Browning®

CbN Helical In-line Gearmotors and Speed Reducers

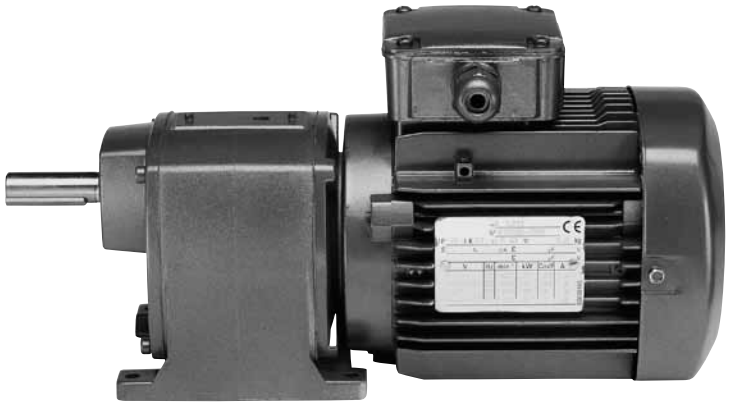
CbN Series

Industries

- ❑ Food Processing
- ❑ Warehousing
- ❑ Parcel and Package Sortation
- ❑ Water/Wastewater Treatment

Applications

- ❑ Positive Displacement Pumps
- ❑ Unit Handling Conveyors
- ❑ Oven Conveyors
- ❑ Low Speed Fans
- ❑ Industrial Door Openers



AC Three Phase

- 1/12 to 3/4 HP designs
- 60 Hz 208-230/460 & 575 VAC
- 50 Hz 380 VAC
- One to four reduction stages
- TEFC enclosure (meets IP55)
- “FO” motor conduit box
- Foot, face or flanged mounting
- Cut and ground helical gearing
- Factory filled with synthetic oil
- Double lipped oil seals
- Ball bearings throughout
- Approved by UL*, CSA and CE
- Class “F” insulation

AC Single Phase

- 1/12 to 1/2 HP designs
- Permanent split capacitor designs
- 60 Hz, 120/240 VAC
- TEFC enclosure (meets IP55)
- “FO” motor conduit box
- Capacitors mounted in box
- Foot, face or flanged mounting
- Cut and ground helical gearing
- Factory filled with synthetic oil
- Ball bearings throughout
- Approved by UL, CSA, CE

DC Permanent Magnet

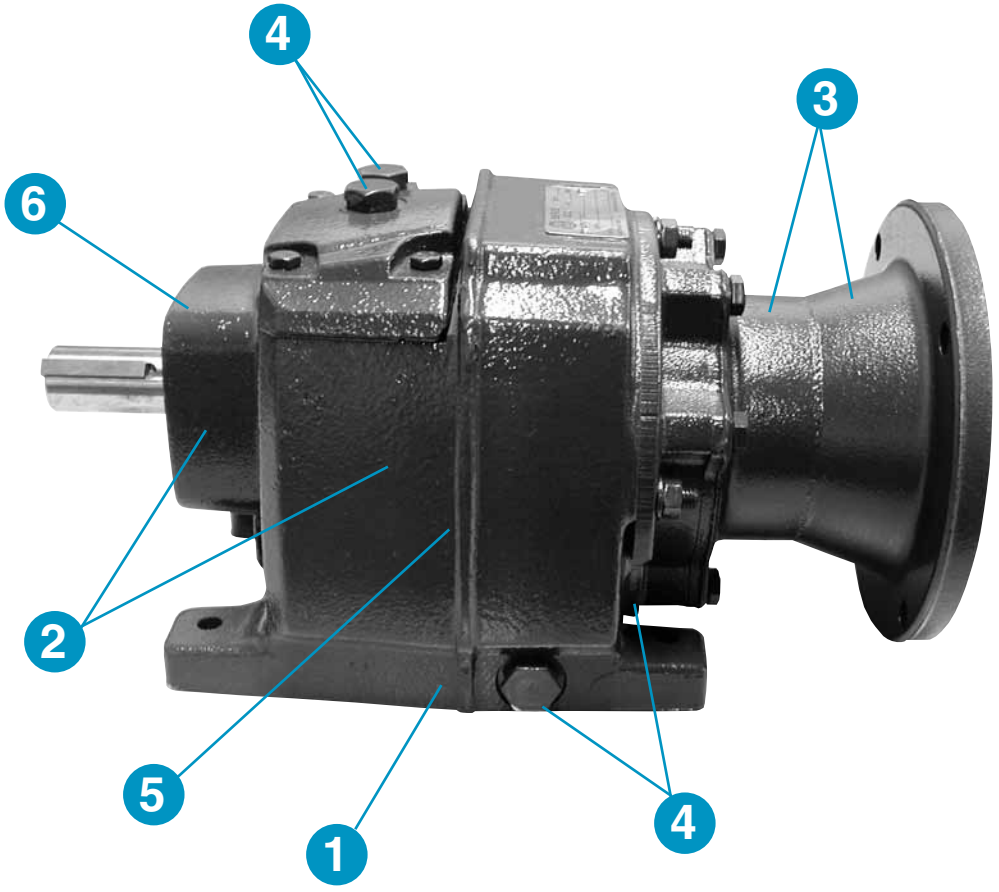
- 1/12 to 3/4 HP designs
- 90 volt PM motor
- One to four reduction stages
- TEFC** enclosure (meets IP44)
- “FO” motor conduit box
- Foot, face or flanged mounting
- Cut and ground helical gearing
- Factory filled with synthetic oil
- Double lipped oil seals
- Ball bearings throughout
- CSA and CE compliant

**56 frames are TENV

Browning®

CbN SERIES 2000 3000

Type CbN Helical In-line Series 2000/3000 Speed Reducer Features...



Design Features

1. Gear reducers are delivered factory filled with synthetic hydrocarbon lubricant.
2. Cast one-piece housing/endshield construction provides added strength and rigidity.
3. Series 3000 C-Face reducers utilize compact quill construction with two bearings for support and the quill has a non-metallic liner to eliminate fretting.
4. Oversized plugs and magnetic drain plug make normal maintenance easier.
5. All gears are keyed to shafts and finished to provide quiet operation.
6. Oversized bearings are used to help provide longer life.

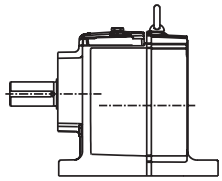
Table of Contents

Browning

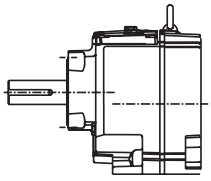
Speed Reducers

Mounting Versatility and Size Range

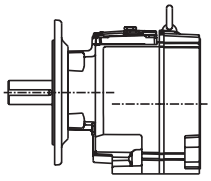
CbN SERIES 2000 3000



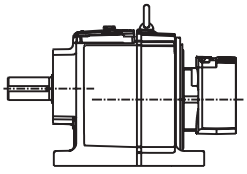
Foot Mount
1, 2, 3 stages
Frames 0 – 9
Max. 150,00 in. lbs.



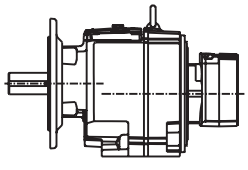
Face Mount
1, 2, 3 stages
Frames 0 – 5
Max. 27,000 in. lbs.



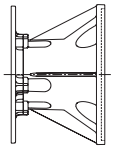
Flange Mount
1, 2, 3 stages
Frames 0 – 8
Max. 88,000 in. lbs.



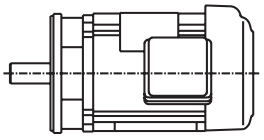
Foot Mount
4, 5, 6 stages
Frames 2 – 9
Max. 150,000 in. lbs.



Flange Mount
4, 5, 6 stages
Frames 2 – 8
Max. 88,000 in. lbs.

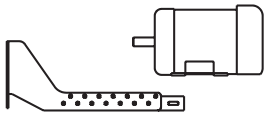


NEMA C-Face
56C to 326TC
Frames 0 – 9

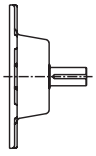


C-Face Motors
Frames 56 - 326TC

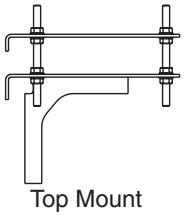
Backstop Option **



Scoop Mount
Frames 2 - 9*
56 to 365T



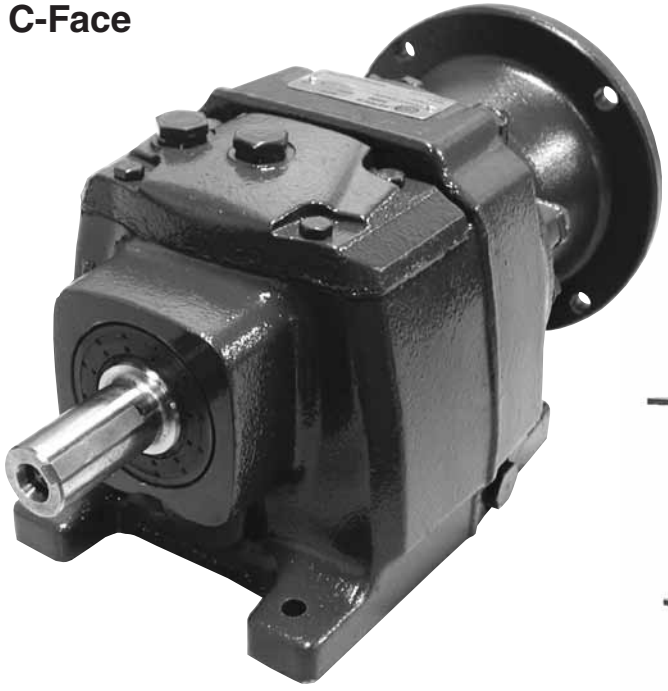
Input Shaft
Frames 0 – 9



Top Mount
Frames 2 - 5*
56 to 250T

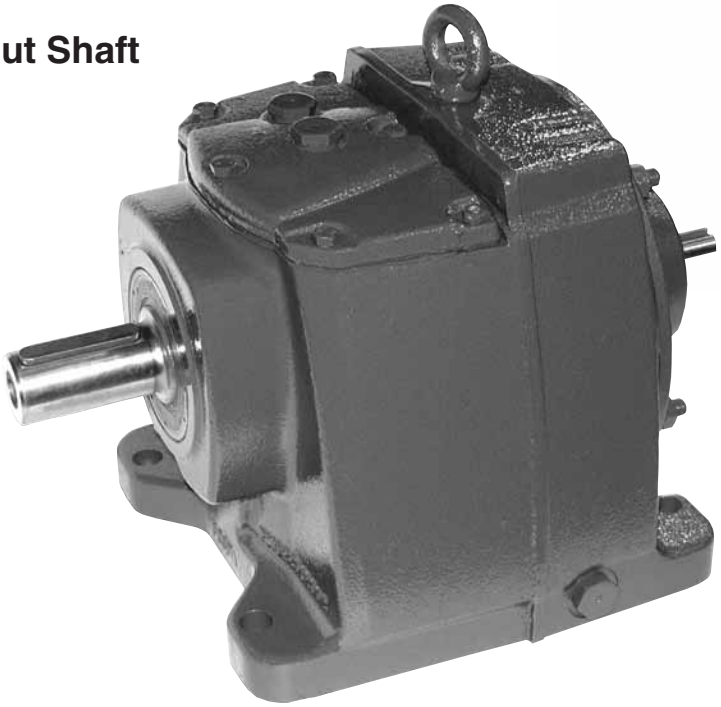
* Excluding frames 2 and 3 single stage and frames 2 - 5 combined 4 and 5 stage product. Refer to dimension pages for availability.
** Frames 1 - 9: 1, 2, and 3 stages. Frames 4 - 9: 4 and 5 stages only.

C-Face



Top Mount

Input Shaft



Selection

Selection Information

1. Input HP

- Based on application data.

2. Speed/Ratio

- Obtain either desired output speed (RPM) or gearbox ratio based on application.

3. Service Factor

- Determine the required service factor using either the AGMA application classification chart (pages A-142 to A-144), or the duration of operation, load type, and drive type with the table below:

Prime Mover	Hours of Operation	Uniform Load U	Moderate Shock Load M	Heavy Shock Load V
Electric Motor	0 - 3	0.80	1.00	1.50
	3 - 10	1.00	1.25	1.75
	10 - 24	1.25	1.50	2.00
Internal Combustion Engine	0 - 3	1.00	1.25	1.75
	3 - 10	1.25	1.50	2.00
	10 - 24	1.50	1.75	2.25

Size Selection

Step 1

- Locate speed reducer selection tables (pages A-146 to A-163) based on input speed to gearbox.

Step 2

- Choose the nominal ratio appropriate for the speeds required.

Step 3

- Select the gear unit size for the chosen ratio and the known input speed so that the mechanical power rating P (hp) satisfies the following:

$$P \geq P_m \bullet SF$$

P = mechanical power rating (hp) of gearbox

P_m = motor power (hp)

SF = required service factor

Note: Size selection based on absorbed power (Pa) or absorbed torque (Ta) at the low speed shaft instead of motor power (Pm) is allowed when the former is known with sufficient accuracy and if the number of start operations is limited. When Ta is applied in size selection, verify if:

$$T \geq T_a \bullet SF$$

T = torque rating (in. lbs.) at low speed shaft

T_a = absorbed torque (in. lbs.) at low speed shaft (based on input hp)

SF = required service factor

Size Selection (cont.)

Step 4

- Verify overhung load ratings where required (see page A-137).

Example

1. Application Data

Rotary lobe pump, 10+ hours per day, speed reducer direct coupled to load, foot mounted, 1.25 service factor.

Motor rating: TEFC, 230/460 volt, 7 1/2 HP, 1750 RPM, 213TC frame footed[1].

Output speed: 280 RPM

2. Size Selection

280 RPM required output	
Equals 6.3:1 ratio	6.1 **3242** Example 10.45 2208
PM • SF = P	
7.5 HP x 1.25 = 9.4 HP	
3242 (10.45 HP) > 9.4 HP	pg. A-146
Select CbN 3242	

(There are no thermal or OHL considerations.)

3. Catalog Designation

(see "ordering" page A-138)

CbN • 3242 • S • B3 • 6.3 • U • 213TC

[1] CbN frame 3242 with 210TC motor required a footed motor with motor outboard foot supported.

Overhung Load Capacities

When a sprocket, sheave, pulley or pinion is mounted on any shaft of a reducer, it is necessary to calculate the overhung load. This calculated load must be compared with the gearbox capacity listed to make sure the gearbox will not be overloaded. To calculate the overhung load you need to know the torque or horsepower at the take-off shaft and the location along the shaft at which the load is applied.

A. If torque is known:

$$OHL = \frac{T \times K \times LLF}{r}$$

B. If horsepower is known:

$$OHL = \frac{63025 \times HP \times K \times LLF}{RPM \times r}$$

OHL capacities are calculated at gear capacity rounded to the closest motor HP at mid shaft. For capacity when HP is known, refer to gearmotor selection tables.

Where:
- OHL = Overhung load (pounds)
- T = Torque (in. lbs.)
- r = Radius of driving member (in.)
- HP = Horsepower
- K = Drive type factor
- LLF = Load location factor

Driving Member	Value of K
Chain Drive	1.00
Pinion	1.25
Timing Belt	1.25
V-Belt	1.50
Flat Belt	2.50

Load Location	Value of LLF
End of shaft extension	1.20
Center of shaft extension	1.00
Shaft extension shoulder	0.80

Single Reduction Overhung Load (lbs.)

Output R.P.M.	Reducer Size					
	0	1	2	3	4	5
	30	31	32	33	34	35
>1000	84	222	230	500	580	802
801-1000	80	229	250	600	615	757
551-800	75	240	288	648	674	1041
451-550	54	320	360	668	874	1234
351-450	33	334	370	806	1244	1495
<350	153	366	457	786	1560	1744

Multiple Reduction Overhung Load (lbs.)

Output R.P.M.	Reducer Size												
	0	1		2		3		4	5	6	7	8	9
	3012	3122	313X	3242	325X	336X	337X	34	35	26	27	28	29
301-450	-	455	-	460	-	890	-	1755	1983	4200	6500	-	-
201-300	-	469	-	557	-	1200	-	1829	2065	4400	7000	9000	-
151-200	129	591	619	670	699	1233	1233	2013	2065	4670	7500	12000	-
101-150	138	603	649	685	692	1296	1296	2015	2163	4900	7500	12000	-
51-100	388	701	714	850	856	1305	1305	2472	2213	5800	9000	12000	14000
31-50	600	-	1030	-	1105	-	1305	3424	3733	6000	11000	12000	20000
16-30	600	-	1297	-	1357	-	1905	3670	4580	6000	11000	12000	20000
<15	600	-	1345	-	1610	-	1905	4340	4580	6000	11000	12000	20000

Minimum OHL capacity based on minimum recommended sheave diameter and unit driven by maximum motor HP.

Browning®

Speed Reducers

Catalog Nomenclature

CbN SERIES 2000 3000

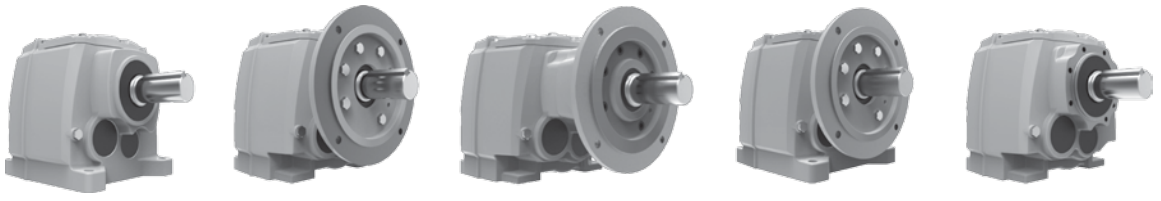
CbN • 3122 • S • B3 • 40 • U • 143TC

See below and next page prior to ordering

See page 141 prior to ordering

Series	Gear Frame	Number of Reductions	Mounting Configuration For Gear (housing and Shaft Extension)	Mounting Position	Nom. Gear Ratio	Gear Input	Motor Frame
3 = 3000	0	1 = 1 stage	Refer to the illustrations below of the basic mounting options based on gear frame and stages of reduction. For Flanged gear mounting, refer to details for options that are available based on frame size, flange dimensions, and thrust loads for the application	See Page A-140	Determine from selection pages	AP = Input shaft	Req'd for any order for c-face or scoop reducer
	1	2 = 2 stages				AD = Input shaft w/backstop*	
	2	3 = 3 stages				SP = Scoop mount	
	3	4 = 4 stages				SD = Scoop mount w/backstop*	
	4	5 = 5 stages				U = C-face	
	5	6 = 6 stages				UD = C-face w/backstop*	
2 = 2000	6					TM = Top mount	
	7					TD = Top mount w/backstop*	
	8						
	9						

* For units with backstops, specify output shaft rotation.



Gear Output	Foot Mounted	Flange Mount (footless)		Flange Mount (footed)	Face Mount (footless)
		Std. Thrust	High Thrust		
Configuration Code (inches)	**S**[1]	See Page A-139	See Page A-139	See Page A-139	**B14**[1]
Frame(s) Available	All	All	See Page A-139	See Page A-139	30 - 35

[1] Inch ouput shaft. For output with metric shaft, insert "M" following last alpha character (i.e. metric footmount, S becomes SM).

Flange - No Feet

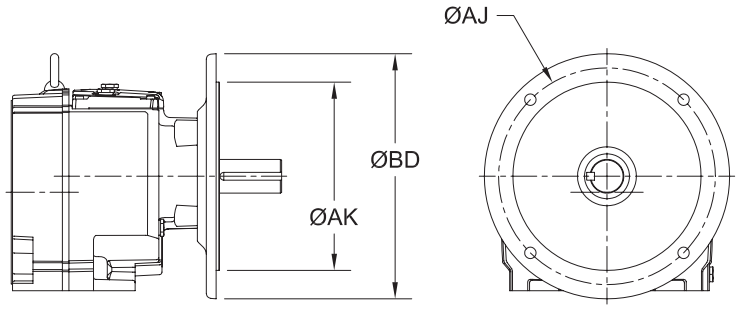
		Output Flange Dimensions Available												
	Reduction Stages		Inches	MM										
		BD	6.50	120	140	160	200	250	300	350	400	450	550	650
		AK	4.50	80	95	110	130	180	230	250	300	350	450	550
		AJ	5.875	100	115	130	165	215	254	300	350	400	500	600
		Gear Frame												
Normal Thrust	Single	30	56C	BD1	BS	BD2	BD3							
		31			BD2	BS								
		32				BD2	BS							
		33					BD2	BS						
		34						BD2	BS					
		35							BD2	BS				
	Multiple	30	56C	BD1	BS	BD2	BD3							
		31		BD3	BD2	BD1	BS							
		32				BD2	BD1	BS						
		33					BD2	BD1	BS					
		34						BD2	BD1	BS				
		35							BD2	BD1	BS			
		26											BS	
		27											BS	
		28												BS
High Thrust	Multiple	33						BR						
		34							BR					
		35								BR				
		26										BR		
		27										BR		

Flange - Footed

		Output Flange Dimensions Available												
	Reduction Stages		Inches	MM										
		BD	6.50	120	140	160	200	250	300	350	400	450	550	650
		AK	4.50	80	95	110	130	180	230	250	300	350	450	550
		AJ	5.875	100	115	130	165	215	254	300	350	400	500	600
		Gear Frame												
Normal Thrust	Single	31			SBD2	SBS								
		32				SBD2	SBS							
		33					SBD2	SBS						
		34						SBD2	SBS					
		35							SBD2	SBS				
	Multiple	30A		SBD1	SBS									
		31		SBD3	SBD2	SBD1								
		32					SBD1	SBS						
		33						SBD1	SBS					
		34							SBD1	SBS				
		35								SBD1	SBS			

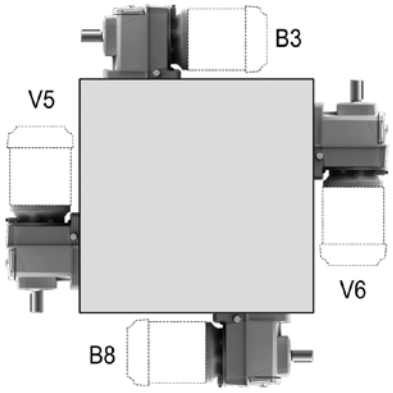
Shaded fields indicate factory lead-time applies

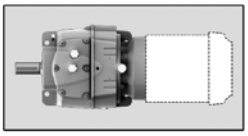
Note: For metric output shaft on any output nomenclature above, add "M" before any numeric designator. (i.e. metric shaft with BD1 flange = BDM1)

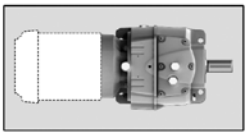


Mounting Positions

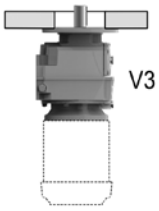
Foot Mounted
(with/without flange)
Any Reduction

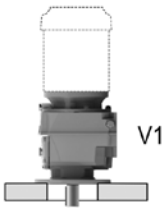


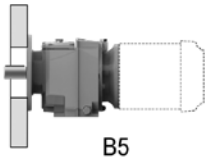




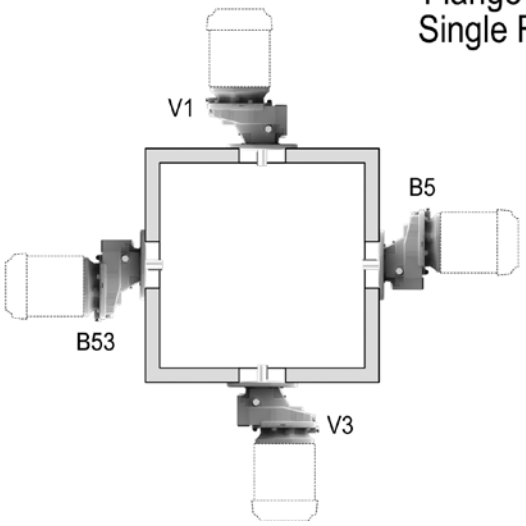
Flange Mounted
(footless)
Multiple Reductions

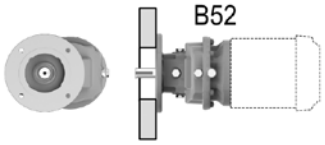


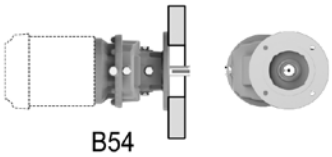




Flange Mounted
Single Reduction







C-Face Reducer Availability

Gear Frame	Reduction Stages	AC Motor Frames Sizes						
		56C	140TC	180TC	210TC	250TC	280TC	320TC
30	1,2,3	X	X [1]	-	-	-	-	-
31	1,2,3	X	X	X [3]	-	-	-	-
32	1,2.3	X	X	X	X [3]	-	-	-
	4,5	X				-	-	-
33	1,2,3	X	X	X	X [2]	-	-	-
	4,5	X	X	-	-	-	-	-
34	1,2,3	X	X	X	X	X	X [3]	
	4,5	X	X	-	-	-	-	-
35	1	X	X	X	X	X	X [3]	X [3]
	2,3	X	X	X	X	X	X	X [3]
	4,5	X	X	X	-	-	-	-
26	2,3	-	-	X	X	X	X	X
	4,5,6	X	X	X	X	-	-	-
27	2,3	-	-	X	X	X	X	X
	4,5,6	X	X	X	X	-	-	-
28	3	-	-	-	X	X	X	X
	4,5,6	X	X	X	X	X	-	-
29	3	-	-	-	X	X	X	X
	4,5,6	X	X	X	X	X	-	-

Scoop Mount Reducer Availability

Gear Frame	Reduction Stages	AC Motor Frames Sizes							
		56	140T	180T	210T	250T	280T	320T	360T
32	2,3	X	X	-	-	-	-	-	-
33	2,3	X	X	X	-	-	-	-	-
34	1,2,3	-	X	X	X	-	-	-	-
35	1	-	-	X	X	X	-	-	-
	2,3	-	X	X	X	X	X	-	-
26	2,3	-	-	X	X	X	X	X	-
	4,5,6	-	X	X	-	-	-	-	-
27	2,3	-	-	X	X	X	X	X	-
	4,5,6	-	X	X	X	-	-	-	-
28	3	-	-	-	-	X	X	X	X
	4,5,6	-	X	X	X	-	-	-	-
29	3	-	-	-	-	X	X	X	X
	4,5,6	-	X	X	X	-	-	-	-

Top Mount Reducer Availability

Gear Frame	Reduction Stages	AC Motor Frames Sizes							
		56	140T	180T	210T	250T	280T	320T	360T
32	2,3	X	X	X	-	-	-	-	-
33	2,3	X	X	X	X	-	-	-	-
34	1		X	X	X	-	-	-	-
	2,3	-	X	X	X	X	-	-	-
35	1	-	X	X	X	X	X	-	-
	2,3	-	X	X	X	X	X	-	-
26,27	2,3	-	-	RO	RO	RO	RO	RO	-
	4,5,6	X	X	X	-	-	-	-	-
28,29	3	-	-	-	RO	RO	RO	RO	RO
	4,5,6		X	X	X	-	-	-	-

[1] Not available on 3012 with ratios of 31.5, 35.5, 40,45. Use frame 3013 in these requirements
[2] When using this frame with 3301 gear, a footed motor with outboard foot supported.
[3] Motor selected must be a footed C-face motor with outboard foot supported

Backstop can be supplied in this input.

Browning®

Speed Reducers

AGMA Application Classifications

CbN SERIES 2000 3000

U: Uniform load **M: Moderate shock load** **V: Heavy shock load**

Application	Load Class Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Agitators (Mixers)			
Pure Liquids	—	1.00	1.25
Liquids & Solids	1.00	1.25	1.50
Liquids - Variable Density	1.00	1.25	1.50
Blowers			
Centrifugal	1.00	1.25	—
Lobe	1.00	1.25	1.50
Vane	—	1.00	1.25
Brewing and Distillers			
Bottling Machinery	—	1.00	1.25
Brew Kettles, Continuous Duty	—	1.00	1.25
Cookers - Continuous Duty	—	1.00	1.25
Mash Tubs - Continuous Duty	—	1.00	1.25
Scale Hoppers, Frequent Starts	1.00	1.25	1.50
Can Filling Machines	—	1.00	1.25
Car Dumpers	1.25	1.50	1.75
Car Pullers	1.00	1.25	1.50
Clarifiers	—	1.00	1.25
Classifiers	1.00	1.25	1.50
Clayworking Industry			
Brick Press	1.25	1.50	1.75
Briquette Machine	1.25	1.50	1.75
Pug Mill	1.00	1.25	1.50
Compactors	1.50	1.75	2.00
Compressors			
Centrifugal	—	1.00	1.25
Lobe	1.00	1.25	1.50
Reciprocating, Multi - Cylinder	1.00	1.25	1.50
Reciprocating, Single - Cylinder	1.25	1.50	1.75
Conveyors - General Purpose			
Uniformly Loaded or Fed	—	1.00	1.25
Not Uniformly Fed	1.00	1.25	1.50
Reciprocating or Shaker	1.25	1.50	1.75
Cranes			
Dry Dock			
Main Hoist	1.25	1.50	1.75
Auxiliary	1.25	1.50	1.75
Boom Hoist	1.25	1.50	1.75
Slewing Drive	1.25	1.50	1.75
Traction Drive	1.50	1.50	1.50
Container			
Main Hoist	Refer To Application Engineering		

Application	Load Class Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Cranes (Continued)			
Boom Hoist	Refer To Application Engineering		
Trolley Drive	Refer To Application Engineering		
(Gantry Drive)			
(Traction Drive)	Refer To Application Engineering		
Mill Duty			
Main	Refer To Application Engineering		
Auxiliary	Refer To Application Engineering		
Bridge & Trolley Travel	Refer To Application Engineering		
Industrial Duty			
Main	1.25	1.50	1.75
Auxiliary	Refer To Application Engineering		
Bridge & Trolley Travel	Refer To Application Engineering		
Crusher			
Stone or Ore	1.50	1.75	2.00
Dredges			
Cable Reels	1.00	1.25	1.50
Conveyors	1.00	1.25	1.50
Cutter Head Drives	1.25	1.50	1.75
Pumps 1.00	1.25	1.50	
Screen Drives	1.25	1.50	1.75
Stackers	1.00	1.25	1.50
Winches	1.00	1.25	1.50
Elevators			
Bucket	1.00	1.25	1.50
Centrifugal Discharge	—	1.00	1.25
Escalators	Refer To Application Engineering		
Freight	Refer To Application Engineering		
Gravity Discharge	—	1.00	1.25
Extruders			
General	1.25	1.25	1.25
Plastics			
(a) Variable Speed Drive	1.50	1.50	1.50
(b) Fixed Speed Drive	1.75	1.75	1.75
Rubber			
(a) Continuous Screw Operation	1.50	1.50	1.50
(b) Intermittent Screw Operation	1.75	1.75	1.75
Fans			
Centrifugal	—	1.00	1.25
Cooling Towers	Refer To Application Engineering		
Forced Draft	1.25	1.25	1.25
Induced Draft	1.00	1.25	1.50
Industrial & Mine	1.00	1.25	1.50

AGMA Application Classifications

U: Uniform load **M: Moderate shock load** **V: Heavy shock load**

Application	Load Class Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Feeders			
Apron	—	1.25	1.50
Belt	1.00	1.25	1.50
Disc	—	1.00	1.25
Reciprocating	1.25	1.50	1.75
Screw	1.00	1.25	1.50
Food Industry			
Cereal Cooker	—	1.00	1.25
Dough Mixers	1.00	1.25	1.50
Meat Grinders	1.00	1.25	1.50
Slicers	1.00	1.25	1.50
Generators and Executors	—	1.00	1.25
Hammer Mills	1.50	1.50	1.75
Hoists			
Heavy Duty	1.25	1.50	1.75
Medium Duty	1.00	1.25	1.50
Skip Hoist	1.00	1.25	1.50
Laundry Tumblers	1.00	1.25	1.50
Laundry Washers	1.00	1.25	1.50
Lumber Industry			
Barkers			
- Spindle Feed	1.25	1.25	1.25
- Main Drive	1.50	1.50	1.50
Conveyors			
- Burner	1.25	1.25	1.50
- Main or Heavy Duty	1.50	1.50	1.50
- Main Log	1.50	1.50	1.50
- Re-Saw, Merry-Go-Round	1.25	1.25	1.50
- Slab	1.50	1.50	1.75
- Transfer	1.25	1.25	1.50
Chains			
- Floor	1.50	1.50	1.50
- Green	1.50	1.50	1.50
Cut-Off Saws			
- Chain	1.50	1.50	1.50
- Drag	1.50	1.50	1.50
Debarking Drums	1.50	1.50	1.75
Feeds			
- Edger	1.25	1.25	1.50
- Gang	1.50	1.50	1.50
- Trimmer	1.25	1.25	1.50
Log Deck	1.50	1.50	1.50
Log Hauls - Incline-Well Type	1.50	1.50	1.50
Log Turning Devices	1.50	1.50	1.50
Planner Feed	1.25	1.25	1.25
Planer Tilting Hoists	1.50	1.50	1.50
Rolls - Live-Off Bearing.-Roll Cases	1.50	1.50	1.50
Sorting Table	1.25	1.25	1.50
Tipple Hoist	1.25	1.25	1.50
Transfers			
- Chain	1.50	1.50	1.50
- Causeway	1.50	1.50	1.50
Tray Drives	1.25	1.25	1.50
Veneer Lathe Drives	Refer To Application Engineering		

Application	Load Class Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Metal Mills			
Draw Bench Carriage & Main Drive	1.00	1.25	1.50
Runout Table			
Non-reversing			
Group Drives	1.00	1.25	1.50
Individual Drives	1.50	1.50	1.75
Reversing	1.50	1.50	1.75
Slab Pushers	1.25	1.25	1.50
Shears	1.50	1.50	1.75
Wire Drawing	1.00	1.25	1.50
Wire Winding Machine	1.00	1.25	1.50
Metal Strip Processing Machinery			
Bridles	1.25	1.25	1.50
Coilers & Uncoilers	1.00	1.00	1.25
Edge Trimmers	1.00	1.25	1.50
Flatteners	1.00	1.25	1.50
Loopers (Accumulators)	1.00	1.00	1.00
Pinch Rolls	1.00	1.25	1.50
Scrap Choppers	1.00	1.25	1.50
Shears	1.50	1.50	1.75
Slitters	1.00	1.25	1.50
Mills, Rotary Type			
Ball & Rod			
Spur Ring Gear	1.50	1.50	1.75
Helical Ring Gear	1.50	1.50	1.50
Direct Connected	1.50	1.50	1.75
Cement Kilns	1.50	1.50	1.50
Dryers & Coolers	1.50	1.50	1.50
Mixers, Concrete	1.00	1.25	1.50
Paper Mills			
Agitator (Mixer)	1.50	1.50	1.50
Agitator for Pure Liquids	1.25	1.25	1.25
Barkers - Mechanical	1.75	1.75	1.75
Barking Drums	1.75	1.75	1.75
Beater	1.50	1.50	1.50
Breaker Stack	1.25	1.25	1.25
❖ Calender	1.25	1.25	1.25
Chipper	1.75	1.75	1.75
Chip Feeder	1.50	1.50	1.50
Coating Rolls	1.25	1.25	1.25
Conveyors			
Chip, Bark, Chemical	1.25	1.25	1.25
Log (Including Slab)	1.75	1.75	1.75
Couch Rolls	1.25	1.25	1.25
Cutter	1.75	1.75	1.75
Cylinder Molds	1.25	1.25	1.25
❖ Dryers			
Paper Machine	1.25	1.25	1.25
Conveyor Type	1.25	1.25	1.25
Embosser	1.25	1.25	1.25
Extruder	1.50	1.50	1.50
Fourdrinier Rolls (Includes Lump Breaker, Dandy Roll, Wire Turning, and Return Rolls)	1.25	1.25	1.25
Jordan	1.25	1.25	1.25
Kiln Drive	1.50	1.50	1.50
Mt. Hope Roll	1.25	1.25	1.25

Browning

Speed Reducers

AGMA Application Classifications

CbN SERIES 2000 3000

U: Uniform load **M: Moderate shock load** **V: Heavy shock load**

Application	Load Class	Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Paper Mills (Continued)				
Paper Rolls		1.25	1.25	1.25
Platter		1.50	1.50	1.50
Presses - Felt & Suction		1.25	1.25	1.25
Pulper		1.50	1.50	1.75
Pumps - Vacuum		1.50	1.50	1.50
Reel (Surface Type)		1.25	1.25	1.50
Screens				
Chip		1.50	1.50	1.50
Rotary		1.50	1.50	1.50
Vibrating		1.75	1.75	1.75
Size Press		1.25	1.25	1.25
Super Calender (See Note)		1.25	1.25	1.25
Thickner				
(AC Motor)		1.50	1.50	1.50
(DC Motor)		1.25	1.25	1.25
Washer				
(AC Motor)		1.50	1.50	1.50
(DC Motor)		1.25	1.25	1.25
Wind and Unwind Stand		1.00	1.00	1.00
Winders (Surface Type)		1.25	1.25	1.25
❖ Yankee Dryers		1.25	1.25	1.25
Plastics Industry - Primary Processing				
Intensive Internal Mixers				
(a) Batch Mixers		1.75	1.75	1.75
(b) Continuous Mixers		1.50	1.50	1.50
Batch Drop Mill - 2 Smooth Rolls		1.25	1.25	1.25
Continuous Feed, Holding & Blend Mill		1.25	1.25	1.25
Compounding Mills		1.25	1.25	1.25
Calenders		1.50	1.50	1.50
Plastics Industry - Secondary Processing				
Blow Molders		1.50	1.50	1.50
Coating		1.25	1.25	1.25
Film		1.25	1.25	1.25
Pipe		1.25	1.25	1.25
Pre-Plasticizers		1.50	1.50	1.50
Rods		1.25	1.25	1.25
Sheet		1.25	1.25	1.25
Tubing		1.25	1.25	1.50
Pullers - Barge Haul		1.00	1.50	1.75
Pumps				
Centrifugal		—	1.00	1.25
Proportioning		1.00	1.25	1.50
Reciprocating				
Single Acting, 3 or more cylinders		1.00	1.25	1.50
Double Acting, 2 or more cylinders		1.00	1.25	1.50
Rotary				
- Gear		—	1.00	1.50
- Lobe		—	1.00	1.25
- Vane		—	1.00	1.25

Application	Load Class	Up to 3 hrs/day	Up to 10 hrs/day	Over 10 hrs/day
Rubber Industry				
Intensive Internal Mixers				
(a) Batch Mixers		1.50	1.75	1.75
(b) Continuous Mixers		1.25	1.50	1.50
Mixing Mill - 2 Smooth Rolls - (If corrugated rolls are used, (then use the same service factors that are used for a Cracker-Warmer)		1.50	1.50	1.50
Batch Drop Mill - 2 Smooth Rolls		1.50	1.50	1.50
Cracker Warmer - 1 Corrugated Roll		1.75	1.75	1.75
Cracker - 2 Corrugated Rolls		1.75	1.75	1.75
Holding, Feed & Blend Mill - 2 Rolls		1.25	1.25	1.25
Refiner - 2 Rolls		1.50	1.50	1.50
Calenders		1.50	1.50	1.50
Sand Miller		1.00	1.25	1.50
Sewage Disposal				
Bar Screens		—	1.00	1.25
Chemical Feeders		—	1.00	1.25
Dewatering Screens		1.00	1.25	1.50
Scum Breakers		1.00	1.25	1.50
Slow or Rapid Mixers		1.00	1.25	1.50
Sludge Collectors		1.00	1.00	1.25
Thickeners		1.00	1.25	1.50
Vacuum Filters		1.00	1.25	1.50
Screens				
Air Washing		—	1.00	1.25
Rotary - Stone or Gravel		1.00	1.25	1.50
Traveling Water Intake		—	1.00	1.25
Sugar Industry				
Beet Slicer		1.50	1.50	1.75
Cane Knives		1.50	1.50	1.50
Crushers		1.50	1.50	1.50
Mills (Low Speed End)		1.50	1.50	1.50
Textile Industry				
Batchers		1.00	1.25	1.50
Calenders		1.00	1.25	1.50
Cards		1.00	1.25	1.50
Dry Cans		1.00	1.25	1.50
Dryers		1.00	1.25	1.50
Dyeing Machinery		1.00	1.25	1.50
Looms		1.00	1.25	1.50
Mangles		1.00	1.25	1.50
Nappers		1.00	1.25	1.50
Pads		1.00	1.25	1.50
Slashers		1.00	1.25	1.50
Soapers		1.00	1.25	1.50
Spinners		1.00	1.25	1.50
Tenter Frames		1.00	1.25	1.50
Washers		1.00	1.25	1.50
Winders		1.00	1.25	1.50

❖ Anti-friction bearings only.

NOTE: A service factor of 1.0 may be applied at the base of a super calender, operating over a speed range where part of the range is constant horsepower and part of the range is constant torque, provided that the constant horsepower part is greater than 1.5 to 1. A service factor of 1.25 is applicable to super calenders operating over the entire speed range at constant torque, or where the constant horsepower speed range is less than 1.5 to 1.

Browning®

CbN Helical Inline Gearmotors and Speed Reducers

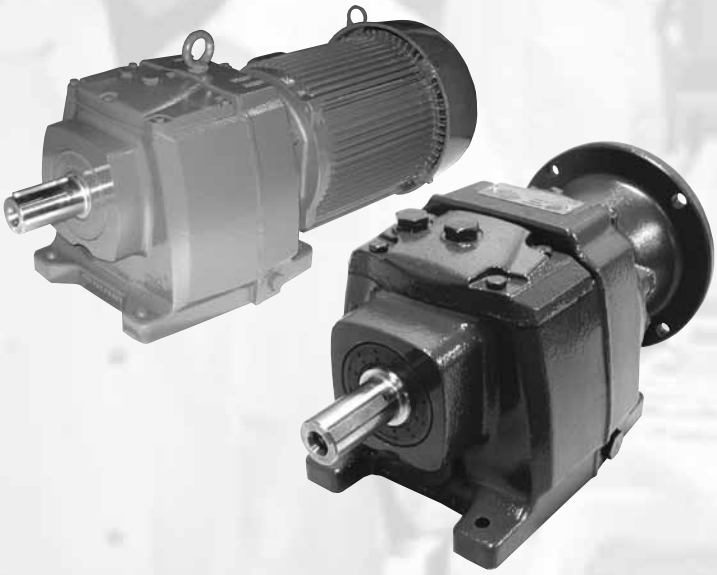
CbN Series

Industries

- ❑ Food Processing
- ❑ Warehousing
- ❑ Parcel and Package Sortation
- ❑ Water/Wastewater Treatment

Applications

- ❑ Positive Displacement Pumps
- ❑ Unit Handling Conveyors
- ❑ Oven Conveyors
- ❑ Low Speed Fans
- ❑ Industrial Door Openers



Browning

Speed Reducers

Motor RPM 1750

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
1400	1.25	1.24	**3001**	1.22	**3101**		1.23	**3201**		1.26	**3301**		
		3.06	134	6.78	292		11.98	520		14.42	643		
1250	1.4	1.46	**3001**	1.38	**3101**		1.45	**3201**		1.46	**3301**		
		3.06	158	6.37	310		11.06	567		13.73	706		
1094	1.6	1.54	**3001**	1.56	**3101**		1.55	**3201**		1.61	**3301**		
		3.06	166	6.15	338		11.39	623		13.43	761		
972	1.8	1.83	**3001**	1.76	**3101**		1.75	**3201**		1.77	**3301**		
		3.06	198	5.91	367		10.58	654		12.83	803		
875	2	1.96	**3001**	2	**3101**		1.94	**3201**		2.04	**3301**		
		3.06	212	5.65	399		10.35	708		14.33	1030		
781	2.24	2.19	**3001**	2.29	**3101**		2.21	**3201**		2.25	**3301**		
		3.06	237	5.37	434		9.08	708		13.63	1083		
700	2.5	2.55	**3001**	2.58	**3101**		2.55	**3201**		2.58	**3301**		
		3.06	275	4.86	442		7.88	708		13.96	1273		
625	2.8	2.75	**3001**	2.74	**3101**		2.77	**3201**		2.91	**3301**		
		3.06	297	4.58	443		7.37	708		11.99	1232		
556	3.15	3.24	**3001**	3.25	**3101**		3.09	**3201**		3.16	**3301**		
		2.98	340	3.86	442		6.5	708		10.1	1127		
493	3.55	3.63	**3001**	3.44	**3101**		3.43	**3201**		3.52	**3301**		
		2.72	348	3.65	442		5.85	708		9.79	1217		
438	4	4.08	**3001**	3.93	**3101**		3.89	**3201**		3.95	**3301**		
		2.58	372	3.19	442		5.15	708		9.42	1315		
				3.91	**3122**		3.87	**3242**		3.96	**3362**		
				6.78	916		16.04	2150		26.24	3615		
389	4.5	4.58	**3001**	4.36	**3101**		4.33	**3201**		4.47	**3301**		
		2.24	362	2.86	442		4.63	708		8.4	1327		
				4.43	**3122**		4.57	**3242**		4.59	**3362**		
				6.32	969		13.94	2208		22.74	3615		
350	5	5.17	**3001**	4.92	**3101**		4.88	**3201**		4.87	**3301**		
		1.05	192	2.55	442		4.11	708		7.73	1327		
				4.99	**3122**		4.88	**3242**		5.06	**3362**		
				6.14	1061		13.07	2208		20.64	3615		
313	5.6	5.82	**3001**	5.69	**3101**		5.71	**3201**		5.5	**3301**		
		1.05	216	2.2	442		3.51	708		6.78	1315		
				5.65	**3122**		5.51	**3242**		5.59	**3362**		
				5.9	1155		11.57	2208		18.68	3615		
278	6.3	6.4	**3001**	6.25	**3101**		6.31	**3201**		6.33	**3301**		
		1	226	2.01	442		3.18	708		5.94	1327		
				6.42	**3122**		6.1	**3242**		6.41	**3362**		
				5.63	1251		10.45	2208		16.28	3615		
246	7.1	7.22	**3001**	7.17	**3101**		6.92	**3201**		7.06	**3301**		
		0.98	250	1	253		2.9	708		5.31	1327		
		7.38	**3012**	7.34	**3122**		6.96	**3242**		7.09	**3362**		
		2.69	683	4.93	1251		9.17	2208		14.73	3615		
219	8	8.13	**3001**	7.91	**3101**		8.06	**3201**		7.83	**3301**		
		0.88	252	1	279		2.48	708		4.8	1327		
		8.16	**3012**	8.28	**3122**	7.57	**3132**	8.02	**3242**	7.63	**3252**	8.14	**3362**	7.85	**3372**
		2.69	762	4.37	1252	5.18	1359	7.95	2208	10.28	2718	12.83	3615	21.22	5767
194	9	8.59	**3012**	8.79	**3122**	8.57	**3132**	8.57	**3242**	9.02	**3252**	9.16	**3362**	9.06	**3372**
		2.56	763	4.11	1252	4.79	1421	7.44	2208	9.26	2891	11.39	3615	19.35	6069
175	10	10.2	**3012**	10.43	**3122**	9.67	**3132**	9.72	**3242**	9.62	**3252**	9.95	**3362**	9.98	**3372**
		2.17	768	3.46	1252	4.42	1480	6.56	2208	8.84	2947	10.49	3615	18.13	6266

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1750 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		4		5		6		7		8		9	
1400	**1.25**	1.24	**3401**	1.28	**3501**								
		38.4	1679	61.53	2770								
1250	**1.4**	1.38	**3401**	1.46	**3501**								
		41.22	2015	59.42	3062								
1094	**1.6**	1.56	**3401**	1.6	**3501**								
		41.74	2292	57.18	3230								
972	**1.8**	1.74	**3401**	1.79	**3501**								
		35.43	2171	55.44	3496								
875	**2**	1.97	**3401**	2	**3501**								
		36.29	2521	52.88	3735								
781	**2.24**	2.17	**3401**	2.25	**3501**								
		34.03	2610	50.13	3982								
700	**2.5**	2.54	**3401**	2.44	**3501**								
		30.62	2745	48.17	4152								
625	**2.8**	2.83	**3401**	2.77	**3501**								
		28.35	2836	46.17	4522								
556	**3.15**	3.18	**3401**	3.07	**3501**	3.17	**2602**						
		25.76	2894	42.96	4655	100	10891						
493	**3.55**	3.6	**3401**	3.55	**3501**	358	**2602**						
		22.84	2903	40.6	5088	90	11202						
438	**4**	4.11	**3401**	3.88	**3501**								
		20	2903	38.16	5221								
		3.91	**3482**	4.07	**3592**	4.05	**2602**						
		38.77	5249	66.63	9371	80	11064						
389	**4.5**	4.41	**3401**	4.35	**3501**								
		18.63	2903	33.97	5221								
		4.37	**3482**	4.66	**3592**	4.6	**2602**						
		41.6	6299	66.63	10727	77	11980						
350	**5**	5.13	**3401**	4.85	**3501**								
		16.01	2903	30.49	5221								
		4.91	**3482**	5.1	**3592**	5.02	**2602**	4.97	**2702**				
		42.14	7168	66.63	11960	65.7	11357	143	24720				
313	**5.6**	5.57	**3401**	5.5	**3501**								
		14.76	2903	26.29	5103								
		5.48	**3482**	5.7	**3592**	5.75	**2602**						
		35.76	6786	57.53	11350	57.7	11171						
278	**6.3**	6.15	**3401**	6.31	**3501**								
		13.36	2903	23.43	5221								
		6.21	**3482**	6.38	**3592**	6.32	**2602**	6.38	**2702**				
		36.63	7883	53.87	11903	120	26171	143	31147				
246	**7.1**	6.83	**3401**	6.87	**3501**								
		11.32	2730	21.54	5221								
		6.86	**3482**	7.18	**3592**	7.13	**2602**	7.24	**2702**				
		34.35	8160	48.81	12133	110	26880	143	35103				
219	**8**	8.1	**3401**	8	**3501**								
		9.47	2708	18.48	5221								
		7.69	**3482**	7.92	**3592**	8.07	**2602**	8.1	**2702**	8.28	**2803A**		
		38.77	10329	66.63	18252	99.7	27577	143	39552	143.2	40102		
194	**9**	8.6	**3482**	9.07	**3592**	9.17	**2602**	8.99	**2702**				
		38.41	11446	64.65	20305	90.6	28197	143	44496				
175	**10**	9.67	**3482**	9.94	**3592**	10	**2602**	10.3	**2702**	10.19	**2803A**		
		35.65	11933	60.86	20956	84.9	29352	133	45825	148.2	49333		

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 1750 (Continued)

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
156	11.2	10.92	**3012**	11.04	**3122**	10.94	**3132**	10.8	**3242**	10.88	**3252**	11.09	**3362**	11.03	**3372**
		2.03	769	3.28	1252	4.07	1542	5.9	2208	8.18	3082	9.41	3615	16.56	6330
140	12.5	12.23	**3012**	12.61	**3122**	12.43	**3132**	12.27	**3242**	12.04	**3252**	12.45	**3362**	12.65	**3372**
		1.82	772	2.87	1252	3.74	1609	5.2	2208	7.64	3186	8.39	3615	15.46	6774
125	14	14.24	**3012**	14.08	**3122**	14.2	**3132**	13.65	**3242**	13.72	**3252**	14.09	**3362**	13.98	**3372**
		1.57	776	2.57	1252	3.42	1681	4.67	2208	7.02	3335	7.41	3615	14.12	6839
109	16	15.35	**3012**	15.79	**3122**	16.03	**3132**	15.36	**3242**	15.82	**3252**	15.33	**3362**	16.05	**3372**
		1.46	777	2.29	1252	3.15	1750	4.15	2208	6.38	3492	6.81	3615	12.68	7052
97	18	18.06	**3012**	18.28	**3122**	17.01	**3132**	18	**3242**	16.9	**3252**	17.33	**3362**	18.08	**3372**
		1.25	781	1.98	1252	2.98	1753	3.54	2208	6.1	3571	6.03	3615	11.39	7132
88	20	20.24	**3012**	20.07	**3122**	20.2	**3132**	19.87	**3242**	19.18	**3252**	19.95	**3362**	19.64	**3372**
		1.12	783	1.8	1252	2.52	1762	3.21	2208	5.6	3719	5.23	3615	10.49	7132
78	22.4	22.76	**3012**	23.01	**3122**	21.36	**3132**	21.79	**3242**	21.31	**3252**	22.29	**3362**	21.89	**3372**
		1	786	1	796	2.39	1765	2.93	2208	5.22	3850	4.68	3615	9.41	7132
70	25	25.59	**3012**	25.39	**3122**	24.41	**3132**	25.44	**3242**	24.2	**3252**	24.68	**3362**	24.56	**3372**
		0.89	787	1	878	2.09	1771	2.51	2208	4.72	3952	4.23	3615	8.39	7132
63	28	28.85	**3012**			27.25	**3132**			26.93	**3252**			27.8	**3372**
		0.79	789			1.88	1776			4.25	3964			7.41	7132
56	31.5	33.48	**3012**			30.55	**3132**			30.29	**3252**	32.32	**3363**	30.24	**3372**
		0.7	791			1.68	1780			3.79	3977	5.4	5910	6.81	7132
49	35.5	35.73	**3012**			35.37	**3132**			35.51	**3252**	37.29	**3363**	34.18	**3372**
		0.64	793			1.46	1786			3.25	3993	4.73	5965	6.03	7132
44	40	40.32	**3012**			38.84	**3132**			39.2	**3252**	41.1	**3363**	39.36	**3372**
		0.57	794			1.33	1790			2.95	4002	4.3	6010	5.23	7132
39	45	45.36	**3012**			44.54	**3132**			42.98	**3252**	45.4	**3363**	43.98	**3372**
		0.51	796			1	1540			2.69	4010	3.97	6070	4.68	7132
35	50	49.16	**3013**			49.15	**3132**			50.19	**3252**	52.09	**3363**	48.68	**3372**
		0.53	796			1	1699			2.32	4024	3.46	6100	4.23	7132
31	56	55.04	**3013**			57.83	**3133**			55.7	**3253**	57.6	**3363**	57.57	**3373**
		0.47	798			0.69	1351			2.13	4032	3.13	6100	3.77	7383
28	63	64.07	**3013**			65.25	**3133**			64.2	**3253**	66.11	**3363**	66.1	**3373**
		0.4	800			0.63	1406			1.85	4038	2.73	6100	3.36	7525
25	71	69.09	**3013**			69.24	**3133**			68.61	**3253**	74.4	**3363**	74.44	**3373**
		0.37	801			0.61	1434			1.73	4038	2.42	6100	3.02	7611
22	80	81.29	**3013**			82.23	**3133**			77.86	**3253**	80.86	**3363**	80.87	**3373**
		0.32	803			0.54	1519			1.53	4038	2.2	6100	2.78	7611
19	90	91.08	**3013**			86.97	**3133**			86.48	**3253**	90.12	**3363**	90.1	**3373**
		0.29	804			0.52	1547			1.37	4038	2	6100	2.5	7611
18	100	102.43	**3013**			99.4	**3133**			98.24	**3253**	101.13	**3363**	101.13	**3373**
		0.25	806			0.48	1618			1.21	4038	1.78	6100	2.22	7611
16	112	115.16	**3013**			110.94	**3133**			109.3	**3253**	114.47	**3363**	114.47	**3373**
		0.23	807			0.45	1678			1.09	4038	1.57	6100	1.96	7611
14	125	129.81	**3013**			124.4	**3133**			122.96	**3253**	124.53	**3363**	124.53	**3373**
		0.2	808			0.41	1744			0.97	4038	1.45	6100	1.8	7611
12.5	140	146.18	**3013**			144.02	**3133**			144.13	**3253**	141	**3363**	140.74	**3373**
		0.18	809			0.37	1804			0.82	4038	1.28	6100	1.6	7611
10.9	160	160.8	**3013**			158.13	**3133**			159.1	**3253**	162.1	**3363**	162.06	**3373**
		0.17	810			0.34	1804			0.75	4038	1.1	6100	1.39	7611
9.7	180	181.46	**3013**			181.32	**3133**			174.46	**3253**	181	**3363**	181.09	**3373**
		0.14	811			0.29	1804			0.68	4038	1	6100	1.24	7611
8.8	200	204.14	**3013**			200.11	**3133**			203.72	**3253**	200.44	**3363**	200.44	**3373**
		0.13	812			0.27	1804			0.58	4038	0.9	6100	1.12	7611

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1750 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
156	11.2	10.78	**3482**	11.1	**3592**	11.5	**2602**	11.3	**2702**	11.53	**2803A**		
		33.16	12381	56.06	21544	63.2	24473	121	46921	143.1	55835		
140	12.5	12.23	**3482**	12.43	**3592**	12.6	**2602**	12.5	**2702**	13.06	**2803A**		
		30.33	12844	52.23	22478	63.2	27313	110	47704	136.4	60319		
125	14	13.5	**3482**	13.96	**3592**	13.9	**2602**	13.9	**2702**	14.82	**2803A**		
		28	13089	47.77	23128	63.2	30591	100	48464	129.7	65066		
109	16	15.77	**3482**	15.17	**3592**	16.3	**2602**	16.1	**2702**	16.59	**2803A**		
		24.63	13452	45.28	23788	55.65	30782	63.2	34961	122.9	69027		
97	18	17.61	**3482**	17.24	**3592**	18.2	**2602**	18.4	**2702**	18.43	**2803A**		
		22.21	13540	41.48	24761	49.95	31088	63.2	39331	117.9	73530		
88	20	19.77	**3482**	19.07	**3592**	20.6	**2602**	20.6	**2702**	21.13	**2803A**		
		19.86	13601	36.51	24111	44.51	30774	63.2	43701	113.2	76671		
78	22.4	22.37	**3482**	22.06	**3592**	22.2	**2602**	22.3	**2702**	22.14	**2803**	22.1	**2903**
		17.64	13663	33.75	25783	41.38	32048	63.63	49279	113	85690	143	108493
70	25	25.55	**3482**	24.08	**3592**	25.1	**2602**	25.7	**2702**	25.1	**2803**	25.1	**2903**
		15.52	13727	31.03	25876	36.75	31766	55.47	47948	102	86597	143	121026
63	28	27.42	**3482**	27.05	**3592**	27.6	**2602**	28	**2702**	28.5	**2803**	28.5	**2903**
		14.49	13760	27.74	25987	33.51	32439	51.52	49874	94.34	89428	143	135549
56	31.5	31.9	**3482**	30.14	**3592**	31.6	**2602**	32.4	**2702**	31.8	**2803**	31.8	**2903**
		12.52	13826	25	26088	29.45	32075	44.36	48308	84.68	90301	134	142509
49	35.5	34.62	**3482**	34.18	**3592**	35.5	**2603**	35.5	**2703**	35.4	**2803**	35.4	**2903**
		11.56	13861	22.14	26199	26.16	31439	38.65	46444	76.52	91967	123	148250
44	40	38.24	**3482**	39.23	**3592**	39.5	**2603**	40	**2703**	40.6	**2803**	40.6	**2903**
		10.5	13901	19.37	26314	23.88	32334	35.35	47865	67.06	90808	108	146426
39	45	42.46	**3482**	42.67	**3592**	45.2	**2603**	45.2	**2703**	44.6	**2803**	44.6	**2903**
		9.48	13941	17.85	26381	21.54	32810	32.19	49034	61.19	93211	98.68	150332
35	50	50.34	**3482**	49.71	**3592**	49.7	**2603**	49.7	**2703**	49.2	**2803**	49.2	**2903**
		8.03	14004	15.39	26496	19.64	33241	30.15	51028	55.63	94159	89.74	151893
31	56	54.71	**3483**	56.63	**3593**	54.9	**2603**	54.9	**2703**	56	**2803**	56	**2903**
		7.55	14033	11.64	22403	17.84	33813	27.6	52331	50.36	95468	81.25	154036
28	63	63.93	**3483**	61.44	**3593**	64.3	**2603**	64.3	**2703**	63.4	**2803**	63.4	**2903**
		6.48	14084	11.13	23239	15.3	32621	23.68	50501	43.52	92811	63.2	134791
25	71	71.36	**3483**	69.82	**3593**	71.9	**2603**	71.9	**2703**	72.3	**2803**	72.3	**2903**
		5.82	14118	10.32	24473	13.7	32932	21.21	50992	38.3	92061	61.83	148618
22	80	80.13	**3483**	77.24	**3593**	81.1	**2603**	81.1	**2703**	80.9	**2803**	80.9	**2903**
		5.2	14152	9.74	25562	12.18	32987	18.86	51087	34.3	92905	55.39	150009
19	90	90.66	**3483**	89.35	**3593**	87.5	**2603**	87.5	**2703**	87.6	**2803**	90	**2903**
		4.61	14187	8.63	26204	11.31	34460	17.52	53374	31.74	96701	51.25	156159
18	100	103.54	**3483**	97.53	**3593**	99	**2603**	99	**2703**	101	**2803**	101	**2903**
		4.04	14222	8.03	26602	10.02	33934	15.53	52569	27.61	93462	44.59	150964
16	112	111.11	**3483**	109.55	**3593**	109	**2603**	109	**2703**	112	**2803**	112	**2903**
		3.77	14240	7.25	26991	9.13	34599	14.14	53607	25.61	97106	41.37	156868
14	125	129.28	**3483**	122.06	**3593**	124	**2603**	124	**2703**	128	**2803**	128	**2903**
		3.25	14277	6.52	27049	8	33870	12.4	52486	22	93102	35.55	150433
12.5	140	140.31	**3483**	138.42	**3593**	137	**2603**	140	**2703**				
		3	14295	5.77	27115	7.28	34490	11.28	53454				
10.9	160	154.98	**3483**	158.87	**3593**	159	**2603**	159	**2703**				
		2.72	14317	5.03	27173	6.3	34139	9.77	52921				
9.7	180	172.09	**3483**	172.82	**3593**								
		2.45	14339	4.63	27212								
8.8	200	203.99	**3483**	201.34	**3593**								
		2.07	14373	3.99	27274								

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 1450

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
1160	1.25	1.24	**3001**	1.22	**3101**		1.23	**3201**		1.26	**3301**		
		2.54	134	5.62	292		10.54	552		12.7	684		
1036	1.4	1.46	**3001**	1.38	**3101**		1.45	**3201**		1.46	**3301**		
		2.54	158	5.61	330		9.74	602		11.82	750		
906	1.6	1.54	**3001**	1.56	**3101**		1.55	**3201**		1.61	**3301**		
		2.54	167	5.41	359		10.03	661		11.29	809		
806	1.8	1.83	**3001**	1.76	**3101**		1.75	**3201**		1.77	**3301**		
		2.54	198	5.2	390		9.31	694		12.63	854		
725	2	1.96	**3001**	2	**3101**		1.94	**3201**		2.04	**3301**		
		2.54	212	4.54	424		8.57	708		12	1095		
647	2.24	2.19	**3001**	2.29	**3101**		2.21	**3201**		2.25	**3301**		
		2.54	237	4.54	442		7.52	708		12	1151		
580	2.5	2.55	**3001**	2.58	**3101**		2.55	**3201**		2.58	**3301**		
		2.54	276	4.03	442		6.53	708		12.06	1327		
518	2.8	2.75	**3001**	2.74	**3101**		2.77	**3201**		2.91	**3301**		
		2.54	298	3.79	443		6.11	708		10.56	1309		
460	3.15	3.24	**3001**	3.25	**3101**		3.09	**3201**		3.16	**3301**		
		2.49	343	3.19	442		5.38	708		8.89	1198		
408	3.55	3.63	**3001**	3.44	**3101**		3.43	**3201**		3.52	**3301**		
		2.27	351	3.02	442		4.85	708		8.62	1293		
363	4	4.08	**3001**	3.93	**3101**		3.89	**3201**		3.95	**3301**		
		2.16	375	2.64	442		4.27	708		7.88	1327		
				3.91	**3122**		3.87	**3242**		3.96	**3362**		
				5.62	919		13.65	2150		21.74	3615		
322	4.5	4.58	**3001**	4.36	**3101**		4.33	**3201**		4.47	**3301**		
		1.87	365	2.37	442		3.83	708		6.96	1327		
				4.43	**3122**		4.57	**3242**		4.59	**3362**		
				5.56	1030		11.55	2208		18.85	3615		
290	5	5.17	**3001**	4.92	**3101**		4.88	**3201**		4.87	**3301**		
		0.84	178	2.11	442		3.41	708		6.4	1327		
				4.99	**3122**		4.88	**3242**		5.06	**3362**		
				5.4	1128		10.83	2208		17.1	3615		
259	5.6	5.82	**3001**	5.69	**3101**		5.71	**3201**		5.5	**3301**		
		0.84	201	1.82	442		2.91	708		5.62	1318		
				5.65	**3122**		5.51	**3242**		5.59	**3362**		
				5.2	1228		9.58	2208		15.48	3615		
230	6.3	6.4	**3001**	6.25	**3101**		6.31	**3201**		6.33	**3301**		
		0.81	221	1.66	442		2.63	708		4.92	1327		
				6.42	**3122**		6.1	**3242**		6.41	**3362**		
				4.66	1252		8.66	2208		13.49	3615		
204	7.1	7.22	**3001**	7.17	**3101**		6.92	**3201**		7.06	**3301**		
		0.81	249	0.81	247		2.4	708		4.4	1327		
		7.38	**3012**	7.34	**3122**		6.96	**3242**		7.09	**3362**		
		2.23	683	4.08	1252		7.59	2208		12.2	3615		
181	8	8.13	**3001**	7.91	**3101**		8.06	**3201**		7.83	**3301**		
		0.81	254	0.81	273		2.06	708		3.98	1327		
		8.16	**3012**	8.28	**3122**	7.57	**3132**	8.02	**3242**	7.63	**3252**	8.14	**3362**	7.85	**3372**
		2.25	766	3.62	1252	4.53	1435	6.59	2208	9	2871	10.63	3615	18.57	6091
161	9	8.59	**3012**	8.79	**3122**	8.57	**3132**	8.57	**3242**	9.02	**3252**	9.16	**3362**	9.06	**3372**
		2.14	768	3.41	1252	4.19	1501	6.17	2208	8.1	3054	9.44	3615	16.94	6410
145	10	10.2	**3012**	10.43	**3122**	9.67	**3132**	9.72	**3242**	9.62	**3252**	9.95	**3362**	9.98	**3372**
		1.81	772	2.87	1252	3.87	1564	5.43	2208	7.74	3113	8.69	3615	15.87	6618

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1450 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		4		5		6		7		8		9	
1160	**1.25**	1.24	**3401**	1.28	**3501**								
		32.27	1703	54.01	2935								
1036	**1.4**	1.38	**3401**	1.46	**3501**								
		34.63	2043	52.14	3243								
906	**1.6**	1.56	**3401**	1.6	**3501**								
		35.06	2324	50.12	3417								
806	**1.8**	1.74	**3401**	1.79	**3501**								
		29.75	2200	48.68	3705								
725	**2**	1.97	**3401**	2	**3501**								
		30.46	2554	46.41	3955								
647	**2.24**	2.17	**3401**	2.25	**3501**								
		28.55	2643	43.98	4217								
580	**2.5**	2.54	**3401**	2.44	**3501**								
		25.69	2779	42.27	4397								
518	**2.8**	2.83	**3401**	2.77	**3501**								
		23.77	2870	40.49	4786								
460	**3.15**	3.18	**3401**	3.07	**3501**	3.17	**2602**						
		21.41	2903	37.67	4926	82	10891						
408	**3.55**	3.6	**3401**	3.55	**3501**	3.58	**2602**						
		18.92	2903	34.51	5221	75	11202						
363	**4**	4.11	**3401**	3.88	**3501**								
		16.57	2903	31.62	5221								
		3.91	**3482**	4.07	**3592**	4.05	**2602**						
		32.58	5324	56.21	9371	65	11064						
322	**4.5**	4.41	**3401**	4.35	**3501**								
		15.44	2903	28.15	5221								
		4.37	**3482**	4.66	**3592**	4.6	**2602**						
		34.96	6388	55.21	10727	62	11980						
290	**5**	5.13	**3401**	4.85	**3501**								
		13.27	2903	25.26	5221								
		4.91	**3482**	5.1	**3592**	5.02	**2602**	4.97	**2702**				
		35.39	7266	56.21	11760	54	11357	119	24720				
259	**5.6**	5.57	**3401**	5.5	**3501**								
		12.23	2903	21.78	5103								
		5.48	**3482**	5.7	**3592**	5.75	**2602**						
		30.03	6877	48.35	11513	47	11171						
230	**6.3**	6.15	**3401**	6.31	**3501**								
		11.07	2903	19.41	5221								
		6.21	**3482**	6.38	**3592**	6.32	**2602**	6.38	**2702**				
		30.75	7986	45.26	12071	105.5	27747	118.5	31151				
204	**7.1**	6.83	**3401**	6.87	**3501**								
		9.38	2730	17.84	5221								
		6.86	**3482**	7.18	**3592**	7.13	**2602**	7.24	**2702**				
		28.82	8264	41	12301	96.2	28499	118.5	35107				
181	**8**	8.1	**3401**	8	**3501**								
		7.91	2731	15.32	5221								
		7.69	**3482**	7.92	**3592**	8.07	**2602**	8.1	**2702**	8.28	**2803A**		
		32.58	10477	55.21	18253	87.59	29238	118.5	39557	139	48399		
161	**9**	8.6	**3482**	9.07	**3592**	9.17	**2602**	8.99	**2702**				
		33.43	12023	55.21	20894	79.6	29895	118.5	44502				
145	**10**	9.67	**3482**	9.94	**3592**	10	**2602**	10.3	**2702**	10.19	**2803A**		
		31.03	12535	52.96	22009	74.07	30906	110.9	46303	130.6	54381		

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 1450 (Continued)

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
129	11.2	10.92	**3012**	11.04	**3122**	10.94	**3132**	10.8	**3242**	10.88	**3252**	11.09	**3362**	11.03	**3372**
		1.69	774	2.71	1252	3.56	1630	4.89	2208	7.16	3255	7.8	3615	14.51	6685
116	12.5	12.23	**3012**	12.61	**3122**	12.43	**3132**	12.27	**3242**	12.04	**3252**	12.45	**3362**	12.65	**3372**
		1.52	776	2.37	1252	3.27	1700	4.31	2208	6.69	3365	6.95	3615	13.43	7101
104	14	14.24	**3012**	14.08	**3122**	14.2	**3132**	13.65	**3242**	13.72	**3252**	14.09	**3362**	13.98	**3372**
		1.31	779	2.13	1252	2.95	1753	3.87	2208	6.14	3522	6.14	3615	12.2	7127
91	16	15.35	**3012**	15.79	**3122**	16.03	**3132**	15.36	**3242**	15.82	**3252**	15.33	**3362**	16.05	**3372**
		1.22	781	1.9	1252	2.63	1759	3.44	2208	5.58	3689	5.64	3615	10.63	7132
81	18	18.06	**3012**	18.28	**3122**	17.01	**3132**	18	**3242**	16.9	**3252**	17.33	**3362**	18.08	**3372**
		1.04	784	1.64	1252	2.48	1763	2.93	2208	5.34	3772	4.99	3615	9.44	7132
73	20	20.24	**3012**	20.07	**3122**	20.2	**3132**	19.87	**3242**	19.18	**3252**	19.95	**3362**	19.64	**3372**
		0.93	786	1.49	1252	2.1	1770	2.66	2208	4.9	3928	4.34	3615	8.69	7132
65	22.4	22.76	**3012**	23.01	**3122**	21.36	**3132**	21.79	**3242**	21.31	**3252**	22.29	**3362**	21.89	**3372**
		0.83	788	0.81	778	1.99	1773	2.42	2208	4.45	3958	3.88	3615	7.8	7132
58	25	25.59	**3012**	25.39	**3122**	24.41	**3132**	25.44	**3242**	24.2	**3252**	24.68	**3362**	24.56	**3372**
		0.74	790	0.81	858	1.74	1779	2.08	2208	3.93	3972	3.51	3615	6.95	7132
52	28	28.85	**3012**			27.25	**3132**			26.93	**3252**			27.8	**3372**
		0.66	792			1.57	1783			3.54	3983			6.14	7132
46	31.5	33.48	**3012**			30.55	**3132**			30.29	**3252**	32.32	**3363**	30.24	**3372**
		0.58	794			1.4	1788			3.16	3995	4.6	6001	5.64	7132
41	35.5	35.73	**3012**			35.37	**3132**			35.51	**3252**	37.29	**3363**	34.18	**3372**
		0.53	795			1.21	1793			2.7	4010	3.99	6100	4.99	7132
36	40	40.32	**3012**			38.84	**3132**			39.2	**3252**	41.1	**3363**	39.36	**3372**
		0.47	797			1.11	1796			2.45	4018	3.62	6100	4.34	7132
32	45	45.36	**3012**			44.54	**3132**			42.98	**3252**	45.4	**3363**	43.98	**3372**
		0.42	798			0.81	1505			2.24	4026	3.28	6100	3.88	7132
29	50	49.16	**3013**			49.15	**3132**			50.19	**3252**	52.09	**3363**	48.68	**3372**
		0.4	796			0.81	1661			1.93	4038	2.86	6100	3.51	7132
26	56	55.04	**3013**			57.83	**3133**			55.7	**3253**	57.6	**3363**	57.57	**3373**
		0.35	798			0.73	1719			1.77	4038	2.58	6100	3.13	7389
23	63	64.07	**3013**			65.25	**3133**			64.2	**3253**	66.11	**3363**	66.1	**3373**
		0.3	800			0.67	1784			1.53	4038	2.25	6100	2.79	7525
20	71	69.09	**3013**			69.24	**3133**			68.61	**3253**	74.4	**3363**	74.44	**3373**
		0.28	801			0.64	1804			1.44	4038	2	6100	2.5	7611
18	80	81.29	**3013**			82.23	**3133**			77.86	**3253**	80.86	**3363**	80.86	**3373**
		0.24	803			0.54	1804			1.26	4038	1.84	6100	2.3	7611
16	90	91.08	**3013**			86.97	**3133**			86.48	**3253**	90.12	**3363**	90.12	**3373**
		0.22	804			0.51	1804			1.14	4038	1.65	6100	2.07	7611
15	100	102.43	**3013**			99.4	**3133**			98.24	**3253**	101.13	**3363**	101.13	**3373**
		0.19	806			0.44	1804			1	4038	1.47	6100	1.84	7611
13	112	115.16	**3013**			110.94	**3133**			109.3	**3253**	114.47	**3363**	114.47	**3373**
		0.17	807			0.4	1804			0.9	4038	1.3	6100	1.63	7611
12	125	129.81	**3013**			124.4	**3133**			122.96	**3253**	124.53	**3363**	124.53	**3373**
		0.15	808			0.23	1804			0.8	4038	1.19	6100	1.5	7611
10	140	146.18	**3013**			144.02	**3133**			144.13	**3253**	141	**3363**	140.74	**3373**
		0.13	809			0.21	1804			0.68	4038	1.06	6100	1.32	7611
9.1	160	160.8	**3013**			158.13	**3133**			159.1	**3253**	162.1	**3363**	162.06	**3373**
		0.12	810			0.19	1804			0.62	4038	0.92	6100	1.15	7611
8.1	180	181.46	**3013**			181.32	**3133**			174.46	**3253**	181	**3363**	181.09	**3373**
		0.11	811			0.18	1804			0.56	4038	0.82	6100	1.03	7611
7.3	200	204.14	**3013**			200.11	**3133**			203.72	**3253**	200.44	**3363**	200.44	**3373**
		0.1	812			0.17	1804			0.48	4038	0.74	6100	0.93	7611

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1450 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
129	11.2	10.78	**3482**	11.1	**3592**	11.5	**2602**	11.3	**2702**	11.53	**2803A**		
		28.86	13006	48.37	22434	52.37	24475	101.4	47392	126.2	59450		
116	12.5	12.23	**3482**	12.43	**3592**	12.6	**2602**	12.5	**2702**	13.06	**2803A**		
		26.28	13433	45.25	23504	52.37	27315	92.34	48164	120.2	64169		
104	14	13.5	**3482**	13.98	**3592**	13.9	**2602**	13.9	**2702**	14.82	**2803A**		
		23.91	13489	40.99	23956	52.37	30593	83.73	48912	114.28	69219		
91	16	15.77	**3482**	15.17	**3592**	16.3	**2602**	16.1	**2702**	16.59	**2803A**		
		20.59	13574	38.91	24673	46.48	31032	52.37	34964	108.35	73433		
81	18	17.61	**3482**	17.24	**3592**	18.2	**2602**	18.4	**2702**	18.43	**2803A**		
		18.52	13631	35.59	25646	41.71	31328	52.37	39334	103.9	78224		
73	20	19.77	**3482**	19.07	**3592**	20.6	**2602**	20.6	**2702**	21.13	**2803A**		
		16.56	13688	30.63	24416	37.15	31000	52.37	43705	99.8	81567		
65	22.4	22.37	**3482**	22.06	**3592**	22.2	**2602**	22.3	**2702**	22.14	**2803**	22.1	**2903**
		14.7	13746	28.15	25956	34.53	32276	53.12	49653	93	85690	120	108439
58	25	25.55	**3482**	24.08	**3592**	25.1	**2602**	25.7	**2702**	25.1	**2803**	25.1	**2903**
		12.93	13806	25.88	26044	30.66	31980	46.29	48290	88.94	90848	118.5	121041
52	28	27.42	**3482**	27.05	**3592**	27.6	**2602**	28	**2702**	28.5	**2803**	28.5	**2903**
		12.08	13836	23.12	26142	27.94	32649	42.98	50218	78.76	90098	118.5	135565
46	31.5	31.9	**3482**	30.14	**3592**	31.6	**2602**	32.4	**2702**	31.8	**2803**	31.8	**2903**
		10.42	13898	20.83	26239	24.55	32271	36.99	48619	70.66	90945	113.93	146632
41	35.5	34.62	**3482**	34.18	**3592**	35.5	**2603**	35.5	**2703**	35.4	**2803**	35.4	**2903**
		9.63	13930	18.44	26345	22.98	33332	33.95	49241	63.84	92594	102.95	149326
36	40	38.24	**3482**	39.23	**3592**	39.5	**2603**	40	**2703**	40.6	**2803**	40.6	**2903**
		8.74	13967	16.13	26451	20.48	33472	31.05	50748	55.92	91391	90.21	147428
32	45	42.46	**3482**	42.67	**3592**	45.2	**2603**	45.2	**2703**	44.6	**2803**	44.6	**2903**
		7.89	14005	14.87	26513	17.94	32472	27.76	51042	51.01	93786	82.3	151319
29	50	50.34	**3482**	49.71	**3592**	49.7	**2603**	49.7	**2703**	49.2	**2803**	49.2	**2903**
		6.68	14063	12.81	26619	16.35	33406	25.31	51711	46.36	94714	74.82	152848
26	56	54.71	**3483**	56.63	**3593**	54.9	**2603**	54.9	**2703**	56	**2803**	56	**2903**
		6.28	14090	10.19	23664	14.85	33973	22.99	52598	41.96	96006	67.76	154962
23	63	63.93	**3483**	61.44	**3593**	64.3	**2603**	64.3	**2703**	63.4	**2803**	63.4	**2903**
		5.39	14137	9.75	24558	12.73	32765	19.71	50740	36.35	93300	52.37	134802
20	71	71.36	**3483**	69.82	**3593**	71.9	**2603**	71.9	**2703**	72.3	**2803**	72.3	**2903**
		4.84	14169	9.03	25850	11.4	33070	17.66	51222	31.89	92518	51.5	149406
18	80	80.13	**3483**	77.24	**3593**	81.1	**2603**	81.1	**2703**	80.9	**2803**	80.9	**2903**
		4.32	14201	8.49	26894	10.13	33118	15.7	51305	28.56	93343	46.13	150765
16	90	90.66	**3483**	89.35	**3593**	87.5	**2603**	87.5	**2703**	87.6	**2803**	90	**2903**
		3.83	14233	7.36	26982	9.41	34592	14.57	53594	26.42	97141	42.67	156918
15	100	103.54	**3483**	97.53	**3593**	99	**2603**	99	**2703**	101	**2803**	101	**2903**
		3.36	14265	6.76	27027	8.34	34056	12.92	52774	22.97	93861	37.12	151652
13	112	111.11	**3483**	109.55	**3593**	109	**2603**	109	**2703**	112	**2803**	112	**2903**
		3.13	14282	6.03	27080	7.59	34719	11.76	53807	21.31	97505	34.43	157557
12	125	129.28	**3483**	122.06	**3593**	124	**2603**	124	**2703**	128	**2803**	128	**2903**
		2.7	14316	5.42	27133	6.65	33980	10.31	52670	18.3	93458	29.58	151049
10	140	140.31	**3483**	138.42	**3593**	137	**2603**	140	**2703**				
		2.49	14333	4.79	27195	6.05	34597	9.38	53633				
9.1	160	154.98	**3483**	158.87	**3593**	159	**2603**	159	**2703**				
		2.26	14353	4.18	27248	5.24	34239	8.12	53086				
8.1	180	172.09	**3483**	172.82	**3593**								
		2.04	14373	3.85	27283								
7.3	200	203.99	**3483**	201.34	**3593**								
		1.72	14404	3.31	27345								

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 1160

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
928	1.25	1.24	**3001**	1.22	**3101**		1.23	**3201**		1.26	**3301**		
		2.03	134	5.33	346		9.36	612		11.27	758		
829	1.4	1.46	**3001**	1.38	**3101**		1.45	**3201**		1.46	**3301**		
		2.03	158	4.97	365		8.64	668		10.72	832		
725	1.6	1.54	**3001**	1.56	**3101**		1.55	**3201**		1.61	**3301**		
		2.03	166	4.8	399		8.58	708		10.49	897		
644	1.8	1.83	**3001**	1.76	**3101**		1.75	**3201**		1.77	**3301**		
		2.03	198	4.61	432		7.59	708		10.02	947		
580	2	1.96	**3001**	2	**3101**		1.94	**3201**		2.04	**3301**		
		2.03	212	4.15	442		6.86	708		11.2	1214		
518	2.24	2.19	**3001**	2.29	**3101**		2.21	**3201**		2.25	**3301**		
		2.03	237	3.63	442		6.02	708		10.65	1276		
464	2.5	2.55	**3001**	2.58	**3101**		2.55	**3201**		2.58	**3301**		
		2.03	276	3.22	442		5.22	708		9.65	1327		
414	2.8	2.75	**3001**	2.74	**3101**		2.77	**3201**		2.91	**3301**		
		2.03	297	3.04	443		4.89	708		8.57	1327		
368	3.15	3.24	**3001**	3.25	**3101**		3.09	**3201**		3.16	**3301**		
		2.02	348	2.56	442		4.31	708		7.89	1327		
327	3.55	3.63	**3001**	3.44	**3101**		3.43	**3201**		3.52	**3301**		
		1.84	356	2.42	442		3.88	708		7.08	1327		
290	4	4.08	**3001**	3.93	**3101**		3.89	**3201**		3.95	**3301**		
		1.75	380	2.11	442		3.41	708		6.31	1327		
				3.91	**3122**		3.87	**3242**		3.96	**3362**		
				5.5	1122		10.92	2208		17.39	3615		
258	4.5	4.58	**3001**	4.36	**3101**		4.33	**3201**		4.47	**3301**		
		1.51	368	1.89	442		3.07	708		5.57	1327		
				4.43	**3122**		4.57	**3242**		4.59	**3362**		
				4.93	1139		9.24	2208		15.08	3615		
232	5	5.17	**3001**	4.92	**3101**		4.88	**3201**		4.87	**3301**		
		0.65	179	1.69	442		2.73	708		5.12	1327		
				4.99	**3122**		4.88	**3242**		5.06	**3362**		
				4.79	1247		8.66	2208		13.68	3615		
207	5.6	5.82	**3001**	5.69	**3101**		5.71	**3201**		5.5	**3301**		
		0.65	201	1.46	442		2.33	708		4.53	1327		
				5.65	**3122**		5.51	**3242**		5.59	**3362**		
				4.24	1252		7.67	2208		12.38	3615		
184	6.3	6.4	**3001**	6.25	**3101**		6.31	**3201**		6.33	**3301**		
		0.65	221	1.33	442		2.11	708		3.93	1327		
				6.42	**3122**		6.1	**3242**		6.41	**3362**		
				3.73	1252		6.92	2208		10.79	3615		
163	7.1	7.22	**3001**	7.17	**3101**		6.92	**3201**		7.06	**3301**		
		0.65	249	0.65	248		1.92	708		3.52	1327		
		7.38	**3012**	7.34	**3122**		6.96	**3242**		7.09	**3362**		
		2.03	781	3.26	1252		6.08	2208		9.76	3615		
145	8	8.13	**3001**	7.91	**3101**		8.06	**3201**		7.83	**3301**		
		0.59	254	0.65	274		1.65	708		3.18	1327		
		8.16	**3012**	8.28	**3122**	7.57	**3132**	8.02	**3242**	7.63	**3252**	8.14	**3362**	7.85	**3372**
		1.82	775	2.89	1252	3.98	1575	5.27	2208	7.9	3151	8.5	3615	16.3	6685
129	9	8.59	**3012**	8.79	**3122**	8.57	**3132**	8.57	**3242**	9.02	**3252**	9.16	**3362**	9.06	**3372**
		1.73	775	2.73	1252	3.68	1648	4.93	2208	7.11	3352	7.55	3615	14.87	7035
116	10	10.2	**3012**	10.43	**3122**	9.67	**3132**	9.72	**3242**	9.62	**3252**	9.95	**3362**	9.98	**3372**
		1.46	777	2.3	1252	3.4	1716	4.35	2208	6.8	3417	6.95	3615	13.66	7120
104	11.2	10.92	**3012**	11.04	**3122**	10.94	**3132**	10.8	**3242**	10.88	**3252**	11.09	**3362**	11.03	**3372**
		1.37	780	2.17	1252	3.07	1756	3.91	2208	6.29	3573	6.24	3615	12.38	7132

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1160 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
928	1.25	1.24	**3401**	1.26	**3501**								
		26.45	1744	44.17	2999								
829	1.4	1.38	**3401**	1.46	**3501**								
		28.35	2091	44.17	3432								
725	1.6	1.56	**3401**	1.6	**3501**								
		28.7	2378	43.14	3677								
644	1.8	1.74	**3401**	1.79	**3501**								
		24.33	2249	41.91	3986								
580	2	1.97	**3401**	2	**3501**								
		24.9	2610	39.95	4256								
518	2.24	2.17	**3401**	2.25	**3501**								
		23.33	2699	37.85	4537								
464	2.5	2.54	**3401**	2.44	**3501**								
		20.96	2835	36.38	4731								
414	2.8	2.83	**3401**	2.77	**3501**								
		19.23	2903	34.85	5150								
368	3.15	3.18	**3401**	3.07	**3501**	3.17	**2602**						
		17.13	2903	31.94	5221	65.9	10891						
327	3.55	3.6	**3401**	3.55	**3501**	3.58	**2602**						
		15.14	2903	27.61	5221	60	11202						
290	4	4.11	**3401**	3.88	**3501**								
		13.26	2903	25.3	5221								
		3.91	**3482**	4.07	**3592**	4.05	**2602**						
		26.69	5452	44.17	9372	52	11064						
258	4.5	4.41	**3401**	4.35	**3601**	4.6	**2602**						
		12.35	2903	22.52	5221	50	11980						
		4.37	**3482**	4.66	**3592**								
		28.62	6538	44.17	10728								
232	5	5.13	**3401**	4.85	**3501**								
		10.62	2903	20.21	5221								
		4.91	**3482**	5.1	**3592**	5.02	**2602**	4.97	**2702**				
		28.96	7433	44.17	11761	43	11357	95	24720				
207	5.6	5.57	**3401**	5.5	**3501**								
		9.78	2903	17.42	5101								
		5.48	**3482**	5.7	**3592**	5.75	**2602**						
		24.56	7031	39.63	11796	37	11171						
184	6.3	6.15	**3401**	6.31	**3501**								
		8.86	2903	15.53	5221								
		6.21	**3482**	6.38	**3592**	6.32	**2602**	6.38	**2702**				
		25.13	8159	37.06	12354	90.33	29684	94.8	31135				
163	7.1	6.83	**3401**	6.87	**3501**								
		7.5	2729	14.27	5221								
		6.86	**3482**	7.18	**3592**	7.13	**2602**	7.24	**2702**				
		23.55	8439	33.56	12584	82.3	30488	94.8	35088				
145	8	8.1	**3401**	8	**3501**								
		6.42	2769	12.25	5221								
		7.69	**3482**	7.92	**3592**	8.07	**2602**	8.1	**2702**	8.28	**2803A**		
		26.69	10729	44.17	18254	73.9	30663	94.75	39536	114.96	48636		
129	9	8.6	**3482**	9.07	**3592**	9.17	**2602**	8.99	**2702**				
		28.62	12867	44.17	20895	65.1	30556	94.8	44478				
116	10	9.67	**3482**	9.94	**3592**	10	**2602**	10.3	**2702**	10.19	**2803A**		
		26.68	13476	44.17	22907	59.9	31231	89.76	46815	98.22	51118		
104	11.2	10.78	**3482**	11.1	**3592**	11.5	**2602**	11.3	**2702**	11.53	**2803A**		
		24.03	13536	39.63	22973	41.88	24465	81.99	47896	94.9	55883		

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 1160 (Continued)

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
93	12.5	12.23	**3012**	12.61	**3122**	12.43	**3132**	12.27	**3242**	12.04	**3252**	12.45	**3362**	12.65	**3372**
		1.22	776	1.9	1252	2.71	1762	3.44	2208	5.87	3693	5.56	3615	10.79	7132
83	14	14.24	**3012**	14.08	**3122**	14.2	**3132**	13.65	**3242**	13.72	**3252**	14.09	**3362**	13.98	**3372**
		1.06	787	1.7	1252	2.38	1769	3.1	2208	5.39	3866	4.91	3615	9.76	7132
73	16	15.35	**3012**	15.79	**3122**	16.03	**3132**	15.36	**3242**	15.82	**3252**	15.33	**3362**	16.05	**3372**
		0.98	785	1.52	1252	2.12	1774	2.75	2208	4.79	3960	4.51	3615	8.5	7132
64	18	18.06	**3012**	18.28	**3122**	17.01	**3132**	18	**3242**	16.9	**3252**	17.33	**3362**	18.08	**3372**
		0.84	791	1.31	1252	2	1776	2.35	2208	4.49	3967	3.99	3615	7.55	7132
58	20	20.24	**3012**	20.07	**3122**	20.2	**3132**	19.87	**3242**	19.18	**3252**	19.95	**3362**	19.64	**3372**
		0.75	792	1.19	1252	1.69	1784	2.13	2208	3.97	3980	3.47	3615	6.95	7132
52	22.4	22.76	**3012**	23.01	**3122**	21.36	**3132**	21.79	**3242**	21.31	**3252**	22.29	**3362**	21.89	**3372**
		0.67	795	0.65	780	1.6	1786	1.94	2208	3.59	3991	3.1	3615	6.24	7132
46	25	25.59	**3012**	25.39	**3122**	24.41	**3132**	25.44	**3242**	24.2	**3252**	24.68	**3362**	24.56	**3372**
		0.59	787	0.65	861	1.4	1791	1.66	2208	3.17	4003	2.8	3615	5.56	7132
41	28	28.85	**3012**			27.25	**3132**			26.93	**3252**			27.8	**3372**
		0.53	798			1.26	1795			2.85	4013			4.91	7132
37	31.5	33.48	**3012**			30.55	**3132**			30.29	**3252**	31.84	**3363**	30.24	**3372**
		0.47	821			1.13	1799			2.54	4023	3.93	6416	4.51	7132
33	35.5	35.73	**3012**			35.37	**3132**			35.51	**3252**	35.18	**3363**	34.18	**3372**
		0.43	801			0.98	1803			2.18	4036	3.4	6100	3.99	7132
29	40	40.32	**3012**			38.84	**3132**			39.2	**3252**	41.1	**3363**	39.36	**3372**
		0.38	799			0.89	1804			1.97	4038	2.9	6100	3.47	7132
26	45	45.36	**3012**			44.54	**3132**			42.98	**3252**	45.4	**3363**	43.98	**3372**
		0.34	804			0.65	1510			1.8	4038	2.63	6100	3.1	7132
23	50	49.16	**3013**			49.15	**3132**			50.19	**3252**	52.09	**3363**	48.68	**3372**
		0.32	803			0.65	1666			1.54	4038	2.29	6100	2.8	7132
21	56	55.04	**3013**			57.83	**3133**			55.7	**3253**	57.6	**3363**	57.57	**3373**
		0.28	787			0.54	1592			1.41	4038	2.07	6100	2.5	7389
18	63	64.07	**3013**			65.25	**3133**			64.2	**3253**	66.11	**3363**	66.1	**3373**
		0.24	785			0.5	1657			1.23	4038	1.9	6100	2.18	7389
16	71	69.09	**3013**			69.24	**3133**			68.61	**3253**	74.4	**3363**	74.44	**3373**
		0.23	812			0.48	1690			1.15	4038	1.7	6100	2	7611
15	80	81.29	**3013**			82.23	**3133**			77.86	**3253**	80.86	**3363**	80.86	**3373**
		0.19	789			0.42	1790			1.01	4038	1.52	6100	1.84	7611
13	90	91.08	**3013**			86.97	**3133**			86.48	**3253**	90.12	**3363**	90.12	**3373**
		0.17	791			0.4	1804			0.91	4038	1.34	6100	1.65	7611
12	100	102.43	**3013**			99.4	**3133**			98.24	**3253**	101.13	**3363**	101.13	**3373**
		0.15	785			0.35	1804			0.8	4038	1.23	6100	1.47	7611
10	112	115.16	**3013**			110.94	**3133**			109.3	**3253**	114.47	**3363**	114.47	**3373**
		0.14	823			0.32	1804			0.72	4038	1.09	6100	1.3	7611
9.3	125	129.81	**3013**			124.4	**3133**			122.96	**3253**	124.53	**3363**	124.53	**3373**
		0.12	796			0.28	1804			0.64	4038	0.96	6100	1.19	7611
8.3	140	146.18	**3013**			144.02	**3133**			144.13	**3253**	141	**3363**	140.74	**3373**
		0.11	821			0.24	1804			0.55	4038	0.85	6100	1.06	7611
7.3	160	160.8	**3013**			158.13	**3133**			159.1	**3253**	162.1	**3363**	162.06	**3373**
		0.1	821			0.22	1804			0.5	4038	0.77	6100	0.92	7611
6.4	180	181.46	**3013**			181.32	**3133**			174.46	**3253**	181	**3363**	181.09	**3373**
		0.09	834			0.19	1804			0.45	4038	0.66	6100	0.82	7611
5.8	200	204.14	**3013**			200.11	**3133**			203.72	**3253**	200.44	**3363**	200.44	**3373**
		0.08	834			0.18	1804			0.39	4038	0.59	6100	0.74	7611

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 1160 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
93	12.5	12.23	**3482**	12.43	**3592**	12.6	**2602**	12.5	**2702**	13.06	**2803A**		
		21.29	13603	37.06	24062	41.88	27305	74.7	48656	90.4	60319		
83	14	13.5	**3482**	13.98	**3592**	13.9	**2602**	13.9	**2702**	14.82	**2803A**		
		19.36	13653	33.55	24504	41.88	30582	67.64	49390	85.94	65066		
73	16	15.77	**3482**	15.17	**3592**	16.3	**2602**	16.1	**2702**	16.59	**2803A**		
		16.66	13728	31.82	25221	37.5	31297	41.88	34950	81.48	69027		
64	18	17.61	**3482**	17.24	**3592**	18.2	**2602**	18.4	**2702**	18.43	**2803A**		
		14.98	13778	28.89	26018	33.6	31583	41.88	39319	78.13	73530		
58	20	19.77	**3482**	19.07	**3592**	20.6	**2602**	20.6	**2702**	21.13	**2803A**		
		13.39	13829	25.02	24929	29.95	31240	41.88	43688	75.1	76673		
52	22.4	22.37	**3482**	22.06	**3592**	22.2	**2602**	22.3	**2702**	22.14	**2803**	22.1	**2903**
		11.88	13880	22.77	26239	27.8	32517	42.84	50049	75	85690	96.1	108439
46	25	25.55	**3482**	24.08	**3592**	25.1	**2602**	25.7	**2702**	25.1	**2803**	25.1	**2903**
		10.44	13932	20.91	26310	24.7	32206	37.31	48653	71.8	91605	94.75	120977
41	28	27.42	**3482**	27.05	**3592**	27.6	**2602**	28	**2702**	28.5	**2803**	28.5	**2903**
		9.75	13959	18.69	26407	22.5	32870	34.64	50583	63.5	90809	94.75	135494
37	31.5	31.9	**3482**	30.14	**3592**	31.6	**2602**	32.4	**2702**	31.8	**2803**	31.8	**2903**
		8.41	14014	16.82	26487	19.8	32477	29.8	48949	56.96	91629	91.88	147806
33	35.5	34.62	**3482**	34.18	**3592**	35.5	**2603**	35.5	**2703**	35.4	**2803**	35.4	**2903**
		7.76	14042	14.88	26575	18.71	33928	28.96	52505	51.44	93259	82.99	150468
29	40	38.24	**3482**	39.23	**3592**	39.5	**2603**	40	**2703**	40.6	**2803**	40.6	**2903**
		7.04	14074	13.02	26673	16.48	33666	25.51	52113	45.04	92008	72,69	148490
26	45	42.46	**3482**	42.67	**3592**	45.2	**2603**	45.2	**2703**	44.6	**2803**	44.6	**2903**
		6.36	14107	11.99	26726	14.4	33159	22.34	51340	41.07	94393	66.3	152364
23	50	50.34	**3482**	49.71	**3592**	49.7	**2603**	49.7	**2703**	49.2	**2803**	49.2	**2903**
		5.38	14158	10.33	26823	13.2	33581	20.36	52001	37.32	95301	60.25	153858
21	56	54.71	**3483**	56.63	**3593**	54.9	**2603**	54.9	**2703**	56	**2803**	56	**2903**
		5.06	14181	9.02	26186	11.9	34142	18.49	52879	33.77	96574	54.52	155941
18	63	63.93	**3483**	61.44	**3593**	64.3	**2603**	64.3	**2703**	63.4	**2803**	63.4	**2903**
		4.34	14223	8.56	26947	10.2	32917	15.85	50993	29.16	93816	41.88	134750
16	71	71.36	**3483**	69.82	**3593**	71.9	**2603**	71.9	**2703**	72.3	**2803**	72.3	**2903**
		3.9	14250	7.55	27009	8.16	33216	14.19	51464	25.65	93000	41.43	150237
15	80	80.13	**3483**	77.24	**3593**	81.1	**2603**	81.1	**2703**	80.9	**2803**	80.9	**2903**
		3.48	14278	6.84	27062	8.14	33255	12.61	51464	22.96	93804	37.1	151561
13	90	90.66	**3483**	89.35	**3593**	87.5	**2603**	87.5	**2703**	87.6	**2803**	90	**2903**
		3.08	14306	5.92	27133	7.56	34731	11.71	53825	21.23	97604	34.31	715771
12	100	103.54	**3483**	97.53	**3593**	99	**2603**	99	**2703**	101	**2803**	101	**2903**
		2.7	14334	5.44	27177	6.69	34185	10.38	52989	18.46	94280	29.84	152375
10	112	111.11	**3483**	109.55	**3593**	109	**2603**	109	**2703**	112	**2803**	112	**2903**
		2.52	14349	4.85	27221	6.1	34845	9.44	54017	17.12	97925	27.67	158283
9.3	125	129.28	**3483**	122.06	**3593**	124	**2603**	124	**2703**	128	**2803**	128	**2903**
		2.17	14378	4.36	27265	5.34	34095	8.28	52863	14.7	93832	23.76	151696
8.3	140	140.31	**3483**	138.42	**3593**	137	**2603**	140	**2703**				
		2	14393	3.85	27319	4.84	34709	7.53	53821				
7.3	160	154.98	**3483**	158.87	**3593**	159	**2603**	159	**2703**				
		1.81	14410	3.36	27372	4.2	34342	6.52	53259				
6.4	180	172.09	**3483**	172.82	**3593**								
		1.64	14428	3.09	27398								
5.8	200	203.99	**3483**	201.34	**3593**								
		1.38	14455	2.66	27451								

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 870

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
696	1.25	1.24	**3001**	1.22	**3101**		1.23	**3201**		1.26	**3301**		
		1.52	134	4.27	370		7.5	654		9.03	810		
621	1.4	1.46	**3001**	1.38	**3101**		1.45	**3201**		1.46	**3301**		
		1.52	158	3.9	391		6.87	708		8.6	890		
544	1.6	1.54	**3001**	1.56	**3101**		1.55	**3201**		1.61	**3301**		
		1.52	166	3.85	425		6.44	708		8.41	959		
483	1.8	1.83	**3001**	1.76	**3101**		1.75	**3201**		1.77	**3301**		
		1.52	197	3.54	442		5.7	708		8.6	1083		
435	2	1.96	**3001**	2	**3101**		1.94	**3201**		2.04	**3301**		
		1.52	212	3.12	442		5.14	708		8.98	1298		
388	2.24	2.19	**3001**	2.29	**3101**		2.21	**3201**		2.25	**3301**		
		1.52	237	2.73	442		4.51	708		8.31	1327		
348	2.5	2.55	**3001**	2.58	**3101**		2.55	**3201**		2.58	**3301**		
		1.52	276	2.42	442		3.92	708		7.24	1327		
311	2.8	2.75	**3001**	2.74	**3101**		2.77	**3201**		2.91	**3301**		
		1.52	298	2.28	443		3.66	708		6.42	1327		
276	3.15	3.24	**3001**	3.25	**3101**		3.09	**3201**		3.16	**3301**		
		1.52	350	1.92	442		3.23	708		5.91	1327		
245	3.55	3.63	**3001**	3.44	**3101**		3.43	**3201**		3.52	**3301**		
		1.39	351	1.81	442		2.91	708		5.31	1327		
218	4	4.08	**3001**	3.93	**3101**		3.89	**3201**		3.95	**3301**		
		1.32	375	1.59	442		2.56	708		4.73	1327		
				3.91	**3122**		3.87	**3242**		3.96	**3362**		
				4.41	1202		8.19	2208		13.04	3615		
193	4.5	4.58	**3001**	4.36	**3101**		4.33	**3201**		4.47	**3301**		
		1.14	365	1.42	442		2.3	708		4.18	1327		
				4.43	**3122**		4.57	**3242**		4.59	**3362**		
				3.96	1221		6.93	2208		11.31	3615		
174	5	5.17	**3001**	4.92	**3101**		4.88	**3201**		4.87	**3301**		
		0.49	178	1.27	442		2.04	708		3.84	1327		
				4.99	**3122**		4.88	**3242**		5.06	**3362**		
				3.6	1252		6.5	2208		10.26	3615		
155	5.6	5.82	**3001**	5.69	**3101**		5.71	**3201**		5.5	**3301**		
		0.49	201	1.09	442		1.74	708		3.4	1327		
				5.65	**3122**		5.51	**3242**		5.59	**3362**		
				3.18	1252		5.75	2208		9.29	3615		
138	6.3	6.4	**3001**	6.25	**3101**		6.31	**3201**		6.33	**3301**		
		0.49	221	1	442		1.58	708		2.95	1327		
				6.42	**3122**		6.1	**3242**		6.41	**3362**		
				2.8	1252		5.19	2208		8.09	3615		
122	7.1	7.22	**3001**	7.17	**3101**		6.92	**3201**		7.06	**3301**		
		0.49	249	0.49	248		1.44	708		2.64	1327		
		7.38	**3012**	7.34	**3122**		6.96	**3242**		7.09	**3362**		
		1.52	733	2.45	1252		4.56	2208		7.32	3615		
109	8	8.13	**3001**	7.91	**3101**		8.06	**3201**		7.83	**3301**		
		0.45	254	0.49	274		1.23	708		2.39	1327		
		8.16	**3012**	8.28	**3122**	7.57	**3132**	8.02	**3242**	7.63	**3252**	8.14	**3362**	7.85	**3372**
		1.37	779	2.17	1252	3.17	1673	3.95	2208	6.29	3151	6.38	3615	13.01	7100
97	9	8.59	**3012**	8.79	**3122**	8.57	**3132**	8.57	**3242**	9.02	**3252**	9.16	**3362**	9.06	**3372**
		1.3	780	2.05	1252	2.93	1750	3.7	2208	5.67	3352	5.66	3615	11.31	7132
87	10	10.2	**3012**	10.43	**3122**	9.67	**3132**	9.72	**3242**	9.62	**3252**	9.95	**3362**	9.98	**3372**
		1.1	783	1.72	1252	2.61	1760	3.26	2208	5.41	3417	5.21	3615	10.26	7132
78	11.2	10.92	**3012**	11.04	**3122**	10.94	**3132**	10.8	**3242**	10.88	**3252**	11.09	**3362**	11.03	**3372**
		1.03	784	1.63	1252	2.32	1766	2.93	2208	5.01	3573	4.68	3615	9.29	7132

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 870 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
696	1.25	1.24	**3401**	1.28	**3501**								
		20.12	1770	33.12	2998								
621	1.4	1.38	**3401**	1.46	**3501**								
		21.57	2121	33.12	3432								
544	1.6	1.56	**3401**	1.6	**3501**								
		21.82	2411	32.35	3677								
483	1.8	1.74	**3401**	1.79	**3501**								
		18.49	2279	31.43	3986								
435	2	1.97	**3401**	2	**3501**								
		18.92	2644	29.96	4256								
388	2.24	2.17	**3401**	2.25	**3501**								
		17.72	2734	28.39	4537								
348	2.5	2.54	**3401**	2.44	**3501**								
		15.92	2870	27.29	4731								
311	2.8	2.83	**3401**	2.77	**3501**								
		14.42	2903	25.15	4956								
276	3.15	3.18	**3401**	3.07	**3501**	3.17	**2602**						
		12.84	2903	23.95	5221	50.5	11130						
245	3.55	3.6	**3401**	3.55	**3501**	3.58	**2602**						
		11.35	2903	20.71	5221	45.6	11340						
218	4	4.11	**3401**	3.88	**3501**								
		9.94	2903	18.97	5221								
		3.91	**3482**	4.07	**3592**	3.58	**2602**						
		20.31	5532	33.12	9370	45.6	11340						
193	4.5	4.41	**3401**	4.35	**3501**								
		9.26	2903	16.89	5221								
		4.37	**3482**	4.66	**3592**	4.6	**2602**						
		21.78	6632	33.12	10725	33.9	10820						
174	5	5.13	**3401**	4.85	**3501**								
		7.96	2903	15.16	5221								
		4.91	**3482**	5.1	**3592**	5.02	**2602**	4.97	**2702**				
		22.03	7537	33.12	11758	33.4	11660	71.2	24500				
155	5.6	5.57	**3401**	5.5	**3501**								
		7.34	2903	13.07	5103								
		5.48	**3482**	5.7	**3592**	5.75	**2602**						
		18.67	7126	30.16	11968	29.3	11680						
138	6.3	6.15	**3401**	6.31	**3501**								
		6.64	2903	11.65	5221								
		6.21	**3482**	6.38	**3592**	6.32	**2602**	6.38	**2702**				
		19.1	8267	28.19	12531	70.15	30734	71.1	31134				
122	7.1	6.83	**3401**	6.87	**3501**								
		5.63	2731	10.17	5221								
		6.86	**3482**	7.18	**3592**	7.13	**2602**	7.24	**2702**				
		17.89	8547	25.52	12761	62.51	30866	71.1	35087				
109	8	8.1	**3401**	8	**3501**								
		4.85	2792	9.19	5221								
		7.69	**3482**	7.92	**3592**	8.07	**2602**	8.1	**2702**	8.28	**2803A**		
		20.31	10887	33.12	18250	55.55	30908	71.1	39535	86.22	48614		
97	9	8.6	**3482**	9.07	**3592**	9.17	**2602**	8.99	**2702**				
		21.78	13051	33.12	20890	49.19	30788	71.1	44477				
87	10	9.67	**3482**	9.94	**3592**	10	**2602**	10.3	**2702**	10.19	**2803A**		
		20.18	13589	33.12	22902	45.24	31459	67.8	47176	73.66	51113		
78	11.2	10.78	**3482**	11.1	**3592**	11.5	**2602**	11.3	**2702**	11.53	**2803A**		
		18.17	13645	30.16	23310	31.41	24465	62	48251	71.15	55863		

If shaded, mechanical H.P. may exceed thermal H.P. limit.
Refer to page A-164.

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Motor RPM 870 (Continued)

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer											
		0		1			2			3			
70	12.5	12.23	**3012**	12.61	**3122**	12.43	**3132**	12.27	**3242**	12.04	**3252**	12.45	**3362**	12.65	**3372**
		0.92	786	1.42	1252	2.05	1772	2.58	2208	4.68	3923	4.17	3615	8.09	7132
62	14	14.24	**3012**	14.08	**3122**	14.2	**3132**	13.65	**3242**	13.72	**3252**	14.09	**3362**	13.98	**3372**
		0.8	789	1.28	1252	1.8	1777	2.32	2208	4.15	3866	3.68	3615	7.32	7132
54	16	15.35	**3012**	15.79	**3122**	16.03	**3132**	15.36	**3242**	15.82	**3252**	15.33	**3362**	16.05	**3372**
		0.74	790	1.14	1252	1.6	1782	2.06	2208	3.61	3960	3.39	3615	6.38	7132
48	18	18.06	**3012**	18.28	**3122**	17.01	**3132**	18	**3242**	16.9	**3252**	17.33	**3362**	18.08	**3372**
		0.63	793	0.98	1252	1.51	1785	1.76	2208	3.39	3967	3	3615	5.66	7132
44	20	20.24	**3012**	20.07	**3122**	20.2	**3132**	19.87	**3242**	19.18	**3252**	19.95	**3362**	19.64	**3372**
		0.56	794	0.9	1252	1.27	1791	1.6	2208	2.99	3980	2.6	3615	5.21	7132
39	22.4	22.76	**3012**	23.01	**3122**	21.36	**3132**	21.79	**3242**	21.31	**3252**	22.29	**3362**	21.89	**3372**
		0.5	796	0.49	780	1.21	1793	1.45	2208	2.7	3991	2.33	3615	4.68	7132
35	25	25.59	**3012**	25.39	**3122**	24.41	**3132**	25.44	**3242**	24.2	**3252**	24.68	**3362**	24.56	**3372**
		0.45	798	0.49	861	1.06	1798	1.25	2208	2.38	4003	2.1	3615	4.17	7132
31	28	28.85	**3012**			27.25	**3132**			26.93	**3252**			27.8	**3372**
		0.4	799			0.95	1801			2.15	4013			3.68	7132
28	31.5	33.48	**3012**			30.55	**3132**			30.29	**3252**	31.84	**3363**	30.24	**3372**
		0.35	800			0.85	1804			1.91	4023	2.81	6100	3.39	7132
25	35.5	35.73	**3012**			35.37	**3132**			35.51	**3252**	35.18	**3363**	34.18	**3372**
		0.32	800			0.73	1804			1.63	4036	2.54	6100	3	7132
22	40	40.32	**3012**			38.84	**3132**			39.2	**3252**	41.1	**3363**	39.36	**3372**
		0.28	800			0.67	1804			1.48	4038	2.21	6100	2.6	7132
19	45	45.36	**3012**			44.54	**3132**			42.98	**3252**	45.4	**3363**	43.98	**3372**
		0.25	800			0.59	1804			1.35	4038	2	6100	2.33	7132
17	50	49.16	**3013**			49.15	**3132**			50.19	**3252**	52.09	**3363**	48.68	**3372**
		0.24	796			0.52	1804			1.16	4038	1.74	6100	2.1	7132
16	56	55.04	**3013**			57.83	**3133**			55.7	**3253**	57.6	**3363**	57.57	**3373**
		0.21	798			0.46	1804			1.06	4038	1.55	6100	1.88	7389
14	63	64.07	**3013**			65.25	**3133**			64.2	**3253**	66.11	**3363**	66.1	**3373**
		0.18	800			0.4	1804			0.92	4038	1.43	6100	1.64	7389
12	71	69.09	**3013**			69.24	**3133**			68.61	**3253**	74.4	**3363**	74.44	**3373**
		0.17	801			0.38	1804			0.86	4038	1.28	6100	1.5	7611
11	80	81.29	**3013**			82.23	**3133**			77.86	**3253**	80.86	**3363**	80.86	**3373**
		0.14	803			0.32	1804			0.76	4038	1.14	6100	1.38	7611
10	90	91.08	**3013**			86.97	**3133**			86.48	**3253**	90.12	**3363**	90.12	**3373**
		0.13	804			0.3	1804			0.68	4038	1.01	6100	1.24	7611
9	100	102.43	**3013**			99.4	**3133**			98.24	**3253**	101.13	**3363**	101.13	**3373**
		0.12	806			0.27	1804			0.6	4038	0.93	6100	1.1	7611
8	112	115.16	**3013**			110.94	**3133**			109.3	**3253**	114.47	**3363**	114.47	**3373**
		0.1	807			0.24	1804			0.54	4038	0.82	6100	0.97	7611
7	125	129.81	**3013**			124.4	**3133**			122.96	**3253**	124.53	**3363**	124.53	**3373**
		0.09	808			0.16	1380			0.48	4038	0.71	6100	0.89	7611
6.2	140	146.18	**3013**			144.02	**3133**			144.13	**3253**	141	**3363**	140.74	**3373**
		0.08	809			0.15	1438			0.41	4038	0.64	6100	0.79	7611
5.4	160	160.8	**3013**			158.13	**3133**			159.1	**3253**	162.1	**3363**	162.06	**3373**
		0.07	810			0.14	1497			0.37	4038	0.58	6100	0.69	7611
4.8	180	181.46	**3013**			181.32	**3133**			174.46	**3253**	181	**3363**	181.09	**3373**
		0.07	811			0.11	1560			0.34	4038	0.49	6100	0.61	7611
4.4	200	204.14	**3013**			200.11	**3133**			203.72	**3253**	200.44	**3363**	200.44	**3373**
		0.06	812			0.11	1628			0.29	4038	0.45	6100	0.56	7611

Exact ratio	**Gear frame**
Input H.P.	Output torque

Motor RPM 870 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer				Size of CbN 2000 Reducer							
		4		5		6		7		8		9	
70	12.5	12.23	**3482**	12.43	**3592**	12.6	**2602**	12.5	**2702**	13.06	**2803A**		
		16.09	13706	28.2	24410	31.41	27305	56.4	49002	67.8	60297		
62	14	13.5	**3482**	13.98	**3592**	13.9	**2602**	13.9	**2702**	14.82	**2803A**		
		14.62	13752	25.51	24847	31.41	30582	51.1	49727	64.5	65092		
54	16	15.77	**3482**	15.17	**3592**	16.3	**2602**	16.1	**2702**	16.59	**2803A**		
		12.58	13821	24.19	25563	28.3	31483	31.41	34950	61.1	69025		
48	18	17.61	**3482**	17.24	**3592**	18.2	**2602**	18.4	**2702**	18.43	**2803A**		
		11.31	13867	21.82	26206	25.37	31762	31.41	39319	58.6	73424		
44	20	19.77	**3482**	19.07	**3592**	20.6	**2602**	20.6	**2702**	21.13	**2803A**		
		10.1	13914	19.01	25248	22.58	31407	31.41	43688	56.3	80890		
39	22.4	22.37	**3482**	22.06	**3592**	22.2	**2602**	22.3	**2702**	22.14	**2803**	22.1	**2903**
		8.96	13961	17.18	26404	20.98	32686	32.3	50327	56.2	85690	72.1	108439
35	25	25.55	**3482**	24.08	**3592**	25.1	**2602**	25.7	**2702**	25.1	**2803**	25.1	**2903**
		7.87	14008	15.78	26475	18.61	32364	26.1	48906	54.12	92136	71.1	120973
31	28	27.42	**3482**	27.05	**3592**	27.6	**2602**	28	**2702**	28.5	**2803**	28.5	**2903**
		7.35	14033	14.1	26560	16.9	33025	26.1	50838	47.89	91306	71.1	135489
28	31.5	31.9	**3482**	30.14	**3592**	31.6	**2602**	32.4	**2702**	31.8	**2803**	31.8	**2903**
		6.34	14083	12.69	26634	14.9	32621	22.45	49178	42.94	92106	69.3	148627
25	35.5	34.62	**3482**	34.18	**3592**	35.5	**2603**	35.5	**2703**	35.4	**2803**	35.4	**2903**
		5.85	14108	11.22	26717	14.09	34072	21.82	52745	38.77	93723	62.6	151266
22	40	38.24	**3482**	39.23	**3592**	39.5	**2603**	40	**2703**	40.6	**2803**	40.6	**2903**
		5.31	14138	9.81	26802	12.41	33801	19.21	52337	33.94	92439	54.8	149231
19	45	42.46	**3482**	42.67	**3592**	45.2	**2603**	45.2	**2703**	44.6	**2803**	44.6	**2903**
		4.79	14169	9.04	26855	10.86	33284	16.82	51547	30.94	94816	50	153093
17	50	50.34	**3482**	49.71	**3592**	49.7	**2603**	49.7	**2703**	49.2	**2803**	49.2	**2903**
		4.05	14215	7.78	26941	9.9	33701	15.33	52202	28.11	95710	45.4	154562
16	56	54.71	**3483**	56.63	**3593**	54.9	**2603**	54.9	**2703**	56	**2803**	56	**2903**
		3.81	14236	6.92	26776	8.98	34260	13.92	53074	25.43	96969	41.1	156622
14	63	63.93	**3483**	61.44	**3593**	64.3	**2603**	64.3	**2703**	63.4	**2803**	63.4	**2903**
		3.27	14274	6.44	27053	7.7	33022	11.93	51168	21.95	94175	31.4	134750
12	71	71.36	**3483**	69.82	**3593**	71.9	**2603**	71.9	**2703**	72.3	**2803**	72.3	**2903**
		2.93	14299	5.68	27115	6.89	33316	10.68	51632	19.3	93335	31.2	150815
11	80	80.13	**3483**	77.24	**3593**	81.1	**2603**	81.1	**2703**	80.9	**2803**	80.9	**2903**
		2.62	14324	5.15	27162	6.12	33351	9.49	51693	17.26	94125	27.9	152115
10	90	90.66	**3483**	89.35	**3593**	87.5	**2603**	87.5	**2703**	87.6	**2803**	90	**2903**
		2.32	14349	4.46	27227	5.68	34827	8.61	53986	15.98	97925	25.8	158272
9	100	103.54	**3483**	97.53	**3593**	99	**2603**	99	**2703**	101	**2803**	101	**2903**
		2.03	14375	4.09	27260	5.03	34275	7.8	53138	13.89	94570	22.5	152877
8	112	111.11	**3483**	109.55	**3593**	109	**2603**	109	**2703**	112	**2803**	112	**2903**
		1.89	14388	3.65	27304	4.58	34932	7.1	54162	12.88	98216	20.8	158786
7	125	129.28	**3483**	122.06	**3593**	124	**2603**	124	**2703**	128	**2803**	128	**2903**
		1.63	14415	3.28	27348	4.01	34175	6.23	52997	11.05	94092	17.9	152145
6.2	140	140.31	**3483**	138.42	**3593**	137	**2603**	140	**2703**				
		1.5	14428	2.9	27395	3.65	34787	5.66	53950				
5.4	160	154.98	**3483**	158.87	**3593**	159	**2603**	159	**2703**				
		1.36	14444	2.53	27442	3.16	34414	4.9	53379				
4.8	180	172.09	**3483**	172.82	**3593**								
		1.23	14460	2.33	27463								
4.4	200	203.99	**3483**	201.34	**3593**								
		1.04	14485	2	27510								

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning®

Speed Reducers

Combined - Motor RPM 1750

CbN SERIES 2000 3000

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer								Size of CbN 2000 Reducer							
		2		3		4		5		6		7		8		9	
12.5	140													136.8	**2805A**	150.7	**2905A**
														19.956	88500	29.169	142500
10.9	160													168.3	**2805A**	168.6	**2905A**
														16.222	88500	26.082	142500
9.7	180									179.6	**2604A**	186.3	**2704A**	189.1	**2805A**	189.1	**2905A**
										5.294	31500	7.97	49200	14.44	88500	23.249	142500
8.8	200									206.1	**2604A**	205.4	**2704A**	210.9	**2805A**	192.9	**2905A**
										4.613	31500	7.231	49200	12.944	88500	22.786	142500
7.8	224	223.5	**3254**	223.2	**3374**	229.4	**3484**	228.2	**3594**	227.8	**2604A**	226.9	**2704A**	239.2	**2805A**	218.9	**2905A**
		0.545	4038	0.964	7132	1.869	14206	3.556	26890	4.174	31500	6.546	49200	11.415	88500	20.08	142500
7	250	247.2	**3254**	246.8	**3374**	241.5	**3484**	258.3	**3594**	261.5	**2604A**	260.3	**2704A**	264.1	**2805A**	245	**2905A**
		0.493	4038	0.872	7132	1.775	14206	3.142	26890	3.636	31500	5.705	49200	10.339	88500	18.713	148600
6.3	280	260.2	**3254**	259.8	**3374**	273.4	**3484**	291.5	**3594**	294.5	**2604A**	287.7	**2704A**	308.6	**2805A**	274	**2905A**
		0.468	4038	0.829	7132	1.568	14206	2.784	26890	3.229	31500	5.162	49200	8.849	88500	16.733	148600
5.6	315	308.9	**3254**	308.4	**3374**	308.5	**3484**	329.7	**3594**	319.9	**2604A**	330.3	**2704A**	344.4	**2805A**	307.8	**2905A**
		0.395	4038	0.698	7132	1.39	14206	2.462	26890	2.972	31500	4.496	49200	7.928	88500	14.894	148600
4.9	355	330.8	**3254**	330.2	**3374**	349	**3484**	374.5	**3594**	356.5	**2604A**	372	**2704A**	386.8	**2805A**	343.4	**2905A**
		0.368	4038	0.652	7132	1.229	14206	2.167	26890	2.667	31500	3.992	49200	7.059	88500	13.351	148600
4.4	400	370.4	**3254**	369.8	**3374**	396.5	**3484**	428	**3594**	400.1	**2604A**	404	**2704A**	437.6	**2805A**	389.4	**2905A**
		0.329	4038	0.582	7132	1.081	14206	1.896	26890	2.376	31500	3.675	49200	6.239	88500	11.774	148600
3.9	450	431.3	**3254**	430.6	**3374**	453	**3484**	483.1	**3594**	452.8	**2604A**	450.3	**2704A**	499.7	**2805A**	429.9	**2905A**
		0.283	4038	0.5	7132	0.946	14206	1.68	26890	2.099	31500	3.298	49200	5.464	88500	10.665	148600
3.5	500	465	**3254**	464.2	**3374**	511.4	**3484**	512.7	**3594**	492.6	**2604A**	505.3	**2704A**	536.3	**2805A**	502.3	**2905A**
		0.262	4038	0.464	7132	0.838	14206	1.583	26890	1.93	31500	2.938	49200	5.091	88500	9.127	148600
3.1	560	547	**3254**	546.1	**3374**	542.6	**3484**	608.8	**3594**	556.7	**2604A**	572	**2704A**	624	**2805A**	560.7	**2905A**
		0.223	4038	0.394	7132	0.79	14206	1.333	26890	1.708	31500	2.596	49200	4.376	88500	8.177	148600
2.8	630	613.1	**3254**	612.1	**3374**	644.4	**3484**	643.8	**3594**	641.1	**2604A**	622.2	**2704A**	677.3	**2805A**	629.6	**2905A**
		0.199	4038	0.352	7132	0.665	14206	1.261	26890	1.483	31500	2.386	49200	4.032	88500	7.282	148600
2.5	710	689.4	**3254**	688.3	**3374**	681.4	**3484**	735.7	**3594**	716.3	**2604A**	703.2	**2704A**	748.1	**2805A**	712.4	**2905A**
		0.177	4038	0.313	7132	0.629	14206	1.103	26890	1.327	31500	2.112	49200	3.65	88500	6.436	148600
2.2	800	775.1	**3254**	773.8	**3374**	778.7	**3484**	821.3	**3594**	792.9	**2604A**	809.8	**2704A**	830.7	**2805A**	813.5	**2905A**
		0.157	4038	0.278	7132	0.551	14206	0.988	26890	1.199	31500	1.834	49200	3.287	88500	5.636	148600
1.9	900	873.9	**3254**	872.4	**3374**	869.3	**3484**	920.8	**3594**	927	**2605A**	904.8	**2704A**	873	**2805A**	873	**2905A**
		0.139	4038	0.247	7132	0.493	14206	0.881	26890	1.048	31500	1.641	49200	3.255	92100	5.252	148600
1.8	1000	983.8	**3254**	982.2	**3374**	974.5	**3484**	1066.1	**3594**	1076.7	**2605A**	1001.6	**2704A**	1015.8	**2805A**	1015.8	**2905A**
		0.124	4038	0.219	7132	0.44	14206	0.761	26890	0.903	31500	1.483	49200	2.797	92100	4.513	148600
1.6	1120	1082.3	**3254**	1080.5	**3374**	1128.3	**3484**	1170.6	**3594**	1212.5	**2605A**	1184.6	**2705A**	1102.5	**2805A**	1102.5	**2905A**
		0.113	4038	0.199	7132	0.38	14206	0.693	26890	0.802	31500	1.328	51000	2.577	92100	4.158	148600
1.4	1250	1221.3	**3254**	1219.3	**3374**	1239	**3484**	1342.4	**3594**	1317.1	**2605A**	1360.1	**2705A**	1217.7	**2805A**	1217.7	**2905A**
		0.1	4038	0.177	7132	0.346	14206	0.605	26890	0.738	31500	1.157	51000	2.333	92100	3.765	148600

Exact ratio	**Gear frame**
Input H.P.	Output torque

Combined - Motor RPM 1750 (Continued)

Exact Ratio rpm, HP and Torque

rpm	Nom. Ratio	Size of CbN 3000 Reducer															
		2		3		4		5		6		7		8		9	
1.3	1400	1374	**3255**	1371.7	**3375**	1420.8	**3484**	1481.4	**3594**	1467.8	**2605A**	1531.6	**2705A**	1352.2	**2805A**	1352.2	**2905A**
		0.091	4038	0.171	7611	0.302	14206	0.548	26890	0.662	31500	1.027	51000	2.101	92100	3.391	148600
1.1	1600	1498.6	**3255**	1555.6	**3375**	1567.9	**3484**	1536.3	**3595**	1647.3	**2605A**	1663.7	**2705A**	1602.8	**2805A**	1602.8	**2905A**
		0.083	4038	0.151	7611	0.273	14206	0.554	27563	0.59	31500	0.946	51000	1.773	92100	2.86	148600
0.97	1800	1779.5	**3255**	1847.1	**3375**	1695.5	**3485**	1738	**3595**	1864.6	**2605A**	1854.1	**2705A**	1742.1	**2806A**	1742.1	**2906A**
		0.07	4038	0.127	7611	0.264	14507	0.489	27563	0.521	31500	0.849	51000	1.668	92100	2.691	148600
0.88	2000	1905.1	**3255**	1977.5	**3375**	1926.4	**3485**	1974.8	**3595**	2028.4	**2605A**	2080.8	**2705A**	1984	**2806A**	2035.7	**2906A**
		0.065	4038	0.119	7611	0.232	14507	0.431	27563	0.479	31500	0.756	51000	1.465	92100	2.303	148600
0.78	2240	2133.6	**3255**	2214.7	**3375**	2200.7	**3485**	2256	**3595**	2292.4	**2605A**	2355.3	**2705A**	2272.1	**2806A**	2272.2	**2906A**
		0.058	4038	0.106	7611	0.203	14507	0.377	27563	0.424	31500	0.668	51000	1.279	92100	2.064	148600
0.7	2500	2484.3	**3255**	2578.7	**3375**	2484.3	**3485**	2546.7	**3595**	2639.7	**2605A**	2562.2	**2705A**	2551.6	**2806A**	2551.6	**2906A**
		0.05	4038	0.091	7611	0.18	14507	0.334	27563	0.368	31500	0.614	51000	1.139	92100	1.838	148600
0.63	2800	2678	**3255**	2779.7	**3375**	2636.2	**3485**	2702.4	**3595**	2949.6	**2605A**	2895.6	**2705A**	2886.9	**2806A**	2887	**2906A**
		0.047	4038	0.084	7611	0.17	14507	0.315	27563	0.329	31500	0.543	51000	1.007	92100	1.624	148600
0.56	3150	3150.7	**3255**	3270.5	**3375**	3130.6	**3485**	3209.2	**3595**	3264.9	**2605A**	3334.3	**2705A**	3296.8	**2806A**	3296.9	**2906A**
		0.04	4038	0.072	7611	0.143	14507	0.265	27563	0.298	31500	0.472	51000	0.881	92100	1.422	148600
0.49	3550	3531.1	**3255**	3665.3	**3375**	3310.4	**3485**	3393.5	**3595**	3556.2	**2606A**	3725.8	**2705A**	3537.9	**2806A**	3538	**2906A**
		0.035	4038	0.064	7611	0.135	14507	0.251	27563	0.3	33800	0.422	51000	0.821	92100	1.325	148600
0.44	4000	3970.7	**3255**	4121.6	**3375**	3783.1	**3485**	3878	**3595**	4085.6	**2606A**	4124.1	**2705A**	4116.5	**2806A**	4116.6	**2906A**
		0.031	4038	0.057	7611	0.118	14507	0.219	27563	0.265	34260	0.382	51000	0.706	92100	1.139	148600
0.39	4500	4464.4	**3255**	4634.1	**3375**	4223.2	**3485**	4329.2	**3595**	4437.9	**2606A**	4437.9	**2706A**	4467.8	**2806A**	4467.9	**2906A**
		0.028	4038	0.051	7611	0.106	14507	0.196	27563	0.244	34260	0.378	53100	0.65	92100	1.049	148600
0.35	5000	5033.2	**3255**	5224.4	**3375**	4734.6	**3485**	4853.5	**3595**	4946	**2606A**	4946	**2706A**	4934.9	**2806A**	4935	**2906A**
		0.025	4038	0.045	7611	0.095	14507	0.175	27563	0.219	34260	0.339	53100	0.589	92100	0.95	148600
0.31	5600	5666.5	**3255**	5881.8	**3375**	5481.6	**3485**	5619.2	**3595**	5550.8	**2606A**	5550.8	**2706A**	5479.8	**2806A**	5479.9	**2906A**
		0.022	4038	0.04	7611	0.082	14507	0.151	27563	0.195	34260	0.302	53100	0.53	92100	0.856	148600
0.28	6300	6233.5	**3255**	6470.3	**3375**	6019.4	**3485**	6170.5	**3595**	6282.9	**2606A**	6282.9	**2706A**	6495.5	**2806A**	6495.7	**2906A**
		0.02	4038	0.036	7611	0.074	14507	0.138	27563	0.172	34260	0.267	53100	0.447	92100	0.722	148600
0.25	7100	7034.2	**3255**	7301.6	**3375**	6904.4	**3485**	7077.7	**3595**	6834.8	**2606A**	6834.8	**2706A**	6911.6	**2806A**		
		0.018	4038	0.032	7611	0.065	14507	0.12	27563	0.158	34260	0.245	53100	0.433	94800		
0.22	8000	7913.5	**3255**	8214.2	**3375**	7617.3	**3485**	7808.5	**3595**	7724.3	**2606A**	7724.3	**2706A**	7674.8	**2806A**		
		0.016	4038	0.029	7611	0.059	14507	0.109	27563	0.14	34260	0.217	53100	0.39	94800		
0.19	9000	8576.5	**3256**	8982.1	**3376**	8891.1	**3486**	8876.4	**3596**	8894.6	**2606A**	8894.6	**2706A**	9097.4	**2806A**		
		0.015	4038	0.027	7611	0.051	14401	0.097	27333	0.122	34260	0.188	53100	0.329	94800		
0.18	10000	9602.3	**3256**	9967.2	**3376**	9932.4	**3486**	9912.3	**3596**	9938.9	**2606A**	9938.9	**2706A**				
		0.013	4038	0.024	7611	0.046	14401	0.087	27333	0.109	34260	0.169	53100				

Exact ratio	**Gear frame**
Input H.P.	Output torque

Browning

Speed Reducers

Thermal Power Rating (Pt)

CbN SERIES 2000 3000

Nominal Ratio	Reducer Size				
	5	6	7	8	9
	Pt (hp)	Pt (hp)	Pt (hp)	Pt (hp)	Pt (hp)
3.15	-	65	84	-	-
3.55	-	65	84	-	-
4	46	65	84	-	-
4.5	46	65	83	-	-
5	46	65	83	-	-
5.6	46	65	83	-	-
6.3	46	65	83	-	-
7.1	45	64	83	-	-
8	45	64	82	95	-
9	44	64	80	95	-
10	43	63	78	95	-
11.2	43	62	76	95	-
12.5	43	60	76	95	-
14	43	59	76	95	-
16	43	-	-	95	-
18	-	-	-	70	-
20	-	-	-	70	-
22.4	-	-	-	70	105
25	-	-	-	70	105
28	-	-	-	70	105
31.5	-	-	-	70	105
35.5	-	-	-	70	105
40	-	-	-	-	105

Gear Modifications

G11 Corro-Duty

Corro-Duty® gear reducers are designed for applications in food processing, chemical, poultry and any other industries that will be subjected to extreme humidity, washdown, steam, detergents, and mild acids. Construction of the Corro-Duty reducer includes the normally closed breather in the gear case. The exterior of the entire unit is then painted in one of the two options chosen at order entry:

Option #1 - Corro-Duty grey
- 3 step paint system using 316 stainless steel paint
- Light grey semigloss finish
- USDA and FDA approved

Option #2 - Corro-Duty white
- 2 step paint system using epoxy paint
- White gloss finish
- USDA and FDA approved

G12a Foodgrade Synthetic Lubricant

When this modification is specified, the CbN oil sump is filled with the required volume of an FDA approved H1 rated synthetic lubricant for helical gearing (Refer to page A-244).

G12b Washdown FG Service Reducer

When this modification is specified, a reducer will be built with all the features detailed above under G11 and G12a. When ordering, state the paint finish that is to be provided.

G15 Export Boxing

Export boxing can be provided for “under-deck” transport. When the quantity of HWN gearmotors or reducers exceeds five (5) units, refer to international sales for most economical accommodations.

G16 Extra or Special Nameplate

Units can be provided with limited additional special information on the standard product nameplate. When required, an extra nameplate may be provided, stamped with custom markings.

Accessories

The following accessories can be ordered along with reducer and will be supplied loose for mounting by others

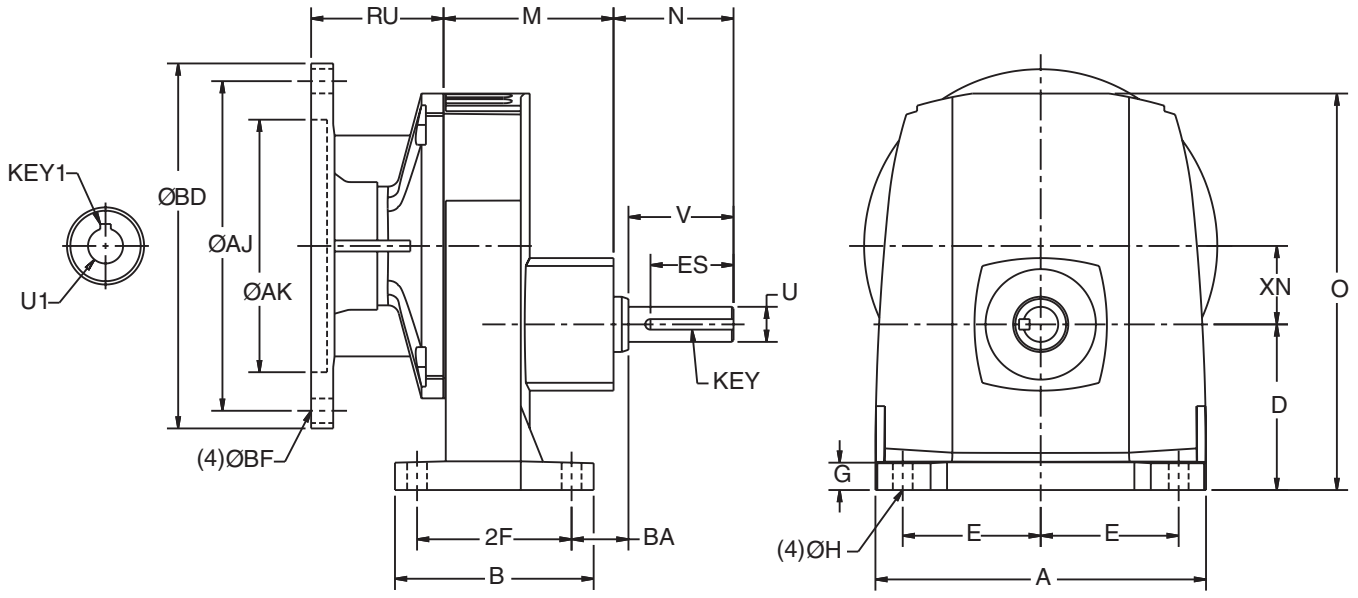
Description	Gear Frames	Part #
NPT Adapter (1/4” NPFT)	31 to 35	0436216
NPT Adapter (3/4” NPFT)	26 to 29	0436218
Oil Level View Port	31 to 35	0435936
	26 to 29	0435938
Scoop Guard Kit (scoop mount reducers)	32 to 35	0965634
	26/27 to 280T	0965635
	26/27 w/ 320T	0965637
	28/29 to 280T	0965636
	28/29 w/ 320T	0965637
	28/29 w/ 360T	0965638
	26 - 29 Comb.	0965634

Browning®

C-Face Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
30	5.90	3.54	2.95	2.46	0.49	0.35	3.03	2.14	7.07	0.63	1.88	1.01	2.76	1.48	1.40	3/16 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	3.33	0.44	4.50	6.50	0.625	3/16 Sq.
140TC [4]	5.875	3.33	0.44	4.50	6.50	0.875	3/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

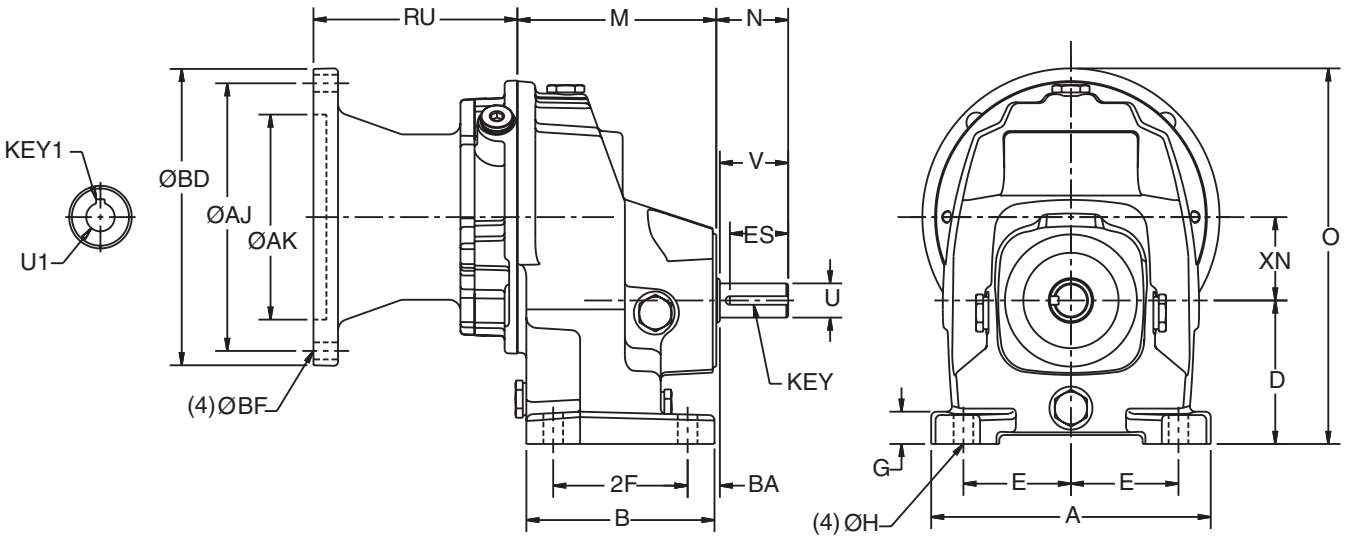
[4] Not available in ratios 5.6 through 8:1.

Browning

C-Face Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
31	6.14	4.13	3.15	2.36	0.71	0.43	4.37	1.58	8.24	0.75	1.50	0.71	2.95	1.28	1.83	3/16 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC [4]	7.250	6.20	0.57	8.50	9.00	1.125	1/4 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

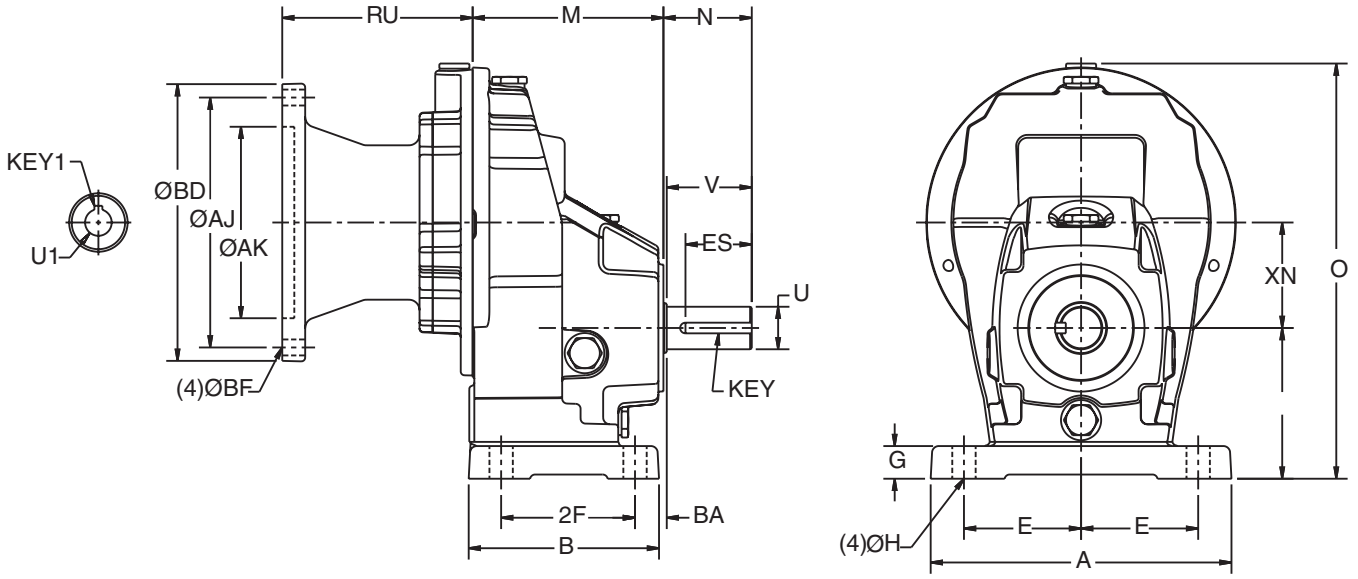
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning

C-Face Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
32	7.08	4.48	3.54	2.76	0.77	0.55	4.49	2.08	9.76	1.00	2.00	0.75	3.15	1.56	2.48	1/4 Sq.

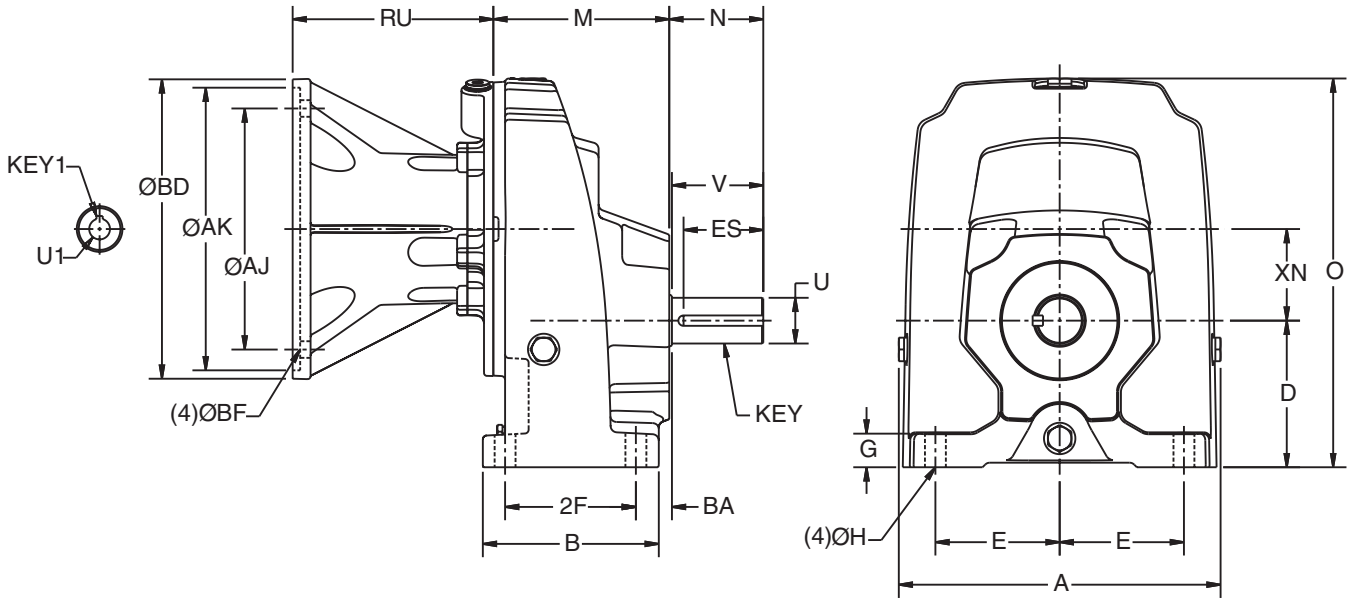
Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.250	6.20	0.57	8.50	9.00	1.125	1/4 Sq.
210TC[4]	7.250	6.20	0.57	8.50	9.00	1.375	5/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
33	9.69	5.30	4.41	3.74	1.00	0.63	5.30	2.83	11.69	1.38	2.75	1.09	3.94	2.40	2.76	5/16 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.32	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.32	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.25	6.04	0.57	8.50	9.00	1.125	1/4 Sq.
210TC [4]	7.25	6.04	0.57	8.50	9.00	1.375	5/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

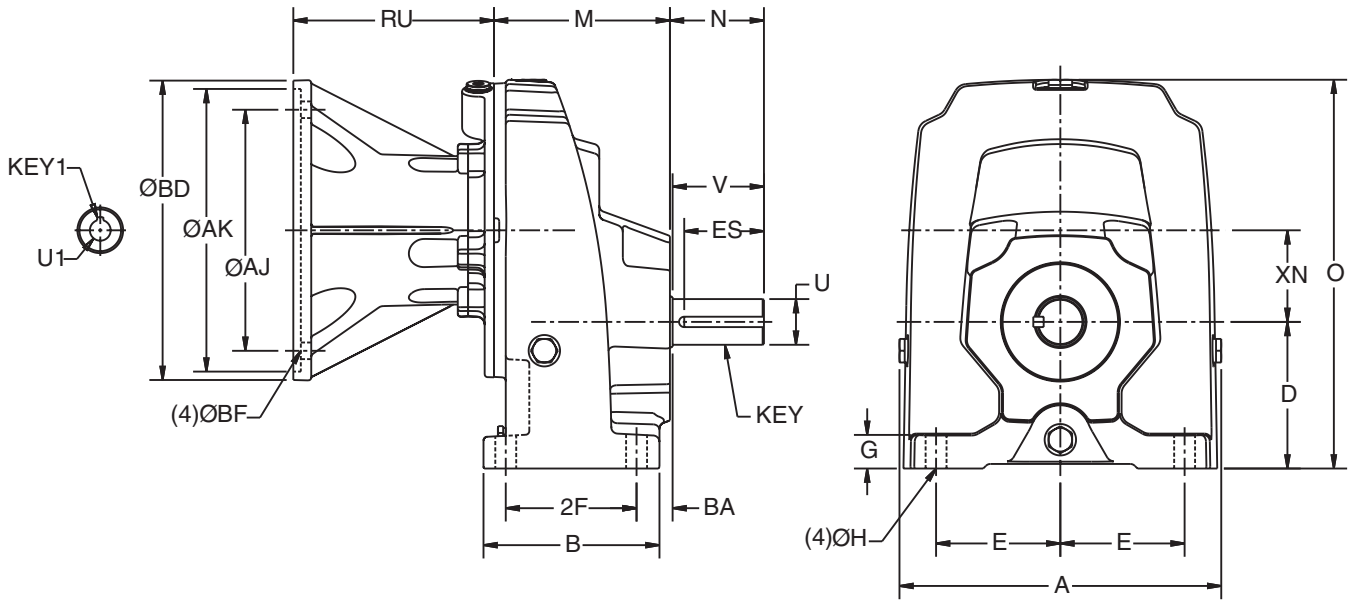
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning®

C-Face Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
34	11.02	6.59	5.20	4.25	1.34	0.71	6.26	3.06	13.90	1.50	3.00	1.10	4.92	2.56	3.43	3/8 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
182/184TC	7.25	6.22	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.25	6.22	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.25	7.43	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC[4]	9.00	8.40	0.57	10.50	11.25	1.875	1/2 Sq.

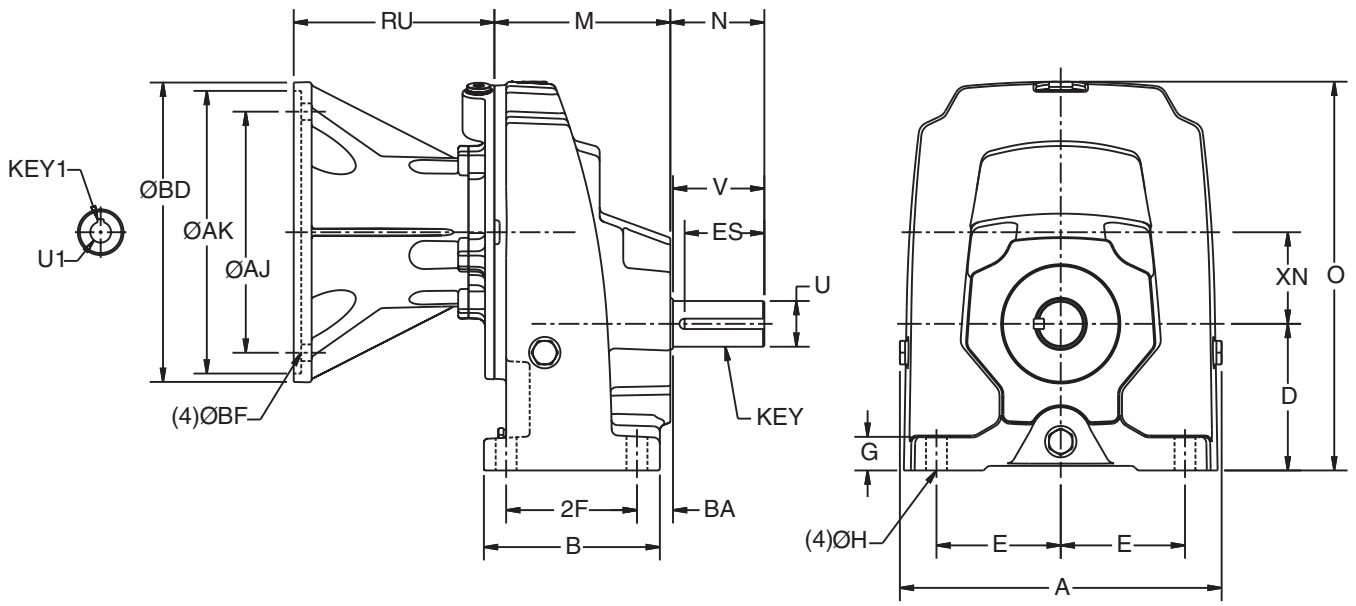
[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Foot Mounted - Single Reduction



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
35	13.65	7.76	6.30	5.12	1.61	0.79	6.83	3.56	17.37	1.75	3.50	1.18	6.30	3.06	4.33	3/8 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
213/215TC	7.25	5.87	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.25	7.09	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC[4]	9.00	8.06	0.57	10.50	11.25	1.875	1/2 Sq.
324/326TC[4]	11.00	8.79	0.69	12.50	13.38	2.125	1/2 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

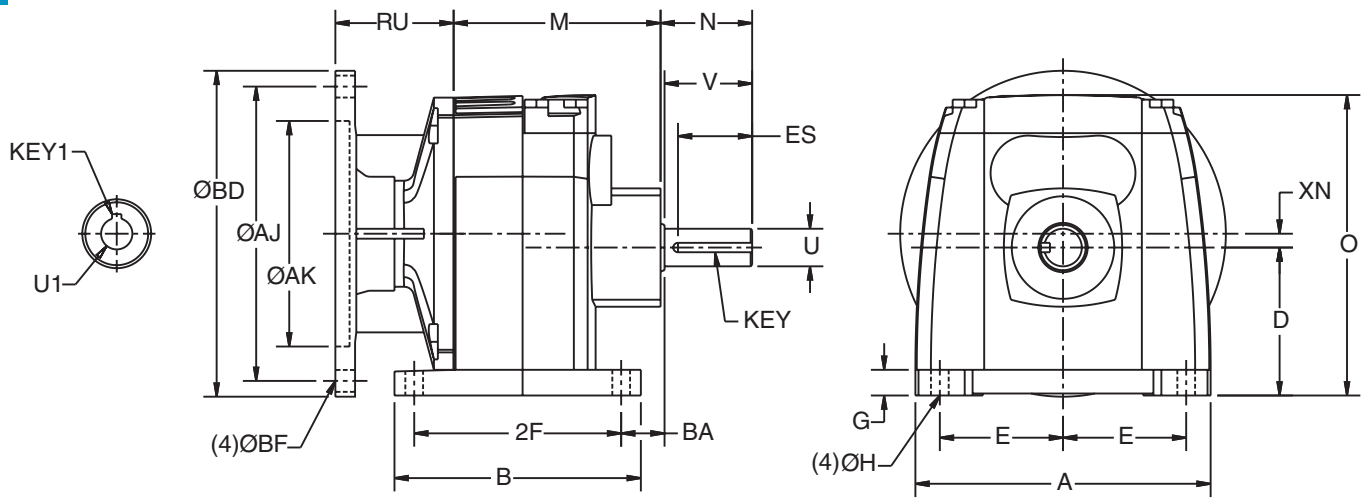
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning

C-Face Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
3012	5.90	4.92	2.95	2.46	0.51	0.35	4.13	1.83	6.00	0.75	1.75	0.87	4.13	1.48	0.28	3/16 Sq.
3013	5.90	5.71	2.95	2.46	0.51	0.35	4.92	1.83	6.00	0.75	1.75	0.87	4.92	1.48	0.28	3/16 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	3.33	0.44	4.50	6.50	0.625	3/16 Sq.
140TC [4]	5.875	3.33	0.44	4.50	6.50	0.875	3/16 Sq.

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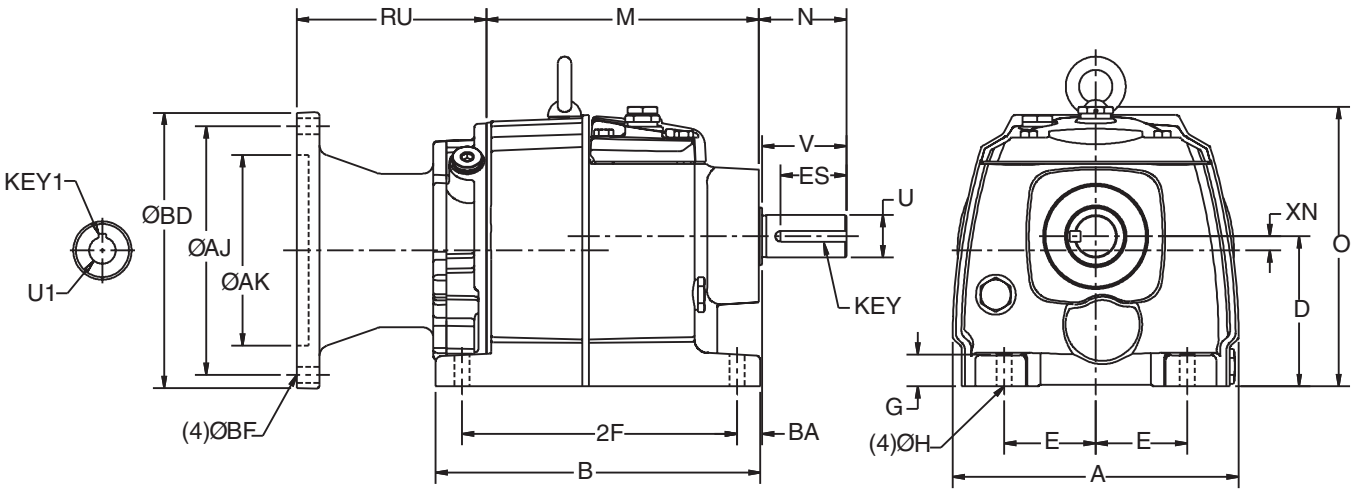
[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Not available for ratio 31.5 to 45:1 in 3012. Use 3013 for 35.5 to 45:1.

Foot Mounted - Double/Triple Reduction



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
31	6.76	7.68	3.54	2.17	0.75	0.35	6.44	2.08	6.60	1.00	2.00	0.59	6.50	1.56	0.33	1/4 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.88	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.88	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC [4]	7.25	6.20	0.57	8.50	9.00	1.125	1/4 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

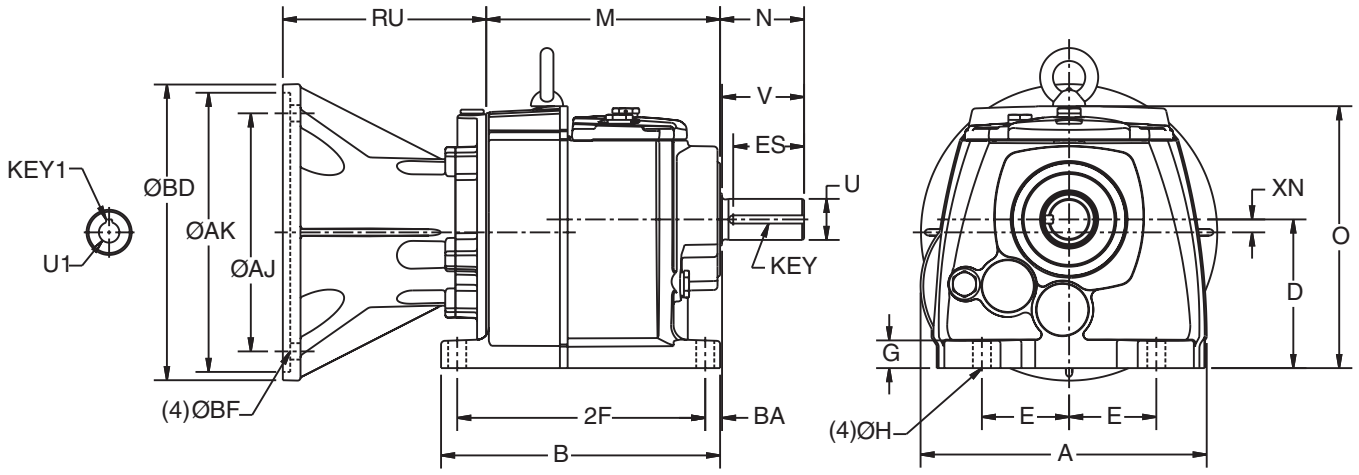
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning

C-Face Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
32	8.72	8.50	4.53	2.66	0.84	0.55	7.13	2.56	7.97	1.25	2.50	0.51	7.56	2.16	0.39	1/4 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.25	6.20	0.57	8.50	9.00	1.125	1/4 Sq.
210TC [4]	7.25	6.20	0.57	8.50	9.00	1.375	5/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

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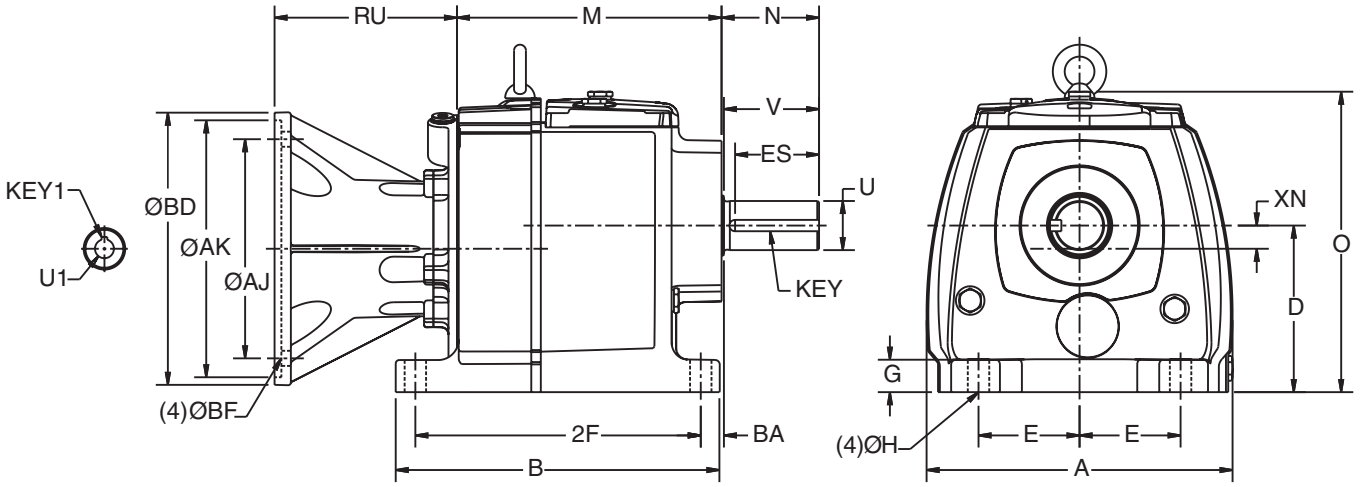
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Foot Mounted - Double/Triple Reduction



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
3362,3363	10.13	10.72	5.51	3.35	1.07	0.71	8.76	3.08	9.94	1.50	3.00	0.77	9.45	2.56	0.77	3/8 Sq.
3372,3373	10.13	10.72	5.51	3.35	1.07	0.71	8.76	3.23	9.94	1.63	3.15	0.77	9.45	2.78	0.77	3/8 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.32	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.32	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.25	6.04	0.57	8.50	9.00	1.125	1/4 Sq.
210TC	7.25	6.04	0.57	8.50	9.00	1.375	5/16 Sq.

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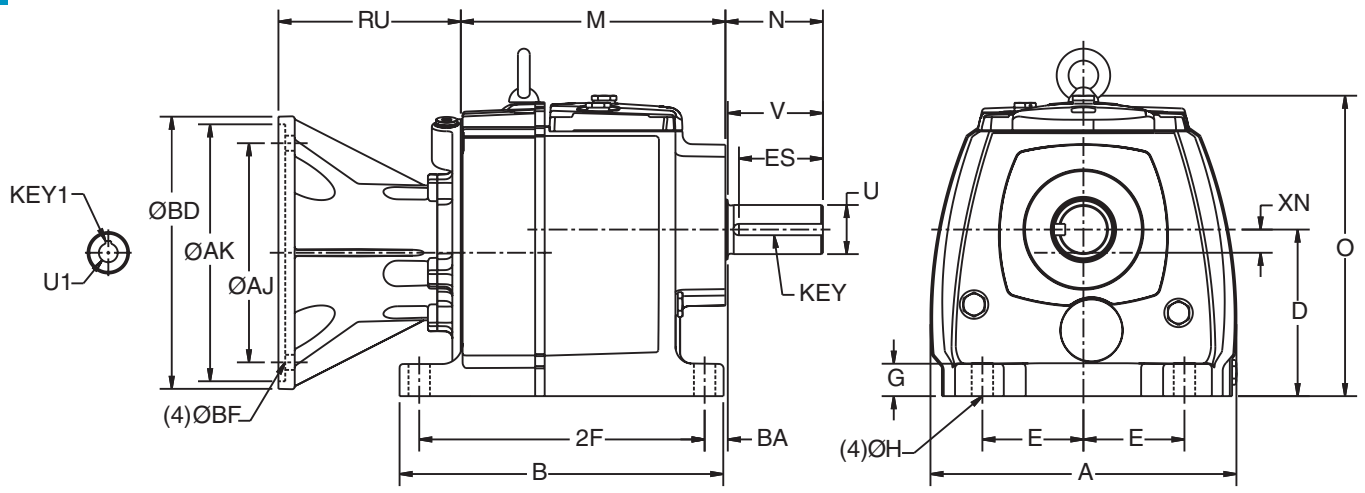
Browning

C-Face Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
34	11.97	10.87	7.09	4.53	1.37	0.71	9.80	3.58	11.89	2.13	3.50	0.98	9.25	3.06	1.02	1/2 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.50	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	5.875	4.50	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	7.250	6.22	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.250	6.22	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.250	7.43	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC[4]	9.000	8.40	0.57	10.50	11.25	1.875	1/2 Sq.

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[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

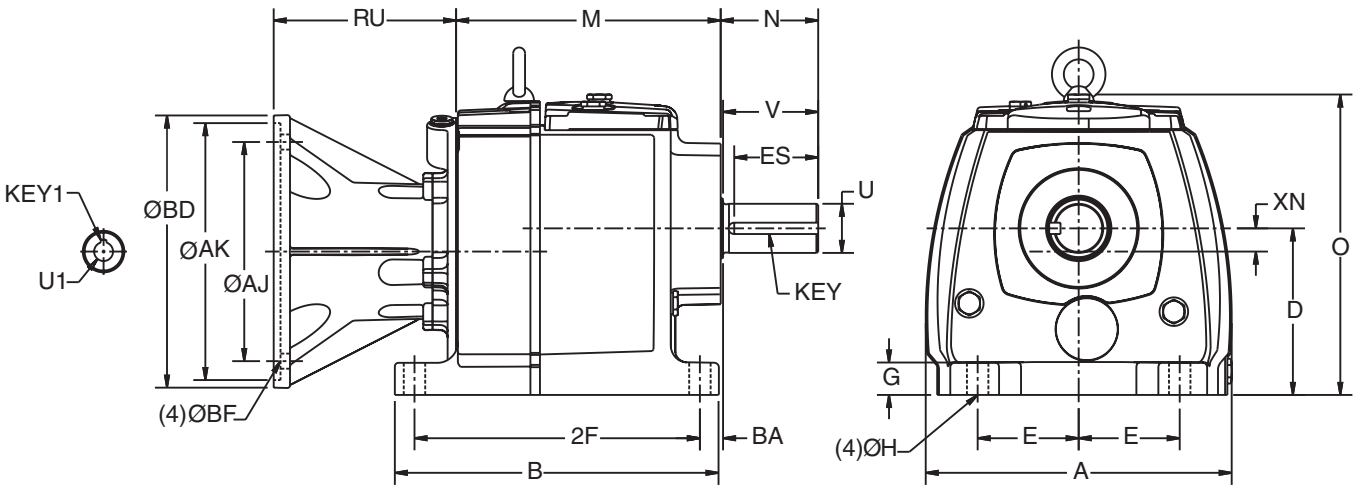
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning®

C-Face Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
35	14.19	12.89	8.86	5.51	1.73	0.87	11.34	4.81	14.84	2.38	4.72	1.10	11.02	4.15	1.14	5/8 Sq.

Motor Frame	AJ	RU	BF	AK	BD	U1	Key1
56C	5.875	4.14	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	5.875	4.14	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	7.250	5.87	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.250	5.87	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.250	7.09	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC	9.000	8.06	0.57	10.50	11.25	1.875	1/2 Sq.
324/326TC[4]	11.000	8.79	0.69	12.50	13.38	2.125	1/2 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

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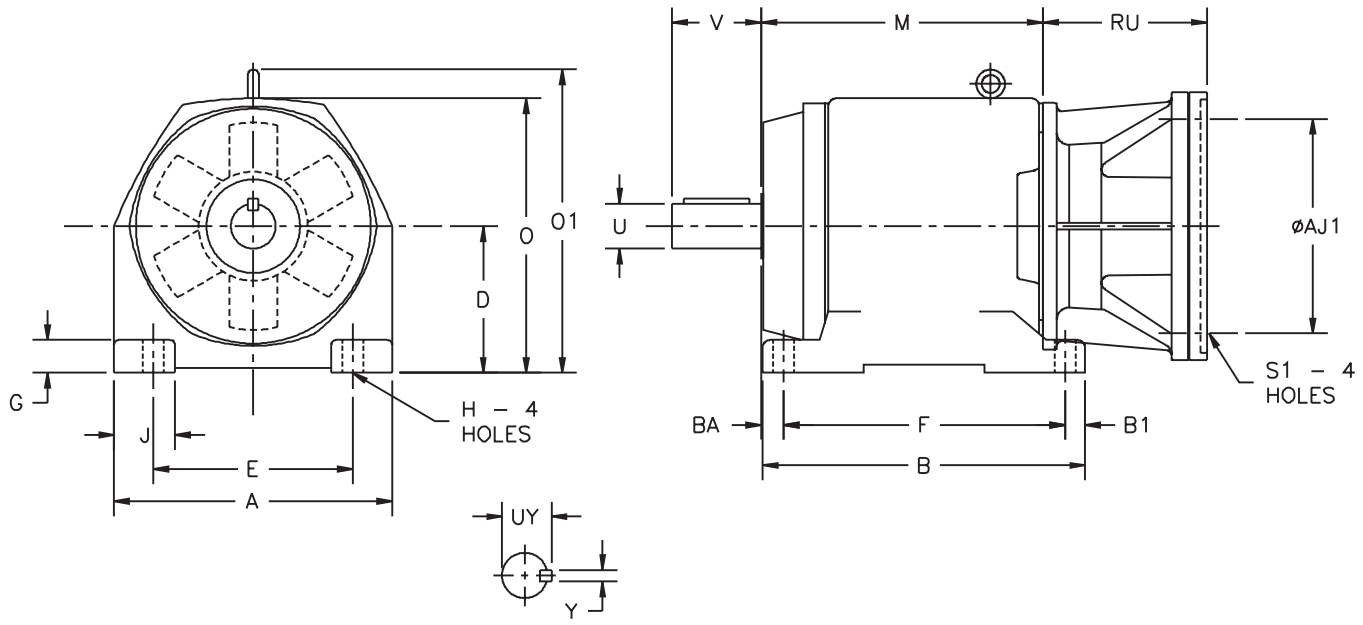
[4] Use foot mounted motor, utilizing separate support of motor feet for this motor frame.

Browning

C-Face Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D	E	F	G	H	J	M	O	O1	U [3]	V	Y	BA	UY	Weight Lb.
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	14.92	16.78	18.9	2.875	5.75	3/4	2.36	3.2	264
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	16.3	18.5	21.06	3.5	7	7/8	2.56	3.882	363
28	23.62	21.65	1.38	12.4	20.08	18.9	2.56	1.02	4.92	19.88	23.47	25.59	4	8	1	3.35	4.436	660
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.30	23.62	27.6	29.72	4.75	9.5	1 1/4	2.36	5.291	1045

Motor Frame	RU				S1	AJ1
	N26	N27	N28	N29		
182 - 184TC	8.18	8.18	-	-	0.500	7.250
213 - 215TC	8.18	8.18	7.91	7.91	0.500	7.250
254 - 256TC	8.18	8.18	7.91	7.91	0.500	7.250
284 - 286TC	9.15	9.15	8.88	8.88	0.500	9.000
324 - 326TC	9.61	9.61	9.61	9.61	0.625	11.000

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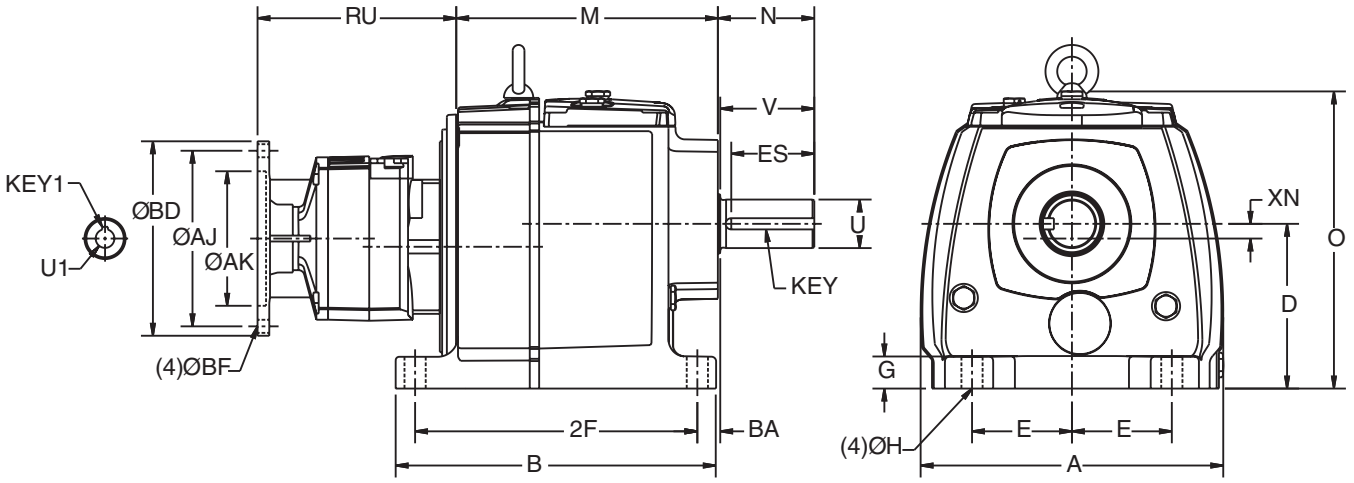
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

C-Face Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
32	8.72	8.50	4.53	2.66	0.84	0.55	7.13	2.56	7.97	1.25	2.50	0.51	7.56	2.16	0.39	1/4 Sq.
33	10.13	10.72	5.51	3.35	1.07	0.71	8.76	3.23	9.94	1.63	3.15	0.77	9.45	2.78	0.49	3/4 Sq.

Motor Frame	RU	AJ	BF	AK	BD	U1	Key1
56C	7.79	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	7.79	5.875	0.44	4.50	6.50	0.875	3/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

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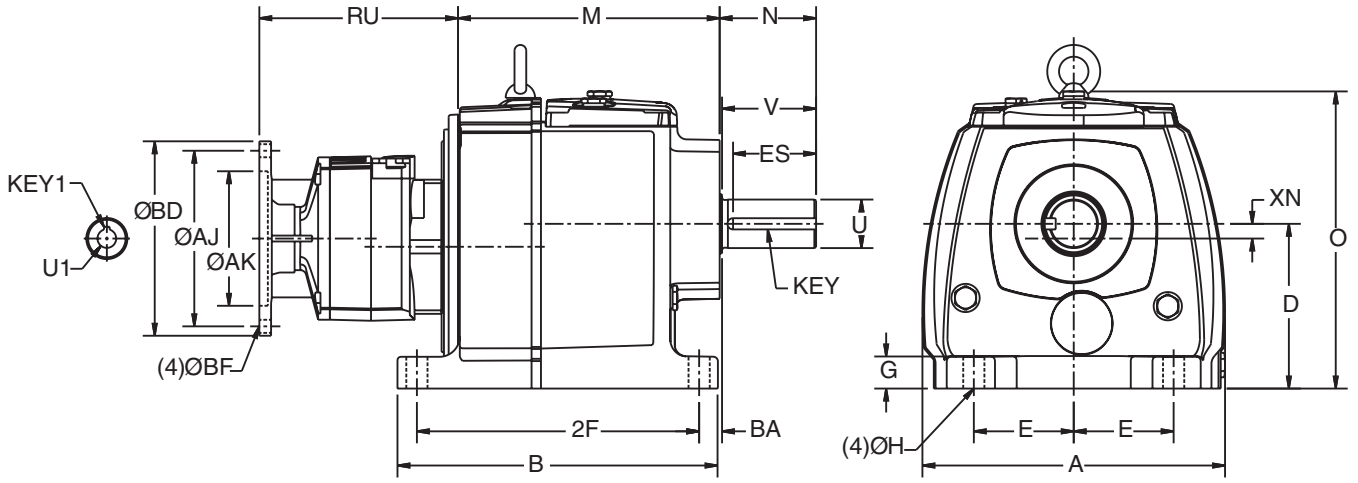
Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
34	11.97	10.87	7.09	4.53	1.37	0.71	9.80	3.58	11.89	2.13	3.50	0.98	9.25	3.12	1.35	1/2 Sq.

Motor Frame	RU	AJ	BF	AK	BD	U1	Key1
56C	11.46	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	11.46	5.875	0.44	4.50	6.50	0.875	3/16 Sq.

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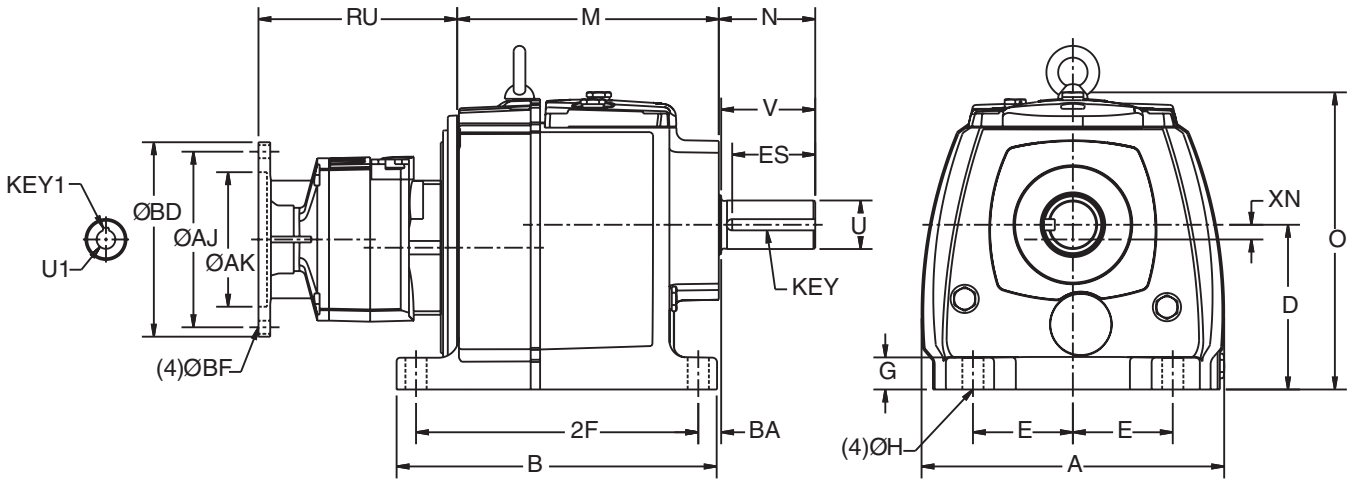
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Foot Mounted - Combined Reduction



Gear Frame	A	B	D [1]	E	G	H	M	N	O	U [3]	V	BA	2F	ES	XN	Key
35	14.19	12.89	8.86	5.51	1.73	0.87	11.34	4.81	14.84	2.38	4.72	1.10	11.02	4.19	1.47	5/8 Sq.

Motor Frame	RU	AJ	BF	AK	BD	U1	Key1
56C	11.11	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	11.11	5.875	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	12.83	7.25	0.57	8.50	9.00	1.125	1/4 Sq.

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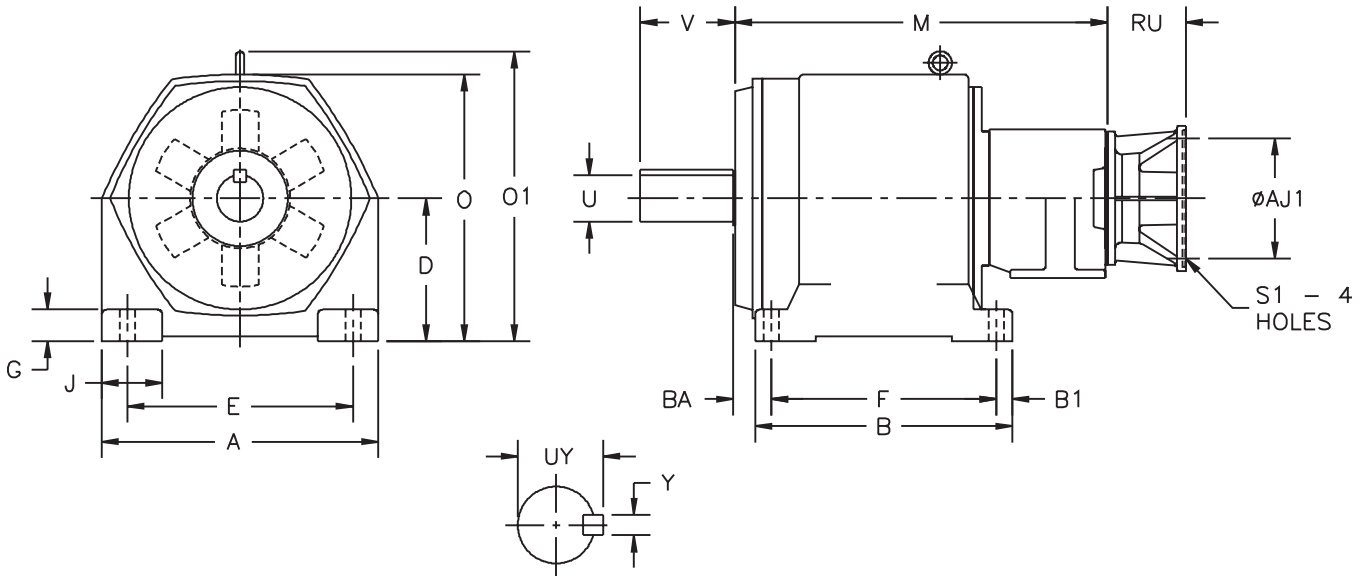
Browning

C-Face Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D	E	F	G	H	J	M	O	O1	U [3]	V	Y	BA	UY	Weight Lb.
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	23.36	16.78	18.9	2.875	5.75	3/4	2.36	3.2	475
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	24.75	18.5	21.06	3.5	7	7/8	2.56	3.882	555
28	23.62	21.65	1.38	12.40	20.08	18.90	2.56	1.02	4.92	28.90	23.47	25.59	4	8	1	3.35	4.436	920
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.30	32.64	27.6	29.72	4.75	9.5	1 1/4	2.36	5.291	1305

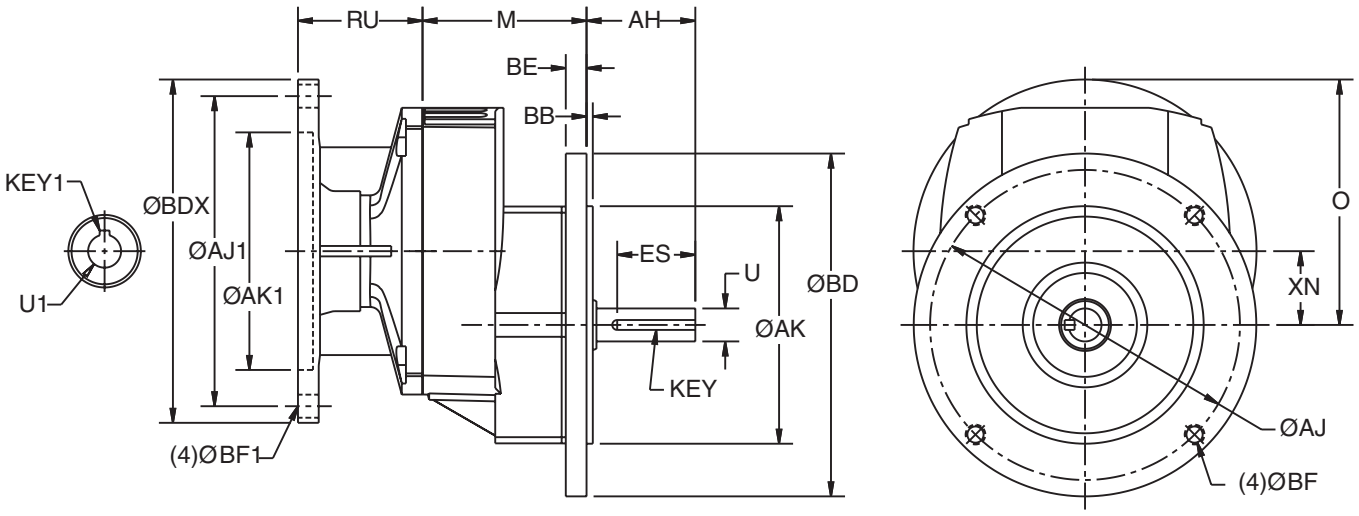
Motor Frame	RU				S1	AJ1
	N26	N27	N28	N29		
56C	4.32	4.32	4.50	4.50	0.375	5.875
143 - 145TC	4.32	4.32	4.50	4.50	0.375	5.875
182 - 184TC	6.04	6.04	6.22	6.22	0.500	7.250
213 - 215TC	6.04	6.04	6.22	6.22	0.500	7.250
254 - 256TC	-	-	7.43	7.43	0.500	7.250

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Flange Mounted - Single Reduction



Gear Frame	M	O	U [3]	AH	ES	XN	Key
30	3.50	4.65	0.625	2.06	1.48	1.40	3/16

Flange Type	AK	AJ	BB	BD	BE	BF
56C	4.50	5.88	0.12	6.50	0.39	3/8-16
BS	3.74	4.53	0.12	5.51	0.31	0.35
BD1	3.15	3.94	0.12	4.72	0.39	0.28
BD2	4.33	5.12	0.08	6.30	0.39	0.35
BD3	5.12	6.50	0.12	7.87	0.31	0.35

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	3.33	0.44	4.50	6.50	0.625	3/16 Sq.
140TC [1]	5.875	3.33	0.44	4.50	6.50	0.875	3/16 Sq.

[1] Not available on ratios 5.6 through 8:1.

[2] All rough casting dimensions may vary by .25" due to casting variations.

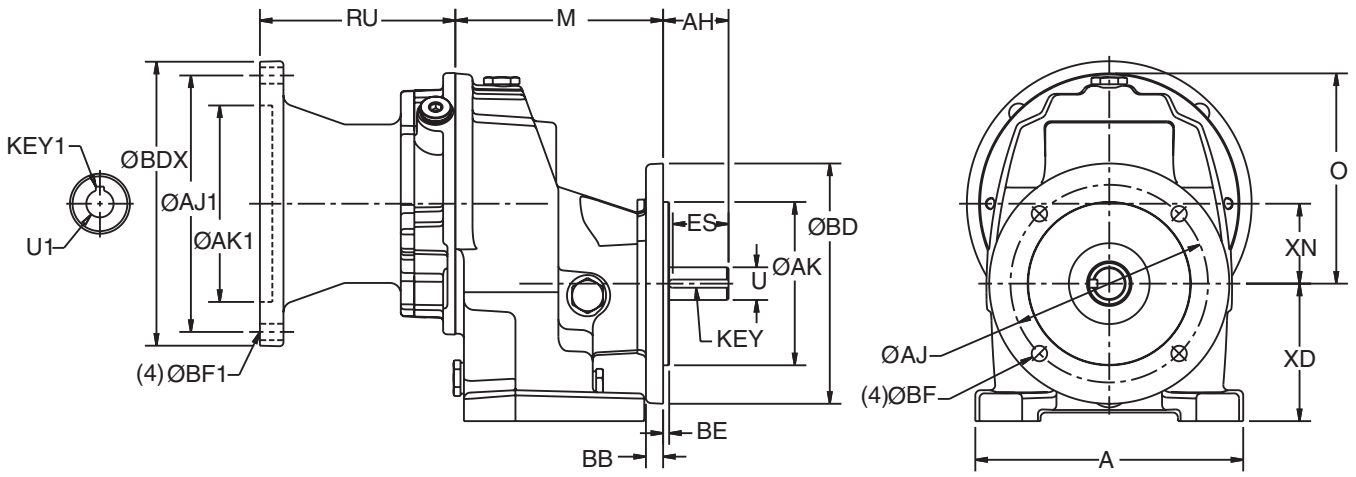
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

C-Face Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
31	6.14	4.76	4.82	0.75	1.50	1.28	3.15	1.83	3/16 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	4.33	5.12	0.14	6.29	0.39	0.35
BD2	3.74	4.53	0.14	5.50	0.39	0.35

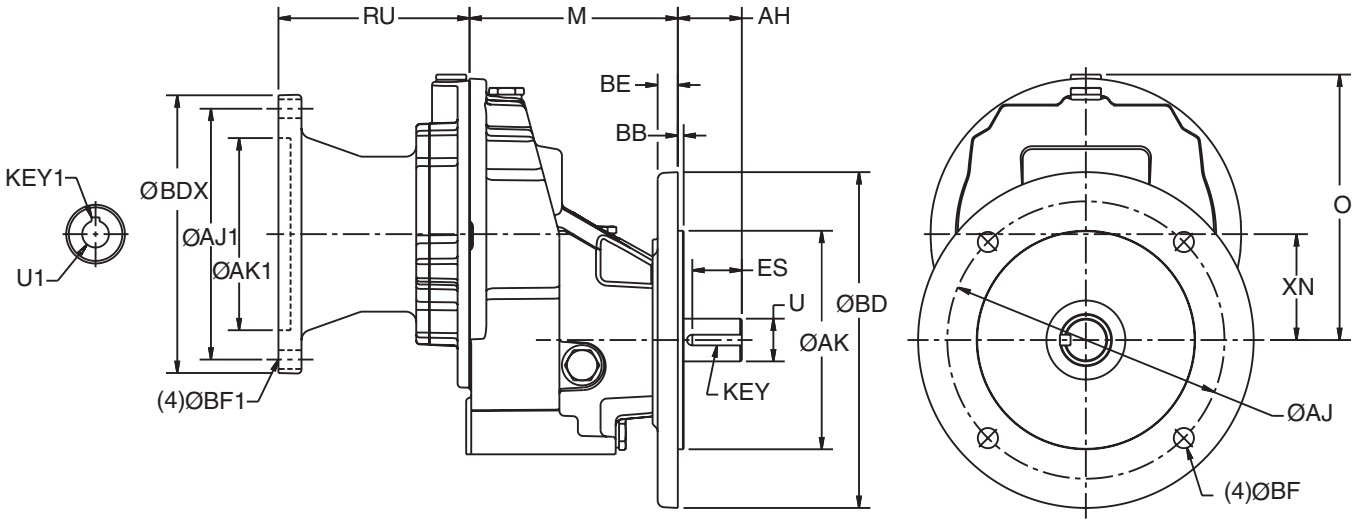
Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC [4]	7.250	6.20	0.57	8.50	9.00	1.125	1/4 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Permitted in vertical mounting only.

Flange Mounted - Single Reduction



Gear Frame	M	O	U [3]	AH	ES	XN	Key
32	4.88	6.22	1.00	1.50	1.16	2.48	1/4 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	5.12	6.5	0.14	7.87	0.47	0.47
BD2	4.33	5.12	0.14	6.29	0.39	0.35

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.250	6.20	0.57	8.50	9.00	1.125	1/4 Sq.
210TC [4]	7.250	6.20	0.57	8.50	9.00	1.375	5/16 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

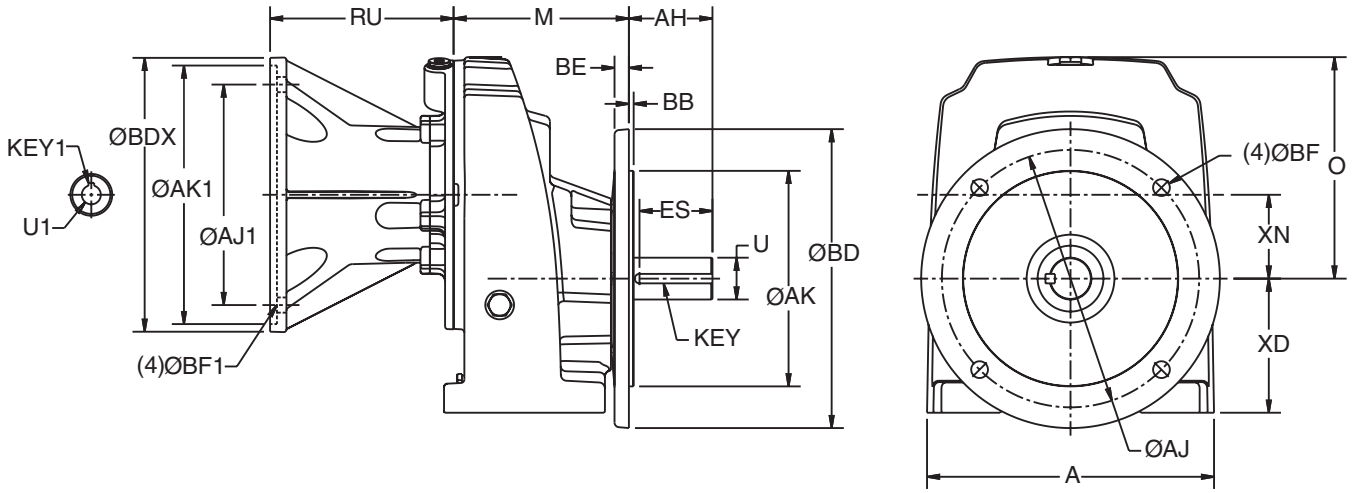
[4] Permitted in vertical mounting only.

Browning

C-Face Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
33	9.44	5.77	7.28	1.375	2.75	2.40	4.41	2.76	5/16 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55
BD2	5.12	6.50	0.16	7.86	0.47	0.43

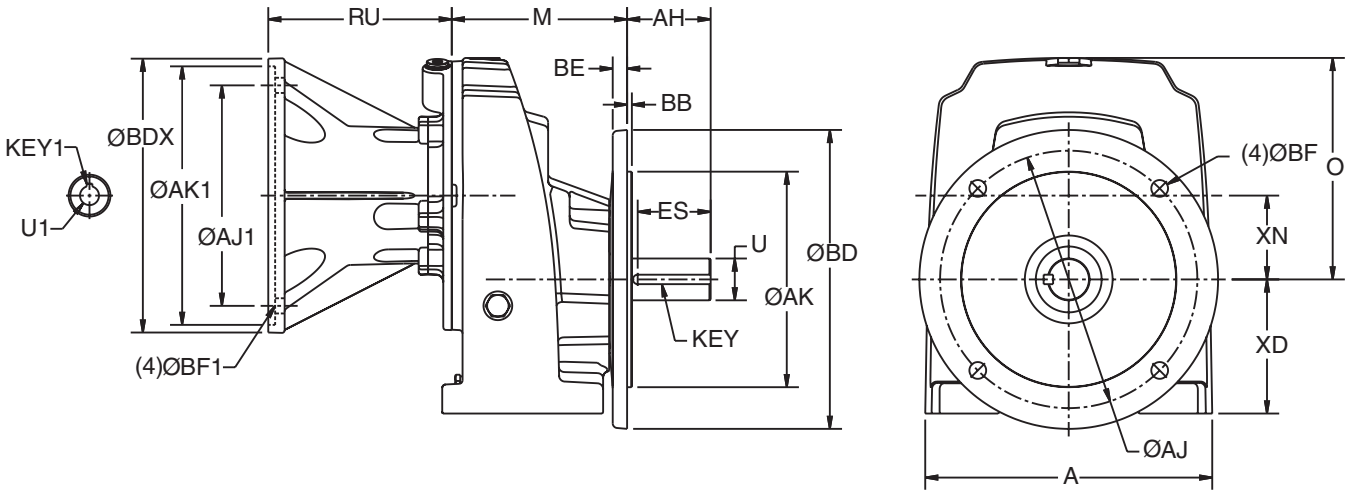
Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.32	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.32	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.250	6.04	0.57	8.50	9.00	1.125	1/4 Sq.
210TC [4]	7.250	6.04	0.57	8.50	9.00	1.375	5/16 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Permitted in vertical mounting only.

Flange Mounted - Single Reduction



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
34	11.02	7.09	8.70	1.50	3.00	2.56	5.20	3.43	3/8 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.06	10.43	0.16	11.80	0.59	0.55
BD2	7.09	8.46	0.16	9.83	0.59	0.55

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
182/184TC	7.25	6.22	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.25	6.22	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.25	7.43	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC[4]	9.00	8.40	0.57	10.50	11.25	1.875	1/2 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

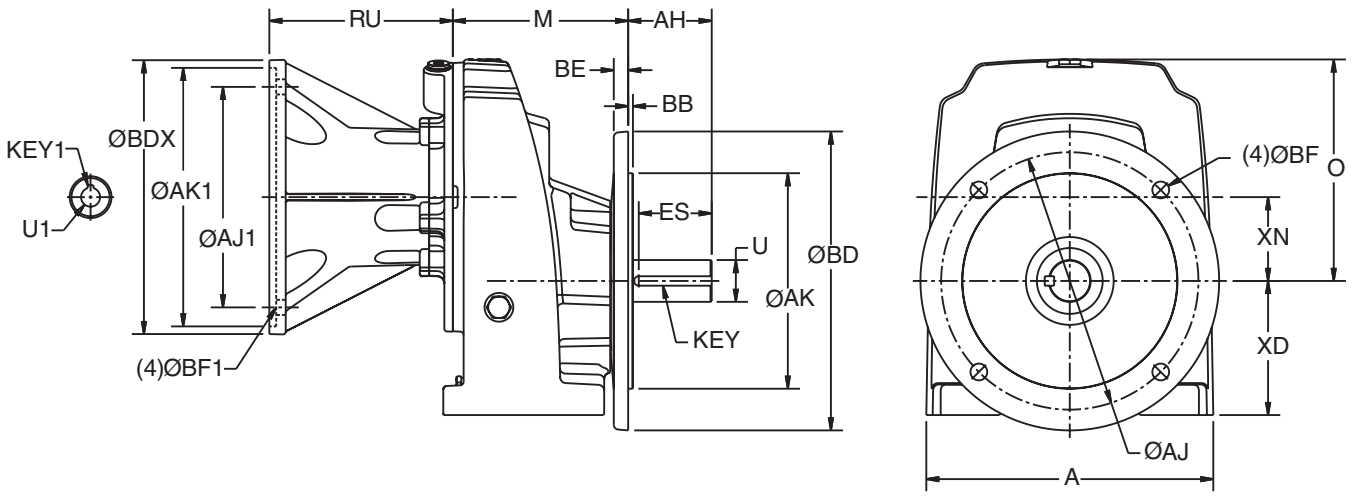
[4] Permitted in vertical mounting only.

Browning

C-Face Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
35	13.65	7.89	11.07	1.75	3.50	3.06	6.30	4.33	3/8 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.20	13.78	0.71	0.71
BD2	9.06	10.43	0.20	11.81	0.71	0.55

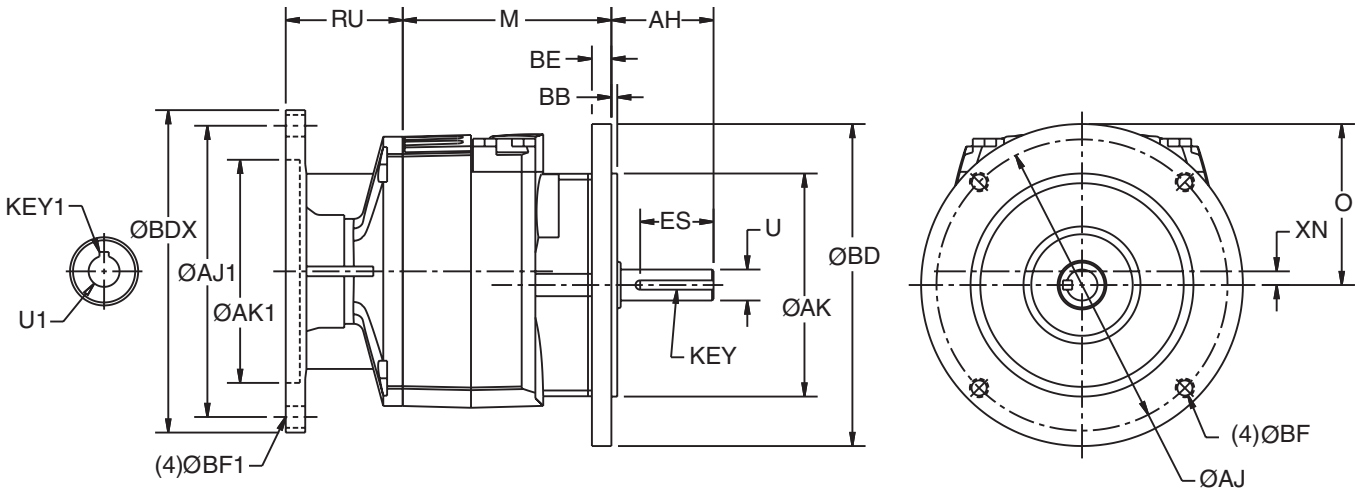
Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
213/215TC	7.25	5.87	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.25	7.09	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC	9.00	8.06	0.57	10.50	11.25	1.875	1/2 Sq.
324/326TC [4]	11.00	8.79	0.69	12.50	13.38	2.125	1/2 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[4] Permitted in vertical mounting only.

Flange Mounted - Double/Triple Reduction



Gear Frame	M	O	U [3]	AH	ES	XN	Key
3012	4.21	3.25	0.63	2.06	1.48	0.28	3/16 Sq.
3013	5.00	3.25	0.63	2.06	1.48	0.28	3/16 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
56C	4.50	5.88	0.12	6.50	0.39	3/8-16
BS	3.74	4.53	0.12	5.51	0.31	0.35
BD1	3.15	3.94	0.10	4.72	0.28	0.28
BD2	4.33	5.12	0.12	6.30	0.31	0.35
BD3	5.12	6.50	0.12	7.87	0.31	0.35

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	3.33	0.44	4.50	6.50	0.625	3/16 Sq.
140TC [1]	5.875	3.33	0.44	4.50	6.50	0.875	3/16 Sq.

[1] Not available on ratios 31.5 to 45:1 in 3012. Use 3013 for 35.5 to 45:1.

[2] All rough casting dimensions may vary by .25" due to casting variations.

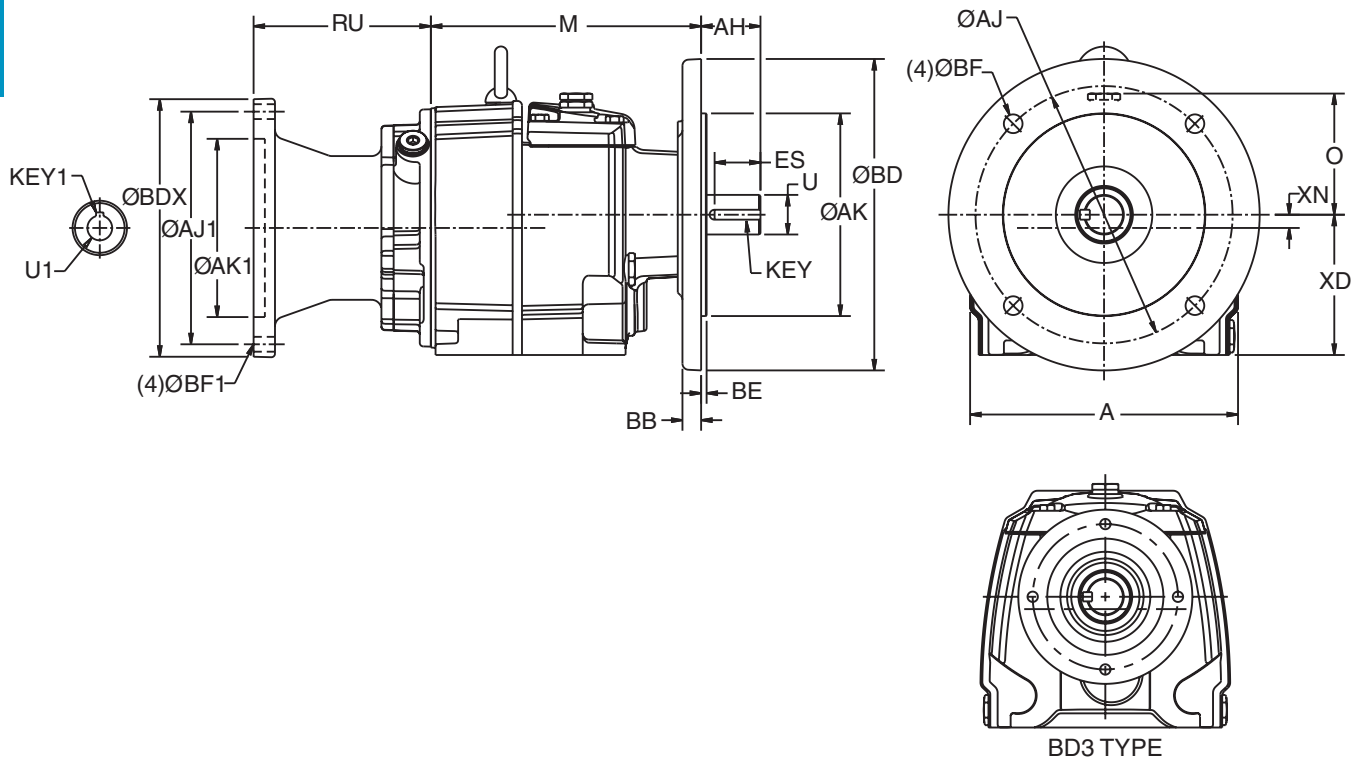
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

C-Face Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
31	6.77	6.83	3.06	1.00	1.50	1.16	3.54	0.33	1/4 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	5.12	6.50	0.14	7.87	0.47	0.47
BD1	4.33	5.12	0.14	6.29	0.39	0.35
BD2	3.74	4.53	0.14	5.50	0.39	0.35
BD3	3.15	3.94	0.10	4.72	0.39	0.28

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.88	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.88	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC [4]	7.25	6.20	0.57	8.50	9.00	1.125	1/4 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

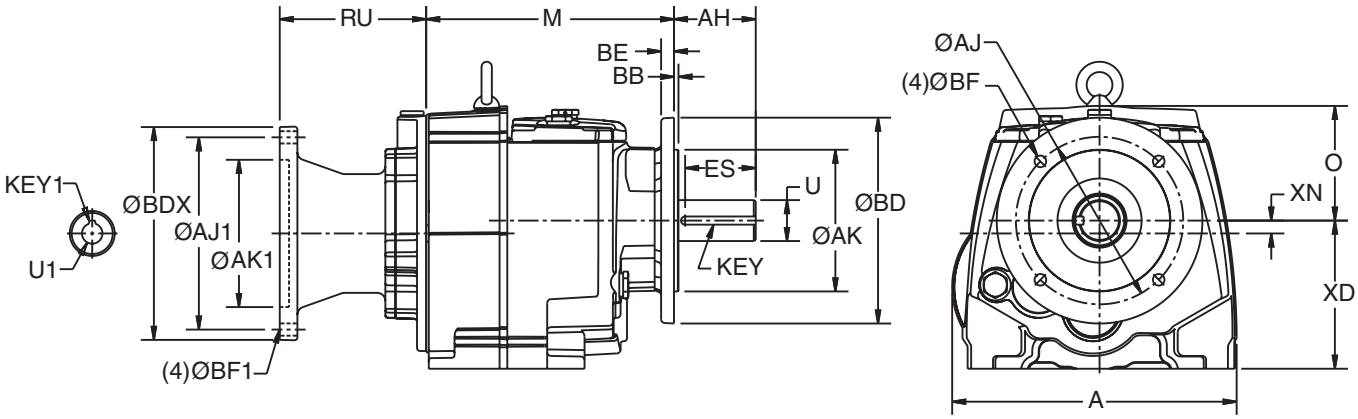
[4] Permitted in vertical mounting only.

Browning®

C-Face Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
32	8.70	7.58	3.50	1.25	2.50	2.16	4.53	0.39	1/4 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47
BD2	4.33	5.12	0.14	6.29	0.39	0.35

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.48	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.48	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.250	6.20	0.57	8.50	9.00	1.125	1/4 Sq.
210TC [4]	7.250	6.20	0.57	8.50	9.00	1.375	5/16 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

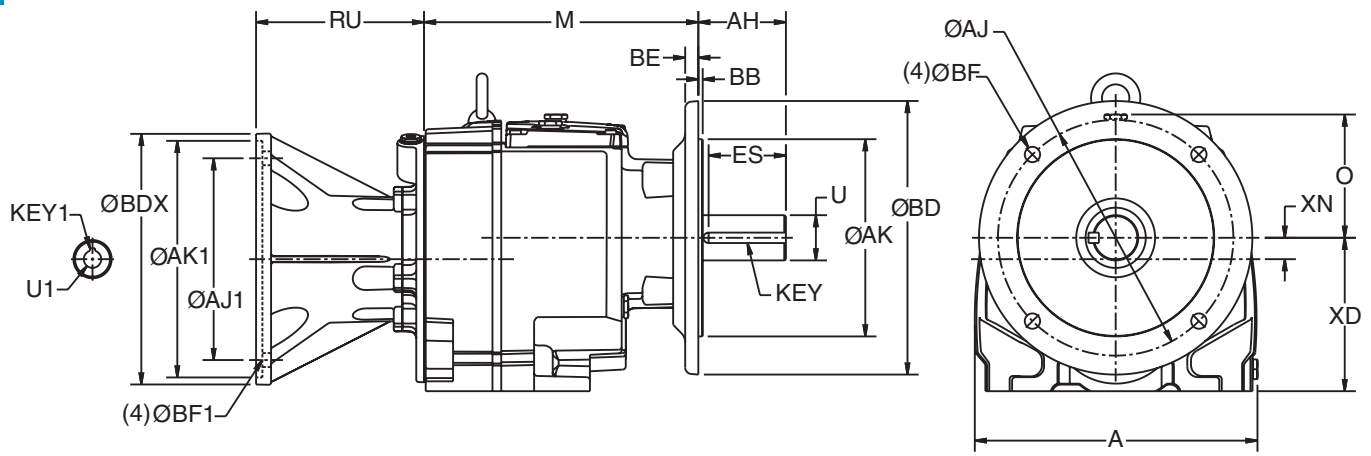
[4] Permitted in vertical mounting only.

Browning

C-Face Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
3362,3363	10.16	9.86	4.43	1.50	3.00	2.56	5.51	0.77	3/4 Sq.
3372,3373	10.16	9.86	4.43	1.63	3.15	2.78	5.51	0.77	3/4 Sq.

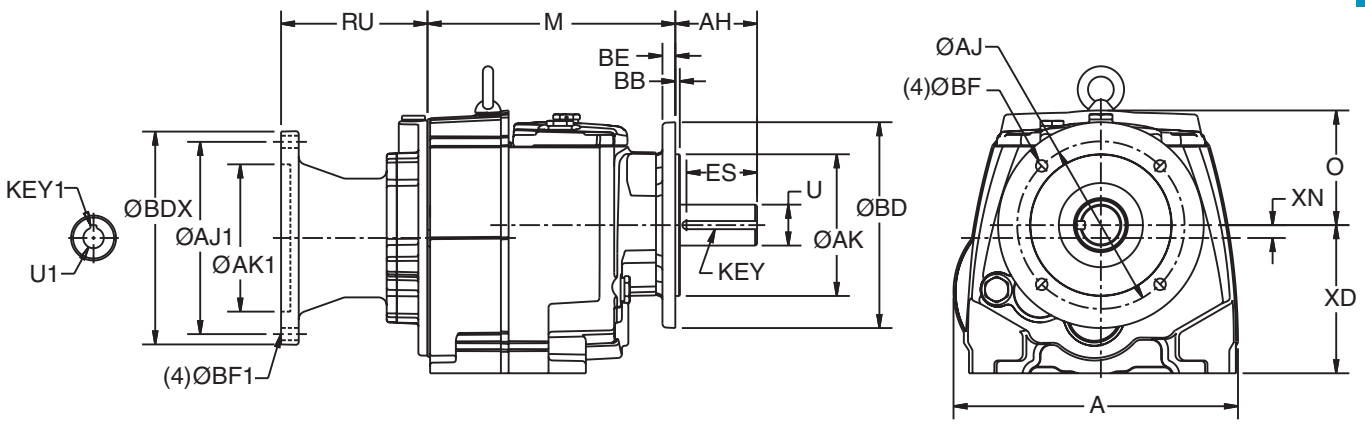
Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.06	10.43	0.16	11.80	0.47	0.55
BD1	7.09	8.46	0.16	9.83	0.47	0.55
BD2	5.12	6.50	0.14	7.86	0.47	0.47

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.32	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	5.875	4.32	0.44	4.50	6.50	0.875	3/16 Sq.
180TC	7.250	6.04	0.57	8.50	9.00	1.125	1/4 Sq.
210TC	7.250	6.04	0.57	8.50	9.00	1.375	5/16 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Flange Mounted - Double/Triple Reduction



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
34	11.97	10.63	4.80	2.13	3.50	3.06	7.09	1.02	1/2 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55
BD2	7.09	8.46	0.16	9.83	0.59	0.55

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.50	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	5.875	4.50	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	7.250	6.22	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.250	6.22	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.250	7.43	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC [4]	9.000	8.40	0.57	10.50	11.25	1.875	1/2 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

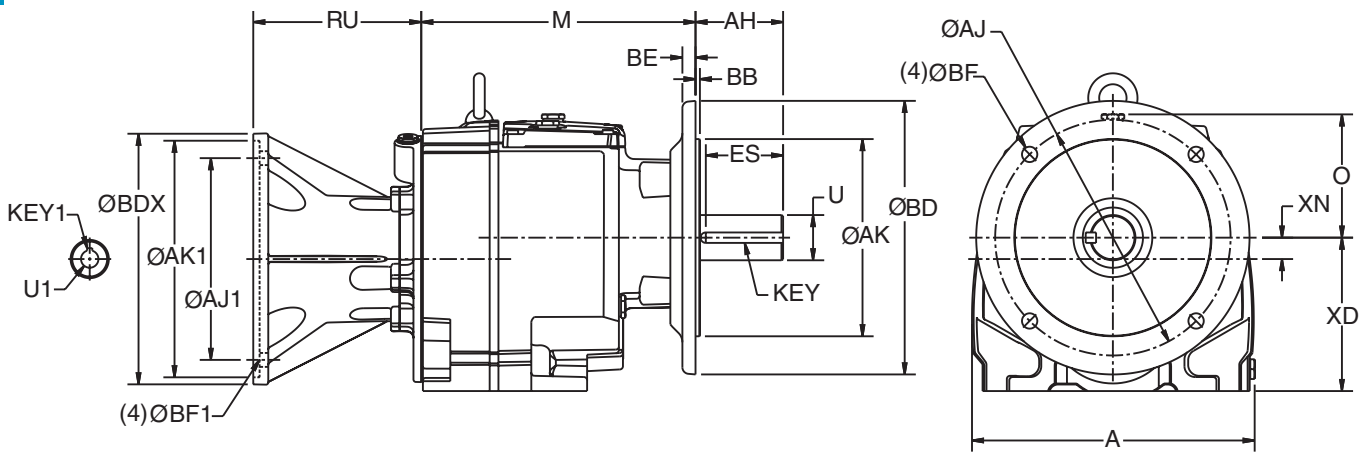
[4] Permitted in vertical mounting only.

Browning

C-Face Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
35	14.19	12.40	5.98	2.375	4.72	4.19	8.86	1.14	5/8 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.84	11.81	0.20	13.78	0.71	0.71
BD2	9.06	10.43	0.20	11.81	0.71	0.55

Motor Frame	AJ1	RU	BF1	AK1	BDX	U1	Key1
56C	5.875	4.14	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	5.875	4.14	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	7.250	5.87	0.57	8.50	9.00	1.125	1/4 Sq.
213/215TC	7.250	5.87	0.57	8.50	9.00	1.375	5/16 Sq.
254/256TC	7.250	7.09	0.57	8.50	9.00	1.625	3/8 Sq.
284/286TC	9.000	8.06	0.57	10.50	11.25	1.875	1/2 Sq.
324/326TC [4]	11.000	8.79	0.69	12.50	13.38	2.125	1/2 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

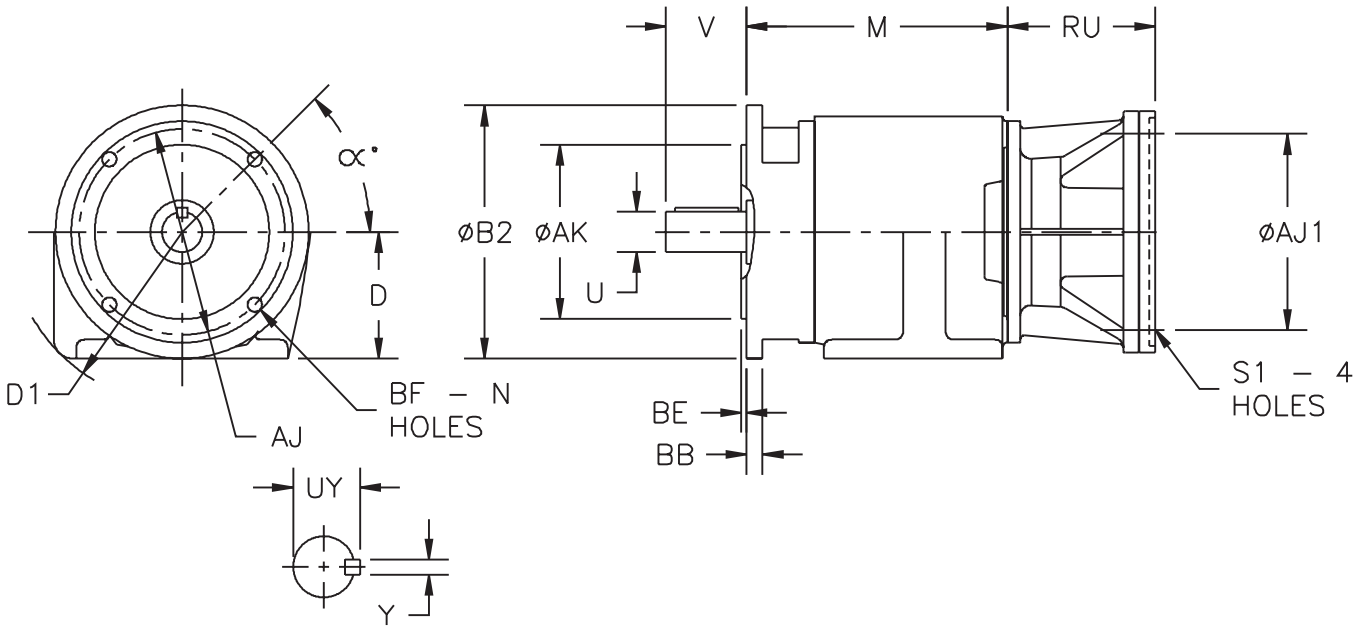
[4] Permitted in vertical mounting only.

Browning®

C-Face Reducer

CbN SERIES 2000 3000

BS Flange Mounted - Double/Triple Reduction



Gear Frame	B2	D	D[1]	M	N	U[3]	V	Y	AJ	AK	BB	BE	BF	UY	μ	Weight Lb.
26	21.65	8.86	12.13	14.92	8	2.875	5.75	3/4	19.685	17.717	0.748	0.197	0.700	3.200	22.5°	260
27	21.65	9.84	13.94	16.30	8	3.5	7	7/8	19.685	17.717	0.787	0.197	0.700	3.882	22.5°	352
28	25.98	12.40	16.70	19.88	8	4	8	1	23.622	21.654	0.945	0.236	0.940	4.436	22.5°	64

Motor Frame	RU			S1	AJ1
	N26	N27	N28		
182 - 184TC	8.18	8.18	-	0.500	7.250
213 - 215TC	8.18	8.18	7.91	0.500	7.250
254 - 256TC	8.18	8.18	7.91	0.500	7.250
284 - 286TC	9.15	9.15	8.88	0.500	9.000
324 - 326TC	9.61	9.61	9.61	0.625	11.000

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

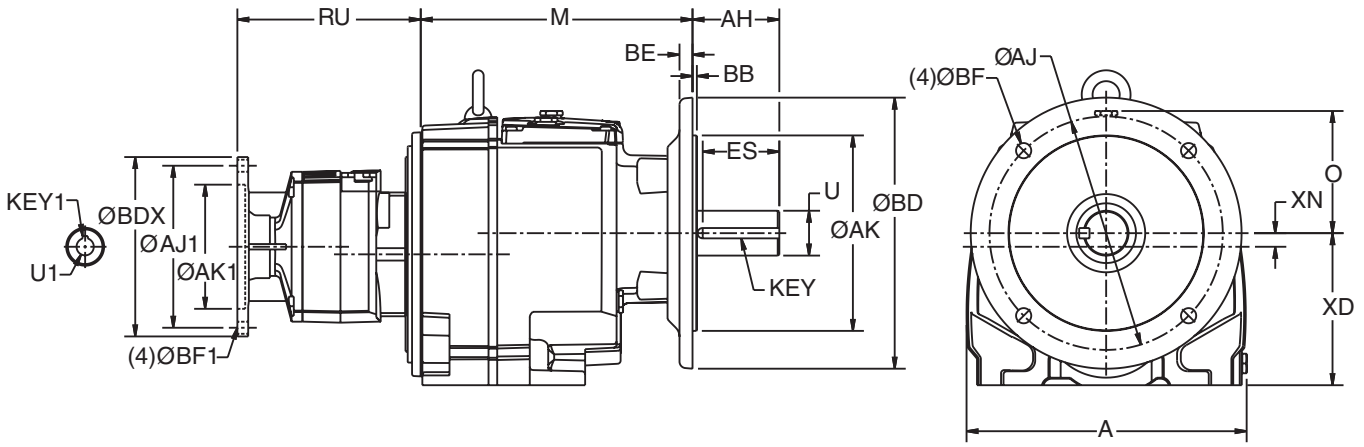
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

C-Face Reducer

Flange Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
3254,3255	8.70	7.58	3.50	1.25	2.50	2.16	4.53	0.12	1/4 Sq.
3374,3375	10.16	9.86	4.43	1.63	3.15	2.78	5.51	0.49	3/8 Sq.

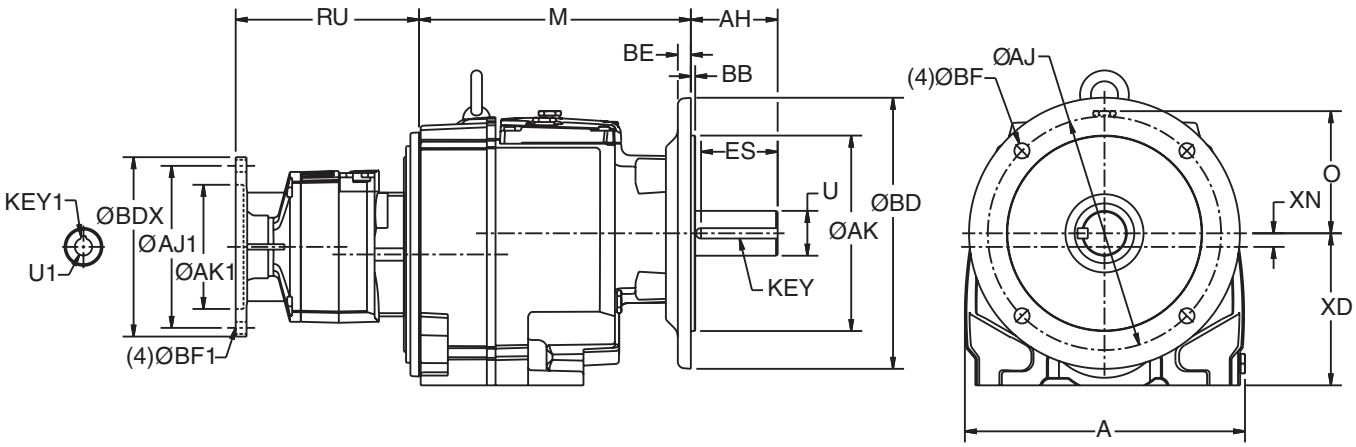
Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55	9.06	10.43	0.16	11.80	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.14	7.86	0.47	0.47

Motor Frame	RU	AJ1	BF1	AK1	BDX	U1	Key1
56C	7.79	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
140TC	7.79	5.875	0.44	4.50	6.50	0.875	3/16 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Flange Mounted - Combined Reduction



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
34	11.97	10.63	4.80	2.13	3.50	3.06	7.09	1.35	1/2 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55
BD2	7.09	8.46	0.16	9.83	0.59	0.55

Motor Frame	RU	AJ1	BF1	AK1	BDX	U1	Key1
56C	11.46	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	11.46	5.875	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	13.18	7.25	0.57	8.50	9.00	1.125	1/4 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

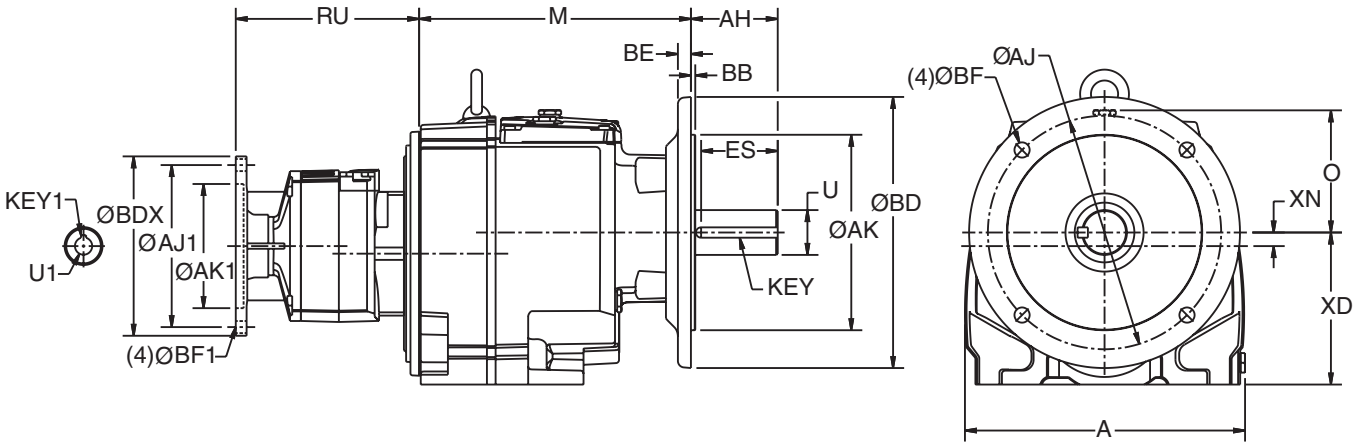
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

C-Face Reducer

Flange Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	M	O	U [3]	AH	ES	XD	XN	Key
35	14.19	12.40	5.98	2.375	4.72	4.19	8.86	1.47	5/8 Sq.

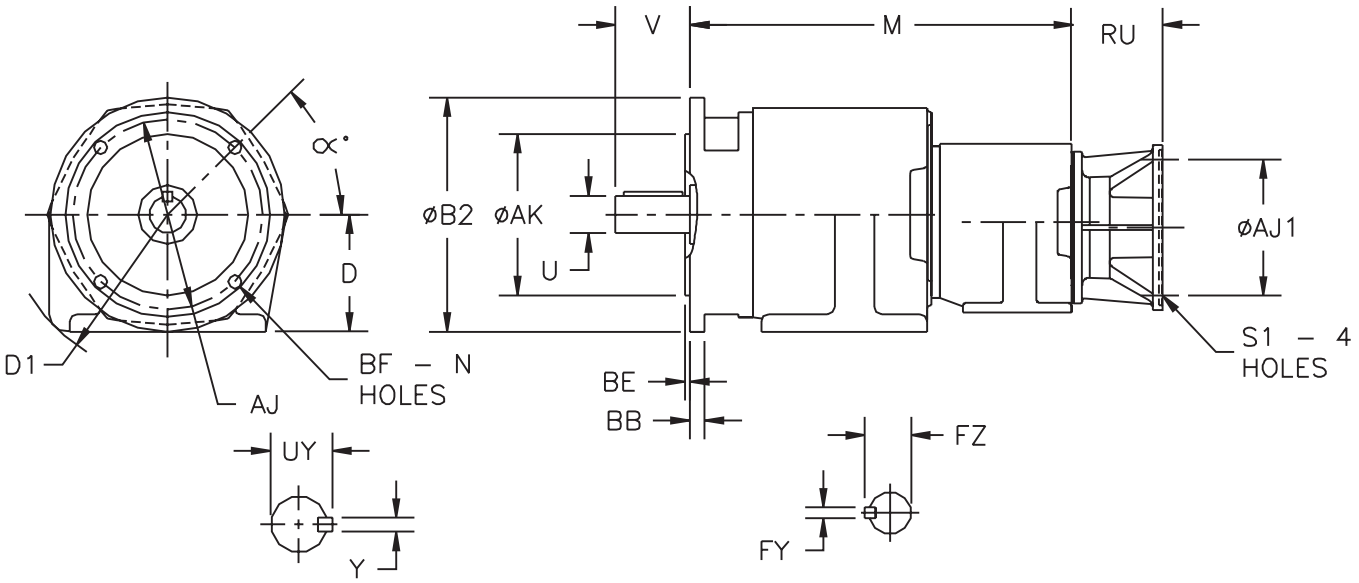
Flange Type	AK	AJ	BB	BD	BE	BF
BS	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.84	11.81	0.20	13.78	0.71	0.71
BD2	9.06	10.43	0.20	11.81	0.71	0.55

Motor Frame	RU	AJ1	BF1	AK1	BDX	U1	Key1
56C	11.11	5.875	0.44	4.50	6.50	0.625	3/16 Sq.
143/145TC	11.11	5.875	0.44	4.50	6.50	0.875	3/16 Sq.
182/184TC	12.83	7.25	0.57	8.50	9.00	1.125	1/4 Sq.

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

BS Flange Mounted - Combined Reduction



Gear Frame	B2	D	D[1]	M	N	U[3]	V	Y	AJ	AK	BB	BE	BF	UY	μ	Weight Lb.
26	21.65	8.86	12.13	24.75	8	2.875	5.75	3/4	19.685	17.717	0.748	0.197	0.70	3.2	22.5°	260
27	21.65	9.84	13.94	24.75	8	3.5	7	7/8	19.685	17.717	0.787	0.197	0.70	3.882	22.5°	352
28	25.98	12.40	16.70	35.47	8	4	8	1	23.622	21.654	0.945	0.236	0.94	4.436	22.5°	649

Motor Frame	RU			S1	AJ1
	N26	N27	N28		
56C	4.32	4.32	4.50	0.375	5.875
143 - 145TC	4.32	4.32	4.50	0.375	5.875
182 - 184TC	6.04	6.04	6.22	0.500	7.250
213 - 215TC	6.04	6.04	6.22	0.500	7.250
254 - 256TC	-	-	7.43	0.500	7.250

[1] Dimension "D" will never be exceeded, but may vary from values shown. When exact dimensions are required. Shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

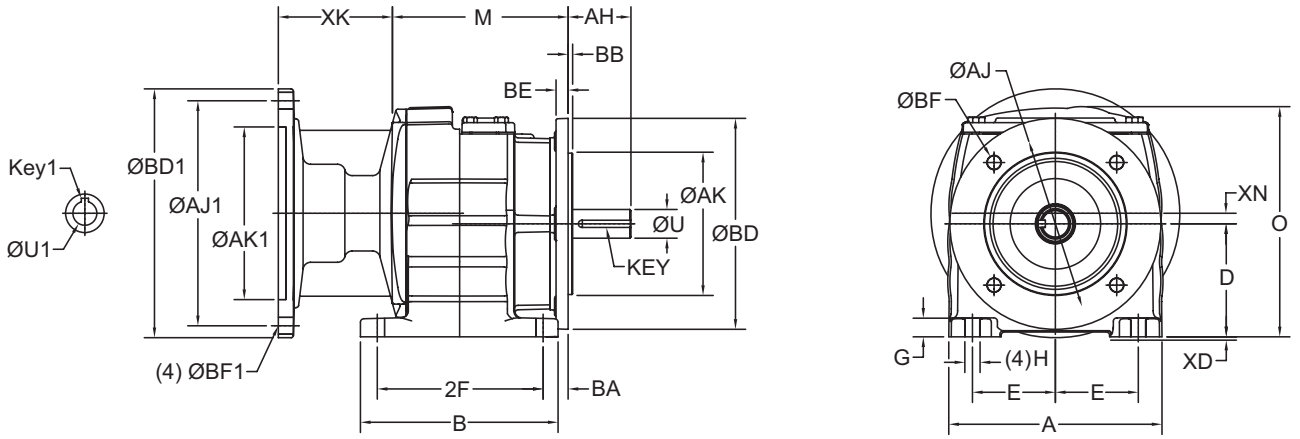
[3] Shaft extension tolerance: +.0000";–.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

C-Face Reducer

Foot Flange Mounted - Double Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D[1]	E	2F	G	H	O	U[3]	ES	M	XN	Key
3012A	5.62	5.16	2.95	2.165	4.33	.47	.35	6.476	0.750	1.25	4.81	.276	3/16 Sq

Flange Type	AH	AJ	AK	BA	BB	BD	BE	BF
BD1	1.52	3.94	3.15	.65	.12	4.72	.28	.28
BS	1.52	4.53	2.74	.65	.12	5.51	.31	.35

Motor Frame	AJ1	AK1	BDX	BF1	RU	U1	Key1
56C	5.875	4.50	6.50	0.44	3.33	.625	3/16 Sq
143,145TC[4]	5.875	4.50	6.50	0.44	3.33	.875	3/16 Sq

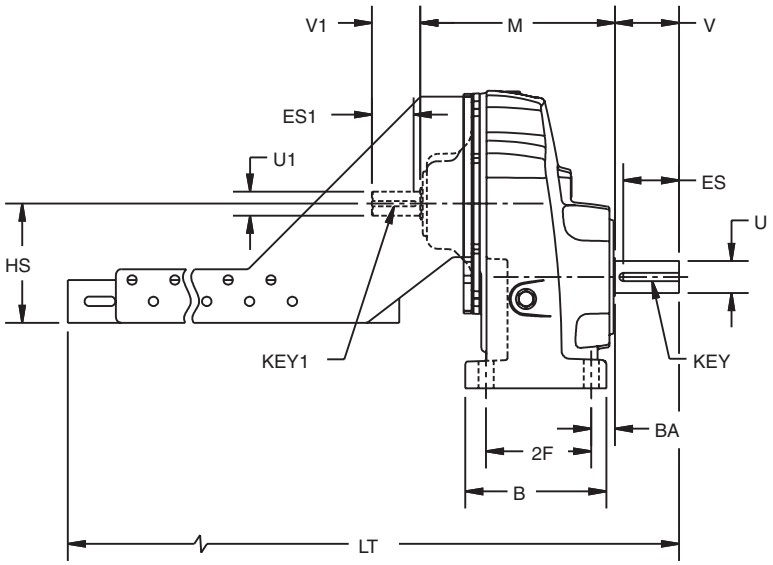
[1] Dimension "D" will never be exceeded, but may vary from value shown. When exact dimension is required, shims up to .03" may be required.
[2] All rough casting dimensions may vary by .25" due to casting variations.
[3] Shaft extension tolerance +.0000", -.0005" up to 1.5" diameter.
[4] Not available in ratios from 31.5 through 45:1.

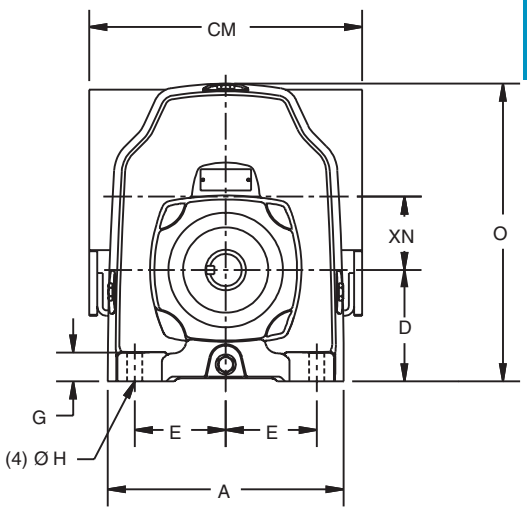
Browning®

Scoop Mount Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000





Gear Frame	A	B	D [1]	E	G	H	M	O	U [3]	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
34	11.02	6.59	5.20	4.25	1.34	0.71	9.10	13.90	1.50	1.13	3.00	2.25	1.10	4.92	2.56	1.94	3.43	3/8 Sq.	1/4 Sq.

Motor Frame					
182/184T			213/215T		
CM	HS	LT	CM	HS	LT
12.75	5.56	34.98	12.75	5.56	35.38

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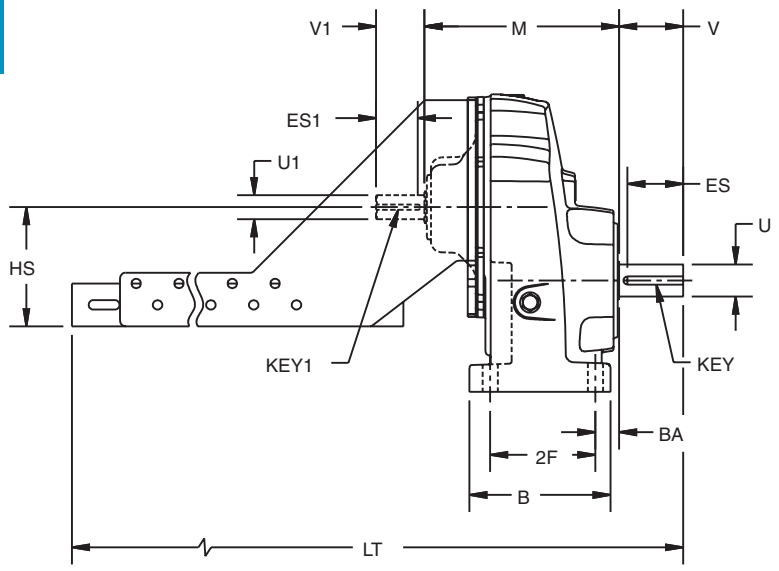
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

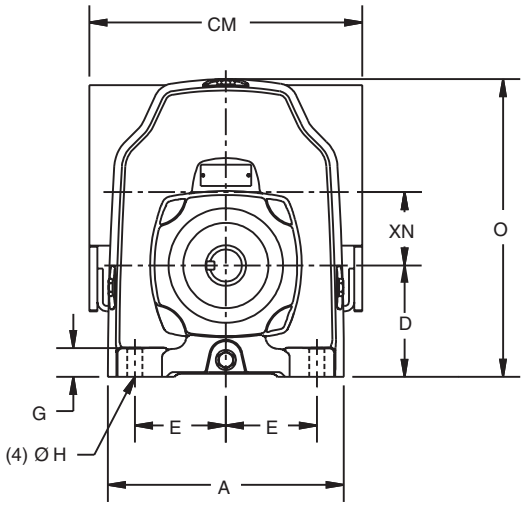
Browning®

Scoop Mount Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000





Gear Frame	A	B	D [1]	E	G	H	M	O	U [3]	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
35	13.65	7.76	6.30	5.12	1.61	0.79	10.38	17.37	1.75	1.38	3.50	2.75	1.18	6.30	3.06	2.31	4.33	3/8 Sq.	5/16 Sq.

Motor Frame								
213/215T			254/256T			284T/286T		
CM	HS	LT	CM	HS	LT	CM	HS	LT
12.75	5.56	37.28	17.00	7.44	41.70	17.00	7.44	41.83

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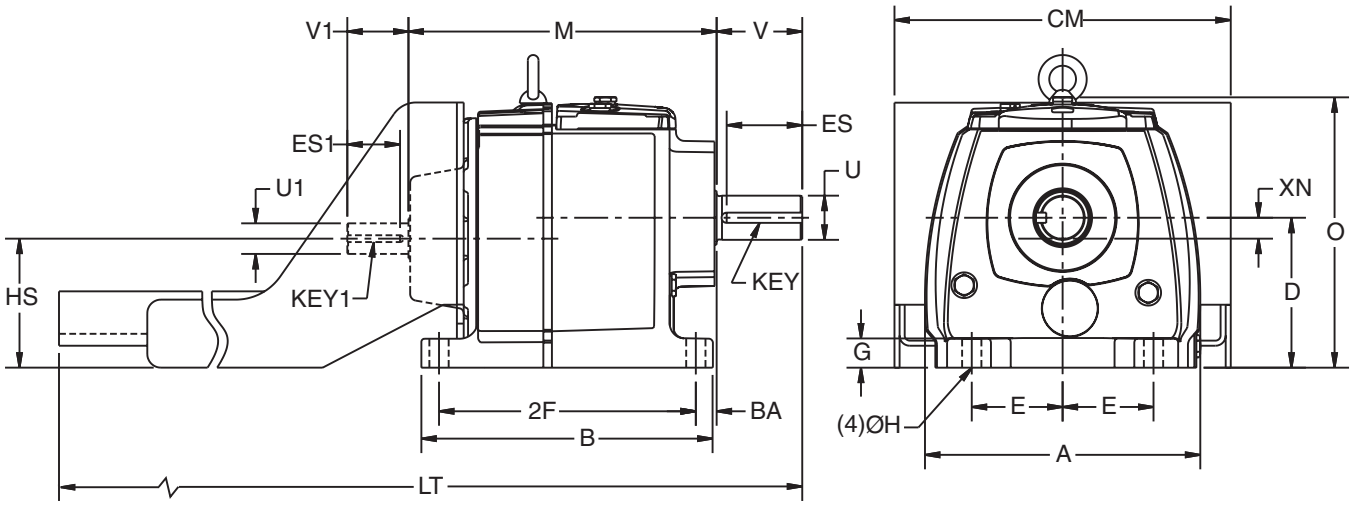
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Scoop Mount Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	O	U [3]	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
32	8.72	8.50	4.53	2.66	0.84	0.55	9.11	7.97	1.25	0.63	2.50	1.25	0.51	7.56	2.16	1.00	0.39	1/4 Sq.	3/16 Sq.
3362,3363	10.13	10.72	5.51	3.35	1.07	0.71	11.34	9.94	1.50	1.13	3.00	2.25	0.77	9.45	2.56	1.94	0.77	3/8 Sq.	1/4 Sq.
3372,3373	10.13	10.72	5.51	3.35	1.07	0.71	11.34	9.94	1.63	1.13	3.15	2.25	0.77	9.45	2.78	1.94	0.77	3/8 Sq.	1/4 Sq.
34	11.97	10.87	7.09	4.53	1.37	0.71	12.66	11.89	2.13	1.13	3.50	2.25	0.98	9.25	3.06	1.94	1.02	1/2 Sq.	1/4 Sq.

Gear Frame	Motor Frame								
	143/145T			182/184T			213/215T		
	CM	HS	LT	CM	HS	LT	CM	HS	LT
32	11.38	3.75	27.97	-	-	-	-	-	-
3362,3363	12.38	4.74	37.31	12.38	4.74	37.31	-	-	-
3372,3373	12.38	4.74	37.46	12.38	4.74	37.46	-	-	-
34	12.75	5.56	40.04	12.75	5.56	39.04	12.75	5.56	39.44

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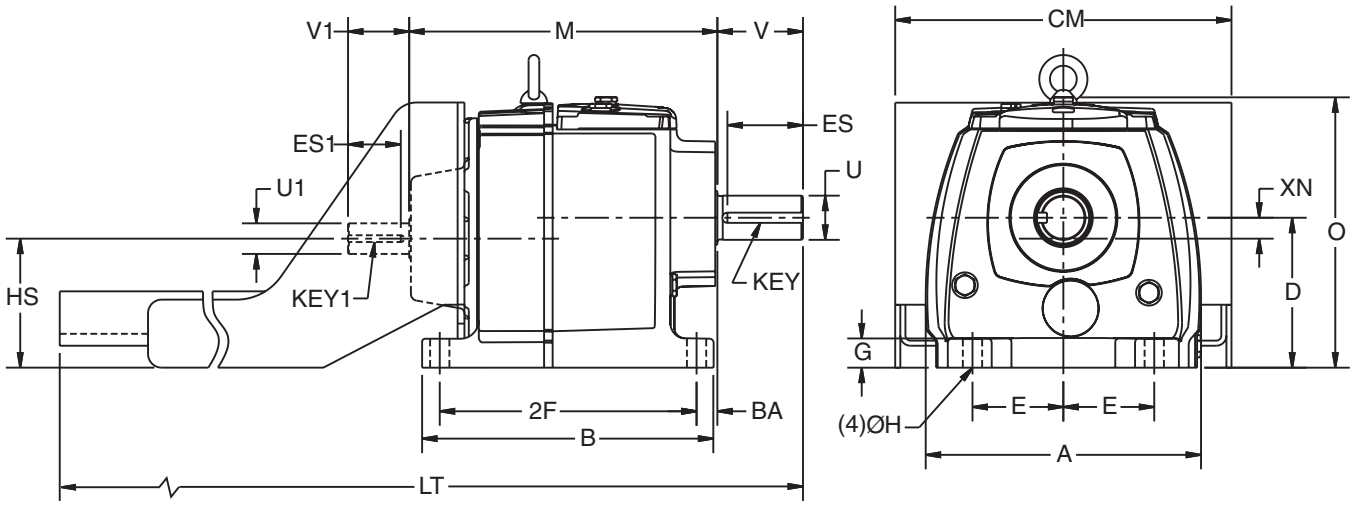
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Scoop Mount Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	O	U [3]	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
35	14.19	12.89	8.86	5.51	1.73	0.87	14.95	14.84	2.38	1.38	4.72	2.75	1.10	11.02	4.19	2.31	1.14	5/8 Sq.	5/16 Sq.

Motor Frame															
143/145T			182/184T			213/215T			254/256T			284/286T		
CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT
12.75	5.56	44.08	12.75	5.56	43.08	12.75	5.56	43.41	17.00	7.44	47.83	17.00	7.44	47.96

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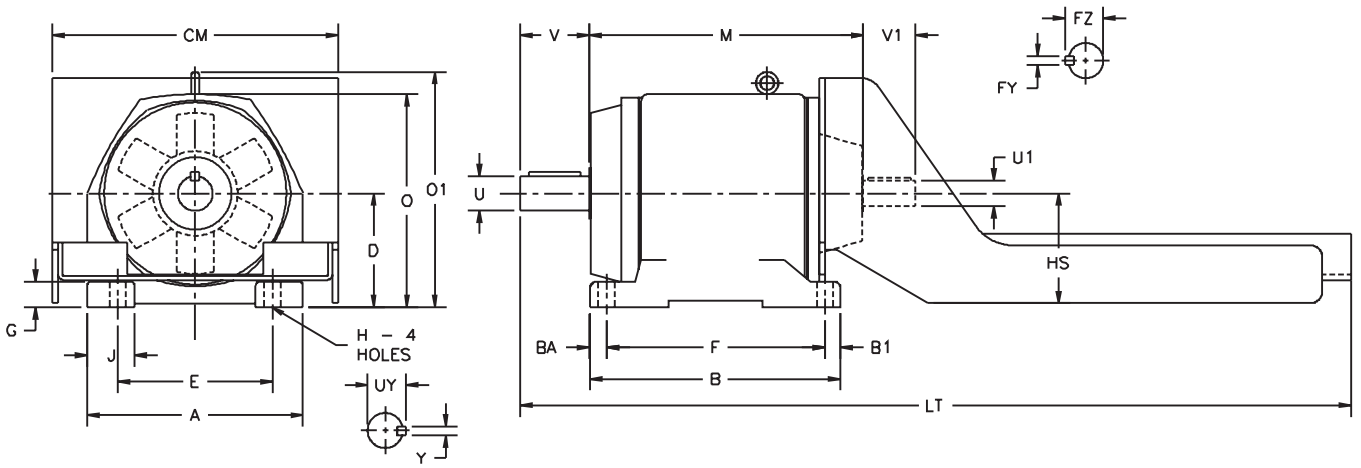
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Scoop Mount Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D	E	F	G	H	J	M	O	O1
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	16.93	16.78	18.9
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	18.3	18.5	21.06
28	23.62	21.65	1.38	12.4	20.08	18.9	2.56	1.02	4.92	22.25	23.47	25.59
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.3	25.98	27.6	29.72

Gear Frame	U [3]	U1 [3]	V	V1	Y	FY	FZ	UY	Weight - Lb.					
									182/184T	213/215T	254/256T	284/286T	324/326T	364/365T
26	2.875	1.875	5.75	3.75	3/4	1/2	2.091	3.2	396	396	420	420	498	
27	3.5	1.875	7	3.75	7/8	1/2	2.091	3.882	405	405	425	425	503	
28	4	2.375	8	4.75	1	5/8	2.646	4.436			892	892	916	916
29	4.75	2.375	9.5	4.75	1 1/4	5/8	2.646	5.291			1375	1375	1400	1400

Gear Frame	Motor Frame																	
	182/184T			213/215T			254/256T			284/286T			324/326T			364/365T		
	CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT
26	15	6.63	47.00	15.00	6.63	50.38	17.00	7.63	50.75	17.00	7.63	51.88	21.31	9.5	53.25			
27	15	6.63	49.50	15.00	6.63	53.00	17.00	7.63	53.38	17.00	7.63	55.88	21.31	9.5	55.88			
28							19.06	8.50	60.25	19.06	8.50	60.38	21.31	9.5	61.75	21.31	10.5	62.75
29							19.06	8.50	65.50	19.06	8.50	65.63	21.31	9.5	67	21.31	10.5	68.00

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[2] All rough casting dimensions may vary by .25" due to casting variations.

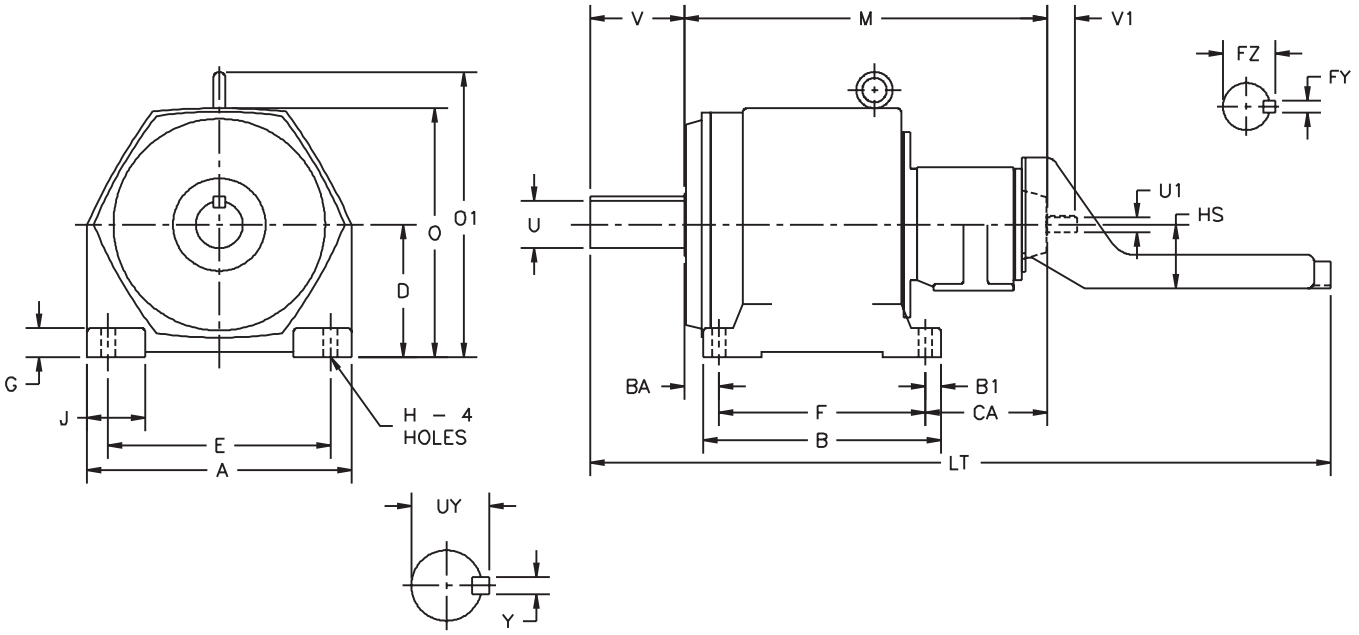
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Scoop Mount Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D	E	F	G	H	J	M	O	O1	U [3]	U1 [3]	V	V1	Y	FY	FZ	UY	Weight Lb
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	25.80	16.78	18.9	2.875	1.125	5.75	2.25	3/4	1/4	1.236	3.2	410
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	27.19	18.5	21.06	3.5	1.125	7	2.25	7/8	1/4	1.236	3.882	465
28	23.62	21.65	1.38	12.4	20.08	18.9	2.56	1.02	4.92	31.56	23.47	25.59	4	1.125	8	2.25	1	1/4	1.236	4.436	825
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.30	35.30	27.6	29.72	4.75	1.125	9.5	2.25	1 1/4	1/4	1.236	5.291	121

Size	Motor Frame					
	143/145T		182/184T		213/215T	
	HS	LT	HS	LT	HS	LT
26	4.75	51.00	4.75	51.25	-	-
27	4.75	53.62	4.75	53.87	5.56	59.20
28	5.56	63.03	5.56	62.03	5.56	62.16
29	5.56	68.16	5.56	67.16	5.56	68.41

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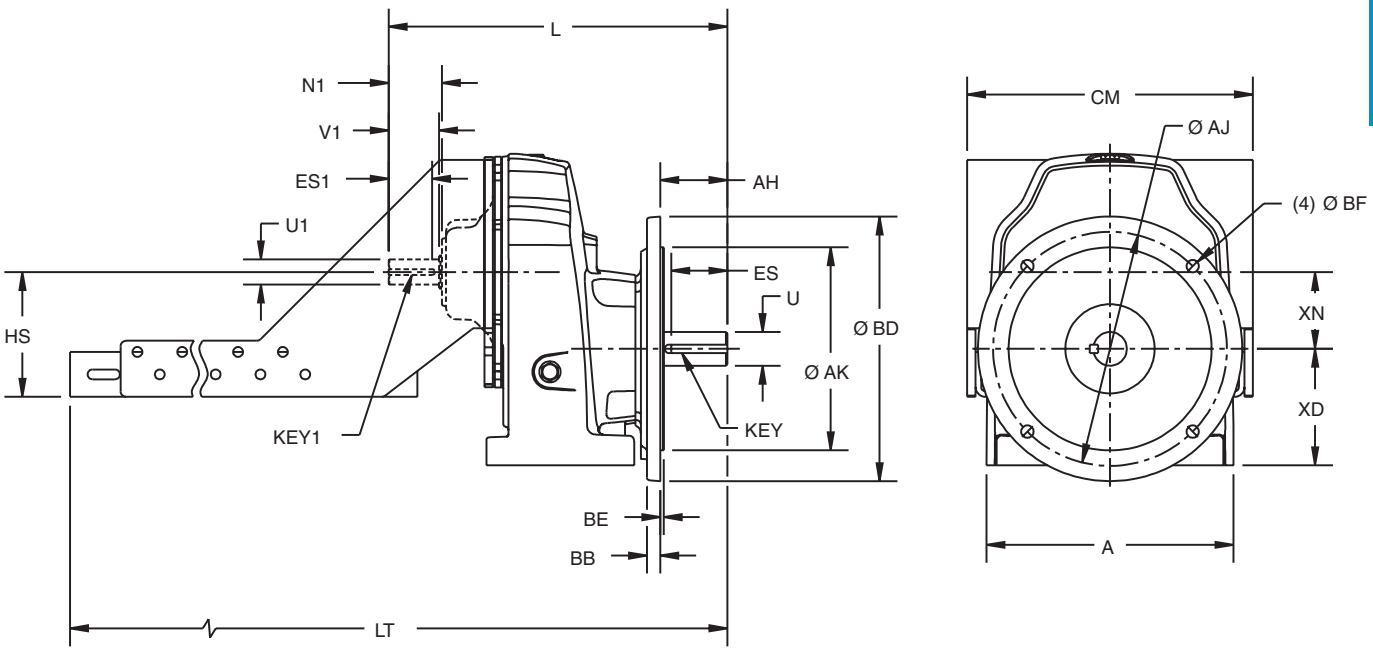
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Scoop Mount Reducer

Flange Mounted - Single Reduction



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	ES	ES1	XD	XN	Key	Key1
34	11.02	15.12	2.37	1.50	1.13	2.25	3.00	2.56	1.94	5.20	3.43	3/8 Sq.	1/4 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.06	10.43	0.16	11.80	0.59	0.55
BD2	7.09	8.46	0.16	9.83	0.59	0.55

Motor Frame					
182/184T			213/215T		
CM	HS	LT	CM	HS	LT
12.75	5.56	35.75	12.75	5.56	36.05

[2] All rough casting dimensions may vary by .25" due to casting variations.

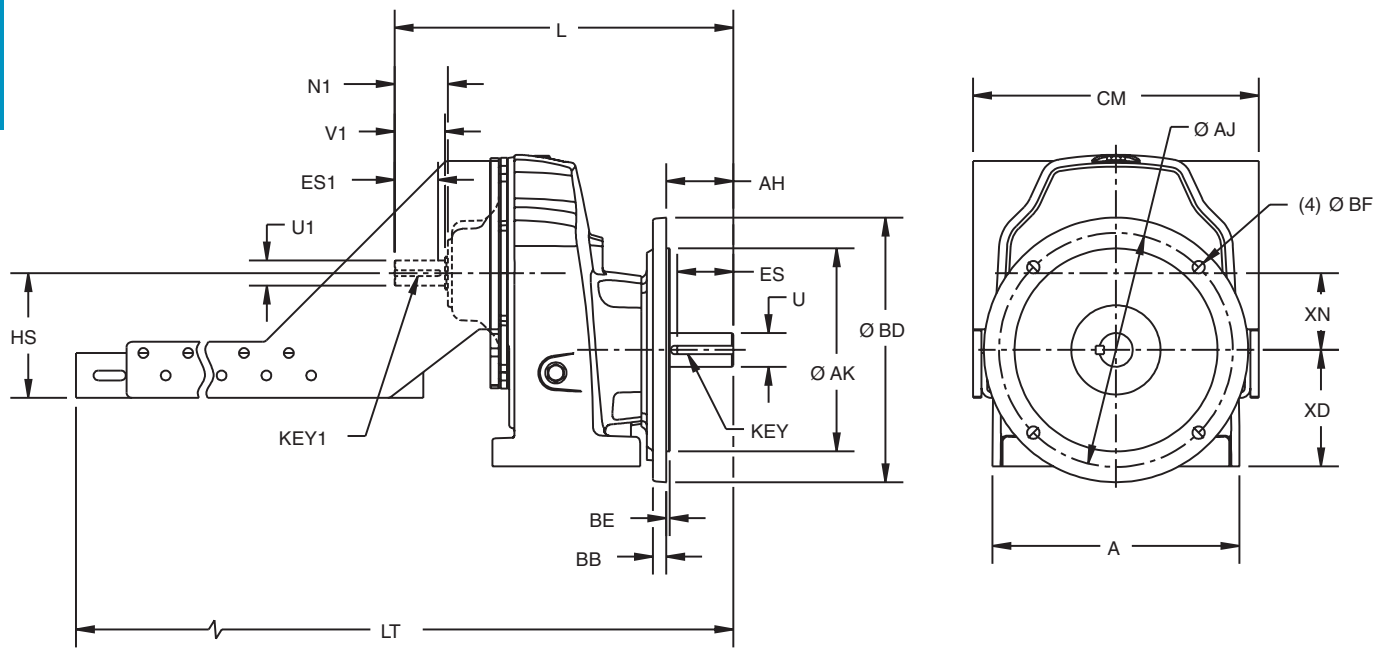
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Scoop Mount Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	ES	ES1	XD	XN	Key	Key1
35	13.65	17.90	2.92	1.75	1.38	2.75	3.50	3.06	2.31	6.30	4.33	3/8 Sq.	5/16 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.20	13.78	0.71	0.71
BD2	9.06	10.43	0.20	11.81	0.71	0.55

Motor Frame								
213/215T			**254/256T**			**284/286T**		
CM	**HS**	**LT**	**CM**	**HS**	**LT**	**CM**	**HS**	**LT**
12.75	5.56	38.85	17.00	7.44	43.27	17.00	7.44	43.40

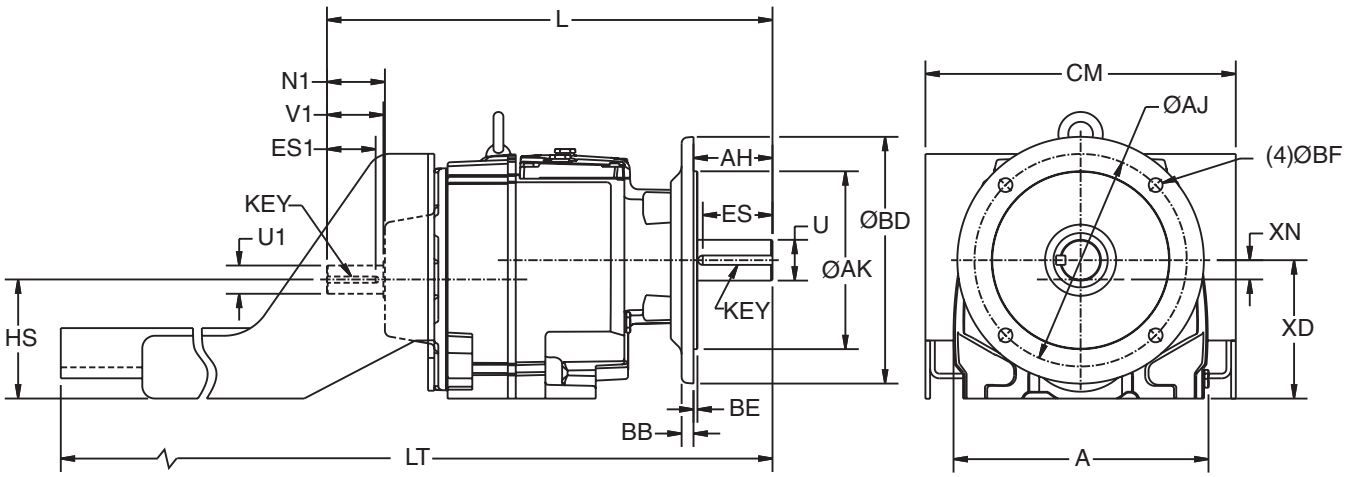
[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Scoop Mount Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	ES	ES1	XD	XN	Key	Key1
32	8.70	13.25	1.29	1.25	0.63	1.25	2.50	2.16	1.00	4.53	0.39	1/4 Sq.	3/16 Sq.
3362,3363	10.16	17.61	2.31	1.50	1.13	2.25	3.00	2.56	1.94	5.51	0.77	3/8 Sq.	1/4 Sq.
3372,3373	10.16	17.76	2.31	1.63	1.13	2.25	3.15	2.78	1.94	5.51	0.77	3/8 Sq.	1/4 Sq.

Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55	9.06	10.43	0.16	11.80	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.14	7.86	0.47	0.47

Gear Frame	Motor Frame					
	143/145T			182/184T		
	CM	HS	LT	CM	HS	LT
32	11.38	3.75	28.36	-	-	-
3362,3363	12.38	4.74	38.33	12.38	4.74	38.33
3372,3373	12.38	4.74	38.48	12.38	4.74	38.48

[2] All rough casting dimensions may vary by .25" due to casting variations.

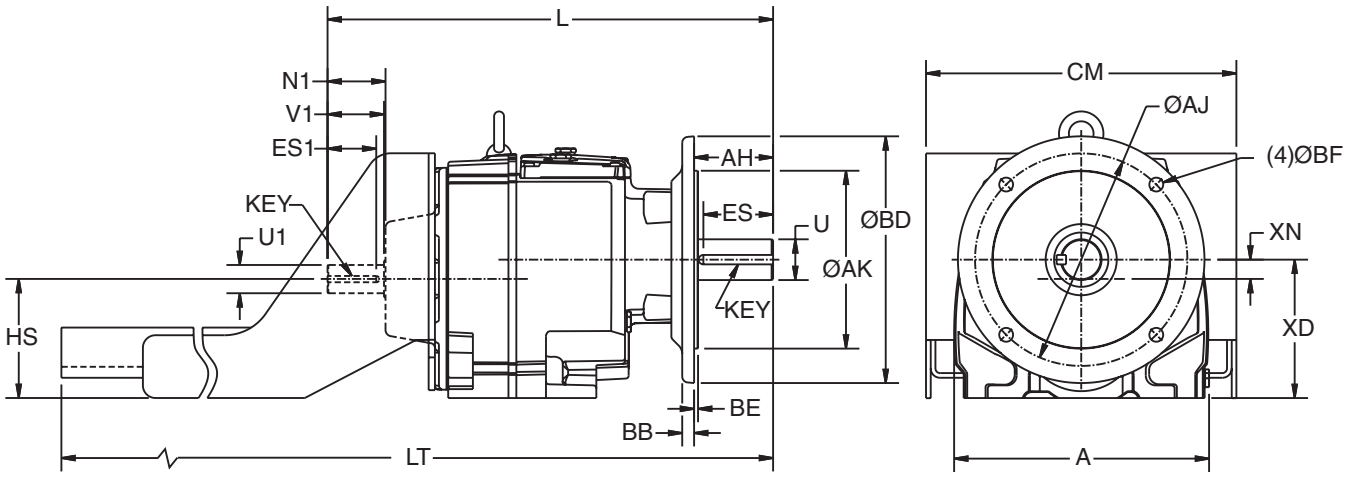
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Scoop Mount Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



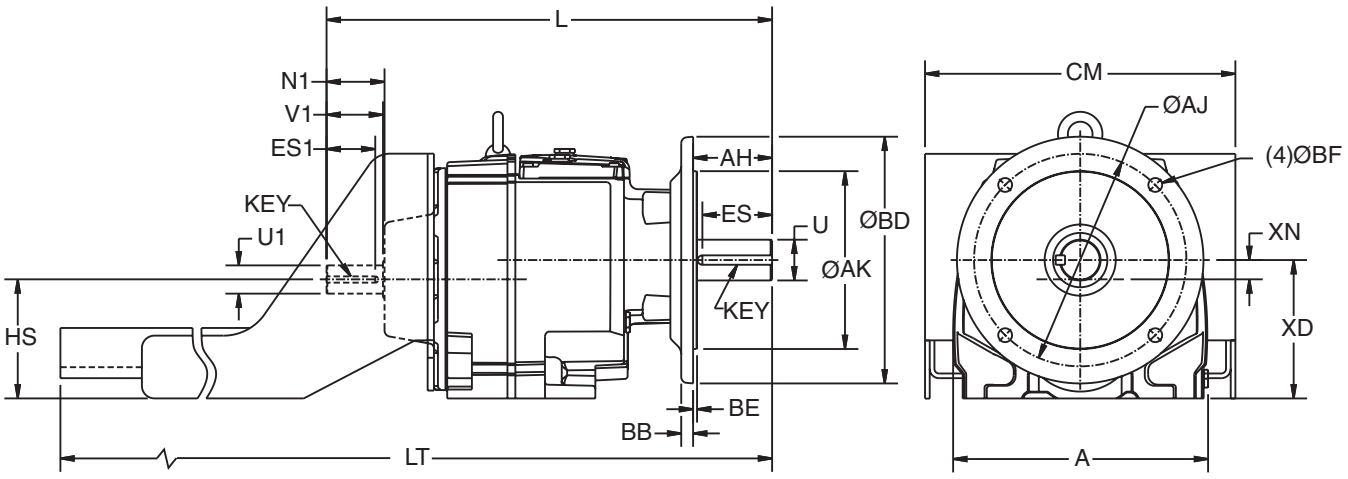
Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	ES	ES1	XD	XN	Key	Key1
34	11.97	19.16	2.37	2.125	1.12	2.25	3.50	3.06	1.94	7.09	1.02	1/2 Sq.	1/4 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55
BD2	7.09	8.46	0.16	9.83	0.59	0.55

Motor Frame								
143/145T			182/184T			213/215T		
CM	HS	LT	CM	HS	LT	CM	HS	LT
12.75	5.56	40.79	12.75	5.56	39.79	12.75	5.56	40.19

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	ES	ES1	XD	XN	Key	Key1
35	14.19	23.42	2.92	2.375	1.375	2.75	4.72	4.19	2.31	8.86	1.14	5/8 Sq.	5/16 Sq.

Flange Type	AK	AJ	BB	BD	BE	BF
BS	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.84	11.81	0.20	13.78	0.71	0.71
BD2	9.06	10.43	0.20	11.81	0.71	0.55

Motor Frame														
56, 143/145T			182/184T			213/215T			254/256T			284/286T		
CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT	CM	HS	LT
12.75	5.56	45.05	12.75	5.56	44.05	12.75	5.56	44.38	17.00	7.44	48.80	17.00	7.44	48.93

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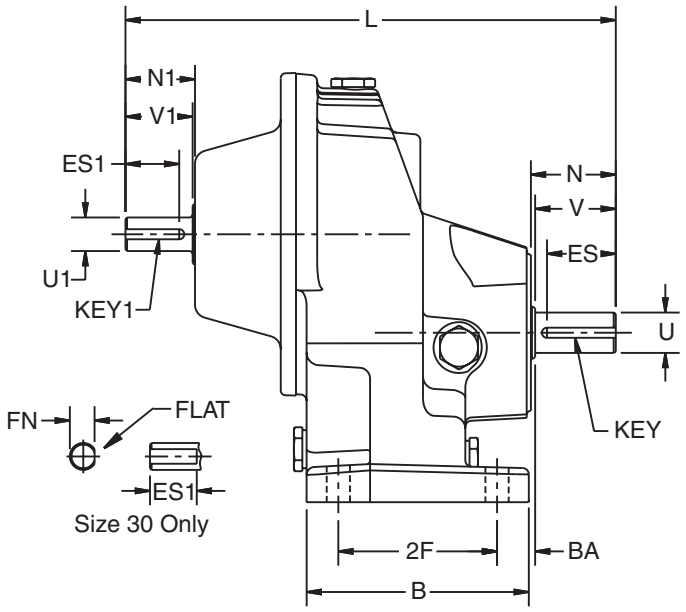
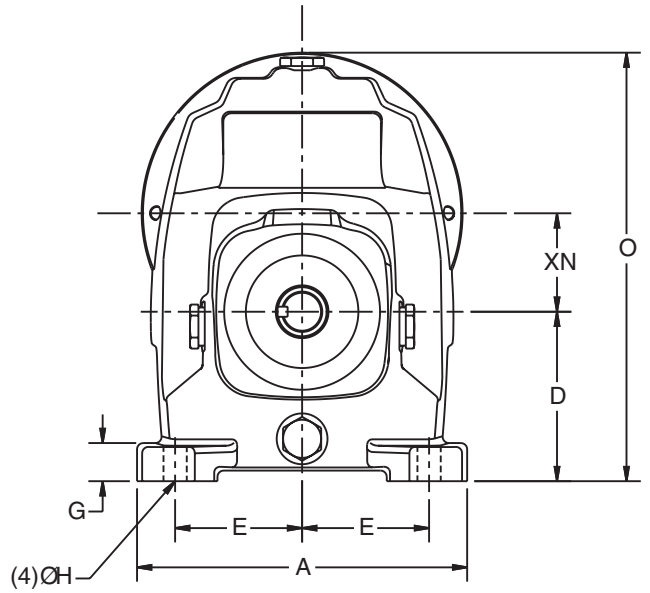
Browning

Input Shaft Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000





Gear Frame	A	B	D [1]	E	G	H	L	N	N1	O	U [3]
30	5.90	3.54	2.95	2.46	0.49	0.35	8.77	2.14	1.12	7.07	0.625
31	6.14	4.13	3.15	2.36	0.71	0.43	9.12	1.58	1.29	7.97	0.75
32	7.28	4.48	3.54	2.76	0.77	0.55	9.74	2.08	1.29	9.67	1.00
33	9.69	5.30	4.41	3.74	1.02	0.63	12.88	2.83	2.31	11.69	1.375
34	11.02	6.59	5.20	4.25	1.34	0.71	14.35	3.06	2.37	13.90	1.500
35	13.65	7.76	6.30	5.12	1.61	0.79	16.73	3.60	2.92	17.37	1.75

Gear Frame	U1 [3]	V	V1	BA	ES	ES1	2F	FN	XN	Key	Key1
30	0.500	1.87	1.00	1.01	1.48	0.87	2.76	0.46	1.40	3/16 Sq.	N/A
31	0.625	1.50	1.25	0.71	1.28	1.00	2.95	N/A	1.83	3/16 Sq.	3/16 Sq.
32	0.625	2.00	1.25	0.75	1.56	1.00	3.15	N/A	2.48	1/4 Sq.	3/16 Sq.
33	1.125	2.75	2.25	1.08	2.40	1.94	3.94	N/A	2.76	5/16 Sq.	1/4 Sq.
34	1.125	3.00	2.25	1.10	2.56	1.94	4.92	N/A	3.43	3/8 Sq.	1/4 Sq.
35	1.375	3.50	2.75	1.18	3.06	2.31	6.30	N/A	4.33	3/8 Sq.	5/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

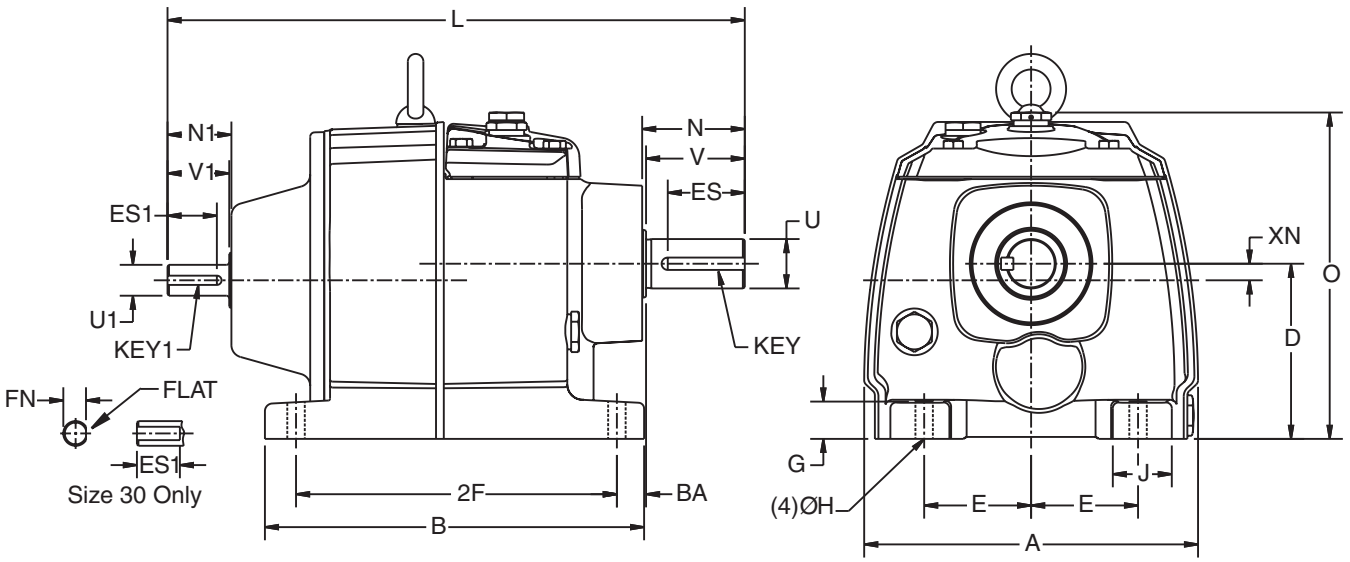
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Input Shaft Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	J	L	N	N1	O	U [3]
3012	5.90	4.92	2.95	2.46	0.51	0.35	1.10	9.56	1.83	1.12	6.00	0.75
3013	5.90	5.71	2.95	2.46	0.51	0.35	1.10	10.35	1.83	1.12	6.00	0.75
31	6.76	7.68	3.54	2.17	0.75	0.35	1.38	11.69	2.08	1.29	6.60	1.00
32	8.72	8.50	4.53	2.66	0.84	0.55	2.56	12.86	2.56	1.29	7.97	1.25
3362,3363	10.13	10.72	5.51	3.35	1.07	0.71	2.56	16.59	3.08	2.31	9.94	1.50
3372,3373	10.13	10.72	5.51	3.35	1.07	0.71	2.56	16.74	3.23	2.31	9.94	1.63
34	11.97	10.87	7.09	4.53	1.37	0.71	1.81	18.41	3.58	2.37	11.89	2.13
35	14.19	12.89	8.86	5.51	1.73	0.87	3.33	22.45	4.75	2.92	14.84	2.37

Gear Frame	U1 [3]	V	V1	BA	ES	ES1	2F	FN	XN	Key	Key1
3012	0.500	1.75	1.00	0.87	1.48	0.87	4.13	0.46	0.28	3/16 Sq.	N/A
3013	0.500	1.75	1.00	0.87	1.48	0.87	4.92	0.46	0.28	3/16 Sq.	N/A
31	0.625	2.00	1.25	0.59	1.56	1.00	6.50	N/A	0.33	1/4 Sq.	3/16 Sq.
32	0.625	2.50	1.25	0.51	2.16	1.00	7.56	N/A	0.39	1/4 Sq.	3/16 Sq.
3362,3363	1.125	3.00	2.25	0.77	2.56	1.94	9.45	N/A	0.77	3/8 Sq.	1/4 Sq.
3372,3373	1.125	3.15	2.25	0.77	2.78	1.94	9.45	N/A	0.77	3/8 Sq.	1/4 Sq.
34	1.125	3.50	2.25	0.98	3.06	N/A	9.25	1.94	1.02	1/2 Sq.	1/4 Sq.
35	1.375	4.72	2.75	1.10	4.19	2.31	11.02	N/A	1.14	5/8 Sq.	5/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

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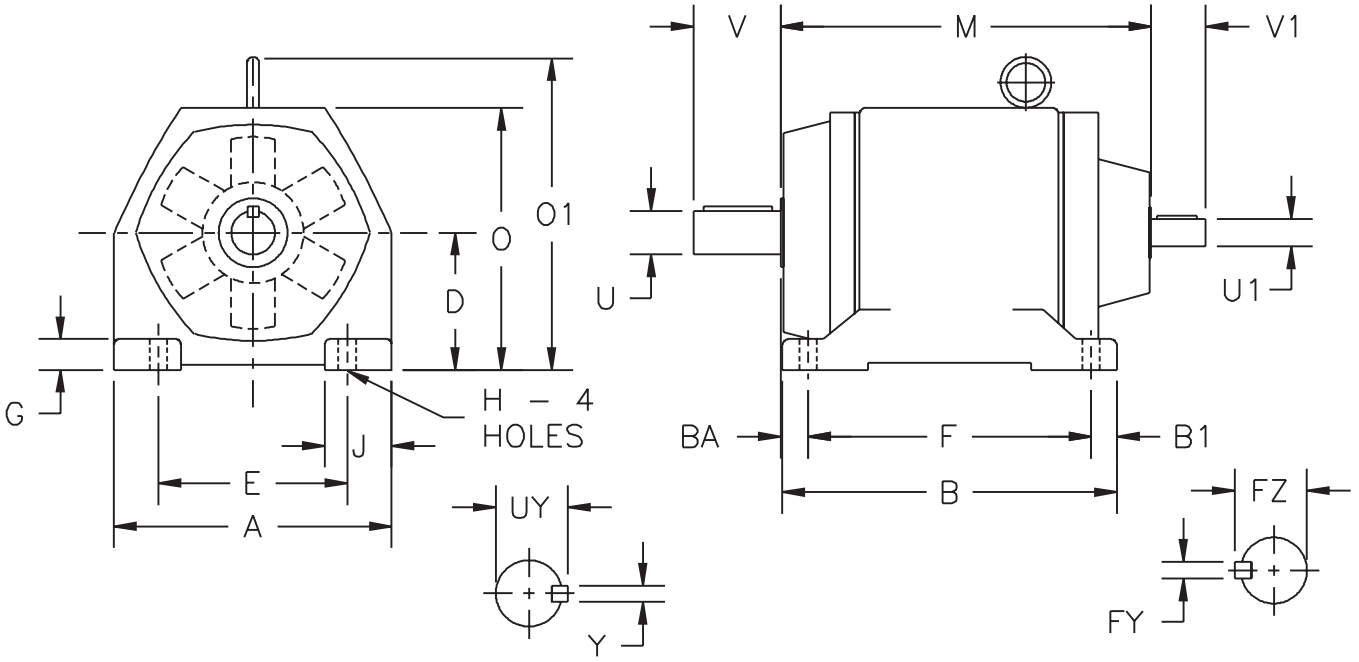
Browning

Input Shaft Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D [1]	E	F	G	H	J	M	O	O1	U [3]	U1 [3]	V	V1
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	16.93	16.78	18.9	2.875	1.875	5.75	3.75
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	18.3	18.5	21.06	3.5	1.875	7	3.75
28	23.62	21.65	1.38	12.4	20.08	18.9	2.56	1.02	4.92	22.25	23.47	25.59	4	2.375	8	4.75
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.30	25.98	27.6	29.72	4.75	2.375	9.5	4.75

Gear Frame	Y	BA	FY	FZ	UY	Weight Lb.
26	3/4	2.36	1/2	2.091	3.2	308
27	7/8	2.56	1/2	2.091	3.882	407
28	1	3.35	5/8	2.646	4.436	726
29	1 1/4	2.36	5/8	2.646	5.291	1210

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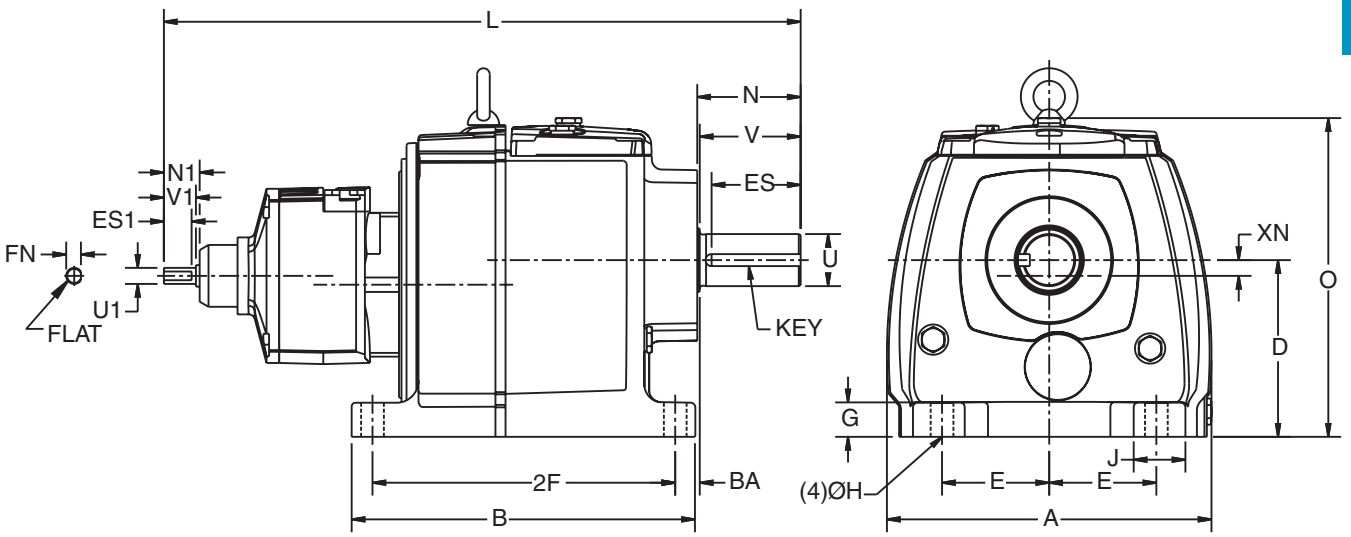
Browning®

Input Shaft Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	J	L	N	N1	O
32	8.72	8.50	4.53	2.66	0.84	0.55	2.56	17.73	2.56	1.12	7.97
33	10.13	10.72	5.51	3.35	1.07	0.71	2.56	19.88	3.23	1.12	9.94

Gear Frame	U [3]	U1 [3]	V	V1	BA	2F	FN	ES	ES1	XN	Key
32	1.25	0.50	2.50	1.00	0.51	7.56	0.46	2.16	0.87	0.12	1/4 Sq.
33	1.625	0.50	3.15	1.00	0.77	9.45	0.46	2.78	0.87	0.49	3/8 Sq.

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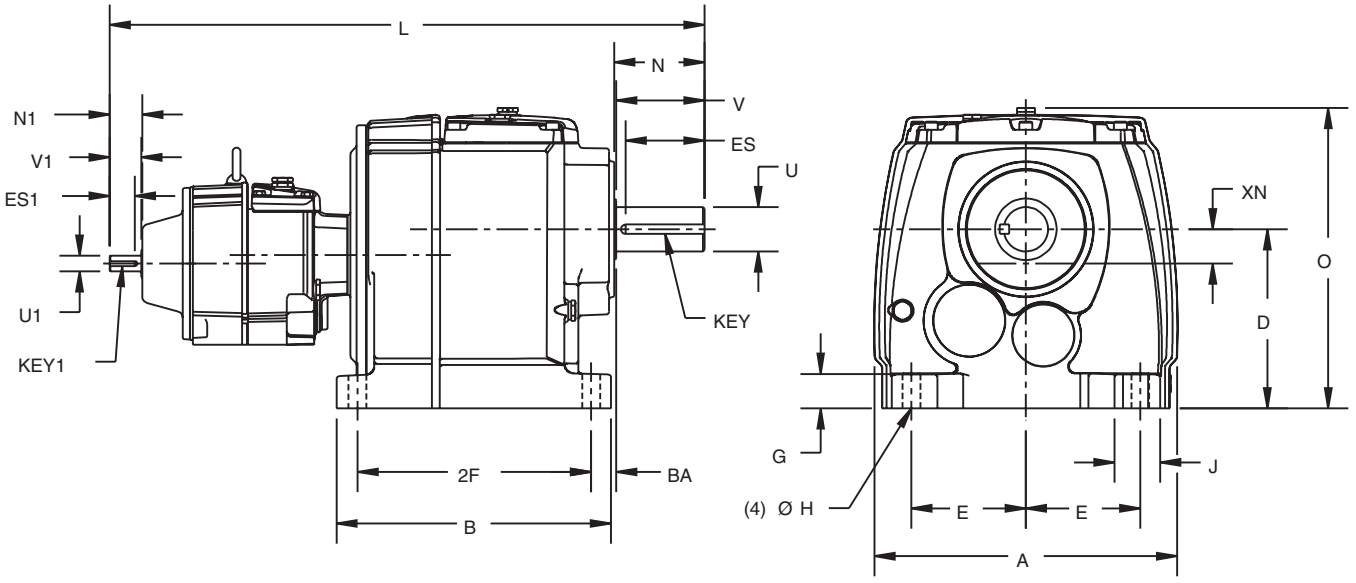
Browning

Input Shaft Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	J	L	N	N1	O	U [3]
34	11.97	10.87	7.09	4.53	1.37	0.71	1.81	23.54	3.58	1.29	11.89	2.125

Gear Frame	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
34	0.625	3.50	1.25	0.98	9.25	3.06	1.00	1.35	1/2 Sq.	3/16 Sq.

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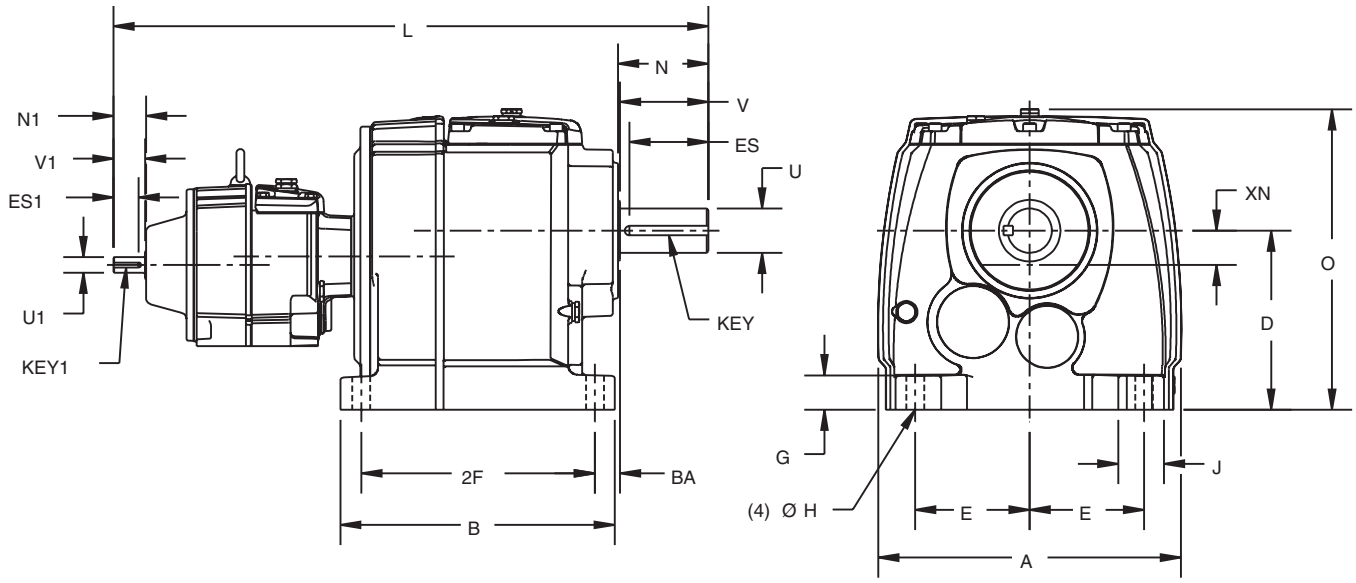
Browning®

Input Shaft Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	J	L	N	N1	O
35	14.19	12.89	8.86	5.51	1.73	0.87	3.33	25.95	4.81	1.29	14.84

Gear Frame	U [3]	U1 [3]	V	V1	BA	2F	ES	ES1	XN	Key	Key1
35	2.375	0.625	4.72	1.25	1.10	11.02	4.19	1.00	1.47	5/8 Sq.	3/16 Sq.

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

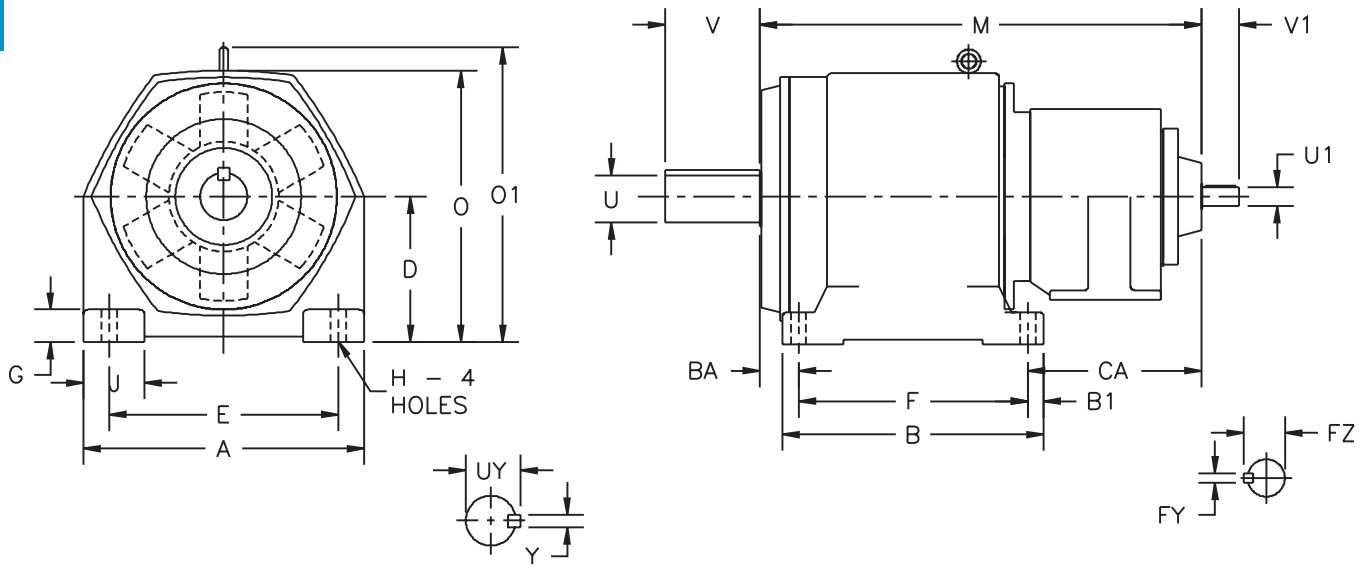
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Input Shaft Reducer

Foot Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	B1	D [1]	E	F	G	H	J	M	O	O1	U [3]	U1 [3]	V	V1
26	17.13	15.94	0.98	8.86	13.98	13.98	1.97	0.94	3.74	25.80	16.78	18.9	2.875	1.125	5.75	2.25
27	19.69	17.72	1.18	9.84	16.54	15.35	2.17	1.02	4.33	27.19	18.5	21.06	3.5	1.125	7	2.25
28	23.62	21.65	1.38	12.4	20.08	18.9	2.56	1.02	4.92	31.56	23.47	25.59	4	1.125	8	2.25
29	25.98	26.38	1.77	14.76	19.69	22.83	2.95	1.38	6.30	35.30	27.6	29.72	4.75	1.125	9.5	2.25

Gear Frame	Y	BA	CA	FY	FZ	UY	Weight Lb.
26	3/4	2.36	9.47	1/4	1.236	3.2	375
27	7/8	2.56	9.27	1/4	1.236	3.882	430
28	1	3.35	9.32	1/4	1.236	4.436	775
29	1 1/4	2.36	10.10	1/4	1.236	5.291	1160

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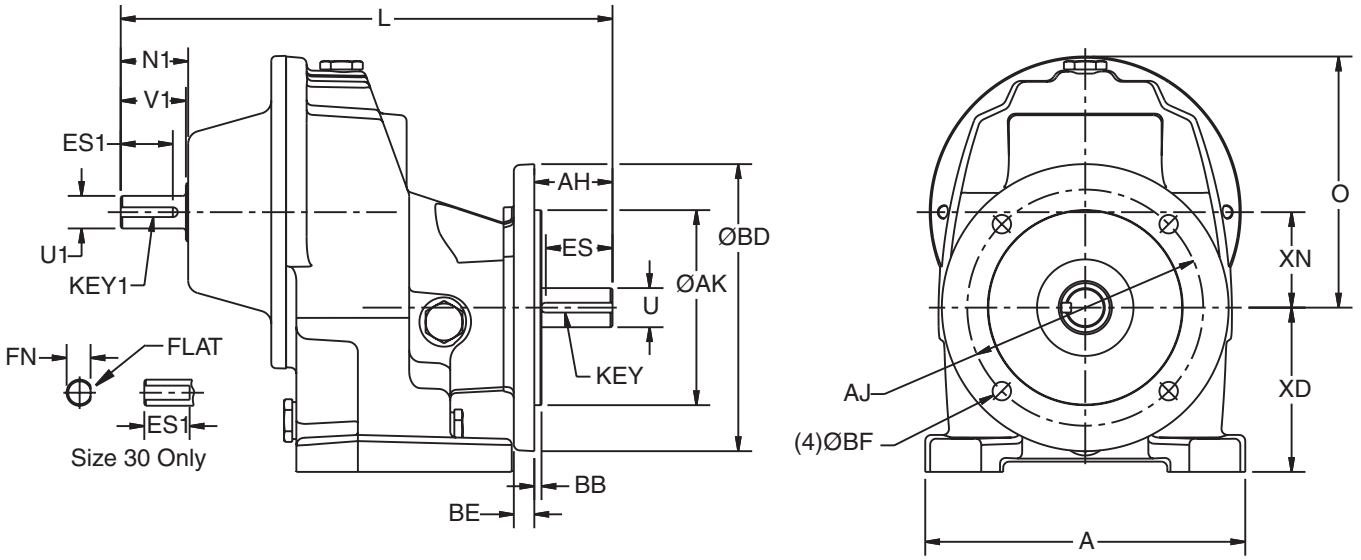

Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
30	-	8.77	1.12	4.11	0.63	0.50	1.00
31	6.14	9.44	1.29	4.82	0.75	0.63	1.25
32	8.70	9.55	1.29	7.38	1.00	0.63	1.25
33	9.44	13.27	2.31	7.28	1.38	1.13	2.25

Gear Frame	AH	ES	ES1	FN	XD	XN	Key	Key1
30	2.06	1.48	0.87	0.46	2.24	1.40	3/16 Sq.	N/A
31	1.50	1.28	1.00	N/A	3.15	1.83	3/16 Sq.	3/16 Sq.
32	1.50	1.16	1.00	N/A	2.68	2.48	1/4 Sq.	3/16 Sq.
33	2.75	2.40	1.94	N/A	4.41	2.76	5/16 Sq.	1/4 Sq.

Flange Type	30						31					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
56C	4.50	5.88	0.12	6.50	0.39	3/8-16	-	-	-	-	-	-
BS	3.74	4.53	0.12	5.51	0.31	0.35	4.33	5.12	0.14	6.29	0.39	0.35
BD1	4.33	5.12	0.08	6.30	0.39	0.35	-	-	-	-	-	-
BD2	3.15	3.94	0.12	4.72	0.39	0.28	3.74	4.53	0.14	5.50	0.39	0.35
BD3	5.12	6.50	0.12	7.87	0.31	0.35	-	-	-	-	-	-

Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	5.12	6.50	0.14	7.87	0.47	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.16	7.86	0.47	0.43

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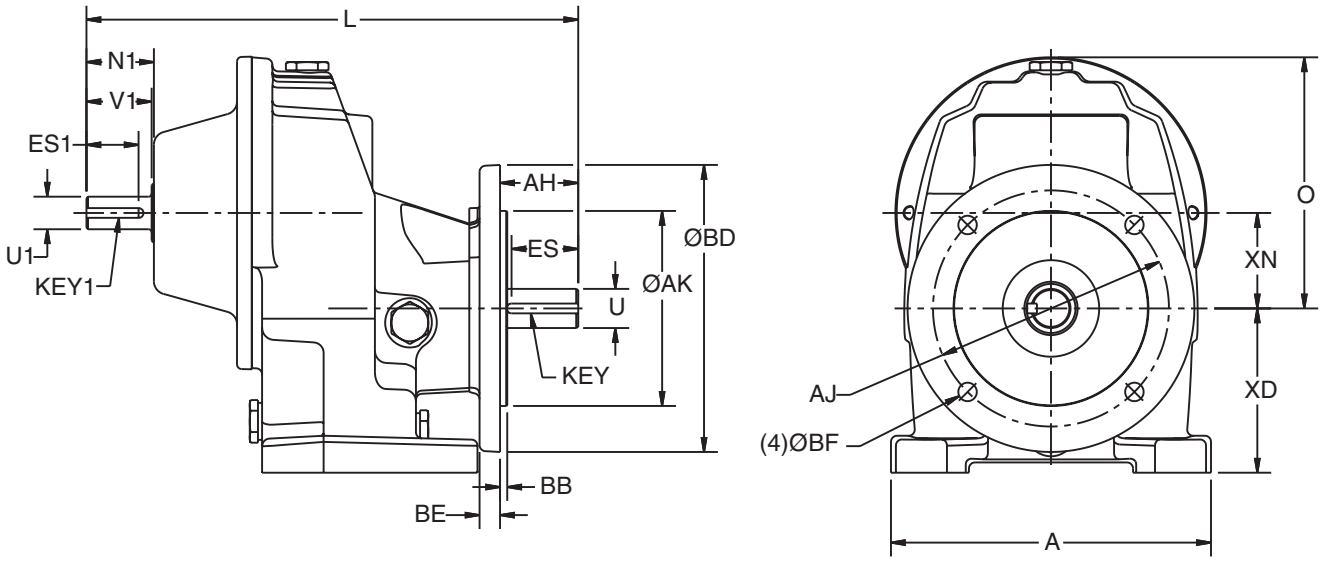
Browning

Input Shaft Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
34	11.02	15.12	2.37	8.70	1.50	1.125	2.25
35	13.65	17.90	2.92	11.07	1.75	1.375	2.75

Gear Frame	AH	ES	ES1	XD	XN	Key	Key1
34	3.00	2.56	1.94	5.20	3.43	3/8 Sq.	1/4 Sq.
35	3.50	3.06	2.31	6.30	4.33	3/8 Sq.	5/16 Sq.

Flange Type	34						35					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	9.06	10.43	0.16	11.80	0.59	0.55	9.84	11.81	0.20	13.78	0.71	0.71
BD2	7.09	8.46	0.16	9.83	0.59	0.55	9.06	10.43	0.20	11.81	0.71	0.55

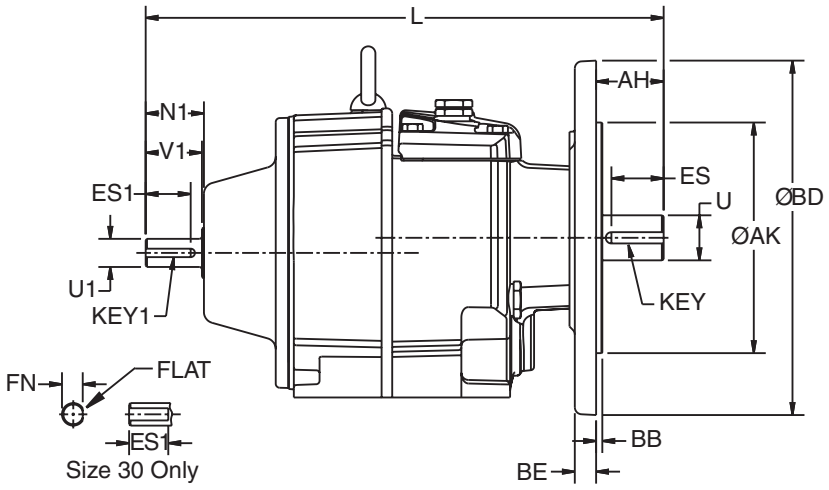
[2] All rough casting dimensions may vary by .25" due to casting variations.

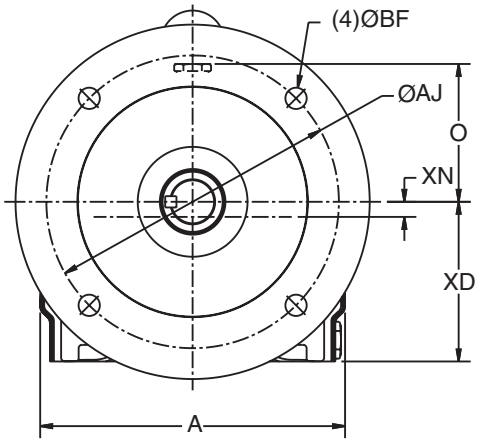
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

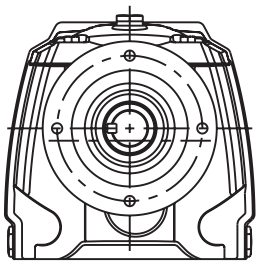
Input Shaft Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000







BD3 TYPE (31)

Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
3012	5.51	9.87	1.12	3.04	0.625	0.500	1.00
3013	5.51	10.66	1.12	3.04	0.625	0.500	1.00
31	6.77	11.50	1.29	3.06	1.000	0.625	1.20

Gear Frame	AH	ES	ES1	FN	XD	XN	Key	Key1
3012	2.07	1.48	0.87	0.46	2.48	0.28	3/16 Sq.	N/A
3013	2.07	1.48	0.87	0.46	2.48	0.28	3/16 Sq.	N/A
31	1.50	1.16	1.00	N/A	3.54	0.33	1/4 Sq.	3/16 Sq.

Flange Type	30						31					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
56C	4.50	5.88	0.12	6.50	0.39	3/8-16	-	-	-	-	-	-
BS	3.74	4.53	0.12	5.51	0.31	0.35	5.12	6.50	0.14	7.87	0.47	0.47
BD1	3.15	3.94	0.10	4.72	0.28	0.28	4.33	5.12	0.14	6.29	0.39	0.35
BD2	4.33	5.12	0.12	6.30	0.31	0.35	3.74	4.53	0.14	5.50	0.39	0.35
BD3	5.12	6.50	0.12	7.87	0.31	0.35	3.15	3.94	0.10	4.72	0.39	0.28

[2] All rough casting dimensions may vary by .25" due to casting variations.

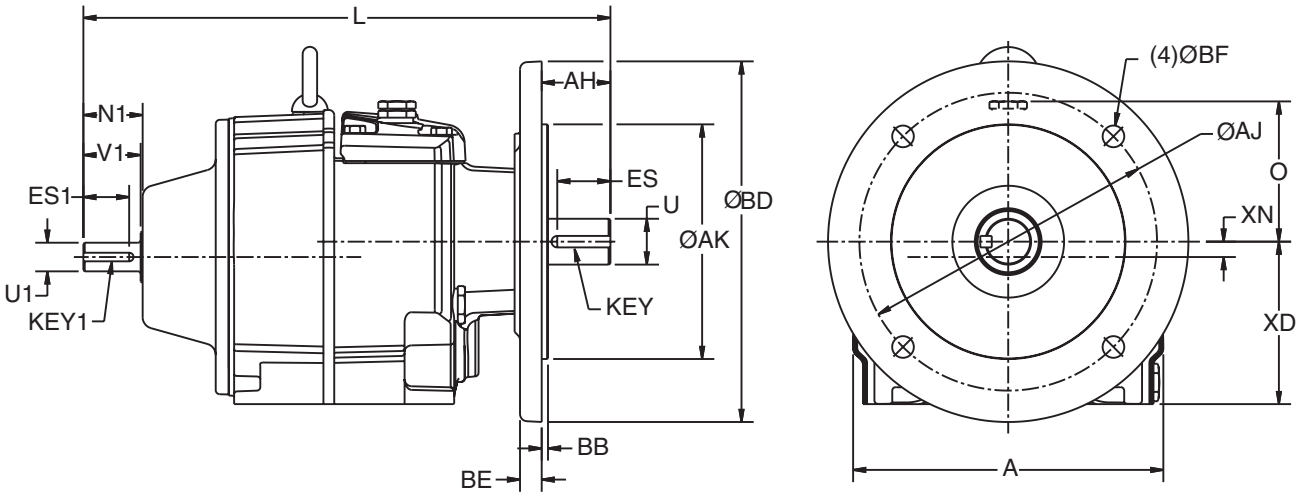
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Input Shaft Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



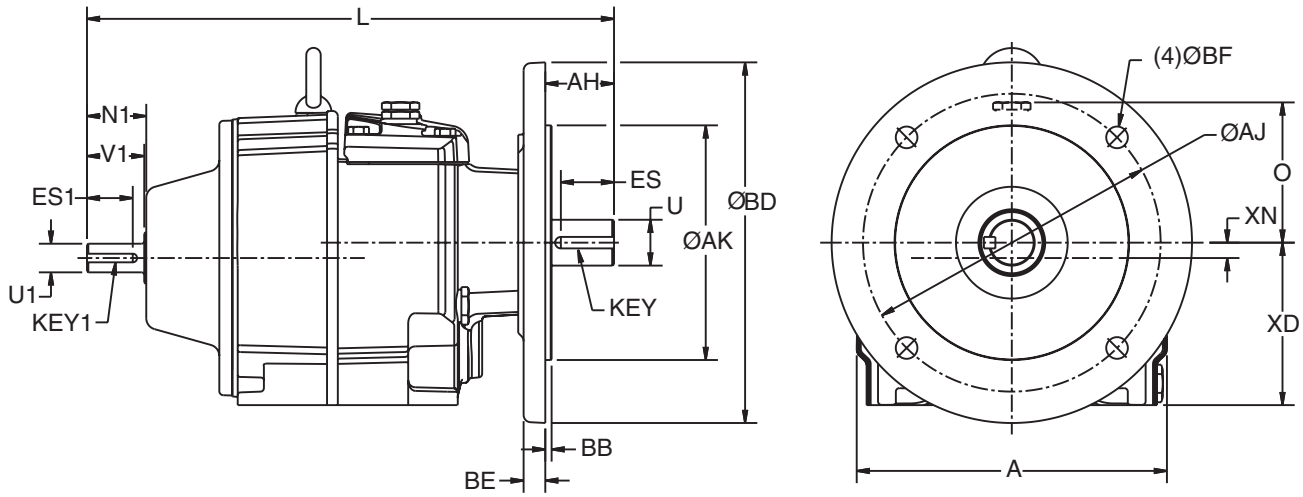
Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
32	8.70	13.25	1.29	3.50	1.250	0.625	1.25
3362,3363	10.16	17.62	2.31	4.43	1.500	1.125	2.25
3372,3373	10.16	17.77	2.31	4.43	1.625	1.125	2.25

Gear Frame	AH	ES	ES1	FN	XD	XN	Key	Key1
32	2.50	2.16	1.00	N/A	4.53	0.39	1/4 Sq.	3/16 Sq.
3362,3363	3.00	2.56	1.94	N/A	5.51	0.77	3/8 Sq.	1/4 Sq.
3372,3373	3.15	2.78	1.94	N/A	5.51	0.77	3/8 Sq.	1/4 Sq.

Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55	9.06	10.43	0.16	11.80	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.14	7.86	0.47	0.47

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".



Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
34	11.97	19.16	2.37	4.80	2.125	1.125	2.25
35	14.19	23.42	2.92	5.98	2.375	1.375	2.75

Gear Frame	AH	ES	ES1	XD	XN	Key	Key1
34	3.5	3.06	1.94	7.09	1.02	1/2 Sq.	1/4 Sq.
35	4.72	4.19	2.31	8.86	1.14	5/8 Sq.	5/16 Sq.

Flange Type	34						35					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55	9.84	11.81	0.20	13.78	0.71	0.71
BD2	7.09	8.46	0.16	9.83	0.59	0.55	9.06	10.43	0.20	11.81	0.71	0.55

[2] All rough casting dimensions may vary by .25" due to casting variations.

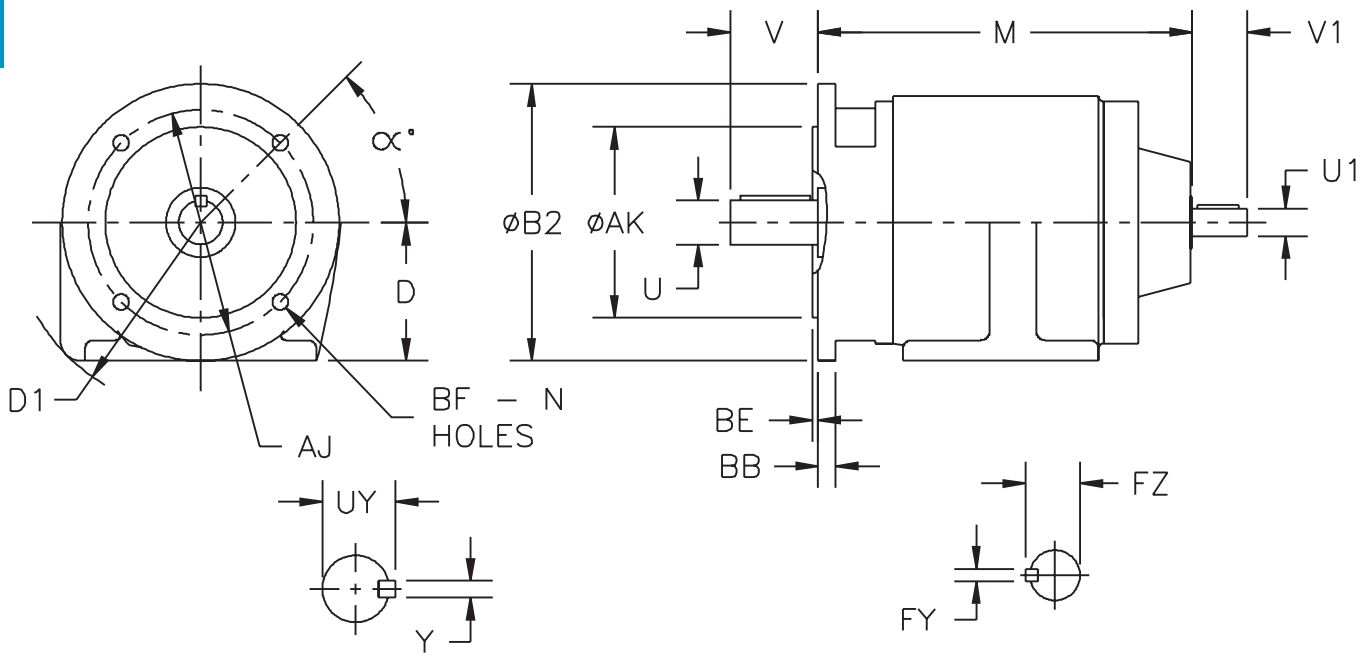
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Input Shaft Reducer

BS Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



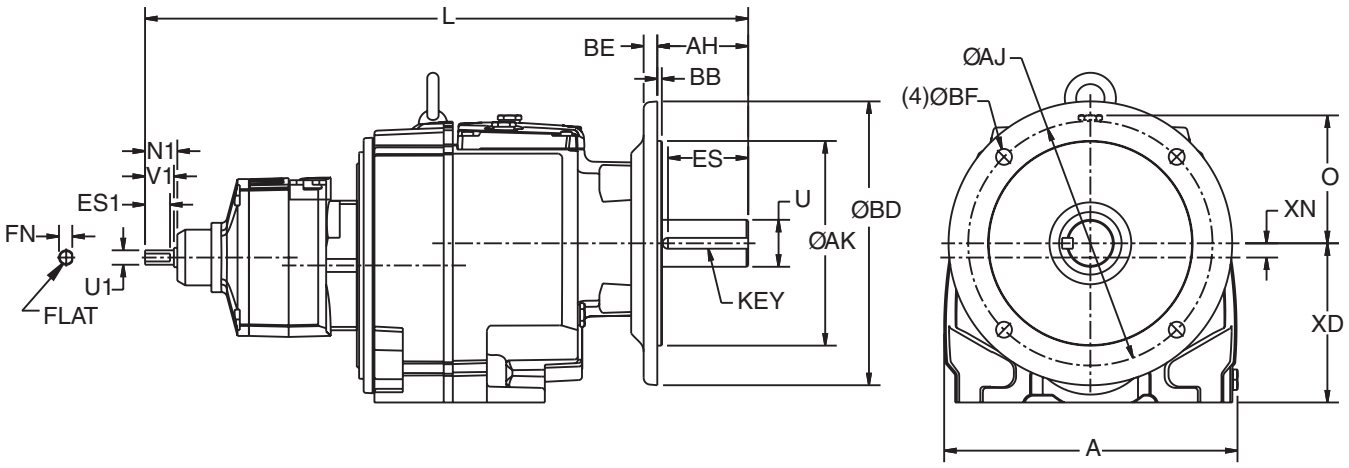
Gear Frame	B2	D	D1	M	N	U[3]	U1[3]	V	V1	Y	AJ	AK	BB	BE	BF
26	21.65	8.86	12.13	14.92	8	2.875	1.875	5.75	3.75	3/4	19.685	17.717	0.748	0.197	0.70
27	21.65	9.84	13.94	16.30	8	3.500	1.875	7.00	3.75	7/8	19.685	17.717	0.787	0.197	0.70
28	25.98	12.40	16.70	19.88	8	4.000	2.375	8.00	4.75	1	23.622	21.654	0.945	0.236	0.94

Gear Frame	FY	FZ	UY	μ	Weight Lb.
26	1/2	2.091	3.200	22.5°	308
27	1/2	2.091	3.882	22.5°	407
28	5/8	2.646	4.436	22.5°	726

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Flange Mounted - Combined Reduction



Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1	XD
32	8.70	18.13	1.12	3.50	1.25	0.50	1.00	4.53
33	10.16	20.90	1.12	4.43	1.63	0.50	1.00	5.51

Gear Frame	AH	ES	ES1	FN	XN	Key
32	2.50	2.16	0.86	0.46	0.12	1/4 Sq.
33	3.15	2.78	0.86	0.46	0.49	3/8 Sq.

Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55	9.06	10.43	0.16	11.80	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.14	7.86	0.47	0.47

[2] All rough casting dimensions may vary by .25" due to casting variations.

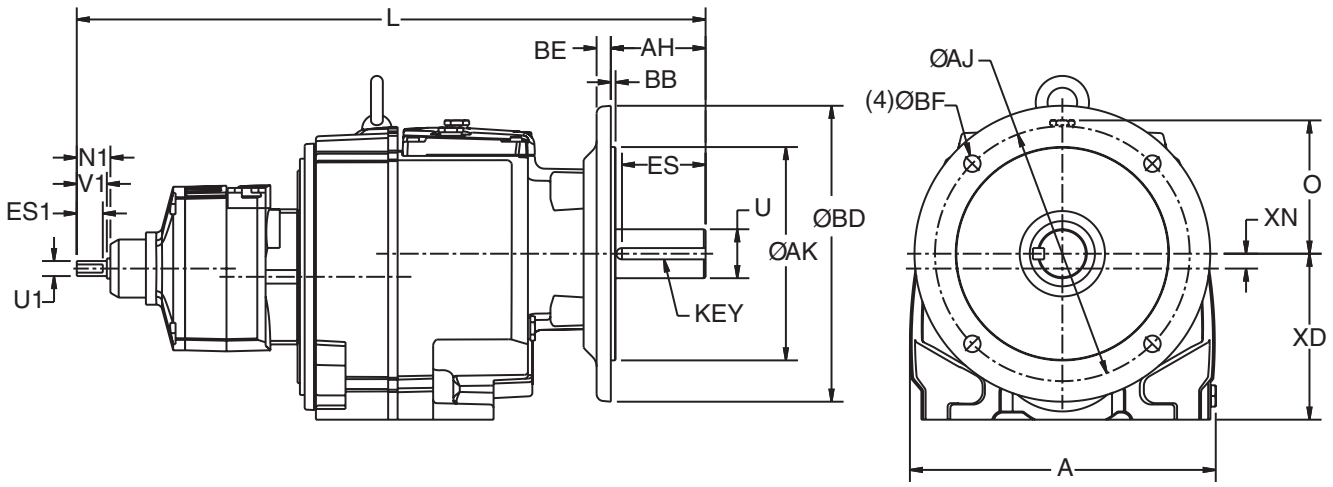
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Input Shaft Reducer

Flange Mounted - Combined Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	O	U [3]	U1 [3]	V1
34	11.97	24.29	1.29	4.80	2.125	1.125	1.25
35	14.19	26.86	1.29	5.98	2.125	0.625	1.25

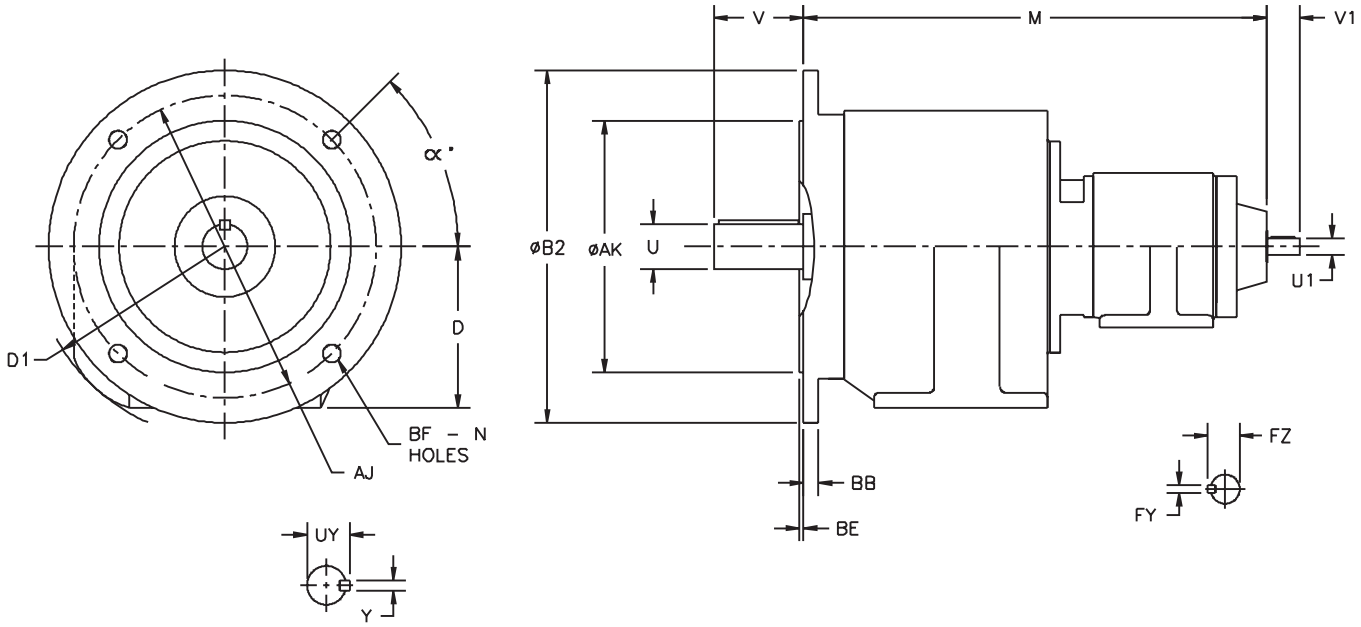
Gear Frame	AH	ES	ES1	XD	XN	Key	Key1
34	3.50	3.06	1.00	7.09	1.35	1/2 Sq.	3/16 Sq.
35	4.72	4.19	1.00	8.86	1.47	5/8 Sq.	3/16 Sq.

Flange Type	34						35					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55	9.84	11.81	0.20	13.78	0.71	0.71
BD2	7.09	8.46	0.16	9.83	0.59	0.55	9.06	10.43	0.20	11.81	0.71	0.55

[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

BS Flange Mounted - Combined Reduction



Gear Frame	B2	D	D1	M	N	U [3]	U1 [3]	V	V1	Y	AJ	AK	BB	BE	BF
26	21.65	8.86	12.13	27.19	8	2.875	1.125	5.75	2.25	3/4	19.685	17.717	0.748	0.197	0.70
27	21.65	9.84	13.94	27.19	8	3.5	1.125	7	2.25	7/8	19.685	17.717	0.787	0.197	0.70
28	25.98	12.40	16.70	38.13	8	4	1.125	8	2.25	1	23.622	21.654	0.945	0.236	0.94

Gear Frame	FY	FZ	UY	μ	Weight Lb.
26	1/4	1.236	3.2	22.5°	340
27	1/4	1.236	3.882	22.5°	450
28	1/4	1.236	4.436	22.5°	760

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

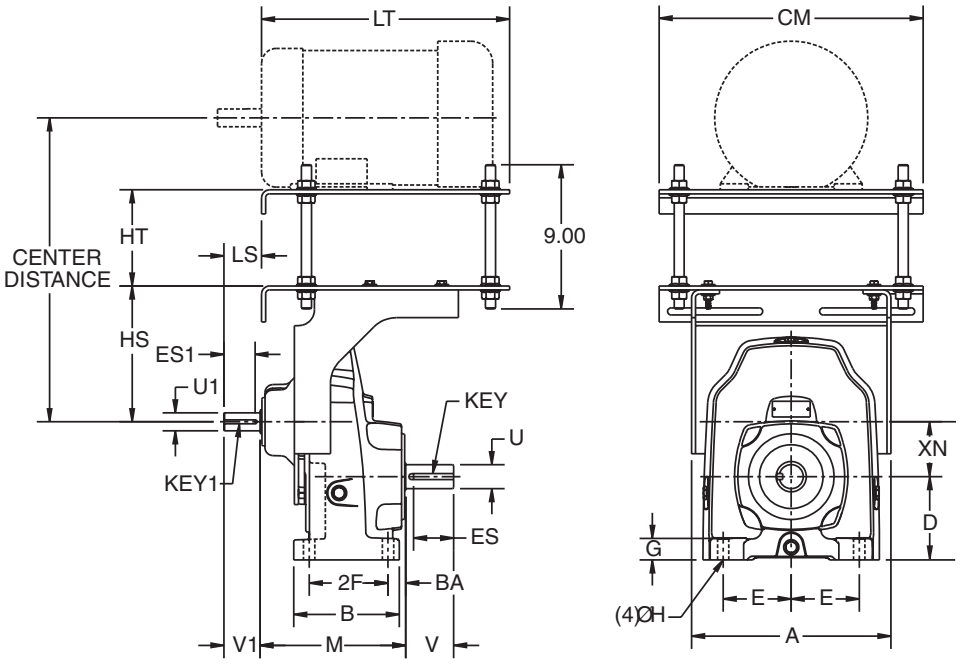
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Top Mount Reducer

Foot Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	U [3]	U1 [3]	V	V1	BA
34	12.47	6.59	5.20	4.25	1.34	0.71	9.10	1.50	1.13	3.00	2.25	1.10
35	15.45	7.76	6.30	5.12	1.61	0.79	10.38	1.75	1.38	3.50	2.75	1.18

Gear Frame	CM	2F	HS	HT		LS	LT	ES	ES1	XN	Key	Key1
				Min.	Max.							
34	16.50	4.92	14.48	1.89	7.36	2.35	15.50	2.56	1.94	3.43	3/8 Sq.	1/4 Sq.
35	20.00	6.30	10.48	1.89	7.36	2.72	20.25	3.06	2.31	4.33	3/8 Sq.	5/16 Sq.

Motor Frame	34 Center Distance		35 Center Distance	
	Min.	Max.	Min.	Max.
143/145T	13.87	19.34	15.87	21.34
182/184T	14.87	20.34	16.87	22.34
213/215T	15.62	21.09	17.62	23.09
254/256T	-	-	18.62	24.09
284/286T	-	-	19.37	24.84

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

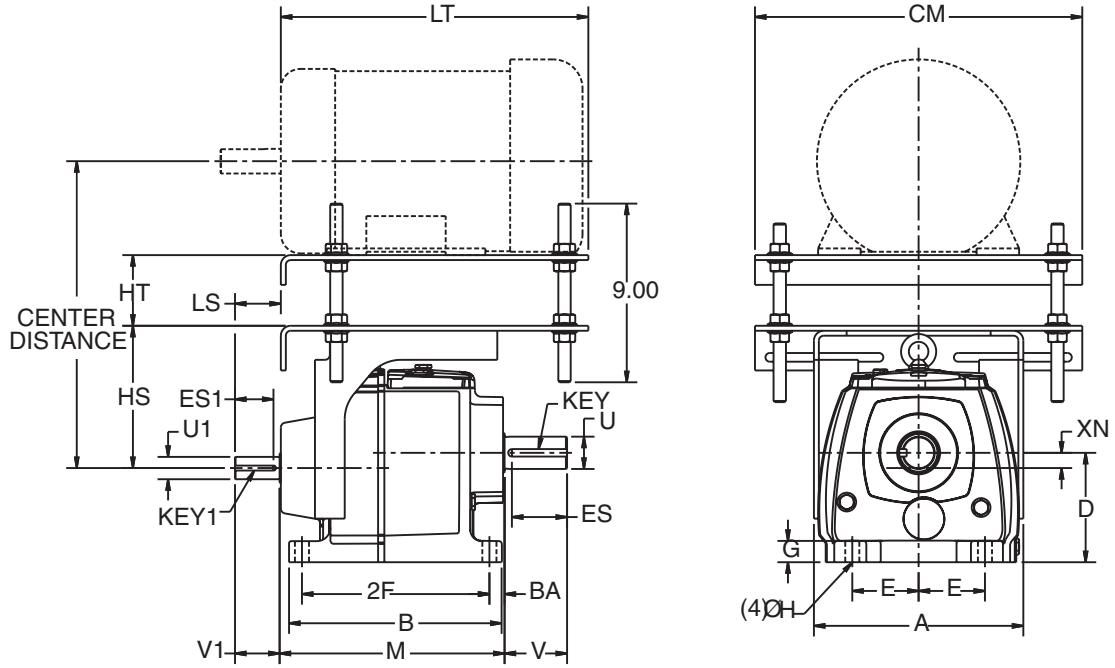
[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Top Mount Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	U [3]	U1 [3]	V	V1	BA
32	10.56	8.50	4.53	2.66	0.84	0.55	9.11	1.25	0.63	2.50	1.25	0.51
3362,3363	10.56	10.72	5.51	3.35	1.07	0.71	11.34	1.50	1.13	3.00	2.25	0.77
3372,3373	10.56	10.72	5.51	3.35	1.07	0.71	11.34	1.63	1.13	3.15	2.25	0.77

Gear Frame	CM	2F	HS	HT		LS	LT	ES	ES1	XN	Key	Key1
				Min.	Max.							
32	16.50	7.56	7.14	1.64	7.61	1.29	15.50	2.16	1.00	0.39	1/4 Sq.	3/16 Sq.
3362,3363	16.50	9.45	7.17	1.64	7.61	2.31	15.50	2.56	1.94	0.77	3/8 Sq.	1/4 Sq.
3372,3373	16.50	9.45	7.17	1.64	7.61	2.31	15.50	2.78	1.94	0.77	3/8 Sq.	1/4 Sq.

Motor Frame	32 Center Distance		33 Center Distance	
	Min.	Max.	Min.	Max.
56	12.28	18.25	12.31	18.28
143/145T	12.28	18.25	12.31	18.28
182/184T	13.28	19.25	13.31	19.28
213/215T	-	-	14.06	20.03

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

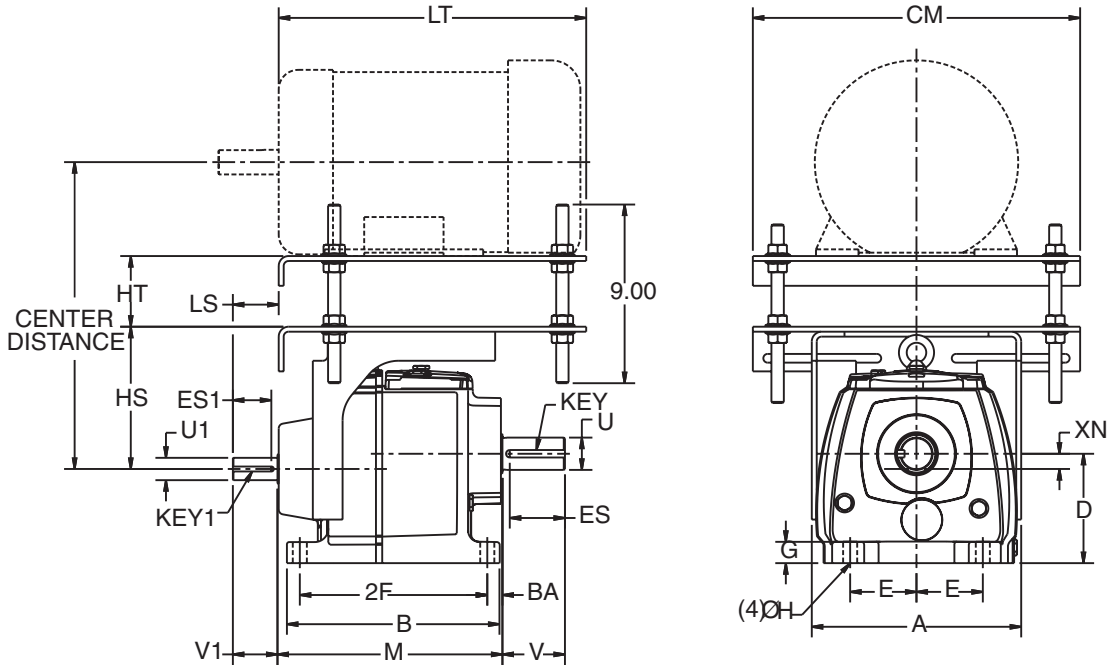
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Top Mount Reducer

Foot Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	B	D [1]	E	G	H	M	U [3]	U1 [3]	V	V1	BA
34	12.47	10.87	7.09	4.53	1.37	0.71	12.66	2.13	1.13	3.50	2.25	0.98
35	15.45	12.89	8.86	5.51	1.73	0.87	14.95	2.38	1.38	4.72	2.75	1.10

Gear Frame	CM	2F	HS	HT		LS	LT	ES	ES1	XN	Key	Key1
				Min.	Max.							
34	16.50	9.25	14.48	1.89	7.36	2.35	15.50	3.06	1.94	1.02	1/2 Sq.	1/4 Sq.
35	20.00	11.02	10.48	1.89	7.36	2.72	20.25	4.19	2.31	1.14	5/8 Sq.	5/16 Sq.

Motor Frame	34 Center Distance		35 Center Distance	
	Min.	Max.	Min.	Max.
143/145T	13.87	19.34	15.87	21.34
182/184T	14.87	20.34	16.87	22.34
213/215T	15.62	21.09	17.62	23.09
254/256T	16.62	22.09	18.62	24.09
284/286T	-	-	19.37	24.84

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

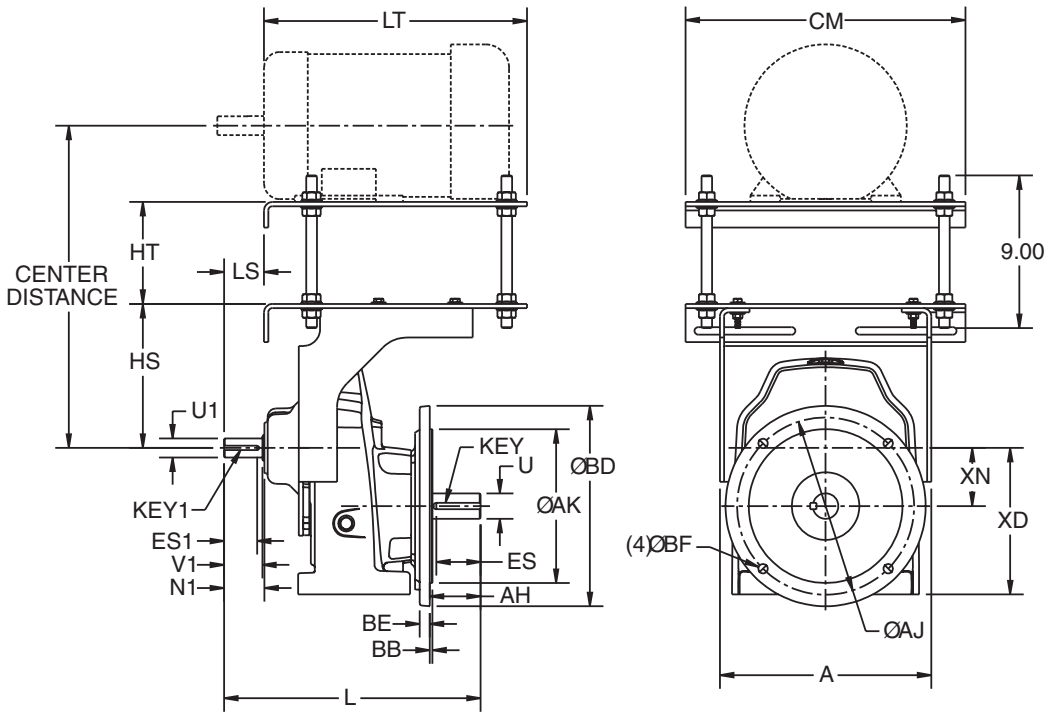
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning®

Top Mount Reducer

Flange Mounted - Single Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	CM	ES
34	12.47	15.12	2.37	1.50	1.13	2.25	3.00	16.50	2.56
35	15.45	17.90	2.92	1.75	1.38	2.75	3.50	20.00	3.06

Gear Frame	ES1	XD	HS	HT		LS	LT	XN	Key	Key1
				Min.	Max.					
34	1.94	5.20	14.48	1.89	7.36	2.35	15.50	3.43	3/8 Sq.	1/4 Sq.
35	2.31	6.30	10.48	1.89	7.36	2.72	20.25	4.33	3/8 Sq.	5/16 Sq.

Flange Type	34						35					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	9.06	10.43	0.16	11.8	0.59	0.55	9.84	11.81	0.2	13.78	0.71	0.71
BD2	7.09	8.46	0.16	9.83	0.59	0.55	9.06	10.43	0.2	11.81	0.71	0.55

Motor Frame	34 Center Distance		35 Center Distance	
	Min.	Max.	Min.	Max.
143/145T	13.87	19.34	15.87	21.34
182/184T	14.87	20.34	16.87	22.34
213/215T	15.62	21.09	17.62	23.09
254/256T	-	-	18.62	24.09
284/286T	-	-	19.37	24.84

[1] Dimension “D” will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

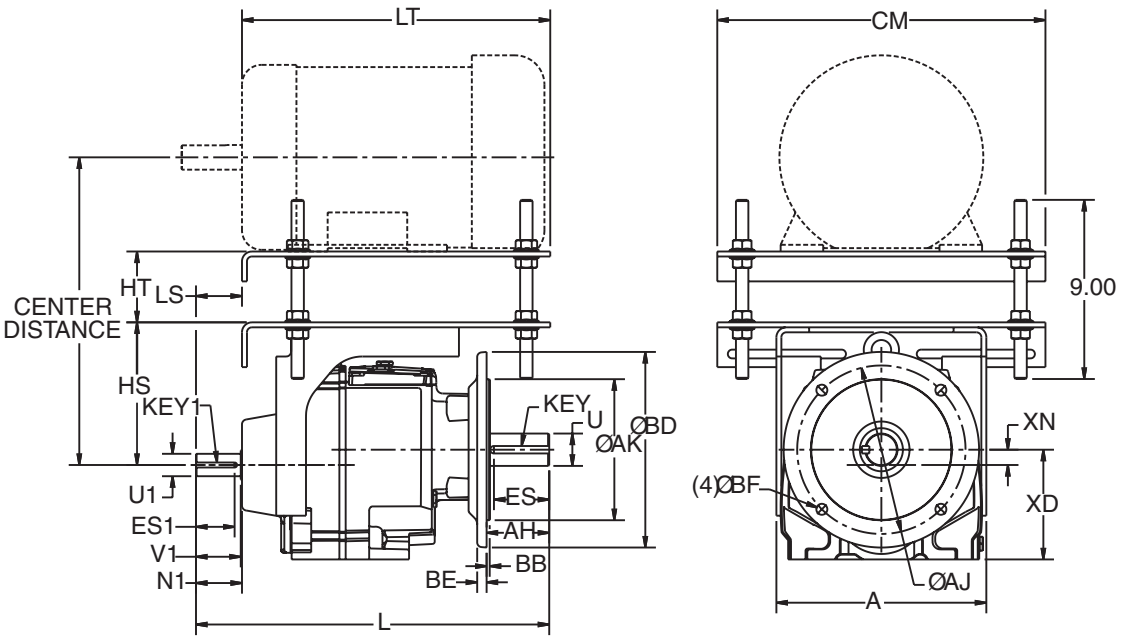
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Browning

Top Mount Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	CM	ES
32	10.56	13.25	1.29	1.25	0.63	1.25	2.50	16.50	2.16
3362,3363	10.56	17.61	2.31	1.50	1.13	2.25	3.00	16.50	2.56
3372,3373	10.56	17.76	2.31	1.63	1.13	2.25	3.15	16.50	2.78

Gear Frame	ES1	XD	HS	HT		LS	LT	XN	Key	Key1
				Min.	Max.					
32	1.00	4.53	7.14	1.64	7.61	1.29	15.50	0.39	1/4 Sq.	3/16 Sq.
3362,3363	1.94	5.51	7.17	1.64	7.61	2.31	15.50	0.77	3/8 Sq.	1/4 Sq.
3372,3373	1.94	5.51	7.17	1.64	7.61	2.31	15.50	0.77	3/8 Sq.	1/4 Sq.

Flange Type	32						33					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	7.09	8.46	0.16	9.83	0.47	0.55	9.06	10.43	0.16	11.80	0.47	0.55
BD1	5.12	6.50	0.14	7.87	0.39	0.47	7.09	8.46	0.16	9.83	0.47	0.55
BD2	4.33	5.12	0.14	6.29	0.39	0.35	5.12	6.50	0.14	7.86	0.47	0.47

Motor Frame	32 Center Distance		33 Center Distance	
	Min.	Max.	Min.	Max.
56	12.28	18.25	12.31	18.28
143T, 145T	12.28	18.25	12.31	18.28
182T, 184T	13.28	19.25	13.31	19.28
213T, 215T	-	-	14.06	20.03

[1] Dimension "D" will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

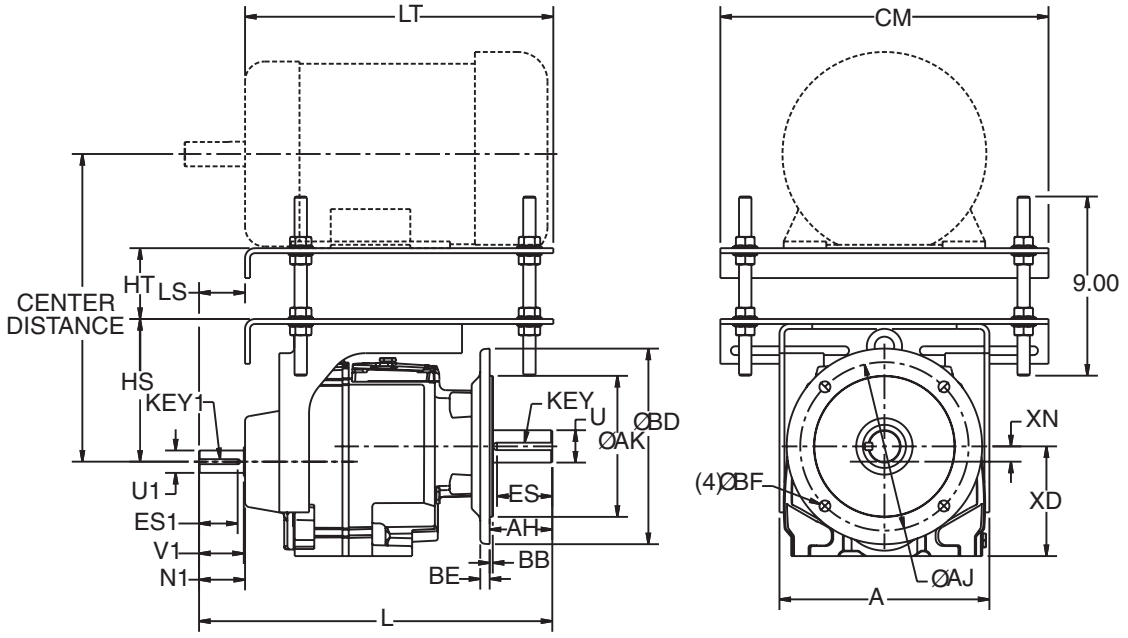
[2] All rough casting dimensions may vary by .25" due to casting variations.

[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

Top Mount Reducer

Flange Mounted - Double/Triple Reduction

CbN SERIES 2000 3000



Gear Frame	A	L	N1	U [3]	U1 [3]	V1	AH	CM	ES
34	12.47	19.16	2.37	2.13	1.13	2.25	3.50	16.50	3.06
35	15.45	23.42	2.92	2.13	1.38	2.75	4.72	20.00	4.19

Gear Frame	ES1	XD	HS	HT		LS	LT	XN	Key	Key1
				Min.	Max.					
34	1.94	7.09	14.48	1.89	7.36	2.35	15.5	1.02	1/2 Sq.	1/4 Sq.
35	2.31	8.86	10.48	1.89	7.36	2.72	20.25	1.14	5/8 Sq.	5/16 Sq.

Flange Type	34						35					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
BS	9.84	11.81	0.16	13.77	0.59	0.71	11.81	13.78	0.20	15.75	0.71	0.71
BD1	9.06	10.43	0.16	11.80	0.59	0.55	9.84	11.81	0.20	13.78	0.71	0.71
BD2	7.09	8.46	0.16	9.83	0.59	0.55	9.06	10.43	0.20	11.81	0.71	0.55

Motor Frame	34 Center Distance		35 Center Distance	
	Min.	Max.	Min.	Max.
143/145T	13.87	19.34	15.87	21.34
182/184T	14.87	20.34	16.87	22.34
213/215T	15.62	21.09	17.62	23.09
254/256T	16.62	22.09	18.62	24.09
284/286T	-	-	19.37	24.84

[1] Dimension "D" will never be exceeded, but may vary from values shown. When exact dimensions are required, shims up to .03" may be necessary.

[2] All rough casting dimensions may vary by .25" due to casting variations.

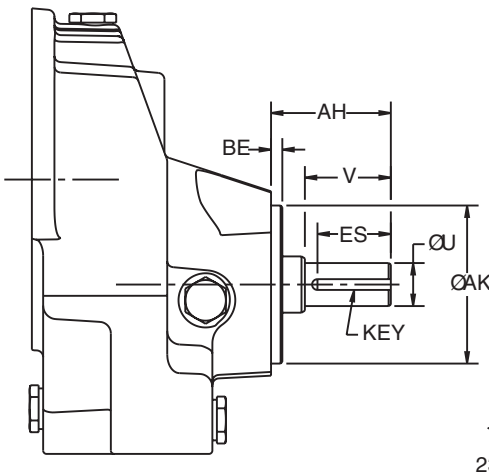
[3] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

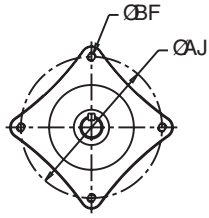
Browning

B14 Face Mounting Supplement

Single Reduction

CbN SERIES 2000 3000





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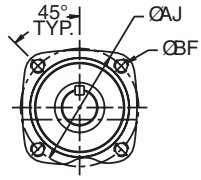
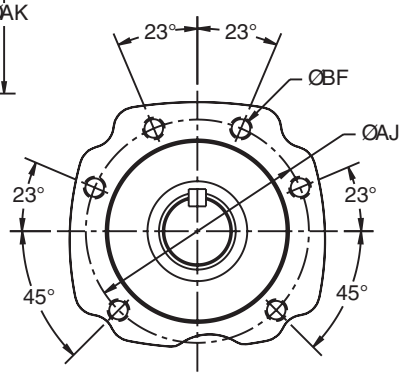


31 / 32



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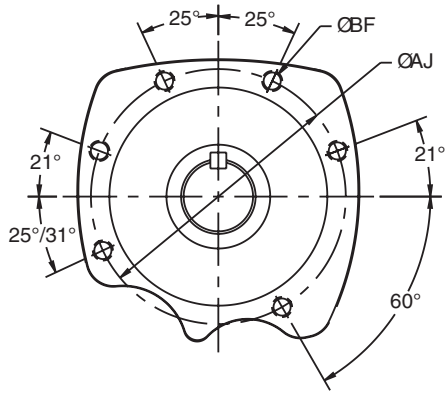


34 / 35

Gear Frame	U [1]	V	AH	AJ	AK [2]	BE	BF	ES	Key
30	0.625	1.88	2.53	3.937	2.362	0.12	M6x.63	1.42	3/16 Sq.
31	0.750	1.50	2.09	3.268	2.756	0.2	M10x.87	1.28	3/16 Sq.
32	1.000	2.00	2.09	3.268	2.756	0.2	M10x.87	1.56	1/4 Sq.
33	1.375	2.75	3.34	4.724	3.937	0.31	M10x.87	2.40	5/16 Sq.
34	2.125	3.00	4.10	5.984	5.118	0.28	M12x.87	2.56	3/8 Sq.
35	2.375	3.50	4.84	7.480	6.100	0.3	M16x1.06	3.06	3/8 Sq.

[1] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

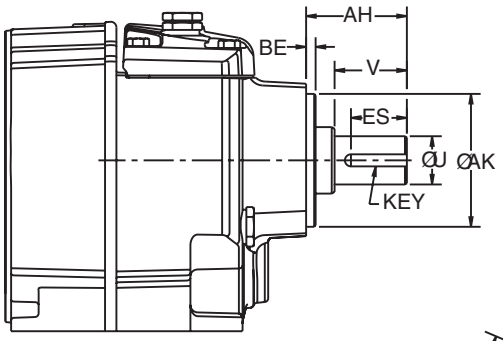
[2] Tolerance is J6.

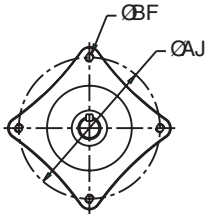
Browning®

B14 Face Mounting Supplement

Multiple Reduction

CbN SERIES 2000 3000





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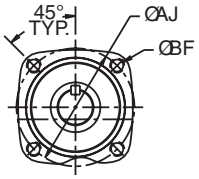

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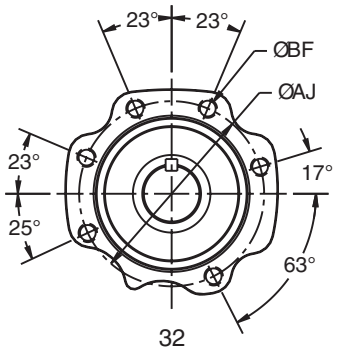

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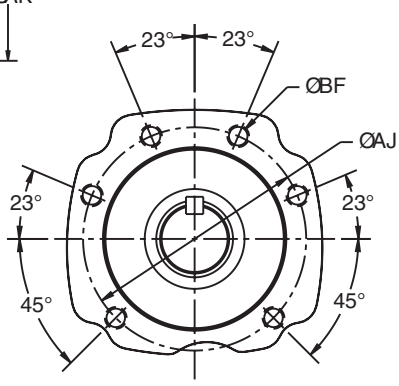

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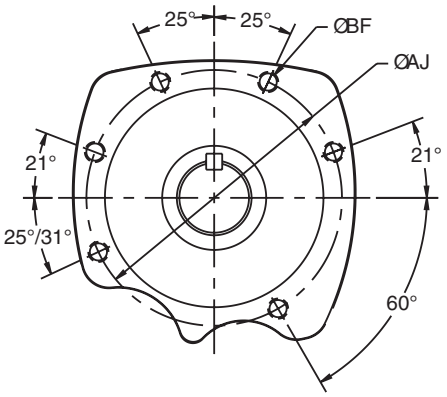


34 / 35

Gear Frame	U [1]	V	AH	AJ	AK [2]	BE	BF	ES	Key
30	0.625	1.50	2.53	3.937	2.362	0.39	M6x.63	1.42	3/16 Sq.
31	1.000	1.50	2.09	3.268	2.756	0.20	M10x.87	1.16	1/4 Sq.
32	1.250	2.50	3.09	3.937	3.228	0.14	M10x.87	2.16	1/4 Sq.
3362,3363	1.500	3.00	3.91	4.842	3.937	-0.14	M10x.87	2.56	3/8 Sq.
3372,3373	1.625	3.15	4.06	4.842	3.937	-0.14	M10x.87	2.78	3/8 Sq.
34	2.125	3.50	4.60	5.984	5.118	0.28	M12x.87	3.06	1/2 Sq.
35	2.375	4.72	6.09	7.480	6.100	0.30	M16x1.06	4.19	5/8 Sq.

[1] Shaft extension tolerance: +.0000"; –.0005" up to 1.5" diameter inclusive. Larger diameters: +.000"; –.001".

[2] Tolerance is J6.

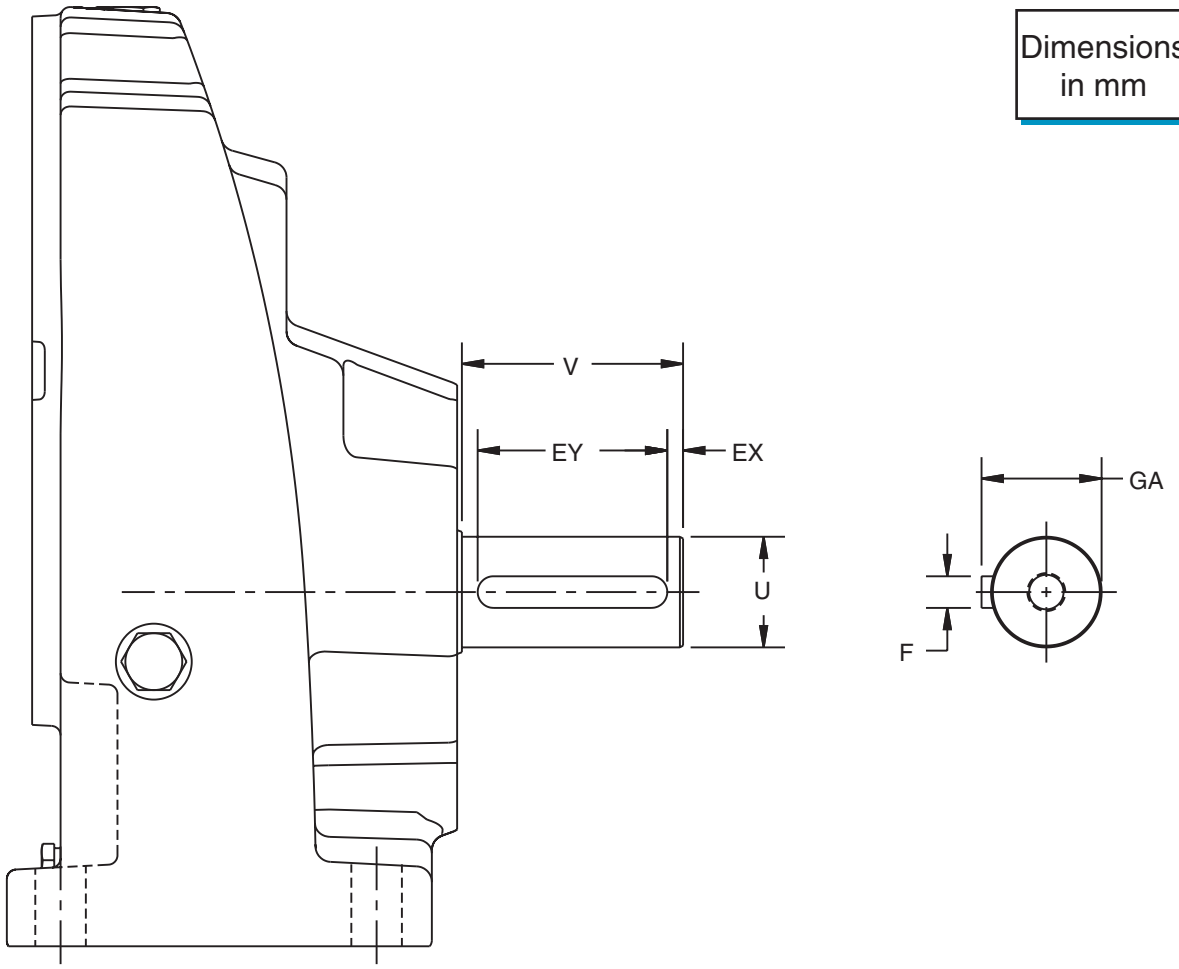
Browning

Metric Output Shaft Dimensions

SM Foot Mounted - Single Reduction

CbN SERIES 2000 3000

Dimensions in mm



Gear Frame	F	U	GA	V	EX	EY
30	5	16j6	18	40	7	25
31	6	20j6	22,5	40	7	30
32	8	25j6	28	50	5	40
33	10	35k6	38	70	5	60
34	12	40k6	43	80	3	72
35	14	45	48.5	90	5	80

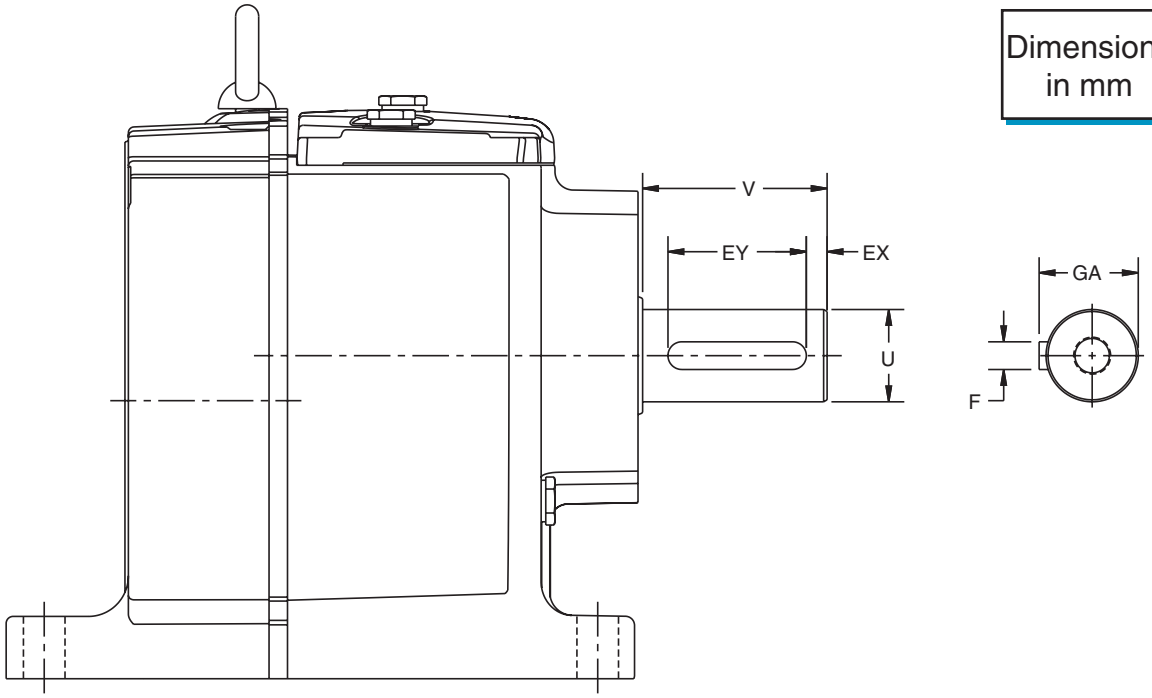
Browning

Metric Output Shaft Dimensions

CbN SERIES 2000 3000

SM Foot Mounted - Multiple Reduction

Dimensions in mm



Gear Frame	F	U	GA	V	EX	EY
30	6	20j6	22,5	40	7	25
31	8	25j6	28	50	5	40
32	8	30j6	33	60	6	45
33	12	40k6	43	80	9	60
34	14	50k6	53.5	100	3	90
35	18	60m6	64	120	4	110
26	20	70 m6	74,5	140	5	130
27	25	90 m6	95	170	5	160
28	28	100 m6	106	210	5	200
29	32	120 m6	127	210	5	200

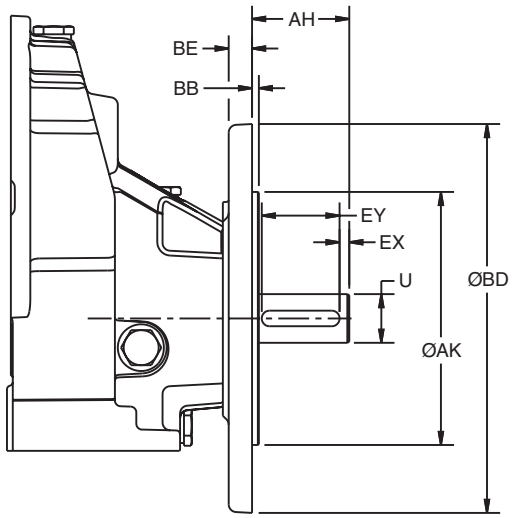
Browning

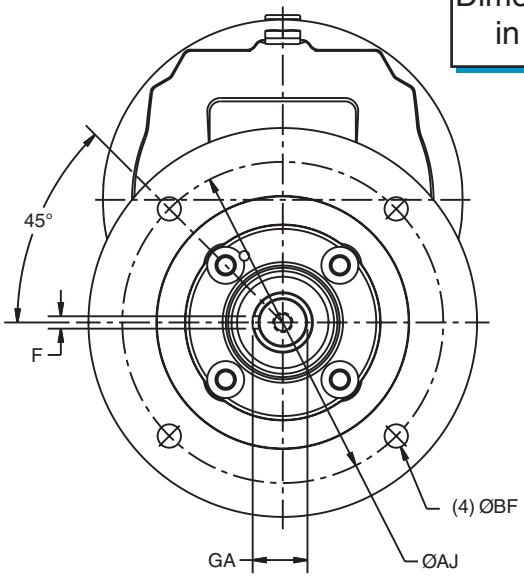
Metric Output Shaft Dimensions

Flange Mounted - Single Reduction

CbN SERIES 2000 3000

Dimensions in mm





Gear Frame	F	U	AH	GA	EX	EY
30	5	16j6	40	18	7	25
31	6	20j6	40	22.5	7	30
32	8	25j6	50	28	5	40
33	10	35k6	70	38	5	60

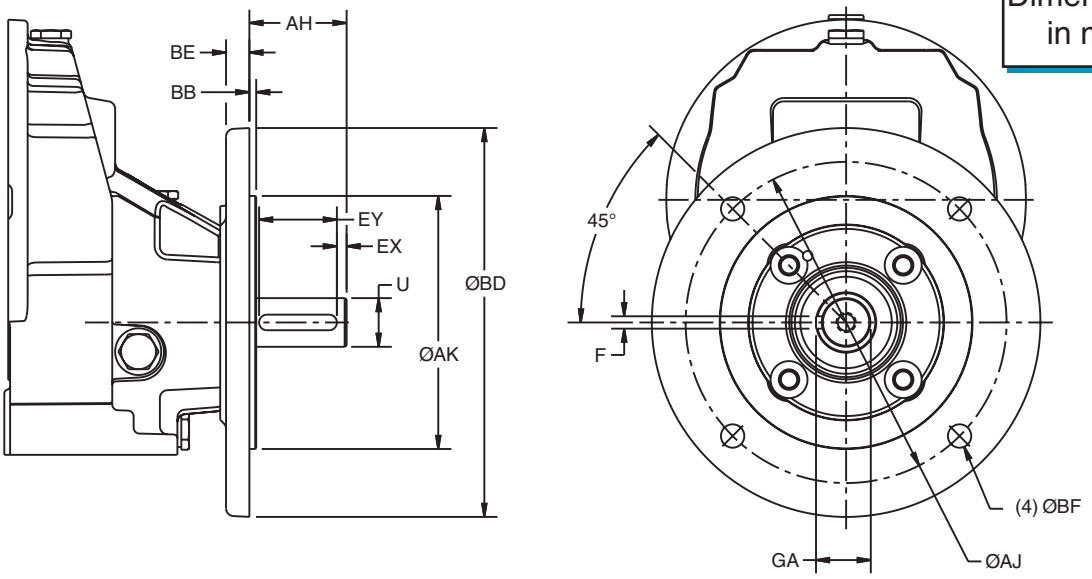
Gear Frame	BSM						BDM1					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
30	95j6	115	3	140	8	9	80j6	100	3	120	10	7
31	110j6	130	3.5	160	10	9	-	-	-	-	-	-
32	130j6	165	3.5	200	12	12	-	-	-	-	-	-
33	180j6	215	4	250	12	14	-	-	-	-	-	-

Gear Frame	BDM2						BDM3					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
30	110j6	130	2	160	10	9	130j6	165	3	200	8	9
31	95j6	115	3	140	10	9	-	-	-	-	-	-
32	110j6	130	3.5	160	9	9	-	-	-	-	-	-
33	130j6	165	3.5	200	12	11	-	-	-	-	-	-

Metric Output Shaft Dimensions

Flange Mounted - Single Reduction

Dimensions in mm



Gear Frame	F	U	AH	GA	EX	EY
34	12	40k6	80	43	3	72
35	14	45	90	48.5	5	80

Gear Frame	BSM						BDM2					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
34	230j6	265	4	300	15	14	180j6	215	4	250	15	14
35	250	300	5	350	18	18	230	265	5	300	18	14

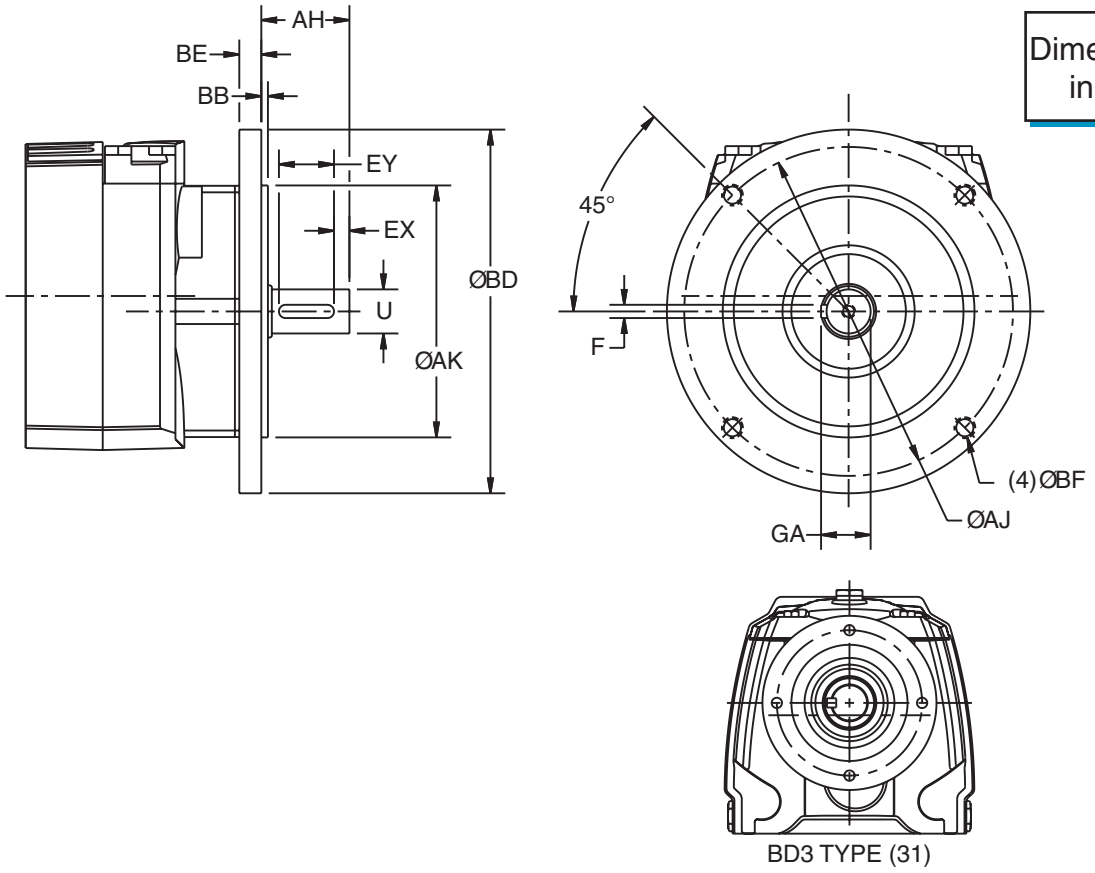
Browning

Metric Output Shaft Dimensions

Flange Mounted - Multiple Reduction

CbN SERIES 2000 3000

Dimensions in mm



BD3 TYPE (31)

Gear Frame	F	U	AH	GA	EX	EY
30	6	20j6	40	22.5	7	25
31	8	25j6	50	28	5	40
32	8	30j6	60	33	6	45
33	12	40k6	80	43	9	6

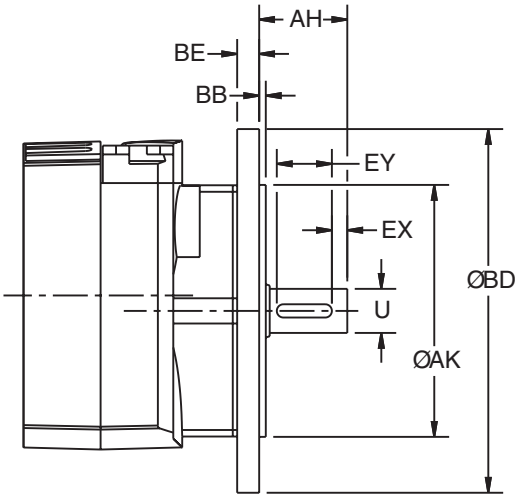
Gear Frame	BSM						BDM1						BDM2					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
30	95j6	115	3	140	8	9	80j6	100	2.5	120	7	7	110j6	130	3	160	8	9
31	130j6	165	3.5	200	10	11	110j6	130	3.5	160	10	9	95j6	115	3.5	140	10	9
32	180j6	215	4	250	12	14	130j6	165	3.5	200	10	11	110j6	130	3.5	160	10	9
33	230j6	265	4	300	12	14	180j6	215	4	250	12	14	130j6	165	3.5	200	12	11

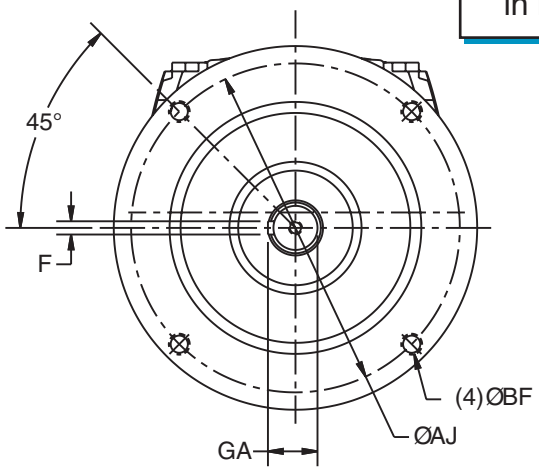
Gear Frame	BDM3					
	AK	AJ	BB	BD	BE	BF
31 (1)	80j6	100	2,5	120	10	7

(1) Refer to illustration above for correct hole orientation in BDM3 flange.

Metric Output Shaft Dimensions

Flange Mounted - Multiple Reduction





Dimensions in mm

Gear Frame	F	U	AH	GA	EX	EY
34	14	50k6	100	53.5	9	85
35	18	60m6	120	64	4	110

Gear Frame	BS						BD1						BD2					
	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF	AK	AJ	BB	BD	BE	BF
34	250	300	4	350	15	18	230	265	4	300	15	14	180	215	4	250	15	14
35	300	350	5	400	18	18	250	300	5	350	15	18	230	265	5	300	15	14

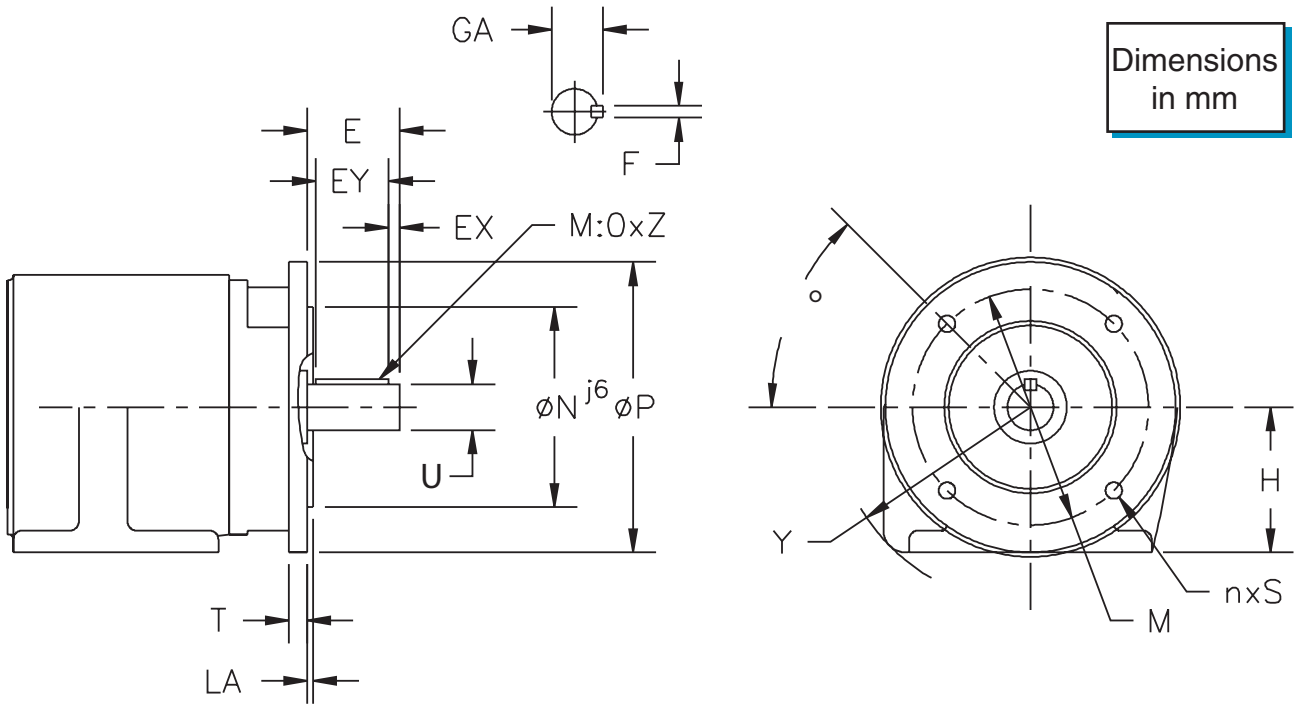
Browning

Metric Output Shaft Dimensions

BSM Flange Mounted - Multiple Reduction

CbN SERIES 2000 3000

Dimensions in mm



Gear Frame	Flange									
	H	Y	M	N	P	n*	S	LA	T	µ
26	225	308	500	450	550	8	18	19	5	22.5°
27	250	354	500	450	550	8	18	20	5	22.5°
28	315	424	600	550	660	8	24	24	6	22.5°

*n = 4: a = 45° - n = 22°30'.

Gear Frame	Output Shaft							
	U	E	EY	EX	GA	F	M:O	Z
26	70m6	140	130	5	74,5	20	20	42
27	90m6	170	160	5	95	25	24	50
28	100m6	210	200	5	106	28	24	50

Product Weights (Lbs.)

Foot Mounted Single Reduction

C-Face Reducers

Gear Frame	Input Size				
	56/140TC	180/210TC	250TC	280TC	320TC
30	11	-	-	-	-
31	24	30	-	-	-
32	35	44	-	-	-
33	53	62	69	-	-
34	-	63	68	70	-
35	-	88	89	92	100

Input Shaft

Gear Frame	Style
	AP
30	9
31	23
32	28
33	55
34	66
35	89

Foot Mounted Multiple Reduction

C-Face Reducers

Gear Frame	Stages	Input Size				
		56/140TC	180/210TC	250TC	280TC	320TC
30	2, 3	17	-	-	-	-
31	2, 3	45	53	-	-	-
32	2, 3	57	66	-	-	-
	4, 5	63	-	-	-	-
33	2, 3	85	94	101	-	-
	4, 5	90	-	-	-	-
34	2, 3	93	95	98	100	-
	4, 5	130	-	-	-	-
35	2, 3	160	163	166	168	178
	4, 5	197	205	-	-	-
26 - 29	2, 3	Refer to dimension print pages				
	4, 5, 6					

Input Shaft

Gear Frame	Stages	Style		
		AP	Scoop	Top Mt.
30	2, 3	15	-	-
31	2, 3	37	-	-
32	2, 3	50	75	97
4, 5		55	-	-
33	2, 3	87	120	134
4, 5		92	-	-
34	2, 3	99	151	169
4, 5		149	-	-
35	2, 3	198	250	172
4, 5		235	-	-
26	2, 3	308	400	-
4, 5, 6		375	410	-

Weight Adders

B14 and Flange Mounted

Single Reduction

Gear Frame	B14 Face Mount	Flange Mount
30	0	1
31	-1	3
32	-1	4
33	-1	8
34	-2	8
35	-2	9

Multiple and Combined

Gear Frame	B14 Face Mount	Flange Mount
30	0	1
31	-1	2
32	-1	4
33	-3	8
34	-5	8
35	-6	9

Browning

Gearmotors

Lubrication

CbN SERIES 2000 3000

CbN gearing is shipped with one of the following synthetic lubricants per the table below and fitted with a magnetic drain. Each reducer is filled according to the mounting position specified when ordered. Refer to the unit nameplate and charts on pages A-244 and A-245 for the mounting position arrangement of your unit.

In the case of synthetic oil, the lubricant does not require changing, but it is recommended that the oil level be checked periodically.

Standard Synthetic Gear Oil (Non-Food Grade)

No Backstop

Manufacturer	-25° F to 125° F (-30° C to 50° C)
Fuchs*	Sintogear* 125
Mobil*	Mobilgear* SHC 150
Shell*	Omala* Fluids HD 150

With Backstop (1)

Manufacturer	-25° F to 125° F (-30° C to 50° C)
Shell*	Omala RL 100
Mobil*	SHC 629

Synthetic Gear Oil (Food Grade)

No Backstop

Manufacturer	22°F to 125°F (-20°C to 50°C)
Mobil*	SHC Cibus 150

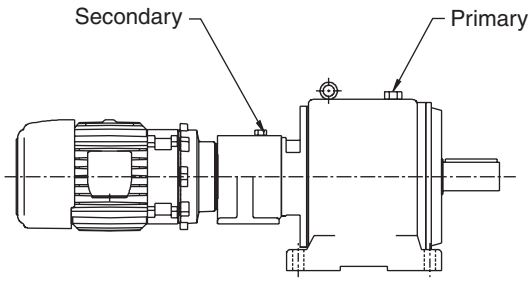
⚠ CAUTION

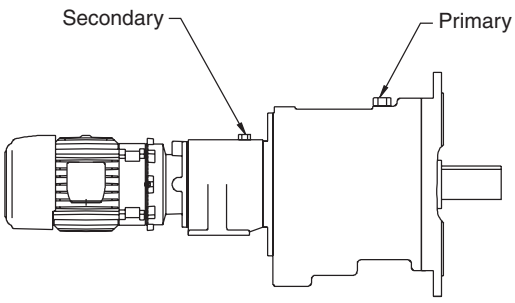
- Never mix synthetic oil and mineral oil.
- Never use extreme pressure (EP) oil in a reducer with a backstop.
- Refer to installation and maintenance manual for mineral oil selection.

Oil Capacities (U.S. Quarts)

Reduction Stages	Gear Frame	Mounting Positions											
		B3	B5	B6	B7	B8	B52	B53	B54	V1	V3	V5	V6
One	30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
	31	0.34	0.34	0.53	0.53	0.74	0.53	0.74	0.53	0.58	1.06	0.58	1.06
	32	0.26	0.26	0.63	0.63	1.06	0.63	1.06	0.63	0.69	1.27	0.69	1.27
	33	0.95	0.95	1.48	1.48	2.01	1.48	2.01	1.48	2.22	2.22	2.22	2.22
	34	1.06	1.06	1.59	1.59	2.64	1.59	2.64	1.59	2.22	2.22	2.22	2.22
	35	1.27	1.17	3.84	3.84	5.69	2.55	3.95	2.55	2.91	3.95	5.12	6.04
Two	30	.64	.64	.64	.64	.64	.64	.64	.64	.64	.64	.64	.64
	31	0.63	0.63	1.00	0.90	1.16	-	-	-	1.22	1.48	1.22	1.48
	32	1.00	1.00	1.85	1.64	2.38	-	-	-	2.38	2.85	2.38	2.85
	33	1.69	1.69	3.49	3.12	4.76	-	-	-	4.76	4.65	4.76	4.65
	34	2.32	2.32	5.39	4.97	7.93	-	-	-	8.24	7.82	8.24	7.82
	35	4.10	4.90	9.80	8.80	14.40	-	-	-	14.5	15.70	15.30	16.30
	26	6.55	6.34	16.80	15.90	25.90	-	-	-	21.5	21.10	25.40	27.90
	27	8.77	8.45	23.60	22.90	37.30	-	-	-	31.00	27.30	36.20	39.20
Three	30	.74	.74	.74	.74	.74	.74	.74	.74	.74	.74	.74	.74
	31	0.63	0.63	1.30	0.90	1.16	-	-	-	1.22	1.48	1.22	1.48
	32	1.00	1.00	2.40	1.64	2.38	-	-	-	2.38	2.85	2.38	2.85
	33	1.69	1.69	4.60	3.12	4.76	-	-	-	4.76	4.65	4.76	4.65
	34	2.32	2.32	6.97	4.97	7.93	-	-	-	8.24	7.82	8.24	7.82
	35	3.61	4.65	9.18	8.83	14.3	-	-	-	14.40	15.80	15.00	15.50
	26	5.92	5.71	15.90	16.00	25.7	-	-	-	21.30	21.30	27.10	28.40
	27	7.93	7.61	22.20	23.00	37.00	-	-	-	31.40	27.50	38.70	39.90
	28	14.60	13.90	44.90	45.20	72.9	-	-	-	52.80	56.00	83.50	72.90
	29	18.00	-	72.90	68.70	122.00	-	-	-	-	-	125.00	109.00

* The following are believed to be the trademarks and/or trade names of their respective owners and are not owned or controlled by Emerson Power Transmission. Fuchs and Sintogear: Fuchs Petrolube AG; Mobil and Mobilgear: Exxon Mobil Corporation; Shell and Omala: Shell Oil Company.





Foot Mounted Combined Units (U.S. Quarts)

Reduction Stages	Gear Frame	Composition		Mounting Positions											
				B3		B8		B6		B7		V5		V6	
		Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.
Four	**3254**	3252	3012	0.95	.64	2.3	.64	2.4	.64	1.6	.64	2.4	.64	2.65	.64
	3374	3372	3012	1.74	.64	5	.64	4.6	.64	2.9	.64	4.7	.64	4.4	.64
	3484	3482	3132	2.32	0.63	7.93	1.16	5.39	1	4.97	0.9	8.24	1.22	7.82	1.48
	3594	3592	3132	4.1	0.63	14.4	1.16	9.8	1	8.8	0.9	15.3	1.22	16.3	1.48
	2604A	2602	3372	6.55	1.69	25.87	4.76	16.8	3.49	15.9	3.13	25.34	4.76	27.88	4.65
	2704A	2702	3372	8.76	1.69	37.28	4.76	23.6	3.49	22.9	3.13	36.22	4.76	39.18	4.65
Five	**3255**	3253	3012	0.95	.64	2.3	.64	2.4	.64	1.6	.64	2.4	.64	2.65	.64
	3375	3373	3012	1.74	.64	5	.64	4.6	.64	2.9	.64	4.7	.64	4.4	.64
	3485	3483	3132	2.32	0.63	7.93	1.16	6.97	1.00	4.97	0.9	8.24	1.22	7.82	1.48
	3595	3593	3132	3.61	0.63	14.3	1.16	9.18	1.00	8.83	0.9	15	1.22	15.5	1.48
	2605A	2602	3373	6.55	1.69	25.87	4.76	16.8	4.62	15.9	3.13	25.34	4.76	27.88	4.65
	2705A	2702	3373	8.76	1.69	37.28	4.76	23.6	4.62	22.9	3.13	36.22	4.76	39.18	4.65
	2805A	2803	3482	14.57	2.32	72.86	7.93	44.9	5.39	45.2	4.97	83.42	8.24	72.86	7.82
	2905A	2903	3482	17.95	2.32	121.44	7.93	72.9	5.39	68.7	4.97	124.61	8.24	108.77	7.82
Six	**2606A**	2603	3373	5.91	1.69	25.66	4.76	15.9	4.62	16	3.13	27.03	4.76	28.41	4.65
	2706A	2703	3373	7.92	1.69	36.96	4.76	22.2	4.62	23	3.13	38.65	4.76	39.92	4.65
	2806A	2803	3483	14.57	2.32	72.86	7.93	44.9	6.97	45.2	4.97	83.42	8.24	72.86	7.82
	2906A	2903	3483	17.95	2.32	121.44	7.93	72.9	6.97	68.7	4.97	124.61	8.24	108.77	7.82

Flanged Mounted Combined Units (U.S. Quarts)

Reduction Stages	Gear Frame	Composition		Mounting Positions					
				B5		V1		V3	
		Prim.	Sec.	Prim.	Sec.	Prim.	Sec.	Prim.	Sec.
Four	**3254**	3252	3012	0.95	.64	2.4	.64	2.65	.64
	3374	3372	3012	1.5	.64	4.7	.64	4.4	.64
	3484	3482	3132	2.32	0.63	8.24	1.22	7.82	1.48
	3594	3592	3132	4.9	0.63	14.5	1.22	15.7	1.48
	2604A	2602	3372	6.34	1.69	21.12	4.76	21.12	4.65
	2704A	2702	3372	8.45	1.69	31.68	4.76	27.24	4.65
Five	**3255**	3253	3012	0.95	.64	2.4	.64	2.65	.64
	3375	3373	3012	1.5	.64	4.7	.64	4.4	.64
	3485	3483	3132	2.32	0.63	8.24	1.22	7.82	1.48
	3595	3593	3132	4.65	0.63	14.4	1.22	15.8	1.48
	2605A	2602	3373	6.34	1.69	21.12	4.76	21.12	4.65
	2705A	2702	3373	8.45	1.69	31.68	4.76	27.24	4.65
	2805A	2803	3482	13.94	2.32	52.8	8.24	55.97	7.82
Six	**2606A**	2603	3373	5.2	1.69	18.59	4.76	21.33	4.65
	2706A	2703	3373	7.6	1.69	25.77	4.76	27.46	4.65
	2806A	2803	3483	13.94	2.32	52.8	8.24	55.97	7.82

Notes:

Typical Motor Performance Data

Motor Input Code HT24, IT24, IGS2, IG2, IG4

TEFC Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[5] @ 460V	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1746	0.64	75.5	74.0	64.7	1	339	462	M	B	
0.5	56	1745	0.88	80.0	78.5	66.7	1.5	344	437	L	B	
0.75	56	1735	1.21	80.0	78.5	72.3	2.25	326	444	K	B	
1	143T	1747	1.52	84.0	81.5	73.4	3	438	509	M	C	1
1.5	145T	1733	2.14	84.0	81.5	76.3	4.5	380	450	L	C	
2	145T	1740	2.91	85.5	82.5	74.8	6	482	491	L	C	1
3	182T	1757	3.83	89.5	87.5	81.4	9	276	425	K	B	2
5	184T	1756	6.2	89.5	87.5	83.9	15	229	353	J	B	2
7.5	213T	1765	9.2	91.0	89.5	84.3	22.5	220	290	J	B	1,4
10	215T	1760	12	91.0	89.5	86.1	30	210	270	G	B	1,4
15	254T	1775	18.4	92.4	91.0	82.7	44.4	231	247	G	B	2,4
20	256T	1770	24	93.0	91.7	84.9	60	229	232	G	B	2,4
25	284T	1775	29.3	93.6	92.4	85.9	75	180	250	G	B	1,3,4
30	286T	1775	35	94.1	93.0	86.9	90	190	250	G	B	1,3,4
40	324T	1775	46	93.6	92.4	87.3	120	170	228	F	B	1,3,4
50	326T	1775	56	94.1	93.0	88.3	150	189	239	F	B	1,3,4

Motor Input Code HT5, IT5

TEFC Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1740	0.53	75.5	74.0	64.7	1	334	470	M	B	
0.50	56	1735	0.73	80.0	78.5	66.7	1.5	315	424	L	B	
0.75	56	1736	0.95	80.0	78.5	72.3	2.25	313	379	J	B	
1	143T	1747	1.2	84.0	81.5	74.5	3	424	489	M	C	1
1.5	145T	1745	1.69	84.0	81.5	76.9	4.5	385	415	L	C	
2	145T	1751	2.29	85.5	82.5	76.4	6	406	422	M	C	1
3	182T	1772	2.93	89.5	87.5	84.2	9	270	355	K	B	2
5	184T	1758	4.92	89.5	87.5	84.8	15	244	300	J	B	2
7.5	213T	1760	7.3	91.0	89.5	84.6	22.5	230	300	H	B	1,4
10	215T	1760	9.6	91.0	89.5	85.9	30	220	280	H	B	1,4
15	254T	1775	14.6	92.4	91.0	83.4	44.4	226	241	G	B	2,4
20	256T	1770	19	93.0	91.7	84.9	59.3	229	231	G	B	2,4
25	284T	1775	23.4	93.0	91.7	85.9	75	180	250	G	B	1,3,4
30	286T	1775	27.6	93.6	92.4	86.9	90	190	250	G	B	1,3,4
40	324T	1775	37	93.6	92.4	87.2	120	180	237	F	B	1,3,4
50	326T	1775	45	94.1	93.0	88.3	150	180	280	G	A	1,3,4

Motor Input Code PT24

TEFC Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[5] @ 460V	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
3	182T	1757	3.83	89.5	87.5	81.4	9	276	425	K	B	
5	184T	1756	6.2	89.5	87.5	83.9	15	229	353	J	B	
7.5	213T	1765	9.3	91.7	90.2	82.8	22.5	247	324	H	B	3,4
10	215T	1760	12	91.7	90.2	85.3	30	235	301	H	B	3,4
15	254T	1775	18.4	92.4	91.0	82.7	45	231	247	G	B	4
20	256T	1770	23.7	93.0	91.7	84.9	60	229	232	G	B	4
25	284T	1775	28.9	93.6	92.4	86.6	75	203	270	G	B	3,4
30	286T	1775	35.5	93.6	92.4	86.9	90	195	257	G	B	3,4
40	324T	1780	45	94.1	93.0	88.0	120	193	251	G	B	3,4
50	326T	1780	56	94.5	93.6	88.3	150	209	264	G	B	3,4

Note(s)

1 — This design exceed standards for a “High Efficiency” motor
2 — This design meets standards for a “Premium Efficiency” motor
3 — This motor is an all cast-iron Corro-Duty motor
4 — Motor has three N/C winding thermostats with leads terminating in the main outlet box
5 — For FL amps at 230V, multiply value shown x2

Browning®

Gearmotor

Typical Motor Performance Data

SERIES 2000 3000

Motor Input Code PT5
TEFC Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
3	182T	1772	2.93	89.5	87.5	84.2	9	270	355	K	B	
5	184T	1758	4.92	89.5	87.5	84.8	15	244	300	J	B	
7.5	213T	1765	7.5	91.7	90.2	82.4	22.5	251	330	H	B	3,4
10	215T	1760	9.6	91.7	90.2	85.4	30	234	299	H	B	3,4
15	254T	1775	14.6	92.4	91.0	83.4	45	231	247	G	B	4
20	256T	1770	19	93.0	91.7	84.9	60	229	231	G	B	4
25	284T	1775	23	93.6	92.4	86.9	75	194	259	G	B	3,4
30	286T	1775	27.6	93.6	92.4	87.0	90	194	256	G	B	3,4
40	324T	1780	36	94.1	93.0	88.0	120	189	245	G	B	3,4
50	326T	1780	45	94.5	93.6	88.3	150	210	264	G	A	3,4

Motor Input Code HC24, IC24
Corro-Duty® Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[5] @ 460V	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1746	0.64	77.0	74.0	64.7	1	339	462	M	B	
0.5	56	1745	0.88	81.5	78.5	66.7	1.5	344	437	L	B	
0.75	56	1735	1.21	81.5	78.5	72.3	2.25	326	444	K	B	
1	143T	1747	1.52	84.0	81.5	73.4	3	438	509	M	C	1
1.5	145T	1733	2.14	84.0	81.5	76.3	4.5	380	450	L	C	
2	145T	1740	2.91	85.5	82.5	74.8	6	482	491	L	C	1
3	182T	1757	3.83	89.5	87.5	81.4	9	276	425	K	B	2
5	184T	1756	6.2	89.5	87.5	83.9	15	229	353	J	B	2
7.5	213T	1765	9.2	91.0	89.5	84.3	22.3	240	310	H	B	4
10	215T	1760	11.9	91.7	90.2	85.7	30	220	280	H	B	4
15	254T	1775	18.4	92.4	91.0	82.8	45	230	134	G	B	4
20	256T	1770	23.7	93.0	91.7	84.9	60	227	230	F'	B	4
25	284T	1775	29.3	93.6	92.4	85.9	75	180	250	G	B	4
30	286T	1775	35	94.1	93.0	86.9	90	190	250	G	B	4
40	324T	1775	46	93.6	92.4	87.3	120	170	228	F	B	4
50	326T	1775	56	94.1	93.0	88.3	150	189	239	F	B	4

Motor Input Code HC5, IC5
Corro-Duty® Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
							Full Load	% Full Load				
				4/4 Load	4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1740	0.53	77.0	74.0	64.7	1	334	470	M	B	
0.50	56	1735	0.73	81.5	78.5	66.7	1.5	315	424	L	B	
0.75	56	1736	0.95	81.5	78.5	72.3	2.25	313	379	J	B	
1	143T	1747	1.2	84.0	81.5	74.5	3	424	489	M	C	1
1.5	145T	1745	1.69	84.0	81.5	76.9	4.5	385	415	L	C	
2	145T	1751	2.29	85.5	82.5	76.4	6	406	422	M	C	1
3	182T	1772	2.93	89.5	87.5	84.2	9	270	355	K	B	2
5	184T	1758	4.92	89.5	87.5	84.8	15	244	300	J	B	2
7.5	213T	1760	7.3	91.0	89.5	84.6	22.3	220	280	H	B	4
10	215T	1760	9.6	91.0	89.5	85.9	30	210	270	H	B	4
15	254T	1775	14.6	92.4	91.0	83.2	45	224	239	G	B	4
20	256T	1770	19.0	93.0	91.7	85.0	60	226	230	F	B	4
25	284T	1775	23.4	93.0	91.7	85.9	75	180	250	G	B	4
30	286T	1775	27.6	93.6	92.4	86.9	90	190	250	G	B	4
40	324T	1775	37	93.6	92.4	87.2	120	180	237	F	B	4
50	326T	1775	45	94.1	93.0	88.3	150	180	280	F	B	4

Note(s)
1 — This design exceed standards for a “High Efficiency” motor
2 — This design meets standards for a “Premium Efficiency” motor
3 — This motor is an all cast-iron Corro-Duty motor
4 — Motor has three N/C winding thermostats with leads terminating in the main outlet box
5 — For FL amps at 230V, multiply value shown x2

Typical Motor Performance Data

Motor Input Code PC24
Corro-Duty® Premium Efficiency Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[4] @ 460V	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
				4/4 Load	4/4 Load	4/4 Load	Full Load (Ft. Lbs.)	% Full Load Locked	% Full Load Breakdown			
3	182T	1757	3.83	89.5	87.5	81.4	9	276	425	K	B	
5	184T	1756	6.2	89.5	87.5	83.9	15	229	353	J	B	
7.5	213T	1765	9.3	91.7	90.2	82.8	22.5	247	324	H	B	3
10	215T	1760	12	91.7	90.2	85.3	30	235	301	H	B	3
15	254T	1775	18.4	92.4	91.0	82.8	45	230	134	G	B	3
20	256T	1770	23.7	93.0	91.7	84.9	60	227	230	F'	B	3
25	284T	1775	28.9	93.6	92.4	86.6	75	203	270	G	B	3
30	286T	1775	35.5	93.6	92.4	86.9	90	195	257	G	B	3
40	324T	1780	45	94.1	93.0	88.0	120	193	251	G	B	3
50	326T	1780	56	94.5	93.6	88.3	150	209	264	G	B	3

Motor Input Code PC5
Corro-Duty® Premium Efficiency Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Guar. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
				4/4 Load	4/4 Load	4/4 Load	Full Load (Ft. Lbs.)	% Full Load Locked	% Full Load Breakdown			
3	182T	1772	2.93	89.5	87.5	84.2	9	270	355	K	B	
5	184T	1758	4.92	89.5	87.5	84.8	15	244	300	J	B	
7.5	213T	1765	7.5	91.7	90.2	82.4	22.5	251	330	H	B	3
10	215T	1760	9.6	91.7	90.2	85.4	30	234	299	H	B	3
15	254T	1775	14.6	92.4	91.0	83.2	45	224	239	G	B	3
20	256T	1770	19.0	93.0	91.7	85.0	60	226	230	F	B	3
25	284T	1775	23	93.6	92.4	86.9	75	194	259	G	B	3
30	286T	1775	27.6	93.6	92.4	87.0	90	194	256	G	B	3
40	324T	1780	36	94.1	93.0	88.0	120	189	245	G	B	3
50	326T	1780	45	94.5	93.6	88.3	150	210	264	G	A	3

Motor Input Code T24
TEFC Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[4] @ 460V	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
				4/4 Load	4/4 Load	Full Load (Ft. Lbs.)	% Full Load Locked	% Full Load Breakdown			
0.33	56	1746	0.64	75.5	64.7	1	339	462	M	B	1
0.50	56	1745	0.88	80.0	66.7	1.5	344	437	L	B	1
0.75	56	1735	1.21	80.0	72.3	2.25	326	444	K	B	1
1	B56	1730	1.56	81.5	74.0	3	352	434	L	C	1
1.5	145T	1733	2.18	82.5	76.7	4.5	380	450	L	C	2
2	145T	1728	2.89	82.5	77.0	6	430	459	L	C	2
3	182T	1745	4.2	84.0	80.0	9	246	344	J	B	3
5	184T	1745	6.8	84.0	81.7	15	220	323	J	B	2
7.5	213T	1750	10.1	86.5	80.4	22.5	230	290	H	B	2
10	215T	1755	13.2	88.5	80.1	30	230	280	H	B	2

Motor Input Code T5
TEFC Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
				4/4 Load	4/4 Load	Full Load (Ft. Lbs.)	% Full Load Locked	% Full Load Breakdown			
0.33	56	1740	0.53	75.5	64.7	1	334	470	M	B	1
0.50	56	1735	0.73	80.0	66.7	1.5	315	424	L	B	1
0.75	56	1736	0.95	80.0	72.3	2.25	313	379	J	B	1
1	B56	1730	1.21	81.5	76.4	3	337	372	L	C	1

Note(s)
1 — Motor frame exempt from NRCan 2011 definition requiring High Efficiency
2 — Refer to HT24 and/or HT5 for designs meeting or exceeding NRCan 2011
3 — Motor has three N/C winding thermostats with leads terminating in the main outlet box
4 — For FL amps at 230V, multiply value shown x2

Browning®

Gearmotor

Typical Motor Performance Data

SERIES 2000 3000

Motor Input Code W24, WP24
Washdown Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[4] @ 460V	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
						Full Load	% Full Load				
				4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1746	0.64	75.5	64.7	1	339	462	M	B	1
0.50	56	1745	0.88	80.0	66.7	1.5	344	437	L	B	1
0.75	56	1735	1.21	80.0	72.3	2.25	326	444	K	B	1
1	B56	1730	1.56	81.5	74.0	3	352	434	L	C	1
1.5	145T	1733	2.14	85.5	76.8	4.5	380	450	L	C	2
2	145T	1740	2.91	85.5	81.4	6	482	491	L	C	2

Motor Input Code W5, WP5
Washdown Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Note(s)
						Full Load	% Full Load				
				4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			
0.33	56	1740	0.53	75.5	64.7	1	334	470	M	B	1
0.50	56	1735	0.73	80.0	66.7	1.5	315	424	L	B	1
0.75	56	1736	0.95	80.0	72.3	2.25	313	379	J	B	1
1	B56	1730	1.21	81.5	76.4	3	337	372	L	C	1
1.5	145T	1745	2.29	84.0	76.9	4.5	385	415	L	C	2
2	145T	1751	2.93	85.5	76.4	6	406	422	M	C	2

Motor Input Code TS12 & TS12B
TEFC Single Phase 115/230V

HP	Frame	Full Load RPM	FL Amps[2] @ 230V	Efficiency	Torque			Design	Brake Option		
					Full Load	% Full Load			Type/Encl	Std. Rating (Ft. Lbs.)	Manual Release
				4/4 Load	(FT. Lbs.)	Locked	Breakdown	Start/Run			
0.33	56	1730	3.2	58.7	1	366	262	Cap Start/Ind. Run	AC/IP21	1.5	Yes
	48	1744	2.5	61.4	1	279	229	Cap Start/Ind. Run	AC/IP21	1.5	Yes
0.5	56	1751	3.8	67.5	1.5	300	240	Cap Start/Ind. Run	AC/IP21	1.5	Yes
	48	1740	3.6	69.0	1.5	302	245	Cap Start/Ind. Run	AC/IP21	1.5	Yes
0.75	56	1744	4.9	71.7	2.3	325	255	Cap. Start/Cap. Run	AC/IP21	3	Yes
	48	1750	3.7	79.8	2.3	338	298	Cap. Start/Cap. Run	AC/IP21	3	Yes
1	143T	1739	6.7	72.9	3	315	250	Cap. Start/Cap. Run	AC/IP21	3	Yes
1.5	145TY	1750	6.5	81.7	4.5	288	290	Cap. Start/Cap. Run	AC/IP21	6	Yes
2	145TY	1755	8.1	89.7	6	247	320	Cap. Start/Cap. Run	AC/IP21	6	Yes

Motor Input Code TS2 and TS2B
TEFC Single Phase 230V

HP	Frame	Full Load RPM	FL Amps @ 230V	Efficiency	Torque			Design	Brake Option		
					Full Load	% Full Load			Type/ Encl	Std. Rating (Ft. Lbs.)	Manual Release
				4/4 Load	(FT. Lbs.)	Locked	Breakdown	Start/Run			
3	184T	1760	17	78.1	9	453	330	Cap. Start/Cap. Run	AC/IP21	10	Yes
5	184T	1740	24	79.4	15	404	275	Cap. Start/Cap. Run	AC/IP21	15	Yes

Note(s)
1 — Motor frame exempt from NRCan 2011 definition requiring High Efficiency
2 — This motor meets NRCan 2011 for High Efficiency
3 — For FL amps at 115V, multiply value shown x2
4 — For FL amps at 230V, multiply value shown x2

Typical Motor Performance Data

Brakemotor Input Code T24B
TEFC Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[6] @ 460V	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Brake			Note(s)
						Full Load	% Full Load							
				4/4 Load	4/4 Load	(FT. Lbs.)	Locked	Breakdown			Type/Encl	Std. Rating (Ft. Lbs.)	Manual Release	
0.33	56	1746	0.64	75.5	64.7	1	339	462	M	B	DC/IP 55	2.2	Std	1,2
0.50	56	1745	0.88	80.0	66.7	1.5	344	437	L	B	DC/IP 55	2.5	Std	1,2
0.75	56	1735	1.21	80.0	72.3	2.25	326	444	K	B	DC/IP 55	4.4	Std	1,2
1	B56	1730	1.56	81.5	74.0	3	352	434	L	C	DC/IP 55	5.9	Std	1,2
1.5	145T	1733	2.18	82.5	76.7	4.5	380	450	L	C	DC/IP 55	7.4	Std	1,2
2	145T	1728	2.89	82.5	77.0	6	430	459	L	C	DC/IP 55	8.85	Std	1,2
3	182T	1757	3.83	89.5	81.4	9	276	425	K	B	DC/IP 55	15	Std	1,2,4
5	184T	1756	6.2	89.5	83.9	15	229	353	K	B	DC/IP 55	23	Std	1,2,4
7.5	213T	1750	10.1	86.5	80.4	22.5	230	290	H	B	AC/IP21	25	Std	
10	215T	1755	13.2	88.5	80.1	30	230	280	H	B	AC/IP21	35	Std	

Brakemotor Input Code T5B
TEFC Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Brake			Note(s)
						Full Load	% Full Load							
				4/4 Load	4/4 Load	(Ft. Lbs.)	Locked	Breakdown			Type/Encl	Std. Rating (Ft. Lbs.)	Manual Release	
0.33	56	1740	0.53	75.5	64.7	1	334	470	M	B	DC/IP 55	2.2	Std	1,2
0.50	56	1735	0.73	80.0	66.7	1.5	315	424	L	B	DC/IP 55	2.5	Std	1,2
0.75	56	1736	0.95	80.0	72.3	2.25	313	379	J	B	DC/IP 55	4.4	Std	1,2
1	B56	1730	1.21	81.5	76.4	3	337	372	L	C	DC/IP 55	5.9	Std	1,2
1.5	145T	1730	1.71	82.5	78.6	4.5	316	403	L	C	DC/IP 55	7.4	Std	1,2
2	145T	1730	2.33	82.5	78.9	6	362	420	L	C	DC/IP 55	8.85	Std	1,2
3	182T	1772	2.93	88.5	84.2	9	270	355	K	B	DC/IP 55	15	Std	1,2,3
5	184T	1758	4.92	88.5	84.8	15	244	300	K	B	DC/IP 55	23	Std	1,2,3

Brakemotor Input Code HT24B, IT24B[5]
High Efficiency,TEFC Three Phase 230/460V

HP	Frame Size	Full Load RPM	FL Amps[6] @ 460V	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Brake			Note(s)
						Full Load	% Full Load							
				4/4 Load	4/4 Load	(FT. Lbs.)	Locked	Breakdown			Type/Encl	Std. Rating (Ft. Lbs.)	Manual Release	
0.33	56	1746	0.64	75.5	64.7	1	339	462	M	B	DC/IP 55	2.2	Std	1,2
0.50	56	1745	0.88	80.0	66.7	1.5	344	437	L	B	DC/IP 55	2.5	Std	1,2
0.75	56	1735	1.21	80.0	72.3	2.25	326	444	K	B	DC/IP 55	4.4	Std	1,2
1	B56	1747	1.52	84.0	73.4	3	438	509	M	C	DC/IP 55	5.9	Std	1,2,5
1.5	145T	1733	2.14	84.0	77.0	4.5	380	450	L	C	DC/IP 55	7.4	Std	1,2
2	145T	1740	2.91	85.5	74.8	6	482	491	L	C	DC/IP 55	8.85	Std	1,2,5
3	182T	1757	3.83	89.5	81.4	9	276	425	K	B	DC/IP 55	15	Std	1,2,4
5	184T	1756	6.2	89.5	83.9	15	229	353	J	B	DC/IP 55	23	Std	1,2,4
7.5	213T	1760	12	91.0	86.1	30	210	270	G	B	AC/IP21	25	Std	3
10	215T	1775	18.4	92.4	82.7	45	231	247	G	B	AC/IP21	35	Std	3

Brakemotor Input Code HT5B, IT5B[5]
High Efficiency,TEFC Three Phase 575V

HP	Frame Size	Full Load RPM	FL Amps	NEMA Nom. Efficiency	Power Factor	Torque			KVA Code	NEMA Design	Brake			Note(s)
						Full Load	% Full Load							
				4/4 Load	4/4 Load	(FT. Lbs.)	Locked	Breakdown			Type/Encl	Std. Rating (Ft. Lbs.)	Manual Release	
0.33	56	1740	0.53	77.0	64.7	1	334	470	M	B	DC/IP 55	2.2	Std	1,2
0.50	56	1735	0.73	81.5	66.7	1.5	315	424	L	B	DC/IP 55	2.5	Std	1,2
0.75	56	1736	0.95	81.5	72.3	2.25	313	379	J	B	DC/IP 55	4.4	Std	1,2
1	B56	1730	1.21	81.5	76.4	3	337	372	L	C	DC/IP 55	5.9	Std	1,2
1.5	145T	1730	1.71	85.5	78.6	4.5	316	403	L	C	DC/IP 55	7.4	Std	1,2
2	145T	1730	2.33	85.5	78.9	6	362	420	L	C	DC/IP 55	8.85	Std	1,2
3	182T	1772	2.93	88.5	84.2	9	270	355	K	B	DC/IP 55	15	Std	1,2,4
5	184T	1758	4.92	88.5	84.8	15	244	300	K	B	DC/IP 55	23	Std	1,2,4
7.5	213T	1760	7.3	92.1	84.6	22.5	230	300	H	B	AC/IP21	25	Std	3
10	215T	1760	9.6	92.6	85.9	30	220	280	H	B	AC/IP21	35	Std	3

Note(s)

1 — Brake actuated by motor or separate 1/230V power is standard. For inverter applications, specify 1/115V separate supply
2 — Manual release lever removable in field
3 — Motor efficiency exceeds "High Efficiency" requirements
4 — Motor efficiency meets NEMA Premium
5 — IT24B and IT5B designs are arranged for 1/115V or 1/230V separate actuation
6 — For FL amps at 230V, multiply value shown x2

Browning®

Gearmotor

Typical Motor Performance Data

SERIES 2000 3000

Motor Input Code T53
TEFC Three Phase 380V 50 HZ

HP	Frame Size	FL RPM	FL Amps @ 380V	S.F.	Insul. Class	4/4 Load Effic	4/4 Load P.F.	FL Torque (Ft. Lbs.)	KVA Code	Note(s)
0.33	56	1433	0.69	1.0	F	75.5	71.9	1.2	M	1,2
0.50	56	1430	0.96	1.0	F	80.0	74.1	1.8	L	1.2
0.75	56	1415	1.37	1.0	F	78.5	79.1	2.7	K	1.2
1	B56	1413	1.76	1.0	F	80.0	80.1	3.6	K	1.2
1.5	145T	1410	2.54	1.0	F	81.5	82.4	5.4	L	1.2
2	145T	1407	3.35	1.0	F	81.5	82.7	7.2	L	1.2
3	182T	1450	4.5	1.0	F	87.5	86.2	10.8	H	1.2
5	184T	1440	6.28	1.0	F	88.5	86.8	18	J	1.2
7.5	213T	1450	11.1	1.0	F	88.7	86.2	27	F	1,2,3
10	215T	1435	14.9	1.0	F	87.2	87.1	36.6	E	1,2,3

Motor Input Code T54
TEFC Three Phase 415V 50 HZ

HP	Frame Size	FL RPM	FL Amps @ 415V	S.F.	Insul. Class	4/4 Load Effic	4/4 Load P.F.	FL Torque (Ft. Lbs.)	KVA Code	Note(s)
0.33	56	1435	0.68	1.0	F	72.0	69.7	1.2	K	1,2
0.50	56	1433	0.94	1.0	F	80.0	74.1	1.8	J	1.2
0.75	56	1440	1.3	1.0	F	78.5	74.6	2.7	J	1.2
1	143T	1428	1.62	1.0	F	81.5	77.9	3.6	K	1.2
1.5	145T	1433	2.27	1.0	F	82.5	80.8	5.4	J	1.2
2	145T	1435	3.13	1.0	F	84.0	78.8	7.2	K	1.2
3	182T	1458	4.05	1.0	F	87.5	85.4	10.8	H	1.2
5	184T	1445	6.75	1.0	F	86.5	87.2	18	G	1.2
7.5	213T	1460	10.4	1.0	F	89.9	83.4	27	G	1,2,3
10	215T	1450	13.5	1.0	F	89.4	86.1	36.2	F	1,2,3

Note(s)
1 — Design is for X-line starting
2 — Motor is self certified for CE
3 — Motor has three N/C winding thermostats with leads terminating in the main outlet box

FCR Brake

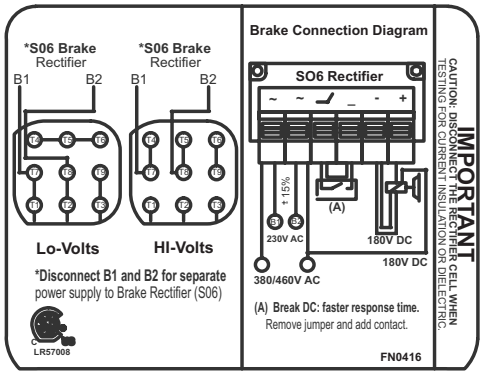
Wiring Diagrams

1.) Fixed Frequency

Three phase brake motors operated from a fixed frequency power supply are supplied with onboard rectifiers in the conduit box to allow powering the brake rectifier directly from the motor. Two versions of rectifiers (SO6 and SO8) can be used interchangeably. Note the rectifier in the motor being wired.

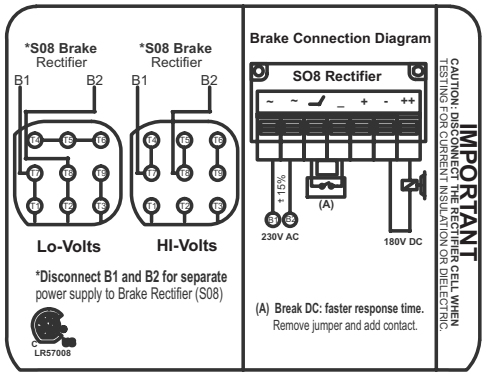
A) Three phase 230/460, 190/380V

SO6 Rectifier

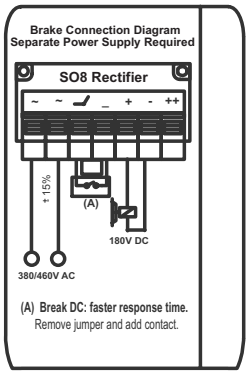


230v or 460v or 380v

SO8 Rectifier



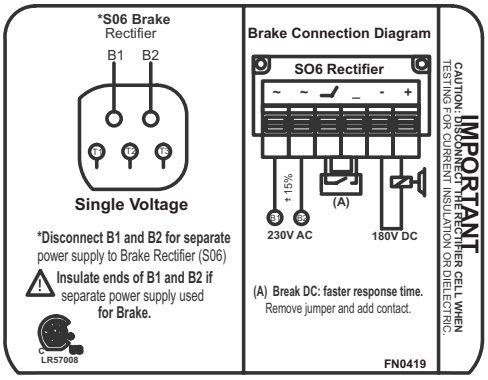
230v



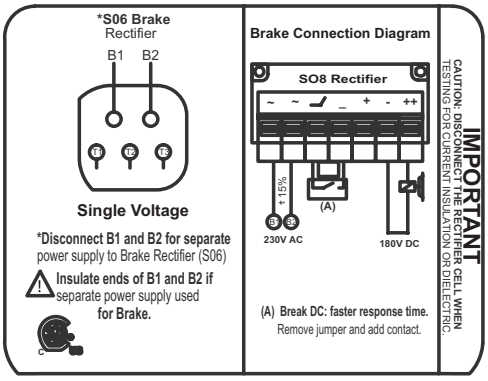
460v or 380v

B) Three phase 575V

SO6 Rectifier



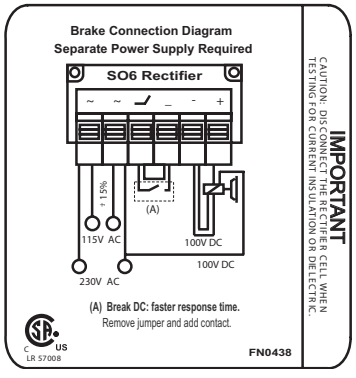
SO8 Rectifier



2) Variable Frequency

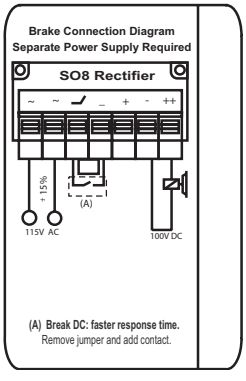
Three phase brake motors operated from a variable frequency power supply are designed with onboard rectifiers in the conduit box to allow powering the brake rectifier from a 115V or 230V fixed frequency single phase power separate from the motor/VFD but interlocked with that power source such that both motor and brake get powered simultaneously.

A1) SO6 Rectifier

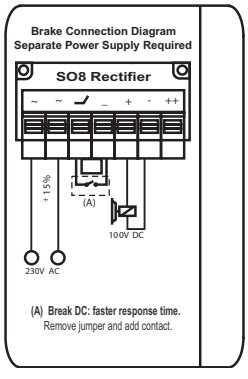


115V or 230V

A2) SO8 Rectifier



115V



230V

General Information

1 - General Information

1.1 - General operating principle

The IntelliGear Plus variable speed gearmotor is a combination of a 3-phase induction motor and an integrated open loop vector variable speed drive. The motor can be combined with many gear types from Emerson Power Transmission's range.

In the standard product version, the integrated drive does not require any connection other than the power supply. The options may be used to broaden the application range of the IntelliGear Plus motor. Based on the advanced technology of the IGBT power module, very high efficiency and reduced noise levels are achieved.

1.2 - Product name

IntelliGear Plus Range							
115V Single Phase Power Supply		230V Single Phase Power Supply		230V Three Phase Power Supply		460V Three Phase Power Supply	
Catalog Number	Motor HP	Catalog Number	Motor HP	Catalog Number	Motor HP	Catalog Number	Motor HP
310 M 033	0.33	31 M 033	0.33	31 TL 033	0.33	31 T 033	0.33
310 M 050	0.50	31 M 050	0.50	31 TL 050	0.50	31 T 050	0.50
32 M 075	0.75	31 M 075	0.75	31 TL 075	0.75	31 T 075	0.75
		31 M 100	1	31 TL 100	1	31 T 100	1
		32 M 150	1.5	32 TL 150	1.5	31 T 150	1.5
		32 M 200	2	32 TL 200	2	31 T 200	2
				33 TL 300	3	32 T 300	3
				33 TL 500	5	32 T 500	5
						33 T 750	7.5
						33 T 1000	10

IntelliGear Plus Speed Controlling Options	
Designation	Description
PD	Digital keypad on enclosure For./Rev./stop/speed-up/speed-down/speed display
P1	Run/Stop/Control knob mounted on enclosure
P2	For./Rev./Stop/Control knob mounted on enclosure
P3	Control knob (only) mounted on enclosure
P4	Control knob (only) mounted inside enclosure w/trim potentiometers
R	Remore signal following (either 0-10 vDC or 4-20 mA)
RP	Fieldbus controlled by customer's PROFIBUS DP

IntelliGear Plus Options	
Part ID	Description
KEYPAD LCD	Parameter setting console w/cable to locally to customize parameters
PX KEY	Drive parameter set-up key storage Fob
AEM904KA006	DC Braking resistors 100W
AEM904KA007	DC Braking resistors 200W
VMA30SOFT	CD w/cable and USB to locally to customize parameters

1.3 - Characteristics

1.3.1 - Electrical Data

Single Phase Design

Power supply	115 V ± 10%, 50 - 60 Hz	230 V ± 10%, 50 - 60 Hz
Output voltage	From input voltage down to (input voltage/speed range)	
Power range	0.33, 0.50, 0.75 HP	0.33, 0.50, 0.75. 1.0, 1.5, 2.0 HP
Maximum numbers of power-ups per hour	10	

Three Phase Design

Power supply	230 V ± 10%, 50 - 60 Hz	460 V ± 10%, 50 - 60 Hz
Output voltage	From input voltage down to (input voltage/speed range)	
Power range	0.33, 0.50, 0.75. 1.0, 1.5, 2.0, 3, 5 HP	0.33, 0.50, 0.75. 1.0, 1.5, 2.0, 3.0, 5.0, 7.5, 10 HP
Maximum numbers of power-ups per hour	150	

1.3.2 - Characteristics and Functions

Characteristic	**IntelliGear Plus**	
Overload	150 % of full load setting for 60 seconds, 10 times per hour	
Motor Frequency Variation Ranges	Standard	60 to 10 Hz 6:1 constant torque up through 3 HP
		74 to 12 Hz 6:1 constant torque for 5 through 10 HP
	Optional	60 to 6 Hz 10:1 constant torque up through 1.5 HP
		90 to 9 Hz 10:1 constant torque for 2 through 10 HP
	Special	120 to 2 Hz depending on thermal and mechanical limits
Efficiency	97.5 % x motor efficiency x gear efficiency (if applicable)	

Drive Control	**IntelliGear Plus**	
Speed Reference	• Analog reference	(0V or 4mA = minimum speed) (10V or 20mA = maximum speed)
		- 0 to 10V with integral potentiometer on enclosure (P1,P2 and P3)
		- 0 to 10V with integral potentiometer in enclosure (P4)
		- 4 to mA with external reference
		- Digital references
		- Fieldbus using Profibus DP
Speed regulation	- Speed regulation with encoder feedback option (only size 33)	
	- Regulation of a reference with integrated PI loop	

1.3.2 - Characteristics and Functions (cont'd.)

Drive Control	IntelliGear Plus
Run/Stop	- With power supply - With remote volt-free contact - With fieldbus - With local run/stop control
Forward/Reverse	- With internal connection on the terminal block - With remote volt-free contact - With fieldbus - With local For./Rev. controls
Stop Mode	- On ramps (using volt-free contact of integrated control) - Freewheel - With electromechanical brake
Ramps	- Ramps are adjustable from 3 to 600 seconds
Fieldbus	- PROFIBUS DP

Protection	IntelliGear Plus
Power	- Undervoltage - Overvoltage - Overloads • thermal of motor or drive • protection from locked rotor - Short-circuit • motor windings - Overspeed
Control	- Short circuit on 0 - 10V/24V inputs or outputs
Drive reset	- By switching off the IntelliGear Plus or by opening/closing the connection between the 24V and ENA (size 31 and 32) terminals, or SD1 and SDI 2 (size 33)

1.4 - Environmental Characteristics

Characteristics	Level - IntelliGear Plus	
Degree of protection	TEFC Version	TEFC motor and NEMA 4/12 Controller
	Washdown Version	Washdown Motor and NEMA 4/12/Controller
Storage temperature	-40 °C to +70 °C	
Transport temperature	-40 °C to +70 °C	
Ambient operating temperature	-20 °C to +40 °C (above 40 °C requires derating 1% per °C	
Altitude	Up to 3000 feet above sea level without derating	
Ambient humidity	95% non-condensing	
Humidity during storage	93%, 40 °C, 4 days	
Vibration	- Exposed product: 0.01 g2 /Hz 1 hr. in accordance with IEC 60068-2-34	
	- Sinusoidal vibration: 2-9 Hz 3.5 ms-2 - 9-200 Hz 10 ms-2 in accordance with IEC 60068-2-6	
Shocks	Packaged product: 15 g, 6 ms, 500 times/direction in all 6 directions in accordance with Standard IEC 600068-2-29	
Immunity	Conforming to EN61000-6-2	
Radiated and conducted emissions	Conforming to EN500081-2 with internal filters	
UL and cUL Standards	Conforming to UL 508 C (E211799)	

* C-Face motors

2 - Faults - Diagnostics

Information relating to the status of the IntelliGear Plus variable speed gearmotor is provided by two indicator lamps located on the control options P1, P2 or P3 or by the internal LED in 31/32.

Color and state of indicator lamp	IntelliGear Plus	Checks to be performed
Steady green	No trip Mains present	
Flashing green	Current limiting	• Check that the motor is not overloaded or stalled.
Flashing red	IGBT temperature alarm Motor overload Braking resistor option overload	• Check that air is able to circulate around the motor fins and IntelliGear Plus casing. • The motor is overloaded: check the motor current using a clamp ammeter. • Check that the deceleration ramp is long enough for applications with high inertia.
Steady red	• Short-circuit of a motor winding • Locked motor rotor • Faulty insulation of a winding • (I2T) overheating • Internal fault • Undervoltage • Overvoltage	• Check that no incident has occurred. • Switch off and then on again to clear the fault. • Check the main voltage. • Check that the deceleration ramp is long enough for applications with high inertia. • If the fault remains, consult Emerson Power Transmission Application Engineering.

The fault is cleared by switching off the IntelliGear Plus or by opening/closing the connection between terminals 12: ENA and 11: +24V (31/32) or SDI1 and SDI2 (33).

3 - Operating Extensions

3.1 - Digital Keypad on enclosure with For./Rev./Stop/ Speedup and down/Speed display/Fault Display (PD)

Ref.	Function
A	Display comprising 4 x 7 segment digits for indicating: - the drive operating status - certain operating data - the adjustment parameters (01 to 80) and their value
B	LED providing a sign for the data (the lit LED corresponds to the “”-”” sign)
C	Keys which can be used to scroll up and down through the parameters or their value. These keys can also be used to vary the speed.
D	Keys which can be used to switch from standard mode to parameter-setting mode. In parameter-setting mode, the parameter number and value are displayed alternately on the display.
E F G	In keypad mode, these buttons are used for the following commands: -Reverse (standerly disabled) - Stop, clear fault - Forward

3.2 - Control knob with integrated run/stop control option (P1)

In addition to speed control, a run button and a stop button make it possible to control the IntelliGear Plus locally, once it is has been switched on, as required. For a run command to be taken into account, the button must be held down for one second.

- It is connected on the P2 connector.
- Has two indicator lights.

3.3 - Control knob with forward/reverse/stop control option (P2)

In addition to speed control, a forward button, a reverse button and a stop button make it possible to control the IntelliGear Plus locally, once it has been switched on, as required. For a run command to be taken into account, the button must be held down for one second.

- Connected on the P2 connector
- Has two indicator lights

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IntelliGear® Plus

Variable Speed Gearmotors

3.4 - Speed control knob option (P3)

The speed is set using a knob with graduations from 15 to 100 percent. Has two indicator lamps. It is connected on the P2 connector.

3.5 - Internal speed control option (P4)

The speeds are set on potentiometers, which are accessible once the cover has been removed.
- a max. spd potentiometer: calibration of the maximum speed
- a min. spd potentiometer: calibration of the minimum speed
- an int. spd potentiometer: speed control, which replaces control via the control knob.

There are also two indicator lights.

3.6 - Braking resistor option (RF100 - RF200)

For operation in four quadrants and energy dissipation, resistors are mounted directly onto the IntelliGear Plus motor.

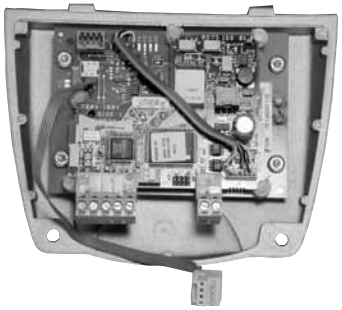
	RF100	RF200 (2x100)		Minimum ohmic value
	P peak kW	P peak kW	Resistor connection	
I31	5.6	2.8	series	100Ω
I31M	1.3	2.6	parallel	50Ω
I32	5.6	11.2	parallel	50Ω

RF100 = thermal power 100W
RF200 = thermal power 200W

External resistors with greater thermal power can be used, provided that the minimum ohmic value is maintained.

3.7 - Fieldbus options

The interface card is fixed inside the casing cover.
Protocol: Profibus DP.



3.8 - Parameter-setting console option (Keypad LCD)

The console option provides access to the drive Internet settings (terminal block configuration, ramp, speed and P1 settings, etc.).

See IntelliGear Plus parameter-setting manual included.

Description of the option:
1 Keypad LCD console
1 cable (3m long)

3.9 - Programming CD (VMA30SOFT)

This CD with manual provides access to the drive internal settings (terminal block configuration, range, speed and PI settings, etc.).
Descriptions of the option:
1 CD in case
1 cable (3m long)

3.10 - XPress Key (PX Key)

The XPress Key option is used to save a copy of all the IntelliGear Plus parameters so that they can be duplicated very simply in another drive.

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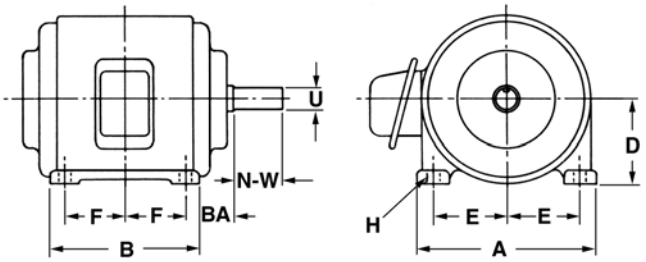
General Information

SERIES 2000 3000

A Guide to NEMA Motor Frames and Shaft Dimensions



Motor ratings and dimensions shown in Table No. 1, below, are for general purpose motors as indicated. Frames for the 1952 - 1953 and the 1964 rerates are shown. All dimensions are subject to change without notice. Those shown are intended as a guide only. Certified dimension drawings from the motor manufacturer should be used.

Table No. 1 **Specifications**

Frame No.	Dimensions									Keyseat		Key Length	HP for Various Motor RPM			
	A Max.	B Max.	D	E	F	H	BA	N-W	U	Width	Depth		3600	1800	1200	900
Fractional Horsepower Motors																
48	5 3/8"	3 1/2"	3"	2 1/8"	1 3/8"	11/32 "s ▲	2 1/2"	1 1/2"	1/2"	Flat	3/64"	-	1/8-1/2	1/8-1/3	1/6	-
56	6 1/2	4 1/2	3 1/2	2 7/16	1 1/2	11/32 ▲	2 3/4	17/8	5/8	3/16"	3/32	1 3/8"	3/4-1	1/3-1	1/8-1/2	-
1952-53 Rerate -- Designs A, B and C -- Open Type -- Squirrel Cage -- Integral H.P. Motors																
182	9	6 1/2	4 1/2	3 3/4	2 1/4	13/32	2 3/4	2 1/4	7/8	3/16	3/32	1 3/8	1 1/2	1	3/4	1/2
184	9	7 1/2	4 1/2	3 3/4	2 3/4	13/32	2 3/4	2 1/4	7/8	3/16	3/32	1 3/8	3,2	2,1 1/2	1 1/2,1	3/4
213	10 1/2	7 1/2	5 1/4	4 1/4	2 3/4	13/32	3 1/2	3	1 1/8	1/4	1/8	2	5	3	2	1 1/2,1
215	10 1/2	9	5 1/4	4 1/4	3 1/2	13/32	3 1/2	3	1 1/8	1/4	1/8	2	7 1/2	5	3	2
254U	12 1/2	10 3/4	6 1/4	5	4 1/8	17/32	4 1/4	3 3/4	1 3/8	5/16	5/32	2 3/4	10	7 1/2	5	3
256U	12 1/2	12 1/2	6 1/4	5	5	17/32	4 1/4	3 3/4	1 3/8	5/16	5/32	2 3/4	15	10	7 1/2	5
284U	14	12 1/2	7	5 1/2	4 3/4	17/32	4 3/4	4 7/8	1 5/8	3/8	3/16	3 3/4	20	15	10	7 1/2
286U	14	14	7	5 1/2	5 1/2	17/32	4 3/4	4 7/8	1 5/8	3/8	3/16	3 3/4	25	20	-	10
324U	16	14	8	6 1/4	5 1/4	21/32	5 1/4	5 5/8	1 7/8	1/2	1/4	4 1/4	-	25	15	-
324S*	16	14	8	6 1/4	5 1/4	21/32	5 1/4	3 1/4	1 5/8	3/8	3/16	1 7/8	30	-	-	-
326U	16	15 1/2	8	6 1/4	6	21/32	5 1/4	5 5/8	1 7/8	1/2	1/4	4 1/4	-	30	20	15
326S*	16	15 1/2	8	6 1/4	6	21/32	5 1/4	3 1/4	1 5/8	3/8	3/16	1 7/8	40	-	-	-
364U	18	15 1/4	9	7	5 5/8	21/32	5 7/8	6 3/8	2 1/8	1/2	1/4	5	-	40	25	20
364US*	18	15 1/4	9	7	5 5/8	21/32	5 7/8	3 3/4	1 7/8	1/2	1/4	2	50	-	-	-
365U	18	16 1/4	9	7	6 1/8	21/32	5 7/8	6 3/8	2 1/8	1/2	1/4	5	-	-	30	25
365US*	18	16 1/4	9	7	6 1/8	21/32	5 7/8	3 3/4	1 7/8	1/2	1/4	2	60	50	-	-
404U	20	16 1/4	10	8	6 1/8	13/16	6 5/8	7 1/8	2 3/8	5/8	5/16	5 1/2	-	-	40	30
404US*	20	16 1/4	10	8	6 1/8	13/16	6 5/8	4 1/4	2 1/8	1/2	1/4	2 3/4	75	60	-	-
405U	20	17 3/4	10	8	6 7/8	13/16	6 5/8	7 1/8	2 3/8	5/8	5/16	5 1/2	-	-	50	40
405US*	20	17 3/4	10	8	6 7/8	13/16	6 5/8	4 1/4	2 1/8	1/2	1/4	2 3/4	100	75	-	-
444U	22	1	11	9	7 1/4	13/16	7 1/2	8 5/8	2 3/8	3/4	3/8	7	-	-	60	50
444US*	22	18 1/2	11	9	7 1/4	13/16	7 1/2	4 1/4	2 1/8	1/2	1/4	2 3/4	125	100	-	-
445U	22	20 1/2	11	9	8 1/4	13/16	7 1/2	8 5/8	2 3/8	3/4	3/8	7	-	-	75	60
445US*	22	20 1/2	11	9	8 1/4	13/16	7 1/2	4 1/4	2 1/8	1/2	1/4	2 3/4	150	125	-	-
1964 Rerate -- Designs A, B and C -- Open Type -- Squirrel Cage -- Integral H.P. Motors																
H143T	7	6	3 1/2	2 3/4	2	11/32	2 1/4	2 1/4	7/8	3/16	3/32	1 3/8	1 1/2	1	3/4	1/2
H145T	7	6	3 1/2	2 3/4	2 1/4	11/32	2 1/4	2 1/4	7/8	3/16	3/32	1 3/8	-	1 1/2	1	3/4
K145T	7	6	3 1/2	2 3/4	2 1/2	11/32	2 1/4	2 1/4	7/8	3/16	3/32	1 3/8	3,2	2	-	-
182T	9	6 1/2	4 1/2	3 3/4	2 1/4	13/32	2 3/4	2 3/4	1 1/8	1/4	1/8	1 3/4	5	3	1 1/2	1
184T	9	7 1/2	4 1/2	3 3/4	2 3/4	13/32	2 3/4	2 3/4	1 1/8	1/4	1/8	1 3/4	7 1/2	5	2	1 1/2
213T	10 1/2	7 1/2	5 1/4	4 1/4	2 3/4	13/32	3 1/2	33/8	1 3/8	5/16	5/32	2 3/8	10	7 1/2	3	2
215T	10 1/2	9	5 1/4	4 1/4	3 1/2	13/32	3 1/2	33/8	1 3/8	5/16	5/32	2 3/8	15	10	5	3
254T	12 1/2	10 3/4	6 1/4	5	41/8	17/32	4 1/4	4	1 5/8	3/8	3/16	2 7/8	20	15	7 1/2	5
256T	12 1/2	12 1/2	6 1/4	5	5	17/32	4 1/4	4	1 5/8	3/8	3/16	2 7/8	25	20	10	7 1/2
284T	14	12 1/2	7	5 1/2	4 3/4	17/32	4 3/4	4 5/8	1 7/8	1/2	1/4	3 1/4	-	25	15	10
284TS*	14	12 1/2	7	5 1/2	4 3/4	17/32	4 3/4	3 1/4	1 5/8	3/8	3/16	1 7/8	30	-	-	-
286T	14	14	7	5 1/2	5 1/2	17/32	4 3/4	4 5/8	1 7/8	1/2	1/4	3 1/4	-	30	20	15
286TS*	14	14	7	5 1/2	5 1/2	17/32	4 3/4	3 1/4	1 5/8	3/8	3/16	1 7/8	40	-	-	-
324T	16	14	8	6 1/4	5 1/4	21/32	5 1/4	5 1/4	2 1/8	1/2	1/4	3 7/8	-	40	25	20
324TS*	16	14	8	6 1/4	5 1/4	21/32	5 1/4	3 3/4	1 7/8	1/2	1/4	2	50	-	-	-
326T	16	15 1/2	8	6 1/4	6	21/32	5 1/4	5 1/4	2 1/8	1/2	1/4	3 7/8	-	50	30	25
326TS*	16	15 1/2	8	6 1/4	6	21/32	5 1/4	3 3/4	1 7/8	1/2	1/4	2	60	-	-	-
364T	18	15 1/4	9	7	5 5/8	21/32	5 7/8	5 7/8	2 3/8	5/8	5/16	4 1/4	-	60	40	30
364TS*	18	15 1/4	9	7	5 5/8	21/32	5 7/8	3 3/4	1 7/8	1/2	1/4	2	75	-	-	-
365T	18	16 1/4	9	7	6 1/8	21/32	5 7/8	5 7/8	2 3/8	5/8	5/16	4 1/4	-	75	50	40
365TS*	18	16 1/4	9	7	6 1/8	21/32	5 7/8	3 3/4	1 7/8	1/2	1/4	2	100	-	-	-
404T	20	16 1/4	10	8	6 1/8	13/16	6 5/8	7 1/4	2 7/8	3/4	3/8	5 5/8	-	100	60	50
404TS*	20	16 1/4	10	8	6 1/8	13/16	6 5/8	4 1/4	2 1/8	1/2	1/4	2 3/4	125	-	-	-
405T	20	17 3/4	10	8	6 7/8	13/16	6 5/8	7 1/4	2 7/8	3/4	3/8	5 5/8	-	125	75	60
405TS*	20	17 3/4	10	8	6 7/8	13/16	6 5/8	4 1/4	2 1/8	1/2	1/4	2 3/4	150	-	-	-
444T	22	18 1/2	11	9	7 1/4	13/16	7 1/2	8 1/2	3 3/8	7/8	7/16	6 7/8	-	-	100	75
444TS*	22	18 1/2	11	9	7 1/4	13/16	7 1/2	4 3/4	2 3/8	5/8	5/16	3	200	150	-	-
445T	22	20 1/2	11	9	8 1/4	13/16	7 1/2	8 1/2	3 3/8	7/8	7/16	6 7/8	-	-	125	100
445TS*	22	20 1/2	11	9	8 1/4	13/16	7 1/2	4 3/4	2 3/8	5/8	5/16	3	250	200	-	-

* These motors are for direct coupled service only.
▲ Slots.

Decimal - Millimeter Equivalents

Fractional	Decimal	M.M.
1/64	.015625	.397
1/32	.03125	.794
3/64	.046875	1.191
1/16	.0625	1.588
5/64	.078125	1.985
3/32	.09375	2.381
7/64	.109375	2.778
1/8	.125	3.175
9/64	.140625	3.572
5/32	.15625	3.969
11/64	.171875	4.366
3/16	.1875	4.763
13/64	.203125	5.159
7/32	.21875	5.556
15/64	.234375	5.953
1/4	.250	6.350
17/64	.265625	6.747
9/32	.28125	7.144
19/64	.296875	7.541
5/16	.3125	7.938
21/64	.328125	8.334
11/32	.34375	8.731
23/64	.359375	9.128
3/8	.375	9.525
25/64	.390625	9.922
13/32	.40625	10.319
27/64	.421875	10.716
7/16	.4375	11.113
29/64	.453125	11.509
15/32	.46875	11.906
31/64	.484375	12.303
1/2	.500	12.700
33/64	.515625	13.097
17/32	.53125	13.494
35/64	.546875	13.891
9/16	.5625	14.288
37/64	.578125	14.684
19/32	.59375	15.081
39/64	.609375	15.478
5/8	.625	15.875
41/64	.640625	16.272
21/32	.65625	16.669
43/64	.671875	17.066
11/16	.6875	17.463
45/64	.703125	17.859
23/32	.71875	18.256
47/64	.734375	18.653
3/4	.750	19.050
49/64	.765625	19.447
25/32	.78125	19.844
51/64	.796875	20.241
13/16	.8125	20.638
53/64	.828125	21.034
27/32	.84375	21.431
55/64	.859375	21.828
7/8	.875	22.225
57/64	.890625	22.622
29/32	.90625	23.019
59/64	.921875	23.416
15/16	.9375	23.813
61/64	.953125	24.209
31/32	.96875	24.606
63/64	.984375	25.003
1	1.000	25.400

HP and Torque

HP is the common unit of mechanical power.

$$HP = \frac{\text{Force x Feet per Minute}}{33000}$$

$$HP = \frac{\text{Torque in In.-Lbs. x rpm}}{63025}$$

One HP = .746 kilowatt

One kilowatt = 1.34 HP

Torque is a twisting moment or turning effort.

Torque in inch-pounds = Force x Lever Arm (Inches)

$$\text{Torque in inch-pounds} = \frac{63025 \times HP}{rpm}$$

The following table gives the torque in Inch-Pounds for one HP at various speeds.

Torque at One HP

R.P.M.	In.-Lbs.	R.P.M.	In.-Lbs.	R.P.M.	In.-Lbs.	R.P.M.	In.-Lbs.
3500	18	580	109	90	700	14	4502
3000	21	500	126	80	788	12	5252
2400	26	400	158	70	900	10	6300
2000	32	300	210	60	1050	8	7878
1750	36	200	315	50	1260	6	10504
1600	39	180	350	40	1576	5	12605
1200	53	160	394	30	2101	4	15756
1160	54	140	450	20	3151	3	21008
1000	63	120	525	18	3501	2	31513
870	72	100	630	16	3939	1	63025

Minimum Sheave Sizes NEMA Standards

The National Electrical Manufacturers Association recommends certain limitations on sheave diameter and width for satisfactory motor operation. The selected sheave diameter should not be smaller nor the width greater than the dimensions below. These dimensions are from NEMA Standard MG1-14.42.

Frame	Horsepower at Sync. Speed, RPM				V-Belt Sheave (Inches)			
					Conventional A, B, C, D, and E Sections		358 3V, 5V and 8V Sections	
	3600	1800	1200	900	Min. Pitch Dia.	Max. Width	Min. Outside Dia.	Max Width
143T	1 1/2	1	3/4	1/2	2.2	4 1/4	2.2	2 1/4
145T	2-3	1 1/2-2	1	3/4	2.4	4 1/4	2.4	2 1/4
182T	3	3	1 1/2	1	2.4	5 1/4	2.4	2 3/4
182T	5	-	-	-	2.6	5 1/4	2.4	2 3/4
184T	-	-	2	1 1/2	2.4	5 1/4	2.4	2 3/4
184T	5	-	-	-	2.6	5 1/4	2.4	2 3/4
184T	7 1/2	5	-	-	3.0	5 1/4	3.0	2 3/4
213T	7 1/2-10	7 1/2	3	2	3.0	6 1/2	3.0	3 3/8
215T	10	-	5	3	3.0	6 1/2	3.0	3 3/8
215T	15	10	-	-	3.8	6 1/2	3.8	3 3/8
254T	15	-	7 1/2	5	3.8	6 1/2	3.8	4
254T	20	15	-	-	4.4	6 1/2	4.4	4
256T	20-25	-	10	7 1/2	4.4	6 1/2	4.4	4
256T	-	20	-	-	4.6	6 1/2	4.4	4
284T	-	-	15	10	4.6	9	4.4	4 5/8
284T	-	25	-	-	5.0	9	4.4	4 5/8
286T	-	30	20	15	5.4	9	5.2	4 5/8
324T	-	40	25	20	6.0	10 1/4	6.0	5 1/4
326T	-	50	30	25	6.8	10 1/4	6.8	5 1/4
364T	-	-	40	30	6.8	11 1/2	6.8	5 7/8
364T	-	60	-	-	7.4	11 1/2	7.4	5 7/8
365T	-	-	50	40	8.2	11 1/2	8.2	5 7/8
365T	-	75	-	-	9.0	11 1/2	8.6	5 7/8
404T	-	-	60	-	9.0	14 1/4	8.0	7 1/4
404T	-	-	-	50	9.0	14 1/4	8.4	7 1/4
404T	-	100	-	-	10.0	14 1/4	8.6	7 1/4
405T	-	-	75	60	10.0	14 1/4	10.0	7 1/4
405T	-	100	-	-	10.0	14 1/4	8.6	7 1/4
405T	-	125	-	-	11.5	14 1/4	10.5	7 1/4
444T	-	-	100	-	11.0	16 3/4	10.0	8 1/2
444T	-	-	-	75	10.5	16 3/4	9.5	8 1/2
444T	-	125	-	-	11.0	16 3/4	9.5	8 1/2
444T	-	150	-	-	-	-	10.5	8 1/2
445T	-	-	125	-	12.5	16 3/4	12.0	8 1/2
445T	-	-	-	100	10.5	16 3/4	12.0	8 1/2
445T	-	150	-	-	-	-	10.5	8 1/2
445T	-	200	-	-	-	-	13.2	8 1/2

To obtain the minimum pitch diameters for flat belt, gearbelt, Poly-V*, chain or gear drives, multiply the 358 sheave pitch diameters in the table above by the following factors:

Drive	Factor
Chain	0.7
Flat Belt (Single Ply)	1.33
Gearbelt	0.9
Helical Gear	0.85
Poly-V	1.00
Spur Gear	0.75

* Poly-V is believed to be the trademark and/or trade name of Veyance Technologies, Inc., and is not owned or controlled by Emerson Power Transmission.

Notes:

All sales are made on our STANDARD TERMS AND CONDITIONS OF SALE in effect at the time a customer's order is accepted. The current Terms and Conditions are set forth below:

STANDARD TERMS AND CONDITIONS OF SALE (September 2, 2009)

These Terms and Conditions, the attendant quotation or acknowledgment and all documents incorporated by specific reference therein, will be the complete and exclusive statement of the terms of the agreement governing the sale of goods ("Goods") by Emerson Power Transmission Corporation and its divisions and subsidiaries ("Seller") to Customer ("Buyer"). Buyer's acceptance of the Goods will manifest Buyer's assent to these Terms and Conditions. If these Terms and Conditions differ in any way from the terms and conditions of Buyer's order, or other documentation, this document will be construed as a counteroffer and will not be deemed an acceptance of Buyer's terms and conditions which conflict herewith.

1. PRICES: Unless otherwise specified in writing by Seller, Seller's price for the goods shall remain in effect for thirty (30) days after the date of Seller's quotation or acknowledgment of Buyer's order for the Goods, whichever occurs first, provided an unconditional, complete authorization for the immediate shipment of the Goods is received and accepted by Seller within such time period. If such authorization is not received by Seller within such thirty (30) day period, Seller shall have the right to change the price for the Good to Seller's price for the Goods at the time of shipment.

2. TAXES: Any tax or governmental charge or increase in same hereafter becoming effective increasing the cost to Seller of producing, selling or delivering the Goods or of procuring material used therein, and any tax now in effect or increase in same payable by the Seller because of the manufacture, sale or delivery of the Goods, may at Seller's option, be added to the price.

3. TERMS OF PAYMENT: Subject to the approval of Seller's Credit Department, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Seller shall have the right, among other remedies, either to terminate the Agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts.

4. SHIPMENT AND DELIVERY: Shipments are made F.O.B. Seller's shipping point. Any claims for shortages or damages suffered in transit shall be submitted by the Buyer directly to the carrier. While Seller will use all reasonable commercial efforts to maintain the delivery date acknowledged or quoted by Seller, all shipping dates are approximate. Seller reserves the right to make partial shipments and to segregate "specials" and made-to-order Goods from normal stock Goods. Seller shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions.

5. QUANTITY: Buyer agrees to accept overruns of up to ten percent (10%) of the order on "made-to-order" Goods, including parts. Any such additional items shall be priced at the price per item charged for the specific quantity ordered.

6. LIMITED WARRANTY: Subject to the limitations of Section 7, Seller warrants that the Goods will be free from defects in material and workmanship under normal use, service and maintenance for a period of one year (unless otherwise specified by Seller in writing) from the date of shipment of the Goods by Seller. **THIS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SELLER WITH RESPECT TO THE GOODS AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOS WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE**.
This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, unauthorized modification or alteration, use beyond rated capacity, or improper installation, maintenance or application. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of Seller's quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void. If within thirty (30) days after Buyer's discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option, repair or replace F.O.B. point of manufacture, or refund the purchase price for, that portion of the goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.
SECTIONS 6 AND 7 APPLY TO ANY ENTITY OR PERSON WHO MAY BUY, ACQUIRE OR USE SELLER'S GOODS, INCLUDING ANY ENTITY OR PERSON WHO BUYS THE GOODS FROM SELLER'S DISTRIBUTOR AND SUCH ENTITY OR PERSON SHALL BE BOUND BY THE LIMITATIONS THEREIN.

7. LIMITATION OF REMEDY AND LIABILITY: **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER (OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 13) SHALL BE LIMITED TO REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE UNDER SECTION 6. SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF USE, LOSS OF REVENUE, COST OF CAPITAL AND DAMAGE OR LOSS OF OTHER PROPERTY OR EQUIPMENT.**
It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer's risk.
GOODS AND/OR SERVICES SOLD HEREUNDER ARE NOT FOR USE IN ANY NUCLEAR AND RELATED APPLICATIONS. Buyer accepts goods and/or services with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchaser or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

8. EXCUSE OF PERFORMANCE: Seller shall not be liable for delays in performance or for non-performance due to acts of God, acts of Buyer, war, riot, fire, flood, other severe weather, sabotage, or epidemics; strikes or labor disturbances; governmental requests, restrictions, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries may be suspended for an appropriate period of time as a result of the foregoing. If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes addressed in this Section 8, Seller may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or material) among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom. Deliveries suspended or not made by reason of this section may be canceled by Seller upon notice to Buyer without liability, but the balance of the agreement shall otherwise remain unaffected.

9. CANCELLATIONS AND DELAYS: The Buyer may cancel orders only upon written notice and upon payment to Seller of cancellation charges which include, among other things, all costs and expenses incurred and commitments made by the Seller and a reasonable profit thereon. Any request by Buyer to extend the delivery schedule must be agreed to in writing by the Seller. If agreement cannot be reached, Seller may deliver product to the last known ship to address and invoice the Buyer upon completion of the product or prior delivery date, whichever is later.

10. CHANGES: Buyer may request changes or additions to the Goods consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price and delivery schedule. Seller reserves the right to change designs and specifications for the Goods without prior notice to Buyer, except with respect to Goods being made-to-order for Buyer.

11. TOOLING: Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interests in, or rights to possession or removal, nor prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

12. ASSIGNMENT: Buyer shall not assign its rights or delegate its duties hereunder or any interest therein or any rights hereunder without the prior written consent of the Seller, and any such assignment, without such consent, shall be void.

13. PATENTS AND COPYRIGHTS: Subject to Section 7, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer's specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of delivery. This warranty is given upon the condition that Buyer promptly notify Seller of any claim or suit involving Buyer in which such infringement is alleged, and, that Buyer cooperate fully with Seller and permit Seller to control completely the defense or compromise of any such allegation of infringement. Seller's warranty as to use only applies to infringements arising solely out of the inherent operation (i) of such Goods, or (ii) of any combination of Goods in a system designed by Seller. In the event such Goods, singularly or in combination, are held to infringe a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods; or modify same to become non-infringing; or grant Buyer a credit for the depreciated value of such Goods and accept return of them.

14. MISCELLANEOUS: These terms and conditions set forth the entire understanding and agreement between Seller and Buyer, and supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions of Sale shall be binding upon the Seller unless made in writing and signed on its behalf by an officer of the Seller. No conditions, usage or trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these Terms and Conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification shall be affected by the acceptance of purchase orders or shipping instruction forms containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected by Seller. No waiver by Seller with respect to any breach or default or any right or remedy and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. Seller is not responsible for typographical or clerical errors made in any quotation, orders or publications. All such errors are subject to correction. The validity, performance, and all other matters relating to the interpretation and effect of this contract shall be governed by the law of the state of New York. The United Nations Convention on the International Sale of Goods shall not apply to
any transaction hereunder.