

Planetary
Speed Reducers



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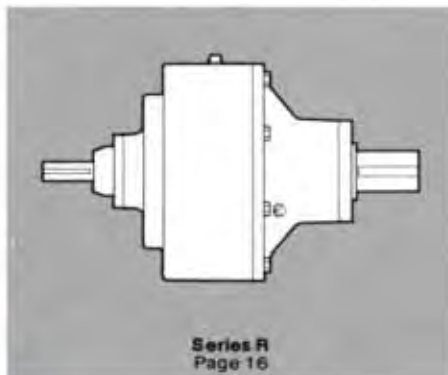
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THE WINSMITH PLANETARY...WHAT IT IS

ANY RATIO OF REDUCTION . . . from about 1.1 to 1 up to 50,000 to 1 in a single stage and in the same housing, can be had in this quiet-running Planetary Helical Gear Speed Reducer to obtain smooth, positive power transmission.

Unusually compact . . . from No. 1H thru No. 61H, these straight-line, efficient speed reduction units are anti-friction bearing equipped. Gears and shafts, in fact all wearing parts, are of specially selected and treated alloy steels. Winsmith Planetary Reducers are in daily use in almost every conceivable phase of industrial service and can be had in sizes to transmit from fractional to over 80 input horsepower.

DISTINCTLY DIFFERENT FROM ORDINARY PLANETARY GEARING

The Winsmith Planetary Reducer, in details of design, resembles the ordinary planetary system in little but general shape. There have been retained, however, such advantages of the ordinary planetary system of gearing as greater load carrying capacity with smoother operation because more teeth are in action; larger reductions possible in a given space, offering a striking compactness; longer transmission radius, minimizing tooth pressure for a given torque load.

Positioning of gears . . . tooth alignment . . . even distribution of load, are all important to load carrying capacity, to smoothness of operation and to service life. In the ordinary planetary system, three planetary gears are usually employed to obtain maximum transmission of power, and because the reaction of the three planetary gears to each other serves to lessen annular stresses on main bearings.

It is here that the importance of extreme accuracy in production of ordinary planetary systems becomes evident. Perfect load distribution, which requires simultaneous contact of all driving teeth, demands absolute accuracy because the gears in the ordinary planetary system are in a fixed position relative to each other without any possibility of load equalization through compensated positioning. In the ordinary planetary system, slight inaccuracies in positioning of the mounting studs in the driven plate . . . a little irregularity of gear tooth indexing in cutting . . . or a small variation in tooth thickness, can and often does result in one planetary gear instead of all three taking the load, with consequent premature failure of the reducer.

EVEN DISTRIBUTION OF LOAD . . . THRU THE UNIFIED PLANETARY ELEMENT

The primary and secondary planetary gears of the Winsmith Planetary Helical Gear Reducer are made integral and combined in a planetary frame of ductile iron, to form a Complete Unified Planetary Element. This design acts to preserve tooth alignment, yet it should be noted that the Unified Planetary Element has no connection with the reducer housing, and that the Planetary Frame carries no part of the load. The power is transmitted and all of the load carried solely through the gears. The Planetary Frame . . . in fact the complete unified element . . . is supported only by the planetary gears and their case hardened and ground steel journals which turn in special sintered bronze impregnated with teflon and lead.

If required to do so, through gradual operating wear, or because of slight inaccuracies, the Unified Planetary Element will automatically float into position which guarantees equalized load distribution so that all three sets of planetary gears do an equal share of the work throughout the life of the Winsmith Reducer. It is apparent that the Unified Planetary Element . . . free to float . . . rides on a cushion of oil between the planetary and internal gear teeth.



• Unified Planetary Element, complete with primary and secondary planetary gears.

The value of this floating feature is reflected in the constantly maintained smoothness of operation and in the quiet-running equalized load distribution throughout the operating life of the reducer.

1.1 TO 1 . . . OR 50,000 TO 1 RATIO . . . IN THE SAME HOUSING

Important though maintenance of equalized load distribution is, it is but one of the superior features of the Winsmith Planetary Reducer. Reference to the illustrations on pages 1 and 2 will show that the economy of parts is outstanding. Moreover, the parts shown are never increased in number regardless of the reduction required . . . whether 1.1 to 1 or 50,000 to 1 ratio . . . overall dimensions of the reducer of a given size always remain the same. Such ratios of reduction as these, just a few taken from many case histories, can be provided for in a Winsmith Planetary Reducer of a given size without a single change in general overall dimensions:

For the No. 51 . . . 5 to 1 . . . 818 to 1 . . . 1,945 to 1 . . . 3,974 to 1 . . . 18,174 to 1 . . . 40,489 to 1, etc.

For the No. 41 . . . 5.04 to 1 . . . 1,023 to 1 . . . 1,492 to 1 . . . 2,413 to 1 . . . 3,054 to 1 . . . 6,178 to 1 . . . 22,258 to 1 . . . 28,185 to 1, etc.

HIGH EFFICIENCY . . . LONG LIFE

Economy of parts, cut tooth Helical Gears, and anti-friction bearings all add up to high efficiency . . . minimum wear . . . and resulting long life. Such characteristics are inherent in the Winsmith Helical Gear Planetary Speed Reducer and are proven by hundreds of installations operating day in and day out in all kinds of service, under a great variety of conditions, indoors and out, 24 hours daily, from coast to coast in the United States and Canada.

WINSMITH PLANETARY SPEED REDUCERS

DESIGN AND CONSTRUCTION

WINSMITH PLANETARY GEARING

All gears in all sizes and types of Winsmith Planetary Speed Reducers are Quiet-Running . . . Helical . . . Gears of 15° Helix-Angle, cut on modern Fellows Gear Shapers.

The High Speed Pinion and Shaft, integral, is machined from SAE 8620 steel or equal with teeth cut in the shaft. Thus the shaft and pinion are in one piece as illustrated. Of course, it is hardened to resist wear.

The Planetary Gears are case hardened, for maximum strength and wear resistance. The hardened and ground planetary gear journals turn in the special bushings, of sintered bronze impregnated with teflon and lead, mounted in the planetary frame. The frame is of ductile iron.

Internal ring gears . . . primary and secondary are of case hardened for maximum strength and wear resistance.



• Alloy steel primary and secondary internal ring gears

OTHER COMPONENT PARTS

The Output or Slow Speed Shaft and Low Speed Gear-Web are illustrated below. The shaft is through hardened and ground to a close degree of accuracy. The gear web is of ductile iron for all reducers.



Bearings to support the input and output shafts are Tapered Roller Bearings for all sizes and types of Winsmith Planetary Speed Reducers. Two opposed bearings support the radial load and take the thrust on each shaft.

Housing . . . Housing Cover . . . Bearing Caps are of a close-grained cast iron, thoroughly blasted and cleaned inside and out. Upon assembly of the reducer, the outside is adequately covered with grey enamel.

Oil Seals, used to keep oil in and dust out, are commonly known as chevron shape or type. The sealing ring is of a dense, grainless material, non-porous, tough and resilient, oil and heat resistant, non-abrasive and has a low coefficient of friction. Two seals are used for the output or slow speed shaft of Vertical Type Reducers; likewise for the bottom shaft . . . whether input or output . . . when a Horizontal Type unit is mounted in a side-wall position; and Type "F" when mounted vertically.



• Alloy steel driving pinion and shaft integral

ASSEMBLY . . . INSPECTION . . . TESTS

All component parts are made and machined in a well-lighted, modern plant adequately equipped with up-to-date general machine tools, automatic grinding and gear cutting equipment. Those operations which lend themselves to production tooling are performed . . . with accuracy and uniformity maintained . . . through the medium of suitable jigs, gauges and fixtures. Parts are thus interchangeable, reducer size for size and ratio for ratio.

All parts of Winsmith Planetary Speed Reducers are carefully inspected for size and finish before assembly. Each reducer is rigidly tested for conformity to specifications, for correct adjustment of bearings, accurate centering of gears, and correct tooth contact.

Following such static tests, each unit is tested. This final phase of inspection and testing assures you of quiet operation, trouble-free performance, and an acceptable length of operating life, granting that the reducer has been properly selected for load and speed, is carefully installed, accurately aligned with driving and driven equipment, and is reasonably well maintained.

Lubrication . . . is treated in Winsmith Engineering Bulletin "Suggestions for Installation and Lubrication." Send for a copy.



SELECTING YOUR PLANETARY SPEED REDUCER

USING THE REDUCER SELECTION CHART ON PAGES 6 - 7 YOU CAN EASILY CHOOSE THE CORRECT SIZE PLANETARY UNIT FOR YOUR PARTICULAR APPLICATION. SIMPLY FOLLOW THE SELECTION PROCEDURE OUTLINED BELOW.

SELECTION PROCEDURE

Example: 8000 in. lbs. of output torque is required to drive a uniformly fed belt conveyor 24 hours per day at an output speed of 20 rpm. Prime Mover=1800 RPM electric motor.

- Determine the appropriate Service Factor for the given application using the AGMA Service Factor Chart (page 4) based on length of service and type of prime mover.
For this example: Service Factor=1.25
- Calculate the Design Torque by multiplying the required output torque by the service factor.
For Example: Design Torque=8000 in. lb. x 1.25=10,000 in. lbs.
- Choose the Output RPM or Ratio on the Selection Chart (1800 RPM input, see Pages 6 - 7) which is closest to the required Output RPM or Ratio.
For Example: Select 20.4 RPM.
- Select a reducer size corresponding to (a) the lowest Output Torque on the selection chart which is greater than or equal to the Design Torque, and (b) the required Output RPM or Ratio.
For Example: a size 20 or 21 unit is chosen at 10,640 in. lbs. of output torque. See chart below.
- Refer to pages 8 - 17 for the specific model reducer that will meet your requirements.

NOTE: IF RELATIVE DIRECTION OF SHAFT ROTATION IS AN IMPORTANT FACTOR, CONSULT THE ROTATION COLUMN ON THE RATING CHARTS (P. 18 - 21) TO CERTIFY DIRECTION OF THE OUTPUT OR SLOW SPEED SHAFT.



See Page 7

OUTPUT RPM	NOMINAL RATIO +5%	UNIT SIZE	1	7 H, F, V	10 F, V, R 11 H	20 F, V, R 21 H	30 F, V, R 31 H	40 F, V, R 41 H	50 F, V, R 51 H	60 F, V, R 61 H
24.9	72.4	OUTPUT TORQUE	1995	3805	5086	10376	19285	29169	58758	103424
		INPUT HP	1.01	1.63	2.44	5.02	8.85	13.92	27.51	49.01
20.4	88.1	OUTPUT TORQUE	2084	3939	5264	10640	19749	30080	59980	107880
		INPUT HP	.88	1.45	2.21	4.39	7.70	11.56	22.73	41.07

THE RATIO YOU REQUIRE . . . MUST IT BE MATHEMATICALLY EXACT?

If a mathematically exact ratio to an infinite number of decimal places is necessary, be sure to consult us before selecting a ratio as such from those listed on pages 18 to 21.

A number of ratios listed are shown as whole numbers to one decimal place. Example: Ratios of 24.0 to 1, 59.0 to 1; 70.0 to 1 are shown for reducers No. 7VM and No. 10VM. These, and a number of others that are shown as exact ratios to one decimal place (00.0 to 1), are not nec-

essarily mathematically exact to an infinite number of decimal places.

Unusual exact ratios, such as 2-18/19 to 1, 3-23/63 to 1, 3-43/58 to 1 can be furnished. If ratios such as these are necessary, consult our Engineering Dept.

GEARING ONLY SUPPLIED

Gearing only can be supplied to those who want to build their own special housing to incorporate Winsmith Planetary Gearing.





AGMA SERVICE FACTORS

PRIME MOVER	DURATION OF SERVICE	UNIFORM	MODERATE SHOCK	HEAVY SHOCK
		U	M	H
Electric Motor	Occasional—1/2 hr. per day	1.00	1.00	1.25
	Intermittent—3 hrs. per day	1.00	1.00	1.50
	8 - 10 hrs. per day	1.00	1.25	1.75
	24 hrs. per day	1.25	1.50	2.00
Multi-Cylinder Internal Combustion Engine	Occasional—1/2 hr. per day	1.00	1.00	1.50
	Intermittent—3 hrs. per day	1.00	1.25	1.75
	8 - 10 hrs. per day	1.25	1.50	2.00
	24 hrs. per day	1.50	1.75	2.25
Single Cylinder Internal Combustion Engine	Occasional—1/2 hr. per day	1.00	1.25	1.75
	Intermittent—3 hrs. per day	1.25	1.50	2.00
	8 - 10 hrs. per day	1.50	1.75	2.25
	24 hrs. per day	1.75	2.00	2.50

EXPLANATORY NOTES:

1. Time specified for intermittent and occasional service refers to total operating time per day.
2. Term "frequent starts and stops" refers to more than 10 - 20 starts per hour.

Normal starting, or occasional momentary peak loads up to 200% of catalog rating at 1800 R.P.M., 2 - 3 times per day, are permissible. If either of these values are exceeded, a service factor of 2 should be used.

Heavy starting loads may be encountered when the slow speed shaft of the Reducer is direct coupled to larger gears or heavy masses. A service factor of 2-1/2 should be used.

Reversing drives and those subjected to quickly repeated shock loads of unusual or unpredictable intensity, stalling loads, drives that are over-running, or that "wind up" due to quick power stoppage and storage of energy are not covered by these factors. A service factor of 3 is indicated. Each is a problem that should be referred to our Engineering Dept.

CLASSIFICATION OF LOAD

CLASSIFICATION OF LOAD TABLE

U — Uniform Load
M — Moderate Shock Load
H — Heavy Shock Load

Conveyor Belt—Uniformly fed 10 hours per day—Uniform Load.
Service Factor= 1.00

Non-uniformly fed 10 hours per day—Moderate Shock Load: Service Factor= 1.25

Application	Application	Application
AGITATORS	COMPRESSORS	Over
Pure Liquids	Centrifugal	Reciprocating
Liquids and Solids	Lobe	Screw
Liquids—Variable Density	Reciprocating*	Shaker
Semi-liquids—Variable Density*	Multi-cylinder	CRANES and HOISTS
BLOWERS	Single Cylinder	Main Hoists
Centrifugal	CONVEYORS—UNIFORMLY LOADED OR FED	Heavy Duty
Lobe	Apron	Medium Duty
Vane	Assembly	Reversing
BREWING and DISTILLING	Belt	Skip Hoists
Bottling Machinery	Bucket	Trolley Drive*
Brew Kettles—Continuous Duty	Chain	Bridge Drive*
Cookers—Continuous Duty	Flight	CRUSHERS
Mash Tubs—Continuous Duty	Over	Gr
Scale Hopper Frequent Starts	Screw	Stone
CAN FILLING MACHINES	CONVEYORS—HEAVY DUTY NOT UNIFORMLY FED	DREDGES
Cane Knives	Apron	Cable Reels
CAR DUMPERS	Assembly	Conveyors
CAR PULLERS —Intermittent Duty	Belt	Cutter Head Drives
CLARIFIERS	Bucket	Jig Drives
CLASSIFIERS	Chain	Maneuvering Winches
CLAY WORKING MACHINERY	Flight	Pumps
Brick Press	Live Roll (Package)	Screen Drive
Briquette Machine		Stackers
Clay Working Machinery		Utility Winches
Pug Mill		

CLASSIFICATION OF LOAD TABLE (CONTINUED)

Application		Application		Application	
ELEVATORS		Tray Drive	M	PRINTING PRESSES	U
Bucket—Uniform Load	U	Trimmer Feed	M	PULLERS	
Bucket—Heavy Load	M	Waste Conveyor	M	Barge Haul	M
Bucket—Continuous	U	MACHINE TOOLS		PUMPS	
Centrifugal Discharge	U	Bending Roll	..	Centrifugal	U
Escalators	U	**Notching Press—Bell Driven	**	*Proportioning	M
Freight	M	Plate Planer	H	Reciprocating	
Gravity Discharge	U	Punch Press—Gear Driven	H	Single Acting	
Man Lifts**	**	Tapping Machines	..	3 or more Cylinders	M
Passenger**	**	Other Machine Tools		Double Acting	
Service—Hand Lift	H	Main Drives	M	2 or more Cylinders	M
FANS		Auxiliary Drives	U	**Single Acting	
Centrifugal	M	METAL MILLS		1 or 2 Cylinders	**
Cooling Towers		Draw Bench—Carriage	H	**Double Acting	
Induced Draft	M	Draw Bench—Main Drive	M	Single Cylinder	**
Forced Draft*	**	Forming Machines	H	Rotary—Gear Type	U
Induced Draft	M	*Pinch Dryer & Scrubber		—Lobe, Vane	U
Large (Mine, etc.)*	M*	Rolls, Reversing	**	RUBBER INDUSTRY	
Large Industrial*	M*	*Slitters	M	Mixer	H
Light (Small Diameter)	U	Table Conveyors		*Rubber Calender	M
FEEDERS		Non-Reversing	M	*Rubber Mill (2 or more)	M
Apron	M	*Reversing		*Sheeter	M
Belt	M	Wire Drawing & Flattening		**Tire Building Machines	**
Disc	U	Machine	M	**Tire & Tube Press Openers	**
Reciprocating	H	Wire Winding Machine	..	Tubers and Strainers	M
Screw	M	MILLS, ROTARY TYPE		SEWAGE DISPOSAL EQUIPMENT	
FOOD INDUSTRY		Ball	H	Bar Screens	U
Beet Slicer	M	**Cement Kilns	**	Chemical Feeders	U
Cereal Cooker	U	Dryers & Coolers	M	Collectors, Circuline or Straightline	U
Dough Mixer	M	Kilns	M	Dewatering Screens	M
Meat Grinders	M	Pebble	H	Grit Collectors	U
GENERATORS—(Not Welding)	U	Rod	H	Scum Breakers	M
HAMMER MILLS	H	Tumbling Barrels	H	Slow or Rapid Mixers	M
LAUNDRY WASHERS		MIXERS		Sludge Collectors	U
Reversing	M	Concrete Mixers, Continuous	M	Thickeners	M
LAUNDRY TUMBLERS	M	Concrete Mixers, Intermittent	U	Vacuum Filters	M
LINE SHAFTS		Constant Density	U	SCREENS	
Heavy Shock Load	H	Variable Density	M	Air Washing	U
Moderate Shock Load	M	OIL INDUSTRY		Rotary—Stone or Gravel	M
Uniform Load	U	Chillers	M	Traveling Water Intake	U
LUMBER INDUSTRY		**Oil Well Pumping	**	SLAB PUSHERS	M
Barkers—Hydraulic-Mechanical	M	Paraffin Filter Press	M	STEERING GEAR	M
Burner Conveyor	M	Rotary Kilns	M	STOKERS	U
Chain Saw and Drag Saw	H	PAPER MILLS		TEXTILE INDUSTRY	
Chain Transfer	H	Agitators (Mixers)	M	Batchers	M
Craneway Transfer	H	Barker Auxiliaries, Hydraulic	..	Calenders	M
De-Barking Drum	H	Barker, Mechanical	..	*Card Machines	M
Edger Feed	M	Barking Drum	H	Cloth Finishing Machines,	
Gang Feed	M	*Beater & Pulper	..	(washers, pads, tenters)	
Green Chain	M	Bleacher	..	(dryers, calenders, etc.)	M
Live Rolls	H	*Calenders	..	Dry Cans	M
Log Deck	H	Calenders—Super	..	Dryers	M
Log Haul—Incline	H	Converting Machines, except	..	Dyeing Machinery	M
Log Haul—Well Type	H	Cutters, Platers	..	**Knitting Machines (looms, etc.)	**
Log Turning Device	H	Conveyors	..	Looms	M
Main Log Conveyor	H	*Couch	..	Mangles	M
Off Bearing Rolls	M	Cutters, Platers	..	Nappers	M
Planer Feed Chains	M	Cylinders	..	Pads	M
Planer Floor Chains	M	*Dryers	..	Range Drives	..
Planer Tilting Hoist	M	Felt Stretcher	..	Slashers	M
Re-saw Merry-Go-Round Conveyor	M	Felt Whipper	..	Soapers	M
Roll Cases	H	Jordans	..	Spinners	M
Slab Conveyor	H	Log Haul	..	Tenter Frames	M
Small Waste Conveyor—Belt	U	*Presses	..	Washers	M
Small Waste Conveyor—Chain	M	Pulp Machines	..	Winders (Other than Batchers)	M
Sorting Table	M	Reel	..	Yarn Preparatory Machines	
Tippie Hoist Conveyor	M	*Stock Chests	..	(Cards, Spinners, Slashers, etc.)	M
Tippie Hoist Drive	M	*Suction Roll	..	*WINDLASS	M*
Transfer Conveyor	H	Washers and Thickeners	..		
Transfer Rolls	H	Winders	..		

*Classes listed are minimum and normal conditions and are assumed. In view of varying load conditions it is suggested that these applications be carefully reviewed, before final selection is made.

**Check safety codes and refer to factory.



REDUCER SELECTION

OUTPUT TORQUE AND OUTPUT RPM OR RATIO

See Pages 3 - 5 for selection procedure, service factors and classification of load tables

All Ratings Stated Are For A.D.M.A. Class I Service

1800 RPM INPUT

OUTPUT RPM	NOMINAL* RATIO ± 5%	UNIT SIZE	1	7H, F, V	10F, V, R 11H	20F, V, R 21H	30F, V, R 31H	40F, V, R 41H	50F, V, R 51H	60F, V 61H
1200.0	1.5	OUTPUT TORQUE	69	154	206	470	762	1225	2459	4136
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
900.0	2.0	OUTPUT TORQUE	82	200	268	636	1017	1634	3307	5506
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
545.5	3.3	OUTPUT TORQUE	149	342	457	1081	1710	2758	5442	9314
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
352.9	5.1	OUTPUT TORQUE	234	520	695	1607	2609	4016	8353	14170
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
281.3	6.4	OUTPUT TORQUE	293	643	860	2008	3281	4954	10475	17477
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
227.8	7.9	OUTPUT TORQUE	358	814	1088	2459	3967	6072	12755	21421
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
185.6	9.7	OUTPUT TORQUE	427	1026	1372	2928	4779	7267	15369	25640
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
153.8	11.7	OUTPUT TORQUE	523	1198	1601	3587	5878	9210	19074	32494
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
125.0	14.4	OUTPUT TORQUE		1400	1922	4533	7503	11462	23716	40438
		INPUT HP		3.12	4.17	9.39	15.21	23.17	48.15	81.51
98.4	18.3	OUTPUT TORQUE	860	1821	2434	5895	9151	13749	29947	48494
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
83.3	21.6	OUTPUT TORQUE	991	2235	2987	6793	10928	16413	34749	57907
		INPUT HP	1.47	3.12	4.17	9.39	15.21	23.17	48.15	81.51
68.4	26.3	OUTPUT TORQUE	1204	2590	3462	7584	12740	20051	37835	70229
		INPUT HP	1.47	3.00	4.15	9.01	15.00	22.50	44.95	78.58
57.5	31.3	OUTPUT TORQUE	1381	2976	3977	8510	14738	21839	43157	76205
		INPUT HP	1.41	2.85	3.99	8.47	14.51	22.43	42.45	77.92
45.3	39.7	OUTPUT TORQUE	1550	3052	4080	9149	15951	24653	48240	84909
		INPUT HP	1.32	2.37	3.39	7.58	12.99	19.79	38.00	67.86
36.1	49.8	OUTPUT TORQUE	1800	3450	4611	9696	17119	27009	51413	95468
		INPUT HP	1.24	2.09	3.02	6.54	11.27	17.53	33.92	61.63
30.0	60.0	OUTPUT TORQUE	1902	3615	4832	10150	18244	28262	55168	97803
		INPUT HP	1.09	1.85	2.71	5.60	10.44	15.32	29.89	52.72

When placing orders, please use actual ratios on rating pages 18-21.
DO NOT PLACE SALES ORDERS USING ABOVE NOMINAL RATIO.

REDUCER SELECTION

OUTPUT TORQUE AND OUTPUT RPM OR RATIO

See Pages 3 - 5 for selection procedure, service factors and classification of load tables.

All Ratings Stated Are For A.G.M.A. Class I Service

1800 RPM INPUT

OUTPUT RPM	NOMINAL* RATIO ± 5%	UNIT SIZE	1	7 H, F, V	10 F, V, R 11H	20 F, V, R 21H	30 F, V, R 31H	40 F, V, R 41H	50 F, V, R 51H	60 F, V 61H
24.9	72.4	OUTPUT TORQUE	1995	3805	5086	10376	19285	29169	58758	103424
		INPUT HP	1.01	1.63	2.44	5.02	8.85	13.92	27.51	49.01
20.4	88.1	OUTPUT TORQUE	2084	3939	5264	10640	19749	30080	59980	107880
		INPUT HP	.88	1.45	2.21	4.39	7.70	11.56	22.73	41.07
16.6	108.2	OUTPUT TORQUE	2204	4033	5390	10888	20075	30768	61370	108700
		INPUT HP	.79	1.19	1.86	3.73	6.75	10.26	19.69	35.89
13.7	131.4	OUTPUT TORQUE	2347	4085	5460	11085	20569	31507	61730	109700
		INPUT HP	.72	1.01	1.61	3.29	5.76	8.93	17.24	30.76
11.1	162.7	OUTPUT TORQUE	2405	4145	5540	11157	20974	32000	62230	111300
		INPUT HP	.63	.82	1.35	2.80	4.98	7.49	14.82	26.11
8.9	201.5	OUTPUT TORQUE	2415	4190	5600	11362	21300	32400	63000	113000
		INPUT HP	.52	.73	1.23	2.43	4.47	6.44	12.41	22.14
7.7	233.1	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	113000
		INPUT HP	.47	.61	1.06	2.14	3.84	5.81	10.50	20.54
6.2	291.7	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	113000
		INPUT HP	.41	.52	.92	1.88	3.35	4.79	9.23	16.38
4.9	368.0	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	+113000
		INPUT HP	.35	.44	.80	1.62	2.88	4.19	7.71	14.88
4.1	440.0	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	113000
		INPUT HP	.30	.37	.69	1.39	2.50	3.50	6.59	11.91
3.3	553.5	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	113000
		INPUT HP	.28	.33	.60	1.20	2.09	3.06	5.67	10.34
1.9	926.0	OUTPUT TORQUE	2425	4265	5700	11700	21600	+32400	+63000	113000
		INPUT HP	.25	.33	.50	1.00	2.00	3.00	5.00	★7.50
1.4	1279.0	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	63000	113000
		INPUT HP	.25	.33	.50	1.00	2.00	3.00	5.00	★7.50
1.1	1570.0	OUTPUT TORQUE	2425	4265	5700	11700	21600	32400	+63000	113000
		INPUT HP	★.25	★.33	★.50	★1.00	★2.00	★3.00	★5.00	★7.50
.96	1875.0	OUTPUT TORQUE	2425	4265	5700	11700	+21600	32400	+63000	113000
		INPUT HP	★.25	★.33	★.50	★1.00	★2.00	★3.00	★5.00	★7.50

★ Use of Shear Pin or Torque Controlled Coupling is recommended.
 * Actual Ratio is not within 5% of Nominal—See Reducer Ratings Pages 18 - 21.
 * For actual ratio per size, see pages 18-21.



horizontal type planetary reducer

SERIES: H

.25 H.P. to 87.11 H.P.

RATIO RANGE – 1.5 to approximately 2,000:1

MAX. OUTPUT TORQUE RANGE 50 to 113,000 in. lbs.

For Horsepower, Torque and Overhung

Load Ratings—See pages 18 through 21

For Service Factors—See page 4.



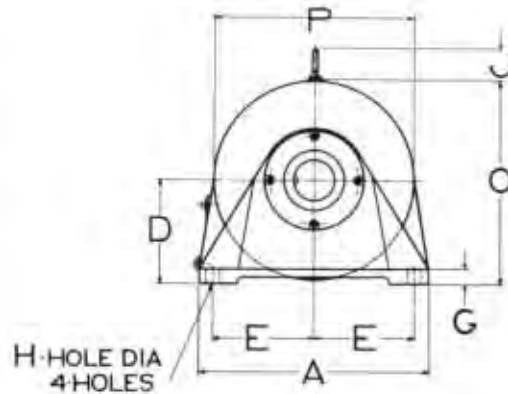
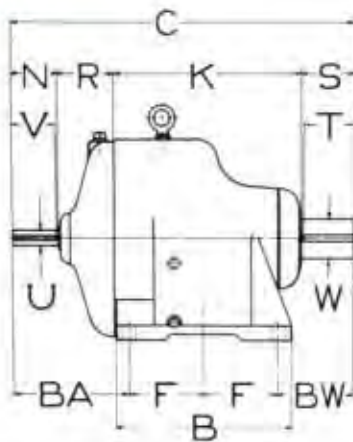
TABLE OF WEIGHTS

Unit	1H	7H	11H	21H	31H	41H	51H	61H
Net Weight	27	50	77	130	245	450	710	1500

The Input Shaft may be driven in either direction.

Alloy steel slow speed shafts.

DIMENSIONS:



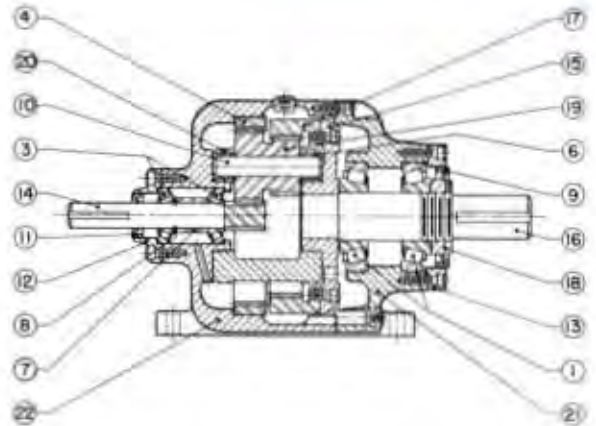
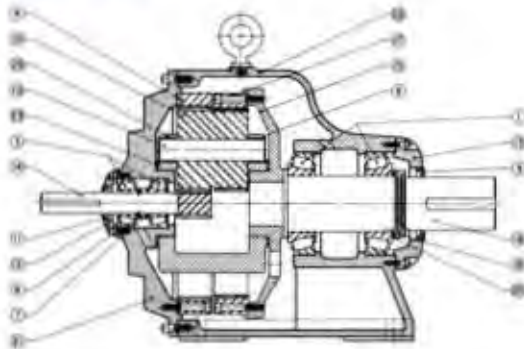
SPEED REDUCER DIMENSIONS (in inches)

Unit	A	B	C	D	E	F	G	H	J	K	O	P	R	BA	BW	High Speed Shaft				Slow Speed Shaft			
																U*	N	V	Keyway	W*	S	T	Keyway
1H	7	4 ³ / ₈	10 ³ / ₈	3 ³ / ₄	3	1 ⁷ / ₈	1/2	3/8	0	5 ³ / ₈	6 ³ / ₈	6	2 ³ / ₄	4 ³ / ₈	2 ¹ / ₈	1/2	1 ³ / ₈	1 ³ / ₈	3/8 x 3/8	1	1 ³ / ₈	1 ³ / ₈	3/4 x 3/8
7H	6 ¹ / ₂	7 ³ / ₈	13 ¹ / ₈	3 ³ / ₈	2 ³ / ₄	3 ³ / ₈	1/8	1 ¹ / ₂	0	7 ³ / ₈	6 ³ / ₈	6 ¹ / ₂	1 ³ / ₈	3	3 ¹ / ₈	3/4	1 ³ / ₈	1 ³ / ₈	3/8 x 3/8	1 ¹ / ₂	2 ¹ / ₄	2 ³ / ₈	5/8 x 5/8
11H	9 ³ / ₄	6 ³ / ₈	15	4 ¹ / ₂	4 ¹ / ₄	2 ¹ / ₈	3/4	1/2	0	7 ³ / ₈	8 ³ / ₈	8 ³ / ₄	3	5 ³ / ₈	4	3/4	1 ³ / ₈	1 ³ / ₈	3/8 x 3/8	1 ¹ / ₂	2 ¹ / ₂	2 ³ / ₈	3/8 x 3/8
21H	11 ³ / ₄	8 ³ / ₈	17 ³ / ₈	5 ¹ / ₈	5 ¹ / ₄	3 ³ / ₈	3/4	1/2	2 ¹ / ₄	9	10 ¹ / ₄	9 ⁷ / ₈	3 ¹ / ₂	6 ³ / ₈	4 ³ / ₈	1	2 ³ / ₈	2	1/2 x 1/2	2	2 ³ / ₄	2 ³ / ₈	1/2 x 3/4
31H	14 ³ / ₈	10 ³ / ₈	21 ¹ / ₈	6 ¹ / ₂	6 ¹ / ₂	4 ³ / ₈	1	1/2	2 ¹ / ₄	11 ³ / ₈	12 ³ / ₈	12 ¹ / ₄	4 ¹ / ₂	7 ³ / ₈	4 ³ / ₈	1 ³ / ₈	2 ¹ / ₂	2 ³ / ₈	1/2 x 1/2	2 ¹ / ₂	3 ¹ / ₄	3 ³ / ₈	5/8 x 5/8
41H	17 ³ / ₄	13 ³ / ₈	25 ¹ / ₂	8	7 ¹ / ₂	5 ¹ / ₂	1 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₄	14 ¹ / ₂	16	15 ³ / ₈	4 ³ / ₈	8 ³ / ₈	5 ³ / ₈	1 ¹ / ₂	3	2 ³ / ₈	3/8 x 3/8	3	3 ³ / ₈	3 ¹ / ₂	3/4 x 3/8
51H	22 ³ / ₄	15 ³ / ₈	29 ¹ / ₈	9 ¹ / ₈	10	6 ¹ / ₈	1 ¹ / ₄	1 ³ / ₈	3	16 ³ / ₈	19 ³ / ₈	18 ³ / ₈	6	10 ³ / ₄	5 ³ / ₈	2	3 ¹ / ₄	3 ³ / ₈	1/2 x 1/2	3 ¹ / ₂	4 ³ / ₈	4	3/8 x 3/8
61H	27	19	39	12 ¹ / ₂	12	8	1 ³ / ₈	1 ³ / ₈	4	20 ¹ / ₂	25	24 ¹ / ₂	7 ¹ / ₂	13 ¹ / ₄	9 ³ / ₄	2 ³ / ₄	4	3 ³ / ₈	3/8 x 3/8	5	7	6 ³ / ₈	1 ¹ / ₄ x 3/8

*Shaft diameter tolerances +.000—-.001. For construction purposes send for Certified Dimension Sheets.

horizontal type planetary reducer

PARTS LIST:



PLANETARY SERIES 1H, 11H, 21H, 31H, 41H, 51H, 61H PARTS INDEX

Part No.	Description	Part No.	Description
1	Slow Speed Bearings	15	Gear Web
3	High Speed Bearings	16	Slow Speed Shaft
4	Primary Internal Gear	17	Secondary Internal Gear
6	Journal Pin Bushings	18	Lock Nut (Slow Speed)
7	Shaft Spacer (High Speed)	19	Integral Planetary Gears (Parts 6 and 10 Included)
8	Retaining Ring (High Speed)	20	Planetary Frame
*9	Oil Seal (Slow Speed)	20A	Unified Planetary Element (Parts 6, 10, 19, 20)
10	Journal Pins	21	Housing Cover
*11	Oil Seal (High Speed)	22	Housing
12	Bearing Cap (High Speed)	**23	Thrust Bearings
13	Bearing Cap (Slow Speed)	25	Lock Washer (Slow Speed)
14	High Speed Shaft and Pinion Integral	□ 26	Motor Adapter (Not Shown)

*When a Horizontal Type Planetary Reducer is mounted in a side-wall position with shafts vertical, the shaft below — whether input or output — is provided with two (2) oil seals.

†Part 20A is supplied as a completely assembled, Unified Planetary Unit or Element because the planetary gears are made in matched sets to engage matched internal gears.

‡Cannot be furnished separately.

**Not used in units 1H, 11H, 21H and 61H.

□ HM Series Only

STANDARD, INVERTED AND SIDEWALL MOUNTINGS:

STANDARD MOUNTING "A"

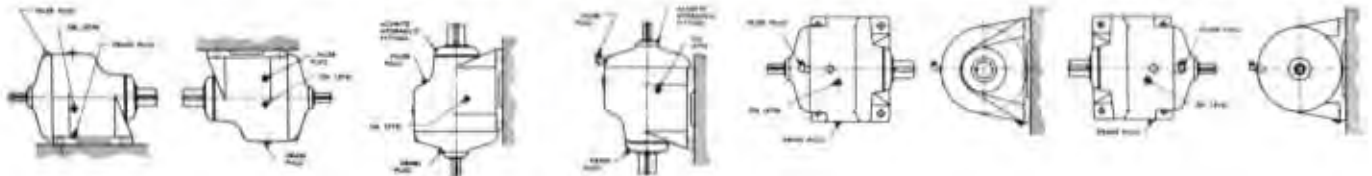
INVERTED MOUNTING "B"

SIDEWALL MOUNTING "C" with input shaft down

SIDEWALL MOUNTING "D" with input shaft up

SIDEWALL MOUNTING "E" with shafts horizontal

SIDEWALL MOUNTING "F" with shafts horizontal



ADDITIONAL CHARGE IS MADE FOR ALL MOUNTINGS EXCEPT (A) — CONSULT FACTORY

WINSMITH



horizontal type-motorized planetary reducer and gearmotor

SERIES: HM-HMW (WITH MOTOR)

.25 H.P. to 87.11 H.P.
RATIO RANGE 1.5 to approximately 2,000:1
MAX. OUTPUT TORQUE RANGE 50 to 113,000 in. lbs.

For Horsepower, Torque and Overhung Load Ratings—See Pages 18 - 21.
 For Service Factors—See Page 4.

Any standard "C" Flange Motor may be used. A Flexible Coupling connects the motor to the Input Shaft. Couplings and motors can be furnished and mounted. If customer is mounting motor, motor frame size and coupling size must be specified.



TABLE OF WEIGHTS

Unit	1HM	11HM	21HM	31HM	41HM	51HM	61HM
Net Weight	36	99	152	285	508	845	1635

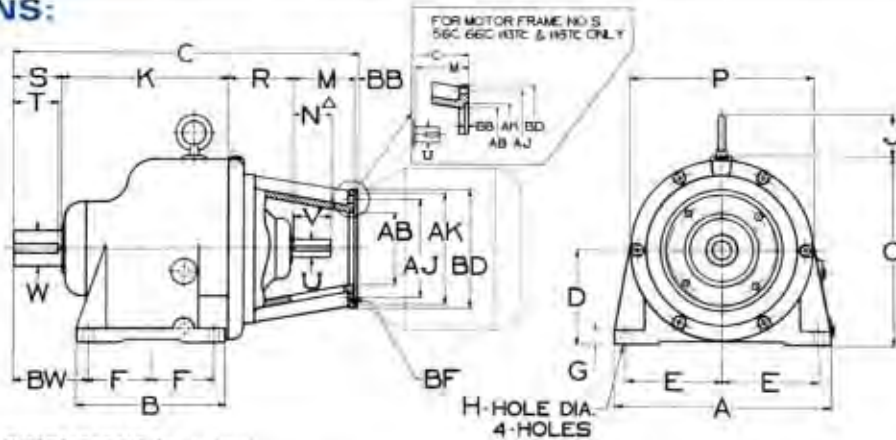
The Input Shaft may be driven in either direction.

Alloy steel slow speed shafts.

PARTS INDEX SAME AS HORIZONTAL PLANETARY (Page 9)

SHOVEL BASE AVAILABLE; SEE PAGE 17

DIMENSIONS:



SPEED REDUCER DIMENSIONS (in inches)

Unit	A	B	BW	D	E	F	G	H	J	K	O	P	R	High Speed Shaft				Slow Speed Shaft			
														U*	N Δ	V†	Keyway	W*	S	T	Keyway
1HM	7	4 $\frac{3}{8}$	2 $\frac{1}{8}$	3 $\frac{3}{8}$	3	1 $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	0	5 $\frac{3}{8}$	6 $\frac{3}{8}$	6	2 $\frac{3}{8}$	$\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{8}$	$\frac{1}{8} \times \frac{1}{8}$	1	1 $\frac{3}{8}$	1 $\frac{1}{4}$	$\frac{1}{4} \times \frac{1}{8}$
11HM	9 $\frac{3}{4}$	6 $\frac{5}{8}$	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	2 $\frac{1}{16}$	$\frac{3}{4}$	$\frac{5}{8}$	0	7 $\frac{3}{8}$	8 $\frac{3}{8}$	8 $\frac{3}{4}$	3	$\frac{3}{4}$	1 $\frac{3}{8}$	1 $\frac{13}{16}$	$\frac{3}{8} \times \frac{3}{32}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	$\frac{3}{8} \times \frac{3}{16}$
21HM	11 $\frac{3}{4}$	8 $\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$	5 $\frac{1}{4}$	3 $\frac{3}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	2 $\frac{1}{4}$	9	10 $\frac{1}{4}$	9 $\frac{7}{8}$	3 $\frac{1}{2}$	1	2 $\frac{1}{8}$	2	$\frac{1}{4} \times \frac{1}{8}$	2	2 $\frac{3}{4}$	2 $\frac{5}{8}$	$\frac{1}{2} \times \frac{1}{4}$
31HM	14 $\frac{3}{8}$	10 $\frac{1}{8}$	4 $\frac{3}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	4 $\frac{3}{8}$	1	$\frac{7}{16}$	2 $\frac{1}{4}$	11 $\frac{1}{8}$	12 $\frac{13}{16}$	12 $\frac{1}{4}$	4 $\frac{1}{4}$	1 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{8}$	$\frac{1}{4} \times \frac{1}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{3}{8}$	$\frac{5}{8} \times \frac{3}{16}$
41HM	17 $\frac{3}{4}$	13 $\frac{13}{16}$	5 $\frac{1}{2}$	8	7 $\frac{1}{2}$	5 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{1}{8}$	2 $\frac{3}{4}$	14 $\frac{1}{2}$	16	15 $\frac{3}{8}$	4 $\frac{1}{8}$	1 $\frac{1}{4}$	3	2 $\frac{1}{8}$	$\frac{3}{8} \times \frac{3}{32}$	3	3 $\frac{3}{8}$	3 $\frac{1}{2}$	$\frac{3}{4} \times \frac{3}{8}$
51HM	22 $\frac{3}{4}$	15 $\frac{3}{4}$	5 $\frac{15}{16}$	9 $\frac{11}{16}$	10	6 $\frac{3}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{8}$	3	16 $\frac{3}{8}$	19 $\frac{3}{8}$	18 $\frac{5}{8}$	6	2	3 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{1}{2} \times \frac{1}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{8}$	4	$\frac{3}{8} \times \frac{3}{8}$
61HM	27	19	9 $\frac{1}{4}$	12 $\frac{1}{2}$	12	8	1 $\frac{3}{8}$	1 $\frac{1}{8}$	4	20 $\frac{1}{2}$	25	24 $\frac{1}{2}$	7 $\frac{1}{2}$	2 $\frac{3}{4}$	4	3 $\frac{3}{4}$	$\frac{3}{8} \times \frac{3}{8}$	5	7	6 $\frac{3}{4}$	$\frac{1}{4} \times \frac{3}{8}$

* Shaft diameter tolerances +.000, —.001.

† It may be necessary to shorten input shaft to provide clearance for motor shaft and coupling.

horizontal type-motorized planetary reducer and gearmotor

DIMENSIONS:

FOR MOTOR FRAME NUMBERS 56C, 143TC AND 145TC ONLY

Unit	AB	AJ	AK†	BB	BD	BF Hole		C	M
						No.	Size		
1HM	4	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{5}{8}$	6 $\frac{1}{2}$	4	1 $\frac{1}{32}$	12	2 $\frac{3}{8}$
11HM	4	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{5}{8}$	6 $\frac{1}{2}$	4	1 $\frac{1}{32}$	16 $\frac{11}{16}$	3 $\frac{3}{8}$
21HM	4	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{5}{8}$	6 $\frac{1}{2}$	4	1 $\frac{1}{32}$	19	3 $\frac{3}{4}$
31HM	4	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{5}{8}$	6 $\frac{1}{2}$	4	1 $\frac{1}{32}$	22 $\frac{1}{2}$	3 $\frac{3}{8}$
41HM	4	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{5}{8}$	6 $\frac{1}{2}$	4	1 $\frac{1}{32}$	27 $\frac{1}{16}$	4 $\frac{3}{8}$
51HM	4 $\frac{1}{2}$	5 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$	7 $\frac{3}{4}$	4	1 $\frac{1}{32}$	31 $\frac{3}{8}$	5 $\frac{1}{4}$

FOR MOTOR FRAME NUMBERS 182TC, 184TC, 213TC, 215TC, 254TC AND 256TC ONLY

Unit	AB	AJ	AK†	BB	BD	BF Hole		C	M
						No.	Size		
11HM	5 $\frac{1}{8}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	9	4	1 $\frac{1}{32}$	18 $\frac{3}{4}$	5 $\frac{1}{8}$
21HM	5 $\frac{1}{8}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	9	4	1 $\frac{1}{32}$	21 $\frac{1}{8}$	5 $\frac{3}{8}$
31HM	6 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	10	4	1 $\frac{1}{32}$	24 $\frac{3}{8}$	5 $\frac{1}{8}$
41HM	6 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	10	4	1 $\frac{1}{32}$	29 $\frac{1}{8}$	6 $\frac{3}{8}$
51HM	6 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	10	4	1 $\frac{1}{32}$	32 $\frac{3}{8}$	5 $\frac{11}{16}$
61HM	6 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{1}{2}$	3 $\frac{5}{8}$	10	4	1 $\frac{1}{32}$	41 $\frac{1}{8}$	6 $\frac{11}{16}$

FOR MOTOR FRAME NUMBERS 284TC AND 286TC ONLY

Unit	AB	AJ	AK†	BB	BD	BF Hole		C	M
						No.	Size		
31HM	5 $\frac{3}{4}$	9	10 $\frac{1}{2}$	3 $\frac{5}{8}$	11 $\frac{1}{4}$	4	1 $\frac{1}{32}$	24 $\frac{3}{4}$	5 $\frac{15}{16}$
41HM	5 $\frac{3}{4}$	9	10 $\frac{1}{2}$	3 $\frac{5}{8}$	11 $\frac{1}{4}$	4	1 $\frac{1}{32}$	29 $\frac{1}{8}$	6 $\frac{3}{4}$
51HM	5 $\frac{3}{4}$	9	10 $\frac{1}{2}$	3 $\frac{5}{8}$	11 $\frac{1}{4}$	4	1 $\frac{1}{32}$	32 $\frac{3}{8}$	6 $\frac{1}{8}$
61HM	5 $\frac{3}{4}$	9	10 $\frac{1}{2}$	3 $\frac{5}{8}$	11 $\frac{1}{4}$	4	1 $\frac{1}{32}$	42 $\frac{1}{4}$	7 $\frac{1}{8}$

FOR MOTOR FRAME NUMBERS 324TC AND 326TC ONLY

Unit	AB	AJ	AK†	BB	BD	BF Hole		C	M
						No.	Size		
41HM	8	11	12 $\frac{1}{2}$	3 $\frac{5}{8}$	14	4	2 $\frac{1}{32}$	28 $\frac{11}{16}$	6
51HM	9	11	12 $\frac{1}{2}$	3 $\frac{5}{8}$	14	4	2 $\frac{1}{32}$	34 $\frac{13}{16}$	8 $\frac{3}{8}$
61HM	9	11	12 $\frac{1}{2}$	3 $\frac{5}{8}$	14	4	2 $\frac{1}{32}$	43 $\frac{5}{8}$	8 $\frac{7}{16}$

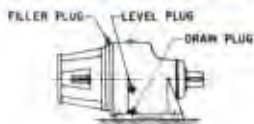
FOR MOTOR FRAME NUMBERS 364T5C AND 365T5C ONLY

Unit	AB	AJ	AK†	BB	BD	BF Hole		C	M
						No.	Size		
51HM	9	11	12 $\frac{1}{2}$	3 $\frac{5}{8}$	14	8	2 $\frac{1}{32}$	34 $\frac{13}{16}$	8 $\frac{5}{16}$
61HM	9	11	12 $\frac{1}{2}$	3 $\frac{5}{8}$	14	8	2 $\frac{1}{32}$	43 $\frac{5}{8}$	8 $\frac{7}{16}$

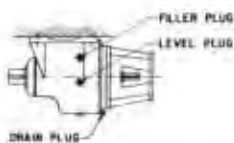
† Register tolerances +.001, +.004.

For construction purposes send for Certified Dimension Sheets.

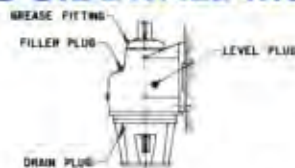
STANDARD, INVERTED AND SIDEWALL MOUNTINGS:



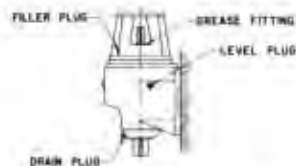
STANDARD MOUNTING A



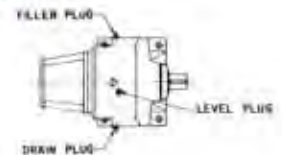
INVERTED MOUNTING B



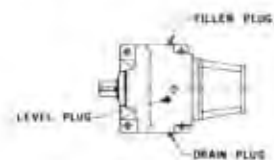
SIDEWALL MOUNTING C
WITH INPUT SHAFT DOWN



SIDEWALL MOUNTING D
WITH INPUT SHAFT UP



SIDEWALL MOUNTING E
WITH SHAFTS HORIZONTAL



SIDEWALL MOUNTING F
WITH SHAFTS HORIZONTAL

ADDITIONAL CHARGE IS MADE FOR ALL MOUNTINGS EXCEPT (A)—CONSULT FACTORY



flange mounted type planetary reducer

SERIES: F

.25 H.P. to 87.11 H.P.

RATIO RANGE —1.5 to approximately 2,000:1

MAX. OUTPUT TORQUE RANGE 50 to 113,000 in. lbs.

For Horsepower, Torque and Overhung Load Ratings—See Pages 18 through 21
For Service Factors—See Page 4.

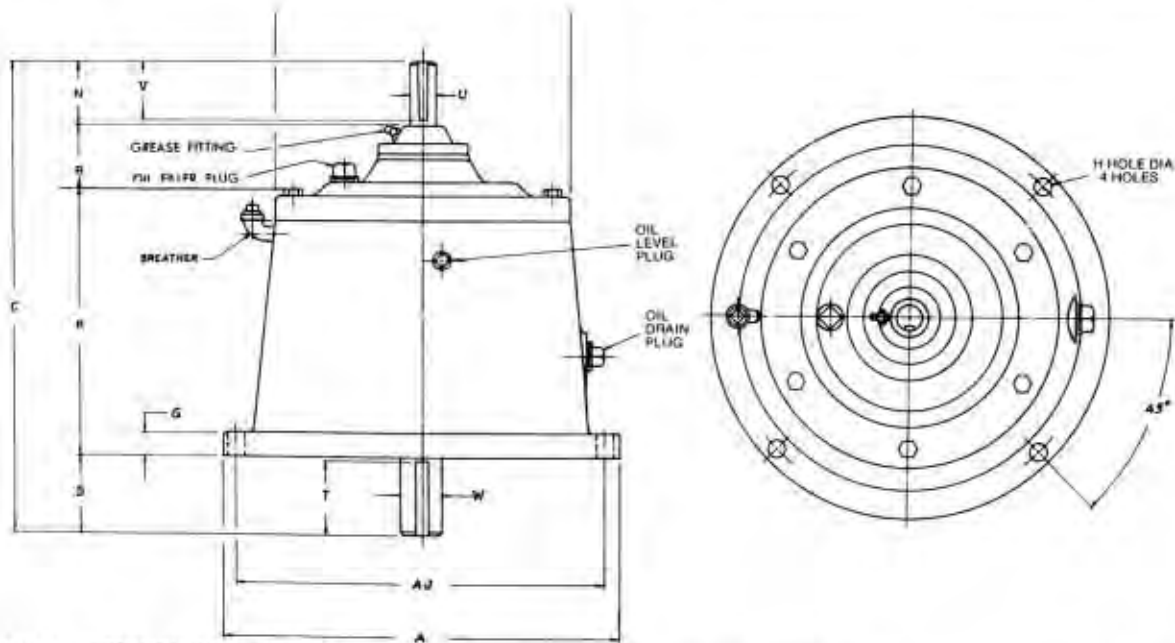
Unless otherwise specified, the Type "F" Reducer will be furnished for floor mounting. We can furnish this reducer for sidewall, or inverted mounting, however, the required mounting must be specified on your order to enable us to arrange the lubrication fittings properly.

The input shaft may be driven in either direction.

TABLE OF WEIGHTS

Unit	1F	7F	10F	20F	30F	40F	50F	60F
Net Weight	32	85	105	130	280	480	800	1750

Alloy steel slow speed shafts



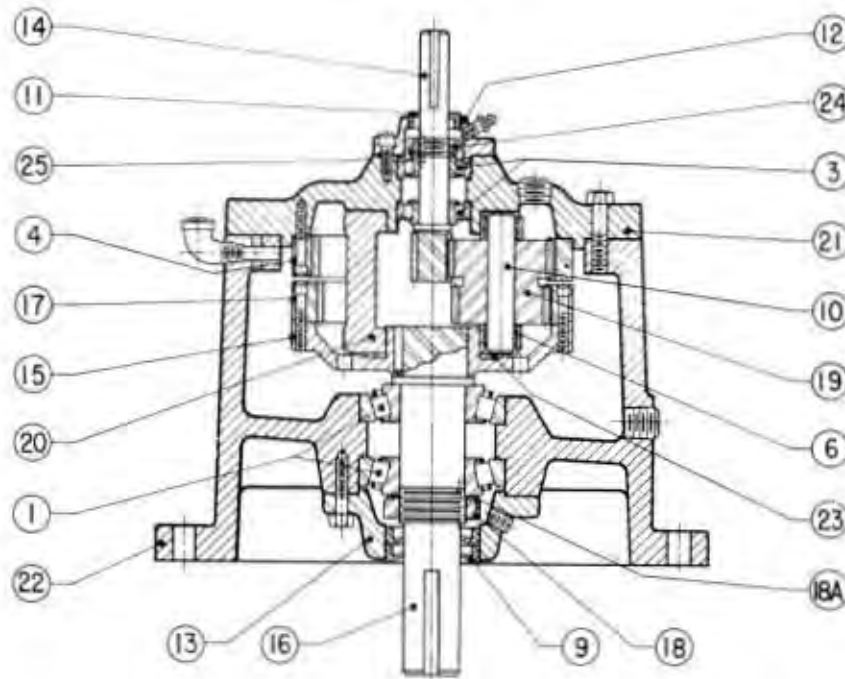
SPEED REDUCER DIMENSIONS (in inches)

Unit	A	AJ	BD	C	G	H	K	R	High Speed Shaft				Slow Speed Shaft			
									U*	N	V	Keyway	W*	S	T	Keyway
1F	9	8	6	10 ³ / ₈	1/2	3/8	5 ³ / ₈	2 ³ / ₈	1/2	1 1/4	1 1/8	1/8 x 3/16	1	1 1/4	1 1/4	1/4 x 1/8
7F	11 3/8	10 3/8	8 3/8	14 1/2	3/4	3/8	8	1 3/2	3/4	1 1/8	1 3/4	3/8 x 3/32	1 1/4	2 3/8	2 1/4	5/8 x 3/32
10F	13	11 1/2	9 3/8	14 3/2	3/8	3/8	8 1/4	1 3/2	3/4	1 3/8	1 3/4	3/8 x 3/32	1 1/2	2 1/2	2 1/2	3/8 x 3/8
20F	15 3/8	13 3/8	11 3/4	17 3/8	1 1/8	3/8	10 1/4	2	3/4	2 1/8	2	3/8 x 3/32	2 1/8	3 1/2	3 3/8	1/2 x 1/4
30F	18 1/8	16 1/4	13 3/8	21 3/2	1 1/8	1/8	11 1/8	2 1/2	3/8	2 1/2	2 3/8	1/2 x 1/8	2 3/8	4 1/2	4 1/8	3/8 x 3/8
40F	21 3/4	19 1/2	15 1/2	25	1 1/4	1/8	13 3/8	2 3/8	1 1/8	3	2 3/8	1/2 x 1/8	3 3/8	5 1/2	5 1/2	3/4 x 3/8
50F	26 1/8	23 3/4	19 3/8	29 3/8	1 1/2	1/8	16 3/8	2 3/4	1 1/4	3 1/4	3	3/8 x 3/32	4	6 3/4	6 3/4	1 x 1/2
60F	39	33 3/4	26	34 3/8	2	1 3/8	20 3/8	3 1/4	2 1/4	4 3/8	4	3/8 x 3/8	5	6 1/2	6 1/4	1 1/4 x 3/8

*Shaft diameter tolerances +.000 —.001. For construction purposes send for Certified Dimension Sheets.

flange mounted type planetary reducer

PARTS LIST:



Part No.	Description	No. Req. Per Unit	Part No.	Description	No. Req. Per Unit
1	Slow Speed Bearings	2	17	Secondary Internal Gear	1
3	High Speed Bearings	2	18	Slow Speed Lock Nut	1
4	Primary Internal Gear	1	18A	Slow Speed Lock Washer	1
6	Journal Pin Bushings	6	19	Planetary Gears (Set of 3) Includes 6 and 10	1
17	High Speed Spacer (Not Shown)	1	20	Planetary Frame	1
18	High Speed Retaining Ring (Not Shown)	1	20A	Unified Planetary Element (Parts 6, 10, 19, 20)	1
9	Slow Speed Oil Seal	2	21	Cover	1
10	Journal Pins	3	22	Housing	1
11	High Speed Oil Seal	1	*23	Friction Ring	1
12	High Speed Bearing Cap	1	24	High Speed Lock Nut	1
13	Slow Speed Bearing Cap	1	25	High Speed Lock Washer	1
14	High Speed Pinion	1			
15	Gear Web	} Not Furnished Separately			
16	Slow Speed Shaft				

* Not used in 1F
 † 1F, 7F, 10F only
 ‡ Not used in 1F, 7F, 10F
 (A) The base flange is flush. There is no interfering slow speed shaft bearing requiring elevation of the unit by blocking.





vertical type-motorized planetary reducer and gearmotor

SERIES: VM-VMW (WITH MOTOR)

.25 H.P. to 87.11 H.P.

RATIO RANGE 1.1:1 to 50,000:1

MAX. OUTPUT TORQUE RANGE 50 to 113,000 in. lbs.

For Horsepower, Torque and Overhung

Load Ratings—See pages 18 through 21

For Service Factors—See page 4.

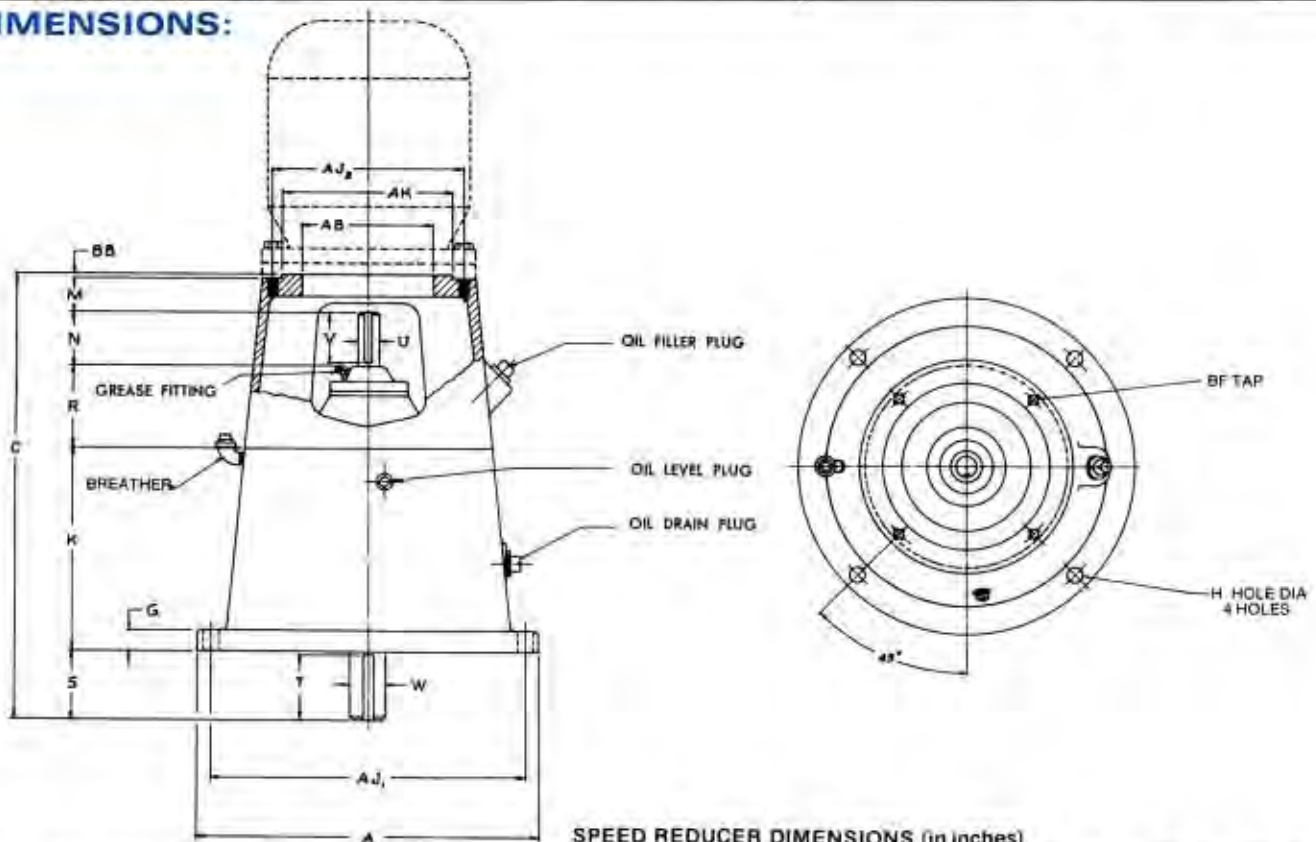
TABLE OF WEIGHTS

Unit	1VM	7VM	10VM	20VM	30VM	40VM	50VM	60VM
Net Weight	36	105	140	245	370	570	960	2600

Alloy steel slows speed shafts



DIMENSIONS:



SPEED REDUCER DIMENSIONS (in inches)

Unit	A	AB	AJ ₁	AJ ₂	AK†	BB	BF	C	G	H	K	M	R	High Speed Shaft			Slow Speed Shaft					
														U*	N	V	Keyway	W*	S	T	Keyway	
1VM	9	4 1/4	8	5 3/8	4 1/2	3/8	1 1/2	12	1/2	3/8	5 3/8	1 3/8	2 1/2	1/2	1 1/4	1 1/8	1 1/8	1 1/8	1 1/4	1 1/4	1/4 x 1/8	
7VM	11 3/8	5 3/8	10 3/8	6 3/4	6	1/2	3/16-18†	15 3/8	3/4	3/8	7	1 1/2	2 3/4	3/4	1 1/4	1 3/4	3/16 x 3/32	1 1/4	2 3/16	2 1/4	3 3/8	3/8 x 3/32
10VM	13	5 3/8	11 1/2	6 3/4	6	1/2	3/16-18†	16 3/8	3/8	3/8	7 1/4	2 1/2	2 3/4	3/4	1 1/8	1 3/4	3/16 x 3/32	1 1/2	2 1/2	2 1/2	3 3/8	3/8 x 3/16
20VM	15 3/8	8 1/2	13 3/8	10	9	1/2	1/2-13†	20 3/8	1 1/8	3/8	8 3/8	2 3/8	3 3/8	3/4	2 1/8	2	3/16 x 3/32	2 1/8	3 1/2	3 3/8	1 1/2 x 1/4	
30VM	18 1/4	8 1/2	16 1/4	10	9	1/2	1/2-13†	22 3/8	1 1/8	1 1/8	10 3/8	1 1 1/2	3 1 1/2	3/4	2 1/2	2 3/8	1/4 x 1/8	2 3/8	4 1/2	4 3/8	5/8 x 3/8	
40VM	21 3/4	8 1/2	19 1/2	10	9	1/2	1/2-13†	26 3/8	1 1/4	1 1/8	12 3/4	1 1/2	3 3/4	1 1/8	3	2 3/8	1/4 x 1/8	3 3/8	5 1/2	5 1/2	3/4 x 3/8	
50VM	26 1/4	8 1/2	23 3/4	12 1/2	11	3/8	3/4-10†	31 3/8	1 1/2	1 3/8	15 1/8	1 3/4	4 1/4	1 1/4	3 1/2	3	3/16 x 3/32	4	6 3/4	6 3/4	1 x 1/2	
60VM	39	12 3/8	33 3/4	16	14	3/8	3/4-10†	39 3/8	2	1 3/8	18 3/8	4 3/8	5 1/2	2 3/4	4 3/8	4	3/8 x 3/8	5	6 1/4	6 1/4	1 1/4 x 1/8	

*Shaft diameter tolerances +.000—-.001. For construction purposes send for Certified Dimension Sheets. †Register tolerance +.001, —.004.

‡4 Holes. §8 Holes. ††For #1VM only—female register tolerance +.001, +.004.

vertical type-motorized planetary reducer and gearmotor

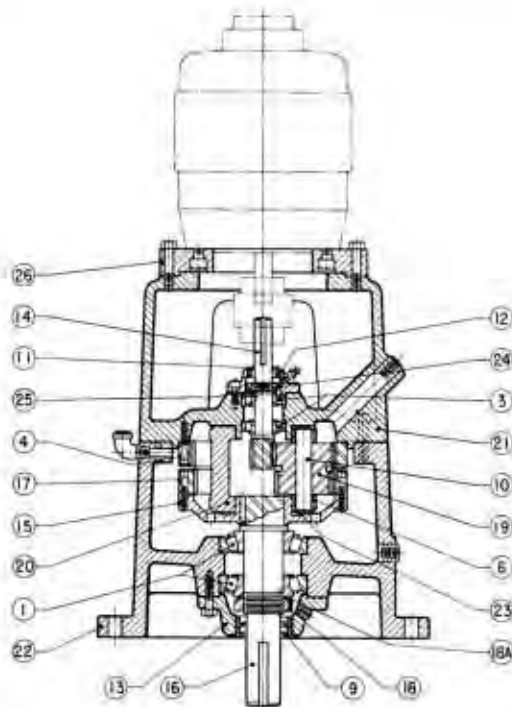
(A) USE ANY MOTOR—Any Standard Flange-Type Motor of ANY make can be used. If customer is mounting motor, motor frame size and coupling size must be specified.

(B) EASE OF INSTALLATION — The high speed end cover forms an adapter. When in place, one half of the flexible coupling is fitted to the high speed shaft. Then the motor, with other half of coupling in place on motor shaft, is simply bolted to the reducer high speed end adapter.

(C) SIMPLICITY OF MOUNTING — The base flange of the reducer is flush. There is no interfering slow speed shaft bearing requiring elevation of the unit by blocking up.

(D) WINSMITH VERTICAL TYPE REDUCERS — Widely used for agitators, mixing machines, sewage disposal equipment, coolers and overhead conveyors. Heat treated alloy steel gears and shafts.

PARTS LIST:



PARTS INDEX

Part No.	Description	No. Req. Per Unit	Part No.	Description	No. Req. Per Unit
1	Slow Speed Bearings	2	17	Secondary Internal Gear	1
3	High Speed Bearings	2	18	Slow Speed Lock Nut	1
4	Primary Internal Gear	1	18A	Slow Speed Lock Washer	1
6	Journal Pin Bushings	6	19	Planetary Gears (Set of 3) Includes 6 and 10	(1 Set)
17	High Speed Spacer (Not Shown)	1	20	Planetary Frame	1
18	High Speed Retaining Ring (Not Shown)	1	20A	Unified Planetary Element (Parts 6, 10, 19, 20)	1
9	Slow Speed Oil Seal	2	21	Adapter	1
10	Journal Pins	3	22	Housing	1
11	High Speed Oil Seal	1	*23	Friction Ring	1
12	High Speed Bearing Cap	1	24	High Speed Lock Nut	1
13	Slow Speed Bearing Cap	1	25	High Speed Lock Washer	1
14	High Speed Pinion	1	26	Adapter Ring	1
15	Gear Web	} Not Furnished Separately			
16	Slow Speed Shaft		1		

‡1VM, 7VM, 10VM, Only
 †Not Used in 1VM, 7VM, 10VM
 *Not used in 1VM

round type planetary reducer

SERIES: R

.25 H.P. to 51.05 H.P.

RATIO RANGE 1.1:1 to 50,000:1

MAX. OUTPUT TORQUE RANGE 50 to 63,000 in. lbs.

For Horsepower, Torque and Overhung
Load Ratings—See pages 18 through 21
For Service Factors—See page 4.

TABLE OF WEIGHTS

Unit	1R	10R	20R	30R	40R	50R
Net Weight	28	45	75	150	300	575

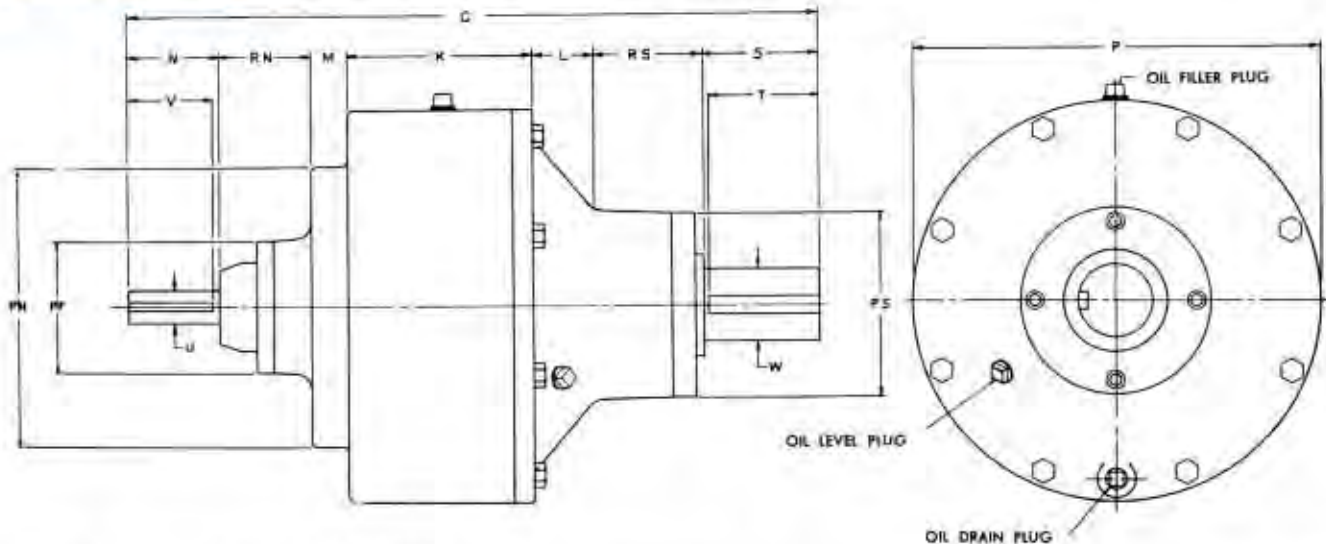
Alloy steel slow speed shafts

• These reducers are widely used where the high speed shaft, the slow speed shaft and the housing all revolve at different speeds. The reducer used thus gives accurate control through a critical speed range when used with a variable speed drive. The input shaft may be driven in either direction.

NOTE: The following ratings on Round Type Reducers apply **only** if the housing is held stationary. If the housing is allowed to revolve, or is driven, the ratio, horsepower and output rpm varies. In some cases they are regenerative. Each application of this type should be referred to our engineering department.

PARTS INDEX SAME AS HORIZONTAL PLANETARY (Page 9)

DIMENSIONS: (Consult factory for special methods of supporting unit.)



SPEED REDUCER DIMENSIONS (in inches)

Unit	C	K	L	M	P	PF	PH	PS	RN	RS	High Speed Shaft				Slow Speed Shaft			
											U*	N	V	Keyway	W*	S	T	Keyway
1R	12 $\frac{1}{8}$	4	—	2 $\frac{5}{16}$	6	—	—	3 $\frac{1}{4}$	—	3 $\frac{3}{16}$	$\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{8}$	$\frac{1}{8} \times \frac{1}{16}$	1	1 $\frac{3}{8}$	1 $\frac{1}{4}$	$\frac{1}{4} \times \frac{1}{8}$
10R	13 $\frac{3}{8}$	3 $\frac{1}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{32}$	7 $\frac{3}{16}$	2 $\frac{1}{2}$	6 $\frac{5}{16}$	4 $\frac{1}{8}$	1 $\frac{17}{32}$	2 $\frac{1}{8}$	$\frac{3}{4}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$	$\frac{3}{16} \times \frac{3}{32}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	$\frac{3}{8} \times \frac{3}{16}$
20R	15 $\frac{29}{32}$	4 $\frac{3}{8}$	1 $\frac{1}{32}$	1 $\frac{1}{32}$	8 $\frac{13}{16}$	3	6 $\frac{1}{2}$	4 $\frac{1}{8}$	1 $\frac{7}{8}$	2 $\frac{29}{32}$	$\frac{3}{4}$	2 $\frac{1}{8}$	2	$\frac{3}{16} \times \frac{3}{32}$	1 $\frac{3}{8}$	2 $\frac{3}{4}$	2 $\frac{5}{8}$	$\frac{3}{8} \times \frac{3}{16}$
30R	18 $\frac{11}{16}$	5 $\frac{1}{2}$	1 $\frac{29}{32}$	1 $\frac{1}{2}$	11 $\frac{1}{16}$	3	8 $\frac{3}{16}$	5 $\frac{3}{8}$	1 $\frac{19}{32}$	3	$\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	$\frac{1}{4} \times \frac{1}{8}$	2 $\frac{1}{8}$	3 $\frac{1}{4}$	3 $\frac{3}{8}$	$\frac{1}{2} \times \frac{1}{4}$
40R	20 $\frac{11}{32}$	6 $\frac{1}{16}$	2 $\frac{1}{32}$	1 $\frac{19}{32}$	14 $\frac{3}{8}$	3 $\frac{3}{8}$	10	5 $\frac{1}{2}$	1 $\frac{13}{16}$	2 $\frac{11}{32}$	1 $\frac{1}{16}$	3	2 $\frac{1}{8}$	$\frac{1}{4} \times \frac{1}{8}$	2 $\frac{1}{8}$	3 $\frac{3}{8}$	3 $\frac{1}{2}$	$\frac{5}{8} \times \frac{3}{16}$
50R	24 $\frac{1}{4}$	7 $\frac{1}{16}$	2 $\frac{11}{16}$	1 $\frac{3}{8}$	18 $\frac{1}{8}$	4	12	6 $\frac{3}{4}$	1 $\frac{3}{4}$	2 $\frac{11}{16}$	1 $\frac{1}{4}$	3 $\frac{1}{4}$	3	$\frac{5}{16} \times \frac{3}{32}$	3 $\frac{1}{8}$	4 $\frac{1}{8}$	4 $\frac{1}{4}$	$\frac{3}{4} \times \frac{3}{8}$

*Shaft diameter tolerances +.000—-.001. For construction purposes send for Certified Dimension Sheets.



planetary reducer ratings

HORSEPOWER, TORQUE, AND OVERHUNG LOAD RATINGS

All ratings stated are for A.G.M.A. Class 1 service.

Tables list mechanical horsepower capacities.

HORIZONTAL TYPE No. 1H & HM

FLANGE TYPE No. 1F

VERTICAL TYPE No. 1VM

ROUND TYPE No. 1R

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	1.47	69
2.0	S	1.47	82
3.3	S	1.47	149
5.1	R	1.47	234
6.4	R	1.47	293
7.6	R	1.47	358
9.4	R	1.47	427
11.5	R	1.47	523
18.8	S	1.47	860
21.7	S	1.47	991
26.6	S	1.47	1204
32.1	S	1.41	1381
39.2	S	1.32	1550
49.3	S	1.24	1800
61.2	S	1.09	1902
72.0	S	1.01	1995
87.0	S	.88	2084
109.0	S	.79	2204
130.5	S	.72	2347
161.0	S	.63	2405
211.7	S	.52	2415
244.7	S	.47	2425
299.4	S	.41	2425
386.3	S	.35	2425
495.9	S	.30	2425
556.0	S	.28	2425
952.6	S	.20	2425
1331.0	R	.17	2425
1592.0	S	.16*	2425
1958.0	S	.14 [†]	2425

HORIZONTAL TYPE No. 7H

FLANGE TYPE No. 7F

VERTICAL TYPE No. 7VM

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	3.12	154
2.0	S	3.12	200
3.2	S	3.12	342
5.1	R	3.12	520
6.3	R	3.12	643
7.9	R	3.12	814
10.0	R	3.12	1026
11.7	R	3.12	1198
14.0	R	3.12	1400
17.7	S	3.12	1821
21.8	S	3.12	2235
26.3	S	3.00	2590
31.8	S	2.85	2976
39.5	S	2.37	3052
51.0	S	2.09	3450
60.8	S	1.85	3615
73.0	S	1.63	3805
85.6	S	1.45	3939
108.6	S	1.19	4033
131.7	S	1.01	4085
168.5	S	.82	4145
193.1	S	.73	4190
242.3	S	.61	4265
298.0	R	.52	4265
362.1	S	.44	4265
454.2	S	.37	4265
562.0	S	.32	4265
882.2	R	.24	4265
1238.0	S	.20	4265
1527.3	R	.19*	4265
1790.7	S	.19*	4265

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds				Output Shaft Suspended Load or Thrust Up or Down Capacity in Pounds 1F & 1VM
Input Shaft 1H-1F-1VM		Output Shaft 1H-1F-1VM		
RPM	Lbs.	RPM	Lbs.	
1800	50	500	415	575
1200	55	300	468	660
900	60	200	518	735
600	70	150	582	760
500	78	100	612	790
300	93	80	700	825
100	135	60	840	860
		50	900	910
		40	950	970
		30	1000	1025
		20	1035	1260
		10 & under	1160	1480

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- * Use of Shear Pin or Torque Controlled Coupling is recommended.
- A. Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5:1 to 1, Input R.P.M. -900, Input H.P. —0.74. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads, (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds					Output Shaft Suspended Load or Thrust Up or Down Capacity in Pounds 7H-7F-7VM
Input Shaft 7H-7F-7VM		Output Shaft			
RPM	Pounds	RPM	7H Pounds	7F & 7VM Pounds	
1800	50	500	385	270	700
1200	65	300	445	315	810
900	75	200	505	360	920
600	95	150	550	390	1000
500	100	100	625	440	1130
300	125	80	665	475	1210
100	200	60	720	515	1310
		50	770	550	1390
		40	820	580	1485
		30	890	635	1620
		20	1010	715	1830
		10 & under	1240	880	2250

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- * Use of Shear Pin or Torque Controlled Coupling is recommended.
- A. Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5:1 to 1, Input R.P.M. -900, Input H.P. —1.56. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads, (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

All ratings stated are for A.G.M.A. Class 1 service.

Tables list mechanical horsepower capacities.

HORIZONTAL TYPE **FLANGE TYPE**
No. 11H & HM **No. 10F**
VERTICAL TYPE **ROUND TYPE**
No. 10VM **No. 10R**

HORIZONTAL TYPE **FLANGE TYPE**
No. 21H & HM **No. 20F**
VERTICAL TYPE **ROUND TYPE**
No. 20VM **No. 20R**

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	4.17	206
2.0	S	4.17	268
3.2	S	4.17	457
5.1	R	4.17	695
6.3	R	4.17	860
7.9	R	4.17	1088
10.0	R	4.17	1372
11.7	R	4.17	1601
14.0	R	4.17	1922
17.7	S	4.17	2434
21.8	S	4.17	2987
26.3	S	4.15	3462
31.8	S	3.99	3977
39.5	S	3.39	4080
51.0	S	3.02	4611
60.8	S	2.71	4832
73.0	S	2.44	5086
85.6	S	2.21	5264
108.6	S	1.86	5390
131.7	S	1.61	5460
168.5	S	1.35	5540
193.1	S	1.23	5600
242.3	S	1.06	5700
298.0	R	.92	5700
362.1	S	.80	5700
454.2	S	.69	5700
562.0	S	.60	5700
882.2	R	.46	5700
1238.0	S	.37	5700
1527.3	R	.33*	5700
1790.7	S	.30*	5700

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	9.39	470
2.0	S	9.39	636
3.4	S	9.39	1081
5.1	R	9.39	1607
6.4	R	9.39	2008
7.9	R	9.39	2459
9.3	R	9.39	2928
11.5	R	9.39	3587
14.5	S	9.39	4533
18.8	S	9.39	5895
21.7	S	9.39	6793
26.6	S	9.01	7584
32.1	S	8.47	8510
39.2	S	7.58	9149
49.3	S	6.54	9696
62.0	S	5.60	10150
72.0	S	5.02	10376
87.0	S	4.39	10640
109.0	S	3.73	10888
130.5	S	3.29	11085
160.9	S	2.80	11157
199.0	S	2.43	11362
244.7	R	2.14	11700
296.0	R	1.88	11700
358.9	S	1.62	11700
450.2	S	1.39	11700
556.8	S	1.20	11700
862.6	S	.85	11700
1227.0	S	.73	11700
1592.1	S	.64*	11700
1957.5	S	.57*	11700

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds				Output Shaft Suspended Load or Thrust Up or Down Capacity In Pounds			
Input Shaft	Output Shaft						
RPM	10F	11H	10F & VM	10R			
1800	75	50	900	370	480	10F-10VM-11H	615
1200	115	65	1050	430	560		720
900	140	75	1150	485	635		810
600	175	95	1250	530	695		885
500	190	100	1350	500	780		1000
300	215	125	1450	640	835		1070
100	335	200	1650	740	905		1160
			50	1650	740		1235
			40	1750	790		1320
			30	1900	860		1440
			20	2150	970		1620
			10 & under	2700	1200		2000

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds				Output Shaft Suspended Load or Thrust Up or Down Capacity In Pounds			
Input Shaft	Output Shaft						
RPM	21H	20F, VM & R	21H	20F & VM	20R		
1800	95	95	500	620	910	20F-20VM-21H	1250
1200	160	105	300	720	1070		1455
900	200	115	200	815	1200		1645
600	260	125	150	900	1310		1790
500	270	135	100	2250	1000		2030
300	350	160	80	2350	1070		2170
100	500	220	60	2580	1160		2340
			50	2750	1240		2500
			40	2850	1320		2670
			30	3140	1440		2910
			20	3570	1620		3280
			10 & under	4480	2000		4050

NOTES

NOTES

S: Input and Output Shafts revolve in the same direction.

R: Input and Output Shafts revolve in opposite directions.

* Use of Shear Pin or Torque Controlled Coupling is recommended.

A: Input Horsepower rating is directly proportional to the

Input HP rating at 1800 R.P.M. Ratio 5:1 to 1, Input R.P.M. —900.

Input H.P. —2.08. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

S: Input and Output Shafts revolve in the same direction.

R: Input and Output Shafts revolve in opposite directions.

* Use of Shear Pin or Torque Controlled Coupling is recommended.

A: Input Horsepower rating is directly proportional to the

Input HP rating at 1800 R.P.M. Ratio 5:1 to 1, Input R.P.M. —900.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.



planetary reducer ratings

HORSEPOWER, TORQUE, AND OVERHUNG LOAD RATINGS

All ratings stated are for A.G.M.A. Class 1 service.

Tables list mechanical horsepower capacities.

**HORIZONTAL TYPE
No. 31H & HM**

**FLANGE TYPE
No. 30F**

**VERTICAL TYPE
No. 30VM**

**ROUND TYPE
No. 30R**

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	15.21	762
2.0	S	15.21	1017
3.4	S	15.21	1710
5.1	R	15.21	2609
6.5	R	15.21	3281
7.8	R	15.21	3967
9.4	R	15.21	4779
11.6	R	15.21	5878
14.8	R	15.21	7503
18.0	S	15.21	9151
21.5	S	15.21	10928
26.5	S	15.00	12740
32.0	S	14.51	14738
39.2	S	12.99	15951
49.6	S	11.27	17119
57.9	S	10.44	18244
74.3	S	8.85	19285
89.8	S	7.70	19749
107.2	S	6.75	20075
133.6	S	5.76	20569
164.1	S	4.98	20974
191.3	S	4.47	21300
237.2	S	3.84	21600
284.0	S	3.35	21600
349.5	S	2.88	21600
425.7	S	2.50	21600
553.0	R	2.09	21600
964.0	R	1.43	21600
1229.0	S	1.21	21600
1621.8	R	1.03*	21600
2334.5	R	.83*	21800

**HORIZONTAL TYPE
No. 41H & HM**

**FLANGE TYPE
No. 40F**

**VERTICAL TYPE
No. 40VM**

**ROUND TYPE
No. 40R**

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	23.42	1225
2.0	S	23.42	1634
3.4	S	23.42	2758
5.2	R	23.42	4016
6.4	R	23.42	4954
7.8	R	23.42	6072
9.4	R	23.42	7267
11.9	R	23.42	9210
14.2	R	23.42	11462
17.7	S	23.42	13749
21.3	S	23.42	16413
26.6	S	22.75	20051
30.5	S	22.68	21839
39.6	S	20.04	24653
50.0	S	17.78	27009
61.0	S	15.57	28262
70.5	S	14.17	29169
90.5	S	11.61	30080
106.8	S	10.51	30768
129.7	S	9.18	31507
164.1	S	7.74	32000
201.4	S	6.69	32400
230.2	S	6.08	32400
296.0	S	5.04	32400
353.4	S	4.44	32400
450.4	S	3.75	32400
545.0	S	3.31	32400
1023.2	S	2.22	32400
1269.0	S	1.96	32400
1491.8	S	1.79*	32400
1907.8	R	1.58*	32400

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds						Output Shaft Suspended Load or Thrust Up or Down Capacity in Pounds 30F-30VM-31H	
Input Shaft			Output Shaft				
RPM	31H	30F, VM & R	RPM	31H	30F & VM		30R
1800	180	100	500	2150	780	910	1610
1200	290	115	300	2400	910	1070	1880
900	350	120	200	2700	1030	1200	2120
600	440	135	150	2900	1125	1310	2320
500	475	145	100	3100	1270	1480	2620
300	580	170	80	3250	1360	1580	2800
100	650	235	60	3700	1470	1720	3020
			50	4050	1565	1830	3230
			40	4150	1670	1960	3440
			30	4450	1820	2130	3750
			20	4870	2050	2400	4240
			10 & under	6200	2530	2960	5220

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- *: Use of Shear Pin or Torque Controlled Coupling is recommended.
- A: Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5.1 to 1, Input R.P.M. -900, Input H.P. -7.6. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads. (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds						Output Shaft Suspended Load or Thrust Up or Down Capacity in Pounds 40F-40VM-41H	
Input Shaft			Output Shaft				
RPM	41H	40F, VM & R	RPM	41H	40F & VM		40R
1800	285	145	500	2500	1360	1020	3040
1200	339	160	300	2950	1580	1185	3540
900	383	175	200	3350	1790	1335	4000
600	452	200	150	3650	1950	1460	4370
500	484	215	100	4100	2200	1650	4940
300	590	245	80	4400	2350	1765	5270
100	678	340	60	4800	2550	1910	5710
			50	5050	2720	2035	6090
			40	5400	2900	2170	6500
			30	5900	3160	2365	7080
			20	6650	3560	2670	8000
			10 & under	8100	4400	3285	9840

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- *: Use of Shear Pin or Torque Controlled Coupling is recommended.
- A: Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5.2 to 1, Input R.P.M. -900, Input H.P. -11.71. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads. (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

All ratings stated are for A.G.M.A. Class 1 service.

Tables list mechanical horsepower capacities.

HORIZONTAL TYPE No. 51H & HM **FLANGE TYPE No. 50F**
VERTICAL TYPE No. 50VM **ROUND TYPE No. 50R**

HORIZONTAL TYPE No. 61H & HM **FLANGE TYPE No. 60F**
VERTICAL TYPE No. 60VM

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	48.90	2459
2.1	S	48.90	3307
3.4	S	48.90	5442
5.2	R	48.90	8353
6.5	R	48.90	10475
7.9	R	48.90	12755
9.5	R	48.90	15369
11.8	R	48.90	19074
14.7	R	48.90	23716
18.6	S	48.90	29947
21.5	S	48.90	34749
25.9	S	45.70	37835
31.6	S	43.20	43157
40.1	S	38.75	48240
48.6	S	34.67	51413
60.4	S	30.64	55168
71.0	S	28.26	58758
90.4	S	23.48	59980
109.6	S	20.44	61370
129.2	S	17.99	61730
156.8	S	15.57	62230
198.1	S	13.16	63000
244.7	S	11.25	63000
290.0	S	9.98	63000
367.2	S	8.46	63000
453.3	S	7.34	63000
557.0	S	6.42	63000
1027.2	R	4.42	63000
1262.0	R	3.95	63000
1661.5	R	3.41*	63000
2234.8	S	2.97*	63000

Ratio of Reduction To 1	Rotation	Input H.P. at 1800 R.P.M. (See Note A)	Output Torque Inch Pounds
1.5	S	83.15	4136
2.0	S	83.15	5506
3.4	S	83.15	9314
5.2	R	83.15	14170
6.4	R	83.15	17477
7.8	R	83.15	21421
9.4	R	83.15	25640
11.9	R	83.15	32494
14.2	R	83.15	40438
17.7	S	83.15	48494
21.3	S	83.15	57907
26.6	S	80.22	70229
30.5	S	79.56	76205
39.6	S	69.50	84909
50.0	S	63.27	95468
61.0	S	54.36	97803
70.5	S	50.65	103424
90.5	S	42.71	107880
106.8	S	37.53	108700
129.7	S	32.40	109700
164.1	S	27.75	111300
201.4	S	23.78	113000
221.4	S	22.18	113000
296.0	S	18.02	113000
335.9	S	16.52	113000
450.4	S	13.55	113000
545.0	S	11.98	113000
971.1	S	8.44	113000
1269.0	S	7.28	113000
1491.8	S	6.69	113000
1907.8	R	5.94	113000

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds						Output Shaft Suspended Load or Thrust Up or Down Capacity In Pounds 50F-50VM-51H	
Input Shaft			Output Shaft				
RPM	51H	50F, VM & R	RPM	51H	50F & VM		
1800	630	185	500	5200	2000	1530	4590
1200	968	210	300	6000	2330	1770	5335
900	1180	225	200	6700	2640	2020	6040
600	1473	255	150	7500	2880	2210	6585
500	1589	275	100	8000	3250	2480	7440
300	1947	315	80	8400	3470	2660	7950
100	2809	435	60	9000	3760	2890	8600
			50	9500	4010	3060	9180
			40	10000	4280	3280	9800
			30	11000	4660	3570	10670
			20	12500	5265	3950	12050
			10 & under	15500	6500	4970	14830

Maximum Allowable Overhung Load (or Chain Pull) Capacity in Pounds						Output Shaft Suspended Load or Thrust Up or Down Capacity In Pounds 60F-60VM-61H
Input Shaft			Output Shaft			
RPM	61 H	60F & VM	RPM	61H	60F & VM	
1800	1150	610	500	9814	2610	5370
1200	1550	690	300	11317	3040	6245
900	1800	745	200	12559	3430	7065
600	2160	845	150	13589	3750	7710
500	2320	910	100	14960	4230	8710
300	2800	1040	80	15870	4520	9300
100	4000	1450	60	16960	4890	10070
			50	17880	5220	10740
			40	19120	5570	11460
			30	20680	6070	12490
			20	23480	6850	14100
			10 & under	29530	8450	17360

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- *: Use of Shear Pin or Torque Controlled Coupling is recommended.
- A: Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5.2 to 1, Input R.P.M. -900. Input H.P. -24.45. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads. (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.

NOTES

- S: Input and Output Shafts revolve in the same direction.
- R: Input and Output Shafts revolve in opposite directions.
- *: Use of Shear Pin or Torque Controlled Coupling is recommended.
- A: Input Horsepower rating is directly proportional to the **input HP rating** at 1800 R.P.M. Ratio 5.2 to 1, Input R.P.M. -900. Input H.P. -41.58. The Torque is independent of the speed.

The above Ratings are for 8 to 10 hours daily operation with steady, non-shock loads. (Service Factor 1). For other service conditions apply proper service factors as shown on page 4.



APPLICATION DATA CHECKLIST

WINSMITH APPLICATION DATA CHECKLIST FOR SELECTING SPEED REDUCERS AND GEARMOTORS

REP _____ CUSTOMER _____ DATE _____

A. Reducer Particulars:

1. Size _____ 2. Model _____ 3. Ratio _____ 4. Assy _____ 5. Exact Mounting (if not clear, send sketch) _____

Critical dimensions _____

B. Drive Systems:

1. How is prime mover connected to unit? _____

2. How is the unit connected to the load? _____

3. List all pertinent data on pulleys, sprockets, drums, etc. _____

4. List speed requirements (input, output, variation, conveyor velocities.) _____

C. Load on Reducer:

1. Output torque required _____ (or)

2. Reasonable estimate of torque _____ (or)

3. List data to calculate output torque _____

4. If loads are in terms of weight, list materials rubbing, sliding or rolling against each other so coefficient of friction can be estimated _____

5. Are there any large inertia forces that must be overcome in starting system?..If so, explain: _____

6. Overhung loads subjected to unit _____

7. Thrust loads subjected to unit _____

D. Type of Service:

1. Uniform _____, Moderate _____, Shock _____, reversing _____, and/or impact _____ loading

2. Extent of peak loads _____

3. Type of prime mover _____

4. Kind of machinery used on _____

5. Unusual dangers to persons that must be considered _____

E. Duty:

1. Length of daily service _____

2. Cycle time _____

3. Does (2) reflect frequent starts & stops? _____

F. Environmental Conditions:

1. Ambient temperature range _____

2. Is unit for outdoor service? _____

3. Atmospheric condition of surroundings (dirty air, etc.) _____

4. List any unusual conditions that the unit is subjected to (heat, water splash, etc.) _____

G. Prime Mover:

1. Capacity (speed & HP or torque) _____

2. Frame size _____ (Can the reducer accept this size?)

3. Obtain certified prints for non-nema mounting dimensions _____

4. Is it constant torque or HP for varying speeds? _____

5. For internal combustion: no. cylinders _____, cycles _____

H. Self-Locking:

1. Must the unit backdrive? _____

2. Must the unit be self-locking? _____ (If so, a brake is recommended.)

I. Torque Control:

1. What torque settings are required? _____ Alarm _____ Shutoff _____

2. When viewing end of slow speed shaft, what is its direction? _____ CW _____ (or) CCW _____

UNUSUAL CONDITIONS CONCERNING INSTALLATION OR APPLICATION





TERMS AND CONDITIONS

THE RECIPIENT OF THIS OFFER IS HEREIN CALLED BUYER AND PEERLESS-WINSMITH, INC. IS HEREIN CALLED SELLER. THE TERM PRODUCT SHALL INCLUDE, WITHOUT LIMITATION, GOODS, SERVICES, WORK AND DATA, EXPRESSLY OR IMPLIEDLY DELIVERED HEREUNDER AND ANY PART THEREOF.

1. CONTROLLING TERMS

The parties agree that there are no understandings, agreements or representations, express or implied, not specified herein, respecting this offer or sale, and that this instrument contains the entire agreement between Seller and Buyer. No course of prior dealing and no usage of the trade shall be relevant to supplement or to explain terms used in this agreement. All sales are expressly limited to, and the rights and liabilities of the parties shall be governed exclusively by, the terms and conditions herein. In the event any purchase order or offer from Buyer states terms additional to or different from those set forth herein, this document shall be deemed a notice of objection to such additional or different terms and a rejection thereof. Any acknowledgement or shipment of product by Seller to Buyer subsequent to Seller's receipt of a purchase order or offer from Buyer shall not be deemed to be an acceptance by Seller of an offer to contract on the basis of any Buyer's terms and conditions. Issuance of a purchase order or acceptance by Buyer of products shall be conclusive evidence of Buyer's acceptance of terms and conditions set forth herein as the sole controlling terms and conditions of the contract between Seller and Buyer.

2. FORCE MAJEUR

This order is accepted subject to delays due to conditions or forces beyond Seller's control including, but not limited to strikes, work stoppages, break down, fires, accidents, contingencies of transportation, storage or delivery, civil disturbances, shortage of labor and acts of God.

3. CREDIT

Buyer agrees to comply with the credit terms and accept deliveries as indicated; upon violation or default by Buyer, or upon bankruptcy or insolvency of Buyer, or by reason of the insecurity of Seller as to the ultimate collectibility of the purchase price as determined by Seller in its sole and unfettered discretion, Seller may, without notice to Buyer, delay or postpone the delivery of the Products; and Seller, at its option, is authorized to change the terms of payment to payment in full in advance of shipment of the entire undelivered balance of said Products. In the event of default by Buyer in the payment of the purchase price or otherwise, Seller after demand, may sell any undelivered Products on hand for the account of Buyer and apply such proceeds as a credit against the contract purchase price, and Buyer agrees to pay balance then due to Seller on demand. Such balance shall bear interest at the highest legal contract rate from the date of demand. Buyer agrees to pay all expenses, including but not limited to, storage and shipment costs, court costs, attorney's fees and other expenses of litigation or preparation therefore, resulting from any default by Buyer in any of the terms thereof. Should Buyer default hereunder prior to the manufacture of all Products ordered hereunder, Buyer agrees to pay as liquidated damages the contract price for such unproduced or partially produced Products, less Seller's then unexpended standard costs for materials, direct labor and variable overhead with respect to the Products as in effect at the time of default. Certification of such standard costs by Seller's independent public accountants shall be conclusive on the parties hereto.

4. CHANGES

Orders arising hereunder may be amended by written Change Order signed by the parties, setting forth the particular changes to be made and the effect of such changes on the price and time of delivery. A charge will be made for changes in drawings and/or specifications after Buyer and Seller have previously agreed upon same. The total charge for such change will include order repossessing costs, additional material and labor costs. Seller will advise the total charge for such changes after receipt of written authorization or direction for such changes. In the event the changes are required as a result of an error on the part of the Seller, no charge will be made.

5. FAIR LABOR STANDARDS ACT

Seller hereby certifies that the Products covered by this order were produced in compliance with the Fair Labor Standards Act of 1938, as amended, and of regulations and orders issued thereunder.

6. TAXES

All applicable taxes of every kind or nature now or hereafter assessed which are or may become effective before this order is completed may be added to the invoice price.

7. BUYER'S REPRESENTATIONS AND INDEMNITY

Buyer represents and warrants that all trademarks, copyright materials, and patents submitted in connection with this order and that the use thereof in accordance with this order will not violate any federal, state or municipal law or regulation, and Buyer agrees to indemnify and hold harmless Seller, its agents, successors and assigns against any suits, loss, claim, demand, liabilities, costs and expenses (including attorneys' fees) arising out of any breach or alleged breach hereof.

8. TERMS

All Sales are made F.O.B. Seller's plant, unless otherwise specified on the face of the Seller's acknowledgement. Payment terms are net 30 days unless otherwise specified on the face of the Seller's acknowledgement. Delivery of all or any part of the Products to a carrier for shipment to Buyer or to a consignee designated by Buyer shall constitute delivery to Buyer and shall pass and vest title to and risk of loss of such goods to Buyer in the event of loss or damage to Products after delivery to a carrier. Seller will, upon request of Buyer, assist in filing claims against the carrier.

9. CANCELLATION-SUSPENSION

Orders for Products received by Seller are accepted subject to the understanding that orders may be cancelled by Seller because of Seller's inability to obtain all or part of the materials necessary to complete the order at prices in effect on the date hereof or by reason of other causes beyond its reasonable control. Cancellation or suspension of orders may be made only upon Seller's written approval. A charge will be made for cancellations and/or suspensions after Buyer and Seller have previously agreed upon same. Seller will advise the total charge for such cancellations and/or suspensions. Buyer agrees to pay such charges, including but not limited to, storage and shipment costs, costs of producing non-standard components, costs of purchasing non-returnable materials, cancellation costs imposed on the Seller by its suppliers, engineering costs and any other costs resulting from cancellation and/or suspension of orders by the Buyer. Certification of such costs by Seller's independent public accountants shall be conclusive on the parties hereto.

10. TOOLS, DIES AND MOLDS

Any and all equipment, including tools, jigs, dies, plates, molds, fixtures, materials, equipment, drawings, designs and other information, which Seller uses, constructs or acquires for Buyer for the purpose of filling this order shall be and remain Seller's property.

11. DELIVERY

Buyer agrees to accept delivery of all goods included in this order within the time specified on the face hereof. No extension of the delivery period shall relieve Buyer from the obligation to accept the goods included in this order. Partial shipment of goods will be made by Seller when ready and invoiced.

12. CLAIMS OR RETURNS

All claims must be made in writing and delivered to Seller within ten (10) days after receipt of the goods and must be accompanied by Seller's packing list and freight bill. Failure of Buyer to make such claims within ten (10) days will constitute a waiver by Buyer or such claims.

In the event of the receipt of notice of such claims, Seller agrees to forward definitive shipping instructions to Buyer or to send a representative of Seller to Buyer's facilities to review shipment and make any necessary adjustments. No return of the goods pursuant to this paragraph shall be made for any purpose without the prior written consent of Seller. Transportation charges on all goods returned after receipt of Seller's Authorization must be prepaid. Any goods returned by Buyer without Seller's consent shall be held for the account of Buyer.

13. CHARGES

Past due accounts are subject to late payment charges of 1½% per month or such lesser amounts are legally permissible.

14. SOLVENCY

Buyer, by these presents and the acceptance of the Products, represents and warrants that Buyer is solvent and able to pay for the Products in accordance with the terms of sale.

15. WARRANTIES

The Products manufactured by Seller are warranted by Seller as follows: (a) Seller has the right to sell the Products, (b) Buyer and its customers shall have the right to enjoy the Products free of claims of third persons against the Seller, and (c) the Products shall be free from manufacturing defects in material and workmanship under normal use and service for a period of twenty-four (24) months from date of shipment. This warranty does not apply to any Products which have been tampered with, improperly stored, exposed to heat or moisture or otherwise subject to misuse or abuse.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, WARRANTIES OR MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

Except as otherwise agreed in writing in each specific instance, the obligation of Seller is limited: (i) in the case of any material breach of the warranties set forth in subparagraphs (a) and (b) above, to the reimbursement of the price paid by Buyer or its customer for such Products; and (ii) in the case of any breach of the warranty set forth in subparagraph (c) above, to any of the following (at Seller's option): refund of the purchase price or repair or replacement of any such defective Product without charge other than for transportation.

SELLER SHALL NOT IN ANY EVENT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES resulting from any use or failure of the Products, including, without limitation, liability for loss of time to, profits or products of, Buyer or the user for any labor or any other expense, damage or loss occasioned by any such defect.

Simultaneously with the delivery by Dealer to its customer of any Products purchased by Buyer from Seller, Buyer shall deliver therewith such printed warranties and disclaimers of warranties in respect to said merchandise as shall be furnished by Seller to Buyer or packed with said merchandise for that purpose. Buyer further agrees that the obligations of Seller to Buyer with respect to all Products purchased by Buyer from Seller shall be as hereinabove set forth. In no event shall Seller's obligation for breach of warranty exceed the purchase price of product.

16. ARBITRATION

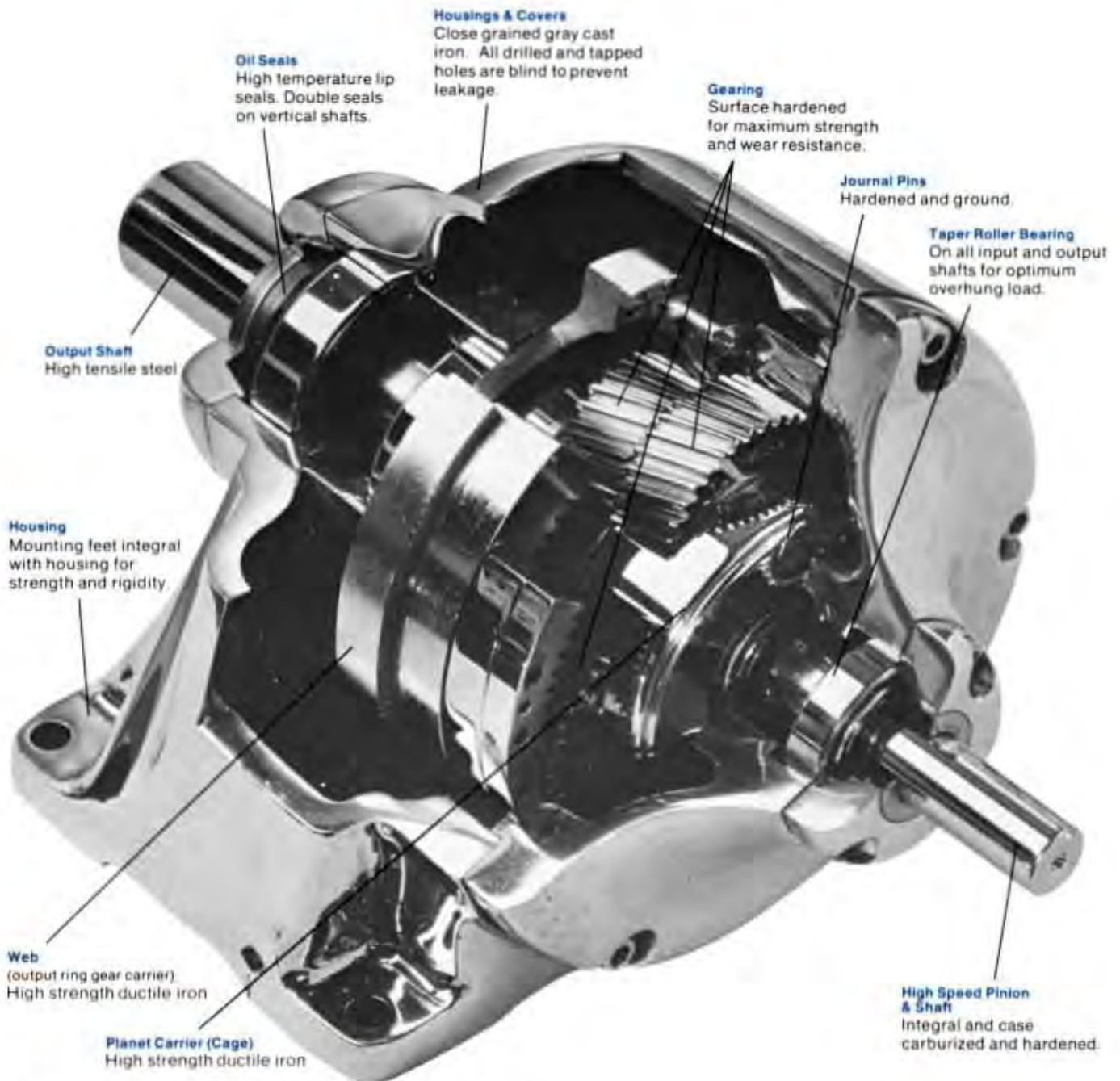
Any controversy arising under, or in any way related to this order or the subject matter hereof shall be settled by arbitration by three disinterested arbitrators in the City and State of New York, and under the laws of said State, in accordance with rules of the American Arbitration Association then obtaining. All costs of such arbitration, and any proceedings directly or indirectly related thereto, including reasonable attorney's fees, shall be paid by the party against whom the arbitrators shall render their award or as otherwise directed by the arbitrators.

17. LAW

The contract shall be governed and construed under the State where the products are manufactured.

REV. 12/99

The inside story



Winsmith planetary reducers combine enormous load capacity, smooth, quiet operation, and long operating life in a strikingly compact package. We achieve that combination by mounting our gears in a planetary element that "floats" the gears, thereby guaranteeing simultaneous contact of all driving teeth and perfect multiple path load distribution. But that's just one of many Winsmith features. Together they add up to a reducer that looks like the others, but operates like nothing but a Winsmith!



WINSMITH DISTRICT OFFICES

ALABAMA

See Georgia

CALIFORNIA

Los Angeles (Santa Fe Springs)

■ **Service Center**
562/404-0304
FAX 562/404-8060
San Francisco (Brentwood)
925/634-2818
FAX 925/634-4314

COLORADO

Lakewood
303/205-1922
FAX 303/205-1477

FLORIDA

Clermont
352/243-7517
FAX 352/243-7518

GEORGIA

Atlanta (Alpharetta)
770/772-7270
FAX 770/772-7277

ILLINOIS

Chicago (Downers Grove)
■ **Service Center**
630/629-3434
FAX 630/629-1010

INDIANA

See Cincinnati, OH

KANSAS

Kansas City
816/524-2010
FAX 816/524-2944

KENTUCKY

See Cincinnati, OH

MASSACHUSETTS

See Rhode Island

MICHIGAN

Detroit
734/878-9050
FAX 734/878-9051

MINNESOTA

Plymouth
763/559-1021
FAX 763/559-6552

MISSOURI

Kansas City
816/524-2010
FAX 816/524-2944
St. Louis
314/576-1488
FAX 314/576-0433

NEW JERSEY

See Philadelphia, PA

NEW YORK

Springville (Factory)
Peerless-Winsmith
716/592-9310
FAX 716/592-9546

NEW YORK (cont.)

New York City
See Philadelphia, PA

NORTH CAROLINA

See Georgia

OHIO

Cleveland (Wickliffe)
440/585-2121
FAX 440/585-2122
Cincinnati
513/791-5009
FAX 513/791-4717

OKLAHOMA

See Texas

OREGON

Portland
■ **Service Center**
503/227-6638
FAX 503/227-5413

PENNSYLVANIA

Harrisburg/Philadelphia
Sales Office
315/684-3553
FAX 315/684-3562
Western PA
Sales Office
716/751-0134
FAX 716/751-4051

RHODE ISLAND

Warwick
401/732-4570
FAX 401/732-4583

SOUTH CAROLINA

See Georgia

TENNESSEE

See Georgia

TEXAS

Dallas/Houston
■ **Service Center**
1-800/383-5918
FAX 877/867-5386

UTAH

See Colorado

VIRGINIA

Vinton
540/890-7756
FAX 540/890-7855

WISCONSIN

Cedarburg
262/375-4465
FAX 262/375-4175

BRITISH COLUMBIA

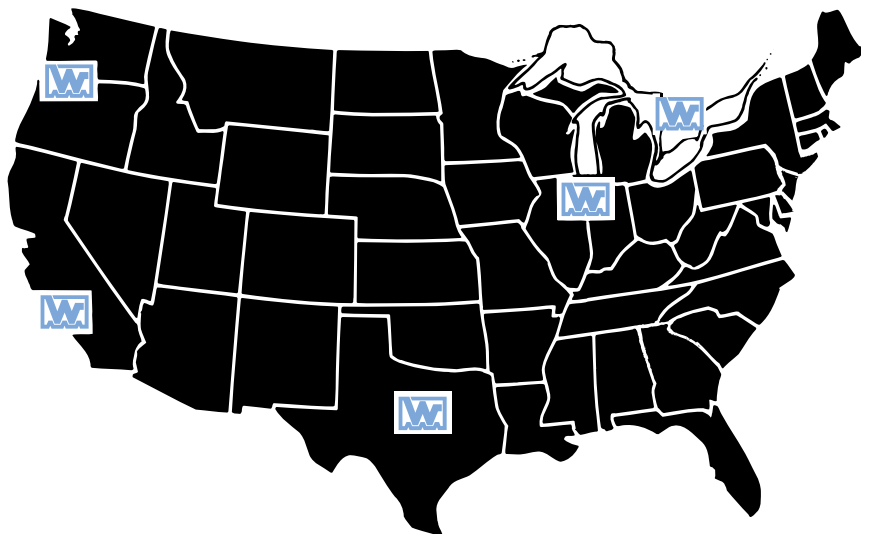
See Springville, NY

ONTARIO

Toronto (Mississauga)
■ **Service Center**
905/828-1222
FAX 905/828-1225

WINSMITH SERVICE CENTERS

WINSMITH®'s Regional Service Centers, shown on the map, can provide prompt solutions to your unique delivery requirements. Each Service Center is fully stocked with the necessary components and assemblies to provide a wide variety of finished units with the same high quality that you expect from WINSMITH's manufacturing plants.





Oil Seals
High temperature lip seals. Double seals on vertical shafts.

Flows are blind to prevent leakage.

Welding
Surface hardened for maximum strength and wear resistance.

Journal Pins
Hardened and ground.

Taper Roller Bearing
On all input and output shafts for optimum overhung load.

Integral housing for strength and rigidity.

Web (output ring gear carrier)
High strength ductile iron

Planet Carrier (Cage)
High strength ductile iron

High Speed Pinion & Shaft
Integral and case carburized and hardened.

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