RENOLD

TW Series

Heavy Duty Wormgear

2nd Edition

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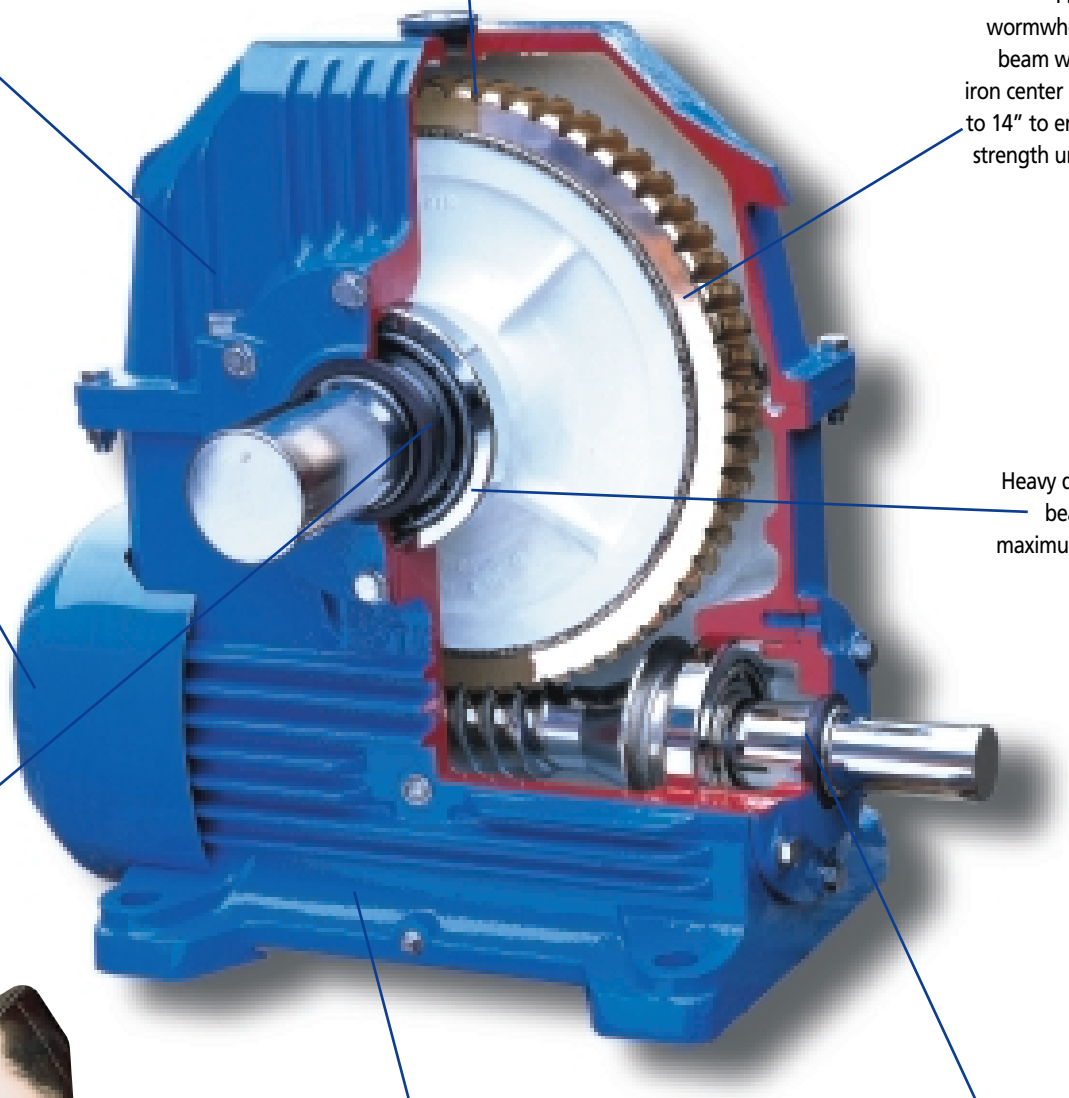
TW Series - Product Features

Wide range of gear unit type single and double reduction options for complete design flexibility.

Unique Holroyd tooth form for maximum torque capacity and optimum efficiency.

Phosphor bronze wormwheel rim electron beam welded onto cast iron center on unit sizes up to 14" to ensure maximum strength under shock load conditions.

Sprag clutch backstop option to prevent drive reversal.



Heavy duty taper roller bearings fitted for maximum load capacity and long life.

Viton oil seals fitted throughout as standard, suitable for use in high ambient temperature.

Two piece close grained cast iron gear case for strength and absorption of vibration for quiet running.

Enhanced sealing available using a grease packed labyrinth system for use in hostile environments.

Section of electron beam welded wormwheel rim and centre showing the fusion of the bronze wormwheel rim onto the cast iron centre. This high security fit allows transmission of power under shock load conditions.

Applications

- **Conveyors**
- **Mining**
- **Lumber**
- **Materials Handling**
- **Packaging Machines**
- **Water Treatment**
- **Foundry Equipment**
- **General Industrial applications**

For more information telephone us - Canada: Toll Free 800.265.9970. USA: Toll Free 800.850.8141

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Contents

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Introduction

For over 100 years, Renold has played a leading role in the development of worm gearing and perfected the design and manufacture of HOLROYD worm gears, such that today the name HOLROYD is renowned world-wide for the quality and reliability of its products.

Renold TW Series worm gear units are available to satisfy the industrial demand for reliable and efficient speed reducers.

Renold TW Series worm gear units are single and double reduction and utilise the unique Renold patented electron beam welded wheel rims.

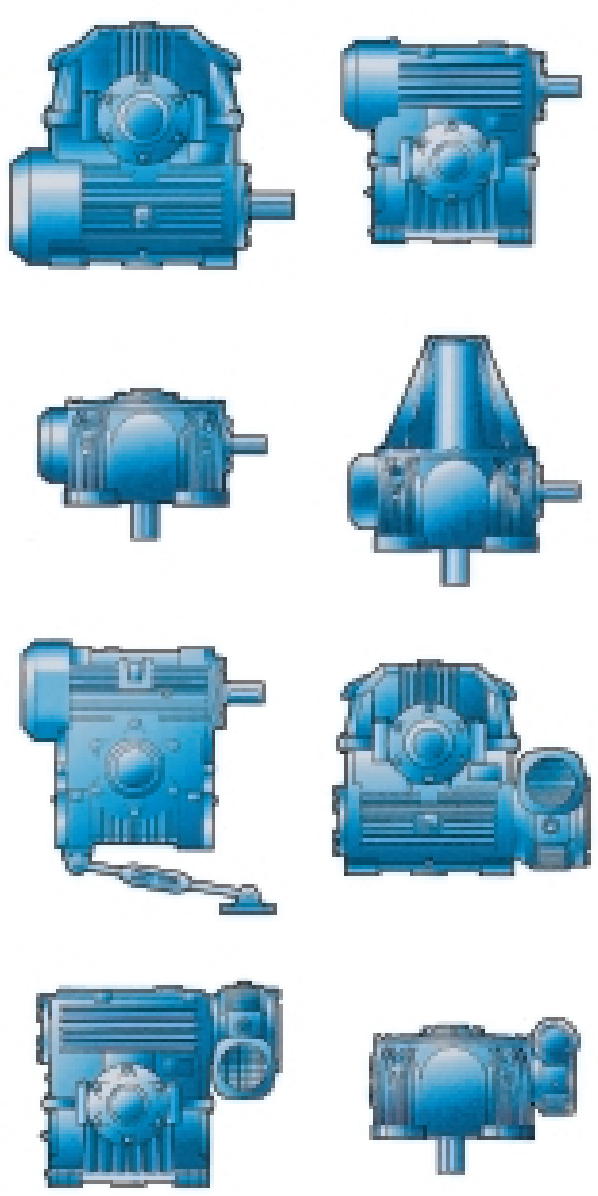
Standard speed reduction ratios range from 5:1 up to 70:1 for single reduction worm gear units, and up to 4900:1 for double reduction.

All TW Series worm gear units can be supplied in various standard types and assemblies and are suitable for combining with most of the other Renold range of fixed and variable speed products.

Most of the units included in the TW Series range are suitable for mounting in alternative positions. Available assemblies are detailed for each type of unit and mounting position variations where applicable.

TW Series reducers are supplied with a solid shaft as standard, however, hollow output bore units are also available.

The TW Series units are available from 10" to 28" center distance and this heavy duty unit range is the result of continuing research and development.



TW Series - General Specification

The RENOLD range of TW Series heavy duty units is the result of continuing research and development, and enables significant increases in the power transmission and overhung load capabilities of each unit to be achieved.

Ten standard types of TW Series units are available with center distances from 10" to 28" and with ratios ranging from 5:1 to 70:1 for single reduction units and from 75:1 to 4900:1 for double reduction units. All units incorporate metric taper roller bearings, and use the finest quality alloy steels for the wormshafts and centrifugally cast phosphor bronze rims for the wormwheels.

Gear Case

The gear cases are of close grained cast iron with all joints and bearing bores accurately machined to ensure oil tightness and precise gear location.

Wormshaft and Wormwheel

The worm is integral with its shaft and manufactured from alloy steel, case hardened on the threads, and ground and polished on the thread profiles.

The wormwheel rim is made from bronze complying with BS 1400 PB2-C (centrifugally cast) and secured to the cast iron center by the electron beam welding process on the 10" - 14" sizes.

The Holroyd gear form used in the TW Series gear units corresponds to British Standard recommendations but, in addition has an exclusive feature which consists principally of an important modification to the worm threads and wheel teeth which confer additional valuable properties to gear performance. This ensures that our gears will run correctly and transmit true uniform angular velocity when running under all load conditions. The modification also gives a tapered oil entry gap between the teeth, which drags the lubricant between the surfaces and results in more efficient lubrication. Standard worm gears have right-hand threads but left-hand threads can be made to order.

Shafts

Standard shaft extensions are to imperial dimensions but metric shaft extensions are also available. The output shaft is produced in carbon steel but, if required by applicational conditions, can be made from high tensile steel. Double extension input or output shafts are also available on request, as well as special shaft extensions.

Bearings

Standard metric taper roller bearings are fitted throughout in the 10", 12" and 14" units, with a face to face arrangement on both the worm and the wheeline to impart the maximum possible stiffness. A similar arrangement is used on the wheeline of the larger sized gear boxes, but on the wormline, a matched set of taper roller bearings is installed at one end to accommodate radial and thrust forces, with a deep groove ball bearing at the opposite end accommodating radial forces only. This bearing is free to move axially in the casing, to allow for expansion of the wormshaft. Where necessary an optional higher capacity bearing arrangement can be specified for the wheeline which considerably increases the overhung load or thrust capacity.

Oil Seals

Viton oil seals are fitted as standard on all TW Series gear units.

Enhanced Oil Seals

Grease packed labyrinth oil seals are available for all TW Series unit sizes, often fitted for total protection in hostile environment conditions.

Lubrication

Gear and bearings are positively lubricated by oil from the sump in the underdriven and overdriven versions at normal motor speeds. With the vertical and agitator types, grease lubrication is necessary to the wheeline bearings.

For lower speeds it may be necessary to consider grease lubrication of certain bearings, and in this instance it is advisable to consult with Renold Engineers. Full lubrication details can be found under the "Installation & Maintenance" section.

Cooling

Maximum heat dissipation by air cooling is carried out by a radial fan directing air over the ribbed gear case. Where applicational circumstances permit, standard units can be supplied without a fan.

Backstop

A Sprag Clutch Backstop can be fitted internally to certain units when required, or alternatively an externally mounted backstop with manual tension release is available.

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Selection of Worm Gears

To select a worm gear unit the following basic information must be known and, if we are to make the selection, should be submitted in full to our Technical Sales Department.

Power

a) Prime mover, type and output power (HP).
b) Gear unit input and output power required (HP).
c) For input speeds below 250 rev/min consult our Technical Sales Department, giving details of required output torque (lbf.ins) and diameter of driven shaft (ins).

Speed

Gear unit input and output rev/min.

Duty

a) The characteristics of the drive eg. degree of impulsiveness of the driven load.
b) Duration of service in hours/day.
c) Starting load (HP) and number of starts per day.
d) For intermittent duty, reversing or shock loading, state normal power (HP) and frequency.
e) Disposition and details of external loads imposed on input/output shafts.
f) Working conditions, i.e. clean, dusty, moist, abnormal temperatures etc.

If the operating conditions are in any way unusual it is advisable to consult our Technical Sales Department.

Enquiry/Ordering Procedure

At the order or enquiry stage, please quote the catalogue reference, shaft assembly number and nominal ratio or exact ratio if this is important (see tables). Non-standard mounting positions should be indicated with a sketch. Where a double extension wormwheel shaft is required, please state any special requirements regarding alignment of keyways.

Mechanical Rating

The mechanical powers listed are those which the TW Series class units will transmit for 10 hours each day and correspond to a service factor of 1,0. Where non-uniform loading or a working day other than 10 hours is involved, a service factor fd should be applied to the selection power or torque which is taken from Table 2.

High numbers of starts per hour also influence the mechanical selection. Table 3 shows the starts factor fs which should also be applied to the selection power or torque.

For guidance, a comprehensive list of the various load conditions for a number of applications is given in Table 1. When confirming the mechanical selection powers therefore, the rating must be equal to or greater than - calculated power or torque demand x application service factor fd (Table 1 and Table 2) x starts factor fs (Table 3)

Efficiencies

The efficiency figures are approximate only and are those that could be expected from a gearbox which is fully run-in and operating under full load with the lubricant at its full working temperature.

For intermittent rating where the lubricant may remain comparatively cool, the efficiency may be somewhat lower due to the increased oil churning losses associated with the higher viscosity of the cool oil.

We shall be pleased to advise on any particular application.

Thermal Rating

The thermal ratings given are those which the gear units will transmit at an ambient temperature of 20°C (68°F), when the heat generated within the gearbox is being dissipated at the same rate. Whilst these ratings can be exceeded under start up conditions, this situation could lead to overheating and subsequent damage if continuously applied.

Thermal torque ratings do not relate to mechanical gear life and are not affected by running time or momentary shock loads.

If the ambient temperature is likely to exceed 20°C (68°F), this situation will have to be taken into account in the selection procedure. This is done by applying the thermal service factor given in Table 4 when calculating the selection output torque.

Eg. Thermal selection torque = continuous torque requirement x thermal service factor ft. Where intermittent running is involved it is possible the thermal limitation can be ignored, such as on a crane or winch application and when this type of operation is being considered; full applicational details should be given to Renold for assessment.

Selection Procedure

The ratings tables for the single reduction wormgear units provide mechanical ratings in terms of input and output power in HP and mechanical and thermal output torque ratings in lbf.ins.

Tables 1 and 2 list the service factors relative to the operational hours each working day and the load classification with regard to the nature of the service. When determining the selection power, the actual power absorbed and not the rating of the prime mover should be used.

The procedure is as follows for single reduction units:-

a) Establish the ratio required by dividing the input speed by the output, choosing the nearest nominal ratio available from tables 8 and 9.

$$\text{Gear ratio} = \frac{\text{Input speed rev/min}}{\text{Output speed rev/min}}$$

b) Determine the load classification from Table 1 and the corresponding mechanical service factor fd from Table 2 and the starts factor fs from Table 3.
c) Multiply the actual power absorbed by the mechanical service factor fd and tentatively select the size of unit by comparing this against the mechanical rating appropriate to the ratio and input speed.

$$\text{SELECTION OUTPUT TORQUE (lb. ins)} = \text{ACTUAL TORQUE (lb. ins)} \times fd \times fs$$

or

$$\text{SELECTION OUTPUT TORQUE (lb. ins)} = \frac{\text{POWER (HP)} \times 63{,}000 \times fd \times fs}{\text{OUTPUT SPEED (RPM)}}$$

d) For continuous operation, check that the thermal rating is at least equal to the thermal torque requirement. External cooling can be offered to increase thermal rate.
Thermal torque requirement = continuous torque x thermal service factor ft from Table 4.
e) Check the capability of the unit to withstand external loads applied to the output shaft. See Tables 5 and 6.

TW Series - Selection Examples

Mechanical Selection Torque	lb.ins =	Actual Torque (lb.ins) Requirement	X	Mechanical Service (f_D) Factor	X	Starts (f_S) Factors
Thermal Selection Torque	lb.ins =	Actual Torque (lb.ins) Requirement	X	Thermal Service (f_T) Factor		
Mechanical Selection Power	(HP) =	Actual Power (HP) Requirement	X	Mechanical Service (f_D) Factor	X	Starts (f_S) Factor
Thermal Selection Power	(HP) =	Actual Power (HP) Requirement	X	Thermal Service (f_T) Factor		

It can be seen from the ratings tables on pages 12 - 25 that both mineral and synthetic oil ratings are included. Depending upon which type of oil is to be used inside the gear unit will determine which rating are used to make a selection.

Example 1

A right angled underdriven wormgear unit is required to drive a steady load conveyor operating for 24 hours per day under ambient temperature conditions of 68°F. Stops/starts will not exceed 5 per hour. The electric motor speed is 1750 rpm and the conveyor headshaft torque is 111,000 lb. ins. at 36 rpm.

1. Gear Ratio = $\frac{1750}{36}$ = 48.6/1
   The nearest standard ratio is 50/1.
2. Mechanical Service (fD) Factor = 1.25
3. Starts Factor (fS) = 1.0
4. Thermal Service (fT) Factor = 1.0
5. Mechanical Selection Torque (lb. ins.) = Actual (lb. ins.) x (f_D) x (f_D)
   Torque
   = 111,000 x 1.25 x 1
   = 138,750 lb. ins.
6. Thermal Selection Torque (lb. ins.) = Actual (lb. ins.) x f_T
   Torque
   = 111,000 x 1
   = 111,000 lb. ins.
7. TWU17 unit is selected using 50/1 ratio. Using mineral oil.
   The mechanical torque rating is 199,337 lb. ins. and thermal rating is 133,990 lb. ins. However by using synthetic oil to lubricate the unit the selection would change to: TWU14 at 50/1 ratio. Using synthetic oil.

Example 2

A wormgear unit is required to drive an ore crusher in a mining complex. The duty is 16 hours per day continuous duty, maximum temperatures 86°F. The limit ratio is 30/1 and the prime mover is an electric motor of 30HP at 1750 rpm (1800 rpm).

1. Mechanical Service (f_D) Factor = 2.0
2. Starts Factor (f_S) = 1.0
3. Thermal Service (f_T) Factor = 1.16
4. Mechanical Selection Power (HP) = Actual HP x (f_D) x (f_S)
   = 30 x 2.0 x 1
   = 60 HP.
5. Thermal Selection Power (HP) = Actual HP x (f_T)
   = 30 x 1.16
   = 34.8 HP.
6. The selection for this application would be TW10 unit at 30/1 ratio using synthetic oil.

Mechanical power rating = 60 HP
Thermal power rating = 60 HP
Using synthetic oil lubricant.

Example 3

A gear unit is required to raise and lower sluice gate 4/5 times each day. The torque required is 200,000 lb. ins. at a speed of 1.5rpm. The electric motor speed is 1150 rpm. A selection of both unit and motor power is required.

1. Gear ratio $\frac{1150}{1.5}$ = 766:1

The nearest standard ratio from table 8 is: 750/1.

2. As this unit is a double reduction type - The thermal ratings are ignored.
3. Mechanical Service Factor (f_D) = 1.0
4. Starts Factor (f_S) = 1.0
5. Mechanical Selection Torque (lb. ins.) = Actual x (f_D) x (f_S)
   Torque
   = 200,000 x 1 x 1
   = 200,000 lb. ins..
6. A TWDU12 double reduction unit selection for this application having a mechanical rating of 209,000 lb. ins.
7. The efficiency of this this unit is listed at 61.6%, the input or motor power required to develop 200,000 lb. ins. output:-

= $\frac{\text{Actual torque x input RPM x 100}}{\text{63,000 x efficiency x ratio}}$

= $\frac{\text{200,000 x 1150 x 100}}{\text{63,000 x 61.6 x 750}}$

= 7.9 HP.

The normal power of the required motor will be 10 HP.

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TW Series - Load Classification by Application

Table 1

Agitators		Sugar (1)	M	Medium duty	M	Individual drives	H	single acting: 1 or 2 cylinders	*
Pure liquids	S	**Dredges**		Skip hoist	M	Reversing	*	double acting: single cylinder	*
Liquids and solids	M	Cable reels	M	**Laundry**		Wire drawing and flattening machine	M	Rotary - gear type	S
Liquids-variable density	M	Conveyors	M	Washers - reversing	M	Wire winding machine	M	Rotary - lobe, vane	S
Blowers		Cutter head drives	H	Tumblers	M	**Mills, rotary type**		**Rubber and plastics industries**	
Centrifugal	S	Jig drives	H	**Line shafts**		Ball (1)	M	Crackers (1)	H
Lobe	M	Manoeuvring winches	M	Driving processing equipment	M	Cement kilns (1)	M	Laboratory equipment	M
Vane	S	Pumps	M	Light	S	Dryers and coolers (1)	M	Mixed mills (1)	H
Brewing and Distilling		Screen drive	H	Other line shafts	S	Kilns other than cement	M	Refiners (1)	M
Bottling machinery	S	Stackers	M	**Lumber industry**		Pebble (1)	M	Rubber calenders (1)	M
Brew kettles-continuous duty	S	Utility winches	M	Barkers, hydraulic, mechanical	M	Rod, plain & wedge bar (1)	M	Rubber mill, 2 on line (1)	M
Cookers-continuous duty	S	**Dry dock cranes**		Burner conveyor	M	Tumbling barrels	H	Rubber mill, 3 on line (1)	S
Mash tubs-continuous duty	S	Main hoist	(2)	Chain saw and drag saw	H	**Mixers**		Sheeter (1)	M
Scale hopper-frequent starts	M	Auxiliary hoist	(2)	Chain transfer	H	Concrete mixers continuous	M	Tyre building machines	*
Can filling machines	S	Boom, luffing	(2)	Craneway transfer	H	Concrete mixers intermittent	M	Tyre and tube press openers	*
Cane knives (1)	M	Rotating, swing or slew	(3)	De-barking drum	H	Constant density	S	Tubers and strainers (1)	M
Car dumpers	H	Tracking, drive wheels	(4)	Edger feed	M	Variable density	M	Warming mills (1)	M
Car pullers	M	**Elevators**		Gang feed	M	**Oil industry**		**Sand muller**	M
Clarifiers	S	Bucket - uniform load	S	Green chain	M	Chillers	M	**Screens**	
Classifiers	M	Bucket - heavy load	M	Live rolls	H	Oil well pumping	*	Air washing	S
Clay working machinery		Bucket - continuous	S	Log deck	H	Paraffin filter press	M	Rotary, stone or gravel	M
Brick press	H	Centrifugal discharge	S	Log haul-incline	H	Rotary kilns	M	Travelling water intake	S
Briquette machine	H	Escalators	S	Log haul-well type	H	**Paper mills**		**Sewage disposal equipment**	
Clay working machinery	M	Freight	M	Log turning device	H	Agitators (mixers)	M	Bar screens	S
Pug mill	M	Gravity discharge	S	Main log conveyor	H	Barker-auxiliaries hydraulic	M	Chemical feeders	S
Compressors		Man lifts	*	Off bearing rolls	M	Barker-mechanical	H	Collectors	S
Centrifugal	S	Passenger	*	Planer feed chains	M	Barking drum	H	Dewatering screws	M
Lobe	M	**Extruders (plastic)**		Planer floor chains	M	Beater and pulper	M	Scum breakers	M
Reciprocating - multi-cylinder	M	Film	S	Planer tilting hoist	M	Bleacher	S	Slow or rapid mixers	M
Reciprocating - single cylinder	H	Sheet	S	Re-saw merry-go-round conveyor	M	Calenders	M	Thickeners	M
Conveyors - uniformly loaded or fed		Coating	S	Roll cases	H	Calenders-super	H	Vacuum filters	M
Apron	S	Rods	S	Slab conveyor	H	Converting machine except		**Slab pushers**	M
Assembly	S	Tubing	S	Small waste conveyor-belt	S	cutters, platers	M	**Steering gear**	*
Belt	S	Blow moulders	M	Small waste conveyor-chain	M	Conveyors	S	**Stokers**	S
Bucket	S	Pre-plasticiers	M	Sorting table	M	Couch	M	**Sugar industry**	
Chain	S	**Fans**		Tipple hoist conveyor	M	Cutters, platers	H	Cane knives (1)	M
Flight	S	Centrifugal	S	Tipple hoist drive	M	Cylinders	M	Crushers (1)	M
Oven	S	Cooling towers		Transfer conveyors	M	Dryers	M	Mills (1)	M
Screw	S	Induced draft	*	Transfer rolls	M	Fell stretcher	M	**Textile industry**	
Conveyors - heavy duty		Forced draft	*	Tray drive	M	Fell whipper	H	Batchers	M
not uniformly fed		Induced draft	M	Trimmer feed	M	Jordans	M	Calenders	M
Apron	M	Large, mine etc.	M	Waste conveyor	M	Log haul	H	Cards	M
Assembly	M	Large, industrial	M	**Machine tools**		Presses	M	Dry cans	M
Belt	M	Light, small diameter	S	Bending roll	M	Pulp machine reel	M	Dryers	M
Bucket	M	**Feeders**		Punch press-gear driven	H	Stock chest	M	Dyeing machinery	M
Chain	M	Apron	M	Notching press-belt drive	*	Suction roll	M	Looms	M
Flight	M	Belt	M	Plate planners	H	Washers and thickeners	M	Mangles	M
Live roll	*	Disc	S	Tapping machine	H	Winders	M	Nappers	M
Oven	M	Reciprocating	H	**Other machine tools**		**Printing presses**	*	Pads	M
Reciprocating	H	Screw	M	Main drives	M	**Pullers**		Range drives	*
Screw	M	**Food industry**		Auxiliary drives	S	Barge haul	H	Slashers	M
Shaker	H	Beef slicer	M	**Metal mills**		**Pumps**		Soapers	M
Crane Drives - not dry dock		Cereal cooker	S	Drawn bench carriage		Centrifugal	S	Spinners	M
Main hoists	S	Dough mixer	M	and main drive	M	Proportioning	M	Tenter frames	M
Bridge travel	*	Meat grinder	M	Pinch, dryer and scrubber		Reciprocating		Washers	M
Trolley travel	*	**Generators - not welding**	S	rolls, reversing	*	single acting:		Winders	M
Crushers		**Hammer mills**	H	Slitters	M	3 or more cylinders	M	Windlass	*
Ore	H	**Hoists**		Table conveyors non-		double acting:			
Stone	H	Heavy duty	H	reversing group drives	M	2 or more cylinders	M		

Service Factors

Table 2 (Service Factor f_D)

Prime mover (Drive input)	Duration Service	Driven machinery characteristics: Steady load	Medium impulsive	Highly impulsive
Electric, Air & Hydraulic Motors or Steam Turbine (Steady input)	Intermittent - 3hrs/day max	0.90	1.00	1.50
	3 - 10 over 10	1.00	1.25	1.75
		1.25	1.50	2.00
Multi-cylinder I.C. engine (Medium impulsive input)	Intermittent - 3hrs/day max	1.00	1.25	1.75
	3 - 10 over 10	1.25	1.50	2.00
		1.50	1.75	2.25
Single-cylinder I.C. engine (Highly impulsive input)	Intermittent - 3hrs/day max	1.25	1.50	2.00
	3 - 10 over 10	1.50	1.75	2.25
		1.75	2.00	2.50

S = Steady
M = Medium Impulsive
H = Highly Impulsive
* = Refer to Renold
(1) = Select on 24 hours per day service factor only.
(2) = Use service factor of 1.00 for any duration of service.
(3) = Use service factor of 1.25 for any duration of service.
(4) = Use service factor of 1.50 for any duration of service.

Note

Machinery characteristics and service factors listed in this catalogue are a guide only. Some applications (e.g. constant power) may require special considerations. Consult Renold Gears.

Table 3 Factor for Starts/Hours (fS)

Maximum number of starts per hour	5	50	100	300
Starts Factor fs	1.0	1.1	1.15	1.2

Table 4 Thermal Service Factor f_T

Ambient °C	10	20	30	40	50	60
Temp °F	50	68	86	105	122	140
Factor f_t	0.87	1.0	1.16	1.35	1.62	1.97

Overhung and Thrust Loads

Output shafts of worm gear units are frequently fitted with a spur pinion, chain pinion or belt pulley causing an overhung load to be imposed on the output shaft and bearings. These loads can generally be sustained by the gear unit; however, if the load is greater than the maximum allowable load for the unit, it may be necessary to either select a larger unit or lessen the effect of the load on the shaft bearings. This can be done in two ways. The pinion can be mounted on a shaft in its own bearings and the shaft coupled to the gear unit; or the wheel shaft may be extended beyond the overhung load and fitted with an outboard bearing. In order to obtain the best possible arrangement for a particular application (where large overhung loads are anticipated) customers are advised to submit details of the load to our Sales Technical Staff for their consideration.

In the interests of good design, the overhung member should be fitted as close as possible to the gear case in order to minimise the stresses and reduce the deflecting moment on the unit.

The maximum imposed axial thrust and overhung loads to which the units can be subjected are given in Tables 5 and 6.

Imposed axial thrust loads can also be minimised by the use of flexible couplings on the input and output shafts.

For drives where both imposed thrust and overhung loads are encountered, it is advisable to consult our Technical Sales Staff.

Where a double extension shaft is fitted, the maximum overhung loads listed apply in full to each shaft extension.

The overhung load may be calculated by the following formula:

resultant overhung load = (lbf)

$$\frac{P \times 126{,}000 \times F}{D \times S}$$

Where P = Power absorbed at output shaft (HP)

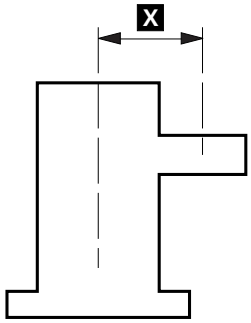
S = Speed of output shaft in rev/min

D = Pitch circle diameter of chain sprocket, spur or helical gear, or belt sheave in ins.

F = Overhung drive application factor as follows:

Chain sprocket	1,00
Spur or helical gear	1,25
Vee sheave	1,50
Flat belt sheave	2,00

Unit Size	Dimension X ins
	Standard Shaft
TW10	10.43
TW12	11.61
TW14	13.97
TW17	16.33
TW20	20.07
TW24	22.24
TW28	25.38



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Output Shaft Overhung and Thrust Loads

TABLE 5 - OUTPUT SHAFT LOAD CAPACITIES FOR TWU, TWO AND TWV IN POUNDS (lbs.)

At 1750 rpm input speed

Ratio	Output Speed	Center Distance						
		10	12	14	17	20	24	28
5	350	8030	8750	9790	12800	17700	26500	34900
10	175	9590	10300	11500	14900	20100	30400	40300
15	117	11300	12300	13500	17600	24200	35100	46200
20	88	13200	14300	15400	20000	26900	39500	51500
25	70	14100	15500	17200	22200	29600	43500	56000
30	58	15000	16500	18600	23900	32100	46900	60700
40	44	17100	18900	20700	27000	35900	52200	67000
50	35	17600	20500	22100	29300	39200	56900	70700
60	29	17600	20400	22200	31200	42200	60600	70900
70	25	17700	20700	22500	32900	44500	60700	71000

At 1150 rpm input speed

Ratio	Output Speed	Center Distance						
		10	12	14	17	20	24	28
5	230	8900	9670	10600	13800	19300	29000	38200
10	115	10700	11600	12800	16500	22400	33600	44300
15	76	12700	13900	15200	19700	27200	39100	51200
20	58	14900	16100	17400	22400	30300	44200	57500
25	46	15900	17500	19400	24900	33300	48800	62700
30	38	17000	18700	21000	26900	36200	52800	68100
40	29	17500	20300	21600	30500	40600	58900	69300
50	23	17600	20400	22000	32400	43200	59500	70000
60	19	17600	20400	22100	32600	43800	59800	70300
70	16	17700	20600	22400	32800	44000	60400	70400

The double reduction worm versions of the above will also accept overhung loads and when these are involved send application details to Renold Engineers.

The loads listed apply to standard bearing fitment. Alternative bearings for higher loads are available which, when used in conjunction with a high tensile steel shaft, can allow an increase in the values given. When a load has to be supported which is in excess of the values listed, send full application details to our Technical Sales Department.

TABLE 6 - SHAFT THRUST LOAD CAPACITIES FOR TWU, TWO AND TWV IN POUNDS (lbs.)

At 1150 rpm input speed

Ratio	Center Distance				
	10	12	14	17	20
5	7930	7740	8460	10500	17200
10	10600	11100	11700	14100	21000
15	13200	14200	14700	17400	26800
20	14500	14700	14700	20200	30200
25	14500	14700	14700	21000	31200
30	14500	14700	14700	21000	31200
40	14500	14700	14700	21000	31200
50	14500	14700	14700	21000	31200
60	14500	14700	14700	21000	31200
70	14500	14700	14700	21000	31200

Allowable thrust loads for unit sizes 24 and 28 will be supplied upon receipt of information relative to a specific application.

TW Series - Exact Ratios

TABLE 7: NOMINAL AND EXACT REDUCTION RATIOS: SINGLE REDUCTION.

Ratio	10	12	14	17	20	24	28
Nominal Ratio	Exact Ratio						
5	$^{41}/_{8}$	$^{46}/_{9}$	$^{51}/_{10}$	$^{51}/_{10}$	$^{56}/_{11}$	$^{61}/_{12}$	$^{61}/_{12}$
7.5	$^{44}/_{6}$	$^{44}/_{6}$	$^{52}/_{7}$	$^{52}/_{7}$	$^{52}/_{7}$	$^{59}/_{8}$	$^{59}/_{8}$
10	$^{39}/_{4}$	$^{39}/_{4}$	$^{49}/_{5}$	$^{49}/_{5}$	$^{49}/_{5}$	$^{59}/_{6}$	$^{59}/_{6}$
12.5	$^{49}/_{4}$	$^{49}/_{4}$	$^{49}/_{4}$	$^{49}/_{4}$	$^{49}/_{4}$	$^{62}/_{5}$	$^{62}/_{5}$
15	$^{44}/_{3}$	$^{44}/_{3}$	$^{59}/_{4}$	$^{59}/_{4}$	$^{59}/_{4}$	$^{59}/_{4}$	$^{59}/_{4}$
20	$^{41}/_{2}$	$^{41}/_{2}$	$^{59}/_{3}$	$^{59}/_{3}$	$^{59}/_{3}$	$^{59}/_{3}$	$^{59}/_{3}$
25	$^{49}/_{2}$	$^{49}/_{2}$	$^{49}/_{2}$	$^{49}/_{2}$	$^{49}/_{2}$	$^{74}/_{3}$	$^{74}/_{3}$
30	$^{59}/_{2}$	$^{59}/_{2}$	$^{59}/_{2}$	$^{59}/_{2}$	$^{59}/_{2}$	$^{59}/_{2}$	$^{59}/_{2}$
35	$^{69}/_{2}$	$^{69}/_{2}$	$^{69}/_{2}$	$^{69}/_{2}$	$^{69}/_{2}$	$^{69}/_{2}$	$^{69}/_{2}$
40	$^{40}/_{1}$	$^{40}/_{1}$	$^{79}/_{2}$	$^{79}/_{2}$	$^{79}/_{2}$	$^{79}/_{2}$	$^{79}/_{2}$
45	$^{45}/_{1}$	$^{45}/_{1}$	$^{45}/_{1}$	$^{45}/_{1}$	$^{45}/_{1}$	$^{89}/_{2}$	$^{89}/_{2}$
50	$^{50}/_{1}$	$^{50}/_{1}$	$^{50}/_{1}$	$^{50}/_{1}$	$^{50}/_{1}$	$^{50}/_{1}$	$^{50}/_{1}$
60	$^{60}/_{1}$	$^{60}/_{1}$	$^{60}/_{1}$	$^{60}/_{1}$	$^{60}/_{1}$	$^{60}/_{1}$	$^{60}/_{1}$
70	$^{70}/_{1}$	$^{70}/_{1}$	$^{70}/_{1}$	$^{70}/_{1}$	$^{70}/_{1}$	$^{70}/_{1}$	$^{70}/_{1}$

TABLE 8: NOMINAL AND EXACT REDUCTION RATIOS: DOUBLE REDUCTION.

Ratio	10	12	14	17	20	24	28
Nominal Ratio	Exact Ratio and Ratio Combinations						
75	$^{31}/_{6} \times ^{44}/_{3} = ^{76}/_{1}$	$^{41}/_{8} \times ^{44}/_{3} = ^{75}/_{1}$	$^{41}/_{8} \times ^{59}/_{4} = ^{76}/_{1}$	$^{41}/_{8} \times ^{59}/_{4} = ^{76}/_{1}$	$^{41}/_{8} \times ^{59}/_{4} = ^{76}/_{1}$	$^{46}/_{9} \times ^{59}/_{4} = ^{75}/_{1}$	$^{51}/_{8} \times ^{59}/_{4} = ^{75}/_{1}$
150	$^{29}/_{3} \times ^{44}/_{3} = ^{142}/_{1}$	$^{39}/_{4} \times ^{44}/_{3} = ^{143}/_{1}$	$^{41}/_{8} \times ^{59}/_{2} = ^{151}/_{1}$	$^{39}/_{4} \times ^{59}/_{4} = ^{143}/_{1}$	$^{39}/_{4} \times ^{59}/_{4} = ^{143}/_{1}$	$^{46}/_{9} \times ^{59}/_{2} = ^{151}/_{1}$	$^{51}/_{10} \times ^{59}/_{2} = ^{150}/_{1}$
250	$^{29}/_{3} \times ^{49}/_{2} = ^{237}/_{1}$	$^{39}/_{4} \times ^{49}/_{2} = ^{239}/_{1}$	$^{39}/_{4} \times ^{49}/_{2} = ^{239}/_{1}$	$^{39}/_{4} \times ^{49}/_{2} = ^{239}/_{1}$	$^{39}/_{4} \times ^{49}/_{2} = ^{239}/_{1}$	$^{39}/_{4} \times ^{74}/_{3} = ^{241}/_{1}$	$^{49}/_{5} \times ^{74}/_{3} = ^{241}/_{1}$
300	$^{31}/_{2} \times ^{41}/_{2} = ^{317}/_{1}$	$^{44}/_{3} \times ^{41}/_{2} = ^{301}/_{1}$	$^{44}/_{3} \times ^{59}/_{3} = ^{288}/_{1}$	$^{39}/_{4} \times ^{59}/_{2} = ^{287}/_{1}$	$^{44}/_{3} \times ^{59}/_{3} = ^{288}/_{1}$	$^{44}/_{3} \times ^{59}/_{3} = ^{288}/_{1}$	$^{59}/_{4} \times ^{59}/_{3} = ^{290}/_{1}$
500	$^{41}/_{2} \times ^{49}/_{2} = ^{502}/_{1}$	$^{41}/_{2} \times ^{49}/_{2} = ^{502}/_{1}$	$^{49}/_{2} \times ^{59}/_{3} = ^{482}/_{1}$	$^{49}/_{2} \times ^{59}/_{3} = ^{482}/_{1}$	$^{49}/_{2} \times ^{59}/_{3} = ^{482}/_{1}$	$^{49}/_{2} \times ^{59}/_{3} = ^{482}/_{1}$	$^{49}/_{2} \times ^{59}/_{3} = ^{482}/_{1}$
750	$^{30}/_{1} \times ^{49}/_{2} = ^{735}/_{1}$	$^{30}/_{1} \times ^{49}/_{2} = ^{735}/_{1}$	$^{59}/_{2} \times ^{49}/_{2} = ^{723}/_{1}$	$^{49}/_{2} \times ^{59}/_{2} = ^{723}/_{1}$	$^{59}/_{2} \times ^{49}/_{2} = ^{723}/_{1}$	$^{49}/_{2} \times ^{59}/_{2} = ^{723}/_{1}$	$^{59}/_{2} \times ^{74}/_{3} = ^{727}/_{1}$
1000	$^{40}/_{1} \times ^{49}/_{2} = ^{980}/_{1}$	$^{40}/_{1} \times ^{49}/_{2} = ^{980}/_{1}$	$^{40}/_{1} \times ^{49}/_{2} = ^{980}/_{1}$	$^{40}/_{1} \times ^{49}/_{2} = ^{980}/_{1}$	$^{40}/_{1} \times ^{49}/_{2} = ^{980}/_{1}$	$^{40}/_{1} \times ^{74}/_{3} = ^{986}/_{1}$	$^{79}/_{2} \times ^{74}/_{3} = ^{974}/_{1}$
1500	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$	$^{50}/_{1} \times ^{59}/_{2} = ^{1475}/_{1}$
2000	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{40}/_{1} \times ^{50}/_{1} = ^{2000}/_{1}$	$^{79}/_{2} \times ^{50}/_{1} = ^{1975}/_{1}$
2500	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$	$^{50}/_{1} \times ^{50}/_{1} = ^{2500}/_{1}$
3000	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$	$^{50}/_{1} \times ^{60}/_{1} = ^{3000}/_{1}$
4200	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$	$^{60}/_{1} \times ^{70}/_{1} = ^{4200}/_{1}$
4900	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$	$^{70}/_{1} \times ^{70}/_{1} = ^{4900}/_{1}$

It is possible to obtain ratios between those shown above - consult the technical sales department, at Renold Gears.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 5/1

Nominal Ratio 5/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	125	150	179	215	235	281	307	368	425	509	511	613	571	684
		Output Torque lb.in., Thermal	21496	25988	30583	36989	39935	48298	52133	63057	71783	86855	85722	103770	94938	114927
1800	360	Input HP, Mechanical	220	244	360	400	488	543	724	805	953	1059	1387	1541	1762	1955
		Output Torque lb.in., Mechanical	37742	42271	61699	69103	83455	93469	123643	138480	162005	181446	234541	262686	296487	332065
		Efficiency %	96	96	96	96	96	96	96	96	95	96	95	96	95	95
		Input HP, Thermal	115	138	165	198	219	263	290	347	412	495	509	610	586	702
		Output Torque lb.in., Thermal	23698	28654	33813	40899	44835	54224	59142	71527	83919	101519	102927	124556	117840	14258
1500	300	Input HP, Mechanical	200	223	326	363	447	497	674	750	894	994	1285	1428	1642	1824
		Output Torque lb.in., Mechanical	41242	46191	67046	75091	91732	102740	138334	154934	182882	204828	261652	293050	333317	373315
		Efficiency %	96	96	96	96	96	96	96	96	96	96	95	96	95	96
		Input HP, Thermal	104	125	148	177	201	241	274	329	384	461	490	587	587	704
		Output Torque lb.in., Thermal	26671	32256	37794	45723	51260	62000	70144	84833	97909	118430	124262	150338	148515	179640
1200	240	Input HP, Mechanical	180	200	294	327	395	440	601	668	805	895	1168	1298	1476	1641
		Output Torque lb.in., Mechanical	46295	51850	75372	84417	101374	113539	154189	172692	206076	230805	298056	333822	376191	421334
		Efficiency %	95	96	96	96	96	96	96	96	96	96	96	96	95	96
		Input HP, Thermal	92	110	129	155	179	215	251	301	353	423	462	554	573	687
		Output Torque lb.in., Thermal	28132	34032	39613	47935	54795	66287	76995	93127	108003	130643	140882	170435	174419	210940
1000	200	Input HP, Mechanical	162	181	267	297	363	404	542	603	730	812	1068	1187	1366	1519
		Output Torque lb.in., Mechanical	49960	55955	82014	91856	111562	124949	166710	186715	224234	251142	327426	366717	418660	468899
		Efficiency %	95	96	95	96	96	96	96	96	96	96	96	96	96	96
		Input HP, Thermal	71	85	99	119	141	169	203	243	297	356	403	484	525	630
		Output Torque lb.in., Thermal	28821	34882	40180	48644	57314	69363	82642	99987	120887	146259	164058	198491	213941	258723
750	150	Input HP, Mechanical	141	157	232	257	317	352	476	529	630	700	894	994	1158	1288
		Output Torque lb.in., Mechanical	57557	64463	94431	105763	129178	144680	194770	218142	257465	288361	365374	409219	473728	530576
		Efficiency %	95	96	95	96	95	96	95	96	96	96	96	96	96	96
		Input HP, Thermal	48	57	65	78	97	116	141	169	219	263	312	374	430	516
		Output Torque lb.in., Thermal	28789	34872	39567	47944	58743	71148	85460	103465	133473	161581	189719	229643	262596	317647
500	100	Input HP, Mechanical	110	122	180	200	246	273	376	418	506	562	738	820	940	1045
		Output Torque lb.in., Mechanical	66605	74598	109335	122455	149290	167204	229508	257049	308721	345768	450545	504610	575599	644671
		Efficiency %	94	95	94	95	94	95	95	96	95	96	95	96	96	96
		Input HP, Thermal	28	33	37	44	58	69	82	98	124	149	188	225	276	331
		Output Torque lb.in., Thermal	32699	39679	44036	53461	68547	83171	98123	118992	148612	180194	225353	273180	333555	403947
250	50	Input HP, Mechanical	72	80	119	126	163	180	247	273	329	364	484	536	626	695
		Output Torque lb.in., Mechanical	85738	96027	141492	151803	194080	217370	295868	331372	395550	443016	582757	652688	758063	849031
		Efficiency %	92	93	92	94	93	94	93	94	94	95	94	95	94	95

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 7.5/1 (This ratio made to order only).

Nominal Ratio 7.5/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	120	144	177	212	239	286	323	387	469	562	588	705	679	813
		Output Torque lb.in., Thermal	29389	35503	43301	52304	59231	71558	80034	96689	116136	140346	144166	174252	165592	200186
1800	240	Input HP, Mechanical	161	179	247	275	410	456	660	733	950	1057	1392	1548	1586	1762
		Output Torque lb.in., Mechanical	39463	44199	60687	67970	102049	114295	164164	183864	236448	264821	343337	384537	389604	436356
		Efficiency %	95	96	96	96	96	96	96	96	96	96	95	96	95	96
		Input HP, Thermal	109	130	160	192	217	261	296	355	440	527	566	678	672	805
		Output Torque lb.in., Thermal	31820	38445	47010	56790	64754	78234	88118	106455	130970	158266	166985	201806	197553	238774
1500	200	Input HP, Mechanical	147	164	228	254	374	416	604	672	874	972	1290	1434	1453	1615
		Output Torque lb.in., Mechanical	43288	48483	67133	75189	111601	124993	180560	202227	261225	292571	382452	428347	429604	481157
		Efficiency %	95	96	95	96	96	96	96	96	96	96	96	96	95	96
		Input HP, Thermal	96	115	141	169	194	232	272	326	394	473	523	627	642	770
		Output Torque lb.in., Thermal	35222	42565	51631	62383	72062	87077	101084	122129	146778	177373	193168	233436	236925	286322
1200	160	Input HP, Mechanical	132	147	206	228	337	375	529	589	765	851	1142	1270	1300	1446
		Output Torque lb.in., Mechanical	48374	54179	75398	84446	125631	140707	197556	221263	285904	320213	423604	474436	481799	539615
		Efficiency %	95	96	95	96	95	96	96	96	96	96	96	96	96	96
		Input HP, Thermal	84	101	122	146	170	204	244	292	353	423	478	574	604	724
		Output Torque lb.in., Thermal	36827	44514	53585	64756	75789	91596	108593	131217	157436	190272	212178	256418	267603	323388
1000	133.3	Input HP, Mechanical	120	133	187	208	309	343	491	545	700	778	1015	1129	1163	1294
		Output Torque lb.in., Mechanical	52410	58699	82289	92163	137794	154329	219382	245708	313406	351015	451791	506005	517630	579746
		Efficiency %	95	96	95	96	95	96	96	96	96	96	96	96	96	96
		Input HP, Thermal	65	77	93	111	132	158	192	230	287	344	402	482	526	631
		Output Torque lb.in., Thermal	37457	45294	53867	65119	77981	94278	113835	137591	170392	205984	237202	286712	311037	375915
750	100	Input HP, Mechanical	100	111	157	174	260	289	419	465	604	671	886	985	992	1103
		Output Torque lb.in., Mechanical	57826	64766	91315	102272	153997	172476	248792	278647	359535	402679	525131	588147	588276	658869
		Efficiency %	94	95	94	95	95	96	95	96	95	96	96	96	96	96
		Input HP, Thermal	43	52	61	73	90	108	131	157	207	248	300	360	410	492
		Output Torque lb.in., Thermal	37353	45199	52845	63924	79154	95756	115761	139996	183161	221542	264511	319871	362102	437797
500	66.7	Input HP, Mechanical	79	87	124	137	204	226	327	363	470	521	699	776	804	893
		Output Torque lb.in., Mechanical	67761	75892	106935	119767	179722	201288	288921	323592	416669	466669	617597	691708	712004	797445
		Efficiency %	93	94	94	95	94	95	94	95	95	96	95	96	95	96
		Input HP, Thermal	25	30	35	42	54	64	76	91	116	139	178	212	255	305
		Output Torque lb.in., Thermal	42719	51762	59064	71540	92515	112071	132346	160257	201969	244615	308162	373117	444087	537525
250	33.3	Input HP, Mechanical	51	56	80	88	132	146	211	234	308	316	460	509	524	581
		Output Torque lb.in., Mechanical	86076	96405	135852	152155	228138	255515	367392	411479	536661	557228	800207	896232	915584	1025455
		Efficiency %	91	93	92	93	92	94	93	94	93	94	94	95	94	95

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 10/1

Nominal Ratio 10/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	108	129	160	192	218	261	294	352	446	534	580	694	681	815
		Output Torque lb.in., Thermal	34849	42074	51859	62605	70972	85680	95808	115654	145383	175542	189292	228595	221421	267422
1800	180	Input HP, Mechanical	109	121	167	186	317	352	518	575	688	765	1186	1318	1590	1766
		Output Torque lb.in., Mechanical	35171	39392	54248	60758	103581	116011	169054	189340	225065	252073	389161	435860	520550	583016
		Efficiency %	95	96	95	96	95	96	95	96	95	96	95	96	95	96
		Input HP, Thermal	97	116	144	172	197	235	268	320	413	495	548	657	662	792
		Output Torque lb.in., Thermal	37440	45208	55761	67322	76884	92823	104557	126218	161850	195423	215381	260084	259278	313107
1500	150	Input HP, Mechanical	100	111	155	172	287	319	463	515	619	687	1075	1195	1446	1607
		Output Torque lb.in., Mechanical	38861	43525	60066	67274	112566	126074	181552	203338	242862	272006	423788	474642	569382	637708
		Efficiency %	95	95	95	96	95	96	95	96	95	96	95	96	95	96
		Input HP, Thermal	85	102	125	150	174	208	243	291	366	438	497	595	620	742
		Output Torque lb.in., Thermal	41161	49710	60697	73291	84799	102391	118781	143399	178932	216059	244220	294908	304191	367323
1200	120	Input HP, Mechanical	89	99	138	154	259	288	414	460	546	606	952	1059	1288	1432
		Output Torque lb.in., Mechanical	42857	48000	66959	74994	126688	141890	202407	226695	267643	299760	469626	525981	635229	711456
		Efficiency %	94	95	95	95	95	96	95	96	95	96	95	96	95	96
		Input HP, Thermal	74	89	108	130	152	182	217	260	324	388	449	537	574	687
		Output Torque lb.in., Thermal	42894	51811	62692	75712	88733	107156	126852	153157	190215	229703	264526	319447	338052	408218
1000	100	Input HP, Mechanical	79	88	124	138	234	260	377	419	498	554	848	943	1156	1285
		Output Torque lb.in., Mechanical	45607	51080	71814	80432	136679	153081	221136	247672	292930	328082	501718	561924	683942	766015
		Efficiency %	94	95	94	95	95	95	95	96	95	96	95	96	95	96
		Input HP, Thermal	57	68	82	98	117	140	170	204	262	313	371	444	490	587
		Output Torque lb.in., Thermal	43528	52594	62768	75825	90871	109768	132180	159624	203803	246164	290765	351194	384828	464756
750	75	Input HP, Mechanical	67	74	103	114	194	215	318	353	426	473	743	825	1005	1116
		Output Torque lb.in., Mechanical	50930	57042	79146	88644	150473	168530	247579	277288	332358	372241	583913	653982	791186	886129
		Efficiency %	93	94	94	95	94	95	94	95	95	96	95	96	95	96
		Input HP, Thermal	38	46	54	65	80	96	116	139	188	224	274	328	375	449
		Output Torque lb.in., Thermal	43426	52499	61508	74340	92037	111230	133911	161781	217502	262824	319832	386452	439788	531307
500	50	Input HP, Mechanical	52	58	81	90	153	169	251	278	335	371	582	646	795	882
		Output Torque lb.in., Mechanical	58948	66022	92347	103429	175944	197058	290148	324966	388957	435631	682153	764011	933645	1045683
		Efficiency %	92	93	93	94	93	94	94	95	94	95	95	95	95	96
		Input HP, Thermal	23	27	31	37	48	57	68	81	105	126	161	193	231	276
		Output Torque lb.in., Thermal	49891	60378	68966	83438	107761	130362	153041	185061	239595	289806	370620	448252	534015	645717
250	25	Input HP, Mechanical	33	37	52	57	98	108	159	176	212	235	373	395	510	546
		Output Torque lb.in., Mechanical	73626	82461	116174	130115	221733	248341	360850	404152	484771	542943	860291	920780	1179668	1278799
		Efficiency %	90	92	91	92	91	93	92	93	92	94	93	94	93	94

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 12.5/1 (This ratio made to order only).

Nominal Ratio 12.5/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	94	112	140	167	194	232	268	321	410	490	500	598	635	759
		Output Torque lb.in., Thermal	37801	45617	56443	68109	78691	94961	108565	131009	166338	200757	204237	246477	259395	313112
1800	144	Input HP, Mechanical	117	130	179	199	266	295	429	476	574	637	987	1096	1471	1633
		Output Torque lb.in., Mechanical	47353	53035	72446	81140	107685	120608	173982	194859	233459	261474	405041	453646	604575	677124
		Efficiency %	94	95	94	95	95	95	95	95	95	96	94	95	95	96
		Input HP, Thermal	84	100	125	149	175	209	242	289	377	450	473	565	611	731
		Output Torque lb.in., Thermal	40499	48877	60478	72984	84766	102299	117442	141725	183533	221511	232295	280326	300658	362893
1500	120	Input HP, Mechanical	107	119	165	183	245	272	389	431	521	579	902	1002	1348	1497
		Output Torque lb.in., Mechanical	51645	57842	79919	89510	119123	133418	189179	211880	254489	285028	445017	498419	666656	746655
		Efficiency %	94	95	94	95	94	95	95	95	95	96	95	96	95	96
		Input HP, Thermal	74	88	109	130	154	184	218	261	330	395	428	512	566	677
		Output Torque lb.in., Thermal	44413	53610	65617	79195	92985	112230	132192	159535	201043	242657	263321	317765	348635	420789
1200	96	Input HP, Mechanical	94	104	146	162	219	242	346	384	458	509	792	879	1191	1323
		Output Torque lb.in., Mechanical	56194	62938	88015	98577	132442	148335	210460	235715	279377	312902	488407	547015	737191	825654
		Efficiency %	93	94	94	95	94	95	94	95	95	96	95	96	95	96
		Input HP, Thermal	64	77	94	112	134	160	193	231	291	348	387	462	520	621
		Output Torque lb.in., Thermal	46229	55810	67662	81673	97006	117096	140388	169442	212459	256457	285159	344133	384205	463732
1000	80	Input HP, Mechanical	83	92	130	144	196	217	316	350	422	469	698	775	1054	1171
		Output Torque lb.in., Mechanical	59470	66606	93584	104814	142008	159049	229653	257211	308350	345352	516293	578249	782470	876367
		Efficiency %	93	94	93	94	94	95	94	95	95	95	95	95	95	96
		Input HP, Thermal	49	59	71	85	103	123	151	180	234	279	320	382	440	526
		Output Torque lb.in., Thermal	46882	56611	67657	81685	99075	119620	145462	175599	226161	273047	313344	378191	432814	522458
750	60	Input HP, Mechanical	71	78	110	122	165	183	265	294	357	396	623	692	936	1039
		Output Torque lb.in., Mechanical	67120	75174	105117	117731	158466	177482	255764	286456	345749	387238	612822	686361	923925	1034796
		Efficiency %	92	93	93	94	93	94	94	95	94	95	94	95	95	96
		Input HP, Thermal	33	40	47	56	71	84	103	123	167	199	236	282	334	399
		Output Torque lb.in., Thermal	46789	56523	66286	80061	100235	121067	146877	177369	240302	290224	344481	415886	490219	591916
500	40	Input HP, Mechanical	55	61	86	94	128	141	206	228	276	306	485	537	730	810
		Output Torque lb.in., Mechanical	77210	86475	121046	135571	182280	204154	295625	331100	397874	445619	709116	794209	1074713	1203678
		Efficiency %	91	92	92	93	92	93	93	94	93	94	94	95	94	95
		Input HP, Thermal	20	23	27	32	42	50	60	71	94	112	139	166	206	245
		Output Torque lb.in., Thermal	53849	65105	74417	89951	117512	142050	167913	202927	264661	319903	398865	481870	592632	716092
250	20	Input HP, Mechanical	35	38	55	60	83	91	133	146	177	195	310	316	442	437
		Output Torque lb.in., Mechanical	95764	107256	151553	169740	229885	257472	371477	416054	498833	558693	889237	920780	1278799	1278799
		Efficiency %	89	90	89	91	90	92	91	92	91	93	92	93	92	94

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 15/1

Nominal Ratio 15/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	84	100	125	149	175	209	241	288	353	422	493	588	588	702
		Output Torque lb.in., Thermal	39995	48253	59895	72258	84897	102427	116620	140692	171082	206401	239072	288477	284086	342810
1800	120	Input HP, Mechanical	96	106	147	163	245	271	394	437	557	618	857	951	1168	1296
		Output Torque lb.in., Mechanical	46058	51585	70592	79063	118753	133003	191241	214190	270453	302908	417383	467469	567813	635951
		Efficiency %	93	94	94	95	94	95	94	95	94	95	94	95	94	95
		Input HP, Thermal	75	89	111	133	157	187	216	258	325	388	459	549	563	672
		Output Torque lb.in., Thermal	42749	51580	63982	77194	91015	109814	125595	151524	188998	228017	267887	323239	327320	394959
1500	100	Input HP, Mechanical	87	96	134	149	224	248	352	390	501	556	776	861	1071	1189
		Output Torque lb.in., Mechanical	49764	55735	77124	86378	129941	145533	204732	229300	292133	327189	454301	508817	626551	701737
		Efficiency %	93	94	93	94	94	95	94	95	94	95	94	95	94	95
		Input HP, Thermal	66	78	97	115	137	164	194	232	285	341	410	489	517	618
		Output Torque lb.in., Thermal	46786	56459	69228	83531	99392	119933	140708	169767	207293	250098	298755	360493	377003	454903
1200	80	Input HP, Mechanical	75	83	118	131	199	221	319	353	448	497	670	743	933	1036
		Output Torque lb.in., Mechanical	53702	60146	84668	94828	144287	161601	231490	259269	326218	365364	489854	548636	683002	764962
		Efficiency %	93	94	93	94	93	95	94	95	94	95	94	95	94	95
		Input HP, Thermal	57	68	83	99	120	143	172	205	252	301	366	437	473	565
		Output Torque lb.in., Thermal	48654	58720	71285	86022	103434	124823	149018	179808	219234	264521	319981	386125	413493	498944
1000	66.7	Input HP, Mechanical	68	75	105	116	177	196	287	318	407	451	629	698	869	964
		Output Torque lb.in., Mechanical	57711	64637	89612	100366	153547	171973	249249	279159	355110	397724	551521	617704	762840	854381
		Efficiency %	92	93	93	94	93	94	93	95	94	95	94	95	94	95
		Input HP, Thermal	44	52	63	75	92	110	134	160	202	241	299	357	398	475
		Output Torque lb.in., Thermal	49315	59530	71202	85940	105414	127237	153986	185833	233549	281832	347141	418956	463091	558848
750	50	Input HP, Mechanical	57	63	89	99	151	167	242	268	345	382	535	593	740	821
		Output Torque lb.in., Mechanical	64202	71906	101179	113321	172565	193273	278855	312317	399289	447203	622775	697509	863381	966987
		Efficiency %	91	93	92	93	92	94	93	94	93	94	94	95	94	95
		Input HP, Thermal	30	35	42	50	63	75	91	109	145	173	219	261	301	359
		Output Torque lb.in., Thermal	49235	59454	69752	84217	106570	128676	155248	187411	248224	299623	378020	456351	521945	630024
500	33.3	Input HP, Mechanical	44	49	70	77	117	129	187	206	263	291	409	453	571	633
		Output Torque lb.in., Mechanical	73843	82704	116531	130515	198715	222561	318943	357216	451190	505332	708336	793337	992699	1111823
		Efficiency %	90	91	91	92	91	93	92	93	92	94	93	94	93	94
		Input HP, Thermal	18	21	24	29	38	45	53	63	82	97	129	154	185	220
		Output Torque lb.in., Thermal	56758	68586	78407	94729	125122	151180	177526	214443	273264	330053	436693	527531	629538	760365
250	16.7	Input HP, Mechanical	28	31	44	49	75	82	120	128	170	187	262	268	363	370
		Output Torque lb.in., Mechanical	91431	102403	144826	162205	247519	277222	400132	434708	568940	637213	889470	920780	1238193	1278799
		Efficiency %	87	89	88	90	89	91	90	91	90	92	91	93	92	93

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 20/1

Nominal Ratio 20/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	62	74	97	115	143	170	197	234	302	360	411	490	494	589
		Output Torque lb.in., Thermal	40682	49059	63682	76797	90776	109482	124907	150639	192733	232455	262635	316787	314427	379269
1800	90	Input HP, Mechanical	70	77	109	121	185	205	293	324	430	476	732	811	1066	1180
		Output Torque lb.in., Mechanical	45576	51045	71816	80434	118177	132359	186867	209291	275243	308272	469685	526047	682684	764607
		Efficiency %	91	92	92	93	93	94	93	94	93	94	93	94	93	94
		Input HP, Thermal	56	66	86	103	127	152	176	209	275	328	381	454	470	559
		Output Torque lb.in., Thermal	43508	52469	67839	81815	96985	116975	133978	161583	210842	254299	292493	352796	359727	433895
1500	75	Input HP, Mechanical	63	69	99	109	170	188	258	286	380	421	652	722	958	1061
		Output Torque lb.in., Mechanical	48835	54695	77837	87177	129941	145534	197273	220945	292043	327088	502288	562562	737862	826406
		Efficiency %	91	92	91	93	92	94	92	94	93	94	93	94	93	94
		Input HP, Thermal	49	58	75	89	111	132	157	187	240	285	338	403	429	511
		Output Torque lb.in., Thermal	47625	57440	73213	88303	105566	127335	149454	180257	228965	276168	324084	390910	411073	495827
1200	60	Input HP, Mechanical	55	61	87	96	150	166	240	266	350	388	595	659	873	967
		Output Torque lb.in., Mechanical	53309	59706	85278	95512	142597	159709	228803	256260	335781	376074	572681	641402	841309	942266
		Efficiency %	90	92	91	92	92	93	92	93	93	94	93	94	93	94
		Input HP, Thermal	43	51	65	77	97	115	139	165	210	250	301	358	390	464
		Output Torque lb.in., Thermal	49531	59743	75292	90817	109668	132294	157884	190436	240642	290268	345617	416899	448383	540841
1000	50	Input HP, Mechanical	50	54	78	86	135	149	216	239	316	350	537	594	780	864
		Output Torque lb.in., Mechanical	57196	64059	91059	101986	152800	171136	246429	276001	362840	406381	618804	693060	901306	1009463
		Efficiency %	89	91	90	92	91	93	92	93	92	94	93	94	93	94
		Input HP, Thermal	33	39	49	58	75	89	108	129	168	200	245	291	326	389
		Output Torque lb.in., Thermal	50205	60565	75136	90641	111603	134648	162757	196338	254642	307192	373107	450108	498817	601724
750	37.5	Input HP, Mechanical	41	45	65	71	112	123	180	199	265	292	451	499	660	731
		Output Torque lb.in., Mechanical	62993	70553	99852	111834	167298	187374	271432	304004	401647	449845	690316	773154	1013131	1134706
		Efficiency %	88	90	89	91	91	92	91	93	92	93	93	94	93	94
		Input HP, Thermal	22	26	33	38	51	61	74	87	120	143	179	213	246	293
		Output Torque lb.in., Thermal	50108	60462	73602	88811	112774	136095	163873	197729	269487	325175	404795	488440	559106	674577
500	25	Input HP, Mechanical	32	35	51	55	87	96	140	154	204	225	346	382	504	553
		Output Torque lb.in., Mechanical	71500	80080	114717	128483	192942	216095	311653	349051	459118	514212	785199	879422	1149954	1278799
		Efficiency %	87	89	88	90	89	91	90	91	91	92	92	93	92	93
		Input HP, Thermal	13	16	19	22	31	37	44	51	68	80	106	126	152	180
		Output Torque lb.in., Thermal	57699	69652	82821	99982	132533	160023	187418	226247	296793	358302	467150	563962	672661	811965
250	12.5	Input HP, Mechanical	20	22	32	35	55	61	89	97	129	142	208	205	287	283
		Output Torque lb.in., Mechanical	87896	98444	141025	157948	237736	266264	383662	429701	565139	632956	920780	920780	1278799	1278799
		Efficiency %	83	86	85	87	86	88	87	89	88	90	89	91	90	91

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 25/1

Nominal Ratio 25/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	56	66	84	99	118	141	162	192	260	309	343	408	431	512
		Output Torque lb.in., Thermal	43200	52091	64916	78274	92217	111195	125825	151713	203747	245691	270636	326355	339929	409940
1800	72	Input HP, Mechanical	63	70	98	108	144	159	232	255	336	371	541	597	802	887
		Output Torque lb.in., Mechanical	48905	54773	76287	85442	112561	126068	180639	202316	264266	295978	428247	479637	636612	713005
		Efficiency %	90	91	90	92	91	92	91	92	92	93	92	93	92	93
		Input HP, Thermal	50	59	75	88	106	125	145	172	236	280	318	377	407	484
		Output Torque lb.in., Thermal	46045	55524	69100	83321	98510	118787	135073	162867	221976	267676	301045	363022	386443	466022
1500	60	Input HP, Mechanical	57	63	89	98	138	152	217	240	315	348	493	544	737	815
		Output Torque lb.in., Mechanical	52699	59023	82658	92577	128971	144448	203348	227750	297273	332946	469022	525304	703603	788035
		Efficiency %	90	91	90	92	91	92	91	92	92	93	92	93	92	93
		Input HP, Thermal	44	52	65	77	93	110	130	154	204	243	281	334	369	439
		Output Torque lb.in., Thermal	50265	60618	74518	89860	107199	129272	150759	181787	240070	289505	333144	401737	438515	528818
1200	48	Input HP, Mechanical	50	55	78	86	122	134	192	212	277	306	430	475	648	716
		Output Torque lb.in., Mechanical	57190	64053	90140	100957	141141	158078	223723	250570	325801	364897	511154	572492	772963	865718
		Efficiency %	89	90	89	91	90	92	91	92	91	93	92	93	92	93
		Input HP, Thermal	38	45	56	66	81	95	115	136	179	213	250	297	334	397
		Output Torque lb.in., Thermal	52212	62970	76606	92384	111350	134286	159318	192116	251672	303510	354980	428083	476006	574043
1000	40	Input HP, Mechanical	45	49	70	77	108	119	172	190	249	275	387	427	575	636
		Output Torque lb.in., Mechanical	60694	67977	95680	107161	150233	168260	239820	268598	350159	392178	550183	616205	822606	921319
		Efficiency %	88	90	89	91	90	91	90	92	91	93	92	93	92	93
		Input HP, Thermal	30	35	42	50	62	74	90	106	143	170	204	242	279	331
		Output Torque lb.in., Thermal	52889	63795	76427	92179	113303	136657	164295	198137	265601	320341	382823	461699	526508	634993
750	30	Input HP, Mechanical	38	41	58	64	90	98	143	157	206	228	324	357	486	536
		Output Torque lb.in., Mechanical	67371	75455	104813	117390	163492	183111	262230	293697	384280	430393	610557	683824	921838	1032458
		Efficiency %	87	89	88	90	89	90	89	91	90	92	91	92	92	93
		Input HP, Thermal	20	24	28	33	43	50	61	72	102	121	149	177	210	249
		Output Torque lb.in., Thermal	52827	63733	74864	90312	114475	138099	165433	199544	280618	338517	414961	500543	587466	708623
500	20	Input HP, Mechanical	29	32	45	49	70	77	111	122	161	177	252	277	378	417
		Output Torque lb.in., Mechanical	76101	85233	120033	134437	188040	210605	301546	337732	441800	494817	702948	787302	1064163	1191863
		Efficiency %	85	87	86	88	87	89	88	90	89	91	90	91	90	92
		Input HP, Thermal	12	14	17	19	26	31	36	43	58	69	89	105	129	153
		Output Torque lb.in., Thermal	61009	73634	84259	101685	134485	162304	189065	228133	309143	373080	478610	577545	705616	851472
250	10	Input HP, Mechanical	18	20	29	31	44	48	70	77	101	110	158	166	234	229
		Output Torque lb.in., Mechanical	91951	102985	145778	163271	229202	256706	367095	411146	536648	601045	856716	920780	1278799	1278799
		Efficiency %	82	84	83	85	84	86	85	87	86	88	87	89	88	90

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 30/1

Nominal Ratio 30/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	51	60	76	90	104	123	143	169	221	262	289	343	349	413
		Output Torque lb.in., Thermal	46311	55839	69951	84339	95679	115355	132170	159347	205424	247673	267992	323113	321004	387036
1800	60	Input HP, Mechanical	55	60	87	95	129	142	207	228	303	334	498	549	718	790
		Output Torque lb.in., Mechanical	50294	56329	79870	89455	119687	134050	191634	214630	282352	316235	464566	520313	666814	746832
		Efficiency %	89	91	89	91	90	91	90	91	90	92	90	92	90	91
		Input HP, Thermal	45	53	67	80	92	109	128	151	201	238	268	318	331	39
		Output Torque lb.in., Thermal	49177	59297	74074	89313	101951	122921	141297	170352	223850	269891	298753	360198	367523	443115
1500	50	Input HP, Mechanical	49	54	78	86	117	129	185	203	272	299	451	497	656	723
		Output Torque lb.in., Mechanical	53947	60420	86072	96401	129626	145181	205092	229703	303781	340234	505476	566133	734541	822686
		Efficiency %	88	90	89	91	89	91	90	91	90	92	90	92	90	92
		Input HP, Thermal	40	47	58	69	81	95	114	135	174	206	238	282	302	358
		Output Torque lb.in., Thermal	53528	64548	79532	95901	110687	133461	157052	189355	242143	291955	331372	399531	420376	506835
1200	40	Input HP, Mechanical	43	47	68	75	102	113	163	179	238	262	391	431	574	633
		Output Torque lb.in., Mechanical	58074	65043	93030	104193	140935	157848	225308	252345	331115	370849	547604	613316	804422	900953
		Efficiency %	87	89	88	90	89	90	89	91	90	91	90	92	90	92
		Input HP, Thermal	34	41	50	59	70	83	101	119	153	181	212	251	275	326
		Output Torque lb.in., Thermal	55534	66972	81585	98381	114833	138467	165567	199629	253868	306105	353617	426362	458821	553195
1000	33.3	Input HP, Mechanical	38	41	60	66	91	100	146	160	213	235	350	386	508	560
		Output Torque lb.in., Mechanical	61105	68438	98032	109796	149237	167146	240365	269209	354934	397526	586749	657159	853011	955372
		Efficiency %	87	89	88	89	88	90	89	90	90	91	90	92	90	92
		Input HP, Thermal	27	31	38	45	54	64	79	93	122	144	173	205	231	273
		Output Torque lb.in., Thermal	56232	67822	81275	98019	116728	140768	170343	205406	267929	323084	381956	460561	510738	615822
750	25	Input HP, Mechanical	32	35	51	56	76	83	120	132	177	195	296	326	434	478
		Output Torque lb.in., Mechanical	68159	76338	108863	121927	164132	183828	261370	292734	389449	436183	656144	734881	966272	1082225
		Efficiency %	85	88	86	88	87	89	88	90	89	90	89	91	90	91
		Input HP, Thermal	18	21	25	30	37	44	54	63	88	103	127	150	175	206
		Output Torque lb.in., Thermal	56237	67841	79649	96076	117911	142218	171328	206625	283048	341368	414394	499741	572489	690358
500	16.7	Input HP, Mechanical	25	27	39	43	59	64	94	103	138	151	231	253	339	373
		Output Torque lb.in., Mechanical	76990	86228	122992	137751	185999	208318	300334	336374	447271	500944	754921	845511	1117879	1252025
		Efficiency %	83	86	84	87	85	87	86	88	87	89	88	90	89	90
		Input HP, Thermal	11	13	15	18	23	27	32	38	50	59	76	89	108	128
		Output Torque lb.in., Thermal	65208	78692	89963	108555	138663	167305	195954	236399	311722	376075	477761	576338	688012	829908
250	8.3	Input HP, Mechanical	15	17	25	27	37	40	60	65	87	95	146	142	201	196
		Output Torque lb.in., Mechanical	91497	102477	147497	165196	225466	252521	366069	409997	543307	608504	918593	920780	1278799	1278799
		Efficiency %	80	83	81	83	82	84	82	85	84	86	85	87	86	88

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 35/1 (This ratio made to order only).

Nominal Ratio 35/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	40	47	61	72	85	100	125	148	196	232	258	305	311	368
		Output Torque lb.in., Thermal	41244	49717	63499	76545	88913	107180	132894	160203	210435	253691	275206	331778	330396	398319
1800	51.4	Input HP, Mechanical	42	46	67	74	100	110	167	184	258	284	409	450	598	658
		Output Torque lb.in., Mechanical	43962	49238	70648	79125	105686	118368	178244	199634	277939	311292	439705	492470	641045	717970
		Efficiency %	86	88	87	89	87	89	88	90	89	91	89	91	89	90
		Input HP, Thermal	36	42	54	64	76	89	112	132	178	210	238	282	295	348
		Output Torque lb.in., Thermal	44097	53158	67742	81661	95355	114948	142079	171278	228880	275929	306115	369038	377382	454956
1500	42.9	Input HP, Mechanical	38	42	61	67	90	99	149	163	230	253	368	405	543	598
		Output Torque lb.in., Mechanical	47128	52783	76174	85315	113836	127497	189770	212543	297206	332871	475311	532348	701265	785416
		Efficiency %	85	87	86	88	87	89	88	90	89	91	89	91	89	91
		Input HP, Thermal	32	37	47	56	67	78	100	118	154	182	211	249	268	317
		Output Torque lb.in., Thermal	48249	58166	73183	88223	104115	125513	157912	190371	247123	297930	338739	408374	430513	519008
1200	34.3	Input HP, Mechanical	33	36	53	58	79	87	131	144	201	221	318	349	475	522
		Output Torque lb.in., Mechanical	50620	56694	82337	92217	123799	138655	207953	232908	323227	362014	512431	573923	766950	858984
		Efficiency %	84	87	85	88	86	88	88	89	89	90	89	91	89	91
		Input HP, Thermal	28	32	41	48	58	69	88	104	135	160	188	222	244	288
		Output Torque lb.in., Thermal	50169	60483	75302	90782	108346	130618	166469	200694	258792	312009	360917	435120	469021	565438
1000	28.6	Input HP, Mechanical	29	32	47	51	70	77	117	129	181	199	287	315	421	463
		Output Torque lb.in., Mechanical	53480	59897	86830	97249	131286	147041	222141	248798	347278	388951	552925	619276	815525	913388
		Efficiency %	83	86	85	87	86	88	87	89	88	90	89	90	89	91
		Input HP, Thermal	21	25	31	37	45	53	69	81	108	127	153	181	204	241
		Output Torque lb.in., Thermal	50843	61300	75178	90639	110417	133125	171269	206495	272795	328916	389155	469191	520934	628051
750	21.4	Input HP, Mechanical	25	27	40	43	59	65	98	107	152	167	244	268	363	399
		Output Torque lb.in., Mechanical	59267	66379	96390	107956	145223	162649	244861	274245	385242	431471	623029	697792	930313	1041950
		Efficiency %	82	84	83	86	84	87	86	88	87	89	88	90	88	90
		Input HP, Thermal	15	17	21	24	31	37	47	55	78	91	113	133	155	182
		Output Torque lb.in., Thermal	50734	61177	73627	88780	111577	134540	172248	207702	287977	347267	421661	508441	582862	702784
500	14.3	Input HP, Mechanical	19	21	31	34	46	50	76	83	118	128	188	206	281	308
		Output Torque lb.in., Mechanical	66911	74940	109170	122271	164630	184385	278986	312464	437020	489463	706212	790958	1063462	1191078
		Efficiency %	79	82	81	84	82	85	84	86	86	88	86	88	87	89
		Input HP, Thermal	9	10	12	14	19	22	28	33	45	52	68	79	96	113
		Output Torque lb.in., Thermal	58384	70419	82707	99755	130761	157713	196950	237552	317201	382618	486000	586181	699938	844162
250	7.1	Input HP, Mechanical	12	13	20	21	29	32	49	53	75	81	119	124	176	171
		Output Torque lb.in., Mechanical	79914	89504	131251	147002	199174	223075	338592	379223	531275	595028	860577	920780	1278799	1278799
		Efficiency %	75	78	77	80	78	81	80	83	82	84	83	85	84	86

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 40/1

Nominal Ratio 40/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	38	44	57	67	85	101	107	126	177	209	233	274	293	346
		Output Torque lb.in., Thermal	45063	54320	67892	81838	103008	124176	127641	153856	214072	258057	280426	338046	353126	425698
1800	45	Input HP, Mechanical	44	48	68	74	86	94	138	152	213	234	338	371	499	548
		Output Torque lb.in., Mechanical	52443	58736	81250	91000	103721	116168	165019	184821	258938	290010	410130	459345	606028	678751
		Efficiency %	85	87	86	88	87	89	86	88	88	90	88	89	88	90
		Input HP, Thermal	34	40	50	59	76	89	96	113	160	189	215	253	276	325
		Output Torque lb.in., Thermal	47937	57787	72091	86901	109164	131600	137045	165192	232523	280301	311465	375461	400750	483103
1500	37.5	Input HP, Mechanical	39	43	61	66	77	85	123	134	190	208	304	333	451	496
		Output Torque lb.in., Mechanical	55860	62563	87158	97617	111494	124873	175416	196466	275878	308984	442469	495565	660559	739826
		Efficiency %	84	87	85	87	87	89	86	88	88	89	88	90	88	90
		Input HP, Thermal	30	35	44	51	66	78	86	101	139	164	190	224	249	294
		Output Torque lb.in., Thermal	52242	62979	77570	93510	117949	142197	152924	184337	250724	302249	344129	414841	453905	547181
1200	30	Input HP, Mechanical	34	37	53	58	67	74	108	118	166	182	262	287	392	431
		Output Torque lb.in., Mechanical	59638	66794	93716	104962	120127	134542	191578	214568	300161	336180	475691	532774	717970	804127
		Efficiency %	83	86	84	87	86	88	86	88	87	89	88	89	88	90
		Input HP, Thermal	26	31	38	44	57	68	77	90	122	143	169	199	226	266
		Output Torque lb.in., Thermal	54226	65374	79656	96029	122061	147162	161590	194788	262349	316272	366289	441563	492073	593201
1000	25	Input HP, Mechanical	31	33	47	51	60	65	97	106	150	164	239	262	353	387
		Output Torque lb.in., Mechanical	63733	71381	98956	110830	126500	141680	206176	230917	324139	363036	518858	581121	773374	866179
		Efficiency %	83	85	83	86	85	87	85	87	87	89	87	89	88	90
		Input HP, Thermal	20	24	29	34	44	52	60	70	97	114	138	162	188	222
		Output Torque lb.in., Thermal	54910	66204	79409	95738	123836	149314	166627	200872	276310	333124	394493	475587	543381	655082
750	18.8	Input HP, Mechanical	26	28	40	43	51	55	82	90	127	138	203	222	302	331
		Output Torque lb.in., Mechanical	69581	77931	109787	122961	140861	157764	228668	256108	360187	403409	582601	652513	875705	980790
		Efficiency %	81	84	82	85	84	86	84	86	86	88	87	89	87	89
		Input HP, Thermal	14	16	19	23	31	36	41	48	70	82	102	119	142	167
		Output Torque lb.in., Thermal	54868	66162	77789	93796	125078	150833	167746	202242	291538	351525	427084	514932	605314	729817
500	12.5	Input HP, Mechanical	20	21	31	33	39	43	63	69	97	106	155	169	232	253
		Output Torque lb.in., Mechanical	78432	87843	124187	139089	159480	178618	258160	289139	405347	453989	653145	731522	989862	1108646
		Efficiency %	78	81	80	82	82	84	82	84	84	86	85	87	86	88
		Input HP, Thermal	8.5	9.8	12	13	19	22	25	29	40	47	61	71	89	104
		Output Torque lb.in., Thermal	63458	76540	87645	105705	147518	177943	191537	230977	321164	387345	492155	593529	726084	875636
250	6.3	Input HP, Mechanical	13	13	20	21	25	27	41	44	62	67	99	107	147	151
		Output Torque lb.in., Mechanical	93745	104994	148949	166823	191460	214435	313353	350955	492955	552110	797267	892939	1205028	1278799
		Efficiency %	74	77	75	78	78	81	77	80	80	83	81	84	82	85

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 45/1 (This ratio made to order only).

Nominal Ratio 45/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	35	41	51	60	74	87	102	119	157	184	219	258	245	287
		Output Torque lb.in., Thermal	46008	55457	67605	81487	99477	119908	136139	164095	212086	255643	295337	356005	322291	388486
1800	40	Input HP, Mechanical	40	43	61	66	96	104	149	163	218	238	290	317	417	456
		Output Torque lb.in., Mechanical	52597	58301	80349	89359	128833	143483	201318	225476	295768	331260	391517	438499	555138	621754
		Efficiency %	84	86	84	86	86	88	86	88	86	88	87	89	85	87
		Input HP, Thermal	31	36	46	53	66	77	91	106	142	167	202	237	232	272
		Output Torque lb.in., Thermal	48913	58961	71807	86554	105682	127390	145296	175133	230461	277794	326301	393329	369298	445141
1500	33.3	Input HP, Mechanical	36	39	54	59	86	94	132	144	193	211	260	284	382	418
		Output Torque lb.in., Mechanical	55871	62576	86065	96393	138490	155109	213099	238671	314758	352529	421763	472374	614094	687785
		Efficiency %	83	86	84	86	85	87	85	87	86	88	87	89	86	88
		Input HP, Thermal	28	32	40	46	58	68	81	95	123	145	177	209	212	249
		Output Torque lb.in., Thermal	53279	64227	77282	93156	114423	137932	161194	194301	248600	299665	358540	432197	422822	509656
1200	26.7	Input HP, Mechanical	31	33	47	52	75	82	118	129	171	187	226	247	336	368
		Output Torque lb.in., Mechanical	59626	66782	92632	103747	149878	167864	235865	264169	346281	387835	457567	512475	675787	756882
		Efficiency %	82	85	83	85	84	87	85	87	86	88	87	89	86	88
		Input HP, Thermal	24	28	34	40	50	59	71	84	108	127	158	185	193	227
		Output Torque lb.in., Thermal	55291	66654	79369	95675	118539	142897	169751	204620	260186	313639	380272	458402	461805	556649
1000	22.2	Input HP, Mechanical	28	30	43	46	68	74	106	116	155	169	206	225	300	328
		Output Torque lb.in., Mechanical	64057	71744	98762	110613	159809	178986	253756	284206	374351	419273	498591	558422	723724	810570
		Efficiency %	81	84	82	84	83	86	84	86	85	87	86	88	86	88
		Input HP, Thermal	19	22	26	31	39	46	56	65	87	101	128	151	162	190
		Output Torque lb.in., Thermal	55984	67495	79129	95392	120358	145101	174473	210325	274088	330415	407963	491807	514423	620093
750	16.7	Input HP, Mechanical	23	25	36	39	57	62	89	97	130	142	174	190	255	279
		Output Torque lb.in., Mechanical	69413	77742	108417	121428	175477	196534	278814	312272	413159	462738	555046	621651	813353	910955
		Efficiency %	79	82	80	83	82	84	83	85	84	86	85	88	85	87
		Input HP, Thermal	13	15	18	21	27	31	39	45	62	73	94	110	123	145
		Output Torque lb.in., Thermal	55951	67463	77510	93450	121552	146557	175382	211442	289208	348677	440537	531129	576763	695290
500	11.1	Input HP, Mechanical	18	19	28	30	44	48	69	75	99	108	131	143	196	213
		Output Torque lb.in., Mechanical	78042	87408	122563	137270	198820	222678	314518	352260	461506	516886	615499	689359	919164	1029464
		Efficiency %	77	80	77	81	79	82	80	83	82	85	84	86	84	86
		Input HP, Thermal	8	9.1	11	12	17	19	23	27	36	42	57	66	78	90
		Output Torque lb.in., Thermal	64747	78087	87301	105278	143117	172597	200567	241856	318530	384113	507702	612243	692649	835146
250	5.6	Input HP, Mechanical	11	12	18	19	28	30	44	47	64	69	84	91	125	135
		Output Torque lb.in., Mechanical	93537	104762	147052	164699	238651	267289	380134	425750	561726	629133	753504	843925	1114390	1248116
		Efficiency %	72	76	73	76	75	78	76	79	78	81	80	82	80	83

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 50/1

Nominal Ratio 50/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	32	37	48	56	67	79	92	107	145	170	190	223	231	271
		Output Torque lb.in., Thermal	45668	55045	68851	82986	98421	118628	133990	161496	215369	259590	281137	338862	338141	407575
1800	36	Input HP, Mechanical	36	39	56	60	86	92	136	146	198	214	328	355	477	516
		Output Torque lb.in., Mechanical	52561	57463	81267	89219	126606	139403	199337	220151	295513	326673	488719	541683	706878	785726
		Efficiency %	82	85	83	85	84	86	84	86	85	87	85	87	85	87
		Input HP, Thermal	28	33	42	49	60	70	82	96	131	154	176	206	218	256
		Output Torque lb.in., Thermal	48553	58523	73051	88050	104708	126207	143232	172637	233907	281936	312310	376435	385650	464834
1500	30	Input HP, Mechanical	33	35	50	55	78	85	120	131	176	192	294	321	432	472
		Output Torque lb.in., Mechanical	55793	62489	87076	97525	136545	152931	210878	236183	314146	351844	526757	589968	773200	865983
		Efficiency %	82	84	82	85	84	86	84	86	85	87	85	87	85	87
		Input HP, Thermal	25	29	37	43	52	61	73	86	114	134	156	182	198	232
		Output Torque lb.in., Thermal	52886	63749	78548	94679	113503	136813	159138	191811	252186	303974	345127	415993	439223	529407
1200	24	Input HP, Mechanical	28	31	44	48	69	75	108	117	156	171	258	281	380	415
		Output Torque lb.in., Mechanical	59916	67106	94197	105500	148908	166777	234915	263105	347573	389281	575703	644788	850708	952793
		Efficiency %	80	83	81	84	83	85	83	86	85	87	85	87	85	87
		Input HP, Thermal	22	26	32	37	46	53	65	76	100	117	139	162	180	211
		Output Torque lb.in., Thermal	54882	66157	80633	97195	117658	141826	167730	202172	263854	318045	367389	442833	477961	576104
1000	20	Input HP, Mechanical	26	28	40	43	62	67	97	106	141	154	233	254	338	369
		Output Torque lb.in., Mechanical	64133	71828	100473	112530	158845	177906	252515	282817	374843	419824	622258	696929	906348	1015109
		Efficiency %	79	82	80	83	82	84	82	85	84	86	85	87	85	87
		Input HP, Thermal	17	20	24	28	36	41	51	59	80	94	113	133	151	177
		Output Torque lb.in., Thermal	55569	66990	80364	96877	119521	144080	172537	207977	277856	334940	395701	476978	530102	638971
750	15	Input HP, Mechanical	21	23	33	36	51	56	81	88	118	129	197	214	287	313
		Output Torque lb.in., Mechanical	69829	78209	109694	122858	172838	193579	276158	309297	411613	461006	691217	774163	1016189	1138131
		Efficiency %	77	80	79	82	80	83	81	84	83	85	84	86	84	87
		Input HP, Thermal	12	14	17	19	25	29	35	41	58	68	84	98	115	134
		Output Torque lb.in., Thermal	55534	66955	78726	94912	120702	145518	173492	209145	293118	353370	428355	516381	592339	714040
500	10	Input HP, Mechanical	17	18	26	28	40	43	63	68	91	98	149	162	219	238
		Output Torque lb.in., Mechanical	77596	86908	123378	138184	195952	219466	311262	348613	460877	516182	769381	861706	1139688	1276450
		Efficiency %	75	78	76	79	78	81	79	81	81	83	82	84	83	85
		Input HP, Thermal	7.3	8.4	10	11	16	18	21	25	34	39	51	59	72	84
		Output Torque lb.in., Thermal	64259	77489	88734	106998	141980	171206	198282	239074	322839	389277	493452	594967	710665	856826
250	5	Input HP, Mechanical	11	11	17	18	26	27	40	43	58	62	95	91	130	125
		Output Torque lb.in., Mechanical	93215	104401	148070	165838	235014	263216	374825	419804	557183	624045	920780	920780	1278799	1278799
		Efficiency %	70	73	71	75	73	76	74	77	76	79	77	80	78	81

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 60/1

Nominal Ratio 60/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	29	33	43	50	59	69	81	94	116	136	166	194	202	236
		Output Torque lb.in., Thermal	48467	58416	73364	88423	100623	121275	137443	165648	197843	238441	286497	345299	345199	416054
1800	30	Input HP, Mechanical	31	32	49	51	71	75	115	120	160	167	284	296	415	430
		Output Torque lb.in., Mechanical	52137	55650	83225	89163	122558	131833	197084	211946	274499	294448	493989	528981	719370	767793
		Efficiency %	80	83	81	84	82	84	82	84	81	84	83	85	82	85
		Input HP, Thermal	26	30	38	45	52	61	72	84	106	124	153	179	190	222
		Output Torque lb.in., Thermal	51372	61919	77499	93408	106895	128836	146599	176684	216799	261288	317724	382935	392973	473629
1500	25	Input HP, Mechanical	28	30	44	47	65	70	103	110	144	151	256	269	375	396
		Output Torque lb.in., Mechanical	55300	61660	89383	99305	133406	147649	212016	232932	296348	320798	535304	580013	785094	852179
		Efficiency %	79	82	80	83	81	84	81	84	81	84	83	85	83	85
		Input HP, Thermal	23	26	33	39	46	53	64	75	93	108	135	158	172	202
		Output Torque lb.in., Thermal	55829	67294	83030	100078	115724	139481	162524	195881	235825	284221	350484	422421	446647	538319
1200	20	Input HP, Mechanical	24	26	39	42	58	62	92	100	126	137	222	242	327	356
		Output Torque lb.in., Mechanical	60069	67278	96948	108582	145608	163081	234174	262275	322719	361445	579854	649437	856547	959333
		Efficiency %	78	81	79	82	80	83	81	83	81	84	83	85	83	85
		Input HP, Thermal	20	23	29	33	40	47	57	66	82	95	120	141	156	183
		Output Torque lb.in., Thermal	57885	69775	85087	102560	119879	144493	171083	206201	248080	298995	372654	449149	485350	584971
1000	16.7	Input HP, Mechanical	22	23	35	37	51	56	83	90	114	124	200	218	290	315
		Output Torque lb.in., Mechanical	63403	71011	102700	115024	154289	172803	250092	280103	347482	389180	624306	699223	907365	1016248
		Efficiency %	77	80	78	81	79	82	80	83	81	83	82	85	83	85
		Input HP, Thermal	16	18	22	26	31	36	45	52	66	77	99	115	131	153
		Output Torque lb.in., Thermal	58601	70642	84713	102115	121712	146710	175778	211868	262688	316613	400846	483144	537384	647702
750	12.5	Input HP, Mechanical	18	20	29	31	43	46	69	74	95	103	168	182	245	266
		Output Torque lb.in., Mechanical	69527	77871	111875	125300	166038	185962	271270	303822	380649	426327	688430	771041	1012036	1133480
		Efficiency %	75	78	76	79	77	80	78	81	79	82	81	84	82	85
		Input HP, Thermal	11	12	15	17	22	25	31	36	48	56	73	85	100	116
		Output Torque lb.in., Thermal	58641	70697	83039	100106	122908	148164	176654	212941	277934	335010	433518	522560	599663	722809
500	8.3	Input HP, Mechanical	14	15	23	24	33	36	54	58	74	79	129	139	186	202
		Output Torque lb.in., Mechanical	76983	86221	125054	140060	188755	211406	306360	343123	426187	477330	768654	860892	1126610	1261804
		Efficiency %	72	76	73	77	75	78	76	79	77	80	79	82	80	83
		Input HP, Thermal	6.7	7.7	9.1	10	14	16	19	22	28	33	45	52	64	73
		Output Torque lb.in., Thermal	68110	82127	93920	113244	144677	174436	201999	243530	305577	368384	499326	601978	719081	866879
250	4.2	Input HP, Mechanical	9.1	9.6	14	15	21	23	34	37	47	50	82	79	112	108
		Output Torque lb.in., Mechanical	91683	102685	148980	166858	225101	252113	366078	410008	510362	571606	920780	920780	1278799	1278799
		Efficiency %	67	71	68	72	69	73	70	74	71	75	74	77	75	78

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

TW Series - Single Reduction - Selection Data

MINERAL & SYNTHETIC OILS, NOMINAL RATIO 70/1

Nominal Ratio 70/1			Center Distance													
Input	Output	Gear	10		12		14		17		20		24		28	
RPM	RPM	Ratings	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn	Min	Syn
		Input HP, Thermal	24	28	36	41	49	56	72	83	102	118	138	160	181	210
		Output Torque lb.in., Thermal	45001	54234	67730	81624	92328	111268	138713	167171	194600	234520	263941	318091	350165	422018
1800	25.7	Input HP, Mechanical	25	25	40	40	59	59	96	96	144	144	234	234	347	347
		Output Torque lb.in., Mechanical	47303	49329	75599	78682	112106	116465	186570	193663	277802	287895	453830	469582	682039	705000
		Efficiency %	76	79	77	80	78	81	79	82	79	82	79	82	80	83
		Input HP, Thermal	22	25	32	37	44	50	64	74	93	108	127	148	170	198
		Output Torque lb.in., Thermal	47888	57714	71956	86718	98808	119078	147844	178176	213631	257456	295248	355820	398119	479808
1500	21.4	Input HP, Mechanical	23	24	36	38	53	55	86	89	129	131	210	214	312	319
		Output Torque lb.in., Mechanical	50821	54787	81797	87902	121582	130209	199604	213023	298346	313963	490577	517410	740344	781948
		Efficiency %	76	79	77	80	77	80	79	82	79	82	80	82	81	83
		Input HP, Thermal	19	22	28	32	38	44	57	66	81	94	113	132	154	179
		Output Torque lb.in., Thermal	52194	62906	77450	93342	107658	129747	163781	197386	232804	280564	328693	396127	451858	544574
1200	17.1	Input HP, Mechanical	20	21	32	34	47	51	76	82	112	120	181	194	270	289
		Output Torque lb.in., Mechanical	54605	61157	88459	98976	132485	147898	219165	244106	322516	357600	530002	585642	803111	887837
		Efficiency %	74	77	75	79	76	79	78	81	78	81	79	82	81	84
		Input HP, Thermal	17	19	24	28	34	39	51	59	72	83	102	118	139	162
		Output Torque lb.in., Thermal	54178	65298	79546	95870	111906	134868	172331	207694	245179	295482	351591	423727	490536	591192
1000	14.3	Input HP, Mechanical	18	19	28	31	42	45	68	74	101	109	162	175	238	258
		Output Torque lb.in., Mechanical	57362	64246	93177	104359	140214	157040	233096	261067	346347	387909	564658	632417	847484	949182
		Efficiency %	73	76	74	78	75	79	77	80	78	81	79	82	81	83
		Input HP, Thermal	13	15	19	22	27	30	40	46	58	67	84	97	117	136
		Output Torque lb.in., Thermal	54858	66121	79308	95587	113932	137315	176988	213315	259918	313254	380704	458825	542497	653831
750	10.7	Input HP, Mechanical	15	16	24	25	35	37	56	61	84	91	136	147	201	218
		Output Torque lb.in., Mechanical	63046	70612	100602	112674	150339	168379	251498	281677	378027	423390	623112	697886	941812	1054829
		Efficiency %	71	74	72	76	73	77	76	79	76	79	78	81	80	82
		Input HP, Thermal	9.3	11	13	15	19	21	28	32	43	49	63	72	89	103
		Output Torque lb.in., Thermal	54800	66055	77677	93628	115078	138705	177836	214351	275176	331661	413539	498422	604812	728971
500	7.1	Input HP, Mechanical	12	12	19	20	28	29	44	47	66	70	105	113	155	167
		Output Torque lb.in., Mechanical	69900	78288	113603	127236	170619	191093	284156	318255	425152	476171	699603	783555	1056345	1183106
		Efficiency %	67	71	69	73	70	74	73	76	74	77	75	79	77	80
		Input HP, Thermal	5.8	6.6	7.9	8.9	12	13	17	20	25	29	39	44	57	66
		Output Torque lb.in., Thermal	63324	76340	87445	105415	134898	162616	203374	245166	302436	364562	476207	574023	725004	873949
250	3.6	Input HP, Mechanical	7.6	7.9	12	13	18	19	29	30	42	45	68	71	100	95
		Output Torque lb.in., Mechanical	82440	92332	134521	150663	202889	227236	337974	378531	504165	564665	840534	920780	1278799	1278799
		Efficiency %	62	66	63	67	64	69	67	71	68	72	70	74	72	76

Max. Output	Single Key	99800	109000	151000	217000	371000	460000	639000
Torque lb. in.	Standard Shaft	1398000	185000	241000	384000	687000	955000	1295000

Notes :- Ratings in shaded area require force feed lubrication.
Higher thermal ratings may be obtained using oil coolers.
Two keys must be specified for the wheel and output shaft when maximum output torque for a single key is exceeded.
High tensile steel output shaft must be specified when maximum output torque for standard shaft is exceeded.

RENOLD

TW Series - Double Reduction - Selection Data

MINERAL OR SYNTHETIC OILS, INPUT SPEED: 1750 RPM

				Center Distance						
Nominal Ratio	Output RPM	Gear Ratings		10	12	14	17	20	24	28
75	23.33	Input Power	hp	24.5	34.2	52.1	74.8	119.6	177.1	232.6
		Output Torque	lb in	56000	78000	121000	175000	283000	421000	554000
		Overall Efficiency	%	83.7	84.5	85.5	86.2	86.9	87.7	88.0
150	11.67	Input Power	hp	18.9	28.7	31.3	60.7	98.2	107.6	150.0
		Output Torque	lb in	77000	120000	134000	262000	428000	478000	670000
		Overall Efficiency	%	83.7	81.4	78.7	83.3	84.2	81.8	82.2
250	7.00	Input Power	hp	14.5	19.9	30.1	42.4	70.5	103.5	146.6
		Output Torque	lb in	92000	129000	200000	284000	485000	725000	1044000
		Overall Efficiency	%	74.5	75.7	77.2	78.0	79.9	80.8	81.8
300	5.83	Input Power	hp	12.8	20.9	32.7	37.5	74.63	110.1	150.6
		Output Torque	lb in	107000	169000	262000	295000	612000	921000	1279000
		Overall Efficiency	%	72.5	74.9	77.0	75.8	79.3	80.5	81.3
500	3.50	Input Power	hp	9.7	15.1	24.1	34.3	54.9	70.0	96.0
		Output Torque	lb in	119000	188000	302000	435000	711000	921000	1279000
		Overall Efficiency	%	67.8	69.1	72.1	73.0	74.7	75.9	76.8
750	2.33	Input Power	hp	7.6	11.8	17.2	24.7	40.5	50.3	67.3
		Output Torque	lb in	127000	201000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	63.3	64.6	67.3	67.5	70.6	70.3	72.6
1000	1.75	Input Power	hp	6.2	9.63	13.6	19.2	31.7	38.5	52.4
		Output Torque	lb in	130000	207000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	59.8	61.2	63.1	64.1	66.5	67.4	69.5
1500	1.17	Input Power	hp	4.4	7.0	9.9	14.0	23.1	28.2	38.4
		Output Torque	lb in	129000	209000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	55.0	56.4	57.6	58.6	60.7	61.5	62.7
2000	0.88	Input Power	hp	3.7	5.7	8.2	11.6	18.9	23.1	31.5
		Output Torque	lb in	127000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	47.7	49.1	51.2	52.0	54.7	55.4	57.2
2500	0.70	Input Power	hp	3.1	4.9	6.9	9.8	15.9	19.5	26.5
		Output Torque	lb in	127000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	45.0	46.4	45.1	49.0	51.8	52.5	53.7
3000	0.58	Input Power	hp	2.7	4.3	6.2	8.8	14.1	17.4	23.6
		Output Torque	lb in	124000	203000	302000	435000	713000	921000	1279000
		Overall Efficiency	%	42.7	44.5	45.1	45.8	46.8	49.1	50.2
4200	0.42	Input Power	hp	2.0	3.2	4.8	7.0	11.2	14.2	18.8
		Output Torque	lb in	112000	183000	277000	435000	701000	921000	1279000
		Overall Efficiency	%	36.1	37.4	38.4	40.9	41.4	42.9	44.9
4900	0.36	Input Power	hp	1.9	3.0	4.4	6.4	10.2	13.0	17.2
		Output Torque	lb in	112000	183000	277000	435000	701000	921000	1279000
		Overall Efficiency	%	33.6	34.8	35.9	38.3	38.8	40.2	42.1

TW Series - Double Reduction - Selection Data

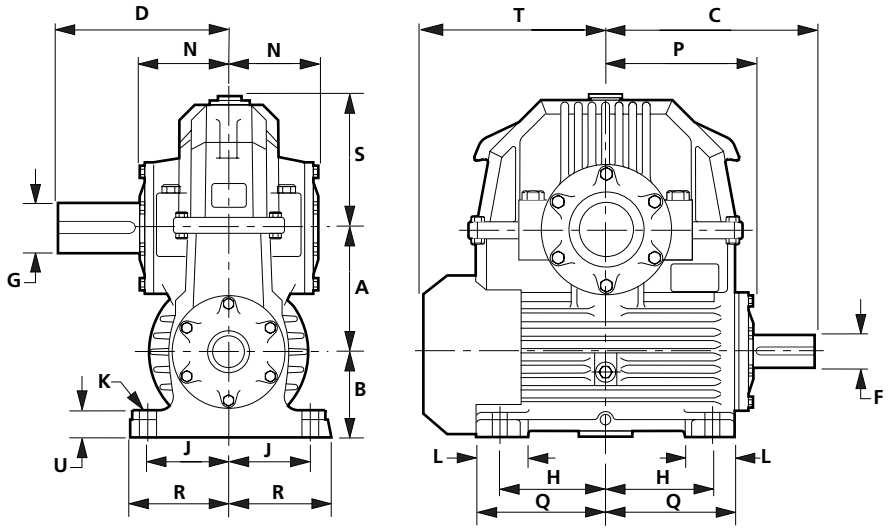
MINERAL OR SYNTHETIC OILS, INPUT SPEED: 1150 RPM

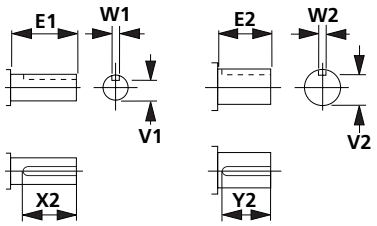
				Center Distance						
Nominal Ratio	Output RPM	Gear Ratings		10	12	14	17	20	24	28
75	15.33	Input Power	hp	21.9	30.4	46.1	65.8	101.8	144.3	196.8
		Output Torque	lb in	74000	103000	160000	230000	360000	515000	705000
		Overall Efficiency	%	81.7	82.6	83.7	84.5	85.4	86.4	86.9
150	7.67	Input Power	hp	14.7	25.1	28.0	48.7	83.1	94.6	131.6
		Output Torque	lb in	89000	156000	177000	311000	539000	625000	876000
		Overall Efficiency	%	78.0	79.3	76.4	81.3	82.3	79.9	80.8
250	4.60	Input Power	hp	11.9	18.2	27.4	38.2	63.3	88.7	120.8
		Output Torque	lb in	111000	174000	268000	378000	644000	921000	1279000
		Overall Efficiency	%	71.9	73.2	74.8	75.6	77.7	78.8	79.9
300	3.83	Input Power	hp	9.6	15.6	25.6	34.0	61.0	74.4	101.5
		Output Torque	lb in	117000	186000	302000	393000	743000	921000	1279000
		Overall Efficiency	%	69.8	72.3	74.5	73.3	77.1	78.3	79.2
500	2.30	Input Power	hp	7.1	11.1	16.5	23.4	39.0	47.5	65.0
		Output Torque	lb in	128000	203000	302000	435000	743000	92100	127900
		Overall Efficiency	%	65.0	66.2	69.4	70.3	72.1	73.5	74.6
750	1.53	Input Power	hp	5.4	8.3	11.8	17.0	27.7	34.4	45.7
		Output Torque	lb in	128000	209000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	60.2	61.6	64.4	64.6	37.8	67.7	70.2
1000	1.15	Input Power	hp	4.3	6.6	9.4	13.3	21.7	26.3	35.7
		Output Torque	lb in	127000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	51.8	53.2	54.4	55.4	57.7	58.7	60.1
1500	0.77	Input Power	hp	3.1	4.8	6.9	9.7	15.9	19.4	26.4
		Output Torque	lb in	128000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	56.7	58.1	60.1	61.1	63.6	64.7	67.0
2000	0.57	Input Power	hp	2.6	4.0	5.7	8.1	13.1	16.0	21.7
		Output Torque	lb in	127000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	44.8	46.1	48.2	49.0	51.7	52.6	54.4
2500	0.46	Input Power	hp	2.2	3.4	4.9	6.9	11.1	13.5	18.3
		Output Torque	lb in	127000	202000	302000	435000	743000	921000	1279000
		Overall Efficiency	%	42.1	43.4	45.5	46.0	48.8	49.7	51.0
3000	0.38	Input Power	hp	1.9	3.0	4.4	6.2	9.9	12.1	16.4
		Output Torque	lb in	124000	203000	302000	435000	713000	921000	1279000
		Overall Efficiency	%	39.9	41.1	42.2	42.8	43.9	46.3	47.5
4200	0.27	Input Power	hp	1.5	2.3	3.4	5.0	7.9	10.0	13.1
		Output Torque	lb in	112000	183000	277000	435000	701000	921000	1279000
		Overall Efficiency	%	33.5	34.7	35.7	38.1	38.7	40.2	42.3
4900	0.23	Input Power	hp	1.3	2.1	3.1	4.6	7.2	9.1	12.0
		Output Torque	lb in	112000	183000	277000	435000	701000	921000	1279000
		Overall Efficiency	%	31.0	32.2	33.2	35.5	36.1	37.6	39.9

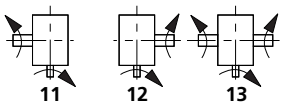
RENOLD

TW Series - Single Reduction - Dimensions (inch)

TYPE TWU UNDERDRIVEN







Shaft Assemblies

Unit Reference	A	B	C	D	F	G	H	J
TWU 10	10.0	6.75	16.75	14.75	2.500/2.499	4.250/4.249	8.50	6.50
TWU 12	12.0	7.50	19.50	16.25	3.000/2.999	4.500/4.499	10.25	7.25
TWU 14	14.0	8.50	22.50	19.00	3.000/2.999	5.000/4.999	11.75	8.50
TWU 17‡	17.0	10.00	25.50	21.50	3.500/3.499	5.750/5.749	15.00	10.00
TWU 20‡	20.0	11.50	32.00	24.00	4.000/3.999	7.000/6.999	17.50	11.50
TWU 24‡	24.0	14.00	36.00	28.00	4.500/4.499	7.750/7.749	21.00	15.50
TWU 28§	28.0	16.00	41.00	32.00	5.000/4.999	8.500/8.499	24.00	18.00

Unit Reference	K	L	N	P	Q	R	S	T	U	Oil Capacity (approx)		Weight (approx) lbs.
										Litres	US Pints	
TWU 10	1.28	4.00	6.94	11.69	10.38	8.13	10.38	16.14	2.125	8.6	18.3	810
TWU 12	1.52	4.00	7.81	13.19	11.88	9.00	12.50	17.00	2.362	12.5	26.6	1,120
TWU 14	1.76	5.00	9.25	15.75	14.25	10.63	14.75	20.00	3.386	18.6	40.0	1,850
TWU 17‡	1.76	6.00	11.25	18.94	17.25	12.75	17.63	23.75	3.500	34.1	72.5	3,080
TWU 20‡	1.89	6.00	13.75	22.00	20.25	15.00	20.50	27.25	4.016	70.5	150	4,480
TWU 24‡	2.05	8.00	16.50	24.88	23.00	19.00	23.50	31.50	4.500	132.0	280	8,010
TWU 28§	2.05	8.50	18.31	28.19	27.00	22.00	29.13	35.00	5.000	168.0	357	11,080

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWU 10	4.94	2,148/2.142	0.625/0.627	4.69
TWU 12	6.13	2.577/2.571	0.750/0.752	5.81
TWU 14	6.57	2.577/2.571	0.750/0.752	6.25
TWU 17	6.75	3.007/3.001	0.875/0.877	6.44
TWU 20	7.87	3.436/3.430	1.000/1.002	9.63
TWU 24	11.25	3.944/3.938	1.000/1.002	11.00
TWU 28	11.75	4.296/4.291	1.250/1.252	11.50

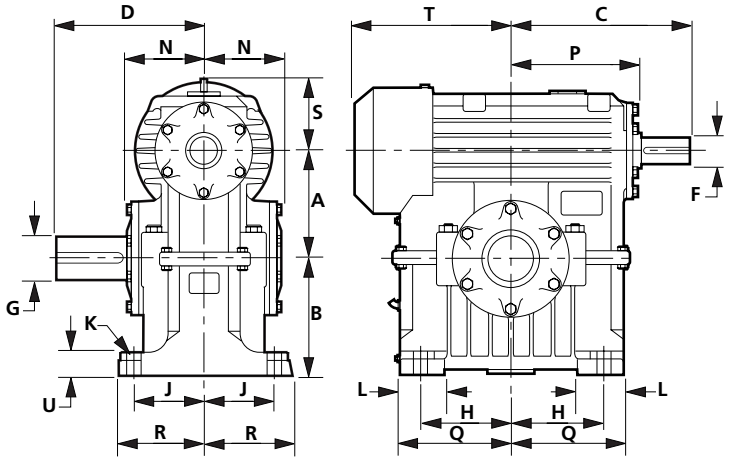
Output Shaft Details

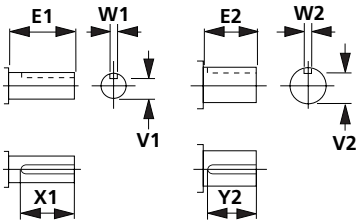
E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

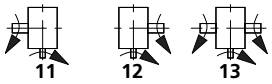
‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.

TW Series - Single Reduction - Dimensions (inch)

TYPE TWO OVERDRIVEN







Unit Reference	A	B	C	D	F	G	H	J
TWO 10	10.0	10.75	16.75	14.75	2.500/2.499	4.250/4.249	8.50	6.50
TWO 12	12.0	13.25	19.50	16.25	3.000/2.999	4.500/4.499	10.25	7.25
TWO 14	14.0	15.50	22.50	19.00	3.000/2.999	5.000/4.999	11.75	8.50
TWO 17‡	17.0	18.50	25.50	21.50	3.500/3.499	5.750/5.749	15.00	10.00
TWO 20‡	20.0	21.50	32.00	24.00	4.000/3.999	7.000/6.999	17.50	11.50
TWO 24‡	24.0	24.50	36.00	28.00	4.500/4.499	7.750/7.749	21.00	15.50
TWO 28§	28.0	29.00	41.00	32.00	5.000/4.999	8.500/8.499	24.00	18.00

Unit Reference	K	L	N	P	Q	R	S	T	U	Oil Capacity (approx)		Weight (approx) lbs.
										Litres	US Pints	
TWO 10	1.28	4.00	6.94	11.69	10.38	8.13	5.75	14.88	2.00	9.1	19.3	750
TWO 12	1.52	4.50	7.81	13.19	11.88	9.00	6.63	17.00	2.25	14.5	30.8	1,080
TWO 14	1.76	6.00	9.25	15.75	14.25	10.63	7.13	20.00	3.25	23.2	49.3	1,850
TWO 17‡	1.76	7.00	11.25	18.94	17.25	12.75	8.50	23.75	3.50	54.6	116	3,105
TWO 20‡	1.89	7.00	13.75	22.00	20.25	15.00	10.00	27.25	4.00	90.9	193	4,480
TWO 24‡	2.05	8.00	16.50	24.88	23.00	19.00	11.00	31.75	4.50	155.0	330	8,010
TWO 28§	2.05	7.00	18.31	28.19	27.00	22.00	11.75	35.00	5.00	292.1	621	11,090

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWO 10	4.94	2,148/2.142	0.625/0.627	4.69
TWO 12	6.13	2.577/2.571	0.750/0.752	5.81
TWO 14	6.57	2.577/2.571	0.750/0.752	6.25
TWO 17	6.75	3.007/3.001	0.875/0.877	6.44
TWO 20	7.87	3.436/3.430	1.000/1.002	9.63
TWO 24	11.25	3.944/3.938	1.000/1.002	11.00
TWO 28	11.75	4.296/4.291	1.250/1.252	11.50

Output Shaft Details

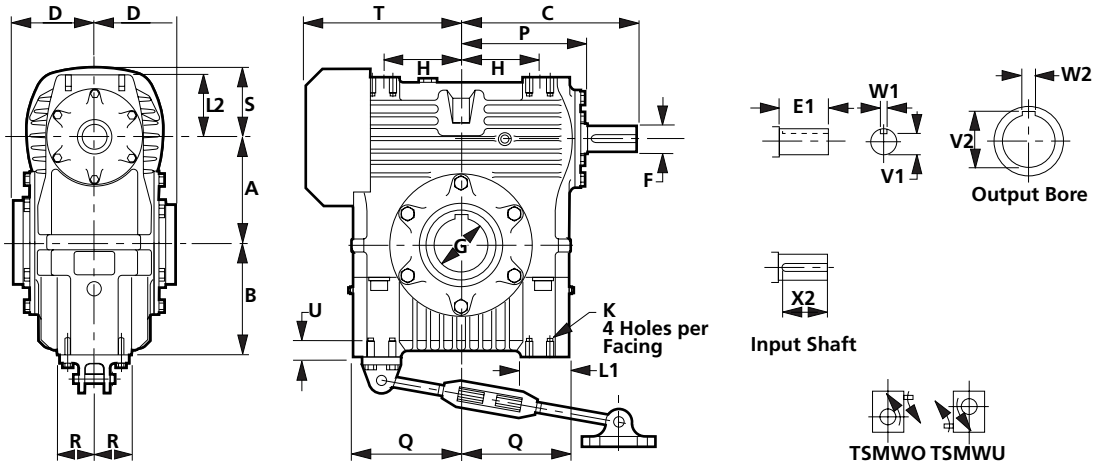
E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.

RENOLD

TWSM Series - Single Reduction - Dimensions (inch)

TYPE TWSM SHAFT MOUNTED



Unit Reference	A	B	C1	C2	D	F	G	H	K1	K2
TWSM 10	10.0	10.50	16.75	4.50	7.65	2.500/2.499	4.9375/4.9395	7.36	M12	.87
TWSM 12	12.0	12.50	19.50	4.50	8.30	3.000/2.999	5.9375/5.9395	8.39	M12	.87
TWSM 14	14.0	14.50	22.50	5.00	9.15	3.000/2.999	6.4375/6.4395	10.00	M12	1.02
TWSM 17	17.0	17.25	25.50	5.00	10.87	3.500/3.499	6.9375/6.9395	13.11	M12	1.02

Unit Reference	L1	L2	M	P	Q	R	S	T	U1	U2	Oil Capacity (approx)		Weight (approx) lbs.
											Litres	US Pints	
TWSM 10	4.50	5.75	2.25	11.65	10.12	3.50	6.75	14.80	1.25	.81	12.7	27.0	800
TWSM 12	5.00	6.26	2.25	13.20	11.62	3.75	7.50	16.82	1.25	.81	22.7	48.2	1,100
TWSM 14	6.00	6.75	3.00	15.75	14.10	4.10	7.75	19.90	1.25	1.00	33	70.0	1,840
TWSM 17	6.00	7.25	3.00	18.95	16.73	4.25	8.90	23.75	1.00	1.00	60	128	3,050

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TSMW 10	4.94	2,148/2.142	0.625/0.627	4.69
TSMW 12	6.13	2.577/2.571	0.750/0.752	5.81
TSMW 14	6.57	2.577/2.571	0.750/0.752	6.25
TSMW 17	6.75	3.007/3.001	0.875/0.877	6.44

Output Bore Details

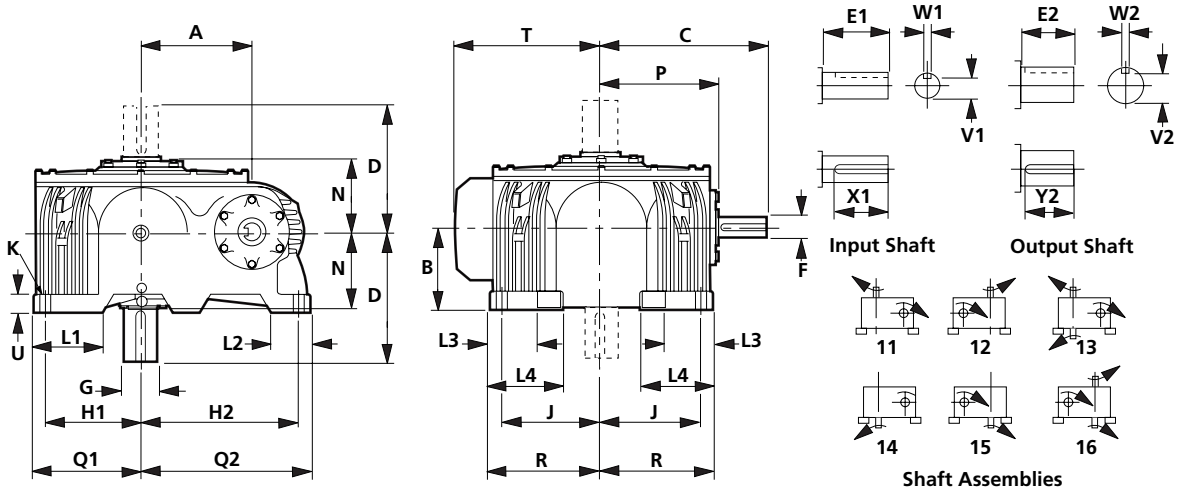
V2	W2
5.487/5.493	1.250/1.252
6.596/6.602	1.500/1.502
7.104/7.110	1.500/1.502
7.705/7.711	1.750/1.752

Flanged torque restraint available - details on request.
If a non reversible unit is essential, a sprag clutch backstop should be fitted.
Weights quoted are without oil.
Torque arm details - see page 38

Larger TWSM unit sizes are available. Please consult Renold.

TW Series - Single Reduction - Dimensions (inch)

TYPE TWV VERTICAL



Unit Reference	A	B	C	D	F	G	H1	H2	J	K
TWV 10	10.0	7.50	16.75	14.75	2.500/2.499	4.250/4.249	9.00	15.75	9.00	1.28
TWV 12	12.0	8.50	19.50	16.25	3.000/2.999	4.500/4.499	10.38	18.25	10.38	1.52
TWV 14	14.0	10.00	22.50	19.00	3.000/2.999	5.000/4.999	12.63	20.50	12.50	1.76
TWV 17	17.0	12.25	25.50	21.50	3.500/3.499	5.750/5.749	15.50	24.25	15.50	1.76
TWV 20	20.0	14.25	32.00	24.00	4.000/3.999	7.000/6.999	18.25	28.63	18.25	1.89
TWV 24	24.0	17.50	36.00	28.00	4.500/4.499	7.750/7.749	21.75	34.00	21.75	2.05
TWV 28	28.0	20.00	41.00	32.00	5.000/4.999	8.500/8.499	25.00	38.00	25.00	2.05

Unit Reference	L1	L2	L3	L4	N	P	Q1	Q2	R	T	U	Oil Capacity (approx)		Weight (approx) lbs.
												Litres	US Pints	
TWV 10	6.81	4.56	4.63	6.50	6.88	11.69	10.75	17.44	10.38	14.88	1.63	15.0	31.8	780
TWV 12	7.50	5.88	5.25	7.50	7.94	13.19	11.88	20.13	11.88	16.50	2.00	18.6	39.5	1,110
TWV 14	9.25	5.75	5.38	9.25	9.25	15.75	14.50	22.50	14.50	19.75	2.50	50.0	106	1,870
TWV 17	11.38	5.88	6.63	11.38	11.38	18.94	17.75	26.38	17.63	24.13	3.00	77.3	164	3,210
TWV 20	13.25	7.50	8.50	13.25	13.75	22.00	20.88	31.13	20.75	27.00	3.25	155	330	4,560
TWV 24	15.50	8.50	10.25	15.50	16.25	24.88	24.25	36.50	24.25	30.25	4.00	218	463	8,120
TWV 28	17.00	10.00	12.00	17.00	18.31	28.19	28.00	41.00	27.50	35.50	4.50	432	918	11,221

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWV 10	4.94	2.148/2.142	0.625/0.627	4.69
TWV 12	6.13	2.577/2.571	0.750/0.752	5.81
TWV 14	6.57	2.577/2.571	0.750/0.752	6.25
TWV 17	6.75	3.007/3.001	0.875/0.877	6.44
TWV 20	7.87	3.436/3.430	1.000/1.002	9.63
TWV 24	11.25	3.944/3.938	1.000/1.002	11.00
TWV 28	11.75	4.296/4.291	1.250/1.252	11.50

Output Shaft Details

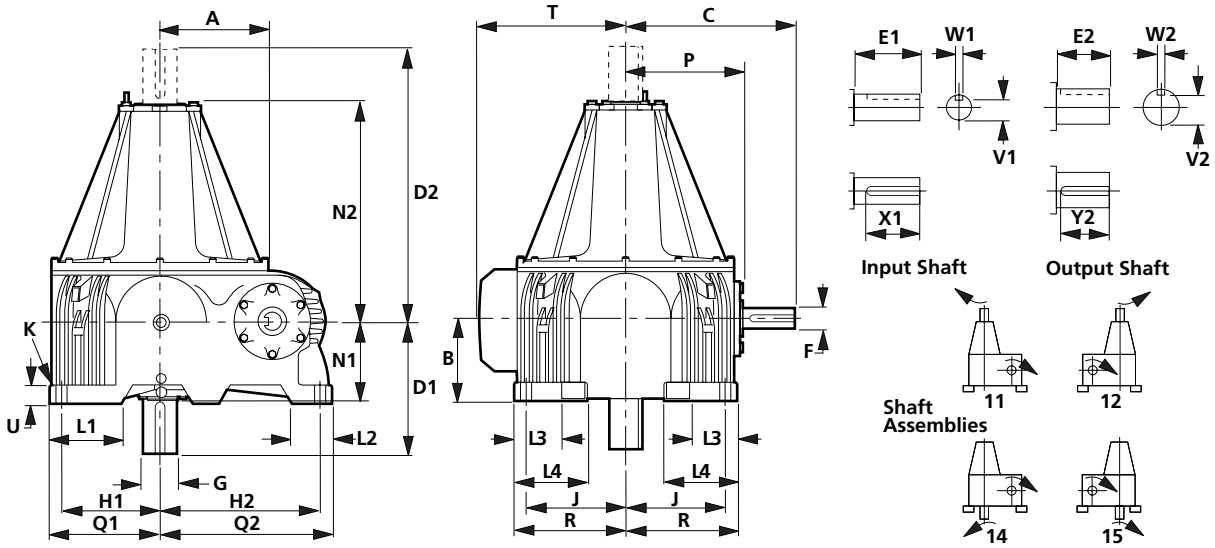
E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

If a non reversible unit is essential, a sprag clutch backstop should be fitted.
Weights quoted are without oil.

RENOLD

TW Series - Single Reduction - Dimensions (inch)

TYPE TWA AGITATOR



Unit Reference	A	B	C	D1	D2	F	G	H1	H2	J	K	L1
TWA 10	10.0	7.50	16.75	14.75	32.63	2.500/2.499	4.250/4.249	9.00	15.75	9.00	1.28	6.81
TWA 12	12.0	8.50	19.50	16.25	36.44	3.000/2.999	4.500/4.499	10.38	18.25	10.38	1.52	7.50
TWA 14	14.0	10.00	22.50	19.00	41.25	3.000/2.999	5.000/4.999	12.63	20.50	12.50	1.76	9.25
TWA 17	17.0	12.25	25.50	21.50	46.50	3.500/3.499	5.750/5.749	15.50	24.25	15.50	1.76	11.38
TWA 20	20.0	14.25	32.00	24.00	51.38	4.000/3.999	7.000/6.999	18.25	28.63	18.25	1.89	13.25
TWA 24	24.0	17.50	36.00	28.00	58.50	4.500/4.499	7.750/7.749	21.75	34.00	21.75	2.05	15.50
TWA 28	28.0	20.00	41.00	32.00	46.00	5.000/4.999	8.500/8.499	25.00	38.00	25.00	2.05	17.00

Unit Reference	L2	L3	L4	N1	N2	P	Q1	Q2	R	T	U	Oil Capacity (approx)		Weight (approx) lbs.
												Litres	US Pints	
TWA 10	4.56	4.63	6.50	6.88	25.00	11.69	10.75	17.44	10.38	14.88	1.63	15.0	31.8	970
TWA 12	5.88	5.25	7.50	7.94	28.13	13.19	11.88	20.13	11.88	16.50	2.00	18.6	39.5	1,350
TWA 14	5.75	5.38	9.25	9.25	31.50	15.75	14.50	22.50	14.50	19.75	2.50	50.0	106	2,340
TWA 17	5.88	6.63	11.38	11.38	36.44	18.94	17.75	26.38	17.63	24.13	3.00	77.3	164	4,010
TWA 20	7.50	8.50	13.25	13.75	44.13	22.00	20.88	31.13	20.75	27.00	3.25	155	330	5,710
TWA 24	8.50	10.25	15.50	16.25	46.63	24.88	24.25	36.50	24.25	30.25	4.00	218	463	10,150
TWA 28	10.00	12.00	17.00	18.31	33.06	28.19	28.00	41.00	27.50	35.50	4.50	432	918	14,090

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWA 10	4.94	2.148/2.142	0.625/0.627	4.69
TWA 12	6.13	2.577/2.571	0.750/0.752	5.81
TWA 14	6.57	2.577/2.571	0.750/0.752	6.25
TWA 17	6.75	3.007/3.001	0.875/0.877	6.44
TWA 20	7.87	3.436/3.430	1.000/1.002	9.63
TWA 24	11.25	3.944/3.938	1.000/1.002	11.00
TWA 28	11.75	4.296/4.291	1.250/1.252	11.50

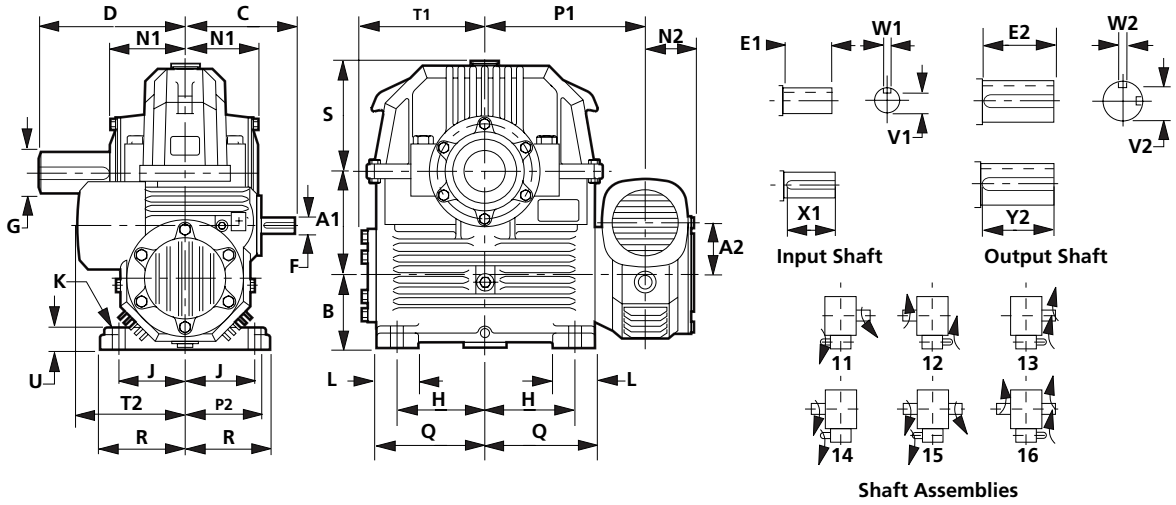
Output Shaft Details

E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

If a non reversible unit is essential, a sprag clutch backstop should be fitted.
Weights quoted are without oil.

TW Series - Double Reduction - Dimensions (inch)

TYPE TWDU UNDERDRIVEN



Unit Reference	A1	A2	B	C	D	F	G	H	J	K
TWDU 10	10.00	5.00	6.75	10.25	14.75	1.500/1.499	4.250/4.249	8.50	6.50	1.28
TWDU 12	12.00	6.00	7.50	11.00	16.25	1.500/1.499	4.500/4.499	10.25	7.25	1.52
TWDU 14	14.00	7.00	8.50	12.50	19.00	1.750/1.749	5.000/4.999	11.75	8.50	1.76
TWDU 17‡	17.00	8.00	10.00	13.50	21.50	1.750/1.749	5.750/5.749	15.00	10.00	1.76
TWDU 20‡	20.00	10.00	11.50	16.75	24.00	2.500/2.499	7.000/6.999	17.50	11.50	1.89
TWDU 24‡	24.00	12.00	14.00	19.50	28.00	3.000/2.999	7.750/7.749	21.00	15.50	2.05
TWDU 28§	28.00	14.00	16.00	22.50	32.00	3.000/2.999	8.500/8.499	24.00	18.00	2.05

Unit Reference	L2	N1	N2	P1	P2	Q	R	S	T1	T2	U	Oil Capacity (approx)		Weight (approx) lbs.
												Litres	US Pints	
TWDU 10	4.00	6.94	5.00	15.13	7.25	10.38	8.13	10.38	14.25	10.13	2.00	12.4	26.3	960
TWDU 12	4.00	7.81	5.50	17.13	7.88	11.88	9.00	12.50	16.31	11.13	2.25	17.4	37.0	1,340
TWDU 14	5.00	9.25	6.13	19.50	9.00	14.25	10.63	14.75	19.19	12.25	3.25	26.3	56.0	2,120
TWDU 17‡	6.00	11.25	6.38	23.25	9.75	17.25	12.75	17.63	22.63	13.13	3.50	44.5	95.0	3,480
TWDU 20‡	6.00	13.75	7.40	26.75	11.69	20.25	15.00	20.50	25.88	14.88	3.75	85.0	180	5,030
TWDU 24‡	8.00	16.50	7.16	30.50	13.19	23.00	19.00	23.50	24.88	17.00	4.50	*	*	*
TWDU 28§	9.50	18.31	8.11	35.75	15.75	27.00	22.00	29.13	28.19	20.00	5.00	*	*	*

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWDU 10	3.00	1.281/1.283	0.375/0.377	2.875
TWDU 12	3.00	1.281/1.282	0.375/0.377	2.875
TWDU 14	3.50	1.531/1.533	0.375/0.377	3.375
TWDU 17	3.75	1.531/1.533	0.375/0.377	3.625
TWDU 20	4.94	2.148/2.142	0.625/0.626	4.69
TWDU 24	6.13	2.577/2.571	0.750/0.752	5.81
TWDU 28	6.57	2.577/2.571	0.750/0.752	6.25

Output Shaft Details

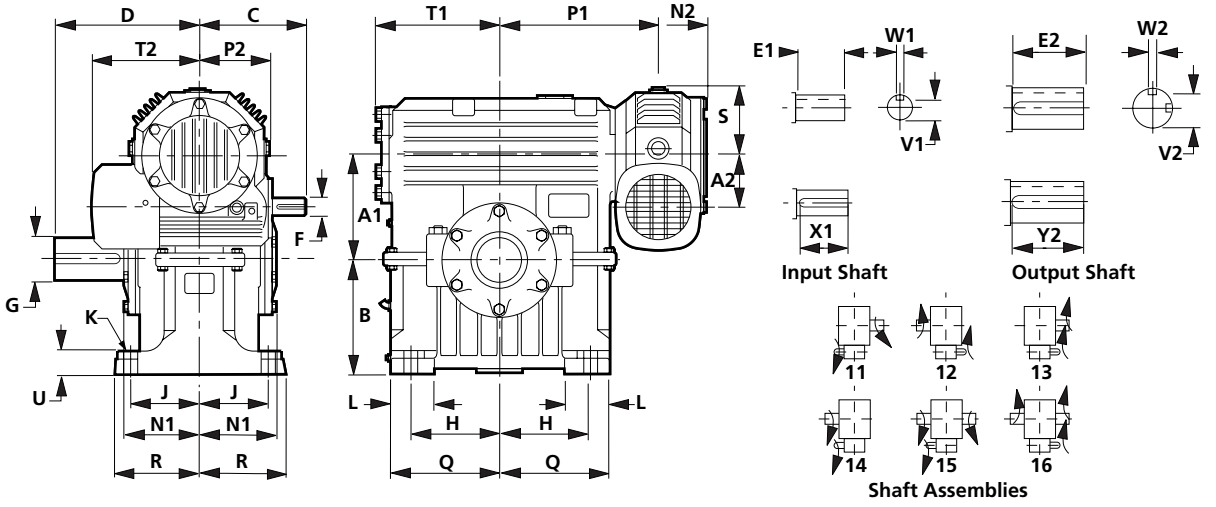
E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.
* FIGURES ON REQUEST

RENOLD

TW Series - Double Reduction - Dimensions (inch)

TYPE TWDO OVERDRIVEN



Unit Reference	A1	A2	B	C	D	F	G	H	J	K
TWDO 10	10.00	5.00	10.75	10.25	14.75	1.500/1.499	4.250/4.249	8.50	6.50	1.28
TWDO 12	12.00	6.00	13.25	11.00	16.25	1.500/1.499	4.500/4.499	10.25	7.25	1.52
TWDO 14	14.00	7.00	15.50	12.50	19.00	1.750/1.749	5.000/4.999	11.75	8.50	1.76
TWDO 17‡	17.00	8.00	18.50	13.50	21.50	1.750/1.749	5.750/5.749	15.00	10.00	1.76
TWDO 20‡	20.00	10.00	21.50	16.75	24.00	2.500/2.499	7.000/6.999	17.50	11.50	1.89
TWDO 24‡	24.00	12.00	24.50	19.50	28.00	3.000/2.999	7.750/7.749	21.00	15.50	2.05
TWDO 28§	28.00	14.00	29.00	22.50	32.00	3.000/2.999	8.500/8.499	24.00	18.00	2.05

Unit Reference	L	N1	N2	P1	P2	Q	R	S	T1	T2	U	Oil Capacity(Approx)		Weight (approx) lbs.
												Litres	US Pints	
TWDO 10	4.00	6.94	5.00	15.13	7.25	10.38	8.13	6.50	14.25	10.13	2.00	2.1/9.1	4.5/19.4	900
TWDO 12	4.50	7.81	5.50	17.13	7.88	11.88	9.00	7.25	16.31	11.13	2.25	2.5/14.6	5.3/30.8	1,290
TWDO 14	6.00	9.25	6.13	19.50	9.00	14.25	10.63	8.38	19.19	12.25	3.25	3.6/23.2	7.7/49.3	3,000
TWDO 17‡	7.00	11.25	6.38	23.25	9.75	17.25	12.75	9.29	22.63	13.13	3.50	4.4/54.6	9.4/116	3,500
TWDO 20‡	7.00	13.75	7.40	26.75	11.69	20.25	15.00	10.94	25.88	14.88	3.75	6.9/90	14.7/193	5,020
TWDO 24‡	8.00	16.50	7.16	30.50	13.19	23.00	19.00	12.28	24.88	17.00	4.50	*	*	*
TWDO 28§	7.00	18.31	8.11	34.50	15.75	26.00	22.00	14.64	28.19	20.00	5.00	*	*	*

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWDO 10	3.00	1.281/1.283	0.375/0.377	2.875
TWDO 12	3.00	1.281/1.282	0.375/0.377	2.875
TWDO 14	3.50	1.531/1.533	0.375/0.377	3.375
TWDO 17	3.75	1.531/1.533	0.375/0.377	3.625
TWDO 20	4.94	2.148/2.142	0.625/0.626	4.69
TWDO 24	6.13	2.577/2.571	0.750/0.752	5.81
TWDO 28	6.57	2.577/2.571	0.750/0.752	6.25

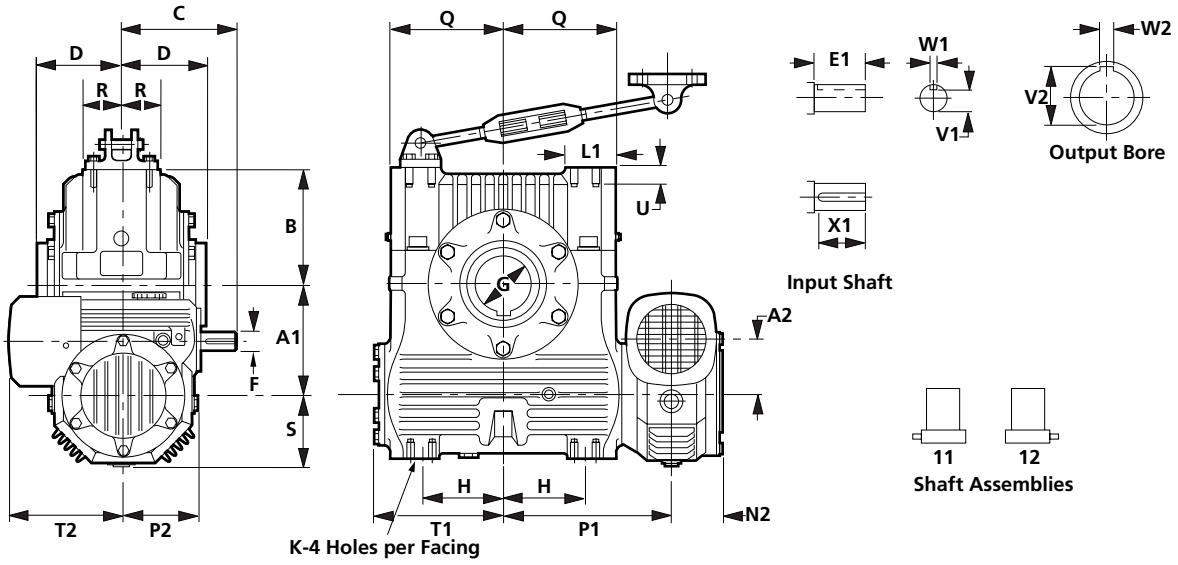
Output Shaft Details

E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.
* FIGURES ON REQUEST

TW Series - Double Reduction - Dimensions (inch)

TYPE TWDSM SHAFT MOUNTED



Unit Reference	A1	A2	B	C1	C2	D	F	G	H	K1	K2
TWDSM 10	10.00	5.00	10.50	10.25	4.50	7.65	1.500/1.499	4.9375/4.9395	7.36	M12	.87
TWDSM 12	12.00	6.00	12.50	11.00	4.50	8.30	1.500/1.499	5.9375/5.9395	8.39	M12	.87
TWDSM 14	14.00	7.00	14.50	12.50	5.00	9.15	1.750/1.749	6.4375/6.4395	10.00	M12	1.02
TWDSM 17	17.00	8.00	17.25	13.50	5.00	10.87	1.750/1.749	6.9375/6.9395	13.11	M12	1.02

Unit Reference	L1	M	N2	P1	P2	Q	R	S	T1	T2	U1	U2	Oil Capacity (approx)		Weight (approx) lbs.
													Litres	US Pints	
TWDSM 10	4.50	2.25	5.00	15.13	7.25	10.12	3.50	6.50	11.70	10.13	1.25	.81	13.0	27.4	950
TWDSM 12	5.00	2.25	5.50	17.13	7.88	11.62	3.75	7.25	13.20	11.13	1.25	.81	19.5	41.5	1,310
TWDSM 14	6.00	3.00	6.13	19.50	9.00	14.10	4.10	8.39	15.80	12.25	1.25	1.00	31.0	65.7	2,090
TWDSM 17	6.00	3.00	6.36	23.25	9.75	16.73	4.25	9.30	19.00	13.13	1.00	1.00	65.0	138	3,450

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWDSM 10	3.00	1.281/1.283	0.375/0.377	2.875
TWDSM 12	3.00	1.281/1.282	0.375/0.377	2.875
TWDSM 14	3.50	1.531/1.533	0.375/0.377	3.375
TWDSM 17	3.75	1.531/1.533	0.375/0.377	3.625

Output Bore Details

V2	W2
5.487/5.493	1.250/1.252
6.596/6.602	1.500/1.502
7.104/7.110	1.500/1.502
7.705/7.711	1.750/1.752

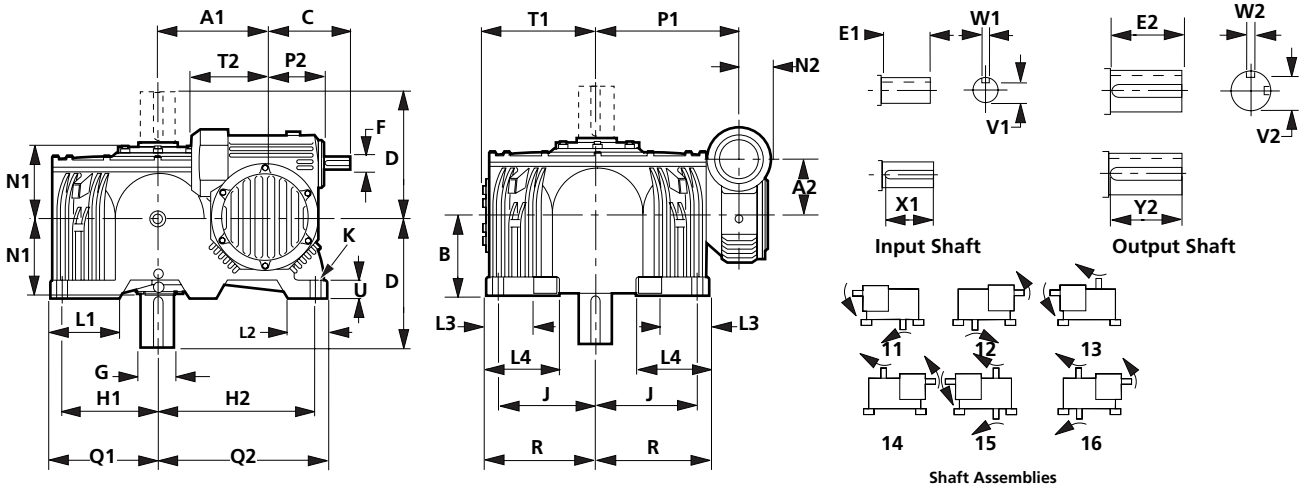
Flanged torque restraint available - details on request.
If a non reversible unit is essential, a sprag clutch backstop should be fitted.
Weights quoted are without oil.
Torque arm details - see page 38.

Larger TWSM sizes are available. Please consult Renold.

RENOLD

TW Series - Double Reduction - Dimensions (inch)

TYPE TWDV VERTICAL



Unit Reference	A1	A2	B	C	D	F	G	H1	H2	J	K	L1	L2
TWDV 10	10.00	5.00	7.50	10.25	14.75	1.500/1.499	4.250/4.249	9.00	15.75	9.00	1.28	6.81	4.56
TWDV 12	12.00	6.00	8.50	11.00	16.25	1.500/1.499	4.500/4.499	10.38	18.25	10.38	1.52	7.50	5.88
TWDV 14	14.00	7.00	10.00	12.50	19.00	1.750/1.749	5.000/4.999	12.63	20.50	12.50	1.76	9.25	5.75
TWDV 17‡	17.00	8.00	12.25	13.50	21.50	1.750/1.749	5.750/5.749	15.50	24.25	15.50	1.76	11.38	5.88
TWDV 20‡	20.00	10.00	14.25	16.75	24.00	2.500/2.499	7.000/6.999	18.25	28.63	18.25	1.89	13.25	7.50
TWDV 24‡	24.00	12.00	17.50	19.50	28.00	3.000/2.999	7.750/7.749	21.75	34.00	21.75	2.05	15.50	8.50
TWDV 28§	28.00	14.00	20.00	22.50	32.00	3.000/2.999	8.500/8.499	25.00	38.00	25.00	2.05	17.00	10.00

Unit Reference	L3	L4	N1	N2	P1	P2	Q1	Q2	R	T1	T2	U	Oil Capacity (approx)		Weight (approx) lbs.
													Litres	US Pints	
TWDV 10	4.63	6.50	6.88	5.00	15.13	7.25	10.75	17.44	10.38	11.70	10.30	1.63	18.8	40.0	930
TWDV 12	5.25	7.50	7.94	5.50	17.13	7.88	11.88	20.13	11.88	13.20	11.13	2.00	23.5	50.0	1,320
TWDV 14	5.38	9.25	9.25	6.13	19.50	9.00	14.50	22.50	14.50	15.80	12.25	2.50	57.7	123	2,130
TWDV 17‡	6.63	11.38	11.38	6.38	23.25	9.75	17.36	26.38	17.63	19.00	13.13	3.00	87.7	186	3,610
TWDV 20‡	8.50	13.25	13.75	7.40	26.75	11.69	20.75	31.13	20.75	22.00	14.88	3.25	170	360	5,110
TWDV 24‡	10.25	15.50	16.25	7.16	30.50	13.19	24.25	36.50	24.25	24.90	17.00	4.00	*	*	*
TWDV 28§	12.00	17.00	18.31	8.11	35.75	15.75	28.00	41.00	27.50	29.60	20.00	4.50	*	*	*

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWDV 10	3.00	1.281/1.283	0.375/0.377	2.875
TWDV 12	3.00	1.281/1.282	0.375/0.377	2.875
TWDV 14	3.50	1.531/1.533	0.375/0.377	3.375
TWDV 17	3.75	1.531/1.533	0.375/0.377	3.625
TWDV 20	4.94	2.148/2.142	0.625/0.626	4.69
TWDV 24	6.13	2.577/2.571	0.750/0.752	5.81
TWDV 28	6.57	2.577/2.571	0.750/0.752	6.25

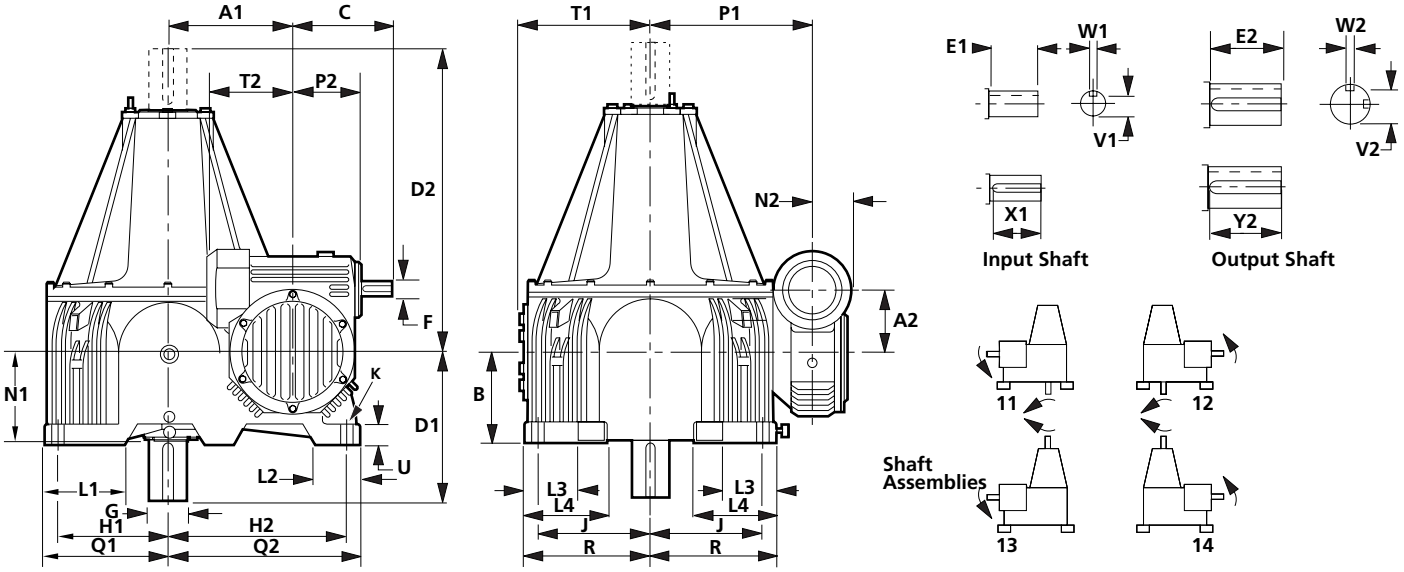
Output Shaft Details

E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.
* FIGURES ON REQUEST

TW Series - Double Reduction - Dimensions (inch)

TYPE TWDA AGITATOR



Unit Reference	A1	A2	B	C	D	D2	F	G	H1	H2	J	K	L1	L2
TWDA 10	10.00	5.00	7.50	10.25	14.75	32.63	1.500/1.499	4.250/4.249	9.00	15.75	9.00	1.28	6.81	4.56
TWDA 12	12.00	6.00	8.50	11.00	16.25	36.44	1.500/1.499	4.500/4.499	10.38	18.25	10.38	1.52	7.50	5.88
TWDA 14	14.00	7.00	10.00	12.50	19.00	41.25	1.750/1.749	5.000/4.999	12.63	20.50	12.50	1.76	9.25	5.75
TWDA 17‡	17.00	8.00	12.25	13.50	21.50	46.50	1.750/1.749	5.750/5.749	15.50	24.25	15.50	1.76	11.38	5.88
TWDA 20‡	20.00	10.00	14.25	16.75	24.00	51.38	2.500/2.499	7.000/6.999	18.25	28.63	18.25	1.89	13.25	7.50
TWDA 24‡	24.00	12.00	17.50	19.50	28.00	58.30	3.000/2.999	7.750/7.749	21.75	34.00	21.75	2.05	15.50	8.50
TWDA 28§	28.00	14.00	20.00	22.50	32.00	46.00	3.000/2.999	8.500/8.499	25.00	38.00	25.00	2.05	17.00	10.00

Unit Reference	L3	L4	N1	N2	P1	P2	Q1	Q2	R	T1	T2	U	Oil Capacity (approx)		Weight (approx) lbs.
													Litres	US Pints	
TWDA 10	4.63	6.50	6.88	5.00	15.13	7.25	10.75	17.44	10.38	11.70	10.30	1.63	18.8	40.0	1,120
TWDA 12	5.25	7.50	7.94	5.50	17.13	7.88	11.88	20.13	11.88	13.20	11.13	2.00	23.5	50.0	1,560
TWDA 14	5.38	9.25	9.25	6.13	19.50	9.00	14.50	22.50	14.50	15.80	12.25	2.50	57.7	123	2,600
TWDA 17‡	6.63	11.38	11.38	6.38	23.25	9.75	17.75	26.38	17.63	19.00	13.13	3.00	87.7	186	4.410
TWDA 20‡	8.50	13.25	13.75	7.40	26.75	11.69	20.88	31.13	20.75	22.00	14.88	3.25	170	360	6,250
TWDA 24‡	10.25	15.50	16.25	7.16	30.50	13.19	24.25	36.50	24.25	24.90	17.00	4.00	*	*	*
TWDA 28§	12.00	17.00	18.31	6.50	35.75	15.75	28.19	41.00	27.50	29.60	20.00	4.50	*	*	*

Input Shaft Details

Unit Reference	E1	V1	W1	X1
TWDA 10	3.00	1.281/1.283	0.375/0.377	2.875
TWDA 12	3.00	1.281/1.282	0.375/0.377	2.875
TWDA 14	3.50	1.531/1.533	0.375/0.377	3.375
TWDA 17	3.75	1.531/1.533	0.375/0.377	3.625
TWDA 20	4.94	2.148/2.142	0.625/0.626	4.69
TWDA 24	6.13	2.577/2.571	0.750/0.752	5.81
TWDA 28	6.57	2.577/2.571	0.750/0.752	6.25

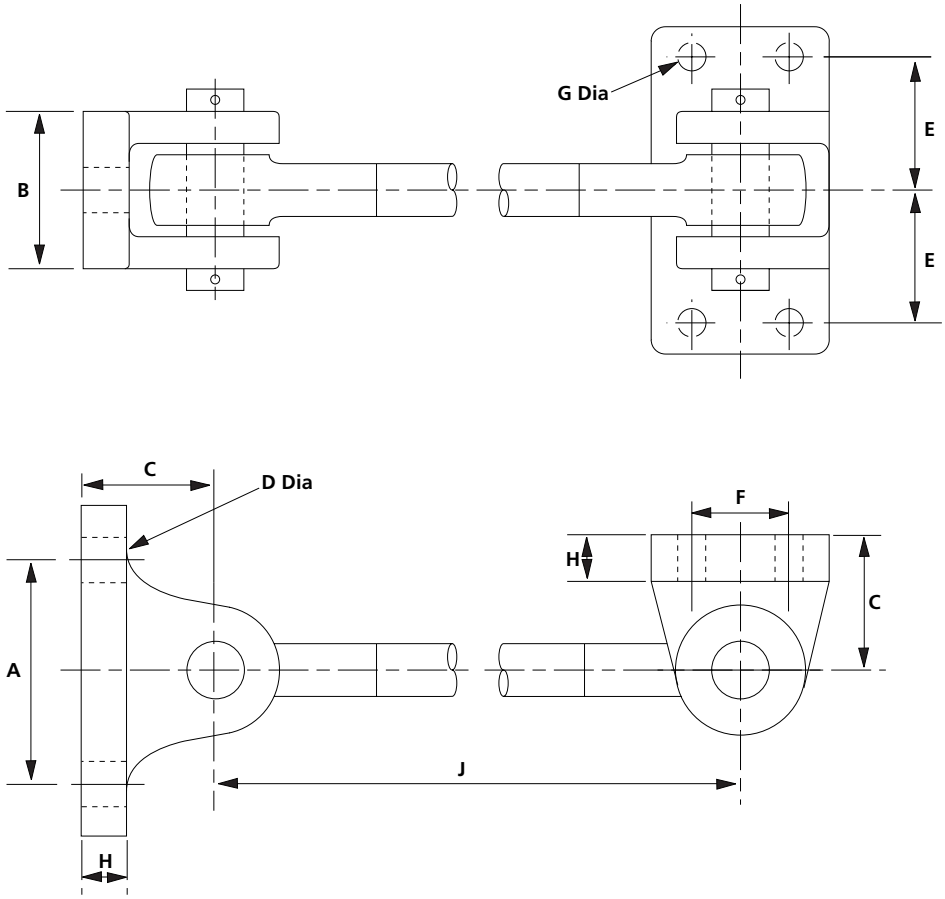
Output Shaft Details

E2	V2	W2	Y2
7.56	3.690/3.684	1.000/1.002	7.25
8.13	3.944/3.938	1.000/1.002	7.88
9.19	4.296/4.290	1.250/1.252	8.88
9.50	4.900/4.894	1.500/1.502	9.00
9.88	6.193/6.133	1.750/1.752	9.63
11.38	6.869/6.863	2.000/2.002	11.13
13.00	7.630/7.624	2.000/2.002	12.75

‡ Units with central mounting pads. § Units with central mounting pad and bolt hole via K.
If non reversible unit is essential, a sprag clutch backstop should be fitted. Weights quoted are without oil.
* FIGURES ON REQUEST

RENOLD

TW Series - Torque Arm - Dimensions (inch)



Size	A	B	C	D	E	F	G	H	J
T10	4.5	3.0	2.25	0.866	2.50	2.0	0.531	0.811	30.0
T12									36.0
T14	5.0	3.50	3.0	1.02	3.0	3.0	0.531	1.0	30.0
T17									36.0

SUITABLE FOR UNIT TYPES TWSM AND TWDSM

TW Series - Installation and Maintenance

Initial running

All units are supplied without oil.

First filling

Single Reduction Units

When installed and before running, the unit should be filled with new lubricant to the correct level as follows.

With the gear stationary, remove the filler and breather plug and oil level plug. Fill until the lubricant level is visible at the indicator (if fitted) or until lubricant overflows from oil level aperture.

Replace and secure both plugs. Care should be taken to avoid overfilling, as this may cause subsequent leakage.

Double Reduction Units

All double reduction gear units have common oil levels and the oil quantities shown in this catalog will be suitable for both 1st and 2nd reduction cases. However, TWDO and overdriven double reduction units do have independent oil levels.

Starting up

All units have been subjected to a short test before despatch to the customer, but it takes many hours running under full load for the gear to attain its highest efficiency. The gear may, if necessary, be put to work immediately on full load, but if circumstances permit, it is better for the ultimate life of the gear to run it in under gradually increasing load attaining the full load after about 20 to 40 hours. Reasonable precautions should, however, be taken to avoid overloads in the early stage of running. Temperature rise on the initial run will be higher than that eventually attained after the gear is fully run in.

Routine maintenance

The oil level in the unit should be regularly maintained and should be checked at least once a month.

To avoid false readings, examination of the oil level should be made with the gear stationary and to maintain free ventilation of the unit under all conditions, the breather hole in the filler plug should be kept clear at all times. In the case of double reduction units, ensure that maintenance requirements given above are applied to both 1st and 2nd stage reduction gears.

Changing oil

The oil should be changed completely at intervals depending upon the working conditions.

Grease lubrication of bearings

Where this feature is included, the bearing caps are fitted with a grease nipple or stauffer lubricator, which should be used to lubricate the bearings.

When mounted with wormshafts vertical, the top bearing requires grease lubrication. Standard units, therefore, need to be modified by the inclusion of a grease nipple and nylos ring adjacent to the top bearing. Customers must advise us of this requirement when placing enquiries and orders.

Couplings and bedplates

All couplings should be carefully fitted and shafts accurately aligned.

To prevent damage to the bearings, coupling half-bodies should not be hammered on to shafts.

Worm gear units and other drive components should be rigidly mounted on firm foundations to prevent movement and vibration which may affect the alignment of the shafts. Suitable bedplates can be supplied if required.

Abnormal ambient temperatures

If the gear unit is to be operated under extremes of temperature or humidity, special oils may be required and recommendations will be made on request.

Storage

All worm gear units stored or left inactive for long periods should be adequately protected, particularly those on exposed sites and those operating in corrosive atmospheres. The following precautions will generally be adequate, but advice on the protection of particular units will be given, if required.

If empty of oil: spray the gear case interior with rust preventative oil compatible with lubricant recommended for service conditions.

If filled with oil: operate at full speed once per month for not less than 10 minutes to ensure liberal coating of all internal parts with oil.

For indefinite storage: completely fill unit with oil ensuring complete submersion of all internal components and shafts should be occasionally turned by hand. When unit is returned to service, drain and refill with new oil to correct level.

Spare parts

Information relating to spare parts is available on request.

RENOLD TW Series - Lubrication

The correct fill of oil for the unit size and mounting position can be found in either the appropriate catalogue or the Installation and Maintenance Guide. Only good quality oils should be used, such as those listed below, as the use of inferior or unsuitable products may cause rapid wear and possible damage to the gearbox. Some EP additives such as Sulphur can attack Bronze especially at operating temperatures above 80°C and therefore should be avoided.

Oils with three viscosity ranges (light, medium and heavy) are listed below, the correct choice depends on the application, operating speed, load and temperature. Operating temperature and speed can often be the main factor as they affect the operating viscosity. If the unit runs below the catalogue rating and operates at a temperature below 60°C then a light grade oil should be used. Running at catalogue rating with operating temperatures up to 90°C require a medium grade, with higher temperatures and loading heavy grade oils should be used. When using Polyalphaolefin oils these temperatures can be increased by about 5°C.

If the unit is operating with gear speeds below 2.5 m/s (500ft/min) then the next higher grade should be used. Using too heavy a grade oil than required will result in reduced efficiency, too light a grade will result in premature wear, if in doubt ask Renold Gears Technical Department

Which Oil to Select

There are three main oils Mineral, Synthetic (Polyalphaolefin) and Synthetic (Polyglycol). Mineral oils tend to be cheaper, have a lower life and are less efficient. Synthetic (Polyalphaolefin) can operate over a higher temperature range, are more efficient, give higher ratings and have a longer life and as such are preferred.

The use of Synthetic (Polyglycol) are not recommended without prior discussion with Renold as special paints and seals are required.

If necessary a list of recommended food grade oils is available on request.

If a Sprag Clutch backstop is fitted internally to the gear unit, oils with EP type additives must not be used.

The oils shown below are all suitable for use with Sprag Clutch backstops.

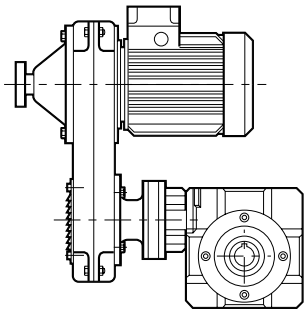
Mineral Oil	Light		Medium		Heavy	
		Temp˚C		Temp˚C		Temp˚C
Mobil DTE	BB	-7 to 90	AA	2 to 90	HH	2 to 90
Castrol Alpha ZN	220	-9 to 120	320	-9 to 120	460	-9 to 120
Shell Vitrea	220	-24 to 120	320	-18 to 120	460	-15 to 120
Esso Teresso	220	-18 to 120	320	-12 to 120	460	-9 to 120
Kluberoil GEM 1	220	-18 to 120	320	0 to 100	460	0 to 100

Synthetic (Polyalphaolefin)	Light		Medium		Heavy	
		Temp˚C		Temp˚C		Temp˚C
Mobil Gear SHC	630	-42 to 160	632	-42 to 160	634	-39 to 160
Castrol Alpha T	220	-36 to 80	320	-33 to 80	460	-33 to 80
Shell Omala RL	220	-40 to 80	320	-40 to 80	460	-40 to 80
Esso Teresso SHP	220	-42 to 150	320	-36 to 150	460	-30 to 150

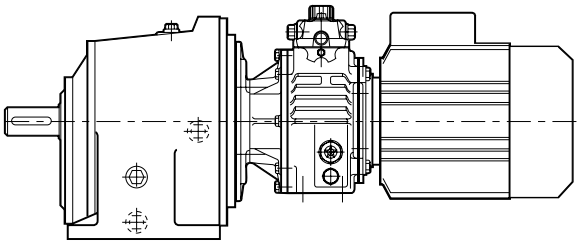
Renold Gears Drive Unit Combination Examples

All of the Renold gear products are designed and built to a modular concept and can be combined in such a way as to give the best drive package to suit the application.

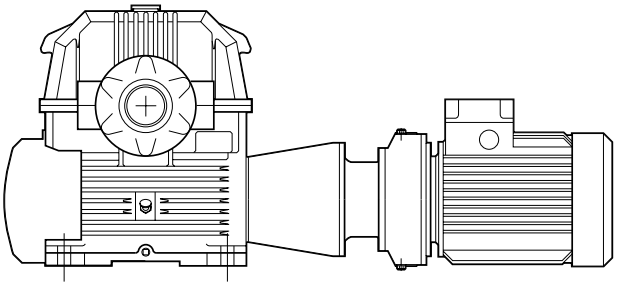
The following are some suggestions.



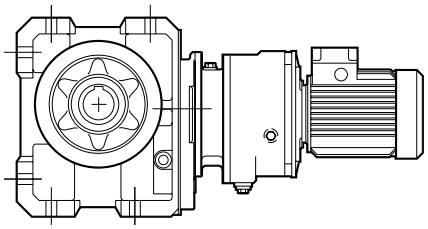
Carter belt variable speed drive driving a jPM wormgear unit giving up to 8.75:1 variable speed range with a right angle drive.



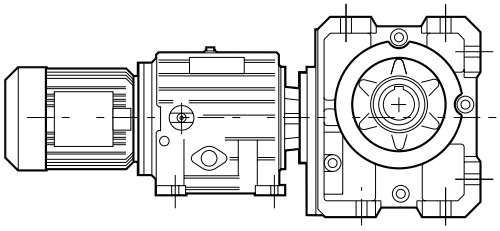
Carter disc variable speed unit, combined with electric motor and RS Series helical unit.



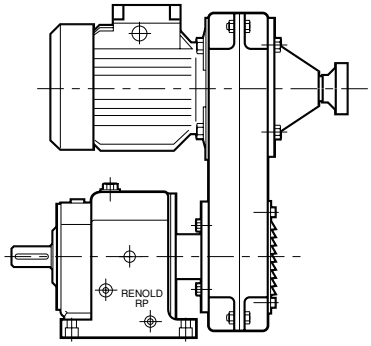
TW Series wormgear unit ratio can be extended beyond the catalogued figure by adding a helical first stage reduction such as RS Series or RP Series.



Combined flange mounted RS Series and ePM Series - PH Type helical/worm unit has a maximum ratio capability of up to 22,000:1.



Motorised Carter hydrostatic variable speed unit with a 27:1 variable speed range combined with e.PM Series - PH Type helical worm unit.



Carter belt variable speed unit combined with a RP Series single, double or triple reduction.

RENOLD

RENOLD Worldwide Sales and Services

ARGENTINA
Bennett Anderson,
Gonzales Y Cia SA, J.Aguero 1817
(1605) Munro
Buenos Aires
Tel: + 54 11 4761 5007/ 3531
Fax: + 54 11 4760 0866

Los Ases Ketten SA,
Avda Gaona 4046,
1407 Buenos Aires
Tel: + 54 116710855
Fax: + 54 116713141

AUSTRALIA
Renold Australia Proprietary Ltd
508-520 Wellington Road,
Mulgrave, Victoria 3170, Mulgrave North
Tel: +61 (0) 3 9262 3333
Fax: +61 (0) 3 9561 8561
Branch Tel: +61 (0) 3 9262 3355
Email: melcag@renold.com.au

Unit 1,
12-18 Victoria Street, Lidcombe,
Sydney, NSW 2141.
Tel: +61 (0) 2 9649 3122
Fax: +61 (0) 2 9646 1295
Email: nswsales@renold.com.au

Unit 10,
31 Boyland Avenue,
Coopers Plains, Brisbane,
Queensland 4108.
Tel: +61 (0) 7 3275 2155
Fax: +61 (0) 7 3875 1779

Corner Orsmond & George Sts.
Hindmarsh, Adelaide,
South Australia 5007.
Tel: +61 (0) 8 8346 9077
Fax: +61 (0) 8 8340 1217

Unit 2,
127 Grandstand Street, Belmont,
Perth, West Australia 6104.
Tel: +61 (0) 8 9479 1388
Fax: +61 (0) 8 9479 1364

Unit 13
56 Industrial Drive,
Mayfield, NSW 2304
Tel: +61 (0) 2 4960 8440
Fax: +61 (0) 2 4960 8455

PO Box 159,
Unanderra, Wollongong, NSW 2526.
Tel: +61 (0) 2 42 621771
Fax: +61 (0) 2 42 621772

Shop B,
247 Ingham Road,
Garbutt, Townsville, QLD 4814.
Tel: +61 (0) 7 4779 5922
Fax: +61 (0) 7 4775 1446

AUSTRIA
Renold GmbH
Obere Donaustrasse 43,
Postfach 60, A-1021 Wien.
Tel: +43 (0) 1 3303484 0
Fax: +43 (0) 1 3303484 5

BANGLADESH
Brady & Co (Bangladesh) Ltd,
31, Bangabandhu Avenue,
Dhaka-1000
Tel: + 880 2802358
Fax: + 880 2802358

BELGIUM
Renold Continental Ltd
Allée Verte 1,1000 Brussel.
Tel: +32 (0) 2 2011262
Fax: +32 (0) 2 2032210
Email: info@renold.be

CANADA
Renold Canada Ltd
121 Roy Boulevard, Brantford,
Ontario, N3T 5N4
Toll Free: 1-800-265-9970
Tel: +1 519 756 6118
Fax: +1 519 756 1767
Email: inquiry@renoldcanada.com

622 rue De Hull,
Ville La Salle,
Quebec, H8R 1V9.
Toll Free: 1-800-361-1414
Tel: +1 514 367 1764
Fax: +1 514 367 4993

CHILE
Sargent S.A.,
Avda. Presidente Bulnes No 205,
Casilla 166-D,
Santiago - Chile.
Tel: (56 2) 510 3000
Fax: (56 2) 698 3989
Email: secventas@sargentagricola.cl

CHINA
Rm210C, Heqiao Building
Guanghua Rd, No.8 (Jia),
Chaoyang Dist, Beijing
Postcode 100020, China.
Tel: +86 10 65817522
Fax: +86 10 65810336
Email: renoldcn@public3.bta.net.cn

COLOMBIA
Transmission de Potencia SA
Carrera 68B No10 - 98
Apartado Aereo 6794
Santafe de Bogato DC
Tel: + 571 2600100
Fax: + 571 2904823

Importadora Casa Sueca Ltda.,
Calle 52, No. 1N-74,
Apartado Aereo 1208, Cali.
Tel: 00 57 2346 4455
Fax: 00 57 2346 4967

CZECH REPUBLIC
Renold GesmbH
Technical Office, Dipl. Ing. R. Badura,
Jaroslavice 129, CZ-76001 Zlin.
Tel: +42 67 7211074
Fax: +42 67 7211074

DENMARK
Renold A/S,
Skelmarksvej 6, Postboks 90,
2605 Brøndby.
Tel: +45 43 452611
Fax: +45 43 456592
Email: renold@post9.tele.dk

EGYPT
Itaco,
Int'l for Trading & Agency,
P.O. Box 7550, Nasr City, Cairo.
Tel: + 20 2 2718036
Fax: + 20 2 2878089

EL SALVADOR
MVA & Cia
Residencial San Luis,
Avenida 4 #45 Block 2,
San Salvador,
El-Salvador, Central America
Tel: + 503 274 649

FINLAND
Kraftmek Oy,
Hitsaajankatu 9, P.O. Box 36,
FIN-00811 Helsinki
Tel: + 358 9 7557355
Fax: + 358 9 7550414

FRANCE
Brampton Renold,
Zone Industrielle A, Rue de la Pointe, BP 359, 59473 Seclin Cedex.
Tel: +33 (0) 320 16 29 29
Fax: +33 (0) 320 16 29 00

Renold Automotive (Chain only)
Brampton Renold S/A,
188 Boulevard Lafayette BP 99,
62102 Calais Cedex
Tel: +33 (0) 321 97 99 45
Fax: +33 (0) 321 97 83 45

GERMANY
Arnold & Stolzenberg,
Juliusmühle,
D37574 Einbeck.
Postal address:
PO Box 1635 + 1645
D37557 Einbeck.
Tel: +49 (0) 5562 81 163
Fax: +49 (0) 5562 81 164
Email: arnoldandstolzenberg@t-online.de

GREECE
Provatas Engineering
53/47 Dragatsaniou St,
185 - 45 Piraeus.
Tel: + 30 1 4170266
Fax + 30 1 4170253

HOLLAND
Renold Continental Ltd,
Jarmuiden 30c,
1046 AD Amsterdam.
Tel: +31 (0) 20 614 6661
Fax: +31 (0) 20 614 6391
Email: info@renold.nl

HUNGARY
Renold GesmbH
Technical Office, Ing. Havasi Janos,
Ret Utca 25, H-6200 Kiskörös.
Tel: +36 (0) 78 312483
Fax: +36 (0) 78 312483

INDIA
Voltas Limited.,
Machine Tool Division,
Voltas House B, 3rd Floor,
TB Kadam Marg,
Chinchpokli,
Mumbai 400033
Tel: 091 22 370 0829
Fax: 091 22 371 4889
Email: mshaik@voltasltd.com

NORTHERN IRELAND
Henry R. Ayton Ltd,
Derriaghy, Dunmurry, Belfast.
Tel: 01232 618511
Fax: 01232 602436

SOUTHERN IRELAND
Henry R. Ayton Ltd.,
Broomhill Drive, Tallagh, Dublin 24
Tel: + 353 (0) 1 4517922
Fax: + 353 (0) 1 4517922

ISRAEL
Technica J. Bokstein Co. Ltd,
3 Hatrupa Street,
Netanya 42504
Tel: + 972 9 8850505
Fax: + 972 36131074

ITALY
Bianchi Cuscinetti SpA
Via Zuretti, 102, 20125 Milano,
Tel: + 39 02 67861
Fax: + 39 02 66981669

JAMAICA
Masterton Ltd,
21-25 Hanover Street, P.O. Box 73
Kingston.
Tel: + 18 767 540557
Fax: + 18 769 227807

KOREA
S.S. Corporation,
Yeouido, P.O. Box 60, Seoul.
Tel: 00-822-783-6829
Fax: 00-822-784-9322
Email: sslcorp@chollian.net

MALAYSIA
Renold (Malaysia)
SDN BHD, 39 Jalan TP 7/7,
Sime UEP Industrial Park,
Section 26, 40400 Shah Alam,
Selangor.
Tel: + 603-5191 9880
Fax: + 603-5191 9881 (General)
Fax: + 603-5191 6881 (Sales)
Email: malaysia@renold.com

201, Jalan Simbang,
Taman Perling,
81200 Joho Bharu, Johor, Malaysia.
Tel: + 60 (0) 7 2384152-3
Fax: + 60 (0) 7 2384155
Email: malaysia@renold.com

452, Jalan Kuala Kangsar,
Loke Lim Garden, 30010 Ipoh,
Perak, Malaysia.
Tel: + 60 (0) 5 2915991-2
Fax: + 60 (0) 5 2915728
Email: malaysia@renold.com

28B Jalan Perai Jaya 3,
Bandar Perai Jaya,13600 Perai,
Penang, Malaysia
Tel: + 604-399 9648
Tel: + 604-399 0648
Fax: + 604-399 5649
Email: malaysia@renold.com

MAURITIUS
Dynamotors Ltd,
P.O. Box 733, Bell Village,
Tel: + 230 2122847/8/9
Fax: + 230 2088348

MEXICO
Accessorios Automotrices y Rodamientos Industriales,
S.A. de C.V., Calz Legaria 833-A
Col Irigacion, Mexico DF 11500
Tel: + 52 5 395 6300
Fax: + 52 5 395 6370

For more information telephone us - Canada: Toll Free 800.265.9970. USA: Toll Free 800.850.8141

RENOLD Worldwide Sales and Services

NEW ZEALAND
Renold New Zealand,
594 Rosebank Road,
Avondale, Auckland.

Postal Address:
PO Box 19460,
Avondale, Auckland.
Tel: + 64 (0) 9 828 5018
Fax: + 64 (0) 9 828 5019
Email: aksales@renold.co.nz

Christchurch Branch Office,
32 Birmingham Drive, Christchurch,
PO Box 9006, Christchurch,
Tel: + 64 03 338 2169
Fax: + 64 03 338 8663

NORWAY
G. Heier A/S,
Postal Address: Postboks 6615,
Rodelokka, 0502 Oslo, Norway.
Office Address: Thv, Meyersgt.
7, Oslo.
Tel: + 47 232 34230
Fax: + 47 232 34242

PAKISTAN
Brady & Co. of Pakistan Ltd,
Shernaz House, P.O. Box 4453,
West Wharf Road, Karachi 2.
Tel: + 92 21.2310367/201712
Fax: + 92 21.2313376/2313378

PERU
Corporacion Basco S.A.C.
Av. Argentina 1165,
Lima 1, RUC 25776186.
Tel: + 51 1 4336633
Fax: + 51 1 4313188

PORTUGAL
Harker, Sumner, S.A.
Zona Industrial Maia 1 - Sector X
4475 - 132 Gemunde - Maia
Portugal
Tel: + 351 229 4478 090
Fax: + 351 229 4478 098

SINGAPORE
Renold Transmission Limited
63 Hillview Avenue, #07-13,
Lam Soon Industrial Building,
Singapore 669569.
Tel: + 65 6760 2422
Fax: + 65 6760 1507
E-mail: renold@mbox5.singnet.com.sg

SOUTH AFRICA
Renold Croft (Pty) Limited,
Corner Liverpool and Bolton Streets,
Nestadt Industrial Sites, Benoni, 1501
Postal Address: Private Bag x 030,
Benoni, 1500.
Tel: + 27 (0) 11 845 1535
Fax: + 27 (0) 11 421 9289
E-mail: renold@iafrica.com

89 Berea Road, Dalbridge,
Durban, 4000,
Postal Address: PO Box 18137,
Dalbridge, Durban, 4014.
Tel: + 27 (0) 31 305 5281
Fax: + 27 (0) 31 304 7961

364 Voortrekker Road,
Maitland, Cape Town, 7405
Postal Address: PO Box 211,
Maitland, 7405.
Tel: + 27 (0) 21 593 8913
Fax: + 27 (0) 21 593 8930

137 Kempston Road,
Port Elizabeth, 6000.
Postal Address : PO Box 4080,
Korsten, 6014.
Tel: + 27 (0) 41 453 2430
Fax: + 27 (0) 41 451 4305

5c van Bruggen St.Ext 25
Witbank, 1035,
Postal Address: PO Box 2661,
Witbank, 1035.
Tel: + 27 (0) 13 692 7760
Fax: + 27 (0) 13 697 0546

9 Macgra Industrial Park,
Cnr. Alumina Allee & Bronze Bar,
Altron, Richards Bay, 3900,
Postal Address: PO Box 21247,
Arboretum, 3900.
Tel: + 27 (0) 351 51 1093-1049
Fax: + 27 (0) 351 51 1315

SPAIN
Brown Pestell,
Ctra N-11 Lm. 599.5 Nave 5,
08780 Palleja, Barcelona.
Tel: + 34 93 6630740
Fax: + 34 93 6632057

SWEDEN
Renold A/S
Skelmarksvej 6, Postboks 90
2605 Brøndby
Denmark.
Tel: + 45 43 452611
Fax: + 45 43 456592
E-mail: renold@post9.tele.dk

SWITZERLAND
Renold (Switzerland) Gmbh,
Ringstrasse 16, Postfach 1115
CH-8600 Dübendorf 1.
Tel: + 41 (0) 1 824 8484
Fax: + 41 (0) 1 824 8411
E-mail: info@renold-gmbh.ch

Route De Prilly 25,
CH-1023 Crissier.
Tel: + 41 (0) 21 632 9460
Fax: + 41 (0) 21 632 9475
E-mail: crissier@renold-gmbh.ch

THAILAND
United Power Engineering Co Ltd
4 Soi Sukhumvit 81 (Siripot)
Sukhumvit Road
Bangjak, Phrakhanong
Bangkok 10260.
Tel: + 66 2 7425366
Fax: + 66 2 7425379

TRINIDAD
Tracmac Engineering Ltd,
P.O. Box 945, Port of Spain,
Trinidad, West Indies.
Tel: + 1 665 460 1532
Fax: + 1 868 671 0012

TURKEY
Glengo Ithalat Ihracat Mumessillik
AS,
Gungoren Cad. No. 35 Bagcilar,
34560
Bakirkoy, Istanbul.
Tel: + 90 212 4613970
Fax: + 90 212 4613972
www.glengo.com.tr

UNITED KINGDOM
Renold Engineering Products
Station Road, Milnrow,
Rochdale OL16 3LS
Tel: + 44 (0) 1706 751010
Fax: + 44 (0) 1706 751011
Web: www.renold.com

Renold Gears
Holroyd Gears Works, Milnrow,
Rochdale OL16 3LS
Tel: +44 (0) 1706 751000
Fax: +44 (0) 1706 751001
E-mail: sales@gears.renold.com
Web: www.renold.com

Renold Clutches & Couplings
Wentloog Corporate Park,
Newlands Road,
Cardiff CF3 2EU, Wales
Tel: + 44 (0) 29 20792737
Fax: + 44 (0) 29 20793004
(Sales):+ 44 (0) 29 20791360
E-mail: couplings@cc.renold.com
Web: www.renold.com

Renold Hi-Tec Couplings
112 Parkinson Road
Halifax HX1 3QH
Tel: +44 (0) 1422 255000
Fax: +44 (0) 1422 320273
E-mail: sales@hitec.renold.com
Web: www.renold.com

Holroyd
Harbour Lane North, Milnrow,
Rochdale, OL16 3LQ.
Tel: +44 (0) 1706 526 590
Fax: +44 (0) 1706 353 350
E-mail: info@holroyd.com
Web: www.holroyd.com

Renold Chain
UK Sales, Horninglow Road,
Burton upon Trent,
Staffordshire, DE14 2PS.
Tel: +44 (0) 1283 512 940
Fax: +44 (0) 1283 512 628
E-mail: enquiry@renold.com

USA
Renold Jeffrey
2305 Global Way,
Hebron, KY 41048
Toll Free Tel: (800) 850-8141
Tel: 859 334 8520
Fax: 859 334 8550
Web: www.renoldusa.com
E-mail: information@renoldusa.com

Renold Inc
Bourne Street, PO Box A, Westfield,
New York, 14787-0546
Tel: + 1 716 326 3121
Fax: + 1 716 326 6121
E-mail: renold@cecomet.net

VENEZUELA
Equipos Y Acessorios Astral CA,
Apartado 1651 Valencia.
Tel: + 584 1 332042
Fax: + 584 1 345641

WEB
www.renold.com

For more information telephone us - Canada: Toll Free 800.265.9970. USA: Toll Free 800.850.8141

CANADA

Renold Canada Ltd
Head Office & Ontario District
121 Roy Boulevard, Brantford,
Ontario N3T 5N4
Toll Free Tel: 800 265 9970
Tel: (519) 756 6118 Fax: (519) 756 1767
Email: inquiry@renoldcanada.com

Quebec District
622 rue De Hull, Ville La Salle,
Quebec H8R 1V9
Toll Free Tel: 800 361 1414
Tel: (514) 367 1764 Fax: (514) 367 4993

Western District
Toll Free Tel: 800 265 9970
Fax: 800 661 6118

Atlantic and Manitoba District
Toll Free Tel: 800 265 9970
Fax: 800 661 6118

USA

Renold Jeffrey
2305 Global Way,
Hebron, KY 41048
Toll Free Tel: 800-850-8141
Tel: 859-334-8520 Fax: 859-334-8550
Web: www.renoldusa.com
E-mail: information@renoldusa.com

RENOLD

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