

CL Serie - eisenlose DC-Motoren



- eisenlose DC - Kleinmotoren
- sehr geringe Eigenträgheit
- kein Rastmoment
- wenig Drehmomentrippel
- hohe Lebensdauer >20.000h
- 3 Baugrößen mit jeweils mehreren Baulängen
- Dauermomente von 10 bis 100mNm
- Wicklungen für 6 – 36Vdc
- elektrische Anschlüsse: Flachstecker / flying leads (optional Stecker)
- optional mit Encoder / Tacho
- optional mit Entstörschaltung
- optionales Getriebe
- Sonderausführungen möglich

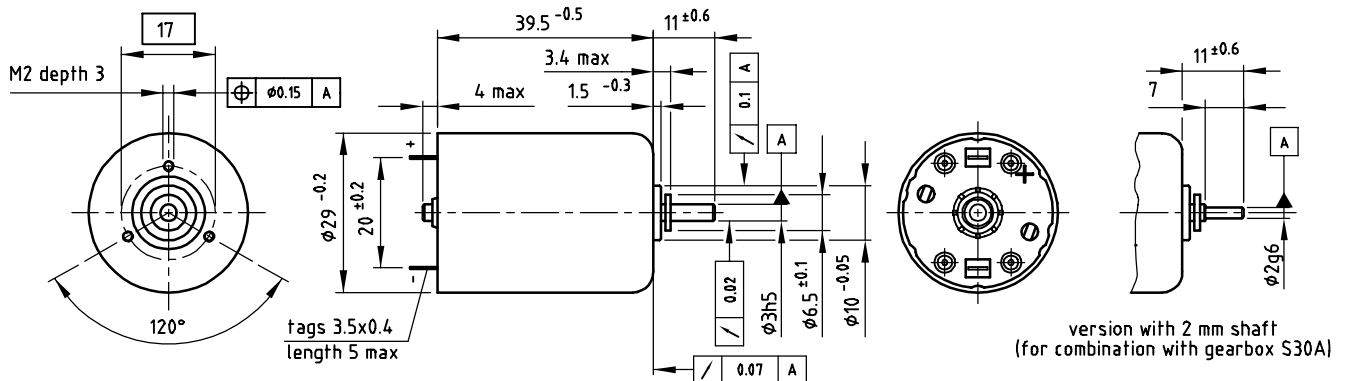
Motortyp	Motor Performance					Planeten-Getriebe		Stirnrad-Getriebe		Encoder / Tacho
	Leistung	Spannung	Drehmoment	Drehzahl	Baugröße	Typ	Drehmoment		Drehmoment	
	W	Vdc	mNm	rpm	d x h mm		Nm	Typ	Nm	
CL29 3,0W	3	6/7,2/9/12/ 15/18/24	10	0- 4.000	29x39,5	P32A, P32B	2/4,5	S30A, S38A, S52B	0,2/0,7/0,8	ja / AC
CL40 3,0W	3	6/9/12/ 15/18/24	10	0- 2.700	40x39,6	P32A, P32B	2/4,5	S37A, S38A, S52B, S70C	0,2/0,7/1,5	ja / AC
CL40 7,0W	7	6/9/12/15/ 18/24/30	22	0- 3.000	40x39,6	P32A, P32B	2/4,5	S37A, S38A, S52B, S70C	1,5	ja / AC
CL40 12,0W	12	12/15/18/ 24/30	26	0- 4.200	40x42	P32A, P32B	2/4,5	S37A, S38A, S52B, S70C	1,5	ja / -
CL66 25,0W	25	12/15/18/ 24/30/36	100	0- 2.600	66x64	P52A	25	S64A, S66A, S70C	3/9	ja / -

CL29

Coreless DC motor

2 Watt

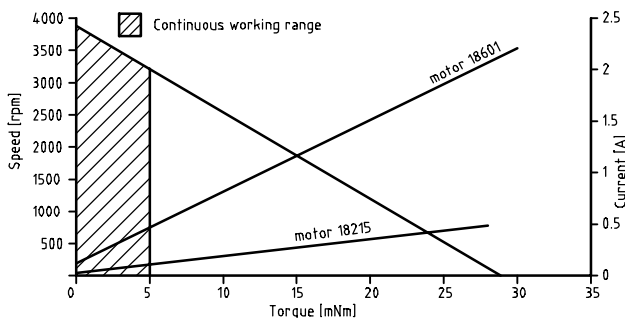
Dimensional drawing



Motor data

Motor order number	shaft ϕ 3 mm	9904 120 +	18601	18602	18603	18105	18605	18606	18215
	shaft ϕ 2 mm	9904 120 +	18611	18612	18613	18614	18615	18616	18617
Nominal Voltage	[V]	6	7.2	9	12	15	18	24	
Nominal Torque	[mNm]	5	5	5	5	5	5	5	
Nominal Speed	[rpm]	3350	3200	3340	3140	3060	3350	3150	
Nominal Current	[mA]	420	335	280	200	160	140	100	
No load Speed	[rpm]	4010	3850	3990	3840	3750	4010	3840	
No load Current	[mA]	67	52	45	31	24	22	16	
EMF at 3000 rpm	[V]	4.35	5.44	6.53	9.07	11.6	13.1	18.1	
Torque constant	[mNm/A]	13.9	17.3	20.8	28.9	37.0	41.6	57.7	
Terminal Resistance	[Ohm]	2.7	4.2	6.1	12.5	20.1	24.5	49.0	
Starting Torque at nominal Voltage	[mNm]	30	30	30	27	27	30	28	
Starting Current at nominal Voltage	[A]	2.21	1.73	1.47	0.96	0.75	0.73	0.49	
Rotor Inductance	[mH]	0.20	0.32	0.46	0.89	1.46	1.84	3.55	
Rotor Moment of Inertia	[kgm ²]	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}
Mechanical time constant	[ms]	13	13	13	13	13	13	13	
Thermal resistance winding-housing	[K/W]	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
Thermal resistance housing-ambient	[K/W]	16.3	16.3	16.3	16.3	16.3	16.3	16.3	

Performance curve



General data

*	Type of bearings	sleeve	
*	Commutation system	precious metal	
*	Maximum radial load 10 mm from mounting front	5	N
*	Maximum axial load	0.5	N
*	Ambient temp. range operating	-20/+80	°C
*	Ambient temp. range storage	-40/+80	°C
*	Mass of motor	125	g

Product combinations

- * Gearbox P32A
- * Gearbox S30A (use motor with 2 mm shaft)
- * Gearbox S38A
- * Gearbox S49A

Options

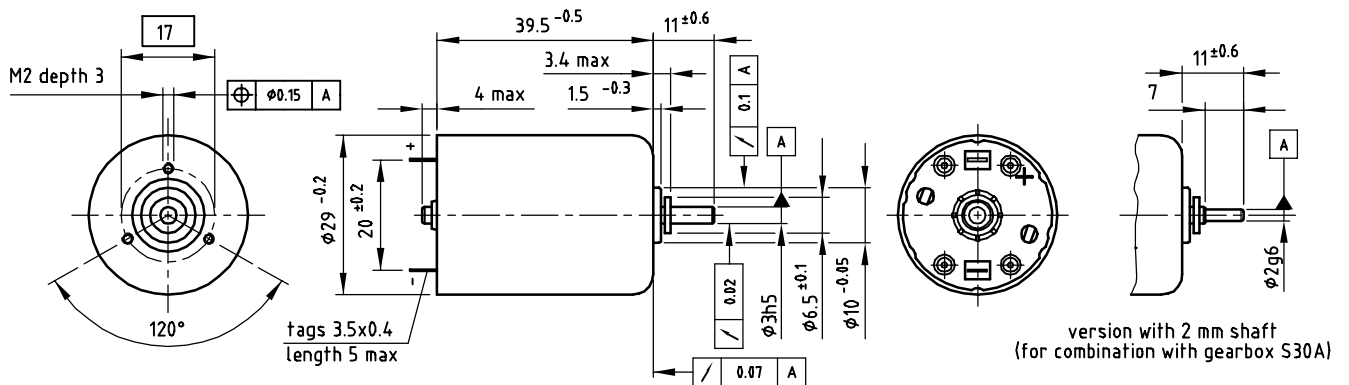
- * Ball bearings
- * Connecting wires
- * Integrated EMI suppression
- * Tacho
- * Special shafts
- * Other supply voltages
- * Encoder

CL29

Coreless DC motor

3 Watt

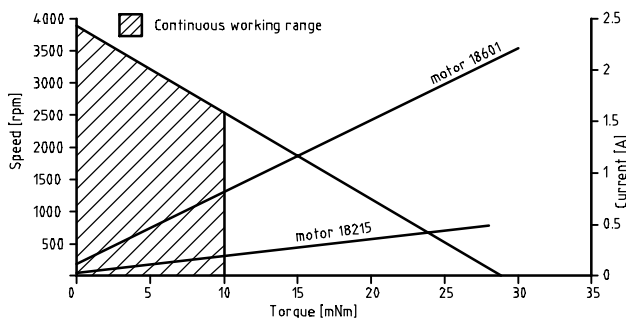
Dimensional drawing



Motor data

Motor order number	shaft $\phi 3$ mm	9904 120 +	18601	18602	18603	18105	18605	18606	18215
	shaft $\phi 2$ mm	9904 120 +	18611	18612	18613	18614	18615	18616	18617
Nominal Voltage	[V]	6	7.2	9	12	15	18	24	
Nominal Torque	[mNm]	10	10	10	10	10	10	10	10
Nominal Speed	[rpm]	2680	2550	2680	2440	2380	2680	2470	
Nominal Current	[mA]	775	620	515	370	290	260	185	
No load Speed	[rpm]	4010	3850	3990	3840	3750	4010	3840	
No load Current	[mA]	67	52	45	31	24	22	16	
EMF at 3000 rpm	[V]	4.35	5.44	6.53	9.07	11.6	13.1	18.1	
Torque constant	[mNm/A]	13.9	17.3	20.8	28.9	37.0	41.6	57.7	
Terminal Resistance	[Ohm]	2.7	4.2	6.1	12.5	20.1	24.5	49.0	
Starting Torque at nominal Voltage	[mNm]	30	30	30	27	27	30	28	
Starting Current at nominal Voltage	[A]	2.21	1.73	1.47	0.96	0.75	0.73	0.49	
Rotor Inductance	[mH]	0.20	0.32	0.46	0.89	1.46	1.84	3.55	
Rotor Moment of Inertia	[kgm ²]	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}	0.9×10^{-6}
Mechanical time constant	[ms]	13	13	13	13	13	13	13	
Thermal resistance winding-housing	[K/W]	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
Thermal resistance housing-ambient	[K/W]	16.3	16.3	16.3	16.3	16.3	16.3	16.3	

Performance curve



General data

*	Type of bearings	sleeve	
*	Commutation system	precious metal	
*	Maximum radial load 10 mm from mounting front	5	N
*	Maximum axial load	0.5	N
*	Ambient temp. range operating	-10/+60	°C
*	Ambient temp. range storage	-40/+70	°C
*	Mass of motor	125	g

Product combinations

- * Gearbox P32A
- * Gearbox S30A (use motor with 2 mm shaft)
- * Gearbox S38A
- * Gearbox S49A

Options

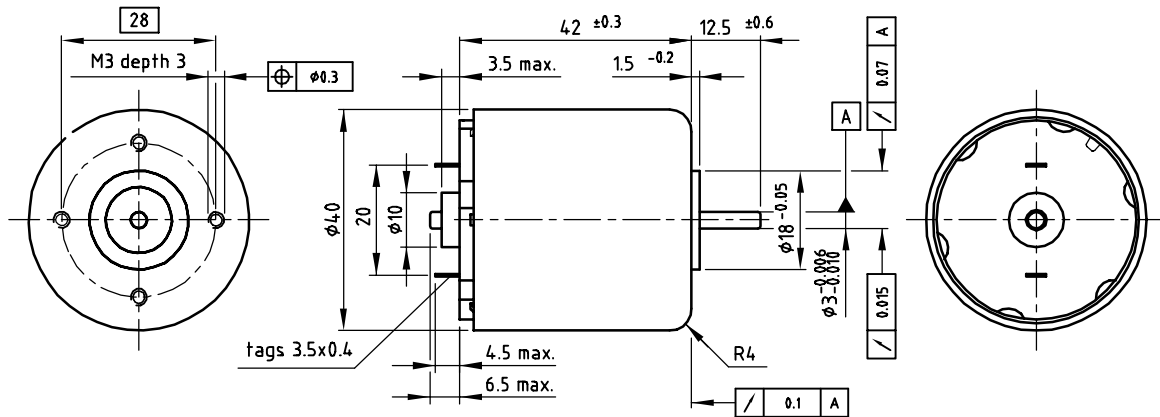
- * Ball bearings
- * Connecting wires
- * Integrated EMI suppression
- * Tacho
- * Special shafts
- * Other supply voltages
- * Encoder

CL40

Coreless DC motor

12 Watt

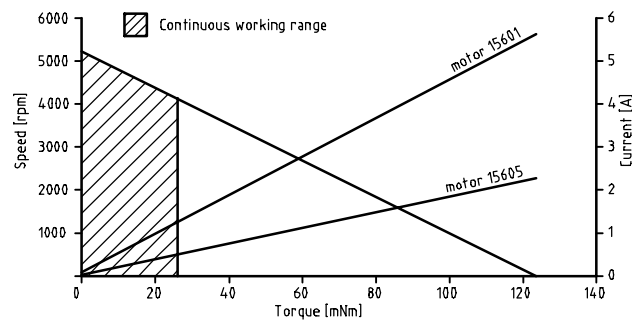
Dimensional drawing



Motor data

Motor order number	9904 120 +	15601	15602	15603	15604	15605
Nominal Voltage	[V]	12	15	18	24	30
Nominal Torque	[mNm]	26	26	26	26	26
Nominal Speed	[rpm]	4140	4090	4150	4170	4100
Nominal Current	[mA]	1250	980	830	630	490
No load Speed	[rpm]	5280	5180	5220	5280	5180
No load Current	[mA]	49	38	32	25	19
EMF at 3000 rpm	[V]	6.76	8.62	10.3	13.5	17.2
Torque constant	[mNm/A]	21.5	27.4	32.6	43.0	54.9
Terminal Resistance	[Ohm]	2.1	3.3	4.6	8.3	13.1
Starting Torque at nominal Voltage	[mNm]	121	123	126	123	125
Starting Current at nominal Voltage	[A]	5.6	4.5	3.9	2.9	2.3
Rotor Inductance	[mH]	0.31	0.50	0.71	1.23	2.01
Rotor Moment of Inertia	[kgm ²]	4x10 ⁻⁶	4x10 ⁻⁶	4x10 ⁻⁶	4x10 ⁻⁶	4x10 ⁻⁶
Mechanical time constant	[ms]	18	18	18	18	18
Thermal resistance winding-housing	[K/W]	5.5	5.5	5.5	5.5	5.5
Thermal resistance housing-ambient	[K/W]	10.5	10.5	10.5	10.5	10.5

Performance curve



General data

* Type of bearings	sleeve + ball	
* Commutation system	graphite / copper	
* Number of commutator segments	9	
* Maximum radial load 10 mm from mounting front	5	N
* Maximum axial load	0.5	N
* Ambient temp. range operating	-10/+60	°C
* Ambient temp. range storage	-40/+70	°C
* Mass of motor	200	g

Product combinations

- * Gearbox P32A
- * Gearbox P32B
- * Gearbox S40A
- * Gearbox S38A

Options

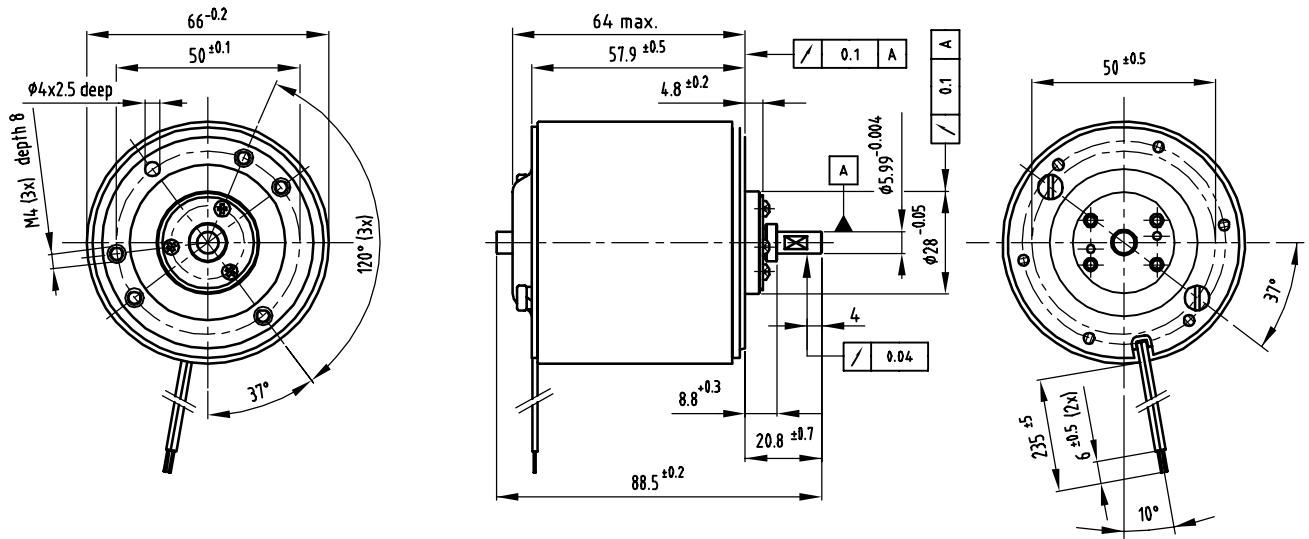
- * Double ball bearings
- * Connecting wires
- * Special shafts
- * Other supply voltages

CL66

Coreless DC motor

25 Watt

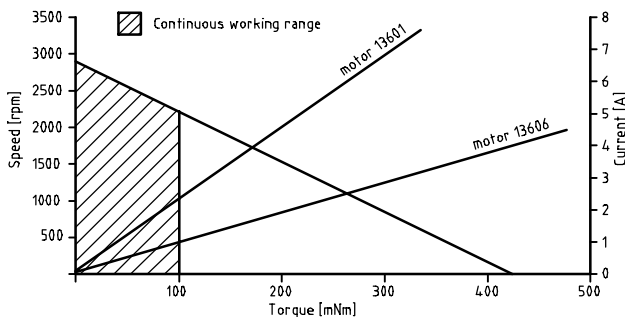
Dimensional drawing



Motor data

Motor order number	9904 120 +	13601	13602	13603	13604	13605	13606
Nominal Voltage	[V]	12	15	18	24	30	36
Nominal Torque	[mNm]	100	100	100	100	100	100
Nominal Speed	[rpm]	1800	2090	2200	2170	2280	2540
Nominal Current	[mA]	2330	2060	1750	1300	1080	980
No load Speed	[rpm]	2560	2830	2890	2850	2960	3210
No load Current	[mA]	81	77	66	49	41	40
EMF at 3000 rpm	[V]	13.9	15.7	18.5	25.0	30.1	33.3
Torque constant	[mNm/A]	4.4.2	50.1	59.0	79.6	95.8	106
Terminal Resistance	[Ohm]	1.6	2.0	2.5	4.6	6.6	8.0
Starting Torque at nominal Voltage	[mNm]	335	384	418	418	436	477
Starting Current at nominal Voltage	[A]	7.6	7.7	7.1	5.3	4.6	4.5
Rotor Inductance	[mH]	0.59	0.75	1.04	1.90	2.75	3.37
Rotor Moment of Inertia	[kgm ²]	21x10 ⁻⁶	21x10 ⁻⁶	21x10 ⁻⁶	21x10 ⁻⁶	21x10 ⁻⁶	21x10 ⁻⁶
Mechanical time constant	[ms]	17	16	15	15	15	15
Thermal resistance winding-housing	[K/W]	2.9	2.9	2.9	2.9	2.9	2.9
Thermal resistance housing-ambient	[K/W]	5.0	5.0	5.0	5.0	5.0	5.0

Performance curve



General data

*	Type of bearings	ball	
*	Commutation system	graphite / copper	
*	Number of commutator segments	9	
*	Maximum radial load 10 mm from mounting front	100	N
*	Maximum axial load	15	N
*	Ambient temp. range operating	-10/+60	°C
*	Ambient temp. range storage	-40/+70	°C
*	Mass of motor	900	g

Product combinations

- * Gearbox S64 A
- * Gearbox S66 A
- * Gearbox P52 A

Options

- * Special shafts
- * Integrated EMI suppression
- * Other supply voltages
- * Encoder