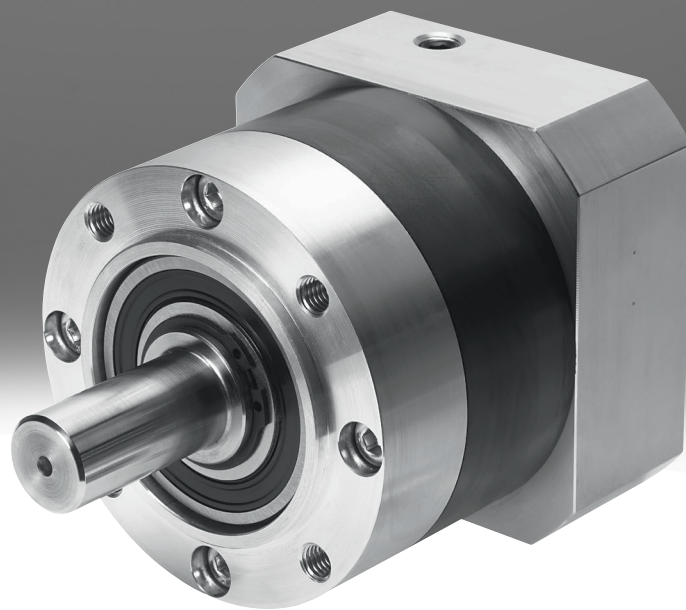


Gear unit EMGA

FESTO



Characteristics

Gear unit type

[P] Planetary gear unit



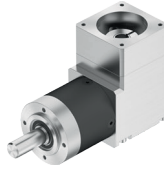
Characteristics:

- Gear ratio $i = 3; 5; 8; 12; 20$ (other ratios on request)
- Lifetime lubrication
- Degree of protection: IP54

Suitable for:

- Servo motors:EMMT-AS
- Stepper motors:EMMT-ST, EMMB-ST

[A] Right-angle gear unit



Characteristics:

- Gear ratio $i = 3; 5; 8; 12; 20$ (other ratios on request)
- Lifetime lubrication
- Degree of protection: IP54

Suitable for:

- Servo motors:EMMT-AS

Type code

001	Series
EMGA	Gear unit

002	Gear unit flange size [mm]
40	40
60	60
80	80
120	120
160	160

003	Gear unit type
P	Planetary gear unit
A	Right-angle gear unit

004	Gear ratio
G3	3:1
G5	5:1
G8	8:1
G12	12:1
G20	20:1

005	Interface
	None
EAS	Eco AC synchronous
SAS	AC synchronous
SST	Stepper motor

006	Flange size, motors [mm]
40	40
42	42
55	55
57	57
60	60
70	70
80	80
87	87
100	100
140	140

Datasheet

Technical data – Gear unit EMGA-40-P

Type of gear unit	Planetary gear				
Gear unit flange size	40 mm				
Gear unit ratio	3:1	5:1	8:1	12:1	20:1
Gear unit interface, output shaft	40G				
Gear unit interface, drive shaft	42A, 40P				40P
Continuous output torque ¹⁾	11 Nm	14 Nm	6 Nm	20 Nm	
Max. output torque ²⁾	17.6 Nm	22 Nm	10 Nm	32 Nm	
Max. drive speed	18,000 rpm				
Torsional rigidity	1		0.8, 0.85		1
Torsional backlash	0.25 deg				0.31 deg
Mass moment of inertia of gear unit ³⁾	0.031 kgcm ²	0.019 kgcm ²	0.015 kgcm ²	0.025 ... 0.026 kgcm ²	0.018 kgcm ²
Degree of protection	IP54				
Max. efficiency	98%		96%		
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Product weight	350 g		350 ... 400 g	450 g	
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Technical data – Gear unit EMGA-60-P

Type of gear unit	Planetary gear									
Gear unit flange size	60 mm									
Gear unit ratio	3:1		5:1		8:1		12:1		20:1	
Gear unit interface, output shaft	60G	60H	60G	60H	60G	60H	60G	60H		
Gear unit interface, drive shaft	57A, 55A, 70A	60P	57A, 55A, 70A	60P	57A	60P	57A	60P		
Continuous output torque ¹⁾	22 Nm	28 Nm	22 Nm	40 Nm	18 Nm		44 Nm			
Max. output torque ²⁾	35.2 Nm	45 Nm	35.2 Nm	64 Nm	29 Nm		70 Nm			
Max. drive speed	13,000 rpm									
Torsional rigidity	2.3				2.4		2.8			
Torsional backlash	0.17 deg								0.2 deg	
Mass moment of inertia of gear unit ³⁾	0.135 kgcm ²		0.078 kgcm ²		0.067 kgcm ²	0.088 kgcm ²	0.118 kgcm ²	0.138 kgcm ²	0.096 kgcm ²	
Degree of protection	IP54									
Max. efficiency	98%				97%		96%			
Operating temperature of gear unit ⁴⁾	-25 ... 90°C									
Product weight	900 g						1,100 g			
Note on materials	RoHS-compliant									
LABS (PWIS) conformity	VDMA24364-B2-L									

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Datasheet

Technical data – Gear unit EMGA-80-P					
Type of gear unit	Planetary gear				
Gear unit flange size	80 mm				
Gear unit ratio	3:1	5:1	8:1	12:1	20:1
Gear unit interface, output shaft	80G				
Gear unit interface, drive shaft	87A, 100A, 80P				100A, 80P
Continuous output torque ¹⁾	85 Nm	110 Nm	50 Nm	120 Nm	
Max. output torque ²⁾	136 Nm	176 Nm	80 ... 190 Nm	192 ... 240 Nm	
Max. drive speed	7,000 rpm				
Torsional rigidity	6		8.4	10.2, 10.4	10.4
Torsional backlash	0.12 deg			0.15 deg	
Mass moment of inertia of gear unit ³⁾	0.77 kgcm ²	0.45 kgcm ²	0.37 kgcm ²	0.589 kgcm ²	0.406 kgcm ²
Max. efficiency	98%		97%	96 ... 97%	96%
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Product weight	2,000 ... 2,100 g		2,000 ... 2,300 g	2,500 ... 2,800 g	
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Technical data – Gear unit EMGA-120-P					
Type of gear unit	Planetary gear				
Gear unit flange size	120 mm				
Gear unit ratio	3:1	5:1	8:1	12:1	20:1
Gear unit interface, output shaft	120G				
Gear unit interface, drive shaft	140A, 100A				
Continuous output torque ¹⁾	115 Nm	195 Nm	120 Nm	260 Nm	
Max. output torque ²⁾	184 Nm	312 Nm	192 ... 380 Nm	416 ... 520 Nm	
Max. drive speed	6,500 rpm				
Torsional rigidity	12		18	22	
Torsional backlash	0.12 deg			0.15 deg	
Mass moment of inertia of gear unit ³⁾	2.63 kgcm ²	1.53 kgcm ²	1.431 kgcm ²	2.224 kgcm ²	1.573 kgcm ²
Max. efficiency	98%		97%	96%	
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Product weight	6,000 g		6,000 ... 7,000 g	8,000 ... 9,000 g	
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Datasheet

Technical data – Gear unit EMGA-160-P

Type of gear unit	Planetary gear				
Gear unit flange size	160 mm				
Gear unit ratio	3:1	5:1			
Gear unit interface, output shaft	160G				
Gear unit interface, drive shaft	140A				
Continuous output torque ¹⁾	400 Nm	450 Nm			
Max. output torque ²⁾	640 Nm	720 Nm			
Max. drive speed	6,500 rpm				
Torsional rigidity	38				
Torsional backlash	0.1 deg				
Mass moment of inertia of gear unit ³⁾	12.14 kgcm ²	6.07 kgcm ²			
Max. efficiency	98%				
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Product weight	18,000 g				
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Technical data – Gear unit EMGA-40-A

Type of gear unit	Right-angle gear unit					
Gear unit flange size	40 mm					
Gear unit ratio	3:1	5:1	8:1	12:1	20:1	
Gear unit interface, output shaft	40G					
Gear unit interface, drive shaft	40P					
Continuous output torque ¹⁾	4.5 Nm	7.5 Nm	6 Nm	20 Nm		
Max. output torque ²⁾	7 Nm	12 Nm	10 Nm	32 Nm		
Max. drive speed	18,000 rpm					
Torsional backlash	0.35 deg			0.41 deg		
Mass moment of inertia of gear unit ³⁾	0.049 kgcm ²	0.035 kgcm ²	0.032 kgcm ²	0.048 kgcm ²	0.035 kgcm ²	
Max. efficiency	95%		92%	94%	92%	
Operating temperature of gear unit ⁴⁾	-25 ... 90°C					
Degree of protection	IP54					
Product weight	500 g			600 g		
Note on materials	RoHS-compliant					
LABS (PWIS) conformity	VDMA24364-B2-L					

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Datasheet

Technical data – Gear unit EMGA-60-A					
Type of gear unit	Right-angle gear unit				
Gear unit flange size	60 mm				
Gear unit ratio	3:1	5:1	8:1	12:1	20:1
Gear unit interface, output shaft	60G				
Gear unit interface, drive shaft	60P				
Continuous output torque ¹⁾	14 Nm	24 Nm	18 Nm	44 Nm	
Max. output torque ²⁾	22 Nm	38 Nm	29 Nm	70 Nm	
Max. drive speed	13,000 rpm				
Torsional backlash	0.27 deg			0.3 deg	
Mass moment of inertia of gear unit ³⁾	0.394 kgcm ²	0.257 kgcm ²	0.243 kgcm ²	0.391 kgcm ²	0.256 kgcm ²
Max. efficiency	95%		93%	94%	92%
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Degree of protection	IP54				
Product weight	1,700 g			1,900 g	
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Technical data – Gear unit EMGA-80-A					
Type of gear unit	Right-angle gear unit				
Gear unit flange size	80 mm				
Gear unit ratio	3:1	5:1	8:1	12:1	20:1
Gear unit interface, output shaft	80G				
Gear unit interface, drive shaft	100A, 80P				
Continuous output torque ¹⁾	40 Nm	67 Nm	50 Nm	120 Nm	
Max. output torque ²⁾	64 Nm	107 Nm	80 ... 190 Nm	192 ... 240 Nm	
Max. drive speed	7,000 rpm				
Torsional backlash	0.22 deg			0.25 deg	
Mass moment of inertia of gear unit ³⁾	1.409 kgcm ²	1.017 kgcm ²	0.934 kgcm ²	1.379 kgcm ²	1.013 kgcm ²
Max. efficiency	95%		94%	93%	
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Degree of protection	IP54				
Product weight	4,300 ... 4,500 g		4,400 ... 4,500 g	5,000 ... 5,100 g	
Note on materials	RoHS-compliant				
LABS (PWIS) conformity	VDMA24364-B2-L				

1) On the output shaft.

2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

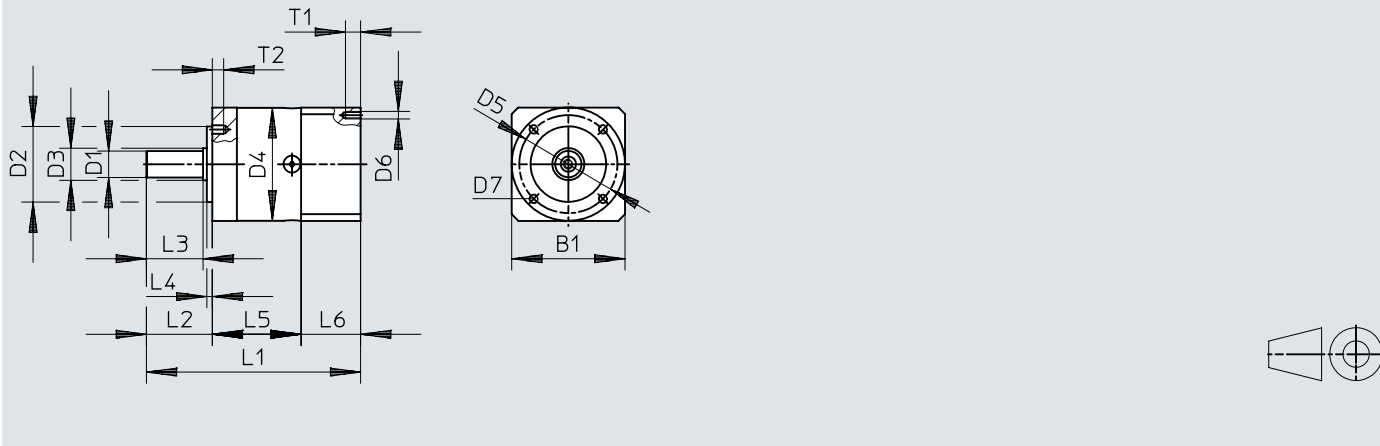
3) Related to the drive shaft.

4) Note the temperature range of the motor.

Dimensions

Dimensions – EMGA-...-P-... for servo motors EMMT-AS

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	1)	B1	D1 ø h7	D2 ø h7	D3 ø	D4 ø	D5 ø	D6
EMGA-40	3, 5, 8 12, 20	40	10	26	12	40	34	M3
EMGA-60	3, 5, 8 12, 20	60	14	40	17	60	52	M4
EMGA-80	3, 5, 8 12, 20	80	20	60	25	80	70	M5
	3, 5, 8 12, 20	100	20	60	25	80	70	M8
EMGA-120	3, 5, 8 12, 20	115	25	80	35	115	100	M8

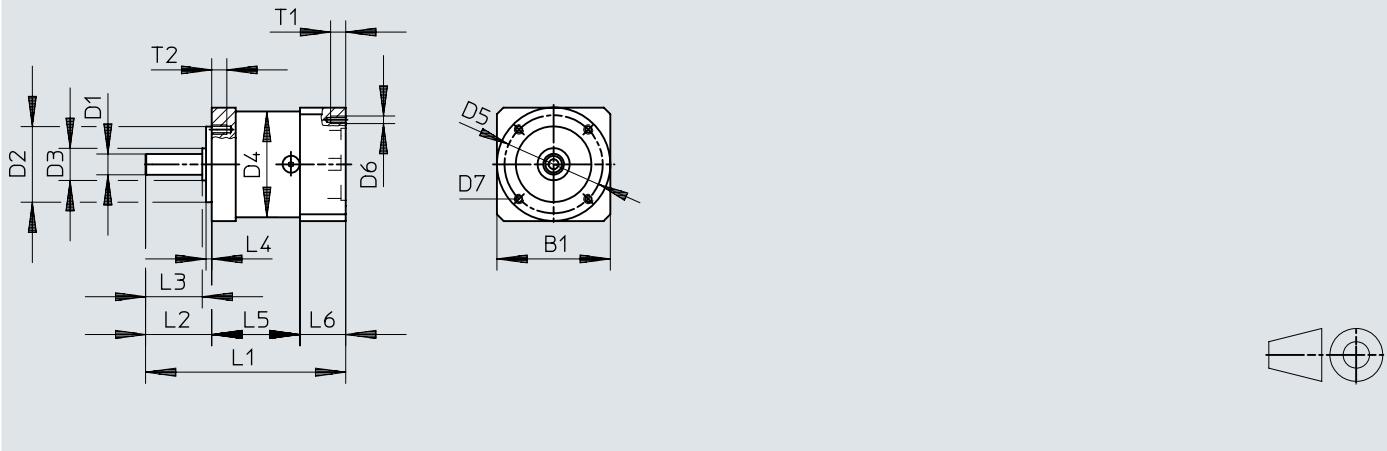
	1)	D7	L1	L2	L3 ±0,2	L4 ±0,2	L5	L6	T1 +2	T2 +2
EMGA-40	3, 5, 8 12, 20	M4	93,5	26	23	2	39	28,5	8	6
	106,5		52							
EMGA-60	3, 5, 8 12, 20	M5	113	35	30	3	47	31	10	8
	125,5		59,5							
EMGA-80	3, 5, 8 12, 20	M6	138,5	40	36	3	60	38,5	12	10
	156		77,5							
	3, 5, 8 12, 20	M6	143,5	40	36	3	60	43,5	16	10
	161		77,5							
EMGA-120	3, 5, 8 12, 20	M10	176,5	55	50	4	74	47,5	20	16
	204		101,5							

1) Gear ratio

Dimensions

Dimensions – EMGA-...-P-... for third-party motors

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	1)	B1	D1 ø h7	D2 ø h7	D3 ø	D4 ø	D5 ø	D6
EMGA-60	3, 5	60	11	40	17	60	52	M5
	3, 5	70	11	40	17	60	52	M5
EMGA-80	3, 5	100	20	60	25	80	70	M8
EMGA-120	3, 5, 8	115	25	80	35	115	100	M8
	12, 20							
	3, 5, 8 12, 20	140	25	80	35	115	100	M10
EMGA-160	3, 5	140	40	130	55	160	145	M10

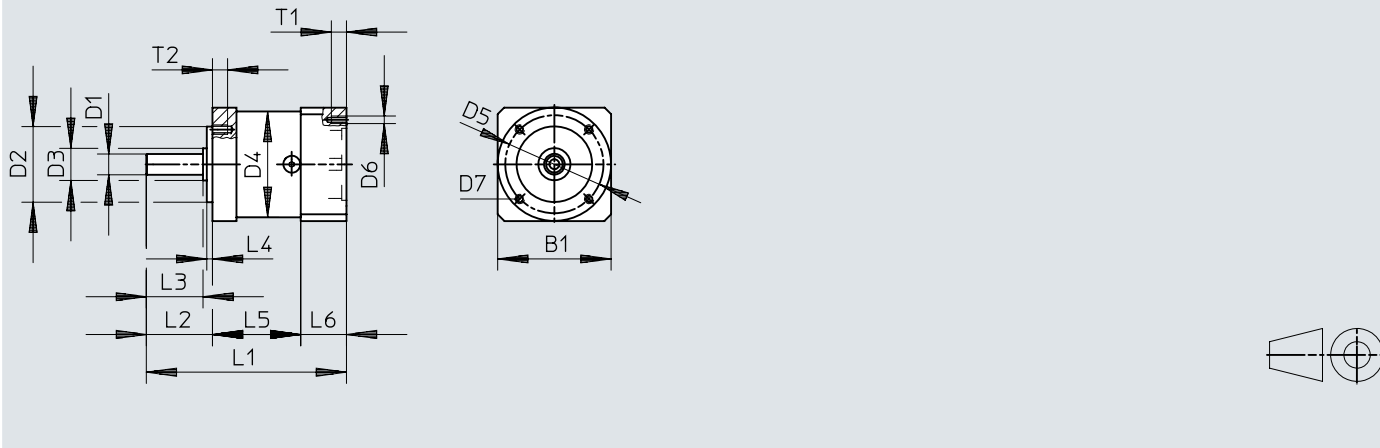
	1)	D7	L1	L2	L3 ±0,2	L4 ±0,2	L5	L6	T1	T2
EMGA-60	3, 5	M5	106	35	30	3	47	24	12	8
	3, 5	M5	106	35	30	3	47	24	12	8
EMGA-80	3, 5	M6	143,5	40	36	3	60	43,5	16	10
EMGA-120	3, 5, 8	M10	176,5	55	50	4	74	47,5	20	16
	12, 20		204				101,5			
	3, 5, 8 12, 20	M10	186,5 214	55	50	4	74 101,5	57,5	25	16
EMGA-160	3, 5	M12	255,5	87	80	5	104	64,5	25	20

1) Gear ratio

Dimensions

Dimensions – EMGA-...-P-... for stepper motors EMMT-ST, EMMB-ST

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	1)	B1	D1 ø h7	D2 ø h7	D3 ø	D4 ø	D5 ø	D6
EMGA-40	3, 5, 8 12	40	10	26	12	40	34	ø3,4
EMGA-60	3, 5, 8 12	60	11	40	17	60	52	M4
EMGA-80	3, 5, 8 12	90	20	60	25	80	70	M5

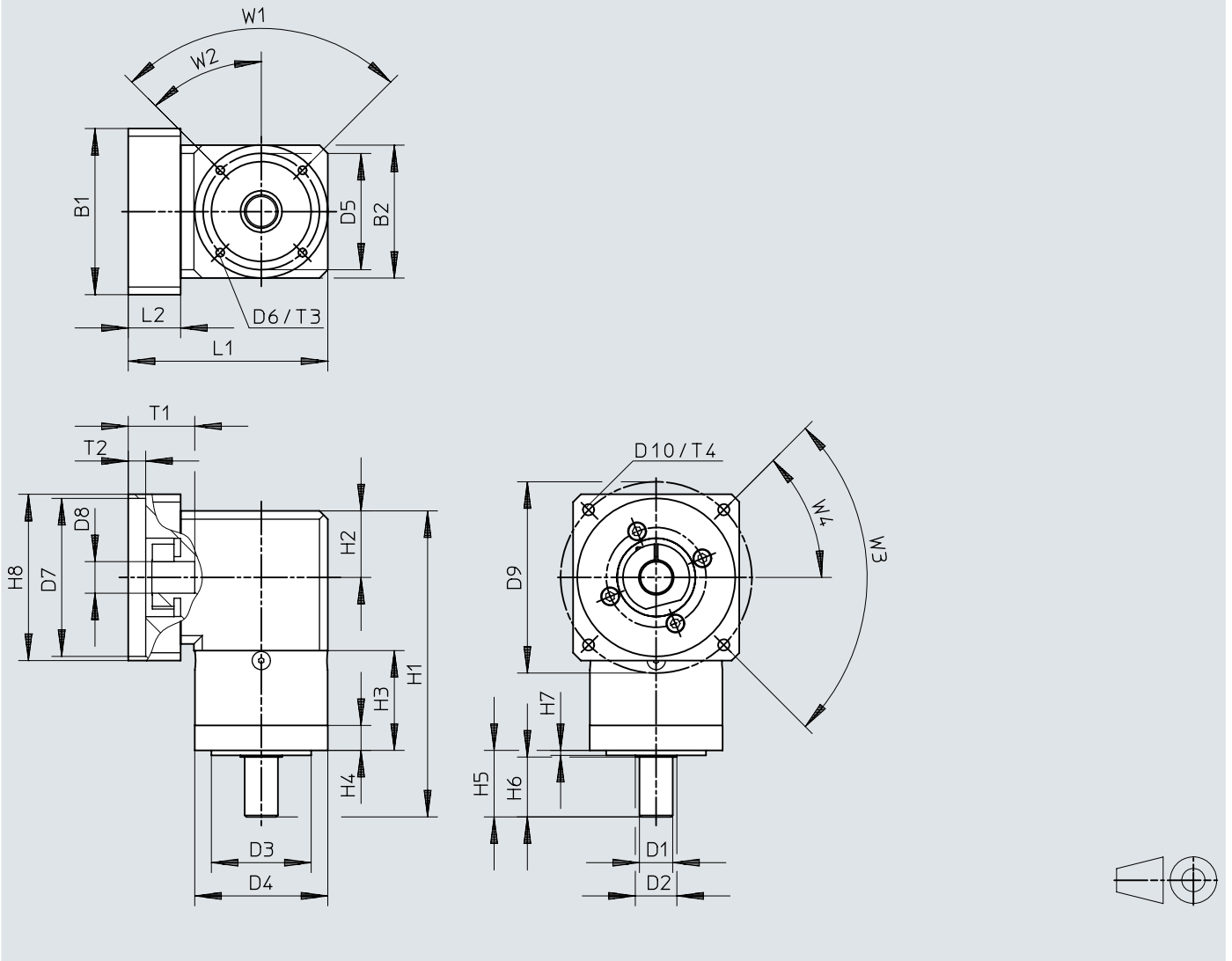
	1)	D7	L1 ±1,5	L2	L3	L4	L5	L6	T1	T2
EMGA-40	3, 5, 8	M4	92,5	26	23	2	39	27,5	5	6
	12		105,5				52			
EMGA-60	3, 5, 8	M5	106	35	30	3	47	24	8	8
	12		118,5				59,5			
EMGA-80	3, 5, 8	M6	135,5	40	36	3	60	35,5	12	10
	12		153				77,5			

1) Gear ratio

Dimensions

Dimensions – EMGA-...-A... for servo motors EMMT-AS

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Dimensions

	1)	B1	B2	D1 ∅ h7	D2 ∅	D3 ∅ h7	D4 ∅	D5 ∅	D6	D7 +0,05/+0,02	D8	D9
EMGA-40	3,5	40	40	10	12	26	40 ^{-0,3}	34	M4	30	8	45
	8						40					
	12, 20											
EMGA-60	3,5	60	60	14	17	40	60 ^{-0,3}	52	M5	50	14	70
	8						60					
	12, 20											
EMGA-80-...-80	3,5	80	80	20	25	60	80 ^{-0,4}	70	M6	70	19	90
	8						80					
	12, 20											
EMGA-80-...-100	3,5	100	100	20	25	60	80 ^{-0,4}	70	M6	95	19	115
	8						80					
	12, 20											

	1)	D10	H1	H2	H3 ±0,2	H4	H5	H6	H7	H8	L1	L2
EMGA-40	3,5	M3	110 ±1,5	20	39	10,2	26±0,6	23 ±0,2	2 ±0,2	40	67	19
	8		110		39		26	23	2			
	12, 20		123		52							
EMGA-60	3,5	M4	146,8 ±1,5	30	46,8	12,7	35±0,8	30 ±0,2	3 ±0,2	60	92,5	23
	8		147		47		35	30	3			
	12, 20		159,5		59,5							
EMGA-80-...-80	3,5	M5	183,9 ±1,5	40	59,9	15	40±0,8	36 ±0,2	3 ±0,2	80	115	26,5
	8		184		60		40	36	3			
	12, 20		201,5		77,5							
EMGA-80-...-100	3,5	M6	183,9 ±1,5	40	59,9	15	40±0,8	36 ±0,2	3 ±0,2	100	120	31,5
	8		184		60		40	36	3			
	12, 20		201,5		77,5							

	1)	T1	T2	T3	T4	W1	W2	W3	W4
EMGA-40	3,5	25+2/+0,5	3,5	6	8	90°	45°	90°	45°
	8		3,4		7				
	12, 20								
EMGA-60	3,5	30+2,5/+0,5	4	8	10	90°	45°	90°	45°
	8								
	12, 20								
EMGA-80-...-80	3,5	35+2,5/+0,5	4,4	10	12	90°	45°	90°	45°
	8								
	12, 20								
EMGA-80-...-100	3,5	40+2,5/+0,5	10,4	10	20	90°	45°	90°	45°
	8		10,5						
	12, 20								

1) Gear ratio

Ordering data

EMGA-...-P for EMME-AS-40					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	40G	40P	★ 2297684	EMGA-40-P-G3-EAS-40
	5:1			★ 2297685	EMGA-40-P-G5-EAS-40
	8:1			8141729	EMGA-40-P-G8-EAS-40
	12:1			8141730	EMGA-40-P-G12-EAS-40
	20:1			8141731	EMGA-40-P-G20-EAS-40

EMGA-...-P for EMMT-AS-60					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	60H	60P	★ 2297686	EMGA-60-P-G3-EAS-60
	5:1			★ 2297687	EMGA-60-P-G5-EAS-60
	8:1			8141735	EMGA-60-P-G8-EAS-60
	12:1			8141736	EMGA-60-P-G12-EAS-60
	20:1			8141737	EMGA-60-P-G20-EAS-60

EMGA-...-P for EMMT-AS-80					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	80G	80P	★ 2297690	EMGA-80-P-G3-EAS-80
	5:1			★ 2297691	EMGA-80-P-G5-EAS-80
	8:1			8141741	EMGA-80-P-G8-EAS-80
	12:1			8141742	EMGA-80-P-G12-EAS-80
	20:1			8141743	EMGA-80-P-G20-EAS-80

EMGA-...-P for EMMT-AS-100					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	80G	100A	★ 552194	EMGA-80-P-G3-SAS-100
		120G		★ 552196	EMGA-120-P-G3-SAS-100
	5:1	80G		★ 552195	EMGA-80-P-G5-SAS-100
		120G		★ 552197	EMGA-120-P-G5-SAS-100
	8:1	80G		8141750	EMGA-80-P-G8-SAS-100
		120G		8141753	EMGA-120-P-G8-SAS-100
	12:1	80G		8141751	EMGA-80-P-G12-SAS-100
		120G		8141754	EMGA-120-P-G12-SAS-100
	20:1	80G		8141752	EMGA-80-P-G20-SAS-100
		120G		8141755	EMGA-120-P-G20-SAS-100

EMGA-...-P for third-party motors					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	60G	55A	552188	EMGA-60-P-G3-SAS-55
	5:1			552189	EMGA-60-P-G5-SAS-55

EMGA-...-P for third-party motors					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	60G	70A	552190	EMGA-60-P-G3-SAS-70
	5:1			552191	EMGA-60-P-G5-SAS-70

EMGA-...-P for EMMT-ST-42, EMMB-ST-42					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	40G	42A	★ 549428	EMGA-40-P-G3-SST-42
	5:1			★ 549429	EMGA-40-P-G5-SST-42
	8:1			8141762	EMGA-40-P-G8-SST-42

Ordering data

EMGA-...-P for EMMT-ST-42, EMMB-ST-42

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	12:1	40G	42A	8141763	EMGA-40-P-G12-SST-42

EMGA-...-P for EMMT-ST-57, EMMB-ST-57

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	60G	57A	★ 549430	EMGA-60-P-G3-SST-57
	5:1			★ 549431	EMGA-60-P-G5-SST-57
	8:1			8141764	EMGA-60-P-G8-SST-57
	12:1			8141765	EMGA-60-P-G12-SST-57

EMGA-...-P for EMMT-ST-87, EMMB-ST-87

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear	3:1	80G	87A	★ 549432	EMGA-80-P-G3-SST-87
	5:1			★ 549433	EMGA-80-P-G5-SST-87
	8:1			8141766	EMGA-80-P-G8-SST-87
	12:1			8141767	EMGA-80-P-G12-SST-87

EMGA-...-A for EMME-AS-40

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Right-angle gear unit	3:1	40G	40P	8085342	EMGA-40-A-G3-40P
	5:1			8085343	EMGA-40-A-G5-40P
	8:1			8141732	EMGA-40-A-G8-40P
	12:1			8141733	EMGA-40-A-G12-40P
	20:1			8141734	EMGA-40-A-G20-40P

EMGA-...-A for EMMT-AS-60

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Right-angle gear unit	3:1	60G	60P	8085344	EMGA-60-A-G3-60P
	5:1			8085345	EMGA-60-A-G5-60P
	8:1			8141738	EMGA-60-A-G8-60P
	12:1			8141739	EMGA-60-A-G12-60P
	20:1			8141740	EMGA-60-A-G20-60P

EMGA-...-A for EMMT-AS-80

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Right-angle gear unit	3:1	80G	80P	8085346	EMGA-80-A-G3-80P
	5:1			8085347	EMGA-80-A-G5-80P
	8:1			8141744	EMGA-80-A-G8-80P
	12:1			8141745	EMGA-80-A-G12-80P
	20:1			8141746	EMGA-80-A-G20-80P

EMGA-...-A for EMMT-AS-100

Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Right-angle gear unit	3:1	80G	100A	8085348	EMGA-80-A-G3-100A
	5:1			8085349	EMGA-80-A-G5-100A
	8:1			8141747	EMGA-80-A-G8-100A
	12:1			8141748	EMGA-80-A-G12-100A
	20:1			8141749	EMGA-80-A-G20-100A