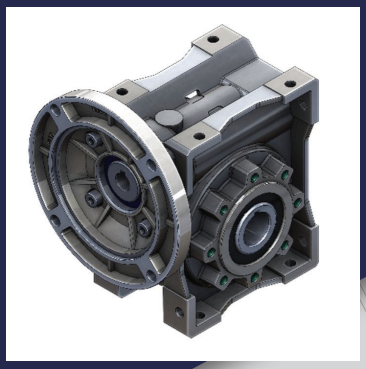
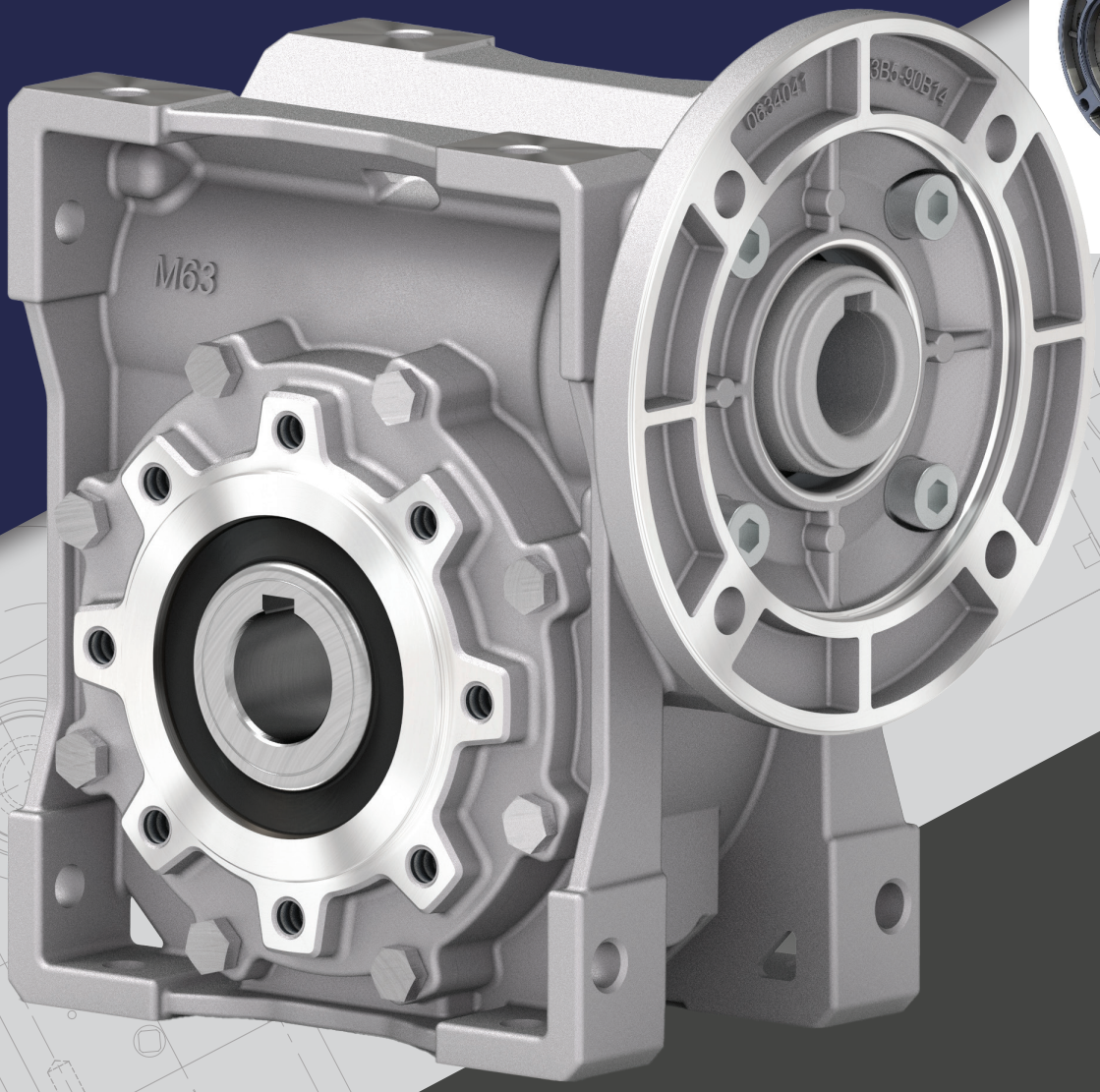
WINSMITH

ALUMINUM SQUARE SPEED REDUCER (ALSQ)

HIGH EFFICIENCY RIGHT ANGLE GEARING





www.winsmith.com

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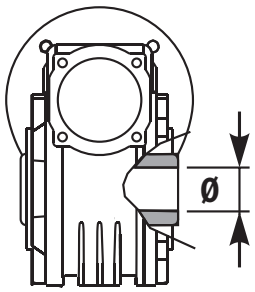
ALUMINUM SQUARE SPEED REDUCER (ALSQ)

Winsmith Aluminum Square Speed Reducers (ALSQ) with its single-piece aluminum housing are dimensionally interchangeable with many global manufacturers of right-angle worm gearboxes. Winsmith stock inventory includes available accessories that allow for precise, quick shipment within 1-3 days from our Asheville, NC gearing facility.

- Modular design allows for precise assembly and quick delivery.
- Dimensionally interchangeable with minimal cost and effort to change from a competitive manufacturer.
- Designed for a wide variety of machine builders who need optimized drives with regard to space, noise, torque and weight considerations.
- Efficiency is optimized, reducing energy losses due to the gearing geometry along with a precision ground and case-hardened worm.
- Single-piece, precision machined housing ensures alignment of gearing and bearings delivering optimal life and performance.
- Robust, compact, lightweight design minimizes space and weight along with increasing life expectancy of supporting elements as compared to cast iron products.
- Wide variety of add on kits to provide many mounting options.
- Aluminum housing provides corrosion resistance and eliminates risk from paint chips.
- Shipped pre-filled with synthetic oil for universal mounting.

MODULAR BASE

SIZE	TORQUE (lbf-in)	ø BORE SIZE OUTPUT SHAFT (in)
45	416	0.750
50	779	1.000
63	1416	1.125



AVAILABLE ACCESSORIES

OUTPUT FLANGE

SINGLE SIDE OUTPUT SHAFT

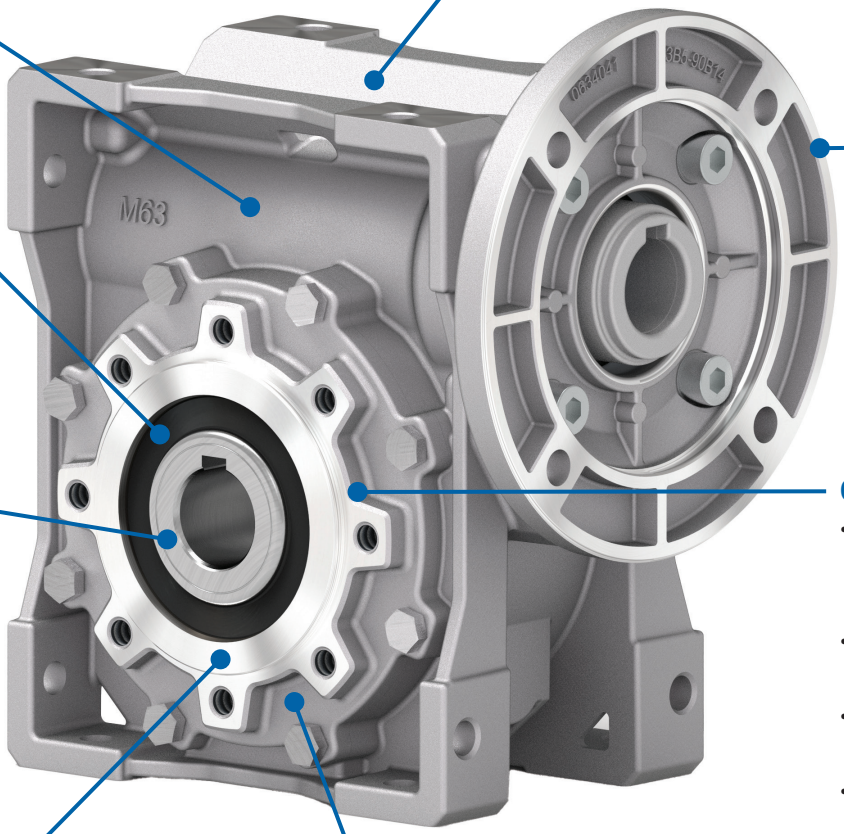
REACTION (TORQUE) ARM

See full list of product Warnings and Cautions on page 14.

ALSQ FEATURES

Single Piece Alloy Steel Input Shaft
- High lead angle worm is case hardened (Rc 58-60))
- Ground worm threads are designed and manufactured for noise reduction and enhanced efficiency

Single-Piece Aluminum Alloy Housing
- Integral, universal mounting holes
- Vacuum impregnated (MIL-STD 276) for protection and sealing
- No secondary finish required but readily accepts paint
- Combines light weight with high tensile strength
- Precision machined for alignment of bearings and gearing



Premium Input/ Output Seals
- High temperature Nitrile output seals
- FKM seals are optional

Motor Flange NEMA/IEC
- Coupled motor input for fret free operation and ease of replacement

Standard Hollow Output Shaft Mounting
- Multiple hollow shaft dimensions available
- Reduces total drive envelope size, weight and cost

Oversized Bearings
- Positively-retained, high speed shaft increases shock load capacity
- Ideal for frequent starting and reversing applications
- Generous overhung load capability
- Allows maximized hollow output bore

Bronze Alloy Worm Gears
- High quality, centrifugally cast, nickel bronze gear for improved operating life

Machined Bearing Caps
- Modular housing readily accepts mounting of accessories
- Extra-deep thread engagement for greater support strength
- Zinc plated hardware offers corrosion resistance

NOMENCLATURE

PM45FC02US-WB3-W-L

P	M45	FC	02	U	S	-W	B3	-W	-L

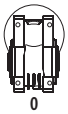
TYPE
P = Motor Flange

SIZE	TORQUE (lbf-in)
M45	416
M50	779
M63	1416

MOUNTING & FEET
FB = Standard
FC = Short Output Flange
FL = Long Output Flange
BR = Reaction (Torque) Arm

BORE SIZE OUTPUT SHAFT (in)
U = (Standard by Base)
M45 = ø0.750
M50 = 1.000
M63 = 1.125

OUTPUT
0 = Hollow Output Shaft Standard Bore Diameter
S = Single Output Shaft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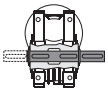
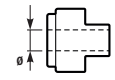

S

MOTOR FRAME SIZE
With Flange for Type P
-W = 56C
-X = 143/5TC
-Y = 182/4TC
-B = 63 B5
-C = 71 B5
-D = 80 B5
-E = 90 B5
-P = 63 B14
-Q = 71 B14
-R = 80 B14
-T = 90 B14
-U = 100/112 B14

STANDARD MOUNTING POSITION
B3 = Worm Top
B6 = DL Drive Left
B7 = DR Drive Right
B8 = Worm Bottom
V5 = Worm Up (input up)
V6 = Worm Down (input down)

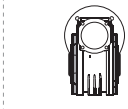
INPUT COUPLING (in)
Coupling*



-W = ø0.625"
-X = ø0.875"
-Y = ø1.125"
-B = IEC63
-C = IEC71
-D = IEC80
-E = IEC90
-F = IEC100/112

**Quill available upon request*

ASSEMBLY OF ACCESSORIES
Flange or Torque Arm
-L = Assy Left
-R = Assy Right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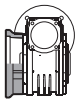
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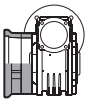
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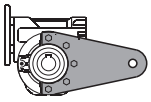
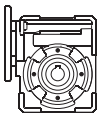

BR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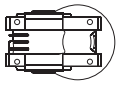
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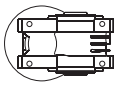
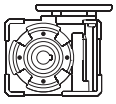
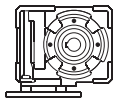

B7


B8


V5

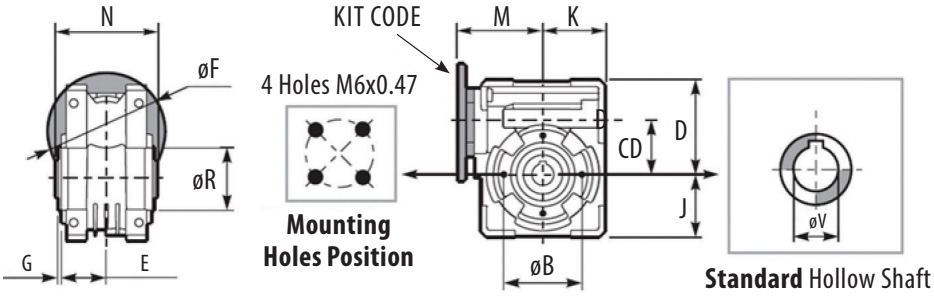

V6

RATIO			
ALSQ	SIZE		
	M45	M50	M63
CODE	RATIO		
11	5:1		
14		5:1	
01	7:1	7:1	7:1
02	10:1	10:1	10:1
03	14:1	14:1	15:1
04	21:1	18:1	19:1
05	28:1	26:1	24:1
12		30:1	
06	37:1	36:1	30:1
07	46:1	43:1	36:1
13		50:1	40:1
08	60:1	60:1	45:1
12			60:1
09	70:1	68:1	67:1
10	102:1	80:1	80:1
11		100:1	94:1

SERVICE FACTOR (S.F.) ASSOCIATED WITH FREQUENT STARTS AND HOURS OF OPERATION

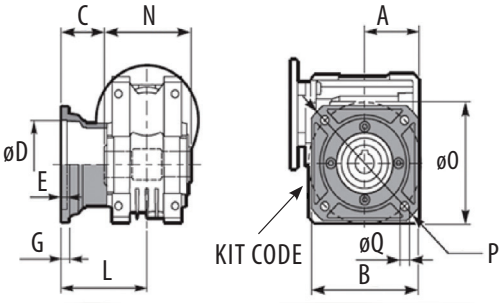
TYPE OF LOAD AND STARTS PER HOUR			HOURS OF OPERATION PER DAY		
			< 2 h	2 - 8 h	8 - 16 h
Continuous or intermittent application with start / hour	≤ 10	Uniform	0.90	1.00	1.25
		Moderate	1.00	1.25	1.50
		Heavy	1.25	1.50	1.75
Intermittent application with start / hour	> 10	Uniform	1.25	1.50	1.75
		Moderate	1.50	1.75	2.00
		Heavy	1.75	2.00	2.25

FB Basic Gearbox



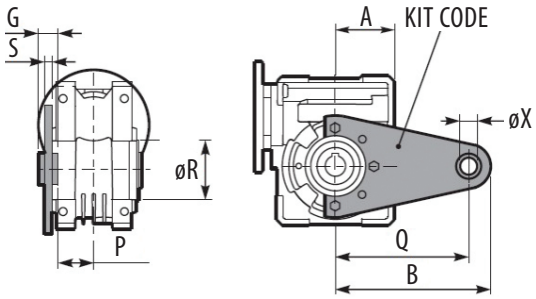
M FLANGES	øB	CD	D	E	øF	G	J	K	M	N	øR		øV	KEYWAY	KIT CODE
56C	2.953	1.772	2.815	1.437	6.5	0.098	1.969	1.969	3.925	2.559	2.3631	±.0009	0.750	3⁄32 X 3⁄16	KU0504041
63B5					5.4				3.149						K0504041
71B5					6.2				3.051						K0504042
56B14					3.1				3.051						KC404049
63B14					3.5				3.149						K0504047
71B14					4.1				3.051						K0504045

FC Short Output Flange and **FL** Long Output Flange



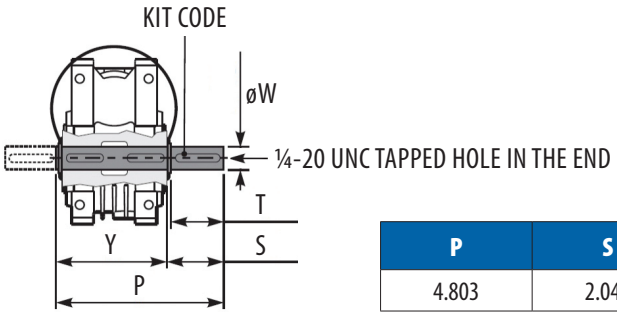
	A	B	C	ØD		E	G	L	N	øO	P	øQ	KIT CODE
FC	1.969	3.74	1.358	2.3631	±.0009	0.160	0.28	2.638	1.358	2.953	4.331	0.350	KM459010
FL			2.539					3.819	2.539				KM459011

BR Reaction (Torque) Arm



A	B	P	Q	øR		G	S	øX	KIT CODE
1.969	4.646	1.240	3.937	2.3613	±.0009	0.55	0.16	0.39	KM459027

S Single Side (Solid) Output Shaft



P	S	T	øW	KEYWAY	Y	KIT CODE
4.803	2.047	1.929	0.750	3⁄32 X 3⁄16	2.756	KU0455028

LUBRICATION

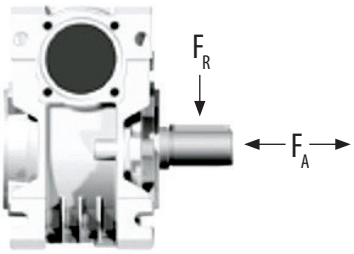
Unit supplied with synthetic oil, helping to provide lifelong lubrication.

045 OIL QUANTITY 3.17 (oz)	
SHELL Omala S4 WE 320	**ENI** Telium VSF 320

RADIAL AND AXIAL LOADS

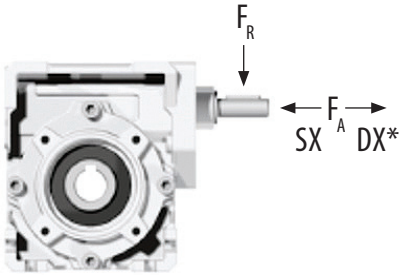
Output Shaft

RPM	F_A (lb)	F_R (lb)
200	40	202
150	45	225
100	49	247
75	54	270
50	58	315
25	67	405
15	90	450



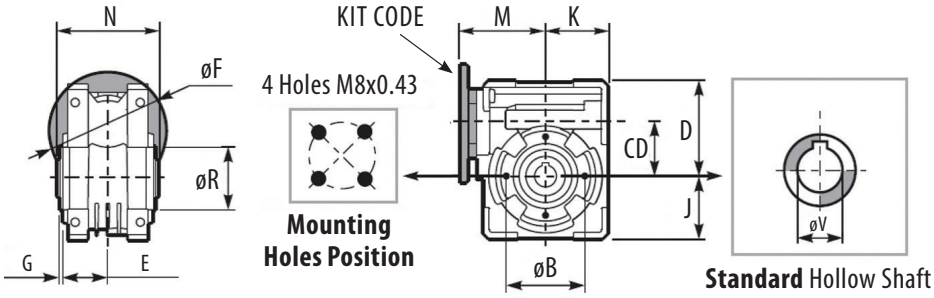
Input Shaft

RPM	F_A (lb)	F_R (lb)
1750	9	47



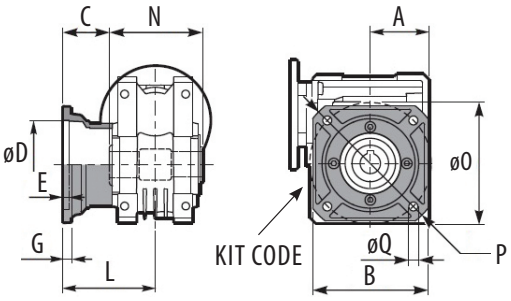
**High axial loads in the SX and DX directions should be avoided.*

FB Basic Gearbox



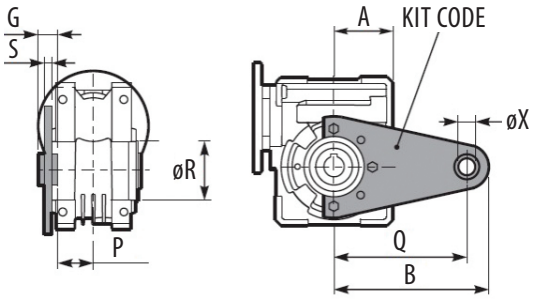
M FLANGES	øB	CD	D	E	øF	G	J	K	M	N	øR		øV	KEYWAY	KIT CODE
56C	3.346	1.969	3.307	1.713	6.5	0.098	2.362	2.362	4.083	3.189	2.7550	±.0009	1.000	⅛ X ¼	KU0504041
63B5					5.4				3.287						K0504041
71B5					6.2				3.188						K0504042
80B5					7.8				3.208						K0504043
56B14					3.1				3.188						KC404049
63B14					3.5				3.287						K0504047
71B14					4.1				3.188						K0504045
80B14					4.7				3.208						K0504046

FC Short Output Flange and **FL** Long Output Flange



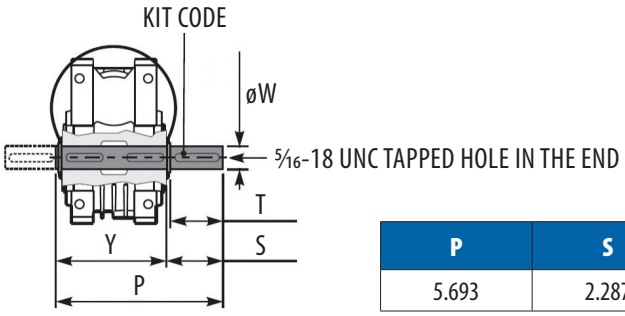
	A	B	C	øD		E	G	L	N	øO	P	øQ	KIT CODE
FC	2.362	4.331	1.949	2.7568	±0.0009	0.20	0.35	3.543	3.189	3.346	4.921	0.430	KM509010
FL			3.130					4.724					KM509011

BR Reaction (Torque) Arm



A	B	P	Q	øR		G	S	øX	KIT CODE
2.362	4.646	1.516	3.937	2.7550	±0.0009	0.55	0.16	0.39	KM509027

S Single Side (Solid) Output Shaft



P	S	T	øW	KEYWAY	Y	KIT CODE
5.693	2.287	2.13	1.000	⅛X ¼	3.405	KU0505028

LUBRICATION

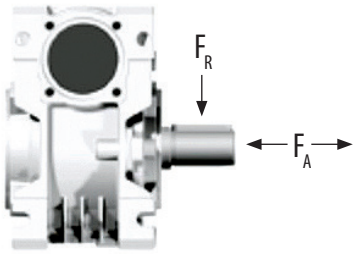
Unit supplied with synthetic oil, helping to provide lifelong lubrication.

050 OIL QUANTITY 4.93 (oz)	
SHELL Omala S4 WE 320	**ENI** Telium VSF 320

RADIAL AND AXIAL LOADS

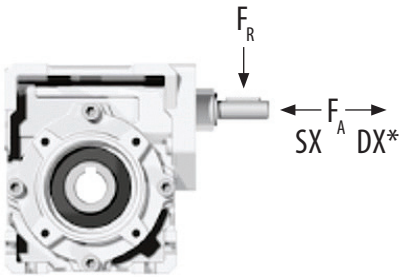
Output Shaft

RPM	F_A (lb)	F_R (lb)
200	54	270
150	63	315
100	67	337
75	76	382
50	85	427
25	108	562
15	126	629



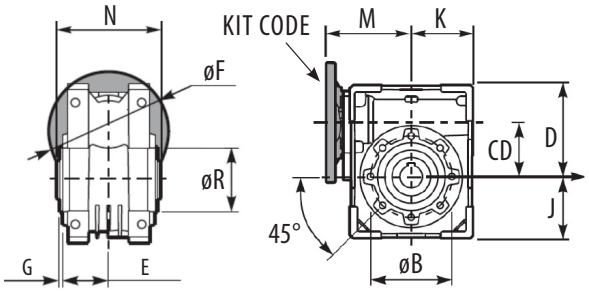
Input Shaft

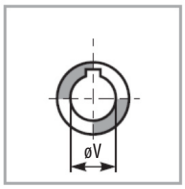
RPM	F_A (lb)	F_R (lb)
1750	17	85



**High axial loads in the SX and DX directions should be avoided.*

FB Basic Gearbox

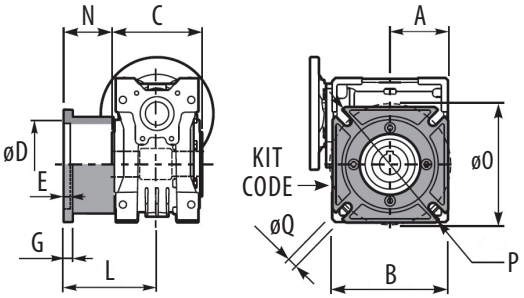




Standard Hollow Shaft

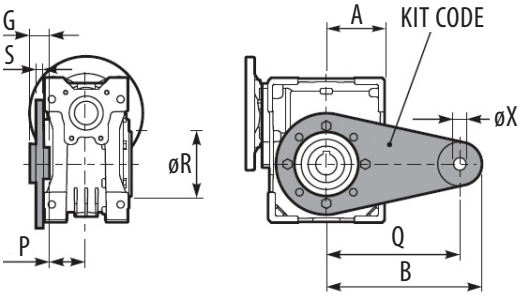
M FLANGES	øB	CD	D	E	øF	G	J	K	M	N	øR		øV	KEYWAY	KIT CODE
56C 143/5 TC	3.740	2.48	4.213	2.087	6.5	0.118	2.835	2.835	4.449	4.409	3.1487	±0.0009	1.125	⅛ X ¼	KU0634041
63B5					5.5				3.956						K0634041
71B5					6.2				3.877						K0634042
80/90B5					7.8				3.956						K0634043
71B14					4.1				3.877						K0634047
80B14					4.7				3.956						K0634046
90B14					5.5				3.956						K0634041

FC Short Output Flange and **FL** Long Output Flange



	A	B	C	øD		E	G	L	N	øO	P	øQ	KIT CODE
FC	2.835	5.591	4.409	4.5286	±0.001	0.24	0.39	3.228	1.024	5.906	7.087	0.430	KM639010
FL								4.409	4.409	5.906			KM509011

BR Reaction (Torque) Arm



A	B	P	Q	øR	G	S	øX	KIT CODE
2.362	4.646	1.516	3.937	2.7550	0.55	0.16	0.39	KM509027

LUBRICATION

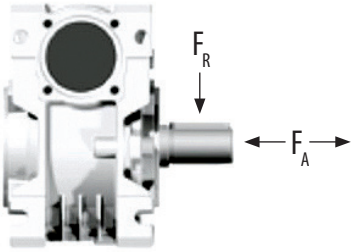
Unit supplied with synthetic oil, helping to provide lifelong lubrication.

063 OIL QUANTITY 10.56 (oz)	
SHELL Omala S4 WE 320	**ENI** Telium VSF 320

RADIAL AND AXIAL LOADS

Output Shaft

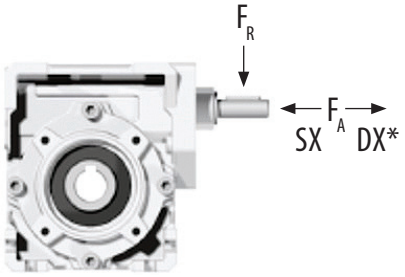
RPM	F_A (lb)	F_R (lb)
200	81.0	404.5
150	90.0	450.0
100	103.5	517.0
75	112.5	562.0
50	135.0	674.5
25	157.0	854.0
15	180.0	899.0



Input Shaft

RPM	F_A (lb)	F_R (lb)
1750	20	101

**High axial loads in the SX and DX directions should be avoided.*



M45 RATINGS INPUT SPEED = 1750 RPM

OUTPUT SPEED	RATIO CODE	RATIO	MOTOR POWER	TRANSMITTED OR OUTPUT TORQUE	SERVICE FACTOR	NOMINAL POWER	NOMINAL TORQUE	AVAILABLE NEMA MOTOR FLANGES	DYNAMIC EFFICIENCY
RPM		i	HP	(lbf-in)	S.F.	HP	(lbf-in)	-W 56C	%
250.0	01	7	1.00	202	1.8	1.82	363		80
175.0	02	10	0.75	213	1.4	1.39	389		79
125.0	03	14	0.50	194	1.3	1.02	389		77
83.3	04	21	0.50	253	1	0.74	372		67
62.5	05	28	0.50	328	1.3	0.64	416		65
47.3	06	37	0.33	277	1.3	0.44	363		63
38.0	07	46	0.33	323	1.1	0.38	363		59
29.2	08	60	0.25	303	1.2	0.3	363		56
25.0	09	70	0.25	340	0.8	0.2	266		54
17.2	10	102	0.25*	450	<0.8	0.14	257		49

**Power is higher than the maximum allowed for this ratio. Select according to the nominal torque required.*

M50 RATINGS INPUT SPEED = 1750 RPM

OUTPUT SPEED	RATIO CODE	RATIO	MOTOR POWER	TRANSMITTED OR OUTPUT TORQUE	SERVICE FACTOR	NOMINAL POWER	NOMINAL TORQUE	AVAILABLE NEMA MOTOR FLANGES	DYNAMIC EFFICIENCY
RPM		i	HP	(lbf-in)	S.F.	HP	(lbf-in)	-W 56C	%
250.0	01	7	2.00	413	1.6	3.25	664		82
175.0	02	10	2.00	576	1.2	2.43	690		80
125.0	03	14	1.50	598	1.2	1.78	699		79
97.2	04	18	1.00	486	1.4	1.38	664		75
67.3	05	26	1.00	646	1.0	0.99	628		69
58.3	12	30	1.00	756	1.0	1.04	779		70
48.6	06	36	0.75	671	1.1	0.82	726		69
40.7	07	43	0.50	511	1.4	0.72	726		66
35.0	13	50	0.50	558	1.2	0.61	673		62
29.2	08	60	0.50	627	1.0	0.51	628		58
25.7	09	68	0.33	461	1.3	0.42	584		57
21.9	10	80	0.33	513	1.1	0.37	575		54
17.5	11	100	0.25	450	1.1	0.27	487		50

RATINGS

M63 RATINGS INPUT SPEED = 1750 RPM

OUTPUT SPEED	RATIO CODE	RATIO	MOTOR POWER	TRANSMITTED OR OUTPUT TORQUE	SERVICE FACTOR	NOMINAL POWER	NOMINAL TORQUE	AVAILABLE NEMA MOTOR FLANGES		DYNAMIC EFFICIENCY
RPM		i	HP	(lbf-in)	S.F.	HP	(lbf-in)	-W 56C	-X 143-5TC	%
250.0	01	7	2.0	419	2.7	5.49	1133	B		83
175.0	02	10	2.0	583	2.0	4.12	1186	B		81
116.7	03	15	2.0	854	1.5	3.11	1310	B		79
92.1	04	19	2.0	1068	1.2	2.44	1283	B		78
72.9	05	24	1.5	972	1.3	1.96	1257	B		75
58.3	06	30	1.5	1199	1.2	1.79	1416	B		74
48.6	07	36	1.0	1323	1.0	1.5	1301	B		68
43.8	13	40	1.0	951	1.4	1.4	1310	B		66
38.9	08	45	1.0	1070	1.1	1.13	1195	B		66
29.2	12	60	0.8	1005	1.2	0.9	1195	B		62
26.1	09	67	0.5	1086	1.0	0.77	1097	B		60
21.9	10	80	0.5	821	1.3	0.67	1080	B		57
18.6	11	94	0.5	880	1.2	0.61	1053	B		52

Note: B - Supplied with Reduction Bushing

WARNINGS AND CAUTIONS

⚠ WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.

Gearboxes operating in high position should have a protective shield for any possible parts falling down for casual accidents where people are moving under them.

Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.

Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.

CAUTION:

Failure to observe the following warnings could create a risk of serious injury.

This product is not recommended for use in reducers in man lift or people moving devices.

Make sure that certain applications do not exceed the allowable load capacities published in the current catalog.

Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application power.

Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

NOTES

- Buyer shall be solely responsible for determining the adequacy of the product for all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.
- Reducers are not to be considered fail safe or self-locking devices. If these features are required, a properly sized, independent holding device should be utilized.
- Reducers should not be used as a brake.
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only and no other associated attachments or motors.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and or shaft breakage from bending fatigue, if not sized properly.

NOTES

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