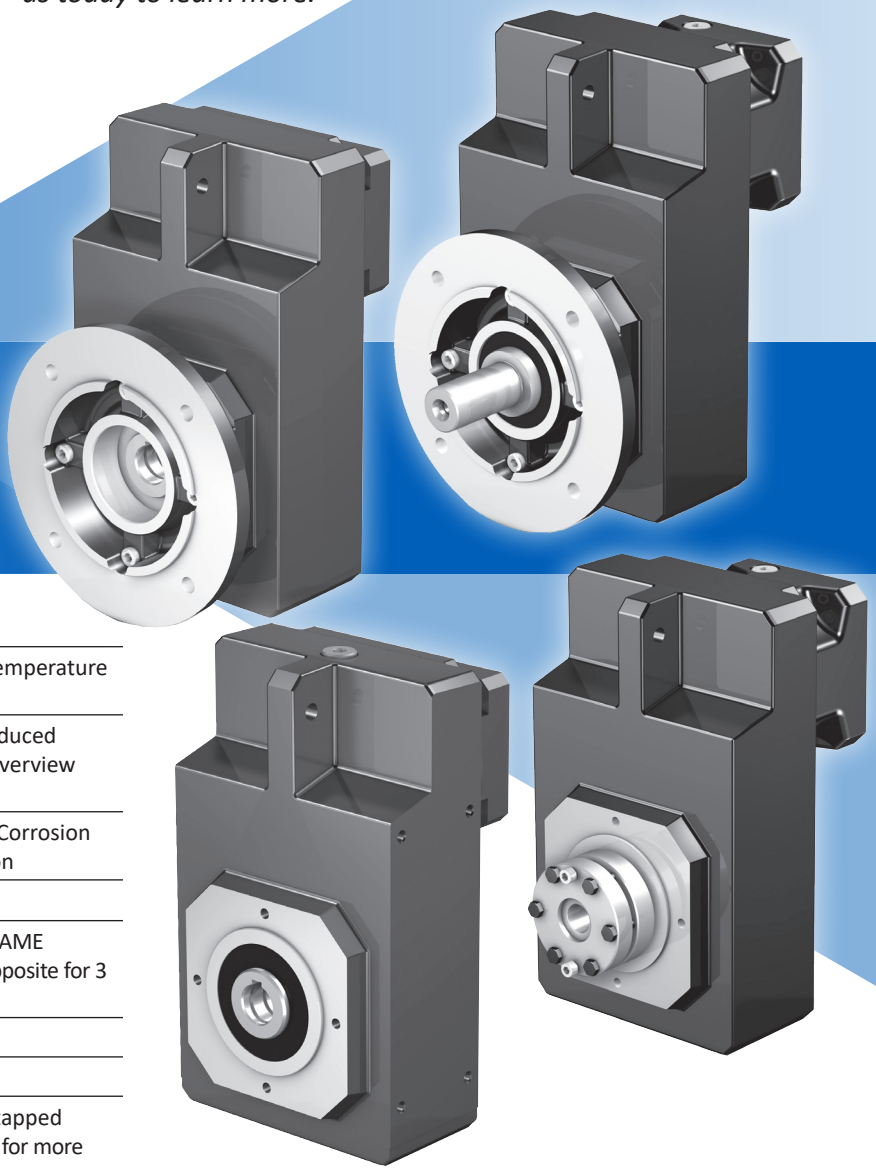
F Series: OFFSET – Versatile Outputs

F Features

- 4.3:1 to 552:1 ratios (higher ratios available. Contact STOBER.)
- Quiet running (<53dB(A))
- Reduced backlash option for increased precision
- Mounting flexibility to fit the application
- Adaptability: shafts available in metric or imperial, carbon or stainless steel to meet your requirements
- Optional food and corrosion resistant package
- Dual seals for extreme duty applications
- Error free motor mounting and quick changeover with toleranced pilot on motor plate
- Magnetic oil filtration to remove contaminants to prevent breakdowns
- Build and ship in one day
- Assembled in the USA

Compact size and flexibility make F Series gear drives a popular choice for applications that require high performance, efficiency, and durability. F Series gear drives are available with a wide selection of configurations to match almost any mounting requirement. Every gearbox is made to order. STOBER will custom whatever you need to fit your application. Contact us today to learn more.

SHIPS in 1 DAY!
NO EXPEDITE FEE FOR 24 HOUR SERVICE

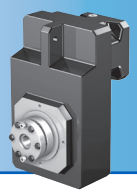


General Specifications

Ambient Temperature	0°C to +40°C (104°F) [Unit temperature <80°C Max]
Backlash	≤10 standard arcmins, ≤6 reduced arcmins (see performance overview chart, (page 104)
Coating	Standard Black (RAL-9005), Corrosion Resistant option, Food option
Degree of Protection	IP65
Direction of Rotation	Input and output rotate the SAME direction got 2 stage units, opposite for 3 stage units (see page 104)
Efficiency	2 stage 97%; 3 stage 96%
Input RPM	Up to 6,000 RPM
Installation	Requires 10.9 fasteners for tapped holes housing. See page 288 for more information
Lubrication	Lubricated for life - standard Mobil 600XP200, option food grade Mobil SHC CIBUS 220
Mounting Position	Must be specified, see page 104
Warranty	5 Year Limited (2 Years on normal wear items: bearings, seals, etc.)

Benefits of NEW ME Motor Adapters

- Higher torques
- Higher input speeds
- More compact with square coupling housing
- More clamp ring options, so less need for adapter bushings
- Clamp ring with roll pin



Overview

Selection Options *At-a-Glance*

Using the **Selection Data** table later in this section, select the F Series Gearhead with the appropriate performance and design options tailored to your motor choice and exact application requirements. Use the part number guide below as a reference to build a part number for the complete gearhead assembly.

Part Number Examples:

1	2	3	4	5	6	7	8	9	
F	1	0	2	V	F	0043	ME10	B	EL1 *

	Design Option	Part Number Code	Description
1	**Series**	F	Offset inline helical
2	**Size**	1 2 3 4 6	5 sizes of gearhead
3	**Generation**	0	Version of gearhead
4	**# of Stages**	2	Two stage for ratios <150:1
		3	Three stage >150:1
5	**Output**	 V	Shaft output (only available with housing option "F"; not available with food or corrosion resistant duty)
		 A	Hollow output (available imperial or metric, stainless steel)
		 W	Single or double wobble-free bushing (If single, specify side 5 or 6 only)
		 S	Shrink ring
6	**Housing**	 F	Round output flange
		 G	Pitch Circle Diameter (PCD) tapped holes
		 NG	Foot mounting (with tapped holes for side mounting)
7	**Ratio**	0043	Ratios range from 4.3:1 to 552:1 (0043=4.3:1; 0063=6.3:1; 5520=520:1)
8	**Motor Adapter**	ME10 – ME40	4 input sizes (see also motor mounting plate option)
9	**Options**	B	Add when ordering Corrosion Resistant Duty
		F	Add when ordering Food Duty
*	**Mounting Position**	EL1 EL2 EL3 EL4 EL5 EL6	Required special instruction for all units, see page 104

Options

ME Adapter Option

- MSS1 Seal – special input seal for longer life. Contact factory for this option.
- Peak Torque Booster – pinion securing element for shock loads, increasing peak torque up to 80%.

Lubrication Options

- Food grade or synthetic optionally available. Contact factory for this option.

Integrated Safety Brake

- ServoStop – provides dynamic braking during power failures or emergency stops in hazardous situations. Contact factory for this option.

Coating Option

- Corrosion Resistant Duty (**B** special option)
- Food Duty (**F** special option)

Food and Corrosion Resistant units are lubricated for life with double output seals (where possible), stainless output shaft, bore, or bushing, and heat cured paint.

ATEX

- ATmosphere EXplosible – rated for explosive environments. Contact factory for this option and allow additional time for delivery.

F Series Performance Overview

F Series performance is dependent on several factors including duty cycle, bearing design, gearhead size and stage configuration, among others. Use the chart below for preliminary evaluation, then use the following performance chart and selection information on the following pages for specific performance sizing and selection.

Size/Generation			F10	F20		F30		F40		F60	
# of Stages			2	2	3	2	3	2	3	2	3
Acceleration Torque M_{2BMAX}		Nm	120	270		450		700		1100	
Output Torque Nom. M_{2N}		Nm	120	240		400		700		1100	
Torsional Stiffness C_2		Nm/arcmin	<7.7	<17.9	<17.9	<21.8	<21.8	<38.7	<38.7	<77.4	<77.4
Torsional Backlash [1] $\Delta\phi$	arcmin	Standard Reduced	≤11 ≤6	≤11 ≤6	≤11 ≤7	≤11 ≤6	≤11 ≤7	≤10 ≤5	≤10 ≤6	≤10 ≤5	≤10 ≤6
Input Speed Max. n_{1MAX}	Continuous	EL1,2,3,4	4000	4000	4000	4000	4000	3700	3800	3500	3500
		EL5,6	4000	3900	3900	3900	3900	3500	3500	3200	3200
	Cyclic		7000	6500	6500	6500	6500	6000	6000	5500	5500
Efficiency (@nom torque)		%	97	97	96	97	96	97	96	97	96
Weight		kg lbs	17.2 38	23.1 51	29.0 64	30.4 67	33.1 73	38.1 84	41.2 91	74.7 165	80.2 177
Noise [2]		dB(A)	≤55	≤53		≤53		≤53		≤61	
Size/Generation/# of Stage			**F102**	**F202/F203**		**F302/F303**		**F402/F403**		**F602/F603**	
Axial Load Max. [3] F_{2AMAX}	Solid Shaft	N	1100	1400		1900		2350		3100	
		lbs	247	351		427		528		697	
	Hollow Bore	N	900	1200		1350		1900		2200	
		lbs	203	270		304		428		495	
Tilting Moment Max.[3] M_{2KMAX}	Solid Shaft	Nm	260	400		600		800		1200	
		in.lbs	2301	3540		5310		7080		10,620	
	Hollow Bore	Nm	175	250		375		550		800	
		in.lbs	1549	2213		3319		4858		7080	

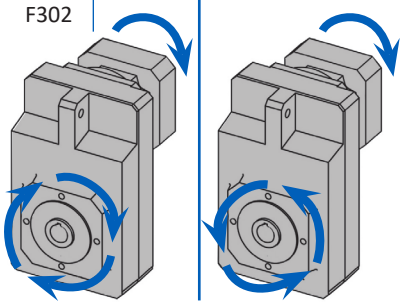
[1] *Tested at 1.5% of nominal torque and recorded on the output side of the gearhead. For lower backlash, contact STOBER technical support.*

[2] *Measurement at one (1) meter distance with input speed (n_1) of 2000 RPM. To calculate torque at higher input speeds, contact the factory.*

[3] *Rating based on output speed (n_2) of 20 RPM. For values at other speeds see page 107*

F Series Direction of Rotation

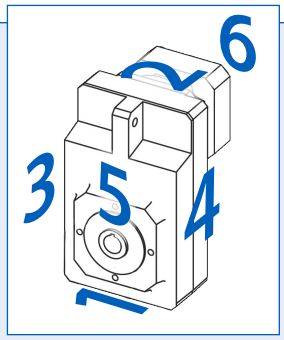
2 Stage Units		3 Stage Units	
F102	F402	F203	F403
F202	F602	F303	F603
F302			

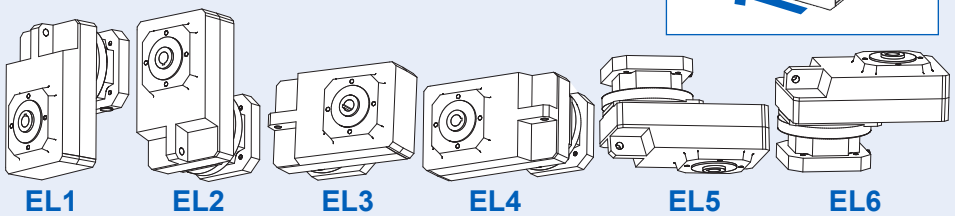


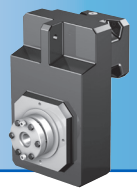
F Series Mounting Position Options

When ordering, the Mounting Position MUST BE SPECIFIED using one of the Mounting Position order codes below.

Note: the code relates to the unit's orientation side that faces down. For example, EL1 has side 1 facing down, EL2 has side 2 facing down, etc.







F Series Motor Mounting Plate Option (Motor information required with Motor Adapter option)

STOBER Servo Gearheads fit the motor of your choice with the appropriate motor mounting plate assembled between the motor and the gearhead.

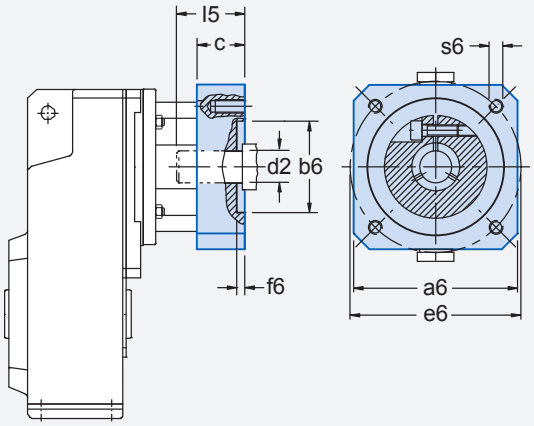
NOTE: When ordering a gearhead:

- Specify the motor manufacturer and part number
- Provide the motor drawing with dimensions, or specify the motor mounting dimensions (per the list shown at right)

For a precise dimension on a specific motor, or for general assistance, we recommend you contact STOBER Technical Support.

Customer Required Dimensions for Properly Sized Motor Mounting Plate

d2	Motor Shaft Diameter (If an adapter bushing is required it will be supplied with the motor plate.)
b6	Pilot Diameter
e6	Bolt Circle Diameter
s6	Bolt Diameter
l5	Motor Shaft Length
f6	Pilot Length
a6	Square Flange (Optional – motor plate will typically be made to match this dimension.)

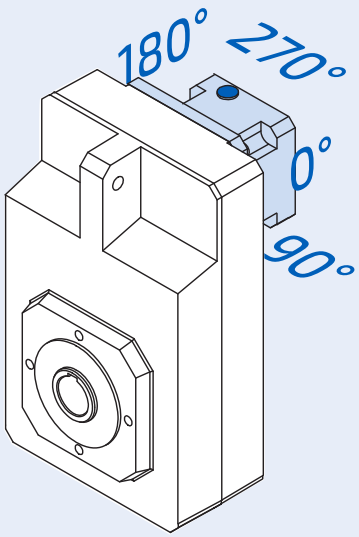


Motor Mounting Plate Dimensions — mm(Gearhead Part Number Specific)	ME10	ME20	ME30	ME40
Maximum Allowed Motor Shaft Dia. d2	19	32	38	48
Minimum Allowed Motor Plate Thickness c*	21	24	26	35

** Note that the c motor plate thickness is determined by the motor shaft length. The minimum motor plate thickness is the value listed.*

F Series Motor Mounting Plate Access Hole

Access to the clamping screw for the motor coupling is located on the 270° side of the motor mounting plate at the location shown. If necessary, the motor mounting plate can be rotated in the field, if a 0°, 90° or 180° orientation for the access hole is desirable.



F Series Output Options

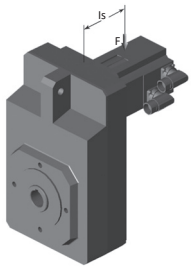
Diameters in **BOLD BLUE** are configurations readily available from inventory. Contact STOBER for delivery on other output sizes.

			F1	F2	F3	F4	F6
Solid Shaft	Carbon Steel	Inches	**1**	**1-1/4**	**1-3/8**	**1-5/8**	**2-1/8**
		Metric	25	—	—	40	—
	Stainless Steel*	Inches	—	—	—	—	—
		Metric	—	—	—	—	—
Hollow Bore	Carbon Steel	Inches	**3/4**	**1**	**1-1/4**	1-7/16 **1-1/2**	**2**
		Metric	20	25	30	40	50
	Stainless Steel*	Inches	—	—	**1-1/4**	**1-1/2**	—
		Metric	—	—	—	—	—
Wobble Free Bushing (Single & Double Bushings**)	Stainless Steel*	Inches	**3/4**	1 **1-3/16**	1 1-3/16 **1-1/4** **1-7/16** **1-1/2**	**1-7/16** **1-1/2**	**1-7/16** **1-1/2** **1-15/16** **2**
		Metric	20	—	—	40	—
Shrink Ring	Carbon Steel	Metric	**20**	**25**	**30**	**40**	—

** Stainless steel options are ideal for food and corrosion rsistant, harsh washdown environments.*
*** Double bushings only available with two stage units*
**** Double bushing only*

Permissible Motor Tilting Torque

The permissible tilting torque of the motor attached to the gear unit is a result of the static and dynamic load "F" from the motor weight, mass acceleration, and vibration multiplied by the distance from the center of gravity "l_S" of the motor.



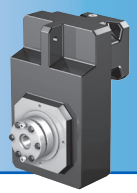
$M_{1k} = F \times l_S \leq M_{1K}$

M_{1K}	ME10	ME20	ME30	ME40	ME50
Nm	25	60	125	250	250

Permissible Output Shaft Load and Tilting Moments*

	V Solid Shaft Output				A, S, W Hollow Output [1]		
	Z_2	F_{2A}	F_{2R}	M_{2K}	Z_2	F_{2A}	M_{2K}
Unit	mm	N	N	Nm	mm	N	Nm
F1	35	1100	4200	260	30	900	175
F2	41	1400	5400	400	33	1200	250
F3	43	1900	7500	600	33	1350	375
F4	44	2350	9250	800	39	1900	550
F6	44	3100	12,500	1200	45	2200	800

** Refer to illustration and definitions below.*
[1] Values shown for "W" Style are for double bushings. For single bushings use value M_{2K} x 0.5 and F_{2A} x 0.5



Overhung Load Calculations

Pulling forces or overhung load of pulleys, sheaves, sprockets, etc. on the reducer output shaft must not exceed the allowable limits shown in the load/life/speed calculations below.

Note: Overhung load is measured at the center of the shaft extension. No overhung load is encountered when a reducer is flange mounted and/or coupling connected to another unit. However, the shafts of all components must be accurately aligned and secured to prevent pre-loading of the bearings and premature bearing failure.

Use the following formula to determine actual overhung load for a given drive:.

$$\textbf{Imperial OHL (lbs)} = \frac{126{,}000 \times HP \times K}{D \times n}$$

$$\textbf{Metric OHL (N)} = \frac{19{,}100 \times kW \times K}{D \times n}$$

Where:

OHL	Overhung load (N or lbs)
HP	Horsepower
kW	Transmitted Kilowatt
D	Pitch Diameter (inches or meters) of Sprocket, Gear, Sheave, Pulley, etc.
n	Maximum Shaft RPM
K	1.00 Single Chain Drive; 1.25 Timing Belt Drive; 1.25 Spur or Helical Gear Drive; 1.50 V-Belt Drive; 2.50 Flat Belt Drive

F Series Load/Life/Speed Calculations

The permissible load and tilting moment values are based on an output speed of 20 RPM. For higher speeds the following applies, where n_2 is the desired speed:

$$F_{2axN} = \frac{F_{2ax20}}{\sqrt[3]{\frac{n_{2m*}}{20\ rpm}}} \qquad F_{2radN} = \frac{F_{2rad20}}{\sqrt[3]{\frac{n_{2m*}}{20\ rpm}}} \qquad M_{2kN} = \frac{M_{2k20}}{\sqrt[3]{\frac{n_{2m*}}{20\ rpm}}}$$

The application output tilting moment should be determined by the following formula:

$$M_{2k*} = \frac{2 \bullet F_{2ax*} \bullet Y_2 + F_{2rad*} \bullet (x_2+z_2)}{1000} \leq M_{2kN}$$

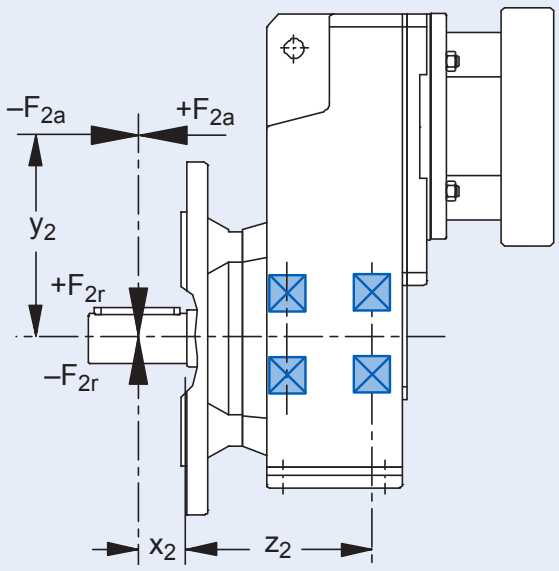
$$F_{2rad*} \leq F_{2radN} \qquad F_{2ax*} \leq F_{2axN}$$

Where:

z_2	Distance of Shaft Shoulder to Center of Output Bearing
n_2	Actual Average Output Speed
x_2	Distance of the Shaft Shoulder to the Force Application Point
Y_2	Distance of the Shaft Axis to the Axial Force Application Point
F_{2ax*}	Actual Axial Force at Gear Unit Output
F_{2ax100}	Permitted Axial Force
$F_{2rad100}$	Permitted Radial Force ≤100RPM
$F_{2rad,acc}$	Radial Acceleration Force
$F_{2rad,acc*}$	Radial Acceleration Force at Gear Unit Output
M_{2K100}	Permitted Tilting Torque ≤100RPM
$M_{2K,acc}$	Permitted Acceleration Tilting Torque
$M_{2k,acc*}$	Permitted Acceleration Tilting Torque at Gear Unit Output
C_{2K}	Tilting Stiffness

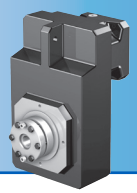
All formulas shown are based on METRIC values

Upper case letters are permissible values. Lower case letters are for existing values.



Reducer Ratio (i)		Output Torque			Backlash [3]	Part Number	Max. Input Speed RPM (n1)			Motor Shaft Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	Peak [2]			Continuous		Cyclic			
		M_{2N}	M_{2acc}	M_{2NOT}	$\Delta\phi_2$					d_{MW}	J_1	C_2
Nom.	Exact	Nm	Nm	Nm	arcmin	(Gearhead + Input)	EL 1,2,3,4	EL 5,6	All	mm	kgcm²	Nm/ arcmin
F1												
4.308	56/13	69	100	125	11/8	F102_0043 ME10	3500	3000	6000	≤19	2.1	6.2
						F102_0043 ME20				≤24	4.0	6.4
7.156	322/45	81	105	200	11/8	F102_0072 ME10	3700	3600	6000	≤19	1.3	6.4
						F102_0072 ME20				≤24	3.2	6.5
10.92	273/25	94	105	200	11/8	F102_0110 ME10	4000	4000	6500	≤19	0.9	6.5
						F102_0110 ME20	3700	3700	6000	≤24	2.8	
18.46	1495/81	1	120	240	11/6	F102_0185 ME10	3700	3600	6000	≤19	1.0	7.7
						F102_0185 ME20				≤24	2.9	
28.17	169/6	120	120	240	11/6	F102_0280 ME10	4000	4000	6500	≤19	0.8	7.7
						F102_0280 ME20	3700	3700	6000	≤24	2.7	
46.43	325/7	120	120	240	11/6	F102_0460 ME10	4000	4000	7000	≤19	0.7	7.7
						F102_0460 ME20	3700	3700	6000	≤24	2.6	
55.97	2015/36	120	120	240	11/6	F102_0560 ME10	4000	4000	7000	≤19	0.7	7.7
						F102_0560 ME20	3700	3700	6000	≤24	2.6	
70.06	1261/18	120	120	240	11/6	F102_0700 ME10	4000	4000	7000	≤19	0.7	7.7
						F102_0700 ME20	3700	3700	6000	≤24	2.6	
93.63	7865/84	120	120	240	11/6	F102_0940 ME10	4000	4000	7000	≤19	0.6	7.7
111.9	2015/18	120	120	240	11/6	F102_1120 ME10	4000	4000	7000	≤19	0.6	7.7
F2		**(continued next page)**										
5.552	5341/962	149	210	400	11/8	F202_0056 ME20	3100	2600	5000	≤32	7.1	15.0
						F202_0056 ME30				≤38	12.0	
9.006	3161/351	160	210	262	11/8	F202_0090 ME10	3600	3100	6000	≤19	1.9	15.0
		175		400		F202_0090 ME20				≤32	5.3	
						F202_0090 ME30	3500		5000	≤38	11.0	
10.80	7303/676	166	210	314	11/8	F202_0110 ME10	3800	3500	6000	≤19	1.6	15.0
		185		400		F202_0110 ME20	3700			≤32	5.0	
						F202_0110 ME30	3500		5000	≤38	10.0	16.0
13.63	109/8	180	210	397	11/8	F202_0135 ME10	3800	3500	6000	≤19	1.3	15.0
		200		400		F202_0135 ME20	3700			≤32	4.7	16.0
						F202_0135 ME30	3500		5000	≤38	10.0	
23.43	2320/99	240	270	480	11/6	F202_0230 ME10	3600	3100	6000	≤19	1.3	18.0
						F202_0230 ME20				≤32	4.7	
						F202_0230 ME30	3500		5000	≤38	10.0	

[1] *Maximum torque for continuous input 1500 RPM - horizontal output position.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
[3] *Backlash shown standard/reduced*



Selection Data

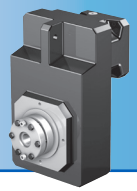
Reducer Ratio (i)		Output Torque			Backlash [3]	Part Number	Max. Input Speed RPM (n1)			Motor Shaft Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	Peak [2]			Continuous		Cyclic			
Nom.	Exact	M_{2N} Nm	M_{2acc} Nm	M_{2NOT} Nm	$\Delta\phi_2$ arcmin	(Gearhead + Input)	EL 1,2,3,4	EL 5,6	All	d_{MW} mm	J_1 kgcm²	C_2 Nm/arcmin
F2		**(continued from previous page)**										
28.11	4020/143	240	270	480	11/6	F202_0280 ME10	3800	3500	6000	≤19	1.1	18.0
						F202_0280 ME20	3700			≤32	4.5	
						F202_0280 ME30	3500		5000	≤38	9.9	
35.46	390/11	240	270	480	11/6	F202_0350 ME10	3800	3500	6000	≤19	1.0	18.0
						F202_0350 ME20	3700			≤32	4.4	
						F202_0350 ME30	3500		5000	≤38	9.7	
56.73	624/11	240	270	480	11/6	F202_0570 ME10	4000	3900	6500	≤19	0.8	18.0
						F202_0570 ME20	3700	3700	6000	≤24	2.7	
70.13	5400/77	240	270	480	11/6	F202_0700 ME10	4000	3900	6500	≤19	0.8	18.0
						F202_0700 ME20	3700	3700	6000	≤24	2.7	
93.82	1032/11	240	270	480	11/6	F202_0940 ME10	4000	3900	6500	≤19	0.7	18.0
						F202_0940 ME20	3700	3700	6000	≤24	2.6	
222.2	2444/11	240	270	480	11/7	F203_2220 ME10	4000	3900	6500	≤19	0.7	18.0
274.7	21150/77	240	270	480	11/7	F203_2750 ME10	4000	3900	6500	≤19	0.7	18.0
367.5	4042/11	240	270	480	11/7	F203_3670 ME10	4000	3900	6500	≤19	0.7	18.0
F3		**(continued next page)**										
5.720	143/25	250	333	416	11/8	F302_0057 ME20	3000	2600	4500	≤32	9.7	20.0
						F302_0057 ME30				≤38	15.0	
8.986	5616/625	180	209	262	11/8	F302_0090 ME10	3500	3100	5000	≤19	3.3	20.0
		290	350	650		F302_0090 ME20				≤32	6.7	
						F302_0090 ME30				≤38	12.0	
10.79	1456/135	187	251	314	11/8	F302_0110 ME10	3700	3500	5500	≤19	2.5	20.0
		308	350	650		F302_0110 ME20				≤32	5.9	
						F302_0110 ME30	3500		5000	≤38	11.0	
13.38	7696/575	199	312	390	11/8	F302_0135 ME10	3700	3500	5500	≤19	1.9	20.0
		331	350	650		F302_0135 ME20				≤32	5.3	
						F302_0135 ME30	3500		5000	≤38	11.0	
23.52	588/25	400	450	685	11/6	F302_0240 ME10	3500	3100	5000	≤19	2.0	22.0
				800		F302_0240 ME20				≤32	5.4	
						F302_0240 ME30				≤38	11.0	
28.23	6860/243	400	450	800	11/6	F302_0280 ME10	3700	3500	5500	≤19	1.7	22.0
						F302_0280 ME20				≤32	5.1	
						F302_0280 ME30	3500		5000	≤38	10.0	

[1] *Maximum torque for continuous input 1500 RPM - horizontal output position.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
[3] *Backlash shown standard/reduced*

Reducer Ratio (i)		Output Torque			Backlash [3]	Part Number	Max. Input Speed RPM (n1)			Motor Shaft Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	Peak [2]			Continuous		Cyclic			
		M_{2N}	M_{2acc}	M_{2NOT}	$\Delta\phi_2$					d_{MW}	J_1	C_2
Nom.	Exact	Nm	Nm	Nm	arcmin	(Gearhead + Input)	EL 1,2,3,4	EL 5,6	All	mm	kgcm²	Nm/ arcmin
F3		**(continued from previous page)**										
35.03	7252/207	400	450	800	11/6	F302_0350 ME10	3700	3500	5500	≤19	1.4	22.0
						F302_0350 ME20				≤32	4.8	
						F302_0350 ME30	3500		5000	≤38	10.0	
47.19	1274/27	400	450	800	11/6	F302_0470 ME10	4000	3900	6500	≤19	1.1	22.0
						F302_0470 ME20	3700	3700	6000	≤32	4.5	
						F302_0470 ME30	3500	3500	5000	≤38	9.8	
56.49	4067/72	400	450	800	11/6	F302_0560 ME10	4000	3900	6500	≤19	1.0	22.0
						F302_0560 ME20	3700	3700	6000	≤32	4.4	
						F302_0560 ME30	3500	3500	5000	≤38	9.7	
70.36	2744/39	400	450	800	11/6	F302_0700 ME10	4000	3900	6500	≤19	0.9	22.0
						F302_0700 ME20	3700	3700	6000	≤24	2.8	
93.64	4214/45	400	450	800	11/6	F302_0940 ME10	4000	3900	6500	≤19	0.8	22.0
						F302_0940 ME20	3700	3700	6000	≤24	2.7	
112.8	3724/33	400	450	800	11/6	F302_1130 ME10	4000	3900	6500	≤19	0.7	22.0
						F302_1130 ME20	3700	3700	6000	≤24	2.6	
182.4	73892/405	400	450	800	11/7	F303_1820 ME20	3700	3700	6000	≤24	2.7	22.0
218.4	117943/540	400	450	800	11/7	F303_2180 ME20	3700	3700	6000	≤24	2.7	22.0
272.1	159152/585	400	450	800	11/7	F303_2720 ME20	3700	3700	6000	≤24	2.7	22.0
275.6	32242/117	400	450	800	11/7	F303_2760 ME10	4000	3900	6500	≤19	0.7	22.0
362.1	244412/675	400	450	800	11/7	F303_3620 ME20	3700	3700	6000	≤24	2.7	22.0
366.8	99029/270	400	450	800	11/7	F303_3670 ME10	4000	3900	6500	≤19	0.7	22.0
442.0	43757/99	400	450	800	11/7	F303_4420 ME10	4000	3900	6500	≤19	0.7	22.0
F4		**(continued next page)**										
5.813	3784/651	415	550	1100	10/7	F402_0058 ME30	2700	2300	4000	≤38	20.0	38.0
						F402_0058 ME40				≤48	42.0	
8.980	440/49	469	523	653	10/7	F402_0090 ME20	3200	2800	4800	≤32	8.8	38.0
		479	550	1100		F402_0090 ME30				≤38	14.0	
						F402_0090 ME40	3000		4500	≤48	36.0	
10.83	682/63	487	550	788	10/7	F402_0110 ME20	3500	3100	5500	≤32	7.5	38.0
		510		1100		F402_0110 ME30			5000	≤38	13.0	
						F402_0110 ME40	3000	3000	4500	≤48	35.0	

[1] *Maximum torque for continuous input 1500 RPM - horizontal output position.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
[3] *Backlash shown standard/reduced*

Selection Data



Reducer Ratio (i)		Output Torque			Backlash [3]	Part Number	Max. Input Speed RPM (n1)			Motor Shaft Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	Peak [2]			Continuous		Cyclic			
		M_{2N}	M_{2acc}	M_{2NOT}	$\Delta\phi_2$					d_{MW}	J_1	C_2
Nom.	Exact	Nm	Nm	Nm	arcmin	(Gearhead + Input)	EL 1,2,3,4	EL 5,6	All	mm	kgcm²	Nm/ arcmin
F4		**(continued from previous page)**										
13.57	5984/441	536	550	932	10/7	F402_0135 ME20	3500	3100	5500	≤32	6.4	38.0
		550		1100		F402_0135 ME30			5000	≤38	12.0	39.0
						F402_0135 ME40	3000	3000	4500	≤48	34.0	
23.21	325/14	658	700	1400	10/5	F402_0230 ME20	3200	2800	4800	≤32	6.4	39.0
						F402_0230 ME30				≤38	12.0	
						F402_0230 ME40	3000		4500	≤48	34.0	
27.99	2015/72	700	700	1400	10/5	F402_0280 ME20	3500	3100	5500	≤32	5.9	39.0
						F402_0280 ME30			5000	≤38	11.0	
						F402_0280 ME40	3000	3000	4500	≤48	33.0	
35.08	2210/63	700	700	1400	10/5	F402_0350 ME20	3500	3100	5500	≤32	5.3	39.0
						F402_0350 ME30			5000	≤38	11.0	
						F402_0350 ME40	3000	3000	4500	≤48	33.0	
55.97	2015/36	700	700	1400	10/5	F402_0560 ME20	3700	3500	6000	≤32	4.7	39.0
						F402_0560 ME30	3500		5000	≤38	10.0	
70.06	1261/18	700	700	1400	10/5	F402_0700 ME20	3700	3500	6000	≤32	4.5	39.0
						F402_0700 ME30	3500		5000	≤38	9.8	
93.33	280/3	700	700	1400	10/5	F402_0930 ME20	3700	3500	6000	≤24	2.8	39.0
112.3	1235/11	700	700	1400	10/5	F402_1120 ME20	3700	3500	6000	≤24	2.7	39.0
216.4	11687/54	700	700	1400	10/6	F403_2160 ME20	3700	3500	6000	≤24	2.7	39.0
270.9	36569/135	700	700	1400	10/6	F403_2710 ME20	3700	3500	6000	≤24	2.7	39.0
274.4	59267/216	700	700	1400	10/6	F403_2740 ME10	3800	3500	6000	≤19	0.7	39.0
360.9	3248/9	700	700	1400	10/6	F403_3610 ME20	3700	3500	6000	≤24	2.7	39.0
365.6	3290/9	700	700	1400	10/6	F403_3660 ME10	3800	3500	6000	≤19	0.7	39.0
434.1	14326/33	700	700	1400	10/6	F403_4340 ME20	3700	3500	6000	≤24	2.7	39.0
439.7	58045/132	700	700	1400	10/6	F403_4400 ME10	3800	3500	6000	≤19	0.7	39.0

[1] Maximum torque for continuous input 1500 RPM - horizontal output position.
[2] Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)
[3] Backlash shown standard/reduced

Reducer Ratio (i)		Output Torque			Backlash [3]	Part Number	Max. Input Speed RPM (n1)			Motor Shaft Max Ø	Input Inertia	Tors. Stiffness
		Nom. [1]	Accel.	Peak [2]			Continuous		Cyclic			
		M_{2N}	M_{2acc}	M_{2NOT}	$\Delta\phi_2$					d_{MW}	J_1	C_2
Nom.	Exact	Nm	Nm	Nm	arcmin	(Gearhead + Input)	EL 1,2,3,4	EL 5,6	All	mm	kgcm²	Nm/ arcmin
F6		**(continued next page)**										
4.546	1273/280	581	706	883	10/7	F602_0045 ME30	2500	2100	3500	≤38	46.0	69.0
		638				F602_0045 ME40				≤48	68.0	
7.159	3551/496	702	1000	1385	10/7	F602_0072 ME30	2900	2500	4500	≤38	26.0	71.0
		743				F602_0072 ME40				≤48	48.0	
10.82	2077/192	564	630	787	10/7	F602_0110 ME20	3300	2800	5000	≤32	12.0	71.0
		819	1000	1600		F602_0110 ME30				≤38	17.0	72.0
		852				F602_0110 ME40	3000		4500	≤48	39.0	
18.52	3445/186	1019	1100	2000	10/5	F602_0185 ME30	2900	2500	4500	≤38	17.0	77.0
						F602_0185 ME40				≤48	39.0	
27.99	2015/72	1100	1100	2000	10/5	F602_0280 ME20	3300	2800	5000	≤32	8.2	77.0
						F602_0280 ME30				≤38	14.0	
						F602_0280 ME40	3000		4500	≤48	36.0	
46.72	1495/32	1100	1100	2000	10/5	F602_0470 ME20	3500	3200	5500	≤32	6.0	77.0
						F602_0470 ME30			5000	≤38	11.0	
						F602_0470 ME40	3000	3000	4500	≤48	33.0	
55.71	390/7	1100	1100	2000	10/5	F602_0560 ME20	3500	3200	5500	≤32	5.5	77.0
						F602_0560 ME30			5000	≤38	11.0	
93.33	280/3	1100	1100	2000	10/5	F602_0930 ME20	3500	3200	5500	≤32	4.7	77.0
						F602_0930 ME30			5000	≤38	10.0	
112.2	9425/84	1100	1100	2000	10/5	F602_1120 ME20	3500	3200	5500	≤24	3.0	77.0
180.6	8671/48	1100	1100	2000	10/6	F603_1810 ME20	3500	3200	5500	≤24	2.8	77.0
215.4	1508/7	1100	1100	2000	10/6	F603_2150 ME20	3500	3200	5500	≤24	2.8	77.0
360.9	3248/9	1100	1100	2000	10/6	F603_3610 ME20	3500	3200	5500	≤24	2.7	77.0
433.8	54665/126	1100	1100	2000	10/6	F603_4340 ME20	3500	3200	5500	≤24	2.7	77.0

[1] *Maximum torque for continuous input 1500 RPM - horizontal output position.*
[2] *Maximum momentary torque for emergency stops or heavy shock load. (Admissible stops per life of gearhead = 1,000 stops maximum.)*
[3] *Backlash shown standard/reduced*