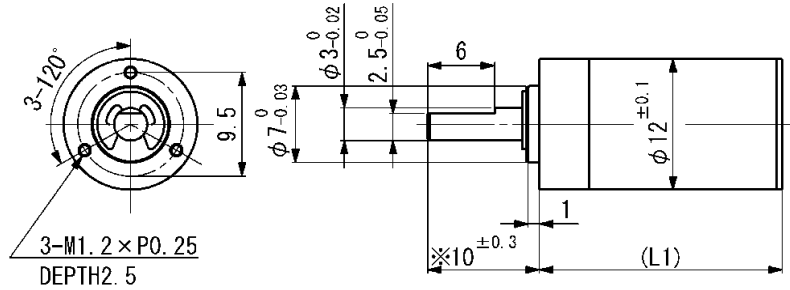


SPG12

Planetary gearhead



Dimension in

Note) Dimension marked ※ is measured with shaft pushed against gearhead.

General specifications	SPG12	
1 Housing material	Metal	
2 Geartrain material	Steel	
3 Recommended max. input speed	8000	rpm
4 Operation temperature range	-10...+60	°C
5 Backlash at no-load per stage	≤ 1	°
6 Bearings on output shaft	Sintered sleeve bearings	
7 Max. shaft radial load (7mm from flange)	4 (25)	N
8 Max. shaft axial load	2	N
9 Max. shaft press fit force	30	N
10 Shaft radial play	≤ 0.03	mm
11 Shaft axial play	≤ 0.3	mm
12 Max. allowable torque (Continuous)	100	mNm
13 Max. allowable torque (Intermittent)	200	mNm

General specifications	SPG12-	3.5	4.8	12	23	58	107	509	
14 Reduction ratio (absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
15 Number of stage		1	1	2	2	3	3	4	
16 Efficiency		85.0	85.0	72.3	72.3	61.4	61.4	52.2	%
17 Direction of rotation		=	=	=	=	=	=	=	
18 Gearhead length: L1		14.2	14.2	18	18	21.8	21.8	25.7	mm
19 Weight		11.6	11.6	14.1	14.1	16.6	16.6	19.1	g

Combination		Reduction ratio (Motor+gearhead total length)							
Type	Model name	3.5	4.8	12	23	58	107	509	
Brushed coreless motor	CMS12-15..P	26.2	26.2	30	30	33.8	33.8	37.7	mm
	CMS12-20..P	34.2	34.2	38	38	41.8	41.8	45.7	mm
	CMS12-30..P	44.2	44.2	48	48	51.8	51.8	55.7	mm
Brushless coreless motor	BMS12-15..P	29.2	29.2	33	33	36.8	36.8	40.7	mm
	BMS12-21..P	35.2	35.2	39	39	42.8	42.8	46.7	mm
	BMS12-30..P	44.2	44.2	48	48	51.8	51.8	55.7	mm

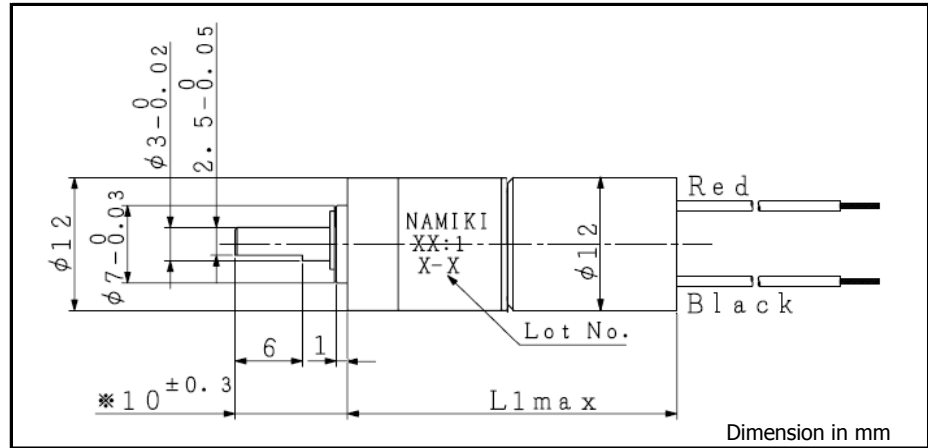
CMS12-15..P Geared motor (Planetary gearhead)

Planetary gearhead

SPG12

Coreless motor

CMS12-1506
CMS12-1514



General specification

	SPG12-	3.5	4.8	12	23	58	107	509	
1 Reduction ratio(absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
2 Number of stage		1	1	2	2	3	3	4	
3 Efficiency		85%	85%	72%	72%	61%	61%	52%	%
4 Direction of rotation		=	=	=	=	=	=	=	
5 Geared motor length: L1		26.2	26.2	30	30	33.8	33.8	37.7	mm
6 Max. allowable torque (Continuous)						100			mNm
7 Max. allowable torque (Intermittent)						200			mNm

CMS12-1506P Rated voltage: 7.4V

Ordering number	CMS12-1506P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.52	2.09	4.53	8.34	18.29	33.69	100.00	mNm
9 Rated speed		5799	4228	1657	902	349	189	42	rpm
10 No load speed		6936	5057	1982	1078	417	226	48	rpm
11 No load current		98	98	98	96	98	98	100	mA
12 Stall torque		9	13	28	51	112	206	829	mNm
13 Stall current		1261	1261	1261	1261	1261	1261	1261	mA

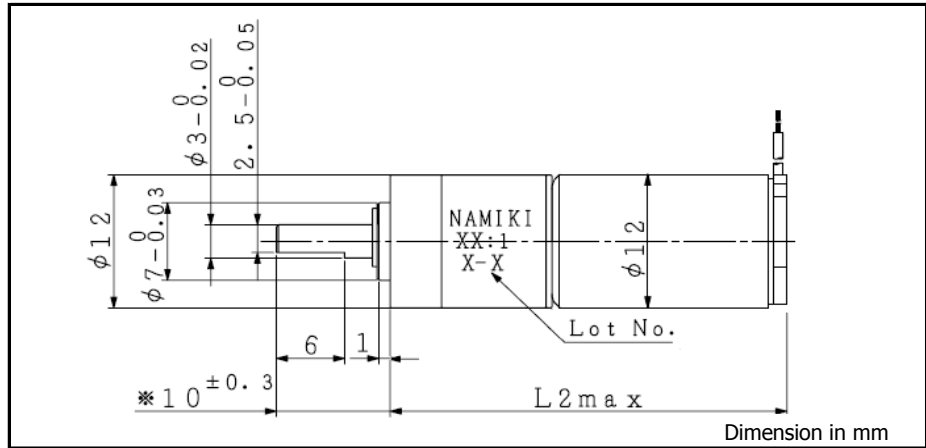
CMS12-1514P Rated voltage: 12V

Ordering number	CMS12-1514P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.51	2.08	4.51	8.30	18.19	33.51	100.00	mNm
9 Rated speed		6241	4551	1783	971	375	204	45	rpm
10 No load speed		7474	5450	2136	1162	450	244	51	rpm
11 No load current		67	67	67	66	67	67	68	mA
12 Stall torque		9	13	27	50	110	203	819	mNm
13 Stall current		833	833	833	833	833	833	833	mA

CMS12-20..P Geared motor (Planetary gearhead)

Planetary gearhead
SPG12

Coreless motor
CMS12-2004
CMS12-2010



General specification	SPG12-	3.5	4.8	12	23	58	107	509	
1 Reduction ratio(absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
2 Number of stage		1	1	2	2	3	3	4	
3 Efficiency		85%	85%	72%	72%	61%	61%	52%	%
4 Direction of rotation		=	=	=	=	=	=	=	
5 Geared motor length: L1		34.2	34.2	38	38	41.8	41.8	45.7	mm
6 Max. allowable torque (Continuous)					100				mNm
7 Max. allowable torque (Intermittent)					200				mNm

CMS12-2004P Rated voltage: 7.4V

Ordering number	CMS12-2004P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.48	2.03	4.41	8.13	17.82	32.82	100.00	mNm
9 Rated speed		5755	4196	1644	894	346	188	41	rpm
10 No load speed		6396	4664	1827	994	385	209	44	rpm
11 No load current		64	64	64	61	64	64	66	mA
12 Stall torque		15	20	44	81	178	327	1321	mNm
13 Stall current		1701	1701	1701	1701	1701	1701	1701	mA

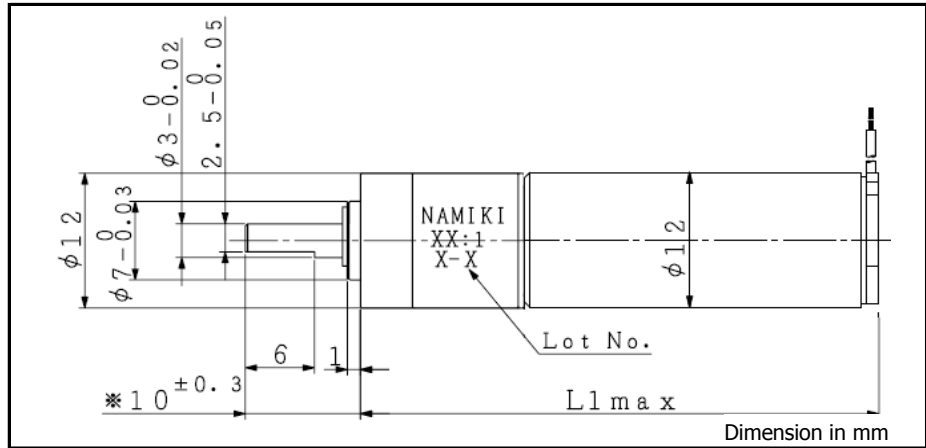
CMS12-2010P Rated voltage: 12V

Ordering number	CMS12-2010P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.53	2.09	4.54	8.36	18.33	33.75	100.00	mNm
9 Rated speed		6043	4407	1727	939	363	197	43	rpm
10 No load speed		6699	4885	1914	1041	403	219	46	rpm
11 No load current		42	42	42	40	42	42	43	mA
12 Stall torque		16	21	46	86	187	345	1391	mNm
13 Stall current		1155	1155	1155	1155	1155	1155	1155	mA

CMS12-30..P Planetary gearhead

Planetary gearhead
SPG12

Coreless motor
CMS12-3005
CMS12-3010



General specification

	SPG12-	3.5	4.8	12	23	58	107	509	
1 Reduction ratio(absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
2 Number of stage		1	1	2	2	3	3	4	
3 Efficiency		85%	85%	72%	72%	61%	61%	52%	%
4 Direction of rotation		=	=	=	=	=	=	=	
5 Geared motor length: L1		44.2	44.2	48	48	51.8	51.8	55.7	mm
6 Max. allowable torque (Continuous)					100				mNm
7 Max. allowable torque (Intermittent)					200				mNm

CMS12-3005P Rated voltage: 7.4V

Ordering number	CMS12-3005P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.48	2.03	4.41	8.13	17.82	32.82	100.00	mNm
9 Rated speed		3412	2488	975	530	205	111	24	rpm
10 No load speed		3623	2642	1035	563	218	118	25	rpm
11 No load current		35	35	35	33	35	35	36	mA
12 Stall torque		25	35	76	140	306	563	2274	mNm
13 Stall current		1605	1605	1605	1605	1605	1605	1605	mA

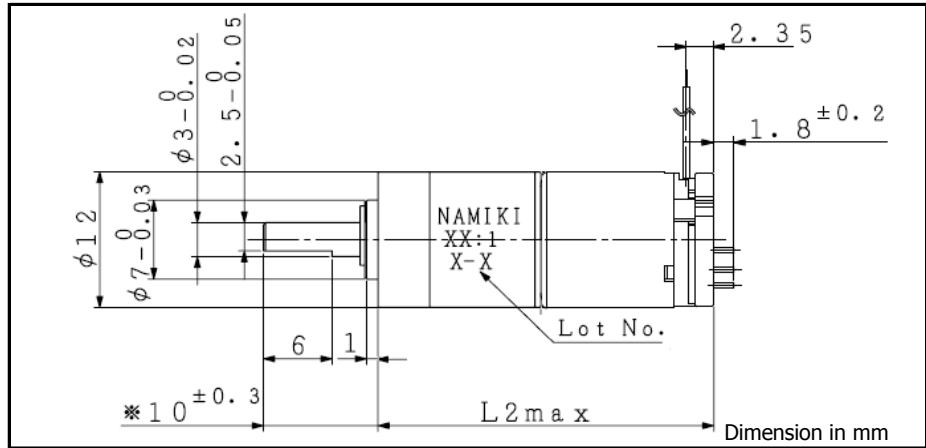
CMS12-3010P Rated voltage: 12V

Ordering number	CMS12-3010P	3.5	4.8	12	23	58	107	509	
8 Rated torque		1.53	2.09	4.54	8.36	18.33	33.75	100.00	mNm
9 Rated speed		6043	4407	1727	939	363	197	43	rpm
10 No load speed		6699	4885	1914	1041	403	219	46	rpm
11 No load current		42	42	42	40	42	42	43	mA
12 Stall torque		16	21	46	86	187	345	1391	mNm
13 Stall current		1155	1155	1155	1155	1155	1155	1155	mA

BMS12-15..P Geared motor (Planetary gearhead)

Planetary gearhead
SPG12

Brushless motor
BMS12-1503
BMS12-1506



General specification	SPG12-	3.5	4.8	12	23	58	107	509	
1 Reduction ratio(absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
2 Number of stage		1	1	2	2	3	3	4	
3 Efficiency		85%	85%	72%	72%	61%	61%	52%	%
4 Direction of rotation		=	=	=	=	=	=	=	
5 Geared motor length: L1		29.2	29.2	33	33	36.8	36.8	40.7	mm
6 Max. allowable torque (Continuous)						100			mNm
7 Max. allowable torque (Intermittent)						200			mNm

BMS12-1503P Rated voltage: 7.4V

Ordering number	BMS12-1503P	3.5	4.8	12	23	58	107	509	
8 Rated torque		5.61	7.70	16.70	30.76	67.44	100.00	100.00	mNm
9 Rated speed		6123	4464	1749	951	368	220	60	rpm
10 No load speed		9337	6808	2668	1450	562	305	64	rpm
11 No load current		201	201	201	199	201	201	203	mA
12 Stall torque		16	22	49	89	196	361	1456	mNm
13 Stall current		2924	2924	2924	2924	2924	2924	2924	mA

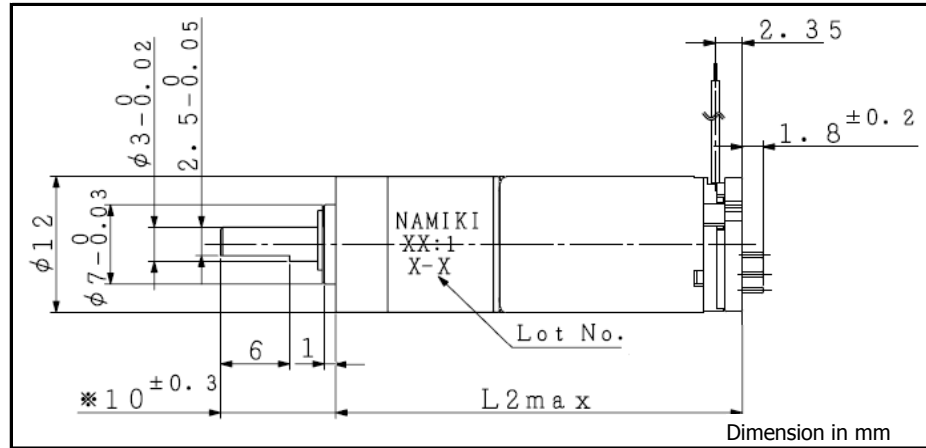
BMS12-1506P Rated voltage: 12V

Ordering number	BMS12-1506P	3.5	4.8	12	23	58	107	509	
8 Rated torque		5.50	7.55	16.37	30.15	66.11	100.00	100.00	mNm
9 Rated speed		6552	4777	1872	1017	394	234	64	rpm
10 No load speed		10003	7294	2858	1553	602	327	69	rpm
11 No load current		136	136	136	135	136	136	138	mA
12 Stall torque		16	22	47	87	192	353	1424	mNm
13 Stall current		1901	1901	1901	1901	1901	1901	1901	mA

BMS12-21..P Geared motor (Planetary gearhead)

Planetary gearhead
SPG12

Brushless motor
BMS12-2102
BMS12-2104



General specification	SPG12-	3.5	4.8	12	23	58	107	509	
1 Reduction ratio(absolute value)		3.50 : 1	4.80 : 1	12.25 : 1	22.56 : 1	58.19 : 1	107.17 : 1	509.07 : 1	
2 Number of stage		1	1	2	2	3	3	4	
3 Efficiency		85%	85%	72%	72%	61%	61%	52%	%
4 Direction of rotation		=	=	=	=	=	=	=	
5 Geared motor length: L1		35.2	35.2	39	39	42.8	42.8	46.7	mm
6 Max. allowable torque (Continuous)		100							mNm
7 Max. allowable torque (Intermittent)		200							mNm

BMS12-2102P Rated voltage: 7.4V

Ordering number	BMS12-2102P	3.5	4.8	12	23	58	107	509	
8 Rated torque		4.21	5.78	12.54	23.09	50.61	93.22	100.00	mNm
9 Rated speed		6925	5049	1978	1075	416	226	60	rpm
10 No load speed		9337	6808	2668	1450	562	305	64	rpm
11 No load current		201	201	201	199	201	201	203	mA
12 Stall torque		16	22	49	89	196	361	1456	mNm
13 Stall current		2924	2924	2924	2924	2924	2924	2924	mA

BMS12-2104P Rated voltage: 12V

Ordering number	BMS12-2104P	3.5	4.8	12	23	58	107	509	
8 Rated torque		4.20	5.76	12.49	22.99	50.41	92.85	100.00	mNm
9 Rated speed		7371	5375	2106	1145	443	241	64	rpm
10 No load speed		10003	7294	2858	1553	602	327	69	rpm
11 No load current		136	136	136	135	136	136	138	mA
12 Stall torque		16	22	47	87	192	353	1424	mNm
13 Stall current		1901	1901	1901	1901	1901	1901	1901	mA