

# Tachogeneratoren

Vollwelle  $\varnothing 14$  bis  $\varnothing 18$  mm mit Flansch

Mit eigener Lagerung

## TDP 13, TDPZ 13



TDP 13

### Technische Daten - elektrisch

|                       |   |
|-----------------------|---|
| Reversiertoleranz     | $\leq 0,1 \%$                               |
| Linearitätstoleranz   | $\leq 0,15 \%$                              |
| Temperaturkoeffizient | $\pm 0,05 \%/K$ (Leerlauf)                  |
| Isolationsklasse      | B   |
| Kalibriertoleranz     | $\pm 3 \%$                                  |
| Klimatische Prüfung   | Feuchte Wärme, konstant (IEC 60068-2-3, Ca) |
| Leerlaufspannung      | 20...200 mV pro U/min                       |
| Störfestigkeit        | EN 61000-6-2                                |
| Störaussendung        | EN 61000-6-3                                |
| Zulassungen           | CE, RoHS                                    |

### TDP 13

|                          |                                   |
|--------------------------|-----------------------------------|
| Leistung                 | 40 W (Drehzahl $\geq 2000$ U/min) |
| Ankerkreis-Zeitkonstante | $< 0,4 \mu s$                     |

### TDPZ 13

|                          |                                      |
|--------------------------|--------------------------------------|
| Leistung                 | 2x 20 W (Drehzahl $\geq 2000$ U/min) |
| Ankerkreis-Zeitkonstante | $< 0,2 \mu s$                        |

### Merkmale

- Kurze Reaktionszeit
- Leerlaufspannung 20...200 mV pro U/min
- Vollwelle  $\varnothing 14$ -18 mm mit Flansch
- Hohe Signalgüte über den gesamten Drehzahlbereich dank patentierter Longlife Technik
- Eigenlagerung
- Keine Hilfsenergie erforderlich

### Optional

- Redundanter Ausgang (mit Option Z)
- Zweites Wellenende (B14)

### Technische Daten - mechanisch

|                           |   |
|---------------------------|---|
| Baugrösse (Flansch)       | $\varnothing 120$ mm<br>$\varnothing 165$ mm<br>$\varnothing 175$ mm                |
| Wellenart                 | $\varnothing 14$ ...18 mm Vollwelle   |
| Flansch                   | B5-, B5k-, B5s-, B10- und B10w-Flansch  |
| Schutzart DIN EN 60529    | IP 55   |
| Betriebsdrehzahl          | $\leq 6000$ U/min   |
| Zulässige Wellenbelastung | $\leq 80$ N axial<br>$\leq 100$ N radial  |
| Werkstoffe                | Gehäuse: Stahl<br>Welle: Edelstahl  |
| Betriebstemperatur        | $-30$ ... $+130$ °C   |
| Widerstandsfähigkeit      | IEC 60068-2-6<br>Vibration 10 g, 10-2000 Hz<br>IEC 60068-2-27<br>Schock 100 g, 6 ms |
| Anschluss                 | Klemmenkasten   |

### TDP 13

|                       |                       |
|-----------------------|-----------------------|
| Drehmoment            | 2,5 Ncm               |
| Trägheitsmoment Rotor | 0,4 kgcm <sup>2</sup> |
| Masse ca.             | 8,5 kg                |

### TDPZ 13

|                       |                       |
|-----------------------|-----------------------|
| Drehmoment            | 4,1 Ncm               |
| Trägheitsmoment Rotor | 0,6 kgcm <sup>2</sup> |
| Masse ca.             | 10 kg                 |

# Tachogeneratoren

## Vollwelle ø14 bis ø18 mm mit Flansch

### Mit eigener Lagerung

**TDP 13, TDPZ 13**

#### Bestellbezeichnung

##### Tachogenerator

TDP13.06LT-

|    |                  |
|----|------------------|
|    | Leerlaufspannung |
| 15 | 20 mV pro U/min  |
| 17 | 65 mV pro U/min  |
| 6  | 100 mV pro U/min |
| 3  | 175 mV pro U/min |
| 2  | 200 mV pro U/min |

##### Doppel-Tachogenerator

TDPZ13.06LT-

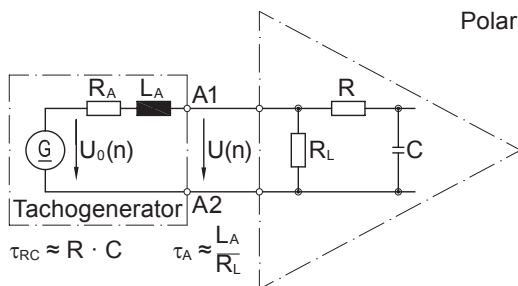
|    |                  |
|----|------------------|
|    | Leerlaufspannung |
| 15 | 20 mV pro U/min  |
| 17 | 65 mV pro U/min  |
| 6  | 100 mV pro U/min |
| 3  | 175 mV pro U/min |
| 2  | 200 mV pro U/min |

#### Daten nach Typ

| Typ            | Leerlaufspannung<br>$U_0$<br>[mV/U/min] | Min. erforderlicher Lastwiderstand in Abhängigkeit vom Drehzahlbereich [U/min] |               |               | Max. Betriebsdrehzahl<br>$n_{max}$<br>[U/min] | Anker-Widerstand<br>$R_A(20^\circ C)$<br>[Ω] | Anker-Induktivität<br>$L_A$<br>[mH] |
|----------------|---|--|---------------|---------------|---|--|-------------------------------------|
|                |   | 0-1000   | 0-3000        | 0- $n_{max}$  |   |  |                                     |
|                |   | $R_L$<br>[kΩ]  | $R_L$<br>[kΩ] | $R_L$<br>[kΩ] |   |  |                                     |
| TDP13.06LT-15  | 20                                      | ≥0,02  | ≥0,09         | ≥0,4          | 6000  | 2,1  | 9                                   |
| TDP13.06LT-17  | 65                                      | ≥0,2   | ≥0,9          | ≥4            | 6000  | 21   | 85                                  |
| TDP13.06LT-6   | 100                                     | ≥0,5   | ≥2,5          | ≥9            | 6000  | 46   | 200                                 |
| TDP13.06LT-3   | 175                                     | ≥1,5   | ≥7            | ≥10           | 3500  | 150  | 610                                 |
| TDP13.06LT-2   | 200                                     | ≥2   | ≥9            | –             | 3000  | 208  | 800                                 |
| TDPZ13.06LT-15 | 20                                      | ≥0,04  | ≥0,2          | ≥0,8          | 6000  | 3,4  | 9                                   |
| TDPZ13.06LT-17 | 65                                      | ≥0,4   | ≥2            | ≥8            | 6000  | 34   | 85                                  |
| TDPZ13.06LT-6  | 100                                     | ≥1   | ≥5            | ≥18           | 6000  | 76   | 200                                 |
| TDPZ13.06LT-3  | 175                                     | ≥3   | ≥14           | ≥20           | 3500  | 250  | 610                                 |
| TDPZ13.06LT-2  | 200                                     | ≥4   | ≥18           | –             | 3000  | 328  | 800                                 |

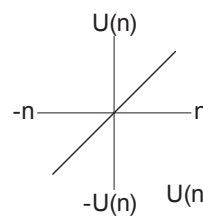
Überlagerte Welligkeit (für  $\tau_{RC} = 0,7$  ms):      ≤0,5% (Spitze-Spitze)      ≤0,25% (effektiv)

#### Ersatzschaltbild



Polarität bei positiver Drehrichtung: A1 (1A1\*, 2A1\*): + A2 (1A2\*, 2A2\*): – (VDE)

\* mit Option Z



$$U(n) = U_0(n) \frac{R_L}{R_A + R_L} \approx U_0(n) \text{ für } R > R_L \gg R_A$$

# Tachogeneratoren

Vollwelle  $\varnothing 14$  bis  $\varnothing 18$  mm mit Flansch

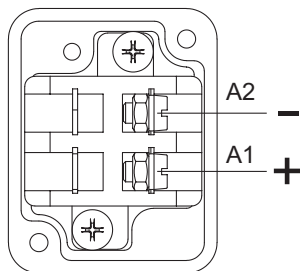
Mit eigener Lagerung

## TDP 13, TDPZ 13

### Anschlussbelegung

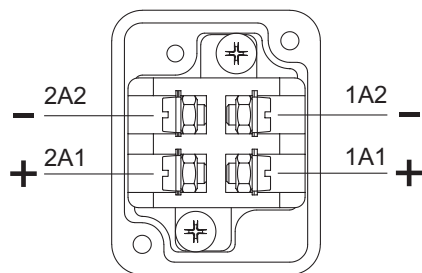
**Ansicht A** - Anschlussklemmen TDP 13

Polarität bei positiver Drehrichtung



**Ansicht A** - Anschlussklemmen TDPZ 13

Polarität bei positiver Drehrichtung



### Zubehör

Kohlebürsten

### Montagezubehör

K 50 Federscheiben-Kupplung  
für Vollwelle  $\varnothing 11 \dots 16$  mm

K 60 Federscheiben-Kupplung  
für Vollwelle  $\varnothing 11 \dots 22$  mm

# Tachogeneratoren

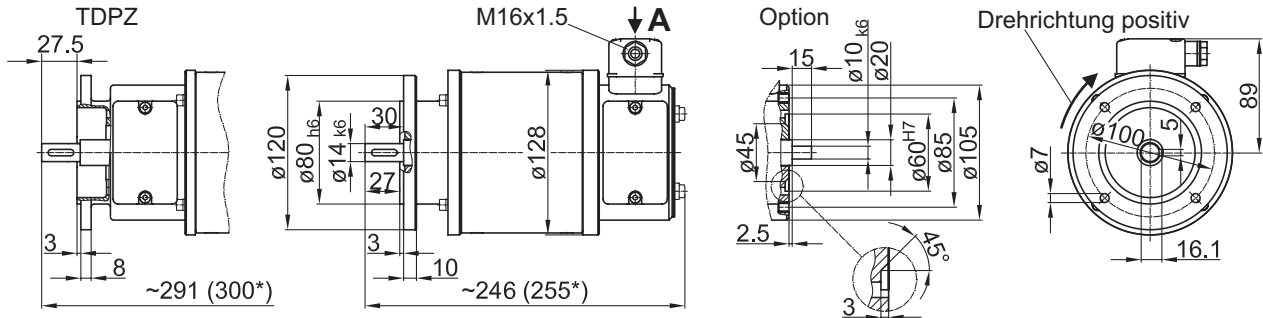
## Vollwelle $\varnothing 14$ bis $\varnothing 18$ mm mit Flansch

### Mit eigener Lagerung

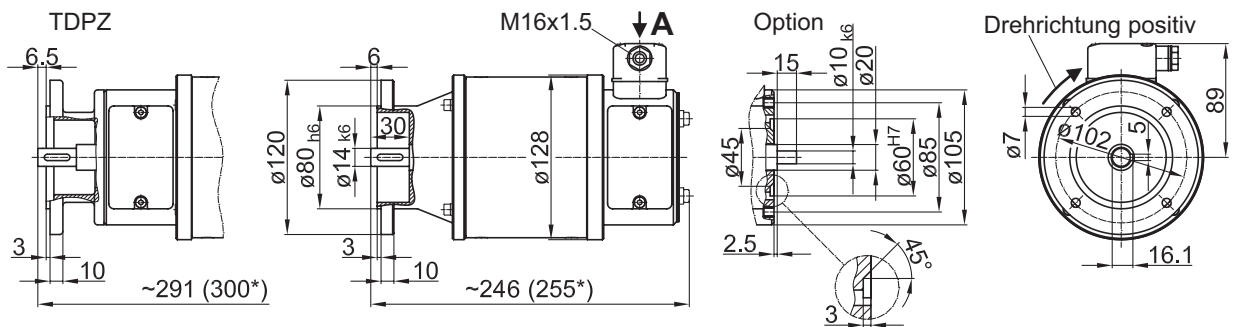
TDP 13, TDPZ 13

#### Abmessungen

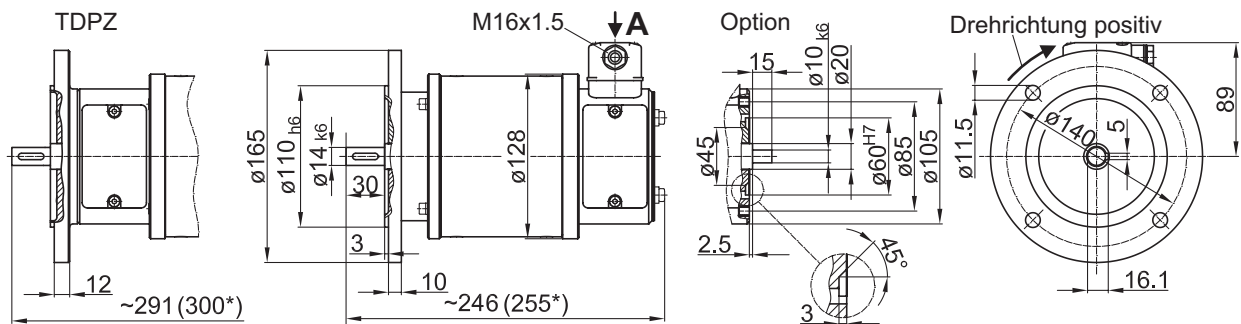
##### TDP 13 (TDPZ 13) - Version mit B5-Flansch



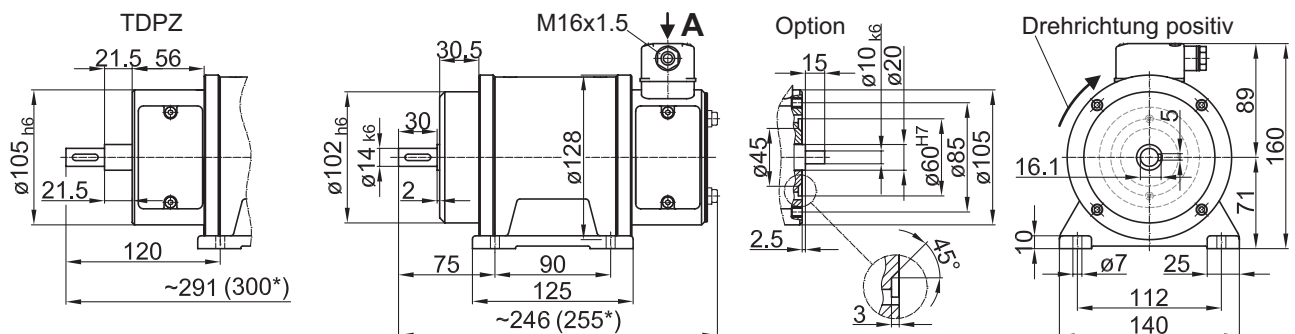
##### TDP 13 (TDPZ 13) - Version mit B5s-Flansch



##### TDP 13 (TDPZ 13) - Version mit B5k-Flansch



##### TDP 13 (TDPZ 13) - Version mit Gehäusefuss (B3)



\* Option mit 2. Wellenende

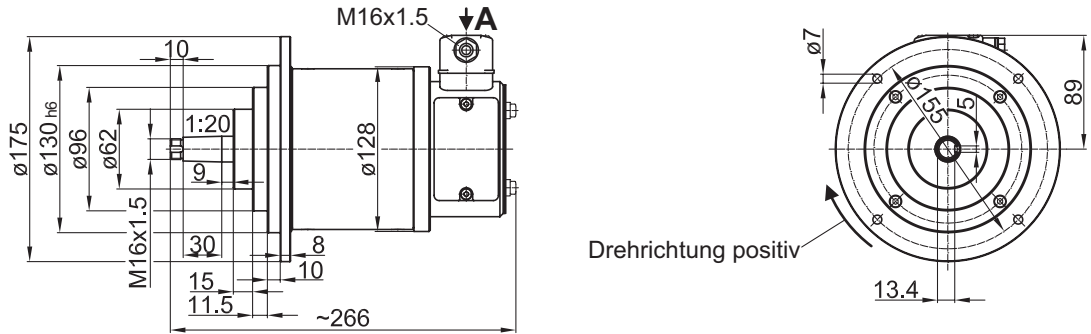
# Tachogeneratoren

Vollwelle  $\varnothing 14$  bis  $\varnothing 18$  mm mit Flansch

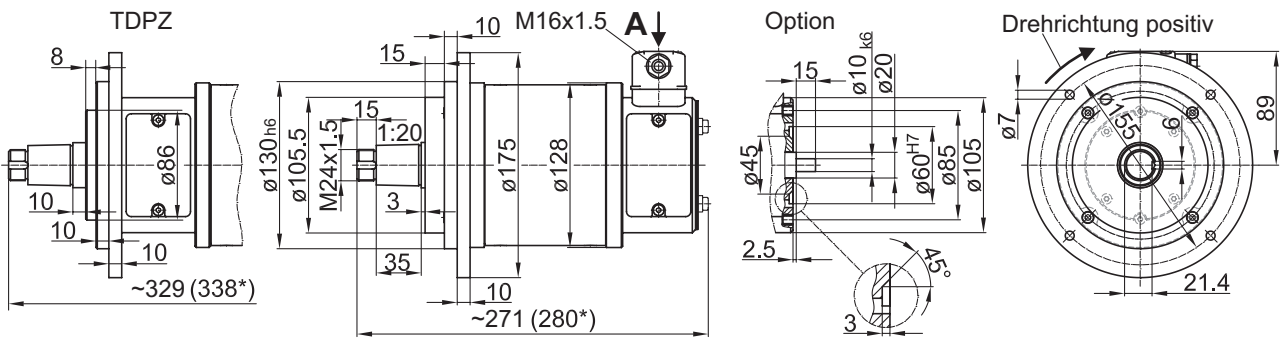
Mit eigener Lagerung

## TDP 13, TDPZ 13

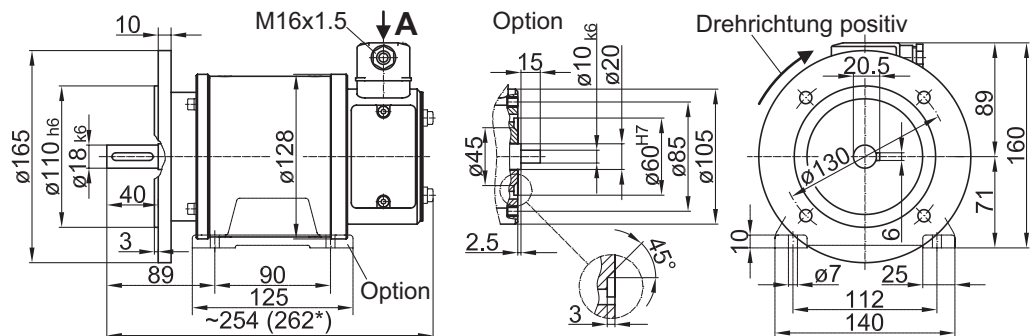
### TDP 13 - Version mit B10-Flansch



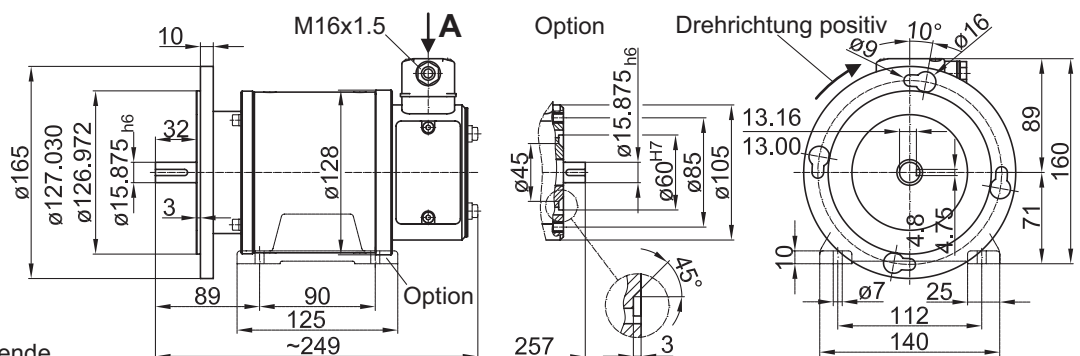
### TDP 13 (TDPZ 13) - Version mit B10w-Flansch



### TDP 13 - Version mit B5kd-Flansch



### TDP 13 - Version mit B5km-Flansch



\* Option mit 2. Wellenende

# Tachogenerators

Solid shaft  $\varnothing 14$  to  $\varnothing 18$  mm with flange

With own bearings

## TDP 13, TDPZ 13



TDP 13

### Technical data - electrical ratings

|                         |  |
|-------------------------|--|
| Reversal tolerance      | $\leq 0.1$ %                             |
| Linearity tolerance     | $\leq 0.15$ %                            |
| Temperature coefficient | $\pm 0.05$ %/K (open-circuit)            |
| Isolation class         | B  |
| Calibration tolerance   | $\pm 3$ %                                |
| Climatic test           | Humid heat, constant (IEC 60068-2-3, Ca) |
| Open-circuit voltage    | 20...200 mV per rpm                      |
| Interference immunity   | EN 61000-6-2                             |
| Emitted interference    | EN 61000-6-3                             |
| Approvals               | CE, RoHS                                 |

### TDP 13

|                                |                              |
|--------------------------------|------------------------------|
| Performance                    | 40 W (speed $\geq 2000$ rpm) |
| Armature-circuit time-constant | $< 0.4$ $\mu$ s              |

### TDPZ 13

|                                |                                 |
|--------------------------------|---------------------------------|
| Performance                    | 2x 20 W (speed $\geq 2000$ rpm) |
| Armature-circuit time-constant | $< 0.2$ $\mu$ s                 |

### Features

- Low response time
- Open circuit voltage 20...200 mV per rpm
- Solid shaft  $\varnothing 14$ -18 mm with flange
- High signal quality due to patented LongLife technology
- With own bearings
- No auxiliary energy source required

### Optional

- Redundant output (with option Z)
- Second shaft end (B14)

### Technical data - mechanical design

|                         |  |
|-------------------------|--|
| Size (flange)           | $\varnothing 120$ mm<br>$\varnothing 165$ mm<br>$\varnothing 175$ mm               |
| Shaft type              | $\varnothing 14$ ...18 mm solid shaft  |
| Flange                  | B5, B5k, B5s, B10 and B10w flange  |
| Protection DIN EN 60529 | IP 55  |
| Operating speed         | $\leq 6000$ rpm  |
| Shaft loading           | $\leq 80$ N axial<br>$\leq 100$ N radial   |
| Materials               | Housing: steel<br>Shaft: stainless steel   |
| Operating temperature   | $-30$ ... $+130$ °C  |
| Resistance              | IEC 60068-2-6<br>Vibration 10 g, 10-2000 Hz<br>IEC 60068-2-27<br>Shock 100 g, 6 ms |
| Connection              | Terminal box   |

### TDP 13

|                         |                       |
|-------------------------|-----------------------|
| Torque                  | 2.5 Ncm               |
| Rotor moment of inertia | 0.4 kgcm <sup>2</sup> |
| Weight approx.          | 8.5 kg                |

### TDPZ 13

|                         |                       |
|-------------------------|-----------------------|
| Torque                  | 4.1 Ncm               |
| Rotor moment of inertia | 0.6 kgcm <sup>2</sup> |
| Weight approx.          | 10 kg                 |

# Tachogenerators

## Solid shaft $\varnothing 14$ to $\varnothing 18$ mm with flange

### With own bearings

**TDP 13, TDPZ 13**

#### Part number

#### Tachogenerator

TDP13.06LT-

|    |                             |
|----|-----------------------------|
|    | <u>Open-circuit voltage</u> |
| 15 | 20 mV per rpm               |
| 17 | 65 mV per rpm               |
| 6  | 100 mV per rpm              |
| 3  | 175 mV per rpm              |
| 2  | 200 mV per rpm              |

#### Twin tachogenerator

TDPZ13.06LT-

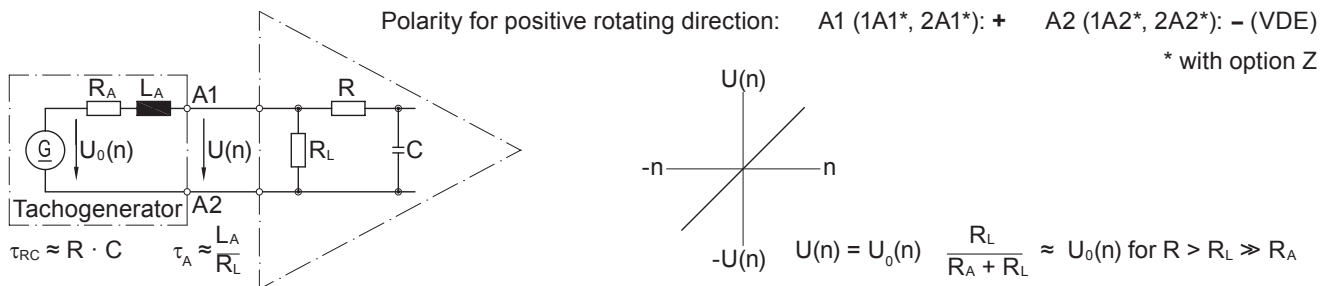
|    |                             |
|----|-----------------------------|
|    | <u>Open-circuit voltage</u> |
| 15 | 20 mV per rpm               |
| 17 | 65 mV per rpm               |
| 6  | 100 mV per rpm              |
| 3  | 175 mV per rpm              |
| 2  | 200 mV per rpm              |

#### Data according to type

| Type           | Off-load voltage<br>$U_0$<br>[mV/rpm] | Minimum load required depending<br>on speed range [rpm] |                        |                        | Maximum<br>operating speed<br>$n_{max}$<br>[rpm] | Armature<br>resistance<br>$R_A$ (20°C)<br>[ $\Omega$ ] | Armature<br>inductance<br>$L_A$<br>[mH] |
|----------------|---------------------------------------|---|------------------------|------------------------|--|--|---|
|                |                                       | 0-1000  | 0-3000                 | 0- $n_{max}$           |  |  |   |
|                |                                       | $R_L$<br>[k $\Omega$ ]                                  | $R_L$<br>[k $\Omega$ ] | $R_L$<br>[k $\Omega$ ] |  |  |   |
| TDP13.06LT-15  | 20                                    | $\geq 0.02$   | $\geq 0.09$            | $\geq 0.4$             | 6000   | 2.1  | 9                                       |
| TDP13.06LT-17  | 65                                    | $\geq 0.2$  | $\geq 0.9$             | $\geq 4$               | 6000   | 21   | 85                                      |
| TDP13.06LT-6   | 100                                   | $\geq 0.5$  | $\geq 2.5$             | $\geq 9$               | 6000   | 46   | 200                                     |
| TDP13.06LT-3   | 175                                   | $\geq 1.5$  | $\geq 7$               | $\geq 10$              | 3500   | 150  | 610                                     |
| TDP13.06LT-2   | 200                                   | $\geq 2$  | $\geq 9$               | –                      | 3000   | 208  | 800                                     |
| TDPZ13.06LT-15 | 20                                    | $\geq 0.04$   | $\geq 0.2$             | $\geq 0.8$             | 6000   | 3.4  | 9                                       |
| TDPZ13.06LT-17 | 65                                    | $\geq 0.4$  | $\geq 2$               | $\geq 8$               | 6000   | 34   | 85                                      |
| TDPZ13.06LT-6  | 100                                   | $\geq 1$  | $\geq 5$               | $\geq 18$              | 6000   | 76   | 200                                     |
| TDPZ13.06LT-3  | 175                                   | $\geq 3$  | $\geq 14$              | $\geq 20$              | 3500   | 250  | 610                                     |
| TDPZ13.06LT-2  | 200                                   | $\geq 4$  | $\geq 18$              | –                      | 3000   | 328  | 800                                     |

Superimposed ripple (for  $\tau_{RC} = 0.7$  ms):       $\leq 0.5\%$  (peak-peak)       $\leq 0.25\%$  (rms)

#### Replacement switching diagram



# Tachogenerators

Solid shaft  $\varnothing 14$  to  $\varnothing 18$  mm with flange

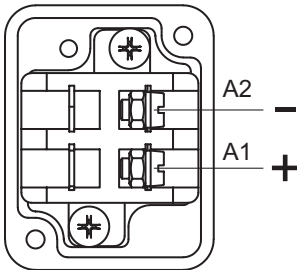
With own bearings

## TDP 13, TDPZ 13

### Terminal assignment

**View A** - Connecting terminal

Polarity for positive direction of rotation



### Accessories

Carbon brushes

### Mounting accessories

|      |  |
|------|--|
| K 50 | Spring disk coupling<br>for solid shaft $\varnothing 11 \dots 16$ mm |
| K 60 | Spring disk coupling<br>for solid shaft $\varnothing 11 \dots 22$ mm |



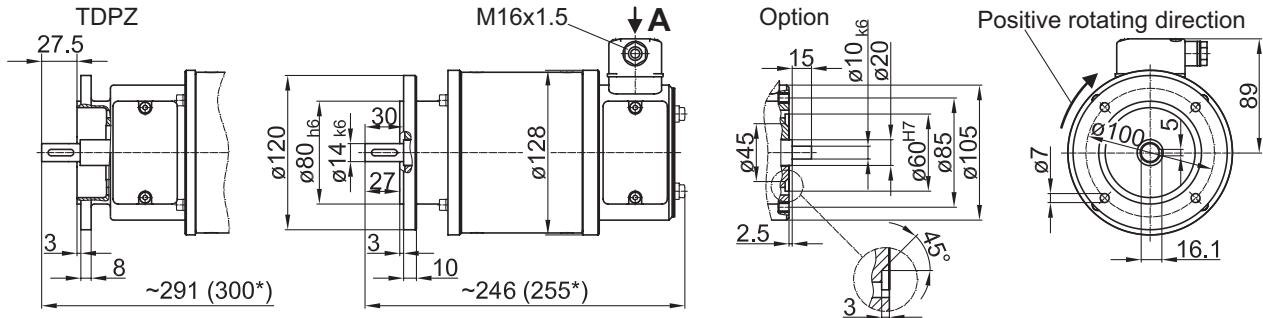
# Tachogenerators

Solid shaft  $\varnothing 14$  to  $\varnothing 18$  mm with flange  
With own bearings

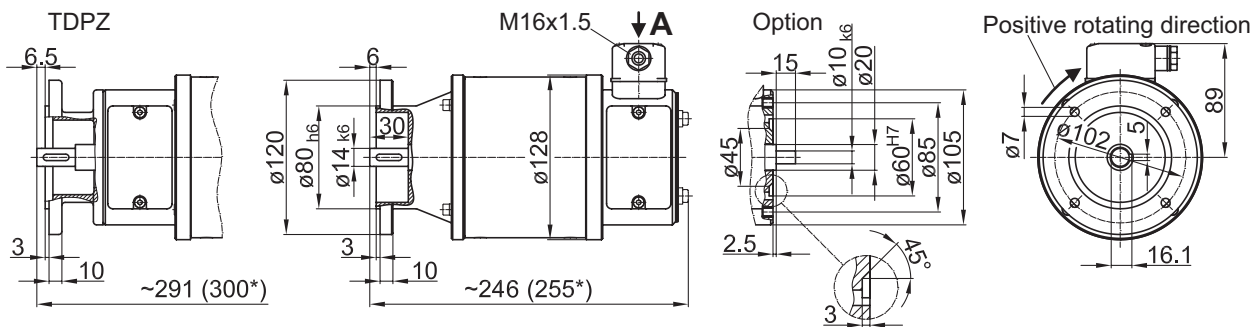
TDP 13, TDPZ 13

## Dimensions

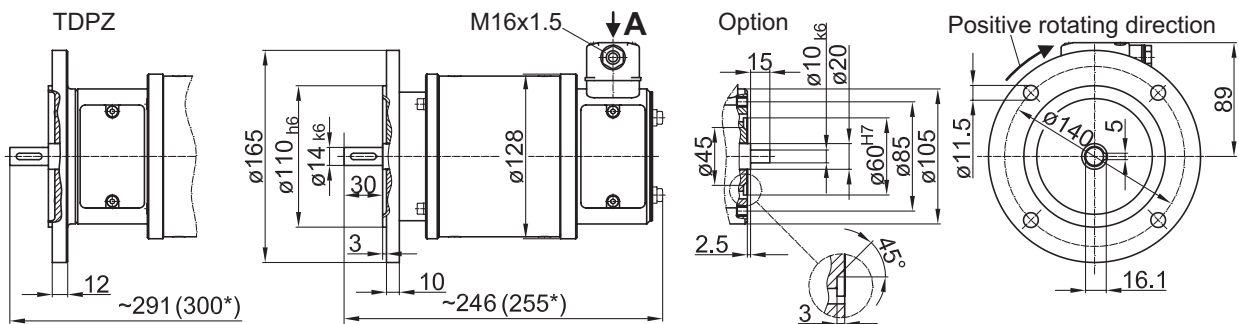
### TDP 13 (TDPZ 13) - Version with B5 flange



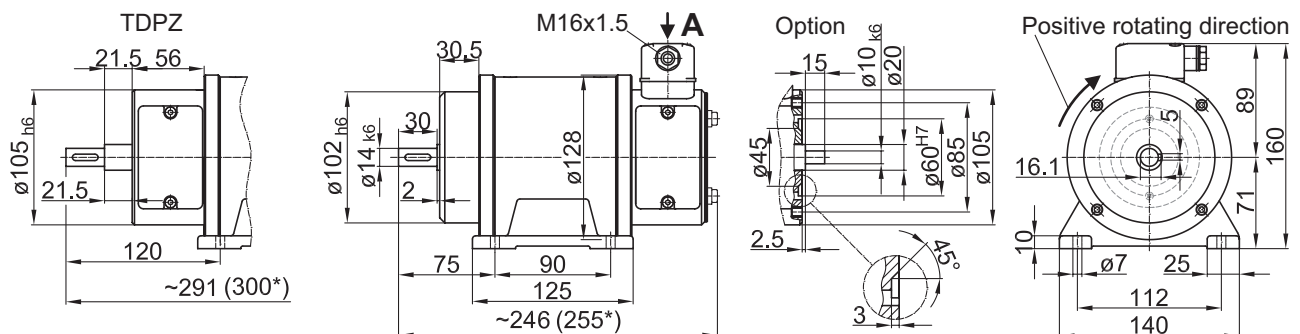
### TDP 13 (TDPZ 13) - Version with B5s flange



### TDP 13 (TDPZ 13) - Version with B5k flange



### TDP 13 (TDPZ 13) - Version with housing foot (B3)



\* Option with second shaft end

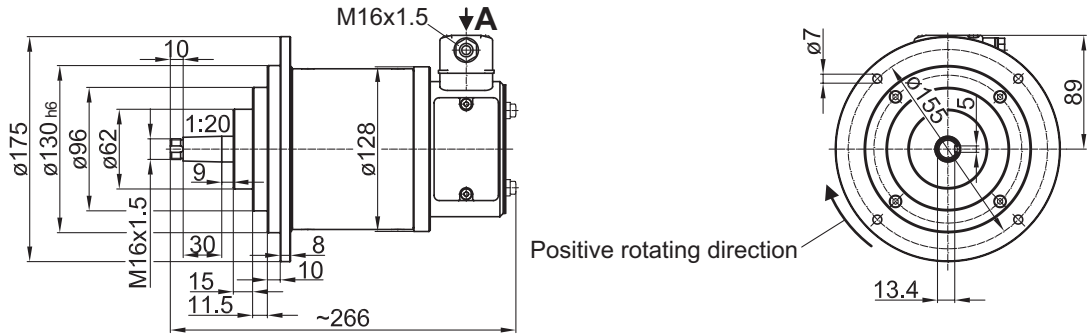
# Tachogenerators

Solid shaft  $\varnothing 14$  to  $\varnothing 18$  mm with flange

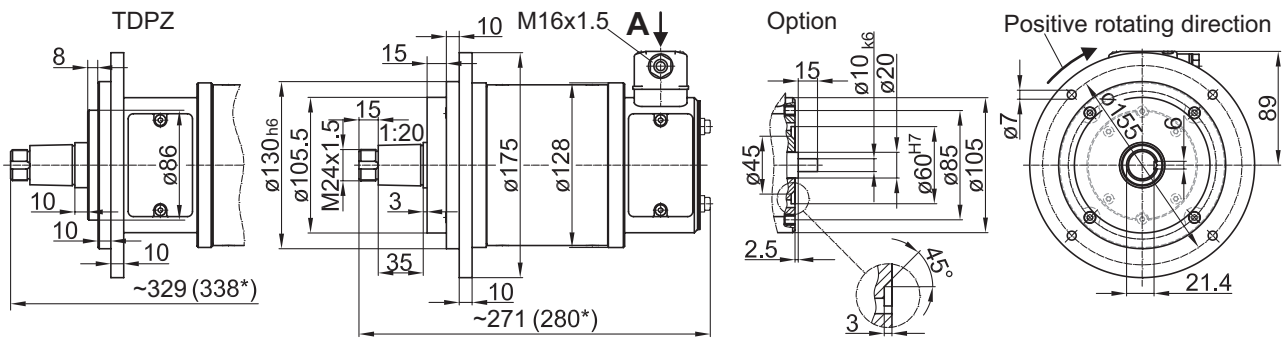
With own bearings

## TDP 13, TDPZ 13

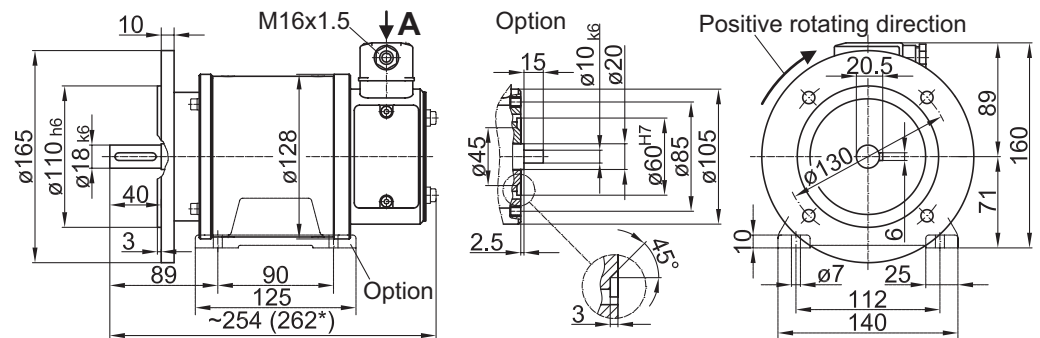
### TDP 13 - Version with B10 flange



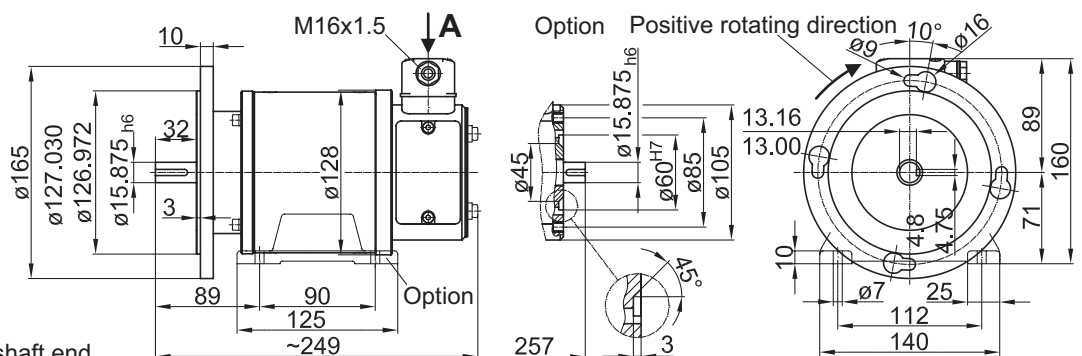
### TDP 13 (TDPZ 13) - Version with B10w flange



### TDP 13 - Version with B5kd flange



### TDP 13 - Version with B5km flange



\* Option with second shaft end