AP / HP SERVO GEARS

Planetary and hybrid gears for ESR servo motors
Reduction from 4 : 1 to 100 : 1
Rated output torque up to 200 Nm

Servo gears of the AP and HP series: one-stage and two-stage planetary gears with low torsional backlash and high torsional rigidity, or hybrid gears, comprising a precision planetary gear and a preceding spur gear.

Products, consulting and service

ESR drive packages consist of servo amplifiers, servo motors, position sensors, gear boxes, and brakes. They are supplemented by power supply units, connectors, cables (ready-assembled on request), and software. All parts of the package are matched and have been tested as combinations. The delivery of the complete drive system from a single source guarantees smooth installation, reliable operation, and definite system responsibility on the part of one single supplier.

Our service offer includes individual drive system determination. With our long-standing experience we help you choose the right servo drive for your application.

Applications

Positioning and feed movements with high dynamics and accuracy in

- Handling and assembly systems
- Optical discs production machinery
- Packaging machinery
- Textile machinery
- Plastics processing machines
- Coiling machines
- Flame cutting machinery
- Measuring and testing machinery
- Electronics production machinery
- ...

Characteristics of the AP and HP servo gears

Design of the servo gears

General

The servo gears described here are available in two series as planetary gears or hybrid gears. With one-stage reduction from 4 : 1 to 10 : 1, two-stage up to 100 : 1, and options like different output shafts they can be adapted to various applications. AP and HP servo gears can be used in combination with virtually all ESR servo motors because of oblong holes in the motor mounting flange – each gear frame size is available with two flange designs.

Design

In the main units of the AP and HP servo gears evolvent gear wheels provide the reduction and the power transmission. Optimally arranged as planetary gears, partly with a preceding spur gear, achieve high power density and great reduction variety. With housings of five different sizes the gears can be optimally adapted to all drive applications. The unique design, consisting of modular units, allows the connection of angular or belt driven back gears.

Planetary gears AP

AP planetary gears are one-stage and two-stage planetary gears with torsional backlash ($\leq$ 3 angular minutes). The compact axial design offers a variety of reductions and smooth run.

Excellent torsional rigidity is achieved by using very hard material in a compact design. This ensures low vibrations and high accuracy of the entire motion.

The gear series comprises 5 frame sizes AP-010 to AP-050 with output torques of 32 to 1500 Nm (peak).

Hybrid gears HP

HP hybrid gears combine the advantages of planetary gears with those of spur gears. The output unit of HP gears is a robust precision planetary gear with fixed reduction. This design offers high output torque at high power density and best overload ability. With a preceding spur gear, designed as built-in module, twelve different gear reductions can be realized in a housing of the same size.

An extremely low moment of inertia at the input shaft in the spur gear or the planetary gear provides for high dynamics.

Even under large-volume production conditions a torsional backlash of $\leq$ 3 angular minutes is achieved by optimized evolvent gear wheels produced with latest technology. This is required for high repeating accuracy in positioning mode.

Reasonable priced HP gears with a torsional backlash of $\leq$ 15 angular minutes are available for standard applications.

The gear series comprises 3 frame sizes HP-010 to HP-030 with output torques of 15 to 360 Nm (peak).

Characteristics of the AP and HP servo gears

Further advantages

- Fixed planetary output gear, combined with an exchangeable spur gear module, for reductions from 4 : 1 to 90 : 1 in a housing of the same size. Adaptation can be carried out on-site!
- Spur gear module made of one piece of casting, inner contours adapted to the spur gear wheels and machined while clamped, for exact parallel axes, optimal lubricant dispersion, and smooth run with less wear and tear.
- Input and output bearing lubricated separately, so the gear can be installed in any way desired.
- Finned die-cast box with large surface area provides for good heat dissipation, resulting in long life of gears and motors.
- Angular or belt driven back gears can be integrated any time, for flexibility in adaptation to changed field conditions or mounting requirements.

Motor mounting

General

The gears are mounted to the motors by qualified personnel at ESR Pollmeier, we supply you with the complete geared motor as one single unit.

Options

For each frame size of the AP and HP servo gears two flange designs are available (in stock):

- With “Interface A” the frame size of the motor mounting flange and of the gear are the same.
- Using “Interface B” the gear can be mounted to a motor of bigger frame size.

By this the AP and HP servo gears can be used in combination with virtually all ESR servo motors (diameter of bolt circle from 63 mm upwards).

Output shaft

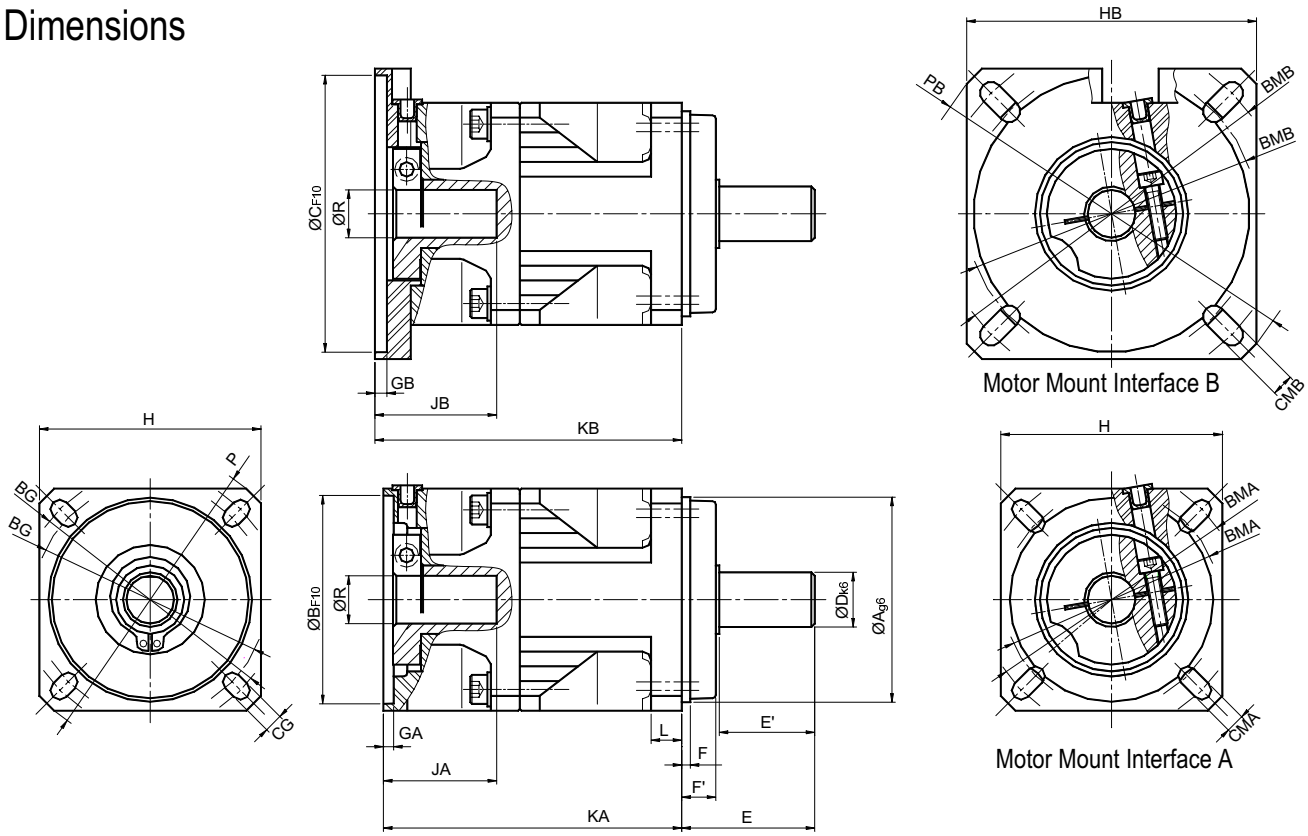
Options

As standard the shafts are without keyway. A shaft end with keyway and thread is available as an option. Other designs of the shafts (e. g. gear shaft) are available on request.

If required, angular or belt driven back gears can be connected.

Servo - Planetary - Reducer Type AP-010

Dimensions



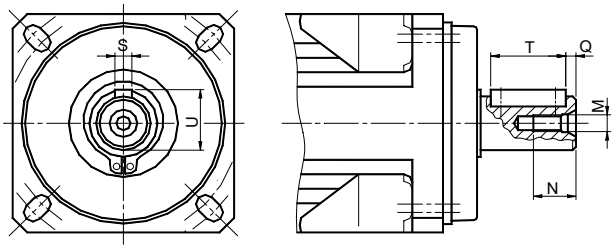
ØD k6	**E'**	**E**	**ØA** g6	**F**	**F'**	**L**	**H**	**P**	**ØBG**	**CG**	**KA**	**ØR** F7	**JA**	**ØB** F10	**GA**	**ØBMA**	**CMA**
16	28	39	60	2,5	10	9	65	86	68-75	5,5	87,5	14	32	60	3	63-75	5,5

Interface B

KB	**JB**	**ØC** F10	**GB**	**HB**	**PB**	**ØBMB**	**CMB**
90	35	80	3,5	85	114	85-100	6,5

M	**N**	**S** P9 /h9	**T**	**U**	**Q**
M5	12,5	5	22	18	3

Output Shaft with Key (Option)



Performance Specifications

			Ratios											
			4	**5**	**7**	**9**	**16**	**20**	**28**	**36**	**40**	**50**	**70**	**90**
Continuous Input Torque	T_{1C}	Nm	6,5	5	4	2,1	1,9	1,35	1,1	0,5	0,7	0,5	0,4	0,2
Instantaneous Input Torque	T_{1In}	Nm	10	10	8	4	3,5	2,5	2	1,0	1,3	1	0,8	0,4
Continuous Output Torque	T_{2C}	Nm	26	25	28	18,9	30,4	27	30,8	18	28	25	28	18
Instantaneous Output Torque	T_{2In}	Nm	50	50	56	37	56	50	56	36	52	50	32	36
max. Input Speed	n_{1max}	rpm	6.000											
Torsional Stiffness	C_t	Nm/arcmin	3,8											
Input Inertia	J_1	kgcm²	0,106	0,094	0,084	0,080	0,094	0,094	0,093	0,092	0,081	0,081	0,081	0,080
Stages			1				2							
Efficiency		%	96				94							
Weight	m	kg	A- Interf. 1,1 / B- Interf. 1,2				A- Interface 1,3 / B- Interface 1,4							
Mounting Position			any											
Operating Temperature		°C	-10° to 90°											
Lubrication			Lifetime Grease Lubrication											
Lifetime	L_h	h	>15.000											
Noise Level at 3000 rpm		dB(A)	<= 69											
Backlash	f	arcmin	reduced < 3 ,standard < 10 , < 20											

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

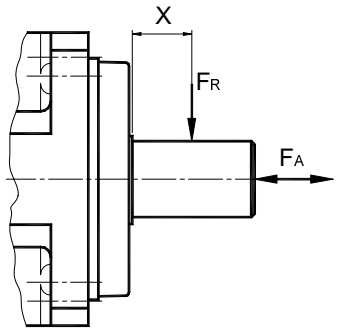
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

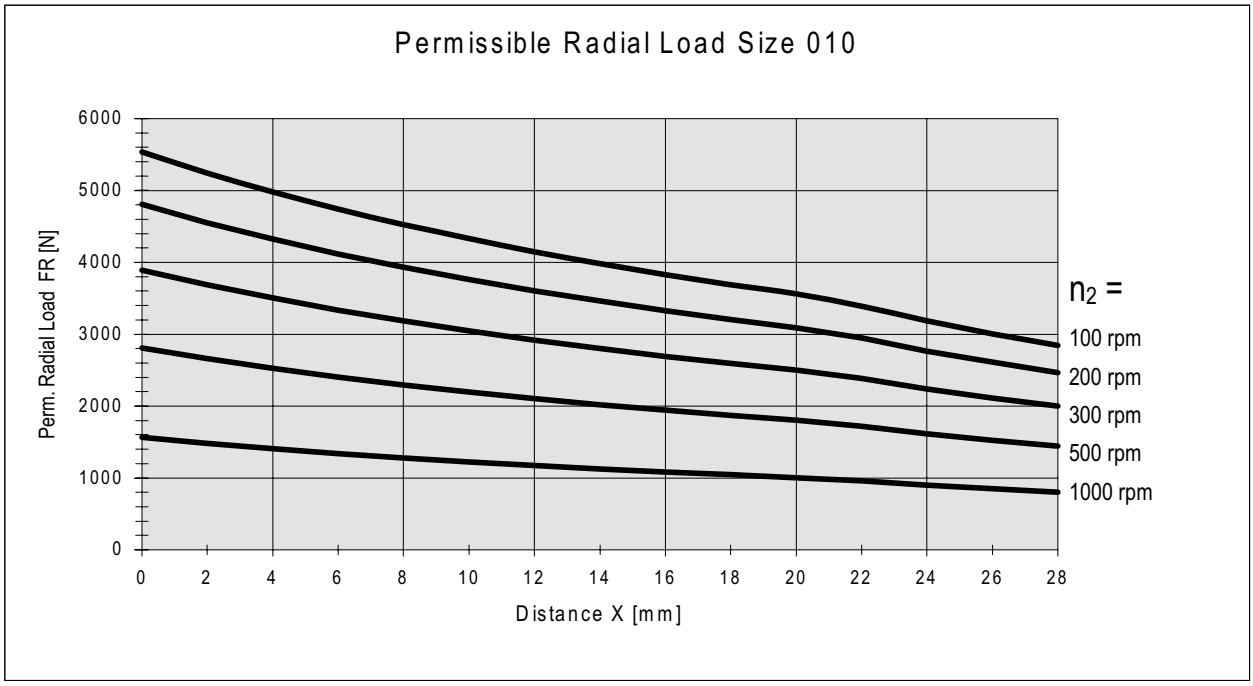
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial loads above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,exist.} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



04-2001

How to Order:

AP - 010 - 007 - 15 - A140 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 03 =< 3‘ (arcmin); 10 =< 10‘; 20=< 20‘

Motor Shaft Ø: Ø9 = 090; Ø24 = 240

Motor Interface: A or B

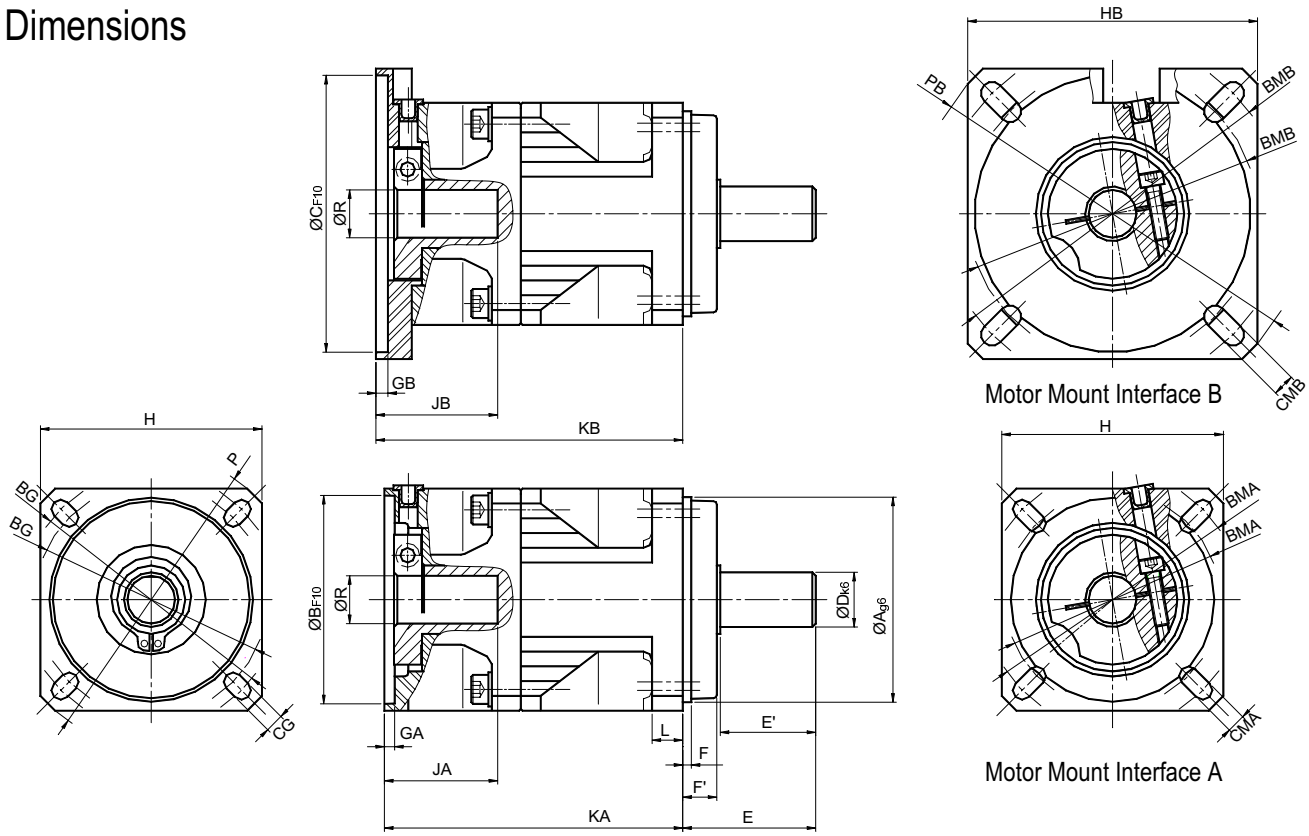
Housing: N = Standard
F = Mounting Plate S = Special

Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

Special -Code

Servo - Planetary - Reducer Type AP-020

Dimensions



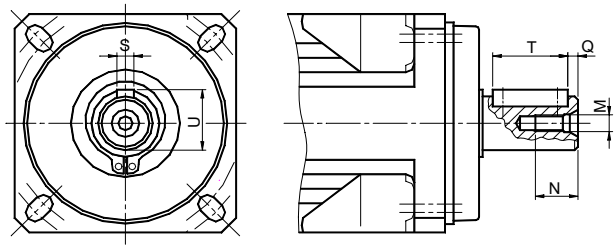
ØD k6	**E'**	**E**	**ØA** g6	**F**	**F'**	**L**	**H**	**P**	**ØBG**	**CG**	**KA**	**ØR** F7	**JA**	**ØB** F10	**GA**	**ØBMA**	**CMA**
22	36	49	70	3	12	11	85	113	85-100	6,6	118,5	19	40	80	3,5	85-100	6,6

Interface B

KB	**JB**	**ØC** F10	**GB**	**HB**	**PB**	**ØBMB**	**CMB**
128,5	50	100	4	115	149	115-130	8,5

M	**N**	**S** P9 /h9	**T**	**U**	**Q**
M8	19	6	28	24,5	4

Output Shaft with Key (Option)



Performance Specifications

			Ratios											
			4	**5**	**7**	**9**	**16**	**20**	**28**	**36**	**40**	**50**	**70**	**90**
Continuous Input Torque	T_{1N}	Nm	20	18	10	7,5	6	4,5	2,5	1,6	2,4	1,9	1	0,75
Instantaneous Input Torque	T_{1In}	Nm	30	25	18	14	10	8	4,5	3,3	4,5	3,7	1,9	1,4
Continuous Output Torque	T_{2N}	Nm	80	90	70	67,5	96	90	70	64,8	96	95	70	67,5
Instantaneous Output Torque	T_{2In}	Nm	120	125	126	126	160	160	126	119	160	160	133	126
max. Input Speed	n_{1max}	rpm	6.000											
Torsional Stiffness	C_t	Nm/arcmin	9,0											
Input Inertia	J_1	kgcm²	0,491	0,447	0,415	0,402	0,461	0,458	0,456	0,455	0,410	0,409	0,409	0,408
Stages			1				2							
Efficiency		%	96				94							
Weight	m	kg	A- Interf. 2,9 / B- Interf. 3,25				A- Interface 3,4 / B- Interface 3,75							
Mounting Position			any											
Operating Temperature		°C	-10° to 90°											
Lubrication			Lifetime Oil Lubrication											
Lifetime	L_h	h	>15.000											
Noise Level at 3000 rpm		dB(A)	<= 69											
Backlash	f	arcmin	reduced < 3 ,standard < 10 , < 20											

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

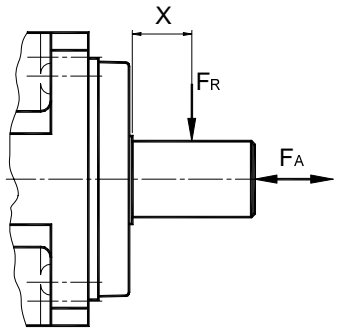
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

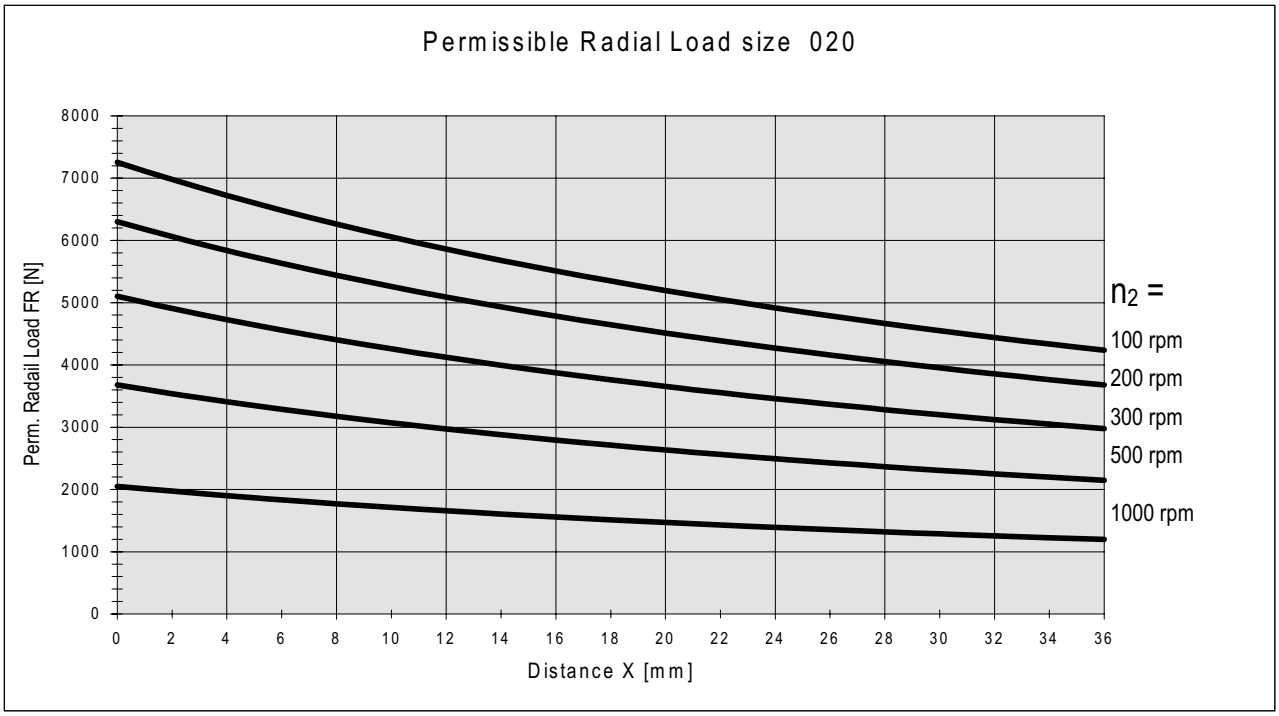
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial loads above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,\text{available.}} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



How to Order:

AP - 020 - 007 - 15 - A190 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 03 =< 3‘ (arcmin); 10 =< 10‘; 20=< 20‘

Special -Code

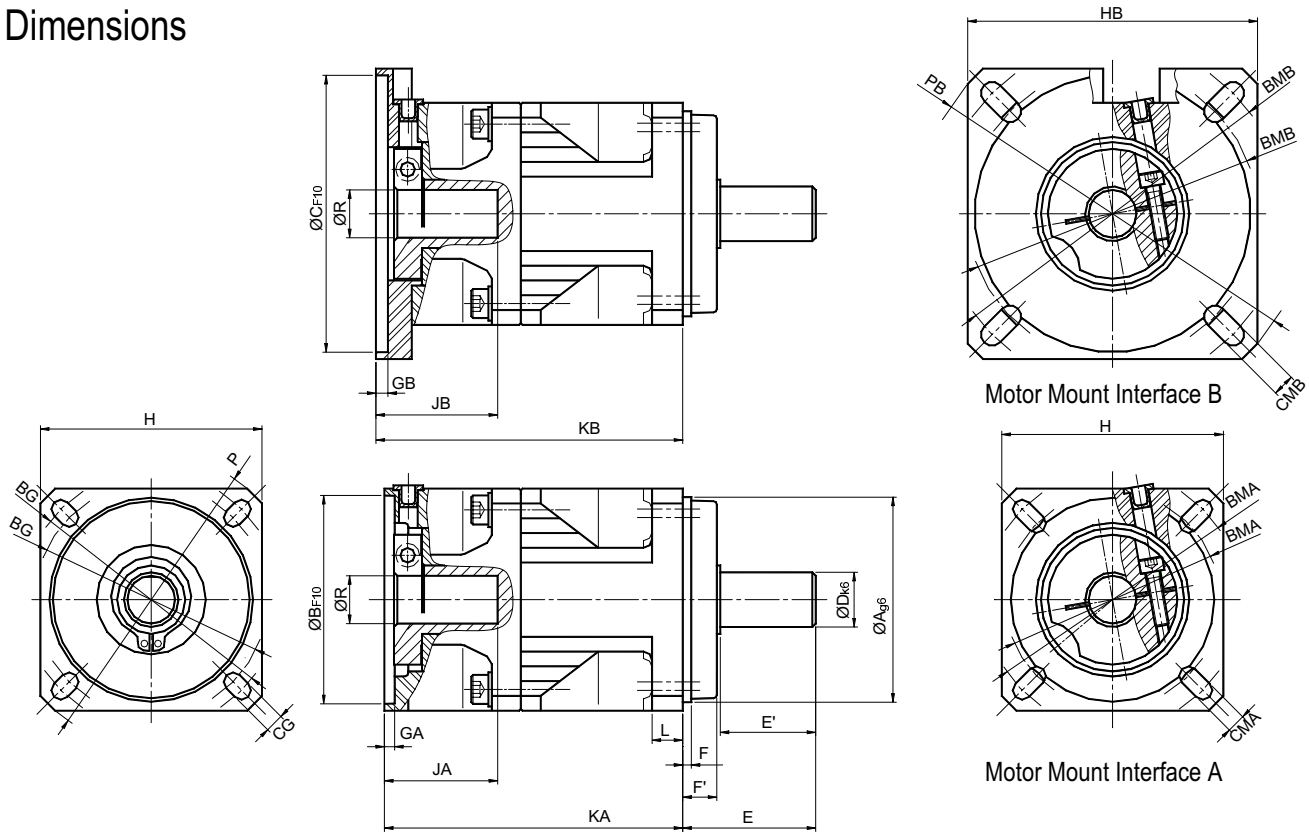
Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

Housing: N = Standard
F = Mounting Plate S = Special

Motor Interface: A or B
Motor Shaft Ø: Ø11 = 100; Ø19 = 190

Servo - Planetary - Reducer Type AP-030

Dimensions

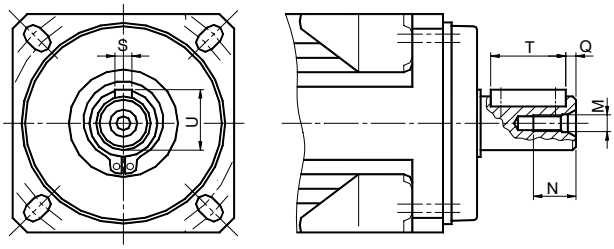


ØD k6	**E'**	**E**	**ØA** g6	**F**	**F'**	**L**	**H**	**P**	**ØBG**	**CG**	**KA**	**ØR** F7	**JA**	**ØB** F10	**GA**	**ØBMA**	**CMA**
32	58	85	100	4	25	13	115	152	115-130	8,5	156,5	24	50	110	4	115-130	8,5

Interface B

KB	**JB**	**ØC** F10	**GB**	**HB**	**PB**	**ØBMB**	**CMB**
157,5	53	130	4	142	188	145-165	11

Output Shaft with Key (Option)



M	**N**	**S** P9 /h9	**T**	**U**	**Q**
M12	28	10	45	35	6

Performance Specifications

			Ratios											
			4	**5**	**7**	**9**	**16**	**20**	**28**	**36**	**40**	**50**	**70**	**90**
Continuous Input Torque	T_{1N}	Nm	45	40	25	12	12	10	6,25	3,25	4,6	4	2,5	1,25
Instantaneous Input Torque	T_{1In}	Nm	80	75	45	22	22	18	12	6	8,6	7,5	4,5	2,4
Continuous Output Torque	T_{2N}	Nm	180	200	175	108	192	200	175	117	184	200	175	112
Instantaneous Output Torque	T_{2In}	Nm	320	375	315	198	352	360	336	216	344	375	315	216
max. Input Speed	n_{1max}	rpm	6.000											
Torsional Stiffness	C_t	Nm/arcmin	26											
Input Inertia	J_1	kgcm²												
Stages			1				2							
Efficiency		%	96				94							
Weight	m	kg	A- Interf. 6,9 / B- Interf. 7,3				A- Interface 7,7 / B- Interface 8,1							
Mounting Position			any											
Operating Temperature		°C	-10° to 90°											
Lubrication			Lifetime Oil Lubrication											
Lifetime	H_l	h	>15.000											
Noise Level at 3000 rpm		dB(A)	<= 69											
Backlash	f	arcsine	reduced < 3 ,standard < 10 , < 20											

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

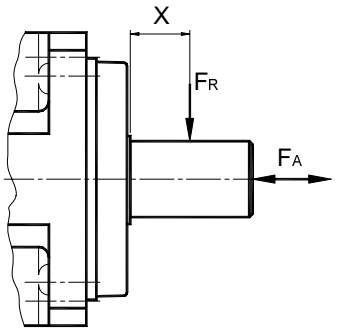
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

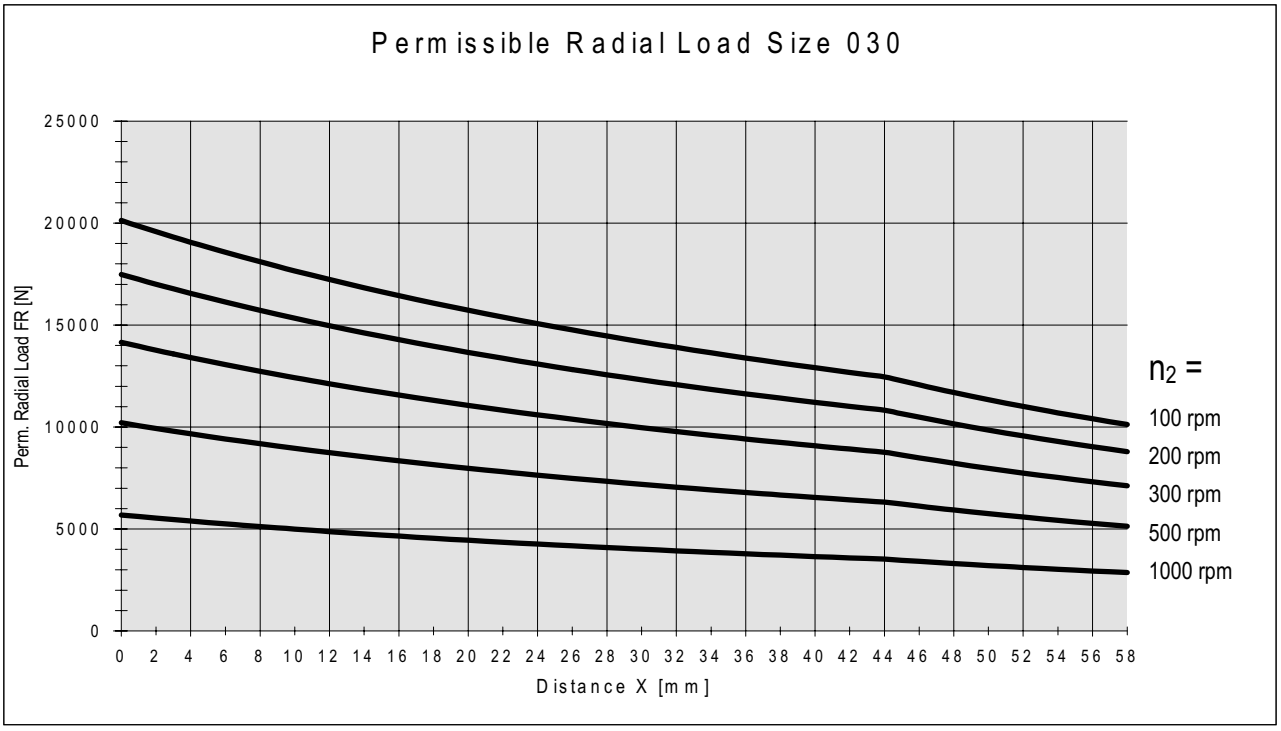
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial loads above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,exist.} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



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How to Order:

AP - 030 - 007 - 15 - A240 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 03 =< 3‘ (arcmin); 10 =< 10‘; 20=< 20‘

Motor Interface: A or B
Motor Shaft Ø: Ø9 = 090; Ø24 = 240

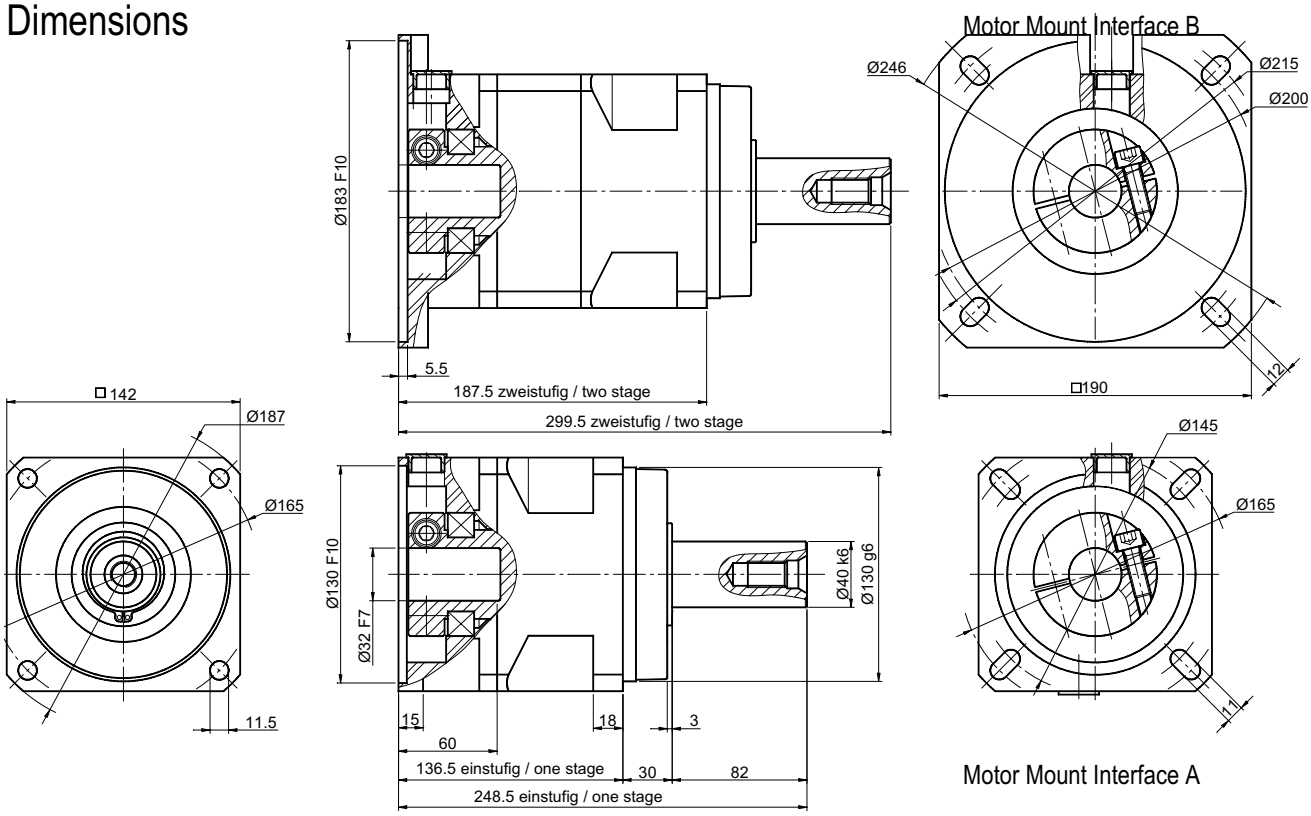
Housing: N = Standard
F = Mounting Plate S = Special

Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

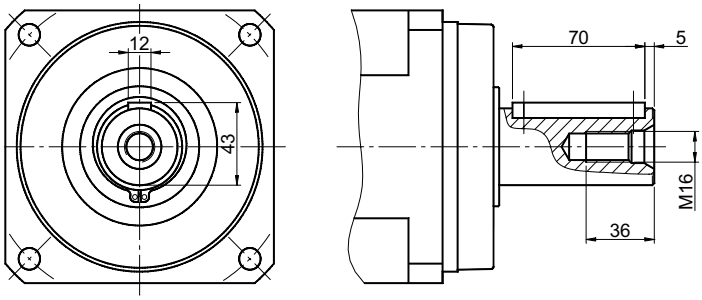
Special -Code

Servo – Planetary - Reducer Type AP-040

Dimensions



Output Shaft with Key (Option)



Performance Specifications

			Ratios										
			4	**5**	**7**	**10**	**16**	**20**	**28**	**40**	**50**	**70**	**100**
Continous Input Torque	T_{1c}	Nm	90	72	52	30	23	18	13	9	8	5	3
Instantaneus Input Torque	T_{1In}	Nm	180	144	104	60	46	36	26	18	16	10	6
Continuous Output Torque	T_{2C}	Nm	360	360	360	300	360	360	360	360	360	360	300
Instantaneus Output Torque	T_{2In}	Nm	720	720	720	600	720	720	720	720	720	720	600
max. Input Speed	n_{1max}	min^{-1}	4.000										
Torsional Stiffness	C_t	Nm/arcmin											
Input Inertia	J_1	$kgcm^2$											
Stages			1				2						
Efficiency		%	96				94						
Weight	M	kg											
Mounting Position			any										
Operating Temperature		°C	-10° bis 90°										
Lubrication			Lifetime Grease Lubrication										
Lifetime	L_h	h	>15.000										
Noise Level at 3000 rpm		dB(A)	<= 69										
Backlash	F	arcmin	red. < 3 , stand. < 10 , < 20				reduced < 5 ,standard < 15 , < 30						

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

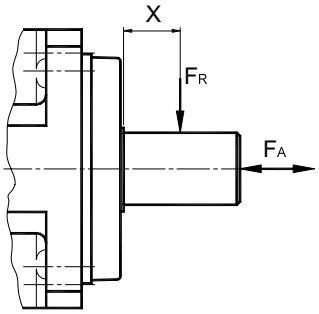
$F_A = 0{,}5 \times F_R$

Without thrust load the permissible radial load may be increased by 1,3

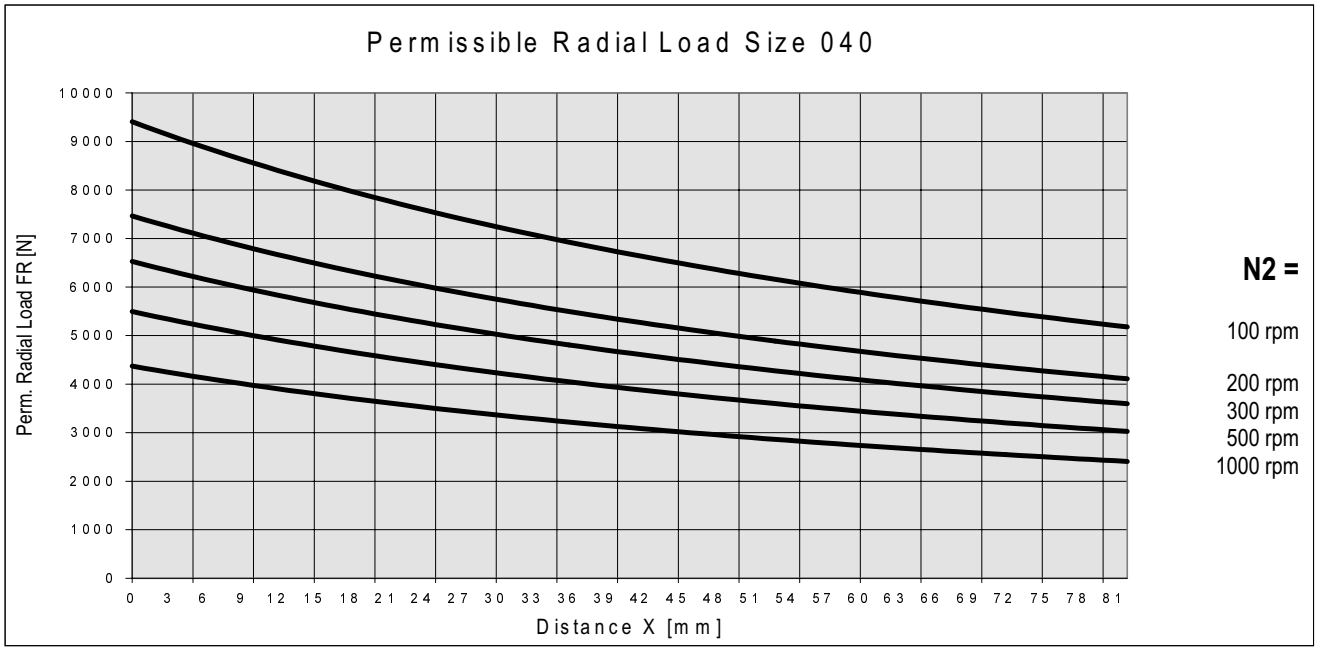
$F_{R(FA=0)} = 1{,}3 \times F_R$ (Diagram)

At radial loads above the values in the diagram, the rated llifetime of the bearings will be reduced as follows:

$L_{h10} = 15\,000 \times (F_R / F_{R\,exist.})^3$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



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How to Order: **AP - 040 - 007 - 15 - A320 - N - N - XXX**

Reducer Type:
AP = Planetary Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
z.B.: 007 = 7:1, 010= 10:1

Backlash: 03 =< 3‘ (arcmin); 10 =< 10‘; 20=< 20‘

Special Code

Output Shaft:
N = Standard
P = with key

Housing:
F = Mounting Plate

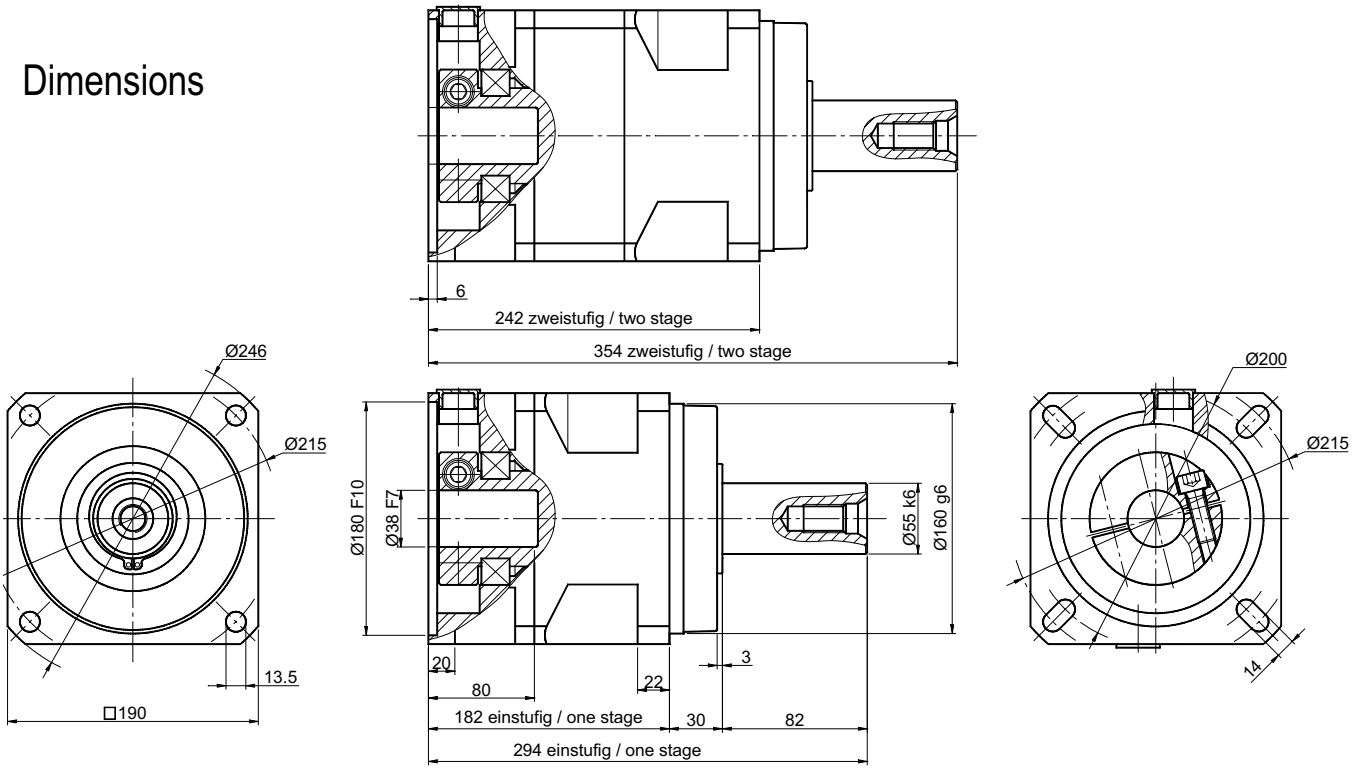
V = Gear Shaft
S = Special

N = Standard
S = Special

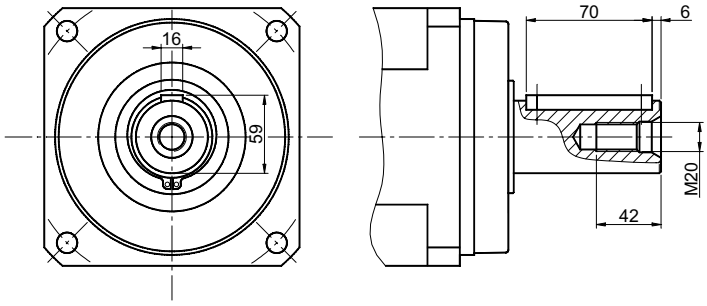
Motor Interface: A or B
Motor Shaft Ø: e.g. Ø9 = 090; Ø32 = 320

Servo – Planetary Reducer Type AP-050

Dimensions



Output Shaft with Key (Option)



Performance Specifications

			Ratios										
			4	**5**	**7**	**10**	**16**	**20**	**28**	**40**	**50**	**70**	**100**
Continous Input Torque	T_{1C}	Nm	188	150	107	65	47	38	27	19	15	11	7
Instantaneus Input Torque	T_{1In}	Nm	376	300	214	130	94	76	54	38	30	22	14
Continuous Output Torque	T_{2C}	Nm	750	750	750	650	750	750	750	750	750	750	650
Instantaneus Output Torque	T_{2In}	Nm	1500	1500	1500	1300	1500	1500	1500	1500	1500	1500	1300
max. Input Speed	n_{1max}	min^{-1}	4.000										
Torsional Stiffness	C_t	Nm/arcmin											
Input Inertia	J_1	kgcm²											
Stages			1				2						
Efficiency		%	96				94						
Weight	M	kg											
Mounting Position			any										
Operating Temperature		°C	-10° bis 90°										
Lubrication			Lifetime Grease Lubrication										
Lifetime	L_h	h	>15.000										
Noise Level at 3000 rpm		dB(A)	<= 69										
Backlash	f	arcmin	red. < 3 , stand. < 10 , < 20				reduced < 5 ,standard < 15 , < 30						

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

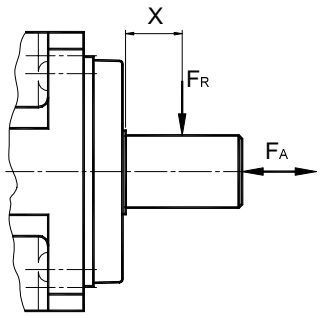
$F_A = 0{,}5 \times F_R$

Without thrust load the permissible radial load may be increased by 1,3

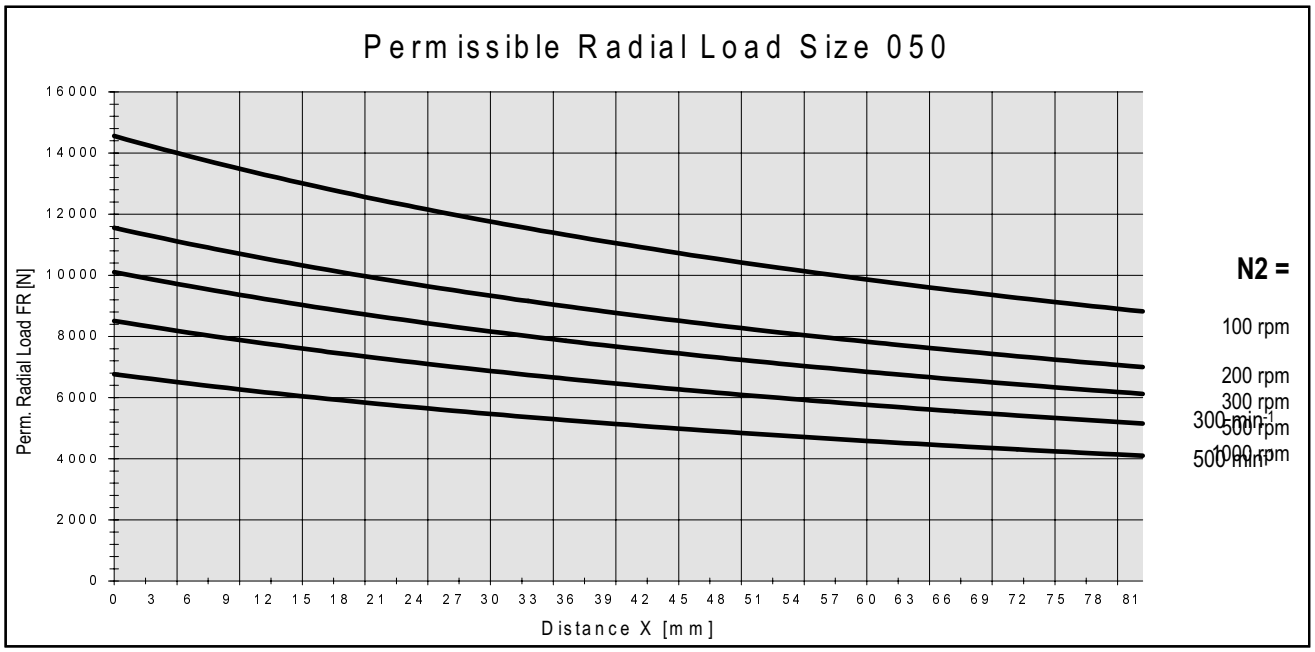
$F_{R(FA=0)} = 1{,}3 \times F_R$ (Diagram)

At radial loads above the values in the diagram, the rated llifetime of the bearings will be reduced as follows:

$L_{h10} = 15\,000 \times (F_R / F_{R\,exist.})^3$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



How to Order: **AP - 050 - 007 - 15 - A320 - N - N - XXX**

Reducer Type:
AP = Planetary Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
z.B.: 007 = 7:1, 010= 10:1

Backlash: 03 =< 3‘ (arcmin); 10 =< 10‘; 20=< 20‘

Special - Code

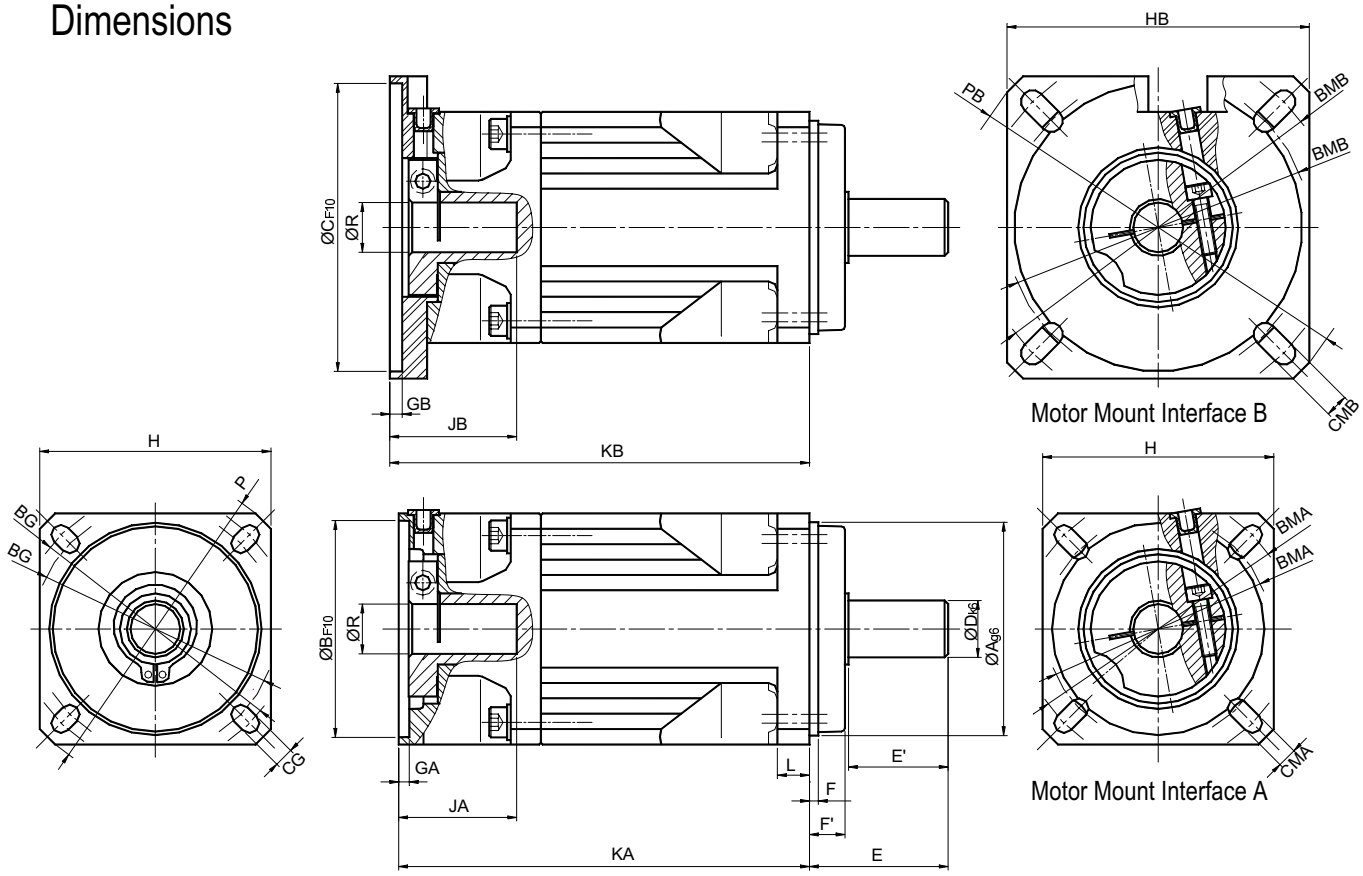
Output Shaft:
N = Standard
P = with key
V = Gear Shaft
S = Special

Housing:
F = Mounting Plate
N = Standard
S = Special

Motor Interface: A or B
Motor Shaft Ø: e.g. Ø9 = 090; Ø32 = 320

Servo - Hybrid - Reducer Type HP-010

Dimensions

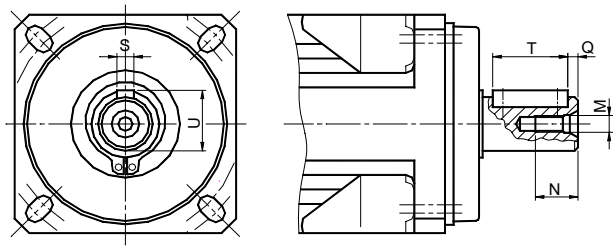


ØD k6	E'	E	ØA g6	F	F'	L	H	P	ØBG	CG	KA	ØR F7	JA	ØB F10	GA	ØBMA	CMA
16	28	39	60	2,5	10	9	65	86	68-75	5,5	115,5	14	32	60	3	63-75	5,5

Interface B

KB	JB	ØC F10	GB	HB	PB	ØBMB	CMB
118	35	80	3,5	85	114	85-100	6,5

Output Shaft with Key (Option)



M	N	S P9 /h9	T	U	Q
M5	12,5	5	22	18	3

Performance Specifications

			Ratios									
			10	15	20	25	30	40	50	60	80	95
Continuous Input Torque	T_{1N}	Nm	1,0	1,0	1,0	1,0	1,0	1,0	0,8	0,66	0,5	0,5
Instantaneous Input Torque	T_{1In}	Nm	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,3	1,0	1,0
Continuous Output Torque	T_{2N}	Nm	10	15	20	25	30	40	40	40	40	40
Instantaneous Output Torque	T_{2In}	Nm	15	22,5	30	37,5	45	60	75	78	80	80
max. Input Speed	n_{1max}	rpm	6.000									
Torsional Stiffness	C_t	Nm/arcmin	1,5									
Input Inertia	J_1	kgcm²	0,151	0,144	0,142	0,141	0,140	0,139	0,140	0,140	0,139	0,139
Efficiency		%	94						92			
Weight	m	kg	A- Interf. 1,4 / B- Interf. 1,5						A- Interf.1,6 / B- Interf. 1,7			
Direction rotation Input-Output			contrarotating						synchronrotating			
Mounting Position			any									
Operating Temperature		°C	-10° to 90°									
Lubrication			Lifetime Grease Lubrication									
Lifetime	L_h	h	>15.000									
Noise Level to 3000 rpm		dB(A)	<= 69									
Backlash	f	arcmin	reduced< 5 , standard < 15 , < 30									

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

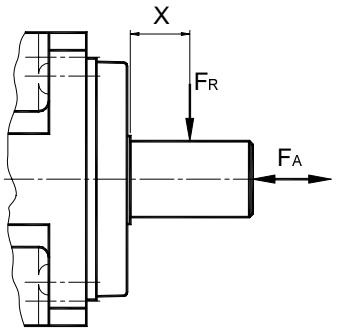
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

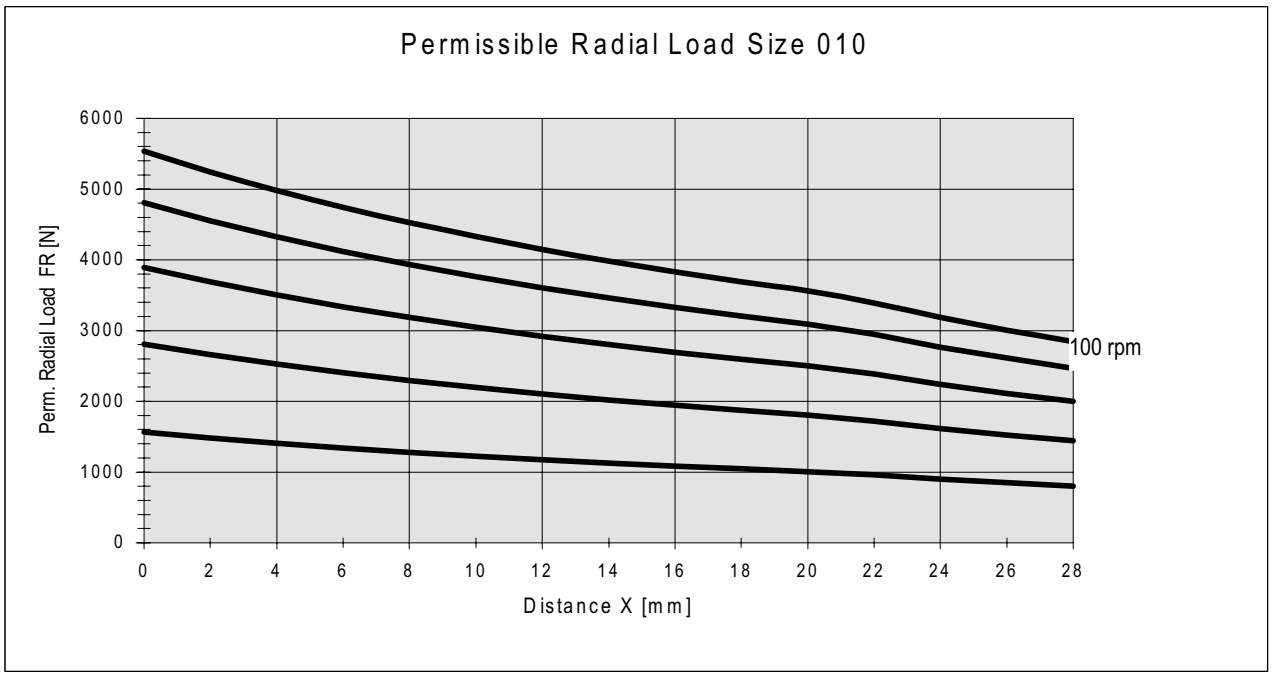
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial loads above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,\text{available}} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



04-2001

How to Order:

HP - 010 - 007 - 15 - A140 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 05 =< 5‘ (arcmin); 15 =< 15‘; 30=< 30‘

Special -Code

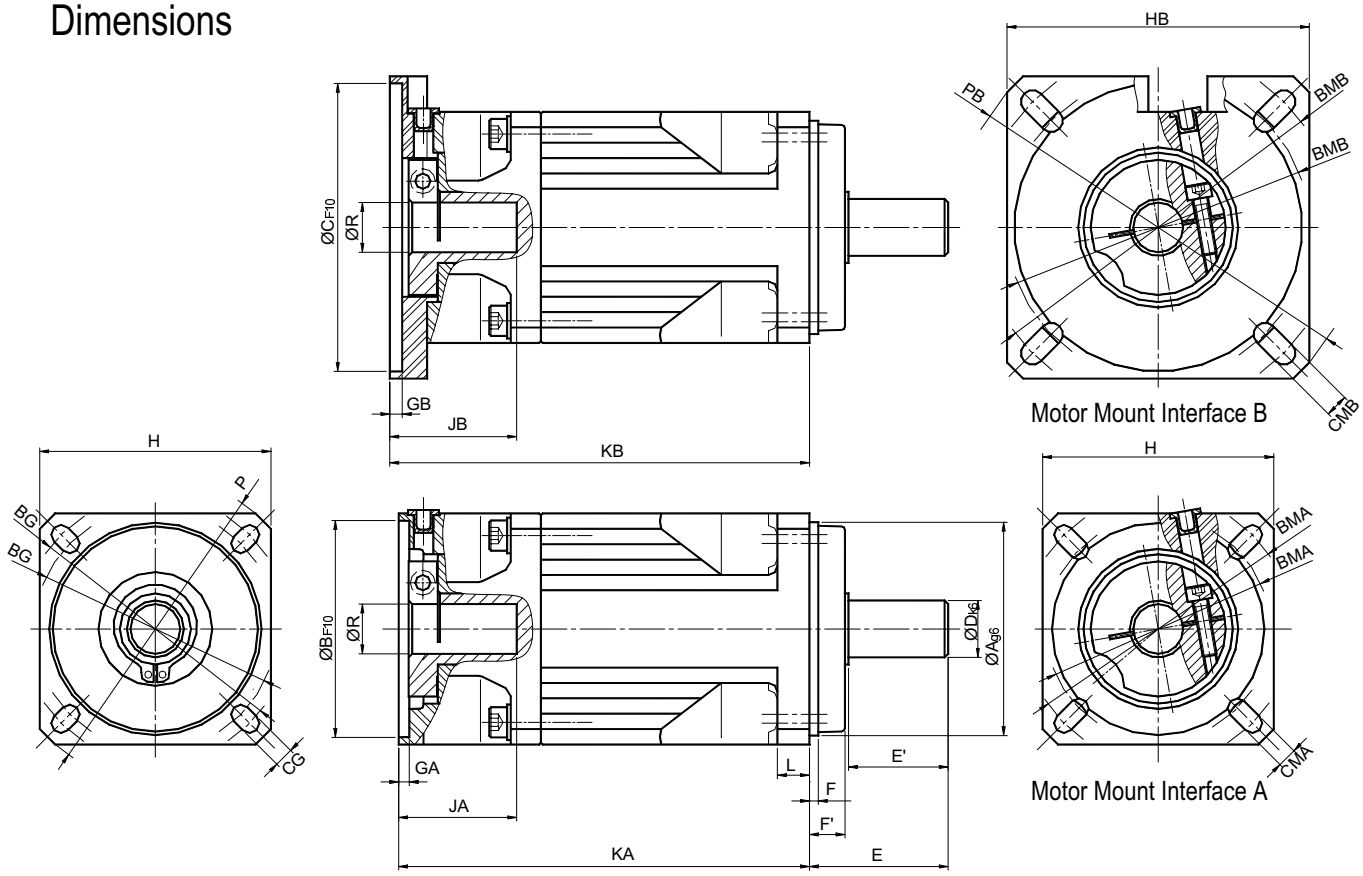
Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

Housing: N = Standard
F = Mounting Plate S = Special

Motor Interface: A or B
Motor Shaft Ø: Ø9 = 090; Ø14 = 140

Servo – Hybrid – Reducer Type HP-020

Dimensions



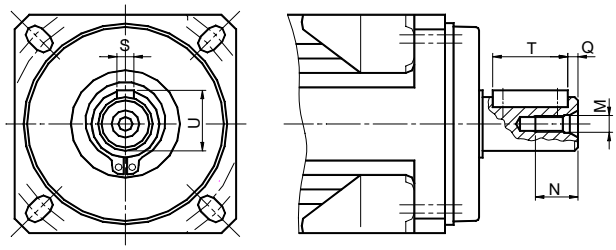
ØD k6	**E'**	**E**	**ØA** g6	**F**	**F'**	**L**	**H**	**P**	**ØBG**	**CG**	**KA**	**ØR** F7	**JA**	**ØB** F10	**GA**	**ØBMA**	**CMA**
22	36	49	70	3	12	11	85	114	85-100	6,6	153,5	19	40	80	3,5	85-100	6,6

Interface B

KB	**JB**	**ØC** F10	**GB**	**HB**	**PB**	**ØBMB**	**CMB**
164	50	100	4	115	149	115-130	8,5

M	**N**	**S** P9 /h9	**T**	**U**	**Q**
M8	19	6	28	24,5	4

Output Shaft with Key (Option)



Performance Specifications

			Ratios								
			10	**15**	**20**	**25**	**30**	**40**	**50**	**60**	**80**	**95**
Continuous Input Torque	T_{1N}	Nm	2,5	2,5	2,5	2,5	2,5	2,5	1,8	1,5	1,125	1,0
Instantaneous Input Torque	T_{1In}	Nm	5,0	5,0	5,0	5,0	5,0	5,0	1,5	1,3	1,0	1,0
Continuous Output Torque	T_{2N}	Nm	25	37,5	50	62,5	75	90	90	90	90	90
Instantaneous Output Torque	T_{2In}	Nm	50	75	100	125	150	180	180	180	180	180
max. Input Speed	n_{1max}	rpm	6.000									
Torsional Stiffness	C_t	Nm/arcmin	4,6									
Input Inertia	J_1	kgcm²	0,930	0,908	0,900	0,898	0,897	0,894	0,897	0,896	0,894	0,892
Efficiency		%	94						92			
Weight	m	kg	A- Interf. 3,15 / B- Interf. 3,5						A- Interf. 3,2 / B- Interf. 3,55			
Direction rotation Input-Output			contrarotating						synchronrotating			
Mounting Position			any									
Operating Temperature		°C	-10° to 90°									
Lubrication			Lifetime Oil Lubrication									
Lifetime	L_h	h	>15.000									
Noise Level at 3000 rpm		dB(A)	<= 69									
Backlash	f	arcmin	reduced< 5 , standard < 15 , < 30									

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at duty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

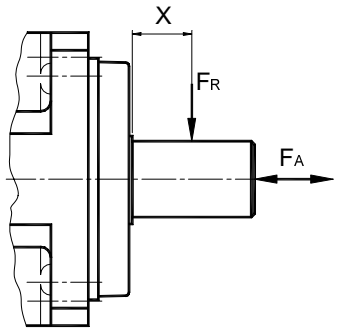
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

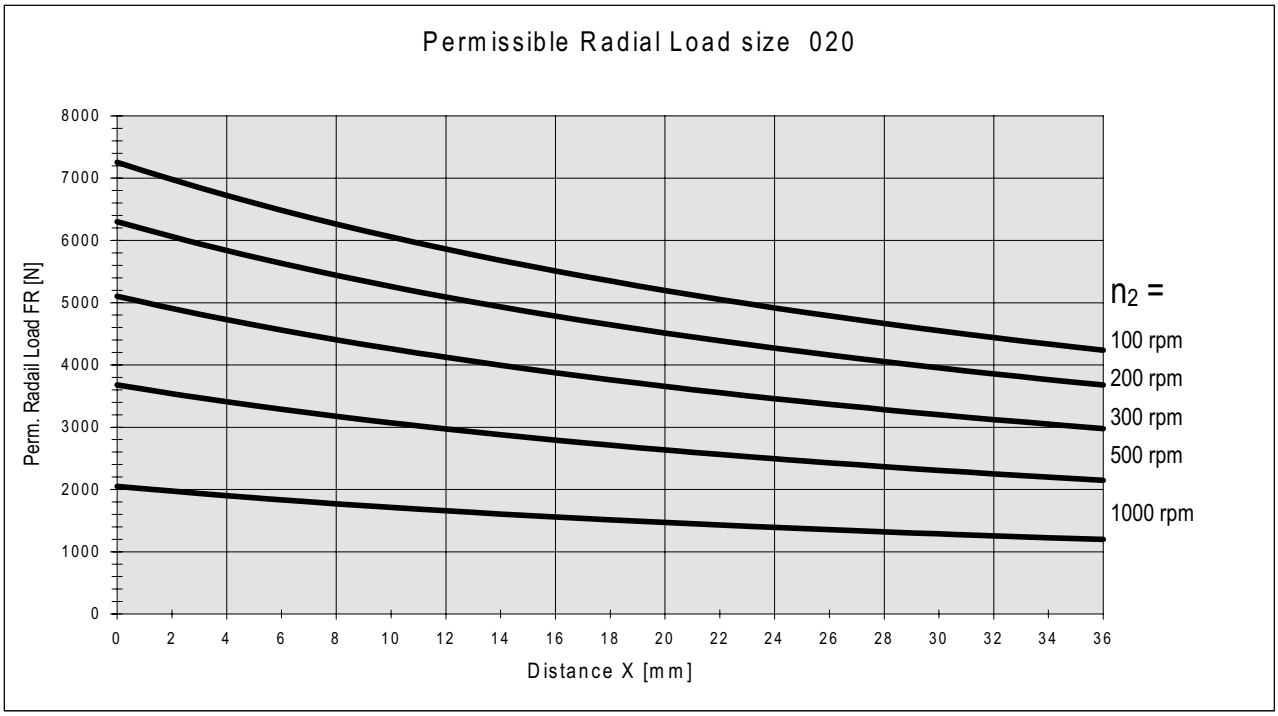
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial load above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,exist.} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



04-2001

How to Order:

HP - 020 - 007 - 15 - A190 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 05 =< 5‘ (arcmin); 15 =< 15‘; 30=< 30‘

Special -Code

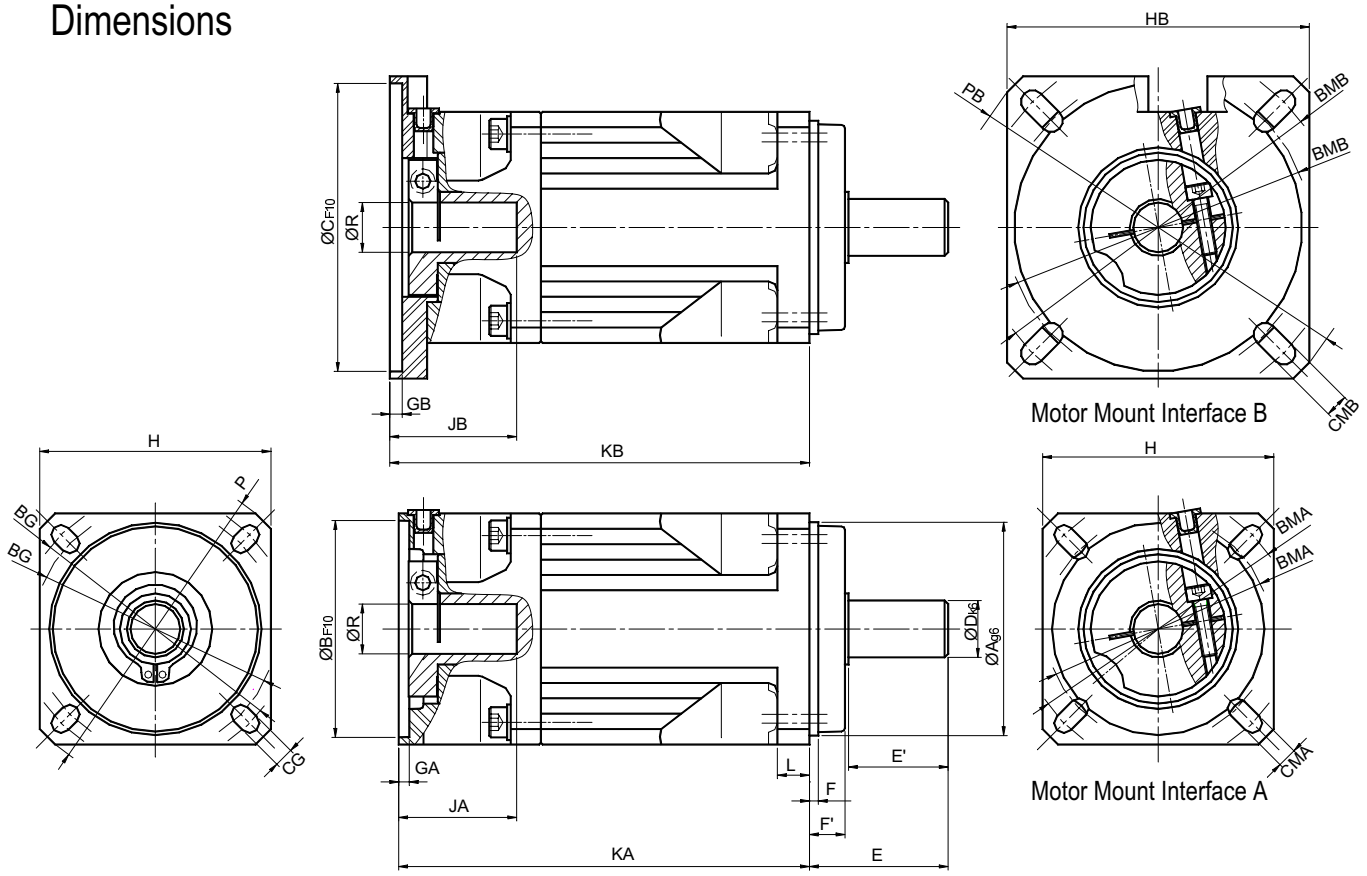
Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

Housing: N = Standard
F = Mounting Plate S = Special

Motor Interface: A or B
Motor Shaft Ø: Ø11 = 100; Ø19 = 190

Servo – Hybrid – Reducer Type HP-030

Dimensions



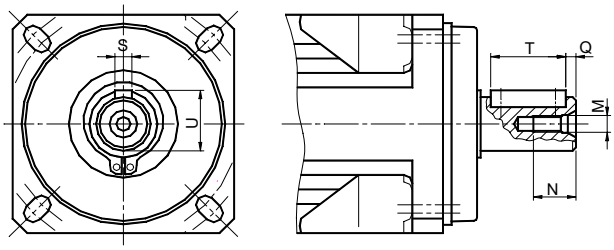
ØD k6	E'	E	ØA g6	F	F'	L	H	P	ØBG	CG	KA	ØR F7	JA	ØB F10	GA	ØBMA	CMA
32	58	85	100	4	25	13	115	152	115-130	8,5	200	24	50	110	4	115-130	8,5

Interface B

KB	JB	ØC F10	GB	HB	PB	ØBMB	CMB
201	53	130	4	142	188	145-165	11

M	N	S P9 /h9	T	U	Q
M12	28	10	45	35	6

Output Shaft with Key (Option)



Performance Specifications

			Ratios									
			10	15	20	25	30	40	50	60	80	95
Continuous Input Torque	T_{1N}	Nm	6,0	6,0	6,0	6,0	6,0	4,5	3,6	3,0	2,25	1,9
Instantaneous Input Torque	T_{1In}	Nm	12	12	12	12	12	9,0	7,2	6,0	4,5	3,8
Continuous Output Torque	T_{2N}	Nm	60	90	120	150	180	180	180	180	180	180
Instantaneous Output Torque	T_{2In}	Nm	120	180	240	125	360	360	360	360	360	360
max. Input Speed	n_{1max}	rpm	6.000									
Torsional Stiffness	C_t	Nm/arcmin	10,8									
Input Inertia	J_1	kgcm²	2,440	2,393	2,376	2,371	2,366	2,361	2,363	2,361	2,358	2,357
Efficiency		%	94						92			
Weight	m	kg	A- Interf. 7,65 / B- Interf. 7,95						A- Interf. 7,8 / B- Interf. 8,1			
Direction rotation Input-Output			contrarotating						synchronrotating			
Mounting Position			any									
Operating Temperature		°C	-10° to 90°									
Lubrication			Lifetime Oil Lubrication									
Lifetime	H_l	h	>15.000									
Noise Level at 3000 rpm		dB(A)	<= 69									
Backlash	f	arcmin	reduced< 5 , standard < 15 , < 30									

Permissible Shaft Load

Rated lifetime of output bearing L_{h10} = 15.000 running hours at uty cycle S4 or S5

Average Output Speed n_2

The values of radial load F_R shown in the diagram include a thrust (axial) load

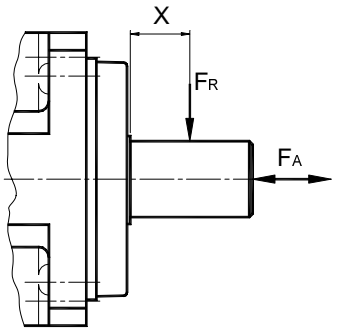
$$F_A = 0{,}5 \times F_R$$

Without thrust load the permissible radial load may be increased by 1,3

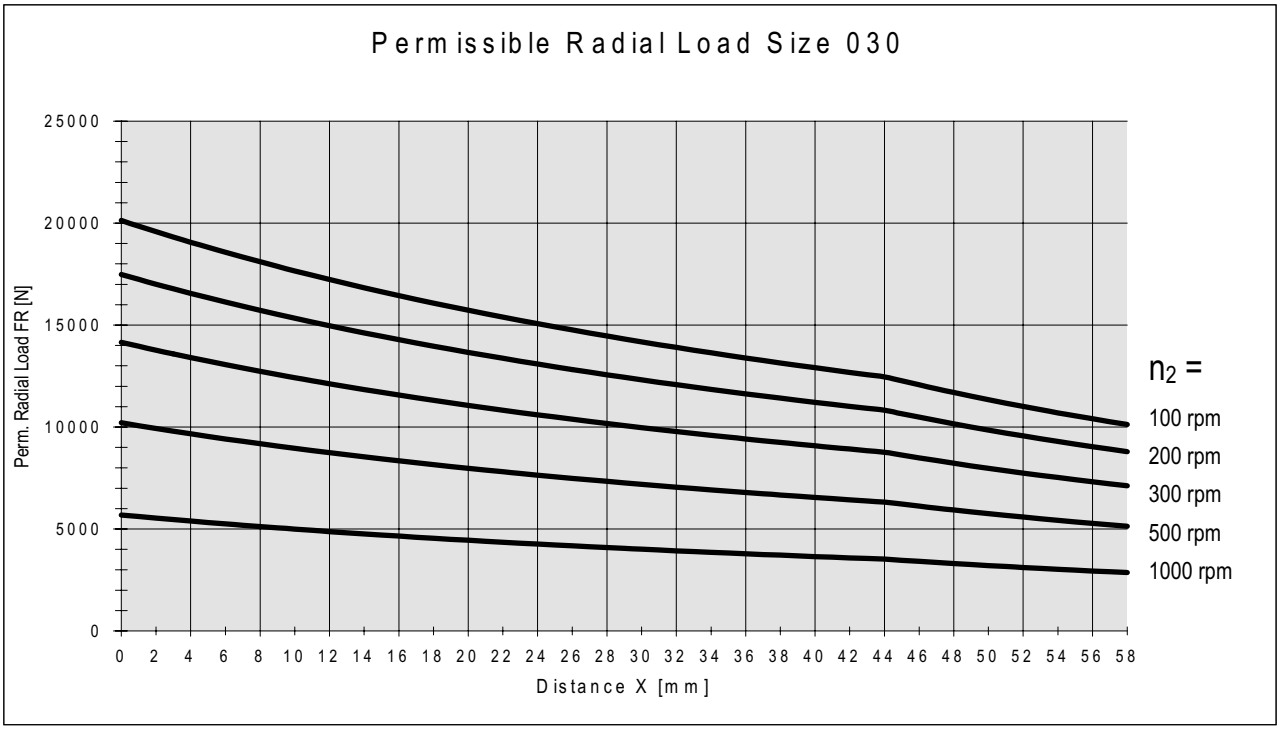
$$F_{R(FA=0)} = 1{,}3 \times F_R \text{ (Diagram)}$$

At radial loads above values in diagram, the rated lifetime of the bearings will be reduced as follows:

$$L_{h10} = 15\,000 \times \left(F_R / F_{R\,exist.} \right)^3$$



F_A = permissible thrust load
F_R = permissible radial load
X = distance



04-2001

How to Order:

HP - 030 - 007 - 15 - A240 - N - N - XXX

Reducer Type:
HP = Hybrid – Reducer
AP = Planetary - Reducer

Size:
010 – 020 – 030 – 040 - 050

Ratio:
007 = 7:1, 010= 10:1

Backlash: 05 =< 5‘ (arcmin); 15 =< 15‘; 30=< 30‘

Special -Code

Output Shaft:
N = Standard V = Gear Shaft
P = with Key S = Special

Housing: N = Standard
F = Mounting Plate S = Special

Motor Interface: A or B
Motor Shaft Ø: Ø9 = 090; Ø24 = 240

Servo drive packages by ESR Pollmeier GmbH

ESR – the complete servo drive from a single source

General

The servo gears of the series AP and HP described in this data sheet are components of the ESR drive packages. These consist of servo amplifiers, servo motors, position sensors, gear boxes, and brakes. They are supplemented by power supply units, connectors, cables (ready-assembled on request), and software. All parts of the package are matched and have been tested as combinations. The delivery of the complete drive system from a single source guarantees smooth installation, reliable operation, and definite system responsibility on the part of one single supplier.

Drive system configuration

Our service offer includes individual drive system determination. With our long-standing experience we help you choose the right servo drive for your application.

Drive packages

AP and HP servo gears are used with AC servo motors in the following drive packages:

TrioDrive servo drives (data sheet 6646.250)

Shaft power up to 1 kW, servo amplifier with 125 V bus voltage, 19" design with 3 height units, available as single-axis and multi-axis amplifier.

MidiDrive servo drives (data sheet 6661.250)

Shaft power up to 2.6 kW, servo amplifier with 320 V bus voltage, available in compact design (single-axis amplifier) and 19" design with 6 height units (multi-axis amplifier).

TrioDrive D servo drives (data sheet 6750.250)

Shaft power up to 1.4 kW, digital servo amplifier with 320 V bus voltage in compact design (single-axis amplifier), integrated positioning control, fieldbus options.

MidiDrive D servo drives (data sheet 6730.250)

Shaft power up to 3.7 kW, digital servo amplifier with 320 V or 560 V bus voltage in compact design (single-axis amplifier), integrated positioning control, fieldbus options.

MaxiDrive servo drives (data sheet 6710.250)

Shaft power up to 10 kW, digital servo amplifier with 560 V bus voltage in compact design (single-axis amplifier), integrated positioning control, fieldbus options.

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