

# Combination

Tachogenerator with integrated centrifugal switch

Solid shaft with EURO flange B10 or housing foot B3

TDP 0,2 + FSL, TDPZ 0,2 + FSL



TDP 0,2 + FSL

## Features

- Low response time
- Open circuit voltage 10...150 mV per rpm
- Redundant tachogenerator output (TDPZ)
- EURO-flange B10 or housing foot B3
- High signal quality due to patented LongLife technology
- Recognition of sense of rotation possible via control
- Mechanical speed monitoring based on centrifugal force

## Technical data - electrical ratings

Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3

## Technical data - electrical ratings (tachogenerator)

Reversal tolerance	≤0.1 %
Linearity tolerance	≤0.15 %
Temperature coefficient	±0.05 %/K (open-circuit)
Isolation class	B
Calibration tolerance	±1 %
Climatic test	Humid heat, constant (IEC 60068-2-3, Ca)

## TDP 0,2 + FSL

Performance	12 W (speed ≥3000 rpm)
Armature-circuit time-constant	<75 μs
Open-circuit voltage	10...150 mV per rpm

## TDPZ 0,2 + FSL

Performance	2x 3 W (speed ≥3000 rpm)
Armature-circuit time-constant	<40 μs
Open-circuit voltage	20...100 mV per rpm

## Technical data - electrical ratings (centrifugal switch)

Switching accuracy	±4 % ( $\Delta n = 2$ rpm/s); = +20 % ( $\Delta n = 1500$ rpm/s)
Switching deviation	≤3 % (cw-ccw rotation)
Switching hysteresis	~40 % of switching speed
Switching outputs	1 output, speed control
Output switching capacity	≤6 A / 230 VAC; ≤1 A / 125 VDC
Minimum switching current	50 mA

## Technical data - mechanical design

Size (flange)	ø115 mm
Shaft type	ø11 mm solid shaft
Admitted shaft load	≤60 N axial ≤80 N radial
Flange	EURO flange B10 Housing foot B3
Protection DIN EN 60529	IP 55
Speed (n)	≤1.25 · ns
Range of switching speed (ns)	850...4500 rpm ( $\Delta n = 2$ rpm/s)
Torque	1.5 Ncm
Materials	Housing: aluminium die-cast Shaft: stainless steel
Operating temperature	-30...+130 °C
Resistance	IEC 60068-2-6 Vibration 5 g, 10-2000 Hz IEC 60068-2-27 Shock 150 g, 1 ms
Connection	2x terminal box
Approval	CE

## TDP 0,2 + FSL

Rotor moment of inertia	1.4 kgcm <sup>2</sup>
Weight approx.	3.1 kg

## TDPZ 0,2 + FSL

Rotor moment of inertia	1.5 kgcm <sup>2</sup>
Weight approx.	3.5 kg

# Combination

## Tachogenerator with integrated centrifugal switch

### Solid shaft with EURO flange B10 or housing foot B3

**TDP 0,2 + FSL, TDPZ 0,2 + FSL**

**Part number**

**Tachogenerator with centrifugal switch**

TDP0,2 LT-    **55 + FSL**

- Switching speed (ns)
- 6 850...949 rpm ( $\Delta n = 2$  rpm/s)\*
  - 5 950...1099 rpm ( $\Delta n = 2$  rpm/s)\*
  - 4 1100...1299 rpm ( $\Delta n = 2$  rpm/s)\*
  - 3 1300...1799 rpm ( $\Delta n = 2$  rpm/s)\*
  - 2 1800...2499 rpm ( $\Delta n = 2$  rpm/s)\*
  - 1 2500...4500 rpm ( $\Delta n = 2$  rpm/s)\*

- Mounting type
- B10 EURO flange B10
  - B3 Housing foot

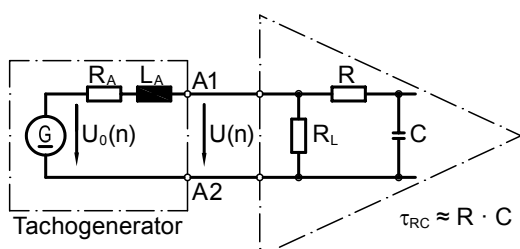
- Open-circuit voltage
- 6 10 mV per rpm
  - 7 20 mV per rpm
  - 10 30 mV per rpm
  - 5 40 mV per rpm
  - 4 60 mV per rpm
  - 3 100 mV per rpm
  - 1 150 mV per rpm

\* Please specify the exact switching speed in addition to the part number (factory setted threshold).

**Data according to type**

Type	Open-circuit voltage $U_0$ [mV/rpm]	Minimum load required depending on speed range [rpm]			Maximum operating speed $n_{max}$ [rpm]	Armature resistance $R_A$ (20°C) [Ω]	Armature inductance $L_A$ [mH]
		0-3000 $R_L$ [kΩ]	0-6000 $R_L$ [kΩ]	0- $n_{max}$ $R_L$ [kΩ]			
TDP0,2 LT-6	10	$\geq 0.1$	$\geq 0.3$	$\geq 0.9$	10000	3	6
TDP0,2 LT-7	20	$\geq 0.3$	$\geq 1.2$	$\geq 3.3$	10000	11	23
TDP0,2 LT-10	30	$\geq 0.7$	$\geq 2.7$	$\geq 7.5$	10000	26	50
TDP0,2 LT-5	40	$\geq 1.2$	$\geq 5$	$\geq 13.5$	10000	47	90
TDP0,2 LT-4	60	$\geq 2.7$	$\geq 11$	$\geq 30$	10000	99	200
TDP0,2 LT-3	100	$\geq 7.5$	$\geq 30$	$\geq 30$	6000	271	550
TDP0,2 LT-1	150	$\geq 16$	---	$\geq 30$	4000	630	1260
Twin tachogenerator with redundant output (The data refer to each of the two tachogenerator outputs)							
TDPZ0,2 LT-7	20	$\geq 1.2$	$\geq 4.8$	$\geq 14$	10000	19	45
TDPZ0,2 LT-5	40	$\geq 4.8$	$\geq 20$	$\geq 54$	10000	70	170
TDPZ0,2 LT-4	60	$\geq 11$	$\geq 44$	$\geq 120$	10000	160	390
TDPZ0,2 LT-3	100	$\geq 30$	$\geq 120$	---	6000	445	1080
Superimposed ripple (for $\tau_{RC} = 0.7$ ms):		$\leq 0.5\%$ (peak-peak)			$\leq 0.2\%$ (rms)		

**Replacement switching diagram**



Polarity for positive rotating direction:  
 A1 (TDPZ: 1A1, 2A1): + (VDE)  
 A2 (TDPZ: 1A2, 2A2): - (VDE)

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

$\tau_A \approx \frac{L_A}{R_L}$

# Combination

## Tachogenerator with integrated centrifugal switch

### Solid shaft with EURO flange B10 or housing foot B3

#### TDP 0,2 + FSL, TDPZ 0,2 + FSL

##### Part number

##### Twin tachogenerator with centrifugal switch

TDPZ0,2 LT-    **55 + FSL**

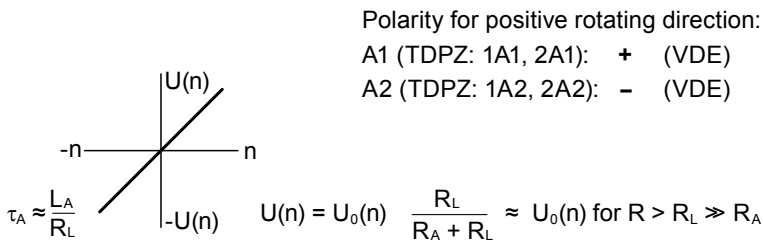
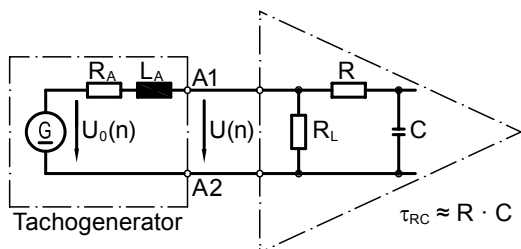
<p>Switching speed (ns)</p> <p>6 850...949 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>5 950...1099 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>4 1100...1299 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>3 1300...1799 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>2 1800...2499 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>1 2500...4500 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>Mounting type</p> <p>B10 EURO flange B10</p> <p>B3 Housing foot</p> <p>Open-circuit voltage</p> <p>7 20 mV per rpm</p> <p>5 40 mV per rpm</p> <p>4 60 mV per rpm</p> <p>3 100 mV per rpm</p>	<p>Switching speed (ns)</p> <p>6 850...949 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>5 950...1099 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>4 1100...1299 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>3 1300...1799 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>2 1800...2499 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>1 2500...4500 rpm (<math>\Delta n = 2</math> rpm/s)*</p> <p>Mounting type</p> <p>B10 EURO flange B10</p> <p>B3 Housing foot</p> <p>Open-circuit voltage</p> <p>7 20 mV per rpm</p> <p>5 40 mV per rpm</p> <p>4 60 mV per rpm</p> <p>3 100 mV per rpm</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

\* Please specify the exact switching speed in addition to the part number (factory setted threshold).

##### Data according to type

Type	Open-circuit voltage	Minimum load required depending on speed range [rpm]			Maximum operating speed	Armature resistance	Armature inductance
		0-3000	0-6000	0-n <sub>max</sub>			
	U <sub>0</sub> [mV/rpm]	R <sub>L</sub> [kΩ]	R <sub>L</sub> [kΩ]	R <sub>L</sub> [kΩ]	n <sub>max</sub> [rpm]	R <sub>A</sub> (20°C) [Ω]	L <sub>A</sub> [mH]
TDP0,2 LT-6	10	≥0.1	≥0.3	≥0.9	10000	3	6
TDP0,2 LT-7	20	≥0.3	≥1.2	≥3.3	10000	11	23
TDP0,2 LT-10	30	≥0.7	≥2.7	≥7.5	10000	26	50
TDP0,2 LT-5	40	≥1.2	≥5	≥13.5	10000	47	90
TDP0,2 LT-4	60	≥2.7	≥11	≥30	10000	99	200
TDP0,2 LT-3	100	≥7.5	≥30	≥30	6000	271	550
TDP0,2 LT-1	150	≥16	---	≥30	4000	630	1260
Twin tachogenerator with redundant output (The data refer to each of the two tachogenerator outputs)							
TDPZ0,2 LT-7	20	≥1.2	≥4.8	≥14	10000	19	45
TDPZ0,2 LT-5	40	≥4.8	≥20	≥54	10000	70	170
TDPZ0,2 LT-4	60	≥11	≥44	≥120	10000	160	390
TDPZ0,2 LT-3	100	≥30	≥120	---	6000	445	1080
Superimposed ripple (for τ <sub>RC</sub> = 0.7 ms):		≤0.5% (peak-peak)			≤0.2% (rms)		

##### Replacement switching diagram



# Combination

## Tachogenerator with integrated centrifugal switch

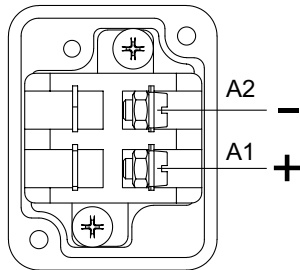
### Solid shaft with EURO flange B10 or housing foot B3

**TDP 0,2 + FSL, TDPZ 0,2 + FSL**

#### Terminal assignment

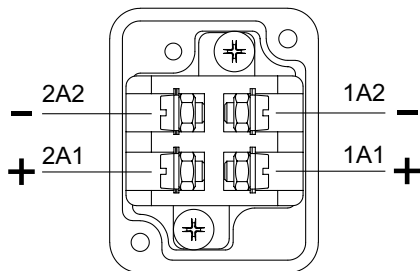
**View A** - Connecting terminal TDP 0,2

Polarity for positive direction of rotation



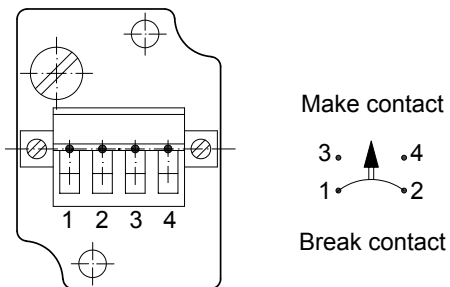
**View A** - Connecting terminal TDPZ 0,2

Polarity for positive direction of rotation



#### View B

Connecting terminal mechanical centrifugal switch FSL



#### Accessories

Carbon brushes

#### Mounting accessories

K 35	Spring washer coupling for solid shaft $\varnothing 6...12$ mm
K 50	Spring washer coupling for solid shaft $\varnothing 11...16$ mm
K 60	Spring washer coupling for solid shaft $\varnothing 11...22$ mm

# Combination

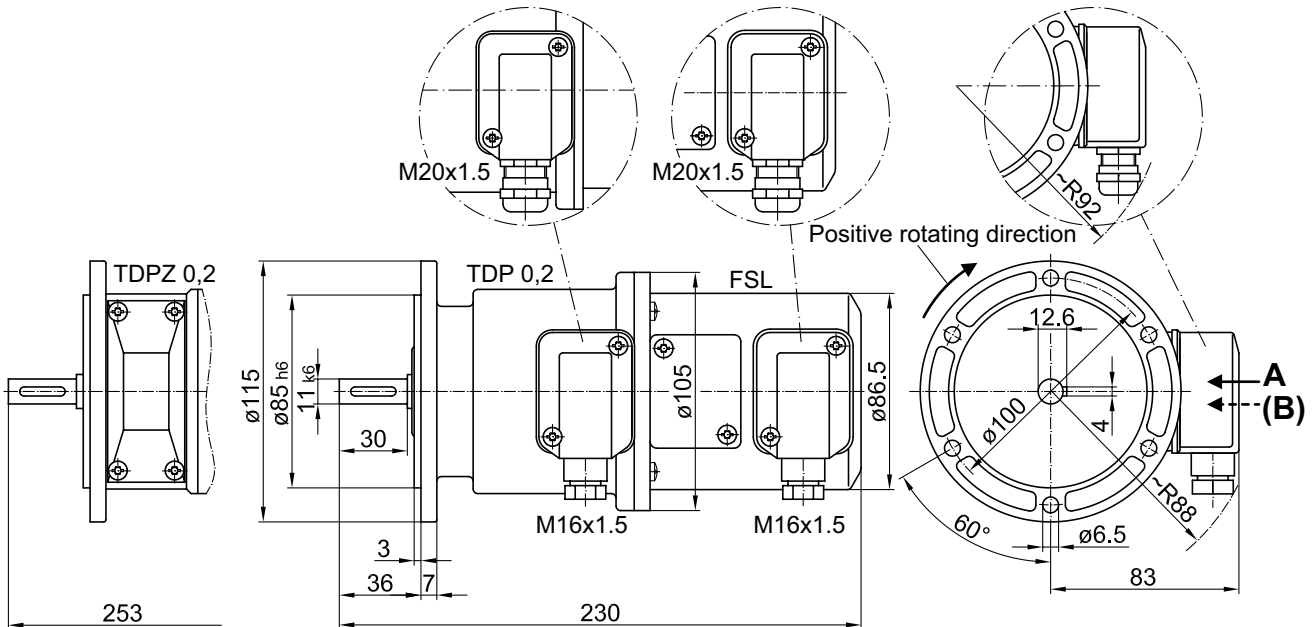
Tachogenerator with integrated centrifugal switch

Solid shaft with EURO flange B10 or housing foot B3

TDP 0,2 + FSL, TDPZ 0,2 + FSL

## Dimensions

TDP 0,2 + FSL (TDPZ 0,2 + FSL) - Version with Euro flange (B10)



TDP 0,2 + FSL (TDPZ 0,2 + FSL) - Version with housing foot (B3)

