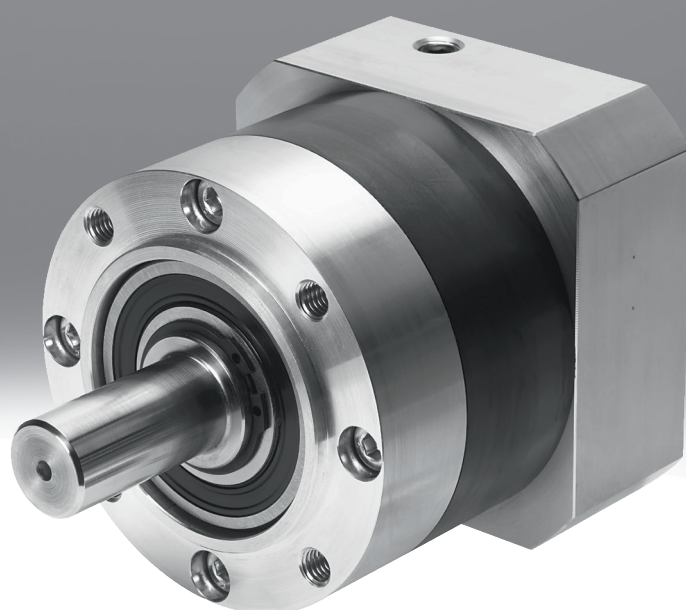


Gear unit EMGA

FESTO



Characteristics

Gear unit type

[P]	Planetary gear unit	[A]	Right-angle gear unit
-----	---------------------	-----	-----------------------

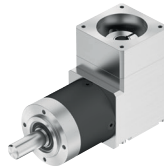


Characteristics:

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

Suitable for:

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



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, EMMT-EC

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	
57	57	
60	60	
80	80	
87	87	
100	100	
140	140	

Datasheet

Technical data – Gear unit EMGA-40-P

Type of gear unit	Planetary gear set				
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		42A	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 Nm/arcmin		0.8 Nm/arcmin	1 Nm/arcmin	
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
Permissible radial shaft load	200 N		–	200 N	
Permissible axial shaft load	200 N		–	200 N	
Max. efficiency	98%		96%		
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
Product weight	350 g		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 set								
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	60P	57A	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 Nm/arcmin				2.4 Nm/arcmin		2.8 Nm/arcmin		
Torsional backlash	0.17 deg								0.2 deg
Mass moment of inertia of gear unit ³⁾	0.135 kgcm²		0.078 kgcm²		0.067 kgcm²	0.088 kgcm²	0.118 kgcm²	0.138 kgcm²	0.096 kgcm²
Permissible radial shaft load	400 N								
Permissible axial shaft load	500 N								
Max. efficiency	98%				97%		96%		
Degree of protection	IP54								
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

Technical data – Gear unit LWSA 80 P					
Type of gear unit	Planetary gear set				
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	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 Nm	192 ... 240 Nm
Max. drive speed	7,000 rpm				
Torsional rigidity	6 Nm/arcmin		8.4 Nm/arcmin	10.2 Nm/arcmin	10.4 Nm/arcmin
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
Permissible radial shaft load	750 N				
Permissible axial shaft load	1,000 N				
Max. efficiency	98%		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	2,800 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

Technical data – Gear unit EMBA 120 A					
Type of gear unit	Planetary gear set				
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 Nm/arcmin		18 Nm/arcmin	22 Nm/arcmin	
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
Permissible radial shaft load	1,750 N				
Permissible axial shaft load	2,500 N				
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 set	
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 Nm/arcmin	
Torsional backlash	0.1 deg	
Mass moment of inertia of gear unit ³⁾	12.14 kgcm ²	6.07 kgcm ²
Permissible radial shaft load	5,000 N	
Permissible axial shaft load	7,000 N	
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
Permissible radial shaft load	200 N				
Permissible axial shaft load	200 N				
Max. efficiency	95%	92%	94%	92%	
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
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

Technical data		Gear unit EMCA 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
Permissible radial shaft load	400 N				
Permissible axial shaft load	500 N				
Max. efficiency	95%		93%	94%	92%
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
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

Technical data Gear unit ENH 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
Permissible radial shaft load	750 N				
Permissible axial shaft load	1,000 N				
Max. efficiency	95%		94%		93%
Degree of protection	IP54				
Operating temperature of gear unit ⁴⁾	-25 ... 90°C				
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.

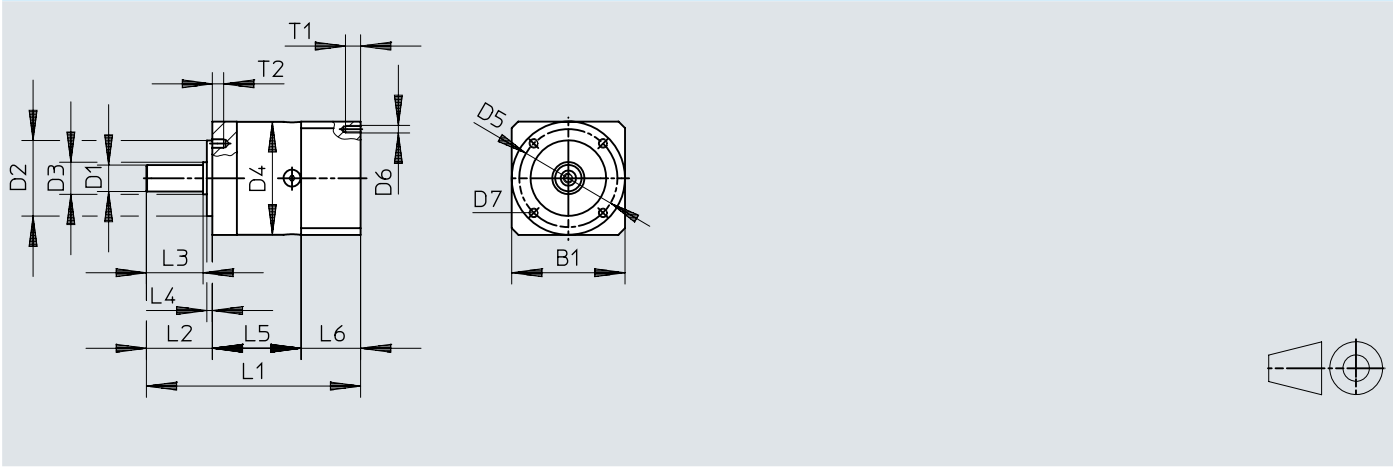
2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

3) Related to the drive shaft.

4) Note the temperature range of the motor.

Dimensions

Dimensions – EMGA-...-P (planetary gear set) [Download CAD data](#) www.festo.com



Dimensions

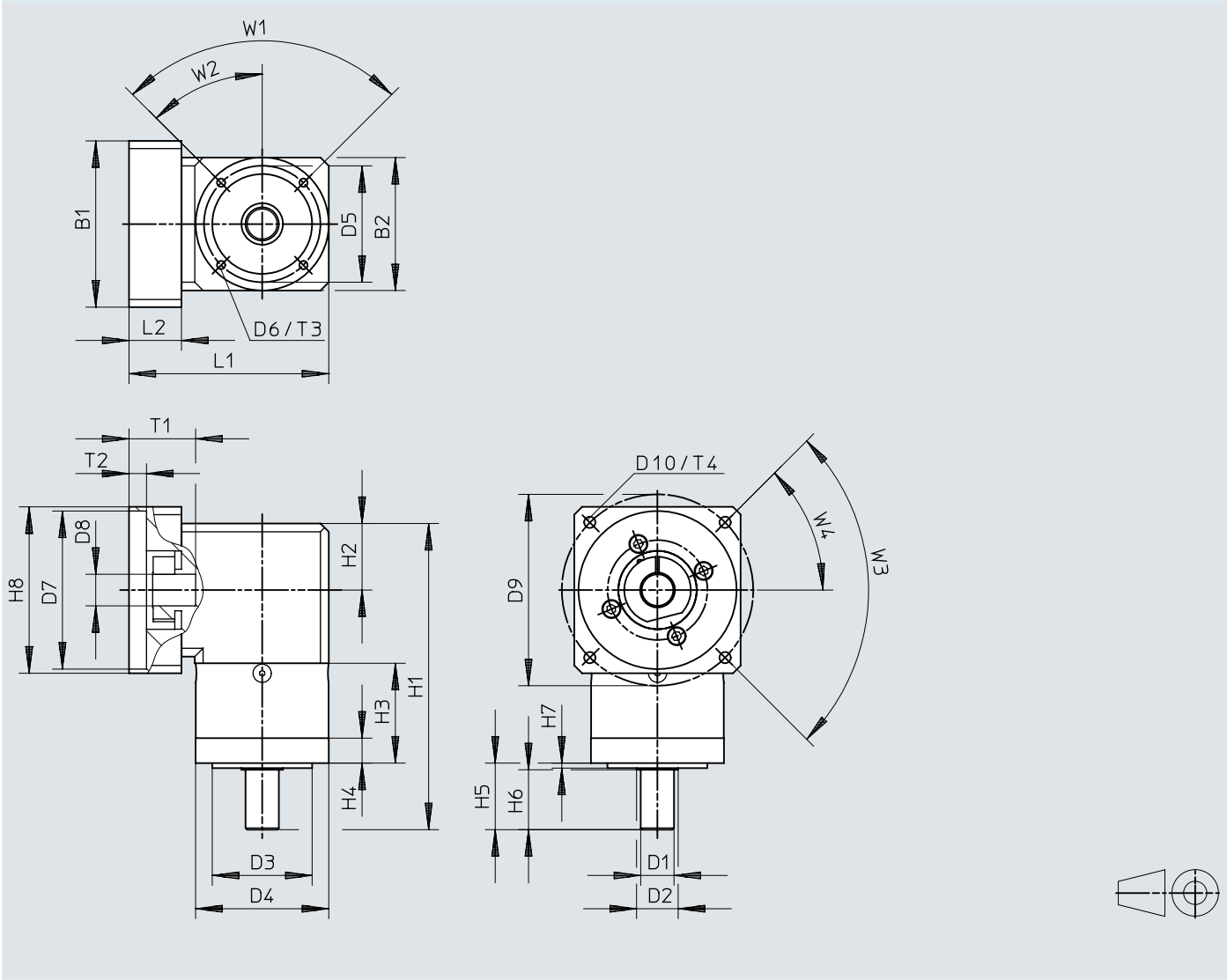
	1)	2)	3)	B1	D1 ø h7	D2 ø h7	D3 ø	D4 ø	D5 ø	D6
EMGA-40	3, 5, 8	40G	40P	40	10	26	12	40	34	M3
	12, 20		42A							ø3,4
	3, 5, 8									
	12									
EMGA-60	3, 5, 8	60H	60P	60	14	40	17	60	52	M4
	12, 20		57A	60	11	40	17	60	52	M4
	3, 5, 8	60G								
	12									
EMGA-80	3, 5, 8	80G	80P	80	20	60	25	80	70	M5
	12, 20		87A	90						M5
	3, 5, 8			100A						
	12									
	3, 5, 8									
	12, 20									
EMGA-120	3, 5, 8	120G	100A	115	25	80	35	115	100	M8
	12, 20		140A 150A	140						M10
	3, 5, 8									
	12, 20									
EMGA-160	3, 5	160G	140A 150A	140	40	130	55	160	145	M10

	1)	2)	3)	D7	L1	L2	L3	L4	L5	L6	T1	T2
							±0,2	±0,2			+2	+2
EMGA-40	3, 5, 8	40G	40P	M4	93,5	26	23	2	39	28,5	8	6
	12, 20		106,5		52							
	3, 5, 8		42A		92,5				39	27,5	5	
	12				105,5				52			
EMGA-60	3, 5, 8	60H	60P	M5	113	35	30	3	47	31	10	8
	12, 20		125,5		59,5							
	3, 5, 8	60G	57A	M5	106	35	30	3	47	24	8	8
	12		118,5		59,5							
EMGA-80	3, 5, 8	80G	80P	M6	138,5	40	36	3	60	38,5	12	10
	12, 20		156		77,5							
	3, 5, 8	80G	87A		135,5				60	35,5	12	
	12		153		77,5							
	3, 5, 8	80G	100A		143,5				60	43,5	16	
	12, 20		161		77,5							
EMGA-120	3, 5, 8	120G	100A	M10	176,5	55	50	4	74	47,5	20	16
	12, 20		204		101,5							
	3, 5, 8		140A 150A		186,5				74	57,5	25	
	12, 20				214				101,5			
EMGA-160	3, 5	160G	140A 150A	M12	255,5	87	80	5	104	64,5	25	20

- 1) Gear ratio
2) Gear unit interface, output shaft
3) Gear unit interface, drive

Dimensions

Dimensions – EMGA-...-A (right-angle gear unit) Download CAD data www.festo.com



Dimensions

	1)	2)	3)	B1	B2	D1 Ø h7	D2 Ø	D3 Ø h7	D4 Ø	D5 Ø	D6	D7 +0,05/+0,02	D8	D9
EMGA-40	3, 5	40G	40P	40	40	10	12	26	40 -0,3	34	M4	30	8	45
	8								40					
	12, 20								40					
EMGA-60	3, 5	60H	60P	60	60	14	17	40	60 -0,3	52	M5	50	14	70
	8								60					
	12, 20								60					
EMGA-80-....-80	3, 5	80G	80P	80	80	20	25	60	80 -0,4	70	M6	70	19	90
	8								80					
	12, 20								80					
EMGA-80-....-100	3, 5	80G	100A	100	100	20	25	60	80 -0,4	70	M6	95	19	115
	8								80					
	12, 20								80					

	1)	2)	3)	D10	H1	H2	H3 ±0,2	H4	H5	H6	H7	H8	L1	L2
EMGA-40	3, 5	40G	40P	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		26	23	2			
EMGA-60	3, 5	60H	60P	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		35	30	3			
EMGA-80-....-80	3, 5	80G	80P	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		40	36	3			
EMGA-80-....-100	3, 5	80G	100A	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		40	36	3			

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

- 1) Gear ratio
2) Gear unit interface, output shaft
3) Gear unit interface, drive

Ordering data

EMGA-....P for EMMT-AS-40, EMMT-EC-40					
Type of gear unit	Gear unit ratio	Gear unit interface, output shaft	Gear unit interface, drive shaft	Part no.	Type
Planetary gear set	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 set	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 set	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 set	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 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 set	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
	12:1			8141763	EMGA-40-P-G12-SST-42

Ordering data

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 set	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 set	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 EMMT-AS-40, EMMT-EC-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