HVAC, Conveyors, any on/off applications using a VFD drive and motor.

### Application Advantage:

- “Lapp Surge Guard” protection to eliminate cable failure due to electrical disturbances
- Industrial Grade PVC jacket passing Oil Res I & II
- UL TC-ER & c(UL)CIC/TC approved
- Double shielded for extra protection



### Technical Data:

Minimum Bending Radius for flexible use: 7.5 x cable diameter.

| Temperature:                                                                                               | Rated Voltage:                                                                                              | Color Code:                                                                                                             | Approvals:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• -40°C to +90°C (ULTC)</li> <li>• -40°C to +105°C (AWM)</li> </ul> | <ul style="list-style-type: none"> <li>• 600V-TC (UL &amp; CSA)</li> <li>• 1000V-TC Wind Turbine</li> </ul> | <ul style="list-style-type: none"> <li>• Three black conductors with white numbers, plus green/yellow ground</li> </ul> | <p>UL:</p> <ul style="list-style-type: none"> <li>• Type TC-ER</li> <li>• Type MTW</li> <li>• Wet Rating 75°C, Oil Res I &amp; II</li> <li>• 90°C, UL-AWM 90°C</li> <li>• Class 1 Div.2 per NEC Art. 336, 392, 501</li> <li>• Sunlight resistant and direct burial</li> <li>• Submersible Pump (14 AWG or Larger)</li> </ul> <p>CSA:</p> <ul style="list-style-type: none"> <li>• c(UL) CIC/TC FT4</li> <li>• AWM I/II A/B FT4</li> </ul> <p>Additional:</p> <ul style="list-style-type: none"> <li>• MSHA: P-07-KA050013-MSHA</li> <li>• ICEA-T-24-380, Corona test</li> </ul> |

| Part Number                                    | Number of Conductors includes ground | Conductor Diameter inches mm | Nominal Outer Diameter inches mm | Copper Weight lbs/mft | Approx. Weight lbs/mft kg/km | SKINTOP® MS-SCL (PG) | SKINTOP® MS-SC-M BRUSH (Metric) |
|------------------------------------------------|--------------------------------------|------------------------------|----------------------------------|-----------------------|------------------------------|----------------------|---------------------------------|
| 18 AWG (19/30) 1.00 mm <sup>2</sup><br>761804  | 4                                    | .104 2.6                     | .394 10.0                        | 52                    | 111 165                      | 53112330             |                                 |
| 16 AWG (28x30) 1.50 mm <sup>2</sup><br>761604  | 4                                    | .117 3.0                     | .456 11.6                        | 61                    | 125 186                      | 53112340             | 53112676                        |
| 14 AWG (46/30) 2.50 mm <sup>2</sup><br>761404  | 4                                    | .134 3.4                     | .497 12.6                        | 86                    | 133 198                      | 53112340             | 53112676                        |
| 12 AWG (56/.0117) 4 mm <sup>2</sup><br>761204  | 4                                    | .158 4.0                     | .555 14.1                        | 119                   | 180 268                      | 53112350             | 53112676                        |
| 10 AWG (82/.0117) 6 mm <sup>2</sup><br>761004  | 4                                    | .200 5.1                     | .667 17.2                        | 178                   | 271 403                      | 53112350             | 53112677                        |
| 8 AWG (74/.0159) 10 mm <sup>2</sup><br>760804  | 4                                    | .276 7.0                     | .897 22.3                        | 290                   | 450 670                      | 53112360             | 53112678                        |
| 6 AWG (119/.0159) 16 mm <sup>2</sup><br>760604 | 4                                    | .320 8.1                     | .994 25.2                        | 429                   | 617 918                      | —                    | 53112678                        |
| 4 AWG (413/30) 25 mm <sup>2</sup><br>760404    | 4                                    | .400 10.2                    | 1.186 30.1                       | 600                   | 917 1365                     | —                    | 53112679                        |
| 2 AWG (665/30) 35 mm <sup>2</sup><br>760204    | 4                                    | .472 11.9                    | 1.394 35.4                       | 985                   | 1339 1992                    | —                    | 53112680                        |

\* Please note: 16 AWG has a drain wire.

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# Cables for Motors & Drives

## ÖLFLEX® VFD with Signal, Flexible VFD Cable with a Pair for Brake or Temperature Sensor

ÖLFLEX® VFD W/ SIGNAL (UL) TC-ER 90°C 600V c(UL) CIC/TC FT4 600V CE MSHA RoHS



**Construction:** Finely stranded tinned copper conductors.

**Insulation:** Specially formulated "Lapp Surge Guard" insulation, pair is specially blended PVC insulation with a foil shield and drain wire, barrier tape; 100% shielding with a foil tape and tinned copper braid (85% coverage) with drain wire.

**Jacket:** Specially formulated oil resistant black PVC jacket.

### Features:

ÖLFLEX® VFD with Signal is an extremely oil resistant, UV resistant shielded motor cable for VFD Drives. It has an additional shielded pair for VFD drives with a brake or temperature sensor. ÖLFLEX® VFD with Signal is designed with "Lapp Surge Guard" to smooth out the stranded copper and disperse increases in voltage and has a specially formulated oil resistant jacket for industrial applications.

### Applications:

VFD drive and motor connections with temperature sensors or brake mechanisms, Web presses, HVAC, any on/off applications using a VFD drive and motor.

### Application Advantage:

- "Lapp Surge Guard" protection to eliminate cable failure due to electrical disturbances
- Industrial Grade & Chemical Resistant elastomeric alloy jacket passing Oil Res I, II
- Shielded pair for brake or temperature sensor
- Double shielded for extra protection
- UL TC-ER & c(UL)CIC/TC approved



### Technical Data:

Minimum Bending Radius for flexible use: 10 x cable diameter

|                                                                                                     |                                                                                                         |                                                                                                               |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|  <b>Temperature:</b> |  <b>Rated Voltage:</b> |  <b>Color Code:</b>          |
| • -40°C to +90°C (ULTC)                                                                             | • 600V-TC (UL & CSA)                                                                                    | • Three black conductors with white numbers, plus green/yellow ground, and one black pair with white numbers. |
| • -40°C to +105°C (UWM)                                                                             | • 1000V Wind Turbine                                                                                    |                                                                                                               |

|                                                                                                     |                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Approvals:</b> |                                                                                                                                            |
| UL:                                                                                                 | • Type TC-ER, 90°C<br>• Type MTW<br>• Wet Rating 75°C, Oil Res I/III<br>• 90°C, UL-AWM 105°C<br>• Class 1 Div.2 per NEC Art. 336, 392, 501 |
| CSA:                                                                                                | • c(UL) CIC/TC FT4<br>• AWM I/II A/B FT4                                                                                                   |
| Additional:                                                                                         | • MSHA: P-07-KA050011-MSHA<br>• ICEA: T-24-380, Corona Test                                                                                |

| Part Number                          | Description   | Number of Conductors includes ground | 1 pair for signal shielded | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km | SKINTOP® MS-SCL (PG) | SKINTOP® MS-SC-M BRUSH (Metric) |
|--------------------------------------|---------------|--------------------------------------|----------------------------|-------------------------------|------|-----------------------|------------------------|-------|----------------------|---------------------------------|
| 16 AWG (28/30) 1.50 mm <sup>2</sup>  |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7416048                              | 16/4c + 18/2c | 4 +                                  | 18 AWG (19/30)             | .515                          | 13.1 | 80                    | 176                    | 262   | 53112340             | 53112676                        |
| 14 AWG (46x30) 2.50 mm <sup>2</sup>  |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7414048                              | 14/4c + 18/2c | 4 +                                  | 18 AWG (19/30)             | .556                          | 14.1 | 105                   | 250                    | 372   | 53112350             | 53112676                        |
| 7414044                              | 14/4c + 14/2c | 4 +                                  | 14 AWG (41/30)             | .581                          | 14.8 | 122                   | 270                    | 402   | 53112350             | 53112676                        |
| 12 AWG (56/.0117) 4 mm <sup>2</sup>  |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7412048                              | 12/4c + 18/2c | 4 +                                  | 18 AWG (19/30)             | .610                          | 15.5 | 165                   | 294                    | 438   | 53112350             | 53112676                        |
| 7412044                              | 12/4c + 14/2c | 4 +                                  | 14 AWG (41/30)             | .632                          | 16.1 | 182                   | 314                    | 467   | 53112350             | 53112677                        |
| 10 AWG (82/.0117) 6 mm <sup>2</sup>  |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7410044                              | 10/4c + 14/2c | 4 +                                  | 14 AWG (41/30)             | .724                          | 18.4 | 232                   | 474                    | 705   | 53112360             | 53112677                        |
| 8 AWG (74/.0159) 10 mm <sup>2</sup>  |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7408044                              | 8/4c + 14/2c  | 4 +                                  | 14 AWG (41/40)             | .953                          | 24.2 | 341                   | 607                    | 903   | 53112360             | 53112678                        |
| 6 AWG (119/.0159) 16 mm <sup>2</sup> |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7406044                              | 6/4c + 14/2c  | 4 +                                  | 14 AWG (41/30)             | 1.082                         | 27.5 | 503                   | 848                    | 1262  | —                    | 53112678                        |
| 4 AWG (413/30) 25 mm <sup>2</sup>    |               |                                      |                            |                               |      |                       |                        |       |                      |                                 |
| 7404044                              | 4/4c + 14/2c  | 4 +                                  | 14 AWG (41/30)             | 1.322                         | 33.6 | 673                   | 1251                   | 1862  | —                    | 53112679                        |

Specifications subject to change. For complete specifications and availability visit [www.lapptannehill.com](http://www.lapptannehill.com)



## ÖLFLEX® VFD SYMMETRICAL, Oil Resistant Motor Supply Cable for Large HP VFD Drives with UL & CSA TC Approval



**Construction:** Bare stranded copper, Class B stranding. 3 bare stranded ground conductors, longitudinal corrugated copper tape shield.

**Insulation:** XLPE. **Jacket:** Black PVC.

### Features:

ÖLFLEX® VFD Symmetrical is a large AWG VFD cable designed with 3 symmetrical grounds and a longitudinal copper tape shield. It is UL TC-ER and CSA TC approved. ÖLFLEX® VFD Symmetrical is available from 1 AWG to 500 KCMIL for 75 HP drives and larger.

### Applications:

VFD drive and motor connections for large HP applications, HVAC, Large presses, any on/off applications using a VFD drive and motor.

### Application Advantage:

- 100% copper tape shield for EMI/RFI protection
- UL TC-ER & c(UL) CIC TC approved
- MSHA approved
- 3 ground design for optimal electrical performance
- More flexible than Metal Clad and corrugated armor cables



### Technical Data:

Minimum Bending Radius for flexible use: 15 x cable diameter.

| Temperature:                                                                                               | Rated Voltage:                                                                                   | Color Code:                                                                                                                                          | Approvals:                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• -40°C to +90°C (ULTC)</li> <li>• -40°C to +105°C (UWM)</li> </ul> | <ul style="list-style-type: none"> <li>• 600V-UL TC.</li> <li>• 1000V-TC Wind Turbine</li> </ul> | <ul style="list-style-type: none"> <li>• Three black conductors with white number, printed one, two and three plus 3 symmetrical grounds.</li> </ul> | <ul style="list-style-type: none"> <li>UL: <ul style="list-style-type: none"> <li>• UL: Type TC-ER</li> <li>• UL Standard 1277, UL Standard 44</li> <li>• Sunlight resistant and direct burial</li> </ul> </li> <li>CSA: <ul style="list-style-type: none"> <li>• c(UL) CIC/TC FT4</li> </ul> </li> <li>Additional: <ul style="list-style-type: none"> <li>• MSHA: P-07-KA050010-MSHA</li> </ul> </li> </ul> |

| Part Number                | 3 Symmetrical Grounds | Diameter Over Shield<br>inches mm | Nominal Outer Diameter<br>inches mm | Copper Weight<br>lbs/mft | Approx. Weight<br>lbs/mft kg/km | SKINTOP®<br>MS-SC-M Brush<br>(Metric) |
|----------------------------|-----------------------|-----------------------------------|-------------------------------------|--------------------------|---------------------------------|---------------------------------------|
| 1 AWG (13/.0718 + 6/.0256) |                       |                                   |                                     |                          |                                 |                                       |
| 760103                     | 8 AWG                 | 1.05 26.7                         | 1.25 32.5                           | 1024                     | 1427 2124                       | 53112679                              |
| 1/0 AWG (19/.0745)         |                       |                                   |                                     |                          |                                 |                                       |
| 761103                     | 6 AWG                 | 1.15 29.2                         | 1.35 34.8                           | 1337                     | 1764 2625                       | 53112679                              |
| 2/0 AWG (19/.0837)         |                       |                                   |                                     |                          |                                 |                                       |
| 762203                     | 6 AWG                 | 1.21 30.7                         | 1.43 36.3                           | 1606                     | 2077 3091                       | 53112680                              |
| 3/0 AWG (19/.0940)         |                       |                                   |                                     |                          |                                 |                                       |
| 763303                     | 4 AWG                 | 1.32 33.5                         | 1.55 39.4                           | 2091                     | 2599 3868                       | 53112680                              |
| 4/0 AWG (19/.1055)         |                       |                                   |                                     |                          |                                 |                                       |
| 764403                     | 4 AWG                 | 1.43 36.3                         | 1.66 42.2                           | 2515                     | 3093 4603                       | 53112680                              |
| 250 KCMIL (37/.0822)       |                       |                                   |                                     |                          |                                 |                                       |
| 762503                     | 4 AWG                 | 1.57 39.9                         | 1.88 47.8                           | 3022                     | 3791 5641                       | 53112681                              |
| 350 KCMIL (37/.0973)       |                       |                                   |                                     |                          |                                 |                                       |
| 763503                     | 2 AWG                 | 1.81 46.0                         | 2.00 50.8                           | 4224                     | 5020 7470                       | 53112681                              |
| 500 KCMIL (37/.1162)       |                       |                                   |                                     |                          |                                 |                                       |
| 765003                     | 1/0 AWG               | 2.08 52.8                         | 2.43 61.6                           | 6058                     | 7012 10435                      | 53112501                              |

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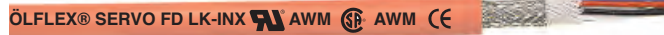
Flexible Control Cable



# Cables for Motors & Drives

## ÖLFLEX® SERVO FD LK-INX, Continuous Flex Servo Cable according to Indramat Standard INK

### Feedback/ Signal Cables:



### Servo Cables:



**Construction:** Finely stranded copper conductors in accordance with IEC 60228 Class.6. Pairs are insulated with special elastomeric material.

**Insulation:** Power conductors insulated with TPE, pairs in servo cables shielded with aluminum foil and tinned copper shield (not all pairs are shielded for feedback cables): overall tinned copper braid (85% coverage). **Jacket:** Specially formulated polyurethane jacket.

### Features:

ÖLFLEX® SERVO FD LK-INX is a highly flexible, oil resistant, UL, CSA, & CE power w/pairs and feedback/signal cable in accordance with Indramat standards. It is designed for continuous flex use and can be provided as a complete assembly.

### Applications:

Motor connections for Servo motors, Machine tool, Food & beverage, Automotive, Pick-n-place, Packaging industry, Multiaxis machinery and Material handling.

### Technical Data:

Minimum Bending Radius: Signal- 10 x cable diameter. Servo- 7.5 x cable diameter.



#### Temperature:

- Signal: -30°C to +80°C
- Servo: -10°C to +80°C



#### Rated Voltage:

- Supply Conductors: 600/1000V
- Feedback/Signal Cables: 300V



#### Color Code:

- Black with white numbers plus green/yellow ground.
- Signal Pairs: Black with White numbers 5/6, 7/8.
- Feedback Cables: See below.



#### Approvals:

##### Power Cables:

- UL: • AWM Style 20234
- CSA: • AWM II A/B FT1

##### Feedback Cables:

- UL: • AWM 20236
- CSA: • AWM II A/B FT1



| Part Number                   | AWG + Number of Conductors             | Indramat Part Number | Nominal Outer Diameter<br>inches mm | Copper Weight<br>lbs/mft | Approx. Weight<br>lbs/mft kg/km |
|-------------------------------|----------------------------------------|----------------------|-------------------------------------|--------------------------|---------------------------------|
| <b>Feedback/Signal Cables</b> |                                        |                      |                                     |                          |                                 |
| 7072400                       | 24 AWG/ 4pr + 18 AWG/ 2c               | INK-0209             | .346 8.8                            | 50                       | 84 120                          |
| 7072401                       | 24 AWG/ 4pr + 20 AWG/ 2c               | INK-0448             | .335 8.5                            | 47                       | 81 100                          |
| 7072402                       | 20 AWG/ 9c                             | INK-0208             | .346 8.8                            | 44                       | 85 126                          |
| 7072414                       | 18 AWG/ 4c + 26 AWG/ 4pr + 26 AWG/ 4c  | INK-0532             | .381 9.7                            | 54                       | 94 140                          |
| 7072415                       | 24 AWG/ 2pr (ISP) + 20 AWG/ 2c         | INK-0234             | .343 8.7                            | 31                       | 60 90                           |
| 7072416                       | 24 AWG/ 2pr + 20 AWG/ 2c               | INK-0750             | .299 7.6                            | 30                       | 62 92                           |
| <b>Servo Cables</b>           |                                        |                      |                                     |                          |                                 |
| 7072417                       | 19 AWG/ 4c + 20 AWG/ 1pr               | INK-0670             | .394 10.0                           | 73                       | 89 132                          |
| 7072403                       | 18 AWG/ 4c + 19 AWG/ 2pr               | INK-0653             | .453 11.5                           | 114                      | 152 226                         |
| 7072404                       | 16 AWG/ 4c + 19 AWG/ 2pr               | INK-0650             | .480 12.2                           | 127                      | 180 268                         |
| 7072405                       | 14 AWG/ 4c + 18 AWG/ 2pr               | INK-0602             | .594 15.1                           | 142                      | 215 320                         |
| 7072406                       | 12 AWG/ 4c + 18 AWG/ 1pr + 16 AWG/ 1pr | INK-0603             | .630 16.0                           | 206                      | 316 470                         |
| 7072407                       | 10 AWG/ 4c + 18 AWG/ 1pr + 16 AWG/ 1pr | INK-0604             | .740 18.8                           | 246                      | 403 600                         |
| 7072408                       | 8 AWG/ 4c + 18 AWG/ 1pr + 16 AWG/ 1pr  | INK-0605             | .866 22.0                           | 380                      | 571 850                         |
| 7072409                       | 6 AWG/ 4c + 16 AWG/ 2pr                | INK-0606             | .992 25.2                           | 450                      | 685 1020                        |
| 7072410                       | 4 AWG/ 4c + 16 AWG/ 2pr                | INK-0607             | 1.102 28.0                          | 655                      | 954 1420                        |

Lapp Part Numbers refer to genuine Lapp products. The Siemens Part Numbers (6FX5002/ 5008, 6FX 7002/ 7008, 6FX8002/ 8008, registered trademarks of Siemens AG) are for informational purposes only. DESINA® is a registered trademark of the Association of German Machine Tool Manufacturers.

### Color Code for Feedback Cables

| Part Number | Color Code                                                                                                                                                                                    |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7072400     | 24 AWG/ 4pr: Brown/Green, Gray/Pink, Blue/Violet, Red/Black<br>18 AWG/ 2c: White, Brown                                                                                                       |
| 7072401     | 24 AWG/ 4pr: Brown/Green, Gray/Pink, Blue/Violet, Red/Black<br>20 AWG/ 2c: White, Brown                                                                                                       |
| 7072402     | 20 AWG/ 9c: Green, Brown, Gray, Yellow, Black, Blue, Red, White, Pink                                                                                                                         |
| 7072414     | 26 AWG/ 4c: Yellow/Black, Brown/Black, Green/Black, Red/Black<br>26 AWG/ 4pr: Red & Black, Brown & Green, Yellow & Violet, White & Green<br>18 AWG/ 4c: White, Brown/Green, White/Green, Blue |
| 7072415     | 24 AWG/ 2pr: White & Brown, Gray & Pink<br>20 AWG/ 2c: Pink, Gray                                                                                                                             |
| 7072416     | 24 AWG/ 2pr: Red & Black, Gray & Pink<br>20 AWG/ 2c: White, Brown                                                                                                                             |
| 7072417     | 20 AWG/ 3c: 3- Black numbered 1, 2, 3 and green/yellow ground<br>19 AWG/ 2c: 2- Black numbered 5, 6                                                                                           |



## ÖLFLEX® 190/190 CY, Extremely Oil Resistant Flexible Control Cable. Now with UL MTW to Comply with NFPA 79 2007

ÖLFLEX® 190 16 AWG (1.5mm<sup>2</sup>) / 25C UL MTW RU AWM E63634- CSA AWM I/II A/B FT1 LL53776



ÖLFLEX® 190 CY 16 AWG (1.5mm<sup>2</sup>) / 4C UL MTW RU AWM E63634- CSA AWM I/II A/B FT1 600V 90°C FT1 L53776



**Construction:** Finely stranded bare copper conductors, Class 5. **Insulation:** Specially blended PVC/nylon insulation; dry lubricant, non-wicking fillers, gray inner PVC jacket; tinned copper braid (85% coverage). **Jacket:** Specially formulated oil resistant gray PVC jacket.

### Features:

Ölflex® 190/190 CY multi-conductor cable has the highest oil, coolant and solvent resistant PVC jacket for control and power applications in an industrial environment. ÖLFLEX® 190 is designed for use in all electrical equipment in dry, damp and wet conditions.

### Applications:

For Machinery: CNC machining centers, Grinding machines, Bottling equipment, Conveyors, Processing equipment, Assembly lines and Control panels.

### Technical Data:

Minimum Bending Radius: for installation- 4 x cable diameter. With shield- 6 x cable diameter.



#### Temperature:

- For flexible use:  
-5°C to +90°C
- For stationary use:  
-40°C to +90°C



#### Rated Voltage:

- Supply Conductors:  
600V
- Test Voltage:  
3000V



#### Color Code:

- Black with white numbers,  
plus green/yellow ground,  
2 conductor cable does not  
include ground.



#### Approvals:

- UL:
- AWM 2587 + 21098
  - Type MTW Oil Res I & II
  - UL 758 80°C
  - Conforms to NFPA 79 2007
- CSA:
- AWM I/II A/B FT 1
  - CSA C22.2.210.2
  - Sec. 7.6.12.1, 8.8.8
- Additional:
- Impact and Crush tests to UL 1277



### ÖLFLEX® 190: Oil Resistant Flexible Control Cable

| Part Number                         | Number of Conductors includes ground | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/ft | Copper Weight kg/m | Approx. Weight lbs/ft | Approx. Weight kg/m |
|-------------------------------------|--------------------------------------|-------------------------------|---------------------------|----------------------|--------------------|-----------------------|---------------------|
| 20 AWG (10/30) 0.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 602002                              | 2                                    | .253                          | 6.4                       | 7                    | 39                 | 58                    |                     |
| 602003                              | 3                                    | .265                          | 6.7                       | 10                   | 41                 | 61                    |                     |
| 602004                              | 4                                    | .285                          | 7.2                       | 13                   | 51                 | 76                    |                     |
| 602005                              | 5                                    | .308                          | 7.8                       | 17                   | 60                 | 89                    |                     |
| 602007                              | 7                                    | .331                          | 8.4                       | 23                   | 81                 | 120                   |                     |
| 602009                              | 9                                    | .409                          | 10.6                      | 30                   | 100                | 149                   |                     |
| 602012                              | 12                                   | .421                          | 10.7                      | 40                   | 168                | 250                   |                     |
| 602018                              | 18                                   | .487                          | 12.4                      | 60                   | 198                | 295                   |                     |
| 602025                              | 25                                   | .586                          | 14.9                      | 83                   | 243                | 361                   |                     |
| 18 AWG (19/30) 1.00 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601802                              | 2                                    | .277                          | 7.0                       | 13                   | 42                 | 63                    |                     |
| 601803                              | 3                                    | .291                          | 7.4                       | 19                   | 44                 | 66                    |                     |
| 601803NG                            | 3                                    | No Ground                     |                           |                      |                    |                       |                     |
| 601804                              | 4                                    | .314                          | 8.0                       | 25                   | 54                 | 81                    |                     |
| 601805                              | 5                                    | .340                          | 8.6                       | 31                   | 64                 | 95                    |                     |
| 601807                              | 7                                    | .367                          | 9.3                       | 44                   | 84                 | 125                   |                     |
| 601809                              | 9                                    | .454                          | 11.5                      | 56                   | 140                | 208                   |                     |
| 601812                              | 12                                   | .471                          | 12.0                      | 75                   | 142                | 211                   |                     |
| 601818                              | 18                                   | .579                          | 14.7                      | 113                  | 207                | 309                   |                     |
| 601825                              | 25                                   | .656                          | 16.4                      | 156                  | 277                | 413                   |                     |
| 601834                              | 34                                   | .953                          | 24.2                      | 213                  | 494                | 735                   |                     |
| 601841                              | 41                                   | 1.043                         | 26.5                      | 256                  | 558                | 830                   |                     |
| 601850                              | 50                                   | 1.110                         | 28.2                      | 313                  | 697                | 1038                  |                     |
| 16 AWG (28/30) 1.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601602                              | 2                                    | .303                          | 7.7                       | 18                   | 57                 | 85                    |                     |
| 601603                              | 3                                    | .319                          | 8.1                       | 27                   | 61                 | 91                    |                     |
| 601604                              | 4                                    | .345                          | 8.8                       | 36                   | 75                 | 112                   |                     |
| 601605                              | 5                                    | .375                          | 9.5                       | 45                   | 91                 | 136                   |                     |
| 601607                              | 7                                    | .406                          | 10.3                      | 64                   | 120                | 179                   |                     |
| 601609                              | 9                                    | .509                          | 12.9                      | 82                   | 180                | 268                   |                     |
| 601612                              | 12                                   | .557                          | 14.2                      | 109                  | 210                | 313                   |                     |
| 601618                              | 18                                   | .644                          | 16.4                      | 163                  | 298                | 444                   |                     |
| 601625                              | 25                                   | .733                          | 18.6                      | 227                  | 416                | 620                   |                     |
| 601634                              | 34                                   | 1.044                         | 26.5                      | 309                  | 946                | 1408                  |                     |
| 14 AWG (46/30) 2.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601641                              | 41                                   | 1.144                         | 29.1                      | 372                  | 1230               | 1830                  |                     |
| 601650                              | 50                                   | 1.219                         | 30.1                      | 454                  | 1500               | 2232                  |                     |
| 601661                              | 61                                   | 1.294                         | 32.9                      | 554                  | 1800               | 2679                  |                     |
| 12 AWG (56/0117) 4 mm <sup>2</sup>  |                                      |                               |                           |                      |                    |                       |                     |
| 601402                              | 2                                    | .337                          | 8.6                       | 30                   | 87                 | 130                   |                     |
| 601403                              | 3                                    | .356                          | 9.0                       | 45                   | 93                 | 138                   |                     |
| 601404                              | 4                                    | .386                          | 9.8                       | 60                   | 122                | 182                   |                     |
| 601405                              | 5                                    | .421                          | 10.7                      | 75                   | 145                | 216                   |                     |
| 601407                              | 7                                    | .457                          | 11.6                      | 105                  | 192                | 286                   |                     |
| 601409                              | 9                                    | .609                          | 15.5                      | 135                  | 271                | 403                   |                     |
| 601412                              | 12                                   | .628                          | 16.0                      | 179                  | 402                | 598                   |                     |
| 601418                              | 18                                   | .729                          | 18.5                      | 269                  | 575                | 855                   |                     |
| 601425                              | 25                                   | .872                          | 22.2                      | 374                  | 860                | 1280                  |                     |
| 10 AWG (82/0117) 6 mm <sup>2</sup>  |                                      |                               |                           |                      |                    |                       |                     |
| 601203                              | 3                                    | .417                          | 10.6                      | 75                   | 156                | 232                   |                     |
| 601204                              | 4                                    | .454                          | 11.5                      | 100                  | 198                | 295                   |                     |
| 601205                              | 5                                    | .497                          | 12.6                      | 125                  | 238                | 354                   |                     |
| 601207                              | 7                                    | .573                          | 14.6                      | 176                  | 363                | 540                   |                     |
| 601211                              | 11                                   | .745                          | 18.9                      | 276                  | 398                | 592                   |                     |
| 8 AWG (72/26) 10 mm <sup>2</sup>    |                                      |                               |                           |                      |                    |                       |                     |
| 600804                              | 4                                    | .695                          | 17.7                      | 245                  | 435                | 648                   |                     |
| 600805                              | 5                                    | .764                          | 19.4                      | 306                  | 525                | 782                   |                     |
| 6 AWG (115/26) 16 mm <sup>2</sup>   |                                      |                               |                           |                      |                    |                       |                     |
| 600604                              | 4                                    | .870                          | 22.1                      | 393                  | 698                | 1040                  |                     |
| 600605                              | 5                                    | .955                          | 24.3                      | 491                  | 842                | 1254                  |                     |
| 4 AWG (182/0157) 25 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 600404                              | 4                                    | 1.184                         | 30.1                      | 541                  | 1007               | 1501                  |                     |
| 600405                              | 5                                    | 1.306                         | 33.2                      | 676                  | 1244               | 1853                  |                     |
| 2 AWG (280/0157) 35 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 600204                              | 4                                    | 1.316                         | 33.4                      | 853                  | 1422               | 2119                  |                     |
| 600205                              | 5                                    | 1.454                         | 36.9                      | 1066                 | 1749               | 2606                  |                     |

### ÖLFLEX® 190 CY: Shielded Oil Resistant Flexible Control Cable

| Part Number                         | Number of Conductors includes ground | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/ft | Copper Weight kg/m | Approx. Weight lbs/ft | Approx. Weight kg/m |
|-------------------------------------|--------------------------------------|-------------------------------|---------------------------|----------------------|--------------------|-----------------------|---------------------|
| 20 AWG (10/30) 0.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 602002CY                            | 2                                    | .329                          | 8.4                       | 23                   | 65                 | 97                    |                     |
| 602003CY                            | 3                                    | .341                          | 8.7                       | 27                   | 82                 | 122                   |                     |
| 602007CY                            | 7                                    | .407                          | 10.3                      | 48                   | 112                | 167                   |                     |
| 602012CY                            | 12                                   | .497                          | 12.6                      | 71                   | 180                | 268                   |                     |
| 602025CY                            | 25                                   | .678                          | 17.2                      | 137                  | 296                | 441                   |                     |
| 18 AWG (19/30) 1.00 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601802CY                            | 2                                    | .353                          | 9.0                       | 26                   | 75                 | 112                   |                     |
| 601803CY                            | 3                                    | .367                          | 9.3                       | 34                   | 82                 | 122                   |                     |
| 601804CY                            | 4                                    | .390                          | 9.9                       | 46                   | 105                | 157                   |                     |
| 601805CY                            | 5                                    | .416                          | 10.6                      | 54                   | 123                | 183                   |                     |
| 601807CY                            | 7                                    | .443                          | 11.3                      | 68                   | 139                | 207                   |                     |
| 601812CY                            | 12                                   | .554                          | 14.1                      | 107                  | 230                | 342                   |                     |
| 601818CY                            | 18                                   | .678                          | 17.2                      | 162                  | 317                | 472                   |                     |
| 601825CY                            | 25                                   | .764                          | 19.4                      | 213                  | 435                | 648                   |                     |
| 16 AWG (28/30) 1.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601603CY                            | 3                                    | .395                          | 10.0                      | 48                   | 111                | 166                   |                     |
| 601604CY                            | 4                                    | .421                          | 10.7                      | 61                   | 128                | 191                   |                     |
| 601605CY                            | 5                                    | .451                          | 11.5                      | 70                   | 149                | 222                   |                     |
| 601607CY                            | 7                                    | .482                          | 12.2                      | 91                   | 181                | 270                   |                     |
| 601612CY                            | 12                                   | .656                          | 16.7                      | 156                  | 311                | 464                   |                     |
| 601618CY                            | 18                                   | .743                          | 18.9                      | 219                  | 456                | 679                   |                     |
| 601625CY                            | 25                                   | .897                          | 22.8                      | 292                  | 639                | 952                   |                     |
| 14 AWG (46/30) 2.50 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 601403CY                            | 3                                    | .432                          | 11.0                      | 69                   | 148                | 221                   |                     |
| 601404CY                            | 4                                    | .462                          | 11.7                      | 86                   | 181                | 269                   |                     |
| 601405CY                            | 5                                    | .497                          | 12.6                      | 106                  | 218                | 325                   |                     |
| 601407CY                            | 7                                    | .572                          | 14.5                      | 136                  | 283                | 421                   |                     |
| 601412CY                            | 12                                   | .736                          | 18.7                      | 226                  | 516                | 769                   |                     |
| 601418CY                            | 18                                   | .905                          | 23.0                      | 334                  | 740                | 1102                  |                     |
| 12 AWG (56/0117) 4 mm <sup>2</sup>  |                                      |                               |                           |                      |                    |                       |                     |
| 601203CY                            | 3                                    | .500                          | 12.7                      | 115                  | 226                | 337                   |                     |
| 601204CY                            | 4                                    | .585                          | 14.9                      | 146                  | 310                | 462                   |                     |
| 601205CY                            | 5                                    | .628                          | 15.9                      | 172                  | 359                | 535                   |                     |
| 601207CY                            | 7                                    | .672                          | 17.1                      | 225                  | 493                | 735                   |                     |
| 10 AWG (82/0117) 6 mm <sup>2</sup>  |                                      |                               |                           |                      |                    |                       |                     |
| 601003CY                            | 3                                    | .623                          | 15.8                      | 155                  | 311                | 463                   |                     |
| 601004CY                            | 4                                    | .669                          | 17.0                      | 196                  | 385                | 574                   |                     |
| 601005CY                            | 5                                    | .731                          | 18.6                      | 238                  | 474                | 706                   |                     |
| 601007CY                            | 7                                    | .786                          | 20.0                      | 316                  | 638                | 950                   |                     |
| 8 AWG (72/26) 10 mm <sup>2</sup>    |                                      |                               |                           |                      |                    |                       |                     |
| 600804CY                            | 4                                    | .803                          | 20.4                      | 305                  | 569                | 848                   |                     |
| 6 AWG (115/26) 16 mm <sup>2</sup>   |                                      |                               |                           |                      |                    |                       |                     |
| 600604CY                            | 4                                    | .994                          | 25.2                      | 467                  | 1114               | 1660                  |                     |
| 4 AWG (182/0157) 25 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 600404CY                            | 4                                    | 1.324                         | 33.6                      | 637                  | 1266               | 1886                  |                     |
| 2 AWG (280/0157) 35 mm <sup>2</sup> |                                      |                               |                           |                      |                    |                       |                     |
| 600204CY                            | 4                                    | 1.468                         | 37.3                      | 969                  | 2189               | 3261                  |                     |

\*2 conductor cable does not include ground wire.



**LAPP GROUP**

Flexible Control Cable



**LAPP Tannehill**

## ÖLFLEX® FD 890/890CY, Super Flexible, Heavy Duty, Continuous Flex Control Cable



**Construction:** Finely stranded bare copper conductors, better than VDE 0295, Class 6.

**Insulation:** Specially blended PVC insulation, dry lubricant, conductors cabled with non-wicking textile wrap, black inner PVC jacket, tinned copper braid (85% coverage). **Jacket:** Specially formulated UV and oil resistant PVC jacket.

### Features:

ÖLFLEX® FD 890/890CY is a super flexible, heavy duty, multi-conductor cable designed for continuous flex applications. Superior stranding, specially formulated PVC insulation and jacket compounds optimize flex life and provide excellent resistance to mineral oils, synthetic oils and water based coolants.

### Applications:

Gantry robots, Cable tracks, Pick and place units, Conveyor systems, Machine tools and other continuous flexing applications.

### Technical Data:

Minimum Bending Radius: for continuous flexing-7.5 x cable diameter. With shield: 10 x cable diameter.



#### Temperature:

- For flexible use:  
-5°C to +90°C
- For stationary use:  
-40°C to +90°C



#### Rated Voltage:

- UL/CSA: 600V



#### Color Code:

- Red with numbered cores, plus green/yellow ground.
- Optional: Other color codes available upon request.



#### Approvals:

- UL:
  - UL-AWM 2587 + 21098
  - Passes Oil Res I/II + UL 758 80°C test
- CSA:
  - CSA-AWM I/II A/B FT 1
  - CSA C22.2 210.2
  - Sec. 7.6.12.1, 8.8.8-Oil Resistance Tests
- Additional:
  - Based on VDE specifications.

\*Passes Impact and Crush tests to UL 1277, excluding 20 AWG designs (Same requirement for Exposed Run)

### ÖLFLEX FD® 890: Super Flexible Heavy Duty Continuous Flex Control Cable

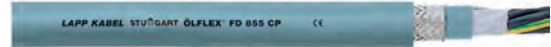
| Part Number                          | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mt | kg/mt | Approx. Weight lbs/mt | kg/mt |
|--------------------------------------|--------------------------------------|-------------------------------|------|----------------------|-------|-----------------------|-------|
| 20 AWG (74/38) 0.50 mm <sup>2</sup>  |                                      |                               |      |                      |       |                       |       |
| 892003                               | 3                                    | .264                          | 6.7  | 10                   | 43    | 64                    |       |
| 892004                               | 4                                    | .291                          | 7.4  | 13                   | 49    | 73                    |       |
| 892005                               | 5                                    | .323                          | 8.2  | 17                   | 54    | 80                    |       |
| 892007                               | 7                                    | .382                          | 9.7  | 23                   | 75    | 112                   |       |
| 892012                               | 12                                   | .457                          | 11.6 | 40                   | 124   | 185                   |       |
| 892018                               | 18                                   | .539                          | 13.7 | 60                   | 183   | 273                   |       |
| 892025                               | 25                                   | .677                          | 17.2 | 83                   | 265   | 395                   |       |
| 892034                               | 34                                   | .756                          | 19.2 | 113                  | 339   | 504                   |       |
| 18 AWG (114/38) 0.75 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891803                               | 3                                    | .287                          | 7.3  | 19                   | 46    | 68                    |       |
| 891804                               | 4                                    | .327                          | 8.3  | 25                   | 60    | 89                    |       |
| 891805                               | 5                                    | .354                          | 9.0  | 31                   | 74    | 110                   |       |
| 891807                               | 7                                    | .429                          | 10.9 | 44                   | 102   | 152                   |       |
| 891812                               | 12                                   | .500                          | 12.7 | 75                   | 158   | 236                   |       |
| 891815                               | 15                                   | .559                          | 14.2 | 94                   | 202   | 301                   |       |
| 891818                               | 18                                   | .614                          | 15.5 | 113                  | 234   | 348                   |       |
| 891825                               | 25                                   | .763                          | 19.4 | 156                  | 336   | 501                   |       |
| 891834                               | 34                                   | .826                          | 20.9 | 213                  | 434   | 646                   |       |
| 16 AWG (190/38) 1.50 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891603                               | 3                                    | .323                          | 8.2  | 27                   | 79    | 118                   |       |
| 891604                               | 4                                    | .358                          | 9.1  | 36                   | 99    | 148                   |       |
| 891605                               | 5                                    | .393                          | 9.9  | 45                   | 124   | 185                   |       |
| 14 AWG (320/38) 2.50 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891404                               | 4                                    | .456                          | 11.6 | 60                   | 148   | 220                   |       |
| 891407                               | 7                                    | .614                          | 15.6 | 105                  | 227   | 338                   |       |
| 12 AWG (512/38) 4 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 891204                               | 4                                    | .531                          | 13.5 | 100                  | 208   | 310                   |       |
| 891207                               | 7                                    | .740                          | 18.8 | 176                  | 335   | 499                   |       |
| 10 AWG (343/34) 6 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 891004                               | 4                                    | .626                          | 15.9 | 147                  | 275   | 410                   |       |
| 8 AWG (301/32) 10 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890804                               | 4                                    | .744                          | 18.9 | 245                  | 481   | 716                   |       |
| 6 AWG (483/32) 16 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890604                               | 4                                    | .909                          | 23.1 | 393                  | 709   | 1055                  |       |
| 4 AWG (768/32) 25 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890404                               | 4                                    | 1.059                         | 26.9 | 541                  | 1005  | 1496                  |       |
| 2 AWG (1026/32) 35 mm <sup>2</sup>   |                                      |                               |      |                      |       |                       |       |
| 890204                               | 4                                    | 1.252                         | 31.8 | 853                  | 1240  | 1846                  |       |

### ÖLFLEX FD® 890 CY: Shielded Super Flexible Heavy Duty Continuous Flex Control Cable

| Part Number                          | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mt | kg/mt | Approx. Weight lbs/mt | kg/mt |
|--------------------------------------|--------------------------------------|-------------------------------|------|----------------------|-------|-----------------------|-------|
| 20 AWG (74/38) 0.50 mm <sup>2</sup>  |                                      |                               |      |                      |       |                       |       |
| 892003CY                             | 3                                    | .342                          | 8.7  | 27                   | 82    | 122                   |       |
| 892004CY                             | 4                                    | .370                          | 9.4  | 32                   | 97    | 145                   |       |
| 892005CY                             | 5                                    | .409                          | 10.4 | 38                   | 108   | 161                   |       |
| 892007CY                             | 7                                    | .468                          | 11.9 | 48                   | 137   | 204                   |       |
| 892012CY                             | 12                                   | .551                          | 14.0 | 71                   | 214   | 319                   |       |
| 892018CY                             | 18                                   | .657                          | 16.7 | 101                  | 293   | 436                   |       |
| 892025CY                             | 25                                   | .803                          | 20.4 | 137                  | 421   | 627                   |       |
| 892034CY                             | 34                                   | .874                          | 22.2 | 196                  | 495   | 737                   |       |
| 18 AWG (114/38) 0.75 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891803CY                             | 3                                    | .375                          | 9.5  | 34                   | 91    | 136                   |       |
| 891804CY                             | 4                                    | .419                          | 10.6 | 46                   | 112   | 167                   |       |
| 891805CY                             | 5                                    | .447                          | 11.4 | 54                   | 131   | 195                   |       |
| 891807CY                             | 7                                    | .528                          | 13.4 | 68                   | 185   | 275                   |       |
| 891812CY                             | 12                                   | .636                          | 16.2 | 107                  | 271   | 404                   |       |
| 891818CY                             | 18                                   | .719                          | 18.3 | 162                  | 357   | 532                   |       |
| 891825CY                             | 25                                   | .887                          | 22.5 | 213                  | 523   | 780                   |       |
| 891834CY                             | 34                                   | .986                          | 25.0 | 273                  | 660   | 984                   |       |
| 16 AWG (190/38) 1.50 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891603CY                             | 3                                    | .409                          | 10.4 | 48                   | 115   | 171                   |       |
| 891604CY                             | 4                                    | .444                          | 11.3 | 61                   | 147   | 219                   |       |
| 891605CY                             | 5                                    | .480                          | 12.2 | 70                   | 163   | 243                   |       |
| 891607CY                             | 7                                    | .598                          | 15.2 | 91                   | 247   | 368                   |       |
| 14 AWG (320/38) 2.50 mm <sup>2</sup> |                                      |                               |      |                      |       |                       |       |
| 891404CY                             | 4                                    | .551                          | 14.0 | 86                   | 181   | 269                   |       |
| 891407CY                             | 7                                    | .709                          | 18.0 | 136                  | 347   | 517                   |       |
| 891418CY                             | 18                                   | 1.012                         | 25.7 | 368                  | 762   | 1134                  |       |
| 12 AWG (512/38) 4 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 891204CY                             | 4                                    | .650                          | 16.5 | 146                  | 245   | 365                   |       |
| 891207CY                             | 7                                    | .858                          | 21.8 | 225                  | 517   | 769                   |       |
| 10 AWG (343/34) 6 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 891004CY                             | 4                                    | .752                          | 19.1 | 196                  | 339   | 505                   |       |
| 8 AWG (301/32) 10 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890804CY                             | 4                                    | .882                          | 22.4 | 305                  | 701   | 1043                  |       |
| 6 AWG (483/32) 16 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890604CY                             | 4                                    | 1.066                         | 27.1 | 467                  | 986   | 1467                  |       |
| 4 AWG (768/32) 25 mm <sup>2</sup>    |                                      |                               |      |                      |       |                       |       |
| 890404CY                             | 4                                    | 1.227                         | 31.2 | 637                  | 1387  | 2065                  |       |
| 2 AWG (1026/32) 35 mm <sup>2</sup>   |                                      |                               |      |                      |       |                       |       |
| 890204CY                             | 4                                    | 1.430                         | 36.3 | 969                  | 1686  | 2510                  |       |



## ÖLFLEX® FD 855 P/855 CP, Halogen-Free, Continuous Flex Cable for Extremely Small Bend Radius Applications



**Construction:** Finely stranded bare copper conductors, extra fine wire per VDE 0295, Class 6, IEC 60228 CL.6.

**Insulation:** TPE insulation, textile wrap. **Jacket:** Specially formulated UV resistant gray polyurethane outer jacket.

### Features:

ÖLFLEX® FD 855 P is designed for extreme mechanical stresses due to tighter bend radius for continuous flexing. The materials used are halogen-free and environmentally friendly with an expanded temperature range. Insulation and jacketing material are mechanically and chemically resistant to many environments. The polyurethane jacket is flame retardant.

### Applications:

Can be use in the most automated manufacturing systems. Excellent in cable track continuous flexing applications.

### Technical Data:

Minimum bending radius: for continuous flexing: 5 x cable diameter. With shield: 7.5 x cable diameter.



|  |                                                                                                                           |  |                       |  |                                                                                                       |  |                                |
|--|---------------------------------------------------------------------------------------------------------------------------|--|-----------------------|--|-------------------------------------------------------------------------------------------------------|--|--------------------------------|
|  | <b>Temperature:</b>                                                                                                       |  | <b>Rated Voltage:</b> |  | <b>Color Code:</b>                                                                                    |  | <b>Approvals:</b>              |
|  | <ul style="list-style-type: none"> <li>For flexing: -40°C to +80°C</li> <li>For stationary use: -50°C to +80°C</li> </ul> |  | • 300/500V            |  | <ul style="list-style-type: none"> <li>Black with white numbers, plus green/yellow ground.</li> </ul> |  | • Based on VDE Specifications. |

### ÖLFLEX® FD 855 P: Halogen-Free Continuous Flex Cable

| Part Number                         | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km | Part Number                          | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km |
|-------------------------------------|--------------------------------------|-------------------------------|------|-----------------------|------------------------|-------|--------------------------------------|--------------------------------------|-------------------------------|------|-----------------------|------------------------|-------|
| 21 AWG (28/34) 0.50 mm <sup>2</sup> |                                      |                               |      |                       |                        |       | 0027562                              | 4                                    | .295                          | 7.5  | 26                    | 47                     | 70    |
| 0027530                             | 2                                    | .213                          | 5.4  | 7                     | 23                     | 34    | 0027563                              | 5                                    | .319                          | 8.1  | 32                    | 62                     | 93    |
| 0027531                             | 3                                    | .232                          | 5.9  | 9                     | 27                     | 40    | 0027564                              | 7                                    | .386                          | 9.8  | 45                    | 82                     | 122   |
| 0027532                             | 5                                    | .272                          | 6.9  | 16                    | 37                     | 55    | 0027565                              | 12                                   | .457                          | 11.6 | 77                    | 132                    | 196   |
| 0027533                             | 6                                    | .291                          | 7.4  | 19                    | 42                     | 63    | 0027566                              | 18                                   | .555                          | 14.1 | 116                   | 184                    | 274   |
| 0027534                             | 7                                    | .315                          | 8.0  | 23                    | 51                     | 76    | 0027568                              | 25                                   | .681                          | 17.3 | 161                   | 259                    | 385   |
| 0027535                             | 12                                   | .374                          | 9.5  | 39                    | 77                     | 114   | 16 AWG (84/34) 1.50 mm <sup>2</sup>  |                                      |                               |      |                       |                        |       |
| 0027536                             | 18                                   | .445                          | 11.3 | 58                    | 111                    | 165   | 0027575                              | 2                                    | .276                          | 7.0  | 19                    | 46                     | 68    |
| 0027537                             | 20                                   | .469                          | 11.9 | 65                    | 121                    | 180   | 0027576                              | 3                                    | .299                          | 7.6  | 29                    | 56                     | 83    |
| 0027538                             | 25                                   | .543                          | 13.8 | 81                    | 147                    | 219   | 0027586                              | 4                                    | .327                          | 8.3  | 39                    | 67                     | 100   |
| 0027540                             | 30                                   | .551                          | 14.0 | 97                    | 169                    | 251   | 0027577                              | 5                                    | .366                          | 9.3  | 48                    | 86                     | 128   |
| 0027541                             | 36                                   | .594                          | 15.1 | 195                   | 195                    | 290   | 0027578                              | 7                                    | .437                          | 11.1 | 68                    | 119                    | 177   |
| 19 AWG (42/34) 0.75 mm <sup>2</sup> |                                      |                               |      |                       |                        |       | 0027579                              | 12                                   | .516                          | 13.1 | 116                   | 185                    | 275   |
| 0027545                             | 2                                    | .232                          | 5.9  | 9                     | 28                     | 42    | 0027580                              | 18                                   | .618                          | 15.7 | 174                   | 272                    | 405   |
| 0027546                             | 3                                    | .252                          | 6.4  | 15                    | 34                     | 50    | 0027581                              | 20                                   | .646                          | 16.4 | 194                   | 304                    | 453   |
| 0027547                             | 4                                    | .276                          | 7.0  | 19                    | 40                     | 60    | 0027582                              | 25                                   | .760                          | 19.3 | 242                   | 380                    | 565   |
| 0027548                             | 5                                    | .299                          | 7.6  | 24                    | 48                     | 71    | 0027585                              | 36                                   | .835                          | 21.2 | 348                   | 510                    | 759   |
| 0027549                             | 7                                    | .358                          | 9.1  | 34                    | 67                     | 99    | 0027587                              | 41                                   | .906                          | 23.0 | 413                   | 657                    | 978   |
| 0027550                             | 12                                   | .421                          | 10.7 | 58                    | 106                    | 158   | 14 AWG (140/34) 2.50 mm <sup>2</sup> |                                      |                               |      |                       |                        |       |
| 0027551                             | 18                                   | .504                          | 12.8 | 87                    | 147                    | 219   | 0027370                              | 3                                    | .362                          | 9.2  | 48                    | 81                     | 121   |
| 0027552                             | 20                                   | .539                          | 13.7 | 97                    | 161                    | 240   | 0027371                              | 4                                    | .402                          | 10.2 | 65                    | 110                    | 163   |
| 0027553                             | 25                                   | .630                          | 16.0 | 121                   | 208                    | 309   | 0027372                              | 5                                    | .449                          | 11.4 | 81                    | 132                    | 196   |
| 0027555                             | 36                                   | .685                          | 17.4 | 174                   | 276                    | 411   | 0027373                              | 7                                    | .543                          | 13.8 | 113                   | 179                    | 266   |
| 18 AWG (56/34) 1.00 mm <sup>2</sup> |                                      |                               |      |                       |                        |       | 0027374                              | 12                                   | .642                          | 16.3 | 194                   | 300                    | 446   |
| 0027560                             | 2                                    | .248                          | 6.3  | 13                    | 34                     | 50    | 0027375                              | 18                                   | .764                          | 19.4 | 290                   | 447                    | 665   |
| 0027561                             | 3                                    | .272                          | 6.9  | 19                    | 41                     | 61    | 0027376                              | 25                                   | .949                          | 24.1 | 403                   | 624                    | 929   |

### ÖLFLEX® FD 855 CP: Shielded Halogen-Free Continuous Flex Cable

| Part Number                         | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km | Part Number                          | Number of Conductors includes ground | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km |
|-------------------------------------|--------------------------------------|-------------------------------|------|-----------------------|------------------------|-------|--------------------------------------|--------------------------------------|-------------------------------|------|-----------------------|------------------------|-------|
| 21 AWG (28/34) 0.50 mm <sup>2</sup> |                                      |                               |      |                       |                        |       | 18 AWG (56/34) 1.00 mm <sup>2</sup>  |                                      |                               |      |                       |                        | 93    |
| 0027605                             | 2                                    | .280                          | 7.1  | 22                    | 45                     | 67    | 0027635                              | 2                                    | .315                          | 8.0  | 30                    | 62                     | 109   |
| 0027606                             | 3                                    | .291                          | 7.4  | 27                    | 53                     | 79    | 0027636                              | 3                                    | .335                          | 8.5  | 37                    | 73                     | 126   |
| 0027607                             | 5                                    | .339                          | 8.6  | 36                    | 72                     | 107   | 0027637                              | 4                                    | .362                          | 9.2  | 46                    | 85                     | 147   |
| 0027608                             | 6                                    | .358                          | 9.1  | 40                    | 81                     | 121   | 0027638                              | 5                                    | .394                          | 10.0 | 54                    | 99                     | 196   |
| 0027609                             | 7                                    | .386                          | 9.8  | 45                    | 89                     | 132   | 0027639                              | 7                                    | .465                          | 11.8 | 71                    | 132                    | 292   |
| 0027610                             | 12                                   | .453                          | 11.5 | 65                    | 128                    | 190   | 0027640                              | 12                                   | .535                          | 13.6 | 118                   | 196                    | 418   |
| 0027611                             | 18                                   | .524                          | 13.3 | 88                    | 165                    | 245   | 0027641                              | 18                                   | .654                          | 16.6 | 163                   | 281                    | 575   |
| 0027612                             | 20                                   | .547                          | 13.9 | 105                   | 189                    | 281   | 0027643                              | 25                                   | .783                          | 19.9 | 221                   | 386                    |       |
| 0027613                             | 25                                   | .638                          | 16.2 | 128                   | 247                    | 367   | 16 AWG (84/34) 1.50 mm <sup>2</sup>  |                                      |                               |      |                       |                        | 115   |
| 0027615                             | 30                                   | .646                          | 16.4 | 149                   | 274                    | 408   | 0027649                              | 2                                    | .339                          | 8.6  | 39                    | 77                     | 139   |
| 0027616                             | 36                                   | .685                          | 17.4 | 169                   | 308                    | 459   | 0027650                              | 3                                    | .366                          | 9.3  | 51                    | 93                     | 156   |
| 19 AWG (42/34) 0.75 mm <sup>2</sup> |                                      |                               |      |                       |                        |       | 0027661                              | 4                                    | .402                          | 10.2 | 61                    | 105                    | 198   |
| 0027620                             | 2                                    | .303                          | 7.7  | 27                    | 53                     | 79    | 0027651                              | 5                                    | .445                          | 11.3 | 75                    | 133                    | 254   |
| 0027621                             | 3                                    | .315                          | 8.0  | 32                    | 65                     | 96    | 0027652                              | 7                                    | .508                          | 12.9 | 97                    | 171                    | 416   |
| 0027622                             | 4                                    | .339                          | 8.6  | 39                    | 75                     | 112   | 0027653                              | 12                                   | .606                          | 15.4 | 163                   | 280                    | 564   |
| 0027623                             | 5                                    | .370                          | 9.4  | 44                    | 85                     | 126   | 0027654                              | 18                                   | .713                          | 18.1 | 233                   | 379                    | 851   |
| 0027624                             | 7                                    | .437                          | 11.1 | 57                    | 111                    | 165   | 0027656                              | 25                                   | .843                          | 21.4 | 327                   | 572                    |       |
| 0027625                             | 12                                   | .500                          | 12.7 | 85                    | 155                    | 231   | 14 AWG (140/34) 2.50 mm <sup>2</sup> |                                      |                               |      |                       |                        | 194   |
| 0027626                             | 18                                   | .591                          | 15.0 | 133                   | 222                    | 330   | 0027380                              | 3                                    | .437                          | 11.1 | 74                    | 130                    | 234   |
| 0027627                             | 20                                   | .638                          | 16.2 | 143                   | 256                    | 381   | 0027381                              | 4                                    | .476                          | 12.1 | 91                    | 157                    | 293   |
| 0027628                             | 25                                   | .717                          | 18.2 | 174                   | 308                    | 459   | 0027382                              | 5                                    | .520                          | 13.2 | 121                   | 197                    | 418   |
| 0027629                             | 30                                   | .720                          | 18.3 | 199                   | 341                    | 508   | 0027383                              | 7                                    | .634                          | 16.1 | 165                   | 281                    | 629   |
| 0027630                             | 36                                   | .787                          | 20.0 | 234                   | 406                    | 605   | 0027384                              | 12                                   | .728                          | 18.5 | 253                   | 423                    | 912   |
|                                     |                                      |                               |      |                       |                        |       | 0027385                              | 18                                   | .870                          | 22.1 | 382                   | 613                    | 1266  |
|                                     |                                      |                               |      |                       |                        |       | 0027386                              | 25                                   | 1.035                         | 26.3 | 514                   | 851                    |       |



## UNITRONIC® FD, Multi-Conductor, Unshielded

LAPP KABEL STUTTGART UNITRONIC®-FD



**Construction:** Finely stranded bare copper conductors, super fine wire, per VDE 0295.

**Insulation:** Specially blended PVC insulation, dry lubricant, non-wicking textile wrap. **Jacket:** Specially formulated gray PVC jacket.

### Features:

UNITRONIC® FD series of DIN style communication cables are designed for continuous flexing in industrial signal and bus applications. The specially blended PVC jacket is resistant to most oils, solvents and water based coolants and is resistant to adjacent cable adherence in cable track installation.

### Applications:

High Speed Automated Equipment, Robotics, CNC, Multi-Axis cutting equipment.



### Technical Data:

Minimum Bending Radius for continuous flexing: 5 x cable diameter.



#### Temperature:

- For flexing: -5°C to +70°C
- For fixed installations: -40°C to +70°C



#### Rated Voltage:

- 250V



#### Color Code:

- DIN 47100, See chart 8



#### Approvals:

- Based on VDE specifications.

| Part Number                         | Number of Conductors | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/mft | Approx. Weight lbs/mft | Approx. Weight kg/km | Part Number                         | Number of Conductors | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/mft | Approx. Weight lbs/mft | Approx. Weight kg/km |
|-------------------------------------|----------------------|-------------------------------|---------------------------|-----------------------|------------------------|----------------------|-------------------------------------|----------------------|-------------------------------|---------------------------|-----------------------|------------------------|----------------------|
| 26 AWG (18/38) 0.14 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      | 22 AWG (42/38) 0.34 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      |
| 0027841                             | 3                    | .161                          | 4.1                       | 3                     | 17                     | 26                   | 0027870                             | 2                    | .193                          | 4.9                       | 5                     | 20                     | 30                   |
| 0027842                             | 4                    | .173                          | 4.4                       | 4                     | 21                     | 31                   | 0027871                             | 3                    | .205                          | 5.2                       | 7                     | 29                     | 43                   |
| 0027843                             | 5                    | .185                          | 4.7                       | 5                     | 24                     | 35                   | 0027872                             | 4                    | .224                          | 5.7                       | 9                     | 38                     | 57                   |
| 0027844                             | 7                    | .213                          | 5.4                       | 7                     | 34                     | 50                   | 0027873                             | 5                    | .244                          | 6.2                       | 12                    | 44                     | 65                   |
| 0027845                             | 10                   | .252                          | 6.4                       | 9                     | 42                     | 63                   | 0027874                             | 7                    | .280                          | 7.1                       | 16                    | 57                     | 85                   |
| 0027846                             | 14                   | .256                          | 6.5                       | 13                    | 52                     | 77                   | 0027875                             | 10                   | .346                          | 8.8                       | 23                    | 79                     | 117                  |
| 0027847                             | 18                   | .283                          | 7.1                       | 17                    | 61                     | 91                   | 0027876                             | 14                   | .350                          | 8.9                       | 33                    | 101                    | 151                  |
| 0027848                             | 25                   | .339                          | 8.6                       | 23                    | 84                     | 125                  | 0027877                             | 18                   | .394                          | 10.0                      | 42                    | 122                    | 182                  |
| 24 AWG (32/38) 0.25 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      | 0027878                             | 25                   | .484                          | 12.3                      | 58                    | 168                    | 250                  |
| 0027855                             | 2                    | .181                          | 4.6                       | 3                     | 18                     | 27                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027856                             | 3                    | .185                          | 4.7                       | 4                     | 22                     | 33                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027857                             | 4                    | .201                          | 5.1                       | 6                     | 27                     | 40                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027858                             | 5                    | .220                          | 5.6                       | 7                     | 34                     | 51                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027859                             | 7                    | .252                          | 6.4                       | 10                    | 43                     | 64                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027860                             | 10                   | .303                          | 7.7                       | 15                    | 56                     | 84                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027861                             | 14                   | .307                          | 7.8                       | 21                    | 73                     | 108                  |                                     |                      |                               |                           |                       |                        |                      |
| 0027863                             | 18                   | .346                          | 8.8                       | 26                    | 87                     | 130                  |                                     |                      |                               |                           |                       |                        |                      |
| 0027865                             | 25                   | .425                          | 10.8                      | 37                    | 120                    | 178                  |                                     |                      |                               |                           |                       |                        |                      |

## Color Codes

### CHART 8: DIN 47100 (without color repetition)

UNITRONIC® FD CY, UNITRONIC® FD CP, UNITRONIC® FD 890, UNITRONIC® LIYY, UNITRONIC® LIYCY, UNITRONIC® LIFYCY

| Conductor | Color        | Conductor | Color       | Conductor | Color              | Conductor | Color              |
|-----------|--------------|-----------|-------------|-----------|--------------------|-----------|--------------------|
| 1         | White        | 17        | White/Gray  | 33        | Green/Red          | 49        | White/Green/Black  |
| 2         | Brown        | 18        | Gray/Brown  | 34        | Yellow/Red         | 50        | Brown/Green/Black  |
| 3         | Green        | 19        | White/Pink  | 35        | Green/Black        | 51        | White/Yellow/Black |
| 4         | Yellow       | 20        | Pink/Brown  | 36        | Yellow/Black       | 52        | Yellow/Brown/Black |
| 5         | Gray         | 21        | White/Blue  | 37        | Gray/Blue          | 53        | White/Gray/Black   |
| 6         | Pink         | 22        | Brown/Blue  | 38        | Pink/Blue          | 54        | Gray/Brown/Black   |
| 7         | Blue         | 23        | White/Red   | 39        | Gray/Red           | 55        | White/Pink/Black   |
| 8         | Red          | 24        | Brown/Red   | 40        | Pink/Red           | 56        | Pink/Brown/Black   |
| 9         | Black        | 25        | White/Black | 41        | Gray/Black         | 57        | White/Blue/Black   |
| 10        | Violet       | 26        | Brown/Black | 42        | Pink/Black         | 58        | Brown/Blue/Black   |
| 11        | Gray/Pink    | 27        | Gray/Green  | 43        | Blue/Black         | 59        | White/Red/Black    |
| 12        | Red/Blue     | 28        | Yellow/Gray | 44        | Red/Black          | 60        | Brown/Red/Black    |
| 13        | White/Green  | 29        | Pink/Green  | 45        | White/Brown/Black  | 61        | Black/White        |
| 14        | Brown/Green  | 30        | Yellow/Pink | 46        | Yellow/Green/Black |           |                    |
| 15        | White/Yellow | 31        | Green/Blue  | 47        | Gray/Pink/Black    |           |                    |
| 16        | Yellow/Brown | 32        | Yellow/Blue | 48        | Red/Blue/Black     |           |                    |



## UNITRONIC® FD CY, Multi-Conductor, Braid Shielded



**Construction:** Finely stranded bare copper conductors.

**Insulation:** Specially blended PVC insulation, dry lubricant, non-wicking textile wrap, tinned copper braid (85% coverage).

**Jacket:** Specially formulated gray PVC jacket.

### Features:

UNITRONIC® FD series of communication cables are designed for continuous flexing in industrial signal and bus applications. EMC resistant design with braid shielding construction are available in all conductor styles.

### Applications:

High Speed Automated Equipment, Robotics, CNC, Multi-Axis cutting equipment.



### Technical Data:

Minimum bending radius for continuous flexing: 7.5 x cable diameter.

|  |                                                                                                                              |  |                                                        |  |                                                                      |  |                                                                                |
|--|------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------|--|----------------------------------------------------------------------|--|--------------------------------------------------------------------------------|
|  | <b>Temperature:</b>                                                                                                          |  | <b>Rated Voltage:</b>                                  |  | <b>Color Code:</b>                                                   |  | <b>Approvals:</b>                                                              |
|  | <ul style="list-style-type: none"> <li>For flexing: -5°C to 70°C</li> <li>For fixed installations: -40°C to +70°C</li> </ul> |  | <ul style="list-style-type: none"> <li>250V</li> </ul> |  | <ul style="list-style-type: none"> <li>DIN 47100, Chart 8</li> </ul> |  | <ul style="list-style-type: none"> <li>Based on VDE specifications.</li> </ul> |

| Part Number                         | Number of Conductors | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/mft | Approx. Weight lbs/mft | Approx. Weight kg/km | Part Number                         | Number of Conductors | Nominal Outer Diameter inches | Nominal Outer Diameter mm | Copper Weight lbs/mft | Approx. Weight lbs/mft | Approx. Weight kg/km |
|-------------------------------------|----------------------|-------------------------------|---------------------------|-----------------------|------------------------|----------------------|-------------------------------------|----------------------|-------------------------------|---------------------------|-----------------------|------------------------|----------------------|
| 26 AWG (18/38) 0.14 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      | 22 AWG (42/38) 0.34 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      |
| 0027411                             | 3                    | .185                          | 4.7                       | 10                    | 25                     | 37                   | 0027440                             | 2                    | .220                          | 5.6                       | 11                    | 32                     | 47                   |
| 0027412                             | 4                    | .197                          | 5.0                       | 10                    | 28                     | 42                   | 0027441                             | 3                    | .232                          | 5.9                       | 19                    | 42                     | 63                   |
| 0027413                             | 5                    | .213                          | 5.4                       | 12                    | 32                     | 47                   | 0027442                             | 4                    | .248                          | 6.3                       | 24                    | 54                     | 81                   |
| 0027414                             | 7                    | .236                          | 6.0                       | 19                    | 47                     | 70                   | 0027443                             | 5                    | .268                          | 6.8                       | 26                    | 60                     | 89                   |
| 0027416                             | 10                   | .276                          | 7.0                       | 26                    | 60                     | 90                   | 0027444                             | 7                    | .303                          | 7.7                       | 35                    | 79                     | 117                  |
| 0027418                             | 14                   | .280                          | 7.1                       | 30                    | 71                     | 106                  | 0027446                             | 10                   | .370                          | 9.4                       | 45                    | 104                    | 155                  |
| 0027420                             | 18                   | .303                          | 7.7                       | 36                    | 83                     | 123                  | 0027448                             | 14                   | .374                          | 9.5                       | 57                    | 130                    | 194                  |
| 0027422                             | 25                   | .362                          | 9.2                       | 46                    | 110                    | 163                  | 0027450                             | 18                   | .421                          | 10.7                      | 67                    | 151                    | 225                  |
| 24 AWG (32/38) 0.25 mm <sup>2</sup> |                      |                               |                           |                       |                        |                      | 0027452                             | 25                   | .508                          | 12.9                      | 104                   | 220                    | 327                  |
| 0027425                             | 2                    | .201                          | 5.1                       | 10                    | 26                     | 39                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027426                             | 3                    | .213                          | 5.4                       | 13                    | 31                     | 46                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027427                             | 4                    | .228                          | 5.8                       | 14                    | 36                     | 53                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027428                             | 5                    | .244                          | 6.2                       | 21                    | 48                     | 71                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027429                             | 7                    | .276                          | 7.0                       | 27                    | 60                     | 89                   |                                     |                      |                               |                           |                       |                        |                      |
| 0027431                             | 10                   | .335                          | 8.5                       | 36                    | 77                     | 114                  |                                     |                      |                               |                           |                       |                        |                      |
| 0027434                             | 14                   | .339                          | 8.6                       | 43                    | 95                     | 141                  |                                     |                      |                               |                           |                       |                        |                      |
| 0027436                             | 18                   | .370                          | 9.4                       | 53                    | 112                    | 167                  |                                     |                      |                               |                           |                       |                        |                      |
| 0027438                             | 25                   | .449                          | 11.4                      | 68                    | 148                    | 221                  |                                     |                      |                               |                           |                       |                        |                      |

## Color Codes

CHART 8: DIN 47100 (without color repetition)

UNITRONIC® FD CY, UNITRONIC® FD CP, UNITRONIC® FD 890, UNITRONIC® LIYY, UNITRONIC® LIYCY, UNITRONIC® LIFYCY

| Conductor | Color        | Conductor | Color       | Conductor | Color              | Conductor | Color              |
|-----------|--------------|-----------|-------------|-----------|--------------------|-----------|--------------------|
| 1         | White        | 17        | White/Gray  | 33        | Green/Red          | 49        | White/Green/Black  |
| 2         | Brown        | 18        | Gray/Brown  | 34        | Yellow/Red         | 50        | Brown/Green/Black  |
| 3         | Green        | 19        | White/Pink  | 35        | Green/Black        | 51        | White/Yellow/Black |
| 4         | Yellow       | 20        | Pink/Brown  | 36        | Yellow/Black       | 52        | Yellow/Brown/Black |
| 5         | Gray         | 21        | White/Blue  | 37        | Gray/Blue          | 53        | White/Gray/Black   |
| 6         | Pink         | 22        | Brown/Blue  | 38        | Pink/Blue          | 54        | Gray/Brown/Black   |
| 7         | Blue         | 23        | White/Red   | 39        | Gray/Red           | 55        | White/Pink/Black   |
| 8         | Red          | 24        | Brown/Red   | 40        | Pink/Red           | 56        | Pink/Brown/Black   |
| 9         | Black        | 25        | White/Black | 41        | Gray/Black         | 57        | White/Blue/Black   |
| 10        | Violet       | 26        | Brown/Black | 42        | Pink/Black         | 58        | Brown/Blue/Black   |
| 11        | Gray/Pink    | 27        | Gray/Green  | 43        | Blue/Black         | 59        | White/Red/Black    |
| 12        | Red/Blue     | 28        | Yellow/Gray | 44        | Red/Black          | 60        | Brown/Red/Black    |
| 13        | White/Green  | 29        | Pink/Green  | 45        | White/Brown/Black  | 61        | Black/White        |
| 14        | Brown/Green  | 30        | Yellow/Pink | 46        | Yellow/Green/Black |           |                    |
| 15        | White/Yellow | 31        | Green/Blue  | 47        | Gray/Pink/Black    |           |                    |
| 16        | Yellow/Brown | 32        | Yellow/Blue | 48        | Red/Blue/Black     |           |                    |



## UNITRONIC® FD CP (TP) Plus, Multi-Pair, Braid Shielded

LAPP KABEL STUTTGART UNITRONIC - FD CP (TP) plus (UL) CMX- e(UL) CMX 70°C

**Construction:** Finely stranded bare copper conductors, super fine wire per VDE 0295, Class 6.

**Insulation:** Polyolefin insulation, conductors paired and cabled together, dry lubricant, non-wicking textile wrap, tinned copper braid (85% coverage).

**Jacket:** Gray polyurethane jacket for a halogen-free construction.

### Features:

UNITRONIC® FD CP (TP) Plus series of communication cables are designed for continuous flexing in industrial signal and bus applications. Tear and abrasion resistant polyurethane jacket provides superior service life in harsh environments with outstanding resistance to most oils, solvents and coolants. EMC resistant design with braid shielding construction is available in all conductor styles.

### Applications:

High Speed Automated Equipment, Robotics, CNC, Multi-Axis cutting equipment.

### Technical Data:

Minimum bending radius for continuous flexing: 7.5 x cable diameter.



#### Temperature:

- For flexing: -5°C to +70°C
- For fixed installations: -40°C to +70°C



#### Rated Voltage:

- 250V



#### Color Code:

- DIN 47100, See chart 8



#### Approvals:

- UL: • Type CMX
- CSA: • Type CMX



| Part Number                         | Number of Pairs | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km | Part Number                         | Number of Pairs | Nominal Outer Diameter inches | mm   | Copper Weight lbs/mft | Approx. Weight lbs/mft | kg/km |
|-------------------------------------|-----------------|-------------------------------|------|-----------------------|------------------------|-------|-------------------------------------|-----------------|-------------------------------|------|-----------------------|------------------------|-------|
| 26 AWG (18/38) 0.14 mm <sup>2</sup> |                 |                               |      |                       |                        |       | 0030930                             | 4               | .374                          | 9.5  | 40                    | 74                     | 119   |
| 0030910                             | 2               | .244                          | 6.2  | 13                    | 26                     | 42    | 0030932                             | 6               | .433                          | 11.0 | 58                    | 103                    | 165   |
| 0030911                             | 3               | .256                          | 6.5  | 16                    | 33                     | 53    | 0030933                             | 8               | .480                          | 12.2 | 72                    | 137                    | 221   |
| 0030912                             | 4               | .268                          | 6.8  | 18                    | 37                     | 59    | 0030934                             | 10              | .559                          | 14.2 | 88                    | 170                    | 274   |
| 0030913                             | 5               | .287                          | 7.3  | 25                    | 47                     | 75    | 20 AWG (28/34) 0.50 mm <sup>2</sup> |                 |                               |      |                       |                        |       |
| 0030914                             | 6               | .295                          | 7.5  | 33                    | 57                     | 91    | 0030964                             | 1               | .244                          | 6.2  | 15                    | 29                     | 47    |
| 0030915                             | 8               | .346                          | 8.8  | 37                    | 68                     | 109   | 0030937                             | 2               | .366                          | 9.3  | 34                    | 62                     | 99    |
| 0030916                             | 10              | .394                          | 10.0 | 40                    | 75                     | 120   | 0030938                             | 3               | .398                          | 10.1 | 48                    | 81                     | 130   |
| 24 AWG (32/38) 0.25 mm <sup>2</sup> |                 |                               |      |                       |                        |       | 0030939                             | 4               | .421                          | 10.7 | 50                    | 92                     | 148   |
| 0030962                             | 1               | .201                          | 5.1  | 9                     | 17                     | 27    | 0030940                             | 5               | .465                          | 11.8 | 57                    | 104                    | 168   |
| 0030919                             | 2               | .287                          | 7.3  | 22                    | 37                     | 60    | 0030941                             | 6               | .480                          | 12.2 | 67                    | 121                    | 194   |
| 0030920                             | 3               | .303                          | 7.7  | 26                    | 45                     | 72    | 0030942                             | 8               | .567                          | 14.4 | 97                    | 176                    | 284   |
| 0030921                             | 4               | .327                          | 8.3  | 29                    | 55                     | 89    | 0030943                             | 10              | .646                          | 16.4 | 118                   | 213                    | 343   |
| 0030922                             | 5               | .350                          | 8.9  | 35                    | 64                     | 103   | 0030944                             | 14              | .657                          | 16.7 | 145                   | 249                    | 401   |
| 0030923                             | 6               | .362                          | 9.2  | 48                    | 81                     | 131   | 18 AWG (42/34) 1.00 mm <sup>2</sup> |                 |                               |      |                       |                        |       |
| 0030924                             | 8               | .425                          | 10.8 | 50                    | 96                     | 155   | 0030955                             | 1               | .276                          | 7.0  | 28                    | 44                     | 71    |
| 0030925                             | 10              | .488                          | 12.4 | 60                    | 116                    | 186   | 0030956                             | 2               | .433                          | 11.0 | 49                    | 80                     | 129   |
| 0030926                             | 14              | .496                          | 12.6 | 75                    | 136                    | 219   | 0030957                             | 3               | .469                          | 11.9 | 63                    | 105                    | 169   |
| 22 AWG (42/38) 0.34 mm <sup>2</sup> |                 |                               |      |                       |                        |       | 0030958                             | 4               | .492                          | 12.5 | 79                    | 127                    | 204   |
| 0030963                             | 1               | .220                          | 5.6  | 13                    | 22                     | 36    | 0030959                             | 5               | .555                          | 14.1 | 93                    | 147                    | 237   |
| 0030928                             | 2               | .346                          | 8.8  | 28                    | 50                     | 81    |                                     |                 |                               |      |                       |                        |       |
| 0030929                             | 3               | .343                          | 8.7  | 35                    | 63                     | 101   |                                     |                 |                               |      |                       |                        |       |

### CHART 7: DIN 47100 For Paired Cables (For telephone and electronic use only)

| # of Pairs | Color                                 | # of Pairs | Color                                |
|------------|---------------------------------------|------------|--------------------------------------|
| 1          | White paired with Brown               | 13         | White/Black paired with Brown/Black  |
| 2          | Green paired with Yellow              | 14         | Gray/Green paired with Yellow/Gray   |
| 3          | Gray paired with Pink                 | 15         | Pink/Green paired with Yellow/Pink   |
| 4          | Blue paired with Red                  | 16         | Green/Blue paired with Yellow/Blue   |
| 5          | Black paired with Violet              | 17         | Green/Red paired with Yellow/Red     |
| 6          | Gray/Pink paired with Red/Blue        | 18         | Green/Black paired with Yellow/Black |
| 7          | White/Green paired with Brown/Green   | 19         | Gray/Blue paired with Pink/Blue      |
| 8          | White/Yellow paired with Yellow/Brown | 20         | Gray/Red paired with Pink/Red        |
| 9          | White/Gray paired with Gray/Brown     | 21         | Gray/Black paired with Pink/Black    |
| 10         | White/Pink paired with Pink/Brown     | 22         | Blue/Black paired with Red/Black     |
| 11         | White/Blue paired with Brown/Blue     | 23-44      | Repeat 1-22                          |
| 12         | White/Red paired with Brown/Red       | 45-66      | Repeat 1-22                          |

The color code for paired cables is in accordance with DIN 47100. At 23 pairs, the identification repeats itself for the first time and from 45 pairs for the second time.



## UNITRONIC® BUS-Profibus DP-Sationary



**Construction:** Solid and stranded bare copper conductors.

**Insulation:** Specially designed foil/tinned copper braid shielding.

**Jacket:** Multiple jacketing options for specific applications including PE, Halogen-Free, Quick Connect PVC, TPE and PVC.

**Features:**

UNITRONIC® BUS-Profibus DP cables are designed for field networks requiring fast, cyclic data exchange between controllers and field devices. Automation devices such as PLCs, PCs, HMI devices, sensors or actuators can communicate via this bus system.

**Applications:**

Factory, Process and Building Automation field networks.



**Technical Data:**

Minimum bending radius: 10 x cable diameter.



**Temperature:**

• <-40°C to +80°C



**Rated Voltage:**

• 250V  
• Test Voltage: 1500V



**Color Code:**

• Red/Green



**Approvals: (As Indicated)**

• CMG  
• CMX

### Rate Table: (Maximum Length- One Bus Segment)

| Communication Rate | Feet | PROFIBUS-DP Meters |
|--------------------|------|--------------------|
| 93.75 Kbps         | 3936 | 1200               |
| 187.5 Kbps         | 3280 | 1000               |
| 500 Kbps           | 1312 | 400                |
| 1.5 Mbps           | 656  | 200                |
| 12.0 Mbps          | 328  | 100                |

| Communication Rate | Feet | FIP Meters |
|--------------------|------|------------|
| 1.0 Kbps           | 656  | 200        |
| 2.5 Kbps           | 656  | 200        |

| Part Number                                                         | Jacket       | Conductor Description | Nominal Outer Diameter inches | mm | Copper Weight lbs/mft | Jacket Color | Approx. Weight lbs/mft | kg/km |
|---------------------------------------------------------------------|--------------|-----------------------|-------------------------------|----|-----------------------|--------------|------------------------|-------|
| <b>Profibus DP, FMS, or FIP (Static Install)</b>                    |              |                       |                               |    |                       |              |                        |       |
| 2170219**                                                           | PVC          | 22/ 1pr               | .315                          | 8  | 20                    | Violet       | 38                     | 57    |
| 2170233                                                             | PE*          | 22/ 1pr               | .315                          | 8  | 17                    | Violet       | 38                     | 57    |
| 2170824**                                                           | PVC          | 24/ 1pr (7/32)        | .315                          | 8  | 20                    | Violet       | 37                     | 55    |
| <b>Quick Connect- Profibus DP, FMS or FIP (Static Install)</b>      |              |                       |                               |    |                       |              |                        |       |
| 2170820                                                             | PVC          | 22/ 1pr               | .315                          | 8  | 17                    | Violet       | 51                     | 76    |
| 2170826                                                             | PVC          | 24/ 1pr (7/32)        | .315                          | 8  | 17                    | Violet       | 45                     | 67    |
| 2170853                                                             | Halogen-Free | 22/ 1pr               | .315                          | 8  | 20                    | Violet       | 50                     | 75    |
| <b>High Temp (105°C)- Profibus DP, FMS or FIP- (Static Install)</b> |              |                       |                               |    |                       |              |                        |       |
| 2170630**                                                           | PVC*         | 24/ 1pr (7/32)        | .315                          | 8  | 20                    | Violet       | 47                     | 70    |

\*UL/CSA CMX

\*\*UL/CSA CMX



## UNITRONIC® BUS FD-Profibus DP



**Construction:** Stranded bare copper conductors, specially designed foil/tinned copper braid shielding;

**Jacket:** Multiple jacketing options for specific applications including Quick Connect PVC, Flexible Abrasion and Oil Resistant PUR.

### Features:

UNITRONIC® BUS-Profibus DP cables are designed for field networks requiring fast, cyclic data exchange between controllers and field devices. Automation devices such as PLCs, PCs, HMI devices, sensors or actuators can communicate via this bus system.

### Applications:

Robotics, Motion Control, Industrial Automation field networks.



### Technical Data:

Minimum Bending Radius: static- 8 x cable diameter. Flexing- 15 x cable diameter.



#### Temperature:

• <-25°C to +75°C



#### Rated Voltage:

• 300V  
• #2170331 & 2170875: 600V



#### Color Code:

• Red/Green Pairs  
• #2170875:  
Black number conductors.



#### Approvals:

UL: • CMG  
• Oil Res I (#2170331, #2170875)  
CSA: • FT4 (#2170331, #2170875).

### Rate Table: (Maximum Length- One Bus Segment)

| Communication Rate | PROFIBUS-DP |        |
|--------------------|-------------|--------|
|                    | Feet        | Meters |
| 93.75 Kbps         | 3936        | 1200   |
| 187.5 Kbps         | 3280        | 1000   |
| 500 Kbps           | 1312        | 400    |
| 1.5 Mbps           | 656         | 200    |
| 12.0 Mbps          | 328         | 100    |

| Communication Rate | FIP  |        |
|--------------------|------|--------|
|                    | Feet | Meters |
| 1.0 Kbps           | 656  | 200    |
| 2.5 Kbps           | 656  | 200    |

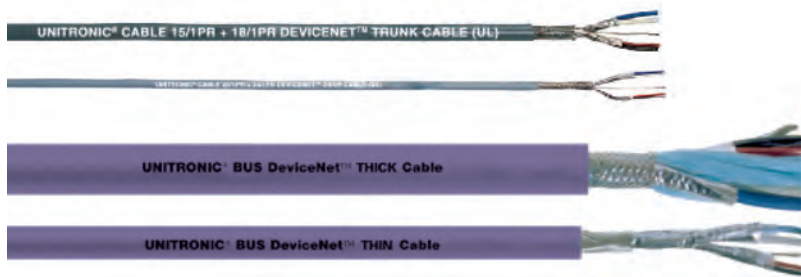
| Part Number                                   | Jacket | Conductor Description | Maximum Outer Diameter |    | Copper Weight | Jacket Color | Approx. Weight |       |
|-----------------------------------------------|--------|-----------------------|------------------------|----|---------------|--------------|----------------|-------|
|                                               |        |                       | inches                 | mm | lbs/mft       |              | lbs/mft        | kg/km |
| <b>Quick Connect- Profibus DP, FMS or FIP</b> |        |                       |                        |    |               |              |                |       |
| 2170322*                                      | PVC    | 22/ 1pr               | .315                   | 8  | 20            | Violet       | 43             | 64    |
| 2170854                                       | PUR    | 24/ 1pr               | .315                   | 8  | 20            | Violet       | 43             | 64    |
| <b>Torsion Flex- Profibus DP, FMS, or FIP</b> |        |                       |                        |    |               |              |                |       |
| 2170332*                                      | PUR    | 22/ 1pr               | .315                   | 8  | 17            | Violet       | 44             | 66    |
| <b>Festoon Cable- Profibus DP, FMS or FIP</b> |        |                       |                        |    |               |              |                |       |
| 2170331                                       | PVC    | 24/ 1pr               | .315                   | 8  | 17            | Violet       | 40             | 60    |
| <b>Hybrid Cable- Profibus DP, FMS or FIP</b>  |        |                       |                        |    |               |              |                |       |
| 2170875                                       | PVC    | 24/ 1pr + 16/4c       | .433                   | 11 | 60            | Violet       | 104            | 155   |

\* UL/CSA (CMX)

Specifications subject to change. For complete specifications and availability visit [www.lapptannehill.com](http://www.lapptannehill.com)



## UNITRONIC® BUS DeviceNet™ BUS CABLES



**Construction:** Stranded tinned copper conductors.

**Insulation:** Data conductors are insulated with foam polyethylene, power conductors are insulated with PVC, both pairs are tri-laminated foil shield (100% Coverage), plus have an overall foil wrap and braid (65% coverage), both pairs utilize a common drain wire and have a tinned copper braid.

**Jacket:** Oil resistant PVC or halogen-free outer jacket.

**Features:**

UNITRONIC® BUS DeviceNet™ Cables are designed to support the robust demands of today's high speed industrial control environments. DeviceNet™ is a versatile, general purpose Fieldbus designed to satisfy 80% of the most common machine and cell-level wiring requirement. Devices can be powered from the network so wiring is minimized.

**Applications:**

Assembly, welding and material handling machines. Single-cable wiring of Multi-input sensor blocks, Smart sensors, pneumatic valves, Barcode readers, Drives and Operator interfaces.



**Technical Data:**

Minimum Bending Radius: 10 x cable diameter.

**Temperature:**  
• <-20°C to +80°C

**Rated Voltage:**  
• 300V  
• Test Voltage: 2000V

**Color Code:**  
• Power pair: Red & black.  
• Data pair: Blue & White.

**Approvals:**  
UL: • CMG  
CSA: • CMG

## THICK & THIN 120 Ohm Bus Cable for Static Applications

**Rate Table:**

| Communication Rate | Maximum Length- Main Cable |              |      |             | Maximum Length- Drop Cable |              |      |             |
|--------------------|----------------------------|--------------|------|-------------|----------------------------|--------------|------|-------------|
|                    | Feet                       | THICK Meters | Feet | THIN Meters | Feet                       | THICK Meters | Feet | THIN Meters |
| 125 Kbps           | 1640                       | 500          | 328  | 100         | 512                        | 156          | 20   | 6           |
| 250 Kbps           | 820                        | 250          | 328  | 100         | 256                        | 78           | 20   | 6           |
| 500 Kbps           | 328                        | 100          | 328  | 100         | 128                        | 39           | 20   | 6           |

## UNITRONIC® DEVICENET™ BUS CABLES

| Part Number                       | Type  | Conductor Description | Nominal Outer Diameter<br>inches mm | Copper Weight<br>lbs/mft | Jacket Color | Approx. Weight<br>lbs/mft kg/km |
|-----------------------------------|-------|-----------------------|-------------------------------------|--------------------------|--------------|---------------------------------|
| <b>PVC Jacketed- UL/CSA (CMG)</b> |       |                       |                                     |                          |              |                                 |
| 4001                              | Trunk | 18/ 1pr + 15/ 1pr     | .437 11.1                           | 59                       | Gray         | 140 209                         |
| 4002                              | Drop  | 24/ 1pr + 22/ 1pr     | .260 6.6                            | 22                       | Gray         | 43 64                           |
| 2170342*                          | Trunk | 18/ 1pr + 15/ 1pr     | .480 12.2                           | 59                       | Violet       | 124 184                         |
| 2170343*                          | Drop  | 24/ 1pr + 22/ 1pr     | .272 6.9                            | 22                       | Violet       | 46 68                           |
| <b>Halogen-Free- UL/CSA (CMG)</b> |       |                       |                                     |                          |              |                                 |
| 2170340                           | Trunk | 18/ 1pr + 15/ 1pr     | .492 12.5                           | 59                       | Violet       | 124 184                         |
| 2170341                           | Drop  | 24/ 1pr + 22/ 1pr     | .283 7.2                            | 22                       | Violet       | 46 68                           |

\* PLTC Approved

DeviceNet is a registered trademark of the Open DeviceNet Vendor Association. Lapp is a member of the Open DeviceNet Vendor Association.



Flexible Control Cable



**LAPP TANNERHILL**

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## UNITRONIC® BUS-CAN BUS Cables

**UNITRONIC® BUS CAN Construction:** 7-wire stranded twisted pair data cable, conductors are surrounded with a foil wrap and a tinned copper braid shield.

**Insulation:** Polyethylene insulation. **Jacket:** Violet jacket is PVC.



**UNITRONIC® BUS FD P CAN Construction:** Finely stranded twisted pair data cable, conductors are surrounded with a non-wicking textile wrap and a tinned copper braid shield.

**Insulation:** Polyethylene insulation. **Jacket:** Violet halogen-free PUR jacket.



**Construction:** Finely stranded twisted pair data cable. **Insulation:** Foam. **Jacket:** Violet halogen-free PUR jacket.

### Features:

UNITRONIC® BUS-CAN BUS Cables are designed to the CAN (Control Area Network) open and ISO 11898 standard. Cable is well suited for high-speed motion control and feedback loop applications providing high reliability, efficient use of network bandwidth and power available on the network.

### Applications:

Motion control systems, Assembly, Welding and Material handling machines. Single-cable wiring of multi-input sensor blocks, Smart sensors, Pneumatic valves, Barcode readers, Drives and Operator interfaces.

### Technical Data:

Minimum bending radius: static- 8 x cable diameter. Flexing- 15 x cable diameter.



#### Temperature:

- Static: -30°C to +80°C
- Flexing: -5°C to +70°C
- Continuous Flex: -30°C to +70°C



#### Rated Voltage:

- 250V



#### Color Code:

- DIN 47100, Chart 7.



#### Approvals:

- UL: • CMX
- CSA: • CMX



## CAN BUS Cable

### 120 Ohm BUS Cable for Static and Continuous Flex Applications

| Part Number            | Pairs | Conductor Description | Nominal Outer Diameter |      | Copper Weight | Jacket Color | Approx. Weight |       |
|------------------------|-------|-----------------------|------------------------|------|---------------|--------------|----------------|-------|
|                        |       |                       | inches                 | mm   | lbs/mft       |              | lbs/mft        | kg/km |
| <b>Static Install</b>  |       |                       |                        |      |               |              |                |       |
| 2170260                | 1pr   | 24 AWG                | .224                   | 5.7  | 11            | Violet       | 28             | 42    |
| 2170261                | 2pr   | 24 AWG                | .299                   | 7.6  | 23            | Violet       | 46             | 68    |
| 2170263                | 1pr   | 22 AWG                | .268                   | 6.8  | 17            | Violet       | 37             | 55    |
| 2170264                | 2pr   | 22 AWG                | .335                   | 8.5  | 31            | Violet       | 59             | 88    |
| 2170266                | 1pr   | 20 AWG                | .295                   | 7.5  | 28            | Violet       | 60             | 90    |
| 2170267                | 2pr   | 20 AWG                | .382                   | 9.7  | 40            | Violet       | 71             | 106   |
| <b>Continuous Flex</b> |       |                       |                        |      |               |              |                |       |
| 2170272                | 1pr   | 24 AWG                | .252                   | 6.4  | 12            | Violet       | 27             | 40    |
| 2170273                | 2pr   | 24 AWG                | .331                   | 8.4  | 22            | Violet       | 47             | 70    |
| 2170275                | 1pr   | 22 AWG                | .268                   | 6.8  | 22            | Violet       | 40             | 60    |
| 2170276                | 2pr   | 22 AWG                | .378                   | 9.6  | 35            | Violet       | 59             | 88    |
| 2170278                | 1pr   | 20 AWG                | .315                   | 8.0  | 28            | Violet       | 50             | 74    |
| 2170279                | 2pr   | 20 AWG                | .425                   | 10.8 | 40            | Violet       | 67             | 100   |

Check out our complete inventory of products at [www.lapptannehill.com](http://www.lapptannehill.com)



## ETHERLINE® 4 Pair: CAT5/CAT5e



**Construction:** Solid and stranded conductor options.

**Insulation:** FPE insulation with foil and braid shielding. **Jacket:** Jacketing options include PVC, Halogen-Free FRNC, and PUR.

**Features:**

ETHERLINE® 4 Pair: CAT5/CAT5e Industrial Ethernet cables are designed to provide reliable network communications in the demanding Industrial and Process Control environment where difficult EMC conditions are pervasive. Conforming to the EIA/TIA-568 standard, Etherline CAT5/CAT 5e Cables support full duplex high speed communications.

**Applications:**

PLC and DCS automation network, Device and Field Level Networking, ProfiNet™, Ethernet IP and other Industrial Ethernet Networks.



**Technical Data:**

Minimum Bending Radius: static- 5 x cable diameter. Flexing- 10 x cable diameter.



**Temperature:**

- Static: -40°C to +80°C
- Flexing: -20°C to +70°C



**Rated Voltage:**

- 125V Peak  
(Not for Power).



**Color Code:**

- White/Blue & Blue
- White/Orange & Orange
- White/Green & Green
- White/Brown & Brown



**Approvals:**

- UL: • CMG (#2170886)
- EIA/TIA 568

## 4 Pair Industrial Ethernet Cable CAT5/ CAT5e Bus Cable for Static and Continuous Flex Applications

| Part Number                          | Jacket                              | Conductor Description   | Category | Nominal Outer Diameter |     | Copper Weight | Jacket Color | Approx. Weight |       |
|--------------------------------------|-------------------------------------|-------------------------|----------|------------------------|-----|---------------|--------------|----------------|-------|
|                                      |                                     |                         |          | inches                 | mm  | lbs/mft       |              | lbs/mft        | kg/km |
| <b>Static- Halogen-Free</b>          |                                     |                         |          |                        |     |               |              |                |       |
| 2170296                              | Zero Halogen (foil)                 | 24/ 4pr Solid Conductor | CAT 5e   | .248                   | 6.3 | 22            | Teal         | 36             | 54    |
| 2170297                              | PUR foil Braid                      | 24/ 4pr Solid Conductor | CAT 5e   | .248                   | 6.3 | 22            | Teal         | 42             | 62    |
| 2170298                              | Zero Hal Double Jacket (Foil/Braid) | 22/ 4pr Solid Conductor | CAT 5e   | .295                   | 7.5 | 22            | Teal         | 54             | 80    |
| 2170886                              | Flexible (Foil/Braid)               | 22/ 2pr 7W Strand       | CAT 5    | .256                   | 6.5 | 22            | Teal         | 36             | 54    |
| <b>Flexible- Halogen-Free</b>        |                                     |                         |          |                        |     |               |              |                |       |
| 2170299                              | Zero Halogen                        | 26/ 4pr 7W Strand       | CAT 5e   | .240                   | 6.1 | 17            | Teal         | 32             | 48    |
| 2170300                              | PUR (Foil/Braid)                    | 26/ 4pr 7W Strand       | CAT 5e   | .240                   | 6.1 | 17            | Teal         | 36             | 54    |
| <b>Continuous Flex- Halogen-Free</b> |                                     |                         |          |                        |     |               |              |                |       |
| 2170489                              | PUR (Braid)                         | 26/ 4p 19W Strand       | CAT 5e   | .248                   | 6.3 | 18            | Teal         | 36             | 54    |

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Flexible Control Cable



**LAPP TANNERHILL**

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# Flexible Control Cables

## Series F Continuous Flex Control Cables

**Construction:** Stranded bare copper 18 to 8 AWG (0.83 to 8.51 mm<sup>2</sup>).

**Insulation:** PVC/nylon. **Jacket:** Black thermoplastic elastomer.

### Features:

- Maximum flex life
- TPE jacket for superior resistance to oils and chemicals
- Finely stranded conductors and slipper agent on conductor insulation for superior high-speed flexing
- Over 20 million rolling flex cycles
- Tic-tock and twist test per MIL-C-13777G

### Applications:

Designed for a variety of flexing styles, they have been tested to exceed over 20 million rolling flex cycles, making them ideal for both single-axis and multi-axis motion control and robotic applications where continuous flexing is required.

### Technical Data:



#### Temperature:

- Static: -25°C to +90°C
- Dynamic: -5°C to +90°C



#### Rated Voltage:

- 600V



#### Color Code:

- Black, blue, or red numbered conductors
- One green/yellow ground conductor
- One white striped neutral (12 conductors or greater)



#### Approvals:

- Suitable for use Class I, Division 2 locations per Article 501 of the National Electric Code
- UL TC-ER
- UL PLTC
- UL TFFN/THHN
- UL Oil Res. I/II
- UL Sunlight Resistant
- CSA AWM I/II A/B FT4
- CE compliant
- RoHS compliant
- California Prop 65



#### 18 AWG (0.83 mm<sup>2</sup>)

Stranding: 41/34 (41 x 0.16 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| F18003KW     | F18003LW    | F18003RW   | 3          | 0.308            | 7.82  | 0.050            | 1.27 |
| F18004KW     | F18004LW    | F18004RW   | 4          | 0.333            | 8.46  | 0.050            | 1.27 |
| F18005KW     | F18005LW    | F18005RW   | 5          | 0.360            | 9.14  | 0.050            | 1.27 |
| F18007KW     | F18007LW    | F18007RW   | 7          | 0.418            | 10.62 | 0.050            | 1.27 |
| F18012KW     | F18012LW    | F18012RW   | 12         | 0.515            | 13.08 | 0.065            | 1.65 |
| F18017KW     | F18017LW    | F18017RW   | 17         | 0.597            | 15.16 | 0.065            | 1.65 |
| F18022KW     | F18022LW    | F18022RW   | 22         | 0.656            | 16.66 | 0.065            | 1.65 |
| F18025KW     | F18025LW    | F18025RW   | 25         | 0.717            | 18.21 | 0.065            | 1.65 |
| F18034KW     | F18034LW    | F18034RW   | 34         | 0.775            | 19.69 | 0.065            | 1.65 |
| F18042KW     | F18042LW    | F18042RW   | 42         | 0.874            | 22.20 | 0.085            | 2.16 |
| F18049KW     | F18049LW    | F18049RW   | 49         | 0.965            | 24.51 | 0.085            | 2.16 |
| F18065KW     | F18065LW    | F18065RW   | 65         | 1.052            | 26.72 | 0.085            | 2.16 |

### Series F Cables

#### 16 AWG (1.31 mm<sup>2</sup>)

Stranding: 65/34 (65 x 0.16 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| F16003KW     | F16003LW    | F16003RW   | 3          | 0.334            | 8.48  | 0.050            | 1.27 |
| F16004KW     | F16004LW    | F16004RW   | 4          | 0.362            | 9.19  | 0.050            | 1.27 |
| F16005KW     | F16005LW    | F16005RW   | 5          | 0.393            | 9.98  | 0.050            | 1.27 |
| F16007KW     | F16007LW    | F16007RW   | 7          | 0.489            | 12.42 | 0.065            | 1.65 |
| F16012KW     | F16012LW    | F16012RW   | 12         | 0.565            | 14.35 | 0.065            | 1.65 |
| F16017KW     | F16017LW    | F16017RW   | 17         | 0.657            | 16.69 | 0.065            | 1.65 |
| F16019KW     | F16019LW    | F16019RW   | 19         | 0.691            | 17.55 | 0.065            | 1.65 |
| F16022KW     | F16022LW    | F16022RW   | 22         | 0.724            | 18.39 | 0.065            | 1.65 |
| F16025KW     | F16025LW    | F16025RW   | 25         | 0.793            | 20.14 | 0.065            | 1.65 |
| F16033KW     | F16033LW    | F16033RW   | 33         | 0.899            | 22.83 | 0.085            | 2.16 |
| F16042KW     | F16042LW    | F16042RW   | 42         | 0.966            | 24.54 | 0.085            | 2.16 |
| F16049KW     | F16049LW    | F16049RW   | 49         | 1.069            | 27.15 | 0.085            | 2.16 |
| F16065KW     | F16065LW    | F16065RW   | 65         | 1.168            | 29.67 | 0.085            | 2.16 |

#### 14 AWG (2.11 mm<sup>2</sup>)

Stranding: 105/34 (105 x 0.16 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| F14004KW     | F14004LW    | F14004RW   | 4          | 0.398            | 10.11 | 0.050            | 1.27 |
| F14005KW     | F14005LW    | F14005RW   | 5          | 0.434            | 11.02 | 0.050            | 1.27 |
| F14007KW     | F14007LW    | F14007RW   | 7          | 0.539            | 13.69 | 0.065            | 1.65 |
| F14012KW     | F14012LW    | F14012RW   | 12         | 0.628            | 15.95 | 0.065            | 1.65 |



## Series M Control Cables

**Construction:** Stranded bare copper 18 to 8 AWG (0.96 to 8.52 mm<sup>2</sup>).

**Insulation:** PVC/nylon. **Jacket:** Slate PVC.

**Features:**

- Slipper agent design
- Abrasion resistant
- Direct burial

**Applications:**

Series M multiconductor cables offer superior performance in static applications, with a tough PVC/PVC-nylon jacket insulation and resistance to oils and chemicals found in most manufacturing environments.

**Technical Data:**

- Temperature:**

  - Static: -25°C to +90°C
  - Dynamic: -5°C to +90°C

**Rated Voltage:**

  - 600V

**Color Code:**

  - Black, blue, or red numbered conductors
  - One green/yellow ground conductor
  - One white striped neutral (12 conductors or greater)

**Approvals:**

  - Suitable for use Class I, Division 2 locations per Article 501 of the National Electric Code
  - UL TC-ER
  - UL PLTC
  - UL MTW
  - UL WTTC
  - UL Oil Res. I
  - UL Sunlight Resistant
  - UL Direct Burial
  - CSA AWM I/II A/B FT4
  - CE compliant
  - RoHS compliant
  - California Prop 65



| 18 AWG (0.96 mm <sup>2</sup> )                                                                     |             |            |            |                  |       |                  |      |
|----------------------------------------------------------------------------------------------------|-------------|------------|------------|------------------|-------|------------------|------|
| Stranding: 19/30 (19 x 0.25 mm)<br>Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon |             |            |            |                  |       |                  |      |
| Part No.                                                                                           |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
| Black Insul.                                                                                       | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| M18103KW                                                                                           | M18103LW    | M18103RW   | 3          | 0.301            | 7.65  | 0.050            | 1.27 |
| M18104KW                                                                                           | M18104LW    | M18104RW   | 4          | 0.326            | 8.28  | 0.050            | 1.27 |
| M18105KW                                                                                           | M18105LW    | M18105RW   | 5          | 0.353            | 8.97  | 0.050            | 1.27 |
| M18107KW                                                                                           | M18107LW    | M18107RW   | 7          | 0.381            | 9.68  | 0.050            | 1.27 |
| M18112KW                                                                                           | M18112LW    | M18112RW   | 12         | 0.515            | 13.08 | 0.065            | 1.65 |
| M18117KW                                                                                           | M18117LW    | M18117RW   | 17         | 0.594            | 15.09 | 0.065            | 1.65 |
| M18122KW                                                                                           | M18122LW    | M18122RW   | 22         | 0.651            | 16.54 | 0.065            | 1.65 |
| M18125KW                                                                                           | M18125LW    | M18125RW   | 25         | 0.699            | 17.75 | 0.065            | 1.65 |
| M18134KW                                                                                           | M18134LW    | M18134RW   | 34         | 0.777            | 19.74 | 0.065            | 1.65 |
| M18142KW                                                                                           | M18142LW    | M18142RW   | 42         | 0.874            | 22.20 | 0.085            | 2.15 |
| M18149KW                                                                                           | M18149LW    | M18149RW   | 49         | 0.923            | 23.44 | 0.085            | 2.15 |
| M18165KW                                                                                           | M18165LW    | M18165RW   | 65         | 1.029            | 26.14 | 0.085            | 2.15 |

### Series M Cables

| 16 AWG (1.32 mm <sup>2</sup> )                                                                     |             |            |            |                  |       |                  |      |
|----------------------------------------------------------------------------------------------------|-------------|------------|------------|------------------|-------|------------------|------|
| Stranding: 26/30 (26 x 0.25 mm)<br>Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon |             |            |            |                  |       |                  |      |
| Part No.                                                                                           |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
| Black Insul.                                                                                       | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| M16103KW                                                                                           | M16103LW    | M16103RW   | 3          | 0.323            | 8.20  | 0.050            | 1.27 |
| M16104KW                                                                                           | M16104LW    | M16104RW   | 4          | 0.350            | 8.89  | 0.050            | 1.27 |
| M16105KW                                                                                           | M16105LW    | M16105RW   | 5          | 0.380            | 9.65  | 0.050            | 1.27 |
| M16107KW                                                                                           | M16107LW    | M16107RW   | 7          | 0.421            | 10.69 | 0.055            | 1.39 |
| M16112KW                                                                                           | M16112LW    | M16112RW   | 12         | 0.557            | 14.14 | 0.065            | 1.65 |
| M16117KW                                                                                           | M16117LW    | M16117RW   | 17         | 0.644            | 16.35 | 0.065            | 1.65 |
| M16119KW                                                                                           | M16119LW    | M16119RW   | 19         | 0.644            | 16.35 | 0.065            | 1.65 |
| M16122KW                                                                                           | M16122LW    | M16122RW   | 22         | 0.707            | 17.95 | 0.065            | 1.65 |
| M16125KW                                                                                           | M16125LW    | M16125RW   | 25         | 0.761            | 19.32 | 0.065            | 1.65 |
| M16133KW                                                                                           | M16133LW    | M16133RW   | 33         | 0.857            | 21.76 | 0.085            | 2.15 |
| M16142KW                                                                                           | M16142LW    | M16142RW   | 42         | 0.950            | 24.13 | 0.085            | 2.15 |
| M16149KW                                                                                           | M16149LW    | M16149RW   | 49         | 1.005            | 25.52 | 0.085            | 2.15 |
| M16165KW                                                                                           | M16165LW    | M16165RW   | 65         | 1.122            | 28.49 | 0.085            | 2.15 |

| 14 AWG (2.09 mm <sup>2</sup> )                                                                     |             |            |            |                  |       |                  |      |
|----------------------------------------------------------------------------------------------------|-------------|------------|------------|------------------|-------|------------------|------|
| Stranding: 41/30 (41 x 0.25 mm)<br>Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.10 mm) nylon |             |            |            |                  |       |                  |      |
| Part No.                                                                                           |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
| Black Insul.                                                                                       | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| M14104KW                                                                                           | M14104LW    | M14104RW   | 4          | 0.384            | 9.75  | 0.050            | 1.27 |
| M14105KW                                                                                           | M14105LW    | M14105RW   | 5          | 0.428            | 10.87 | 0.055            | 1.39 |
| M14107KW                                                                                           | M14107LW    | M14107RW   | 7          | 0.483            | 12.26 | 0.065            | 1.65 |
| M14112KW                                                                                           | M14112LW    | M14112RW   | 12         | 0.615            | 15.62 | 0.065            | 1.65 |
| M14125KW                                                                                           | M14125LW    | M14125RW   | 25         | 0.887            | 22.52 | 0.085            | 2.15 |



# Flexible Control Cables

## Series P Enhanced Stationary Control Cable

**Construction:** Stranded bare copper 18 to 8 AWG (0.96 to 8.52 mm<sup>2</sup>).

**Insulation:** PVC/nylon. **Jacket:** Yellow, orange, or black thermoplastic elastomer.

### Features:

- Enhanced flexibility and routability
- Superior resistance to oils and chemicals
- Abrasion resistant

### Applications:

The cable can be used in flex applications where travel distances and flexing speeds are low.

### Technical Data:



#### Temperature:

- -25°C to +90°C



#### Rated Voltage:

- 600V



#### Color Code:

- Black, blue, or red numbered conductors
- One green/yellow ground conductor
- One white striped neutral (12 conductors or greater)



#### Approvals:

- Suitable for use Class I, Division 2 locations per Article 501 of the National Electric Code
- UL TC-ER
- UL PLTC
- L TFFN/THHN
- UL Oil Res. I/II
- UL Sunlight Resistant
- CSA AWM I/II A/B FT4
- CE compliant
- RoHS compliant
- California Prop 65



### 18 AWG (0.96 mm<sup>2</sup>)

Stranding: 19/30 (19 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.010 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| MP18103KW    | MP18103LW   | MP18103RW  | 3          | 0.313            | 7.95  | 0.050            | 1.27 |
| MP18104KW    | MP18104LW   | MP18104RW  | 4          | 0.338            | 8.58  | 0.050            | 1.27 |
| MP18105KW    | MP18105LW   | MP18105RW  | 5          | 0.365            | 9.27  | 0.050            | 1.27 |
| MP18107KW    | MP18107LW   | MP18107RW  | 7          | 0.393            | 9.98  | 0.050            | 1.27 |
| MP18112KW    | MP18112LW   | MP18112RW  | 12         | 0.527            | 13.39 | 0.065            | 1.65 |
| MP18117KW    | MP18117LW   | MP18117RW  | 17         | 0.606            | 15.39 | 0.065            | 1.65 |
| MP18122KW    | MP18122LW   | MP18122RW  | 22         | 0.663            | 16.84 | 0.065            | 1.65 |
| MP18125KW    | MP18125LW   | MP18125RW  | 25         | 0.711            | 18.06 | 0.065            | 1.65 |
| MP18134KW    | MP18134LW   | MP18134RW  | 34         | 0.789            | 20.04 | 0.065            | 1.65 |
| MP18142KW    | MP18142LW   | MP18142RW  | 42         | 0.886            | 22.50 | 0.085            | 2.16 |
| MP18149KW    | MP18149LW   | MP18149RW  | 49         | 0.935            | 23.75 | 0.085            | 2.16 |
| MP18165KW    | MP18165LW   | MP18165RW  | 65         | 1.041            | 26.44 | 0.085            | 2.16 |

### Series P Cables

### 16 AWG (1.32 mm<sup>2</sup>)

Stranding: 26/30 (26 x 0.25 mm)  
Insulation thickness: 0.016 (0.41mm) PVC/0.005 (0.010 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| MP16103KW    | MP16103LW   | MP16103RW  | 3          | 0.335            | 8.51  | 0.050            | 1.27 |
| MP16104KW    | MP16104LW   | MP16104RW  | 4          | 0.362            | 9.19  | 0.050            | 1.27 |
| MP16105KW    | MP16105LW   | MP16105RW  | 5          | 0.392            | 9.96  | 0.050            | 1.27 |
| MP16107KW    | MP16107LW   | MP16107RW  | 7          | 0.423            | 10.74 | 0.050            | 1.27 |
| MP16112KW    | MP16112LW   | MP16112RW  | 12         | 0.569            | 14.45 | 0.065            | 1.65 |
| MP16117KW    | MP16117LW   | MP16117RW  | 17         | 0.656            | 16.66 | 0.065            | 1.65 |
| MP16122KW    | MP16122LW   | MP16122RW  | 22         | 0.719            | 18.26 | 0.065            | 1.65 |
| MP16125KW    | MP16125LW   | MP16125RW  | 25         | 0.773            | 19.63 | 0.065            | 1.65 |
| MP16133KW    | MP16133LW   | MP16133RW  | 33         | 0.869            | 22.07 | 0.085            | 2.16 |
| MP16142KW    | MP16142LW   | MP16142RW  | 42         | 0.962            | 24.43 | 0.085            | 2.16 |
| MP16149KW    | MP16149LW   | MP16149RW  | 49         | 1.017            | 25.83 | 0.085            | 2.16 |
| MP16165KW    | MP16165LW   | MP16165RW  | 65         | 1.134            | 28.80 | 0.085            | 2.16 |

### 14 AWG (2.08 mm<sup>2</sup>)

Stranding: 41/30 (41 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.010 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| MP14104KW    | MP14104LW   | MP14104RW  | 4          | 0.396            | 10.06 | 0.050            | 1.27 |
| MP14105KW    | MP14105LW   | MP14105RW  | 5          | 0.430            | 10.92 | 0.050            | 1.27 |
| MP14107KW    | MP14107LW   | MP14107RW  | 7          | 0.495            | 12.57 | 0.065            | 1.65 |
| MP14112KW    | MP14112LW   | MP14112RW  | 12         | 0.627            | 15.93 | 0.065            | 1.65 |
| MP14125KW    | MP14125LW   | MP14125RW  | 25         | 0.899            | 22.83 | 0.085            | 2.16 |

### 12 AWG (3.31 mm<sup>2</sup>)

Stranding: 65/30 (65 x 0.25 mm)  
Insulation thickness: 0.016 (0.41 mm) PVC/0.005 (0.010 mm) nylon

| Part No.     |             |            | Conductors | Nominal Diameter |       | Jacket Thickness |      |
|--------------|-------------|------------|------------|------------------|-------|------------------|------|
| Black Insul. | Blue Insul. | Red Insul. |            | Inch             | mm    | Inch             | mm   |
| MP12104KW    | MP12104LW   | MP12104RW  | 4          | 0.472            | 11.99 | 0.065            | 1.65 |
| MP12105KW    | MP12105LW   | MP12105RW  | 5          | 0.511            | 12.98 | 0.065            | 1.65 |
| MP12107KW    | MP12107LW   | MP12107RW  | 7          | 0.552            | 14.02 | 0.065            | 1.65 |



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## Series SF Servo Control Cable

**Construction:** Stranded bare copper 18 to 8 AWG (0.96 to 8.52 mm<sup>2</sup>).

**Conductors:** 4 power, 4 power + 2 pairs for control.

**Shielding coverage Foil + braid shielding:** aluminum/polyester foil and tinned copper braid, 85% PVC/nylon.

**Insulation:** PVC/nylon. **Jacket:** Orange thermoplastic elastomer.

### Features:

Designed specifically for connecting power between the supply and servo motors, drives, and controllers, Series SF cables feature a flexible TPE jacket and PVC/nylon insulation, making them suitable for flexing applications that require continuous movement. The cables are available in two configurations. The power cable has four conductors for power and ground. The composite cable adds two additional individually shielded twisted pairs for brake or temperature control.

### Applications:

- Machine tools
- Pick and place equipment
- Cartesian and articulated motion control
- Automated material handling systems

### Technical Data:



**Temperature:**  
• -25°C to +90°C



**Rated Voltage:**  
• 600/1000 V



**Color Code:**  
• Black, blue, or red numbered conductors  
• One green/yellow ground conductor  
• One white striped neutral  
(12 conductors or greater)



**Approvals:**  
• Suitable for use Class I, Division 2 locations per Article 501 of the National Electric Code  
• UL TC-ER  
• UL WTTC  
• UL Oil Res. I/II  
• UL Sunlight Resistant  
• CSA AWM I/II A/B FT4  
• CE compliant  
• RoHS compliant

#### Flexible Power Servo Cable

4 conductors for power/ground

| Part No.  | Conductors | Wire Size |                 | Stranding |            | Nominal Diameter |       | Jacket Thickness |      |
|-----------|------------|-----------|-----------------|-----------|------------|------------------|-------|------------------|------|
|           |            | AWG       | mm <sup>2</sup> | AWG       | mm         | Inch             | mm    | Inch             | mm   |
| SF61118CY | 4          | 18        | 0.96            | 19/30     | 19 x 0.25  | 0.382            | 9.70  | 0.055            | 1.40 |
| SF61116CY | 4          | 16        | 1.32            | 26/30     | 26 x 0.25  | 0.406            | 10.31 | 0.055            | 1.40 |
| SF61114CY | 4          | 14        | 2.09            | 41/30     | 41 x 0.25  | 0.440            | 11.18 | 0.055            | 1.40 |
| SF61112CY | 4          | 12        | 3.31            | 65/30     | 65 x 0.25  | 0.506            | 12.85 | 0.065            | 1.65 |
| SF61110CY | 4          | 10        | 5.32            | 105/30    | 105 x 0.25 | 0.603            | 15.32 | 0.065            | 1.65 |
| SF61108CY | 4          | 8         | 8.50            | 168/30    | 168 x 0.25 | 0.785            | 19.94 | 0.065            | 1.65 |

#### Flexible Composite Servo Cable

4 conductors for power/ground +2 individually shielded pairs for brake or temperature control

| Part No.  | Conductors | Wire Size       |                 | Stranding       |                         | Nominal Diameter |       | Jacket Thickness |      |
|-----------|------------|-----------------|-----------------|-----------------|-------------------------|------------------|-------|------------------|------|
|           |            | AWG             | mm <sup>2</sup> | AWG             | mm                      | Inch             | mm    | Inch             | mm   |
| SF61220CY | 4 +2 pairs | 16 pwr<br>18 pr | 1.32<br>0.96    | 26/30<br>19/30  | 26 x 0.25<br>19 x 0.25  | 0.590            | 14.99 | 0.065            | 1.65 |
| SF61221CY | 4 +2 pairs | 14 pwr<br>18 pr | 2.09<br>0.96    | 41/30<br>19/30  | 41 x 0.25<br>19 x 0.25  | 0.618            | 15.70 | 0.065            | 1.65 |
| SF61222CY | 4 +2 pairs | 12 pwr<br>16 pr | 3.31<br>1.32    | 65/30<br>26/30  | 65 x 0.25<br>26 x 0.25  | 0.674            | 17.12 | 0.065            | 1.65 |
| SF61223CY | 4 +2 pairs | 10 pwr<br>16 pr | 5.37<br>1.32    | 105/30<br>26/30 | 105 x 0.25<br>26 x 0.25 | 0.757            | 19.23 | 0.065            | 1.65 |
| SF61224CY | 4 +2 pairs | 8 pwr<br>16 pr  | 8.50<br>1.32    | 168/30<br>26/30 | 168 x 0.25<br>26 x 0.25 | 0.943            | 23.95 | 0.085            | 2.16 |

Specifications subject to change. For complete specifications and availability visit [www.lapptannehill.com](http://www.lapptannehill.com)

# Flexible Control Cables

## Series XM

**Construction:** Stranded bare copper 18 to 8 AWG (1.32 to 13.49 mm<sup>2</sup>).

**Shielding:** Tinned copper braid, 85% coverage, or unshielded.

**Insulation:** PVC/nylon. **Jacket:** Black PVC.

**Features:**

- Specially formulated PVC jacket for continuous flex applications
- Finely stranded conductors for better flexibility
- PVC jacket and insulation resist moisture, oils, coolants, and UV radiation

**Applications:**

- Continuous-flex applications
- Automated material handling equipment
- Transfer shuttles
- High-speed pick-and-place robotic systems
- Conveyors
- Flex track installations

**Technical Data:**



**Temperature:**

- Static: -30°C to +90°C
- Dynamic: -5°C to +90°C



**Rated Voltage:**

- 600/1000V



**Color Code:**

- Black, blue, or red numbered conductors
- One green/yellow ground conductor



**Approvals:**

- Meets NFPA Standard 79 for industrial machinery
- UL TC-ER
- UL MTW
- UL WTTC
- UL Oil Res. I
- UL Sunlight Resistant
- CSA AWM I/II A/B FT4
- CE compliant
- RoHS compliant
- California Prop 65



| 18 AWG (0.83 mm <sup>2</sup> ) |         |         |            |                  |       |                  |      |
|--------------------------------|---------|---------|------------|------------------|-------|------------------|------|
| 41/34 (41 x 0.16 mm) Stranding |         |         |            |                  |       |                  |      |
| Part No. (Unshielded*)         |         |         | Conductors | Nominal Diameter |       | Jacket Thickness |      |
| Red                            | Blue    | Black   |            | Inch             | mm    | Inch             | mm   |
| XM1803R                        | XM1803L | XM1803K | 3          | 0.308            | 7.82  | 0.050            | 1.27 |
| XM1804R                        | XM1804L | XM1804K | 4          | 0.333            | 8.46  | 0.050            | 1.27 |
| XM1805R                        | XM1805L | XM1805K | 5          | 0.360            | 9.14  | 0.050            | 1.27 |
| XM1807R                        | XM1807L | XM1807K | 7          | 0.418            | 10.62 | 0.050            | 1.27 |
| XM1812R                        | XM1812L | XM1812K | 12         | 0.486            | 12.34 | 0.050            | 1.27 |
| XM1817R                        | XM1817L | XM1817K | 17         | 0.597            | 15.16 | 0.065            | 1.65 |
| XM1822R                        | XM1822L | XM1822K | 22         | 0.656            | 16.66 | 0.065            | 1.65 |
| XM1825R                        | XM1825L | XM1825K | 25         | 0.717            | 18.21 | 0.065            | 1.65 |
| XM1834R                        | XM1834L | XM1834K | 34         | 0.775            | 19.69 | 0.065            | 1.65 |
| XM1842R                        | XM1842L | XM1842K | 42         | 0.874            | 22.20 | 0.085            | 2.16 |
| XM1849R                        | XM1849L | XM1849K | 49         | 0.965            | 24.51 | 0.085            | 2.16 |
| XM1865R                        | XM1865L | XM1865K | 65         | 1.052            | 26.72 | 0.085            | 2.16 |

### Series XM Cables

| 16 AWG (1.31 mm <sup>2</sup> ) |         |         |            |                  |       |                  |      |
|--------------------------------|---------|---------|------------|------------------|-------|------------------|------|
| 65/34 (65 x 0.16 mm) Stranding |         |         |            |                  |       |                  |      |
| Part No. (Unshielded*)         |         |         | Conductors | Nominal Diameter |       | Jacket Thickness |      |
| Red                            | Blue    | Black   |            | Inch             | mm    | Inch             | mm   |
| XM1603R                        | XM1603L | XM1603K | 3          | 0.334            | 8.48  | 0.050            | 1.27 |
| XM1604R                        | XM1604L | XM1604K | 4          | 0.362            | 9.19  | 0.050            | 1.27 |
| XM1605R                        | XM1605L | XM1605K | 5          | 0.393            | 9.98  | 0.050            | 1.27 |
| XM1607R                        | XM1607L | XM1607K | 7          | 0.459            | 11.66 | 0.050            | 1.27 |
| XM1612R                        | XM1612L | XM1612K | 12         | 0.565            | 14.35 | 0.065            | 1.65 |
| XM1617R                        | XM1617L | XM1617K | 17         | 0.657            | 16.69 | 0.065            | 1.65 |
| XM1619R                        | XM1619L | XM1619K | 19         | 0.691            | 17.55 | 0.065            | 1.65 |
| XM1622R                        | XM1622L | XM1622K | 22         | 0.724            | 18.39 | 0.065            | 1.65 |
| XM1625R                        | XM1625L | XM1625K | 25         | 0.793            | 20.14 | 0.065            | 1.65 |
| XM1633R                        | XM1633L | XM1633K | 33         | 0.899            | 22.83 | 0.085            | 2.16 |
| XM1642R                        | XM1642L | XM1642K | 42         | 0.966            | 24.54 | 0.085            | 2.16 |
| XM1649R                        | XM1649L | XM1649K | 49         | 1.069            | 27.15 | 0.085            | 2.16 |
| XM1665R                        | XM1665L | XM1665K | 65         | 1.168            | 29.67 | 0.085            | 2.16 |

| 14 AWG (2.11 mm <sup>2</sup> )   |         |         |    |       |       |       |      |
|----------------------------------|---------|---------|----|-------|-------|-------|------|
| 105/34 (105 x 0.16 mm) Stranding |         |         |    |       |       |       |      |
| XM1403R                          | XM1403L | XM1403K | 3  | 0.366 | 9.30  | 0.050 | 1.27 |
| XM1404R                          | XM1404L | XM1404K | 4  | 0.398 | 10.11 | 0.050 | 1.27 |
| XM1405R                          | XM1405L | XM1405K | 5  | 0.464 | 11.79 | 0.065 | 1.65 |
| XM1407R                          | XM1407L | XM1407K | 7  | 0.539 | 13.69 | 0.065 | 1.65 |
| XM1412R                          | XM1412L | XM1412K | 12 | 0.627 | 15.93 | 0.065 | 1.65 |

| 12 AWG (3.38 mm <sup>2</sup> )   |         |         |   |       |       |       |      |
|----------------------------------|---------|---------|---|-------|-------|-------|------|
| 168/34 (168 x 0.16 mm) Stranding |         |         |   |       |       |       |      |
| XM1203R                          | XM1203L | XM1203K | 3 | 0.431 | 10.95 | 0.050 | 1.27 |
| XM1204R                          | XM1204L | XM1204K | 4 | 0.501 | 12.73 | 0.065 | 1.65 |
| XM1205R                          | XM1205L | XM1205K | 5 | 0.545 | 13.84 | 0.065 | 1.65 |
| XM1207R                          | XM1207L | XM1207K | 7 | 0.640 | 16.26 | 0.065 | 1.65 |

\*Braid shielded versions are available in constructions up to 49 conductors. To order a shielded version add "CY" to the end of the desired part number.



## Series V VFD Cables

**Construction:** Stranded bare copper 16 to 4/0 AWG (1.32 to 109 mm<sup>2</sup>).

**Shielding:** Tinned copper braid, 85% coverage, or unshielded.

**Insulation:** PVC/nylon. **Jacket:** Black thermoplastic elastomer.

### Features:

- Symmetrical geometry for uniform electrical properties
- Low-capacitance construction for improved signal transmission and extended cable runs
- Resists potential effects of harmonics, power distortion, and transient noise
- Outstanding oil, solvent, chemical, and fuel resistance
- Round geometry helps ensure a liquid-tight installation per IP67 or NEMA 6
- Double shielded for superior EMI performance
- Specially formulated XLPE conductor insulation will not degrade under heavy electrical load
- Capable of handling the effects of wave reflections on long cable runs

### Applications:

Alpha Series V VFD cables are compatible with drives from all major manufacturers.

### Additional Information:

- Conductors 3 or 4
- Optional brake pair



### Technical Data:

**Temperature:**  
• 40°C to +90°C

**Rated Voltage:**  
• 600/1000V

**Color Code:**  
• Black, blue, or red numbered conductors  
• One green/yellow ground conductor

**Approvals:**

- Suitable for use Class I, Division 2 locations per Article 501 of the National Electric Code
- UL TC-ER
- UL RHW-2/XHHW-2
- UL 1000 V Flexible Motor Supply
- UL Oil Res. I
- UL Sunlight Resistant
- UL Direct Burial
- CSA AWM I/II A/B FT4
- Pennsylvania MSHA
- CE compliant
- RoHS compliant

### Series V VFD Cables

| Three-Conductor VFD Cables |           |                 |           |            |            |                      |      |                  |      |                  |       |
|----------------------------|-----------|-----------------|-----------|------------|------------|----------------------|------|------------------|------|------------------|-------|
| Part No.                   | Wire Size |                 | Stranding |            | Shielding  | Insulation Thickness |      | Jacket Thickness |      | Nominal Diameter |       |
|                            | AWG       | mm <sup>2</sup> | AWG       | mm         |            | Inch                 | mm   | Inch             | mm   | Inch             | mm    |
| V16316                     | 16        | 1.32            | 26/30     | 26 x 0.25  | Foil/Braid | 0.046                | 1.17 | 0.050            | 1.27 | 0.468            | 11.89 |
| V16314                     | 14        | 2.09            | 41/30     | 41 x 0.25  | Foil/Braid | 0.046                | 1.17 | 0.065            | 1.65 | 0.538            | 13.67 |
| V16312                     | 12        | 3.31            | 65/30     | 65 x 0.25  | Foil/Braid | 0.046                | 1.17 | 0.065            | 1.65 | 0.578            | 14.68 |
| V16310                     | 10        | 5.37            | 105/30    | 105 x 0.25 | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.642            | 16.31 |
| V16308                     | 8         | 8.53            | 133/29    | 133 x 0.28 | Foil/Braid | 0.061                | 1.55 | 0.065            | 1.65 | 0.798            | 20.27 |
| V16306                     | 6         | 13.57           | 133/27    | 133 x 0.36 | Foil/Braid | 0.061                | 1.55 | 0.085            | 2.15 | 0.924            | 23.47 |
| V16304                     | 4         | 21.58           | 133/25    | 133 x 0.45 | Foil/Braid | 0.061                | 1.55 | 0.085            | 2.15 | 1.050            | 26.67 |
| V16302                     | 2         | 34.32           | 133/23    | 133 x 0.57 | Tape       | 0.061                | 1.55 | 0.085            | 2.15 | 1.157            | 29.39 |
| V16001                     | 1         | 43.28           | 133/22    | 133 x 0.64 | Tape       | 0.056                | 1.42 | 0.085            | 2.15 | 1.197            | 30.48 |
| V16000                     | 1/0       | 54.58           | 133/21    | 133 x 0.72 | Tape       | 0.056                | 1.42 | 0.085            | 2.15 | 1.294            | 32.77 |
| V16020                     | 2/0       | 68.85           | 133/20    | 133 x 0.81 | Tape       | 0.056                | 1.42 | 0.085            | 2.15 | 1.399            | 35.56 |
| V16030                     | 3/0       | 86.9            | 133/19    | 133 x 0.91 | Tape       | 0.056                | 1.42 | 0.085            | 2.15 | 1.517            | 38.53 |
| V16040                     | 4/0       | 109             | 133/18    | 133 x 1.02 | Tape       | 0.056                | 1.42 | 0.085            | 2.15 | 1.653            | 41.98 |

| Four-Conductor VFD Cable |           |       |           |            |            |                      |      |                  |      |                  |       |
|--------------------------|-----------|-------|-----------|------------|------------|----------------------|------|------------------|------|------------------|-------|
| Part No.                 | Wire Size |       | Stranding |            | Shielding  | Insulation Thickness |      | Jacket Thickness |      | Nominal Diameter |       |
|                          | AWG       | mm²   | AWG       | mm         |            | Inch                 | mm   | Inch             | mm   | Inch             | mm    |
| V16016                   | 16        | 1.32  | 26/30     | 26 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.547            | 13.89 |
| V16014                   | 14        | 2.09  | 41/30     | 41 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.584            | 14.83 |
| V16012                   | 12        | 3.31  | 65/30     | 65 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.633            | 16.08 |
| V16010                   | 10        | 5.37  | 105/30    | 105 x 0.25 | Foil/Braid | 0.047                | 1.19 | 0.085            | 2.15 | 0.746            | 18.95 |
| V16008                   | 8         | 8.53  | 133/29    | 133 x 0.28 | Foil/Braid | 0.061                | 1.55 | 0.086            | 2.15 | 0.920            | 23.37 |
| V16006                   | 6         | 13.57 | 133/27    | 133 x 0.36 | Foil/Braid | 0.061                | 1.55 | 0.086            | 2.15 | 1.017            | 25.83 |
| V16004                   | 4         | 21.58 | 133/25    | 133 x 0.45 | Foil/Braid | 0.061                | 1.55 | 0.086            | 2.15 | 1.157            | 29.39 |
| V16002                   | 2         | 34.32 | 133/23    | 133 x 0.57 | Foil/Braid | 0.061                | 1.55 | 0.088            | 2.15 | 1.308            | 33.22 |

| Four-Conductor VFD Cable with 14 AWG (2.09) Brake Pair |           |      |           |            |            |                      |      |                  |      |                  |       |
|--------------------------------------------------------|-----------|------|-----------|------------|------------|----------------------|------|------------------|------|------------------|-------|
| Part No.                                               | Wire Size |      | Stranding |            | Shielding  | Insulation Thickness |      | Jacket Thickness |      | Nominal Diameter |       |
|                                                        | AWG       | mm²  | AWG       | mm         |            | Inch                 | mm   | Inch             | mm   | Inch             | mm    |
| V16116                                                 | 16        | 1.32 | 26/30     | 26 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.717            | 18.21 |
| V16114                                                 | 14        | 2.09 | 41/30     | 41 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.743            | 18.87 |
| V16112                                                 | 12        | 3.31 | 65/30     | 65 x 0.25  | Foil/Braid | 0.047                | 1.19 | 0.065            | 1.65 | 0.785            | 19.94 |
| V16110                                                 | 10        | 5.37 | 105/30    | 105 x 0.25 | Foil/Braid | 0.047                | 1.19 | 0.085            | 2.15 | 0.875            | 22.23 |
| V16108                                                 | 8         | 8.53 | 133/29    | 133 x 0.28 | Foil/Braid | 0.061                | 1.55 | 0.085            | 2.15 | 1.032            | 26.21 |



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