

# **ATOM HS Series**

## SVTN A 02

Coreless BLDC motors  
2 Pole High-speed Brushless DC Motors



# ATOM HS Series

## SVTN A 02

Coreless BLDC motors

2 Pole High-speed Brushless DC Motors



Cost effective



Low noise



High speed



Typically employed in the medical field for surgical tools, these motors merge the SVTN A Series characteristics to a optimized project for high-speed functions.

Thanks to a precise balancing of the rotor and the use of special bearings, maximum stability and low noise are guaranteed.

### Benefits

High-speed

Long lifespan

Cost-effective

Low inertia

High efficiency

Low noise

High reliability

## Product code

SVTN A 02 ○○◇◇ - □□ - 〡 - 〡☆☆

A Series

02 Brushless DC Motors

○ Diameter

◇ Length

□ Nominal Voltage

〡 Shaft  
Single shaft - standard [S]; Double shaft [D]

〡 Sensor  
Sensorless [0]; Hall sensor - standard [H]\*

☆☆ Customizations

\* Not available for SVTN A 02 2053 and SVTN A 02 2057

## Features

Winding	3 phase
Operating temperature	-30° +100° C
Connectors	JST PHR-8 1636; 1644; 1656; 2040
Magnets	Neodymium
Design technology	Coreless winding system
Estimated operating lifetime	Lifetime depends on motor working conditions. It can reach 20.000 hours under optimal conditions.

## Feedback

Hall Sensor (standard)

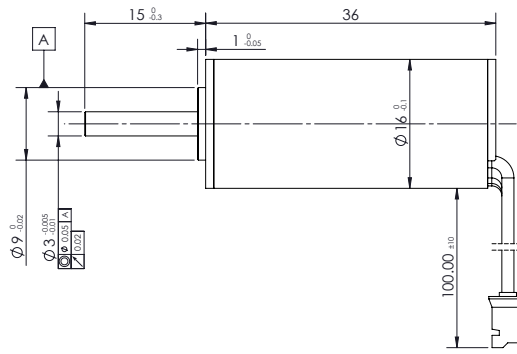
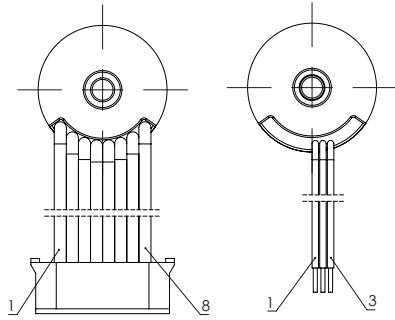
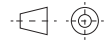
## Customizations

Flange	Shape
Shaft	Length/Diameter/D-Cut
Leadwire	PVC/Silicon/Teflon/UL No/Dimension/length
Connector	JST



# ATOM HS Series SVTN A 02 1636

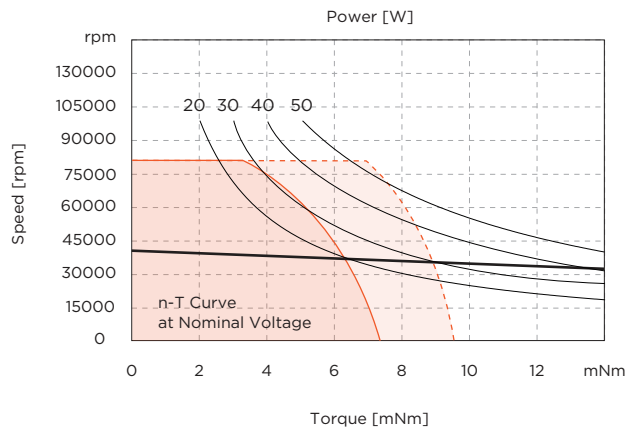
50 Watt



V 2.6.5

Values	Unit	SVTN A 02 1636-24..	1636-30..	1636-36..
<b>Motor Data</b>				
1	Nominal voltage	V	24	30
2	No load speed	rpm	40273	40225
3	No load current	mA	90	77
4	Nominal speed	rpm	37067	36958
5	Nominal torque	mNm	5	5
6	Nominal current	A	0,98	0,79
7	Stall torque	mNm	62,8	61,6
8	Stall current	A	11,2	8,8
9	Max. efficiency	%	82,9	82,2
<b>Characteristics</b>				
10	Terminal resistance*	Ω	2,14	3,41
11	Terminal inductance*	mH	0,11	0,17
12	Torque constant	mNm/A	5,65	7,06
13	Speed constant	rpm/V	1692	1353
14	Speed/torque gradient	rpm/mNm	641	653
15	Mechanical time constant	ms	3,7	3,8
16	Rotor inertia	gcm <sup>2</sup>	0,55	0,55
<b>Mechanical data</b>				
17	Thermal resistance housing-ambient	18,6 K/W		
18	Thermal resistance winding-housing	3,44 K/W		
19	Thermal time constant winding	6 s		
20	Thermal time constant motor	298 s		
21	Ambient temperature	-30...+100°C		
22	Max. permissible winding temperature	+150°C		
23	Max. permissible speed	80000 rpm		
24	Radial play	preloaded		
25	Max. axial load (dynamic)	2.5 N		
26	Max. force for press fits (static)	44 N		
27	Max. radial loading, 5mm from flange	11 N		
<b>Other specifications</b>				
28	Number of poles	2		
29	Number of phases	3		
30	Weight	32 g		

\*The diagram based on ambient temperature of 25°.



Continuous operating range  
Continuous operating range with Reduced Rth.2 50%

## Connection

Connection H (Sensor)	PVC
Pin 1	Vhall 3-18 VDC
Pin 2	Hall sensor HA
Pin 3	Hall sensor HB
Pin 4	Hall sensor HC
Pin 5	GND
Pin 6	Motor winding MA
Pin 7	Motor winding MB
Pin 8	Motor winding MC
Connector	PHR-8
Connection O (Sensorless)	
Pin 1	Motor winding MA
Pin 2	Motor winding MB
Pin 3	Motor winding MC

## Drive combinations

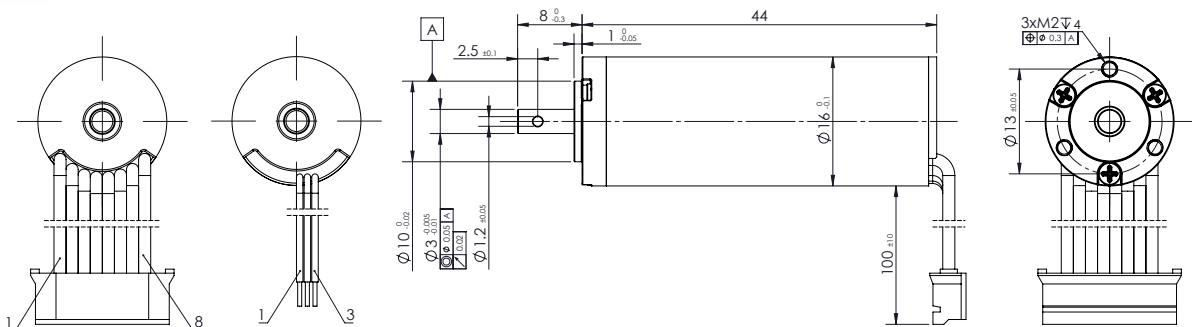
**Hall sensors**  
SVTE-A-E45  
SVTE-A-E55



ATOM HS Series  
SVTN A 02 1644

55 Watt

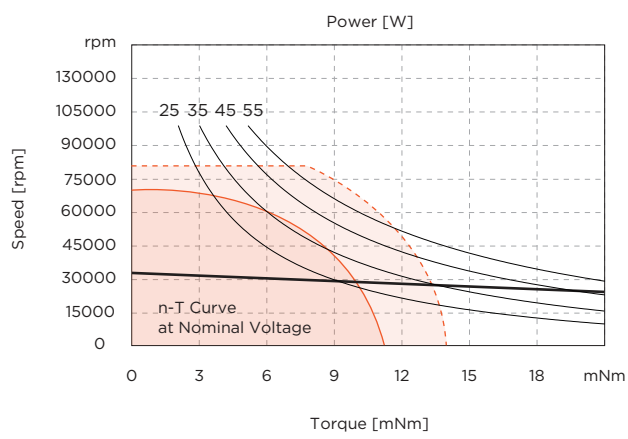
servotecnica



V 2.6.5

Values	Unit	SVTN A 02	1644-24..	1644-30..	1644-36..
<b>Motor Data</b>					
1	Nominal voltage	V	24	30	36
2	No load speed	rpm	30580	30900	30160
3	No load current	mA	95	80	76
4	Nominal speed	rpm	28134	28403	27632
5	Nominal torque	mNm	7,5	7,5	7,5
6	Nominal current	A	1,1	0,9	0,74
7	Stall torque	mNm	93,8	92,8	89,5
8	Stall current	A	12,7	10,2	8
9	Max. efficiency	%	83,4	83	81,5
<b>Characteristics</b>					
10	Terminal resistance*	Ω	1,89	2,95	4,5
11	Terminal inductance*	mH	0,12	0,19	0,28
12	Torque constant	mNm/A	7,44	9,2	11,3
13	Speed constant	rpm/V	1284	1038	846
14	Speed/torque gradient	rpm/mNm	326	333	337
15	Mechanical time constant	ms	2,8	2,9	2,9
16	Rotor inertia	gcm <sup>2</sup>	0,82	0,82	0,82
<b>Mechanical data</b>					
17	Thermal resistance housing-ambient	16.2 K/W			
18	Thermal resistance winding-housing	3.5 K/W			
19	Thermal time constant winding	4 s			
20	Thermal time constant motor	339 s			
21	Ambient temperature	-30...+100°C			
22	Max. permissible winding temperature	+150°C			
23	Max. permissible speed	80000 rpm			
24	Radial play	preloaded			
25	Max. axial load (dynamic)	2.5 N			
26	Max. force for press fits (static)	44 N			
27	Max. radial loading, 5mm from flange	11 N			
<b>Other specifications</b>					
28	Number of poles	2			
29	Number of phases	3			
30	Weight	43g			

\*The diagram based on ambient temperature of 25°.



Continuous operating range  
Continuous operating range with Reduced Rth. 50%

Connection

Connection H (Sensor)	PVC
Pin 1	Vhall 3-18 VDC
Pin 2	Hall sensor HA
Pin 3	Hall sensor HB
Pin 4	Hall sensor HC
Pin 5	GND
Pin 6	Motor winding MA
Pin 7	Motor winding MB
Pin 8	Motor winding MC
Connector	JST PHR-8
Connection O (Sensorless)	
Pin 1	Motor winding MA
Pin 2	Motor winding MB
Pin 3	Motor winding MC

Drive combinations

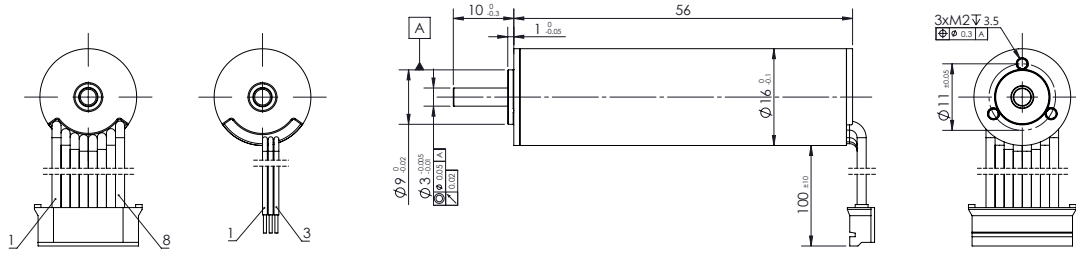
Hall sensors  
SVTE-A-E45  
SVTE-A-E55

HIGH SPEED



# ATOM HS Series SVTN A 02 1656

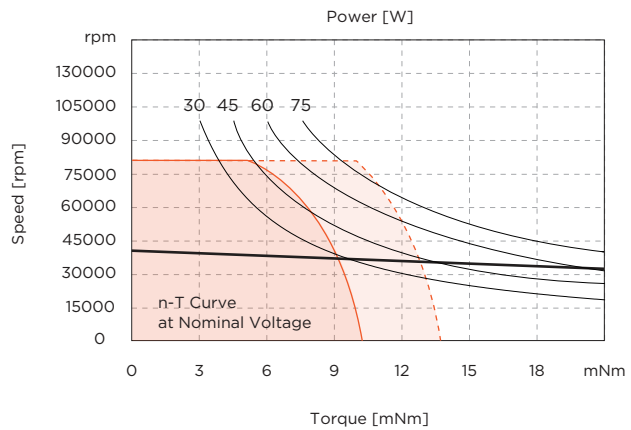
75 Watt



V 2.6.5

Values	Unit	SVTN A 02 1656-24..	1656-30..	1656-36..
<b>Motor Data</b>				
1	Nominal voltage	V	24	30
2	No load speed	rpm	41670	40775
3	No load current	mA	103	89
4	Nominal speed	rpm	39232	38438
5	Nominal torque	mNm	6	6
6	Nominal current	A	1,2	0,95
7	Stall torque	mNm	103	105
8	Stall current	A	18,9	15,1
9	Max. efficiency	%	85,8	85,2
<b>Characteristics</b>				
10	Terminal resistance*	$\Omega$	1,27	1,99
11	Terminal inductance*	mH	0,09	0,14
12	Torque constant	mNm/A	5,47	6,98
13	Speed constant	rpm/V	1746	1367
14	Speed/torque gradient	rpm/mNm	406	390
15	Mechanical time constant	ms	2,6	2,5
16	Rotor inertia	gcm <sup>2</sup>	0,61	0,61
<b>Mechanical data</b>				
17	Thermal resistance housing-ambient	K/W	16,2	
18	Thermal resistance winding-housing	K/W	1,9	
19	Thermal time constant winding	s	5	
20	Thermal time constant motor	s	397	
21	Ambient temperature	°C	-30...+100	
22	Max. permissible winding temperature	°C	+150	
23	Max. permissible speed	rpm	80000	
24	Radial play		preloaded	
25	Max. axial load (dynamic)	N	2,5	
26	Max. force for press fits (static)	N	44	
27	Max. radial loading, 5mm from flange	N	11	
<b>Other specifications</b>				
28	Number of poles		2	
29	Number of phases		3	
30	Weight	g	50	

\*The diagram based on ambient temperature of 25°.



Continuous operating range  
Continuous operating range with Reduced Rth,2 50%

## Connection

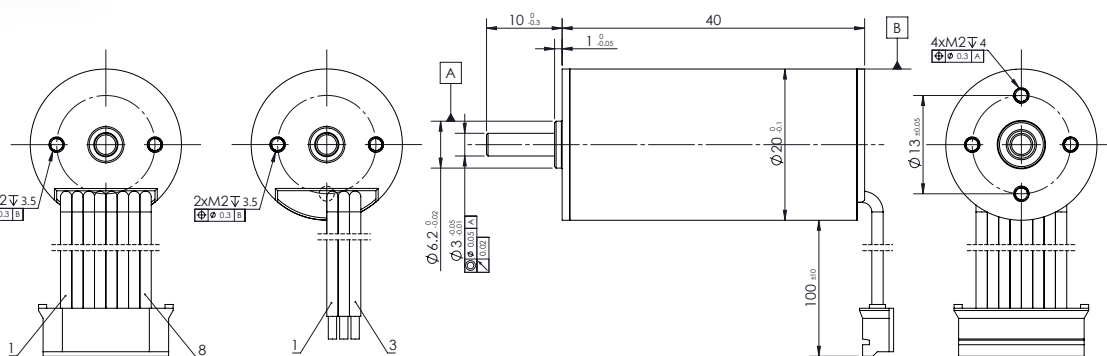
Connection H (Sensor)	PVC
Pin 1	Vhall 3-18 VDC
Pin 2	Hall sensor HA
Pin 3	Hall sensor HB
Pin 4	Hall sensor HC
Pin 5	GND
Pin 6	Motor winding MA
Pin 7	Motor winding MB
Pin 8	Motor winding MC
Connector	JST PHR-8
Connection O (Sensorless)	
Pin 1	Motor winding MA
Pin 2	Motor winding MB
Pin 3	Motor winding MC

## Drive combinations

**Hall sensors**  
SVTE-A-E45  
SVTE-A-E55



ATOM HS Series  
SVTN A 02 2040



V 2.6.5

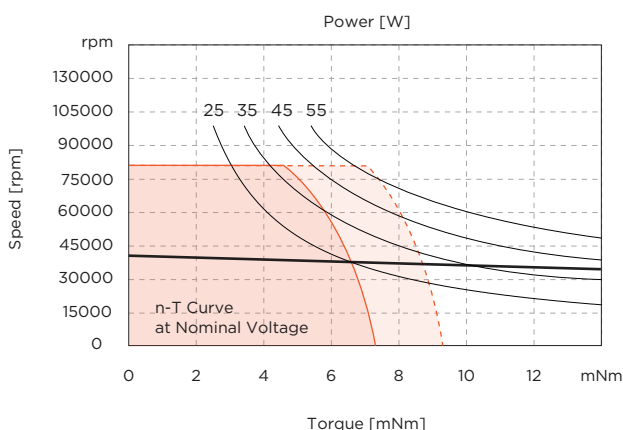
Values	Unit	SVTN A 02	2040-24..	2040-30..	2040-36..
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Motor Data					
1	Nominal voltage	V	24	30	36
2	No load speed	rpm	41392	40700	40020
3	No load current	mA	69	60	55
4	Nominal speed	rpm	37500	36777	36049
5	Nominal torque	mNm	6,3	6,3	6,3
6	Nominal current	A	1,21	0,96	0,79
7	Stall torque	mNm	67	65,4	63,5
8	Stall current	A	12,2	9,4	7,5
9	Max. efficiency	%	85,5	84,7	83,6
Characteristics					
10	Terminal resistance*	$\Omega$	1,96	3,19	4,8
11	Terminal inductance*	mH	0,21	0,47	0,47
12	Torque constant	mNm/A	5,51	6,99	8,53
13	Speed constant	rpm/V	1734	1365	1120
14	Speed/torque gradient	rpm/mNm	618	623	630
15	Mechanical time constant	ms	4,5	4,5	4,6
16	Rotor inertia	gcm <sup>2</sup>	0,69	0,69	0,69

Mechanical data		
17	Thermal resistance housing-ambient	18.7 K/W
18	Thermal resistance winding-housing	1.9 K/W
19	Thermal time constant winding	5 s
20	Thermal time constant motor	397 s
21	Ambient temperature	-30...+100°C
22	Max. permissible winding temperature	+150°C
23	Max. permissible speed	80000 rpm
24	Radial play	preloaded
25	Max. axial load (dynamic)	2.5 N
26	Max. force for press fits (static)	44 N
27	Max. radial loading, 5mm from flange	11 N

Other specifications		
28	Number of poles	2
29	Number of phases	3
30	Weight	53 g

\*The diagram based on ambient temperature of 25°.



Continuous operating range  
Continuous operating range with Reduced Rth.2 50%

Connection

Connection H (Sensor)	PVC		
Pin 1	Vhall 3-18 VDC	AWG26	black
Pin 2	Hall sensor HA	AWG26	black
Pin 3	Hall sensor HB	AWG26	black
Pin 4	Hall sensor HC	AWG26	black
Pin 5	GND	AWG26	black
Pin 6	Motor winding MA	AWG26	black
Pin 7	Motor winding MB	AWG26	black
Pin 8	Motor winding MC	AWG26	black
Connector	JST PHR-8		
Connection O (Sensorless)			
Pin 1	Motor winding MA	AWG26	yellow
Pin 2	Motor winding MB	AWG26	green
Pin 3	Motor winding MC	AWG26	blue

Drive combinations

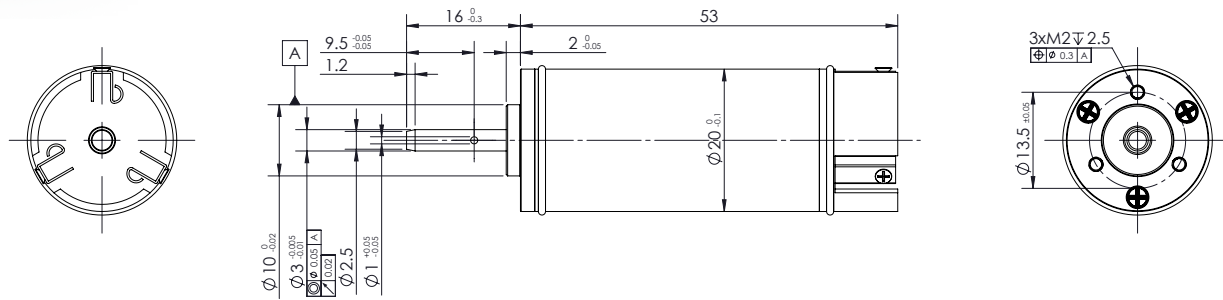
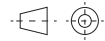
**Hall sensors**  
SVTE-A-E45  
SVTE-A-E55





# ATOM HS Series SVTN A 02 2053

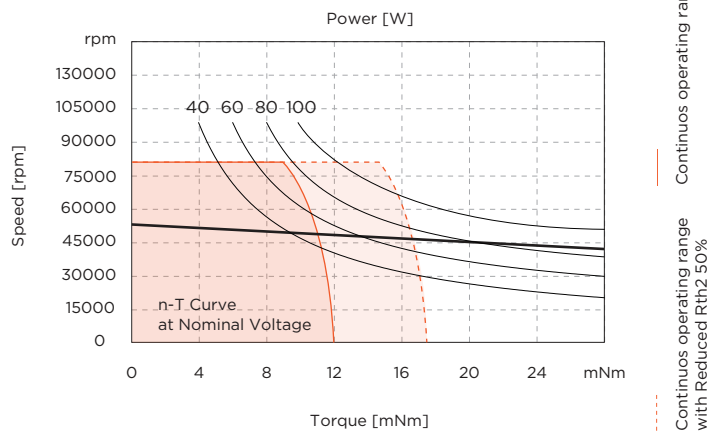
100 Watt



V 2.6.5

Values	Unit	SVTN A 02 2053-18..	2053-24..	2053-36..	2053-48..	
<b>Motor Data</b>						
1	Nominal voltage	V	18	24	36	48
2	No load speed	rpm	50202	50832	51448	50700
3	No load current	mA	136	107	81	68
4	Nominal speed	rpm	45684	46379	46936	46188
5	Nominal torque	mNm	10	10	10	10
6	Nominal current	A	3,07	2,33	1,58	1,18
7	Stall torque	mNm	111	114	114	112
8	Stall current	A	32,7	25,5	17,2	12,6
9	Max. efficiency	%	87,5	87,5	86,8	85,8
<b>Characteristics</b>						
10	Terminal resistance*	$\Omega$	0,55	0,94	2,09	3,82
11	Terminal inductance*	mH	0,06	0,1	0,23	0,38
12	Torque constant	mNm/A	3,41	4,49	6,65	8,99
13	Speed constant	rpm/V	2801	2127	1436	1062
14	Speed/torque gradient	rpm/mNm	452	445	451	451
15	Mechanical time constant	ms	3,9	3,9	3,9	3,9
16	Rotor inertia	gcm <sup>2</sup>	0,83	0,83	0,83	0,83
<b>Mechanical data</b>						
17	Thermal resistance housing-ambient	K/W	11,8			
18	Thermal resistance winding-housing	K/W	0,8			
19	Thermal time constant winding	s	2			
20	Thermal time constant motor	s	386			
21	Ambient temperature	°C	-30...+100			
22	Max. permissible winding temperature	°C	+150			
23	Max. permissible speed	rpm	80000			
24	Radial play		preloaded			
25	Max. axial load (dynamic)	N	2,5			
26	Max. force for press fits (static)	N	44			
27	Max. radial loading, 5mm from flange	N	11			
<b>Other specifications</b>						
28	Number of poles		2			
29	Number of phases		3			
30	Weight	g	63			

\*The diagram based on ambient temperature of 25°.



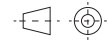
## Connection

Screw terminals

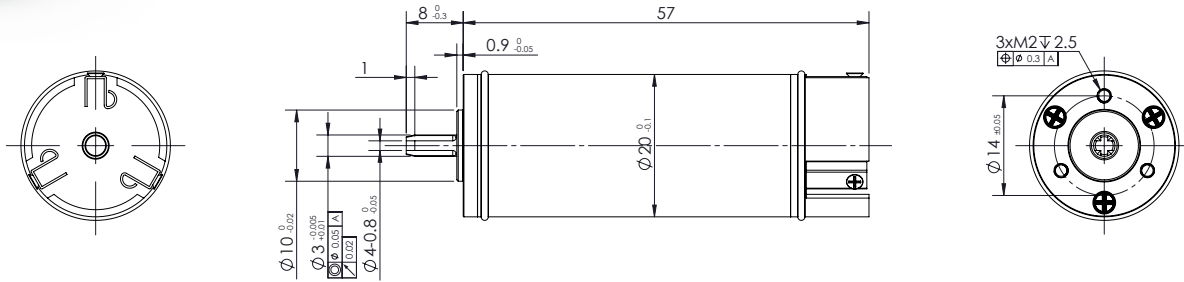


ATOM HS Series  
**SVTN A 02 2057**

150 Watt



servotecnica

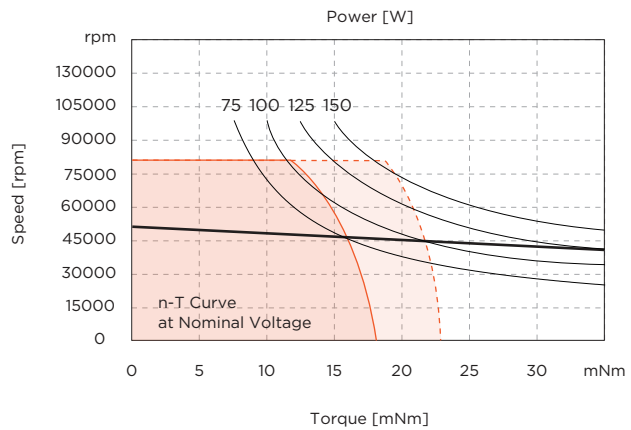


V 2.6.5

Values	Unit	SVTN A 02 2057-18..	2057-24..	2057-36..	2057-48..	
<b>Motor Data</b>						
1	Nominal voltage	V	18	24	36	48
2	No load speed	rpm	50202	50832	51286	50700
3	No load current	mA	210	158	113	94
4	Nominal speed	rpm	46263	46714	47328	46436
5	Nominal torque	mNm	15	15	15	15
6	Nominal current	A	4,61	3,5	2,36	1,76
7	Stall torque	mNm	191	185	194	178
8	Stall current	A	56,3	41,4	29,2	19,9
9	Max. efficiency	%	88,2	88	87,9	86,7
<b>Characteristics</b>						
10	Terminal resistance*	$\Omega$	0,32	0,58	1,23	2,41
11	Terminal inductance*	mH	0,04	0,06	0,14	0,25
12	Torque constant	mNm/A	3,41	4,49	6,68	9
13	Speed constant	rpm/V	2799	2126	1430	1061
14	Speed/torque gradient	rpm/mNm	263	275	264	284
15	Mechanical time constant	ms	2,5	2,6	2,5	2,7
16	Rotor inertia	gcm <sup>2</sup>	0,91	0,91	0,91	0,91
<b>Mechanical data</b>						
17	Thermal resistance housing-ambient	K/W	7,6			
18	Thermal resistance winding-housing	K/W	1,6			
19	Thermal time constant winding	s	5			
20	Thermal time constant motor	s	410			
21	Ambient temperature	°C	-30...+100			
22	Max. permissible winding temperature	°C	+150			
23	Max. permissible speed	rpm	80000			
24	Radial play		preloaded			
25	Max. axial load (dynamic)	N	2,5			
26	Max. force for press fits (static)	N	44			
27	Max. radial loading, 5mm from flange	N	11			
<b>Other specifications</b>						
28	Number of poles		2			
29	Number of phases		3			
30	Weight	g	69			

HIGH SPEED

\*The diagram based on ambient temperature of 25°.



Continuous operating range  
Continuous operating range with Reduced Rth,2 50%

Connection

Screw terminals