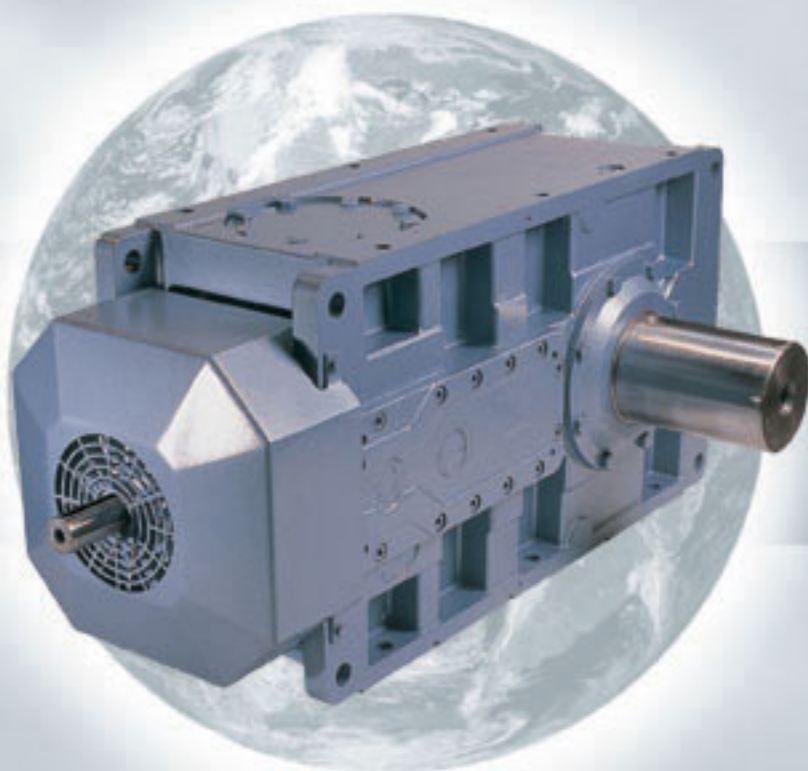


Series G



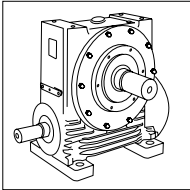
TEXTRON POWER TRANSMISSION

SERIES G

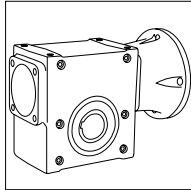
PRODUCTS IN THE RANGE

0205

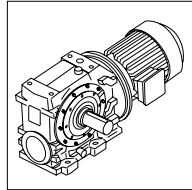
Serving an entire spectrum of mechanical drive applications from food, energy, mining and metal; to automotive, aerospace and marine propulsion, We are here to make a positive difference to the supply of drive solutions.



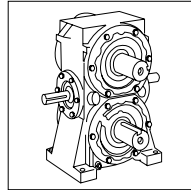
Series A
Worm gear units
and geared motors
in single & double
reduction types



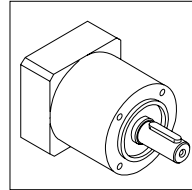
Series B
Conax helicoidal
gear geometry right
angle gearmotors
and reducers



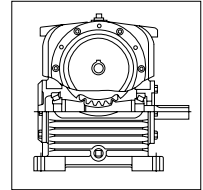
Series C
Right angle drive
helical worm geared
motors & reducers



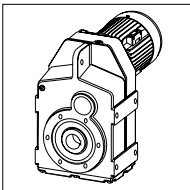
Series D
Dual gears on
parallel output shafts



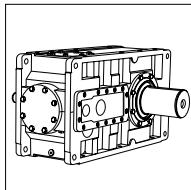
Series E
Economical
planetary servo
gearboxes



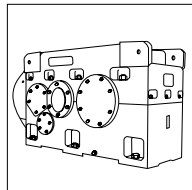
Extruder Drive
Rugged duty
reducer takes high
screw pressure



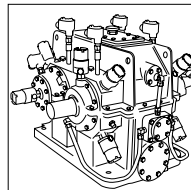
Series F
Parallel helical shaft
mounted geared
motors & reducers



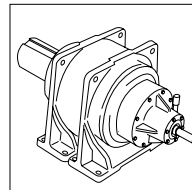
Series G
Helical parallel shaft
& bevel helical
right angle drive gear
units



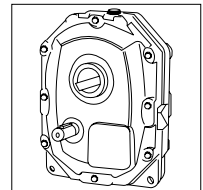
Series H
Large helical parallel
shaft & bevel helical
right angle drive
units



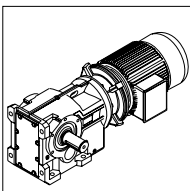
Highspeed
Helical parallel shaft
high speed units



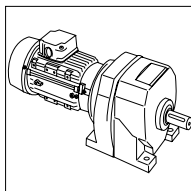
HTP
High torque
planetary gear units



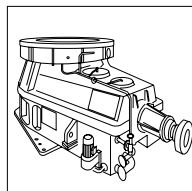
Series J
Shaft mounted
helical speed
reducers



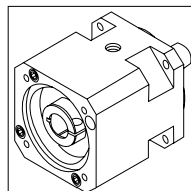
Series K
Right angle helical
bevel helical geared
motors & reducers



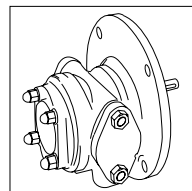
Series M
In-line helical geared
motors & reducers



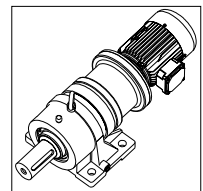
Mill Drives
Bevel planetary
vertical mill drives



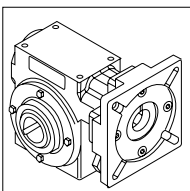
Series P
Precision planetary
servo gearboxes



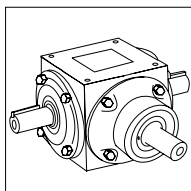
Pumps
Double helical gear
pumps



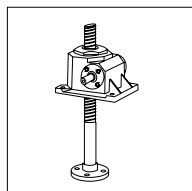
Series Q
In-line planetary
geared motors &
reducers



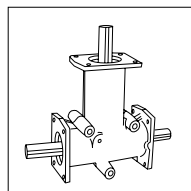
Model RG
Right angle
gearhead in two
precision levels



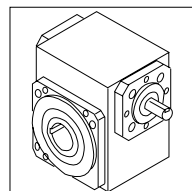
Series R
Right angle spiral
bevel gear unit



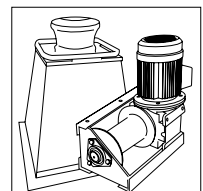
Series S
Screwjack worm
gear units



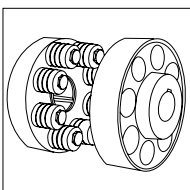
Series T
Right angle straight
bevel gear unit



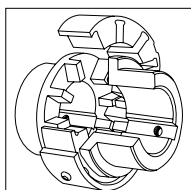
Series W
Precision right angle
servo gearboxes



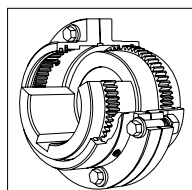
**Winches &
Capstans**
Custom engineered
solutions



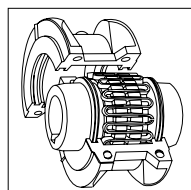
**Series X
Cone Ring**
Pin and bush
elastomer coupling



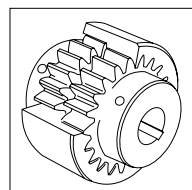
**Series X
Flexiwrap**
Double flexing
elastomer coupling



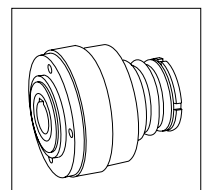
**Series X
Gear**
Torsionally rigid,
high torque coupling



**Series X
Grid**
Double flexing steel
grid coupling



**Series X
Nylicon**
Gear coupling with
nylon sleeve



**Series X
Torque Limiter**
Overload protection
device

We can create custom engineered transmission solutions of any size and configuration.

SERIES G

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SERIES G

GENERAL DESCRIPTION

0202

Series G

Series G gear units are available in parallel shaft helical units and right angle shaft bevel/helical units in double, triple and quadruple reduction gear stages having a maximum output torque of up to 130,000 Nm.

The modular design and construction of the Series G offers many engineering and performance benefits including a high degree of interchangeability of parts and sub assemblies. This in turn provides considerable economies of production whilst maintaining the highest standard of component integrity.

Adding to the new range of power transmission geared motors this product takes advantage of our many years of accumulated design expertise together with the use of high quality materials and components. The end result is a series of speed reducing gear units offering high load carrying capacities, increased efficiency, quiet running and reliability.

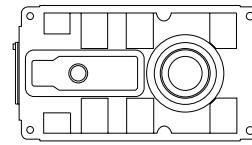
The Range Includes

- 7 sizes of units with a ratio coverage of 6.3:1 to 315:1.
- Parallel shaft helical units and Right angle bevel/helical units.

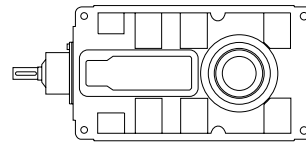
Design Features Include

- Profile ground helical gears / hard finished spiral bevel gears.
- High level of surface finish for quiet running.
- Units can be offered in horizontal mounting positions or alternatively vertical mounting.
- Specially designed units are available for heavy duty agitator or tower applications.
- All units are also available with a hollow bore for output shaft mounting. Output bores are connected by a shrink disc or can be supplied with a KIBO bush.
- Backstops can be fitted to all Series G units when required to operate in non-reversing drives.

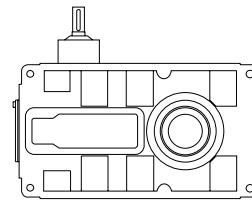
As improvements in design are being made continually this specification is not to be regarded as binding in detail and drawings and capacities are subject to alteration without notice. Certified drawings will be sent on request.



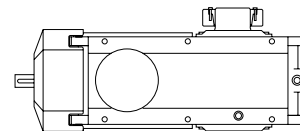
Parallel shaft unit



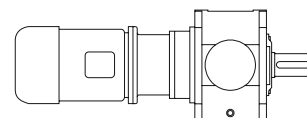
Right angle shaft unit



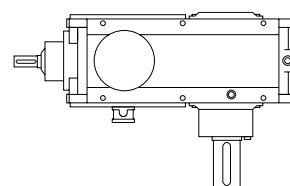
Type 'J' right angle shaft unit



Right angle shaft unit with mechanical fan and hollow output shaft with shrink disc



Parallel shaft unit with a lantern housing coupling and motor



Right angle heavy duty agitator unit

SERIES G

UNIT DESIGNATIONS

0203

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
*																				
EXAMPLE	G	1	4	3	0	5	0	.	H	-	-	-	-	R	L	1	-	-	-	-

1- SERIES G
RANGE G

2,3- SIZE OF UNIT
1 4 THROUGH 2 1

4- NO OF REDUCTIONS
2 THROUGH 4

5- REVISION VERSION
0 ETC

6,7,8- NOMINAL OVERALL RATIO
eg

8	.	0
5	0	.

 See pages 26 for parallel shaft units
40 for right angle units

9- UNIT VERSION
H - HORIZONTAL PARALLEL SHAFT UNIT
V - VERTICAL PARALLEL SHAFT UNIT
B - HORIZONTAL RIGHT ANGLE UNIT
R - VERTICAL RIGHT ANGLE UNIT

10- OUTPUT SHAFT
- - STD SOLID SINGLE EXTENSION
D - STD SOLID DOUBLE EXTENSION
H - STD HOLLOW SHAFT WITH SHRINK DISC
 STD HOLLOW SHAFT WITH KIBO BUSH - entry depends on shaft diameter see page 56
A - STD AGITATOR WITH DROP BEARING HOUSING
C - STD TOWER WITH EXTENDED BEARING HOUSING
 FOR INCH OUTPUT SHAFT OPTIONS SEE PAGES 15 and 16

20 - TORQUE ARM
- - NO TORQUE ARM
T - TORQUE ARM

19 - CASE CONSTRUCTION
- - CAST IRON
S - SG IRON
F - FABRICATED STEEL CASE

18 - OIL LEVEL
- - DIPSTICK
G - SIGHTGLASS

17 - COOLING
- - NONE
F - MECHANICAL FAN
E - ELECTRIC FAN
C - COOLING COIL
A - MECHANICAL FAN & COOLING COIL
B - ELECTRIC FAN & COOLING COIL
S - SPRAY

16 - SHAFT ROTATION
1 2 3 OR 4 SEE PAGES 11 and 12

14,15 - UNIT HANDLING
 eg R L SEE PAGES 11 and 12

13 - TYPE OF UNIT
 FOR REDUCER (STANDARD UNIT)
 ENTER -
 TO ALLOW FITTING OF MOTOR
 SEE PAGES 61 and 62

12- BACKSTOP
- - NO BACKSTOP
X - BACKSTOP FITTED

11- INPUT SHAFT
- - STANDARD SINGLE EXTENSION
D - STANDARD DOUBLE EXTENSION (HORIZONTAL UNITS ONLY)
 FOR INCH INPUT SHAFT OPTIONS
 SEE PAGE 14

* THIS PAGE MAY BE PHOTOCOPIED ALLOWING THE CUSTOMER TO ENTER THEIR ORDER

Shaft Mounted Units

Shaft mounted units can be mounted on the driven machine shaft extension and connected to the foundation by a torque arm, supplied as an optional extra.

Additionally, unit feet are available for mounting on a baseplate with motor and coupling, the complete assembly being mounted on the driven machine shaft extension and connected to the foundation by a torque arm.

Shaft mounted units are fitted with a 'shrink disc' device to provide positive clamping on the driven machine shaft extension. It is positioned on the input side of the gear unit.

Shaft mounted units with KIBO bushes may also be supplied for fitting on to a keyed shaft. KIBO bushings make the gear unit easier to mount onto the shaft, eliminating fretting corrosion ensuring easy dismounting.

Motorised Gear Units

Gear units are available as standard assemblies comprising IEC standard metric (B5) flanged and NEMA 'C' motors directly mounted on the gearcase input shaft housings by adaptors. Motor and gear unit shafts are connected by flexible couplings.

Baseplates

Standard baseplates can be supplied for units with parallel or right angle shafts. Assemblies comprise of gear units and foot mounted motors correctly aligned in manufacture and connected by our couplings. Coupling guards are fitted.

Baseplates for right angle shaft gear units are designed for use with either foot or shaft mounted arrangements, and provision is made for attaching torque arms where required.

Designs provide ample stiffness to prevent distortion under load. Full details are available from our Application Engineers.

Backstops

Externally mounted Backstops can be fitted to all Series G gear units, when required to operate in non-reversing drives. They are located on the helical pinion shaft and have adequate capacities to deal with full rated torques. All backstops are centrifugal lift off type. Changing the direction of locking rotation is a simple operation. If required, a torque limiting backstop with controllable tension release can be fitted to all units (consult our Application Engineers).

Preservation / Protection

Series G gear units are despatched without oil.

Prior to despatch they are test run with a rust preventative oil giving adequate protection to internal parts for a period of six months covering normal transport and covered storage.

Shaft extensions and hollow output shafts are protected with a rust inhibitor which is proof against sea water and suitable for under-cover storage up to 12 months.

Note: Where gear units are to operate in abnormal conditions, or where they are to stand for long periods without running, eg in plant installation, we must be notified so that suitable protective arrangements can be made.

Gears

High quality alloy case hardening materials provide long life wear resistance and fatigue strength.

Profile ground single helical gears and hard finished spiral bevel gears ensure high standards of accuracy, surface finish and quiet running characteristics. Helical gears are fitted in parallel shaft units. Units with shafts at right angles incorporate spiral bevel and helical gears.

Gearcases

Standard gearcases are of rigid cast iron construction with modern styling, special cases can be supplied as SG iron or fabricated steel.

Horizontal split case design for ease of maintenance.

Gearcase design using finite element analysis to give high strength to weight ratio.

Inspection cover provided for viewing gear contacts.

Oil level dipstick, ventilator and drain plugs are fitted.

With an option to fit an oil level sight glass.

Gearcase Finish

Gearcases are shotblasted to SA 2 $\frac{1}{2}$ or better.

External surfaces are finished with alkyde gloss blue paint.

These paints are resistant to dilute acids and alkalis, oils and solvents, sea water and temperatures up to 140°C.

External Dimensions

Shaft extensions and hollow wheelshaft bores are to metric standards.

Fasteners are metric.

Lubrication

Lubrication in most instances is by the transfer of oil by gears dipping in the sumps of gear unit bases.

Where high pitch line speeds could cause churning of the lubricant. Spray lubrication is necessary where shown and complete systems can be supplied when required.

The unit oil grade and change period will be stamped on the nameplate. The change period will be 6 months for mineral oil based lubricants and 18 months for synthetic oil based lubricants. These figures assume a sump temperature of 110°C. Oil change periods can be extended for lower sump temperatures see installation and maintenance leaflet.

Units are provided with a dipstick, ventilator and drain plugs.

Cooling

Depending on the application standard gear units are cooled by:-

Normal heat dissipation by convection from external surfaces.

Mechanical fan fitted to high speed shaft.

Electric thermostatically controlled fan.

Cooling water coil fitted in gear unit base.

Fan and cooling coil.

Separate oil cooler incorporated in forced lubrication system.

As improvements in design are being made continually this specification is not to be regarded as binding in detail and drawings and capacities are subject to alteration without notice. Certified drawings will be sent on request.

EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

0105

Gear unit selection is made by comparing actual loads with catalogue ratings. Catalogue ratings are based on a standard set of loading conditions, whereas actual load conditions vary according to type of application. Service Factors are therefore used to calculate an equivalent load to compare with catalogue ratings. i.e. Equivalent Load = Actual Load x Service Factor

Mechanical and Thermal Service Factor must be considered:- Mechanical Service Factors F_m and F_s
Thermal Service Factors F_t , F_d , F_h and F_v

Mechanical ratings and service factors F_m and F_s

Mechanical ratings measure capacity in terms of life and/or strength, assuming 10 hr/day continuous running under uniform load conditions.

Catalogue ratings allow 100% overload at starting, braking or momentarily during operation up to 10 times per day.

The unit selected must therefore have a catalogue rating at least equal to half maximum overload.

Mechanical Service Factor F_m (Table 1) is used to modify the actual load according to daily operating time, and type of loading. Required mechanical power rating $P(\text{mech}) = \text{absorbed power} \times F_m$

Load characteristics for a wide range of applications are detailed in Table 3 opposite, which are used in deciding the appropriate Service Factor F_m from Table 1.

If loading can be calculated, or accurately assessed, actual loads should be used instead modifying using F_m .

For units subject to torque reversal or frequent stop/start overloads in excess of 10 times per day, the following check should be made

$$\text{gear unit input power capacity (kW)} \geq \frac{T_m \times F_s \times n}{2 \times 9550}$$

Where T_m = motor starting torque (Nm) or rating of torque limiting device, fluid coupling etc
 n = input speed (rev/min)
 F_s = number of starts factor (See table 2)

For applications where high inertia loads are involved e.g. crane travel drives, slewing motion etc, or when units are to operate in extremely dusty or moist/humid atmospheres, unit selection should be referred to our Application Engineers.

Table 1. Mechanical Service Factor (F_m)

Prime mover	Duration of service-hours per day	Load classification-driven machine		
		Uniform	Moderate Shock	Heavy Shock
Electric motor, steam turbine or hydraulic motor	Under 3	0.80	1.00	1.50
	3 to 10	1.00	1.25	1.75
	Over 10	1.25	1.50	2.00
Multi-cylinder internal combustion engine	Under 3	1.00	1.25	1.75
	3 to 10	1.25	1.50	2.00
	Over 10	1.50	1.75	2.25
Single cylinder internal combustion engine	Under 3	1.25	1.50	2.00
	3 to 10	1.50	1.75	2.25
	Over 10	1.75	2.00	2.50

Table 2. Number of Starts Factor (F_s)

Start / Stops per hour (1)	Up to 1	5	10	40	60	≥ 200
Unidirectional	1.0	1.03	1.06	1.10	1.15	1.20
Reversing	1.4	1.45	1.50	1.55	1.60	1.70

Note: (1) Intermediate values are obtained by linear interpolation

EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

9901

Table 3. Load Classification by Applications

U = Uniform load

M = Moderate shock load

H = Heavy shock load

† = Refer to our Application Engineers

[illegible]

EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

9901

Thermal ratings and service factors

The Thermal ratings are a measure of the gear units ability to dissipate heat. If they are exceeded the lubricant may overheat and breakdown, resulting in gear failure.

Thermal ratings are given on page 32 for parallel shaft units and page 46 for right angle shaft units. The following choices are available:

- i) No additional cooling
- ii) Unit fitted with fan cooling
- iii) Unit fitted with water cooling coil
- iv) Unit fitted with cooling coil and fan

Catalogue thermal limitations are based on the unit operating continuously in an environment with an ambient temperature equal to 20°C and in a horizontal mounting position. The thermal rating is affected by ambient temperature, duration of running per hour, altitude and operating area. To account for these varying conditions, the service factors given in tables 4, 5, 6 and 7 should be applied as follows:-

$$P_{\text{therm}} = \frac{\text{Absorbed Power}}{F_t \times F_d \times F_h \times F_v}$$

- P_{therm} = Required thermal rating (kW)
- F_t = Service factor for ambient temperature (see Table 4)
- F_d = Service factor for intermittent duty (see Table 5)
- F_h = Thermal service factor for altitude (see Table 6)
- F_v = Thermal service factor for air velocity correction (operating area) (see Table 7)

Table 4. Ambient Temperature Adjustment Factor (F_t)

Unit Type	Ambient Temperature °C							
	-20	-10	0	10	20	30	40	50
All Units	1.57	1.43	1.29	1.14	1.00	0.86	0.71	0.5

Table 5. Intermittent Duty Factor (F_d)

Unit Output Speed (Rev / min)			% Running time per hour				
			100	80	60	40	20
0	to	10	1.00	1.18	1.45	1.72	2.38
>10	to	25	1.00	1.16	1.39	1.64	2.22
>25	to	50	1.00	1.14	1.31	1.54	2.00
>50	to	100	1.00	1.08	1.19	1.33	1.64
>100	to	150	1.00	1.04	1.08	1.19	1.41
>150	to	200	1.00	1.00	1.00	1.06	1.23
>200			1.00	1.00	1.00	1.00	1.00

Table 6. Altitude Adjustment Factor (F_h)

Altitude (m)	Factor F_h
Sea Level	1.0
500	0.97
1000	0.93
1500	0.90
2000	0.87
3000	0.81
4000	0.75
5000	0.70

Table 7. Ambient Air Velocity Correction Factor (F_v)

Operating Area	If V_v is not known use this value for F_v	Air Velocity V_v m/sec	Factor F_v If V_v is known use this formula for F_v
Small confined space	0.86	0 - 1.4	$F_v = 0.1 V_v + 0.86$
Large indoor space	1.0	> 1.4 - < 6	$F_v = 0.2 V_v + 0.72$
Sheltered outdoor space	1.3	> 2 - < 6	$F_v = 0.17 V_v + 0.9$
Outdoor space	1.5	> 2	$F_v = 0.17 V_v + 0.9$ (max $F_v = 1.92$)

General

When checking thermal capacities of units, use actual load required to be transmitted, not rating of prime mover.

SERIES G

SELECTION PROCEDURE

0002

EXAMPLE APPLICATION DETAILS

Absorbed power of driven machine = 70 kW
 Output speed of gearbox or Input speed of machine = 65 rev/min
 Application = Uniformly loaded belt conveyor operating in a large indoor space
 Duration of service (hours per day) = 24hrs
 Motor speed = 3 phase electric motor, 4 pole, 1450 rev/min
 Mounting position = Horizontal, Right Angle Shaft
 Ambient temperature = 30°C
 Running time (%) = 100%
 Altitude = Sea Level

1 DETERMINE RATIO OF GEARBOX REQUIRED

$$\frac{\text{Motor speed}}{\text{Gearbox output speed}} = \frac{1450}{65} = 22.31$$

Refer to exact ratios (page 40) for nearest standard ratio = 22:1

3 DETERMINE REQUIRED MECHANICAL OUTPUT TORQUE CAPACITY OF GEARBOX

Required mechanical = Absorbed power x Fm rating (Pmech)

$$P_{mech} = 70 \times 1.25 = 87.5 \text{ kW}$$

2 DETERMINE MECHANICAL SERVICE FACTOR (Fm)

Refer to Load Classification by Application, table 3, page 6

Application = Uniformly loaded belt conveyor

Conveyors-uniformly loaded or fed

apron	U	U = Uniform load
assembly	U	
belt	U	
bucket	U	
chain	U	

Refer to mechanical service factor (Fm), table 1, page 5

Duration of service (hours per day) = 24hrs

Prime mover	Duration of service-hrs per day	Load classification-drive	
		Uniform	Moderate Shock
Electric motor, steam turbine or hydraulic motor	Under 3	0.80	1.00
	3 to 10	1.00	1.25
	Over 10	1.25	1.50

Therefore mechanical service factor (Fm) = 1.25

4 DETERMINE SIZE OF GEAR BOX REQUIRED

Unit input power capacity $\geq$ Pmech

Refer to ratings tables, Input speed = 1450rev/min, therefore refer to page 42.

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE UNIT - SIZE			
			G14	G15	G16	G17
22.	65.9	Input Power - kW	69.2	103	185	243
		Output Torque - Nm	9550	14000	23700	35300

Mechanical input power capacity must be equal or more than required mechanical input power capacity of the gear box (Pmech). Required mechanical input power = 87.5 kW. At a 22:1 ratio, nominal output speed 65.9 a G15 unit has a mechanical input power capacity of 103 kW. Therefore the unit is acceptable.

If the unit is subject to torque reversal or frequent stop /starts the input power capacity must be checked in accordance with the formulae on page 5.

5 DETERMINE EXACT RATIO OF GEARBOX

Refer to exact ratios table, page 40

Nominal Ratio Column Entry	14	15	16	17
6 7 8				
2 2 .	21.775	21.541	21.756	22.894
Exact ratio =	21.541			

Go to point 6 page 9

SERIES G

SELECTION PROCEDURE

9902

6 DETERMINE THERMAL SERVICE FACTOR (Ft)

Refer to table 4, page 7
Ambient temperature = 30°C

Ambient temperature °C	-20	-10	0	10	20	30
Factor Ft	1.57	1.43	1.29	1.14	1.00	0.86

Ft = 0.86

7 DETERMINE THERMAL SERVICE FACTOR (Fd)

Refer to table 5, page 7
Unit running time per hour = 100%
Nominal output speed (rev/min) = 65.9

Unit Output Speed (Rev / min)			% Running time per hour	
			100	80
>10	to	25	1.0	1.16
>25	to	50	1.0	1.14
>50	to	100	1.0	1.08

Fd = 1.0

8 DETERMINE ALTITUDE ADJUSTMENT THERMAL SERVICE FACTOR (Fh)

Refer to table 6, page 7

Altitude (m)	Factor Fh
Sea Level	1.0
500	0.97
1000	0.93

Fh = 1.0

9 DETERMINE AMBIENT AIR VELOCITY FACTOR (Fv)

Operating Area	If Vv is not known use this value for Fv	Air Velocity Vv m/sec	Factor Fv If Vv is known use this formula for Fv
Small confined space	0.86	0 - 1.4	$Fv = 0.1 Vv + 0.86$
Large indoor space	1.0	> 1.4 - < 6	$Fv = 0.2 Vv + 0.72$

Fv = 1.0

10 CALCULATE REQUIRED THERMAL RATING P_{therm}

$$P_{therm} = \frac{\text{Absorbed Power (kW)}}{F_t \times F_d \times F_h \times F_v}$$

$$P_{therm} = \frac{70}{0.86 \times 1.0 \times 1.0 \times 1.0}$$

$$P_{therm} = 81.4 \text{ kW}$$

11 CHECK THERMAL CAPACITY

Thermal Rating $\geq$ P_{therm}

Thermal Ratings kW Right Angle Shaft Units - Triple Reduction

Type of Cooling	Input Speed (rev/min)	RIGHT ANGLE SHAFT UNIT SIZE			
		14	15	16	17
Units with no Additional Cooling	1750	75	75	125	125
	1450	69	69	115	115
	1160	67	67	111	111
	960	65	65	108	108
	725	63	63	105	105
Units with Fan Cooling	1750	169	169	281	281
	1450	138	138	230	230
	1160	124	124	206	206
	960	107	107	178	178
	725	95	95	157	157

P_{therm} = 82 kW
therefore unit requires cooling.

Thermal rating for a fan cooled G15 unit = 138 kW.

Thermal capacity is therefore acceptable.

12 CHECK OVERHUNG LOADS

If sprocket, gear, etc is mounted on the input or output shaft then refer to Overhung loads procedure, pages 19 & 20

13 CHECK COUPLING HUB CAPACITIES

NOTE: It is advisable that all selections are verified by our Application Engineers.

If any of the following conditions occur then our Application Engineers must be consulted:-

- a) Inertia of the Driven Machine (Referred to motor speed) > 1.0 Inertia of Gear Unit plus Motor
- b) Ambient temperature is above 50°C

SERIES G

LUBRICATION

0204

All Series G units are despatched without oil (a warning label is attached), and therefore filled by the client. The grade and type of oil will be stamped on the nameplate in accordance with either of the types of oil from tables 2 and 3. Recommended oils are listed in the Approved Lubrication scheme booklet. The oil change period will be as stated in the lubrication section of Design Features page 4.

The approximate quantity of oil required is given in Table 1, but the unit should always be filled to the level marked on the dipstick or any other level indicator fitted (sight glass etc). Warning: Do not overfill the unit as this can cause leakage and overheating.

Where possible run the unit without load for a short time to circulate the lubricant thoroughly, then stop the unit and recheck the oil level after allowing the unit to stand for 10 minutes and if necessary top up to the correct mark on the dipstick or any other level indicator fitted (sight glass etc).

In addition where bearings are grease packed, the greases approved are NLGI grade 2 and recommended greases are listed in the Approved Lubrication scheme booklet.

TABLE 1 LUBRICANT QUANTITY (Litres)

Unit Type		UNIT SIZE						
		14	15	16	17	18	19	21
Parallel Shaft 2 Stage	Horizontal	22	20	47	42	92	95	180
	Vertical	18	18	40	37	80	85	140
Parallel Shaft 3 Stage	Horizontal	21	19	46	41	91	94	185
	Vertical	18	18	40	37	80	85	140
Parallel Shaft 4 Stage	Horizontal	21	19	46	41	91	94	185
	Vertical	18	18	40	37	80	85	140
Right Angle 3 Stage	Horizontal	21	19	47	42	92	95	185
	Vertical	20	20	43	39	87	92	140
Right Angle 4 Stage	Horizontal	-	-	48	43	94	96	190
	Vertical	-	-	45	39	89	89	140

TABLE 2 OIL GRADES

EP Mineral Oil (type E)

LUBRICANT	AMBIENT TEMPERATURE RANGE		
	-5°C to 25°C	0°C to 40°C	10°C to 50°C
Oil Grade	5E (VG 220)	6E (VG 320)	7E (VG 460)

TABLE 3 OIL GRADES

Polyalphaolefin based Synthetic (type H)

LUBRICANT	AMBIENT TEMPERATURE RANGE		
	-10°C to 30°C	0°C to 45°C	10°C to 50°C
Oil Grade	5H (VG 220)	5H (VG 220)	6H (VG 320)

SERIES G

UNIT HANDINGS & SHAFT ROTATIONS

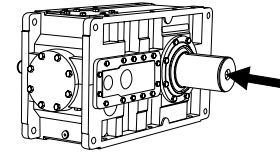
PARALLEL SHAFT UNITS

0106

Column 14 Entry - Output Shaft Positions

L SINGLE EXTENSION ON LEFT		R SINGLE EXTENSION ON RIGHT		D DOUBLE EXTENSION
Horizontal	Vertical	Horizontal	Vertical	Horizontal (Not applicable on vertical units)
Note: for shaft mounted units driven machine side (opposite to shrink disc) is assumed as extension side.				

Column 16 Entry - Shaft Rotations



For parallel shaft units all rotations should be viewed from output shaft end** (This side if double extended).
** driven machine side for shaft mounted units

Column 15 Entry - Input Shaft Positions

L SINGLE EXTENSION ON LEFT		R SINGLE EXTENSION ON RIGHT		D DOUBLE EXTENSION
Horizontal	Vertical	Horizontal (Not applicable on vertical units)	Vertical	Horizontal (Not applicable on vertical units)

Rotation		Parallel Shaft	
Outputshaft	Inputshaft	2 Stage & 4 Stage	3 Stage
Clockwise	Clockwise	1 (std)	n/a
Anticlockwise	Anticlockwise	2	n/a
Clockwise	Anticlockwise	n/a	1 (std)
Anticlockwise	Clockwise	n/a	2

All units are rotation reversible, except when fitted with a backstop (anti-runback device).

(std) if no rotation is entered rotation will be assumed as standard build.

Double & Quadruple Reduction	Horizontal Mounting	
	Vertical Mounting	
Triple Reduction	Horizontal Mounting	
	Vertical Mounting	

Note: parallel shaft unit handings **R R** or **L L** are subject to a reduction in external overhung load capacities

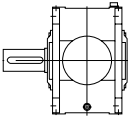
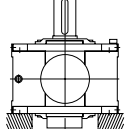
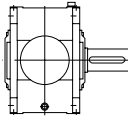
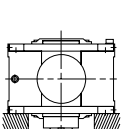
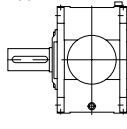
SERIES G

UNIT HANDINGS & SHAFT ROTATIONS

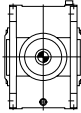
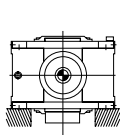
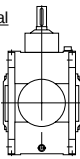
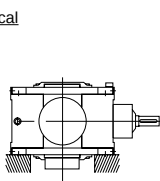
RIGHT ANGLE SHAFT UNITS

0202

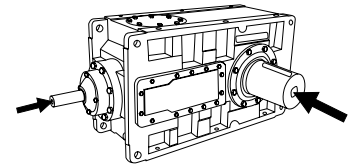
Column 14 Entry - Output Shaft Positions

L SINGLE EXTENSION ON LEFT		R SINGLE EXTENSION ON RIGHT		D DOUBLE EXTENSION
Horizontal	Vertical	Horizontal	Vertical	Horizontal (Not applicable on vertical units)
				
Note: for shaft mounted units driven machine side (opposite to shrink disc) is assumed as extension side.				

Column 15 Entry - Input Shaft Positions

B STANDARD RIGHT ANGLE EXTENSION		J RIGHT ANGLE UNIT TYPE J	
Horizontal	Vertical	Horizontal	Vertical
			
Note: Only available as standard for ratios: G14, G16, G18 - 22:1 to 63:1 G15, G17, G19 - 28:1 to 80:1			

Column 16 Entry - Shaft Rotations



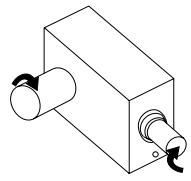
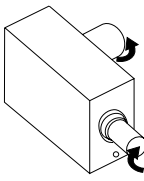
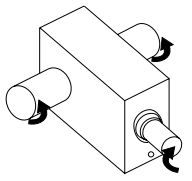
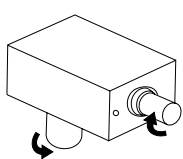
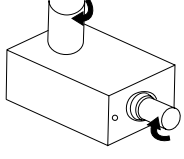
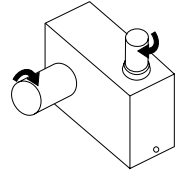
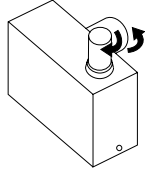
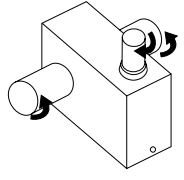
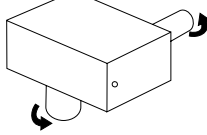
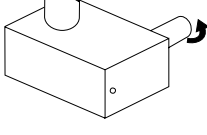
Right angle units rotations as viewed looking on shaft ends (This side if double extended).

Rotation		Parallel Shaft	
Outputshaft	Inputshaft	2 Stage & 4 Stage	3 Stage
Clockwise	Clockwise	1 (std)	n/a
Anticlockwise	Anticlockwise	2	n/a
Clockwise	Anticlockwise	n/a	1 (std)
Anticlockwise	Clockwise	n/a	2

All units are rotation reversible, except when fitted with a backstop (anti-runback device).

(std) if no rotation is entered rotation will be assumed as standard build.

* Right angle unit rotations 3 & 4 are subject to a reduction in output shaft external overhung load capacities

Right Angle Shafts - Triple & Quadruple Reduction	Horizontal Mounting			
	Vertical Mounting			
Type J Shafts - Triple & Quadruple Reduction	Horizontal Mounting			
	Vertical Mounting			

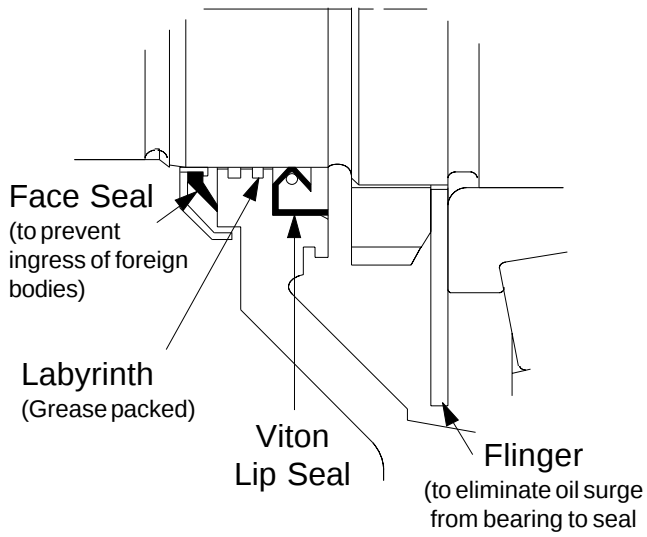
Note: For units fitted with a backstop please see page 58 for backstop position.

SERIES G

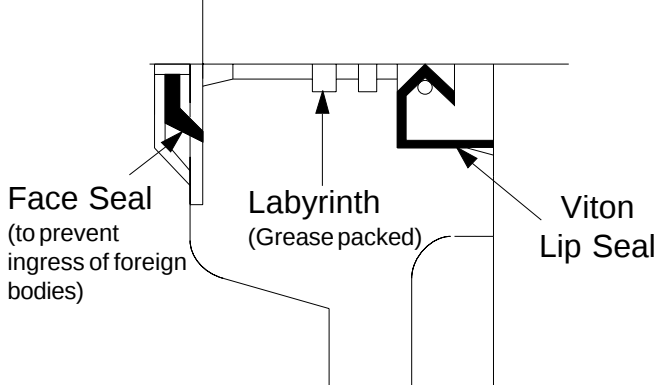
STANDARD SHAFT SEALING ARRANGEMENTS

0203

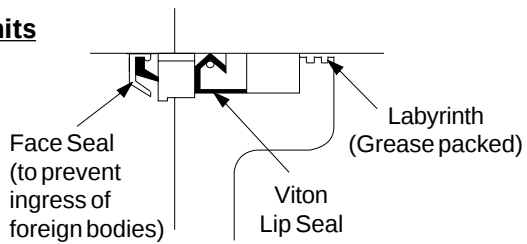
Right Angle Unit Input Shaft



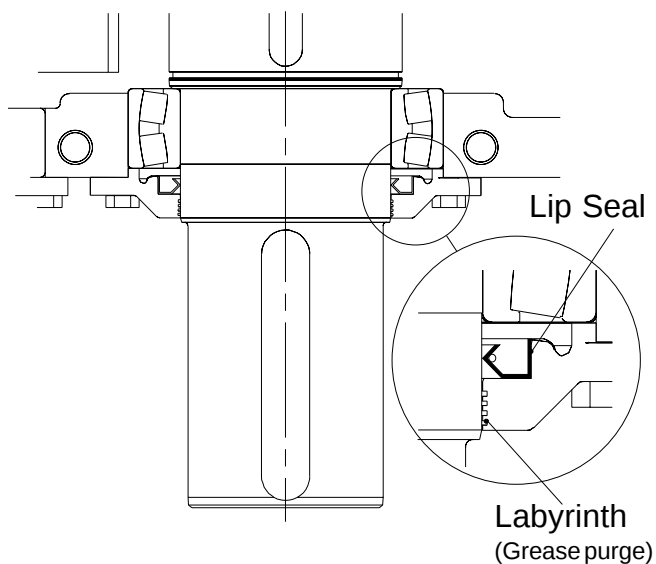
Parallel Unit Input Shaft



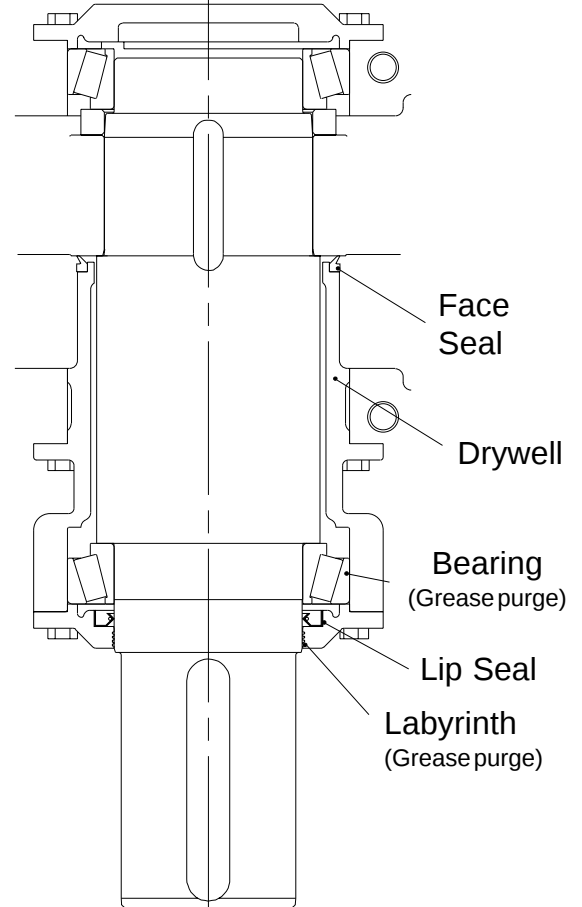
G21 units



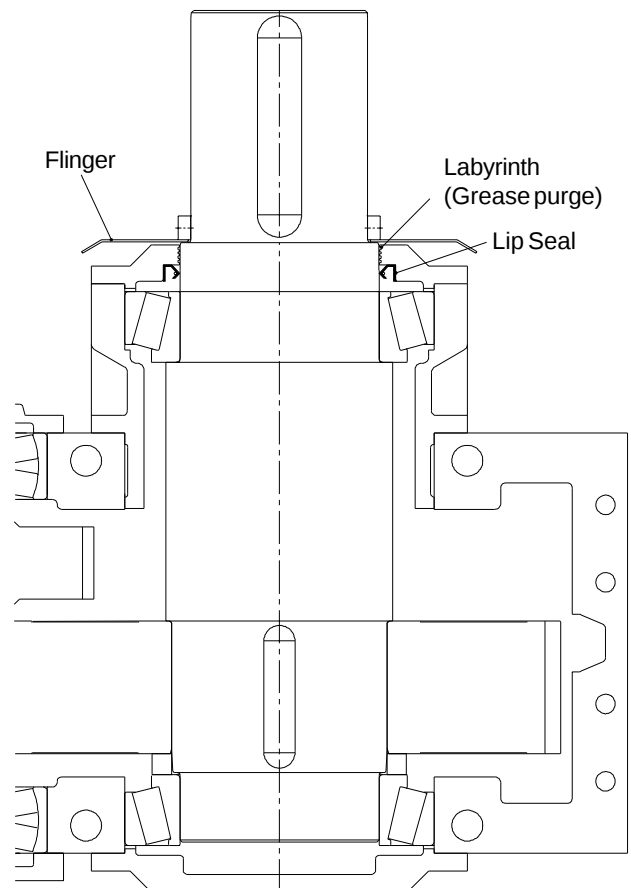
Standard Unit Output Shaft



Heavy Duty Agitator Unit Output Shaft



Heavy Duty Tower Unit Output Shaft



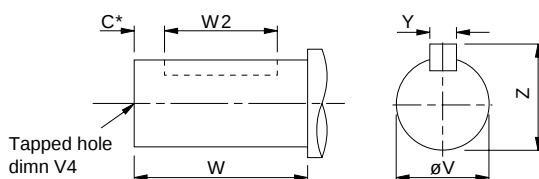
SERIES G

INPUTSHAFT OPTIONS

0203

INPUTSHAFT OPTIONS

* Inch shaft has an open ended keyway, therefore no 'C' dimension is required.



Column 11 Entry

Standard	Inch
Single -	Single N
Double D	Double P

Parallel Shaft Units

SIZE OF UNIT	TYPE OF INPUTSHAFT	NO OF REDUCTIONS	DIMENSIONS IN MM (Inch Shaft in Inches)						
			C*	ØV	V4	W	W2	Y	Z
14 and 15	Standard Metric	2 Stage	3	50.018 50.002	M16 x 36	138	130	14	53.5
		3 and 4 Stage	3	35.018 35.002	M12 x 25	99	90	10	38
16 and 17	Standard Metric	2 Stage	3	60.030 60.011	M20 x 43	148	140	18	64
		3 and 4 Stage	3	45.018 45.002	M16 x 36	118	110	14	48.5
18 and 19	Standard Metric	2 Stage	3	85.035 85.013	M24 x 52	190	180	22	90
		3 and 4 Stage	3	60.030 60.011	M20 x 43	150	140	18	64
21	Standard Metric	2 Stage	3	110.035 110.013	M30 x 63	210	200	28	116
		3 and 4 Stage	3	80.030 80.011	M20 x 43	190	180	22	85

14 and 15	Inch	2 Stage	-	1.8750" 1.8740"	5/8" UNF x 1.25 deep	5.31"	4.13"	0.500"	2.10"
		3 and 4 Stage	-	1.3750" 1.3745"	1/2" UNF x 1 deep	3.74"	3.00"	0.3125"	1.51"
16 and 17	Inch	2 Stage	-	2.2500" 2.2490"	3/4" UNF x 1.62 deep	5.71"	4.13"	0.500"	2.47"
		3 and 4 Stage	-	1.7500" 1.7490"	5/8" UNF x 1.25 deep	4.53"	4.13"	0.375"	1.92"
18 and 19	Inch	2 Stage	-	3.2500" 3.2490"	1" UNF x 2 deep	7.48"	5.88"	0.750"	3.58"
		3 and 4 Stage	-	2.2500" 2.2490"	3/4" UNF x 1.62 deep	5.71"	4.13"	0.500"	2.47"
21	Inch	2 Stage	-	4.2500" 4.2490"	1" UNF x 2 deep	8.27"	7.5"	1.000"	4.69"
		3 and 4 Stage	-	3.0000" 2.9990"	3/4" UNF x 1.62 deep	7.48"	6.50"	0.750"	3.33"

Right Angle Shaft Units

SIZE OF UNIT	TYPE OF INPUTSHAFT	NO OF REDUCTIONS	DIMENSIONS IN MM (Inch Shaft in Inches)						
			C*	ØV	V4	W	W2	Y	Z
14 and 15	Standard Metric	3 Stage	3	38.018 38.002	M12 x 32	100	90	10	41
16 and 17	Standard Metric	3 Stage	3	50.018 50.002	M16 x 36	140	130	14	53.5
		4 Stage	3	38.018 38.002	M12 x 32	100	90	10	41
18 and 19	Standard Metric	3 Stage	3	75.030 75.011	M20 x 43	160	150	20	79.5
		4 Stage	3	50.018 50.002	M16 x 36	140	130	14	53.5
21	Standard Metric	3 Stage	3	100.035 100.013	M24 x 52	210	200	28	106
		4 Stage	3	75.030 75.011	M20 x 43	160	150	20	79.5

14 and 15	Inch	3 Stage	-	1.5000" 1.4995"	5/8" UNF x 1.25 deep	3.94"	3.44"	0.375"	1.66"
16 and 17	Inch	3 Stage	-	1.8750" 1.8740"	5/8" UNF x 1.25 deep	5.51"	4.13"	0.500"	2.10"
		4 Stage	-	1.5000" 1.4995"	5/8" UNF x 1.25 deep	3.94"	3.44"	0.375"	1.66"
18 and 19	Inch	3 Stage	-	3.0000" 2.9990"	3/4" UNF x 1.62 deep	6.30"	5.25"	0.750"	3.33"
		4 Stage	-	1.8750" 1.8740"	5/8" UNF x 1.25 deep	5.51"	4.13"	0.500"	2.10"
21	Inch	3 Stage	-	4.0000" 3.9990"	1" UNF x 2 deep	8.27"	7.5"	1.00"	4.44"
		4 Stage	-	3.0000" 2.9990"	3/4" UNF x 1.62 deep	6.30"	5.25"	0.750"	3.33"

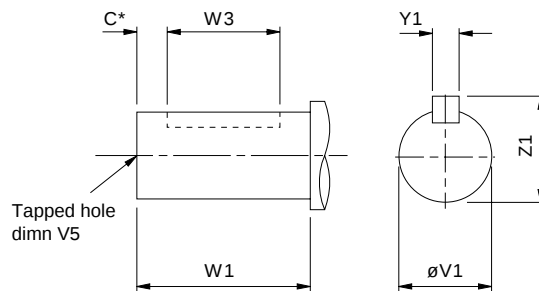
SERIES G

OUTPUTSHAFT OPTIONS

0202

OUTPUTSHAFT OPTIONS

* Inch shaft has an open ended keyway, therefore no 'C' dimension is required.



Column 10 Entry

Standard

Single	-	
Double	D	
Agitator	A	Tower C

Inch

Single	N	
Double	P	
Agitator	S	Tower T

SIZE OF UNIT	TYPE OF OUTPUTSHAFT	DIMENSIONS IN MM (Inch Shaft in Inches)						
		C*	ØV1	V5	W1	W3	Y1	Z1
14	Standard Single	5	110.035 110.013	M30 x 3.5 63 deep	180	170	28	116
	Standard Double							
	Standard Agitator / Tower							
15	Standard Single	5	130.040 130.015	M30 x 3.5 63 deep	190	180	32	137
	Standard Double							
	Standard Agitator / Tower							
16	Standard Single	5	145.040 145.015	M42 x 4.5 81 deep	230	220	36	153
	Standard Double							
	Standard Agitator / Tower							
17	Standard Single	5	170.040 170.015	M42 x 4.5 81 deep	250	240	40	179
	Standard Double							
	Standard Agitator / Tower							
18	Standard Single	5	190.046 190.017	M42 x 4.5 81 deep	300	290	45	200
	Standard Double							
	Standard Agitator / Tower							
19	Standard Single	5	210.046 210.017	M42 x 4.5 81 deep	350	340	50	221
	Standard Double							
	Standard Agitator / Tower							
21	Standard Single	5	220.046 220.017	M42 x 4.5 81 deep	350	340	50	231
	Standard Double							
	Standard Agitator / Tower							

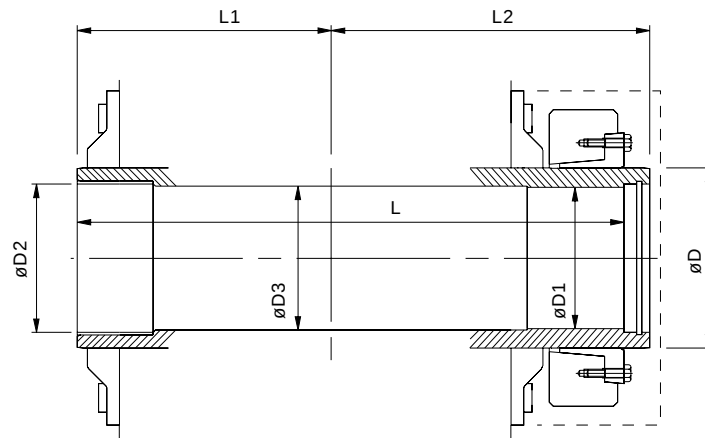
14	Inch Single	-	4.500" 4.499"	1" UNF x 2" deep	7.09"	6.50"	1.00"	4.94"
	Inch Double							
	Inch Agitator / Tower							
15	Inch Single	-	5.000" 4.999"	1" UNF x 2" deep	7.48"	7.13"	1.25"	5.55"
	Inch Double							
	Inch Agitator / Tower							
16	Inch Single	-	6.000" 5.999"	1.25" UNF x 2.5" deep	9.06"	8.75"	1.50"	6.66"
	Inch Double							
	Inch Agitator / Tower							
17	Inch Single	-	6.750" 6.749"	1.25" UNF x 2.5" deep	9.84"	9.38"	1.75"	7.39"
	Inch Double							
	Inch Agitator / Tower							
18	Inch Single	-	7.500" 7.499"	1.5" UNF x 3" deep	11.81"	11.38"	1.75"	8.15"
	Inch Double							
	Inch Agitator / Tower							
19	Inch Single	-	8.250" 8.249"	1.5" UNF x 3" deep	13.78"	13.00"	2.00"	8.88"
	Inch Double							
	Inch Agitator / Tower							
21	Inch Single	-	8.500" 8.499"	1.5" UNF x 3" deep	13.78"	13.00"	2.00"	9.13"
	Inch Double							
	Inch Agitator / Tower							

SERIES G

OUTPUTBORE OPTIONS

0203

OUTPUTBORE OPTIONS



Column 10 Entry *

Standard

With Shrink Disc ☐ H

Inch

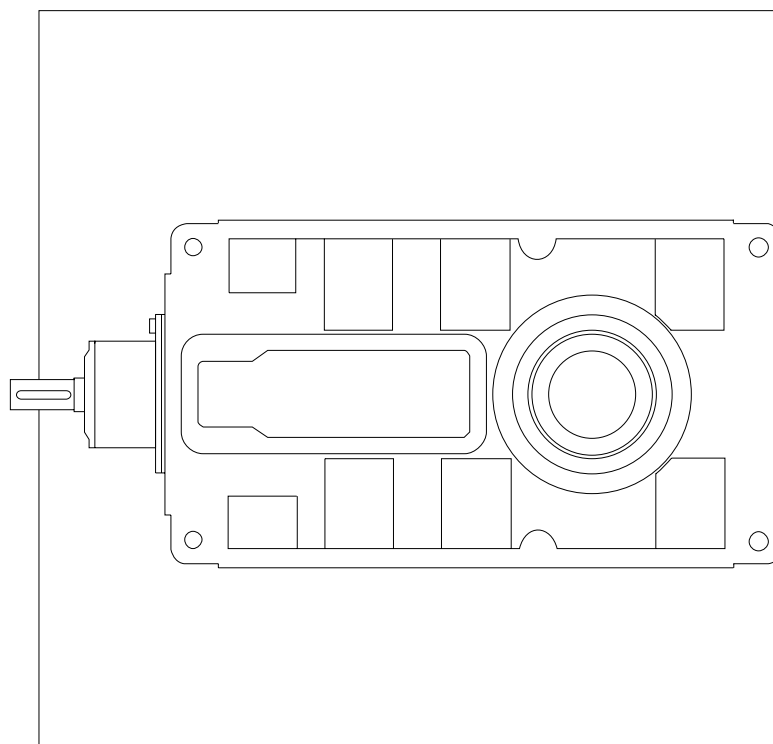
With Shrink Disc ☐ H

SIZE OF UNIT	TYPE OF OUTPUTBORE	DIMENSIONS IN MM (Inch Bore in Inches)						
		ØD	ØD1	ØD2	ØD3	L	L1	L2
14	Standard with Shrink Disc	120	95.035 95.000	100.087 100.000	96	415	180	255
15	Standard with Shrink Disc	140	110.035 110.000	115.087 115.000	111	420	180	260
16	Standard with Shrink Disc	160	125.040 125.000	130.100 130.000	126	533	230	325
17	Standard with Shrink Disc	180	145.040 145.000	150.100 150.000	147	548	230	340
18	Standard with Shrink Disc	200	160.040 160.000	170.100 170.000	162	688	300	410
19	Standard with Shrink Disc	220	170.040 170.000	180.100 180.000	172	708	300	430
21	Standard with Shrink Disc	260	210.046 210.000	220.100 220.000	212	824	350	500
14	Inch with Shrink Disc	4.72"	3.7415" 3.7402"	3.940" 3.937"	3.78"	16.34"	7.09"	10.04"
15	Inch with Shrink Disc	5.51"	4.3321" 4.3307"	4.531" 4.528"	4.37"	16.54"	7.09"	10.24"
16	Inch with Shrink Disc	6.30"	4.9228" 4.9213"	5.122" 5.118"	4.96"	20.98"	9.06"	12.80"
17	Inch with Shrink Disc	7.09"	5.7102" 5.7087"	5.909" 5.906"	5.79"	21.57"	9.06"	13.39"
18	Inch with Shrink Disc	7.87"	6.3008" 6.2992"	6.697" 6.693"	6.38"	27.09"	11.81"	16.14"
19	Inch with Shrink Disc	8.66"	6.6945" 6.6929"	7.091" 7.087"	6.77"	27.87"	11.81"	16.93"
21	Inch with Shrink Disc	10.24"	8.2695" 8.2677"	8.665" 8.661"	8.35"	32.44"	13.78"	19.69"

* Please see pages 55 & 56 for details of the hollow output shaft with Kibo bush

SERIES G

NOTES



REDUCER SERIES G

SERIES G

OVERHUNG & AXIAL LOADS ON SHAFTS

0202

Maximum permissible overhung loads

When a sprocket, gear etc. is mounted on the shaft a calculation, as below, must be made to determine the overhung load on the shaft, and the results compared to the maximum permissible overhung loads tabulated. Overhung loads can be reduced by increasing the diameter of the sprocket, gear, etc. If the maximum permissible overhung load is exceeded, the sprocket, gear, etc. should be mounted on a separate shaft, flexibly coupled and supported in its own bearings, or the gear unit shaft should be extended to run in an outboard bearing. Alternatively, a larger gear is often a less expensive solution.

Permissible overhung loads vary according to the direction of rotation. The values tabulated are for the most unfavourable direction with the unit transmitting full rated power and the load P applied midway along the shaft extension. Hence they can sometimes be increased for a more favourable direction of rotation, or if the power transmitted is less than the rated capacity of the gear unit, or if the load is applied nearer to the gear unit case. Refer to our Application Engineers for further details. In any event, the sprocket, gear etc. should be positioned as close as possible to the gear unit case in order to reduce bearing loads and shaft stresses, and to prolong life.

All units will accept 100% momentary overload on stated capacities.

Overhung load (Newtons)

$$P = \frac{kW \times 9,500,000 \times K}{N \times R}$$

where

P = equivalent overhung load (Newtons)
kW = power transmitted by the shaft (kilowatts)
N = speed of shaft (rev/min)
R = pitch radius of sprocket, etc. (mm)
K = factor

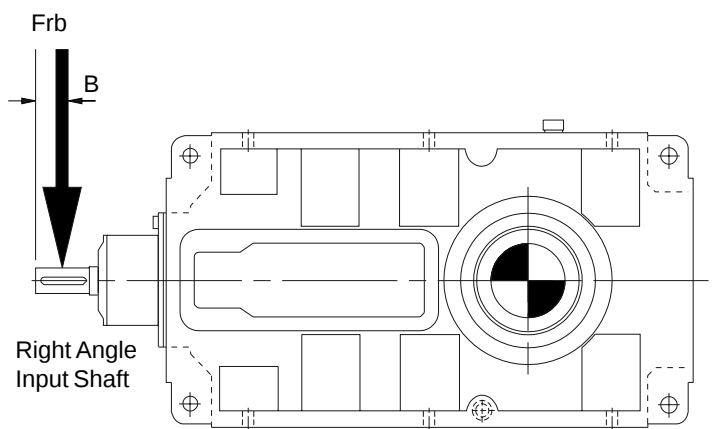
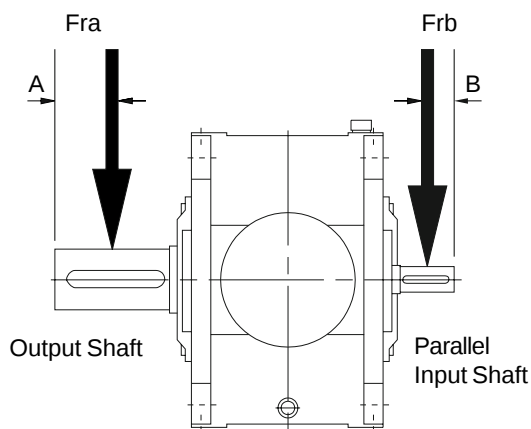
Overhung member

K (factor)

Chain sprocket* 1.00
Spur or helical pinion 1.25
Vee belt sheave 1.50
Flat belt pulley 2.00

* If multistrand chain drives are equally loaded and the outer strand is further than dimension A output or B input, refer to our Application Engineers.

Note: 1 Newton = 0.10197 kg = 0.2248 lbs.



Output Shaft - Distance 'A' (midway along the shaft extension)

Size of unit	Dimension A (mm)
G14	90
G15	95
G16	115
G17	125
G18	150
G19	175
G21	175

Input Shaft - Distance 'B' (midway along the shaft extension)

Size of unit	Parallel Shaft Unit		Right Angle Shaft Unit	
	2 Stage	3 & 4 Stage	3 Stage	4 Stage
G14 and G15	67.5	47.5	50	-
G16 and G17	72.5	57.5	70	50
G18 and G19	95	72.5	80	70
G21	105	95	105	80

Axial Thrust Capacities (Newtons)

Permissible axial thrust capacities vary according to the direction of rotation and the direction of thrust, towards or away from the unit. The values tabulated are for the most unfavourable direction and hence can sometimes be increased. Similarly they can sometimes be increased if the power transmitted is less than the rated capacity of the gear unit.

Thrust capacities tabulated refer to outputshafts, and are calculated without any overhung loads being applied. In cases where combined axial thrusts and overhung loads are to be applied, refer to our Application Engineers.

SERIES G

OVERHUNG & AXIAL LOADS ON SHAFTS

0202

OVERHUNG LOADS (Fra) ON OUTPUTSHAFT (KN)

Parallel Shaft Units Handlings: LR, RL, DL and DR
Right Angle Shaft Units All handlings with preferred shaft rotations

Shaft Speed (Rev/min)	Unit Size						
	14	15	16	17	18	19	21
< 240	25	40	43	82	85	116	175
< 180	27	43	46	82	87	116	175
< 130	29	47	49	82	90	116	180
< 90	32	50	52	82	95	116	200
< 45	34	55	55	82	110	116	250
< 20	34	55	55	82	116	116	350

OVERHUNG LOADS (Fra) ON OUTPUTSHAFT (KN)

Parallel Shaft Units Handlings: LL and RR
Right Angle Shaft Units All handlings with non-preferred shaft rotations

Shaft Speed (Rev/min)	Unit Size						
	14	15	16	17	18	19	21
< 240	17	32	28	60	60	80	130
< 180	18	35	29	60	61	80	135
< 130	19	37	31	60	63	80	140
< 90	21	40	31	60	68	80	153
< 45	21	45	31	60	80	80	205
< 20	21	45	31	60	80	80	300

AXIAL THRUST ON OUTPUTSHAFT (KN)

Shaft Speed (Rev/min)	Unit Size						
	14	15	16	17	18	19	21
< 240	5.0	8.5	8.0	25	16	26	32
< 180	5.1	8.6	8.5	25	17	27	34
< 130	5.3	9.9	9.5	27	18	30	37
< 90	6.2	12	10	29	19	34	44
< 45	11	20	15	40	36	45	65
< 20	19	32	28	65	65	65	110

OVERHUNG LOADS (Frb) ON INPUTSHAFT (KN)

Unit Type		Unit Size						
		14	15	16	17	18	19	21
Parallel Shaft	2 Stage	15	15	22	22	39	39	70
	3 and 4 Stage	6.9	6.9	9.1	9.1	16	16	25
Right Angle	3 Stage	11	11	16	16	41	41	56
	4 Stage	-	-	11	11	16	16	41

SERIES G

AGITATOR APPLICATIONS

BENDING MOMENT CAPACITY

0202

To calculate the Bending Moment on the gearbox output shaft using the method recommended in The Engineering Equipment Users' Association Handbook No. 9:-

$$\text{Bending Moment} = \frac{\text{Absorbed Power (kW)} \times 9.5 \times L}{\text{Shaft Speed} \times 0.75 R} = \text{kNm}$$

The above information is given for guidance. When more precise bending moment values are available they should be used.

Check the Bending Moment Capacity of the Gearbox
Agitator units are suitable for supporting a paddle directly coupled to the gearbox output shaft and for accepting the bending moments and axial thrusts generated from the forces at the paddle. Agitator type units have an extended bearing span and taper bearings to accept higher loads than the standard unit.

Check the Bending Moment Capacity limited by shaft stress, using Table 2.

Check the Bending Moment Capacity limited by bearing life, using Table 3.

Note: Bearing Capacities are based on 10,000 hours, L10 life.
For other bearing lives multiply the values in Table 3 by the factors in Table 1.

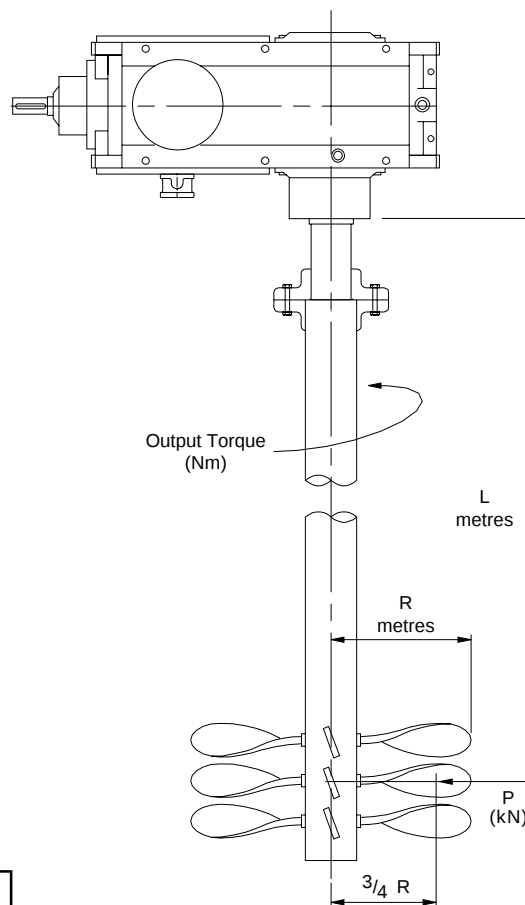


Table 1 Bearing Life Factors (F_B)

	Required Life (hours)				
	5000	10000	25000	50000	100000
Factor	1.23	1	0.76	0.62	0.50
For intermediate values					
$F_B = \left(\frac{10000}{\text{Required Life (hours)}} \right)^{0.3}$					

Table 2 Bending Moment Capacity (kNm)

Allowable Bending Moment at output shaft lower bearing, limited by SHAFT STRESS

Unit type	Unit size						
	14	15	16	17	18	19	21
Agitator Units	11.2	17.3	24.2	37.3	50	68	102

Table 3 Bending Moment Capacity (kNm)

Allowable Bending Moment on output shaft bearings, limited by BEARING LIFE (10,000 hrs L10)*

Unit type	Output speed rev/min	Unit size						
		14	15	16	17	18	19	21
Agitator Units	< 240	5.9	10.9	11.5	25.7	26.9	36.8	40
	< 180	7.4	12.9	14.5	30.1	33.7	45	53
	< 130	10.6	16.8	21.2	38.9	48.8	61	84
	< 90	11.5	18.4	22.9	42.6	53	68	91
	< 45	16.6	25.2	33.3	55	73	89	133
	< 20	24.1	32.9	46.7	71	97	117	176

* For other lives multiply values by the factors in table 1

SERIES G

AGITATOR APPLICATIONS

AXIAL THRUST LOADS

0202

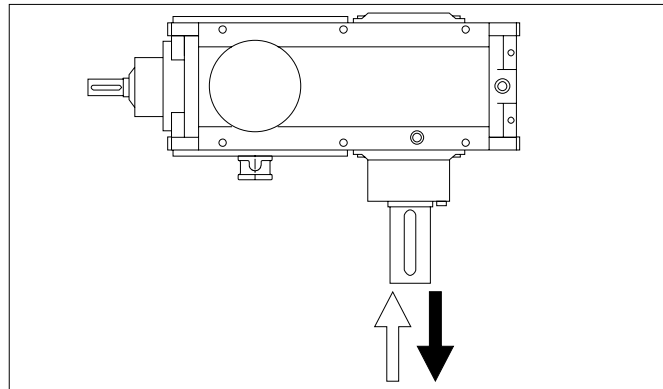


Table 4 Axial thrust capacity (kN) Allowable thrust on output shaft, limited by COVER BOLT STRESS

Unit type	Unit size						
	14	15	16	17	18	19	21
Agitator Units	30	40	55	65	65	65	150

Note: The values in table 4 are calculated for the most adverse direction of rotation. For the opposite rotation they can be increased. Consult our Application Engineers for an analysis where necessary.

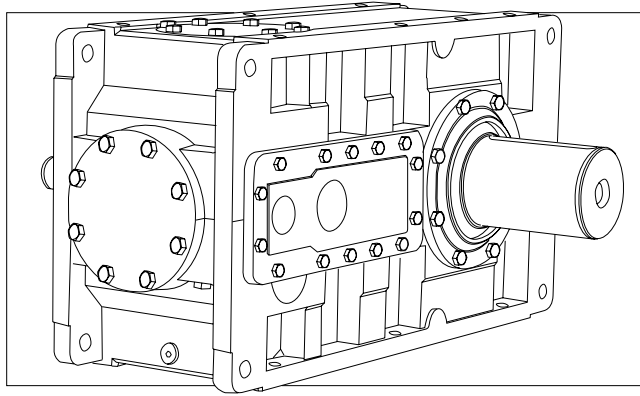
Table 5 Axial thrust capacity (kN) Allowable thrust on output shaft, limited by BEARING LIFE (10,000 hrs L10)*

Direction of thrust	Unit type	Output speed rev/min	Unit size						
			14	15	16	17	18	19	21
↑	Agitator Units	< 240	14	26	23	51	40	55	56
		< 180	14	27	24	52	41	56	58
		< 130	15	28	25	52	41	57	58
		< 90	16	30	28	57	46	63	66
		< 45	26	43	45	81	75	97	110
		< 20	40	63	70	116	115	146	175
↓	Agitator Units	< 240	10	22	17	44	31	45	40
		< 180	11	23	18	45	32	46	41
		< 130	11	24	18	46	32	47	41
		< 90	13	25	21	50	37	53	50
		< 45	23	39	38	74	65	86	93
		< 20	36	59	64	110	106	135	157

* For other lives multiply values by the factors in table 1 page 21.
 Note: Values are based on the most unfavourable directions of rotation. Higher values may be permitted after analysis by our Application Engineers.

SERIES G

NOTES



PARALLEL SHAFT UNITS

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Mechanical Ratings - Input Power / Output Torque _____	27 - 31
Thermal Ratings _____	32
Dimension Sheets - Speed Reducers _____	33 - 37

SERIES G

MOMENTS OF INERTIA

PARALLEL SHAFT UNITS

0202

MOMENTS OF INERTIA (Kg cm²) Referred to Input Shaft

PARALLEL SHAFT UNITS - without fans

NOMINAL RATIO COLUMN ENTRY 6 7 8	PARALLEL SHAFT UNITS - SIZE							
	G14	G15	G16	G17	G18	G19	G21	
6 . 3	410	-	1420	-	6670	-	-	DOUBLE REDUCTION
7 . 1	335	-	1320	-	5760	-	23000	
8 . 0	295	485	1140	1765	4645	7960	20000	
9 . 0	255	395	975	1620	4010	6860	17500	
1 0 .	225	345	835	1400	3735	5490	15200	
1 1 .	195	300	700	1165	3230	4685	12900	
1 2 .	170	260	585	985	2500	4310	11300	
1 4 .	145	220	485	825	2335	3685	9590	
1 6 .	125	190	445	690	1945	2860	8050	
1 8 .	105	165	415	565	1730	2610	7490	TRIPLE REDUCTION
2 0 .	98	135	380	505	1665	2150	6630	
2 2 .	90	115	350	460	1530	1910	6130	
2 5 .	85	105	320	420	1345	1810	5650	
2 8 .	79	97	296	380	1305	1650	5265	
3 2 .	73	89	292	345	1200	1430	4935	
3 6 .	45	83	150	315	610	1375	4765	
4 0 .	39	77	141	310	595	1250	2395	
4 5 .	37	43	133	165	560	655	2270	
5 0 .	35	41	126	150	515	630	2150	
5 6 .	34	39	120	140	505	590	2050	
6 3 .	33	37	118	135	475	535	1970	
7 1 .	31	35	112	125	435	520	1925	QUADRUPLE REDUCTION
8 0 .	31	34	108	122	430	490	1670	
9 0 .	30	32	107	115	415	445	1625	
1 0 0	30	31	92	111	365	435	1600	
1 1 2	29	31	91	110	360	425	1300	
1 2 5	29	30	90	95	350	365	1280	
1 4 0	18	30	57	92	250	360	1270	
1 6 0	18	29	53	91	225	355	840	
1 8 0	18	18	52	60	220	250	730	
2 0 0	18	18	52	53	220	225	720	
2 2 5	-	18	-	52	-	220	715	
2 5 0	-	18	-	52	-	220	-	

PARALLEL SHAFT UNITS - with fans

If fan cooling is required the inertia of the fan must be added to the table above.

MOMENTS OF INERTIA of fans (Kg cm²)

	G14 / G15	G16 / G17	G18 / G19	G21
DOUBLE REDUCTION	122	397	1320	1320
TRIPLE REDUCTION	30	122	397	1320

$$GD^2 \text{ (Kg cm}^2\text{)} = 4 \times \text{Moment of Inertia (Kg cm}^2\text{)}$$

SERIES G

EXACT RATIOS

PARALLEL SHAFT UNITS

0202

EXACT RATIOS - PARALLEL SHAFT UNITS

Double Reduction

Nominal Ratio Column Entry 6 7 8	UNIT SIZE						
	14	15	16	17	18	19	21
6 . 3	6.100	-	6.528	-	6.324	-	-
7 . 1	7.029	-	7.060	-	6.986	-	7.360
8 . 0	7.752	7.700	7.729	8.393	8.016	7.930	8.153
9 . 0	8.578	8.873	8.820	9.078	8.935	8.760	9.221
1 0 .	9.531	9.785	9.929	9.938	9.765	10.051	10.104
1 1 .	10.643	10.828	11.063	11.340	10.957	11.204	11.324
1 2 .	11.957	12.031	12.641	12.766	12.797	12.245	12.765
1 4 .	13.534	13.435	14.360	14.223	14.092	13.739	14.494
1 6 .	15.462	15.094	15.504	16.253	15.982	16.047	16.608
1 8 .	-	17.084	-	18.463	-	17.671	17.851
2 0 .	-	19.517	-	19.934	-	20.040	-

Triple Reduction

Nominal Ratio Column Entry 6 7 8	UNIT SIZE						
	14	15	16	17	18	19	21
1 8 .	17.401	-	17.934	-	17.539	-	-
2 0 .	19.335	-	20.190	-	19.168	-	20.569
2 2 .	21.591	21.966	22.494	23.058	21.507	21.994	23.051
2 5 .	24.256	24.406	25.704	25.958	25.120	24.036	25.985
2 8 .	27.455	27.254	29.199	28.921	27.662	26.969	29.506
3 2 .	31.365	30.619	31.525	33.048	31.371	31.499	33.809
3 6 .	34.721	34.657	35.770	37.542	35.182	34.688	36.340
4 0 .	38.579	39.592	40.269	40.532	38.450	39.339	41.011
4 5 .	43.080	43.828	44.865	45.990	43.141	44.117	45.960
5 0 .	48.399	48.698	51.268	51.774	50.388	48.215	51.810
5 6 .	54.782	54.379	58.239	57.683	55.488	54.098	58.829
6 3 .	62.583	61.094	62.877	65.916	62.928	63.185	67.408
7 1 .	-	69.151	-	74.879	-	69.580	72.455
8 0 .	-	78.999	-	80.842	-	78.909	-

Quadruple Reduction

Nominal Ratio Column Entry 6 7 8	UNIT SIZE						
	14	15	16	17	18	19	21
7 1 .	70.494	-	71.590	-	73.105	-	-
8 0 .	78.327	-	81.324	-	80.504	-	79.169
9 0 .	87.465	88.984	87.800	92.044	91.298	91.671	90.715
1 0 0	98.265	98.872	104.001	104.559	102.455	100.949	97.506
1 1 2	111.224	110.407	118.142	112.886	112.825	114.485	115.479
1 2 5	127.063	124.039	127.550	133.716	127.953	128.475	132.320
1 4 0	136.419	140.398	140.233	151.897	140.825	141.479	142.226
1 6 0	153.263	160.392	166.109	163.993	158.034	160.449	159.476
1 8 0	173.476	172.201	188.694	180.299	174.029	176.590	188.872
2 0 0	198.181	193.464	203.721	213.568	197.364	198.170	216.416
2 2 5	-	218.978	-	242.607	-	218.227	232.618
2 5 0	-	250.163	-	261.927	-	247.488	-

SERIES G

PARALLEL SHAFT UNIT

MECHANICAL RATINGS AT 1750 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	PARALLEL SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
6.3	278	Input Power - kW	288	-	551	-	1250	-	-	DOUBLE REDUCTION
		Output Torque - Nm	9330	-	19100	-	42300	-	-	
7.1	246	Input Power - kW	260	-	534	-	1170	-	2250	
		Output Torque - Nm	9680	-	20000	-	43900	-	89000	
8.0	219	Input Power - kW	242	291	497	551	1060	1250	2250	
		Output Torque - Nm	9930	11900	20400	24600	45400	53000	98000	
9.0	194	Input Power - kW	224	262	461	534	986	1170	2250	
		Output Torque - Nm	10200	12300	21600	25800	47000	55000	110000	
10.	175	Input Power - kW	206	244	424	497	950	1060	2150	
		Output Torque - Nm	10400	12700	22300	26200	49500	57000	116000	
11.	156	Input Power - kW	187	227	387	461	875	986	1980	
		Output Torque - Nm	10500	13000	22700	27700	51000	59000	119000	
12.	140	Input Power - kW	169	208	368	424	761	950	1815	
		Output Torque - Nm	10700	13200	24500	28700	51700	62100	123000	
14.	125	Input Power - kW	151	189	314	387	724	875	1630	
		Output Torque - Nm	10800	13400	23800	29200	54100	64000	125000	
16.	109.4	Input Power - kW	135	170	295	372	648	761	1470	
		Output Torque - Nm	11000	13600	24200	31900	54800	64900	130000	
18.	97.2	Input Power - kW	116	153	238	314	570	724	1360	
		Output Torque - Nm	10600	13600	22400	30600	52700	67900	130000	
20.	87.5	Input Power - kW	108	136	229	295	570	648	1185	TRIPLE REDUCTION
		Output Torque - Nm	11000	14000	24200	31100	57500	68800	130000	
22.	79.5	Input Power - kW	97.8	116	210	238	512	570	1060	
		Output Torque - Nm	11000	13300	24700	28800	57900	66100	130000	
25.	70.0	Input Power - kW	87.9	107	191	238	445	570	941	
		Output Torque - Nm	11000	13700	25600	32400	58600	72200	130000	
28.	62.5	Input Power - kW	78.4	96.6	168	230	405	512	830	
		Output Torque - Nm	11000	13800	25600	34900	58600	76800	130000	
32.	54.7	Input Power - kW	69.2	86.6	156	204	357	479	726	
		Output Torque - Nm	11000	13900	25600	35200	58600	79100	130000	
36.	48.6	Input Power - kW	59.8	77.4	137	180	305	435	676	
		Output Torque - Nm	11000	14000	25600	35300	58600	79100	130000	
40.	43.8	Input Power - kW	54.4	68.4	122	167	292	384	600	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
45.	38.9	Input Power - kW	49.2	59.1	110	143	261	305	536	
		Output Torque - Nm	11000	13500	25600	34400	58600	70100	130000	
50.	35.0	Input Power - kW	44.2	53.7	96	129	223	305	476	
		Output Torque - Nm	11000	13700	25600	34700	58600	76600	130000	
56.	31.3	Input Power - kW	39.4	48.6	84.6	116	203	281	420	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
63.	27.8	Input Power - kW	34.8	43.6	78.4	103	179	241	367	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	24.6	Input Power - kW	29.4	38.9	69.4	90.5	137	219	342	
		Output Torque - Nm	10700	14000	25600	35300	51500	79200	130000	
80.	21.9	Input Power - kW	26.7	34.4	61.2	84.3	129	193	315	QUADRUPE REDUCTION
		Output Torque - Nm	10800	14000	25600	35400	53300	79200	130000	
90.	19.4	Input Power - kW	24.1	28.7	56.7	70.5	118	153	275	
		Output Torque - Nm	10900	13300	25600	33500	55600	72400	130000	
100	17.5	Input Power - kW	21.7	25.8	47.9	62.7	108	144	256	
		Output Torque - Nm	11000	13200	25600	33800	57000	75200	130000	
112	15.6	Input Power - kW	19.3	23.2	42.2	59.0	101	133	217	
		Output Torque - Nm	11000	13600	25600	34300	58600	78400	130000	
125	14.0	Input Power - kW	17.1	20.6	39.2	49.7	89.3	120	190	
		Output Torque - Nm	11000	13800	25600	34200	58600	79300	130000	
140	12.5	Input Power - kW	15.5	18.3	35.6	43.8	81	109	177	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
160	10.9	Input Power - kW	13.9	16.0	30.1	40.7	72.3	96.3	158	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
180	9.7	Input Power - kW	12.4	14.9	26.5	37.0	65.7	87.4	133	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
200	8.8	Input Power - kW	10.9	13.2	24.6	31.2	58.0	78.0	116	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
225	7.8	Input Power - kW	-	11.7	-	27.4	-	70.9	108	
		Output Torque - Nm	-	14000	-	34200	-	79300	130000	
250	7.0	Input Power - kW	-	10.3	-	25.5	-	62.6	-	
		Output Torque - Nm	-	14000	-	34200	-	79300	-	

Shaded Area - Forced lubrication system required

SERIES G

PARALLEL SHAFT UNIT

MECHANICAL RATINGS AT 1450 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	PARALLEL SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
6.3	230	Input Power - kW	253	-	483	-	1090	-	-	DOUBLE REDUCTION
		Output Torque - Nm	9870	-	20200	-	44700	-	-	
7.1	204	Input Power - kW	228	-	468	-	1030	-	1860	
		Output Torque - Nm	10200	-	21200	-	46400	-	89000	
8.0	181	Input Power - kW	210	255	435	483	930	1090	1860	
		Output Torque - Nm	10400	12600	21600	26000	48000	56100	98000	
9.0	161	Input Power - kW	192	230	404	468	865	1030	1860	
		Output Torque - Nm	10500	13100	22800	27200	49700	58200	110000	
10.	145	Input Power - kW	175	213	372	435	833	930	1860	
		Output Torque - Nm	10600	13300	23600	27700	52300	60200	122000	
11.	129	Input Power - kW	159	194	339	404	767	865	1760	
		Output Torque - Nm	10800	13500	24000	29300	53900	62300	129000	
12.	116	Input Power - kW	143	177	313	372	667	833	1570	
		Output Torque - Nm	10900	13600	25200	30400	54700	65600	130000	
14.	104	Input Power - kW	129	160	275	339	635	767	1380	
		Output Torque - Nm	11000	13800	25200	30800	57200	67600	130000	
16.	90.6	Input Power - kW	115	144	259	320	568	667	1210	
		Output Torque - Nm	11000	13900	25600	33200	58000	68600	130000	
18.	80.6	Input Power - kW	96.6	129	209	275	500	635	1130	
		Output Torque - Nm	10600	14000	23700	32400	55700	71800	130000	
20.	72.5	Input Power - kW	89.6	114	201	259	482	568	984	TRIPLE REDUCTION
		Output Torque - Nm	11000	14000	25600	32900	58600	72700	130000	
22.	65.9	Input Power - kW	81.0	96.6	180	209	430	500	879	
		Output Torque - Nm	11000	13400	25600	30400	58600	70000	130000	
25.	58.0	Input Power - kW	72.8	88.5	158	209	369	500	780	
		Output Torque - Nm	11000	13700	25600	34300	58600	76300	130000	
28.	51.8	Input Power - kW	64.9	80.0	139	191	335	449	689	
		Output Torque - Nm	11000	13800	25600	34900	58600	76800	130000	
32.	45.3	Input Power - kW	57.3	71.9	129	169	296	397	602	
		Output Torque - Nm	11000	13900	25600	35200	58600	79100	130000	
36.	40.3	Input Power - kW	49.5	64.1	114	149	265	361	561	
		Output Torque - Nm	11000	14000	25600	35300	58600	79100	130000	
40.	36.3	Input Power - kW	45.0	56.6	101	139	242	319	498	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
45.	32.2	Input Power - kW	40.7	48.9	90.8	119	216	267	445	
		Output Torque - Nm	11000	13500	25600	34400	58600	74200	130000	
50.	29.0	Input Power - kW	36.6	44.5	79.6	107	185	261	395	
		Output Torque - Nm	11500	13700	25600	34700	58600	79200	130000	
56.	25.9	Input Power - kW	32.6	40.2	70.1	96	168	233	349	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
63.	23.0	Input Power - kW	28.8	36.1	65	84.9	148	200	304	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	20.4	Input Power - kW	24.3	32.2	57.5	75	120	181	283	QUADRUPE REDUCTION
		Output Torque - Nm	10700	14000	25600	35300	54500	79200	130000	
80.	18.1	Input Power - kW	22.1	28.5	50.7	69.8	113	160	261	
		Output Torque - Nm	10800	14000	25600	35400	56400	79200	130000	
90.	16.1	Input Power - kW	20.0	23.8	47.0	59.6	103	134	228	
		Output Torque - Nm	10900	13300	25600	34200	58600	76600	130000	
100	14.5	Input Power - kW	17.9	21.4	39.7	52.5	92.2	126	213	
		Output Torque - Nm	11000	13200	25600	34200	58600	79300	130000	
112	12.9	Input Power - kW	16.0	19.2	35.0	48.8	83.8	111	180	
		Output Torque - Nm	11000	13600	25600	34200	58600	79300	130000	
125	11.6	Input Power - kW	14.1	17.1	32.4	41.2	74.0	99.4	157	
		Output Torque - Nm	11000	13800	25600	34200	58600	79300	130000	
140	10.4	Input Power - kW	12.8	15.1	29.4	36.3	67.1	90.4	146	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
160	9.1	Input Power - kW	11.5	13.3	24.9	33.7	59.9	79.8	131	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
180	8.1	Input Power - kW	10.3	12.3	21.9	30.6	54.4	72.4	110	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
200	7.3	Input Power - kW	9.1	11.0	20.3	25.8	48.0	64.6	96.5	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
225	6.4	Input Power - kW	-	9.7	-	22.7	-	58.7	89.2	
		Output Torque - Nm	-	14000	-	34200	-	79300	130000	
250	5.8	Input Power - kW	-	8.5	-	21.1	-	51.8	-	
		Output Torque - Nm	-	14000	-	34200	-	79300	-	

SERIES G

PARALLEL SHAFT UNIT

MECHANICAL RATINGS AT 1160 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	PARALLEL SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
6.3	184	Input Power - kW	214	-	413	-	937	-	-	DOUBLE REDUCTION
		Output Torque - Nm	10400	-	21600	-	47700	-	-	
7.1	163	Input Power - kW	189	-	400	-	881	-	1490	
		Output Torque - Nm	10600	-	22600	-	49500	-	89000	
8.0	145	Input Power - kW	173	211	372	413	796	937	1490	
		Output Torque - Nm	10700	13000	23000	27800	51200	59800	98000	
9.0	129	Input Power - kW	158	187	345	400	740	881	1490	
		Output Torque - Nm	10900	13300	24400	29100	53000	62100	110000	
10.	116	Input Power - kW	144	171	318	372	713	796	1490	
		Output Torque - Nm	11000	13400	25200	29600	55800	64300	122000	
11.	104	Input Power - kW	130	156	289	345	656	740	1410	
		Output Torque - Nm	11000	13500	25600	31300	57600	66500	129000	
12.	93	Input Power - kW	117	142	254	318	570	713	1260	
		Output Torque - Nm	11000	13700	25600	32400	58400	70000	130000	
14.	83	Input Power - kW	104	129	223	290	520	656	1110	
		Output Torque - Nm	11000	13800	25600	33000	58600	72300	130000	
16.	72.5	Input Power - kW	92	115	207	264	460	570	970	
		Output Torque - Nm	11000	13900	25600	34300	58600	73200	130000	
18.	64.4	Input Power - kW	77.8	103	179	235	422	543	900	
		Output Torque - Nm	10700	14000	25300	34600	58600	76700	130000	
20.	58.0	Input Power - kW	71.7	90.9	161	222	386	486	788	TRIPLE REDUCTION
		Output Torque - Nm	11000	14000	25600	35200	58600	77600	130000	
22.	52.7	Input Power - kW	64.8	77.8	144	179	345	425	704	
		Output Torque - Nm	11000	13500	25600	32600	58600	74100	130000	
25.	46.4	Input Power - kW	58.2	70.8	126	169	295	416	625	
		Output Torque - Nm	11000	13700	25600	34700	58600	79100	130000	
28.	41.4	Input Power - kW	51.9	64.0	111	153	268	371	552	
		Output Torque - Nm	11000	13800	25600	34900	58600	79100	130000	
32.	36.3	Input Power - kW	45.9	57.5	103	135	237	318	482	
		Output Torque - Nm	11000	13900	25600	35200	58600	79200	130000	
36.	32.2	Input Power - kW	39.6	51.3	90.9	119	212	289	449	
		Output Torque - Nm	11000	14000	25600	35300	58600	79200	130000	
40.	29.0	Input Power - kW	36.0	45.3	80.8	111	194	255	399	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
45.	25.8	Input Power - kW	32.6	39.1	72.6	94.9	173	228	357	
		Output Torque - Nm	11000	13500	25600	34400	58600	79200	130000	
50.	23.2	Input Power - kW	29.3	35.6	63.7	85.2	148	209	317	
		Output Torque - Nm	11000	13700	25600	34700	58600	79200	130000	
56.	20.7	Input Power - kW	26.1	32.2	56.1	76.8	135	186	279	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
63.	18.4	Input Power - kW	23.0	28.9	52.0	67.9	119	160	244	
		Output Torque - Nm	11000	14000	25600	35200	58600	79300	130000	
71.	16.3	Input Power - kW	19.4	25.8	46.0	60.0	103	145	227	QUADRUPE REDUCTION
		Output Torque - Nm	10700	14000	25600	35300	58300	79300	130000	
80.	14.5	Input Power - kW	17.7	22.8	40.5	55.8	93.6	128	209	
		Output Torque - Nm	10800	14000	25600	35400	58600	79300	130000	
90.	12.9	Input Power - kW	16.0	19.0	37.6	47.7	82.7	111	183	
		Output Torque - Nm	10900	13300	25600	34200	58600	79300	130000	
100	11.6	Input Power - kW	14.3	17.1	31.7	42.1	73.7	101	170	
		Output Torque - Nm	11000	13400	25600	34300	58600	79300	130000	
112	10.4	Input Power - kW	12.8	15.3	28.0	39.1	67	89.2	144	
		Output Torque - Nm	11000	13600	25600	34300	58600	79300	130000	
125	9.3	Input Power - kW	11.3	13.7	25.9	32.9	59.2	79.5	126	
		Output Torque - Nm	11000	13600	25600	34200	58600	79300	130000	
140	8.3	Input Power - kW	10.3	12.1	23.6	29.0	53.7	72.3	117	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
160	7.3	Input Power - kW	9.2	10.6	19.9	27.0	47.9	63.8	104	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
180	6.4	Input Power - kW	8.2	9.8	17.5	24.5	43.5	57.9	88.4	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
200	5.8	Input Power - kW	7.3	8.8	16.3	20.6	38.4	51.7	77.2	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
225	5.2	Input Power - kW	-	7.8	-	18.2	-	46.9	71.9	
		Output Torque - Nm	-	14000	-	34200	-	79300	130000	
250	4.6	Input Power - kW	-	6.8	-	16.9	-	41.4	-	
		Output Torque - Nm	-	14000	-	34200	-	79300	-	

SERIES G

PARALLEL SHAFT UNIT

MECHANICAL RATINGS AT 960 RPM INPUT

0203

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	PARALLEL SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
6.3	152	Input Power - kW	177	-	352	-	820	-	-	DOUBLE REDUCTION
		Output Torque - Nm	10400	-	22300	-	50400	-	-	
7.1	135	Input Power - kW	156	-	350	-	771	-	1230	
		Output Torque - Nm	10600	-	23900	-	52300	-	89000	
8.0	120	Input Power - kW	143	175	326	352	697	820	1230	
		Output Torque - Nm	10800	13000	24400	28600	54200	63200	98000	
9.0	107	Input Power - kW	131	155	300	350	648	771	1230	
		Output Torque - Nm	10900	13300	25500	30800	56100	65600	110000	
10.	96	Input Power - kW	119	142	267	326	619	697	1230	
		Output Torque - Nm	11000	13400	25600	31300	58600	68000	122000	
11.	86	Input Power - kW	108	129	240	303	553	648	1170	
		Output Torque - Nm	11000	13500	25600	33200	58600	70400	12900	
12.	77	Input Power - kW	96.7	118	210	279	474	624	1040	
		Output Torque - Nm	11000	13700	25600	34300	58600	74100	130000	
14.	69	Input Power - kW	86.2	106	185	254	431	575	920	
		Output Torque - Nm	11000	13800	25600	34900	58600	76400	130000	
16.	60.0	Input Power - kW	76.1	95.5	172	225	381	500	800	
		Output Torque - Nm	11000	13900	25600	35200	58600	77500	130000	
18.	53.3	Input Power - kW	64.7	85.2	149	198	350	464	750	
		Output Torque - Nm	10800	14000	25600	35300	58600	79100	130000	
20.	48.0	Input Power - kW	59.3	75.2	133	185	320	410	653	TRIPLE REDUCTION
		Output Torque - Nm	11000	14000	25600	35400	58600	79100	130000	
22.	43.6	Input Power - kW	53.6	64.4	119	156	285	352	583	
		Output Torque - Nm	11000	13500	25600	34400	58600	74000	130000	
25.	38.4	Input Power - kW	48.2	58.6	105	140	245	345	518	
		Output Torque - Nm	11000	13700	25600	34700	58600	79200	130000	
28.	34.3	Input Power - kW	43.0	53.0	92.2	126	222	307	457	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
32.	30.0	Input Power - kW	37.9	47.6	85.5	112	196	264	400	
		Output Torque - Nm	11000	13900	25600	35200	58600	79100	130000	
36.	26.7	Input Power - kW	32.8	42.4	75.3	98.7	175	240	372	
		Output Torque - Nm	10900	14000	25600	35300	58600	79100	130000	
40.	24.0	Input Power - kW	29.8	37.5	66.9	91.8	160	212	331	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
45.	21.3	Input Power - kW	27.0	32.4	60.1	78.5	143	189	295	
		Output Torque - Nm	11000	13500	25600	34400	58600	74200	130000	
50.	19.2	Input Power - kW	24.2	29.4	52.7	70.5	123	173	262	
		Output Torque - Nm	11000	13700	25600	34700	58600	79200	130000	
56.	17.1	Input Power - kW	21.6	26.6	46.4	63.6	111	154	231	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
63.	15.2	Input Power - kW	19.1	23.9	43.0	56.2	98.3	132	202	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	13.5	Input Power - kW	16.1	21.3	38.0	49.6	85.3	120	188	QUADRUPLE REDUCTION
		Output Torque - Nm	10700	14000	25600	35300	58600	79200	130000	
80.	12.0	Input Power - kW	14.6	18.8	33.5	46.2	77.5	106	173	
		Output Torque - Nm	10800	14000	25600	35400	58600	79200	130000	
90.	10.7	Input Power - kW	13.2	15.7	31.1	39.5	68.4	91.9	151	
		Output Torque - Nm	10900	13300	25600	34200	58600	79300	130000	
100	9.6	Input Power - kW	11.9	14.2	26.3	34.7	61.0	83.5	141	
		Output Torque - Nm	11000	13400	25600	34200	58600	79300	130000	
112	8.6	Input Power - kW	10.6	12.7	23.1	32.3	55.4	73.8	119	
		Output Torque - Nm	11000	13600	25600	34300	58600	79300	130000	
125	7.7	Input Power - kW	9.3	11.3	21.5	27.2	48.9	65.8	104	
		Output Torque - Nm	11000	13800	25600	34200	58600	79300	130000	
140	6.9	Input Power - kW	8.5	10.0	19.5	24.0	44.4	59.8	96.9	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
160	6.0	Input Power - kW	7.6	8.8	16.5	22.3	39.6	52.8	86.4	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
180	5.3	Input Power - kW	6.8	8.1	14.5	20.3	36.0	47.9	73.1	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
200	4.8	Input Power - kW	6.0	7.3	13.5	17.1	31.8	42.7	63.8	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
225	4.3	Input Power - kW	-	6.4	-	15.0	-	38.8	59.4	
		Output Torque - Nm	-	14000	-	34200	-	79300	130000	
250	3.8	Input Power - kW	-	5.6	-	14.0	-	34.3	-	
		Output Torque - Nm	-	14000	-	34300	-	79300	-	

SERIES G

PARALLEL SHAFT UNIT

MECHANICAL RATINGS AT 725 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	PARALLEL SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
6.3	115	Input Power - kW	134	-	266	-	634	-	-	DOUBLE REDUCTION
		Output Torque - Nm	10400	-	22300	-	51500	-	-	
7.1	102	Input Power - kW	118	-	266	-	634	-	935	
		Output Torque - Nm	10600	-	24000	-	56900	-	89000	
8.0	91	Input Power - kW	108	132	258	266	570	634	935	
		Output Torque - Nm	10800	13000	25600	28600	58600	64600	98000	
9.0	81	Input Power - kW	98.9	117	227	266	512	634	935	
		Output Torque - Nm	10900	13300	25600	30900	58600	71300	110000	
10.	73	Input Power - kW	89.9	107	202	266	468	573	935	
		Output Torque - Nm	11000	13400	25600	33800	58600	73900	122000	
11.	65	Input Power - kW	81.3	97.7	181	237	418	532	885	
		Output Torque - Nm	11000	13500	25600	34400	58600	76500	129000	
12.	58	Input Power - kW	73.1	88.8	159	213	358	504	785	
		Output Torque - Nm	11000	13700	25600	34700	58600	79100	130000	
14.	52	Input Power - kW	65.1	70.3	140	192	326	450	695	
		Output Torque - Nm	11000	13800	25600	34900	58600	79100	130000	
16.	45.3	Input Power - kW	57.5	72.1	130	170	287	386	603	
		Output Torque - Nm	11000	14000	25600	35200	58600	79100	130000	
18.	40.3	Input Power - kW	49.2	64.3	113	150	264	351	562	
		Output Torque - Nm	10800	14000	25600	35300	58600	79200	130000	
20.	36.3	Input Power - kW	44.8	56.8	100	139	242	310	494	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
22.	33.0	Input Power - kW	40.5	48.7	90.2	118	216	266	441	TRIPLE REDUCTION
		Output Torque - Nm	11000	13500	25600	34400	58600	74000	130000	
25.	29.0	Input Power - kW	36.4	44.2	79.0	106	185	261	392	
		Output Torque - Nm	11000	13700	25600	34700	58600	79200	130000	
28.	25.9	Input Power - kW	32.4	40.0	69.6	95.4	168	232	346	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
32.	22.7	Input Power - kW	28.6	35.9	64.5	84.3	148	264	302	
		Output Torque - Nm	11000	13900	25600	35200	58600	79100	130000	
36.	20.1	Input Power - kW	24.8	32.0	56.9	74.5	132	181	281	
		Output Torque - Nm	11000	14000	25600	35300	58600	79100	130000	
40.	18.1	Input Power - kW	22.5	28.3	50.5	69.3	121	160	250	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
45.	16.1	Input Power - kW	20.4	24.5	45.4	59.3	108	143	223	
		Output Torque - Nm	11000	13500	25600	34400	58600	74200	130000	
50.	14.5	Input Power - kW	18.3	22.2	39.8	53.3	92.5	131	198	
		Output Torque - Nm	11000	13700	25600	34700	58600	79200	130000	
56.	12.9	Input Power - kW	16.3	20.1	35.0	48.0	84.0	116	174	
		Output Torque - Nm	11000	13800	25600	34900	58600	79200	130000	
63.	11.5	Input Power - kW	14.4	18.1	32.5	42.4	74.2	99.8	152	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	10.2	Input Power - kW	12.1	16.1	28.7	37.5	64.4	90.7	142	
		Output Torque - Nm	10700	14000	25600	35300	58600	79200	130000	
80.	9.1	Input Power - kW	11.0	14.2	25.3	34.9	58.5	80.0	131	
		Output Torque - Nm	10800	14000	25600	35400	58600	79200	130000	
90.	8.1	Input Power - kW	10.0	11.9	23.5	29.8	51.6	69.4	114	QUADRUPE REDUCTION
		Output Torque - Nm	10900	13200	25600	34200	58600	79300	130000	
100	7.3	Input Power - kW	9.0	10.7	19.8	26.2	46.0	63.1	106	
		Output Torque - Nm	11000	13400	25600	34200	58600	79300	130000	
112	6.5	Input Power - kW	8.0	9.6	17.5	24.4	41.8	55.7	90.0	
		Output Torque - Nm	11000	13600	25600	34300	58600	79300	130000	
125	5.8	Input Power - kW	7.0	8.5	16.2	20.6	36.9	49.7	78.6	
		Output Torque - Nm	11000	13800	25600	34200	58600	79300	130000	
140	5.2	Input Power - kW	6.4	7.5	14.7	18.1	33.5	45.1	73.2	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
160	4.5	Input Power - kW	5.8	6.6	12.4	16.8	29.9	39.9	65.3	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
180	4.0	Input Power - kW	5.1	6.2	11.0	15.3	27.2	36.2	55.2	
		Output Torque - Nm	11000	14000	25600	34300	58600	79300	130000	
200	3.6	Input Power - kW	4.5	5.5	10.2	12.9	24.0	32.3	48.2	
		Output Torque - Nm	11000	14000	25600	34200	58600	79300	130000	
225	3.2	Input Power - kW	-	4.8	-	11.4	-	29.3	55.9	
		Output Torque - Nm	-	14000	-	34200	-	79300	130000	
250	2.9	Input Power - kW	-	4.3	-	10.6	-	25.9	-	
		Output Torque - Nm	-	14000	-	34300	-	79300	-	

SERIES G

PARALLEL SHAFT UNIT

THERMAL RATINGS

0202

Thermal Ratings kW

Parallel Shaft Units - Double Reduction

Type of Cooling	Input Speed (rev/min)	PARALLEL SHAFT UNIT SIZE						
		14	15	16	17	18	19	21
Units with no Additional Cooling	1750	113	113	185	185	290	315	627
	1450	103	103	170	170	265	285	556
	1160	100	100	166	166	258	279	544
	960	98	98	163	163	250	270	526
	725	95	95	158	158	245	265	513
Units with Fan Cooling	1750	173	173	295	295	465	505	878
	1450	152	152	260	260	425	460	722
	1160	148	148	240	240	375	405	680
	960	134	134	220	220	340	365	632
	725	120	120	197	197	320	330	565
Units with Cooling Coil	1750	265	265	435	435	645	670	967
	1450	250	250	415	415	605	625	895
	1160	235	235	390	390	570	590	884
	960	225	225	375	375	545	565	866
	725	220	220	365	365	530	550	853
Units with Fan and Cooling Coil	1750	325	325	545	545	820	860	1218
	1450	299	299	505	505	765	800	1662
	1160	283	283	464	464	687	716	1020
	960	261	261	432	432	635	660	971
	725	245	245	404	404	605	615	904

Parallel Shaft Units - Triple Reduction

Type of Cooling	Input Speed (rev/min)	PARALLEL SHAFT UNIT SIZE						
		14	15	16	17	18	19	21
Units with no Additional Cooling	1750	75	75	123	123	193	210	380
	1450	69	69	113	113	177	190	342
	1160	67	67	111	111	172	186	336
	960	65	65	109	109	167	180	326
	725	63	63	105	105	163	177	317
Units with Fan Cooling	1750	121	121	197	197	309	336	532
	1450	105	105	170	170	265	285	452
	1160	97	97	150	150	232	251	420
	960	88	88	147	147	225	243	388
	725	79	79	132	132	204	221	349
Units with Cooling Coil	1750	227	227	373	373	550	565	720
	1450	215	215	358	358	515	530	682
	1160	200	200	335	335	485	500	676
	960	192	192	318	318	460	475	666
	725	185	185	310	310	435	440	657

Parallel Shaft Units - Quadruple Reduction

Type of Cooling	Input Speed (rev/min)	PARALLEL SHAFT UNIT SIZE						
		14	15	16	17	18	19	21
Units with no Additional Cooling	1750	59	59	97	97	153	166	280
	1450	54	54	89	89	139	150	254
	1160	53	53	88	88	136	147	250
	960	52	52	86	86	132	142	242
	725	50	50	83	83	129	139	240

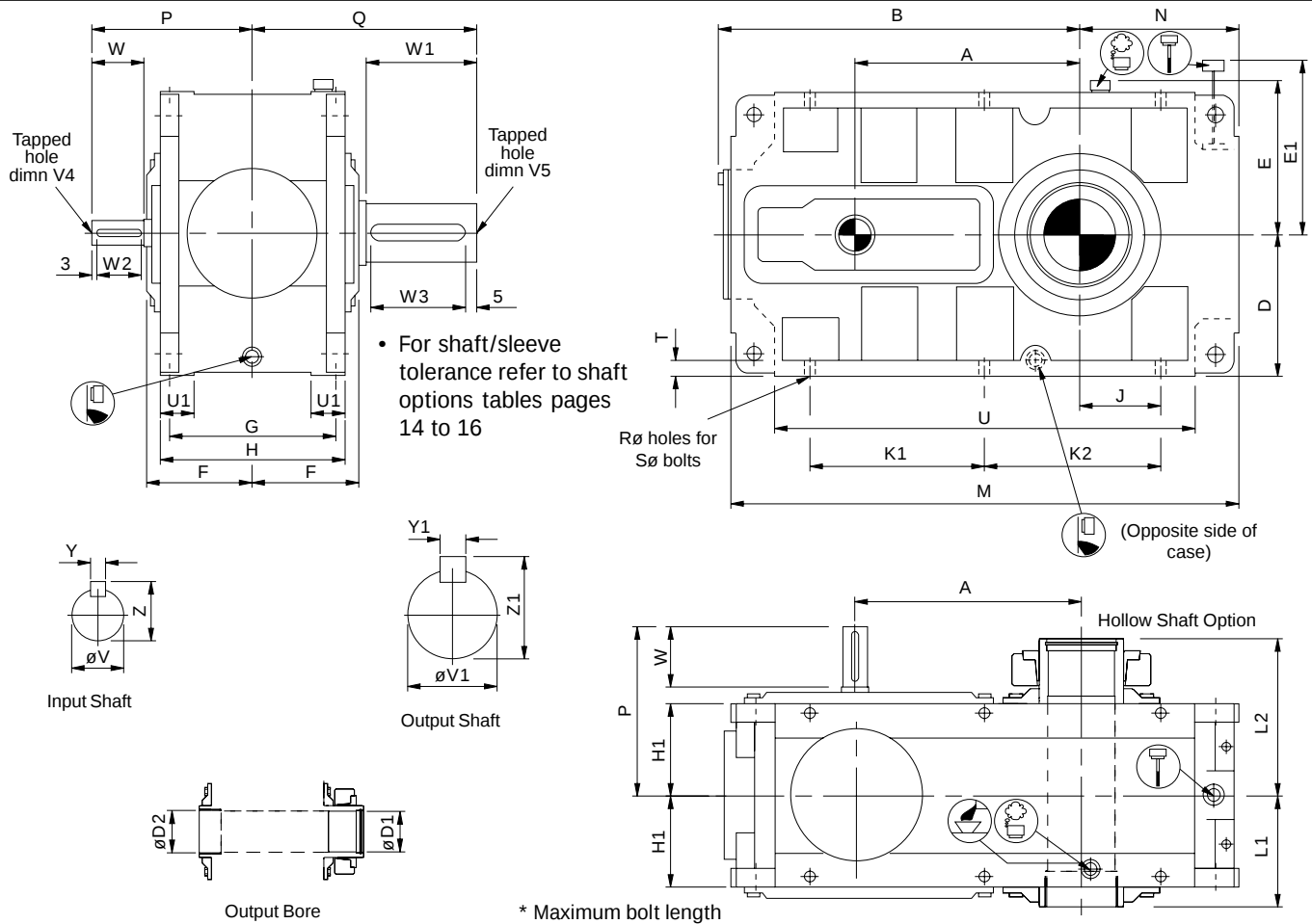
SERIES G

DIMENSIONS

HORIZONTAL PARALLEL SHAFTS DOUBLE REDUCTION

0202

G 20 H Double Reduction Parallel Shaft Units Horizontal



Unit Size	A	B	D	E	E1	F	G	H	H1	J	K1	K2	M	N	P	Q	R	S	T	U	U1
G14	325	554	230	250	370	177	265	300	150	170	285		820	295	315	360	18.5	6 x M16 x 60*	25	684	55
G15	365	594	230	250	370	177	265	300	150	130	285		820	255	315	370	18.5	6 x M16 x 60*	25	684	55
G16	430	728	300	335	515	225	330	380	190	225	385		1060	370	370	460	28	6 x M24 x 80*	30	898	70
G17	485	783	300	335	515	225	330	380	190	170	385		1060	315	370	480	28	6 x M24 x 80*	30	898	70
G18	570	953	385	420	710	290	440	500	250	153	520	350	1240	338	480	600	33	6 x M30 x 100*	37	1036	90
G19	635	1018	385	420	710	290	440	500	250	220	500		1374	407	480	650	33	6 x M30 x 100*	40	1170	90
G21	765	1240	465	507	750	340	530	600	300	225	695	480	1655	465	560	700	39	6 x M36 x 100*	50	1380	120

Unit Size	Input Shaft •						Output Shaft •						Output Bore •			
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1	D1	D2	L1	L2
G14	50 k6	M16 x 36	138	130	14	53.5	110 m6	M30 x 63	180	170	28	116	95	100	180	255
G15	50 k6	M16 x 36	138	130	14	53.5	130 m6	M30 x 63	190	180	32	137	110	115	180	260
G16	60 m6	M20 x 43	148	140	18	64	145 m6	M42 x 81	230	220	36	153	125	130	230	325
G17	60 m6	M20 x 43	148	140	18	64	170 m6	M42 x 81	250	240	40	179	145	150	230	340
G18	85 m6	M24 x 52	190	180	22	90	190 m6	M42 x 81	300	290	45	200	160	170	300	410
G19	85 m6	M24 x 52	190	180	22	90	210 m6	M42 x 81	350	340	50	221	170	180	300	430
G21	110 m6	M30 x 63	210	200	28	116	220 m6	M42 x 81	350	340	50	231	210	220	350	500

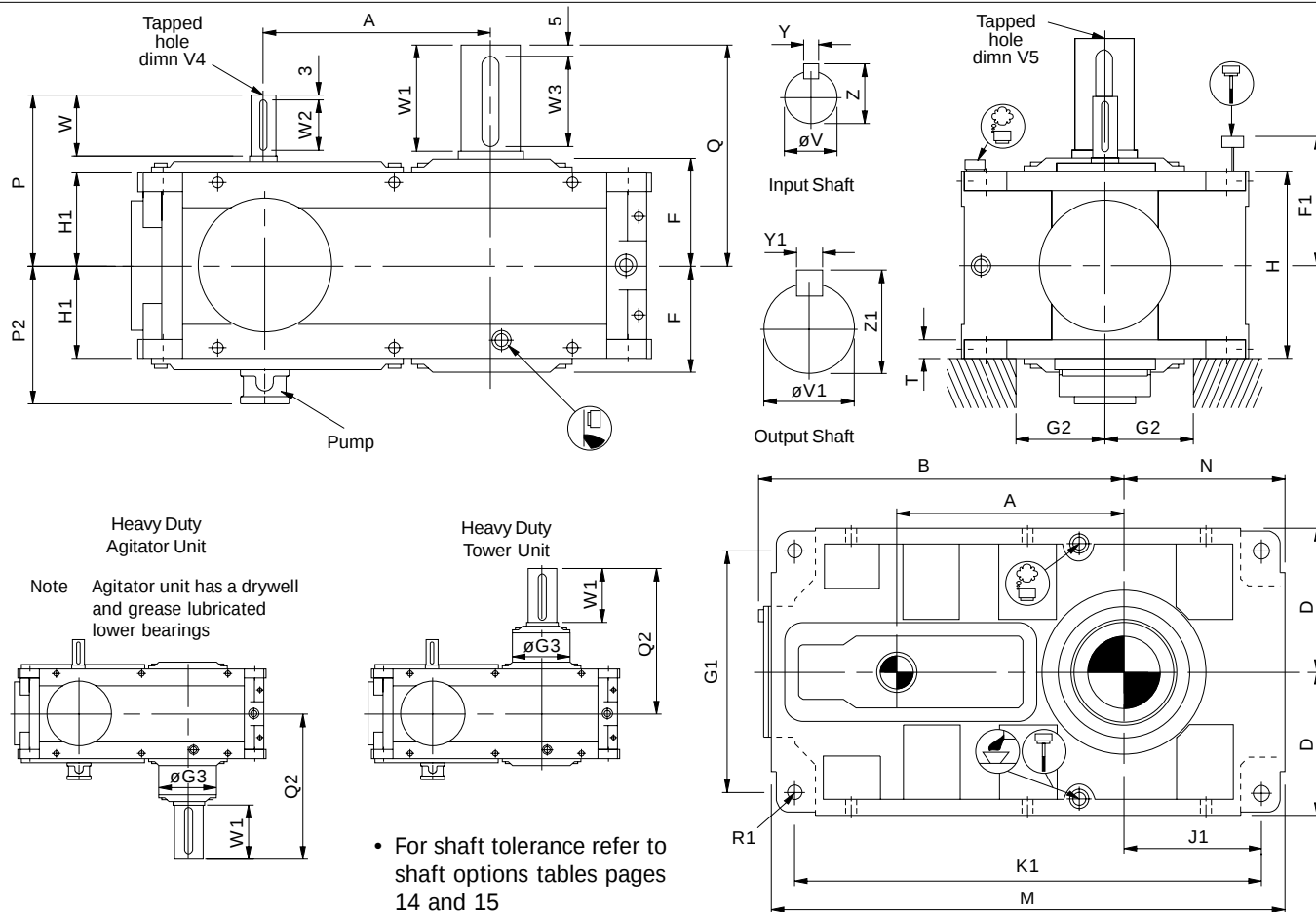
SERIES G

DIMENSIONS

VERTICAL PARALLEL SHAFTS DOUBLE REDUCTION

0202

G 20 V Double Reduction Parallel Shaft Units Vertical



Unit Size	A	B	D	F	F1	G1	G2 (min)	G3	H	H1	J1	K1	M	N	P	P2	Q	Q2	R1	T
G14	325	554	230	177	390	390	135	230	300	150	260	750	820	295	315	236	360	475	4 x $\varnothing 24$	30
G15	365	594	230	177	390	390	135	260	300	150	220	750	820	255	315	236	370	495	4 x $\varnothing 24$	30
G16	430	728	300	225	515	506	175	300	380	190	325	970	1060	370	370	285	460	595	4 x $\varnothing 33$	45
G17	485	783	300	225	515	506	175	340	380	190	270	970	1060	315	370	285	480	615	4 x $\varnothing 33$	45
G18	570	953	385	290	700	656	205	370	500	250	281	1126	1240	338	480	345	600	760	4 x $\varnothing 40$	55
G19	635	1018	385	290	700	656	205	400	500	250	350	1260	1374	407	480	345	650	815	4 x $\varnothing 40$	55
G21	765	1240	465	340	750	730	255	500	600	300	395	1515	1655	465	560	400	700	925	4 x $\varnothing 48$	70

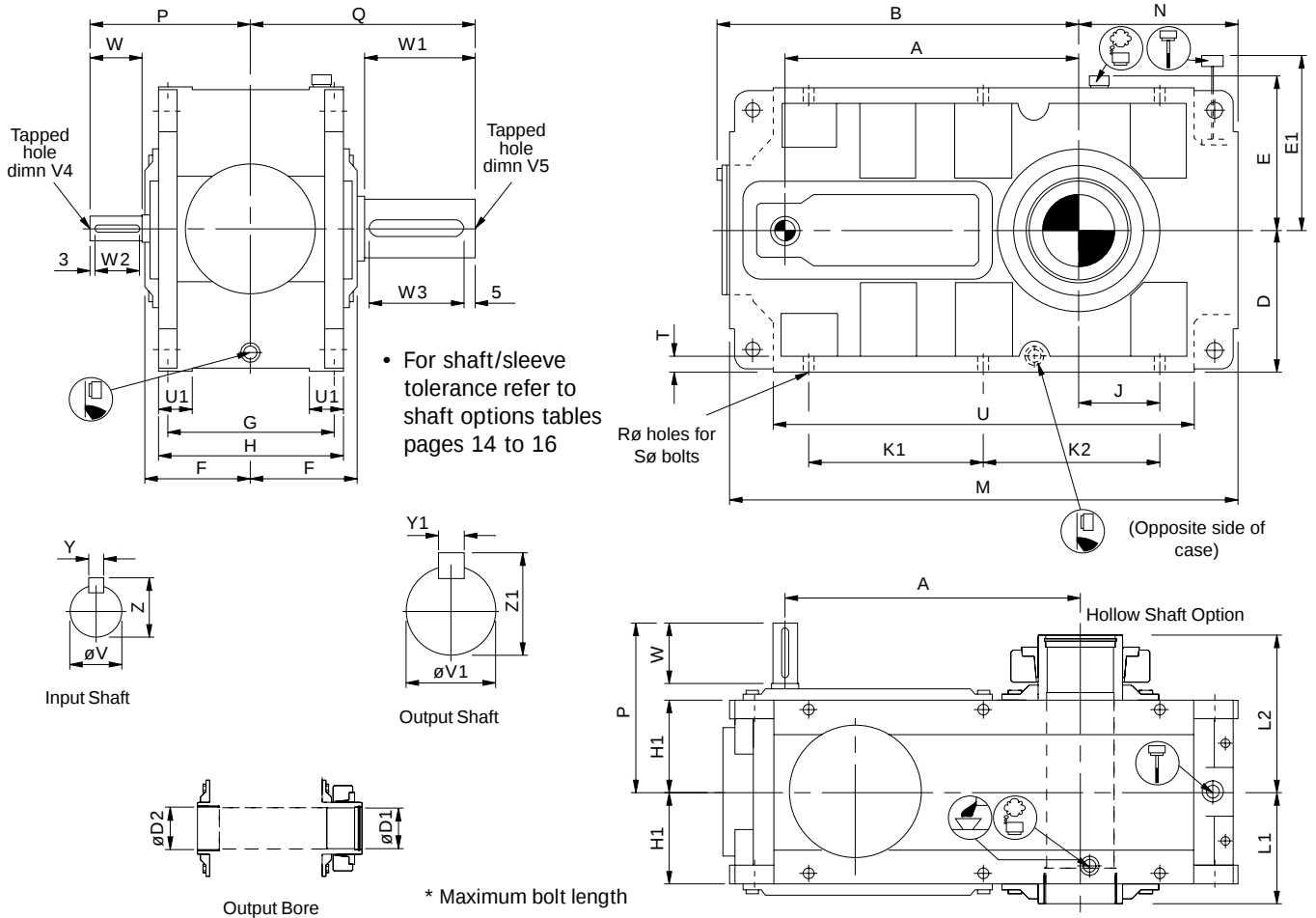
Unit Size	Input Shaft •						Output Shaft •					
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1
G14	50 k6	M16 x 36	138	130	14	53.5	110 m6	M30 x 63	180	170	28	116
G15	50 k6	M16 x 36	138	130	14	53.5	130 m6	M30 x 63	190	180	32	137
G16	60 m6	M20 x 43	148	140	18	64	145 m6	M42 x 81	230	220	36	153
G17	60 m6	M20 x 43	148	140	18	64	170 m6	M42 x 81	250	240	40	179
G18	85 m6	M24 x 52	190	180	22	90	190 m6	M42 x 81	300	290	45	200
G19	85 m6	M24 x 52	190	180	22	90	210 m6	M42 x 81	350	340	50	221
G21	110 m6	M30 x 63	210	200	28	116	220 m6	M42 x 81	350	340	50	231

SERIES G

DIMENSIONS

0204 HORIZONTAL PARALLEL SHAFTS TRIPLE & QUADRUPLE REDUCTION

G 3 0 H Triple and Quadruple Reduction Parallel Shaft Units Horizontal



Unit Size	A	B	D	E	E1	F	G	H	H1	J	K1	K2	M	N	P	Q	R	S	T	U	U1
G14	435	554	230	250	370	177	265	300	150	170	285		820	295	275	360	18.5	6 x M16 x 60*	25	684	55
G15	475	594	230	250	370	177	265	300	150	130	285		820	255	275	370	18.5	6 x M16 x 60*	25	684	55
G16	570	728	300	335	515	225	330	380	190	225	385		1060	370	340	460	28	6 x M24 x 80*	30	898	70
G17	625	783	300	335	515	225	330	380	190	170	385		1060	315	340	480	28	6 x M24 x 80*	30	898	70
G18	755	953	385	420	710	290	440	500	250	153	520	350	1240	338	440	600	33	6 x M30 x 100*	37	1036	90
G19	820	1018	385	420	710	290	440	500	250	220	500		1374	407	440	650	33	6 x M30 x 100*	40	1170	90
G21	1010	1240	465	507	750	340	530	600	300	225	695	480	1655	465	540	700	39	6 x M36 x 100*	50	1380	120

Unit Size	Input Shaft •						Output Shaft •						Output Bore •			
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1	D1	D2	L1	L2
G14	35 k6	M12 x 25	99	90	10	38	110 m6	M30 x 63	180	170	28	116	95	100	180	255
G15	35 k6	M12 x 25	99	90	10	38	130 m6	M30 x 63	190	180	32	137	110	115	180	260
G16	45 k6	M16 x 36	118	110	14	48.5	145 m6	M42 x 81	230	220	36	153	125	130	230	325
G17	45 k6	M16 x 36	118	110	14	48.5	170 m6	M42 x 81	250	240	40	179	145	150	230	340
G18	60 m6	M20 x 43	150	140	18	64	190 m6	M42 x 81	300	290	45	200	160	170	300	410
G19	60 m6	M20 x 43	150	140	18	64	210 m6	M42 x 81	350	340	50	221	170	180	300	430
G21	80 m6	M20 x 43	190	180	22	85	220 m6	M42 x 81	350	340	50	231	210	220	350	500

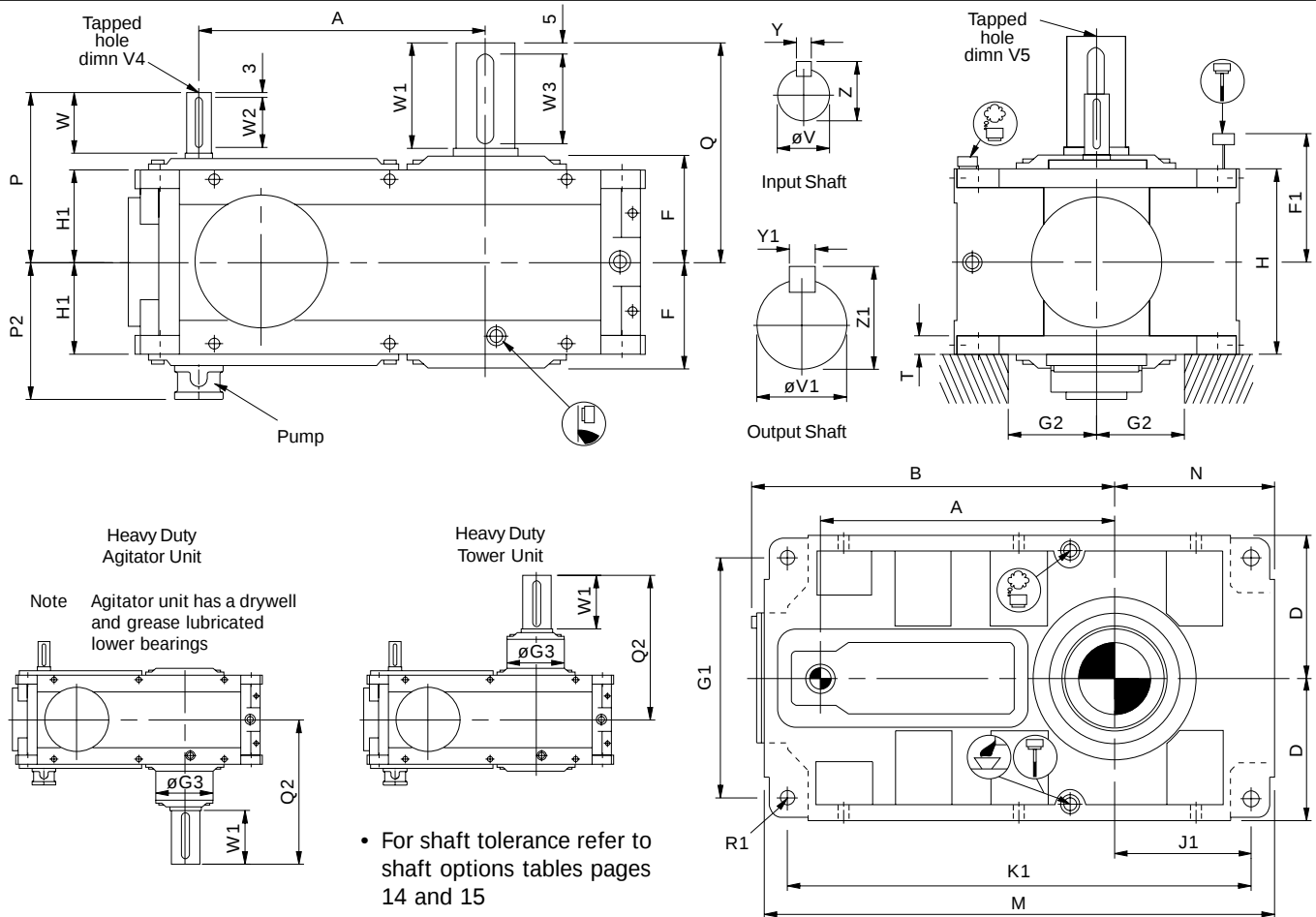
SERIES G

DIMENSIONS

0204

VERTICAL PARALLEL SHAFTS TRIPLE & QUADRUPLE REDUCTION

G **3** **0** **V** Triple and Quadruple Reduction Parallel Shaft Units Vertical



Unit Size	A	B	D	F	F1	G1	G2 (min)	G3	H	H1	J1	K1	M	N	P	P2	Q	Q2	R1	T
G14	435	554	230	177	390	390	135	230	300	150	260	750	820	295	275	236	360	475	4 x Ø24	30
G15	475	594	230	177	390	390	135	260	300	150	220	750	820	255	275	236	370	495	4 x Ø24	30
G16	570	728	300	225	515	506	175	300	380	190	325	970	1060	370	340	285	460	595	4 x Ø33	45
G17	625	783	300	225	515	506	175	340	380	190	270	970	1060	315	340	285	480	615	4 x Ø33	45
G18	755	953	385	290	700	656	205	370	500	250	281	1126	1240	338	440	345	600	760	4 x Ø40	55
G19	820	1018	385	290	700	656	205	400	500	250	350	1260	1374	407	440	345	650	815	4 x Ø40	55
G21	1010	1240	465	340	750	730	255	500	600	300	395	1515	1655	465	540	400	700	925	4 x Ø48	70

Unit Size	Input Shaft •						Output Shaft •					
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1
G14	35 k6	M12 x 25	99	90	10	38	110 m6	M30 x 63	180	170	28	116
G15	35 k6	M12 x 25	99	90	10	38	130 m6	M30 x 63	190	180	32	137
G16	45 k6	M16 x 36	118	110	14	48.5	145 m6	M42 x 81	230	220	36	153
G17	45 k6	M16 x 36	118	110	14	48.5	170 m6	M42 x 81	250	240	40	179
G18	60 m6	M20 x 43	150	140	18	64	190 m6	M42 x 81	300	290	45	200
G19	60 m6	M20 x 43	150	140	18	64	210 m6	M42 x 81	350	340	50	221
G21	80 m6	M20 x 43	190	180	22	85	220 m6	M42 x 81	350	340	50	231

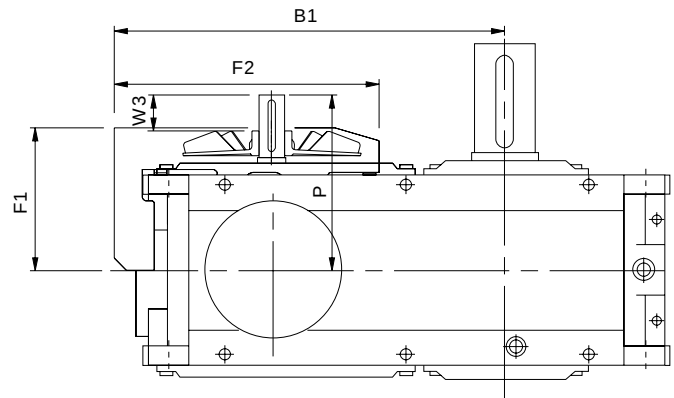
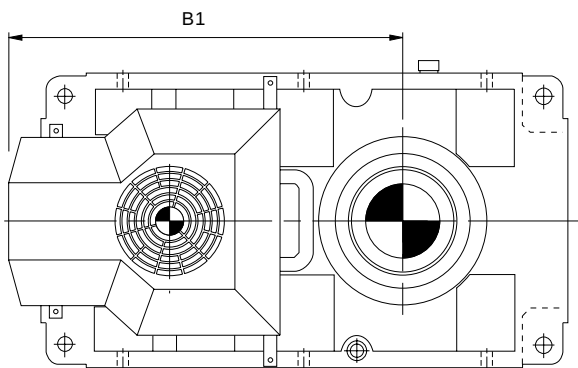
SERIES G

FAN COOLING DIMENSIONS

PARALLEL SHAFTS

0202

Parallel Shaft Units with Mechanical Fans



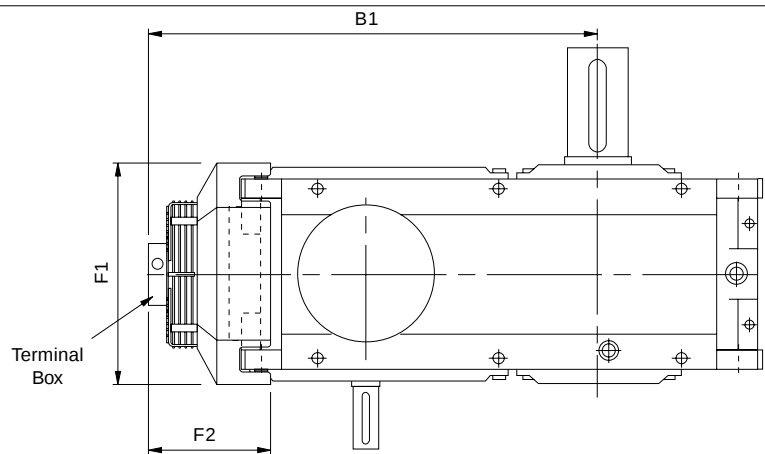
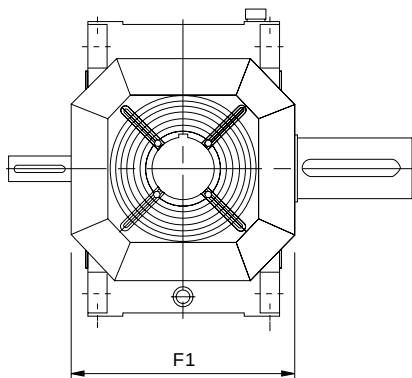
Double Reduction

Unit Size	B1	F1	F2	P	W3 (useable shaft extension)
G14	575	225	425	315	100
G15	615	225	425	315	100
G16	753	275	558	370	110
G17	808	275	558	370	110
G18	988	360	723	480	135
G19	1053	360	723	480	135
G21	1265	420	840	560	150

Triple and Quadruple Reduction

Unit Size	B1	F1	F2	P	W3 (useable shaft extension)
G14	570	210	338	275	70
G15	610	210	338	275	70
G16	753	266	456	340	85
G17	808	266	456	340	85
G18	988	345	598	440	110
G19	1053	345	598	440	110
G21	1265	420	733	540	135

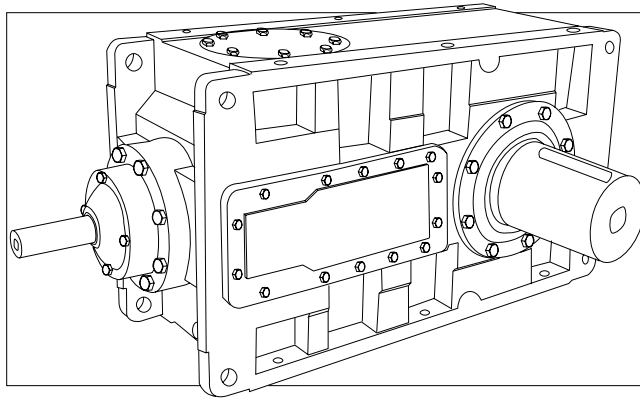
Parallel Shaft Units with Electric Fans



Double, Triple and Quadruple Reduction

Unit Size	B1	F1	F2
G14	680	350	195
G15	720	350	195
G16	865	430	215
G17	920	430	215
G18	1100	575	258
G19	1165	575	258
G21	Consult our Application Engineers		

Motor power supply:-
three phase 230/400 V, 50 Hz



RIGHT ANGLE UNITS

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SERIES G

MOMENTS OF INERTIA

RIGHT ANGLE SHAFTS

0202

MOMENTS OF INERTIA (Kg cm²) Referred to Input Shaft

RIGHT ANGLE UNITS - without fans

NOMINAL RATIO COLUMN ENTRY 6 7 8	RIGHT ANGLE UNITS - SIZE							
	G14	G15	G16	G17	G18	G19	G21	
8 . 0	610	-	2100	-	10900	-	-	TRIPLE REDUCTION
9 . 0	565	-	2060	-	10350	-	39600	
1 0 .	540	-	1940	-	9630	-	37700	
1 1 .	515	-	1830	-	9210	-	36000	
1 2 .	495	565	1740	2110	9040	10180	35500	
1 4 .	475	540	1660	1960	8710	9650	33100	
1 6 .	460	515	1580	1840	8240	9410	32800	
1 8 .	445	490	1515	1740	8140	9000	30800	
2 0 .	435	470	1505	1640	7870	8460	29900	
2 2 .	115	455	860	1560	1875	8320	29400	
2 5 .	110	440	835	1545	1835	8010	7900	
2 8 .	105	120	815	890	1755	1980	7570	
3 2 .	100	115	795	860	1645	1920	7260	
3 6 .	96	110	780	835	1620	1825	7010	
4 0 .	93	105	775	810	1555	1695	6800	
4 5 .	50	100	625	790	780	1660	6690	
5 0 .	45	95	615	785	750	1590	3040	
5 6 .	43	50	610	630	740	830	2940	
6 3 .	41	45	605	620	715	775	2860	
7 1 .	-	44	435	615	1520	760	2820	QUADRUPLEREDUCTION
8 0 .	-	42	435	610	1500	730	7500	
9 0 .	-	-	110	440	830	1530	7420	
1 0 0	-	-	105	435	827	1510	1610	
1 1 2	-	-	105	110	820	840	1580	
1 2 5	-	-	95	107	785	835	1570	
1 4 0	-	-	95	106	780	825	1460	
1 6 0	-	-	95	96	775	785	1450	
1 8 0	-	-	46	95	625	780	1440	
2 0 0	-	-	42	94	610	776	725	
2 2 5	-	-	42	47	608	630	680	
2 5 0	-	-	41	42	607	610	670	
2 8 0	-	-	-	42	-	610	670	
3 1 5	-	-	-	42	-	610	-	

RIGHT ANGLE UNITS - with fans

If fan cooling is required the inertia of the fan must be added to the table above.

MOMENTS OF INERTIA of fans (Kg cm²)

	G14 / G15	G16 / G17	G18 / G19	G21
TRIPLE REDUCTION	46	122	397	1320

$$GD^2 \text{ (Kg cm}^2\text{)} = 4 \times \text{Moment of Inertia (Kg cm}^2\text{)}$$

SERIES G

EXACT RATIOS

RIGHT ANGLE SHAFTS

0202

EXACT RATIOS - RIGHT ANGLE UNITS

Triple Reduction

Nominal Ratio Column Entry 6 7 8	UNIT SIZE						
	14	15	16	17	18	19	21
8 . 0	7.691	-	8.095	-	7.842	-	-
9 . 0	8.863	-	8.755	-	8.663	-	9.127
1 0 .	9.774	-	9.584	-	9.939	-	10.110
1 1 .	10.816	-	10.937	-	11.080	-	11.434
1 2 .	12.018	12.338	12.312	12.323	12.109	12.464	12.529
1 4 .	13.420	13.653	13.718	14.062	13.586	13.893	14.041
1 6 .	15.077	15.170	15.675	15.830	15.868	15.184	15.828
1 8 .	17.065	16.940	17.807	17.637	17.474	17.037	17.973
2 0 .	19.495	19.031	19.225	20.154	19.817	19.898	20.594
2 2 .	21.775	21.541	21.756	22.894	22.636	21.912	22.136
2 5 .	24.195	24.609	24.492	24.718	24.738	24.850	25.597
2 8 .	27.017	27.487	27.288	27.972	27.757	28.384	28.686
3 2 .	30.353	30.541	31.182	31.490	32.419	31.021	32.337
3 6 .	34.356	34.104	35.422	35.084	35.700	34.806	36.718
4 0 .	39.249	38.315	38.243	40.091	40.487	40.652	42.073
4 5 .	41.605	43.368	43.244	45.543	42.830	44.767	45.223
5 0 .	46.743	49.544	49.417	49.170	50.024	50.769	52.335
5 6 .	52.907	52.518	56.136	55.600	55.087	53.708	59.426
6 3 .	60.442	59.003	60.606	63.536	62.474	62.729	68.092
7 1 .	-	66.784	-	72.174	-	69.078	73.190
8 0 .	-	76.295	-	77.922	-	78.340	-

Quadruple Reduction

Nominal Ratio Column Entry 6 7 8	UNIT SIZE						
	14	15	16	17	18	19	21
7 1 .	-	-	73.432	-	68.805	-	-
8 0 .	-	-	79.280	-	78.030	-	83.586
9 0 .	-	-	89.584	94.412	88.634	86.279	89.844
1 0 0	-	-	101.765	101.931	97.661	97.847	102.173
1 1 2	-	-	109.869	115.180	110.755	111.207	117.073
1 2 5	-	-	130.142	130.840	124.290	122.463	125.838
1 4 0	-	-	147.837	141.260	136.870	138.883	149.034
1 6 0	-	-	159.611	167.326	155.221	155.855	170.768
1 8 0	-	-	169.192	190.077	175.521	171.630	183.552
2 0 0	-	-	200.412	205.214	196.970	194.643	194.176
2 2 5	-	-	227.661	217.533	216.906	220.098	229.968
2 5 0	-	-	245.792	257.672	245.990	246.994	263.505
2 8 0	-	-	-	292.708	-	271.994	283.223
3 1 5	-	-	-	316.018	-	308.463	-

SERIES G

RIGHT ANGLE SHAFT MECHANICAL RATINGS AT 1750 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
8.0	219	Input Power - kW	196	-	417	-	925	-	-	
		Output Torque - Nm	7920	-	17800	-	38600	-	-	
9.0	194	Input Power - kW	196	-	417	-	925	-	1825	
		Output Torque - Nm	9130	-	19300	-	42600	-	88500	
10.	175	Input Power - kW	196	-	417	-	925	-	1825	
		Output Torque - Nm	10100	-	21100	-	48900	-	98000	
11.	156	Input Power - kW	190	-	417	-	925	-	1825	
		Output Torque - Nm	10800	-	24000	-	54400	-	111000	
12.	140	Input Power - kW	173	196	393	417	913	925	1809	
		Output Torque - Nm	11000	12700	25500	27100	58600	61300	120000	
14.	125	Input Power - kW	157	189	354	417	815	925	1710	
		Output Torque - Nm	11000	13600	25500	30900	58600	68200	127000	
16.	109	Input Power - kW	141	171	310	404	699	925	1543	
		Output Torque - Nm	11000	13700	25500	33700	58600	74500	130000	
18.	97	Input Power - kW	126	155	273	375	635	863	1361	
		Output Torque - Nm	11000	13800	25600	34800	58600	77800	130000	
20.	87.5	Input Power - kW	111	139	253	325	561	750	1190	
		Output Torque - Nm	11000	14000	25600	34400	58600	79000	130000	
22.	79.5	Input Power - kW	83.5	124	210	293	471	682	1109	
		Output Torque - Nm	9550	14000	24000	35300	56100	79000	130000	
25.	70.0	Input Power - kW	83.5	110	199	273	450	603	941	
		Output Torque - Nm	10600	14000	25600	35400	58600	79000	127000	
28.	62.5	Input Power - kW	78.1	83.5	179	210	402	471	857	
		Output Torque - Nm	11000	13000	25600	31000	58600	70500	130000	
32.	54.7	Input Power - kW	70.2	82.5	157	210	344	457	761	
		Output Torque - Nm	11000	13400	25600	34700	58600	74600	130000	
36.	48.6	Input Power - kW	62.6	77.1	138	189	313	432	671	
		Output Torque - Nm	11000	13800	25600	35000	58600	79000	130000	
40.	43.8	Input Power - kW	55.2	69.3	128	167	276	371	587	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
45.	38.9	Input Power - kW	50.2	61.8	113	148	261	337	546	
		Output Torque - Nm	11000	14000	25600	35300	58600	79200	130000	
50.	35.0	Input Power - kW	45.6	54.5	99.2	138	224	297	473	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
56.	31.3	Input Power - kW	40.7	50.2	87.4	118	203	265	418	
		Output Torque - Nm	11000	14000	25600	34500	58600	74600	130000	
63.	27.8	Input Power - kW	35.9	45.1	81.0	106	180	241	365	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	24.6	Input Power - kW	-	40.2	67.6	93.5	165	219	340	
		Output Torque - Nm	-	14000	25600	35300	58600	79200	130000	
80.	21.9	Input Power - kW	-	35.5	62.7	87.0	145	194	300	
		Output Torque - Nm	-	14000	25600	35400	58600	79200	130000	
90.	19.4	Input Power - kW	-	-	55.4	72.3	126	166	278	
		Output Torque - Nm	-	-	25600	35400	51500	74100	130000	
100	17.5	Input Power - kW	-	-	48.8	67.3	116	157	244	
		Output Torque - Nm	-	-	25600	35400	53300	79300	130000	
112	15.6	Input Power - kW	-	-	45.2	58.3	102	126	213	
		Output Torque - Nm	-	-	25600	34700	55600	72400	130000	
125	14.0	Input Power - kW	-	-	38.2	52.2	91.4	125	199	
		Output Torque - Nm	-	-	25600	35400	57000	79300	130000	
140	12.5	Input Power - kW	-	-	33.7	48.6	83.0	111	168	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
160	10.9	Input Power - kW	-	-	31.2	40.8	73.3	98.5	147	
		Output Torque - Nm	-	-	25600	35200	58600	79300	130000	
180	9.7	Input Power - kW	-	-	26.7	36.0	64.8	89.5	137	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
200	8.8	Input Power - kW	-	-	23.6	33.5	57.8	79	129	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
225	7.8	Input Power - kW	-	-	21.9	26.7	52.5	69.9	109	
		Output Torque - Nm	-	-	25600	30000	58600	79300	130000	
250	7.0	Input Power - kW	-	-	20.3	23.6	46.3	62.3	95.3	
		Output Torque - Nm	-	-	25600	31500	58600	79300	130000	
280	6.3	Input Power - kW	-	-	-	23.4	-	56.6	88.7	
		Output Torque - Nm	-	-	-	35300	-	79300	130000	
315	5.6	Input Power - kW	-	-	-	21.8	-	50.0	-	
		Output Torque - Nm	-	-	-	35400	-	79300	-	

TRIPLE REDUCTION

QUADRUPLE REDUCTION

SERIES G

RIGHT ANGLE SHAFT

MECHANICAL RATINGS AT 1450 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
8.0	181	Input Power - kW	172	-	365	-	767	-	-	TRIPLE REDUCTION
		Output Torque - Nm	8400	-	18900	-	38600	-	-	
9.0	161	Input Power - kW	166	-	365	-	767	-	1500	
		Output Torque - Nm	9400	-	20400	-	42600	-	88000	
10.	145	Input Power - kW	162	-	365	-	767	-	1500	
		Output Torque - Nm	10100	-	22300	-	48800	-	97000	
11.	129	Input Power - kW	157	-	365	-	767	-	1500	
		Output Torque - Nm	10800	-	25400	-	54300	-	110000	
12.	116	Input Power - kW	144	162	327	373	757	767	1500	
		Output Torque - Nm	11000	12700	25500	29300	58600	61200	120000	
14.	104	Input Power - kW	130	156	293	365	676	767	1432	
		Output Torque - Nm	11000	13500	25600	32700	58600	68100	129000	
16.	91	Input Power - kW	117	142	257	345	580	767	1273	
		Output Torque - Nm	11000	13700	25600	34700	58600	74400	130000	
18.	81	Input Power - kW	104	128	227	311	527	726	1123	
		Output Torque - Nm	11000	13800	25600	34900	58600	79000	130000	
20.	72.5	Input Power - kW	91.9	115	210	275	466	623	983	
		Output Torque - Nm	11000	14000	25600	35200	58600	79000	130000	
22.	65.9	Input Power - kW	69.2	103	185	243	407	567	915	
		Output Torque - Nm	9550	14000	23700	35300	58500	79000	130000	
25.	58.0	Input Power - kW	69.2	82.5	165	226	373	501	776	
		Output Torque - Nm	10700	14000	25600	35400	58600	79100	127000	
28.	51.8	Input Power - kW	64.7	69.2	148	185	333	407	706	
		Output Torque - Nm	11000	12000	25600	32700	58600	73300	130000	
32.	45.3	Input Power - kW	58.1	69.2	130	174	286	392	627	
		Output Torque - Nm	11000	13400	25600	34700	58600	77100	130000	
36.	40.3	Input Power - kW	51.8	63.9	114	157	259	359	554	
		Output Torque - Nm	11000	14000	25600	34900	58600	79100	130000	
40.	36.3	Input Power - kW	45.8	57.4	106	139	229	308	484	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
45.	32.2	Input Power - kW	41.6	51.2	93.8	123	216	279	451	
		Output Torque - Nm	11000	14000	25600	35300	58600	78200	130000	
50.	29.0	Input Power - kW	37.8	45.2	82.2	114	185	247	391	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
56.	25.9	Input Power - kW	33.7	41.6	72.4	99.2	169	220	345	
		Output Torque - Nm	11000	14000	25600	35000	58600	75000	130000	
63.	23.0	Input Power - kW	29.8	37.3	67.1	87.7	149	200	301	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	20.4	Input Power - kW	-	33.3	56.0	77.5	136	182	280	
		Output Torque - Nm	-	14000	25600	35200	58600	79200	130000	
80.	18.1	Input Power - kW	-	29.4	51.9	72.1	120	160	248	QUADRUPLE REDUCTION
		Output Torque - Nm	-	14000	25600	35300	58600	79300	130000	
90.	16.1	Input Power - kW	-	-	45.9	59.9	106	145	231	
		Output Torque - Nm	-	-	25600	35300	54500	78400	130000	
100	14.5	Input Power - kW	-	-	40.4	55.8	96.2	130	202	
		Output Torque - Nm	-	-	25600	35400	56400	79300	130000	
112	12.9	Input Power - kW	-	-	37.5	49.0	84.9	107	177	
		Output Torque - Nm	-	-	25600	35200	58600	74300	130000	
125	11.6	Input Power - kW	-	-	31.7	43.2	75.7	104	165	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
140	10.4	Input Power - kW	-	-	27.9	40.2	68.8	91.6	139	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
160	9.1	Input Power - kW	-	-	25.9	33.8	60.7	81.7	122	
		Output Torque - Nm	-	-	25600	35200	58600	79300	130000	
180	8.1	Input Power - kW	-	-	22.1	29.8	53.7	74.2	113	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
200	7.3	Input Power - kW	-	-	19.6	27.8	47.9	65.5	107	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
225	6.4	Input Power - kW	-	-	18.1	22.1	43.5	57.9	90.4	
		Output Torque - Nm	-	-	25600	30000	58600	79300	130000	
250	5.8	Input Power - kW	-	-	16.8	19.6	38.4	51.6	78.9	
		Output Torque - Nm	-	-	25600	31500	58600	79300	130000	
280	5.2	Input Power - kW	-	-	-	19.4	-	46.9	73.5	
		Output Torque - Nm	-	-	-	35300	-	79300	130000	
315	4.6	Input Power - kW	-	-	-	18.0	-	41.4	-	
		Output Torque - Nm	-	-	-	35400	-	79300	-	

SERIES G

RIGHT ANGLE SHAFT MECHANICAL RATINGS AT 1160 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
8.0	145	Input Power - kW	138	-	299	-	613	-	-	
		Output Torque - Nm	8450	-	19300	-	38500	-	-	
9.0	129	Input Power - kW	133	-	299	-	613	-	1200	
		Output Torque - Nm	9380	-	20800	-	42500	-	88000	
10.	116	Input Power - kW	130	-	299	-	613	-	1200	
		Output Torque - Nm	10100	-	22700	-	48700	-	97000	
11.	104	Input Power - kW	126	-	294	-	613	-	1200	
		Output Torque - Nm	10800	-	25600	-	54200	-	110000	
12.	93	Input Power - kW	115	130	262	299	607	613	1200	
		Output Torque - Nm	11000	12700	25600	29300	58600	61100	120000	
14.	83	Input Power - kW	104	125	235	297	541	613	1148	
		Output Torque - Nm	11000	13500	25600	33200	58600	68000	129000	
16.	73	Input Power - kW	93.4	114	206	276	464	613	1020	
		Output Torque - Nm	11000	13700	25600	34700	58400	74300	130000	
18.	64	Input Power - kW	83.3	103	182	249	422	583	900	
		Output Torque - Nm	11000	13800	25600	35000	58600	79000	130000	
20.	58.0	Input Power - kW	73.5	90.2	168	220	373	500	787	
		Output Torque - Nm	11000	14000	25600	35200	58600	79100	130000	
22.	52.7	Input Power - kW	55.3	82.2	148	195	326	454	733	
		Output Torque - Nm	9550	14000	25300	35300	58600	79100	130000	
25.	46.4	Input Power - kW	55.3	72.6	132	181	299	401	621	
		Output Torque - Nm	10600	14000	25600	35400	58600	79100	127000	
28.	41.4	Input Power - kW	51.8	55.3	119	148	267	326	566	
		Output Torque - Nm	11000	12000	25600	33000	58600	73300	130000	
32.	36.3	Input Power - kW	46.5	55.3	104	139	228	314	503	
		Output Torque - Nm	11000	13400	25600	34700	58600	77100	130000	
36.	32.2	Input Power - kW	41.5	51.1	91.6	126	208	287	444	
		Output Torque - Nm	11000	13800	25600	35000	58600	79200	130000	
40.	29.0	Input Power - kW	36.6	45.9	84.9	111	183	246	388	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
45.	25.8	Input Power - kW	33.3	40.9	75.1	98.0	173	224	361	
		Output Torque - Nm	11000	14000	25600	35300	58600	79200	130000	
50.	23.2	Input Power - kW	30.2	36.2	65.8	91.2	148	197	313	
		Output Torque - Nm	11000	14000	25600	35400	58600	79200	130000	
56.	20.7	Input Power - kW	27.0	33.2	57.9	79.4	135	176	276	
		Output Torque - Nm	11000	14000	25600	35000	58600	75000	130000	
63.	18.4	Input Power - kW	23.8	29.9	53.7	70.2	119	160	241	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	16.3	Input Power - kW	-	26.6	44.8	62	109	145	224	
		Output Torque - Nm	-	14000	25600	35300	58600	79200	130000	
80.	14.5	Input Power - kW	-	23.5	41.5	57.7	96.4	128	198	
		Output Torque - Nm	-	14000	25600	35400	58600	79300	130000	
90.	12.9	Input Power - kW	-	-	36.7	47.9	84.7	118	185	
		Output Torque - Nm	-	-	25600	35300	58300	79300	130000	
100	11.6	Input Power - kW	-	-	32.3	44.6	76.9	104	162	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
112	10.4	Input Power - kW	-	-	30.0	39.2	67.9	88.7	141	
		Output Torque - Nm	-	-	25600	35200	58600	77000	130000	
125	9.3	Input Power - kW	-	-	25.3	34.6	60.6	83.0	132	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
140	8.3	Input Power - kW	-	-	22.3	32.2	55.0	73.3	111	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
160	7.3	Input Power - kW	-	-	20.7	27.0	48.6	65.3	97.3	
		Output Torque - Nm	-	-	25600	35200	58600	79300	130000	
180	6.4	Input Power - kW	-	-	17.7	23.9	42.9	59.3	90.5	
		Output Torque - Nm	-	-	23500	35300	58600	79300	130000	
200	5.8	Input Power - kW	-	-	15.7	22.2	38.3	52.4	85.5	
		Output Torque - Nm	-	-	24500	35400	58600	79300	130000	
225	5.2	Input Power - kW	-	-	14.5	17.7	34.8	46.3	72.3	
		Output Torque - Nm	-	-	25600	30000	58600	79300	130000	
250	4.6	Input Power - kW	-	-	13.4	15.7	30.7	41.3	63.1	
		Output Torque - Nm	-	-	25600	31500	58600	79300	130000	
280	4.1	Input Power - kW	-	-	-	15.5	-	37.5	58.8	
		Output Torque - Nm	-	-	-	35300	-	79300	130000	
315	3.7	Input Power - kW	-	-	-	14.5	-	33.1	-	
		Output Torque - Nm	-	-	-	35400	-	79300	-	

TRIPLE REDUCTION

QUADRUPLEREDUCTION

SERIES G

RIGHT ANGLE SHAFT

MECHANICAL RATINGS AT 960 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
8.0	120	Input Power - kW	114	-	247	-	507	-	-	
		Output Torque - Nm	8450	-	19200	-	38400	-	-	
9.0	107	Input Power - kW	110	-	247	-	507	-	995	
		Output Torque - Nm	9380	-	20800	-	42400	-	88000	
10.	96	Input Power - kW	107	-	247	-	507	-	995	
		Output Torque - Nm	10100	-	22700	-	48600	-	97000	
11.	86	Input Power - kW	104	-	244	-	507	-	995	
		Output Torque - Nm	10800	-	25600	-	54200	-	110000	
12.	77	Input Power - kW	95.1	107	217	247	503	507	995	
		Output Torque - Nm	11000	12700	25600	29200	58600	61000	120000	
14.	69	Input Power - kW	86.0	103	195	246	448	507	950	
		Output Torque - Nm	11000	13500	25600	33200	58600	68000	129000	
16.	60	Input Power - kW	77.3	94.0	171	229	385	507	845	
		Output Torque - Nm	11000	13700	25600	34700	58600	74200	130000	
18.	53	Input Power - kW	68.9	85.0	150	206	350	482	746	
		Output Torque - Nm	11000	13800	25600	34900	58600	79100	130000	
20.	48.0	Input Power - kW	60.8	76.3	139	182	309	414	652	
		Output Torque - Nm	11000	14000	25600	35200	58600	79100	130000	
22.	43.6	Input Power - kW	45.8	68.0	122	161	269	376	607	
		Output Torque - Nm	9550	14000	25600	35300	58600	79100	130000	
25.	38.4	Input Power - kW	45.8	60.1	109	150	247	332	514	
		Output Torque - Nm	10700	14000	25600	35400	58600	79200	126000	
28.	34.3	Input Power - kW	42.8	45.8	98.2	122	221	269	469	
		Output Torque - Nm	11000	12000	25600	33000	58600	73500	130000	
32.	30.0	Input Power - kW	38.5	45.8	86.0	115	189	260	417	
		Output Torque - Nm	11000	13400	25600	34700	58600	77100	130000	
36.	26.7	Input Power - kW	34.3	42.3	75.8	104	172	238	368	
		Output Torque - Nm	11000	14000	25600	34900	58600	79200	130000	
40.	24.0	Input Power - kW	30.3	38.0	70.2	91.8	152	204	321	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
45.	21.3	Input Power - kW	27.5	33.9	62.1	81.1	143	185	300	
		Output Torque - Nm	10800	14000	25600	35300	58600	79200	130000	
50.	19.2	Input Power - kW	25.0	29.9	54.4	75.5	123	163	259	
		Output Torque - Nm	10900	14000	25600	35400	58600	79300	130000	
56.	17.1	Input Power - kW	22.3	27.5	48.0	65.7	112	145	228	
		Output Torque - Nm	11000	14000	25600	35000	58600	75000	130000	
63.	15.2	Input Power - kW	19.7	24.7	44.4	58.1	98.5	132	200	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
71.	13.5	Input Power - kW	-	22.0	37.1	51.3	90.4	120	185	
		Output Torque - Nm	-	14000	25600	35300	58600	79300	130000	
80.	12.0	Input Power - kW	-	19.5	34.4	47.7	79.8	106	164	
		Output Torque - Nm	-	14000	25600	35400	58600	79300	130000	
90.	10.7	Input Power - kW	-	-	30.4	39.7	70.1	97.5	153	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
100	9.6	Input Power - kW	-	-	26.8	36.9	63.7	86.1	134	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
112	8.6	Input Power - kW	-	-	24.8	32.4	56.2	75.6	117	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
125	7.7	Input Power - kW	-	-	21.0	28.6	50.1	68.7	109	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
140	6.9	Input Power - kW	-	-	18.5	26.6	45.5	60.6	92.1	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
160	6.0	Input Power - kW	-	-	17.1	22.4	40.2	54.1	80.5	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
180	5.3	Input Power - kW	-	-	14.6	19.7	35.5	49.1	74.9	
		Output Torque - Nm	-	-	23500	35400	58600	79300	130000	
200	4.8	Input Power - kW	-	-	13.0	18.4	31.7	43.4	70.7	
		Output Torque - Nm	-	-	24500	35400	58600	79300	130000	
225	4.3	Input Power - kW	-	-	12.0	14.6	28.8	38.3	59.8	
		Output Torque - Nm	-	-	25700	30000	58600	79300	130000	
250	3.8	Input Power - kW	-	-	11.1	13.0	25.4	34.2	52.2	
		Output Torque - Nm	-	-	25700	31500	58600	79300	130000	
280	3.4	Input Power - kW	-	-	-	12.8	-	31.1	48.6	
		Output Torque - Nm	-	-	-	35400	-	79300	130000	
315	3.0	Input Power - kW	-	-	-	11.9	-	27.4	-	
		Output Torque - Nm	-	-	-	35400	-	79300	-	

TRIPLE REDUCTION

QUADRUPLE REDUCTION

SERIES G

RIGHT ANGLE SHAFT MECHANICAL RATINGS AT 725 RPM INPUT

0202

NOMINAL RATIO	NOMINAL OUTPUT SPEED REV / MIN	CAPACITY	RIGHT ANGLE SHAFT UNITS - SIZE							
			G14	G15	G16	G17	G18	G19	G21	
8.0	91	Input Power - kW	86.4	-	187	-	383	-	-	
		Output Torque - Nm	8450	-	19200	-	38400	-	-	
9.0	81	Input Power - kW	83.2	-	187	-	383	-	752	
		Output Torque - Nm	9380	-	20800	-	42400	-	88000	
10.	73	Input Power - kW	81.0	-	187	-	383	-	752	
		Output Torque - Nm	10100	-	22700	-	48600	-	97000	
11.	65	Input Power - kW	78.5	-	184	-	383	-	752	
		Output Torque - Nm	10800	-	25600	-	54100	-	110000	
12.	58	Input Power - kW	71.8	81.0	164	187	380	383	752	
		Output Torque - Nm	11000	12700	25600	29200	58600	61000	120000	
14.	52	Input Power - kW	65.0	78.1	147	186	339	383	720	
		Output Torque - Nm	11000	13500	25600	33200	58600	68000	129000	
16.	45	Input Power - kW	58.4	71.0	129	173	291	383	639	
		Output Torque - Nm	11000	13700	25600	34700	58600	74100	130000	
18.	40	Input Power - kW	52.0	64.2	114	156	264	365	564	
		Output Torque - Nm	11000	13800	25600	34900	58600	79100	130000	
20.	36.3	Input Power - kW	45.9	57.6	105	138	233	313	493	
		Output Torque - Nm	11000	14000	25600	35200	58600	79200	130000	
22.	33.0	Input Power - kW	34.6	51.4	92.4	122	204	285	459	
		Output Torque - Nm	9550	14000	25600	35300	58600	79200	130000	
25.	29.0	Input Power - kW	34.6	45.4	82.6	113	187	251	389	
		Output Torque - Nm	10700	14000	25600	35400	58600	79200	126000	
28.	25.9	Input Power - kW	32.4	34.6	74.2	92.4	167	204	355	
		Output Torque - Nm	11000	12000	25600	33000	58600	73500	130000	
32.	22.7	Input Power - kW	29.1	34.6	65.0	87.0	143	196	315	
		Output Torque - Nm	11000	13400	25600	34700	58600	77100	130000	
36.	20.1	Input Power - kW	25.9	32.0	57.3	78.4	130	180	278	
		Output Torque - Nm	11000	14000	25600	34900	58600	79200	130000	
40.	18.1	Input Power - kW	22.9	28.7	53.1	69.4	114	154	243	
		Output Torque - Nm	11000	14000	25600	35200	58600	79300	130000	
45.	16.1	Input Power - kW	20.8	25.6	46.9	61.3	108	140	226	
		Output Torque - Nm	10800	14000	25600	35300	58600	79300	130000	
50.	14.5	Input Power - kW	18.9	22.6	41.1	57.0	92.7	123	195	
		Output Torque - Nm	11000	14000	25600	35400	58600	79300	130000	
56.	12.9	Input Power - kW	16.8	20.8	36.2	49.6	84.2	110	172	
		Output Torque - Nm	11000	14000	25600	35000	58600	75000	130000	
63.	11.5	Input Power - kW	14.9	18.7	33.6	43.9	74.4	100	150	
		Output Torque - Nm	11000	14000	25600	35200	58600	79300	130000	
71.	10.2	Input Power - kW	-	16.6	28.0	38.7	68.2	90	140	
		Output Torque - Nm	-	14000	25600	35300	58600	79300	130000	
80.	9.1	Input Power - kW	-	14.7	25.9	36.0	60.2	80.2	124	
		Output Torque - Nm	-	14000	25600	35400	58600	79300	130000	
90.	8.1	Input Power - kW	-	-	22.9	29.9	52.9	73.6	115	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
100	7.3	Input Power - kW	-	-	20.2	27.9	48.1	65.0	101	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
112	6.5	Input Power - kW	-	-	18.7	24.5	42.4	57.1	88.3	
		Output Torque - Nm	-	-	25600	35300	58600	79300	130000	
125	5.8	Input Power - kW	-	-	15.8	21.6	37.8	51.9	82.2	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
140	5.2	Input Power - kW	-	-	13.9	20.1	34.4	45.8	69.5	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
160	4.5	Input Power - kW	-	-	12.9	16.9	30.3	40.8	60.7	
		Output Torque - Nm	-	-	25600	35400	58600	79300	130000	
180	4.0	Input Power - kW	-	-	11.0	14.9	26.8	37.1	56.5	
		Output Torque - Nm	-	-	23500	35400	58600	79300	130000	
200	3.6	Input Power - kW	-	-	9.8	13.9	23.9	32.7	53.4	
		Output Torque - Nm	-	-	24500	35400	58600	79300	130000	
225	3.2	Input Power - kW	-	-	9.1	11.0	21.7	29.0	45.2	
		Output Torque - Nm	-	-	25700	30000	58600	79300	130000	
250	2.9	Input Power - kW	-	-	8.4	9.8	19.2	25.8	39.4	
		Output Torque - Nm	-	-	25700	31500	58600	79300	130000	
280	2.6	Input Power - kW	-	-	-	9.7	-	23.5	36.7	
		Output Torque - Nm	-	-	-	35400	-	79300	130000	
315	2.3	Input Power - kW	-	-	-	9.0	-	20.7	-	
		Output Torque - Nm	-	-	-	35400	-	79300	-	

TRIPLE REDUCTION

QUADRUPLE REDUCTION

SERIES G

RIGHT ANGLE SHAFT

THERMAL RATINGS

0202

Thermal Ratings kW

Right Angle Shaft Units - Triple Reduction

Type of Cooling	Input Speed (rev/min)	RIGHT ANGLE SHAFT UNIT SIZE						
		14	15	16	17	18	19	21
Units with no Additional Cooling	1750	75	75	125	125	193	209	321
	1450	69	69	115	115	178	192	291
	1160	67	67	111	111	173	187	284
	960	65	65	108	108	168	181	276
	725	63	63	105	105	162	176	262
Units with Fan Cooling	1750	169	169	281	281	435	471	626
	1450	138	138	230	230	356	385	509
	1160	124	124	206	206	320	346	455
	960	107	107	178	178	277	299	400
	725	95	95	157	157	244	264	353
Units with Cooling Coil	1750	227	227	378	378	548	564	664
	1450	215	215	358	358	519	533	634
	1160	200	200	333	333	483	497	627
	960	192	192	320	320	464	478	619
	725	185	185	308	308	447	460	605
Units with Fan and Cooling Coil	1750	321	321	534	534	790	825	969
	1450	284	284	473	473	696	726	852
	1160	257	257	428	428	630	656	798
	960	234	234	390	390	573	595	743
	725	217	217	361	361	528	548	696

Right Angle Shaft Units - Quadruple Reduction

Type of Cooling	Input Speed (rev/min)	RIGHT ANGLE SHAFT UNIT SIZE						
		14	15	16	17	18	19	21
Units with no Additional Cooling	1750	-	-	94	94	146	158	238
	1450	-	-	87	87	134	145	216
	1160	-	-	84	84	130	141	211
	960	-	-	82	82	126	137	204
	725	-	-	79	79	123	133	194

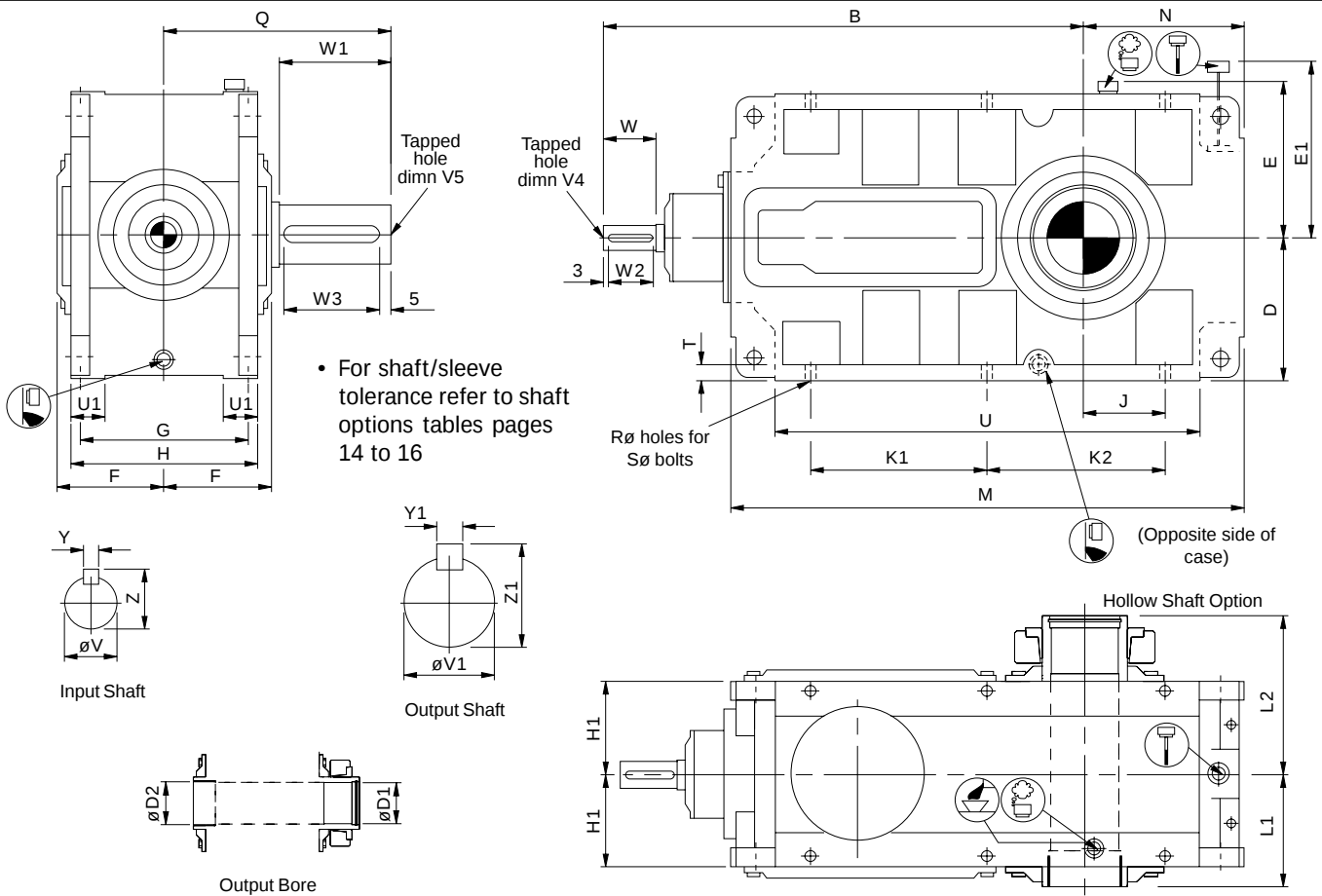
SERIES G

DIMENSIONS

HORIZONTAL RIGHT ANGLE SHAFTS TRIPLE REDUCTION

0202

G 30 B Triple Reduction Right Angle Units Horizontal



Unit Size	B	D	E	E1	F	G	H	H1	J	K1	K2	M	N	Q	R	S	T	U	U1
G14	720	230	250	370	177	265	300	150	170	285		820	295	360	18.5	6 x M16 x 60*	25	684	55
G15	760	230	250	370	177	265	300	150	130	285		820	255	370	18.5	6 x M16 x 60*	25	684	55
G16	940	300	335	515	225	330	380	190	225	385		1060	370	460	28	6 x M24 x 80*	30	898	70
G17	995	300	335	515	225	330	380	190	170	385		1060	315	480	28	6 x M24 x 80*	30	898	70
G18	1220	385	420	710	290	440	500	250	153	520	350	1240	338	600	33	6 x M30 x 100*	37	1036	90
G19	1285	385	420	710	290	440	500	250	220	500		1374	407	650	33	6 x M30 x 100*	40	1170	90
G21	1630	465	507	750	340	530	600	300	225	695	480	1655	465	700	39	6 x M36 x 100*	50	1380	120

Unit Size	Input Shaft •						Output Shaft •						Output Bore •			
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1	D1	D2	L1	L2
G14	38 k6	M12 x 32	100	90	10	41	110 m6	M30 x 63	180	170	28	116	95	100	180	255
G15	38 k6	M12 x 32	100	90	10	41	130 m6	M30 x 63	190	180	32	137	110	115	180	260
G16	50 k6	M16 x 36	140	130	14	53.5	145 m6	M42 x 81	230	220	36	153	125	130	230	325
G17	50 k6	M16 x 36	140	130	14	53.5	170 m6	M42 x 81	250	240	40	179	145	150	230	340
G18	75 m6	M20 x 43	160	150	20	79.5	190 m6	M42 x 81	300	290	45	200	160	170	300	410
G19	75 m6	M20 x 43	160	150	20	79.5	210 m6	M42 x 81	350	340	50	221	170	180	300	430
G21	100 m6	M24 x 52	210	200	28	106	220 m6	M42 x 81	350	340	50	231	210	220	350	500

* Maximum bolt length

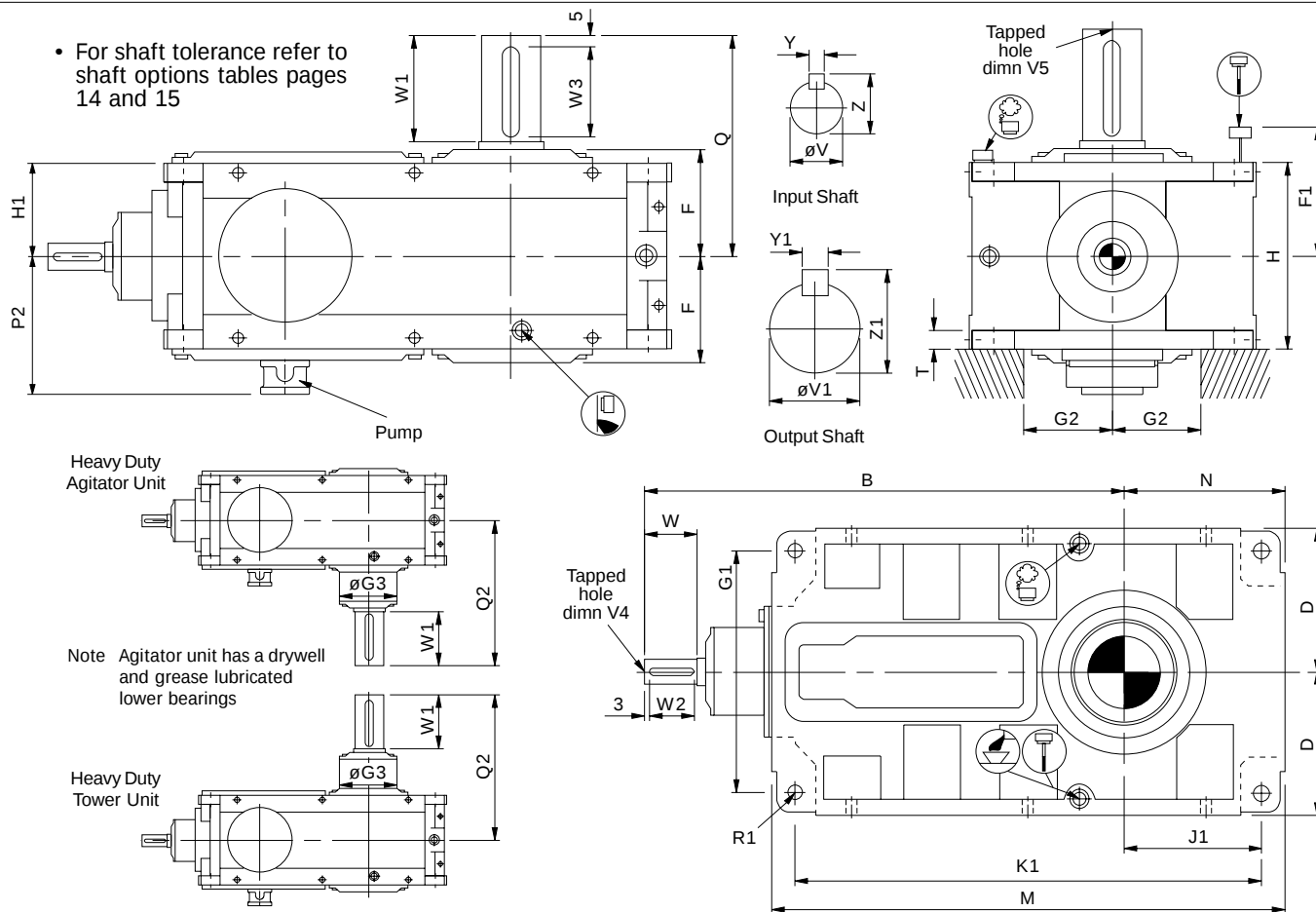
SERIES G

DIMENSIONS

VERTICAL RIGHT ANGLE SHAFTS TRIPLE REDUCTION

0205

G **30** **R** Triple Reduction Right Angle Units Vertical



Unit Size	B	D	F	F1	G1	G2 (min)		G3	H	H1	J1	K1	M	N	P2	Q	Q2	R1	T
						No Fan	With Fan												
G14	720	230	177	390	390	135	155	230	300	150	260	750	820	295	236	360	475	4 x $\phi 24$	30
G15	760	230	177	390	390	135	155	260	300	150	220	750	820	255	236	370	495	4 x $\phi 24$	30
G16	940	300	225	515	506	175	205	300	380	190	325	970	1060	370	285	460	595	4 x $\phi 33$	45
G17	995	300	225	515	506	175	205	340	380	190	270	970	1060	315	285	480	615	4 x $\phi 33$	45
G18	1220	385	290	700	656	205	245	370	500	250	281	1126	1240	338	345	600	760	4 x $\phi 40$	55
G19	1285	385	290	700	656	205	245	400	500	250	350	1260	1374	407	345	650	815	4 x $\phi 40$	55
G21	1630	465	340	750	730	255	315	500	600	300	395	1515	1655	465	400	700	925	4 x $\phi 48$	70

Unit Size	Input Shaft •						Output Shaft •					
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1
G14	38 k6	M12 x 32	100	90	10	41	110 m6	M30 x 63	180	170	28	116
G15	38 k6	M12 x 32	100	90	10	41	130 m6	M30 x 63	190	180	32	137
G16	50 k6	M16 x 36	140	130	14	53.5	145 m6	M42 x 81	230	220	36	153
G17	50 k6	M16 x 36	140	130	14	53.5	170 m6	M42 x 81	250	240	40	179
G18	75 m6	M20 x 43	160	150	20	79.5	190 m6	M42 x 81	300	290	45	200
G19	75 m6	M20 x 43	160	150	20	79.5	210 m6	M42 x 81	350	340	50	221
G21	100 m6	M24 x 52	210	200	28	106	220 m6	M42 x 81	350	340	50	231

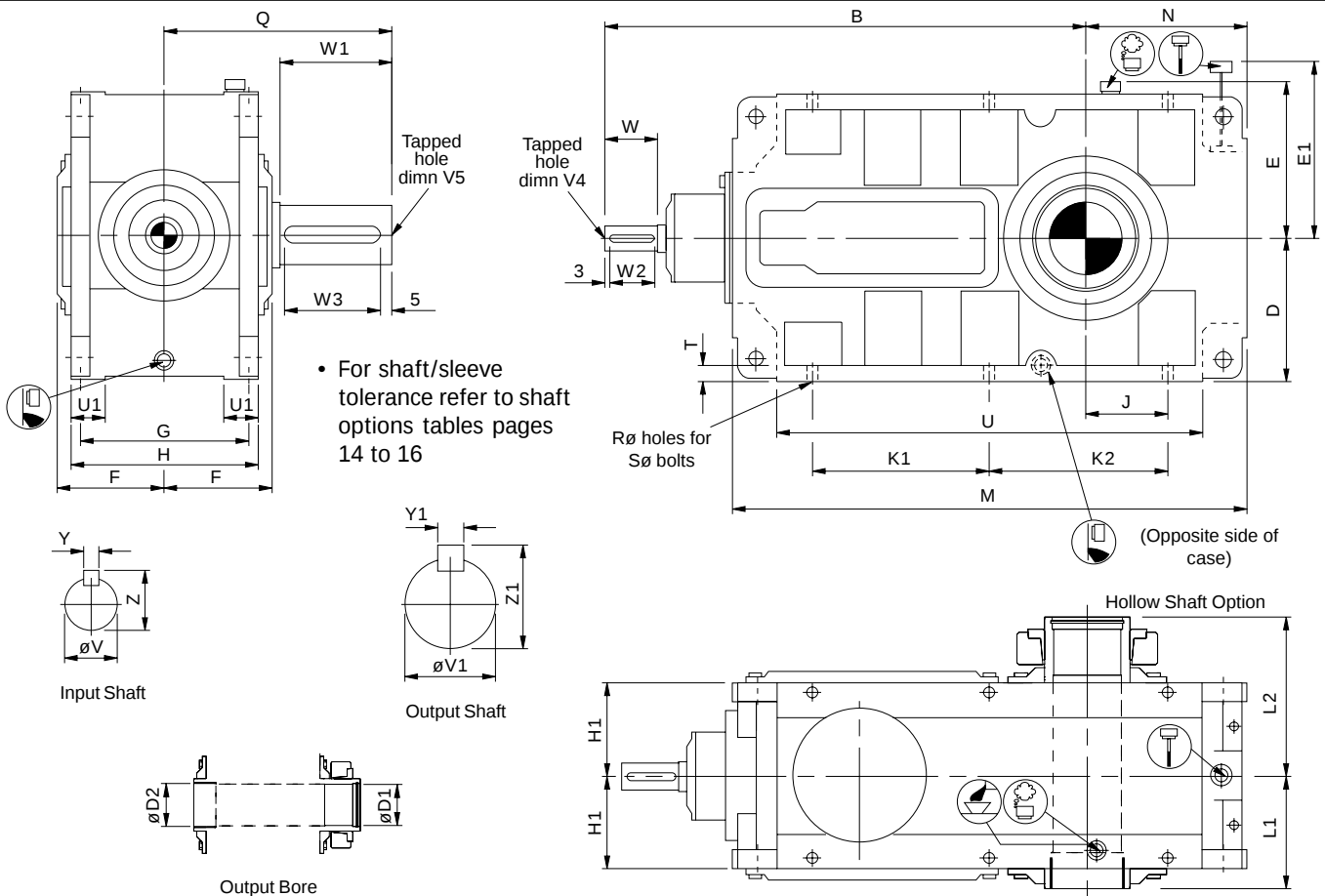
SERIES G

DIMENSIONS

0202

HORIZONTAL RIGHT ANGLE SHAFTS QUADRUPLE REDUCTION

G **40** **B** Quadruple Reduction Right Angle Units Horizontal



Unit Size	B	D	E	E1	F	G	H	H1	J	K1	K2	M	N	Q	R	S	T	U	U1
G16	965	300	335	515	225	330	380	190	225	385		1060	370	460	28	6 x M24 x 80*	30	898	70
G17	1020	300	335	515	225	330	380	190	170	385		1060	315	480	28	6 x M24 x 80*	30	898	70
G18	1265	385	420	710	290	440	500	250	153	520	350	1240	338	600	33	6 x M30 x 100*	37	1036	90
G19	1330	385	420	710	290	440	500	250	220	500		1374	407	650	33	6 x M30 x 100*	40	1170	90
G21	1660	465	507	750	340	530	600	300	225	695	480	1655	465	700	39	6 x M36 x 100*	50	1380	120

Unit Size	Input Shaft •						Output Shaft •						Output Bore •			
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1	D1	D2	L1	L2
G16	38 k6	M12 x 32	100	90	10	41	145 m6	M42 x 81	230	220	36	153	125	130	230	325
G17	38 k6	M12 x 32	100	90	10	41	170 m6	M42 x 81	250	240	40	179	145	150	230	340
G18	50 k6	M16 x 36	140	130	14	53.5	190 m6	M42 x 81	300	290	45	200	160	170	300	410
G19	50 k6	M16 x 36	140	130	14	53.5	210 m6	M42 x 81	350	340	50	221	170	180	300	430
G21	75 m6	M20 x 43	160	150	20	79.5	220 m6	M42 x 81	350	340	50	231	210	220	350	500

* Maximum bolt length

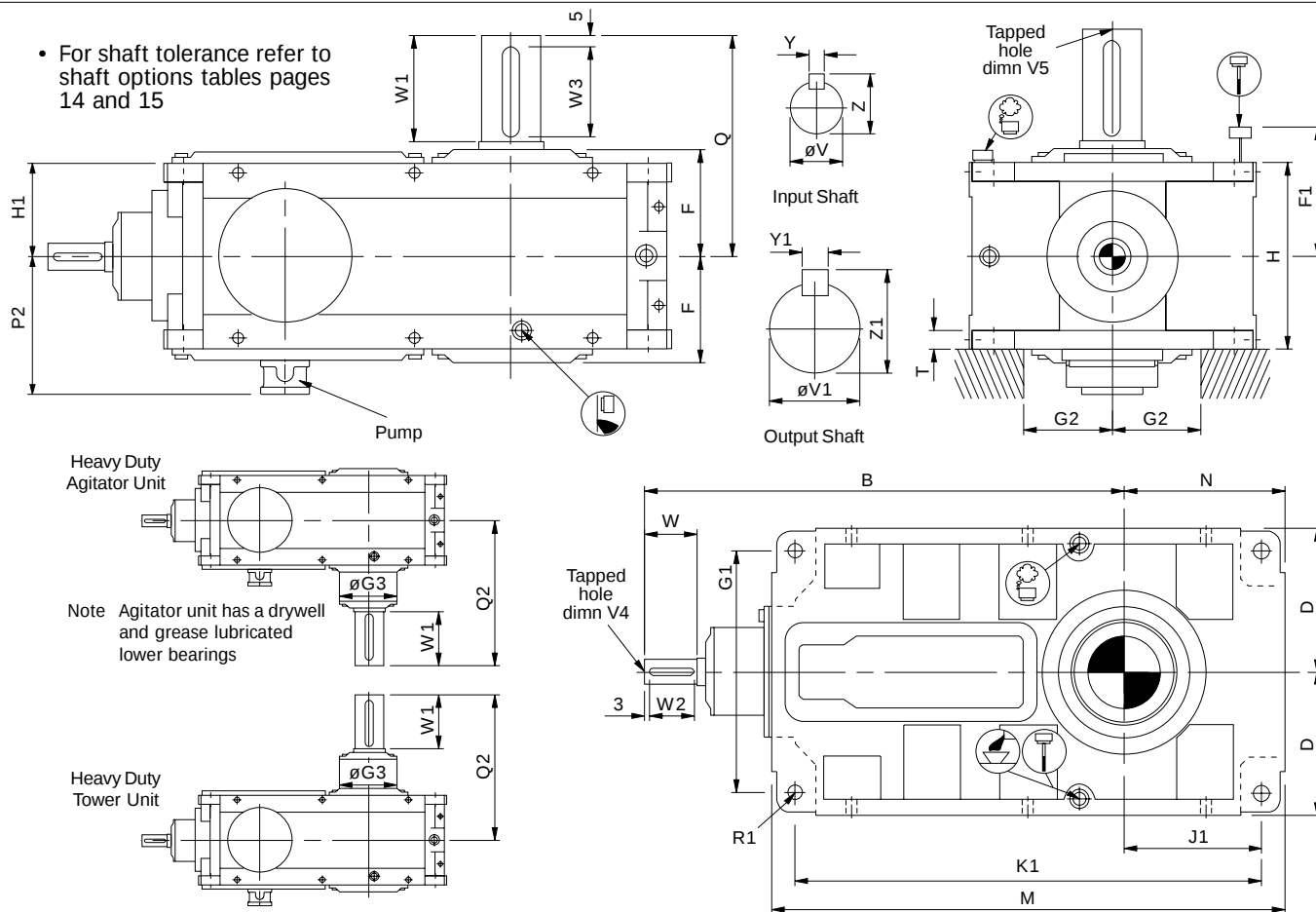
SERIES G

DIMENSIONS

VERTICAL RIGHT ANGLE SHAFTS QUADRUPLE REDUCTION

0202

G **40** **R** Quadruple Reduction Right Angle Units Vertical



Unit Size	B	D	F	F1	G1	G2 (min)	G3	H	H1	J1	K1	M	N	P2	Q	Q2	R1	T
G16	965	300	225	515	506	175	300	380	190	325	970	1060	370	285	460	595	4 x Ø33	45
G17	1020	300	225	515	506	175	340	380	190	270	970	1060	315	285	480	615	4 x Ø33	45
G18	1265	385	290	700	656	205	370	500	250	281	1126	1240	338	345	600	760	4 x Ø40	55
G19	1330	385	290	700	656	205	400	500	250	350	1260	1374	407	345	650	815	4 x Ø40	55
G21	1660	465	340	750	730	255	500	600	300	395	1515	1655	465	400	700	925	4 x Ø48	70

Unit Size	Input Shaft •						Output Shaft •					
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1
G16	38 k6	M12 x 32	100	90	10	41	145 m6	M42 x 81	230	220	36	153
G17	38 k6	M12 x 32	100	90	10	41	170 m6	M42 x 81	250	240	40	179
G18	50 k6	M16 x 36	140	130	14	53.5	190 m6	M42 x 81	300	290	45	200
G19	50 k6	M16 x 36	140	130	14	53.5	210 m6	M42 x 81	350	340	50	221
G21	75 m6	M20 x 43	160	150	20	79.5	220 m6	M42 x 81	350	340	50	231

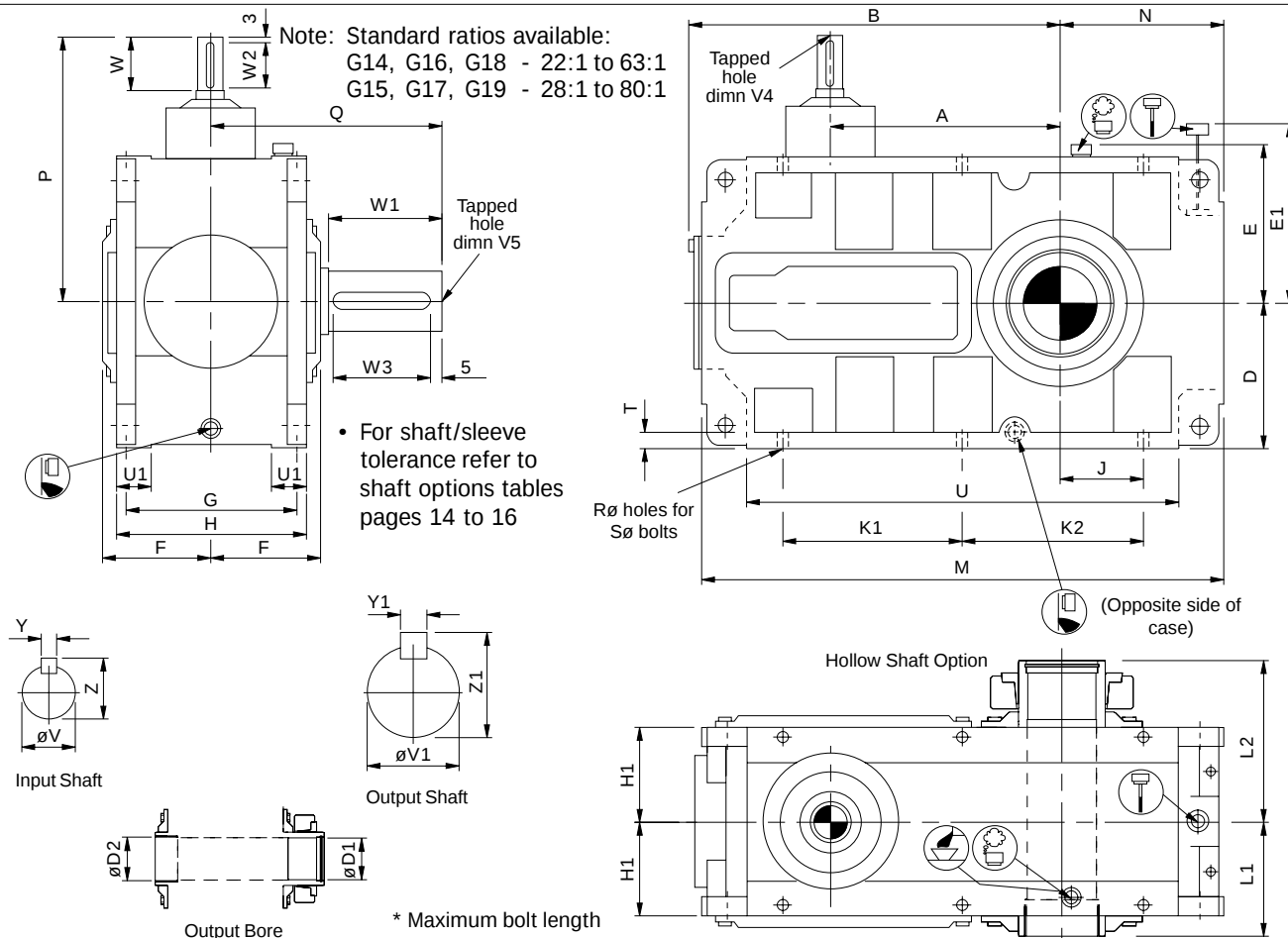
SERIES G

DIMENSIONS

0202

HORIZONTAL 'J' TYPE RIGHT ANGLE SHAFTS TRIPLE REDUCTION

G 3 0 B Triple Reduction 'J' Type Right Angle Units Horizontal



Unit Size	A	B	D	E	E1	F	G	H	H1	J	K1	K2	M	N	P	Q	R	S	T	U	U1
G14	325	554	230	250	370	177	265	300	150	170	285		820	295	395	360	18.5	6 x M16 x 60*	25	684	55
G15	365	594	230	250	370	177	265	300	150	130	285		820	255	395	370	18.5	6 x M16 x 60*	25	684	55
G16	430	728	300	335	515	225	330	380	190	225	385		1060	370	510	460	28	6 x M24 x 80*	30	898	70
G17	485	783	300	335	515	225	330	380	190	170	385		1060	315	510	480	28	6 x M24 x 80*	30	898	70
G18	570	953	385	420	710	290	440	500	250	153	520	350	1240	338	650	600	33	6 x M30 x 100*	37	1036	90
G19	635	1018	385	420	710	290	440	500	250	220	500		1374	407	650	650	33	6 x M30 x 100*	40	1170	90
G21	765	1240	465	507	750	340	530	600	300	225	695	480	1655	465	865	700	39	6 x M36 x 136*	50	1380	120

Unit Size	Input Shaft •						Output Shaft •						Output Bore •			
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1	D1	D2	L1	L2
G14	38 k6	M12 x 32	100	90	10	41	110 m6	M30 x 63	180	170	28	116	95	100	180	255
G15	38 k6	M12 x 32	100	90	10	41	130 m6	M30 x 63	190	180	32	137	110	115	180	260
G16	50 k6	M16 x 36	140	130	14	53.5	145 m6	M42 x 81	230	220	36	153	125	130	230	325
G17	50 k6	M16 x 36	140	130	14	53.5	170 m6	M42 x 81	250	240	40	179	145	150	230	340
G18	75 m6	M20 x 43	160	150	20	79.5	190 m6	M42 x 81	300	290	45	200	160	170	300	410
G19	75 m6	M20 x 43	160	150	20	79.5	210 m6	M42 x 81	350	340	50	221	170	180	300	430
G21	100 m6	M24 x 52	210	200	28	106	220 m6	M42 x 81	350	340	50	231	210	220	350	500

SERIES G

DIMENSIONS

0202

VERTICAL 'J' TYPE RIGHT ANGLE SHAFTS TRIPLE REDUCTION

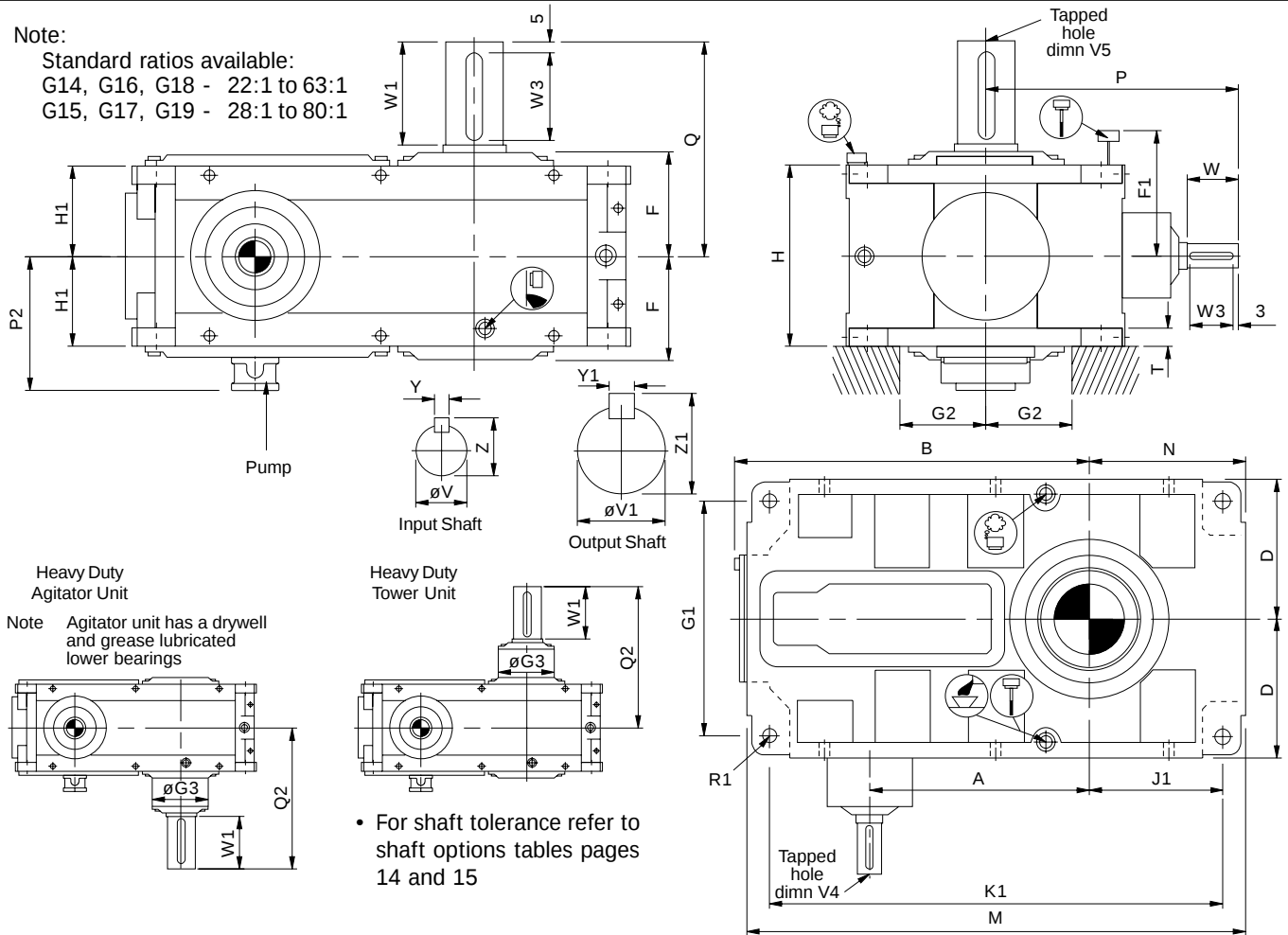
G 3 0 R Triple Reduction 'J' Type Right Angle Units Vertical

Note:

Standard ratios available:

G14, G16, G18 - 22:1 to 63:1

G15, G17, G19 - 28:1 to 80:1



Unit Size	A	B	D	F	F1	G1	G2 (min)	G3	H	H1	J1	K1	M	N	P	P2	Q	Q2	R1	T
G14	325	554	230	177	390	390	135	230	300	150	260	750	820	295	395	236	360	475	4 x ø24	30
G15	365	594	230	177	390	390	135	260	300	150	220	750	820	255	395	236	370	495	4 x ø24	30
G16	430	728	300	225	515	506	175	300	380	190	325	970	1060	370	510	285	460	595	4 x ø33	45
G17	485	783	300	225	515	506	175	340	380	190	270	970	1060	315	510	285	480	615	4 x ø33	45
G18	570	953	385	290	700	656	205	370	500	250	281	1126	1240	338	650	345	600	760	4 x ø40	55
G19	635	1018	385	290	700	656	205	400	500	250	350	1260	1374	407	650	345	650	815	4 x ø40	55
G21	765	1630	465	340	750	730	255	500	600	300	395	1515	1655	465	865	400	700	925	4 x ø48	70

Unit Size	Input Shaft •						Output Shaft •					
	V	V4	W	W2	Y	Z	V1	V5	W1	W3	Y1	Z1
G14	38 k6	M12 x 32	100	90	10	41	110 m6	M30 x 63	180	170	28	116
G15	38 k6	M12 x 32	100	90	10	41	130 m6	M30 x 63	190	180	32	137
G16	50 k6	M16 x 36	140	130	14	53.5	145 m6	M42 x 81	230	220	36	153
G17	50 k6	M16 x 36	140	130	14	53.5	170 m6	M42 x 81	250	240	40	179
G18	75 m6	M20 x 43	160	150	20	79.5	190 m6	M42 x 81	300	290	45	200
G19	75 m6	M20 x 43	160	150	20	79.5	210 m6	M42 x 81	350	340	50	221
G21	100 m6	M24 x 52	210	200	28	106	220 m6	M42 x 81	350	340	50	231

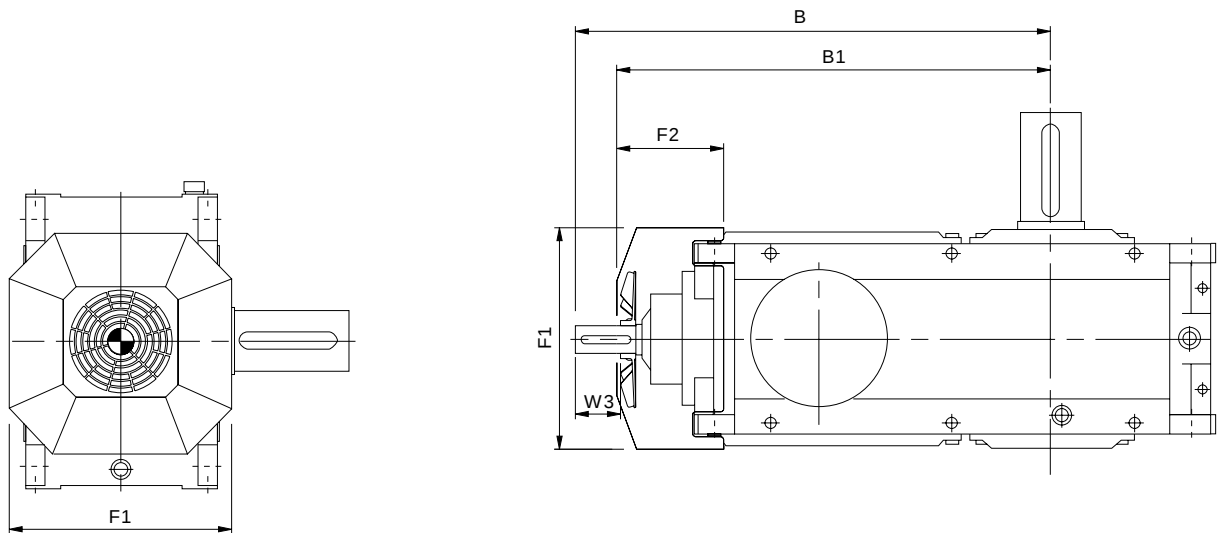
SERIES G

FAN COOLING DIMENSIONS

RIGHT ANGLE SHAFTS

9901

Right Angle Shaft Units with Mechanical Fans



Triple Reduction Only

Unit Size	B	B1	F1	F2	W3 (useable shaft extension)
G14	720	650	350	165	75
G15	760	690	350	165	75
G16	940	845	430	195	105
G17	995	900	430	195	105
G18	1220	1122	575	280	105
G19	1285	1187	575	280	105
G21	1630	1490	690	345	155

SERIES G

HOLLOW OUTPUT SHAFT WITH SHRINK DISC

0202

The gear unit is fitted with a 'shrink disc' device located on the hollow output shaft to provide a positive outer locking connection between gear unit and driven shaft. The 'shrink disc' is a friction device, without keys, which exerts an external clamping force on the hollow output shaft, thus establishing a mechanical shrink fit between the gear unit hollow shaft and driven shaft. 'Shrink disc' capacities have ample margins in dealing with transmitted torques and external loading imposed on gear units.

WORKING PRINCIPLE

The 'shrink disc' consists of a locking collar, a tapered inner ring and locking screws. By tightening the locking screws, the locking collar and tapered inner ring are pulled together, exerting radial forces on the inner ring, thus creating a positive friction connection between hollow shaft and driven shaft.

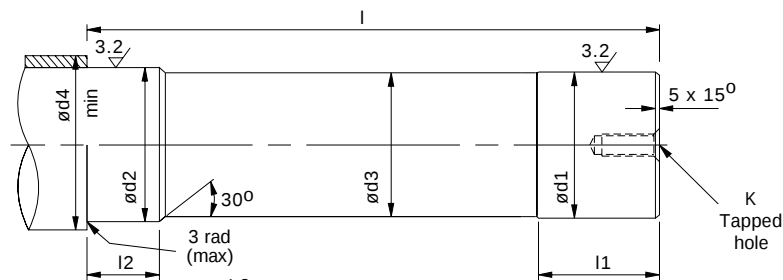
As the tapered surfaces of locking collar and inner ring are lubricated with Molykote 321R or similar and the taper angle is not self locking, locking collar will not seize on the inner ring and can be released easily when removal is necessary.

When the shrink disc is clamped in position the high contact pressures between tapered surfaces and screw heads and their seatings ensure hermetic sealing and eliminate the possibility of fretting corrosion.

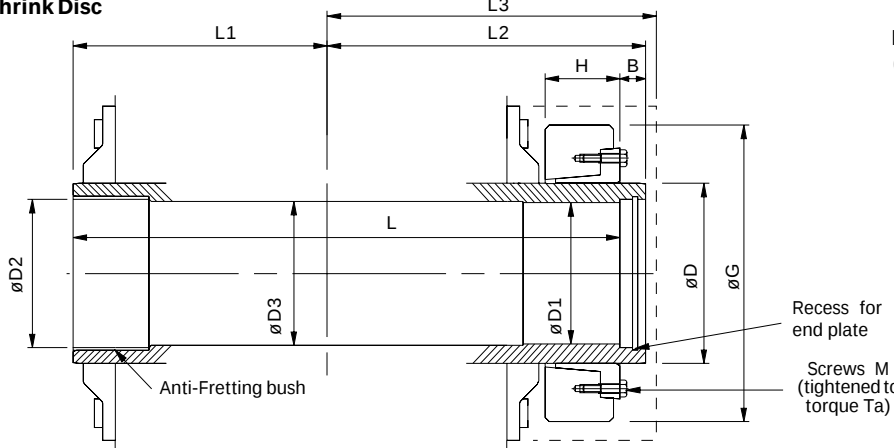
UNIT SIZE	CUSTOMERS SHAFT								SHRINK DISC						
	ød1	ød2	ød3	ød4	I	I1	I2	K	Type	B	øD	øG	H	M	Torque Ta (Nm)
14	95 h6	100 h6	94.5	115	413	55	50	M24 x50	HSD 120-81-95	22	120	197	53	M12	121
15	110 h6	115 h6	109.5	130	418	60	60	M24 x50	HSD 140-81-110	22	140	230	58	M14	193
16	125 h6	130 h6	124.5	147	530	70	70	M24 x50	HSD 160-81-125	28	160	290	68	M16	295
17	145 h6	150 h6	144.5	167	545	90	90	M30 x60	HSD 180-81-145	28	180	320	85	M16	295
18	160 h6	170 g6	159.5	185	685	90	90	M30 x60	HSD 200-81-160	30	200	340	85	M16	295
19	170 g6	180 g6	169.5	195	705	105	105	M30 x60	HSD 220-81-170	30	220	370	103	M20	570
21	210 g6	220 g6	209.5	225	820	130	105	M30 x60	HSD 260-81-210	30	260	430	119	M20	570

UNIT SIZE	HOLLOW SHAFT								END PLATE						
	øD1	øD2	øD3	L	L1	L2	L3	C	C1	ød5	ød6	øK1	M crs	P	Circlip
14	95	100	96	415	180	255	276	20	10.0 9.8	99.75 99.50	78	26	55	M12	D1300-1000
15	110	115	111	420	180	260	276	20	10.0 9.8	114.75 114.50	90	26	65	M12	D1300-1150
16	125	130	126	533	230	325	348	25	12.0 11.8	129.75 129.50	103	26	70	M16	D1300-1300
17	145	150	147	548	230	340	348	25	12.0 11.8	149.75 149.50	120	33	85	M16	D1300-1500
18	160	170	162	688	300	410	442	25	12.0 11.8	169.75 169.50	135	33	100	M16	D1300-1700
19	170	180	172	708	300	430	442	25	12.0 11.8	184.75 184.50	150	33	110	M16	D1300-1850
21	210	220	212	824	350	500	510	28	14.0 13.8	219.75 219.50	170	33	130	M20	D1300-2200

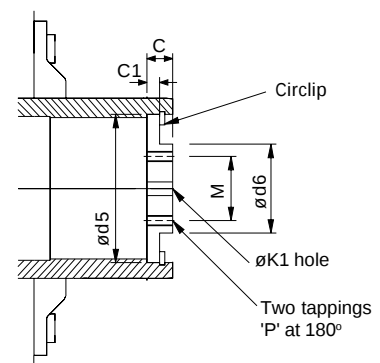
Customers Shaft



Hollow Shaft and Shrink Disc



End Plate (If required)



Advantages with Kibo taper bushes

- Simple design
- Easy to mount
- Easy to dismount, built in puller
- Tapered bushes assure a safe mounting
- Reduces risk for shearing of key
- Bushings for different bore dimensions are available

The Kibo bush kit comprises of: bushes, locking nuts, end plate, fastening bolt, shaft key and protective cover.

Mounting

For correct mounting of speed reducer it is important that both bushings get the same squeezing force.

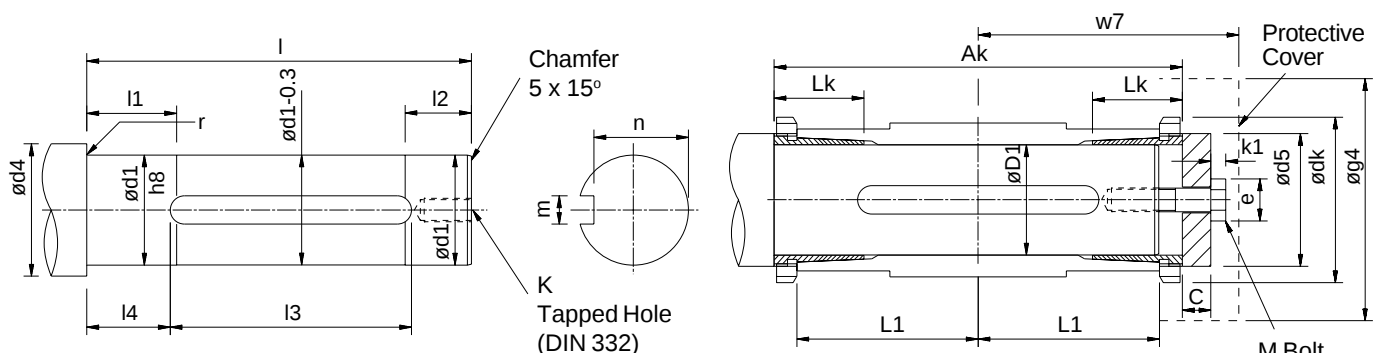
1. Mount the inner bushing with the nut in its outer position. The bushing should be mounted against the shoulder or circlip. The shoulder should not exceed inside diameter of nut.
2. Fit the key in the keyway.
3. Mount the reducer on the machine-shaft and press it against the inner bushing
4. Mount the outer bushing with the nut in it's inner position. Check that the bushing is not squeezed but the nut is in contact with the shaft sleeve.
5. Mount the end plate with its fixing bolt. Tighten the bolt with correct torque. The inner bushing is now locked.
6. Loosen the bolt, so the outer bushing is loose. Turn the nut on the bushing, in it's outer position.
7. Tighten the bolt once again with correct torque. The outer bushing is now locked.
The thicker end plate may be changed to the thinner one in order to gain more space at the hollow shaft end. The thinner end plate should be tightened with a torque of 25% of the value given in the table below.
8. Screw the nuts against the hollow shaft by hand, mounting is completed.
9. Fit protective cover.

Dismounting

- Loosen the bolt and take away the end plate.
- Pull out the outer bushing with the nut, by turning the nut with an adequate tool. Take out the bushing.
- Press the reducer from the inner bushing with the nut, dismounting is completed.

NOTE:

If reducer is mounted in a corrosive environment, ensure machine shaft bushings and nuts are oiled or greased.
Do NOT use grease based on molybdendisulfide.



SERIES G

KIBO BUSHES

0203

Unit Size	Customers Shaft											
	ød1	ød4		l	l1	l2	l3	l4	m	n	K	r (max)
		min	max									
14	95	103	106	383	65	47	181	112	25	86	M24 x 50	2
	90	98								81		
	85	93							22	76	M20 x 42	
	80	88								71		
15	110	120	126	385	75	54	170	119	28	100	M24x50	2.5
	105	115								95		
	100	110								90		
	95	105							25	86		
	90	100								81		
16	125	135	136	483	78	51	240	136	32	114	M24x50	2.5
	120	130								109		
	115	127								104		
	110	120							28	100		
17	140	152	160	488	114	86	270	123	36	128	M30x60	3
	130	142							32	119	M24x50	
	125	137								114		
	120	132								109		
	18	160							172	175	627	
150		162	36	138								
140		152		128								
19	180	192	205	630	125	95	405	130	45	165	M30x60	3
21	Contact our Application Engineers											

Unit Size	Hollow Shaft							End Plate						Cover	
	øD1	Kit Number	Column 10 Entry	ødk	L1	Ak	Lk	ød5	C	Fixing Bolt			Tightening Torque Nm	øg4	w7
										M	e	k1			
14	95	C38794-S1	1	145	180	404	64	110	24	M24	42	15	289	280	276
	90	C38794-S2	2												
	85	C38794-S3	3												
	80	C38794-S4	4												
15	110	C38874-S1	1	165	180	406	75	130	10	M24	42	15	312	280	276
	105	C38874-S2	2												
	100	C38874-S3	3												
	95	C38874-S4	4												
	90	C38874-S5	5												
16	125	C38914-S1	1	180	230	512	78	140	10	M24	42	15	510	350	333
	120	C38914-S2	2												
	115	C38914-S3	3												
	110	C38914-S4	4												
17	140	C38954-S1	1	210	230	518	114	165	10	M30	53	19	688	350	348
	130	C38954-S2	2												
	125	C38954-S3	3												
	120	C38954-S4	4												
18	160	C38994-S1	1	230	300	660	85	180	14	M30	53	19	598	470	442
	150	C38994-S2	2												
	140	C38994-S3	3												
19	180	C39004-S1	1	250	300	660	125	200	40	M30	53	19	853	470	442
21	Contact our Application Engineers														

SERIES G

COOLING COIL CONNECTIONS

0202

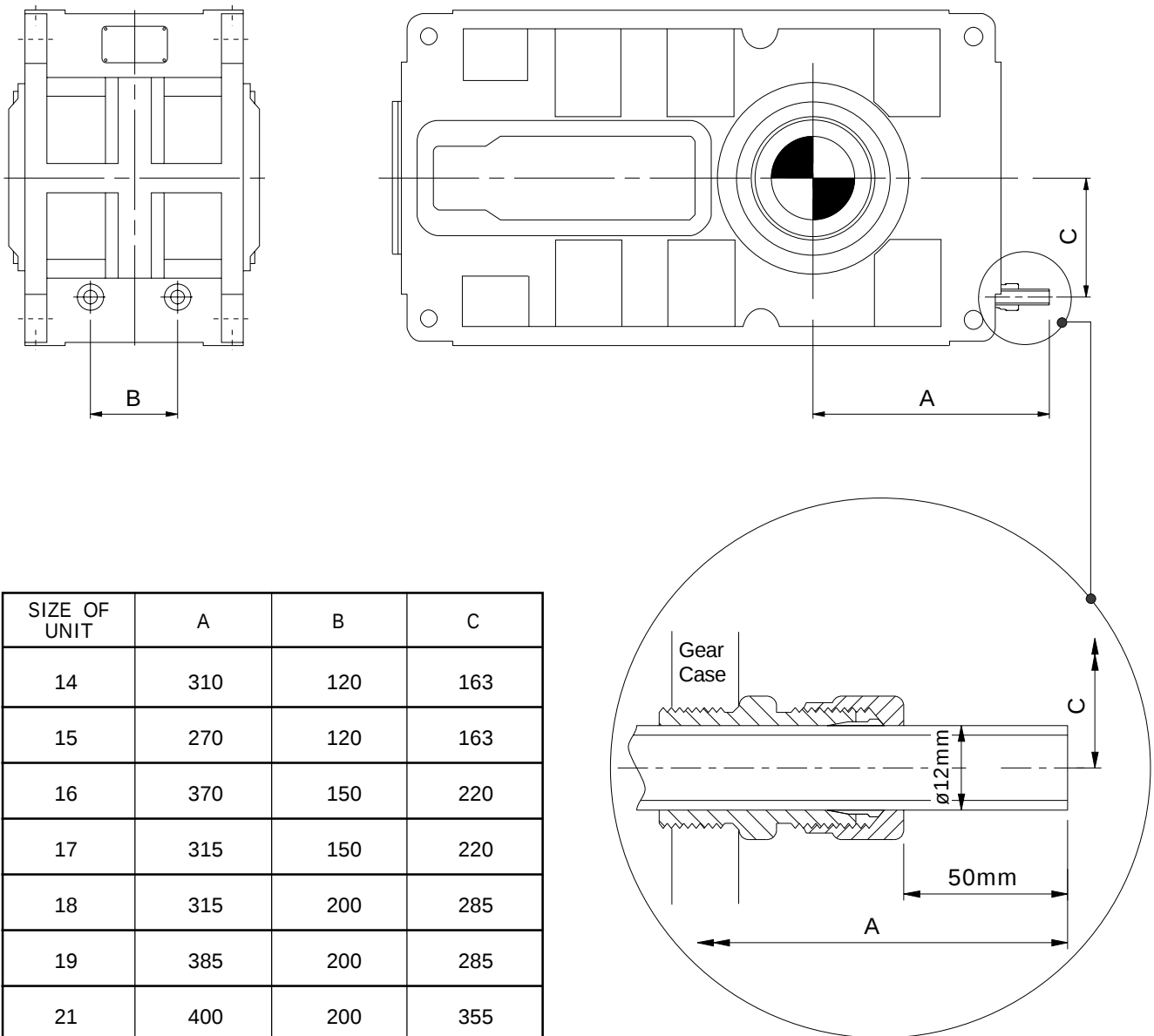
Cooling coils can be fitted to all unit types and handings.

Cooling coil connections for water inlet and outlet pipes are $\varnothing 12\text{mm}$ on all sizes.

The protruding cooling coil pipe can be connected to customers pipe work via a suitable straight coupling.

Water supply: Cooling coils are suitable for fresh, brackish or sea water with flow in either direction. Connections are therefore interchangeable.

For best performance, the water supply should be at 10°C / 12°C temperature and at a flow rate of 5 litres / minute.



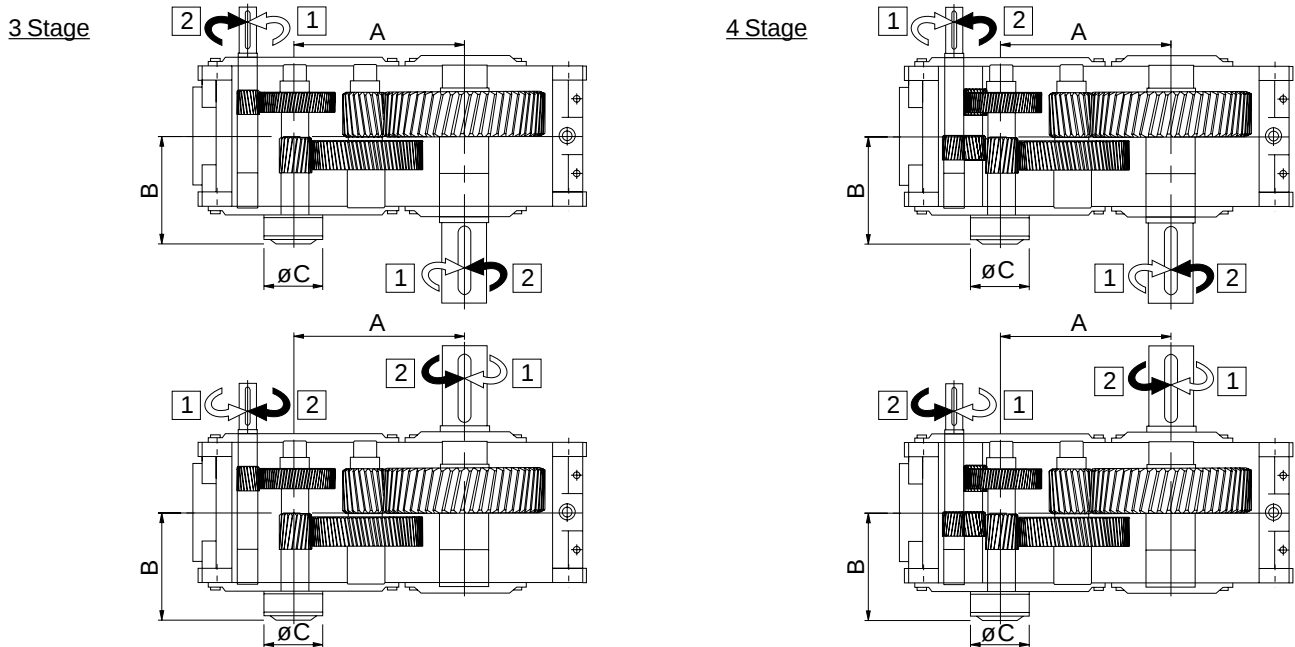
SERIES G

BACKSTOPS

0202

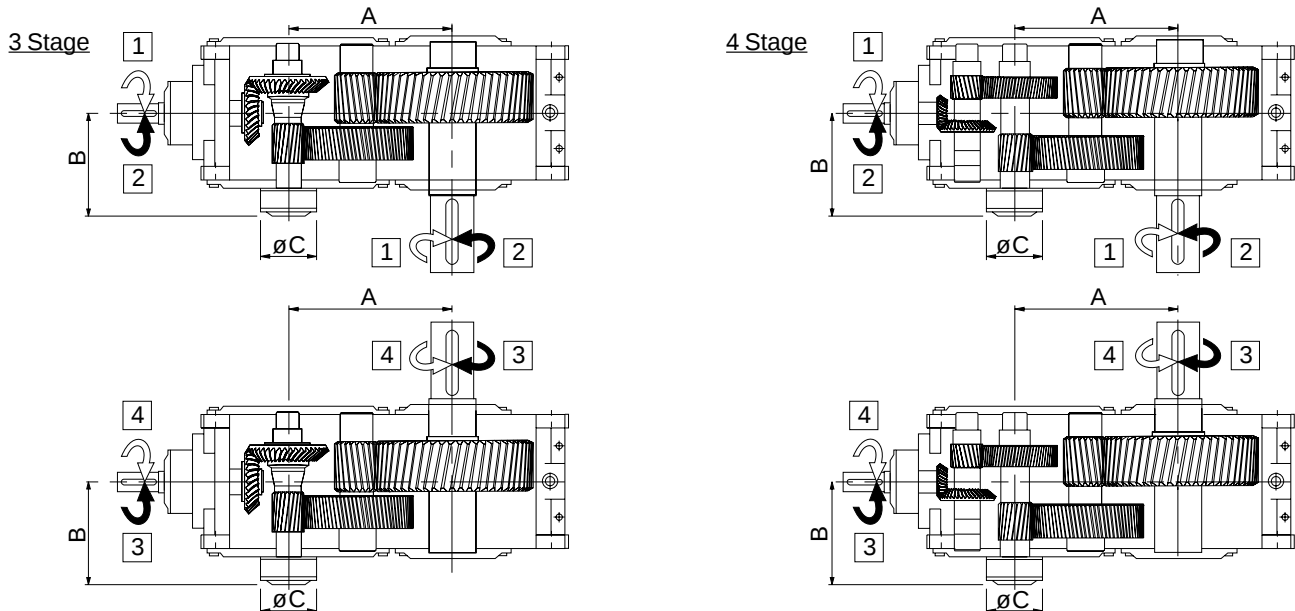
Externally mounted Backstops can be fitted to all Series G gear units, when required to operate in non-reversing drives. They are located on the helical pinion shaft and have adequate capacities to deal with full rated torques. All backstops are centrifugal lift off type. Changing the direction of locking rotation is a simple operation.

Parallel Shaft Units - Column 16 entry, shaft rotation shown



Right Angle Shaft Units - Column 16 entry, shaft rotation shown

For right angle units, if backstop position is required at opposite side of unit to outputshaft, column 16 entry must be 3 or 4 (see page 14)



Unit Size	A	B	$\varnothing C$	Backstop
G14	325	275	175	85-40
G15	365			
G16	430	340	210	120-50
G17	485			
G18	570	433	290	170-63
G19	635			
G21	765	500	310	200-63

Note: Torque limiting backstops with controllable tension release can be fitted to all Series G units (for details consult our Application Engineers).

SERIES G

TORQUE ARM

0202

Torque arms are available for all shaft mounted units with parallel or right angle shafts. They are supplied as optional extras and are secured to gear cases as shown below.

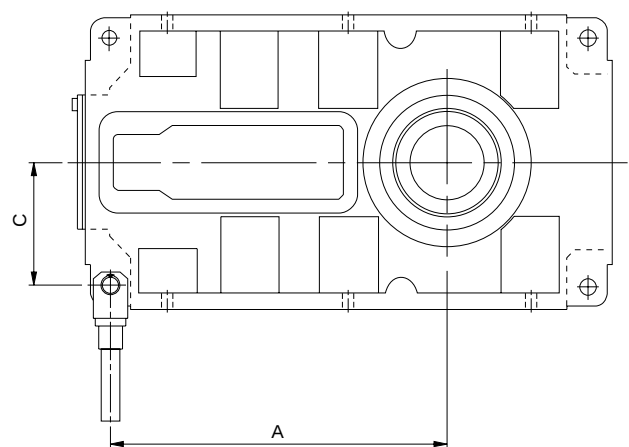
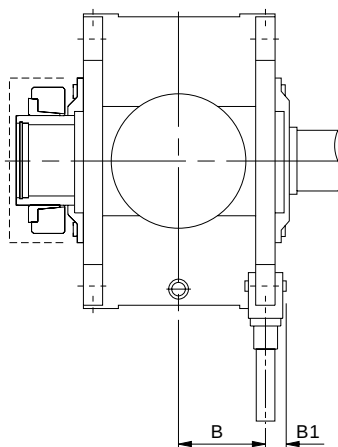
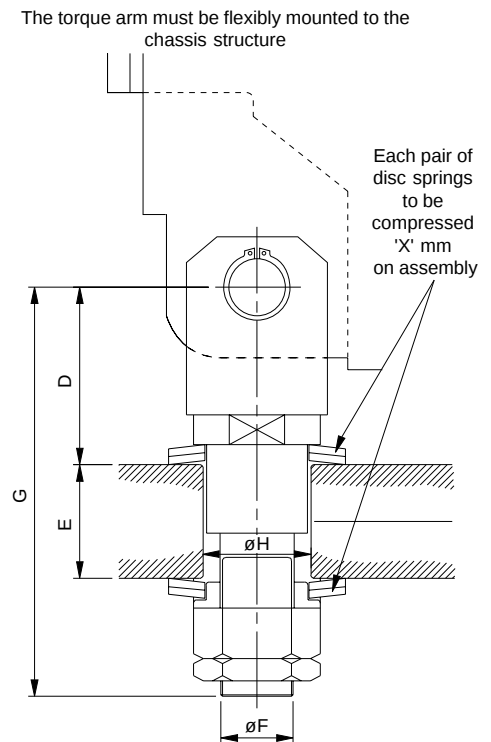
Torque arms must be secured to the chassis structure in a flexible mounting as indicated.

Shaft mounted units are designed to operate in the horizontal position. Reference must be made to our Application Engineers, with details, where units are required to operate in an inclined position.

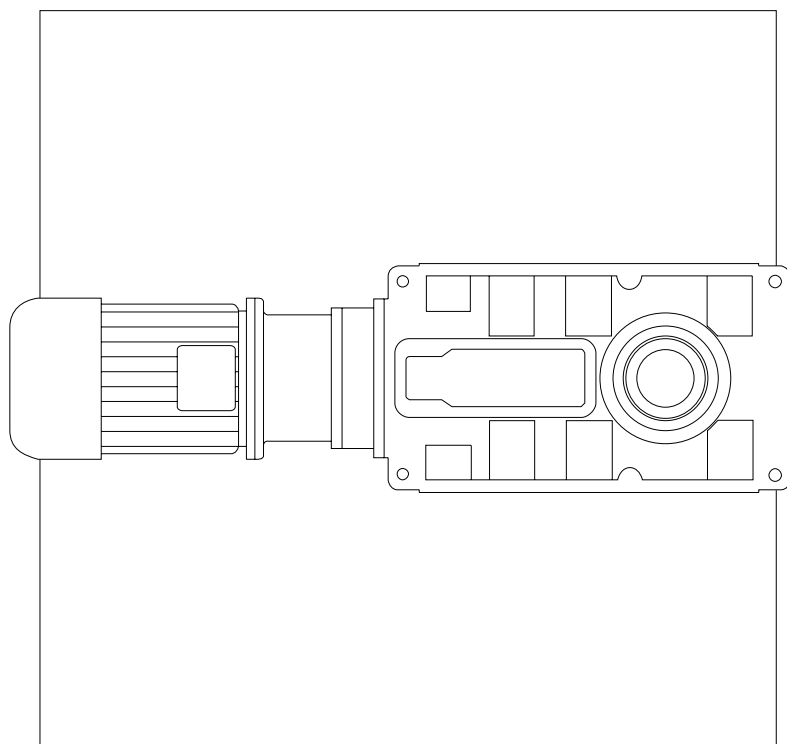
SHAFT MOUNTED UNITS FOR HIGH INERTIA DRIVE

When used on Traverse drives with high inertia driven loads, eg crane drives (slewing, long travel and cross travel) bogie drives and selected high inertia load roller table drives, it is recommended that shaft mounted units should be fitted with shock absorbing Torque Arms. Consult our Application Engineers with specific application details.

It is recommended that the torque arm is fitted on the side of the unit adjacent to the driven machine.



SIZE OF UNIT	A	B	B1	C	D	E		F	G	Disc Spring Ref	X	H
						MIN	MAX					
14	490	135	55	195	95	40	60	M30	207	80 x 41 x 4	1.1	41
15	530											
16	645	167	65	253	125	50	75	M36	262	100 x 51 x 6	1.1	52
17	700											
18	845	222	80	328	150	70	105	M48	336	125 x 71 x 6	1.7	72
19	910											
21	Contact our Application Engineers											



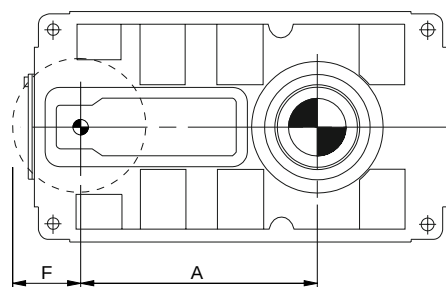
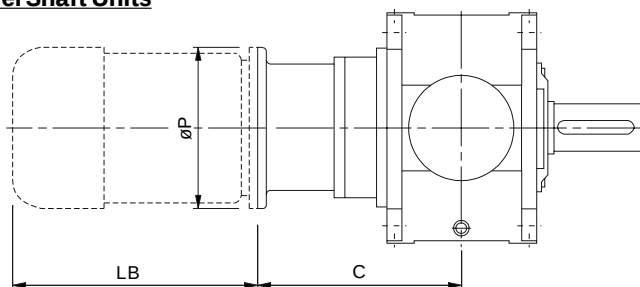
MOTORISED SERIES G

SERIES G

MOTORISED DIMENSIONS

9904

Parallel Shaft Units



Double Reduction

IEC Motors							
Unit Size	Motor Size	Column 13 Entry	A	C	F	LB (max)	ø P
G1420	200	D	325	428	229	651	400
	225	E	325	458	229	786	450
	250	F	325	458	275	839	550
	280	G	325	458	275	951	550
G1520	200	D	365	428	229	651	400
	225	E	365	458	229	786	450
	250	F	365	458	275	839	550
	280	G	365	458	275	951	550
G1620	250	F	430	513	298	839	550
	280	G	430	513	298	951	550
	315	H	430	543	330	1028	660
G1720	250	F	485	513	298	839	550
	280	G	485	513	298	951	550
	315	H	485	543	330	1028	660

NEMA Motors					
Motor Size	Column 13 Entry	C	F	LB (max)	ø P
324TC/326TC	R	445.0	229	657	339.7
364TC/365TC	S	460.9	229	785	339.7
404TC/405TC	T	495.8	229	839	352.4
324TC/326TC	R	445.0	229	657	339.7
364TC/365TC	S	460.9	229	785	339.7
404TC/405TC	T	495.8	229	839	352.4
364TC/365TC	S	515.9	383	785	339.7
404TC/405TC	T	550.8	383	839	352.4
444TC/445TC	U	582.6	383	951	352.4
364TC/365TC	S	515.9	383	785	339.7
404TC/405TC	T	550.8	383	839	352.4
444TC/445TC	U	582.6	383	951	352.4

Triple and Quadruple Reduction

IEC Motors							
Unit Size	Motor Size	Column 13 Entry	A	C	F	LB (max)	ø P
G1430 / G1440	132	A	435	358	170	420	300
	160	B	435	388	175	540	350
	180	C	435	388	175	598	350
	200	D	435	388	200	651	400
	225	E	435	418	225	786	450
	250	F	435	418	275	839	550
G1530 / G1540	132	A	475	358	170	420	300
	160	B	475	388	175	540	350
	180	C	475	388	175	598	350
	200	D	475	388	200	651	400
	225	E	475	418	225	786	450
	250	F	475	418	275	839	550
G1630 / G1640	132	A	570	423	170	420	300
	160	B	570	453	175	540	350
	180	C	570	453	175	598	350
	200	D	570	453	200	651	400
	225	E	570	483	225	786	450
	250	F	570	483	275	839	550
	280	G	570	483	275	951	550
	315	H	570	513	330	1028	660
G1730 / G1740	132	A	625	423	170	420	300
	160	B	625	453	175	540	350
	180	C	625	453	175	598	350
	200	D	625	453	200	651	400
	225	E	625	483	225	786	450
	250	F	625	483	275	839	550
	280	G	625	483	275	951	550
	315	H	625	513	330	1028	660
G1830 / G1840	180	C	755	553	198	598	350
	200	D	755	553	200	651	400
	225	E	755	583	225	786	450
	250	F	755	583	275	839	550
	280	G	755	583	275	951	550
	315	H	755	613	330	1028	660
G1930 / G1940	180	C	820	553	198	598	350
	200	D	820	553	200	651	400
	225	E	820	583	225	786	450
	250	F	820	583	275	839	550
	280	G	820	583	275	951	550
	315	H	820	613	330	1028	660

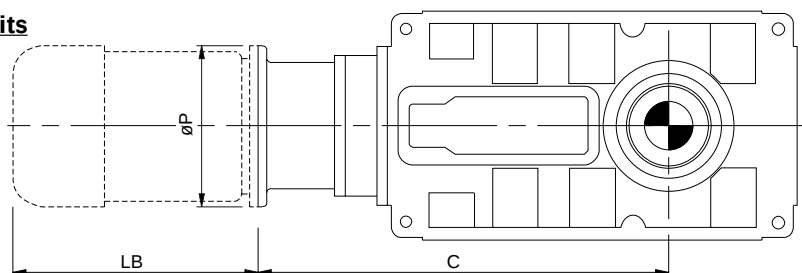
NEMA Motors					
Motor Size	Column 13 Entry	C	F	LB (max)	ø P
254TC/256TC	P	373.2	170	546	254.0
284TC/286TC	Q	389.1	170	605	285.8
324TC/326TC	R	405.0	170	657	339.7
364TC/365TC	S	420.9	170	785	339.7
404TC/405TC	T	455.8	177	839	352.4
254TC/256TC	P	373.2	170	546	254.0
284TC/286TC	Q	389.1	170	605	285.8
324TC/326TC	R	405.0	170	657	339.7
364TC/365TC	S	420.9	170	785	339.7
404TC/405TC	T	455.8	177	839	352.4
254TC/256TC	P	438.2	170	546	254.0
284TC/286TC	Q	454.1	170	605	285.8
324TC/326TC	R	470.0	170	657	339.7
364TC/365TC	S	485.9	170	785	339.7
404TC/405TC	T	520.8	177	839	352.4
444TC/445TC	U	552.6	213	951	425.5
254TC/256TC	P	438.2	170	546	254.0
284TC/286TC	Q	454.1	170	605	285.8
324TC/326TC	R	470.0	170	657	339.7
364TC/365TC	S	485.9	170	785	339.7
404TC/405TC	T	520.8	177	839	352.4
444TC/445TC	U	552.6	213	951	425.5
254TC/256TC	P	538.2	198	546	254.0
284TC/286TC	Q	554.1	198	605	285.8
324TC/326TC	R	570.0	198	657	339.7
364TC/365TC	S	585.9	198	785	339.7
404TC/405TC	T	620.8	198	839	352.4
444TC/445TC	U	652.6	213	951	425.5

SERIES G

MOTORISED DIMENSIONS

9901

Right Angle Shaft Units



Triple Reduction

IEC Motors					
Unit Size	Motor Size	Column 13 Entry	C	LB (max)	ø P
G1430	132	A	803	420	300
	160	B	833	540	350
	180	C	833	598	350
	200	D	833	651	400
	225	E	863	786	450
	250	F	863	839	550
	280	G	863	951	550
G1530	132	A	843	420	300
	160	B	873	540	350
	180	C	873	598	350
	200	D	873	651	400
	225	E	903	786	450
	250	F	903	839	550
	280	G	903	951	550
G1630	200	D	1053	651	400
	225	E	1083	786	450
	250	F	1083	839	550
	280	G	1083	951	550
	315	H	1113	1028	660
G1730	200	D	1108	651	400
	225	E	1138	786	450
	250	F	1138	839	550
	280	G	1138	951	550
	315	H	1168	1028	660
G1830	225	E	1363	786	450
	250	F	1363	839	550
	280	G	1363	951	550
	315	H	1393	1028	660
G1930	225	E	1428	786	450
	250	F	1428	839	550
	280	G	1428	951	550
	315	H	1458	1028	660

NEMA Motors				
Motor Size	Column 13 Entry	C	LB (max)	ø P
254TC/256TC	P	818.3	546	254.0
284TC/286TC	Q	834.1	605	285.8
324TC/326TC	R	850.0	657	339.7
364TC/365TC	S	865.9	785	339.7
404TC/405TC	T	900.8	839	352.4
254TC/256TC	P	858.3	546	254.0
284TC/286TC	Q	874.1	605	285.8
324TC/326TC	R	890.0	657	339.7
364TC/365TC	S	905.9	785	339.7
404TC/405TC	T	940.8	839	352.4
324TC/326TC	R	1070.0	657	339.7
364TC/365TC	S	1085.9	785	339.7
404TC/405TC	T	1120.8	839	352.4
444TC/445TC	U	1152.6	951	425.5
324TC/326TC	R	1125.9	657	339.7
364TC/365TC	S	1140.9	785	339.7
404TC/405TC	T	1175.8	839	352.4
444TC/445TC	U	1207.6	951	425.5
364TC/365TC	S	1365.9	785	339.7
404TC/405TC	T	1400.8	839	352.4
444TC/445TC	U	1432.6	951	425.5
364TC/365TC	S	1430.9	785	339.7
404TC/405TC	T	1465.8	839	352.4
444TC/445TC	U	1497.6	951	425.5

Quadruple Reduction

IEC Motors					
Unit Size	Motor Size	Column 13 Entry	C	LB (max)	ø P
G1640	132	A	1048	420	300
	160	B	1078	540	350
	180	C	1078	598	350
	200	D	1078	651	400
	225	E	1108	786	450
	250	F	1108	839	550
G1740	132	A	1113	420	300
	160	B	1133	540	350
	180	C	1133	598	350
	200	D	1133	651	400
	225	E	1163	786	450
	250	F	1163	839	550
G1840	160	B	1378	540	350
	180	C	1378	598	350
	200	D	1378	651	400
	225	E	1408	786	450
	250	F	1408	839	550
	280	G	1408	951	550
G1940	315	H	1438	1028	660
	160	B	1443	540	350
	180	C	1443	598	350
	200	D	1443	651	400
	225	E	1473	786	450
	250	F	1473	839	550
	280	G	1473	951	550
	315	H	1503	1028	660

NEMA Motors				
Motor Size	Column 13 Entry	C	LB (max)	ø P
254TC/256TC	P	1063.3	546	254.0
284TC/286TC	Q	1079.1	605	285.8
324TC/326TC	R	1095.0	657	339.7
364TC/365TC	S	1110.9	785	339.7
404TC/405TC	T	1145.8	839	352.4
254TC/256TC	P	1118.3	546	254.0
284TC/286TC	Q	1134.1	605	285.8
324TC/326TC	R	1150.0	657	339.7
364TC/365TC	S	1165.9	785	339.7
404TC/405TC	T	1200.8	839	352.4
254TC/256TC	P	1363.3	546	254.0
284TC/286TC	Q	1379.1	605	285.8
324TC/326TC	R	1396.0	657	339.7
364TC/365TC	S	1410.9	785	339.7
404TC/405TC	T	1445.8	839	352.4
444TC/445TC	U	1477.6	951	425.5
254TC/256TC	P	1428.8	546	254.0
284TC/286TC	Q	1444.1	605	285.8
324TC/326TC	R	1461.0	657	339.7
364TC/365TC	S	1475.9	785	339.7
404TC/405TC	T	1510.8	839	352.4
444TC/445TC	U	1542.6	951	425.5

SERIES G

SHIPPING SPECIFICATION

0202

UNIT MASS (KG)

Gear Unit	No of Reductions	Output Shaft	Unit Size						
			14	15	16	17	18	19	21
Parallel Shaft	2 Stage	Standard	360	415	790	905	1530	1875	3150
		Shaft Mount	340	385	755	855	1435	1755	2950
		Agitator	400	455	840	980	1630	1995	3350
	3 Stage	Standard	375	430	805	920	1550	1895	3200
		Shaft Mount	355	400	770	870	1455	1775	3000
		Agitator	415	470	855	995	1650	2015	3400
	4 Stage	Standard	385	440	820	935	1580	1925	3250
		Shaft Mount	365	405	785	885	1485	1805	3050
		Agitator	425	480	870	1010	1680	2045	3450
Right Angle Shaft	3 Stage	Standard	395	450	840	940	1640	1985	3350
		Shaft Mount	375	420	705	890	1545	1865	3150
		Agitator	435	490	890	1015	1740	2105	3550
	4 Stage	Standard	-	-	840	940	1620	1965	3300
		Shaft Mount	-	-	705	705	1525	1845	3100
		Agitator	-	-	890	890	1720	2085	3500

Mass excludes: lubricant, cooling fans or coil.

UNIT VOLUME (m³)

Gear Unit	No of Reductions	Output Shaft	Unit Size						
			14	15	16	17	18	19	21
Parallel Shaft	2 Stage	Standard	0.275	0.279	0.579	0.593	1.122	1.296	2.08
		Shaft Mount	0.202	0.202	0.418	0.418	0.811	0.895	1.76
		Agitator	0.309	0.316	0.636	0.649	1.233	1.421	2.350
	3 Stage	Standard	0.259	0.263	0.558	0.572	1.081	1.250	2.06
		Shaft Mount	0.185	0.185	0.397	0.397	0.769	0.849	1.72
		Agitator	0.293	0.301	0.616	0.629	1.193	1.377	2.32
	4 Stage	Standard	0.259	0.263	0.558	0.572	1.081	1.250	2.06
		Shaft Mount	0.185	0.185	0.397	0.397	0.769	0.849	1.72
		Agitator	0.293	0.301	0.616	0.629	1.193	1.377	2.32
Right Angle Shaft	3 Stage	Standard	0.262	0.266	0.570	0.586	1.116	1.280	2.12
		Shaft Mount	0.212	0.214	0.462	0.474	0.890	0.994	1.73
		Agitator	0.304	0.314	0.645	0.660	1.260	1.440	1.47
	4 Stage	Standard	-	-	0.581	0.598	1.148	1.314	2.15
		Shaft Mount	-	-	0.470	0.483	0.916	1.021	1.76
		Agitator	-	-	0.657	0.673	1.296	1.478	2.50

SERIES G

NOTES

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NOTES

IMPORTANT

Product Safety Information

General - The following information is important in ensuring safety. It **must** be brought to the attention of personnel involved in the selection of power transmission equipment, those responsible for the design of the machinery in which it is to be incorporated and those involved in its installation, use and maintenance.

Our equipment will operate safely provided it is selected, installed, used and maintained properly. As with any power transmission equipment **proper precautions must** be taken as indicated in the following paragraphs, to ensure safety.

Potential Hazards - these are **not** necessarily listed in any order of severity as the degree of danger varies in individual circumstances. It is important therefore that the list is studied in its entirety:-

- 1) Fire/Explosion
 - (a) Oil mists and vapour are generated within gear units. It is therefore dangerous to use naked lights in the proximity of gearbox openings, due to the risk of fire or explosion.
 - (b) In the event of fire or serious overheating (over 300 °C), certain materials (rubber, plastics, etc.) may decompose and produce fumes. Care should be taken to avoid exposure to the fumes, and the remains of burned or overheated plastic/rubber materials should be handled with rubber gloves.
- 2) Guards - Rotating shafts and couplings must be guarded to eliminate the possibility of physical contact or entanglement of clothing. It should be of rigid construction and firmly secured.
- 3) Noise - High speed gearboxes and gearbox driven machinery may produce noise levels which are damaging to the hearing with prolonged exposure. Ear defenders should be provided for personnel in these circumstances. Reference should be made to the Department of Employment Code of Practice for reducing exposure of employed persons to noise.
- 4) Lifting - Where provided (on larger units) only the lifting points or eyebolts must be used for lifting operations (see maintenance manual or general arrangement drawing for lifting point positions). Failure to use the lifting points provided may result in personal injury and/or damage to the product or surrounding equipment. Keep clear of raised equipment.
- 5) Lubricants and Lubrication
 - (a) Prolonged contact with lubricants can be detrimental to the skin. The manufacturer's instruction must be followed when handling lubricants.
 - (b) The lubrication status of the equipment must be checked before commissioning. Read and carry out all instructions on the lubricant plate and in the installation and maintenance literature. Heed all warning tags. Failure to do so could result in mechanical damage and in extreme cases risk of injury to personnel.
- 6) Electrical Equipment - Observe hazard warnings on electrical equipment and isolate power before working on the gearbox or associated equipment, in order to prevent the machinery being started.
- 7) Installation, Maintenance and Storage
 - (a) In the event that equipment is to be held in storage, for a period exceeding 6 months, prior to installation or commissioning, we must be consulted regarding special preservation requirements. Unless otherwise agreed, equipment must be stored in a building protected from extremes of temperature and humidity to prevent deterioration.

The rotating components (gears and shafts) must be turned a few revolutions once a month (to prevent bearings brinelling).
 - (b) External gearbox components may be supplied with preservative materials applied, in the form of a "waxed" tape overwrap or wax film preservative. Gloves should be worn when removing these materials. The former can be removed manually, the latter using white spirit as a solvent.

Preservatives applied to the internal parts of the gear units do not require removal prior to operation.
 - (c) Installation must be performed in accordance with the manufacturer's instructions and be undertaken by suitably qualified personnel.
 - (d) Before working on a gearbox or associated equipment, ensure that the load has been removed from the system to eliminate the possibility of any movement of the machinery and isolate power supply. Where necessary, provide mechanical means to ensure the machinery cannot move or rotate. Ensure removal of such devices before work is complete.
 - (e) Ensure the proper maintenance of gearboxes in operation. Use only the correct tools and our approved spare parts for repair and maintenance. Consult the Maintenance Manual before dismantling or performing maintenance work.
- 8) Hot Surfaces and Lubricants
 - (a) During operation, gear units may become sufficiently hot to cause skin burns. Care must be taken to avoid accidental contact.
 - (b) After extended running the lubricant in gear units and lubrication systems may reach temperatures sufficient to cause burns. Allow equipment to cool before servicing or performing adjustments.
- 9) Selection and Design
 - (a) Where gear units provide a backstop facility, ensure that back-up systems are provided if failure of the backstop device would endanger personnel or result in damage.
 - (b) The driving and driven equipment must be correctly selected to ensure that the complete machinery installation will perform satisfactorily, avoiding system critical speeds, system torsional vibration, etc.
 - (c) The equipment must not be operated in an environment or at speeds, powers, torques or with external loads beyond those for which it was designed.
 - (d) As improvements in design are being made continually the contents of this catalogue are not to be regarded as binding in detail, and drawings and capacities are subject to alterations without notice.

The above guidance is based on the current state of knowledge and our best assessment of the potential hazards in the operation of the gear units. Any further information or clarification required may be obtained by contacting our Application Engineers.

SERIES G

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AGRICULTURE

ENERGY

PULP & PAPER

AUTOMOTIVE

FOOD & BEVERAGE

QUARRYING

CEMENT

FORESTRY

RUBBER & PLASTICS

CHEMICAL

MARINE

TEXTILES

CONSTRUCTION

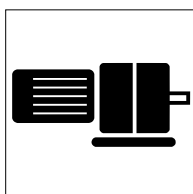
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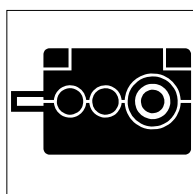
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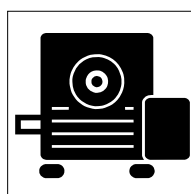
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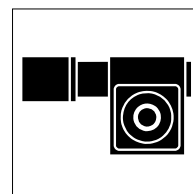
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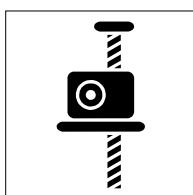
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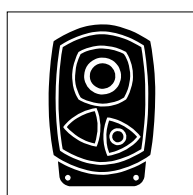
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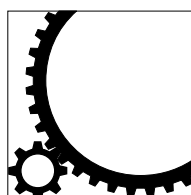
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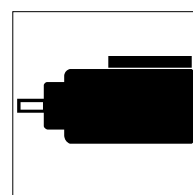
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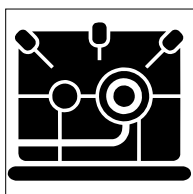
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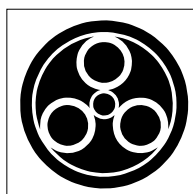
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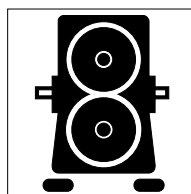
Vertical mill drives



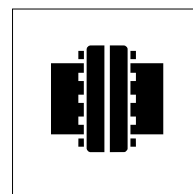
High speed



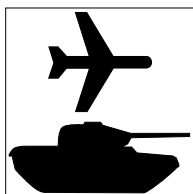
Planetary units



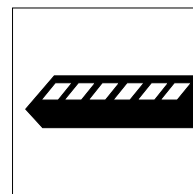
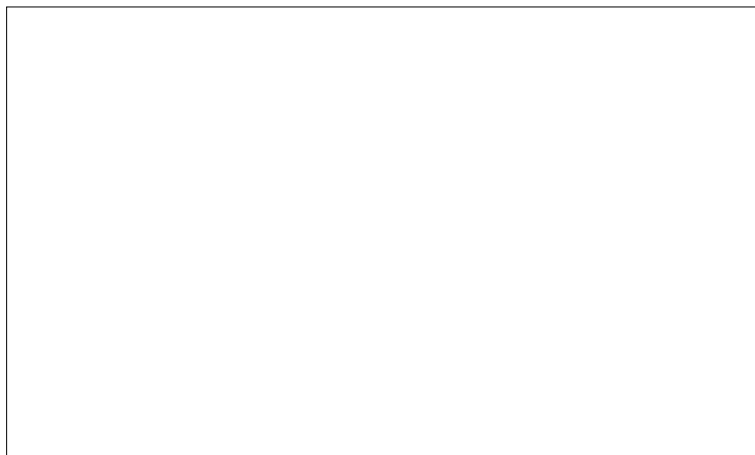
Specialist drives



Couplings



Defence Systems



Rail