



DATAFLEX®
Torque measuring device

Made for Motion



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Torque measuring device

General description:

DATAFLEX® is a device that allows for real-time measurement of application torque and speed via an optical measuring principle. This provides high-resolution insight to applications with minimal set-up and maintenance. Results are easily obtained through a variety of commonly available data acquisition devices.

Function and Design

DATAFLEX® measures torques without contacts or radio frequencies, is low maintenance and has high frequency response. It operates via a patented optical principle. An optical-electronic light process senses the torsional relationship of the drive and driven sides. The light is projected through two opposing slotted discs. The ratio of light changes proportionally to the transmitted torque. This produces high resolution measurements without the use of strain gages, slip rings and telemetry.

DATAFLEX® measures torques up to 442,550 lb-in with a band width of more than 15 kHz. The analog output values are available both as voltage and current. They can be easily read with a multimeter, oscilloscope or by a computer with acquisition capabilities.



Standard features

Measured values for increment of torque

DATAFLEX® measures torques with a band width of more than 15 kHz and is able to sense high frequency torque variations, such as the starting of an engine, precisely and continuously.

Easy analysis with standard devices

Analog output values are available both as voltage (0 ... 10 V) and current (4 ... 20 mA). They can be easily read with a multimeter, oscilloscope or easily analyzed by computer.

Reduced Maintenance:

DATAFLEX® does not require daily maintenance. All electronics are located in a stationary housing. Since neither data nor energy is transmitted from the rotating shaft, there is no maintenance due to slip ring wear or expensive telemetry to maintain.

Two in One – control of torque and speed

In addition to torque measurement, DATAFLEX® also measures shaft speed. This feature is a standard part of the low cost package.

On site calibration

DATAFLEX® can be easily calibrated on site and includes fully automatic offset balancing. Disassembly or removal is not required since all communications to the internal microprocessor are accessible via a standard multiple pin connector.

Plug & Play: problem-free assembly.

Options to DATAFLEX®

RADEX®-N steel disc coupling or RADEX®-NC servo disc coupling.

Compact, complete solution which can be easily integrated into your product – and saves space!

Real time torque measuring – Effective process control

DATAFLEX® torque measuring couplings supply precise readings economically. Many machine control options can now be made practical like process control in agitator drives, extruders and worm drives, the control of coiling / lapping machines, shredders and boring mills.

DATAFLEX® torque measuring couplings are also available for production use – just call KTR!

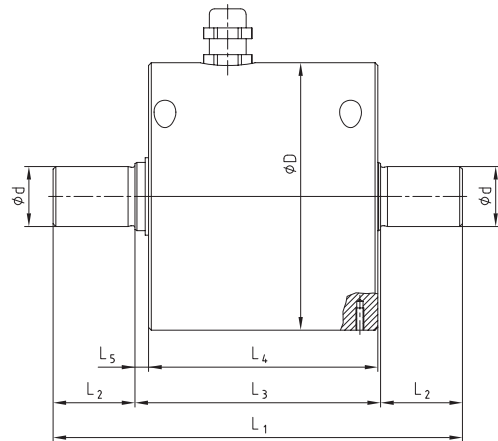


Size 22/20, 22/50, 22/100



- DATAFLEX® 22 for low torques
- Optical torque measurement
- Integrated speed sensor
- High resolution
- Easily integrated with other couplings

| DATAFLEX® – Dimensions | | | | | | | |
|------------------------|-----------------|------|----------------|----------------|----------------|----------------|----------------|
| Size | Dimensions [in] | | | | | | |
| | d | D | L ₁ | L ₂ | L ₃ | L ₄ | L ₅ |
| DATAFLEX® 22/20 | | | | | | | |
| DATAFLEX® 22/50 | 0.87 | 3.86 | 5.91 | 1.18 | 3.54 | 3.31 | 0.20 |
| DATAFLEX® 22/100 | | | | | | | |



| Technical Data | | | |
|---|----------------------------|------------|------------|
| DATAFLEX® Size | 22/20 | 22/50 | 22/100 |
| Electrical Data | | | |
| Rated torque T_{KN} [lb-in] | -170...170 | -440...440 | -880...880 |
| Torque signal with limit frequency [kHz] | 16 | | |
| Inaccuracy in measuring [%] ¹⁾ | ± 0.5 | | |
| Influence of temperature [%/K] ¹⁾ | 0.05 | | |
| Nominal temperature range [°F] | 32...131 | | |
| Distribution voltage [V] | 24 ± 4 | | |
| Max. current consumption [mA] | 100 | | |
| Connection ²⁾ | Sub-D-15 pol. high density | | |
| Output of torque | | | |
| Output of voltage [V] | 0...10 | | |
| Output of current [mA] | 4...20 | | |
| Output of speed | | | |
| Number of pulses / revolutions | 60 | | |
| Output signal [V] | 24 | | |
| Mechanical data | | | |
| Static load limit $T_{K \max}$ [%] ¹⁾ | 150 | | |
| Breaking load $T_{K \text{ break}}$ [%] ¹⁾ | 300 | | |
| Max. bending moment [lb-in] | 44 | 89 | 159 |
| Max. radial force [lbf] | 9.5 | 18.9 | 33.8 |
| Max. axial force [lbf] | 675 | 1125 | 1688 |
| Weight [lb] | 3.31 | | |
| Torsion spring stiffness C_T [lb-in/rad] | 25,350 | 36,390 | 126,790 |
| Twisting angle with T_{KN} [degree] | 0.4 | | |
| Mass moment of inertia [lb-in-sec ²] | 0.00116 | 0.00117 | 0.00119 |
| Max. speed [rpm] | 8,000 | | |

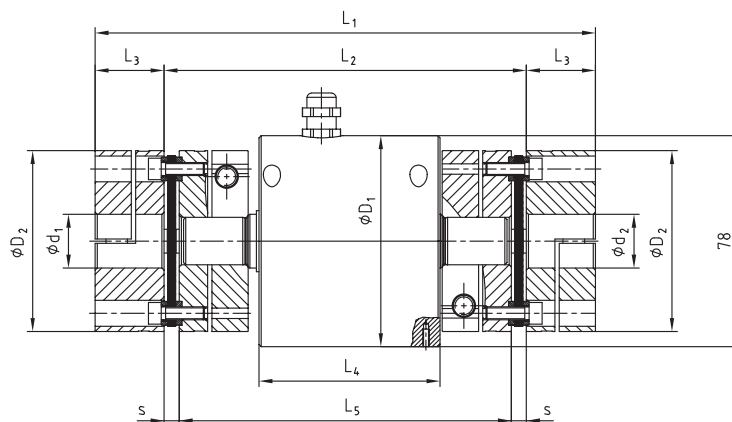
1) Referring to T_{KN}

2) See accessory: Connection box DF 01

Size 22/20, 22/50, 22/100 – Accessories: RADEX®-NC Servo disc coupling



- Accommodates for:
 - axial misalignment
 - parallel misalignment
 - angular misalignment
- Compact design
- Zero-backlash, torsionally stiff
- Ease of assembly



Technical Data

| DATAFLEX® Size | 22/20 | 22/50 | 22/100 |
|--|--------|--------|---------|
| Coupling size RADEX®-NC | 25 | 35 | |
| Dimensions | | | |
| Dimension d_1/d_2 max. | 1.38 | 1.57 | |
| Dimension D_1 | 3.86 | 3.86 | |
| Dimension D_2 | 2.76 | 3.31 | |
| Dimension L_1 | 8.98 | 9.61 | |
| Dimension L_2 | 6.46 | 6.85 | |
| Dimension L_3 | 1.26 | 1.38 | |
| Dimension L_4 | 3.31 | 3.31 | |
| Dimension L_5 | 6.06 | 6.30 | |
| Dimension s | 0.20 | 0.28 | |
| Setscrews | | | |
| Dimension G | M8 | M10 | |
| Tightening torque T_A [lb-in] | 221 | 434 | |
| Torque of coupling | | | |
| T_{KN} [lb-in] | 531 | 885 | |
| $T_{K max.}$ [lb-in] | 1062 | 1770 | |
| Mechanical data of the entire system | | | |
| Mass moment of inertia [lb-in-sec ²] | 0.008 | 0.018 | |
| Torsion spring stiffness C_T [lb-in/rad] | 22,313 | 56,496 | 101,326 |
| Weight [lb] | 5.64 | 6.95 | 6.97 |
| Max. speed [rpm] ¹⁾ | 8,000 | 8,000 | 8,000 |

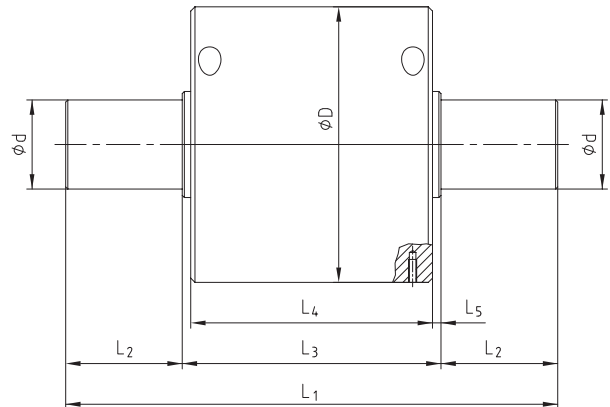
1) Higher speeds on request

Size 42/200, 42/500, 42/1000



- DATAFLEX® 42 for average torques
- Optical torque measurement
- Integrated speed sensor
- High resolution
- Easily integrated with other couplings

| DATAFLEX® – Dimensions | | | | | | | |
|------------------------|-----------------|------|----------------|----------------|----------------|----------------|----------------|
| Size | Dimensions [in] | | | | | | |
| | d | D | L ₁ | L ₂ | L ₃ | L ₄ | L ₅ |
| DATAFLEX® 42/200 | | | | | | | |
| DATAFLEX® 42/500 | 1.65 | 5.12 | 9.13 | 2.17 | 4.80 | 4.49 | 0.26 |
| DATAFLEX® 42/1000 | | | | | | | |



| Technical Data | | | |
|---|----------------------------|----------------|----------------|
| DATAFLEX® Size | 42/200 | 42/500 | 42/1000 |
| Electrical Data | | | |
| Rated torque T_{KN} [lb-in] | -1,770...1,770 | -4,420...4,420 | -8,850...8,850 |
| Torque signal with limit frequency [kHz] | 16 | | |
| Inaccuracy in measuring [%] ¹⁾ | ± 0.5 | | |
| Influence of temperature [%/K] ¹⁾ | 0.05 | | |
| Nominal temperature range [°F] | 32-131 | | |
| Distribution voltage [V] | 24 ± 4 | | |
| Max. current consumption [mA] | 100 | | |
| Connection ²⁾ | Sub-D-15 pol. high density | | |
| Output of torque | | | |
| Output of voltage [V] | 0...10 | | |
| Output of current [mA] | 4...20 | | |
| Output of speed | | | |
| Number of pulses / revolutions | 60 | | |
| Output signal [V] | 24 | | |
| Mechanical data | | | |
| Static load limit $T_{K \max}$ [%] ¹⁾ | 150 | | |
| Breaking load $T_{K \text{ break}}$ [%] ¹⁾ | 300 | | |
| Max. bending moment [lb-in] | 443 | 1,195 | 2,390 |
| Max. radial force [lbf] | 63 | 169 | 338 |
| Max. axial force [lbf] | 2,700 | 4,500 | 6,750 |
| Weight [lb] | 10.4 | 10.7 | 11.0 |
| Torsion spring stiffness C_T [lb-in/rad] | 362,260 | 905,640 | 1,811,290 |
| Twisting angle with T_{KN} [degree] | 0.28 | | |
| Mass moment of inertia [lb-in-sec ²] | 0.0065 | 0.0067 | 0.0071 |
| Max. speed [rpm] | 6,000 | | |

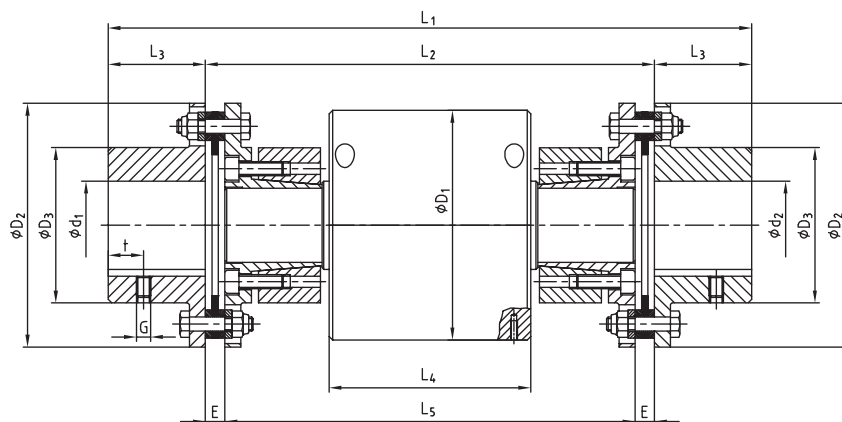
1) Referring to T_{KN}

2) See accessory: Connection box DF 01

Size 42/200, 42/500, 42/1000 – Accessories: RADEX®-N Steel disc coupling



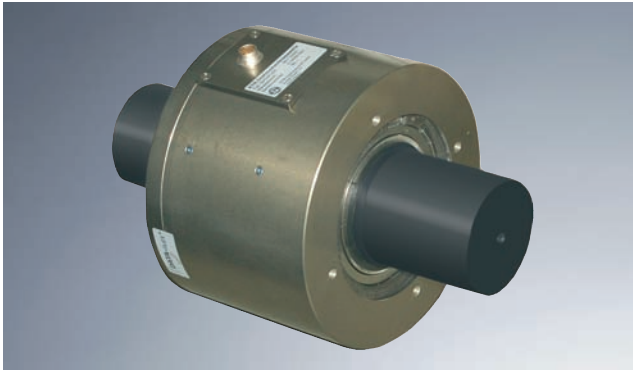
- Accommodates for:
 - axial misalignment
 - parallel misalignment
 - angular misalignment
- Compact design
- Zero-backlash, torsionally stiff
- Ease of assembly



| Technical Data | | | |
|---|---------|---------|---------|
| DATAFLEX® Size | 42/200 | 42/500 | 42/1000 |
| Coupling size RADEX®-N | 60 | | 80 |
| Dimensions | | | |
| Dimension d ₁ /d ₂ max. | 2.36 | | 3.15 |
| Dimension D ₁ | 5.12 | | 5.12 |
| Dimension D ₂ | 5.43 | | 7.05 |
| Dimension D ₃ | 3.46 | | 4.61 |
| Dimension L ₁ | 14.33 | | 16.54 |
| Dimension L ₂ | 10.00 | | 10.63 |
| Dimension L ₃ | 2.17 | | 2.95 |
| Dimension L ₄ | 4.49 | | 4.49 |
| Dimension L ₅ | 9.13 | | 9.53 |
| Dimension E | 0.43 | | 0.55 |
| Setscrews | | | |
| Dimension G | M8 | | M10 |
| Dimension t | 0.79 | | 0.79 |
| Tightening torque T _A [lb-in] | 88.5 | | 150 |
| Torque of coupling | | | |
| T _{KN} [lb-in] | 6,100 | | 13,277 |
| T _{K max.} [lb-in] | 12,210 | | 26,553 |
| T _{KW} [lb-in] | 2,030 | | 4,426 |
| Mechanical data of the entire system | | | |
| Mass moment of inertia [lb-in-sec ²] | 0.1531 | 0.1540 | 0.5036 |
| Torsion spring stiffness C _T [lb-in/rad] | 262,030 | 462,940 | 769,040 |
| Weight [lb] | 30.6 | 30.9 | 53.8 |
| Max. speed [rpm] ¹⁾ | 6,000 | 6,000 | 5,100 |

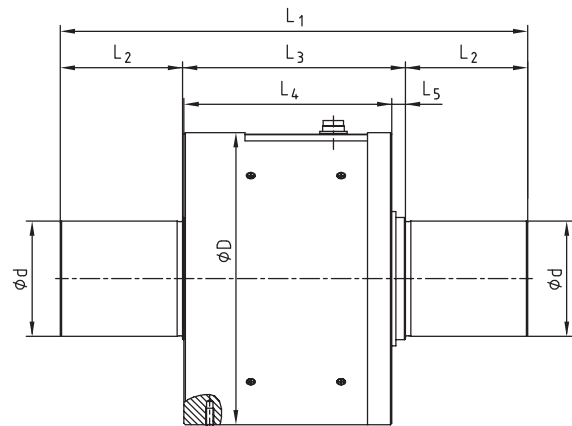
1) Higher speeds on request

Size 85/2000, 85/5000, 85/10000



- DATAFLEX® 85 for high torques
- Optical torque measurement
- Integrated speed sensor
- High resolution
- Easily integrated with other couplings

| DATAFLEX® – Dimensions | | | | | | | |
|------------------------|-----------------|------|----------------|----------------|----------------|----------------|----------------|
| Size | Dimensions [in] | | | | | | |
| | d | D | L ₁ | L ₂ | L ₃ | L ₄ | L ₅ |
| DATAFLEX® 85/2000 | | | | | | | |
| DATAFLEX® 85/5000 | 3.35 | 8.46 | 13.54 | 3.54 | 6.46 | 6.02 | 0.39 |
| DATAFLEX® 85/10000 | | | | | | | |



| Technical Data | | | |
|---|-------------------|------------------|------------------|
| DATAFLEX® Size | 85/2000 | 85/5000 | 85/10000 |
| Electrical Data | | | |
| Rated torque T_{KN} [lb-in] | -17,700...17,700 | -44,250...44,250 | -85,510...85,510 |
| Torque signal with limit frequency [kHz] | 16 | | |
| Inaccuracy in measuring [%] ¹⁾ | ± 0.5 | | |
| Influence of temperature [%/K] ¹⁾ | 0.05 | | |
| Nominal temperature range [°F] | 32...131 | | |
| Distribution voltage [V] | 24 ± 4 | | |
| Max. current consumption [mA] | 100 | | |
| Connection ²⁾ | Binder serial 423 | | |
| Output of torque | | | |
| Output of voltage [V] | 0...10 | | |
| Output of current [mA] | 4...20 | | |
| Output of speed | | | |
| Number of pulses / revolutions | 60 | | |
| Output signal [V] | 24 | | |
| Mechanical data | | | |
| Static load limit $T_{K \max}$ [%] ¹⁾ | 150 | | |
| Breaking load $T_{K \text{ break}}$ [%] ¹⁾ | 300 | | |
| Max. bending moment [lb-in] | 3,360 | 6,720 | 11,240 |
| Max. radial force [lbf] | 13,270 | 26,550 | 44,250 |
| Max. axial force [lbf] | 440 | 700 | 970 |
| Weight [lb] | 49.9 | 51.2 | 52.6 |
| Torsion spring stiffness C_T [lb-in/rad] | 3,381,080 | 7,245,160 | 11,270,240 |
| Twisting angle with T_{KN} [degree] | 0.30 | 0.35 | 0.45 |
| Mass moment of inertia [lb-in-sec ²] | 0.1448 | 0.1486 | 0.1542 |
| Max. speed [rpm] | 2,500 | | |

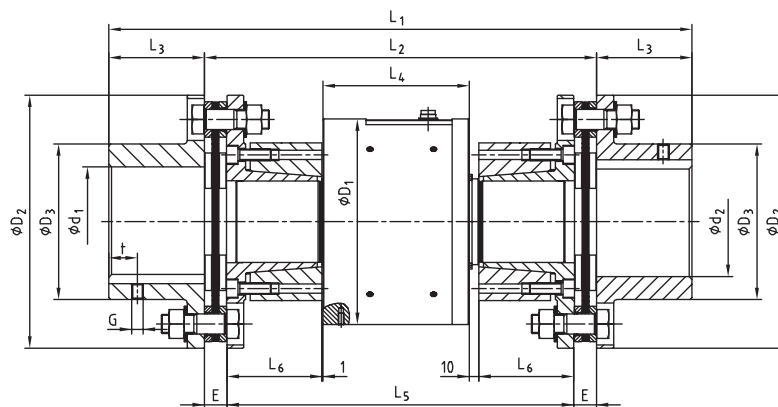
1) Referring to T_{KN}

2) See accessory: Connection box DF 01

Size 85/2000, 85/5000, 85/10000 – Accessories: RADEX®-N Steel disc coupling



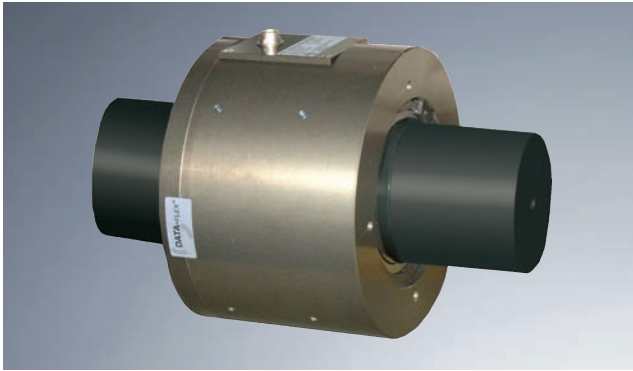
- Accommodates for:
 - axial misalignment
 - parallel misalignment
 - angular misalignment
- Compact design
- Zero-backlash, torsionally stiff
- Ease of assembly



| Technical Data | | | |
|--|-----------|-----------|-----------|
| DATAFLEX® Size | 85/2000 | 85/5000 | 85/10000 |
| Coupling size RADEX®-N | 105 | 115 | 135 |
| Dimensions | | | |
| Dimension d_1/d_2 max. | 4.13 | 4.53 | 5.31 |
| Dimension D_1 | 8.46 | 8.46 | 8.46 |
| Dimension D_2 | 8.86 | 10.43 | 12.01 |
| Dimension D_3 | 5.79 | 6.42 | 7.24 |
| Dimension L_1 | 22.20 | 24.02 | 29.84 |
| Dimension L_2 | 15.12 | 16.14 | 19.21 |
| Dimension L_3 | 3.54 | 3.94 | 5.31 |
| Dimension L_4 | 6.02 | 6.02 | 6.02 |
| Dimension L_5 | 13.54 | 14.33 | 17.09 |
| Dimension L_6 | 3.54 | 3.94 | 5.31 |
| Dimension E | 0.79 | 0.91 | 1.06 |
| Setscrews | | | |
| Dimension G | M12 | M12 | M20 |
| Dimension t | 1.18 | 1.18 | 1.57 |
| Tightening torque T_A [lb-in] | 350 | 350 | 1230 |
| Torque of coupling | | | |
| T_{KN} [lb-in] | 45,140 | 79,650 | 106,210 |
| $T_{K max.}$ [lb-in] | 90,280 | 159,310 | 212,420 |
| T_{KW} [lb-in] | 15,040 | 26,550 | 35,400 |
| Mechanical data of the entire system | | | |
| Mass moment of inertia [lb-in-sec ²] | 1.9915 | 4.1909 | 8.9103 |
| Torsion spring stiffness C_T [lb-in/rad] | 2,593,340 | 4,921,150 | 8,213,720 |
| Weight [lb] | 136 | 189 | 287 |
| Max. speed [rpm] ¹⁾ | 2,500 | 2,500 | 2,500 |

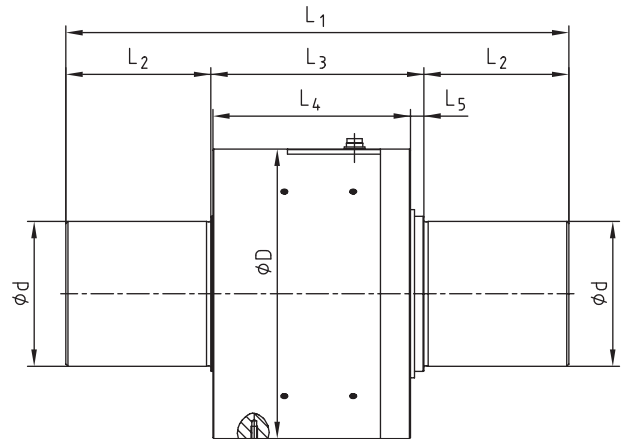
1) Higher speeds on request

Size 140/20000, 140/50000



- DATAFLEX® 140 for high torques
- Optical torque measurement
- Integrated speed sensor
- High resolution
- Easily integrated with other couplings

| DATAFLEX® – Dimensions | | | | | | | |
|------------------------|-----------------|-------|----------------|----------------|----------------|----------------|----------------|
| Size | Dimensions [in] | | | | | | |
| | d | D | L ₁ | L ₂ | L ₃ | L ₄ | L ₅ |
| DATAFLEX® 140/20000 | 5.51 | 11.02 | 19.13 | 5.51 | 8.11 | 7.52 | 0.51 |
| DATAFLEX® 140/50000 | | | | | | | |



| Technical Data | | |
|--|--------------------|--------------------|
| DATAFLEX® Size | 140/20000 | 140/50000 |
| Electrical Data | | |
| Rated torque T _{KN} [lb-in] | -177,020...177,020 | -442,550...442,550 |
| Torque signal with limit frequency [kHz] | 16 | |
| Inaccuracy in measuring [%] ¹⁾ | ± 0.5 | |
| Influence of temperature [%/K] ¹⁾ | 0.05 | |
| Nominal temperature range [°F] | 32...131 | |
| Distribution voltage [V] | 24 ± 4 | |
| Max. current consumption [mA] | 100 | |
| Connection ²⁾ | Binder serial 423 | |
| Output of torque | | |
| Output of voltage [V] | 0...10 | |
| Output of current [mA] | 4...20 | |
| Output of speed | | |
| Number of pulses / revolutions | 60 | |
| Output signal [V] | 24 | |
| Mechanical data | | |
| Static load limit T _{K max} [%] ¹⁾ | 150 | |
| Breaking load T _{K break} [%] ¹⁾ | 300 | |
| Max. bending moment [lb-in] | 24,340 | 48,680 |
| Max. radial force [lbf] | 1,800 | 3,600 |
| Max. axial force [lbf] | 22,500 | 36,000 |
| Weight [lb] | 163 | 169 |
| Torsion spring stiffness C _T [lb-in/rad] | 34,828,680 | 59,744,250 |
| Twisting angle with T _{KN} [degree] | 0.30 | 0.42 |
| Mass moment of inertia [lb-in-sec ²] | 1.5047 | 1.5489 |
| Max. speed [rpm] | 2,000 | |

1) Referring to T_{KN}

2) See accessory: Connection box DF 01

DATAFLEX® Connection accessories

Connection box DF 01 and connecting cable



- Standard connector for all DATAFLEX® sizes
- standard DIN rail mounting
- Screw connectors
- Adjustable low pass integrated filter
- Integrated calibration system for fast calibration
- Cable lengths of 6.5 ft, 16 ft and 32 ft available