

Sumitomo Drive Technologies



TUAKA®
ACTUATORS

PERFECTION IN MOTION

Human and Machine

Shaping the Future of Intelligent Motion.

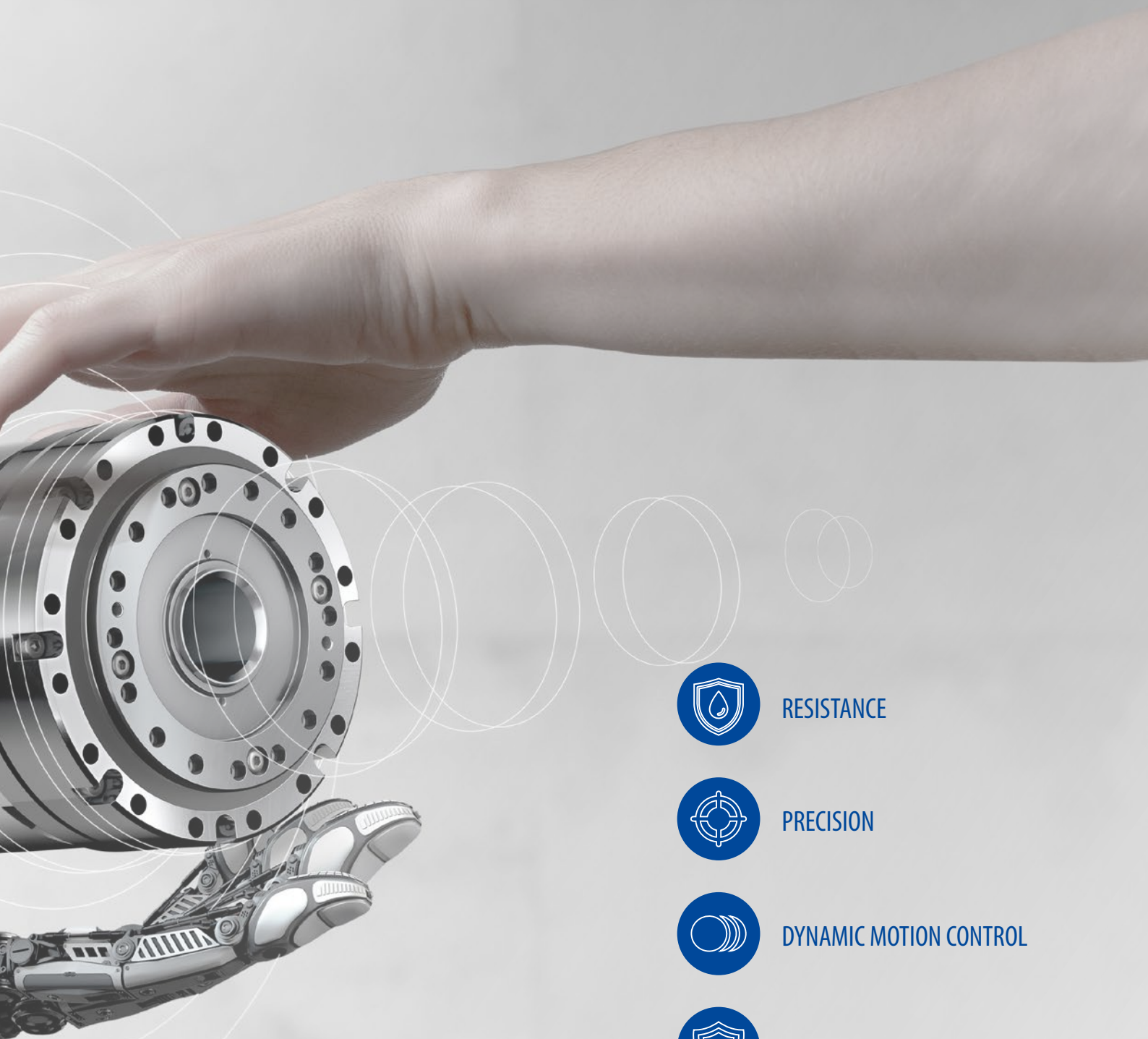
TUAKA® is more than a product—it's a vision brought to life. Born from the fusion of engineering precision and technical mastery, the Sumitomo Drive Technologies actuator series TUAKA® empowers machines with intelligent, dynamic motion control.

Designed for modern robotics, TUAKA® combines high-torque density, integrated sensor feedback, and modular architecture to deliver unmatched control and flexibility.

Our engineers have redefined what actuators can achieve—building a system that not only meets today's complex demands but anticipates tomorrow's possibilities. With exceptional dynamic performance, control accuracy, and reliability, TUAKA® sets a new standard in safety and durability for robotics.

Precise motion begins here.
Power it with TUAKA®.





RESISTANCE



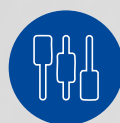
PRECISION



DYNAMIC MOTION CONTROL



SAFETY



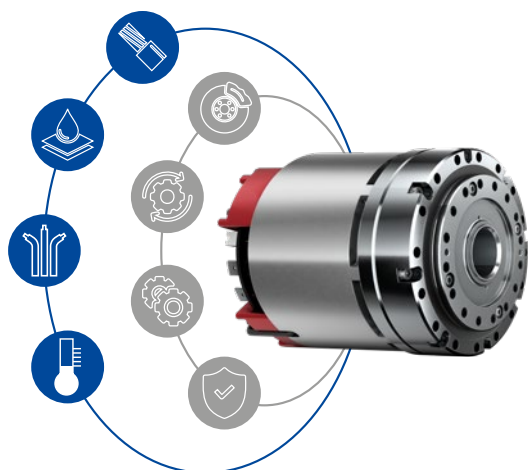
CONFIGURABILITY



COMPACTNESS

THE TUAKA® FAMILY

Versions

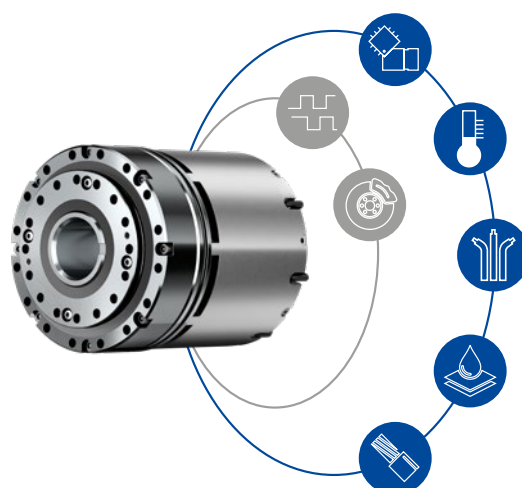


TUAKA® DRIVE

Gearbox + Motor + Encoder + Drive

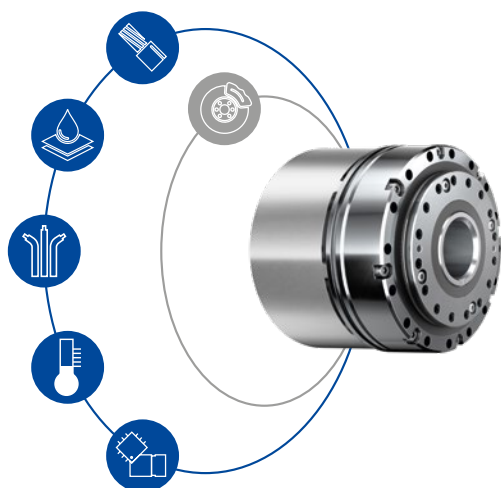
TUAKA® SERVO

Gearbox + Motor + Encoder



TUAKA® ACTIVE

Gearbox + Motor



Options and accessories

BASIC OPTIONS:



Integrated disc brake

Matched to the motor torque



Second Encoder at gear output

Absolute singleturn/multiturn



Advanced safety functions

STO, SBC, SS1, SS2, SOS, SMS, SLS,
SDI, SDO, SAI, Safe process data (FSOE)



Integrated torque sensor

Matched to the entire torque range of
the gearbox



Choice of encoder

Synapticon, Heidenhain KCI1319 FS / KBI1335 FS,
RLS AksIM-2, (SICK SES/SEM)

ACCESSORIES:



Housing protection IP class 50 or 62 or 66

Standard protection: IP20



External Driver

Wired to the axis and configured Plug & Play



Internal protection of shaft for cable installation

Static tube made from resin material to
protect wires



Standard connector set (all industrial types)

Standard wires without connectors
(ferrules only)



Additional heat sink

For increase of power consumption, designed
around the available space of the customer

NOMENCLATURE

Sumitomo Drive Technologies

ACTECY-103-50-T M1 B D 1 S Z

GBX:
ECY

Frame:
103
107

Ratio:
50
(80)
100

Tq. Sensor:
Yes - T
No - "blank"

Motor:
TQ - M1

Holding brake:
Yes - B
No - "blank"

Drive/Encoder:
Synapticon - D
Heidenhain - H
(SICK - S)
RLS - R
None - "blank"

No. of encoders:
Single encoder - 1
Double encoder - 2

Position detection:
Singleturn - S
Multiturn - M

Safety (SMM):
Yes - Z
No - "blank"

T

U

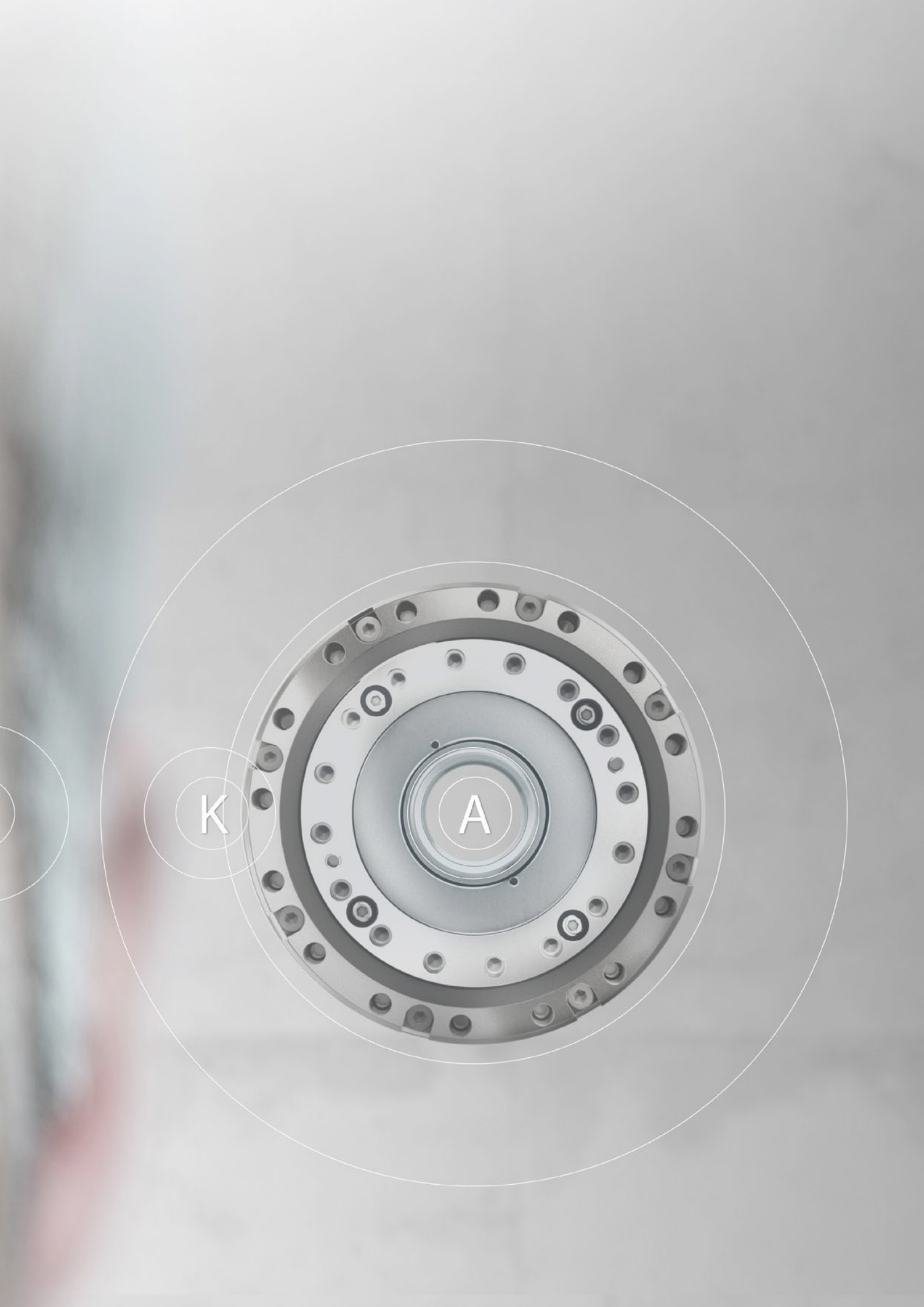
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Updated specifications
can be found here:



Or visit us at:

emeia.sumitomodrive.com/actuators



TUAKA® DRIVE

Features and Advantages

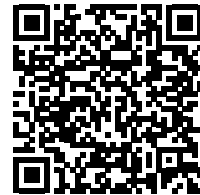
For applications where every millisecond counts, precision must begin at the source. With its decentralized drive technology for lowest latency, simplified wiring and quick installation, TUAKA Drive® constitutes an ideal solution for cobotic and robotic applications.

The Plug & Play Solution:

- High-precision strain-wave gear
- Frameless torque motor
- Integrated high resolution encoder
- Synapticon Circulo 7/9 drive
- STO/SBC according to SIL 3 PL-e

Available Options:

- Spring-applied brake system
- 2nd encoder on gear output shaft
- Torque sensor
- Safe motion module (by Synapticon)



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Specifications

FRAME	103			107		
Diameter (mm)	Ø75			Ø96		
Ratio	50	80*	100	50	80*	100

* Ratio 80 only available on request. Please reach out to us for more information

General

Operating ambient Temperature	°C	10 ... 55
Storage Temperature (non condensing)	°C	0 ... 60
Operating ambient humidity (non condensing)	% rH	20 ... 80
Max. installation altitude	m	1000
Lifetime (rated)	h	7000
Lubrication	HGO-3 No. 00 from Nippeco	
Degree of protection (EN 60034-5)	IP20/IP66 available	

Common Data

Rated output torque	Nm	16	22	24	39	63	67
Peak output torque	Nm	34	43	54	98	137	157
Max. rotation output speed	rpm	123	77	62	56	35	28
	deg/s	740	463	370	334	209	167
Rated Power consumption	W	388	336	287	388	391	333
Max. Power consumption	W	1259			1453		
Number of pole pairs	10			10			
Rated current I _r	A pk/rms	9.37/6.88			18.2/12.87		
Torque constant k _T @20°C	mNm/A	64			143		
Terminal resistance R _{TT} @20°C	mΩ	166			107		
Terminal inductance L _{TT} @20°C	μH	295			313		
Max. rotation angle	°	Infinite					
Supply voltage	V	48					

Geometry Information

Hollow shaft diameter	mm	Ø19.2 Exeptions: Dual encoder - Ø14.8	Ø26.2 Exeptions: Dual encoder - Ø21.8
Total length	mm	~127	~145
Weight	g	1450/1550	3000/3200
Brake Option additional weight	g	+200	+300
Inertia Input	kgmm ²	106,9	399,2
Inertia Output	kgmm ²	88,3	328,4
Brake Option additional inertia	kgmm ²	+16,0 (input) / +1,3 (output)	+42,3 (input) / +5,1 (output)

Encoder Specification

Resolution	bit	input: 19 output (option): 19	input: 20 output (option): 20
Accuracy	Arcsec	input: ±90 output (option): ±72	input: ±72 output (option): ±72
Repeatability	Arcsec	input: ±14 output (option): ±25	input: ±8 output (option): ±13
Multi-turn	-	input: no output: yes, battery-based, 18bit // battery available as an option	
Interface	-	integrated (BISS-C)	

Specifications

Brake Specification - Option

Type	-	Disc - spring applied - overexcitation implemented	
Max. allowable braking work per 1 cycle	J	44	78
Total work capacity	J	8700	15500

Servo Drive Specification

Type	-	Synapticon Circulo 7	Synapticon Circulo 9	
Communication	-	EtherCAT, DS402, CoE, FoE, FSoE		
Hardware protections	-	Overcurrent, overvoltage, undervoltage, overtemperature, PWM deadline, PWM shoot through		
Input/Output (GPIO)	-	5x DIO(3.3/5V), 1x DO(3.3/5V), 1x DI(24V)		
		1x Analog In Single Ended (0-10V)		
		1x Analog In Differential +−5V; (not available in combination with torque sensor)		
Standard safety functions	-	STO/SBC according to SIL 3 PL-e		
Safe Motion Module (Option)	SAFETY FUNCTIONS	-	STO+SBC (Safe Torque Off + Safe Brake Control)	
			SS1 (Safe Stop 1) - ramp stop and STO+SBC	
			SS2 (Safe Stop 2) - ramp stop and SOS	
			SOS (Safe Operating Stop) - hold current position	
			SMS (Safe Maximum Speed)	
				4xSLS (Safe Limited Speed, 4 instances)
	SAFE PROCESS DATA VIA FSOE (4ms cycle time)	-	Safe velocity, Safe position, Safe Torque	
			SDI, SDO, SAI	
			2x Safe Digital Input	
	SAFE INPUTS/OUTPUTS	-	1x Safe Digital output (OSSD) 1x Safe analog Input (differential) Safe Power Delivery (5V)	

Gearbox Specifications

Strain Wave Gear Main Bearings

SIZE	PITCH CIRCLE DIAMETER OF MAIN BEARING	OFFSET	BASIC DYNAMIC RATED LOAD	BASIC DYNAMIC RATED LOAD	PERMISSIBLE TORQUE	PERMISSIBLE RADIAL LOAD	PERMISSIBLE AXIAL LOAD	TORQUE STIFFNESS (TYPICAL VALUES)
	dp	R	C	C0	Nm	N	N	Nm/arcmin
	mm	mm	N	N				
103	54.7	18.35	9000	18300	105	1300	1590	29.4
107	72.0	19.45	18100	30400	219	2050	3000	59.1

Table ECY-2 Input side main bearing

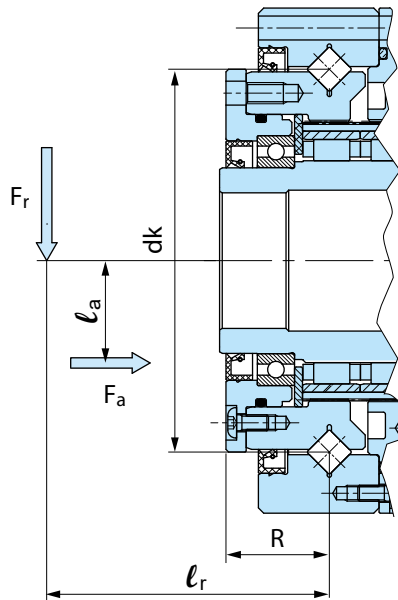


Fig. ECY-6 Load position output

STATIC SAFETY FACTOR

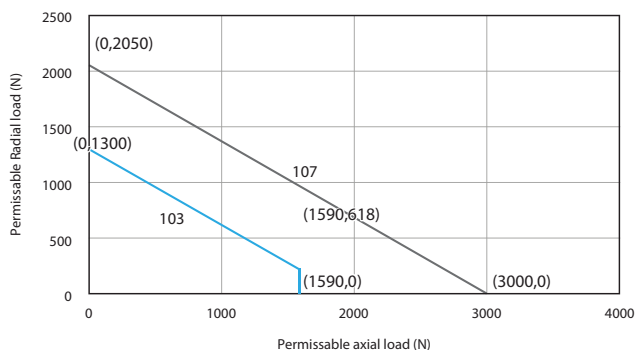
F_s

If high speed accuracy is required	≥ 3
In event of vibrations and/or impact	≥ 2
Under normal operating conditions	≥ 1.5

Table ECY-3 Static safety factor f_s

SIZE	θ_1^* (NM/ARCMIN)	T_{KMAX} (NM)	D_K (MM)	R (MM)	C (N)	C_0 (N)
103	29.4	105	54.7	18.75	9000	18300
107	59.1	219	72	19.85	18100	30400

Table ECY-6 Specification cross roller bearings



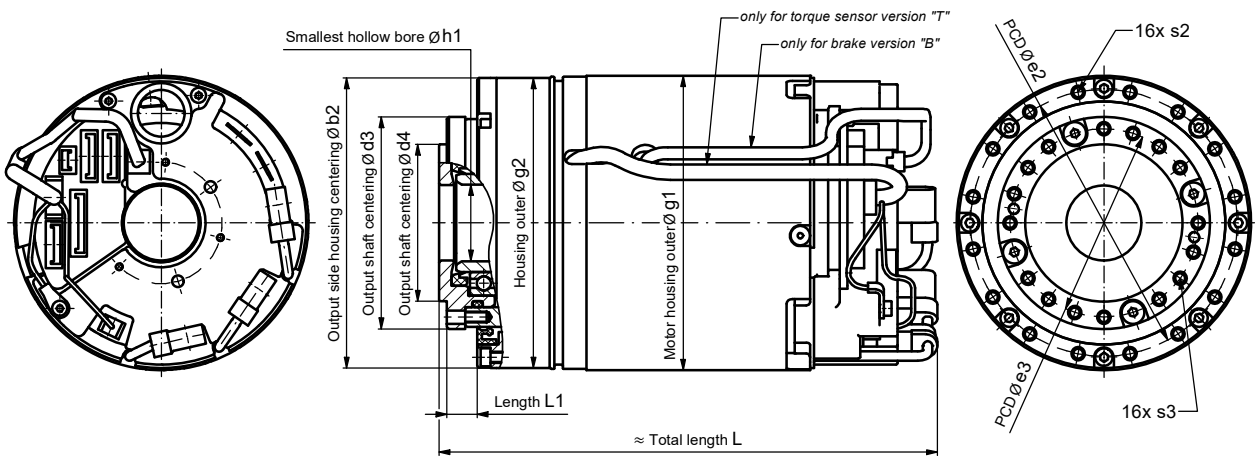
If the radial load and axial load act in combination with one another, ensure that the total load is within the value range indicated in Fig. ECY-7.

* For further details, please refer to the Precision Gearbox Catalogue.

TUAKA® DRIVE

Dimensions

Option: Synapticon Encoder



ACTECY -	L	L1	Ø g1 ± 0,05	Ø g2	Ø b2 h7	Ø e2	Ø s2	Ø d3 h7	Ø d4 h7	Ø e3	Ø s3	Ø h1	Weight without brake	Weight with brake
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	thread	[mm]	[mm]	[mm]	thread	[mm]	[Gramm]	[Gramm]
103-(T)M1(B)	127	7.7	75	74	74	68	M3	54	40	48	M3	19.2	1450	1650
107-(T)M1(B)	145	6.5	95	95	95	87.5	M4	72	50	63	M4	26.2	3000	3300

*D1S = single encoder / singleturn
D2M = double encoder / multiturn

TUAKA® SERVO

Features and Advantages

When flexibility and integration matter most, TUAKA® Servo delivers. Combines the benefits of a highly integrated actuator with the flexibility to connect to any off-the-shelf single- or multi-axis drive—perfect for camera systems, antennas or medical applications.

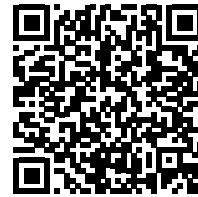
The all-in-one actuator solution for use with an external drive:

- High-precision strain-wave gear
- Frameless torque motor
- Integrated high resolution encoder

Available options:

- Spring-applied brake system
- Available encoders:
 - 1x Heidenhain (Endat 2.2), 2x Heidenhain (Endat 2.2),
 - 1x RLS Aksim-2 (BiSS-C), 1x Sick SES/SEM (Hiperface)*
- Motor Drive: Synapticon Somanet Node (external - but wired and configured)

*The Sick SES/SEM encoder is only available on request. Please reach out to us for more information.



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Specifications

FRAME	103			107		
Diameter (mm)	Ø75			Ø96		
Ratio	50	80*	100	50	80*	100

* Ratio 80 only available on request. Please reach out to us for more information

General

Operating ambient Temperature	°C	10 ... 55
Storage Temperature (non condensing)	°C	0 ... 60
Operating ambient humidity (non condensing)	% rH	20 ... 80
Max. installation altitude	m	1000
Lifetime (rated)	h	7000
Lubrication	HGO-3 No. 00 from Nippeco	
Degree of protection (EN 60034-5)	IP20/IP66 available	

Common Data

Rated output torque	Nm	16	22	24	39	63	67
Peak output torque	Nm	34	43	54	98	137	157
Max. rotation output speed	rpm	123	77	62	56	35	28
	deg/s	740	463	370	334	209	167
Number of pole pairs		10			10		
Rated current I _r	A pk/rms	9.37/6.88			18.2/12.87		
Torque constant k _T @20°C	mNm/A	64			143		
Terminal resistance R _{TT} @20°C	mΩ	166			107		
Terminal inductance L _{TT} @20°C	μH	295			313		
Max. rotation angle	°				Infinite		
Supply voltage	V				48		

Geometry Information

Total length	mm	With RLS or Heidenhain encoder: ~105	With RLS or Heidenhain encoder: ~124
		With Heidenhain dual encoder: ~119	With Heidenhain dual encoder: ~138.5
Weight	g	1500	3200
Brake Option additional weight	g	+200	+250
Inertia Input	kgmm ²	106,9	399,2
Inertia Output	kgmm ²	88,3	328,4
Brake Option additional inertia	kgmm ²	+16,0 (input) / +1,3 (output)	+42,3 (input) / +5,1 (output)

Specifications

Encoder Specification

Resolution	bit	Heidenhain KCI1319 FS / KBI1335 FS: 19	Heidenhain KCI1319 FS / KBI1335 FS: 19
		RLS AksIM-2: 19	RLS AksIM-2: 19
Accuracy	Arcsec	Heidenhain KCI1319 FS / KBI1335 FS: +/-90;	Heidenhain KCI1319 FS / KBI1335 FS: +/-90;
		RLS AksIM-2: +/-25	RLS AksIM-2: +/-25
Repeatability	Arcsec	Less than unit of resolution	Less than unit of resolution
Multi-turn	-	Heidenhain KCI1319 FS / KBI1335 FS:	input: Single encoder: Yes, battery based, 16-bit // battery available as an option Dual encoder: No output: No
		RLS AksIM-2:	Yes, non-volatile memory, 16bit
Interface	-	Heidenhain KCI1319 FS / KBI1335 FS:	EnDat 2.2
		RLS AksIM-2:	Biss, RS422 (UART), SPI, SSI

Brake Specification - Option

Type	-	Disc - spring applied - overexcitation implemented	
Max. allowable braking work per 1 cycle	J	44	78
Total work capacity	J	8700	15500

TUAKA® Active & Servo - External Drive - Option

Type	-	Synapticon Somanet Node (external - but wired and configured)
Communication	-	EtherCAT, DS402, CoE, FoE, FSoE
Hardware protections	-	Overcurrent, overvoltage, undervoltage, overtemperature, PWM deadline, PWM shoot through
Input/Output (GPIO)	-	4x GPIO/SPI**/I ² C**/UART 2x single-ended 0-10V, 2x differential ±5V
Standard safety functions	-	STO/SBC according to SIL 3 PL-e cat.3

Gearbox Specifications

Strain Wave Gear Main Bearings

SIZE	PITCH CIRCLE DIAMETER OF MAIN BEARING	OFFSET	BASIC DYNAMIC RATED LOAD	BASIC DYNAMIC RATED LOAD	PERMISSIBLE TORQUE	PERMISSIBLE RADIAL LOAD	PERMISSIBLE AXIAL LOAD	TORQUE STIFFNESS (TYPICAL VALUES)
	dp	R	C	C0	Nm	N	N	Nm/arcmin
	mm	mm	N	N				
103	54.7	18.35	9000	18300	105	1300	1590	29.4
107	72.0	19.45	18100	30400	219	2050	3000	59.1

Table ECY-2 Input side main bearing

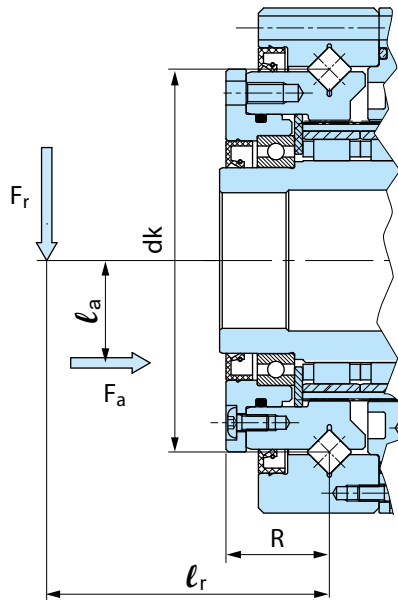


Fig. ECY-6 Load position output

STATIC SAFETY FACTOR

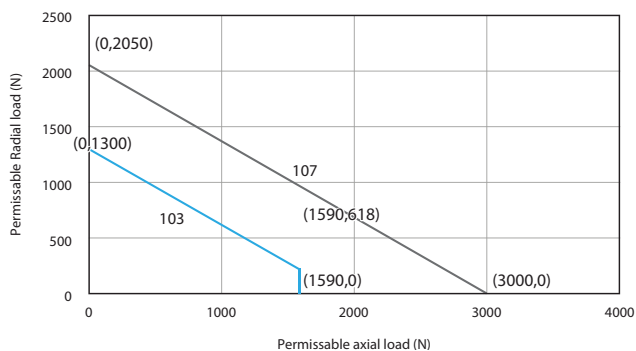
F_s

If high speed accuracy is required	≥ 3
In event of vibrations and/or impact	≥ 2
Under normal operating conditions	≥ 1.5

Table ECY-3 Static safety factor f_s

SIZE	θ_1^* (NM/ARCMIN)	T_{KMAX} (NM)	D_K (MM)	R (MM)	C (N)	C_0 (N)
103	29.4	105	54.7	18.75	9000	18300
107	59.1	219	72	19.85	18100	30400

Table ECY-6 Specification cross roller bearings



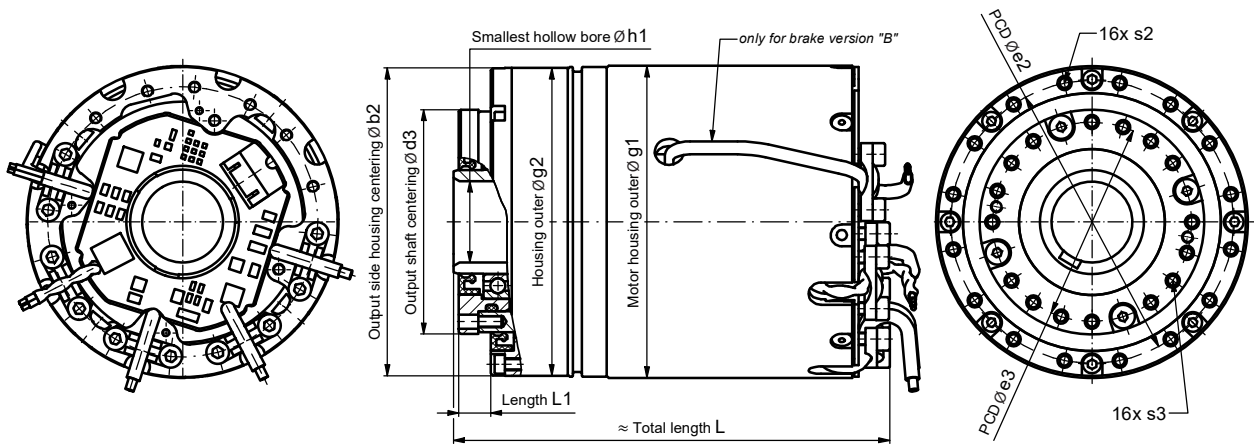
If the radial load and axial load act in combination with one another, ensure that the total load is within the value range indicated in Fig. ECY-7.

* For further details, please refer to the Precision Gearbox Catalogue.

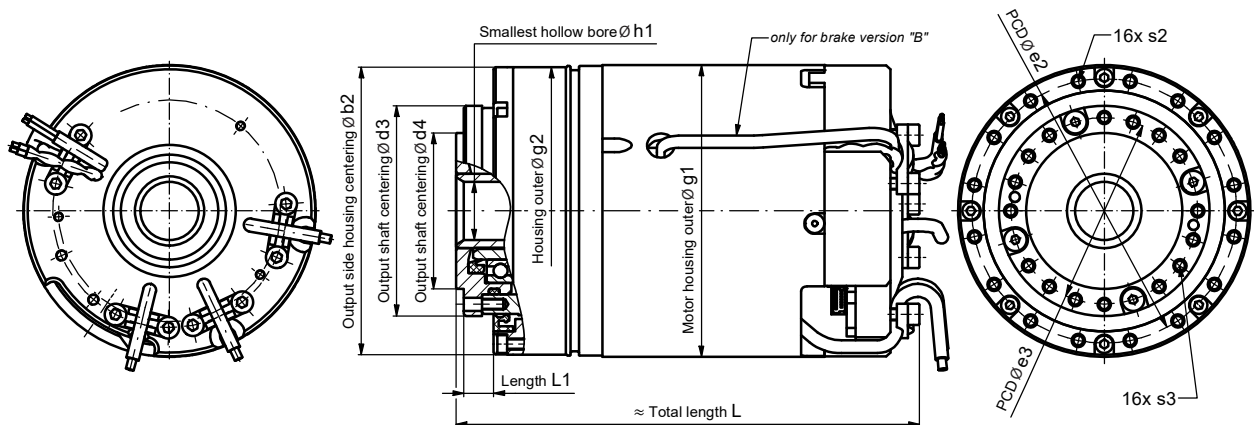
TUAKA® SERVO SIZE 103 | HEIDENHAIN ENCODER

Dimensions

Option: Single Encoder |
ACTECY-103-M1(B)H1S+H1M



Option: Double Encoder |
ACTECY-103-M1(B)H2S



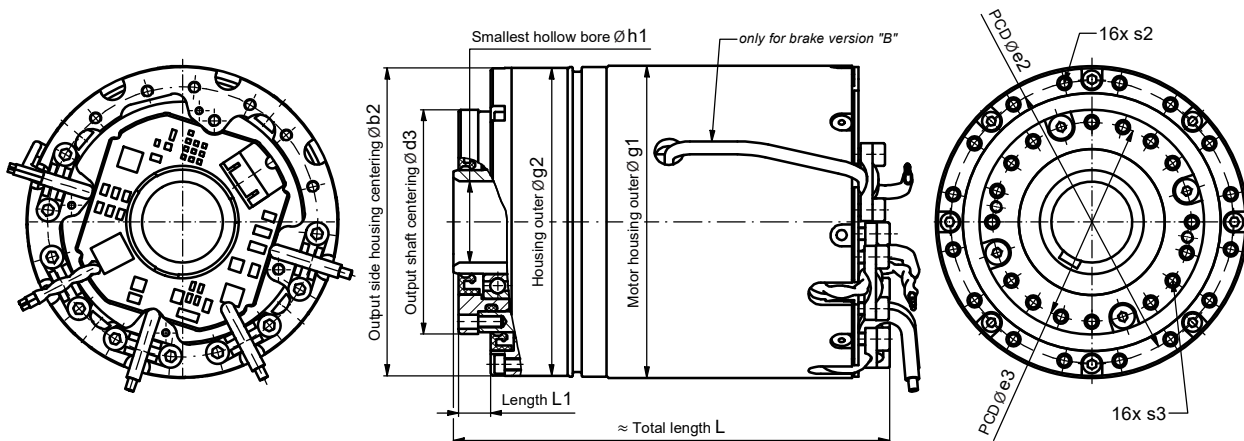
ACTECY -	L	L1	$\pm 0,05$	$\varnothing g1$	$\varnothing g2$	$\varnothing b2$ h7	$\varnothing e2$	$\varnothing s2$	$\varnothing d3$ h7	$\varnothing d4$ h7	$\varnothing e3$	$\varnothing s3$	$\varnothing h1$	Weight without brake	Weight with brake
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	thread	[mm]	[mm]	[mm]	thread	[mm]	[Gramm]	[Gramm]
103-M1(B)	H1S/H1M*	105	7.7	75	74	74	68	M3	54	--	48	M3	19.3	1500	1700
	H2S*	119								40			14.8	1600	1800

*H1S = single encoder / singleturn
H1M = single encoder / multiturn
H2S = double encoder / singleturn

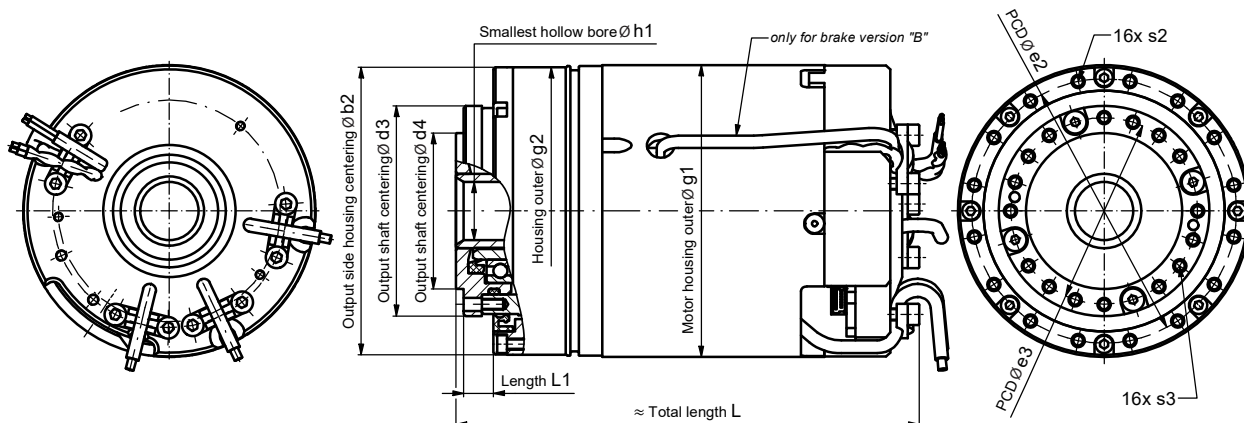
TUAKA® SERVO SIZE 107 | HEIDENHAIN ENCODER

Dimensions

Option: Single Encoder |
ACTECY-107-M1(B)H1S+H1M



Option: Double Encoder |
ACTECY-107-M1(B)H2S



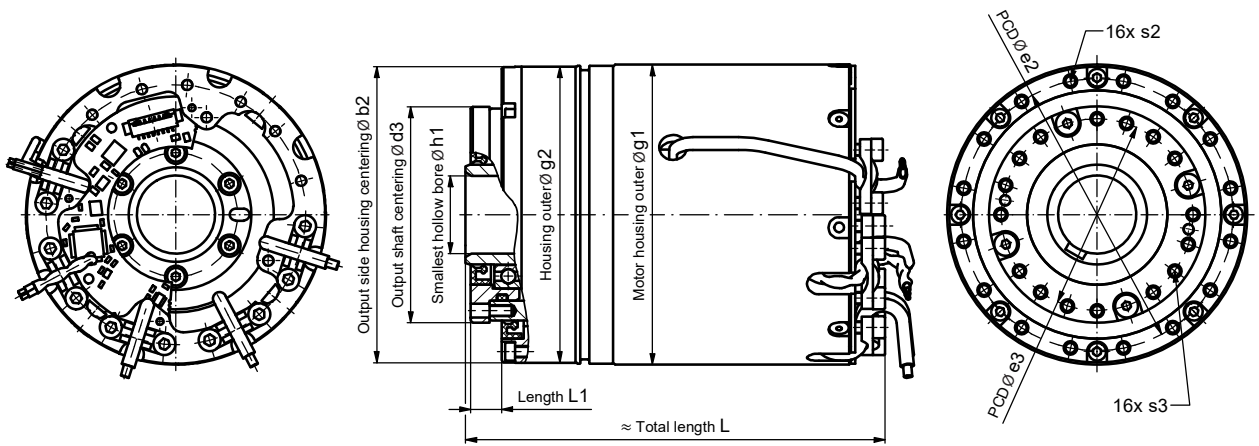
ACTECY -	L	L1	ø g1	ø g2	ø b2	ø e2	ø s2	ø d3	ø d4	ø e3	ø s3	ø h1	Weight without brake	Weight with brake
			± 0,05		h7			h7	h7					
			[mm]		[mm]			[mm]	[mm]			[mm]		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	thread	[mm]	[mm]	[mm]	thread	[mm]	[Gramm]	[Gramm]
107-M1(B)	H1S/H1M*	124							--			21.8	3200	3500
	H2S*	139	6.5	95	95	95	87.5	M4	72	50	63	M4	14.8	3250

*H1S = single encoder / singleturn
 H1M = single encoder / multiturn
 H2S = double encoder / singleturn

TUAKA® SERVO | RLS ENCODER

Dimensions

Option: Single Encoder |
ACTECY-103-M1(B)R1M



ACTECY -		L	L1	$\varnothing g1$ $\pm 0,05$	$\varnothing g2$	$\varnothing b2$ h7	$\varnothing e2$	$\varnothing s2$	$\varnothing d3$ h7	$\varnothing e3$	$\varnothing s3$	$\varnothing h1$	Weight without brake	Weight with brake
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	thread	[mm]	[mm]	thread	[mm]	[Gramm]	[Gramm]
103-M1(B)	R1M	105	7.7	75	74	74	68	M3	54	48	M3	19.2	1450	1650
107-M1(B)	R1M	124	6.5	95	95	95	87.5	M4	72	63	M4	26.2	3000	3300

TUAKA® ACTIVE

Features and Advantages

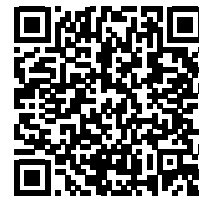
For motion tasks that demand continuous, smooth rotation, TUAKA® Active leads the way. Designed for uninterrupted rotation, this actuator is a high-performance alternative to servo motors for conveyors or machine tools.

The classic Motor + Gear Solution:

- High-precision strain-wave gear
- Frameless torque motor

Available options:

- Spring-applied brake system



[get insights](#)



Specifications

FRAME	103			107		
Diameter (mm)	Ø75			Ø96		
Ratio	50	80*	100	50	80*	100

* Ratio 80 only available on request. Please reach out to us for more information

General

Operating ambient Temperature	°C	10 ... 55
Storage Temperature (non condensing)	°C	0 ... 60
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Max. installation altitude	m	1000
Lifetime (rated)	h	7000
Lubrication	HGO-3 No. 00 from Nippeco	
Degree of protection (EN 60034-5)	IP20/IP66 available	

Common Data

Rated output torque	Nm	16	22	24	39	63	67
Peak output torque	Nm	34	43	54	98	137	157
Max. rotation output speed	rpm	123	77	62	56	35	28
	deg/s	740	463	370	334	209	167
Number of pole pairs		10				10	
Rated current I _r	A pk/rms	9.37/6.88				18.2/12.87	
Torque constant k _T @20°C	mNm/A	64				143	
Terminal resistance R _{TT} @20°C	mΩ	166				107	
Terminal inductance L _{TT} @20°C	μH	295				313	
Max. rotation angle	°	Infinite					
Supply voltage	V	48					

Geometry Information

Max. outer diameter	mm	Ø75			Ø96		
Hollow shaft diameter	mm	Ø19.3			Ø21.8		
Total length	mm	95			112.5		
Weight	g	1400			3100		
Brake Option additional weight	g	+200			+300		
Inertia Input	kgmm ²	106,9			399,2		
Inertia Output	kgmm ²	88,3			328,4		
Brake Option additional inertia	kgmm ²	+16,0 (input) / +1,3 (output)			+42,3 (input) / +5,1 (output)		

Brake Specification - Option

Type	-	Disc - spring applied - overexcitation implemented					
Max. allowable braking work per 1 cycle	J	44			78		
Total work capacity	J	8700			15500		

TUAKA® Active & Servo - External Drive - Option

Type	-	Synapticon Somanet Node (external - but wired and configured)					
Communication	-	EtherCAT, DS402, CoE, FoE, FSoE					
Hardware protections	-	Overcurrent, overvoltage, undervoltage, overtemperature, PWM deadline, PWM shoot through					
Input/Output (GPIO)	-	4x GPIO/SPI/I ² C/UART 2x single-ended 0-10V, 2x differential ±5V					
Standard safety functions	-	STO/SBC according to SIL 3 PL-e cat.3					

Gearbox Specifications

Strain Wave Gear Main Bearings

SIZE	PITCH CIRCLE DIAMETER OF MAIN BEARING	OFFSET	BASIC DYNAMIC RATED LOAD	BASIC DYNAMIC RATED LOAD	PERMISSIBLE TORQUE	PERMISSIBLE RADIAL LOAD	PERMISSIBLE AXIAL LOAD	TORQUE STIFFNESS (TYPICAL VALUES)
	dp	R	C	C0	Nm	N	N	Nm/arcmin
	mm	mm	N	N				
103	54.7	18.35	9000	18300	105	1300	1590	29.4
107	72.0	19.45	18100	30400	219	2050	3000	59.1

Table ECY-2 Input side main bearing

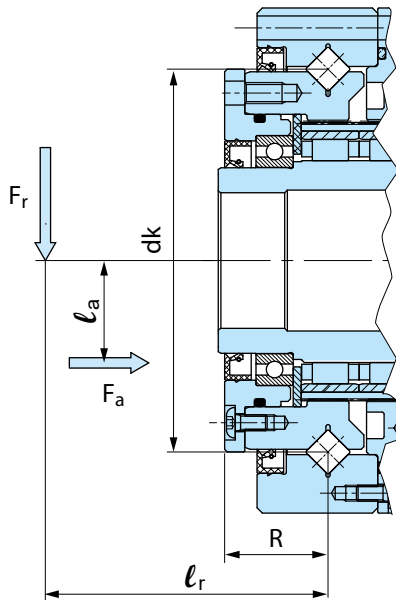


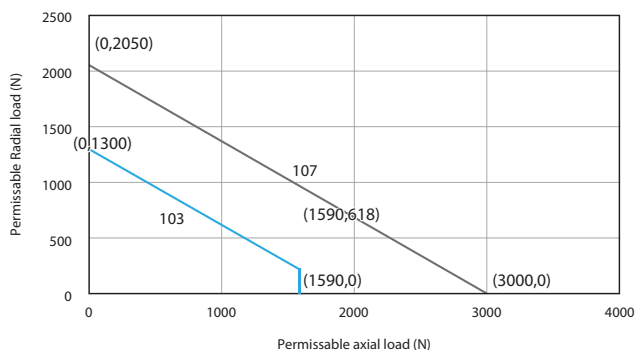
Fig. ECY-6 Load position output

STATIC SAFETY FACTOR	F_s
If high speed accuracy is required	≥ 3
In event of vibrations and/or impact	≥ 2
Under normal operating conditions	≥ 1.5

Table ECY-3 Static safety factor f_s

SIZE	θ_1^* (NM/ARCMIN)	T_{KMAX} (NM)	D_K (MM)	R (MM)	C (N)	C_0 (N)
103	29.4	105	54.7	18.75	9000	18300
107	59.1	219	72	19.85	18100	30400

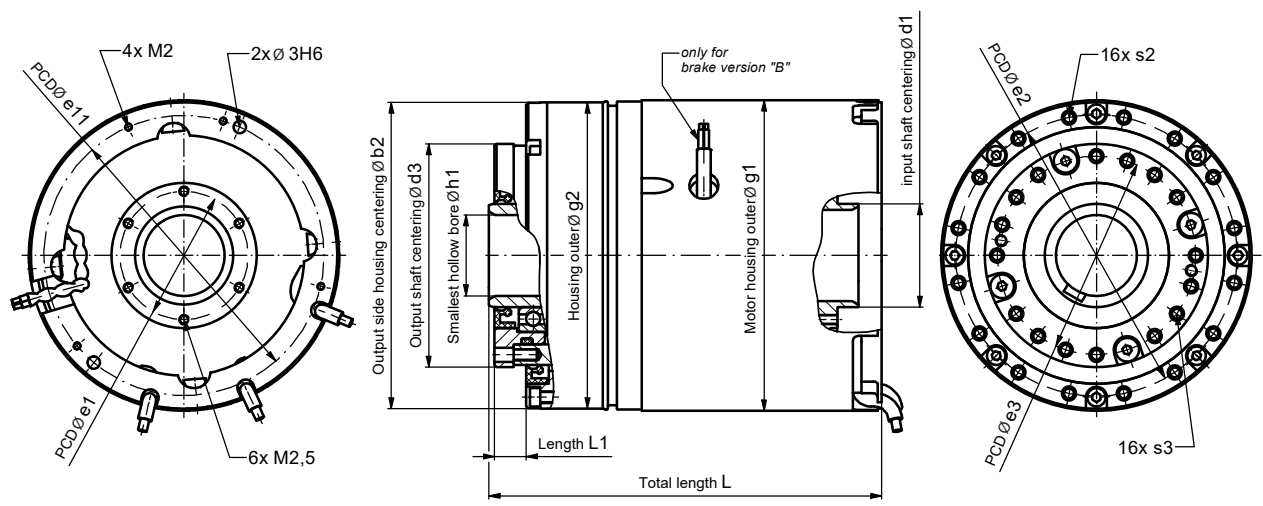
Table ECY-6 Specification cross roller bearings



If the radial load and axial load act in combination with one another, ensure that the total load is within the value range indicated in Fig. ECY-7.

* For further details, please refer to the Precision Gearbox Catalogue.

Dimensions



ACTECY -	L	L1	$\varnothing g1$	$\varnothing g2$	$\varnothing b2$	$\varnothing e2$	$\varnothing s2$	$\varnothing d3$	$\varnothing e3$	$\varnothing s3$	$\varnothing e11$	$\varnothing d1$	$\varnothing e1$	$\varnothing h1$	Weight without brake	Weight with brake
			$\pm 0,05$		$h7$			$h7$				$h6$				
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	thread	[mm]	[mm]	thread	[mm]	[mm]	[mm]	[mm]	[Gramm]	[Gramm]
103-M1(B)	95	7.7	75	74	74	68	M3	54	48	M3	67.7	25	31	19.3	1400	1600
107-M1(B)	112.5	6.5	95	95	95	87.5	M4	72	63	M4	87.7	25	31	21.8	3100	3400



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