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Standard gear drives for small and medium volume production based on the modular system

Planetary Gears IMS.baseline

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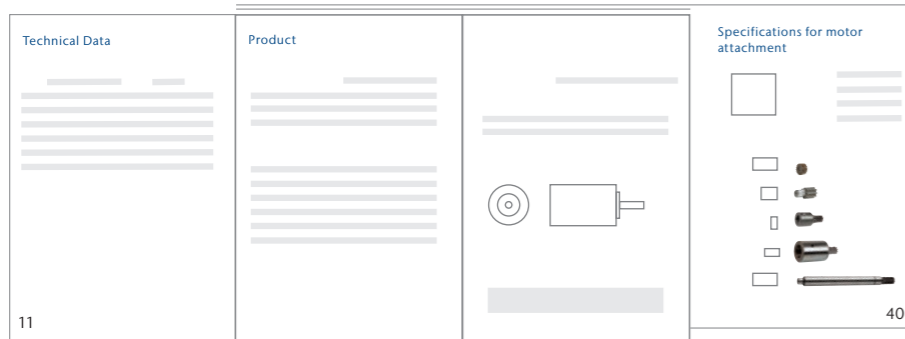
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Specifications for motor attachment

The IMS.baseline catalogue has two fold-out pages with additional information to the single planetary gears - so you have all the relevant information at a glance.



Please refer to the fold-out page (page 11) on the left, technical data overview.

For information about the single planetary gears, please refer to the product pages (from page 12):

- Gear dimensions
- Parameter
- Reduction ratios
- Dimensions motor flange
- etc.

Please refer to the fold-out page (page 40) on the right, for specifications regarding the motor attachment.

! This catalogue and its limits. Our modular system provides more than 10,000 variants. Because of this immense variety, we are only able to introduce some selected gears in this catalogue. If the planetary gear you are looking for should not be mentioned, please contact us. We are happy to help.

PK 52



Technical features

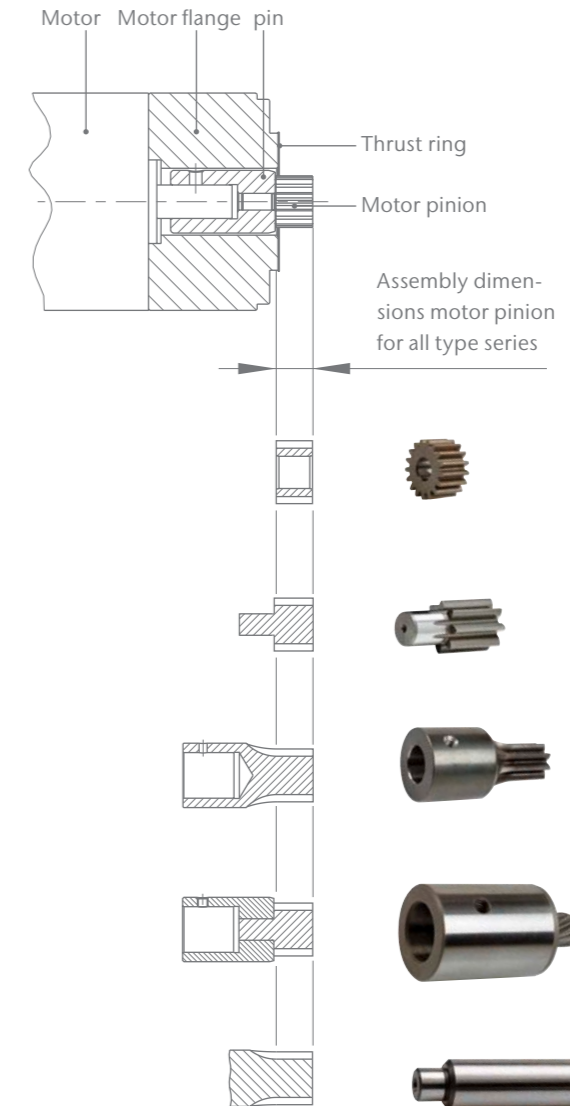
- 2-stage
- 25:1
- 5 Nm*

PM 105



Technical features

- 1-stage
- 7:1
- 35 Nm*



Size	Assembly dimension in mm
PM/PK 22	4.7 - 0.3
PM/PK 32/LN	6.1 - 0.4
PM/PK 42/LN	8.0 + 0.3
PM/PK 52/LN	8.0 + 0.3
PM 62/LN	10.4 - 0.3
PM 72/LN	12.1 - 0.3
PM 81/LN	13.5 + 0.15/-0.25
PM 105/LN	18.3 - 0.3
PM 120	19.4 + 0.2/-0.3

Our Planetary gears catalogue and what you'll find in it

Page	BASIC INFORMATION
2	Philosophy
3	Always the optimum - Modification options and quantity structures
4	Interaction - Overview planetary gears
6	The modular system and it's possibilities
8	First steps for planetary gear selection
10	Summary of torque ranges
11	Technical data overview
	OUR TYPE SERIES
	metal (PM), plastic (PK) and Low Noise (LN)
12	Ø 22 mm PK 0.2 - 0.6 Nm
14	Ø 32 mm PK 0.4 - 2.0 Nm
16	Ø 42 mm PK 0.8 - 4.0 Nm
18	Ø 52 mm PK 2.0 - 10.0 Nm
20	Ø 22 mm PM 0.6 - 0.8 Nm
22	Ø 32 mm PM/LN 0.8 - 4.5 Nm
24	Ø 42 mm PM/LN 3.0 - 15.0 Nm
26	Ø 52 mm PM/LN 4.0 - 25.0 Nm
28	Ø 62 mm PM/LN 8.0 - 50.0 Nm
30	Ø 72 mm PM/LN 14.0 - 84.0 Nm
32	Ø 81 mm PM/LN 20.0 - 120.0 Nm
34	Ø 105 mm PM/LN 35.0 - 195.0 Nm
36	Ø 120 mm PM 50.0 - 300.0 Nm
38	Examples of configuration
40	Specifications for motor attachment



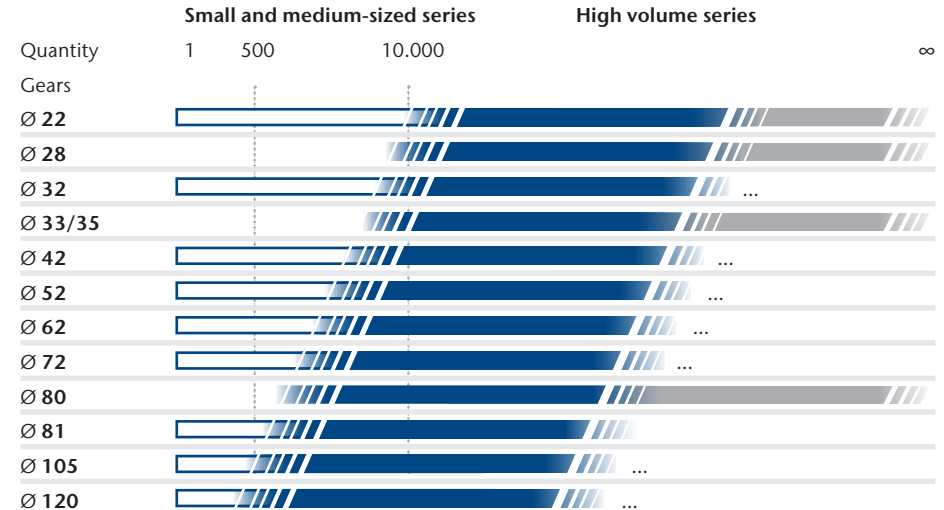
Always the optimum

	IMS.baseline	IMS.techline	IMS.SDline
MODIFICATION OPTIONS	-/✓		
Motor-/output end	✓	✓	✓
Geardrive diameter	—	✓	✓
Material mix	—	✓	✓
Reduction ratio	—	✓	✓
Geometry of toothed parts	—	—	✓
Material of toothed parts	—	—	✓
Tooth shape	—	—	—

Philosophy

Planetary Gears from IMS.baseline are the solution for **small and medium production runs** as well as **samples**. This product line is characterized by **tremendous diversity** and **fast availability**.

IMS.baseline offers a broad range of different diameters, materials and reduction ratios as well as adapter options to suit different motor and output configurations. In excess of 1,800 variants provide solutions for virtually all problem scenarios. The high level of value added specific to IMS Gear products assures fast delivery capability and an optimum price-performance ratio.



All figures are approximate values. Variations are possible and may arise for example due to non-standardized inspection and measurement methods. For more detailed information, please contact us directly. The company always reserves the right to make technical modifications. For current status, please consult our website www.ims-gear.com

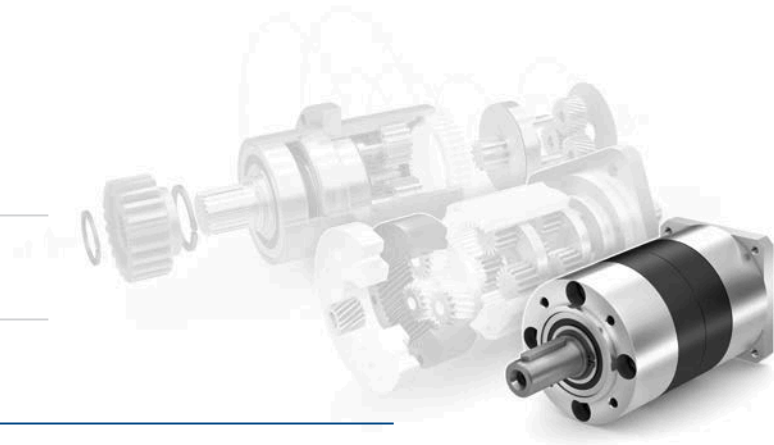
Interaction

Fast availability and highly adaptable

IMS.SDline

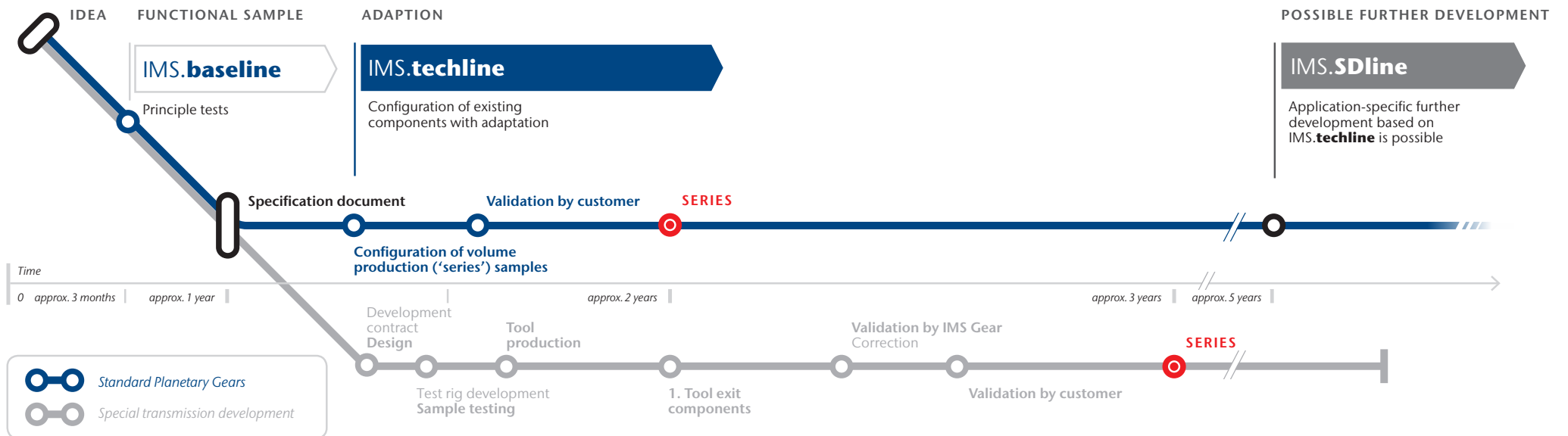
IMS.techline

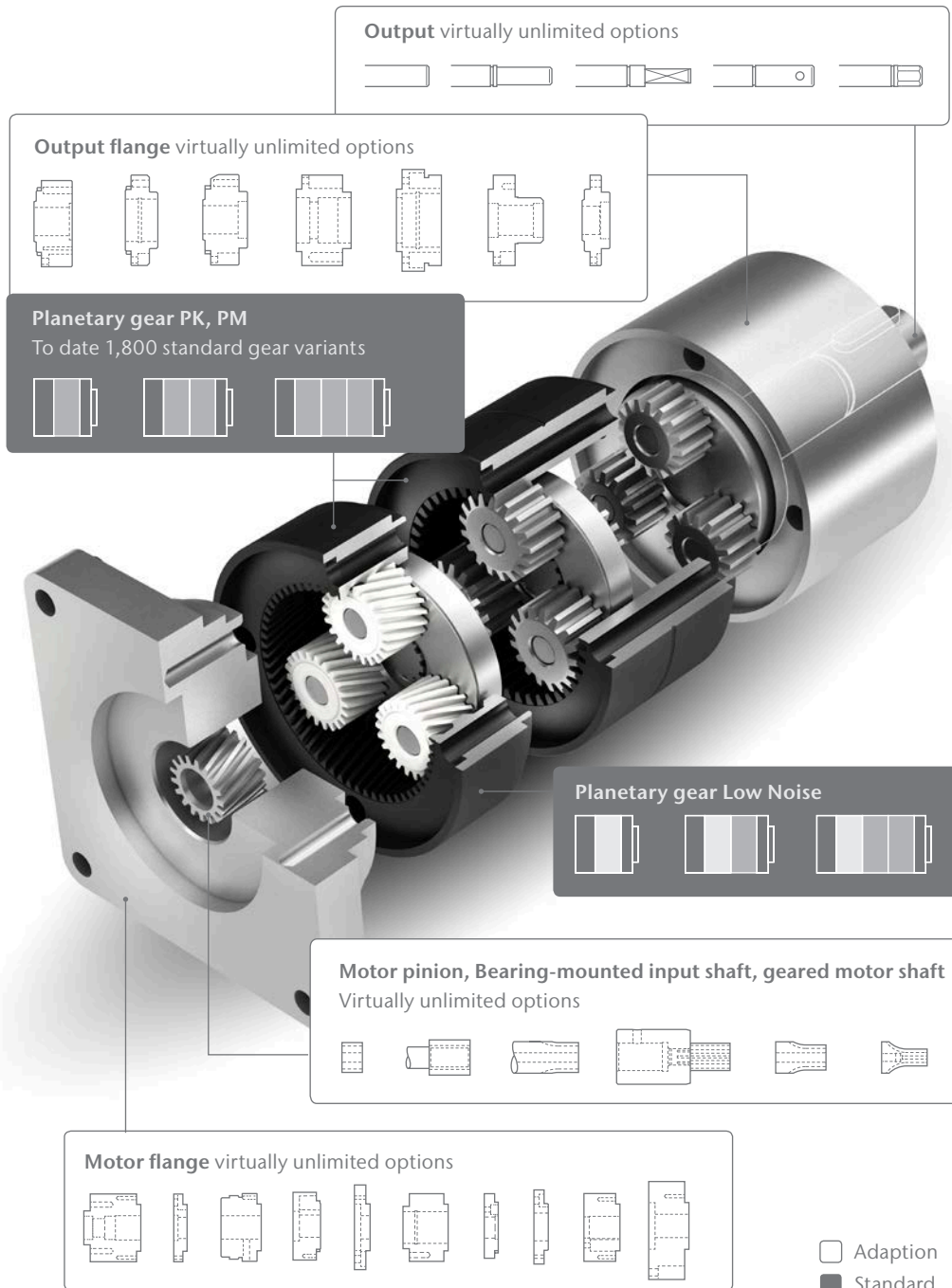
IMS.baseline



PLANETARY GEARS FROM IMS.BASELINE constitute a fast and adaptable solution from a modular design concept, beginning with validation of the first idea all the way through to principle tests and function samples.

The results can then be implemented in a short production run or a specification document or the creation of near-production sample components.





The modular system and it's options

MOTOR PINION ADAPTION

Our planetary gears are designed for connecting any current type of motor, using three different modes: with different motor pinions in various designs or by bearing-mounted input shaft. With appropriate quantities and after consultations with the motor manufacturer, the motor shaft can also be intermeshed directly. With an adapted motor mounting plate, the motor can then be connected to the annular wheel without any additional motor flange, allowing shorter and more cost-effective gearing assemblies.

MOTOR FLANGE ADAPTION

Flanges are available in plastic, die cast zinc or aluminium, adapted individually depending on the requirements. For larger quantities you can also obtain toolspecific special flanges, e.g. made of plastic or die cast zinc. Type series PM 52 to PM 120 are also available with standard DIN 42948 flanges.

PLANETARY GEARS LOW NOISE STANDARD

The Low Noise modules for the first stage feature a well-attuned combination of module, number of teeth, helical angle, gearing width and choice of material, guaranteeing ultimate smooth running and high torque stability. The external dimensions and reductions, identical to those of the straight-toothed gears and differing only in microns, allow easy replacement

in most cases.

PLANETARY GEARS PK, PM STANDARD

Nine different diameters with as many as three (even four on request) gear stages and a wide variety of reduction ratios ranging from 3.7:1 to 601:1 are available in plastic, metal or material mix versions with output torques ranging from 0.2 to 300 Nm. Although this results in an immense variety of options, we describe our planetary gears (PLGs) as standard gears, which can be manufactured in high-volume production and therefore cost-effective.

OUTPUT FLANGE ADAPTION

The output flange includes the bearing. Sintered metal bearings or ball bearings can be selected to match the operating requirements. Gearboxes with two RS seals in the ball bearing of the output shaft are protection class IP 53, whereas with two Z cover disks they are protection class IP 42. Sintered metal versions are protection class IP 00. Higher protection classes can be implemented by applying specific seals.

OUTPUT ADAPTION

The planet carrier of the last stage and the output shaft are manufactured in one piece without any additional assembly effort. Depending on the machine to be driven, the output shaft can be designed in any customer specific layout.

Please refer the brochure plg.technology for additional information.

First steps for planetary gear selection

The **T_{AB} output torque** is one of the first important variables when selecting the most suitable PLG.

The maximum **output torque T_{AB}** is calculated from the **Nominal output torque T_N** multiplied with the **operating factor C_B**.

$$T_{AB} = T_N * C_B$$

C_B is a factor which addresses the different working conditions of a PLG and needs to be selected by you to suit your individual application. All figures in this catalogue refer to **C_B = 1**, this means: constant direction of rotation, no shocks, daily operating time of 3 hours. (Details C_B-values refer to page 9.)

For PM gears the 1.5 times T_{AB} is temporary possible, but needs to be checked application-specific.

The **Nominal output torque T_N** is calculated from the **Motor torque T_M** multiplied with the desired reduction ratio **i**

- 1-stage** 4:1 bis 13:1
- 2-stage** 14:1 bis 89:1
- 3-stage** 51:1 bis 601:1

and the respective **gear efficiency η**.

For the available **reduction ratios i** and details of the **gear efficiency η**, please refer to the appropriate type series in this catalogue.

$$T_N = T_M * i * \eta$$

- i** = Reduction ratio
- T_{AB}** = Output torque
- T_N** = Nominal output torque
- T_M** = Motor torque
- η** = Gear efficiency
- C_B** = Operating factor

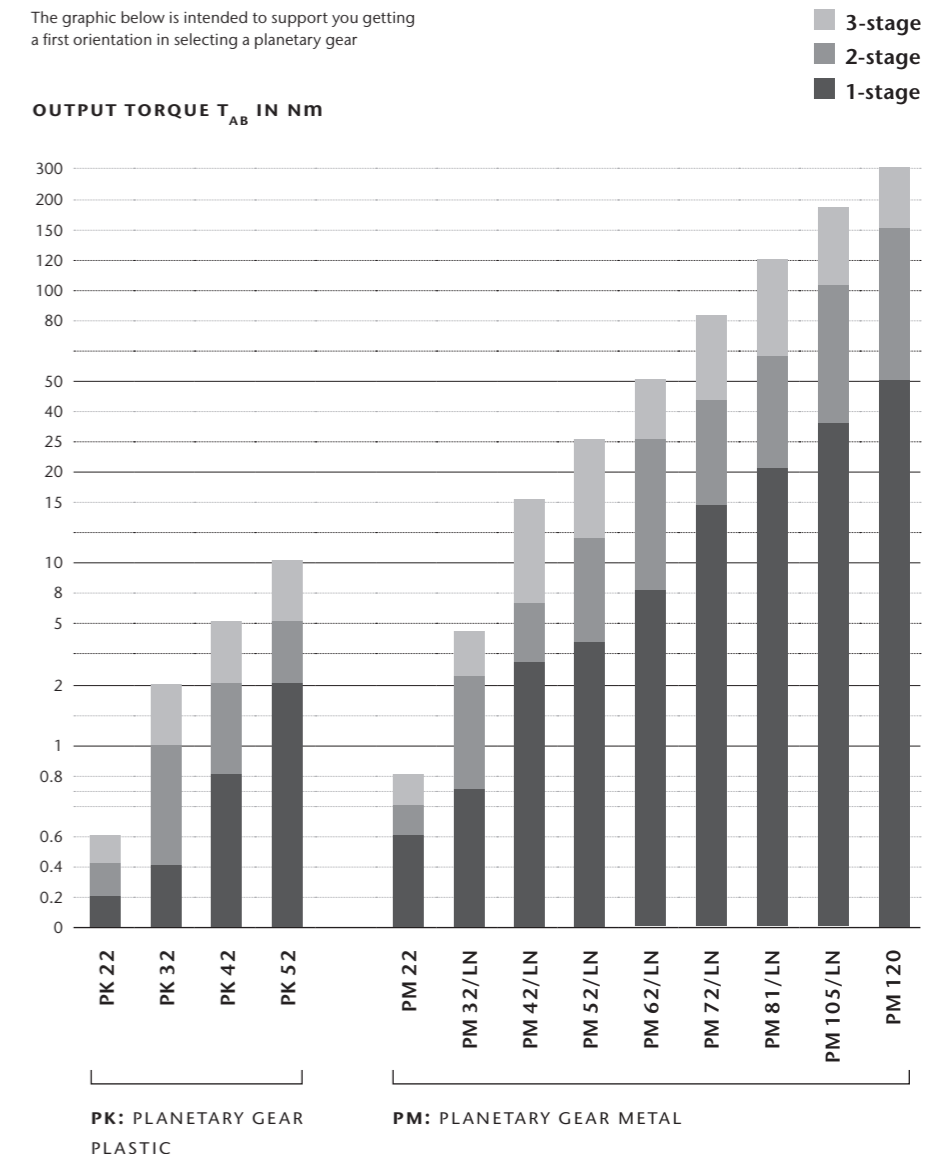
Determining the operating factor C_B

Direction of rotation	Load (shocks)	Daily operating time		
		3h	8h	24h
constant	none	C _B = 1.0	C _B = 1.1	C _B = 1.3
	medium	C _B = 1.2	C _B = 1.3	C _B = 1.5
	strong	C _B = 1.4	C _B = 1.5	C _B = 1.8
alternating	none	C _B = 1.3	C _B = 1.4	C _B = 1.6
	medium	C _B = 1.6	C _B = 1.7	C _B = 1.9
	strong	C _B = 1.9	C _B = 2.0	C _B = 2.2

Summary of torque ranges

The graphic below is intended to support you getting a first orientation in selecting a planetary gear

OUTPUT TORQUE T_{AB} IN Nm



Technical data overview

For details regarding the type series please refer to the product pages.

	Permitted output torque* (Operating factor C _B = 1.0)			Recommended input speed	Radial loading (10 mm from flange)*	Max. axial loading*
	1-stage	2-stage	3-stage			
PK 22	0.2 Nm	0.4 Nm	0.6 Nm	6,000 U/min	15 - 45 N	30 N
PM 22	0.6 Nm	0.7 Nm	0.8 Nm	6,000 U/min	25 - 50 N	10 - 15 N
PK 32	0.4 Nm	1.0 Nm	2.0 Nm	3,000 U/min	15 - 45 N	5 - 15 N
PM 32/LN	0.75 Nm	2.25 Nm	4.5 Nm	3,000 U/min	40 - 100 N	10 - 30 N
PK 42	0.8 Nm	2.0 Nm	4.0 Nm	3,000 U/min	15 - 45 N	5 - 30 N
PM 42/LN	3.0 Nm	7.5 Nm	15.0 Nm	3,000 U/min	160 - 300 N	50 - 110 N
PK 52	2.0 Nm	5.0 Nm	10.0 Nm	3,000 U/min	200 - 450 N	60 - 150 N
PM 52/LN	4.0 Nm	12.0 Nm	25.0 Nm	3,000 U/min	200 - 450 N	60 - 150 N
PM 62/LN	8.0 Nm	25.0 Nm	50.0 Nm	3,000 U/min	240 - 520 N	70 - 150 N
PM 72/LN	14.0 Nm	42.0 Nm	84.0 Nm	3,000 U/min	320 - 760 N	70 - 160 N
PM 81/LN	20.0 Nm	60.0 Nm	120.0 Nm	3,000 U/min	400 - 1,000 N	80 - 200 N
PM 105/LN	35.0 Nm	105.0 Nm	195.0 Nm	3,000 U/min	600 - 1,500 N	120 - 300 N
PM 120	50.0 Nm	150.0 Nm	300.0 Nm	3,000 U/min	600 - 1,500 N	120 - 300 N

* Greater performance capability regarding axial or radial load as well as output torque may be available and feasible on request.

PK: Planetary Gear plastic PM: Planetary Gear metal LN: Low Noise

C_B = 1.0: constant direction of rotation, no shock load, daily operating time of 3 hours

Diameter: equates to designation, e.g. PK 22 with Ø22

Operating temperature: On PK Gears -15° C to +65° C; with PM/LN Gears -30° C to +120° C

Type of bearing on output end: Sinter bearings on PK Gears and ball bearings on PM/LN Gears; PK52 is an exception, equipped with ball bearing

Please refer the brochure plg.technology for additional information.

PK 22 Ø22 mm, plastic

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor (C _B = 1.0)	0.2 Nm	0.4 Nm	0.6 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	1.50 °DEG	2.00 °DEG	2.50 °DEG
Recommended initial speed	6,000 U/min	6,000 U/min	6,000 U/min
Min. Operating temperature	-15 °C	-15 °C	-15 °C
Max. Operating temperature	+65 °C	+65 °C	+65 °C

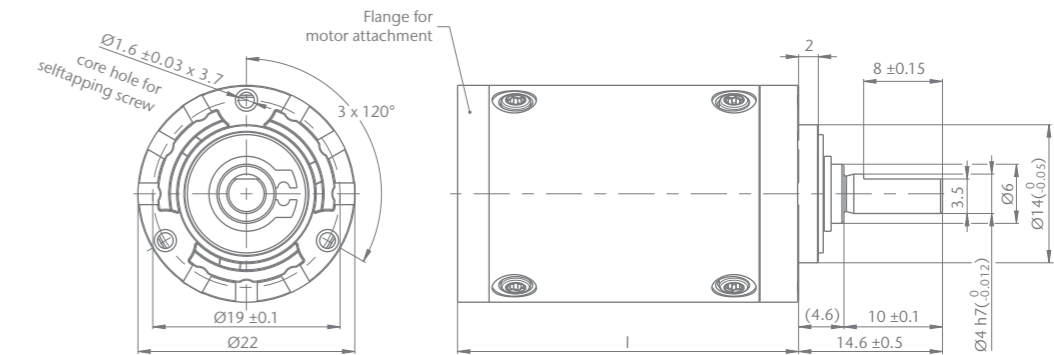
Current reduction ratios i rounded

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with sintered metal bearing	1-stage	2-stage	3-stage
Max. load, radial (10mm from flange)	15 N	30 N	45 N
Max. load, axial	30 N	30 N	30 N
Max. perm.fitting pressure	150 N	150 N	150 N
Weight approx.	33 g	42 g	50 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	24.25 ± 0.5	32.4 ± 0.5	40.6 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.
 Variations are possible and may arise for example due to non-standardized inspection and measurement methods. For more detailed information, please contact us directly. The company always reserves the right to make technical modifications. For current status, please consult www.ims-gear.com

PK 32 Ø 32 mm, plastic

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	0.4 Nm	1.0 Nm	2.0 Nm
Gearbox efficiency. approx.	0.75	0.70	0.65
Max. backlash	1.90 °DEG	1.95 °DEG	2.00 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-15 °C	-15 °C	-15 °C
Max. Operating temperature	+65 °C	+65 °C	+65 °C

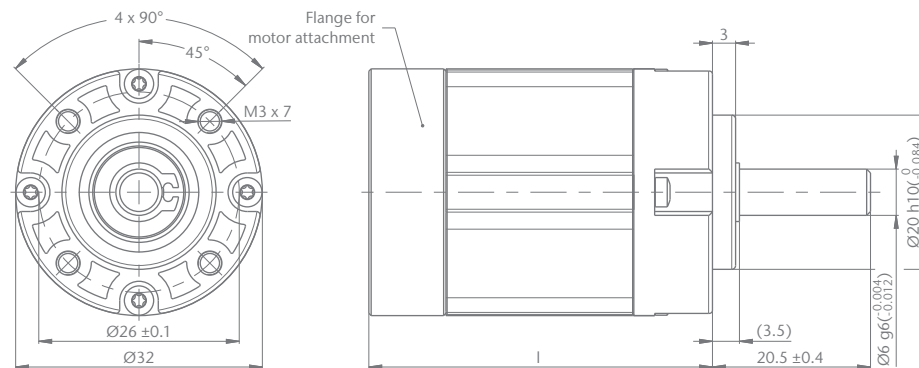
Current reduction ratios i rounded

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with sintered metal bearing	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	15 N	30 N	45 N
Max. load, axial	5 N	10 N	15 N
Max. perm.fitting pressure	150 N	150 N	150 N
Weight approx.	100 g	115 g	130 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	29.6 ± 0.5	39.1 ± 0.5	48.6 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PK 42 Ø 42 mm, plastic

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1,0$)	0.8 Nm	2.0 Nm	4.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	1.70 °DEG	1.75 °DEG	1.80 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-15 °C	-15 °C	-15 °C
Max. Operating temperature	+65 °C	+65 °C	+65 °C

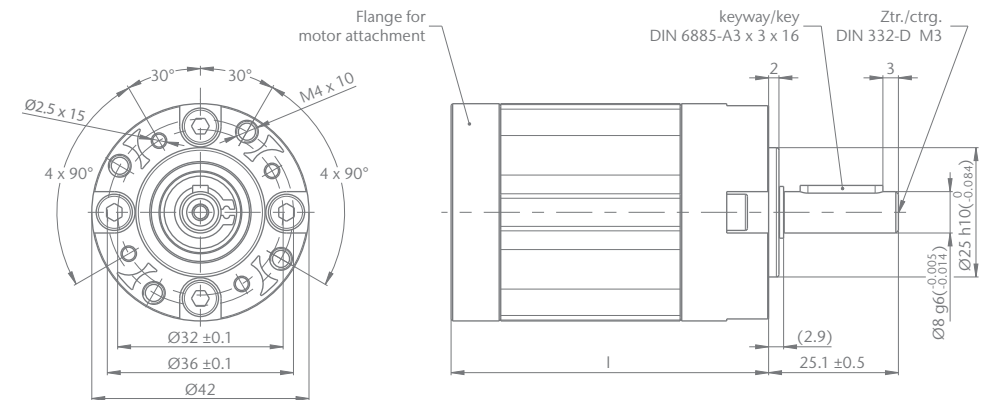
Current reduction ratios i rounded

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with sintered metal bearing	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	15 N	30 N	45 N
Max. load, axial	5 N	10 N	30 N
Max. perm.fitting pressure	150 N	150 N	150 N
Weight approx.	150 g	180 g	215 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	48.7	61.7	74.7

* The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PK 52 Ø 52 mm, plastic

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	2.0 Nm	5.0 Nm	10.0 Nm
Gearbox efficiency. approx.	0.75	0.70	0.65
Max. backlash	1.10 °DEG	1.15 °DEG	1.20 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-15 °C	-15 °C	-15 °C
Max. Operating temperature	+65 °C	+65 °C	+65 °C

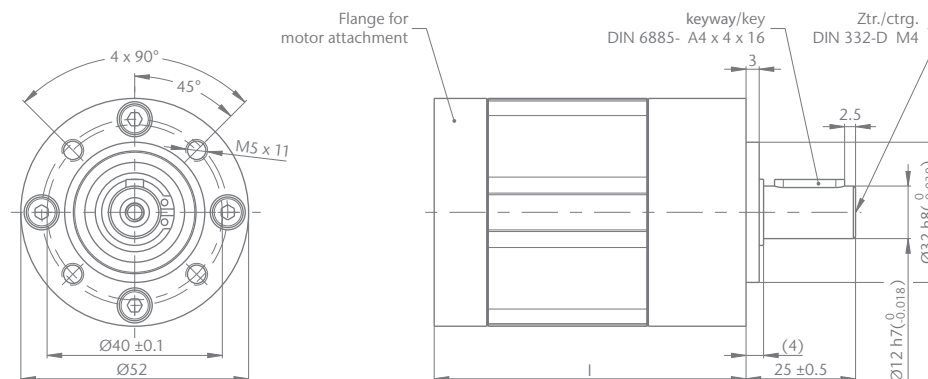
Current reduction ratios i rounded

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	200 N	320 N	450 N
Max. load, axial	60 N	100 N	150 N
Max. perm.fitting pressure	500 N	500 N	500 N
Weight approx.	335 g	395 g	460 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	54.8 ± 0.5	69.2 ± 0.5	83.65 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.

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PM 22 $\varnothing 22$ mm, Metall

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1,0$)	0.6 Nm	0.7 Nm	0.8 Nm
Gearbox efficiency, approx.	0.90	0.80	0.70
Max. backlash	1.5 °DEG	2.0 °DEG	2.5 °DEG
Recommended initial speed	6,000 U/min	6,000 U/min	6,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

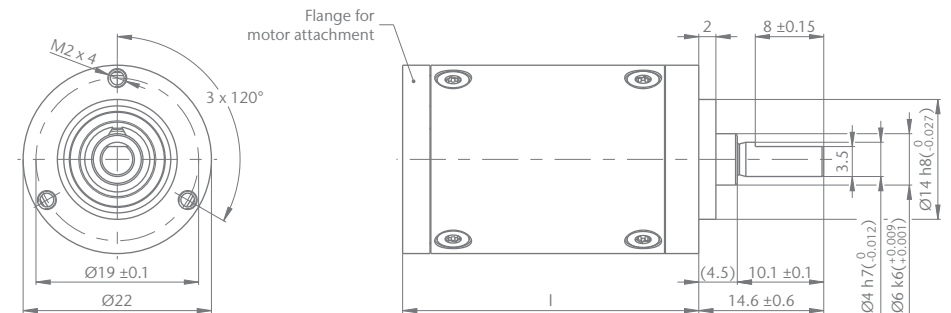
Current reduction ratios i rounded

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
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	27:1 (26.85)	95:1 (95.18)
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		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with ball bearing (Z2)	1-stage	2-stage	3-stage
Max. load, radial (10 mm from flange)	25 N	35 N	50 N
Max. load, axial	10 N	15 N	15 N
Max. perm.fitting pressure	80 N	80 N	80 N
Weight approx.	43 g	59 g	75 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	24.25 ± 0.5	32.4 ± 0.5	40.6 ± 0.5

* The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PM 32/LN Ø 32 mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	0.75 Nm	2.25 Nm	4.50 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	1.50 °DEG*	1.55 °DEG	1.60 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 2,00 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

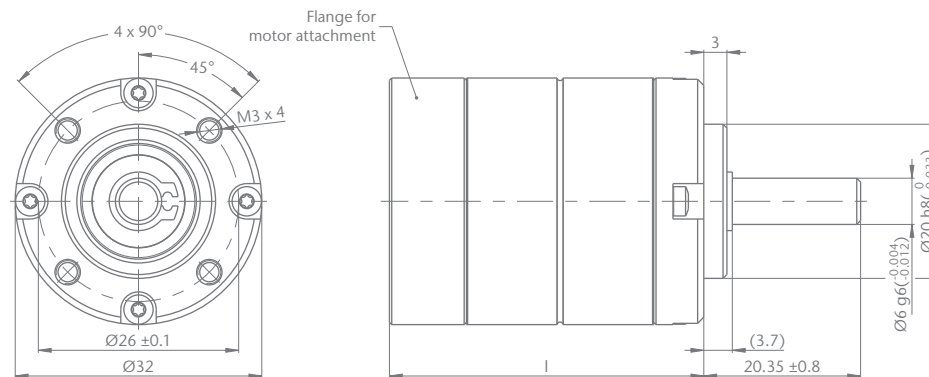
Current reduction ratios i rounded (PM/LN)

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with ball bearing (Z2)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	40 N	70 N	100 N
Max. load, axial	10 N	20 N	30 N
Max. perm.fitting pressure	120 N	120 N	120 N
Weight approx.	160 g	210 g	260 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	25.8 ± 0.5	35.3 ± 0.5	44.8 ± 0.5

* The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.

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PM 42/LN \varnothing 42 mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	3.0 Nm	7.5 Nm	15.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.90 °DEG*	0.95 °DEG	1.00 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 1,30 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

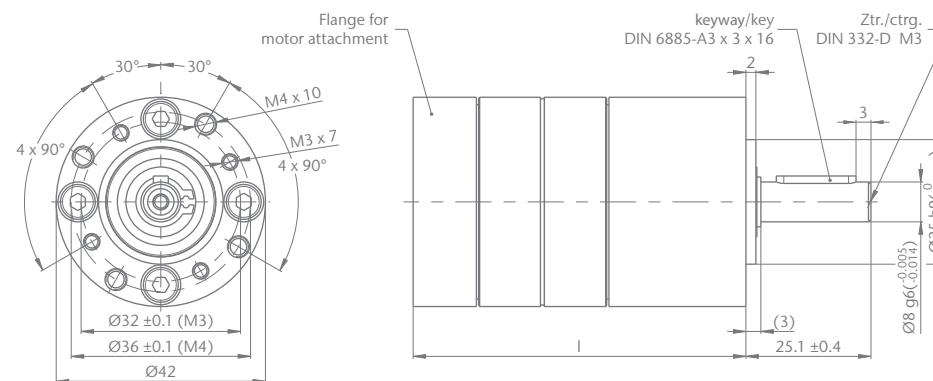
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	160 N	230 N	300 N
Max. load, axial	50 N	80 N	110 N
Max. perm.fitting pressure	320 N	320 N	320 N
Weight approx.	275 g	385 g	500 g

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	49.1 ± 0.5	62.2 ± 0.5	75.3 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.

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PM 52/LN Ø52 mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	4.0 Nm	12.0 Nm	25.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.70 °DEG*	0.75 °DEG	0.80 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 1,10 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

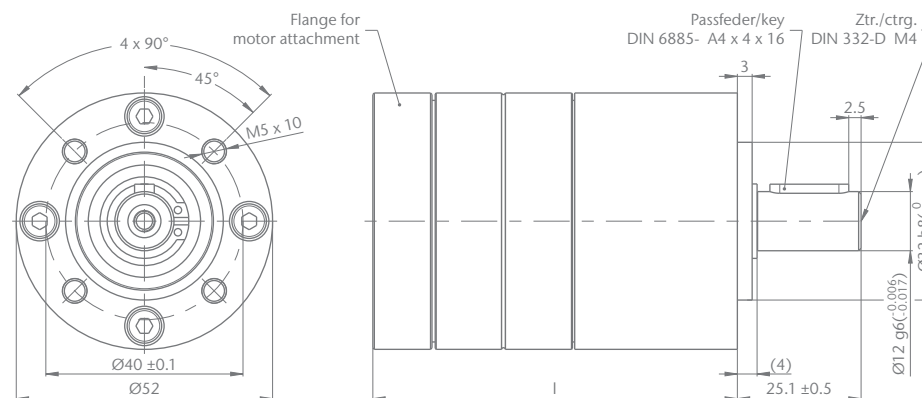
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	200 N	320 N	450 N
Max. load, axial	60 N	30 N	30 N
Max. perm.fitting pressure	500 N	500 N	500 N
Weight approx. with motor flange C80	0.7 kg	0.9 kg	1.1 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	54.2 ± 0.5	68.35 ± 0.5	82.6 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PM 62/LN $\varnothing 62$ mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	8.0 Nm	25.0 Nm	50.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.65 °DEG*	0.7 °DEG	0.75 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 0,95 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

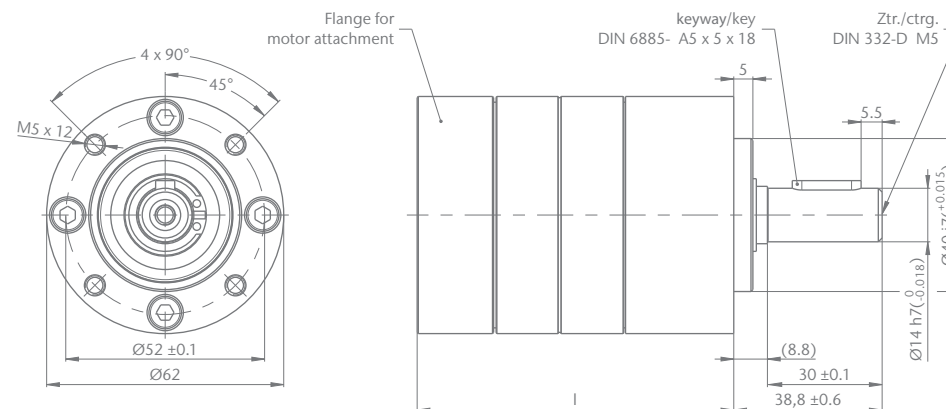
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	240 N	360 N	520 N
Max. load, axial	70 N	100 N	150 N
Max. perm.fitting pressure	1,000 N	1,000 N	1,000 N
Weight approx. with motor flange C80	0.8 kg	1.2 kg	1.6 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	54.6 ± 0.5	71.45 ± 0.5	88.5 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PM 72/LN $\varnothing 72$ mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	14.0 Nm	42.0 Nm	84.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.60 °DEG*	0.65 °DEG	0.70 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 0,90 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

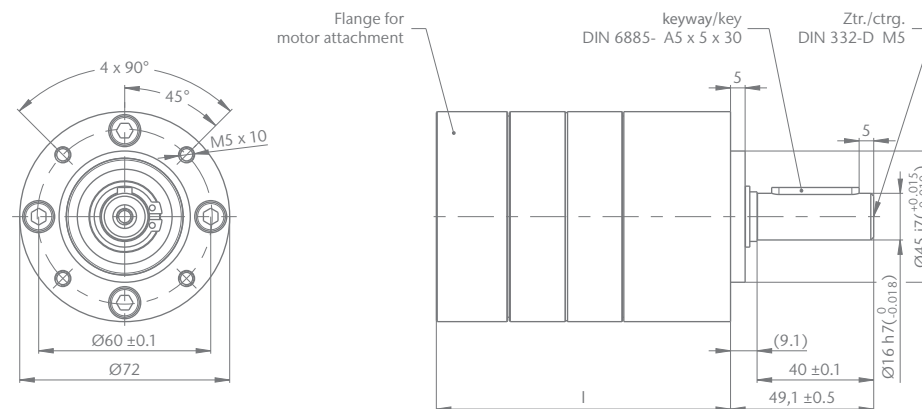
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	320 N	480 N	760 N
Max. load, axial	70 N	100 N	160 N
Max. perm.fitting pressure	1,300 N	1,300 N	1,300 N
Weight approx. with motor flange C80	1.4 kg	1.9 kg	2.4 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	66.3 ± 0.5	85.9 ± 0.5	105.5 ± 0.5

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PM 81/LN $\varnothing 81$ mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	20.0 Nm	60.0 Nm	120.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.50 °DEG*	0.55 °DEG	0.60 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 0,85 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

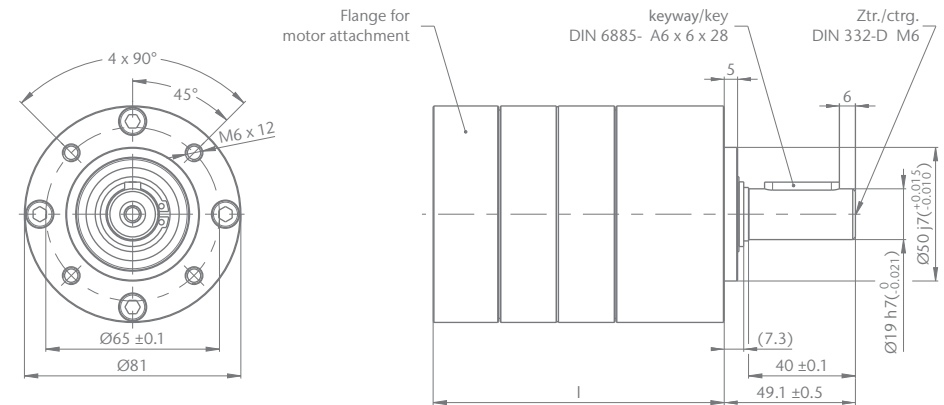
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	400 N	600 N	1.000 N
Max. load, axial	80 N	120 N	200 N
Max. perm.fitting pressure	1,500 N	1,500 N	1,500 N
Weight approx. with motor flange C80	1.8 kg	2.5 kg	3.2 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	72.8 ± 0.6	94.45 ± 0.6	116.1 ± 0.6

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



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PM 105/LN \varnothing 105 mm, Metall-Low-Noise

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	35.0 Nm	105.0 Nm	195.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	0.55 °DEG*	0.60 °DEG	0.65 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

* LN: 0,90 °DEG. For plastic PL wheels only! Impact of 1st stage for 2-4 stage versions is negligible.

Current reduction ratios i rounded

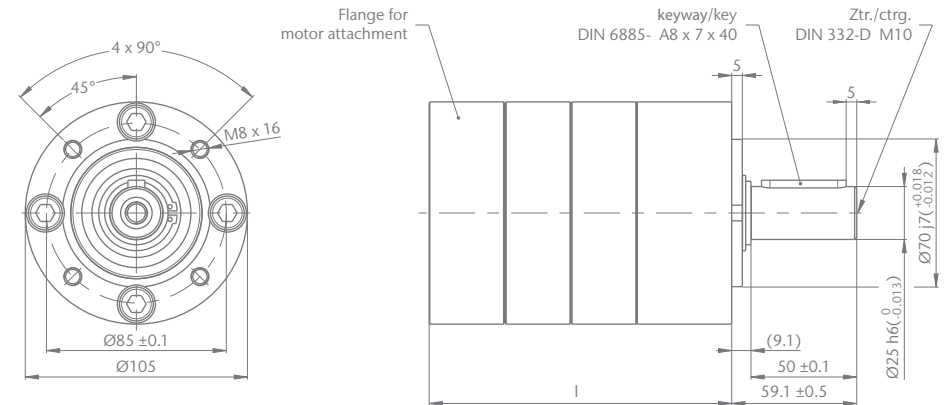
1-stage		2-stage		3-stage	
PM	LN	PM	LN	PM	LN
4:1 (3.71)	4:1 (3.65)	14:1 (13.73)	14:1 (13.53)	51:1 (50.89)	50:1 (50.16)
4:1 (4.29)	5:1 (4.59)	16:1 (15.88)	16:1 (15.65)	59:1 (58.86)	58:1 (58.01)
5:1 (5.18)	5:1 (5.36)	18:1 (18.37)	17:1 (17.00)	68:1 (68.07)	67:1 (67.08)
7:1 (6.75)	7:1 (6.55)	19:1 (19.20)	19:1 (18.92)	71:1 (71.16)	70:1 (70.13)
	9:1 (8.63)	22:1 (22.21)	23:1 (22.96)	79:1 (78.72)	81:1 (81.11)
	*13:1 (13.20)	25:1 (25.01)	25:1 (24.65)	93:1 (92.70)	91:1 (91.36)
		27:1 (26.85)	28:1 (27.76)	95:1 (95.18)	98:1 (98.07)
		29:1 (28.93)	28:1 (28.05)	100:1 (99.51)	102:1 (101.89)
		35:1 (34.98)	34:1 (33.92)	107:1 (107.21)	106:1 (105.65)
		46:1 (45.56)	45:1 (44.69)	115:1 (115.08)	115:1 (114.77)
			58:1 (58.22)	124:1 (123.98)	123:1 (123.20)
			*68:1 (64.40)	130:1 (129.62)	128:1 (127.74)
			*89:1 (89.10)	139:1 (139.14)	137:1 (136.99)
				150:1 (149.90)	145:1 (145.36)
				169:1 (168.85)	166:1 (166.40)
				181:1 (181.25)	176:1 (175.75)
				195:1 (195.27)	192:1 (191.54)
				236:1 (236.10)	232:1 (231.59)
				308:1 (307.55)	302:1 (301.68)
					393:1 (392.98)
					*462:1 (461.70)
					*601:1 (601.43)

* not all reduction ratios available ex-stock

Output side with ball bearing (2RS)	1-stufig	2-stufig	3-stufig
Max. load, radial (Middle output shaft)	600 N	900 N	1,500 N
Max. load, axial	120 N	180 N	300 N
Max. perm.fitting pressure	2,000 N	2,000 N	2,000 N
Weight approx. with motor flange C80	4.4 kg	6.0 kg	7.6 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	94.3 ± 0.6	125.6 ± 0.6	156.6 ± 0.6

*The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.
 Variations are possible and may arise for example due to non-standardized inspection and measurement methods. For more detailed information, please contact us directly. The company always reserves the right to make technical modifications. For current status, please consult www.ims-gear.com

PM 120 \varnothing 120 mm, Metal

Parameter	1-stage	2-stage	3-stage
Perm. output torque Appl. factor ($C_B = 1.0$)	50.0 Nm	150.0 Nm	300.0 Nm
Gearbox efficiency, approx.	0.80	0.75	0.70
Max. backlash	1.00 °DEG	1.50 °DEG	2.00 °DEG
Recommended initial speed	3,000 U/min	3,000 U/min	3,000 U/min
Min. Operating temperature	-30 °C	-30 °C	-30 °C
Max. Operating temperature	+120 °C	+120 °C	+120 °C

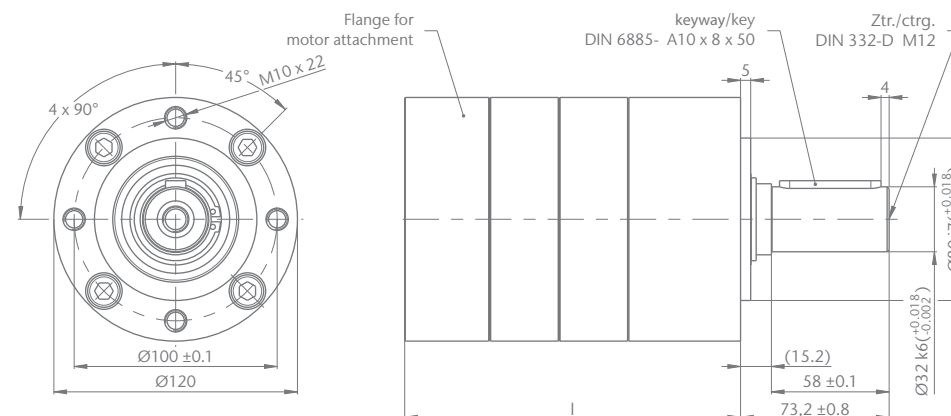
Current reduction ratios i rounded (PM/LN)

1-stage	2-stage	3-stage
4:1 (3.71)	14:1 (13.73)	51:1 (50.89)
4:1 (4.29)	16:1 (15.88)	59:1 (58.86)
5:1 (5.18)	18:1 (18.37)	68:1 (68.07)
7:1 (6.75)	19:1 (19.20)	71:1 (71.16)
	22:1 (22.21)	79:1 (78.72)
	25:1 (25.01)	93:1 (92.70)
	27:1 (26.85)	95:1 (95.18)
	29:1 (28.93)	100:1 (99.51)
	35:1 (34.98)	107:1 (107.21)
	46:1 (45.56)	115:1 (115.08)
		124:1 (123.98)
		130:1 (129.62)
		139:1 (139.14)
		150:1 (149.90)
		169:1 (168.85)
		181:1 (181.25)
		195:1 (195.27)
		236:1 (236.10)
		308:1 (307.55)

Output side with ball bearing (2RS)	1-stage	2-stage	3-stage
Max. load, radial (Middle output shaft)	600 N	900 N	1,500 N
Max. load, axial	120 N	180 N	300 N
Max. perm.fitting pressure	2,500 N	2,500 N	2,500 N
Weight approx. with motor flange C105	5.6 kg	8.0 kg	10.4 kg

Gearbox length in mm	1-stage	2-stage	3-stage
Length l*	109.2 ± 0.6	143.4 ± 0.6	177.5 ± 0.6

* The minimum length is only possible with an optimal attachment to the motor, the actual length we like to determine for you.



All figures are approximate values.

Variations are possible and may arise for example due to non-standardized inspection and measurement methods. For more detailed information, please contact us directly. The company always reserves the right to make technical modifications. For current status, please consult www.imsgear.com

Examples of configuration

PM 42 LN



Technical features

- 3-stage
- 393 : 1
- 15 Nm*

PM 22



Technical features

- 3-stage
- 51 : 1
- 0.8 Nm*

* Limited output torque (operating factor $C_g = 1,0$)