



Servo Gear Units

***Geared to a higher
standard™***

**In-Position
Technologies**

www.iptech1.com | (877) 478-3241 | help@iptech1.com



STÖBER

Servo Gear Units



Welcome to STOBBER!

Thank you for your interest in the servo gear reducers offered by STOBBER Drives, Inc.!

In 1934, the Stöber brothers founded a small shop in Pforzheim, Germany that made machines and repaired engines. Today, STOBBER is an international organization with offices in ten countries.

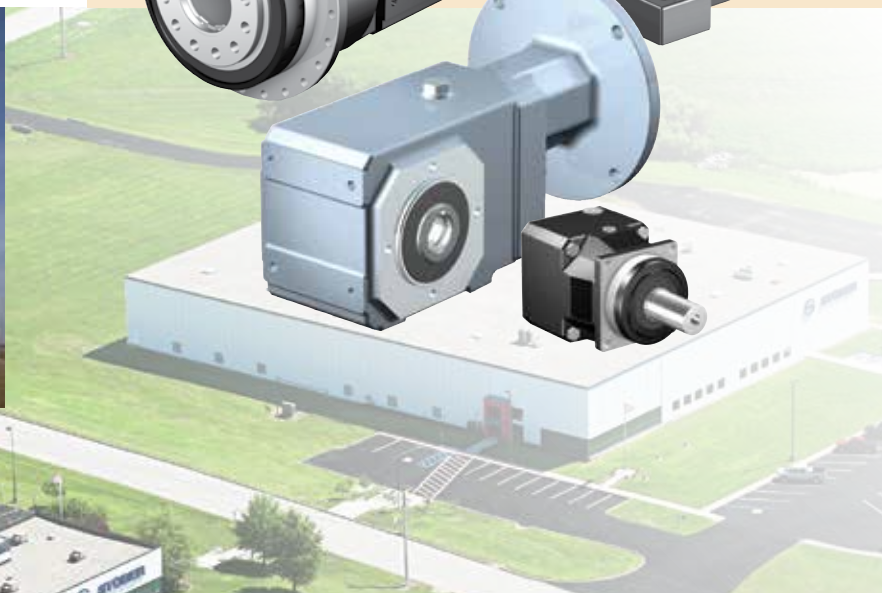
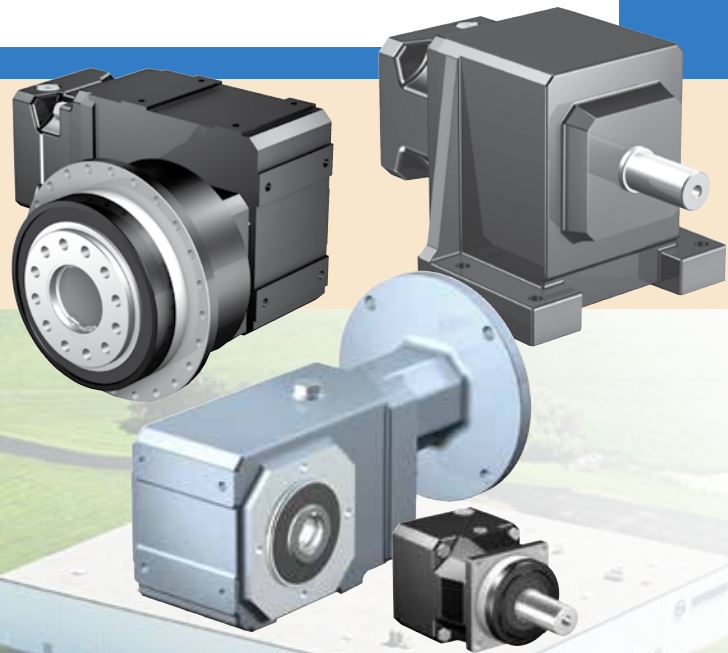
This 80 year heritage has given us expertise in servo gearing for which STOBBER is recognized worldwide as the “gold standard.” STOBBER products are of the highest quality and use only the best components.

This catalog covers our comprehensive servo gearbox products — Servo Precision Planetary and Modular Gearheads. STOBBER is recognized across the United States for its solution design, product durability, and service support. We look forward to the opportunity to work with you, and to help with your servo gearing needs.

Peter Feil, General Manager, STOBBER Drives, Inc.



STOBBER Drives Inc. was founded in 1991. Our Maysville, Kentucky campus includes 85,000 square feet of sales and service offices, assembly, manufacturing, and warehousing space for German-engineered STOBBER products for 1 day shipment nationwide.



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All manufactured components are inspected before being released to assembly. Our quality inspection team ensures every part meets tolerances and is in spec.

Unsurpassed:

STOBER products are designed and built to perform for the toughest applications. Reliability, adaptability and maintainability are our focus, and durability is truly our trademark.

Solution Designs that build quality around every requirement.

Product Durability that enhances the reliability and life of every application.

Service Support that is empowered to meet and exceed client expectations.



STOBER Serviced Industries:

- Beverage
- Food Processing
- Packaging
- Machine Tool
- Robotics
- Material Handling
- Semiconductor
- Printing
- Converting and many others...

Servo Gear Units

The Best you Can Buy...

At STÖBER, offering the best is not a buzz word — it is our passion and way of life. We offer the best product, provided by the best people and processes, and backed by the best service.

Why is STÖBER considered the industry Gold Standard? Our products are backed with superior service, outstanding quality, and the STÖBER guarantee.

- STÖBER gearheads survive in the toughest environments, providing long life under extreme conditions. Their high reliability and durability saves non-productive downtime and cost
- Our product reliability is backed by one of the best warranties in the industry
- We build and ship in 1 day saving you inventory hassle and cost
- Adapts to any servo motor

The Servo Gear Difference

A STÖBER Servo Gearhead helps optimize your total operational performance with:

- High torsional stiffness, superior accuracy
- Smoother running, better efficiency
- Leakage free, maintenance free
- Runs cool – a difference you can feel
- Runs measurably quieter – 16 times more quiet*
- Lower backlash
- The versatility and interchangeability of our components allow most products to be assembled and shipped in 1 day

* Noise Level

If a planetary is loud — something is WRONG!

STÖBER Servo planetary =
60 dB(A)

Convention spur gear planetary =
70-72 dB(A)

Bottom line: 1 conventional gearhead produces the same noise level as 16 STÖBER planetary gearheads with HeliCamber™ gearing

Striving Harder to Deliver the Best Gear Solutions

STÖBER Drives has been assembling products at our Maysville, Kentucky facility for over twenty years. Our expertise in the production and assembly of low-backlash gear units produces products that comply with the highest quality standards.

But, we don't remain satisfied with the status quo. We are continuously improving our modern machining production center including numerous recent acquisitions to improve our manufacture time and to ensure maximum quality levels.

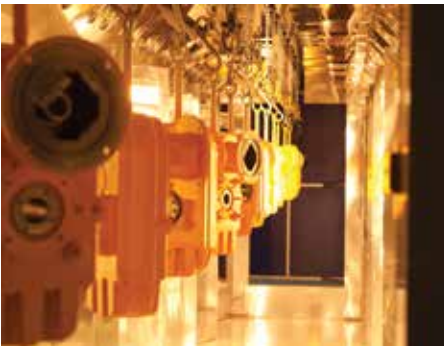
All reducer components (gears, covers, material, etc.) are backed by a five year warranty. Normal wear items (oil seals, bearings, etc.) are covered for two years.

Vision: To be recognized as the gold standard

Mission: To provide the most reliable drive solutions for demanding applications in the shortest lead-time

Values: Seeking the best; operating with integrity; serving others, growth through learning





Assembly stages of "F" Series gearheads: Paint curing oven allows for one day assembly and higher paint durability (left); units awaiting final inspection prior to shipment (right).

Service Support for a Lifetime

We stand behind every drive we sell, which is why our service support is also the gold standard in the industry:

STOBER takes pride in offering knowledgeable, factory-trained USA-based service support for our customers. When you call, you won't get a call center on the other side of the globe. Your call is answered in 3 rings or less, letting you know you've found a support system that values your time.

Our easy order method insures you maintain a single contact throughout the process. And, your service representatives are directly responsible for your account. After the sale, our products are easy to install, but if you do have a question or a problem, we provide application and installation support anywhere in the US. With over 80 years gearing & 30 years motor and electronics experience, we have the expertise to solve your most difficult problems.

Application Support Programs

- For support during normal business hours: call 800-711-3588 or email sales@stober.com
- 24/7 emergency customer service hotline: 606.563.6035
- Consultative product support team available via phone or live chat on our website
- Application Sizing Software
- Online web tools: CAD and configurator
- On-site training available
- Emergency shipments available 24/7



Key STOBER Numbers

1 day shipping

1 hour quoting

3 rings or less when you call in — we answer the phone, not an automated switchboard!

100% inspected and tested during assembly for seal pressure test and ratio verification. STOBER also observes the reducer for any abnormal noise or vibrations during testing

5 year warranty

24/7 customer service



STOBER Staff Team Members

Facing page: Earl Bennington, Warehouse Team Leader, 1992, and Anita Truesdell, Picker, 2007;

From top, left to right: Stephanie Berry, LMS Administrator, 2006; Brian Sharp, Product Management Team Leader, 2003; Rick McCall, Machinist, 2007; Lee Thomas, Industrial Engineer, 2003

The Servo Gear Unit Difference

The following outlines some of our quality standards and unique STÖBER features that set Servo gearheads apart from all others...

Food and Corrosion Resistant Duty

P PKX PK C F K/KL KSS

Lifetime lubrication; double output seals (where possible); maintenance free design; stainless output bushing, shaft, or bore — finish is USDA approved for food processing and handling; heat cured.

KSS for extreme high pressure food washdown!

- IP69K certified for extreme high pressure food washdown (sprayed at close distance at 100 bars or 1,450 PSI)
- Certified against dust and water ingress
- 304 stainless steel cast housing

Explosion Proof

P PA PH PHA PHQ PHQA
PKX PHKX C F K

ATEX is often used in process control and converting where unstable gases and dust can be found

ATEX is a directive consisting of two European directives describing equipment or work environment allowed in an environment with an explosive atmosphere. ATEX derives its name from the ATmospheres EXplosible.

Please consult our product support team for assistance selecting an ATEX gearbox.

Large Input Planetary

P PA PE PH PHA PHQ PHQA KS

Equipping a Servo gearhead with the large input option allows a larger shaft diameter motor to be used, keeping gearhead size and cost down! This input is ideal for inertia matching.

ServoCool®

P PA PH PHA



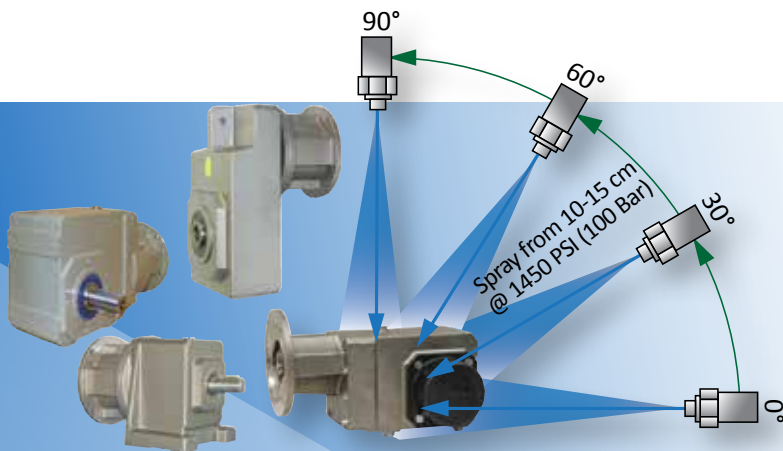
Servo gearheads with the air cooled ServoCool® option reduces the operating temperature 22°C (increases the ambient temperature limit 22°C), increases the output speed 54% and improves the servo motor rating 25%.

Servo motors are connected to Servo gearheads by using a motor adapter.

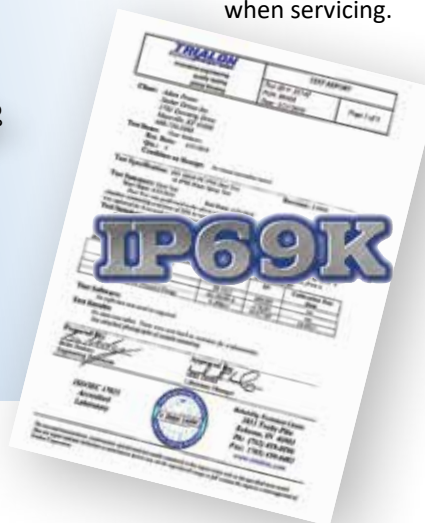
Spiral Groove Hollow Bore

F K KL KS KSS

The inside diameter on our hollow bore units feature a spiral (rifle) bore design providing an anti-seize lubricating groove. This enables the Servo gearhead to slide off freely when servicing without damage to the output shaft. With conventional smooth-surface hollow bore designs, any anti-seize lubricant applied during installation of the output shaft has no where to go except out the other end. Invariably, these designs will seize, making it necessary to cut off the output shaft when servicing.



Above: KSS Servo Gearheads are IP69K certified to withstand frequent pressure cleaning operations typical in the food industry and elsewhere. Other STÖBER products, including C, F and K Series, are optionally available with IP69K compliant protection.

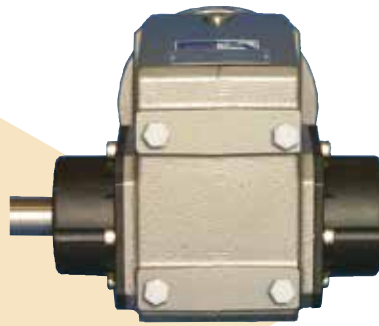


Wobble Free Bushing

F K KL KSS

The STÖBER “Wobble Free” bushing is a unique (U.S. Patent Number 5,496,127), bushing system which can be supplied on a single side or double sides. Each case size can be provided with a variety of bushing bores. The unit is selected based on torque rating, output speed or ratio, and the shaft size of the driven equipment.

- A distinct support side and a clamp side, the dual tapered cones will overcome a wide range of tolerances normally found with standard shaft materials. No shaft key necessary.
- Many unit sizes can be supplied with output covers on one or both sides which protect the seals and also cover the rotating bushing
- The reducer output bore can be changed any time by changing the bushing kit
- The quill, all bushing parts, and hardware can be supplied stainless steel to provide corrosion resistance for washdown applications



Double Sided Bushing:

This unique design allows the unit to be mounted on the shaft from either side of the reducer by reversing the clamp side and support side bushings. The clamp side is determined by the customer but is usually the easily accessible outside bushing.

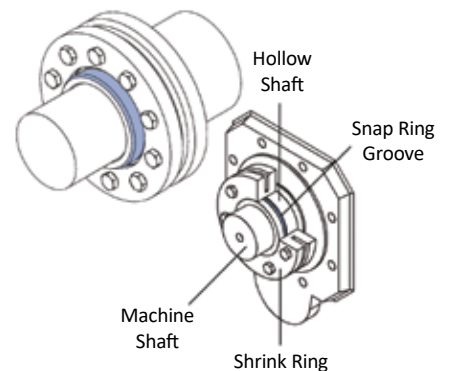
The double sided bushing is not installed into the unit at assembly, but with easy-to-follow installation instructions, the unit and bushing can be mounted on the machinery quickly – without any special tools.

Single Sided Bushing :

The single sided bushing is assembled at the time of the order. The bushing side extension must be specified by the customer before assembly. The bushing is installed into the unit for shipping and is not interchangeable once the unit is assembled.

Shrink Ring Connection

F K KL KS



F, K, KL and KS Series gearheads with a hollow bore can be connected to a finished machine drive shaft by frictional engagement through compression of a shrink ring on the hollow shaft.

This shaft-hub connection is totally free of backlash. Because of its self-centering property, it can transmit high torques and axial thrusts with great accuracy.

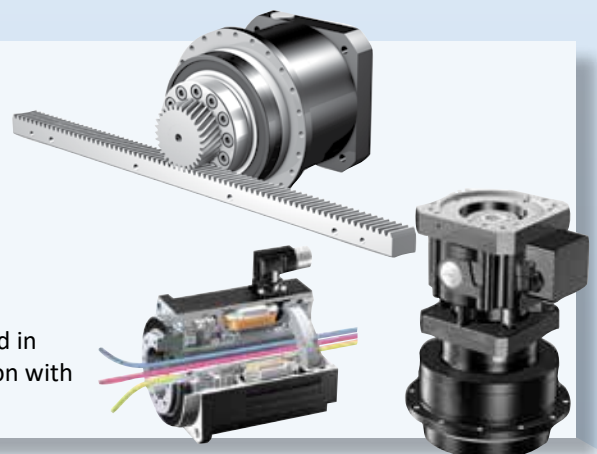
Gear units supplied with a shrink ring, are shipped with the ring installed on the hollow shaft end, ready for assembly.

See page 331 for More Servo Gearhead Compatible Products...

EZ Series Servo Motors available to fit all Servo gearheads

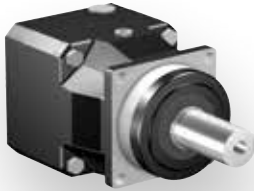
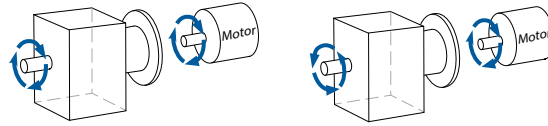
Rack and Pinion Servo gearhead systems are a ready to install engineered solution for precision automation applications requiring forces up to 122 kN (27,400 lbs.) with linear backlash as low as 7 µm

ServoStop automatic, electrically-actuated integrated holding brake used in place of a servo motor brake for dynamic safety braking, or in conjunction with the servo motor brake for redundancy in safety applications



Servo Gear Units

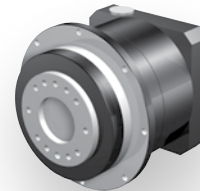
Inline & Offset Inline Gearheads



P/PA — Shaft Output *

STOBBER P Series is the cornerstone of most of our inline family of precision planetary gearheads. They are the most accurate and efficient planetary gearheads available. HeliCamber® gear technology provides minimum wear, low backlash and low noise. The PA Advanced Series takes backlash to the absolute minimum, and performance to the max.

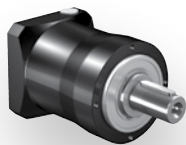
- 3:1 to 100:1
- Up to 2,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: P: <3 arc min; PA: <1 arc min



PH/PHA/PHQ/PHQA — Flange Output*

STOBBER PH family gearheads offer a rotating flange output version of the P Series. The PHA Advanced Series takes backlash to the absolute minimum, and the PHQ and PHQA feature “Quattro” power planetary gearing for extreme torque and ratio capabilities.

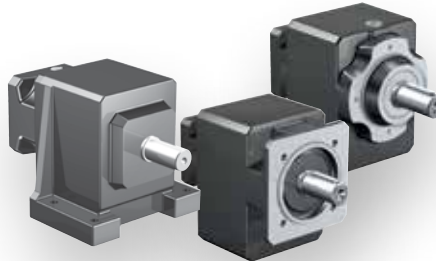
- 4:1 to 600:1
- Up to 13,000 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: PH/PHQ: <3 arc min; PHA/PHQA: <1 arc min



PE — Shaft Output*

STOBBER PE Series Servo Precision Planetary Gearheads are available for applications where very low backlash is not a criteria. They are an economical helical tooth planetary, comparable in quality to other STOBBER units.

- 3:1 to 100:1
- Up to 160 Nm torque (nom)
- Up to 8,000 RPM input speed
- Backlash: < 8 arc min



C — Shaft Output*

STOBBER C Series gear drives offer performance, durability, and economy for a wide range of applications. High efficiency helical gearing keeps motor size to a minimum while running almost silently.

- 2:1 to 276:1
- Up to 7,000 Nm torque (nom)
- Up to 6,500 RPM input speed
- Backlash: < 14 arc min

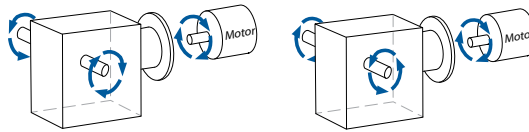
F — Versatile Outputs*

STOBBER F Series gear drives are a popular choice for applications that require high performance, efficiency, durability, and flexibility. F Series are available with a wide selection of configurations to match almost any mounting requirement.

- 4:1 to 551:1
- Up to 1,100 Nm torque (nom)
- Up to 7,000 RPM input speed
- Backlash: < 10 arc min

* See page 326 for comparison of all output options and sizes available

Right Angle Gearheads



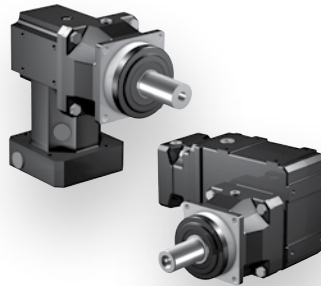
Many right angle gearheads offer output on either or both sides



K – Versatile Outputs*

STOBER K Series helical/bevel gear drives are the most popular and versatile Servo right angle gearheads. They are the optimal drive for truly demanding continuous-duty applications, offering higher efficiencies than conventional worm gear drives or planetary gearheads.

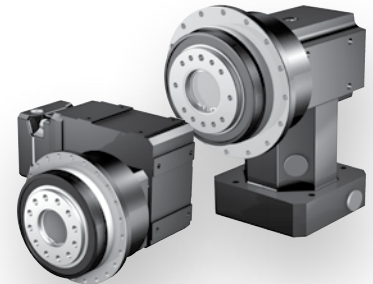
- 4:1 to 381:1
- Up to 12,000 Nm torque (nom)
- Up to 7,000 RPM input speed
- Backlash <10 arc min



PKX/PK – Shaft Output*

STOBER PKX and PK Series precision planetary gearheads combine the P Series gearhead with the low ratio “KX” right angle platform or the reduced backlash K Series platform.

- Ratios: 3:1 to 300:1;
- Up to 2,000 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: PKX: ≤4 arc min;
PK: ≤3.5 arc min



PHKX/PHK/PHQK – Flange Output*

STOBER PH right angle gearhead configurations offer a rotating flange output combining the P Series gearhead with the low ratio “KX” or reduced backlash K Series. The PHQK features the “Quattro” power planetary gearing for extreme torque and ratio capabilities.

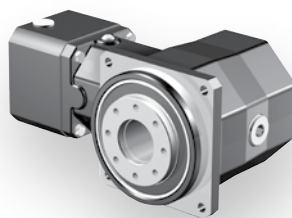
- 4:1 to 591:1
- Torque: 13,000 Nm (nom)
- Up to 7,000 RPM input speed
- Backlash <3.5 arc min



KL – Versatile Outputs*

The STOBER KL Series offers the same output and housing versatility as the K series, but is much more compact and ideal for smaller gearhead size applications.

- 4:1 to 32:1
- Up to 50 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: ≤20 arc min



KS – Versatile Outputs*

STOBER KS Series precision planetary gearheads use time-tested helical gearing and finish ground spiral bevel gears to provide a low backlash unit, that is smooth running, with high efficiency, high power density, and high input speed capacity..

- 6:1 to 200:1
- Up to 250 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: < 4 arc min



KSS – Versatile Outputs*

STOBER is proud to offer our quality-proven, high-efficiency KSS Series Helical/Bevel speed reducer in a stainless steel housing necessary for the toughest washdown applications.

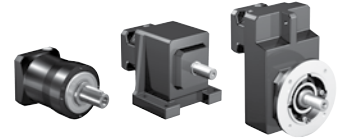
- 4:1 to 70:1
- Up to 346 Nm torque (nom)
- Up to 6,000 RPM input speed
- Backlash: < 10 arc min

Servo Gear Units

Versatility

STOBER Drives offers the world's largest variety of gearheads to fit virtually all servo needs.

INLINE & OFFSET INLINE GEARHEADS



Performance, Configurations and Options

		P	PA	PH	PHA	PHQ	PHQA	PE	C	F
		page 14		page 46				page 92	page 102	page 140
Input	Large Input	•	•	•	•	•	•	•		
	ServoCool	•	•	•	•					
	Solid Shaft	•	•					•	•	•
Output <small>(see page 326 for details)</small>	Hollow Bore									•
	Rotating Flange			•	•	•	•		•	•
	Shrink Ring									•
	Single Bushing									•
	Double Bushing									•
Housing	Flange								•	•
	Foot Mount								•	•
	Tapped Holes								•	•
Protection	IP65	•	•	•	•	•	•	IP64	•	•
	IP69K Washdown								Opt	Opt
	ATEX Certified	Opt	Opt	Opt	Opt	Opt	Opt		Opt	Opt
	304SS Housing									
Paint/Coatings	Standard Black	•	•	•	•	•	•	•	•	•
	Food Duty	•							•	•
	Corrosion Resistant Duty								•	•
Added Functionality	ServoStop*	•	•	•	•				•	•
	Rack and Pinion*	•	•	•				•		
Performance <small>+ Good +++ Better +++++ Best</small>	Continuous RPM	+++	+++	++	++	++	++	+++	+++	++
	Stiffness	+++	+++	++	++++	+++++	+++++	+	+	++++
	Torque Density	+++	+++	++	++++	+++++	+++++	+	+	++++
Precision <small>ArcMin Backlash</small>	1	•		Opt		Opt				
	1-3			•		•			•	
	3-5				•					
	5-10						Opt			Opt
	10-15		•				•			•
	15-20							•		
Nominal Output Torque Ranges <small>Nm</small>	0-50	•	•	•	•			•	•	•
	50-200	•	•	•	•			•	•	•
	200-1,000	•	•			•	•	•	•	•
	1,000-5,000	•	•			•	•	•	•	•
	5,000-10,000					•	•	•	•	•
	10,000-23,000					•	•			

* See page 331 for more information

RIGHT ANGLE GEARHEADS

SS304



	K	KL	PKX	PK	PHKX	PHK	PHQK	KS	KSS
	page 162		page 214		page 248			page 298	page 312
								•	
	•	•	•	•				•	•
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Servo Gear Units Application-Tailored Solutions

Industry	Ideal Gearhead Applications	Recommended STÖBER Gearhead
Aerospace	<ul style="list-style-type: none"> Automated Guided Vehicles (AGV) Drilling and Riveting Machine Tool Testing and Inspection 	<ul style="list-style-type: none"> Carbon Fiber Placement Fuselage Space Tracking Systems Wing assembly
Automation	<ul style="list-style-type: none"> Assembly turn tables Linear presses Robotics auxiliary axis Palletizing 	<ul style="list-style-type: none"> Custom assembly machines Radar Pipe and wire bending
Automotive Manufacturing	<ul style="list-style-type: none"> Transfer lines Robotic auxiliary Machining Tire manufacturing Carbon fiber production 	<ul style="list-style-type: none"> Metal cutting and bending Pick and place Index tables Electronics assembly
Converting	<ul style="list-style-type: none"> Cutting Tension Control Web Lines 	<ul style="list-style-type: none"> Winding Paper Converting
Machine Tool	<ul style="list-style-type: none"> Horizontal and vertical mills Large gantry cranes Carbon fiber placement Flame, laser, water jet, and plasma cutting Back gauging 	<ul style="list-style-type: none"> Grinding X-Y tables Indexing tables Chip conveyors Bending and forming Tool changers
Material Handling	<ul style="list-style-type: none"> Pick and place Line diverter Sorting/diverting 	<ul style="list-style-type: none"> Linear transfer Palletizing
Medical	<ul style="list-style-type: none"> Imaging Radiation Centrifuge 	
Packaging	<ul style="list-style-type: none"> Continuous or intermittent filling applications 	
Plastics/Composites	<ul style="list-style-type: none"> Often used to replace hydraulic actuators in injection molding Injection molding Carbon fiber placement 	<ul style="list-style-type: none"> Extrusion lines Blow molding Thermoforming Rubber molding
Printing	<ul style="list-style-type: none"> Labels Flexographic printing 	<ul style="list-style-type: none"> Circuit Boards Sheet
Robotics	<ul style="list-style-type: none"> Delta Pick and place Telescoping arms 	<ul style="list-style-type: none"> Auxiliary axis to rotate and move robot Positioning axis
Semiconductor	<ul style="list-style-type: none"> Wafer polishing Wafer handling 	<ul style="list-style-type: none"> Circuit web printing
Valve Control	<ul style="list-style-type: none"> Ideal for handling rapid dithering positioning Ball, gate, and globe valves 	<ul style="list-style-type: none"> Throttle/governor valves Chokes Process valves ATEX explosion proof available

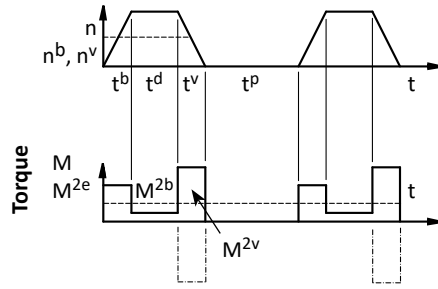
Gearhead Sizing to your Specific Application Requirements

Sizing/Selection

Use the chart on the facing page and below to determine the best series and the right size gearhead to meet your specific application requirements. In each product section of this catalog, the necessary data and a "Load/Life/Speed Calculation" section are provided to help you work through these equations..

By all means, please feel free to call or email (sales@stober.com), if you have any questions or need assistance determining the best solution for your application.

Cycle Run



$$M_{2e} = \sqrt[3]{\frac{n_{2b} \cdot t_b \cdot M_{2b}^3 + \dots + n_{2n} \cdot t_n \cdot M_{2n}^3}{n_{2b} \cdot t_b + \dots + n_{2n} \cdot t_n}}$$

Service Factor

Apply to Nominal Rating ONLY

P, PA, PE PH, PHA PHV, PHVA, PHQ, PHQA, KS	PKX, PK, PHKX, PHK, PHQK, C, F, K, KSS
--	---

Load Factor f_B

Operating Mode

Continuous	1.0	1.0
Cyclic	1.0	1.25
Cyclic-	1.0	1.4
Reversing		

Running Time Factor f_L

≤8 hours	1.0
≤16 hours	1.15
≤24 hours	1.2

Apply to Input RPM

Temperature Factor f_T

	Without Ventilation	Fan Cooled
<20°C	1.00	0.90
<30°C	1.10	1.00
<40°C	1.25	1.15

Continuous Duty: Drive is considered continuous duty if the running time ($t^r = t^b + t^d + t^v$) is 60% of the complete cycle time ($t^b + t^d + t^v + t^p$) or longer than 20 minutes.

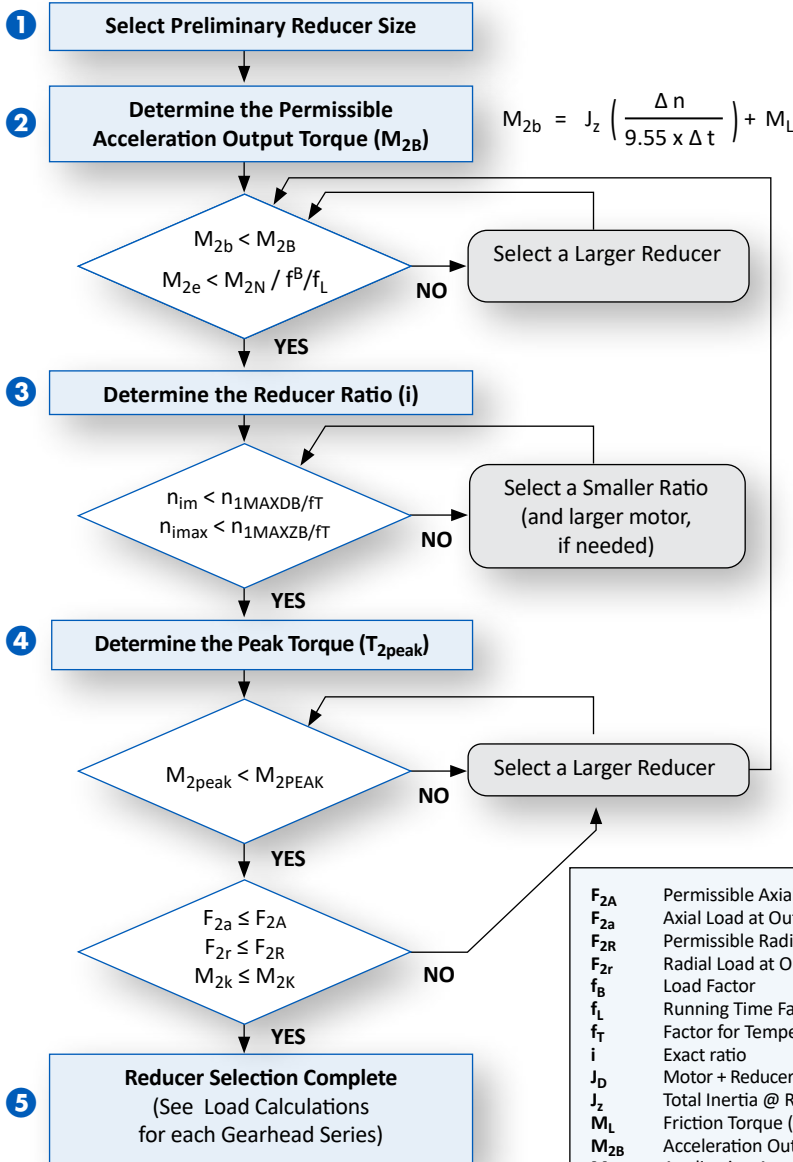
Cyclic Duty: Drive will cycle on and off.

For cyclic operation, the recommended ratio of external (application) inertia to gearhead inertia can be determined by the following equation:

$$\frac{J_z}{i^2} = 4 \cdot J_D$$

The gearhead selected, using the following equation for inertia ratio, will result in the lowest motor torque demand and the optimum drive selection:

$$\frac{J_z}{i^2} = J_D$$



F_{2A}	Permissible Axial Load	M_{2K}	Rated Tilting Torque
F_{2a}	Axial Load at Output Shaft	M_{2k}	Equivalent Tilting Load
F_{2R}	Permissible Radial load	M_{2N}	Nominal Output Torque
F_{2r}	Radial Load at Output Shaft	M_{2peak}	Peak Output Torque
f_B	Load Factor	n_{1db}	Maximum Continuous Input
f_L	Running Time Factor	n_{1zb}	Maximum Cyclic Input
f_T	Factor for Temperature	n_{im}	Maximum Continuous Speed
i	Exact ratio	n_{imax}	Maximum Cyclic Speed
J_D	Motor + Reducer Inertia @ Motor RPM	T_{2PEAK}	Peak Torque
J_z	Total Inertia @ Reducer RPM	t_r	Running Time
M_L	Friction Torque (Losses)	t_b	Acceleration Time
M_{2B}	Acceleration Output Torque	t_d	Duration Time
M_{2b}	Application Acceleration Torque	t_v	Deceleration Time
M_{2e}	Equivalent Torque (Avg RMS Torque)		

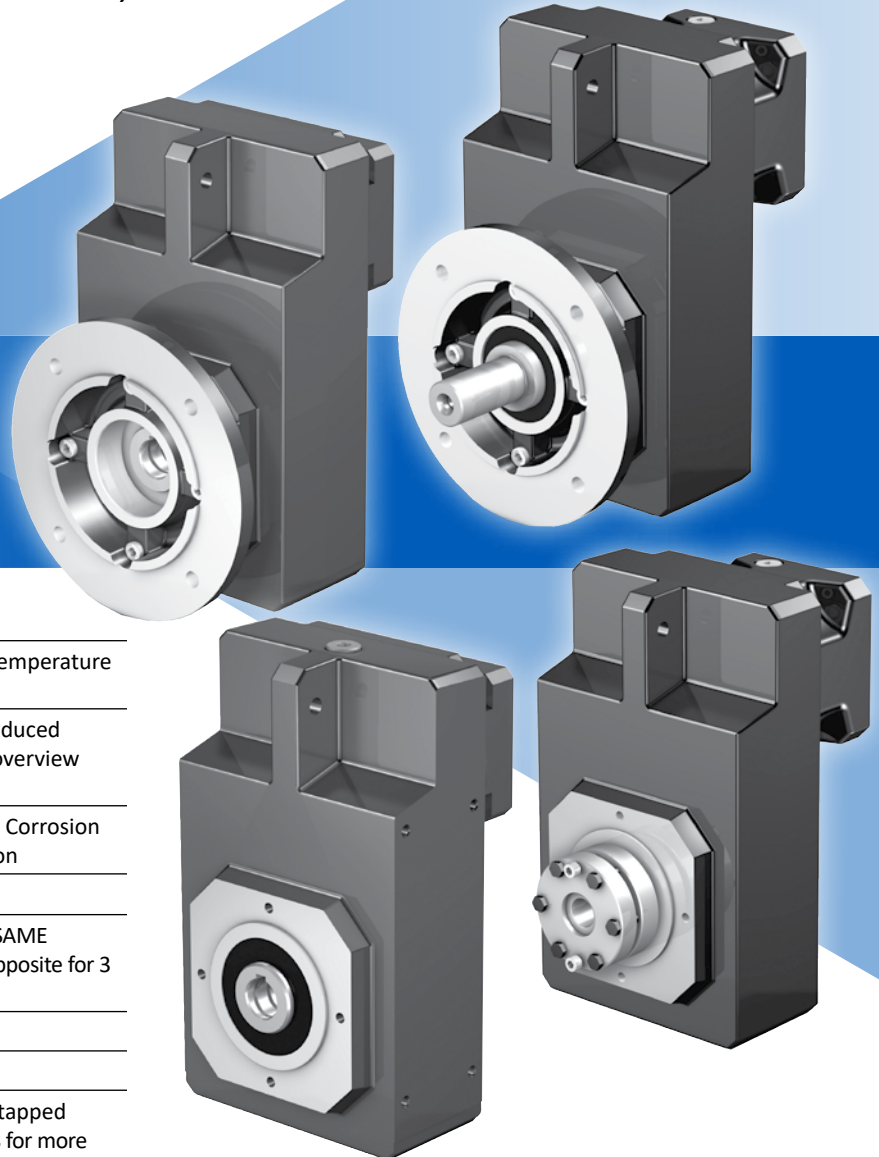
F Series: OFFSET – Versatile Outputs

Features

- 4.3:1 to 552:1 ratios (higher ratios available. Contact STÖBER.)
- 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. STÖBER 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

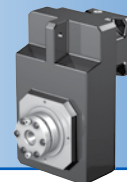


General Specifications

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 142))
Coating	Standard Black (RAL 790-4), 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 142)
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 328 for more information
Lubrication	Lubricated for life - standard Mobil 600XP200, option food grade Mobil SHC CIBUS 220
Mounting Position	Must be specified, see page 142
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

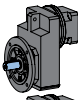








Overview

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 3	Two stage for ratios <150:1 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 142

F Series: OFFSET – Versatile Outputs

Options

Lubrication Options

Food grade or synthetic optionally available (contact factory)

ATEX

- Atmosphere EXplosible — Please allow up to 8 weeks for delivery

Coating Options

- 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.

ME Adapter Options

(Contact factory)

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

F Series: OFFSET – Versatile Outputs

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.

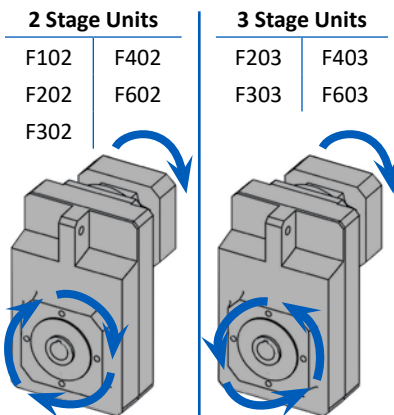
		Size/Generation	F10			F20		F30		F40		F60		
		# of Stages	2	2	3	2	3	2	3	2	3	2	3	
Acceleration Torque	M_{2BMAX}	Nm	120	270		450		700		1100				
Output Torque Nom.	M_{2N}	Nm	120	240		400		700		1100				
Torsional Stiffness	C_2	Nm/arcmin	<7.7	<17.9	<17.9	<21.8	<21.8	<38.7	<38.7	<77.4	<77.4			
Torsional Backlash ¹⁾	$\Delta\phi$	arcmin	Standard	≤11	≤11	≤11	≤11	≤10	≤10	≤10	≤10			
			Reduced	≤6	≤6	≤7	≤6	≤7	≤5	≤6	≤5	≤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 STÖBER technical support.

²⁾ Measurement at one (1) meter distance with input speed (n_1) of 2000 RPM.

³⁾ Rating based on output speed (n_2) of 20 RPM. For values at other speeds see page 145

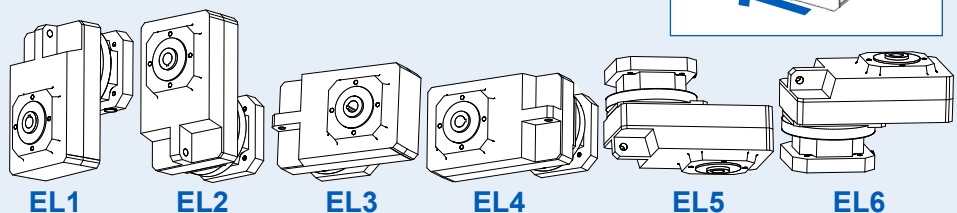
F Series Direction of Rotation

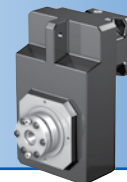


F Series Mounting Position Options

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.





Overview

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

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

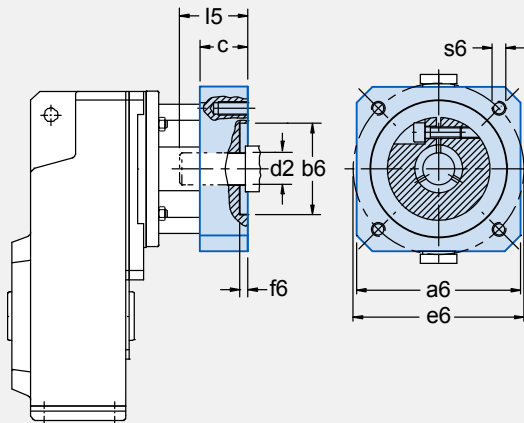
NOTE: When ordering a gearhead:

- 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 STÖBER 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
- I5 Motor Shaft Length
- f6 Pilot Length
- a6 Square Flange (Optional – motor plate will typically be made to match this dimension.)



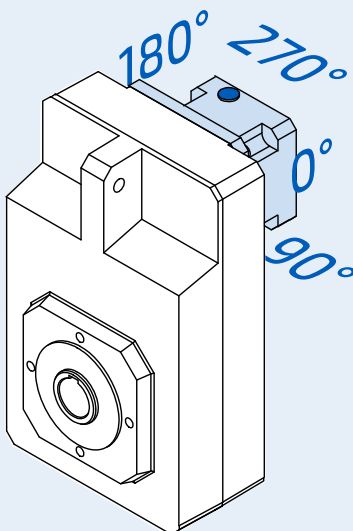
Motor Mounting Plate Dimensions — mm(Gearhead Part Number Specific)

	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: OFFSET – Versatile Outputs

F Series: OFFSET – Versatile Outputs

F Series Output Options

Diameters in **BOLD BLUE** are configurations readily available from inventory. Contact STÖBER 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	—	—	—	—	—
	Stainless Steel*	Inches	—	—	—	—	—
		Metric	—	—	—	—	—
Hollow Bore	Carbon Steel	Inches	3/4	1	1-1/4	1-1/2	2
		Metric	20	25	30	40	50
	Stainless Steel*	Inches	—	1	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 1-3/8 1-7/16 1-1/2	1 1-3/16 1-1/4 1-3/8 1-7/16 1-1/2	1-7/16 1-1/2 1-5/8 1-11/16 1-3/4 1-7/8 1-15/16 2
		Metric	20	30	30 35	40***	40***
Shrink Ring	Carbon Steel	Metric	20	25	30	40	50

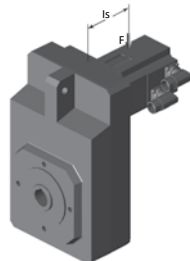
* Stainless steel options are ideal for food and corrosion resistant, harsh washdown environments.

** 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 “I_S” of the motor.



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

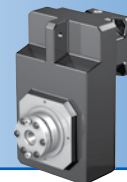
M _{1K}	ME10	ME20	ME30	ME40	ME50
Nm	25	60	125	250	250

Permissible Output Shaft Load and Tilting Moments*

Unit	V Solid Shaft Output				A, S, W Hollow Output ¹⁾		
	Z ₂	F _{2A}	F _{2R}	M _{2K}	Z ₂	F _{2A}	M _{2K}
	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



Overview

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:

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

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

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:

$$F_{2aX} = \frac{F_{2A}}{\sqrt[3]{\frac{n_2}{20}}}, \quad F_{2rX} = \frac{F_{2R}}{\sqrt[3]{\frac{n_2}{20}}}, \quad M_{2kX} = \frac{M_{2K}}{\sqrt[3]{\frac{n_2}{20}}}$$

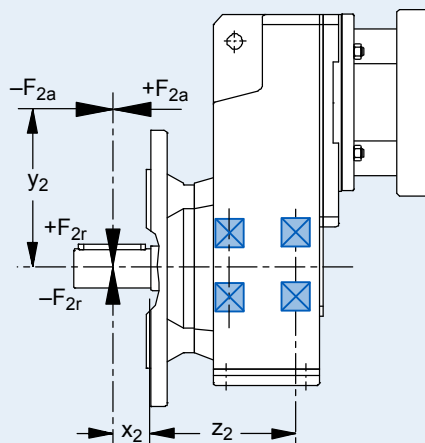
The application output tilting moment should be determined by the following formula:

$$M_{2a} = \frac{2 \cdot F_{2a} \cdot y_2 + F_{2rb} \cdot (x_2 + z_2)}{1000} \leq M_{2K}$$

Where:

F_{2a}	Axial Load at Output Shaft
F_{2A}	Permissible Axial Load
F_{2r}	Radial Load at Output Shaft
F_{2R}	Permissible Radial Load
F_{2RB}	Acceleration Permissible Radial Load
M_{2K}	Rated Tilting Torque
M_{2k}	Equivalent Tilting Load
M_{2KB}	Acceleration Tilting Torque
z₂	Distance Factor

All formulas shown are based on METRIC values
Upper case letters are permissible values. Lower case letters are for existing values.



F Series: OFFSET – Versatile Outputs

F Series: OFFSET – Versatile Outputs

Reducer Ratio (i)		Output Torque			Backlash ³⁾	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{2N} ≤ 1500 RPM	Acceleration M _{2B}	Peak ²⁾ M _{2PEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin	EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm	

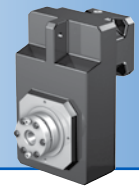
F1

4.308	56/13	69	100	130	11/8	F102_0043 ME10	3500	3000	6000	≤19	2.1	6.2
						F102_0043 ME20				≤24	4.0	6.4
6.462	84/13	79	110	190	11/8	F102_0065 ME10	3500	3000	6000	≤19	1.4	6.4
						F102_0065 ME20				≤24	3.3	6.5
7.156	322/45	81	110	200	11/8	F102_0072 ME10	3700	3600	6000	≤19	1.3	6.4
						F102_0072 ME20				≤24	3.2	6.5
8.948	1029/115	88	110	200	11/8	F102_0089 ME10	3700	3600	6000	≤19	1.1	6.5
						F102_0089 ME20				≤24	3.0	
10.92	273/25	94	110	200	11/8	F102_0110 ME10	4000	4000	6500	≤19	0.9	6.5
						F102_0110 ME20	3700	3700	6000	≤24	2.8	
13.59	231/17	100	110	200	11/8	F102_0135 ME10	4000	4000	6500	≤19	0.9	6.5
						F102_0135 ME20	3700	3700	6000	≤24	2.7	
18.46	1495/81	110	120	240	11/6	F102_0185 ME10	3700	3600	6000	≤19	1.0	7.7
						F102_0185 ME20				≤24	2.9	
23.08	3185/138	120	120	240	11/6	F102_0230 ME10	3700	3600	6000	≤19	0.9	7.7
						F102_0230 ME20				≤24	2.8	
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	
35.05	3575/102	120	120	240	11/6	F102_0350 ME10	4000	4000	6500	≤19	0.8	7.7
						F102_0350 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
139.8	559/4	120	120	240	11/6	F102_1400 ME10	4000	4000	7000	≤19	0.6	7.7

¹⁾ Maximum torque for continuous input 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 (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal M _{ZN} ¹⁾ ≤ 1500 RPM	Acceleration M _{ZB}	Peak ²⁾ M _{ZPEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin	EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm	

F2 (continued next page)

4.680	2616/559	110	110	140	11/8	F202_0047 ME10	3100	2600	5000	≤19	4.7	14.0
		140	210	340		F202_0047 ME20				≤32	8.1	15.0
						F202_0047 ME30				≤38	13.0	
5.552	5341/962	150	210	400	11/8	F202_0056 ME20	3100	2600	5000	≤32	7.1	15.0
						F202_0056 ME30				≤38	12.0	
7.167	5777/806	150	170	210	11/8	F202_0072 ME10	3600	3100	6000	≤19	2.6	15.0
		160	210	400		F202_0072 ME20				≤32	6.0	
						F202_0072 ME30	3500	5000	≤38	11.0		
9.006	3161/351	160	210	260	11/8	F202_0090 ME10	3600	3100	6000	≤19	1.9	15.0
		170		400		F202_0090 ME20				≤32	5.3	
				F202_0090 ME30		3500	5000	≤38	11.0			
10.80	7303/676	170	210	310	11/8	F202_0110 ME10	3800	3500	6000	≤19	1.6	15.0
		190		400		F202_0110 ME20				3700	≤32	
				F202_0110 ME30		3500	5000	≤38	10.0			
13.63	109/8	180	210	400	11/8	F202_0135 ME10	3800	3500	6000	≤19	1.3	15.0
		200				F202_0135 ME20				3700	≤32	
						F202_0135 ME30	3500	5000	≤38	10.0		
18.65	6360/341	220	270	480	11/6	F202_0185 ME10	3600	3100	6000	≤19	1.6	18.0
						F202_0185 ME20				≤32	5.0	
						F202_0185 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		
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	
						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	
						F202_0350 ME30	3500	5000	≤38	9.7		
47.05	1035/22	240	270	480	11/6	F202_0470 ME10	4000	3900	6500	≤19	0.9	18.0
						F202_0470 ME20				3700	3700	
						F202_0470 ME30	3500	3500	5000	≤38	9.6	

F Series: OFFSET – Versatile Outputs

¹⁾ Maximum torque for continuous input 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

F Series: OFFSET – Versatile Outputs

Reducer Ratio (i)		Output Torque			Backlash ³⁾	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{2N} ≤ 1500 RPM	Acceleration M _{2B}	Peak ²⁾ M _{2PEAK}			Continuous	EL 1,2,3,4	EL 5,6			
Nom.	Exact	Nm	Nm	Nm	arcmin				mm	kgcm ²	Nm	

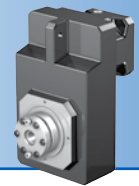
F2 (continued from previous page)

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	
112.7	1240/11	240	270	480	11/6	F202_1130 ME10	4000	3900	6500	≤19	0.7	18.0
140.9	1550/11	240	270	480	11/6	F202_1410 ME10	4000	3900	6500	≤19	0.6	18.0
184.3	16215/88	240	270	480	11/7	F203_1840 ME10	4000	3900	6500	≤19	0.7	18.0
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
441.5	14570/33	240	270	480	11/7	F203_4420 ME10	4000	3900	6500	≤19	0.7	18.0
551.9	36425/66	240	270	480	11/7	F203_5520 ME10	4000	3900	6500	≤19	0.7	18.0

¹⁾ Maximum torque for continuous input 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 (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{ZN} ≤ 1500 RPM	Acceleration M _{ZB}	Peak ²⁾ M _{ZPEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm

F3 (continued next page)

4.644	4992/1075	230	270	340	11/8	F302_0046 ME20	3000	2600	4500	≤32	12.0	20.0
		230	350	650		F302_0046 ME30				≤38	18.0	
5.720	143/25	250	330	420	11/8	F302_0057 ME20	3000	2600	4500	≤32	9.7	20.0
						F302_0057 ME30				≤38	15.0	
7.172	208/29	270	350	520	11/8	F302_0072 ME20	3500	3100	5000	≤32	7.9	20.0
						F302_0072 ME30				≤38	13.0	
8.986	5616/625	180	210	260	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	190	250	310	11/8	F302_0110 ME10	3700	3500	5500	≤19	2.5	20.0
		310	350	650		F302_0110 ME20				≤32	5.9	
						F302_0110 ME30	3500	5000	≤38	11.0		
13.38	7696/575	200	310	390	11/8	F302_0135 ME10	3700	3500	5500	≤19	1.9	20.0
		330	350	650		F302_0135 ME20				≤32	5.3	
						F302_0135 ME30	3500	5000	≤38	11.0		
18.77	4900/261	370	450	800	11/6	F302_0190 ME20	3500	3100	5000	≤32	5.9	22.0
						F302_0190 ME30				≤38	11.0	
23.52	588/25	400	680	450	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		
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	

F Series: OFFSET – Versatile Outputs

¹⁾ Maximum torque for continuous input 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

F Series: OFFSET – Versatile Outputs

Reducer Ratio (i)		Output Torque			Backlash ³⁾	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{2N} ≤ 1500 RPM	Acceleration M _{2B}	Peak ²⁾ M _{2PEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin	EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm	

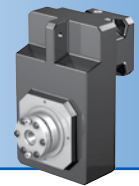
F3 (continued from previous page)

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	
140.6	7595/54	400	450	620	11/6	F302_1410 ME10	4000	3900	6500	≤19	0.7	22.0
182.4	73892/405	400	450	800	11/7	F303_1820 ME20	3700	3700	6000	≤24	2.7	22.0
184.8	29939/162	400	450	800	11/7	F303_1850 ME10	4000	3900	6500	≤19	0.7	22.0
218.4	117943/540	400	450	800	11/7	F303_2180 ME20	3700	3700	6000	≤24	2.7	22.0
221.2	191149/864	400	450	800	11/7	F303_2210 ME10	4000	3900	6500	≤19	0.7	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
550.9	356965/648	400	450	620	11/7	F303_5510 ME10	4000	3900	6500	≤19	0.7	22.0

¹⁾ Maximum torque for continuous input 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⁾ arcmin	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶ mm	Input Inertia J ₁ kgcm ²	Torsional Stiffness C ₂ (per arcmin) Nm
		Nominal ¹⁾ M _{ZN} ≤ 1500 RPM Nm	Acceleration M _{ZB} Nm	Peak ²⁾ M _{ZPEAK} Nm			Continuous EL 1,2,3,4	Cyclic EL 5,6	All			
Nom.	Exact	Nm	Nm	Nm	arcmin							

F4 (continued next page)

4.678	1408/301	390	550	910	10/7	F402_0047 ME30	2700	2300	4000	≤38	24.0	38.0		
						F402_0047 ME40				≤48	46.0			
5.813	3784/651	410	550	1100	10/7	F402_0058 ME30	2700	2300	4000	≤38	20.0	38.0		
						F402_0058 ME40				≤48	42.0			
7.202	605/84	420	420	520	10/7	F402_0072 ME20	3200	2800	4800	≤32	11.0	38.0		
		450	550	1100		F402_0072 ME30				≤38	16.0			
						F402_0072 ME40				3000	4500		≤48	38.0
8.980	440/49	470	520	650	10/7	F402_0090 ME20	3200	2800	4800	≤32	8.8	38.0		
		480	550	1100		F402_0090 ME30				≤38	14.0			
						F402_0090 ME40				3000	4500		≤48	36.0
10.83	682/63	490	550	790	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
13.57	5984/441	540	550	930	10/7	F402_0135 ME20	3500	3100	5500	≤32	6.4	38.0		
		550		1100		F402_0135 ME30				5000	≤38		12.0	
				F402_0135 ME40		3000				3000	4500		≤48	34.0
18.62	3575/192	610	700	1350	10/5	F402_0185 ME20	3200	2800	4800	≤32	7.3	39.0		
				1400		F402_0185 ME30				≤38	13.0			
						F402_0185 ME40				3000	4500		≤48	35.0
23.21	325/14	660	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
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
46.94	845/18	700	700	1400	10/5	F402_0470 ME20	3700	3500	6000	≤32	4.9	39.0		
						F402_0470 ME30				3500	5000		≤38	10.0
						F402_0470 ME40				3000	3000		4500	≤48

F Series: OFFSET – Versatile Outputs

¹⁾ Maximum torque for continuous input 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

F Series: OFFSET – Versatile Outputs

Reducer Ratio (i)		Output Torque			Backlash ³⁾	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{2N} ≤ 1500 RPM	Acceleration M _{2B}	Peak ²⁾ M _{2PEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin	EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm	

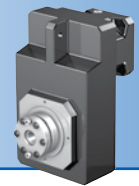
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55.97	2015/36	700	700	1400	10/5	F402_0560 ME20	3700	3500	6000	≤32	4.7	39.0
						F402_0560 ME30	3500		5000	≤38	10.0	
70.06	1261/18	700	700	1400	10/5	F402_0700 ME20	3700	3500	6000	≤32	4.5	39.0
						F402_0700 ME30	3500		5000	≤38	9.8	
93.33	280/3	700	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
139.8	559/4	700	700	1400	10/5	F402_1400 ME20	3700	3500	6000	≤24	2.7	39.0
181.5	4901/27	700	700	1400	10/6	F403_1820 ME20	3700	3500	6000	≤24	2.7	39.0
183.9	39715/216	700	700	1180	10/6	F403_1840 ME10	3800	3500	6000	≤19	0.7	39.0
216.4	11687/54	700	700	1400	10/6	F403_2160 ME20	3700	3500	6000	≤24	2.7	39.0
219.2	94705/432	700	700	1400	10/6	F403_2190 ME10	3800	3500	6000	≤19	0.7	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
547.4	26273/48	700	700	1400	10/6	F403_5470 ME10	3800	3500	6000	≤19	0.7	39.0

¹⁾ Maximum torque for continuous input 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 (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{ZN} ≤ 1500 RPM	Acceleration M _{ZB}	Peak ²⁾ M _{ZPEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin		EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm

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4.546	1273/280	580	710	880	10/7	F602_0045 ME30	2500	2100	3500	≤38	46.0	69.0
		640				F602_0045 ME40				≤48	68.0	
5.673	1407/248	650	880	1100	10/7	F602_0057 ME30	2500	2100	3500	≤38	34.0	70.0
		690				F602_0057 ME40				≤48	56.0	
7.159	3551/496	700	1000	1380	10/7	F602_0072 ME30	2900	2500	4500	≤38	26.0	71.0
		740				F602_0072 ME40				≤48	48.0	
8.995	1943/216	520	520	650	10/7	F602_0090 ME20	2900	2500	4500	≤32	15.0	70.0
		760	1000	1600		F602_0090 ME30				≤38	20.0	72.0
		800	F602_0090 ME40	≤48		42.0						
10.82	2077/192	560	630	790	10/7	F602_0110 ME20	3300	2800	5000	≤32	12.0	71.0
		820	1000	1600		F602_0110 ME30	≤38		17.0	72.0		
		850	F602_0110 ME40	3000		4500	≤48		39.0			
13.61	871/64	590	740	920	10/7	F602_0135 ME20	3300	2800	5000	≤32	9.4	72.0
		860	1000	1600		F602_0135 ME30	≤38		15.0			
		920	F602_0135 ME40	3000		4500	≤48		37.0			
18.52	3445/186	1020	1100	2000	10/5	F602_0185 ME30	2900	2500	4500	≤38	17.0	77.0
						F602_0185 ME40				≤48	39.0	
23.27	1885/81	1100	1100	1690	10/5	F602_0230 ME20	2900	2500	4500	≤32	9.5	77.0
				2000		F602_0230 ME30				≤38	15.0	
				F602_0230 ME40		≤48				37.0		
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	
35.21	845/24	1100	1100	2000	10/5	F602_0350 ME20	3300	2800	5000	≤32	7.0	77.0
						F602_0350 ME30	≤38		12.0			
						F602_0350 ME40	3000		4500	≤48	34.0	
46.72	1495/32	1100	1100	2000	10/5	F602_0470 ME20	3500	3200	5500	≤32	6.0	77.0
						F602_0470 ME30	≤38		11.0			
						F602_0470 ME40	3000		3000	4500	≤48	
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		

F Series: OFFSET – Versatile Outputs

¹⁾ Maximum torque for continuous input 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

F Series: OFFSET – Versatile Outputs

Reducer Ratio (i)		Output Torque			Backlash ³⁾	Part Number (Gearhead + Input)	Maximum Input Speed RPM			Motor Shaft Max Ø D ⁶	Input Inertia J ₁	Torsional Stiffness C ₂ (per arcmin)
		Nominal ¹⁾ M _{2N} ≤ 1500 RPM	Acceleration M _{2B}	Peak ²⁾ M _{2PEAK}			Continuous	Cyclic				
Nom.	Exact	Nm	Nm	Nm	arcmin	EL 1,2,3,4	EL 5,6	All	mm	kgcm ²	Nm	

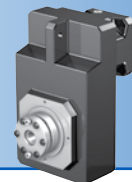
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69.64	975/14	1100	1100	2000	10/5	F602_0700 ME20	3500	3200	5500	≤32	5.1	77.0
						F602_0700 ME30			5000	≤38	10.0	
93.33	280/3	1100	1100	2000	10/5	F602_0930 ME20	3500	3200	5500	≤32	4.7	77.0
						F602_0930 ME30			5000	≤38	10.0	
112.2	9425/84	1100	1100	2000	10/5	F602_1120 ME20	3500	3200	5500	≤24	3.0	77.0
139.8	559/4	1100	1100	2000	10/5	F602_1400 ME20	3500	3200	5500	≤24	2.8	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
269.3	1885/7	1100	1100	2000	10/6	F603_2690 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
540.4	16211/30	1100	1100	2000	10/6	F603_5400 ME20	3500	3200	5500	≤24	2.7	77.0

¹⁾ Maximum torque for continuous input 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



Dimensional Data

"V" Shaft Output with "F" Output Flange – All Sizes

* See Motor Mounting Plate Option, page 143 for details.

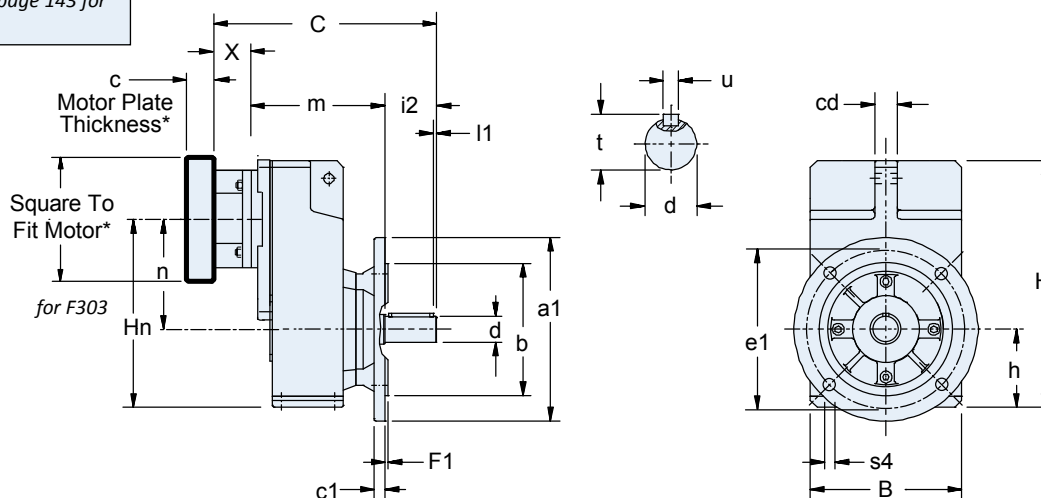


Table 1 Dimensions (mm)

Unit	a1	B	b _{j6}	c1	cd	e1	F1	H	h	Hn	i2	l1	n	s4
F1	160	145	110	10	20	130	3.5	238	74	176	50	5	102	9
F2	200	180	130	14	22	165	3.5	299	93	224	60	5	131	11
F3	250	206	180	15	30	215	4	335.5	106	219	70	5	149.5 ¹⁾	14
F4	250	230	180	15	30	215	4	370	116	285 ¹⁾	80	5	169 ¹⁾	14
F6	300	265	230	17	35	265	4	433	137	333	100	5	196	14

¹⁾ For F303, n is 113 with ME20; For F403, n is 132 with ME20 and Hn is 248.

Table 2 "V" Shaft Output Dimensions

Unit	Standard Shaft - in			Optional Shaft* - mm		
	d _{h6}	t	u	d _{k6}	t	u
F1	1.000	1.11	1/4 x 1/4 x 1-9/16	25	28	A8x7x40
F2	1.250	1.36	1/4 x 1/4 x 1-15/16	30	33	A8x7x50
F3	1.375	1.51	5/16 x 5/16 x 2-5/16	35	38	A10x8x60
F4	1.625	1.79	3/8 x 3/8 x 2-7/8	40	43	A12x8x70
F6	2.125	2.35	1/2 x 1/2 x 3-5/32	50	53.5	A14x9x90

*Metric output available on request

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	m	C	m	C	m	C	m	
F102	219.5	129.5	233.5	133.5	—	—	—	—	38
F202	253	153	267	157	279	159	—	—	51
F203	290	190	—	—	—	—	—	—	64
F302	279.5	169.5	293.5	173.5	305.5	175.5	—	—	67
F303	316.5	206.5	336.5	216.5	—	—	—	—	73
F402	—	—	318.5	188.5	330.5	190.5	361.5	193.5	84
F403	341.5	221.5	361.5	231.5	—	—	—	—	91
F602	—	—	369.5	219.5	381.5	221.5	412.5	224.5	165
F603	—	—	412.5	262.5	—	—	—	—	177

Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME10	21	19	40	5
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.

For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.

F Series: OFFSET – Versatile Outputs

F Series: OFFSET – Versatile Outputs

“W” Single Bushing with “G” Pitch Circle Diameter (PCD) Tapped Holes – All Sizes

Important: For ease of installation, a 1/32" x 45° chamfer (minimum) is recommended for the output shaft end.

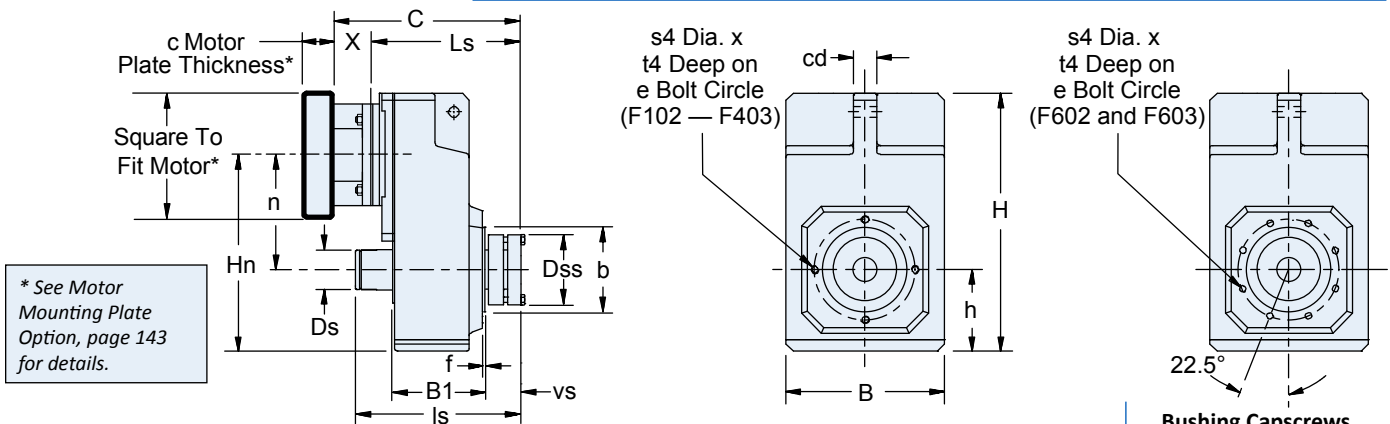


Table 1 Dimensions (mm)

Unit	B	b _g	B1	cd	Ds	Ds	Dss	e	f	H	h	Hn	ls	n	s4	t4	vs	Bushing Capscrews	
																		No. – Size Metric	Tightening Torque – Nm
F1	145	75	87	20	34.5	34.5	68	85	2.5	238	74	176	170.9	102	M8x1.25	13	30	6 – M6x25	10
F2	180	95	105	22	44.5	44.5	78	115	3	299	93	224	197.4	131	M8x1.25	13	39	8 – M6x30	10
F3	206	110	120	30	48	48	84	130	3.5	335.5	106	255.5	218.9	149.5 ¹⁾	M10x1.5	16	39	8 – M6x30	10
F4	230	110	135	30	54.5	54.5	97	130	3.5	370	116	285 ¹⁾	243.1	169 ¹⁾	M10x1.5	16	45	8 – M8x30	25
F6	265	130	166	35	64.5	64.5	105	165	3.5	433	137	333	275.3	196	M10x1.5	16	45	8 – M8x30	25

¹⁾ For F303, n is 113 with ME20; For F403, n is 132 with ME20 and Hn is 248.

Table 2 “WF” Single Side Bushings* – Stock Bores Sizes

Unit	Metric					Inches											
	20	30	35	3/4	1	1-3/16	1-1/4	1-3/8	1-7/16	1-1/2	1-5/8	1-11/16	1-3/4	1-7/8	1-15/16	2	
F1	WF1-20	—	—	WF1-075	—	—	—	—	—	—	—	—	—	—	—	—	
F2	—	WF2-30	—	—	WF2-100	WF2-103	—	—	—	—	—	—	—	—	—	—	
F3	—	WF3-30	WF3-35	—	WF3-100	WF3-103	WF3-104	WF3-106	WF3-107	WF3-108	—	—	—	—	—	—	
F4	—	—	—	—	WF4-100	WF4-103	WF4-104	WF4-106	WF4-107	WF4-108	—	—	—	—	—	—	
F6	—	—	—	—	—	—	—	—	WF5-107	WF5-108	WF5-110	WF5-111	WF5-112	WF5-114	WF5-115	WF5-200	

*A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer. The bushing will accept a shaft with a tolerance of +0.000/-0.005.

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	Ls	C	Ls	C	Ls	C	Ls	
F102	170	130	184	134	—	—	—	—	38
F202	197	157	211	161	223	163	—	—	51
F203	234	194	—	—	—	—	—	—	64
F302	212	172	226	176	238	178	—	—	67
F303	249	209	269	219	—	—	—	—	73
F402	—	—	247	197	259	199	290	202	84
F403	270	230	290	240	—	—	—	—	91
F602	—	—	278	228	290	230	321	233	165
F603	—	—	321	271	—	—	—	—	177

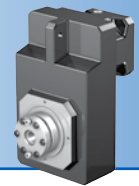
Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.

For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.



Dimensional Data

“W” Double Bushing with “G” Pitch Circle Diameter (PCD) Tapped Holes – Two Stage Units Only

Important: For ease of installation, a 1/32" x 45° chamfer (minimum) is recommended for the output shaft end. The double bushing cannot be mounted in sizes F203, F303, F403, or F603.

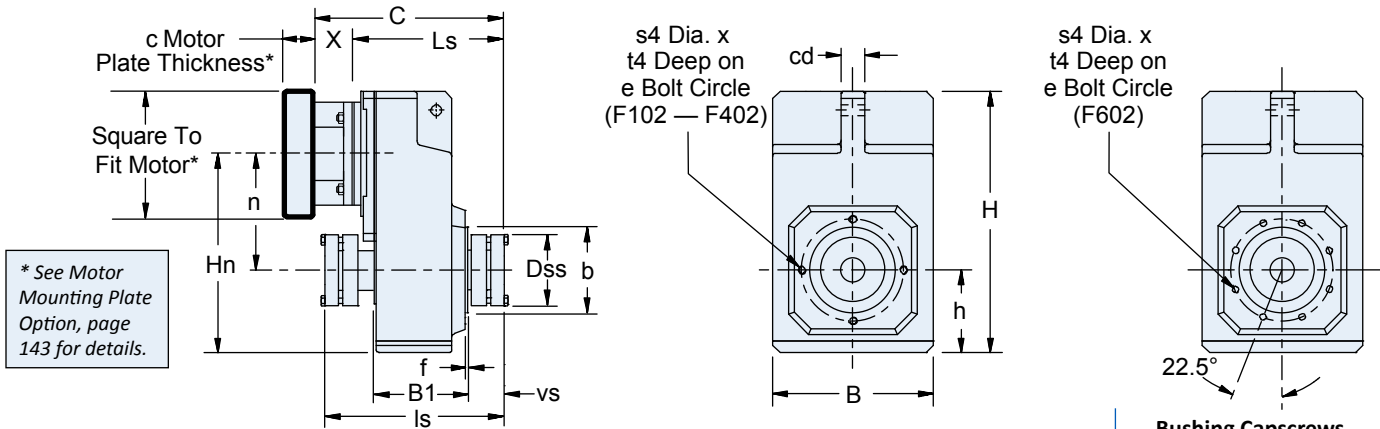


Table 1 Dimensions (mm)

Unit	B	b ₁₆	B1	cd	Dss	e	f	H	h	Hn	ls	n	s4	t4	vs	Bushing Capscrews	
																No. – Size Metric	Tightening Torque – Nm
F102	145	75	87	20	68	85	2.5	238	74	176	170.9	102	M8x1.25	13	30	6 – M6x25	10
F202	180	95	105	22	78	115	3	299	93	224	197.4	131	M8x1.25	13	39	8 – M6x30	10
F302	206	110	120	30	84	130	3.5	335.5	106	255.5	218.9	149.5	M10x1.5	16	39	8 – M6x30	10
F402	230	110	135	30	97	130	3.5	370	116	285	243.1	169	M10x1.5	16	45	8 – M8x30	25
F602	265	130	166	35	105	165	3.5	433	137	333	275.3	196	M10x1.5	16	45	8 – M8x30	25

Table 2 “WFN” Double Side Bushings* – Stock Bores Sizes

Unit	Metric				Inches													
	20	30	35	40	3/4	1	1-3/16	1-1/4	1-3/8	1-7/16	1-1/2	1-5/8	1-11/16	1-3/4	1-7/8	1-15/16	2	
F102	WFN1-20	—	—	—	WFN1-075	—	—	—	—	—	—	—	—	—	—	—	—	—
F202	—	WFN2-30	—	—	—	WFN2-100	WFN2-103	—	—	—	—	—	—	—	—	—	—	—
F302	—	WFN3-30	WFN3-35	—	—	WFN3-100	WFN3-103	WFN3-104	WFN3-106	WFN3-107	WFN3-108	—	—	—	—	—	—	—
F402	—	—	—	WFN4-40	—	WFN4-100	WFN4-103	WFN4-104	WFN4-106	WFN4-107	WFN4-108	—	—	—	—	—	—	—
F602	—	—	—	WFN5-40	—	—	—	—	—	WFN5-107	WFN5-108	WFN5-110	WFN5-111	WFN5-112	WFN5-114	WFN5-115	WFN5-200	

*A complete bushing kit includes the locking ring assembly, tapered cone, support ring, and all hardware to mount the kit into the reducer. The bushing will accept a shaft with a tolerance of +0.000/-0.005.

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	Ls	C	Ls	C	Ls	C	Ls	
F102	170	130	184	134	—	—	—	—	38
F202	197	157	211	161	223	163	—	—	51
F302	212	172	226	176	238	178	—	—	67
F402	—	—	247	197	259	199	—	—	84
F602	—	—	278	228	290	230	321	233	165

Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME10	21	19	40	5
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.

For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.

F Series: OFFSET – Versatile Outputs

“A” Hollow Output with “F” Output Flange – All Sizes

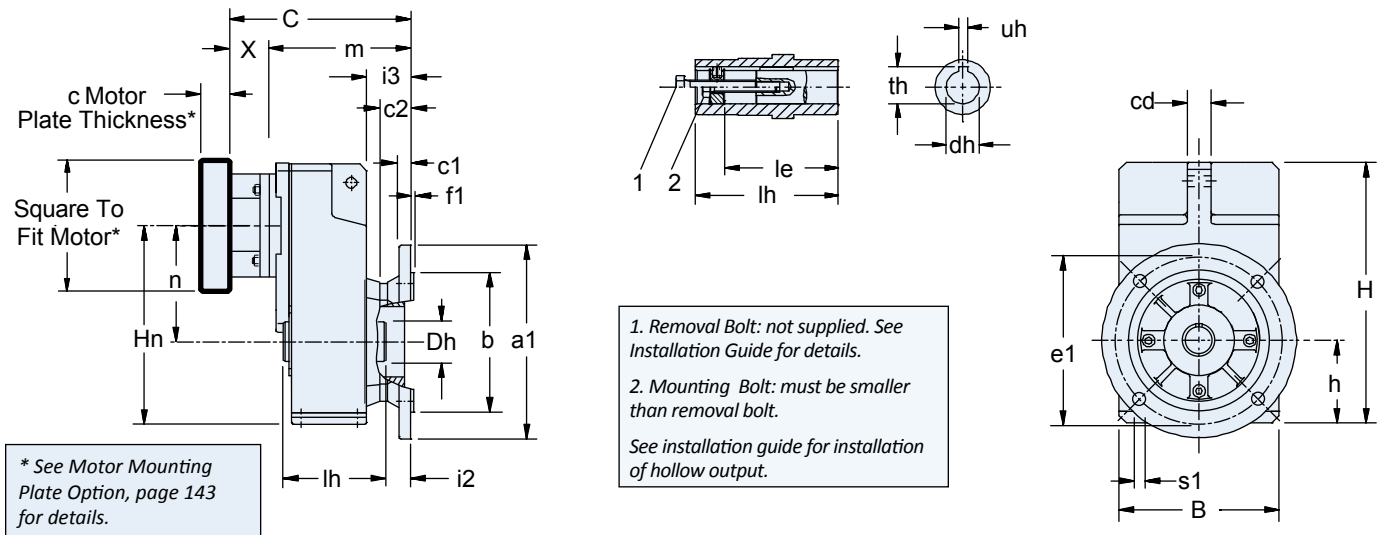


Table 1 Dimensions (mm)

Unit	a1	B	b _{j6}	c1	c2	cd	Dh	e1	f1	H	h	Hn	i2	i3	le	lh	s1	n
F1	160	145	110	10	32	20	35	130	3.5	238	74	176	25.5	44.5	73	95	9	102
F2	200	180	130	14	38	22	45	165	3.5	299	936	224	30	53	92	115	11	131
F3	250	206	180	15	40	30	50	215	4	335.5	106	255.5 ¹⁾	31.5	56.5	103	130	14	149.5 ¹⁾
F4	250	230	180	15	40	30	55	215	4	370	116	285 ¹⁾	31.5	56.5	114	145	14	169 ¹⁾
F6	300	265	230	17	40	35	70	265	4	433	137	333	29.5	60.5	143	180	14	196

¹⁾ For F303, Hn is 219 and n is 113 with ME20 For F403, Hn is 248 and n is 132 with ME20

Table 2 “A” Hollow Bore Dimensions (mm)

Unit	Standard Bore - inches			Optional Bore* - mm		
	dh _{g7}	th	uh	dh _{H7}	th	uh _{J59}
F1	0.750	0.84	0.187	20	22.8	6
F2	1.000	1.12	0.250	25	28.3	8
F3	1.250	1.37	0.250	30	33.3	8
F4	1.500	1.67	0.375	40	43.3	12
F6	2.000	2.23	0.500	50	53.8	14

*Metric output available on request.

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	m	C	m	C	m	C	m	
F102	169.5	129.5	183.5	133.5	—	—	—	—	38
F202	193	153	207	157	219	159	—	—	51
F203	230	190	—	—	—	—	—	—	64
F302	209.5	169.5	223.5	173.5	235.5	175.5	—	—	67
F303	246.5	206.5	266.5	216.5	—	—	—	—	73
F402	—	—	238.5	188.5	250.5	190.5	281.5	193.5	84
F403	261.5	221.5	281.5	231.5	—	—	—	—	91
F602	—	—	269.5	219.5	281.5	221.5	312.5	224.5	165
F603	—	—	312.5	262.5	—	—	—	—	177

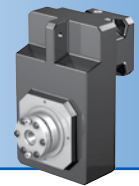
For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.

Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME10	21	19	40	5
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.



Dimensional Data

"A" Hollow Output with "G" Pitch Circle Diameter (PCD) Tapped Holes – All Sizes

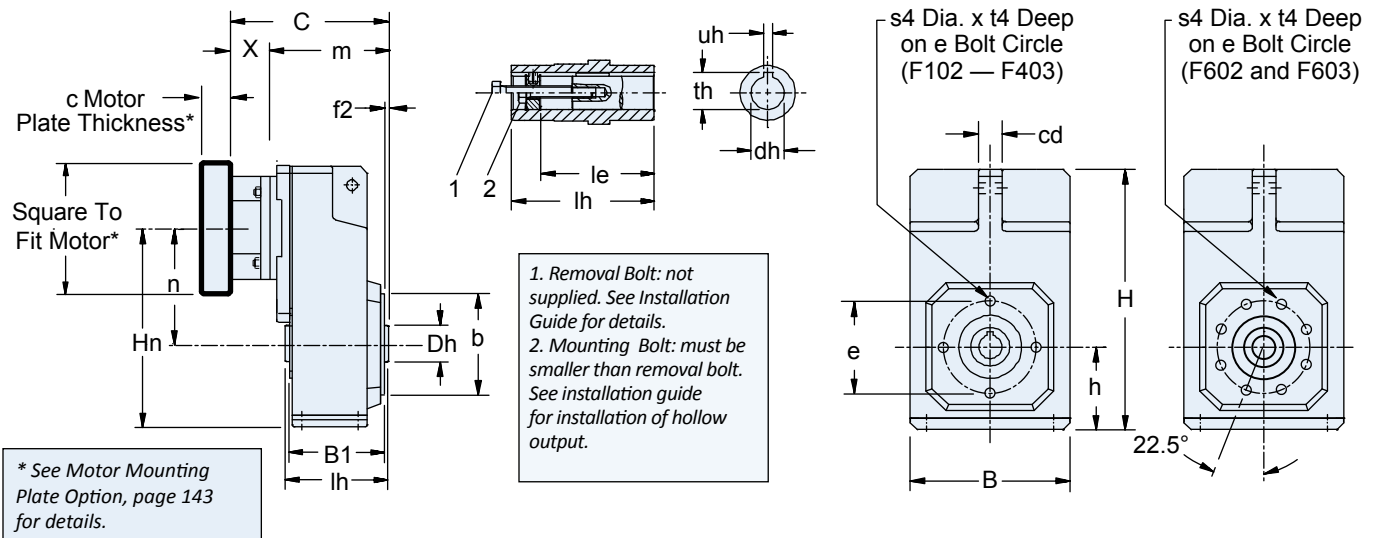


Table 1 "Dimensions (mm)

Unit	B	B1	b _{j6}	cd	Dh	e	f2	H	h	Hn	le	lh	n	s4	t4
F1	145	87	70	20	35	85	2.5	238	74	176	73	95	102	M8x1.25	13
F2	180	105	95	22	45	115	3	299	93	224	92	115	131	M8x1.25	13
F3	206	120	110	30	50	130	3.5	335.5	106	255.5 ¹⁾	103	130	149.5 ¹⁾	M10x1.5	16
F4	230	135	110	30	55	130	3.5	370	116	285 ¹⁾	114	145	169 ¹⁾	M10x1.5	16
F6	265	166	130	35	70	165	3.5	433	137	333	143	180	196	M10x1.5	16

¹⁾ For F303, Hn is 219 with ME20 and n is 113; For F403, Hn is 248 with ME20 and n is 132

Table 2 "A" Hollow Bore Dimensions (mm)

Unit	Standard Bore - inches			Optional Bore* - mm		
	dh _{g7}	th	uh	dh _{H7}	th	uh _{J59}
F1	0.750	0.84	0.187	20	22.8	6
F2	1.000	1.12	0.250	25	28.3	8
F3	1.250	1.37	0.250	30	33.3	8
F4	1.500	1.67	0.375	40	43.3	12
F6	2.000	2.23	0.500	50	53.8	14

*Metric output available on request.

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	m	C	m	C	m	C	m	
F102	144	104	158	108	—	—	—	—	38
F202	163	123	177	127	189	129	—	—	51
F203	200	160	—	—	—	—	—	—	64
F302	178	138	192	142	204	144	—	—	67
F303	215	175	235	185	—	—	—	—	73
F402	—	—	207	157	219	159	250	162	84
F403	230	190	250	200	—	—	—	—	91
F602	—	—	240	190	252	192	283	195	165
F603	—	—	283	233	—	—	—	—	177

For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.

Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME10	21	19	40	5
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

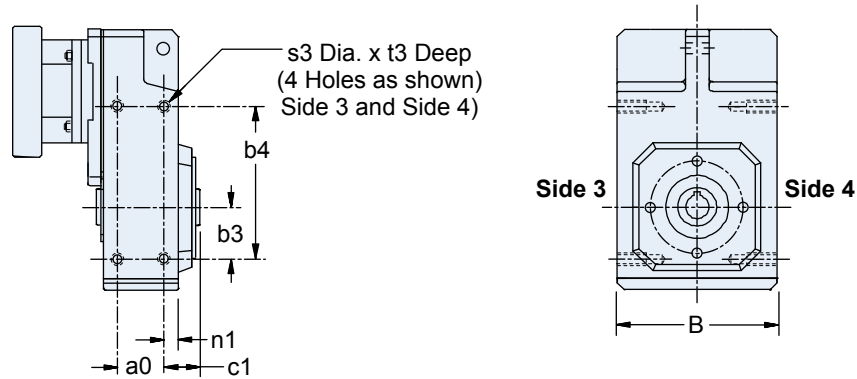
²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.

F Series: OFFSET – Versatile Outputs

F Series: OFFSET – Versatile Outputs

“A” Hollow Output with “NG” Foot Mounting – All Sizes



See Rubber Buffer
Option below for
mounting torque arms.

Table 1 Dimensions (mm)

Unit	a0	B	b3	b4	c1	n1	s3	t3
F1	50	142	40	140	29	10	M6	11
F2	64	176	55	175	33.5	10.5	M8	13
F3	72	204	60	200	37.5	12.5	M10	16
F4	87	228	70	220	37.5	12.5	M10	16
F6	108	262	85	270	46.5	15.5	M12	19

Rubber Buffer Option

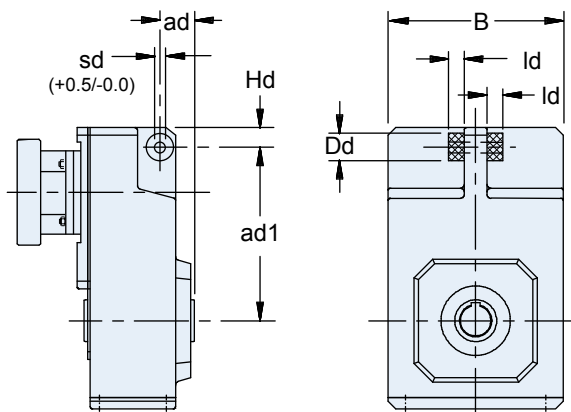
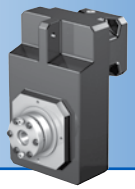


Table 2 “Rubber Buffer Dimensions (mm)

Unit	Part No.	ad	ad1	B	Dd	Hd	Id	sd
F1	25192	35	150	142	30	14	15	11
F2	25192	40	181	176	30	25	15	11
F3	25193	45	205	204	40	24.5	20	12.5
F4	25193	45	228	228	40	26	20	12.5
F6	25194	55	270	262	60	26	30	21

Order two (2) rubber buffers for each unit.

Torque arms are not supplied by STÖBER.



Dimensional Data

"S" Shrink Ring with "G" Pitch Circle Diameter (PCD) Tapped Holes – All Sizes

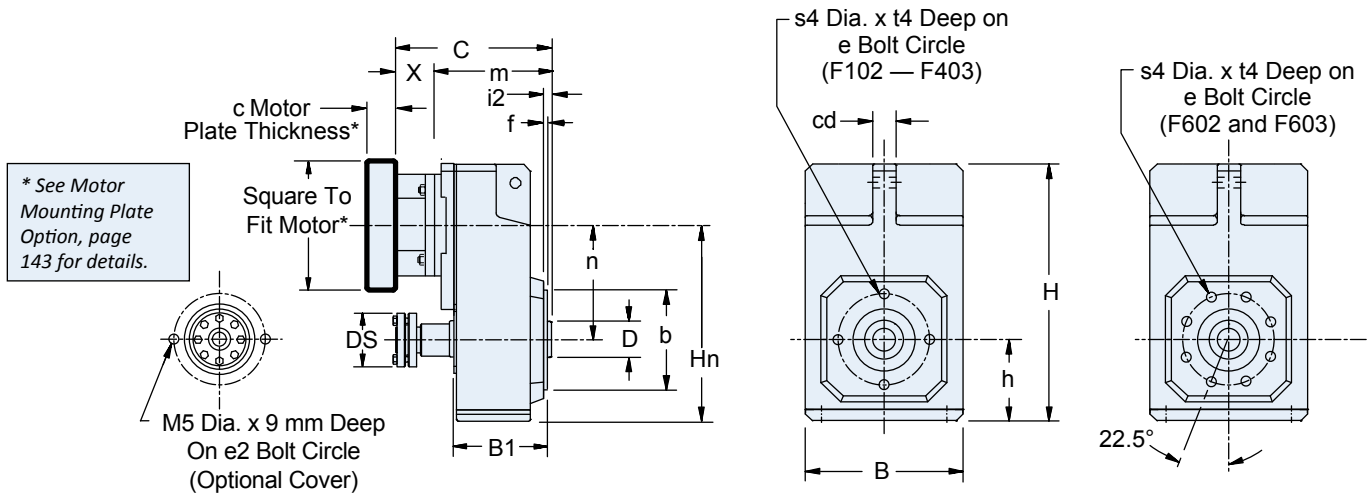
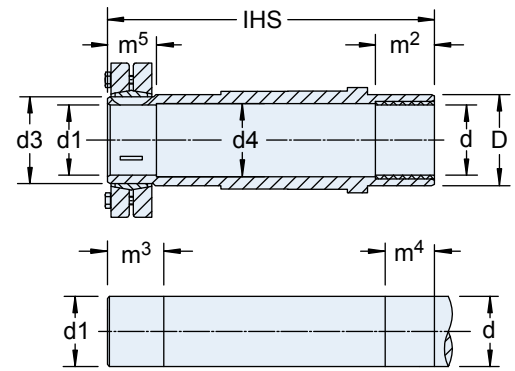


Table 1 Shaft Dimensions (mm)

Unit	B	B1	b _{j6}	cd	d _{h9}	D	Bore d ^{H7}	Shaft d _{h9}	d3	d4
F1	145	87	70	20	20	35	20	20	24	20.5
F2	180	105	95	22	25	45	25	25	30	25.5
F3	206	120	110	30	30	50	30	30	36	30.5
F4	230	135	110	30	40	55	40	40	50	40.5
F6	265	166	130	35	50	70	50	50	62	50.5



See Installation Guide for shrink ring installation.

Table 2 Dimensions (mm)

Unit	DS	e	e2	f	H	h	Hn	i2	IHS	m ²	m ³	m ⁴	m ⁵	n	s4	t4
F1	50	85	58	2.5	238	74	176	6.5	146	20	31	25	26	102	M8x1.25	13
F2	60	115	72	3	299	93	224	8	175	20	37	25	32	131	M8x1.25	13
F3	72	130	78	3.5	335.5	106	255.5	8.5	192	25	37	30	32	149.5	M10x1.5	16
F4	90	130	83	3.5	370	116	285 ²⁾	8.5	210	40	45	45	40	169 ³⁾	M10x1.5	16
F6	106	165	102	3.5	433	137	333	10.5	248	40	47	45	42	196	M10x1.5	16

¹⁾ For F303, Hn is 219 with ME20 and n is 113; For F403, Hn is 248 with ME20 and n is 132

Table 3 Dimensions (mm)

Unit	ME10		ME20		ME30		ME40		Approx. Wt. lbs.
	C	m	C	m	C	m	C	m	
F102	144	104	158	108	—	—	—	—	38
F202	163	123	177	127	189	129	—	—	51
F203	200	160	—	—	—	—	—	—	64
F302	178	138	192	142	204	144	—	—	67
F303	215	175	235	185	—	—	—	—	73
F402	—	—	207	157	219	159	250	162	84
F403	230	190	250	200	—	—	—	—	91
F602	—	—	240	190	252	192	283	195	165
F603	—	—	283	233	—	—	—	—	177

Table 4 Motor Adapter Dimensions (mm)

Motor Adapter	Thickness ³⁾ c Min.	Motor Shaft d2 Max. ²⁾	X	Wt. lbs.
ME10	21	19	40	5
ME20	24	32	50	8
ME30	25	38	60	12
ME40	33	48	88	18

²⁾ If an adapter bushing is required it will be supplied as a component of the motor mounting plate.

³⁾ Motor plate maximum thickness (c) will vary with motor shaft length but will not be less than shown.

For approximate weight, add unit weight from Table 3 and adapter weight from Table 4.

F Series: OFFSET – Versatile Outputs