

# **COSMOS** SVTG

Planetary gearboxes



# COSMOS SVTG

## Planetary gearboxes



Cost effective



Robust



Compact



The planetary gearboxes are characterized by a robust design and are employed for uses where high-performance and reduce dimensions are required.

The gear trains can be made of steel or plastic polymers, also in blended configurations when needed.

The gearboxes are lubricated according to the needs with reference to temperature and functionality. They are available with sleeve, ball or customized bearings.

Available also in personalized options designed upon request.

## Features

Gear materials	Metal / Polymer
Diameter	from 10mm to 42mm
Torque	from 0.2Nm to 45Nm
Operating temperature	-20° +100°C (special lubrication might be needed)
Estimated operating lifetime	Lifetime depends on gearbox working conditions. Operating life span can vary between 1.000 to 3.000 work hours.

## Product code

SVTG ◊ ○○ - ◇ - □□□□□ - ◊△△

<span style="color: red;">◊</span> Bearings Sleeve [A]; Ball [B]	<span style="color: red;">□</span> Ratio
<span style="color: red;">○</span> Diameter	<span style="color: red;">◊</span> Type of motor Brushless [A]; Brushed [B]; Flat [F]
<span style="color: red;">◇</span> Number of gear stages	<span style="color: red;">△</span> Motor diameter

## Benefits

Robust

Compact

Cost-effective

Low Noise

## Customizations

Flange

Shaft

Input-stage geartrain

Shape

Length/Diameter/D-Cut/...

Polymer (for quiet operation)

## Table explanation

### 1 Housing material

### 2 Geartrain material

Geartrain could be in metal and polymer to increase torque performance and reduce noise.

### 3 Max input speed (continuous operation)

It is based on service life considerations. If this value is greatly exceeded, the service life can be shortened, the gear heats up more and more noise is generated.

### 4 Bearing on output shaft

It is possible to choose a ball bearing or sleeve bearing depending on the application, as standard from size 22 is available only for ball bearings.

### 5 Max radial load (dynamics)

The value is given for a typical distance from the front flange. As the distance increases, this value decreases.

### 6 Max. axial load

Dynamic: axial loading permissible in operation. If different values apply for traction and thrust, the smaller value is given.

### 7 Max shaft press fit force

Maximum axial force applying to the shaft at standstill if the force is not input at the other shaft end. This is not possible for motors with only one shaft end.

### 8 Radial play

The radial measurement is always carried out under a test force that is smaller than the maximum radial load.

### 9 Axial play

The value for the axial play of a gear is determined between the two axial end positions of the output shaft.

### 10 Temperature range

The temperature range is  $-20^{\circ}\text{C}$  and  $+125^{\circ}\text{C}$ , but may be extended for some gears. Special lubrication can be supplied on request, even for other temperature ranges.

### 11 Number of stages

It states the number of gear stages engaged in series.

### 12 Reduction ratio

The reduction indicates the ratio by which the speed of the gear output shaft is smaller than the motor speed.

### 13 Gear length L [mm]

L describes the gearbox length (adapter flange included).

### 14 Continuous torque [Nm]

The continuous torque provides the maximum load permanently delivered to the output shaft. It can be exceeded, but it affects the service life.

### 15 Intermittent torque [Nm]

The short-time torque is the maximum torque that may be output on the output shaft.

### 16 Efficiency [%]

The specified efficiency is a maximum value that is valid for maximum continuous torque. The efficiency is stage-dependent and is related to the output torque and operating temperature.

### 17 No load backlash [°]

Gear backlash is the turning angle of the gear output shaft when the input shaft is blocked.

### 18 Weight [g]

# Table explanation

---

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The reduction indicates the ratio by which the speed of the gear output shaft is smaller than the motor speed.

## 13 Gear length L [mm]

L describes the gearbox length (adapter flange included).

## 14 Continuous torque [Nm]

The continuous torque provides the maximum load permanently delivered to the output shaft. It can be exceeded, but it affects the service life.

## 15 Intermittent torque [Nm]

The short-time torque is the maximum torque that may be output on the output shaft.

## 16 Efficiency [%]

The specified efficiency is a maximum value that is valid for maximum continuous torque. The efficiency is stage-dependent and is related to the output torque and operating temperature.

## 17 No load backlash [°]

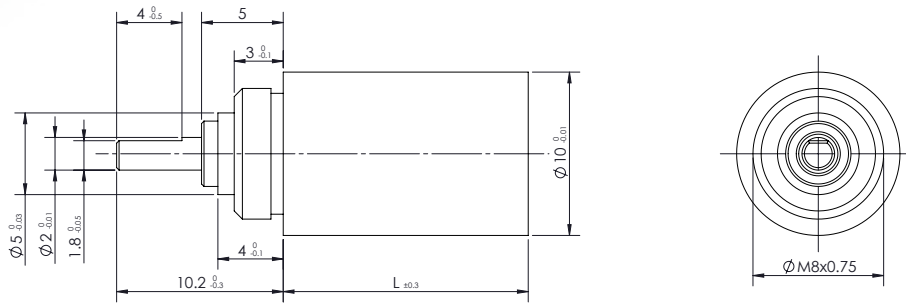
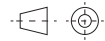
Gear backlash is the turning angle of the gear output shaft when the input shaft is blocked.

## 18 Weight [g]





## COSMOS Series SVTG A 10



V 3

A 10							
Values	Unit						
1	Housing material		Metal				
2	Geartrain material		Metal/Polymer				
3	Max input speed (continuous operation)	rpm	≤ 20.000				
4	Bearings on output shaft		Sleeve bearings				
Max shaft load							
5	Radial (5mm from mounting face)	N	≤ 10				
6	Axial	N	≤ 8				
7	Max shaft press fit force	N	≤ 10				
Shaft play							
8	Radial	mm	≤ 0.1				
9	Axial	mm	≤ 0.2				
10	Operating temperature range	°C	-20 +125				
11	Number of gear stages		1	2	3	4	5
12	Reduction ratio		4:1	16:1	64:1	256:1	1024:1
13	Gearhead Length L	mm	11	13.8	16.6	19.4	22.2
14	Continuous torque	Nm	0.01	0.025	0.1	0.15	0.15
15	Intermittent torque	Nm	0.02	0.05	0.15	0.2	0.2
16	Max Efficiency	%	90	81	73	65	59
17	No-Load Backlash	°	1	1.2	1.2	1.5	1.5
18	Weight	g	5	6.3	7.5	8.8	10

### Motor combinations

#### SVTN A - Brushless

SVTN A 01-1220\*

SVTN A 01-1230\*

SVTN A 03-1228\*

#### SVTN B - Brushed

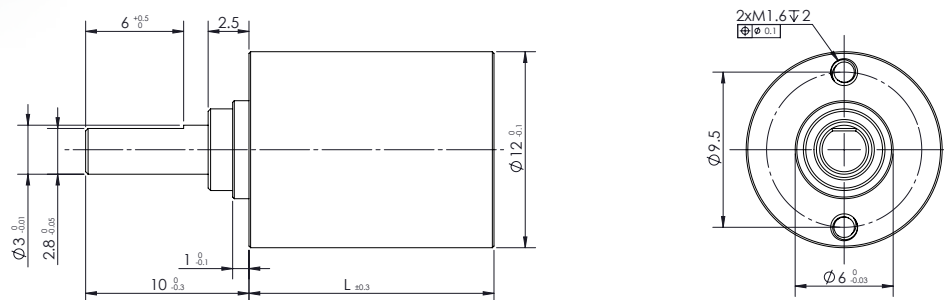
SVTN B 01-1219\*

SVTN B 01-1331\*

\*On request



COSMOS Series  
**SVTG A 12**



V 3

A 12							
Values	Unit						
1	Housing material	Metal					
2	Geartrain material	Metal/Polymer					
3	Max input speed (continuous operation)	rpm	≤ 20.000				
4	Bearings on output shaft	Sleeve bearings/Ball bearings**					
Max shaft load							
5	Radial (5mm from mounting face)	N	≤ 10				
6	Axial	N	≤ 8				
7	Max shaft press fit force	N	≤ 10				
Shaft play							
8	Radial	mm	≤ 0.1				
9	Axial	mm	≤ 0.2				
10	Operating temperature range	°C	-20 +125				
11	Number of gear stages		1	2	3	4	5
12	Reduction ratio		3.9:1	14:1	42:1	146:1	650:1
			4.6:1	16:1	54:1	187:1	946:1
				18:1	61:1	282:1	1345:1
				21:1	72:1	342:1	1661:1
					84:1	387:1	2094:1
					98:1	454:1	2586:1
						560:1	3194:1
13	Gearhead Length L	mm	13,3	16,1	18,9	21,7	24,5
14	Continuous torque	Nm	0,2	0,2	0,3	0,3	0,35
15	Intermittent torque	Nm	0,3	0,3	0,45	0,45	0,5
16	Max Efficiency	%	90	81	73	65	59
17	No-Load Backlash	°	1	1.2	1.2	1.5	1.5
18	Weight	g	7	10	13	16,5	20

Motor combinations

**SVTN A - Brushless**

SVTN A 01-1220\*

SVTN A 01-1230\*

SVTN A 03-1228\*

**SVTN B - Brushed**

SVTN B 01-1219\*

SVTN B 01-1331\*

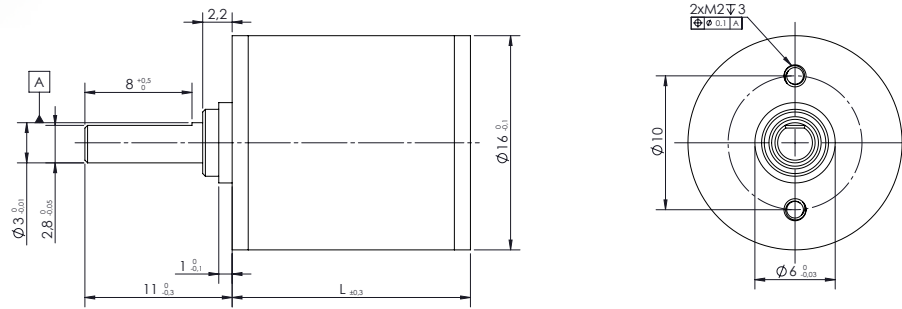
\*On request

\*\*Optional





## COSMOS Series SVTG A 16



V 3

A 16							
Values	Unit						
1	Housing material		Metal				
2	Geartrain material		Metal/Polymer				
3	Max input speed (continuous operation)	rpm	$\leq 20.000$				
4	Bearings on output shaft		Sleeve bearings/Ball bearings*				
Max shaft load							
5	Radial (5mm from mounting face)	N	$\leq 10$				
6	Axial	N	$\leq 8$				
7	Max shaft press fit force	N	$\leq 10$				
Shaft play							
8	Radial	mm	$\leq 0.1$				
9	Axial	mm	$\leq 0.2$				
10	Operating temperature range	$^{\circ}\text{C}$	$-20 +125$				
11	Number of gear stages		1	2	3	4	5
12	Reduction ratio		3.8:1	14:1	54:1	206:1	1012:1
			4.3:1	16:1	70:1	267:1	1152:1
			5.1:1	18:1	80:1	304:1	1311:1
				22:1	94:1	407:1	1492:1
					111:1	479:1	1596:1
				131:1	664:1	2067:1	
						2434:1	
13	Gearhead Length L	mm	17.8	21.4	25	28.6	32.2
14	Continuous torque	Nm	0.2	0.2	0.3	0.3	0.35
15	Intermittent torque	Nm	0.3	0.3	0.45	0.45	0.5
16	Max Efficiency	%	90	81	73	65	59
17	No-Load Backlash	$^{\circ}$	1	1.5	1.5	2	2
18	Weight	g	15	20	25	30	35

### Motor combinations

#### SVTN A - Brushless

SVTN A 01-1630

SVTN A 01-1636

SVTN A 03-1638

#### SVTN B - Brushed

SVTN B 01-1524

SVTN B 01-1640

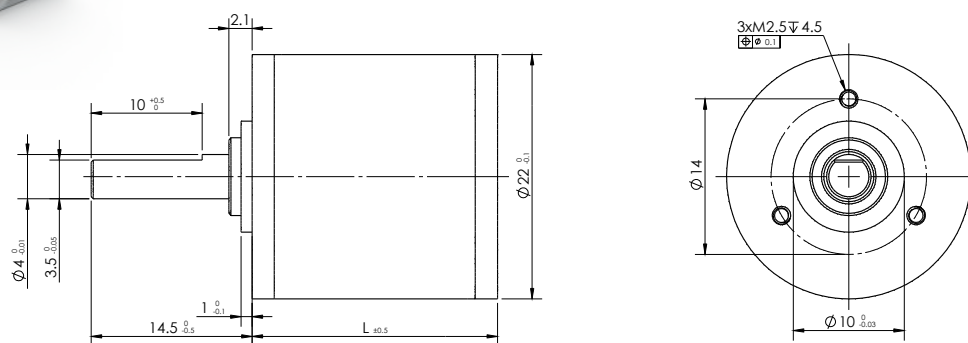
SVTN B 01-1725

SVTN B 01-1740

\*Optional



## COSMOS Series SVTG B 22



V 3

B 22											
Values	Unit										
1 Housing material	Metal										
2 Geartrain material	Metal/Polymer										
3 Max input speed (continuous operation)	rpm	$\leq 10.000$									
4 Bearings on output shaft	Ball bearings										
Max shaft load											
5 Radial (5mm from mounting face)	N	$\leq 50$									
6 Axial	N	$\leq 50$									
7 Max shaft press fit force	N	$\leq 100$									
Shaft play											
8 Radial	mm	$\leq 0.1$									
9 Axial	mm	$\leq 0.2$									
10 Operating temperature range	$^{\circ}\text{C}$	$-20 +125$									
11 Number of gear stages		1	2	3	4	5					
12 Reduction ratio		3.6:1	5.5:1	13:1	22:1	46:1	101:1	182:1	405:1	729:1	1936:1
		4.0:1		14:1		51:1	121:1	204:1	466:1	816:1	2286:1
				16:1		59:1		263:1	557:1	1024:1	2662:1
				18:1		64:1		302:1		1209:1	
					74:1		339:1		1557:1		
					85:1						
13 Gearhead Length L	mm	22.1	28.5	27.6	32.6	31.4	36.4	35.2	40.2	39	44
14 Continuous torque	Nm	0.3		0.3		0.5		0.5		0.75	
15 Intermittent torque	Nm	0.5		0.5		0.8		0.8		1	
16 Max Efficiency	%	90		81		73		65		59	
17 No-Load Backlash	$^{\circ}$	1		1.5		1.5		2		2	
18 Weight	g	30		35		46		55		65	

### Motor combinations

#### SVTN A - Brushless

SVTN A 01-2040  
SVTN A 01-2232  
SVTN A 01-2240  
SVTN A 01-2248  
SVTN A 01-2260  
SVTN A 03-2238  
SVTN A 03-2246

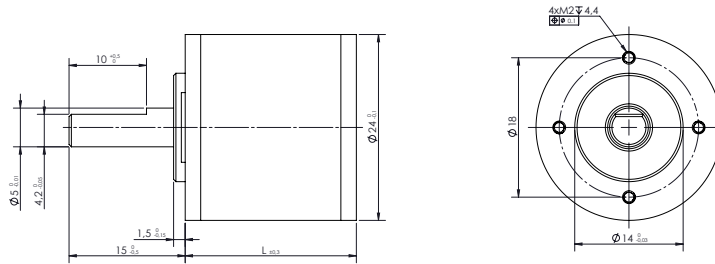
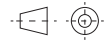
#### SVTN B - Brushed

SVTN B 01-2225  
SVTN B 01-2230

\*Optional



## COSMOS Series SVTG B 24



V 3

B 24											
Values	Unit										
1	Housing material	Metal									
2	Geartrain material	Metal/Polymer									
3	Max input speed (continuous operation)	rpm	≤ 10.000								
4	Bearings on output shaft	Ball bearings									
Max shaft load											
5	Radial (5mm from mounting face)	N	≤ 50								
6	Axial	N	≤ 50								
7	Max shaft press fit force	N	≤ 100								
Shaft play											
8	Radial	mm	≤ 0.1								
9	Axial	mm	≤ 0.2								
10	Operating temperature range	°C	-20 +125								
11	Number of gear stages		1	2	3	4	5				
12	Reduction ratio		3.3:1	12:1	17:1	36:1	56:1	119:1	408:1	660:1	1036:1
			4.3:1	14:1	22:1	47:1	95:1	154:1	493:1	741:1	1346:1
						61:1		200:1		857:1	1628:1
						79:1		260:1			1748:1
								337:1			2114:1
13	Gearhead Lenght L	mm	22.1	26.2	30.8	32	36.6	36.1	40.7	40.2	44.8
14	Continuous torque	Nm	0.5	0.8		1.5		1.8		2.5	
15	Intermittent torque	Nm	1	1.5		2		2.5		3.5	
16	Max Efficiency	%	90	81		73		65		59	
17	No-Load Backlash	°	1	1.5		1.5		2		2	
18	Weight	g	35	41		52		59		68	

### Motor combinations

#### SVTN A - Brushless

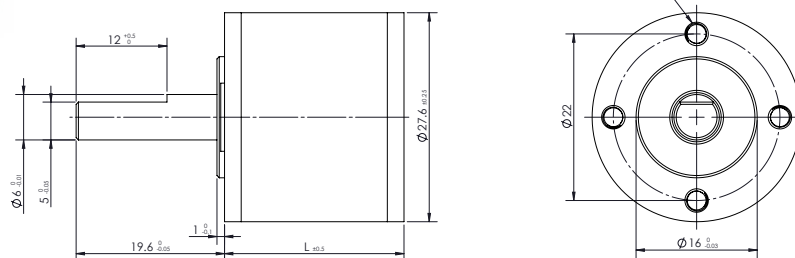
SVTN A 01-2232  
 SVTN A 01-2240  
 SVTN A 01-2248  
 SVTN A 01-2260  
 SVTN A 01-2446  
 SVTN A 01-2453  
 SVTN A 03-2238  
 SVTN A 03-2246  
 SVTN A 03-2452  
 SVTN A 03-2459

#### SVTN B - Brushed

SVTN B 01-2225  
 SVTN B 01-2230



COSMOS Series  
**SVTG B 28**



V 3

B 28											
Values	Unit										
1	Housing material	Metal									
2	Geartrain material	Metal/Polymer									
3	Max input speed (continuous operation)	rpm	≤ 10.000								
4	Bearings on output shaft	Ball bearings									
Max shaft load											
5	Radial (5mm from mounting face)	N	≤ 50								
6	Axial	N	≤ 50								
7	Max shaft press fit force	N	≤ 100								
Shaft play											
8	Radial	mm	≤ 0.1								
9	Axial	mm	≤ 0.2								
10	Operating temperature range	°C	-20 +125								
11	Number of gear stages		1	2	3	4	5				
12a	Reduction ratio ("A" combination)		3.6:1	5.5:1	16:1	46:1	101:1	182:1	405:1	729:1	1936:1
			4.0:1		18:1	51:1	121:1	204:1	466:1	816:1	2286:1
					21:1	59:1		263:1	557:1	1024:1	2662:1
						64:1		302:1		1209:1	
						74:1		339:1		1557:1	
13a	Gearhead Length L ("A" combination)	mm	28.7	34.2	33.2	37.7	44.2	42.2	48.7	46.7	53.2
12b	Reduction ratio ("B" combination)		3.6:1		16:1	46:1		182:1		729:1	
			4.0:1		18:1	51:1		204:1		816:1	
			5.5:1		21:1	59:1		263:1		1024:1	
						64:1		302:1		1209:1	
						74:1		339:1		1557:1	
13b	Gearhead Length L ("B" combination)	mm		23.7	29.2	33.7	44.2	42.2	48.7	46.7	53.2
12c	Reduction ratio ("C" combination)		3.6:1	4.0:1	16:1	46:1		182:1		729:1	
				5.5:1	18:1	51:1		204:1		816:1	
					21:1	59:1		263:1		1024:1	
						64:1		302:1		1209:1	
						74:1		339:1		1557:1	
13c	Gearhead Length L ("C" combination)	mm	28.7	34.2	38.7	43.2		47.7		52.2	
14	Continuous torque	Nm	0.5		1	3		3		3	
15	Intermittent torque	Nm	0.8		2	4		4		4	
16	Max Efficiency	%	90		81	73		65		59	
17	No-Load Backlash	°	1		1.2	1.2		1.5		1.5	
18	Weight	g	50		65	85		95		110	

Motor combinations "A"

- |                           |                         |
|---------------------------|-------------------------|
| <b>SVTN A - Brushless</b> | <b>SVTN B - Brushed</b> |
| SVTN A 01-2845            | SVTN B 01-2864          |
| SVTN A 01-2854            |                         |
| SVTN A 01-2864            |                         |
| SVTN A 03-2854            |                         |
| SVTN A 03-2863            |                         |

Motor combinations "B"

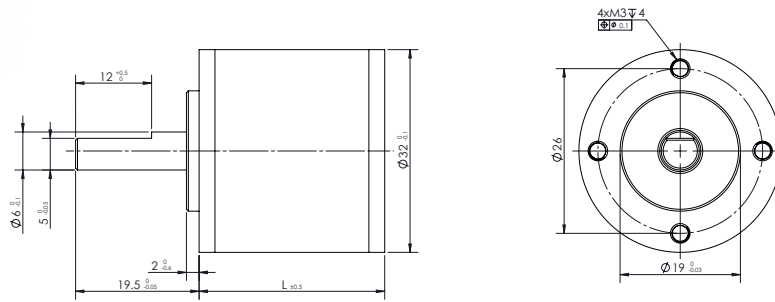
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|---------------------------|-------------------------|
| <b>SVTN A - Brushless</b> | <b>SVTN B - Brushed</b> |
| SVTN A 01-2446            | SVTN B 01-2642          |
| SVTN A 01-2453            |                         |
| SVTN A 03-2452            |                         |
| SVTN A 03-2459            |                         |

Motor combinations "C"

- |                           |
|---------------------------|
| <b>SVTN A - Brushless</b> |
| SVTN A 01-3242            |
| SVTN A 01-3260            |
| SVTN A 01-3270            |
| SVTN A 03-3270            |



## COSMOS Series SVTG B 32



V 3

B 32													
Values	Unit												
1	Housing material	Metal											
2	Geartrain material	Metal/Polymer											
3	Max input speed (continuous operation) rpm	≤ 10.000											
4	Bearings on output shaft	Ball bearings											
Max shaft load													
5	Radial (5mm from mounting face)	N	≤ 100										
6	Axial	N	≤ 80										
7	Max shaft press fit force	N	≤ 120										
Shaft play													
8	Radial	mm	≤ 0.1										
9	Axial	mm	≤ 0.2										
10	Operating temperature range	°C	-20 +125										
11	Number of gear stages	1		2		3		4		5			
12a	Reduction ratio ("A" combination)	3.1:1	4.8:1	10:1	15:1	30:1	46:1	159:1	223:1	412:1	694:1	2548:1	
		4.0:1			19:1	51:1	62:1	178:1	266:1		765:1	3174:1	
					23:1		72:1		298:1		856:1		
							80:1		344:1		989:1		
							92:1				1429:1		
							111:1				1836:1		
13a	Gearhead Length L ("A" combination)	mm	29.3	38.8	38.1	42.6	44.4	48.9	50.7	55.2	57.2	61.5	63.5
12b	Reduction ratio ("B" combination)		3.1:1	5.7:1	10:1	23:1	30:1	159:1		412:1	694:1	3174:1	
			4.0:1		15:1		46:1	178:1			765:1		
			4.8:1		19:1		51:1	223:1			856:1		
							62:1	266:1			989:1		
							72:1	298:1			1429:1		
							80:1	344:1			1846:1		
							92:1				2548:1		
							111:1						
13b	Gearhead Length L ("B" combination)		29.3	38.8	38.1	44.6	44.4	50.7		57.2	57	63.5	
14	Continuous torque	Nm	1	1.5		2.5		3			5		
15	Intermittent torque	Nm	2	3		5		6			7.5		
16	Max Efficiency	%	90	81		73		65			59		
17	No-Load Backlash	°	1	1.5		1.5		2			2		
18	Weight	g	125	147		169		191			213		

### Motor combinations "A"

#### SVTN A - Brushless

SVTN A 01-3242  
SVTN A 01-3260  
SVTN A 01-3270  
SVTN A 03-3270

### Motor combinations "B"

#### SVTN A - Brushless

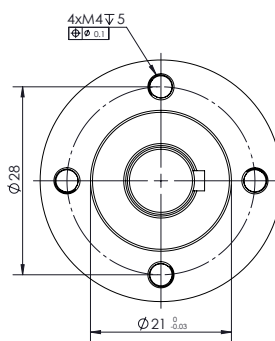
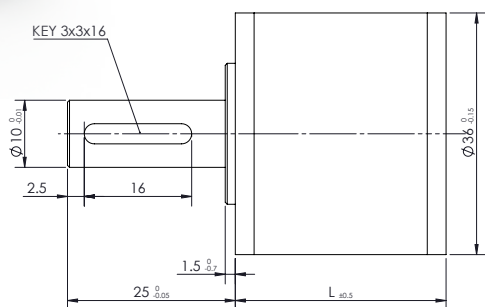
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SVTN A 01-2854  
SVTN A 01-2864  
SVTN A 03-2854  
SVTN A 03-2863

#### SVTN B - Brushed

SVTN B 01-2864



COSMOS Series  
**SVTG B 36**



V 3

B 36												
Values	Unit											
1	Housing material	Metal										
2	Geartrain material	Metal/Polymer										
3	Max input speed (continuous operation)	rpm	$\leq 10.000$									
4	Bearings on output shaft	Ball bearings										
Max shaft load												
5	Radial (5mm from mounting face)	N	$\leq 100$									
6	Axial	N	$\leq 80$									
7	Max shaft press fit force	N	$\leq 120$									
Shaft play												
8	Radial	mm	$\leq 0.1$									
9	Axial	mm	$\leq 0.2$									
10	Operating temperature range	$^{\circ}\text{C}$	$-20 +125$									
11	Number of gear stages		1	2		3		4		5		
12	Reduction ratio		3.7:1	6.5:1	14:1	30:1	53:1	142:1	198:1	661:1	1429:1	1285:1
			4.7:1		17:1		66:1	169:1	246:1	920:1	1779:1	3083:1
					22:1		82:1	197:1	306:1		2213:1	4294:1
							102:1	241:1	381:1			5981:1
								275:1	474:1			
13	Gearhead Length L	mm	31.4	39.4	42.7	50.7	50	58	57.3	65.3	64.6	72.6
14	Continuous torque	Nm	4	8		16		16		20		
15	Intermittent torque	Nm	5	12		25		25		30		
16	Max Efficiency	%	90	81		73		65		59		
17	No-Load Backlash	$^{\circ}$	0.8	1		1		1.2		1.2		
18	Weight	g	210	245		280		315		350		

Motor combinations

**SVTN A - Brushless**

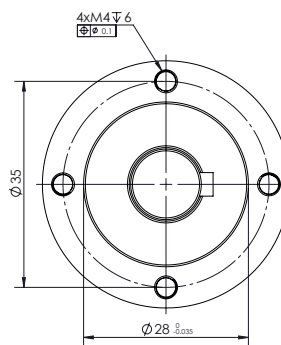
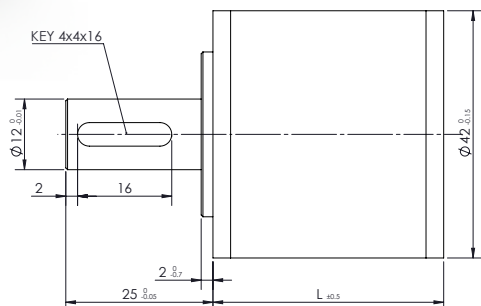
- SVTN A 01-3242
- SVTN A 01-3260
- SVTN A 01-3270
- SVTN A 01-3660
- SVTN A 01-3670
- SVTN A 03-3270
- SVTN A 03-3673
- SVTN A 03-3683

**SVTN B - Brushed**

- SVTN B 01-3571



## COSMOS Series SVTG B 42



V 3

B 42											
Values	Unit										
1	Housing material	Metal									
2	Geartrain material	Metal/Polymer									
3	Max input speed (continuous operation)	rpm	≤ 10.000								
4	Bearings on output shaft	Ball bearings									
Max shaft load											
5	Radial (5mm from mounting face)	N	≤ 200								
6	Axial	N	≤ 100								
7	Max shaft press fit force	N	≤ 120								
Shaft play											
8	Radial	mm	≤ 0.1								
9	Axial	mm	≤ 0.2								
10	Operating temperature range	°C	-20 +125								
11	Number of gear stages		1	2	3	4	5				
12a	Reduction ratio ("A" combination)		3.1:1	5.7:1	10:1	43:1	115:1	168:1	574:1	807:1	1834:1
			4.2:1		12:1	54:1	159:1	225:1	661:1	1080:1	2300:1
					15:1	72:1		301:1	762:1	1434:1	3301:1
					20:1	83:1		400:1		4060:1	
						96:1		461:1		5247:1	
12b	Gearhead Length L ("A" combination)	mm	39.2	41.7	51.2	60.2	62.7	75.2	77.7	84.2	86.7
13a	Reduction ratio ("B" combination)		3.1:1	5.7:1	10:1	43:1	115:1	168:1	574:1	806.5:1	1834:1
			4.2:1		12:1	54:1	159:1	225:1	661:1	1080:1	2300:1
					15:1	72:1		301:1	762:1	1434:1	3301:1
					20:1	83:1		400:1		4060:1	
						96:1		461:1		5247:1	
13b	Gearhead Length L ("B" combination)	mm	34.2	39.2	46.2	55.2	60.2	70.2	75.2	79.2	84.2
18	Continuous torque	Nm	3		12	16		25		25	
19	Intermittent torque	Nm	5		20	25		36		36	
20	Max Efficiency	%	90		81	73		65		59	
21	No-Load Backlash	°	0.8		1	1		1.2		1.2	
22	Weight	g	250		345	405		490		580	

### Motor combinations "A"

#### SVTN A - Brushless

SVTN A 01-4058  
SVTN A 01-4070  
SVTN A 01-4088

#### SVTN B - Brushed

SVTN B 01-4050  
SVTN B 01-4070

### Motor combinations "B"

#### SVTN A - Brushless

SVTN A 01-3660  
SVTN A 01-3670  
SVTN A 03-3673  
SVTN A 03-3683

#### SVTN B - Brushed

SVTN B 01 3571