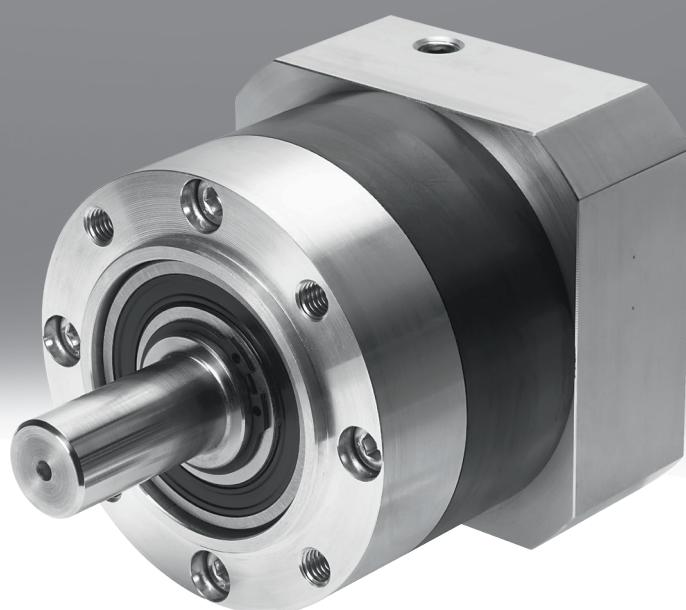


Gear unit EMGA

FESTO



Characteristics

Gear unit type

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

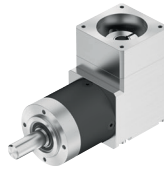


Characteristics:

- 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				
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
Permissible radial shaft load	200 N				
Permissible axial shaft load	200 N				
Max. efficiency	98%		96%		
Degree of protection	IP54				
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	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				2.4		2.8		
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				
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
Permissible radial shaft load	750 N				
Permissible axial shaft load	1,000 N				
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

Technical data Gear unit EMR 120 A					
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
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	
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
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 kgcm²	0.035 kgcm²	0.032 kgcm²	0.048 kgcm²	0.035 kgcm²
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

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.

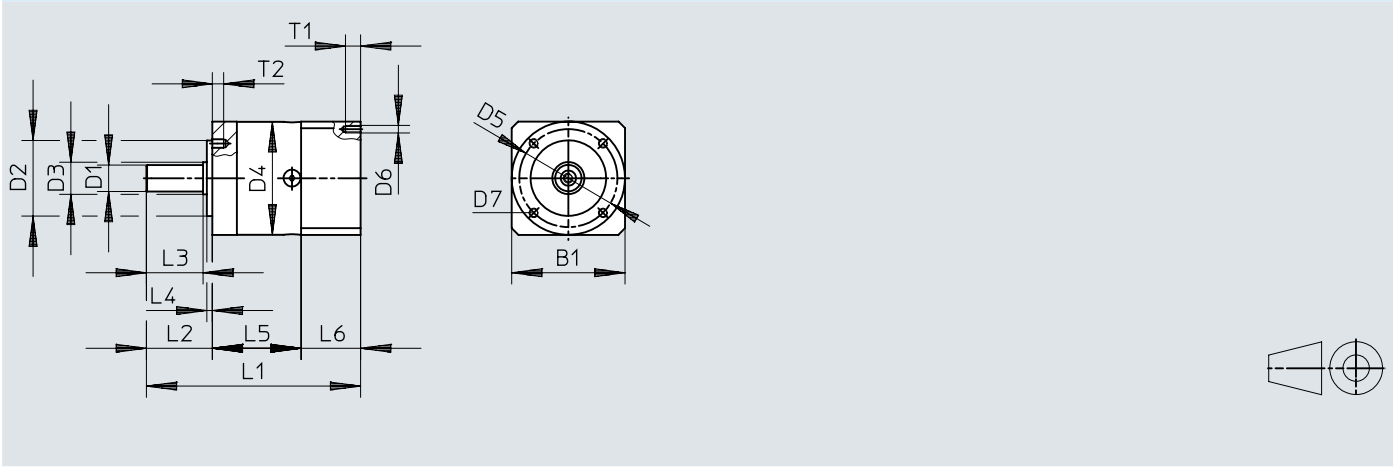
2) The data refers to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C.

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

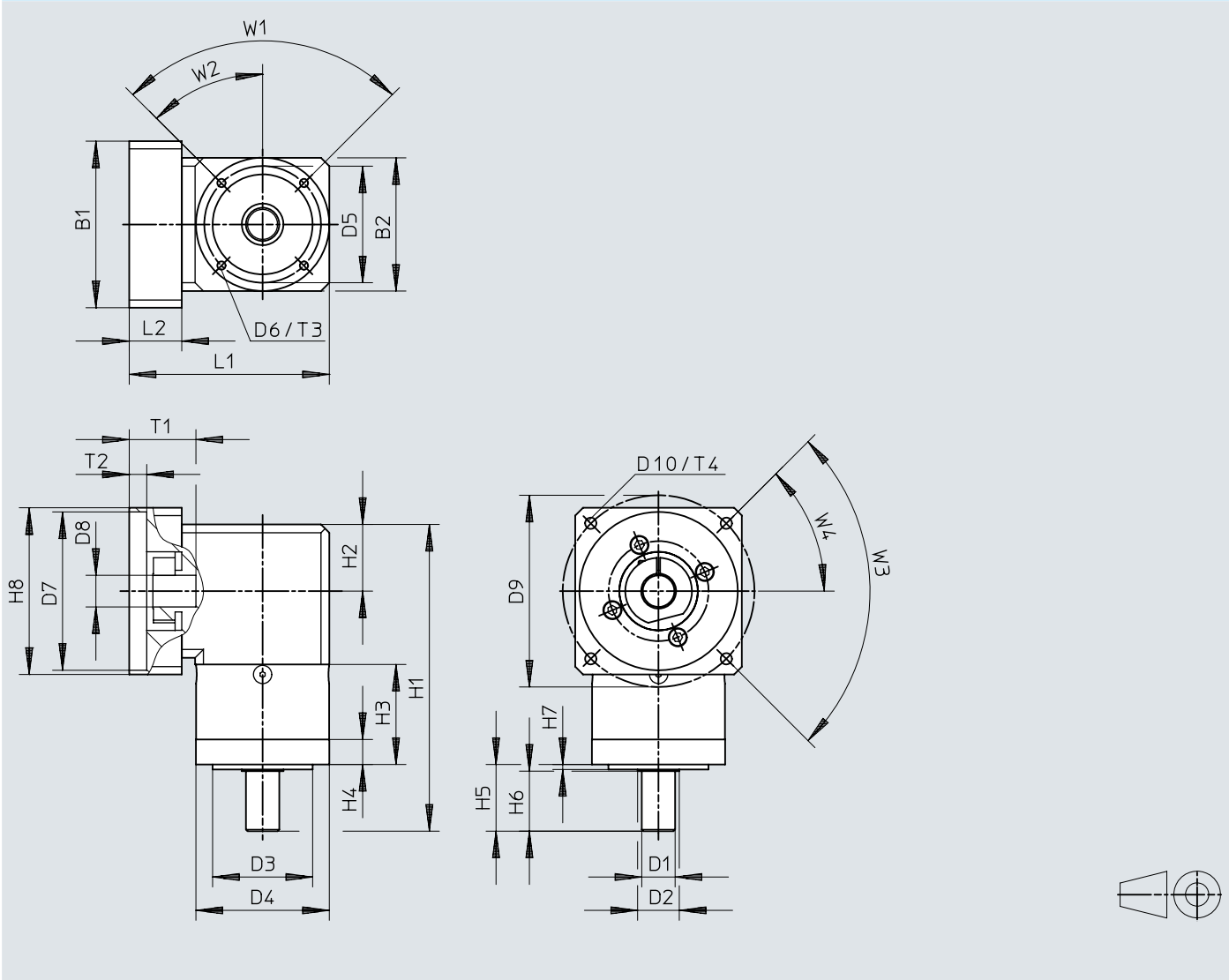
	1)	2)	3)	B1	D1 ø h7	D2 ø h7	D3 ø	D4 ø	D5 ø	D6
EMGA-40	3, 5, 8	40G	40P	40	10	26	12	40	34	M3
	12, 20		42A							ø3,4
	3, 5, 8									
	12									
EMGA-60	3, 5, 8	60H	60P	60	14	40	17	60	52	M4
	12, 20		57A	60	11	40	17	60	52	M4
	3, 5, 8	60G								
	12									
EMGA-80	3, 5, 8	80G	80P	80	20	60	25	80	70	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
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	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 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
	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	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 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