

HIGH PRECISION GEARS



FROM STANDARD DRIVES TO CUSTOMISED PRECISION GEARBOXES

Originated from a traditional gear company with more than 100 years of experience in drive technology, today Melior Motion offers customised and individual solutions from our headquarters in Hamelin, Germany. We develop, produce, assemble and test innovative precision gearboxes for the global market.

Focus on precision gear under a new name

As one of the first movers in high precision gearboxes for the Robotics industry, we have supplied reliable and precise transmissions for various industry sectors for over 35 years.

Our customers benefit from our in-depth know-how in standard gearboxes as well as for individual customised solutions, ensuring that we are able to provide a fast and efficient response to the demanding needs of the various markets we serve.

At Melior Motion, you will find the newly developed standard series as well as the customised gearboxes for robotics and automation industry.

We look forward to a future as your strategic partners.

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PRODUCT



APPLICATIONS

Gearbox sub-assembly PSC



- Robotics
- Automation

Fully enclosed gearbox unit PSC



- Robotics
- Automation
- Machine tools
- Printing industry
- Packaging machines
- Turntables
- Medical industry
- Defence

Special gearbox PSD



- Delta robots
- Machine builders

Customized gearboxes



- Robotics
- Automation
- Many other applications in different industry sectors



Figure 1:
Melior Motion PSC sub-assembly, hollow shaft

With 30 years experience in the development and production of highly precise precision gearboxes for industrial robots, the new compact gear range MELIOR MOTION® has been presented to the market. The unique advantages convince in robotics applications, as well as in medical industry, machine tools and other automation industries.

With a backlash of ≤ 0.1 arcmin, the MELIOR MOTION® range can be considered as zero backlash gearbox. They are available in seven sizes, each as sub-assembly or fully enclosed gearbox unit and as solid or hollow shaft version.

Sub-assemblies can be directly integrated into your drive system or machine design. As an alternative, we offer fully enclosed gearboxes which are filled with a standard mineral oil. Geared motors can be supplied on request.

Hollow shafts up to 75 mm dia. allow a feed-through of cables or similar.

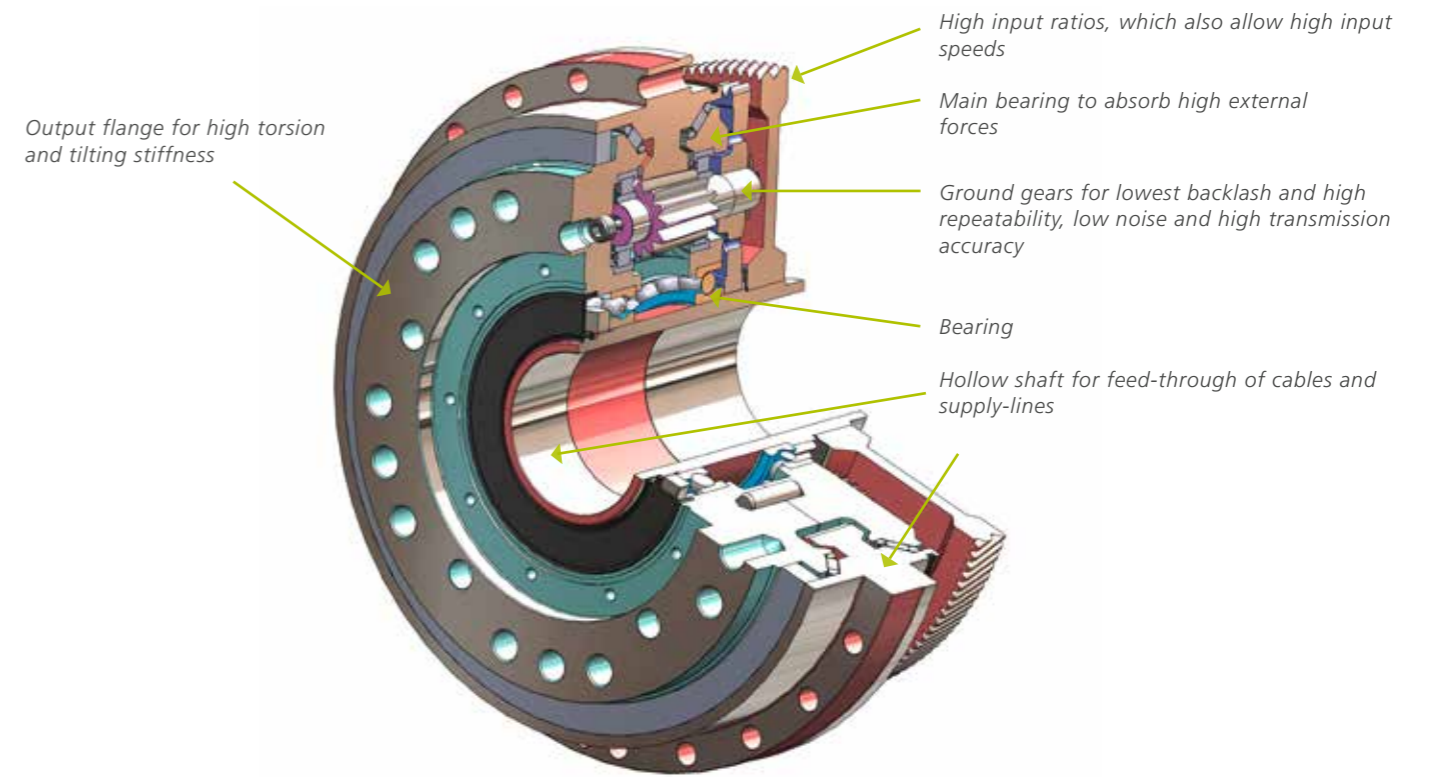


Figure 2:
Melior Motion PSC fully enclosed gearbox, solid shaft with motor flange and coupling for easy motor adaption

SPECIALS

- Patented self-adjusting solution to regulate wear throughout the lifetime of the gearbox
- Newly developed main bearing where bearing running surface is integrated in gear components
- High quality, dynamic sealing
- Optimized macro and micro geometry for highest precision

gearboxes are designed as planetary gearboxes with an additional integrated helical stage.



FEATURES



YOUR BENEFIT

Backlash ≤ 0.1 arcmin	Highest precision for your application
Lost Motion ≤ 0.6 arcmin	Superior accuracy also for small torques
Self-regulating tooth contact system	Constant precision throughout the whole lifetime
Fully-loaded lifetime of 20,000 operating hours	Longer lifetime, greatly reduced maintenance costs
High torques in output, acceleration and emergency stops	More safety for your application
Superior tilting and torsion stiffness	Allows positioning straight-to-the-point
Low vibrations	High repeatability
Lowest breakaway torque	Better controllability of the whole system
Use of a standard mineral oil	Reduced cost of lubrication
Low heat development	Longer lifetime of components and lubricant
Low moments of inertia	Excellent dynamic performance
Efficiency $> 90\%$	Use of motors / systems with less energy consumption
Small weight	Lighter overall system
Compact design	Smarter periphery design
Low noise	Reduced noise exposure at workplaces

PSC-GEARBOXES

Our low backlash PSC precision gearboxes achieve a particularly high power density thanks to multiple teeth engagement (sun gear, planetary gears and housing gear).

The efficiency of $> 90\%$ and the extremely low breakaway torque ensure outstanding energy efficiency. Thanks to the high efficiency, the gearbox temperature remains unchanged at a particularly low level. For example, elastic seals, e.g. radial shaft seals have a significantly lower stress.

The result is an impressive lifetime of 20,000 hours.

This is much more than with conventional precision gearboxes and has been verified in numerous tests.

At the same time, the low backlash precision gearbox is extremely quiet. The noise in the work environment is thus reduced.

Not only quiet but also accurate, the design even works equally well in the range of small torques, ensuring high accuracy for small movements.

Low backlash precision gearboxes PSC

Performance table PSC solid shaft gearboxes
valid for sub-assemblies and fully enclosed units

GEARBOX	Nominal ratio	Exact ratio	Permanent output torque [Nm]	Nominal output torque 1a) 12×10^6 [Nm]	Acceleration torque 1b) 6×10^6 [Nm]	Emergency Stop Torque 1c) [Nm]	Max. output speed 3) [1/min]	Permissible average input speed 4) [1/min]	Max. permissible input speed 3) [1/min]	Permanet bending moment 2b) [Nm]	Emergency Stop bending moment max. 1c) 7) [Nm]	Tilting stiffness [Nm/arcmin]	Torsion stiffness 5) [Nm/arcmin]	Max. axial force static 2b) [kN]	max. radial force static 2c) [kN]	Max. axial force dynamic 2b) [kN]	Max. radial force dynamic 2c) [kN]	Power density [Nm/kg]	Weight 6) [kg]
PSC056-V	50	564788/11745	575	445	625	1,545	120	4,000	6,000	1,070	3,645	1,170	165	152	55	18.0	11.0	57.8	7.7
	63	85946/1305																	
	80	116641/1450																	
	100	239421/2465																	
	125	3508/29																	
	160	251699/1595																	
PSC080-V	50	754/15	980	770	1,075	2,530	100	3,500	5,000	1,280	4,345	1,560	260	168	57	18.5	11.5	68.8	11.2
	63	33176/525																	
	80	57304/735																	
	100	1508/15																	
	125	12818/105																	
	160	1508/9																	
PSC112-V	50	325367/6525	1,480	1,165	1,630	3,780	100	3,500	5,000	2,410	5,910	2,230	430	270	85	29.5	18.0	73.3	15.9
	63	227143/3625																	
	80	6139/75																	
	100	42973/435																	
	125	834904/6525																	
	160	853321/5220																	
PSC160-V	50	354928/6975	1,850	1,450	2,030	4,800	100	3,500	5,000	2,750	7,800	2,300	570	292	97	31.0	19.0	72.9	19.9
	63	3169/50																	
	80	386618/4725																	
	100	15845/162																	
	125	136267/1050																	
	160	415139/2700																	
PSC224-V	50	3531/70	2,325	1,820	2,550	6,090	90	3,000	4,500	3,060	9,280	2,620	680	315	100	32.0	20.0	65.7	27.7
	63	1584/25																	
	80	3828/49																	
	100	11880/119																	
	125	12177/98																	
	160	162																	
PSC300-V	50	6338/125	3,435	2,690	3,765	8,990	80	2,500	4,000	4,800	11,410	5,490	1,130	400	140	42.5	26.5	71.9	37.4
	63	358097/5625																	
	80	186971/2250																	
	100	383449/3825																	
	125	129929/1050																	
	160	434153/2700																	
PSC400-V	50	354928/6975	4,495	3,505	4,905	11,980	70	2,000	3,500	6,080	13,750	6,260	1,350	535	170	46.0	29.0	69.7	50.3
	63	3169/50																	
	80	34859/450																	
	100	9507/95																	
	125	72887/600																	
	160	224999/1350																	

Backlash [arcmin] - output torque	≤ 0.1
Lost Motion [arcmin] - output torque	≤ 0.6
Angular transmission accuracy [arcsec]	≤ 50
Efficiency under full load	≥ 90%
Lifetime	20,000 operating hours
Noise level	< 70 dB(A)
Lubrication	sub-assemblies: delivery without oil fully enclosed gearboxes: filled with standard mineral oil, viscosity 320

- 1a) Referring to 12 million times during lifetime
- 1b) Referring to 6 million times during lifetime
- 1c) Referring to 3,000 times during lifetime
- 2a) Permanent tilting moment for load case $F_a = 0$ and $F_r = 0$
- 2b) Max. axial force for load case permanent tilting moment = 0 and $F_r = 0$
- 2c) Max. radial force for load case permanent tilting moment = 0 and $F_a = 0$
- 3) higher max. speeds are possible - please contact us
- 4) at nominal torque and 20 ° C ambient temperature
- 5) at 50% to 100% of nominal torque
- 6) The indicated mass refers in each case to gearbox sub-assemblies with nominal ratio 50
- 7) Calculation of the screw connection has to be provided by the user!
(permissible strength class 12.9 for housing and output flange and 10.9 for cover flange)

General:
Calculations are based on an output speed of $n_2 = 15 \text{ min}^{-1}$
Calculations are valid for S5 intermittent operation;
for S1 continuous operation, please contact us
Further ratios are available on request.

Low backlash precision gearboxes PSC

Performance table PSC hollow shaft gearboxes
valid for sub-assemblies and fully enclosed units

GEARBOX	Nominal ratio 1)	Exact ratio	Permanent output torque [Nm]	Nominal output torque 1a) 12x10 ⁶ [Nm]	Acceleration torque 1b) 6x10 ⁶ [Nm]	Emergency Stop Torque 1c) [Nm]	Max. output speed 3) [1/min]	Permissible average input speed 4) [1/min]	Max. permissible input speed 3) [1/min]	Permanet bending moment 2a) [Nm]	Emergency Stop bending moment max. 1c) 7) [Nm]	Tilting stiffness [Nm/arcmin]	Torsion stiffness 5) [Nm/arcmin]	Max. axial force static 2b) [kN]	Max. radial force static 2c) [kN]	Max. axial force dynamic 2b) [kN]	Max. radial force dynamic 2c) [kN]	Power density [Nm/kg]	Weight 6) [kg]
PSC056-H	35.5	2422/65	575	445	625	1,545	120	4,000	6,000	1,070	3,645	2,090	185	152	55	18.0	11.0	57.8	7.7
	45	15224/325																	
	56	26296/455																	
	71	22836/325																	
	90	5882/65																	
	125	4844/39																	
131.5	97572/715																		
PSC080-H	35.5	21614/611	980	770	1,075	2,530	100	3,500	5,000	1,280	4,345	2,730	305	168	57	18.5	11.5	68.8	11.2
	45	82012/1833																	
	56	169882/3055																	
	71	43935/611																	
	90	401273/4277																	
	125	820120/6721																	
131.5	8787/65																		
PSC112-H	35.5	25422/725	1,480	1,165	1,630	3,780	100	3,500	5,000	2,410	5,910	3,315	480	270	85	29.5	18.0	73.3	15.9
	45	26537/600																	
	56	27429/500																	
	71	28321/400																	
	90	446/5																	
	125	3122/25																	
131.5	--																		
PSC160-H	35.5	218327/6188	1,850	1,450	2,030	4,800	100	3,500	5,000	2,750	7,800	3,670	690	292	97	31.0	19.0	72.9	19.9
	45	228342/5083																	
	56	236354/4199																	
	71	244366/3315																	
	90	250375/2652																	
	125	292438/2431																	
131.5	294441/2210																		
PSC224-H	35.5	206719/5733	2,325	1,820	2,550	6,090	90	3,000	4,500	3,060	9,280	4,100	820	315	100	32.0	20.0	65.7	27.7
	45	324046/7007																	
	56	94979/1729																	
	71	681614/9555																	
	90	698375/7644																	
	125	776593/6370																	
131.5	--																		
PSC300-H	35.5	228342/6409	3,435	2,690	3,765	8,990	80	2,500	4,000	4,800	11,410	8,810	1,240	400	140	42.5	26.5	71.9	37.4
	45	14021/312																	
	56	246369/4420																	
	71	274411/3757																	
	90	20030/221																	
	125	2003/17																	
131.5	144216/1105																		
PSC400-H	35.5	12544/351	4,495	3,505	4,905	11,980	70	2,000	3,500	6,080	13,750	10,250	1,460	535	170	46.0	29.0	69.7	50.3
	45	504/11																	
	56	13440/247																	
	71	4592/65																	
	90	1176/13																	
	125	4816/39																	
131.5	--																		

Backlash [arcmin] - output torque	≤ 0.1
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Angular transmission accuracy [arcsec]	≤ 50
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- 4) at nominal torque and 20 ° C ambient temperature
- 5) at 50% to 100% of nominal torque
- 6) The indicated mass refers in each case to gearbox sub-assemblies with nominal ratio 50
- 7) Calculation of the screw connection has to be provided by the user!
(permissible strength class 12.9 for housing and output flange and 10.9 for cover flange)

General:
Calculations are based on an output speed of $n_2 = 15 \text{ min}^{-1}$
Calculations are valid for S5 intermittent operation; for S1 continuous operation, please contact us
Further ratios are available on request.

The moments of inertia in kgcm² are related to the input.

Size i _{nom}	50	56	63	71	80	90	100	112	125	140	160	180	200	
SOLID SHAFT	056V	1.01	0.85	0.75	0.64	0.51	0.42	0.35	0.29	0.24	0.21	0.16	0.14	0.12
	080V	1.92	1.62	1.43	1.21	0.96	0.79	0.67	0.56	0.45	0.40	0.31	0.26	0.22
	112V	3.37	2.85	2.52	2.12	1.69	1.40	1.19	0.98	0.80	0.71	0.54	0.46	0.39
	160V	3.37	2.85	2.52	4.14	3.30	2.73	2.31	1.92	1.56	1.38	1.05	0.90	0.76
	224V	10.29	8.71	7.69	6.48	5.16	4.27	3.62	3.00	2.44	2.16	1.64	1.40	1.18
	300V	16.92	14.32	12.64	10.66	8.48	7.02	5.95	4.93	4.01	3.55	2.70	2.31	1.94
	400V	27.87	23.59	20.83	17.56	13.97	11.56	9.80	8.12	6.60	5.85	4.45	3.80	3.20
Size i _{nom}	35,5	40	45	50	56	63	71	80	90	100	112	125	131,5	
HOLLOW SHAFT	056H	2.42	2.25	1.89	1.54	1.28	1.05	0.86	0.68	0.52	0.45	0.38	0.32	0.27
	080H	5.47	4.26	3.58	2.92	2.42	2.00	1.64	1.28	0.98	0.85	0.73	0.61	0.50
	112H	9.63	7.50	6.31	5.15	4.26	3.52	2.89	2.26	1.73	1.50	1.28	1.08	
	160H	18.79	14.64	12.31	10.04	8.32	6.87	5.63	4.41	3.38	2.92	2.49	2.10	1.73
	224H	29.38	22.89	19.25	15.71	13.01	10.74	8.81	6.90	5.29	4.57	3.90	3.29	
	300H	48.31	37.64	31.65	25.83	21.39	17.66	14.49	11.34	8.70	7.51	6.41	5.40	4.46
	400H	79.59	62.01	52.13	42.55	35.24	29.10	23.87	18.68	14.33	12.37	10.57	8.90	

The moments of inertia are based on the gearbox with input pinion, option "R". Housing is fixed and output shaft turns.

Breakaway / drag friction	PSC056	PSC080	PSC112	PSC160	PSC224	PSC300	PSC400
Running friction torque on output	41	46	45	49	53	87	96
Standard deviation	25 %		20 %			15 %	
Breakaway torque	1.0.....1.5* running friction torque (depending on size, mounting position, oil level and operating temperature)						

Gearbox sub-assembly
PSC V/H-E

Fully enclosed gearbox
PSC V/H-B



Solid shaft version



Hollow shaft version



Delivery with oil filling



Food-proof oil



Shaft seals

Standard: NBR, Viton on request

Output options

Output flange
Standard: housing is static, output flange turns
Option: housing turns, output flange is static

Output with pinion
Standard: housing is static, output flange turns
Option: housing turns, output flange is static

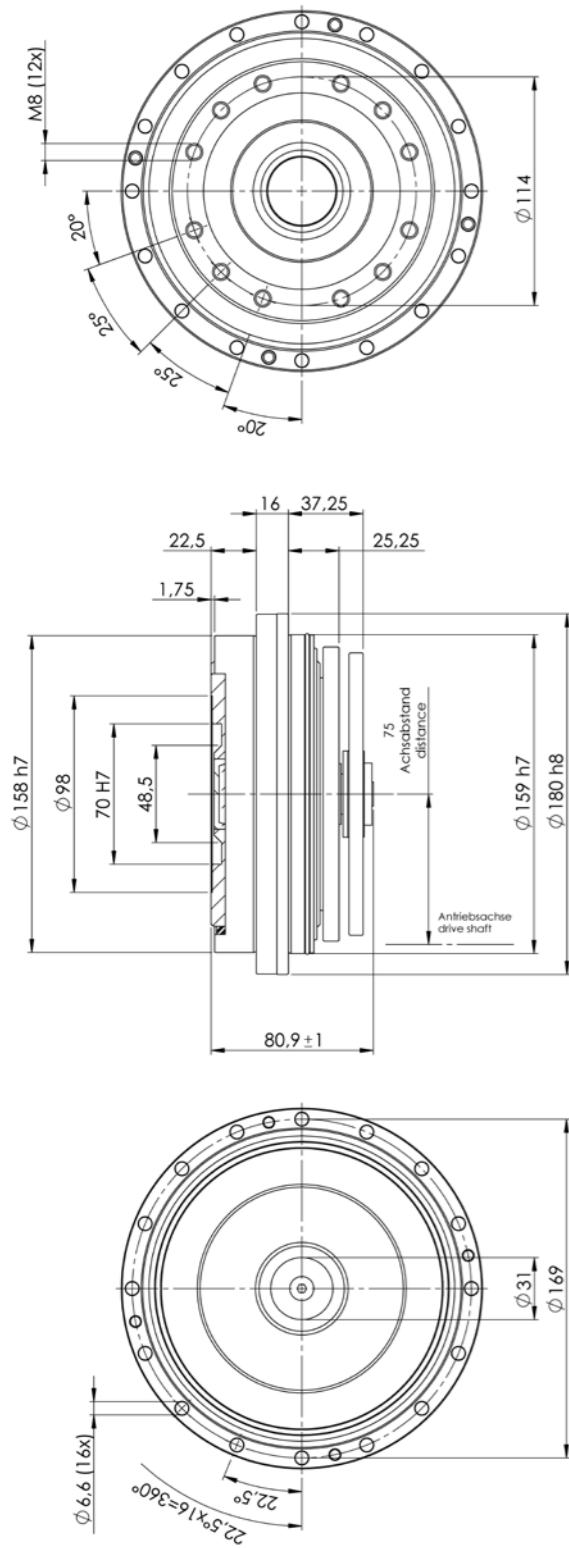


Other possibilities on request

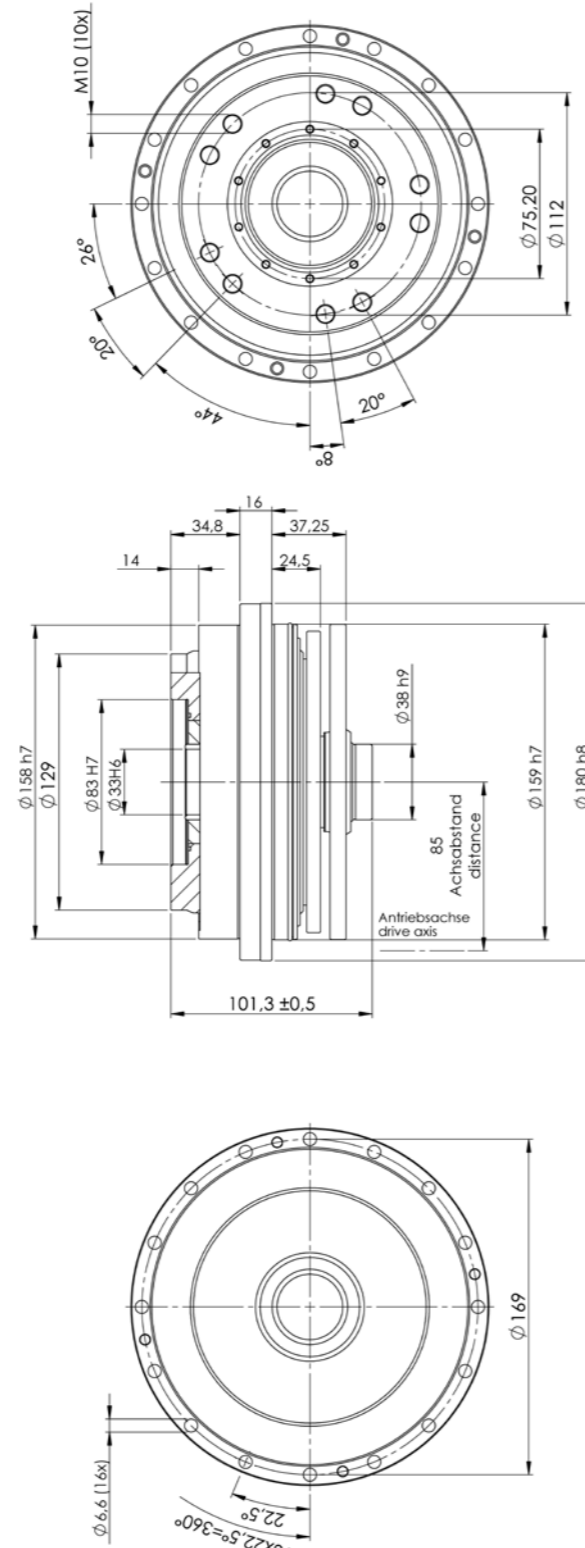
Low backlash precision gearboxes PSC

PSC sub-assembly dimensions

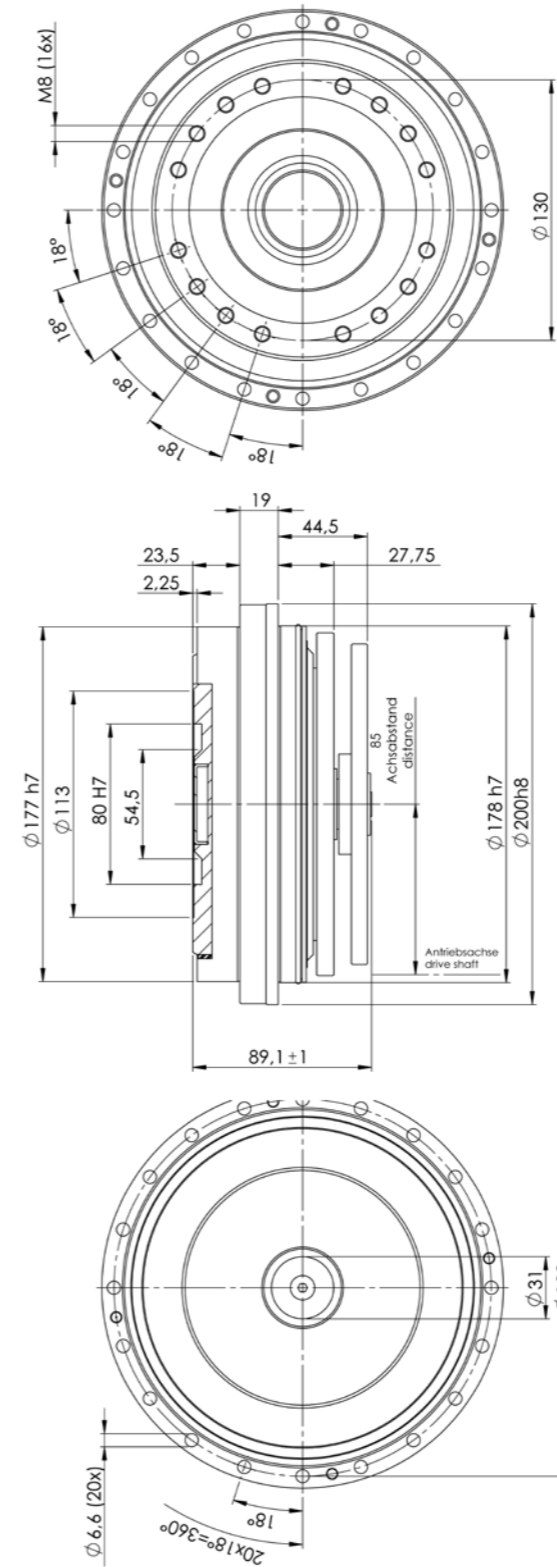
Gearbox size PSC056-V-E
(Solid shaft, sub-assembly)



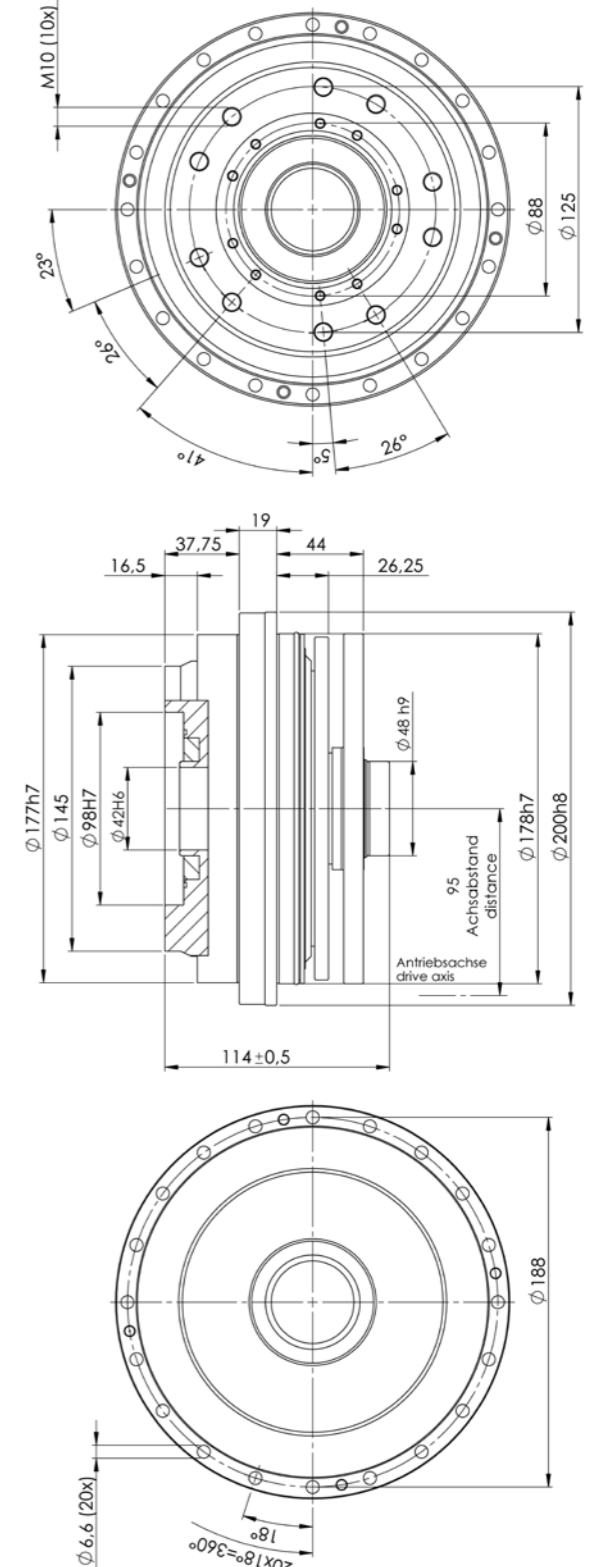
Gearbox size PSC056-H-E
(Hollow shaft, sub-assembly)



Gearbox size PSC080-V-E
(Solid shaft, sub-assembly)



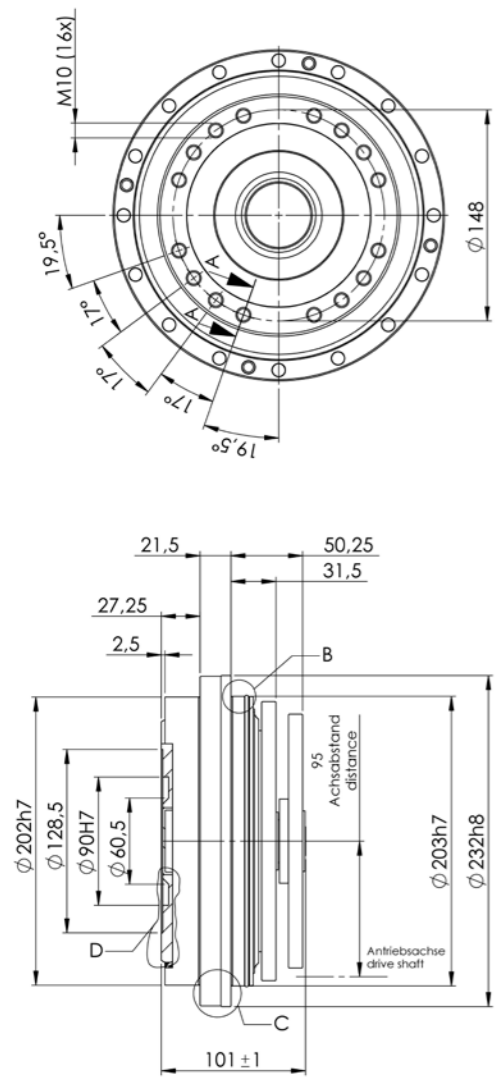
Gearbox size PSC080-H-E
(Hollow shaft, sub-assembly)



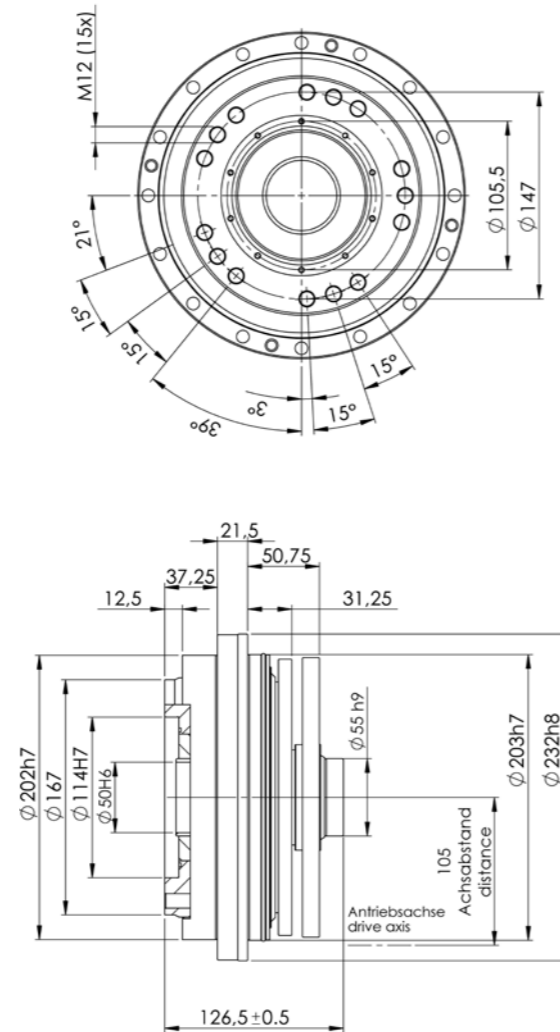
Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC056-H is reduced to 29 mm.

Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC080-H is reduced to 38 mm.

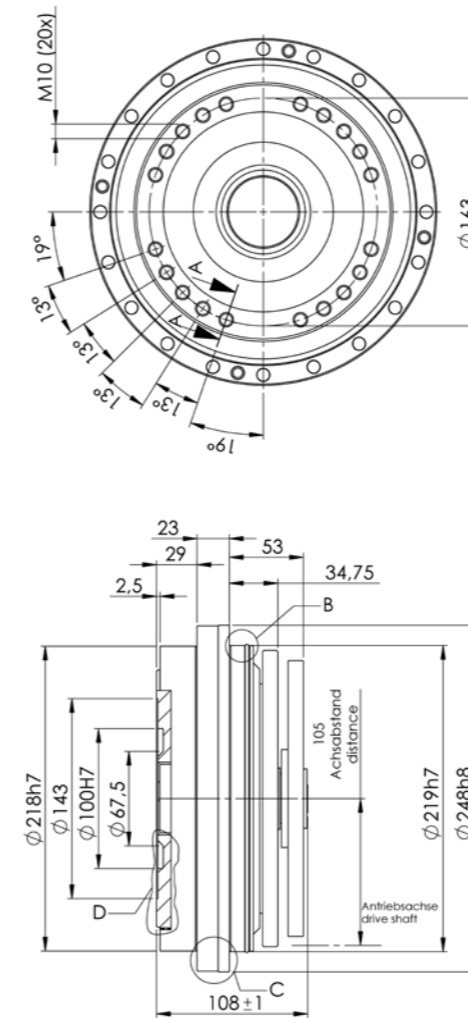
Gearbox size PSC112-V-E
(Solid shaft, sub-assembly)



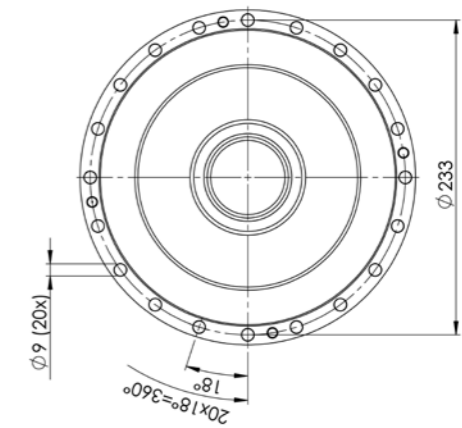
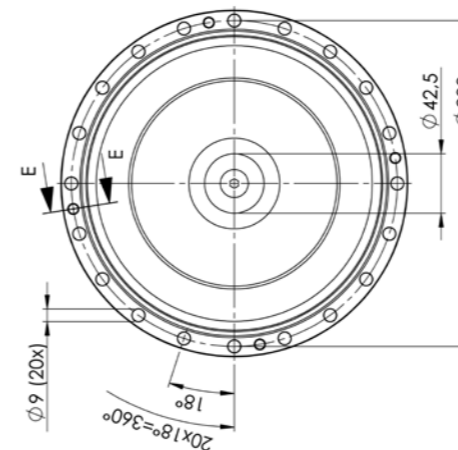
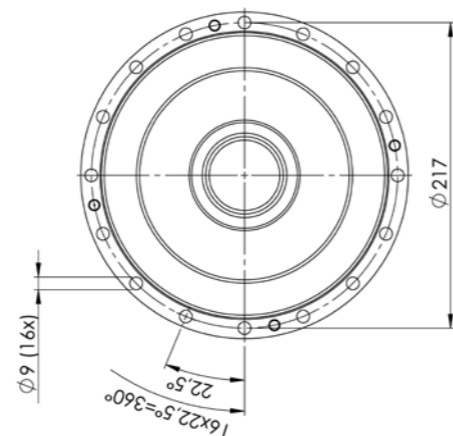
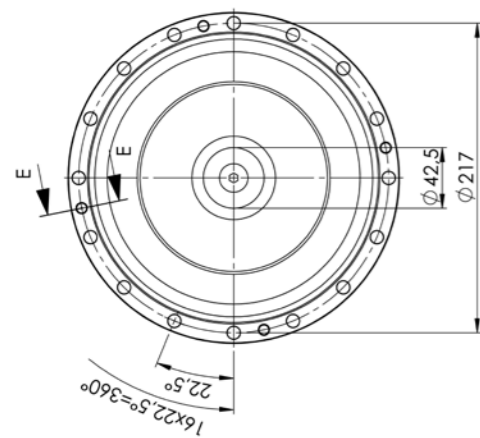
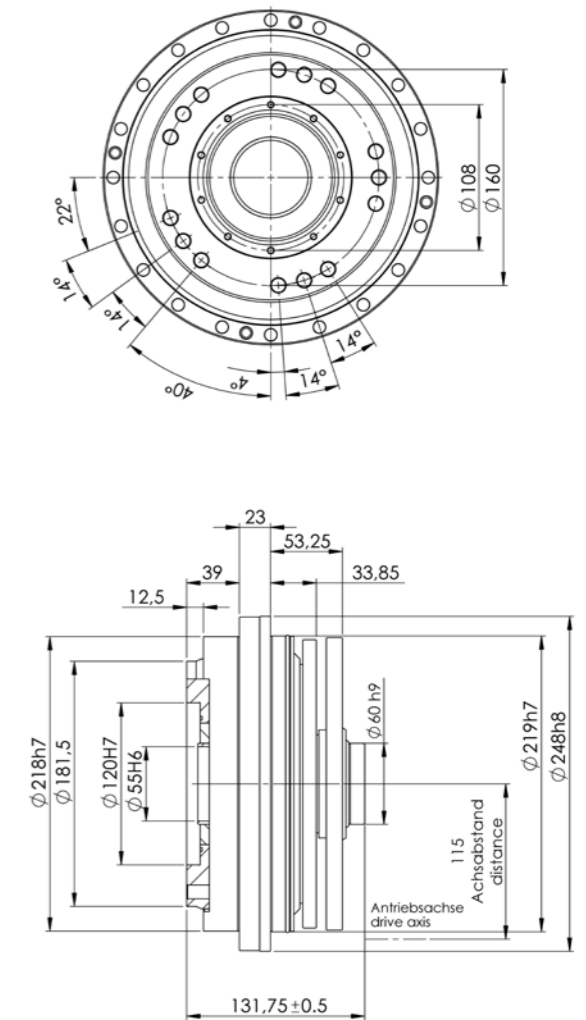
Gearbox size PSC112-H-E
(Hollow shaft, sub-assembly)



Gearbox size PSC160-V-E
(Solid shaft, sub-assembly)



Gearbox size PSC160-H-E
(Hollow shaft, sub-assembly)



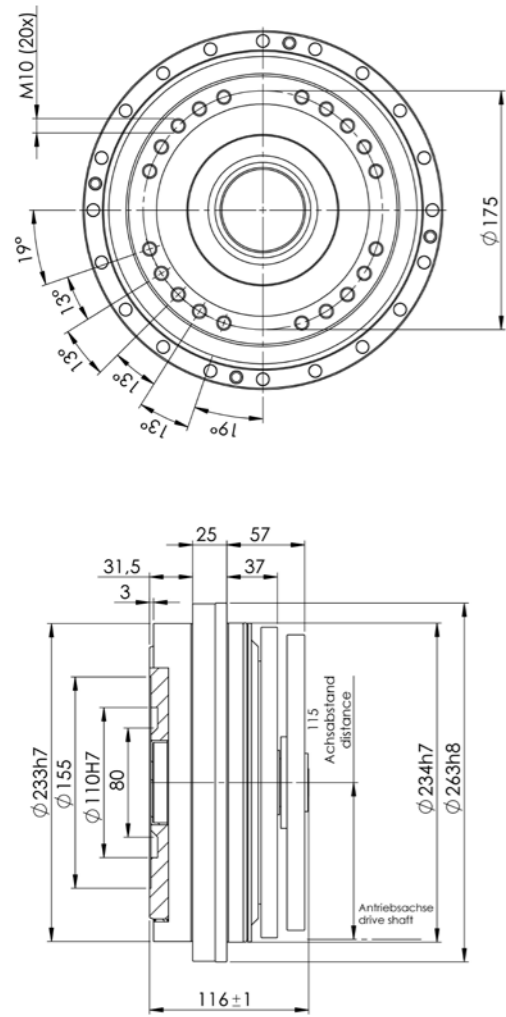
Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC112-H is reduced to 46 mm.

Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC160-H is reduced to 51 mm.

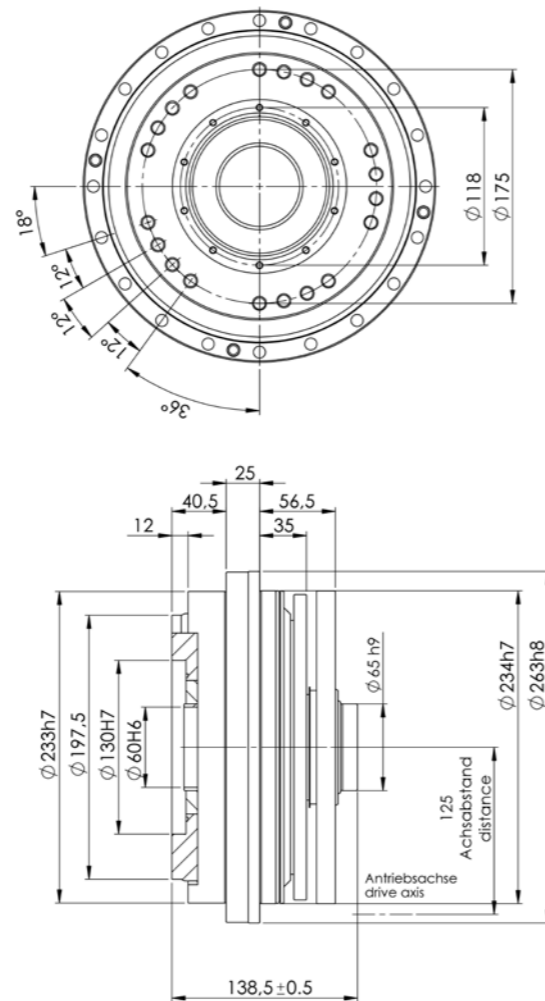
Low backlash precision gearboxes PSC

PSC sub-assembly dimensions

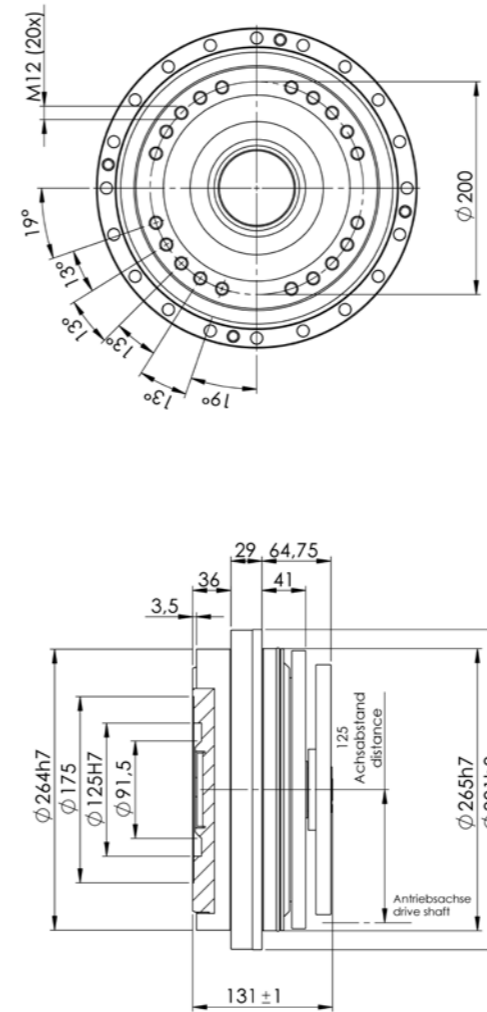
Gearbox size PSC224-V-E
(Solid shaft, sub-assembly)



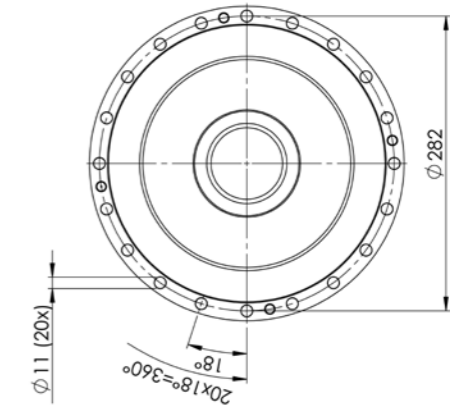
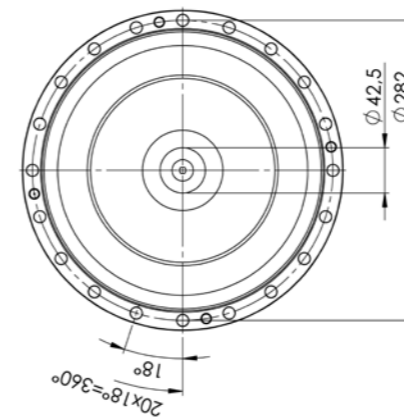
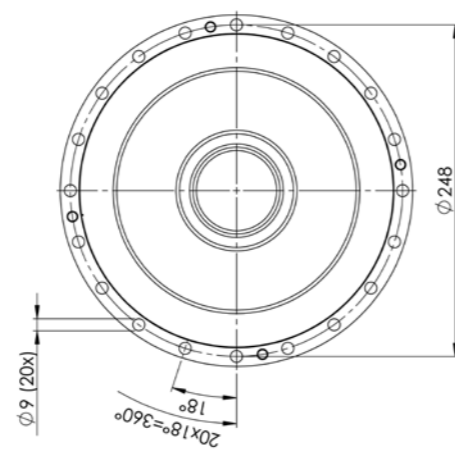
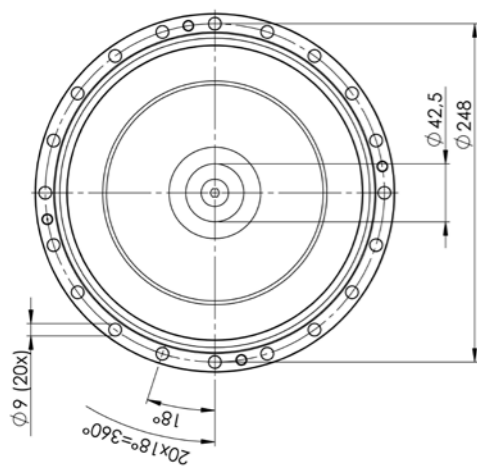
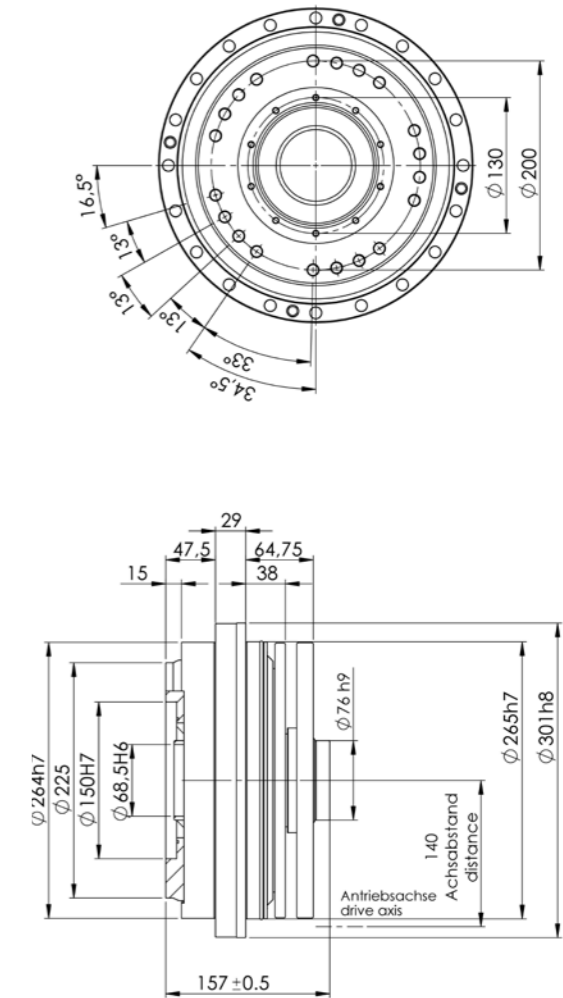
Gearbox size PSC224-H-E
(Hollow shaft, sub-assembly)



Gearbox size PSC300-V-E
(Solid shaft, sub-assembly)



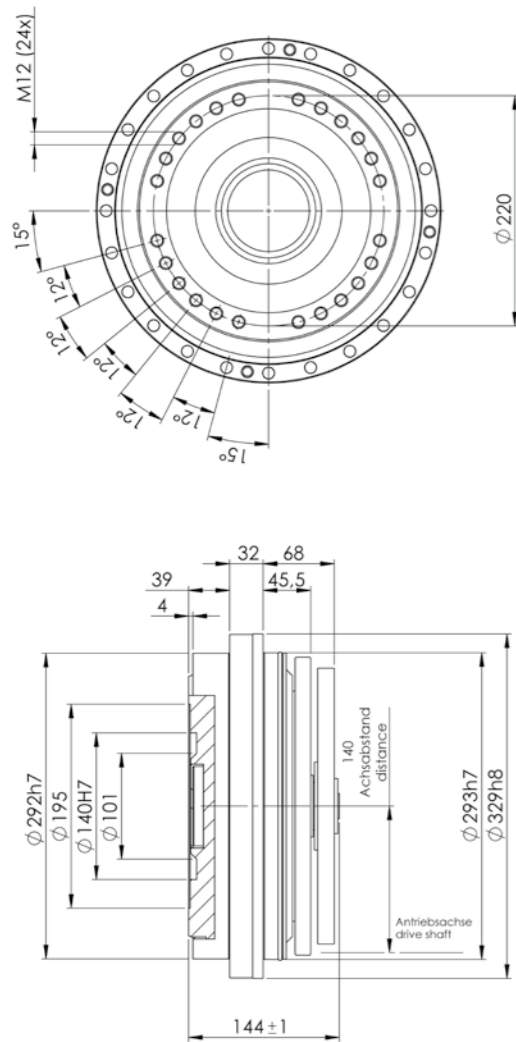
Gearbox size PSC300-H-E
(Hollow shaft, sub-assembly)



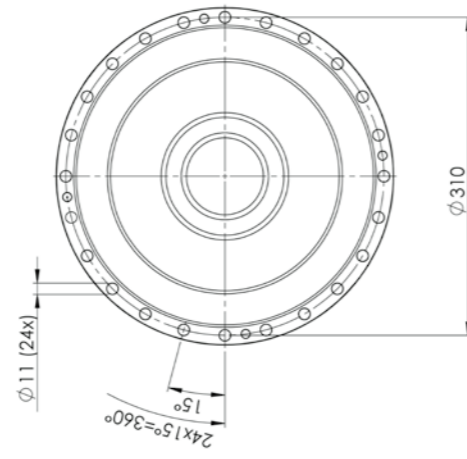
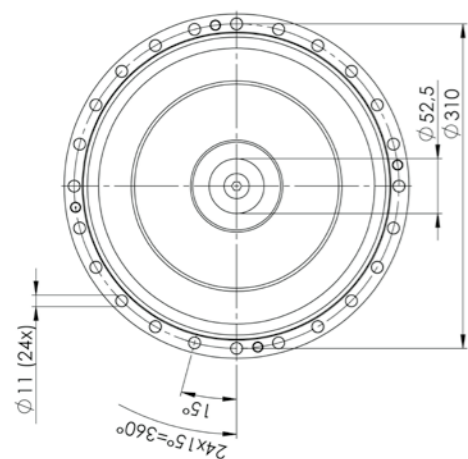
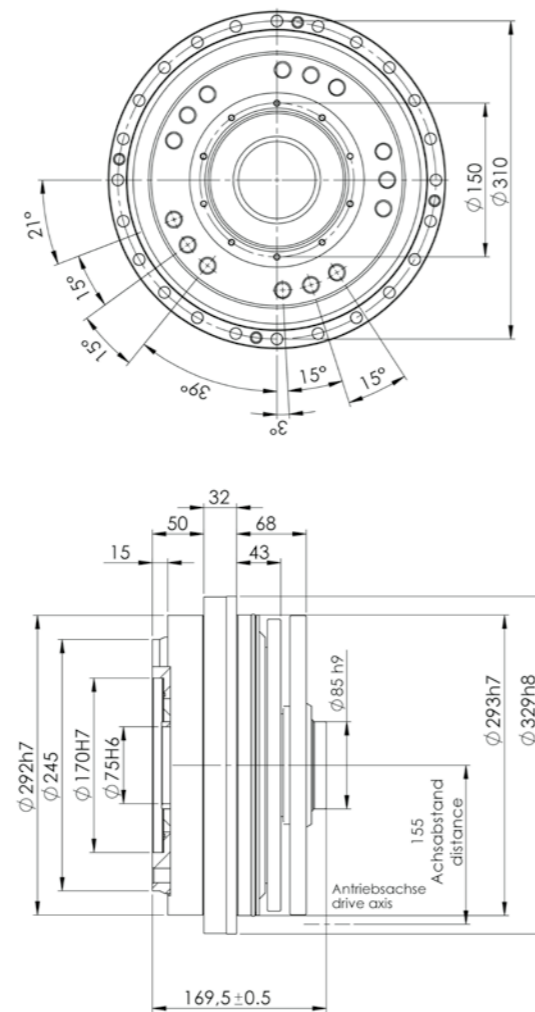
Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC224-H is reduced to 56 mm.

Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC300-H is reduced to 64,5 mm.

Gearbox size PSC400-V-E
(Solid shaft, sub-assembly)



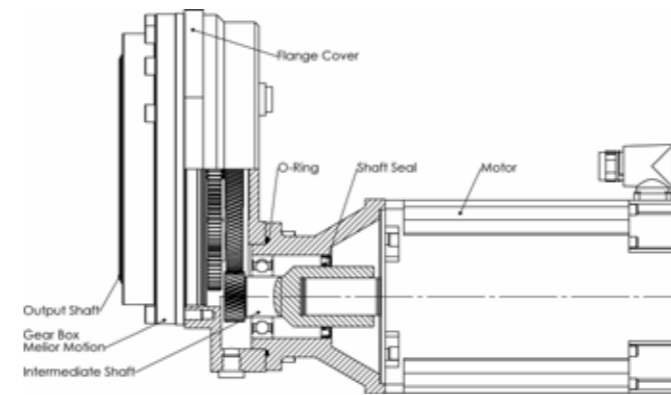
Gearbox size PSC400-H-E
(Hollow shaft, sub-assembly)



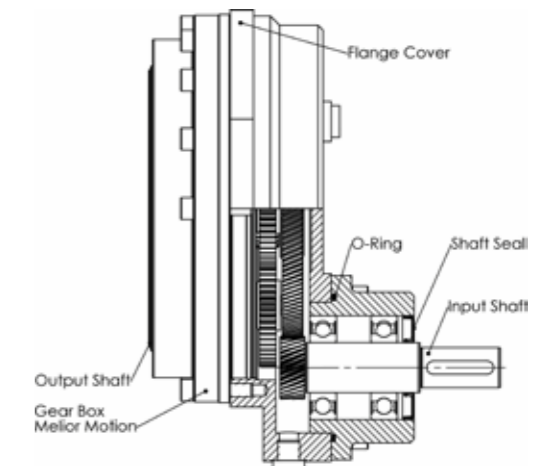
PSC fully enclosed gearbox units
Possible motor adaptations

The basic sketches below show the possible motor adaptations

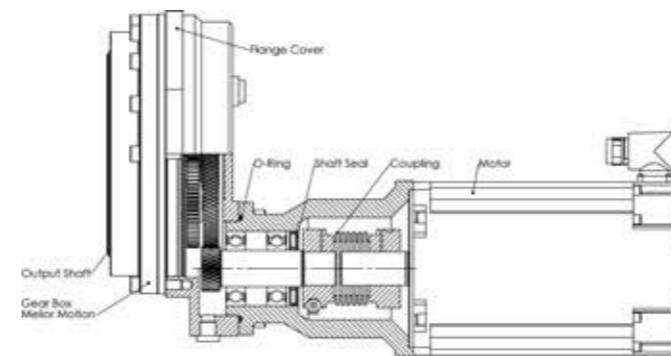
Motor adaption "1"
(plug in or slip-on pinion)



Motor adaption "2"
(free input shaft)

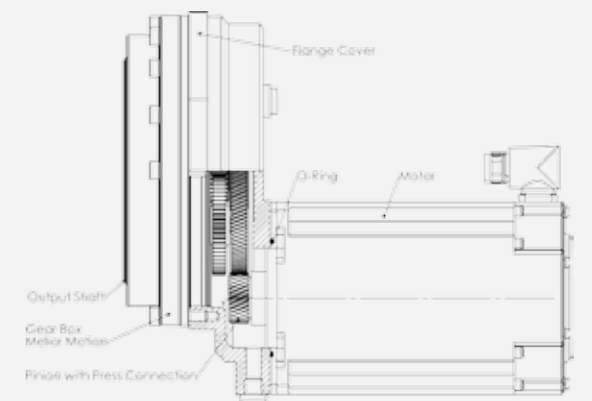


Motor adaption "0"
(with lantern and coupling)

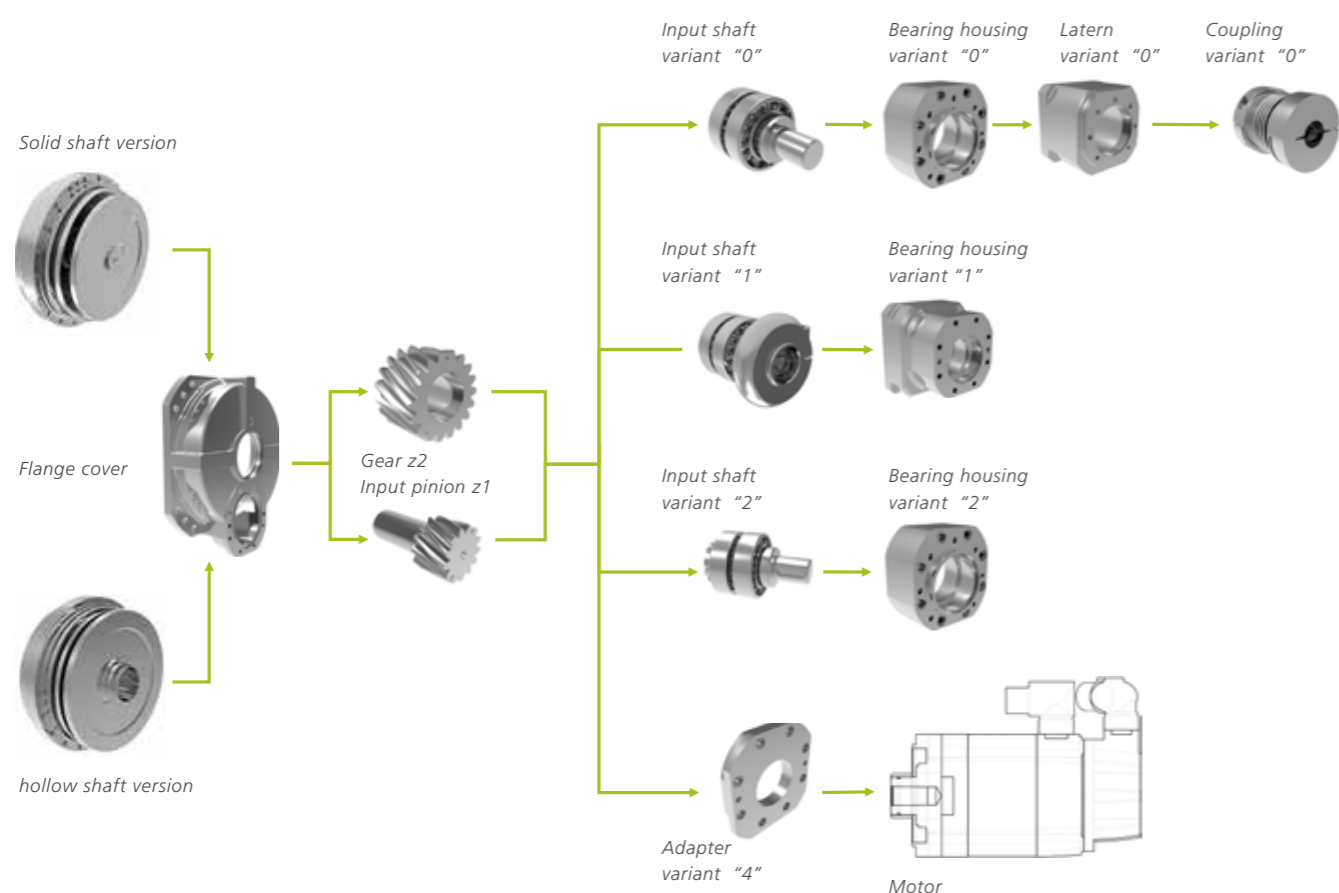


Other options on request:

- Direct motor mount = motor adaption "4"
- With additional right angle gearbox
- With splined shaft
- With clamping hub and keyway



Note: for the hollow shaft version we offer a protection sleeve on request. With protective sleeve the diameter of the hollow shaft of PSC400-H is reduced to 71 mm.



As standard the following motor shafts can be adapted:

Size motor shaft d x l [mm]	PSC056	PSC080	PSC112	PSC160	PSC224	PSC300	PSC400
11 x 23	✓	✓					
14 x 30	✓	✓					
16 x 40	✓	✓	✓	✓	✓		
19 x 40	✓	✓	✓	✓	✓		
22 x 50	✓	✓	✓	✓	✓		
24 x 50	✓	✓	✓	✓	✓		
28 x 60	✓	✓	✓	✓	✓	✓	✓
32 x 60	✓	✓	✓	✓	✓	✓	✓
35 x 60			✓	✓	✓	✓	✓
38 x 80			✓	✓	✓	✓	✓

Note: standard is smooth motor shaft. Motor shafts with keyway are not recommended. Further motor shaft dimensions are possible on request.

Gearbox dimensions for motor adaption variant "1" / solid shaft

Gearbox size	A	B	1	Ø D1	Ø D2	E	ZL*	X
PSC056-V	38.5	86.25	123.5	180	220	186	23	65.75
							30	70.75
							40	84.5
							50	95.5
							60	105.5
PSC080-V	42.5	97.5	133.5	200	240	206	30	65.75
							40	84.5
							50	95.5
							60	105.5
PSC112-V	48.75	111.75	154.75	232	282	236	40	85.25
							50	100.5
							60	110.5
							80	130.5
PSC160-V	52	117.25	164.75	248	297	254	40	85.25
							50	100.5
							60	110.5
							80	130.5
PSC224-V	56.5	126.5	174.75	263	311	269	40	85.25
							50	100.5
							60	110.5
							80	130.5
PSC300-V	65	145.75	196.75	301	330	307	60	111.5
							80	131.5
PSC400-V	71	155	211.75	329	390	335	60	111.5
							80	131.5

* ZL = length of the motor shaft

Gearbox dimensions for motor adaption variant "1" / hollow shaft

Gearbox size	A	B	1	Ø D1	Ø D2	E	F	ZL*
PSC056-H	50.8	98.55	123.5	180	220	186	23	30
							33	30
							40	30
							50	30
							60	30
PSC080-H	56.75	111.75	133.5	200	240	206	30	30
							42	30
							40	30
							50	30
							60	30
PSC112-H	58.75	121.75	154.75	232	282	236	50	40
							50	40
							60	40
							60	40
							80	40
PSC160-H	62	127.25	164.75	248	297	254	55	40
							50	40
							60	40
							60	40
							80	40
PSC224-H	65.5	135.5	174.75	263	311	254	60	40
							50	40
							60	40
							80	40
PSC300-H	76.5	157.25	196.75	301	330	307	68.5	60
							80	60
PSC400-H	82	166	211.75	329	390	335	75	60
							80	60

* ZL = length of the motor shaft; all dimensions are in mm

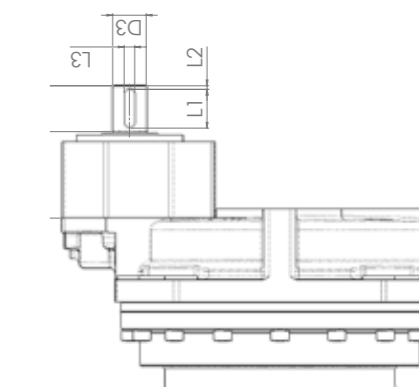
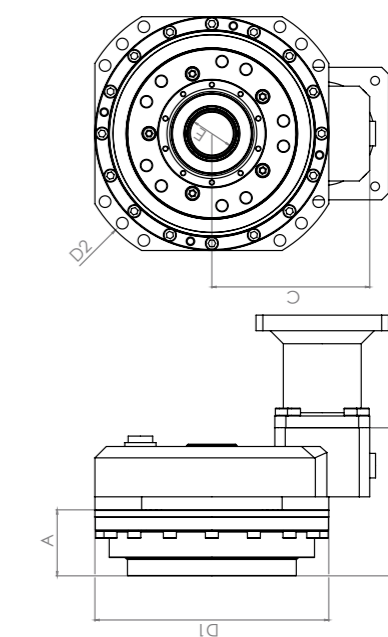
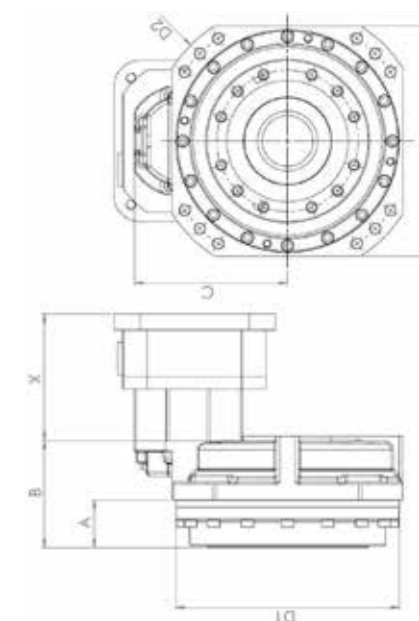
Gearbox dimensions for motor adaption variant "2" /

Identical for solid and hollow shaft

Gearbox size	Y1	Y2	L1	L2	L3/mm	Ø D3
PSC056-V/H PSC080-V/H	75	27	22	2	6	19
PSC112-V/H PSC160-V/H PSC224-V/H	90	35	30	2	8	24
PSC300-V/H PSC400-V/H	100	45	40	2	8	30

All dimensions are in mm

Dimensions for motor adaption variant "0" and others on request.



TORSIONAL STIFFNESS

The torsional stiffness is defined as the quotient of the torsional torque coming from the outside of the gearbox and the resulting twisting angle at the output. This characteristic value is given in Nm / arc min. In order to determine this parameter, the gearbox is bi-directionally loaded with a continuously increasing torque up to the nominal value while the input shaft is blocked. By using a suitable measuring sensor system, the torsion torque as well as the angle of rotation at the output flange is recorded (hysteresis curve) and the value range between 50% to 100% of the nominal load is evaluated.

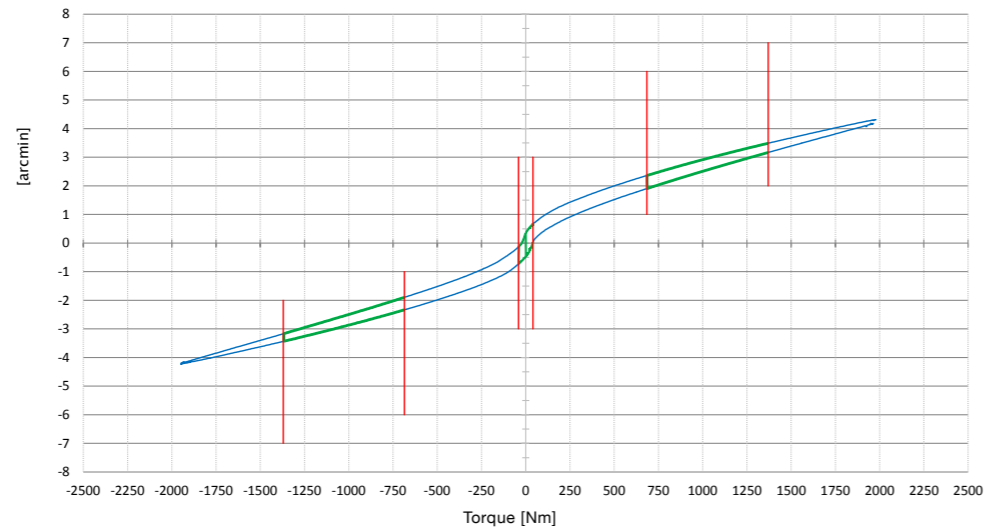


Figure: hysteresis curve on example PSC160-V – Torsional stiffness (practical test)

BACKLASH, LOST MOTION

The torsional backlash is the angle tolerance of torsion of the output shaft in relation to the input shaft at zero torque. The measurement is done when input shaft is blocked. The torsional backlash can also be seen in the hysteresis curve.

Lost Motion, also called positioning error, means the torsional angle on the output which is reached if all outer loads are removed. The measurement is taking place at +/-3% of nominal torque.

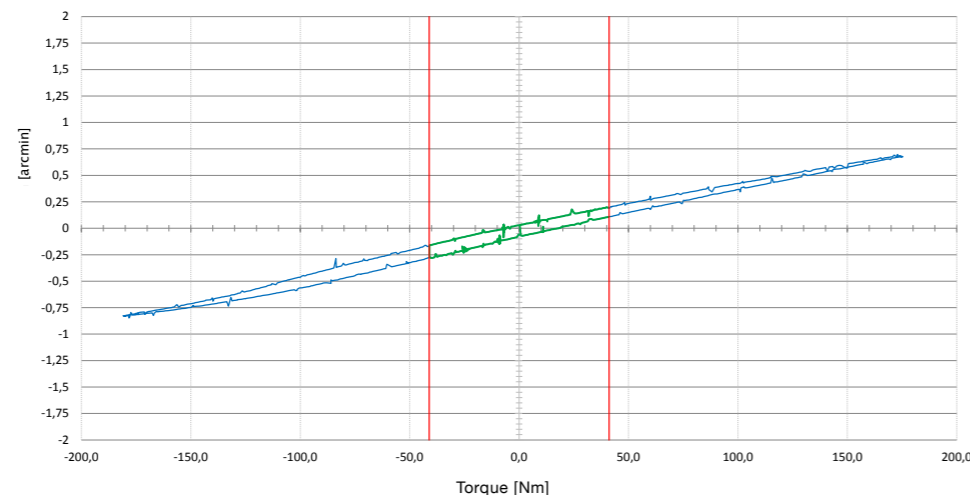


Figure: hysteresis curve on example PSC160-V – Backlash, Lost Motion (practical test)

TILTING STIFFNESS

The tilting stiffness is defined as the quotient of the bending moment resulting from external forces and the resulting tilt angle between the output and housing flange. This characteristic value is given in Nm / arc min. To determine this parameter, the gear housing is attached to a sufficiently rigid structure. The output is bi-directionally loaded with a continuously increasing bending moment up to the maximum permissible value. The output is bi-directionally loaded with a continuously increasing bending moment up to the maximum permissible value. By using a suitable measuring sensor system, the torque and the tilt at the output flange (hysteresis curve) and the entire range of values for the determination of the tilting stiffness are evaluated.

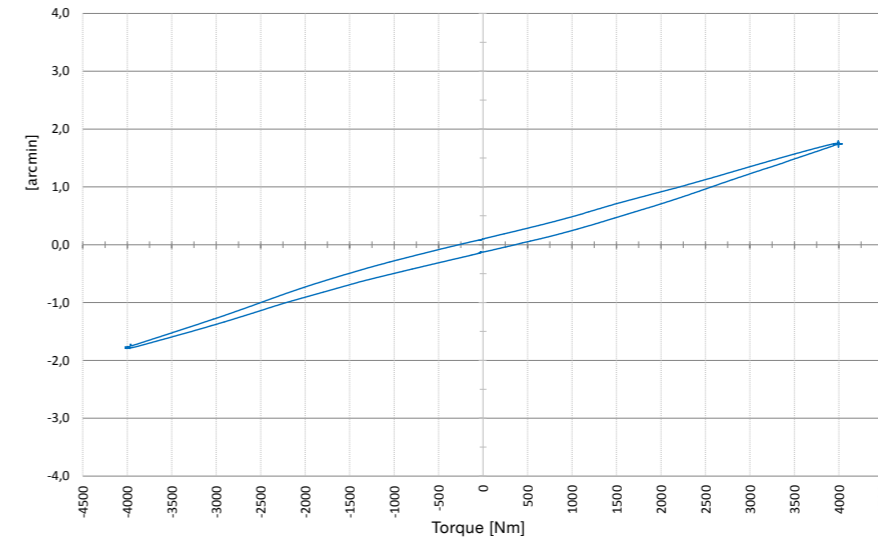


Figure: Measurement tilting stiffness on example PSC160-V (practical test)

ANGULAR TRANSMISSION ACCURACY

The angular transmission accuracy defines the maximum transmission error (maximum amplitude of the variation) of the real output rotational movement, based on the value theoretically calculated over the transmission ratio. This parameter is specified in angle seconds [arc sec]

For the determination of this parameter, the gear unit is rotated without load during drag operation. By using a suitable measuring sensor system, the input and output rotary movements are recorded. The value range over a full revolution of the output is evaluated for determining the angular transmission accuracy.

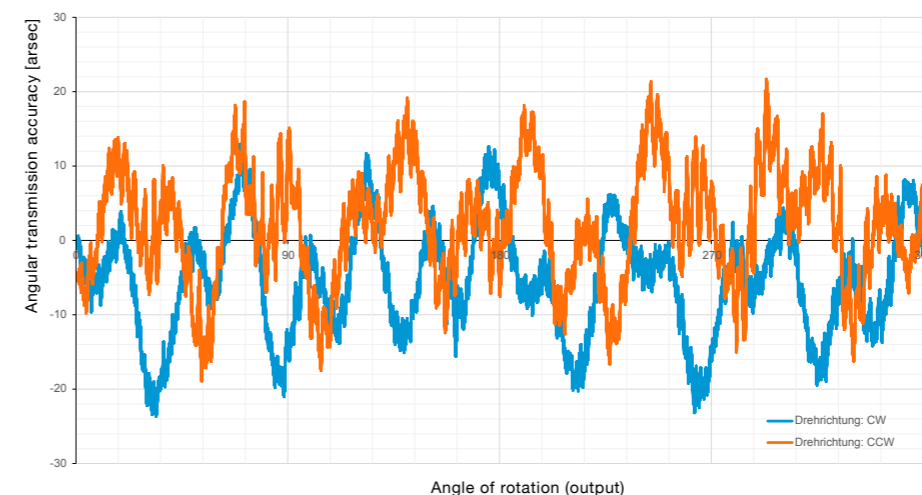
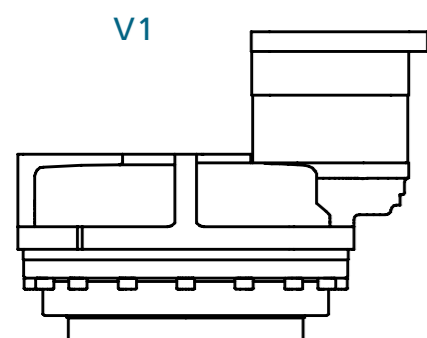


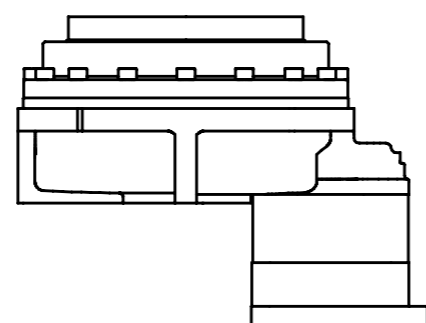
Figure: Measurement angular transmission accuracy on example PSC160-V (practical test)

Drive down, input up,
input position optional



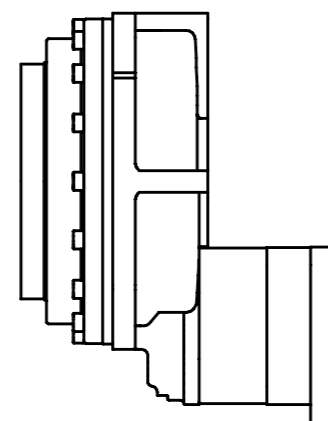
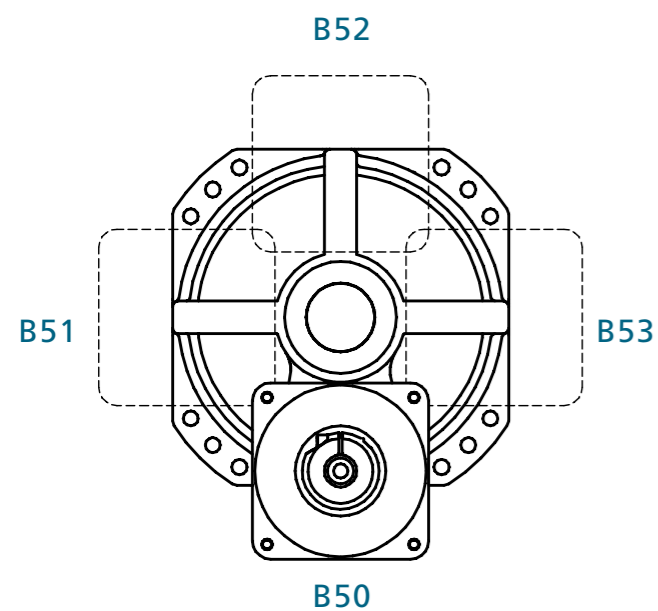
V1

Drive up, input down,
input position optional



V3

Drive horizontal,
input position optional



	PSC	112	H	E	100	1	V1	F	0
Gearbox series (PSC)									
Sizes (056 ... 400)									
Execution:									
V = solid shaft									
H = hollow shaft									
Type:									
E = gearbox sub-assembly									
B = fully enclosed gearbox with flange									
M = geared motor									
S = others									
Ratios: (35.5 ... 200)									
Input:									
0 = coupling									
1 = clamped									
2 = keyway									
3 = clamped + keyway									
4 = integral motor									
5 = input shaft									
6 = bevel gear									
7 = additional gear									
8 = splined shaft									
0 = others									
Mounting position: (V1, V3, ...) see page 26									
Output:									
F = flange (standard)									
W = shaft end (to specify)									
R = pinion on output (to specify)									
S = special (to specify)									
Others: (0,1)									

For motor adaption motor data sheet has to be provided.



The precision gearbox PSD is ideally suitable for use in Delta Robots. However, it may also be used in any other application where highest precision in combination with fast reverse movements are required.

In Delta Robot applications, varying product weights and differing pick & place distances play an important role when designing a gearbox. The challenges involve very high cycle numbers and short, highly dynamic motions in a high duty cycle. With the development of a high precision gearbox which may be used in robotics and automation industry, highly dynamic drive systems with constant precision can be offered.



The gearbox has a hollow shaft to allow a feed-through of cables. A variable motor interface allows individual motor adaption.

The precision gearbox PSD is a helical gearbox with a special tooth profile guaranteeing very low backlash, which remains on a constantly low level throughout the whole lifetime of the gearbox.

The housings are made of high-grade aluminium alloy which contributes to the low weight.

Only high quality bearings are used to secure the highest possible quality. The gearboxes can be assembled in any mounting position and are also available in solid shaft version.



Figure:
Precision gearbox PSD

PSD – TECHNICAL DATA

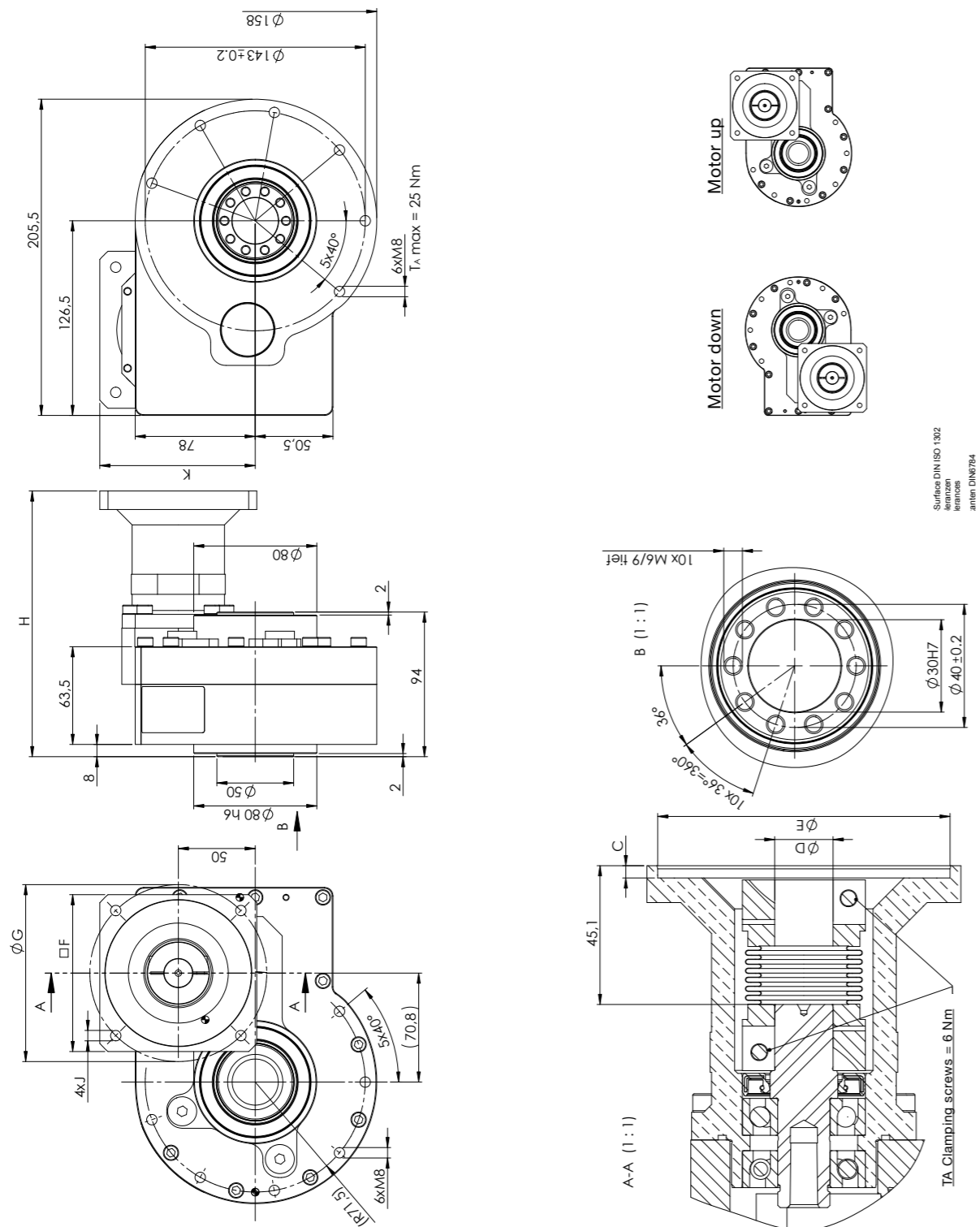
Scope of ratios		20.044 ... 51.698
Number of stages		2
Nominal torque	Nm	100
Permanent output torque (equivalent torque)	Nm	130
Acceleration torque	Nm	140
Emergency stop torque (1000 times)	Nm	400
Rated input speed	min ⁻¹	4,800
Max. input speed	min ⁻¹	6,000
Nominal speed	min ⁻¹	50
Admissible radial force (dynamic)	N	1,000
Backlash	arcmin	≤ 0.5 (at i=51,698)
Lifetime	Std.	20,000
Torsion stiffness	Nm/arcmin	42
Weight approx.	kg	7.5
Efficiency	%	>95 %
Noise level	dB(A)	68

FEATURES



YOUR BENEFIT

Very low backlash	Constant precision throughout the whole lifetime of the gearbox
Compact design	Smarter periphery design
Low noise level	Reduced noise exposure at workplaces
Low friction	Higher energy efficiency
High stiffness	Allows positioning straight-to-the-point
High efficiency	Use of motors/systems with less energy consumption
Gearbox with hollow shaft	With hollow shaft allowing a feed-through of cables
Motor adaption via lantern and coupling	Easy motor adaption for all standard servo motors
Special tooth profile allows fast reverse movements	S1 duty cycle is possible
Lifetime lubrication	Maintenance-free



Note: Dimensions C-K depend on the servo motor which is being used

Melior Motion offers an unlimited range of tailored solutions especially designed for your application. From complete custom-made gear units to modification of standard gear units to optimize your equipment, we develop and manufacture precision gearboxes based on planetary, helical or bevel gear configurations.

Some examples are shown below:

SP191 – Robotic gearbox

Dimensions:	custom-made
hollow shaft:	80 mm
Backlash:	≤ 0.1 arcmin
Ratio:	100 / 130:1
Torque:	$M_{\text{max}} = 2000 \text{ Nm}$



SP244 – gearbox for linear axis

Dimensions:	custom-made
Backlash:	< 4 arcmin
Ratio:	10:1
Torque:	$M_{\text{max}} = 800 \text{ Nm}$
Special feature:	with output pinion for rack and pinion applications



SP224 – Positioning gearbox

Dimensions:	custom-made
Backlash:	< 0.1 arcmin
Ratio:	up to 130:1
hollow shaft:	up to 95 mm dia.
Positioning accuracy:	$\pm 0.03 \text{ mm}$





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