

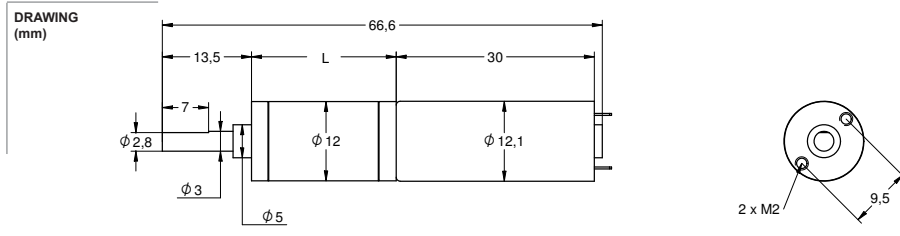
# PLANETARY GEAR DC MOTORS | Ø 12 - 42 mm 0.023 - 25 W

Transmotec sell a broad range of high quality planetary gear dc motors in standard and customized configurations. Transmotec is the ideal supplier source especially to instrument and apparatus builders. We keep a high number of motors in stock for immediate delivery.

## Customizations include:

- ✓ Customized harness
- ✓ Shaft configuration
- ✓ Winding configuration
- ✓ And more...

Model	Diameter mm	Length mm	Voltage V	Speed rpm	Torque mNm	Power mW	Page
PD1230	12	43 - 59	2.4	2400 - 2.8	1.9 - 196	420 - 23	<a href="#">1</a>
PD1230	12	43 - 59	3.0	2400 - 2.9	2.0 - 196	420 - 23	<a href="#">2</a>
PD1330	13	40 - 57	2.4	2400 - 2.8	2.0 - 196	420 - 23	<a href="#">3</a>
PD1330	13	40 - 57	3.0	2400 - 2.8	1.9 - 196	399 - 23	<a href="#">4</a>
PD1626	16	45 - 60	12	1330 - 2.3	2.1 - 235	230 - 23	<a href="#">5</a>
PD1626	16	45 - 60	24	2400 - 4.1	3.0 - 235	613 - 41	<a href="#">6</a>
PD2232	22	46 - 61	12	1450 - 3.8	7.6 - 294	920 - 47	<a href="#">7</a>
PD2232	22	46 - 61	24	1600 - 4.2	7.6 - 294	1015 - 52	<a href="#">8</a>
PD2238	22	62 - 86	12	1500 - 2.0	25 - 588	3213 - 49	<a href="#">9</a>
PD2238	22	62 - 86	24	1550 - 2.0	25 - 588	3320 - 49	<a href="#">10</a>
PD2846	28	72 - 90	12	1000 - 5.7	31 - 980	2636 - 293	<a href="#">11</a>
PD2846	28	72 - 90	24	990 - 5.7	37 - 980	3099 - 293	<a href="#">12</a>
PD3046	30	70 - 89	12	1120 - 9.5	44 - 980	4152 - 494	<a href="#">13</a>
PD3046	30	70 - 89	24	1150 - 9.8	53 - 980	5116 - 505	<a href="#">14</a>
PD3237	32	58 - 78	12	995 - 8.3	29 - 1176	2459 - 513	<a href="#">15</a>
PD3237	32	58 - 78	24	995 - 8.3	29 - 1176	2459 - 513	<a href="#">16</a>
PD3246	32	67 - 86	12	1140 - 7.2	44 - 1176	4226 - 445	<a href="#">17</a>
PD3246	32	67 - 86	24	1170 - 7.2	53 - 1176	5204 - 445	<a href="#">18</a>
PD3557	35	79 - 98	12	950 - 8.0	98 - 1176	7826 - 494	<a href="#">19</a>
PD3557	35	79 - 98	24	990 - 8.0	98 - 1176	8155 - 494	<a href="#">20</a>
PD3665	36	98 - 124	12	1250 - 9.5	108 - 2942	11327 - 1467	<a href="#">21</a>
PD3665	36	98 - 124	24	1240 - 9.4	108 - 2942	11236 - 1452	<a href="#">22</a>
PD3865	38	98 - 124	12	1100 - 8.4	98 - 2942	9061 - 1297	<a href="#">23</a>
PD3865	38	98 - 124	24	1050 - 8.4	108 - 2942	9514 - 1297	<a href="#">24</a>
PD4266	42	98 - 126	12	1400 - 1.9	216 - 2942	25372 - 235	<a href="#">25</a>
PD4266	42	98 - 126	24	1445 - 1.9	176 - 2942	21426 - 235	<a href="#">26</a>
PDS4265	42	91 - 116	12	1250 - 8.8	98 - 2942	10297 - 1359	<a href="#">27</a>
PDS4265	42	91 - 116	24	1290 - 6.5	88 - 2942	9564 - 1004	<a href="#">28</a>

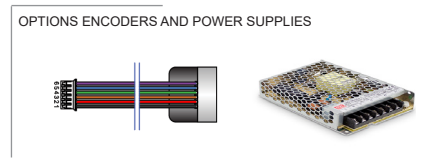


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230 - VOLTAGE - REDUCTION - B - F - E - C

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



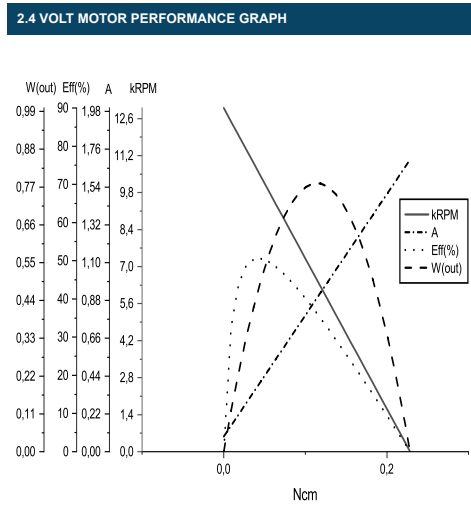
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GEAR MOTOR DATA								C
Gear reduction		1:4	1:16	1:64	1:256	1:1024	1:4096	
Nominal torque   ^ gear box limit	mNm	2.0	6.9	24.5	82.4	196^	196^	
Nominal speed	rpm	2400	600	150	38	10	2.8	
Peak torque   ^ gear box limit	mNm	235	353	471	530	588^	588^	
Mechanical power	W	0.420	0.324	0.251	0.181	0.093	0.023	
Efficiency gear head	%	85	75	65	55	45	40	
Length gear box = L	mm	12.8	16.1	19.4	22.7	26.0	29.3	
Weight	g	25.1	27.2	29.3	31.4	33.5	35.6	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   hardened SS	
Motor pinion material   shape	Brass   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 brass	●
Material > 1:4 ratio / stage	POM first + brass	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 2.5	

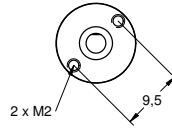
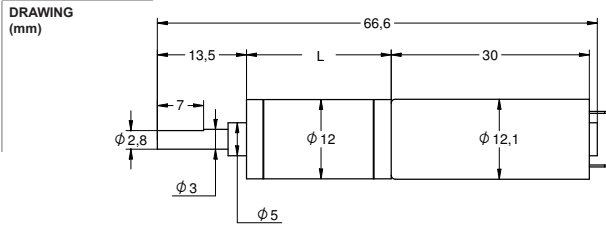


MOTOR SPECIFIC DATA		C
Nominal voltage	V 2.4 (3V separate data sheet)	●
No load speed	rpm 12500	
No load current	A 0.09	
Nominal speed	rpm 10125	
Nominal torque	Ncm 0.043	
Nominal current	A ≤ 0.45	
Nominal mechanical power	W 0.46	
Stall torque	Ncm 0.23	
Starting current	A 1.7	
Motor commutation	Metal brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 1.5 - 3.5	●
Capacitor emc	No	
Resistance	ohm 1.7-2.5	
Inductance	mH 0.31	
Insulation class	B	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR	C
Pulses per revolution		3 x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover		No cover	
Sensor technical data		Refer externally to brand and part UTC-SK1816	
Size		Ø 7 x 6 mm	
Harness connector		JST ZHR-6 P=1.5-6P	●
Harness cable		UL1061 AWG26 100 mm	●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	
Supply voltage Vcc		min.3.5 ref - max. 20 V	
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA	
Open collector output		Requires external output resistors	



OPTIONS ENCODERS AND POWER SUPPLIES



MODEL NO. DESIGNATION EXAMPLE

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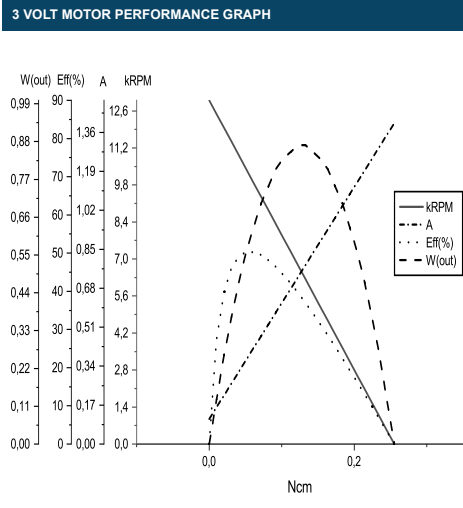
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GEAR MOTOR DATA								C
Gear reduction		1:4	1:16	1:64	1:256	1:1024	1:4096	
Nominal torque   ^ gear box limit	mNm	1.9	6.4	22	76	196^	196^	
Nominal speed	rpm	2400	610	150	39	10	2.8	
Peak torque   ^ gear box limit	mNm	235	353	471	530	588^	588^	
Mechanical power	W	0.399	0.306	0.231	0.172	0.093	0.023	
Efficiency gear head	%	85	75	65	55	45	40	
Length gear box = L	mm	12.8	16.1	19.4	22.7	26.0	29.3	
Weight	g	25.1	27.2	29.3	31.4	33.5	35.6	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   SUS303	
Motor pinion material   shape	Brass   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 brass	●
Material > 1:4 ratio / stage	POM first + brass	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 2.5	

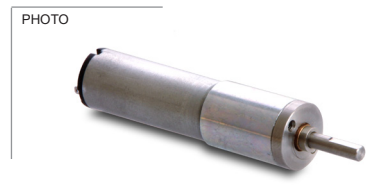
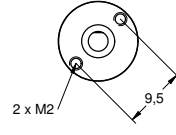
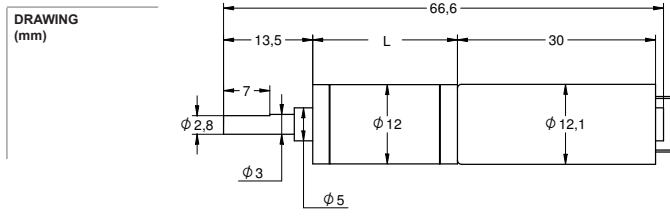


MOTOR SPECIFIC DATA		C
Nominal voltage	V 3.0 (2.4V separate data sheet)	●
No load speed	rpm 13000	
No load current	A 0.11	
Nominal speed	rpm 10140	
Nominal torque	Ncm 0.056	
Nominal current	A ≤ 0.41	
Nominal mechanical power	W 0.59	
Stall torque	Ncm 0.25	
Starting current	A 1.4	
Motor commutation	Metal brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 2.0 - 4.0	●
Capacitor emc	No	
Resistance	ohm 1.1 - 1.5	
Inductance	mH 0.5	
Insulation class	B	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR	C
Pulses per revolution		3 x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover		No cover	
Sensor technical data		Refer externally to brand and part UTC-SK1816	
Size		Ø 7 x 6 mm	
Harness connector		JST ZHR-6 P=1.5-6P	●
Harness cable		UL1061 AWG26 100 mm	●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	
Supply voltage Vcc		min.3.5 ref - max. 20 V	
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA	
Open collector output		Requires external output resistors	

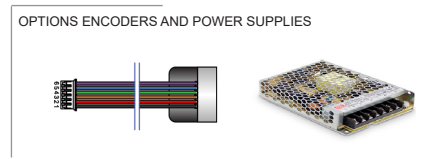


**MODEL NO. DESIGNATION EXAMPLE**

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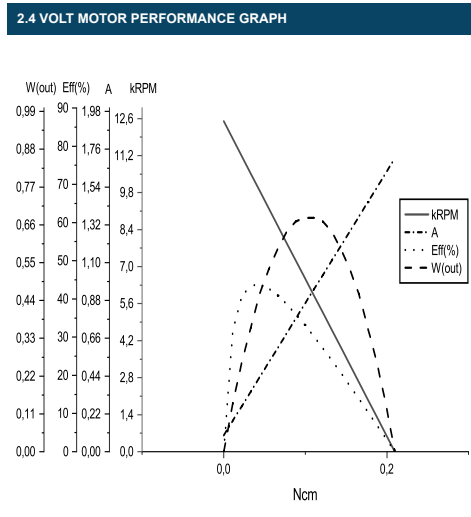
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GEAR MOTOR DATA								C
Gear reduction		1:4	1:16	1:64	1:256	1:1024	1:4096	
Nominal torque   ^ gear box limit	mNm	2.0	6.9	24	82	196^	196^	
Nominal speed	rpm	2400	600	150	38	10	2.8	
Peak torque   ^ gear box limit	mNm	235	353	471	530	588^	588^	
Mechanical power	W	0.420	0.324	0.251	0.181	0.093	0.023	
Efficiency gear head	%	85	75	65	55	45	40	
Length gear box = L	mm	10.3	13.6	16.9	20.2	23.5	26.8	
Weight	g	24.2	26.3	28.4	30.5	32.6	34.7	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   SUS303	
Motor pinion material   shape	Brass   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 brass	●
Material > 1:4 ratio / stage	POM first + brass	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 2.5	

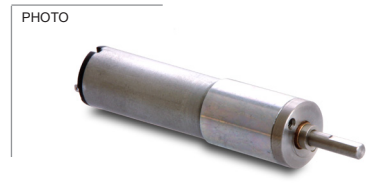
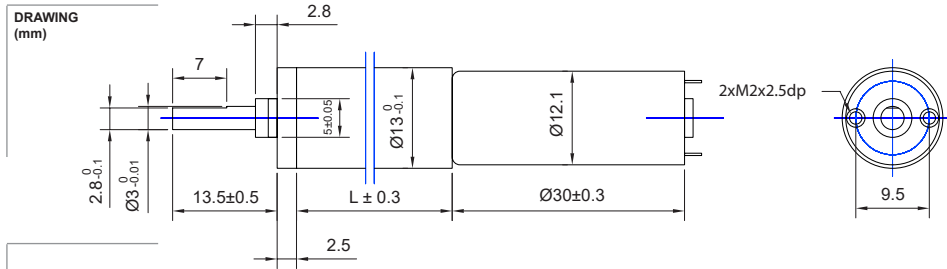


MOTOR SPECIFIC DATA		C
Nominal voltage	V 2.4 (3V separate data sheet)	●
No load speed	rpm 12500	
No load current	A 0.09	
Nominal speed	rpm 10125	
Nominal torque	Ncm 0.043	
Nominal current	A ≤ 0.45	
Nominal mechanical power	W 0.46	
Stall torque	Ncm 0.23	
Starting current	A 1.7	
Motor commutation	Metal brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 1.5 - 3.5	●
Capacitor emc	No	
Resistance	ohm 1.7-2.5	
Inductance	mH 0.31	
Insulation class	B	●

GEAR MOTOR RANGE STANDARD AVAILABILITY		C
Nominal voltage	V 2.4 - 24	separate data sheet
Nominal mechanical power	W 0.023 - 25	separate data sheet
Diameter	mm 12 - 42	separate data sheet
Feedback encoder	Hall	see below

ACCESSORIES		C
Power supplies LRS	V 3.3 - 48	separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		No cover		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 7 x 6 mm		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		

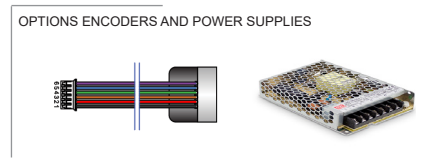


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

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 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
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PD1230 - VOLTAGE - REDUCTION - B - F - E - C



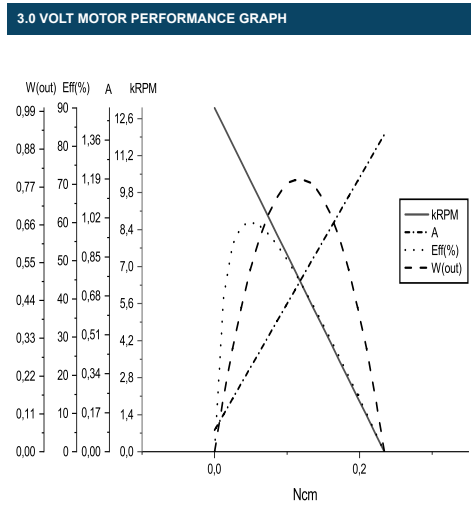
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GEAR MOTOR DATA								C
Gear reduction		1:4	1:16	1:64	1:256	1:1024	1:4096	
Nominal torque   ^ gear box limit	mNm	1.9	6.4	22.6	76.5	196^	196^	
Nominal speed	rpm	2400.0	600.0	150.0	38.0	10.0	2.8	
Peak torque   ^ gear box limit	mNm	235	353	471	530	588^	588^	
Mechanical power	W	0.399	0.306	0.231	0.172	0.093	0.023	
Efficiency gear head	%	85	75	65	55	45	40	
Length gear box = L	mm	10.3	13.6	16.9	20.2	23.5	26.8	
Weight	g	24.2	26.3	28.4	30.5	32.6	34.7	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   SUS303	
Motor pinion material   shape	Brass   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 brass	●
Material > 1:4 ratio / stage	POM first + brass	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 2.5	

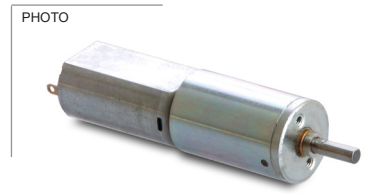
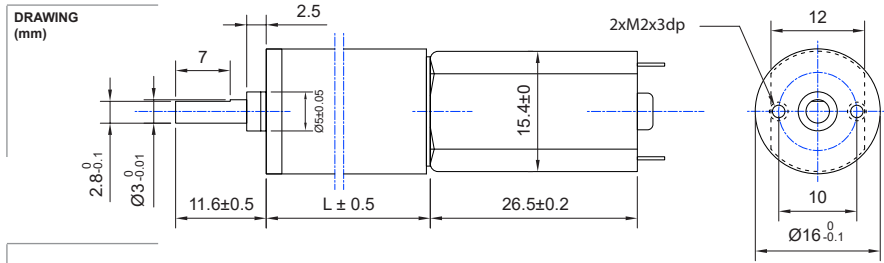


MOTOR SPECIFIC DATA		C
Nominal voltage	V 3.0 (2.4V separate data sheet)	●
No load speed	rpm 13000	
No load current	A 0.11	
Nominal speed	rpm 10140	
Nominal torque	Ncm 0.056	
Nominal current	A ≤ 0.41	
Nominal mechanical power	W 0.59	
Stall torque	Ncm 0.25	
Starting current	A 1.4	
Motor commutation	Metal brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 2.0 - 4.0	●
Capacitor emc	No	
Resistance	ohm 1.1 - 1.5	
Inductance	mH 0.5	
Insulation class	B	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR	C
Pulses per revolution		3 x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover		No cover	
Sensor technical data		Refer externally to brand and part UTC-SK1816	
Size		Ø 7 x 6 mm	
Harness connector		JST ZHR-6 P=1.5-6P	●
Harness cable		UL1061 AWG26 100 mm	●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	
Supply voltage Vcc		min.3.5 ref - max. 20 V	
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA	
Open collector output		Requires external output resistors	

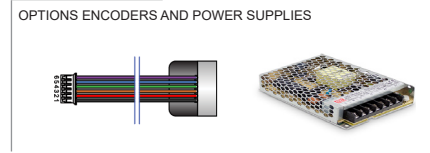


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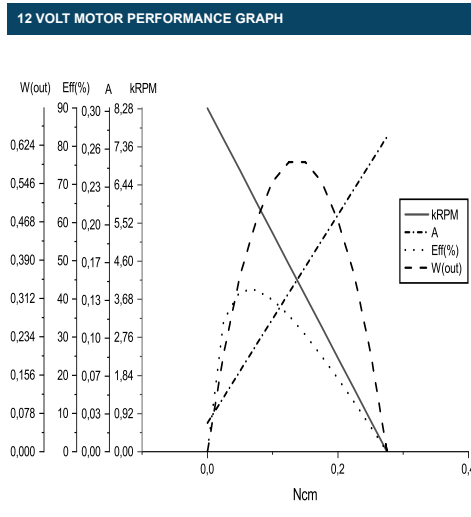
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GEAR MOTOR DATA																		C				
Gear reduction		1:4	1:14	1:19	1:29	1:62	1:72	1:84	1:104	1:128	1:157	1:231	1:316	1:370	1:455	1:561	1:690	1:1024	1:1621	1:1996	1:3027	
Nominal torque   ^ gear box limit	mNm	2.1	5.9	8.0	11.8	21.6	25.5	29.4	37.3	45.1	53.9	68.6	93.2	107	132	166	196	235^	235^	235^	235^	
Nominal speed	rpm	1330	430	315	205	100	85	73	59	48	39	26	19	16	13.5	11	8.9	6	3.8	3.2	2.3	
Peak torque   ^ gear box limit	mNm	235	353	353^	353^	471	471^	471^	471^	471^	471^	588	588^	588^	588^	588^	588^	706	706^	706^	706^	
Mechanical power	W	0.230	0.186	0.186	0.177	0.136	0.137	0.135	0.139	0.136	0.133	0.094	0.093	0.091	0.094	0.096	0.092	0.059	0.038	0.032	0.023	
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	
Length gear box = L	mm	15.05	18.7	18.7	18.7	22.35	22.35	22.35	22.35	22.35	22.35	26	26	26	26	26	26	29.65	29.65	29.65	29.65	
Weight	g	37	41	41	41	45	45	45	45	45	45	49	49	49	49	49	49	53	53	53	53	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   JIS SUJ2	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 steel	●
Material > 1:4 ratio / stage	POM first + steel	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 3.0	

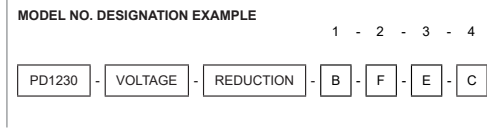
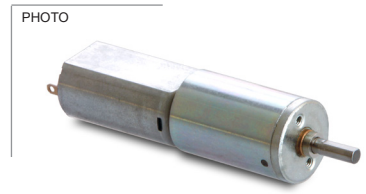
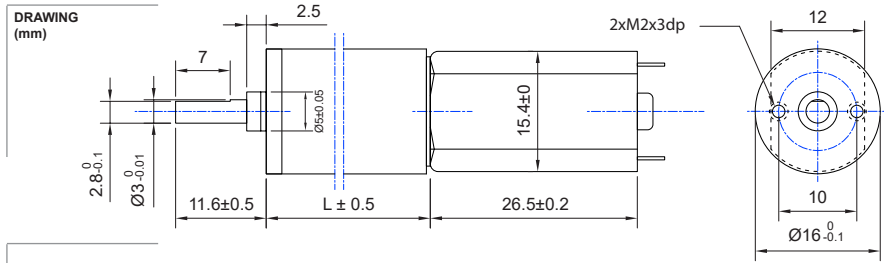


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24V separate data sheet)	●
No load speed	rpm 8300	
No load current	A 0.025	
Nominal speed	rpm 6285	
Nominal torque	Ncm 0.071	
Nominal current	A ≤ 0.09	
Nominal mechanical power	W 0.467	
Stall torque	Ncm 0.27	
Starting current	A 0.28	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 17.6	●
Capacitor emc	No	
Resistance	ohm 42.8	
Inductance	mH 9.4	
Insulation class	A	●

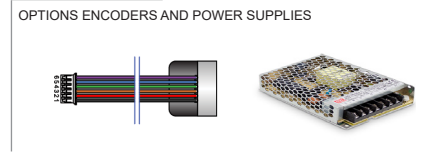
GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		No cover		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 9.5 x 6 mm		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		



- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



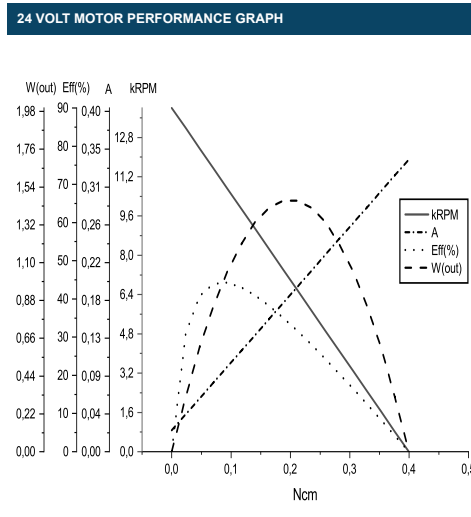
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA																				C		
Gear reduction		1:4	1:14	1:19	1:29	1:62	1:72	1:84	1:104	1:128	1:157	1:231	1:316	1:370	1:455	1:561	1:690	1:1024	1:1621	1:1996	1:3027	
Nominal torque   ^ gear box limit	mNm	3.0	8.3	11.8	17.7	32.4	37.3	44.1	54.9	67.7	83.4	98.1	137	157	196	196	235 <sup>^</sup>	235 <sup>^</sup>	235 <sup>^</sup>	235 <sup>^</sup>	235 <sup>^</sup>	
Nominal speed	rpm	2400	760	555	365	170	150	130	105	85	69	47	34	29	24	19.5	15.9	11	7.2	6.1	4.1	
Peak torque   ^ gear box limit	mNm	235	353	353 <sup>^</sup>	353 <sup>^</sup>	471	471 <sup>^</sup>	471 <sup>^</sup>	471 <sup>^</sup>	471 <sup>^</sup>	471 <sup>^</sup>	588	588 <sup>^</sup>	588 <sup>^</sup>	588 <sup>^</sup>	588 <sup>^</sup>	588 <sup>^</sup>	706	706 <sup>^</sup>	706 <sup>^</sup>	706 <sup>^</sup>	
Mechanical power	W	0.613	0.466	0.480	0.474	0.347	0.352	0.361	0.363	0.362	0.362	0.242	0.245	0.239	0.247	0.201	0.196	0.109	0.071	0.060	0.041	
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	
Length gear box = L	mm	15.05	18.7	18.7	18.7	22.35	22.35	22.35	22.35	22.35	22.35	26	26	26	26	26	26	29.65	29.65	29.65	29.65	
Weight	g	37	41	41	41	45	45	45	45	45	45	49	49	49	49	49	49	53	53	53	53	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.08   ≤ 0.2	
Shaft axial load	N 4.9	
Radial load	N 4.9	
Press fit force max.	N 14.7	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   JIS SUJ2	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 steel	●
Material > 1:4 ratio / stage	POM first + steel	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 3.0	



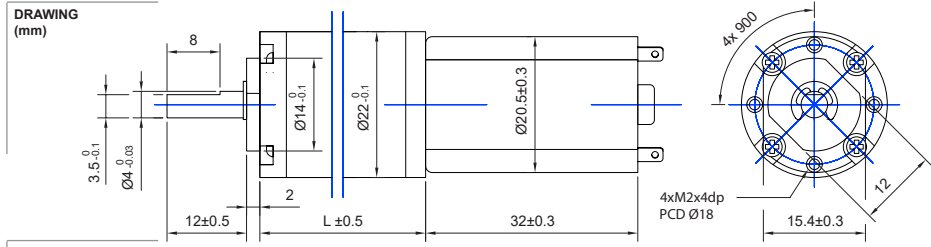
MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12V separate data sheet)	●
No load speed	rpm 14000	
No load current	A 0.025	
Nominal speed	rpm 10920	
Nominal torque	Ncm 0.096	
Nominal current	A ≤ 0.09	
Nominal mechanical power	W 1.1	
Stall torque	Ncm 0.43	
Starting current	A 0.34	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 40	●
Capacitor emc	No	
Resistance	ohm 70.5	
Inductance	mH 15	
Insulation class	A	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		No cover		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 9.5 x 6 mm		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		



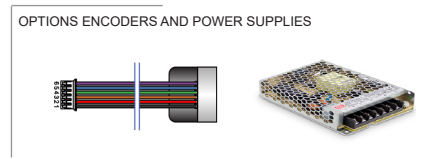


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230 - VOLTAGE - REDUCTION - B - F - E - C

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



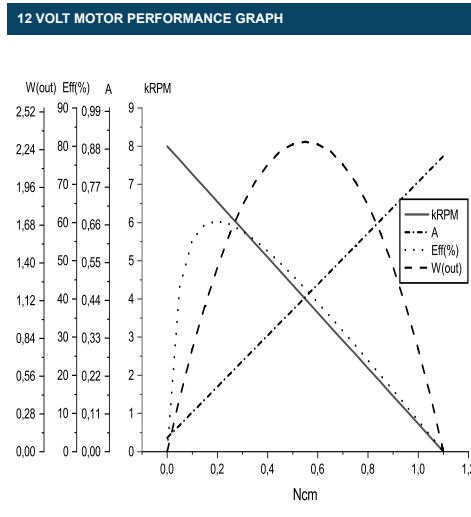
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA																					C		
Gear reduction		1:4	1:14	1:16	1:19	1:53	1:62	1:72	1:84	1:104	1:198	1:231	1:270	1:316	1:370	1:455	1:742	1:1014	1:1249	1:1621	1:1996		
Nominal torque   ^ gear box limit	mNm	7.6	21.1	24.5	28.9	68.2	79.4	93.2	108	134	206	245^	245^	245^	245^	294^	294^	294^	294^	294^	294^	294^	
Nominal speed	rpm	1450	470	405	348	127	109	93.0	79.0	64.0	34.0	29.0	25.0	22.0	19.0	15.5	9.5	7.4	6.0	4.6	3.8		
Peak torque   ^ gear box limit	mNm	294	441	441^	441^	588	588^	588^	588^	588^	735	735^	735^	735^	735^	735^	883^	883^	883^	883^	883^		
Mechanical power	W	0.920	0.728	0.730	0.740	0.545	0.545	0.546	0.537	0.542	0.368	0.373	0.322	0.283	0.245	0.200	0.117	0.091	0.074	0.057	0.047		
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	40		
Length gear box = L	mm	14.4	18.1	18.1	18.1	21.7	21.7	21.7	21.7	21.7	25.4	25.4	25.4	25.4	25.4	25.4	29.0	29.0	29.0	29.0	29.0		
Weight	g	58	62	62	62	66	66	66	66	81	91	91	91	91	91	91	96	96	96	96	96		

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.2	
Shaft axial load	N 5.9	
Radial load	N 9.8	
Press fit force max.	N 49	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 steel	●
Material > 1:4 ratio / stage	POM first + steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

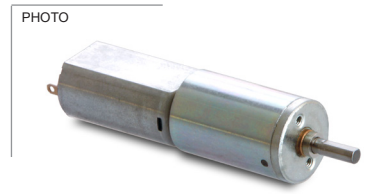
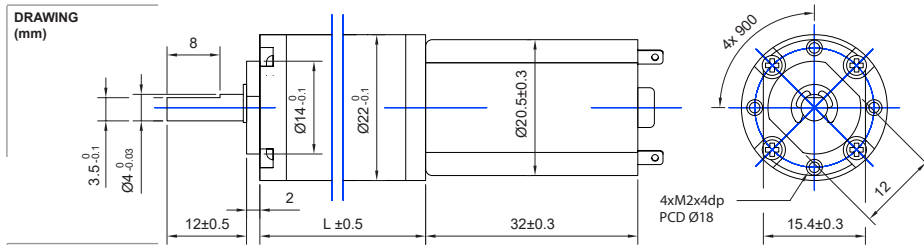


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24V separate data sheet)	●
No load speed	rpm 8000	
No load current	A 0.040	
Nominal speed	rpm 6560	
Nominal torque	Ncm 0.198	
Nominal current	A ≤ 0.2	
Nominal mechanical power	W 1.36	
Stall torque	Ncm 1.10	
Starting current	A 0.86	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 13	●
Capacitor emc	No	
Resistance	ohm 13.5	
Inductance	mH 7.5	
Insulation class	A	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		No cover		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 10 x 8.5 mm		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		

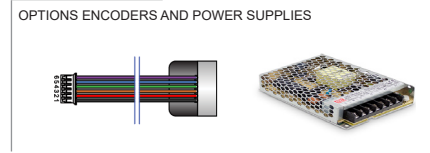


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230	-	VOLTAGE	-	REDUCTION	-	B	-	F	-	E	-	C
--------	---	---------	---	-----------	---	---	---	---	---	---	---	---

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



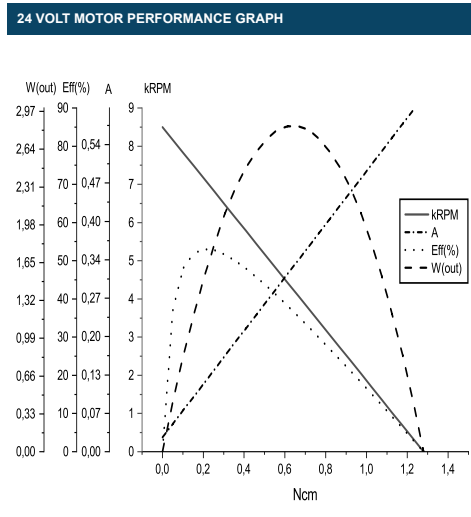
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C																			
Gear reduction		1:4	1:14	1:16	1:19	1:53	1:62	1:72	1:84	1:104	1:198	1:231	1:270	1:316	1:370	1:455	1:742	1:1014	1:1249	1:1621	1:1996
Nominal torque   ^ gear box limit	mNm	7.6	21.1	24.5	28.9	68.2	79.4	93.2	108	134	206	245^	245^	245^	245^	294^	294^	294^	294^	294^	294^
Nominal speed	rpm	1600	515	450	384	140	120	103	88	71	37	32	28	24	21	18	11	8.0	6.6	5.0	4.2
Peak torque   ^ gear box limit	mNm	294	441	441^	441^	588	588^	588^	588^	588^	735	735^	735^	735^	735^	735^	883	883^	883^	883^	883^
Mechanical power	W	1.015	0.798	0.811	0.817	0.601	0.601	0.605	0.598	0.601	0.400	0.412	0.360	0.302	0.270	0.225	0.130	0.099	0.082	0.062	0.052
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	40
Length gear box = L	mm	14.4	18.1	18.1	18.1	21.7	21.7	21.7	21.7	21.7	25.4	25.4	25.4	25.4	25.4	25.4	29.0	29.0	29.0	29.0	29.0
Weight	g	58	62	62	62	66	66	66	66	81	91	91	91	91	91	91	96	96	96	96	96

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.2	
Shaft axial load	N 5.9	
Radial load	N 9.8	
Press fit force max.	N 49	
Backlash no load	° ≤ 3	
Bearing type   shaft material	Sleeve bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 steel	●
Material > 1:4 ratio / stage	POM first + steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	



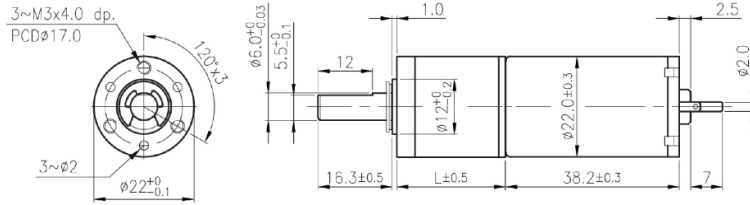
MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12V separate data sheet)	●
No load speed	rpm 8500	
No load current	A 0.025	
Nominal speed	rpm 7661	
Nominal torque	Ncm 0.213	
Nominal current	A ≤ 0.11	
Nominal mechanical power	W 1.71	
Stall torque	Ncm 1.28	
Starting current	A 0.62	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 27	●
Capacitor emc	No	
Resistance	ohm 38.4	
Inductance	mH 22	
Insulation class	A	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		No cover		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 10 x 8.5 mm		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		

DRAWING (mm)



PHOTO



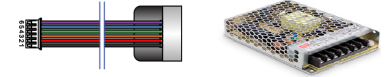
MODEL NO. DESIGNATION EXAMPLE



1 - 2 - 3 - 4

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

OPTIONS ENCODERS AND POWER SUPPLIES

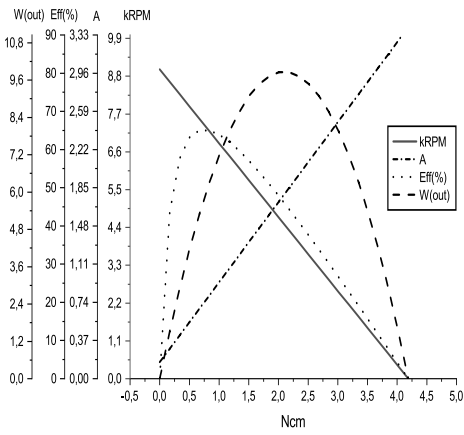


● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA																		C		
Gear reduction		1:5	1:18	1:20	1:25	1:66	1:77	1:90	1:110	1:136	1:246	1:336	1:393	1:484	1:597	1:735	1:1079	1:1475	1:2124	1:3968
Nominal torque   ^ gear box limit	mNm	25.5	83.4	98.1	118	265	314	363	392	392	490	490	490	490	490	490	588^	588^	588^	588^
Nominal speed	rpm	1500	400	340	280	105	92.0	79.0	64.0	52.0	29.4	22.4	19.6	16.0	12.9	10.5	7.4	5.5	4.0	2.0
Peak torque   ^ gear box limit	mNm	294	883	883^	883^	1177	1177^	1177^	1177^	1471	1471^	1471^	1471^	1471^	1471^	1471^	1765	1765^	1765^	1765^
Mechanical power	W	3.213	2.451	2.451	2.422	1.752	1.819	1.806	1.582	1.071	0.757	0.577	0.505	0.412	0.332	0.270	0.183	0.136	0.099	0.049
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50	50	50	50	40	40	40	40
Length gear box = L	mm	23.3	29.5	29.5	29.5	35.7	35.7	35.7	35.7	41.9	41.9	41.9	41.9	41.9	41.9	41.9	48.1	48.1	48.1	48.1
Weight	g	97	102	102	102	109	109	109	109	109	116	116	116	116	116	116	123	123	123	123

GEAR MOTOR COMBINED DATA			C	GEAR BOX SHAFT DATA			C	GEAR BOX SPECIFIC DATA			C
Service life brush wear	500 h continuous operation		●	Radial play   thrust play	mm	≤ 0.05   ≤ 0.3		Material gear stage	Ratio 1:5 sintered steel		●
Performance tolerances	% ± 15			Shaft axial load	N	6.9		Material > 1:5 ratio / stage	POM first + sintered steel		●
Operating temperature	-10...+60 °C		●	Radial load	N	11.8		Direction of rotation	CCW or CW by reversed V polarity		
IP code	30			Press fit force max.	N	58.8		Assembly front bell	mm	Maximum screw depth 4.0	
Manufacturing standard	ISO9001   ISO 14001   TS16949			Backlash no load	°	≤ 2.5					
Compliance	RoHS and REACH			Bearing type   shaft material		Ball bearing   AISI 1144					
Label CE   UL	CE no   UL no			Motor pinion material   shape		Brass   straight					●

12 VOLT MOTOR PERFORMANCE GRAPH



MOTOR SPECIFIC DATA

Nominal voltage	V	12 (24V separate data sheet)	●
No load speed	rpm	9000	
No load current	A	0.160	
Nominal speed	rpm	7100	
Nominal torque	Ncm	0.68	
Nominal current	A	≤ 0.70	
Nominal mechanical power	W	5.16	
Stall torque	Ncm	4.187	
Starting current	A	3.40	
Motor commutation		Carbon brush	●
Motor rotor   stator		Iron rotor   Ferrit magnet	
Varistor emc	V	27-45	●
Capacitor emc	V	12	
Resistance	ohm	3.6	
Inductance	mH	2.3	
Insulation class		F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY

Nominal voltage	V	2.4 - 24	separate data sheet
Nominal mechanical power	W	0.023 - 25	separate data sheet
Diameter	mm	12 - 42	separate data sheet
Feedback encoder		Hall	see below

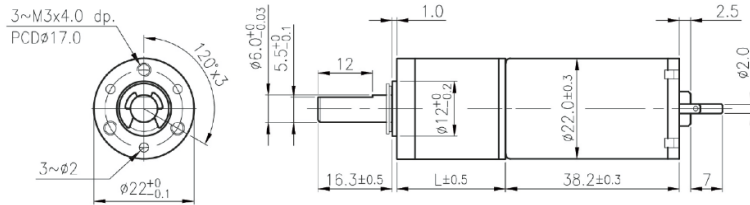
ACCESSORIES

Power supplies LRS	V	3.3 - 48	separate data sheet
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ENCODER OPTIONS

ENCODER OPTIONS		MAGNETIC HALL SENSOR		C
Pulses per revolution		3 x 2		●
Channels   phase shift		2   90° ±(1/6)T		
Encoder rear cover		Cover cap in ABS plastic		
Sensor technical data		Refer externally to brand and part UTC-SK1816		
Size		Ø 22 x 12.6		
Harness connector		JST ZHR-6 P=1.5-6P		●
Harness cable		UL1061 AWG26 100 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output		Requires external output resistors		

DRAWING (mm)



PHOTO



MODEL NO. DESIGNATION EXAMPLE



- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

OPTIONS ENCODERS AND POWER SUPPLIES



● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA

	1:5	1:18	1:20	1:25	1:66	1:77	1:90	1:110	1:136	1:246	1:336	1:393	1:484	1:597	1:735	1:1079	1:1475	1:2124	1:3968
Gear reduction	1:5	1:18	1:20	1:25	1:66	1:77	1:90	1:110	1:136	1:246	1:336	1:393	1:484	1:597	1:735	1:1079	1:1475	1:2124	1:3968
Nominal torque   ^ gear box limit	mNm 25.5	83.4	98.1	118	265	314	363	392 <sup>A</sup>	392 <sup>A</sup>	490 <sup>A</sup>	490 <sup>A</sup>	490 <sup>A</sup>	490 <sup>A</sup>	490 <sup>A</sup>	490 <sup>A</sup>	588 <sup>A</sup>	588 <sup>A</sup>	588 <sup>A</sup>	588 <sup>A</sup>
Nominal speed	rpm 1500	400	340	280	105	92.0	79.0	64.0	52.0	29.4	22.4	19.6	16.0	12.9	10.5	7.4	5.5	4.0	2.0
Peak torque   ^ gear box limit	mNm 294	883	883 <sup>A</sup>	883 <sup>A</sup>	1177	1177 <sup>A</sup>	1177 <sup>A</sup>	1177 <sup>A</sup>	1471	1471 <sup>A</sup>	1471 <sup>A</sup>	1471 <sup>A</sup>	1471 <sup>A</sup>	1471 <sup>A</sup>	1471 <sup>A</sup>	1765 <sup>A</sup>	1765 <sup>A</sup>	1765 <sup>A</sup>	1765 <sup>A</sup>
Mechanical power	W 3.213	2.451	2.451	2.422	1.752	1.819	1.806	1.582	1.071	0.757	0.577	0.505	0.412	0.332	0.270	0.183	0.136	0.099	0.049
Efficiency gear head	% 80	70	70	70	60	60	60	60	50	50	50	50	50	50	50	40	40	40	40
Length gear box = L	mm 23.3	29.5	29.5	29.5	35.7	35.7	35.7	35.7	41.9	41.9	41.9	41.9	41.9	41.9	41.9	48.1	48.1	48.1	48.1
Weight	g 97	102	102	102	109	109	109	109	109	116	116	116	116	116	116	123	123	123	123

GEAR MOTOR COMBINED DATA

Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	30	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

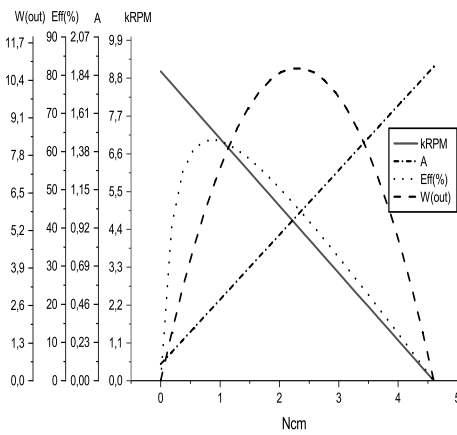
GEAR BOX SHAFT DATA

Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 6.9	
Radial load	N 11.8	
Press fit force max.	N 58.8	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Brass   straight	●

GEAR BOX SPECIFIC DATA

Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CW or CCW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

24 VOLT MOTOR PERFORMANCE GRAPH



MOTOR SPECIFIC DATA

Nominal voltage	V 24 (12V separate data sheet)	●
No load speed	rpm 9000	
No load current	A 0.100	
Nominal speed	rpm 7400	
Nominal torque	Ncm 0.68	
Nominal current	A ≤ 0.36	
Nominal mechanical power	W 5.54	
Stall torque	Ncm 4.60	
Starting current	A 1.89	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 27-45	●
Capacitor emc	V 24	
Resistance	ohm 13.7	
Inductance	mH 8.7	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY

Nominal voltage	V 2.4 - 24	separate data sheet
Nominal mechanical power	W 0.023 - 25	separate data sheet
Diameter	mm 12 - 42	separate data sheet
Feedback encoder	Hall	see below

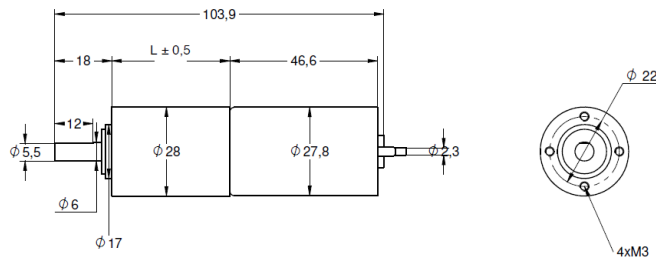
ACCESSORIES

Power supplies LRS	V 3.3 - 48	separate data sheet
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ENCODER OPTIONS

Pulses per revolution	3 x 2	●
Channels   phase shift	2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	
Sensor technical data	Refer externally to brand and part UTC-SK1816	
Size	Ø 22 x 12.6	
Harness connector	JST ZHR-6 P=1.5-6P	●
Harness cable	UL1061 AWG26 100 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA	
Open collector output	Requires external output resistors	

DRAWING (mm)



PHOTO



MODEL NO. DESIGNATION EXAMPLE



- 1 - 2 - 3 - 4
- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

OPTIONS ENCODERS AND POWER SUPPLIES

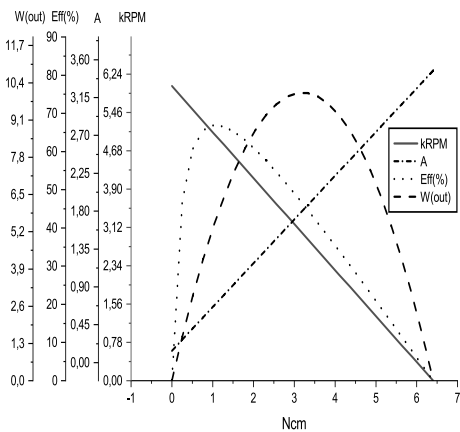


● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA														C	
Gear reduction		1:5	1:14	1:19	1:27	1:35	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721	1:939
Nominal torque   ^ gear box limit	mNm	31.4	73.5	98.1	137	186	235	324	461	647	726	981^	981^	981^	981^
Nominal speed	rpm	1000	375	270	193	148	102	73.0	52.0	37.3	27.5	19.7	10.5	7.5	5.7
Peak torque   ^ gear box limit	mNm	588	883^	883^	1177^	1177^	1765^	1765^	2354^	2354^	2942^	2942^	2942^	2942^	2942^
Mechanical power	W	2.636	2.027	1.946	1.948	2.027	1.512	1.488	1.510	1.521	1.048	1.014	0.541	0.386	0.293
Efficiency gear head	%	80	70	70	70	70	60	60	60	60	50	50	50	50	50
Length gear box = L	mm	24.5	30.9	30.9	30.9	30.9	37.3	37.3	37.3	37.3	43.7	43.7	43.7	43.7	43.7
Weight	g	163	163	173	173	173	186	186	186	186	200	200	200	200	200

GEAR MOTOR COMBINED DATA			C	GEAR BOX SHAFT DATA			C	GEAR BOX SPECIFIC DATA			C
Service life brush wear	500 h continuous operation		●	Radial play   thrust play	mm	≤ 0.05   ≤ 0.3		Material gear stage	Ratio 1:5 sintered steel		●
Performance tolerances	% ± 15			Shaft axial load	N	24.5		Material > 1:5 ratio / stage	POM first + sintered steel		●
Operating temperature	-10...+60 °C		●	Radial load	N	34.3		Direction of rotation	CCW or CW by reversed V polarity		
IP code	20			Press fit force max.	N	98.1		Assembly front bell	mm	Maximum screw depth 4.0	
Manufacturing standard	ISO9001   ISO 14001   TS16949			Backlash no load	°	≤ 2.5					
Compliance	RoHS and REACH			Bearing type   shaft material		Ball bearing   AISI 1144					
Label CE   UL	CE no   UL no			Motor pinion material   shape		Steel   straight					●

12 VOLT MOTOR PERFORMANCE GRAPH

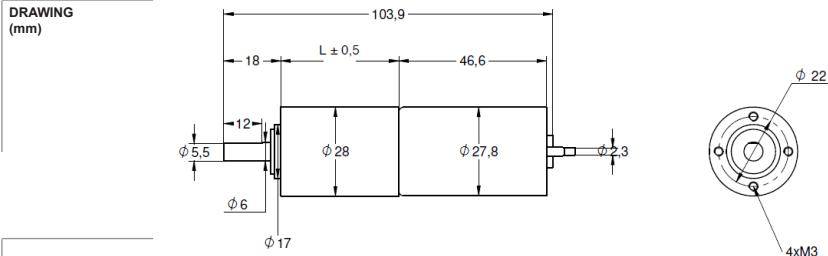


MOTOR SPECIFIC DATA			C	GEAR MOTOR RANGE STANDARD AVAILABILITY		
Nominal voltage	V	12 (24V separate data sheet)	●	Nominal voltage	V	2.4 - 24 separate data sheet
No load speed	rpm	6000		Nominal mechanical power	W	0.023 - 25 separate data sheet
No load current	A	0.120		Diameter	mm	12 - 42 separate data sheet
Nominal speed	rpm	5200		Feedback encoder	Hall   Optical	see below
Nominal torque	Ncm	0.77				
Nominal current	A	≤ 0.5				
Nominal mechanical power	W	4.93				
Stall torque	Ncm	6.4				
Starting current	A	3.47				
Motor commutation		Carbon brush	●			
Motor rotor   stator		Iron rotor   Ferrit magnet				
Varistor emc	V	19.2-28.8	●			
Capacitor emc	V	12				
Resistance	ohm	3.54				
Inductance	mH	2.2				
Insulation class		F	●			

ACCESSORIES

Power supplies LRS	V	3.3 - 48	separte data sheet
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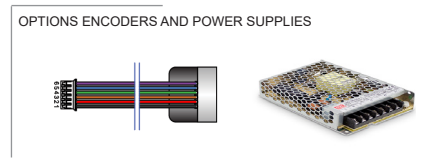
ENCODER OPTIONS		MAGNETIC HALL SENSOR		OPTICAL SENSOR		C
Pulses per revolution		7 x 2		(100   200   256   360   400   500) x 2		●
Channels   phase shift			2   90° ±(1/6)T			
Encoder rear cover		Cover cap in ABS plastic		Zink alloy		
Sensor technical data		Refer externally to brand and part UTC-SK1816				
Size		Ø 30 x 12.1		D19+4.5 x W30 x H40 mm		
Harness connector		JST ZHR-6 P=1.5-6P		JST SMR-05V		●
Harness cable		UL1061 AWG26 100 mm		UL2464 AWG24x4C 195 mm		●
Connection		BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B		RED Vcc   GRN GND   BLK A   WHT B		
Supply voltage Vcc		min.3.5 ref - max. 20 V		5 ±10% V		
Supply Current Ice		Vcc 20V open output   min. - ref. 5 max. 10 mA				
Open collector output		Requires external output resistors				
Output current / channel				± 20 mA		



**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap



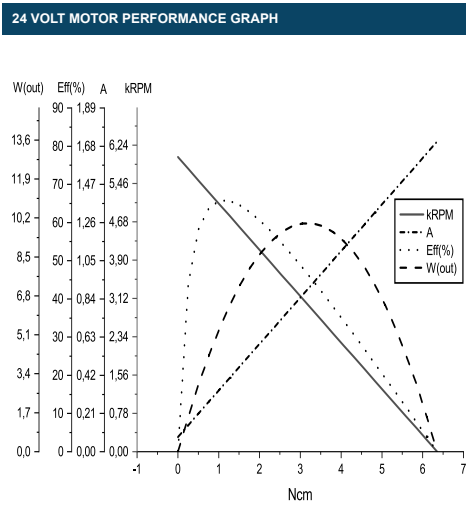
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA														C	
Gear reduction		1:5	1:14	1:19	1:27	1:35	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721	1:939
Nominal torque   ^ gear box limit	mNm	37.3	88.3	118	167	226	275	392	549	765	863	981^	981^	981^	981^
Nominal speed	rpm	990	370	265	191	147	101	72.0	51.5	36.9	27.2	19.3	10.4	7.4	5.7
Peak torque   ^ gear box limit	mNm	588	883	883^	1177	1177^	1765	1765^	2354	2354^	2942	2942^	2942^	2942^	2942^
Mechanical power	W	3.099	2.400	2.292	2.340	2.437	1.747	1.779	1.782	1.778	1.232	0.994	0.535	0.381	0.293
Efficiency gear head	%	80	70	70	70	70	60	60	60	60	50	50	50	50	50
Length gear box = L	mm	24.5	30.9	30.9	30.9	30.9	37.3	37.3	37.3	37.3	43.7	43.7	43.7	43.7	43.7
Weight	g	161	161	171	171	171	184	184	184	184	198	198	198	198	198

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

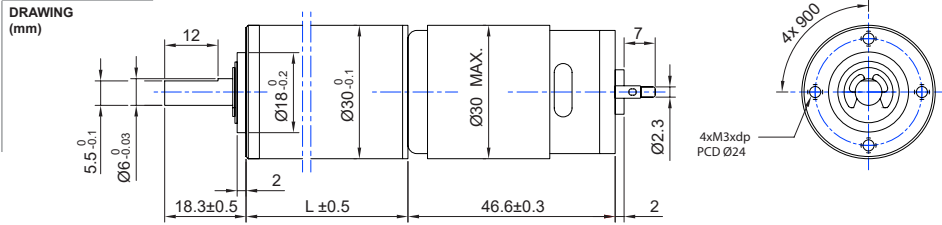


MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12V separate data sheet)	●
No load speed	rpm 6000	
No load current	A 0.080	
Nominal speed	rpm 5140	
Nominal torque	Ncm 0.92	
Nominal current	A ≤ 0.30	
Nominal mechanical power	W 4.98	
Stall torque	Ncm 6.35	
Starting current	A 1.71	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 26-38	●
Capacitor emc	V 24	
Resistance	ohm 14.55	
Inductance	mH 7.5	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

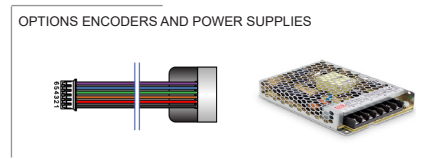


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap

Example: PD1230 - VOLTAGE - REDUCTION - B - F - E - C



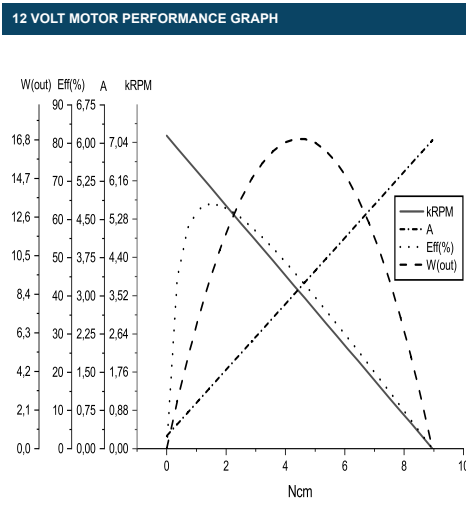
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GEAR MOTOR DATA													C
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	44.1	108	147	206	333	461	647	785	981^	981^	981^	981^
Nominal speed	rpm	1120	430	310	221	117	83.0	60.0	45.0	32.0	25.0	13.2	9.6
Peak torque   ^ gear box limit	mNm	588	883^	883^	1177^	1765^	1765^	2354^	2354^	2942^	2942^	2942^	2942^
Mechanical power	W	4.152	3.409	3.352	3.345	2.458	2.410	2.447	2.224	1.648	1.287	0.680	0.494
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	23.6	36.4	36.4	30.0	42.8	42.8	36.4	36.4	42.8	42.8	42.8	42.8
Weight	g	188	188	201	201	216	216	216	216	231	231	231	231

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

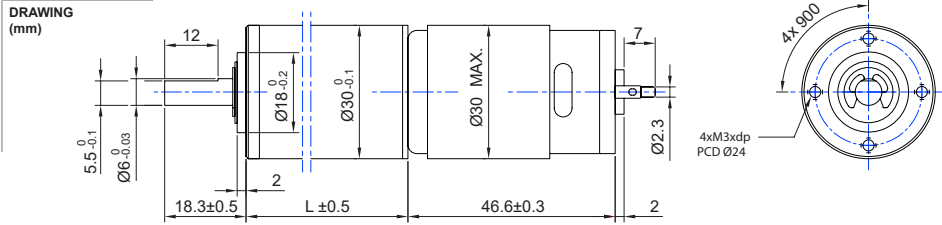


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24V separate data sheet)	●
No load speed	rpm 7400	
No load current	A 0.190	
Nominal speed	rpm 5950	
Nominal torque	Ncm 1.08	
Nominal current	A ≤ 0.90	
Nominal mechanical power	W 7.0	
Stall torque	Ncm 8.95	
Starting current	A 6.06	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 19.2-28.8	●
Capacitor emc	V 12	
Resistance	ohm 2.5	
Inductance	mH 1.05	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

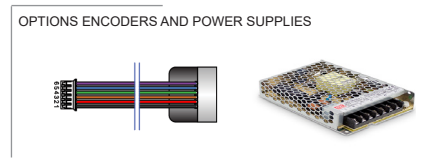


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap

PD1230 - VOLTAGE - REDUCTION - B - F - E - C



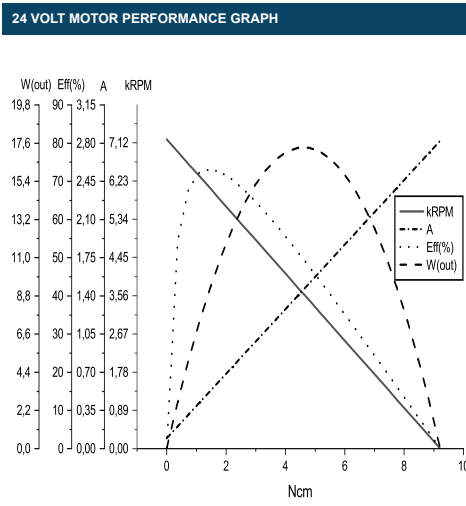
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA													C
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	53.0	118	167	235	392	539	765	785	981^	981^	981^	981^
Nominal speed	rpm	1150	445	320	229	212	87.0	62.0	46.0	34.5	26.0	13.5	9.8
Peak torque   ^ gear box limit	mNm	588	883	883	1177	1765	1765^	2354	2354^	2942	2942^	2942	2942^
Mechanical power	W	5.116	3.849	3.921	3.961	5.239	2.956	2.988	2.274	1.776	1.339	0.695	0.505
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	23.6	36.4	36.4	30.0	42.8	42.8	36.4	36.4	42.8	42.8	42.8	42.8
Weight	g	188	188	201	201	216	216	216	216	231	231	231	231

GEAR MOTOR COMBINED DATA			C
Service life brush wear	500 h continuous operation		●
Performance tolerances	% ± 15		
Operating temperature	-10...+60 °C		●
IP code	20		
Manufacturing standard	ISO9001   ISO 14001   TS16949		
Compliance	RoHS and REACH		
Label CE   UL	CE no   UL no		

GEAR BOX SHAFT DATA			C
Radial play   thrust play	mm	≤ 0.05   ≤ 0.3	
Shaft axial load	N	24.5	
Radial load	N	34.3	
Press fit force max.	N	98.1	
Backlash no load	°	≤ 2.5	
Bearing type   shaft material		Ball bearing   AISI 1144	
Motor pinion material   shape		Steel   straight	●

GEAR BOX SPECIFIC DATA			C
Material gear stage	Ratio 1:5 sintered steel		●
Material > 1:5 ratio / stage	POM first + sintered steel		●
Direction of rotation	CCW or CW by reversed V polarity		
Assembly front bell	mm	Maximum screw depth 4.0	



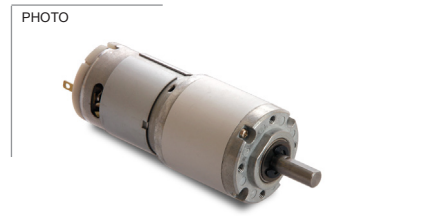
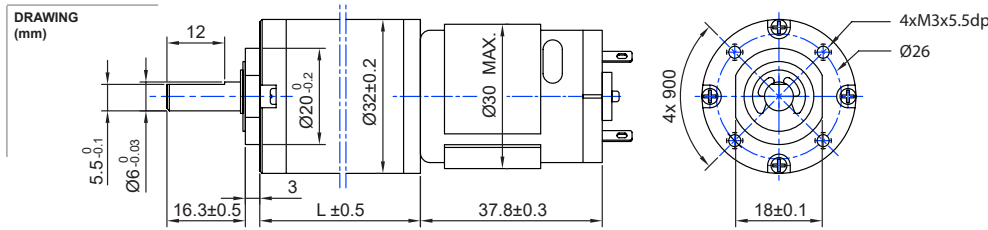
MOTOR SPECIFIC DATA			C
Nominal voltage	V	24 (12 V separate data sheet)	●
No load speed	rpm	7400	
No load current	A	0.120	
Nominal speed	rpm	6160	
Nominal torque	Ncm	1.27	
Nominal current	A	≤ 0.5	
Nominal mechanical power	W	8.29	
Stall torque	Ncm	9.22	
Starting current	A	2.82	
Motor commutation		Carbon brush	●
Motor rotor   stator		Iron rotor   Ferrit magnet	
Varistor emc	V	26-38	●
Capacitor emc	V	24	
Resistance	ohm	8.77	
Inductance	mH	4.1	
Insulation class		F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY		
Nominal voltage	V	2.4 - 24 separate data sheet
Nominal mechanical power	W	0.023 - 25 separate data sheet
Diameter	mm	12 - 42 separate data sheet
Feedback encoder	Hall   Optical	see below

ACCESSORIES		
Power supplies LRS	V	3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	



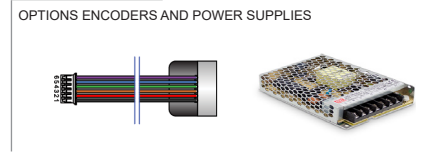


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230	-	VOLTAGE	-	REDUCTION	-	B	-	F	-	E	-	C
--------	---	---------	---	-----------	---	---	---	---	---	---	---	---

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



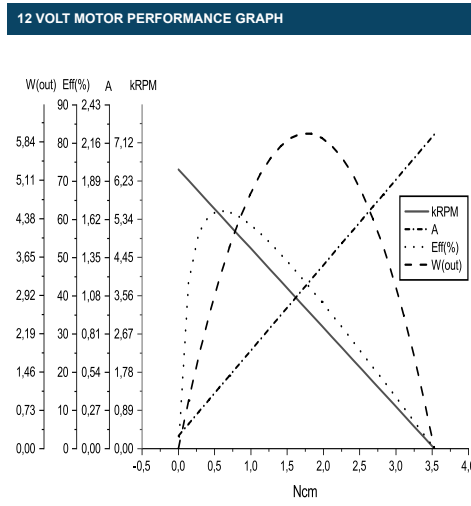
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C												
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721	
Nominal torque   ^ gear box limit	mNm	29.4	73.5	98.1	137	226	324	451	637	716	981	1177^	1177^	
Nominal speed	rpm	995	373	270	195	104	74.0	53.0	38.0	28.0	20.0	11.2	8.3	
Peak torque   ^ gear box limit	mNm	588	1177	1177^	1765	2354	2354^	2942	2942^	3530	3530^	3530^	3530^	
Mechanical power	W	2.459	2.016	1.946	1.968	1.478	1.509	1.506	1.526	1.052	1.030	0.692	0.513	
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50	
Length gear box = L	mm	20.6	27.0	27.0	27.0	33.4	33.4	33.4	33.4	39.8	39.8	39.8	39.8	
Weight	g	174	194	194	194	219	219	219	219	245	245	245	245	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

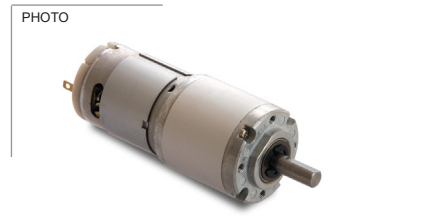
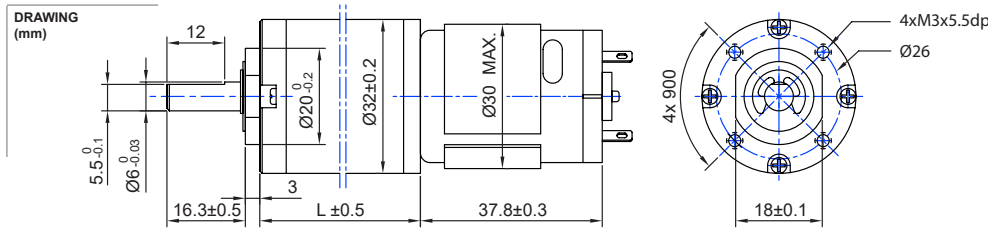


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 6500	
No load current	A 0.150	
Nominal speed	rpm 5290	
Nominal torque	Ncm 0.76	
Nominal current	A ≤ 0.53	
Nominal mechanical power	W 4.22	
Stall torque	Ncm 3.53	
Starting current	A 2.22	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 13-18.4	●
Capacitor emc	V 12	
Resistance	ohm 5.67	
Inductance	mH 3.35	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

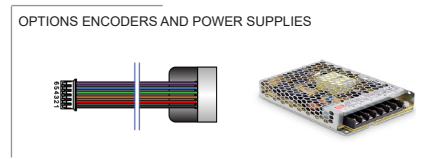


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap

PD1230 - VOLTAGE - REDUCTION - B - F - E - C



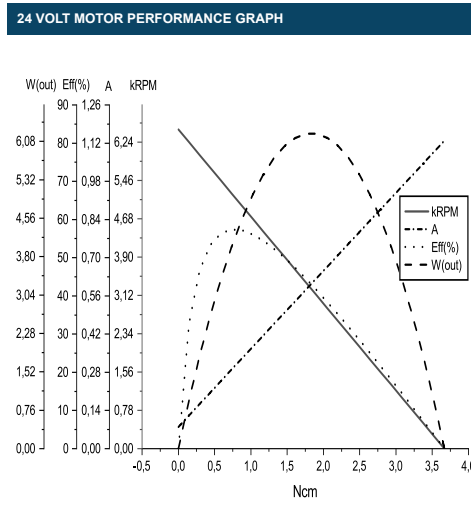
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GEAR MOTOR DATA													C
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	29.4	73.5	98.1	137	226	324	451	637	716	981	1177^	1177^
Nominal speed	rpm	995	373	270	195	104	74.0	53.0	38.0	28.0	20.0	11.2	8.3
Peak torque   ^ gear box limit	mNm	588	1177	1177^	1765	2354	2354^	2942	2942^	3530	3530^	3530^	3530^
Mechanical power	W	2.459	2.016	1.946	1.968	1.478	1.509	1.506	1.526	1.052	1.030	0.692	0.513
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	20.6	27.0	27.0	27.0	33.4	33.4	33.4	33.4	39.8	39.8	39.8	39.8
Weight	g	174	194	194	194	219	219	219	219	245	245	245	245

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	

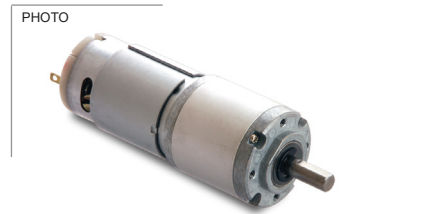
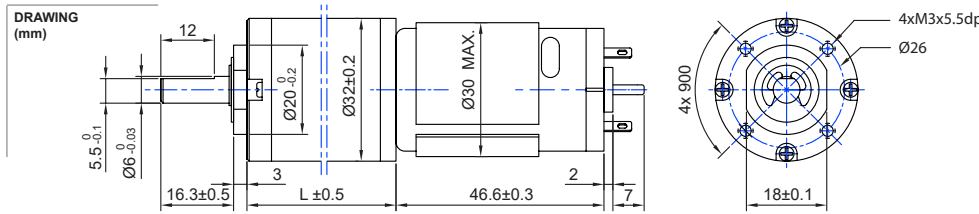


MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12 V separate data sheet)	●
No load speed	rpm 6500	
No load current	A 0.100	
Nominal speed	rpm 5290	
Nominal torque	Ncm 0.72	
Nominal current	A ≤ 0.25	
Nominal mechanical power	W 3.97	
Stall torque	Ncm 3.67	
Starting current	A 1.13	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 26-38	●
Capacitor emc	V 24	
Resistance	ohm 23.86	
Inductance	mH 12.9	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift	2   90° ±(1/6)T		
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

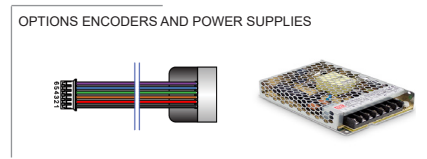


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230	-	VOLTAGE	-	REDUCTION	-	B	-	F	-	E	-	C
--------	---	---------	---	-----------	---	---	---	---	---	---	---	---

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



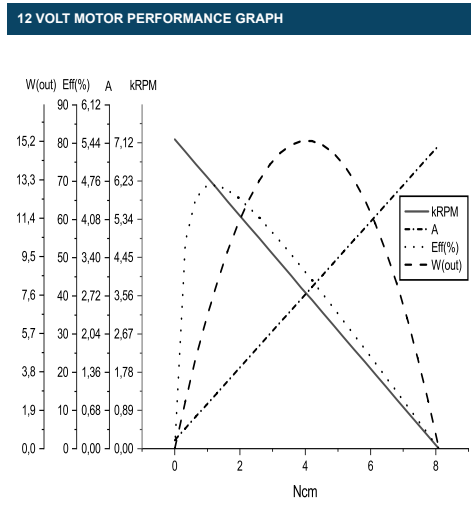
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GEAR MOTOR DATA		C													
Gear reduction		1:5	1:14	1:19	1:27	1:35	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721	1:939
Nominal torque   ^ gear box limit	mNm	44.1	107.9	147.1	205.9	264.8	333.4	460.9	647.2	892.4	980.7	1177^	1177^	1177^	1177^
Nominal speed	rpm	1140	430	310	221	170	117	83.0	60.0	44.0	32.0	24.0	12.9	9.5	7.2
Peak torque   ^ gear box limit	mNm	588	1177	1177^	1765	1765^	2354	2354^	2942	2942^	3530	3530^	3530^	3530^	3530^
Mechanical power	W	4.226	3.409	3.352	3.345	3.308	2.458	2.410	2.447	2.474	1.648	1.483	0.797	0.587	0.445
Efficiency gear head	%	80	70	70	70	70	60	60	60	60	50	50	50	50	50
Length gear box = L	mm	20.6	27.0	27.0	27.0	27.0	33.4	33.4	33.4	33.4	39.8	39.8	39.8	39.8	39.8
Weight	g	211	231	231	231	231	256	256	256	256	282	282	282	282	282

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	



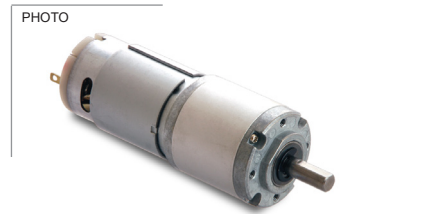
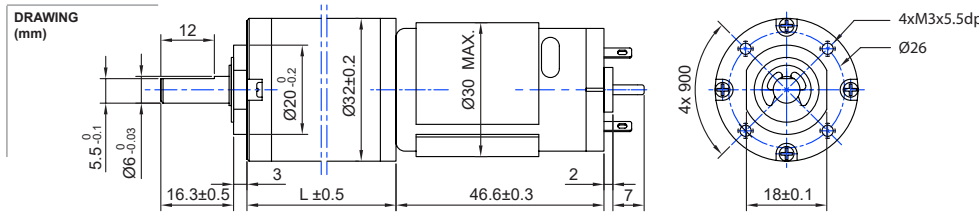
MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 7200	
No load current	A 0.150	
Nominal speed	rpm 5950	
Nominal torque	Ncm 1.07	
Nominal current	A ≤ 0.9	
Nominal mechanical power	W 7.0	
Stall torque	Ncm 8.09	
Starting current	A 5.4	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 19.2-28.8	●
Capacitor emc	V 12	
Resistance	ohm 2.5	
Inductance	mH 1.05	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

**ACCESSORIES**

Power supplies LRS	V 3.3 - 48	separate data sheet
--------------------	------------	---------------------

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

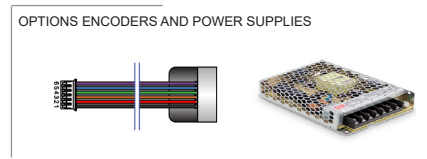


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230	-	VOLTAGE	-	REDUCTION	-	B	-	F	-	E	-	C
--------	---	---------	---	-----------	---	---	---	---	---	---	---	---

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



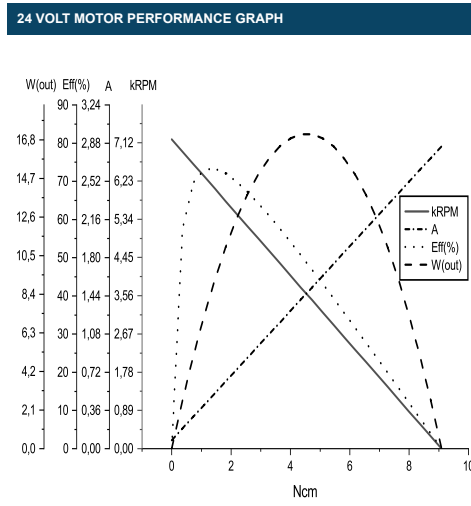
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C													
Gear reduction		1:5	1:14	1:19	1:27	1:35	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721	1:939
Nominal torque   ^ gear box limit	mNm	53.0	117.7	166.7	235.4	304.0	392.3	539.4	647	981	1177	1177	1177	1177	1177
Nominal speed	rpm	1170	445	320	229	176	121	87	60	45.0	34.0	25.0	13.0	9.6	7.2
Peak torque   ^ gear box limit	mNm	588	1177	1177	1765	1765	2354	2354	2942	2942	3530	3530	3530	3530	3530
Mechanical power	W	5.204	3.849	3.921	3.961	3.933	2.990	2.956	2.447	2.780	2.101	1.545	0.803	0.593	0.445
Efficiency gear head	%	80	70	70	70	70	60	60	60	60	50	50	50	50	50
Length gear box = L	mm	20.6	27.0	27.0	27.0	27.0	33.4	33.4	33.4	33.4	39.8	39.8	39.8	39.8	39.8
Weight	g	211	231	231	231	231	256	256	256	256	282	282	282	282	282

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 4.0	



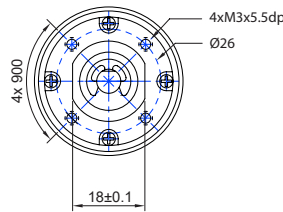
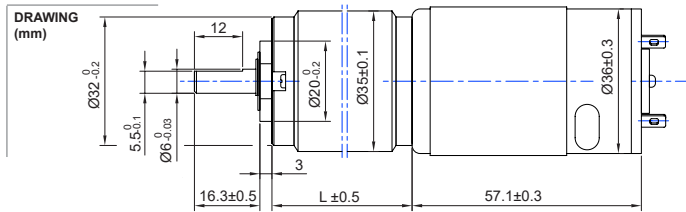
MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12 V separate data sheet)	●
No load speed	rpm 7200	
No load current	A 0.080	
Nominal speed	rpm 6160	
Nominal torque	Ncm 1.27	
Nominal current	A ≤ 0.5	
Nominal mechanical power	W 8.5	
Stall torque	Ncm 9.09	
Starting current	A 2.85	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 26-38	●
Capacitor emc	V 24	
Resistance	ohm 8.77	
Inductance	mH 4.1	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

**ACCESSORIES**

Power supplies LRS	V 3.3 - 48	separte data sheet
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ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 30 x 12.1	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

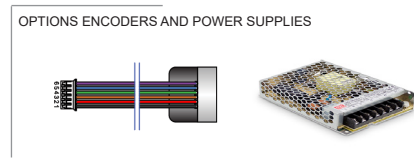


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230	-	VOLTAGE	-	REDUCTION	-	B	-	F	-	E	-	C
--------	---	---------	---	-----------	---	---	---	---	---	---	---	---

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



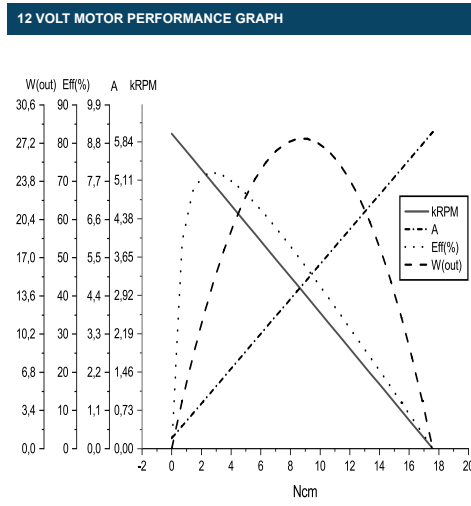
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C											
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	98.1	235	324	461	745	785	981	981	1177^	1177^	1177^	1177^
Nominal speed	rpm	950	359	257	183	97.0	71.5	52.0	39.0	29.0	21.0	11.0	8.0
Peak torque   ^ gear box limit	mNm	588	1177	1177^	1765	2354	2354^	2942	2942^	3530	3530^	3530^	3530^
Mechanical power	W	7.826	6.210	6.113	6.199	4.555	3.534	3.213	2.409	1.792	1.297	0.680	0.494
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	22.1	28.5	28.5	28.5	34.9	34.9	34.9	34.9	41.3	41.3	41.3	41.3
Weight	g	328	362	362	362	396	396	396	396	430	430	430	430

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   AISI 1144	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 5.5	

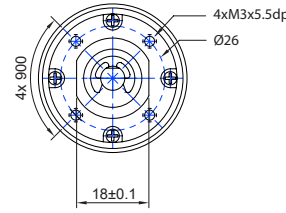
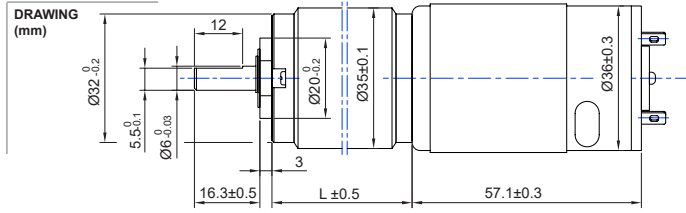


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 6000	
No load current	A 0.260	
Nominal speed	rpm 4930	
Nominal torque	Ncm 2.45	
Nominal current	A ≤ 1.6	
Nominal mechanical power	W 12.8	
Stall torque	Ncm 17.59	
Starting current	A 9.12	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 13-18.4	●
Capacitor emc	V 12	
Resistance	ohm 1.22	
Inductance	mH 1.02	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 36 x 13.5	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

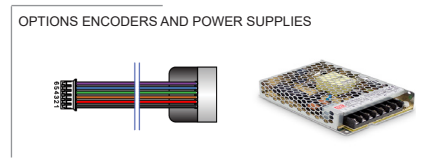


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230 - VOLTAGE - REDUCTION - B - F - E - C

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



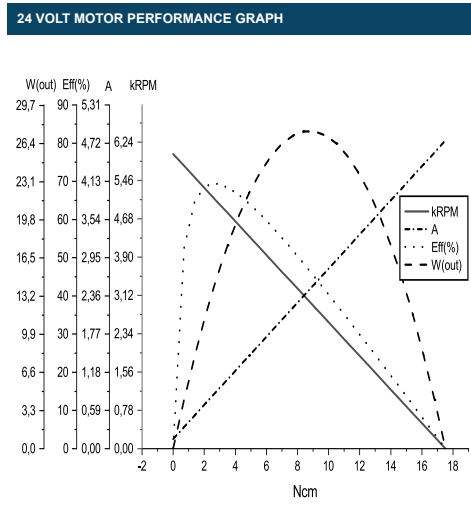
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GEAR MOTOR DATA		C											
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	98.1	226	314	441	716	785	981	981	1177^	1177^	1177^	1177^
Nominal speed	rpm	990	375	268	192	101	74.5	54.0	40.0	29.5	22.0	11.5	8.0
Peak torque   ^ gear box limit	mNm	588	1177	1177^	1765	2354	2354^	2942	2942^	3530	3530^	3530	3530^
Mechanical power	W	8.155	6.217	6.181	6.228	4.555	3.682	3.336	2.471	1.823	1.359	0.710	0.494
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	22.1	28.5	28.5	28.5	34.9	34.9	34.9	34.9	41.3	41.3	41.3	41.3
Weight	g	328	362	362	362	396	396	396	396	430	430	430	430

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	20	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 24.5	
Radial load	N 34.3	
Press fit force max.	N 98.1	
Backlash no load	° ≤ 2.5	
Bearing type   shaft material	Ball bearing   hardened SS	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 5.5	



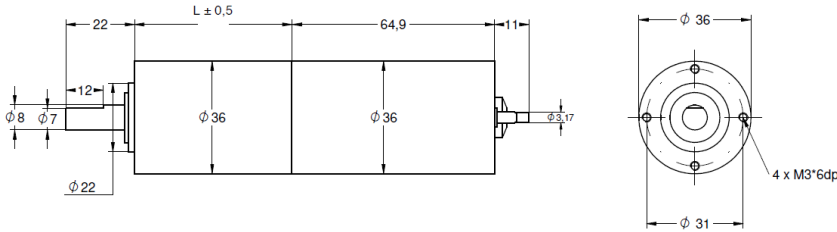
MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12 V separate data sheet)	●
No load speed	rpm 6000	
No load current	A 0.160	
Nominal speed	rpm 5150	
Nominal torque	Ncm 2.45	
Nominal current	A ≤ 0.75	
Nominal mechanical power	W 12.7	
Stall torque	Ncm 17.51	
Starting current	A 4.76	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 27-45	●
Capacitor emc	V 24	
Resistance	ohm 5.3	
Inductance	mH 9.0	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY		C
Nominal voltage	V 2.4 - 24	separate data sheet
Nominal mechanical power	W 0.023 - 25	separate data sheet
Diameter	mm 12 - 42	separate data sheet
Feedback encoder	Hall   Optical	see below

ACCESSORIES		C
Power supplies LRS	V 3.3 - 48	separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift	2   90° ±(1/6)T		
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 36 x 13.5	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

DRAWING (mm)



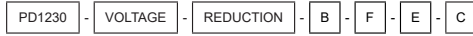
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OPTIONS ENCODERS AND POWER SUPPLIES



MODEL NO. DESIGNATION EXAMPLE



1 - 2 - 3 - 4

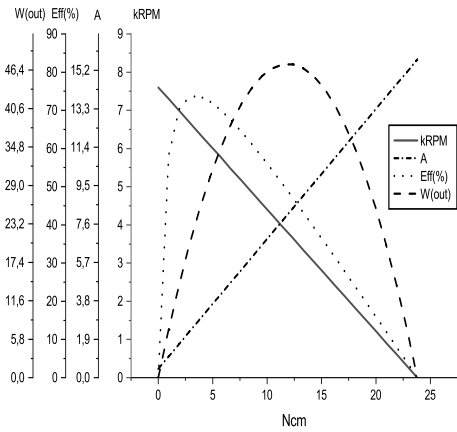
- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C											
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	107.9	245.2	353.0	490.3	804.1	1128	1569	1961	2452^	2452^	2942^	2942^
Nominal speed	rpm	1250	475	340	243	129	92.0	66.0	47.2	34.8	25.1	13.2	9.5
Peak torque   ^ gear box limit	mNm	883	2354	2354^	2942	5296	5296^	5884	5884^	7355	7355^	8826	8826^
Mechanical power	W	11.327	5.111	5.268	8.758	6.535	6.536	5.491	4.909	4.479	3.231	2.039	1.467
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	33.1	41.8	41.8	41.8	50.5	50.5	50.5	50.5	59.2	59.2	59.2	59.2
Weight	g	354	394	394	394	434	434	434	434	474	474	474	474

GEAR MOTOR COMBINED DATA		C		GEAR BOX SHAFT DATA		C		GEAR BOX SPECIFIC DATA		C	
Service life brush wear	500 h continuous operation	●		Radial play   thrust play	mm ≤ 0.05   ≤ 0.3			Material gear stage	Ratio 1:5 sintered steel	●	
Performance tolerances	% ± 15			Shaft axial load	N 29.4			Material > 1:5 ratio / stage	POM first + sintered steel	●	
Operating temperature	-10...+60 °C	●		Radial load	N 78.5			Direction of rotation	CCW or CW by reversed V polarity		
IP code	40			Press fit force max.	N 147.1			Assembly front bell	mm Maximum screw depth 5.5		
Manufacturing standard	ISO9001   ISO 14001   TS16949			Backlash no load	° ≤ 3.0						
Compliance	RoHS and REACH			Bearing type   shaft material	Ball bearing   SCM435						
Label CE   UL	CE no   UL no			Motor pinion material   shape	Steel   straight	●					

12 VOLT MOTOR PERFORMANCE GRAPH



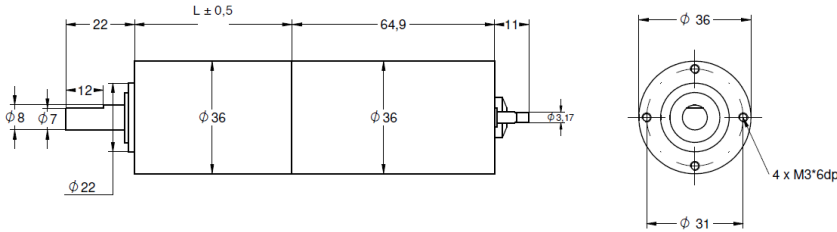
MOTOR SPECIFIC DATA		C		GEAR MOTOR RANGE STANDARD AVAILABILITY			
Nominal voltage	V 12 (24 V separate data sheet)	●		Nominal voltage	V 2.4 - 24	separate data sheet	
No load speed	rpm 7500			Nominal mechanical power	W 0.023 - 25	separate data sheet	
No load current	A 0.320			Diameter	mm 12 - 42	separate data sheet	
Nominal speed	rpm 6570			Feedback encoder	Hall   Optical	see below	
Nominal torque	Ncm 2.65						
Nominal current	A ≤ 2.05						
Nominal mechanical power	W 18.23						
Stall torque	Ncm 23.81						
Starting current	A 15.74						
Motor commutation	Carbon brush	●					
Motor rotor   stator	Iron rotor   Ferrit magnet						
Varistor emc	V 13-18.4	●					
Capacitor emc	V 12						
Resistance	ohm 0.77						
Inductance	mH 0.68						
Insulation class	F	●					

ACCESSORIES

Power supplies LRS V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		OPTICAL SENSOR		C	
Pulses per revolution	7 x 2			(100   200   256   360   400   500) x 2			●
Channels   phase shift			2   90° ±(1/6)T				
Encoder rear cover	Cover cap in ABS plastic			Zink alloy			
Sensor technical data	Refer externally to brand and part UTC-SK1816						
Size	Ø 36 x 13.5			D19+4.5 x W30 x H40 mm			
Harness connector	JST ZHR-6 P=1.5-6P			JST SMR-05V			●
Harness cable	UL1061 AWG26 100 mm			UL2464 AWG24x4C 195 mm			●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B			RED Vcc   GRN GND   BLK A   WHT B			
Supply voltage Vcc	min.3.5 ref - max. 20 V			5 ±10% V			
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA						
Open collector output	Requires external output resistors						
Output current / channel				± 20 mA			

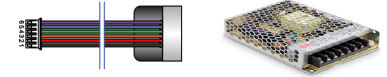
DRAWING (mm)



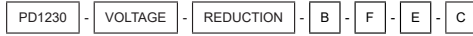
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OPTIONS ENCODERS AND POWER SUPPLIES



MODEL NO. DESIGNATION EXAMPLE



1 - 2 - 3 - 4

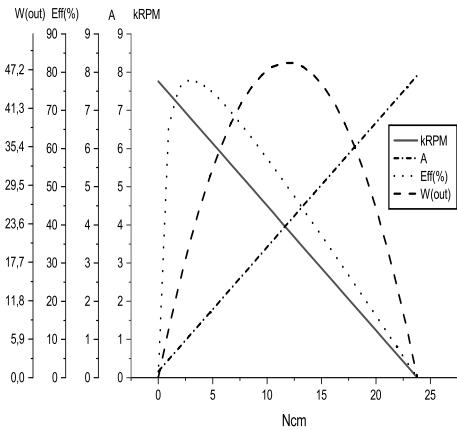
- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C											
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	107.9	264.8	372.7	519.7	853.2	1177	1667	1961	2452^	2452^	2942^	2942^
Nominal speed	rpm	1240	470	335	240	127	91.0	65.0	46.5	34.3	24.8	13.0	9.4
Peak torque   ^ gear box limit	mNm	883	2354	2354^	2942	5296	5296^	5884	5884^	7355	7355^	8826	8826^
Mechanical power	W	11.24	9.15	9.18	9.17	6.83	6.75	6.83	5.75	4.41	3.19	2.01	1.45
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	33.1	41.8	41.8	41.8	50.5	50.5	50.5	50.5	59.2	59.2	59.2	59.2
Weight	g	356	396	396	396	436	436	436	436	476	476	476	476

GEAR MOTOR COMBINED DATA		C		GEAR BOX SHAFT DATA		C		GEAR BOX SPECIFIC DATA		C	
Service life brush wear	500 h continuous operation	●		Radial play   thrust play	mm ≤ 0.05   ≤ 0.3			Material gear stage	Ratio 1:5 sintered steel	●	
Performance tolerances	% ± 15			Shaft axial load	N 29.4			Material > 1:5 ratio / stage	POM first + sintered steel	●	
Operating temperature	-10...+60 °C	●		Radial load	N 78.5			Direction of rotation	CCW or CW by reversed V polarity		
IP code	40			Press fit force max.	N 147.1			Assembly front bell	mm Maximum screw depth 5.5		
Manufacturing standard	ISO9001   ISO 14001   TS16949			Backlash no load	° ≤ 3.0						
Compliance	RoHS and REACH			Bearing type   shaft material	Ball bearing   SCM435						
Label CE   UL	CE no   UL no			Motor pinion material   shape	Steel   straight	●					

24 VOLT MOTOR PERFORMANCE GRAPH



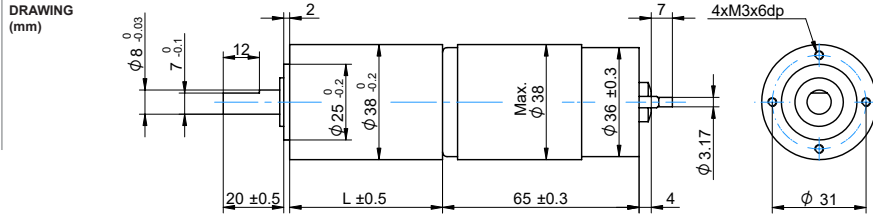
MOTOR SPECIFIC DATA		C		GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 24 (12 V separate data sheet)	●		Nominal voltage	V 2.4 - 24 separate data sheet
No load speed	rpm 7500			Nominal mechanical power	W 0.023 - 25 separate data sheet
No load current	A 0.180			Diameter	mm 12 - 42 separate data sheet
Nominal speed	rpm 6480			Feedback encoder	Hall   Optical see below
Nominal torque	Ncm 2.79				
Nominal current	A ≤ 1.05				
Nominal mechanical power	W 18.96				
Stall torque	Ncm 24.93				
Starting current	A 7.92				
Motor commutation	Carbon brush	●			
Motor rotor   stator	Iron rotor   Ferrit magnet				
Varistor emc	V 27-45	●			
Capacitor emc	V 24				
Resistance	ohm 3.08				
Inductance	mH 2.5				
Insulation class	F	●			

ACCESSORIES

Power supplies LRS V 3.3 - 48 separate data sheet

ENCODER OPTIONS		MAGNETIC HALL SENSOR		OPTICAL SENSOR		C	
Pulses per revolution	7 x 2			(100   200   256   360   400   500) x 2			●
Channels   phase shift			2   90° ±(1/6)T				
Encoder rear cover	Cover cap in ABS plastic			Zink alloy			
Sensor technical data	Refer externally to brand and part UTC-SK1816						
Size	Ø 36 x 13.5			D19+4.5 x W30 x H40 mm			
Harness connector	JST ZHR-6 P=1.5-6P			JST SMR-05V			●
Harness cable	UL1061 AWG26 100 mm			UL2464 AWG24x4C 195 mm			●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B			RED Vcc   GRN GND   BLK A   WHT B			
Supply voltage Vcc	min.3.5 ref - max. 20 V			5 ±10% V			
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA						
Open collector output	Requires external output resistors						
Output current / channel				± 20 mA			



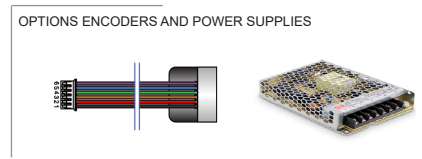


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap

PD1230 - VOLTAGE - REDUCTION - B - F - E - C



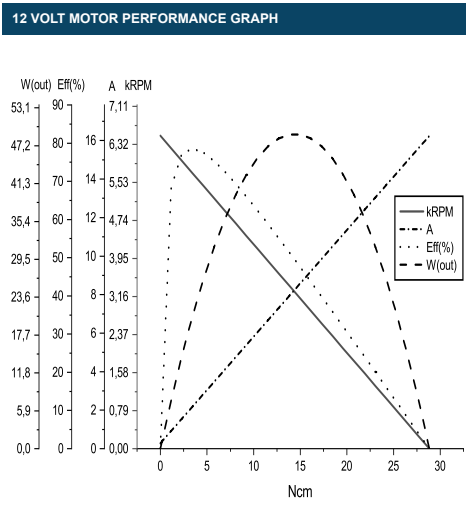
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C											
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	98.1	235.4	323.6	460.9	745.3	980.7	1471	1961	2256	2452	2942^	2942^
Nominal speed	rpm	1100	420	300	210	110	81.0	58.0	41.0	30.0	22.5	11.6	8.4
Peak torque   ^ gear box limit	mNm	883	2354	2354^	2942	5296	5296^	5884	5884^	7355	7355^	8826	8826^
Mechanical power	W	9.06	7.27	7.14	7.11	5.16	5.00	5.37	5.07	3.55	2.90	1.79	1.30
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	33.1	41.8	41.8	41.8	50.5	50.5	50.5	50.5	59.2	59.2	59.2	59.2
Weight	g	413	461	461	461	509	509	509	509	557	557	557	557

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	40	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 29.4	
Radial load	N 78.5	
Press fit force max.	N 147.1	
Backlash no load	° ≤ 3.0	
Bearing type   shaft material	Ball bearing   SCM435	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 5.5	



MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 6400	
No load current	A 0.320	
Nominal speed	rpm 5800	
Nominal torque	Ncm 2.45	
Nominal current	A ≤ 1.6	
Nominal mechanical power	W 14.89	
Stall torque	Ncm 28.83	
Starting current	A 16.25	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 13-18.4V	●
Capacitor emc	V 12	
Resistance	ohm 0.75	
Inductance	mH 0.68	
Insulation class	F	●

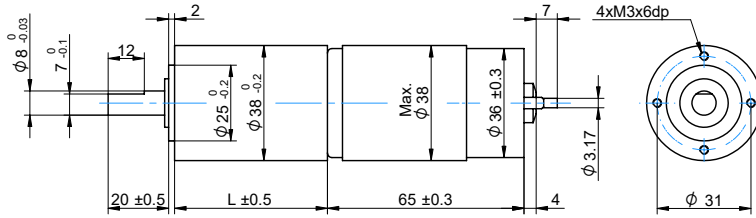
GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

**ACCESSORIES**

Power supplies LRS	V 3.3 - 48	separte data sheet
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ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 36 x 13.5	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

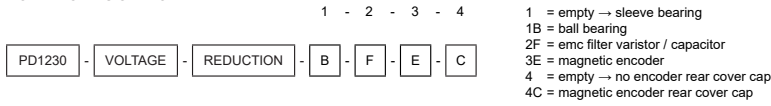
DRAWING (mm)



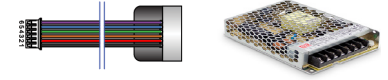
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MODEL NO. DESIGNATION EXAMPLE



OPTIONS ENCODERS AND POWER SUPPLIES



● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

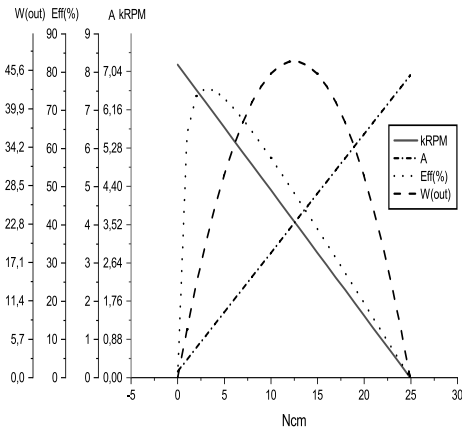
GEAR MOTOR DATA													C
Gear reduction		1:5	1:14	1:19	1:27	1:51	1:71	1:100	1:139	1:189	1:264	1:516	1:721
Nominal torque   ^ gear box limit	mNm	107.9	264.8	362.8	509.9	833.6	1177	1569	1961	2452^	2452^	2942^	2942^
Nominal speed	rpm	1050	390	280	200	105	76.0	55.0	41.0	29.0	22.5	11.6	8.4
Peak torque   ^ gear box limit	mNm	883	2354	2354^	2942	5296	5296^	5884	5884^	7355	7355^	8826	8826^
Mechanical power	W	9.51	7.59	7.47	7.50	5.51	5.63	5.44	5.07	3.73	2.90	1.79	1.30
Efficiency gear head	%	80	70	70	70	60	60	60	60	50	50	50	50
Length gear box = L	mm	33.1	41.8	41.8	41.8	50.5	50.5	50.5	50.5	59.2	59.2	59.2	59.2
Weight	g	415	463	463	463	511	511	511	511	559	559	559	559

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	40	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 29.4	
Radial load	N 78.5	
Press fit force max.	N 147.1	
Backlash no load	° ≤ 3.0	
Bearing type   shaft material	Ball bearing   SCM435	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:5 sintered steel	●
Material > 1:5 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 5.5	

24 VOLT MOTOR PERFORMANCE GRAPH

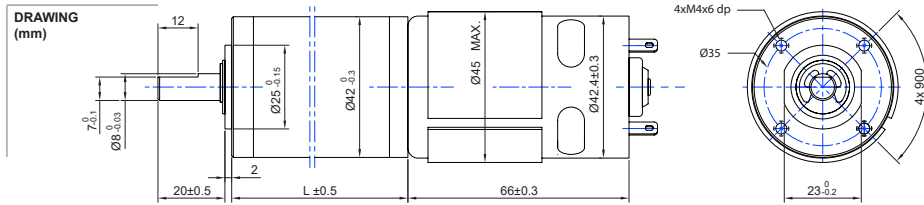


MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12 V separate data sheet)	●
No load speed	rpm 6400	
No load current	A 0.180	
Nominal speed	rpm 5500	
Nominal torque	Ncm 2.84	
Nominal current	A ≤ 0.9	
Nominal mechanical power	W 15.81	
Stall torque	Ncm 24.93	
Starting current	A 7.92	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 27-45V	●
Capacitor emc	V 24	
Resistance	ohm 2.98	
Inductance	mH 2.5	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	7 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 36 x 13.5	D19+4.5 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	

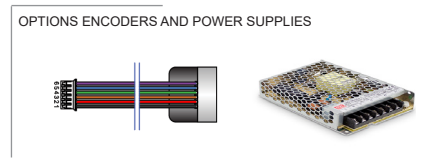


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

PD1230 - VOLTAGE - REDUCTION - B - F - E - C

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap



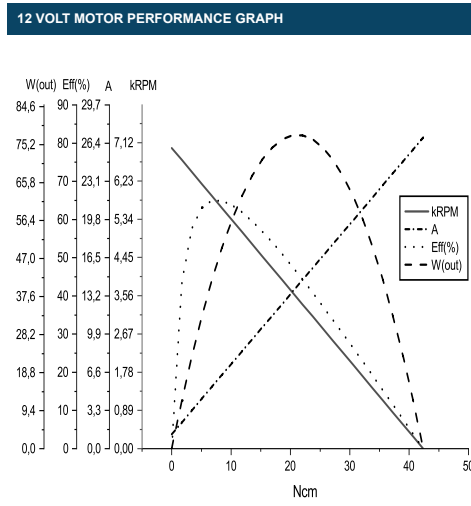
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA																				C			
Gear reduction		1:4	1:14	1:17	1:24	1:49	1:61	1:84	1:104	1:144	1:212	1:294	1:504	1:624	1:720	1:864	1:1062	1:1470	1:2500	1:3000	1:3600		
Nominal torque   ^ gear box limit	mNm	215.7	637.4	784.5	784.5	1765 <sup>A</sup>	1765 <sup>A</sup>	1765 <sup>A</sup>	1961 <sup>A</sup>	1961 <sup>A</sup>	2452 <sup>A</sup>	2452 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	
Nominal speed	rpm	1400	405	325	248	120	98.0	76.0	63.0	45.0	31.0	22.0	13.5	10.9	9.5	8.0	6.5	4.6	2.7	2.3	1.9		
Peak torque   ^ gear box limit	mNm	883	2354	2354 <sup>A</sup>	2354 <sup>A</sup>	5296	5296 <sup>A</sup>	5296 <sup>A</sup>	8826	5884	7355	7355 <sup>A</sup>	8826	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>	
Mechanical power	W	25.37	18.97	18.74	14.30	13.34	10.90	8.45	7.78	5.56	3.99	2.83	2.09	1.68	1.47	1.24	0.80	0.57	0.33	0.28	0.23		
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	40	40	
Length gear box = L	mm	32.5	39.2	39.2	39.2	45.9	45.9	45.9	59.2	45.9	52.6	52.6	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	
Weight	g	499	551	551	551	591	591	591	591	591	641	641	641	641	641	641	686	686	686	686	686	686	

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	10	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 29.4	
Radial load	N 78.5	
Press fit force max.	N 147.1	
Backlash no load	° ≤ 3.0	
Bearing type   shaft material	Ball bearing   SCM435	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 sintered steel	●
Material 1:14-1:24 ratio / stage	POM first + steel	●
Material > 1:24 ratio / stage	POM first + sintered steel + steel last	
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 6.0	

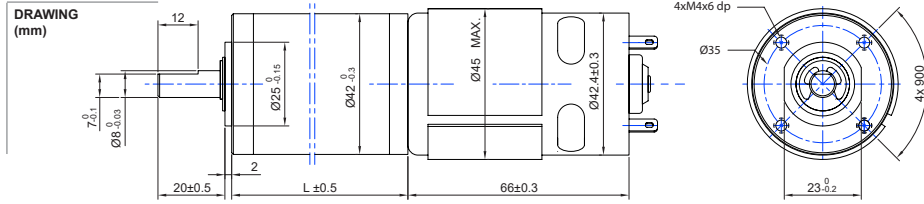


MOTOR SPECIFIC DATA		C
Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 7000	
No load current	A 1.15	
Nominal speed	rpm 5700	
Nominal torque	Ncm 6.86	
Nominal current	A ≤ 5.5	
Nominal mechanical power	W 41.3	
Stall torque	Ncm 42.36	
Starting current	A 26.88	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 26-38	●
Capacitor emc	V 12	
Resistance	ohm 0.52	
Inductance	mH 0.4	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	19 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift	2   90° ±(1/6)T		
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 42.5 x 15.5 mm	D19+10 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel			± 20 mA

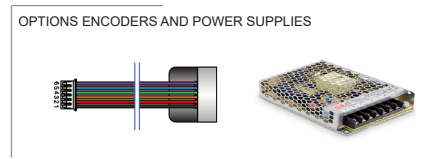


**MODEL NO. DESIGNATION EXAMPLE**

1 - 2 - 3 - 4

1 = empty → sleeve bearing  
 1B = ball bearing  
 2F = emc filter varistor / capacitor  
 3E = magnetic encoder  
 4 = empty → no encoder rear cover cap  
 4C = magnetic encoder rear cover cap

PD1230 - VOLTAGE - REDUCTION - B - F - E - C



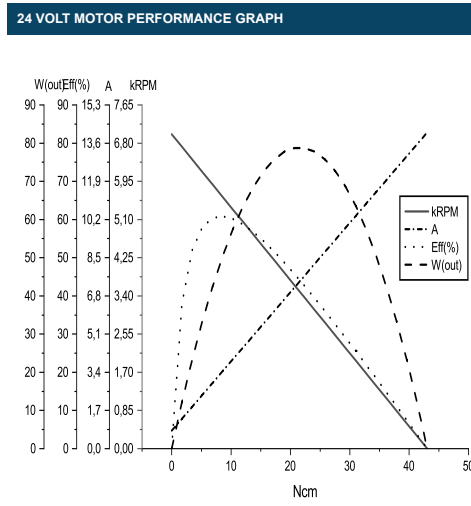
● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C																			
Gear reduction		1:4	1:14	1:17	1:24	1:49	1:61	1:84	1:104	1:144	1:212	1:294	1:504	1:624	1:720	1:864	1:1062	1:1470	1:2500	1:3000	1:3600
Nominal torque   ^ gear box limit	mNm	176	529.6	647.2	784.5	1569	1765	1765	1961	1961	2452^	2452^	2942^	2942^	2942^	2942^	2942^	2942^	2942^	2942^	2942^
Nominal speed	rpm	1445	420	340	246	122	102	77.5	63.0	47.0	31.0	21.8	13.5	10.9	9.5	8.0	6.5	4.6	2.7	2.3	1.9
Peak torque   ^ gear box limit	mNm	883	2354	2354^	2354^	5296^	5296^	5296^	8826	5884	7355	7355	8826^	8826^	8826^	8826^	8826^	8826^	8826^	8826^	8826^
Mechanical power	W	21.42	16.35	16.17	14.19	12.06	11.34	8.62	7.78	5.81	3.99	2.81	2.09	1.68	1.47	1.24	0.80	0.57	0.33	0.28	0.23
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50	40	40	40	40	40
Length gear box = L	mm	32.5	39.2	39.2	39.2	45.9	45.9	45.9	59.2	45.9	52.6	52.6	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9
Weight	g	499	551	551	551	591	591	591	591	591	641	641	641	641	641	641	686	686	686	686	686

GEAR MOTOR COMBINED DATA		C
Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	10	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

GEAR BOX SHAFT DATA		C
Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 29.4	
Radial load	N 78.5	
Press fit force max.	N 147.1	
Backlash no load	° ≤ 3.0	
Bearing type   shaft material	Ball bearing   SCM435	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA		C
Material gear stage	Ratio 1:4 sintered steel	●
Material 1:14-1:24 ratio / stage	POM first + steel	●
Material > 1:24 ratio / stage	POM first + sintered steel + steel last	
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 6.0	



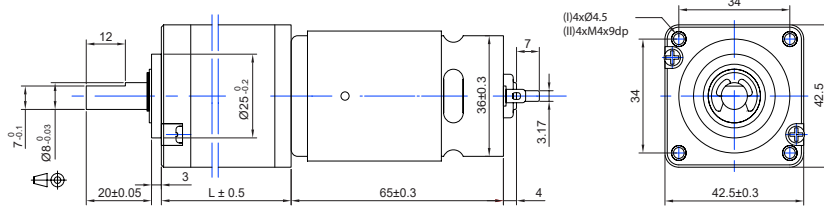
MOTOR SPECIFIC DATA		C
Nominal voltage	V 24 (12 V separate data sheet)	●
No load speed	rpm 7000	
No load current	A 0.60	
Nominal speed	rpm 5900	
Nominal torque	Ncm 5.59	
Nominal current	A ≤ 2.1	
Nominal mechanical power	W 15.81	
Stall torque	Ncm 43.05	
Starting current	A 14.08	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 26-38	●
Capacitor emc	V 24	
Resistance	ohm 1.99	
Inductance	mH 1.7	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY	
Nominal voltage	V 2.4 - 24 separate data sheet
Nominal mechanical power	W 0.023 - 25 separate data sheet
Diameter	mm 12 - 42 separate data sheet
Feedback encoder	Hall   Optical see below

ACCESSORIES	
Power supplies LRS	V 3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	19 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy	
Sensor technical data	Refer externally to brand and part UTC-SK1816		
Size	Ø 42.5 x 15.5 mm	D19+10 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel			± 20 mA

DRAWING (mm)



PHOTO



MODEL NO. DESIGNATION EXAMPLE



1 - 2 - 3 - 4

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

OPTIONS ENCODERS AND POWER SUPPLIES



● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA

		1:4	1:14	1:17	1:24	1:49	1:61	1:84	1:104	1:144	1:212	1:294	1:504	1:624	1:720	1:864
Gear reduction		1:4	1:14	1:17	1:24	1:49	1:61	1:84	1:104	1:144	1:212	1:294	1:504	1:624	1:720	1:864
Nominal torque   ^ gear box limit	mNm	98.1	294.2	353.0	509.9	902.2	1079	1471	1863	1961	2452	2452 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>	2942 <sup>A</sup>
Nominal speed	rpm	1250	363	293	212	103	83.5	60.5	49.0	38.0	25.4	18.9	11.2	8.8	8.0	8.8
Peak torque   ^ gear box limit	mNm	1177	2354	2354 <sup>A</sup>	2354 <sup>A</sup>	4413	4413 <sup>A</sup>	4413 <sup>A</sup>	5884	5884 <sup>A</sup>	7355	7355 <sup>A</sup>	8826	8826 <sup>A</sup>	8826 <sup>A</sup>	8826 <sup>A</sup>
Mechanical power	W	10.297	7.849	7.603	7.946	5.854	5.675	5.607	5.752	4.695	3.269	2.433	1.730	1.359	1.236	1.359
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50
Length gear box = L	mm	26.2	33.0	33.0	33.0	39.8	39.8	39.8	39.8	39.8	46.5	46.5	46.5	46.5	46.5	46.5
Weight	g	456	516	516	516	571	571	571	571	571	626	626	626	626	626	626

GEAR MOTOR COMBINED DATA

Service life brush wear	500 h continuous operation	●
Performance tolerances	% ± 15	
Operating temperature	-10...+60 °C	●
IP code	10	
Manufacturing standard	ISO9001   ISO 14001   TS16949	
Compliance	RoHS and REACH	
Label CE   UL	CE no   UL no	

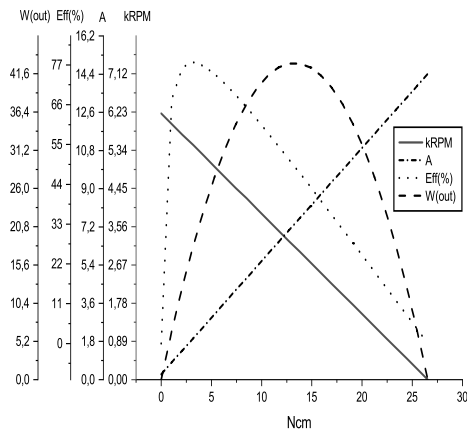
GEAR BOX SHAFT DATA

Radial play   thrust play	mm ≤ 0.05   ≤ 0.3	
Shaft axial load	N 29.4	
Radial load	N 78.5	
Press fit force max.	N 147.1	
Backlash no load	° ≤ 3.0	
Bearing type   shaft material	Ball bearing   SCM435	
Motor pinion material   shape	Steel   straight	●

GEAR BOX SPECIFIC DATA

Material gear stage	Ratio 1:4 sintered steel	●
Material > 1:4 ratio / stage	POM first + sintered steel	●
Direction of rotation	CCW or CW by reversed V polarity	
Assembly front bell	mm Maximum screw depth 9.0	

12 VOLT MOTOR PERFORMANCE GRAPH



MOTOR SPECIFIC DATA

Nominal voltage	V 12 (24 V separate data sheet)	●
No load speed	rpm 6000	
No load current	A 0.250	
Nominal speed	rpm 5090	
Nominal torque	Ncm 3.13	
Nominal current	A ≤ 2.1	
Nominal mechanical power	W 17.09	
Stall torque	Ncm 26.54	
Starting current	A 14.41	
Motor commutation	Carbon brush	●
Motor rotor   stator	Iron rotor   Ferrit magnet	
Varistor emc	V 13-18.4	●
Capacitor emc	V 12	
Resistance	ohm 0.85	
Inductance	mH 0.68	
Insulation class	F	●

GEAR MOTOR RANGE STANDARD AVAILABILITY

Nominal voltage	V 2.4 - 24	separate data sheet
Nominal mechanical power	W 0.023 - 25	separate data sheet
Diameter	mm 12 - 42	separate data sheet
Feedback encoder	Hall   Optical	see below

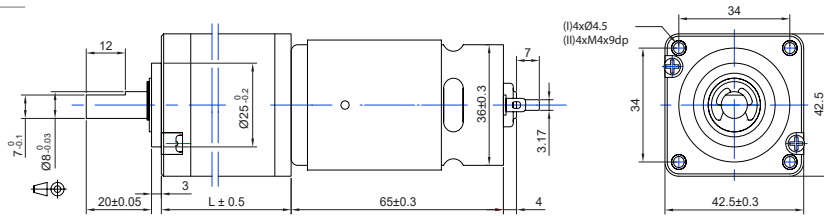
ACCESSORIES

Power supplies LRS	V 3.3 - 48	separate data sheet
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ENCODER OPTIONS

	MAGNETIC HALL SENSOR	OPTICAL SENSOR
Pulses per revolution	19 x 2	(100   200   256   360   400   500) x 2
Channels   phase shift	2   90° ±(1/6)T	
Encoder rear cover	Cover cap in ABS plastic	Zink alloy
Sensor technical data	Refer externally to brand and part UTC-SK1816	
Size	Ø 42.5 x 15.5 mm	D19+10 x W30 x H40 mm
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA	
Open collector output	Requires external output resistors	
Output current / channel		± 20 mA

DRAWING (mm)



PHOTO



MODEL NO. DESIGNATION EXAMPLE



1 - 2 - 3 - 4

- 1 = empty → sleeve bearing
- 1B = ball bearing
- 2F = emc filter varistor / capacitor
- 3E = magnetic encoder
- 4 = empty → no encoder rear cover cap
- 4C = magnetic encoder rear cover cap

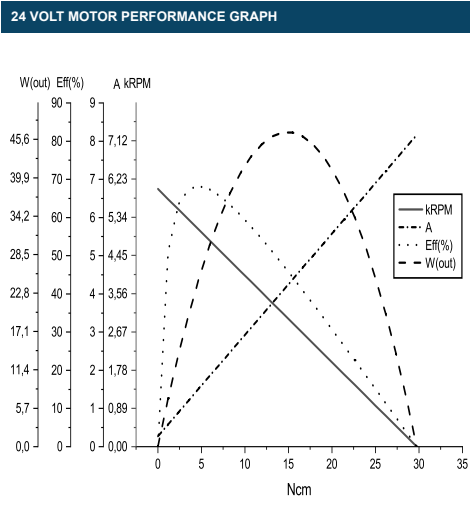
OPTIONS ENCODERS AND POWER SUPPLIES



● C = customizations are offered on demand even for smaller quantities. Typical customizations indicated with green dot at column end. Please contact us for any customization request

GEAR MOTOR DATA		C															
Gear reduction		1:4	1:14	1:17	1:24	1:49	1:61	1:84	1:104	1:144	1:212	1:294	1:504	1:624	1:720	1:864	
Nominal torque   ^ gear box limit	mNm	98.1	294.2	353.0	509.9	902.2	1079	1471	1863	1961	2452	2452^	2942^	2942^	2942^	2942^	
Nominal speed	rpm	1250	363	293	212	103	83.5	60.5	49.0	38.0	25.4	18.9	11.2	8.8	8.0	8.8	
Peak torque   ^ gear box limit	mNm	1177	2354	2354^	2354^	4413	4413^	4413^	5884	5884^	7355	7355^	8826	8826^	8826^	8826^	
Mechanical power	W	10.297	7.849	7.603	7.946	5.854	5.675	5.607	5.752	4.695	3.269	2.433	1.730	1.359	1.236	1.359	
Efficiency gear head	%	80	70	70	70	60	60	60	60	60	50	50	50	50	50	50	
Length gear box = L	mm	26.2	33.0	33.0	33.0	39.8	39.8	39.8	39.8	39.8	46.5	46.5	46.5	46.5	46.5	46.5	
Weight	g	456	516	516	516	571	571	571	571	571	626	626	626	626	626	626	

GEAR MOTOR COMBINED DATA			GEAR BOX SHAFT DATA			GEAR BOX SPECIFIC DATA		
Service life brush wear	500 h continuous operation	●	Radial play   thrust play	mm	≤ 0.05   ≤ 0.3	Material gear stage	Ratio 1:4 sintered steel	●
Performance tolerances	% ± 15		Shaft axial load	N	29.4	Material > 1:4 ratio / stage	POM first + sintered steel	●
Operating temperature	-10...+60 °C	●	Radial load	N	78.5	Direction of rotation	CCW or CW by reversed V polarity	
IP code	10		Press fit force max.	N	147.1	Assembly front bell	mm	Maximum screw depth 9.0
Manufacturing standard	ISO9001   ISO 14001   TS16949		Backlash no load	°	≤ 3.0			
Compliance	RoHS and REACH		Bearing type   shaft material		Ball bearing   SCM435			
Label CE   UL	CE no   UL no		Motor pinion material   shape		Steel   straight			



MOTOR SPECIFIC DATA		C
Nominal voltage	V	24 (12 V separate data sheet) ●
No load speed	rpm	6000
No load current	A	0.270
Nominal speed	rpm	5250
Nominal torque	Ncm	2.74
Nominal current	A	≤ 0.9
Nominal mechanical power	W	15.56
Stall torque	Ncm	29.74
Starting current	A	8.16
Motor commutation		Carbon brush ●
Motor rotor   stator		Iron rotor   Ferrit magnet ●
Varistor emc	V	27-45 ●
Capacitor emc	V	24
Resistance	ohm	2.98
Inductance	mH	2.5
Insulation class		F ●

GEAR MOTOR RANGE STANDARD AVAILABILITY		
Nominal voltage	V	2.4 - 24 separate data sheet
Nominal mechanical power	W	0.023 - 25 separate data sheet
Diameter	mm	12 - 42 separate data sheet
Feedback encoder	Hall   Optical	see below

ACCESSORIES		
Power supplies LRS	V	3.3 - 48 separate data sheet

ENCODER OPTIONS	MAGNETIC HALL SENSOR	OPTICAL SENSOR	C
Pulses per revolution	19 x 2	(100   200   256   360   400   500) x 2	●
Channels   phase shift		2   90° ±(1/6)T	
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Size	Ø 42.5 x 15.5 mm	D19+10 x W30 x H40 mm	
Harness connector	JST ZHR-6 P=1.5-6P	JST SMR-05V	●
Harness cable	UL1061 AWG26 100 mm	UL2464 AWG24x4C 195 mm	●
Connection	BLK M-   RED M+   BRN Vcc   GRN GND   BLU A   VIO B	RED Vcc   GRN GND   BLK A   WHT B	
Supply voltage Vcc	min.3.5 ref - max. 20 V	5 ±10% V	
Supply Current Ice	Vcc 20V open output   min. - ref. 5 max. 10 mA		
Open collector output	Requires external output resistors		
Output current / channel		± 20 mA	