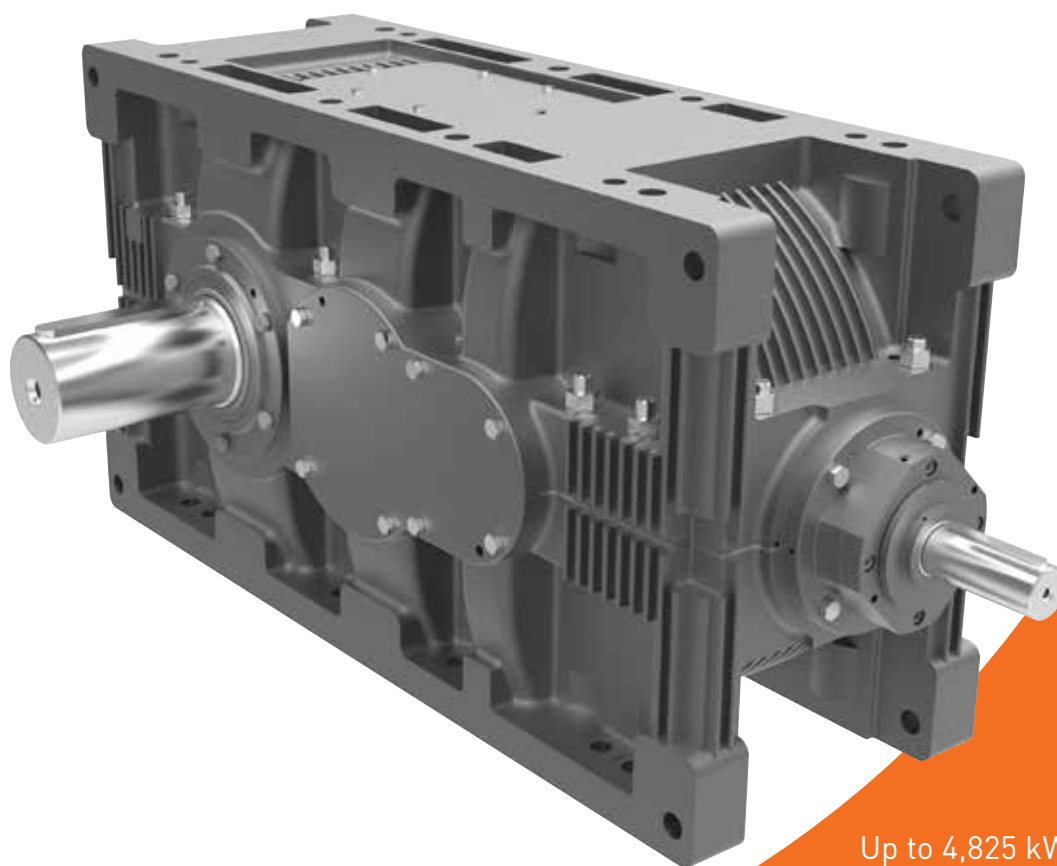


radicon   
with you at every turn

benzlers   
with you at every turn

Series E Industrial Gear Boxes

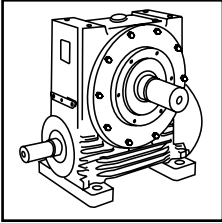


Technical  
Up to 4,825 kW / 132,000 Nm

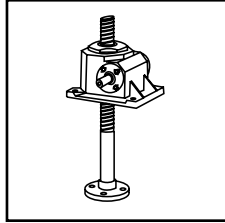
Series E  
CE2.00GBD0416

# PRODUCTS IN THE RANGE

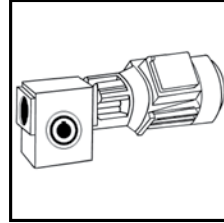
Serving an entire spectrum of mechanical drive applications from food, energy, mining and metal; to automotive, aerospace and marine propulsion, we are here to make a positive difference to the supply of drive solutions.



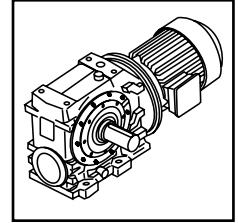
**Series A**  
Worm Gear units and geared motors in single & double reduction types



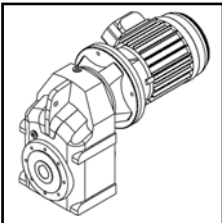
**Series BD**  
Screwjack worm gear unit



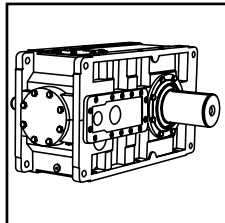
**Series BS**  
Worm gear unit



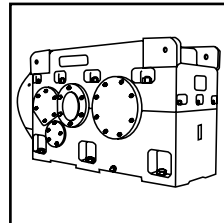
**Series C**  
Right angle drive helical worm geared motors & reducers



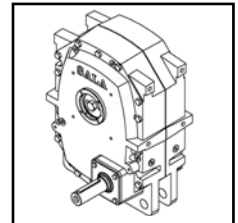
**Series F**  
Parallel shaft helical geared motors & reducers



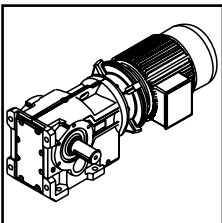
**Series G**  
Helical parallel shaft & bevel helical right angle drive gear units



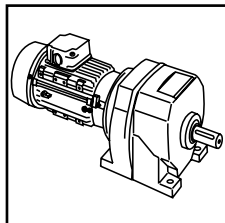
**Series H**  
Large helical parallel shaft & bevel helical right angle drive units



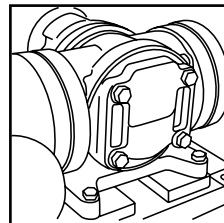
**Series J**  
Shaft mounted helical speed reducers



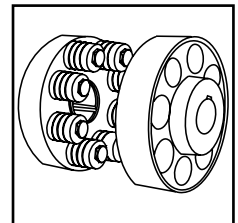
**Series K**  
Right angle helical bevel helical geared motors & reducers



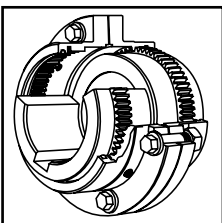
**Series M**  
In-line helical geared motors & reducers



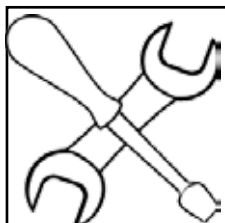
**Roloid Gear Pump**  
Lubrication and fluid transportation pump



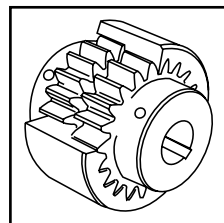
**Series X Cone Ring**  
Pin and bush elastomer coupling



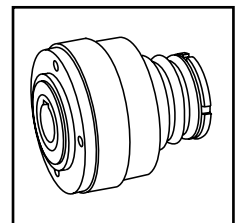
**Series X Gear**  
Torsionally rigid, high torque coupling



**Service & Repair**  
All brands and types



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



**Series X Torque Limiter**  
Overload protection device



We offer a wide range of repair services and many years experience of repairing demanding and highly critical transmissions in numerous industries.

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

## 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 after 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.

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## GENERAL DESCRIPTION

Series E Industrial Reducers are proven to be the optimum solution for drive requirements in the market. The Series E Industrial gear unit is designed to meet the requirements of the most demanding applications in the medium and heavy duty sectors of the power transmission market. The modern design and construction of the Series E offers many engineering and performance benefits including higher torque and thermal ratings, with a high degree of interchangeability of components. The gear housing has been designed to withstand the normal forces whilst reducing weight to the ideal level leading to the most optimal industrial gear unit solution available.

The series E has been designed using the latest software, with a tooth geometry which combines maximum efficiency with high load carrying capacity and minimal noise generation. Serviceability was at the forefront of our thoughts in the design guaranteeing durability, reliability and minimal downtime.

### Unit Sizes

11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

### Types

Parallel Shaft: Single, Double, Triple and Quadruple Reduction

Right Angle Shaft: Double, Triple and Quadruple Reduction

### Input Power

Up to 4,825Kw

### Output Torque

Up to 132,000Nm

### Gear Ratios

1.25/1 to 560/1 in multistage

Single Reduction Parallel Shaft S1/H1 i = 1.25 to 5	Double Reduction Right Angle Shaft K2/B2 i = 5 to 22.4
Double Reduction Parallel Shaft S2/H2 i = 5.6 to 22.4	Triple Reduction Right Angle Shaft K3/B3 i = 20 to 100
Triple Reduction Parallel Shaft S3/H3 i = 20 to 112	Quadruple Reduction Right Angle Shaft K4/B4 i = 80 to 560
Quadruple Reduction Parallel Shaft S4/H4 i = 90 to 560	

### Efficiencies:

99 % for single reduction helical gearboxes

98 % for double reduction helical gearboxes

97.5% for triple reduction helical gearboxes

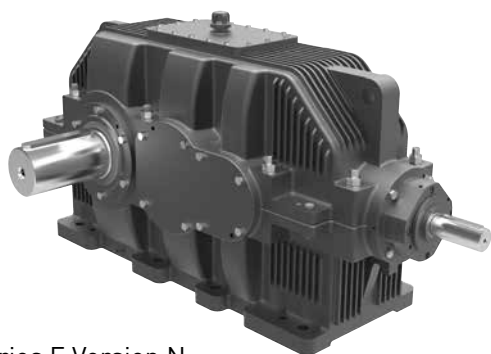
97% for quadruple reduction helical gearboxes

97.5% for double reduction bevel helical gearboxes

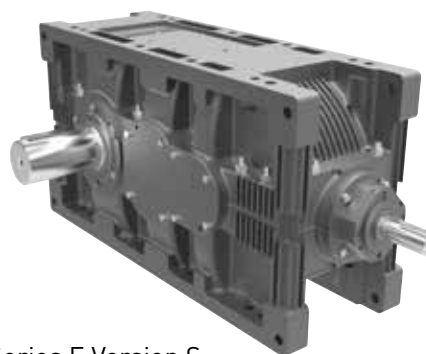
97% for triple reduction bevel helical gearboxes

96.5% for quadruple reduction bevel helical gearboxes

Available with dedicated foot mounted case Version N, which gives the optimum torque/kg, or with multimount case Version S giving flexibility on mounting options.



Series E Version N:  
Horizontal Mounting Applications



Series E Version S:  
Multimount Applications

## GENERAL DESCRIPTION

### Design Features

#### 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.

Shaft mounted units with keyed sleeves may also be supplied for fitting on to a keyed shaft.

#### 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 E 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 E 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

Gearcase housings are shot blasted to SA 2-1/2 (or better) prior to painting.

Standard Paint System - Short oil alkyd resin/pigment semi-gloss, Colour: - RAL 5009 (Blue).

Optional Paint System for Extreme Climatic and Environmental Conditions - Two pack epoxy acrylic semi-gloss finish, Colour: - RAL 5009 (Blue).

Both paint systems are resistant to dilute acids and alkalis, oils and solvents, sea water and temperatures up to 140 Deg 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.

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.

- Cooling water coil fitted in gear unit base.

- Fan and cooling coil.

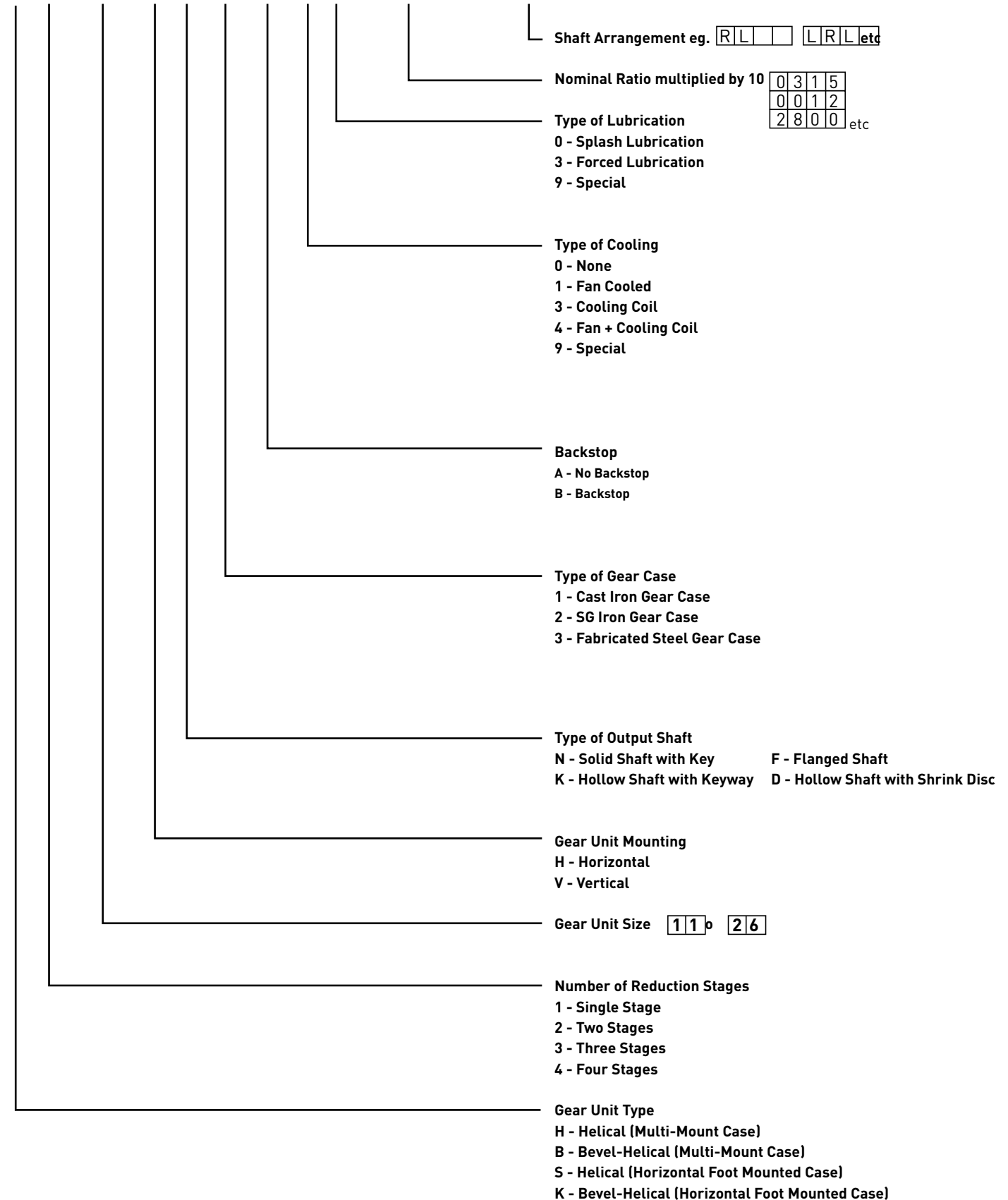
- Separate oil cooler incorporated in forced lubrication system.

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.

# SERIES E

## GENERAL DESCRIPTION

**H 3 20 H N 1 A 00 0315 R L**



## EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

Gear unit selection is made by comparing actual loading with the catalogue ratings.

Catalogue ratings are based on a standard set of loading conditions, whereas actual loading conditions will vary according to the type of application.

Service factors are used to calculate an equivalent load to compare with the catalogue ratings.

Both Mechanical and Thermal Capacities must be considered.

### Mechanical Ratings

Mechanical ratings measure the gear unit's capacity in terms of life and strength, assuming 10 hours per day continuous operation under uniform loading conditions.

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

The Mechanical Service Factor  $F_m$  (table 1) is used to modify the actual load according to the daily operating time, and the type of loading.

The required Mechanical Rating  $P$  (mech) = Absorbed Power  $\times F_m$

The load characteristics for a wide range of applications are listed in the Load Classification by Application (Table 3)

The load classification is used to determine the appropriate Service Factor  $F_m$  (table 1)

Gear units subjected to torque reversals or frequent stop/start overloads require the following check to be made:

$$\text{Gear Unit Nominal Power Rating (kW)} > \frac{T_m \times F_s \times n}{2 \times 9550}$$

$T_m$  = Motor starting torque (Nm) or rating of torque limiting device, fluid coupling etc...

$n$  = Input speed (rpm)

$F_s$  = Starting Frequency Factor

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 humid environments, the unit selection should be referred to our Application Engineers.

**Table 1. Mechanical Service Factor (  $F_m$  )**

Prime Mover	Operating Hours/day	Load Classification			
		Uniform	Moderate	Heavy	Extra Heavy
		U	M	H	X
"Electric Motor Steam Turbine Hydraulic Motor"	< 3	1.00	1.00	1.50	2.00
	3 to 10	1.00	1.25	1.75	2.25
	> 10	1.25	1.50	2.00	2.50
"4 to 6 Cylinder Internal Combustion Engine"	< 3	1.00	1.25	1.75	2.25
	3 to 10	1.25	1.50	2.00	2.50
	> 10	1.50	1.75	2.25	2.75
"1 to 3 Cylinder Internal Combustion Engine"	< 3	1.25	1.50	2.00	2.50
	3 to 10	1.50	1.75	2.25	2.75
	> 10	1.75	2.00	2.50	3.00

$F_m$	Starts / Stops per hour						
	1	2 - 20	21 - 40	41 - 80	81 - 160	161 - 320	> 320
1.00	1.00	1.20	1.30	1.50	1.60	2.00	2.50
1.25	1.00	1.10	1.20	1.35	1.45	1.80	2.20
1.50	1.00	1.17	1.15	1.20	1.30	1.65	2.00
1.75	1.00	1.15	1.16	1.18	1.20	1.50	1.90
2.00	1.00	1.06	1.08	1.10	1.15	1.40	1.75
2.25	1.00	1.03	1.06	1.07	1.10	1.30	1.60
2.50	1.00	1.00	1.03	1.05	1.07	1.25	1.50
2.75	1.00	1.00	1.00	1.00	1.05	1.20	1.45
3.00	1.00	1.00	1.00	1.00	1.00	1.15	1.40

For Reversing Duty  $F_s$  = 1.4 minimum



## EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

**Table 3. Load Classification by Application**

**U** Uniform Load   **M** Moderate Shock Load   **H** Heavy Shock Load   **X** Extra Heavy Shock Load   † Consult Our Engineers

Driven Machines		Driven Machines		Driven Machines	
<b>Excavators and stackers</b>		Impeller blowers	U	--- wet	H
Bucket chain excavators	H	Turbo blowers	U	--- suction	H
Travelling gear		Centrifugal blowers	U	Suction rollers	H
--- caterpillar track	H	<b>Generators</b>		Drying cylinders	H
--- rail	M	Generators, uniform load	U	<b>Pumps</b>	
Bucket-wheel stackers	M	Welding generators	†	Proportioning pumps	M
Bucket Wheels		<b>Rubber and plastic</b>		Piston pumps	
--- clearing	H	Extruders		- U < 1:100	H
--- coal	H	--- rubber	H	- U < 1:100 - 1:200	M
--- lime	H	--- plastics	M	Centrifugal pumps	
Cutter heads	H	Calenders	M	- light liquids	U
Slewing Machines	M	Kneading machines, rubber	H	- viscous liquids	M
Suction pumps	M	Mixers	M	Compression pumps	H
Cable drums	M	Mills, rubber	M	Plunger pumps	H
Winches	M	Rolling mills, rubber	H	Sand pumps	M
<b>Mining, rock, earth</b>		<b>Wood working machinery</b>		<b>Machines for the Textile Industry</b>	
Concrete mixers	M	Devotivating drums	H	Bobbin winding machines	M
Crushers	H	Planing machine	M	Printing machines	M
Briquetting presses	X	Saw frames	M	Dyeing machines	M
Rotary kilns	H	<b>Irons and steel industry</b>		Tan-liquor machines	M
Pneumatic sifters	M	Foundary crane (hoisting gear)	H	Calenders	M
Clay mixers	M	Converters	†	Willowing machines	M
<b>Chemical Industry</b>		Slag cars	U	Drying machines	M
Mixers	M	Sintering belts	U	Looms	M
Agitators		Crusher	H	<b>Compressors</b>	
--- pure liquids	U	Torpedo mixers	†	Rotary piston compressors	
--- liquids and solids	M	Car tipper	H	- U < 1:100	H
---liquids with various densities	M	<b>Cranes</b>		- U < 1:100 - 1:200	M
Rotary Dryer	M	Luffing gear	U	Centrifugal compressors	M
Centrifuges		Travelling gear	M	Turbo compressors	M
--- light	U	Hoisting gear	†	<b>Rolling Mills</b>	
--- heavy	M	Slewing gear	†	Plate tilters	M
<b>Petroleum Industry</b>		Winches	U	Bloom pushers	X
Drilling pumps	†	<b>Metal Working</b>		Bloom conveyor plant	H
Rotary kilns	M	Folding presses	H	Wire pulls	M
Filter Presses	M	Plate bending machines	M	Revolving turrets	M
Pipeline pumps	M	Plate straightening presses	H	(contin, casting)	
Scavenging pumps	M	Eccentric presses	H	De-scaling crushers	H
<b>Conveyor plants</b>		Hammers	H	Reels	
Uniform load	U	Planing machine	H	- strip	M
Bucket conveyors	U	Crank presses	H	- wire	M
Roasting furnace conveyors	U	Shearing machine	M	Walking beam conveyors	M
Assembly line belts	U	Forging presses	H	Chain transporter	M
Band conveyors	U	Punching machine	H	Cooling troughs	M
Overhead Conveyors	U	<b>Mills</b>		Traverse tractors	M
Chain Conveyors	U	Hammer mills	X	Pipe welding machine	H
Apron Conveyors	U	Edge mills	X	Pipe drawing machine	H
Worm conveyors	U	Ball mills	X	Roller straightening machine	M
Meadium and heavy load		Pendulum mills	X	Roller gear beds	
Shaft - sinking machines	H	Impact mills	X	--- light	M
Bucket conveyors	M	Tube mills	X	--- heavy	H
Bucket belts	M	Beating mills	X	Shears	
Assembly line conveyors	M	Rod mills	X	--- plate	H
Conveyors winders	M	Roller mills	X	--- wire	M
Conveyprs	H	<b>Foodstuffs machines</b>		--- billet	H
Belt Conveyors	M	Filling machines	U	--- cropping	M
Chain Conveyors	M	Kneading machines	M	--- plate trimming	M
Goods lifts	M	Packing machines	U	Winding turret	M
Passenger lifts	†	Weighing machines	M	Winding tractor	M
Apron conveyors	M	Sugarcane crushers	M	Continuous casting plants	H
Shaker conveyors	M	Sugarcane mills	H	Shifting device	H
Worm conveyors	M	Sugarcane cutters	M	Roller adjusting device	M
Inclined lifts	H	Sugar-beet cutters	M	<b>Water recycling machine</b>	
<b>Blowers, fans, ventilators</b>		<b>Paper machines</b>		Thickeners	M
Axial blowers	M	Couchers	H	Gyroscopic ventilators	M
Rotary piston blowers	M	Glazing cylinders	H	Mixers	M
Large ventilators (mining)	M	Calenders	M	Water screws	M
Cooling tower fans	†	Mixers	M	Vacuum filter presses	M
Radial blowers	M	Presses		Rate/ Screen drives	U
Induced draft fans	M	--- glue	H		

## EXPLANATION AND USE OF RATINGS AND ASSOCIATED RATING FACTORS

### Thermal Capacity Ratings

The thermal capacities are a measure of the gear units capacity to dissipate heat, if the thermal capacity is exceeded the lubricant may overheat and breakdown causing premature gear unit failure.

Thermal capacities are given on the gear unit ratings pages, cooling systems may be utilised as follows:

- Unit with no additional cooling
- Unit with fan cooling
- Unit with water cooling coil
- Unit with fan and water cooling coil

The catalogue Thermal Capacities are based on the unit operating continuously in an environment ambient of 20°C. The actual thermal capacity is affected by ambient temperature, duration of running per hour, the operating environment and altitude. To account for these varying conditions the service factors given in tables 4, 5 and 6 should be applied.

Check: Thermal Capacity Rating  $P1 \geq P_{therm}$

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

- $P_{therm}$  = The required thermal rating (kW)
- $P1$  = Thermal capacity rating (kW)
- $F_t$  = Service factor for ambient temperature (table 4)
- $F_h$  = Service factor for operating altitude (table 5)
- $F_v$  = Service factor for operating environment (table 6)

When checking thermal capacities, use the actual load requirement and not the rating of the prime mover.

**Table 4. Ambient Temperature Factor ( Ft )**

Cooling Type	Ambient	Duration of Operation / Hour				
		100%	80%	60%	40%	20%
No Ad- ditional Cooling	-20°C	1.49	1.79	2.09	2.39	2.68
	-10°C	1.37	1.64	1.92	2.19	2.46
	0°C	1.25	1.49	1.74	1.99	2.24
	10°C	1.12	1.34	1.57	1.79	2.02
	20°C	1.00	1.20	1.40	1.60	1.80
	30°C	0.88	1.06	1.23	1.41	1.58
	40°C	0.75	0.90	1.05	1.20	1.35
	50°C	0.63	0.76	0.88	1.01	1.13
Fan Cooling	-20°C	1.46	1.75	2.04	2.34	2.63
	-10°C	1.35	1.62	1.89	2.16	2.43
	0°C	1.24	1.49	1.74	1.98	2.23
	10°C	1.15	1.38	1.61	1.84	2.07
	20°C	1.00	1.20	1.40	1.60	1.80
	30°C	0.90	1.08	1.26	1.44	1.62
	40°C	0.80	0.96	1.12	1.28	1.44
Cooling Coil	-20°C	1.15	1.38	1.61	1.84	2.07
	-10°C	1.15	1.38	1.61	1.84	2.07
	0°C	1.15	1.38	1.61	1.84	2.07
	10°C	1.10	1.32	1.54	1.76	1.98
	20°C	1.00	1.20	1.40	1.60	1.80
	30°C	0.90	1.08	1.26	1.44	1.62
	40°C	0.85	1.02	1.19	1.36	1.53
	50°C	0.80	0.96	1.12	1.28	1.44

**Table 5. Altitude Adjustment Factor (Fh)**

Altitude (m)	Factor Fh
Sea Level	1.00
500	0.97
1000	0.93
1500	0.90
2000	0.87
3000	0.81

**Table 6. Air Velocity Correction Factor (Fv)**

Operating Environment	Without Fan	Fan Cooled
Small Confined Space	0.86	1.00
Large Indoor Space	1.00	1.00
Sheltered Outdoor Space	1.30	1.00
Open Outdoor Space	1.50	1.00

## SELECTION PROCEDURE

### EXAMPLE

Absorbed Power of Driven machine	=	70 kW
Output Speed	=	57 rpm
Application	=	Uniformly Loaded Belt Conveyor
Duration of Service	=	24 hours/day
Input Speed	=	1450 rpm (electric motor)
Unit type	=	Right Angle Shaft
Running Time/hour	=	100%
Operating Altitude	=	Sea level
Ambient Temperature	=	30°C
Operating Environment	=	Large Indoor Space

### 1. DETERMINE REQUIRED RATIO

$$\frac{\text{Input speed}}{\text{Output speed}} = \frac{1450 \text{ rpm}}{57 \text{ rpm}} = 25.43$$

The nearest nominal transmission ratio (in) = 25

### 2. DETERMINE THE MECHANICAL SERVICE FACTOR (Fm)

Refer to Load Classification by Application (table 3)  
Uniformly Loaded Belt Conveyor Load Classification = U

Refer to Mechanical Service Factor (Fm) (table 1)  
For Electric Motor driven, Uniform Loading, Operating over 10 hours/day

Prime Mover	Operating Hours/day	Load Classification			
		Uni-form U	Moderate M	Heavy H	Extra Heavy X
Electric Motor	< 3	1.00	1.00	1.50	2.00
Steam Turbine	3 - 10	1.00	1.25	1.75	2.25

The Mechanical Service Factor Fm = 1.25

### 3. DETERMINE THE STARTING FREQUENCY FACTOR (Fs)

Refer to Starting Frequency Factor (Fs) (table 2)

Fm	Starts / Stops per hour						
	1	2 - 20	21 - 40	41 - 80	81 - 160	161 - 320	> 320
1.0	1.00	1.20	1.30	1.50	1.60	2.00	2.50
1.25	1.00	1.10	1.20	1.35	1.45	1.80	2.20
1.5	1.00	1.17	1.15	1.20	1.30	1.65	2.00

For Fm = 1.25 with < 10 starts/ day, The Starting Frequency Factor Fs = 1.00

### 4. DETERMINE REQUIRED MECHANICAL CAPACITY (kW)

Required Mechanical Rating (P mech) = Absorbed Power (kW) x Factor Fm x Factor Fs

### 5. DETERMINE THE SIZE OF GEARBOX

Check: Nominal Power Rating  $\geq$  P mech

Refer to: Nominal Power Ratings - Unit type K3 (Bevel Helical-Triple Stage)

i <sub>n</sub>	n <sub>1</sub>	N <sub>2</sub>	Gear Unit Size					
			18	19	20	21	22	23
25	1500	60	55	78	104	144	200*	259*
	1000	40	38	53	69	100	138	173
	750	30	29	40	52	75	106	130

P mech = 87.5 kW  
size K3-20 unit has a power rating > P mech (104 kW)

Go to point 6

## SELECTION PROCEDURE

### 6. DETERMINE THE ACTUAL RATIO OF THE GEARBOX

Refer to the Actual Ratio table:

Type	i <sub>n</sub>	Gear Unit Size						
		18	19	20	21	22	23	24
K3	25	24.07	25.07	26.31	23.8	24.76	26.13	24.58
	28	27.22	27.86	29.47	27.22	27.86	29.11	27.53

$$n_1 = 1450 \quad n_2 = 1450 / 26.31 = 55.1 \text{ rpm}$$

### 7. DETERMINE THE THERMAL RATING

Refer to the Thermal Capacity Ratings

i <sub>n</sub>	n <sub>1</sub>	Gear Unit Size						
		18	19	20	21	22	23	24
Thermal Capacity P1 (kW) for gear unit without cooling								
20 - 35	1500	64	81	106	128	166	195	254
	1000	61	75	95	125	150	166	239
	750	56	69	87	119	148	158	229

$$\text{Thermal Capacity (P1)} = 106 \text{ kW}$$

### 8. DETERMINE THE AMBIENT TEMPERATURE FACTOR (Ft)

Refer to Ambient Temperature Factor (Ft) (table 4)

Cooling Type	Ambient	Duration of Operation / Hour		
		100%	80%	60%
No Additional Cooling	-20°C	1.49	1.79	2.09
	-10°C	1.37	1.64	1.92
	0°C	1.25	1.49	1.74
	10°C	1.12	1.34	1.57
	20°C	1.00	1.20	1.40
	30°C	0.88	1.06	1.23
	50°C	0.63	0.76	0.88

$$\text{Ambient Temperature Factor (Ft)} = 0.88$$

### 9. DETERMINE THE ALTITUDE ADJUSTMENT FACTOR (Fh)

Refer to Altitude Adjustment Factor (Fh) (table 5)

Altitude (m)	Factor Fh
Sea Level	1.00
500	0.97
1000	0.93
1500	0.90
2000	0.87
3000	0.81

$$\text{Altitude Adjustment Factor (Fh)} = 1.00$$

### 10. DETERMINE THE AIR VELOCITY CORRECTION FACTOR (Fv)

Refer to Air Velocity Correction Factor (Fv) (table 6)

Operating Environment	Without Fan	Fan Cooled
Small Confined Space	0.86	1.00
Large Indoor Space	1.00	1.00
Sheltered Outdoor Space	1.30	1.00
Open Outdoor Space	1.50	1.00

$$\text{Air Velocity Correction Factor (Fv)} = 1.00$$

### 11. CALCULATE THE REQUIRED THERMAL CAPACITY (P<sub>therm</sub>)

Refer to Air Velocity Correction Factor (Fv) (table 6)

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

$$P_{\text{therm}} = \frac{70 \text{ kW}}{0.88 \times 1.00 \times 1.00}$$

$$P_{\text{therm}} = 79.5 \text{ kW}$$

### 12. CHECK THE UNIT THERMAL CAPACITY

Check: Thermal Capacity P1 ≥ P<sub>therm</sub>

$$P_1 = 106 \text{ kW}$$

$$P_{\text{therm}} = 79.5 \text{ kW}$$

**Note!** It advisable that all selections are verified by our application engineers  
If any of the following occur then our application engineers must be consulted:

- The unit shafts are subjected to external overhung loads
- The ambient temperature exceeds 50°C
- If the inertia of the driven machine (referred to the motor shaft) exceeds the inertia of the gear unit and motor

## NOMINAL POWER RATING (kW) - HELICAL - SINGLE STAGE

## TYPE H1/S1

i <sub>n</sub>	n1	n2	Gear unit Size											
			11	13	15	17	18	20	21	22	23	24	25	26
1.25	1500	1200	84	171	319	579	723	1376*	2015*	2573*				
	1000	800	56	114	213	386	482	917	1343	1716				
	750	600	42	86	160	290	361	688	1007	1287				
1.4	1500	1071	75	153	285	517	645	1228*	1799*	2298*				
	1000	714	50	102	190	345	430	819	1199	1532				
	750	535	37	76	142	259	323	614	899	1149				
1.6	1500	937	63	121	213	381	488	925	1375*	1875*	2563*			
	1000	625	45	89	163	288	363	688	1000	1375	1813	2625	3488*	
	750	468	35	70	131	238	300	569	825	1125	1475	1950	2850	
1.8	1500	833	56	114	200	363	444	863	1250	1750*	2500*			
	1000	555	40	83	150	275	331	650	938	938	1750	2250	3275*	4825*
	750	416	31	65	123	225	275	531	763	763	1400	1813	2675	3938
2	1500	750	48	99	188	338	425	788	1188	1625*	2250*			
	1000	500	34	71	138	250	313	594	875	1175	1625	2100	3125	4538*
	750	375	26	55	111	206	263	488	725	963	1275	1713	2488	3713
2.24	1500	669	46	85	169	313	388	750	1113	1500*	2063*			
	1000	446	33	60	125	238	294	563	813	1125	1500	2000	2875	4200*
	750	334	25	46	103	194	238	463	663	925	1213	1575	2275	3438
2.5	1500	600	38	71	156	288	363	688	1025	1375	1875*	2563*		
	1000	400	26	51	119	213	275	513	775	1025	1400	1813	2625	3850*
	750	300	21	40	96	175	225	419	625	838	1125	1475	2150	3150
2.8	1500	535	34	60	144	263	331	619	938	1250	1688	2313*		
	1000	357	24	43	100	200	250	469	700	938	1250	1638	2388	3613
	750	267	19	34	78	163	206	381	575	763	1025	1338	1950	2950
3.15	1500	476	29	59	114	238	300	575	850	1150	1563	2063	2900*	4375*
	1000	317	20	41	78	175	225	438	638	863	1150	1500	2188	3300
	750	238	16	33	59	138	188	356	513	713	938	1200	1788	2688
3.55	1500	432	25	54	115	231	300	575	850	1150	1550	1888	2750	4038*
	1000	281	18	39	79	163	225	438	613	788	1125	1425	2075	3038
	750	211	14	30	59	125	188	344	475	688	888	1163	1688	2488
4	1500	375	21	44	94	200	256	575	800	1063	1538	1688	2488	3663
	1000	250	14	31	66	131	175	438	569	750	1100	1275	1875	2750
	750	187	11	24	50	101	138	331	444	613	838	1038	1525	2329
4.5	1500	333	18	39	68	171	244	469	675	975	1388	1550	2213	3200
	1000	222	12	28	49	115	175	319	475	710	983	1175	1538	2238
	750	166	9.0	21	38	87	131	244	369	534	740	963	1188	1750
5	1500	300.0	15	34	63	146	175	451	594	838	1164	1388	2075	3088
	1000	200.0	10	24	45	98	123	304	425	594	780	1050	1563	2188
	750	150.0	7.9	19	35	74	96	229	325	450	587	863	1275	1688

\*Requires forced feed lubrication.

### Thermal Capacity (kW)

Nominal Transmission Ratio i <sub>n</sub>	n1	Gear unit Size												
		11	13	15	17	18	20	21	22	23	24	25	26	
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>														
1.25 to 2.8	1500	29	46	74	115	144	219	281	350	444				
	1000	26	43	68	109	140	209	273	344	438	550	675	860	
	750	25	40	64	101	129	200	264	338	431	538	663	810	
3.15 to 5	1500	23	39	64	103	128	200	275	338	431	550	700	863	
	1000	20	36	56	99	118	189	263	325	419	531	669	813	
	750	18	28	50	98	108	175	250	300	400	519	656	800	
<b>Thermal Capacity P2 (kw) for gear unit with fan cooling</b>														
1.25 to 2.8	1500	53	81	128	198	250	388	500	625	800				
	1000	44	69	106	165	225	350	406	528	700	863	1075	1340	
	750	38	63	94	150	206	325	388	488	656	788	1013	1280	
3.15 to 5	1500	48	75	115	190	238	375	473	594	769	981	1225	1556	
	1000	35	54	94	153	188	300	400	519	656	856	1044	1313	
	750	30	46	81	138	169	300	356	450	594	756	956	1250	
<b>Thermal Capacity P3 (kw) for gear unit with cooling coil</b>														
1.25 to 5	1500	126	180	265	361	419	588	694	813	956	1155			
	1000	120	176	255	356	415	571	679	804	950	1138	1338	1420	
	750	119	175	245	339	410	563	670	800	938	1113	1325	1390	
<b>Thermal Capacity P4 (kw) for gear unit with fan and cooling coil</b>														
1.25 to 5	1500	145	215	326	472	569	836	1033	1251	1540	1810			
	1000	133	201	300	441	546	791	950	1173	1461	1785	2161	2450	
	750	127	194	282	413	522	761	925	1138	1418	1706	2100	2325	

## NOMINAL POWER RATING (kW) - HELICAL - DOUBLE STAGE

## TYPE H2/S2

i <sub>N</sub>	n1	n2	Gear unit Size												
			14	15	16	17	18	19	20	21	22	23	24	25	26
5.6	1500	267	54	77	112	136	226	318	461	617	829	982*	1547*	2319*	3230*
	1000	178	36	52	75	91	151	212	308	411	553	748	1112	1546	2153
	750	133	27	39	56	68	113	159	231	308	415	603	834	1159	1615
6.3	1500	238	45	65	85	123	189	256	371	481	663	898*	1378*	1813*	2525*
	1000	158	30	44	57	82	130	181	280	364	500	681	1000	1375	1973
	750	119	23	31	43	62	93	138	214	288	388	553	750	1125	1484
7.1	1500	211	44	62	76	109	182	244	364	475	613	841	1287*	1688*	2470*
	1000	140	29	42	51	72	121	169	246	332	456	624	900	1250	1769
	750	105	22	30	38	54	89	125	185	263	344	469	688	988	1330
8	1500	187	38	57	70	96	163	234	332	438	585	766	1150	1625*	2275*
	1000	125	26	39	46	64	111	156	223	319	419	544	850	1188	1607
	750	93	19	28	35	48	85	120	168	238	313	408	650	888	1208
9	1500	166	35	52	62	85	163	231	293	400	563	707	1025	1375	1950*
	1000	111	24	35	42	57	108	156	203	269	375	507	775	1000	1426
	750	83	18	25	31	43	84	119	153	213	305	380	625	813	1071
10	1500	150	30	46	56	78	130	188	263	364	488	654	950	1313	1846*
	1000	100	20	31	37	52	88	124	175	244	331	437	675	938	1275
	750	75	15	23	28	39	63	100	132	194	268	328	525	750	958
11.2	1500	133	28	42	49	71	124	175	234	325	429	610	850	1125	1625
	1000	89	19	27	33	48	85	119	162	219	306	408	625	850	1131
	750	67	14	20	25	36	61	90	122	163	231	306	500	625	849
12.5	1500	120	25	38	44	62	104	143	214	293	416	532	800	1063	1526
	1000	80	17	25	29	41	68	100	143	206	286	355	563	750	1021
	750	60	13	19	22	31	53	73	107	156	206	267	413	563	767
14	1500	107	22	34	40	54	88	130	195	267	364	459	688	888	1235
	1000	71	15	22	26	36	60	91	131	189	254	306	500	650	903
	750	53	11	16	20	27	44	65	98	138	181	230	363	525	678
16	1500	93	19	29	36	49	78	117	169	241	325	407	613	813	1118
	1000	62	13	20	24	33	52	78	115	163	219	272	438	613	776
	750	46	9.8	14	18	25	40	59	86	118	163	204	338	463	583
18	1500	83	17	25	32	43	72	95	150	182	286	361	538	715	962
	1000	55	11	18	21	29	49	66	100	122	189	241	396	513	702
	750	41	8.3	13	16	22	38	50	80	96	138	181	313	425	530
20	1500	75	15		28	40		95	138		242	324		650	910
	1000	50	10		19	27		64	93		161	216		475	629
	750	37	7.7		14	20		48	73		121	162		388	472
22.4	1500	67	14		26	35		85	124		231	291		613	850
	1000	44	9.0		18	24		55	83		156	194		438	567
	750	33	6.7		14	18		43	65		124	146		364	426

\*Requires forced feed lubrication.

## Thermal Capacity (kW)

Nominal Transmission Ratio i <sub>N</sub>	n1	Gear Unit Size												
		14	15	16	17	18	19	20	21	22	23	24	25	26
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>														
5.6 to 14	1500	37	52	59	72	104	126	159	207	258	278	386	489	606
	1000	32	46	57	63	94	114	157	197	240	293	360	481	612
	750	29	40	48	60	84	113	139	178	225	298	353	518	601
16 to 22.4	1500	32	44	50	64	81	104	133	178	231	240	337	439	548
	1000	28	38	43	55	80	105	135	166	219	266	350	466	551
	750	25	31	39	47	70	94	125	148	203	247	344	449	513
<b>Thermal Capacity P2 (kw) for gear unit with fan cooling</b>														
5.6 to 14	1500	60	84	95	116	167	202	256	333	416	448	621	788	976
	1000	49	69	85	95	141	172	236	297	362	442	544	727	924
	750	40	56	67	85	118	158	195	250	315	418	494	725	842
16 to 22.4	1500	54	74	83	107	135	173	221	295	383	399	559	728	909
	1000	43	57	65	83	120	158	203	250	330	402	529	703	832
	750	34	44	55	66	98	132	175	207	284	346	482	628	718
<b>Thermal Capacity P3 (kw) for gear unit with cooling coil</b>														
5.6 to 22.4	1500	184	215	228	236	292	311	349	394	435	443	695	853	1048
	1000	169	203	222	224	282	294	339	380	429	464	546	659	859
	750	152	175	193	215	260	288	316	354	412	480	526	713	834
<b>Thermal Capacity P4 (kw) for gear unit with fan and cooling coil</b>														
5.6 to 22.4	1500	203	252	275	306	405	460	550	672	799	842	1225	1534	1893
	1000	181	228	262	276	372	418	527	629	743	864	1044	1344	1724
	750	159	195	222	259	333	402	468	563	685	861	988	1408	1639

## NOMINAL POWER RATING (kW) - HELICAL - TRIPLE STAGE

## TYPE H3/S3

i <sub>n</sub>	n1	n2	Gear unit Size															
			15	16	17	18	19	20	21	22	23	24	25	26				
20	1500	75	21				74						181			481		
	1000	50	15				49						123			363		
	750	37	11				38						96			300		
22.4	1500	67	21				65						163			438		
	1000	44	14				44						114			331		
	750	33	10				33						86			269		
25	1500	60	17	24	33	55	78	104	150	208	257	413	563	754*				
	1000	40	12	16	21	38	53	71	104	143	171	319	394	506				
	750	30	8.7	12	15	28	39	54	75	109	129	244	300	378				
28	1500	53	16	21	29	50	70	94	131	181	231	388	506	680*				
	1000	35	10	14	18	34	48	68	90	128	154	288	356	454				
	750	26	7.8	11	14	25	35	51	68	96	115	206	269	341				
31.5	1500	47	14	19	25	41	60	89	119	163	205	363	481	601*				
	1000	31	9.5	13	17	28	41	59	79	109	137	250	319	401				
	750	23	7.1	9.4	13	21	31	43	61	81	103	188	238	301				
35.5	1500	43	12	17	23	40	58	77	109	154	185	350	431	543				
	1000	28	8.4	11	15	28	38	52	73	103	124	231	288	362				
	750	21	6.3	8.4	11	20	29	39	54	77	93	175	219	272				
40	1500	37	11	15	21	38	54	70	98	136	166	300	388	484				
	1000	25	7.4	9.9	15	26	35	47	65	91	111	206	256	323				
	750	18	5.5	7.4	10	19	28	35	51	68	83	156	194	242				
45	1500	33	10	13	18	33	45	63	86	122	149	275	344	436				
	1000	22	6.7	8.8	13	21	31	42	58	82	100	188	225	291				
	750	16	5.0	6.6	8.6	16	23	31	45	61	75	144	175	218				
50	1500	30	8.8	12	15	29	40	56	78	112	130	250	306	380				
	1000	20	5.9	7.9	11	20	28	37	54	75	87	169	206	254				
	750	15	4.4	5.9	8.0	15	20	28	40	56	65	125	150	190				
56	1500	26	8.0	11	14	25	35	49	69	99	117	219	275	339				
	1000	17	5.3	7.1	9.6	18	24	34	48	66	78	150	181	226				
	750	13	4.0	5.3	7.0	13	19	26	35	50	59	114	138	169				
63	1500	23	6.9	9.4	12	21	30	44	59	82	105	188	244	306				
	1000	15	4.5	6.3	7.6	14	20	30	39	54	70	131	163	204				
	750	11	3.4	4.7	6.1	11	15	23	29	40	53	98	123	153				
71	1500	21	6.6	8.4	10	19	26	40	52	73	99	169	219	270				
	1000	14	4.3	5.6	7.1	13	18	27	35	49	66	115	144	180				
	750	10	3.2	4.2	5.4	9.4	14	20	25	36	50	86	108	135				
80	1500	18	5.4	7.4	9.1	18	24	36	45	69	88	150	194	258				
	1000	12	3.6	5.0	6.5	11	16	24	30	43	59	103	125	172				
	750	9	2.7	3.7	4.9	8.8	13	18	24	34	44	79	95	129				
90	1500	16		6.6	8.5		21	32		58	79		175	230				
	1000	11		4.4	5.9		14	22		39	53		115	153				
	750	8		3.3	4.3		11	16		31	39		86	115				
100	1500	15		5.9	8.5		21	28		55	71		168	207				
	1000	10		4.0	5.9		14	19		37	47		112	138				
	750	7		3.0	4.3		10	14		28	35		84	104				
112	1500	13		5.3	7.4		19	26		48	62		144	183				
	1000	8		3.5	5.1		12	17		32	41		94	122				
	750	6		2.7	3.6		9.3	13		24	31		73	91				

\*Requires forced feed lubrication.

### Thermal Capacity (kW)

Nominal Transmission Ratio i <sub>n</sub>	n1	Gear Unit Size											
		15	16	17	18	19	20	21	22	23	24	25	26
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>													
20 to 35.5	1500	30	40	50	68	99	112	141	187	248	248	285	340
	1000	25	36	42	62	88	104	137	177	231	244	265	320
	750	22	30	38	54	78	92	119	154	217	217	242	305
40 to 112	1500	25	33	44	67	94	109	128	175	229	300	328	335
	1000	22	28	39	64	83	99	127	168	208	307	310	327
	750	20	28	34	53	77	86	115	140	177	279	295	318
<b>Thermal Capacity P2 (kw) for gear unit with fan cooling</b>													
20 to 35.5	1500	60	67	86	114	161	183	230	279	393	369	440	540
	1000	58	61	73	103	143	170	225	264	366	363	418	478
	750	50	56	67	95	130	156	197	244	339	339	399	447
40 to 112	1500	60	67	81	118	162	182	215	275	367	402	425	506
	1000	50	56	71	111	151	173	221	265	330	385	405	481
	750	45	54	63	96	142	150	206	241	298	365	385	451
<b>Thermal Capacity P3 (kw) for gear unit with cooling coil</b>													
20 to 112	1500	90	95	113	147	187	208	266	313	422	402	450	550
	1000	85	87	96	132	167	193	260	297	393	396	435	540
	750	70	72	85	116	148	171	224	259	368	368	425	520
<b>Thermal Capacity P4 (kw) for gear unit with fan and cooling coil</b>													
20 to 112	1500	110	125	154	204	278	312	395	483	659	631	700	834
	1000	100	114	131	184	247	289	386	458	614	622	650	815
	750	90	98	118	164	221	260	335	407	573	579	600	773

## NOMINAL POWER RATING (kW) - HELICAL - QUADRUPLE STAGE

## TYPE H4/S4

$i_n$	n1	n2	Gear unit Size								
			18	19	20	21	22	23	24	25	26
90	1500	16	17			45			138		
	1000	11	11			30			92		
	750	8	8.3			23			69		
100	1500	15	15			41			125		
	1000	10	9.9			27			83		
	750	7	7.4			20			62		
112	1500	13	13			36			114		
	1000	8	8.8			25			74		
	750	6	6.6			19			54		
125	1500	12	12	19	21	33	43	55	101	121	152
	1000	8	7.9	13	14	21	28	37	66	80	101
	750	6	5.9	9.5	11	16	21	28	50	60	76
140	1500	10	11	17	21	29	38	54	90	109	133
	1000	7	7.1	11	14	20	25	36	59	71	89
	750	5	5.3	8.3	10	15	19	27	45	55	66
160	1500	9	9.3	15	18	25	34	49	79	95	121
	1000	6	6.2	9.8	12	18	23	33	53	64	81
	750	4	4.6	7.4	9.0	13	17	24	40	49	61
180	1500	8	8.3	12	15	24	31	39	71	86	100
	1000	5	5.5	8.0	9.8	15	21	26	48	58	68
	750	4	4.1	6.0	7.3	12	16	19	36	44	51
200	1500	7	7.4	11	13	19	28	34	64	78	92
	1000	5	5.0	7.1	8.9	13	18	23	43	51	61
	750	3	3.7	5.3	6.7	10	14	17	26	38	44
225	1500	6	6.6	8.7	12	18	24	30	56	69	82
	1000	4	4.4	5.8	8.0	11	17	20	38	46	54
	750	3	3.3	4.3	6.0	8.8	12	15	29	28	41
250	1500	6	5.9	8.5	10	15	22	27	50	60	71
	1000	4	4.0	5.6	7.0	11	15	18	34	40	48
	750	3	3.0	4.2	5.2	8.1	11	14	25	30	36
280	1500	5	5.3	7.4	9.5	14	19	25	45	55	65
	1000	3	3.5	5.0	6.4	9.4	13	16	30	36	43
	750	2	2.7	3.7	4.8	6.9	9.7	12	23	28	32
315	1500	4	4.7	6.1	8.4	12	16	22	40	49	58
	1000	3	3.1	4.1	5.6	8.1	12	15	26	31	37
	750	2	2.4	3.0	4.2	6.3	8.8	11	20	25	29
355	1500	4	4.2	4.8	7.3	11	16	20	36	44	51
	1000	2	2.8	3.2	4.9	7.5	10	13	24	29	34
	750	2	2.1	2.4	3.7	5.6	7.8	9.9	18	21	25
400	1500	3	3.7	4.9	6.7	10	14	18	33	39	45
	1000	2	2.5	3.3	4.5	6.3	9.4	12	21	25	30
	750	1	1.9	2.5	3.3	5.0	7.0	8.9	13	19	23
450	1500	3	3.3	3.9	6.3	9.4	12	16	26	36	46
	1000	2	2.2	2.6	4.2	6.3	8.3	10	18	24	31
	750	1	1.7	1.9	3.2	4.4	6.2	7.8	14	18	21
500	1500	3		4.8	5.7		11	14		32	37
	1000	2		3.2	3.8		7.5	9.4		22	25
	750	1		2.4	2.8		5.6	7.0		16	20
560	1500	2		4.0	4.9		10	13		28	33
	1000	1		2.6	3.3		6.6	8.4		19	22
	750	1		2.0	2.5		5.0	6.3		15	17

### Thermal Capacity (kW)

Nominal Transmission Ratio $i_n$	n1	Gear Unit Size								
		18	19	20	21	22	23	24	25	26
Thermal Capacity P1 (kw) for gear unit without cooling										
90 to 560	1500	25	40	46	65	82	107	139	161	190
	1000	23	37	40	54	73	87	124	143	164
	750	20	32	35	54	68	72	113	139	161



# SERIES E

## NOMINAL OUTPUT TORQUE RATING (NM)

Type	i <sub>n</sub>	Gear unit Size														
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26
H1/S1	1.25	648	1345	-	2539	-	4658	5664	-	10948	16153	20480	-	-	-	-
	1.4	660	1350	-	2454	-	4572	5820	-	10828	16034	20480	-	-	-	-
	1.6	630	1244	-	2136	-	3911	4938	-	9325	14083	19204	26245	39502	51957	-
	1.8	651	1321	-	2279	-	4103	4978	-	9984	14108	15871	28216	39394	55753	83296
	2	590	1257	-	2388	-	4195	5412	-	9789	15121	20692	28650	40110	58331	88472
	2.24	673	1210	-	2417	-	4503	5482	-	10807	15657	21374	29389	42748	60404	91159
	2.5	585	1134	-	2425	-	4485	5566	-	10630	16507	22116	30158	40045	62672	91043
	2.8	597	1082	-	2517	-	4642	5707	-	10989	16414	21664	30083	39261	64982	96235
	3.15	568	1188	-	2215	-	4914	5955	-	11844	16553	23338	31502	40085	57148	87542
	3.55	562	1208	-	2563	-	5521	6741	-	13351	18941	25841	36389	42413	61740	93029
	4	541	1079	-	2354	-	5161	6345	-	15074	19864	27058	39731	40961	63348	95726
4.5	502	1079	-	1910	-	5030	6983	-	13693	18861	27623	40243	43174	61627	93478	
5	498	1074	-	1990	-	4913	5440	-	14689	18901	26660	37409	42610	66054	99514	
H2/S2	5.6	-	-	1810	2738	3952	5086	8025	11430	17026	21864	29389	35591	55923	82665	118808
	6.3	-	-	1736	2437	3505	5081	7439	10365	15032	18885	27316	36044	54892	74255	106214
	7.1	-	-	1923	2595	3536	5133	7977	11108	17131	21169	27806	38605	57839	76183	116072
	8	-	-	1930	2724	3551	5155	8216	11587	17215	21664	29119	40379	57123	82767	117810
	9	-	-	1921	2785	3556	5159	8832	13181	16682	21497	32231	40024	58258	78371	113926
	10	-	-	1927	2772	3557	5160	7724	11933	17363	21948	31727	42944	58704	84442	120689
	11.2	-	-	1911	2779	3562	5151	8420	12256	16747	22578	30205	42960	58424	77992	119922
	12.5	-	-	1934	2838	3566	5129	7975	11608	17382	23004	32751	43002	62918	86248	124849
	14	-	-	1923	2806	3555	5127	7755	11490	18513	23094	32582	43044	60249	79771	114242
	16	-	-	1908	2758	3529	5118	7790	11842	18486	23565	33107	43069	60405	82767	120429
	18	-	-	1828	2687	3537	5106	8033	10876	18043	19801	31126	43094	60390	81029	114060
	20	-	-	1913	2740	3545	5122	9134	12084	18521	22508	30767	43114	60214	82767	121099
22.4	-	-	1898	2950	3696	5109	9150	11949	19079	22234	32564	43130	60996	89690	125336	
H3/S3	25	-	-	-	2785	3786	4811	8724	12491	15946	23670	33455	43149	64720	90127	125428
	28	-	-	-	2615	3711	4873	8739	13003	16136	23225	33040	43164	67724	91929	125475
	31.5	-	-	-	2765	3725	4877	8125	12539	16745	23032	32913	43179	70595	95958	125542
	35.5	-	-	-	2710	3685	5190	8877	12429	17440	24254	34969	43187	76020	99058	125581
	40	-	-	-	2740	3591	5089	9195	13370	17443	23455	34980	43195	73558	100063	125622
	45	-	-	-	2795	3604	4857	8808	12893	17446	26160	34984	43203	75134	97744	125654
	50	-	-	-	2735	3832	4903	8952	12478	17448	23771	34989	43213	76866	95170	125696
	56	-	-	-	2775	3756	4995	8390	12584	12674	24031	34993	43220	73408	97747	125723
	63	-	-	-	26665	3770	4596	7920	12094	16697	22146	31426	43224	71997	97494	125740
	71	-	-	-	2875	3823	4715	8114	11797	17455	22283	32039	43226	72202	96624	125769
	80	-	-	-	2680	3651	4819	8228	12097	17456	21759	32470	43231	72225	95500	125772
	90	-	-	-	-	3563	5092	9395	11818	17458	27270	32541	43238	76983	97744	125794
	100	-	-	-	-	3621	5716	9529	13074	17460	27785	35015	43239	77066	106648	125803
112	-	-	-	-	3695	5333	9587	13153	17461	27102	35018	43243	76091	99011	125823	
H4/S4	125	-	-	-	-	-	-	9295	14943	16464	24759	35020	41061	79132	96505	125710
	140	-	-	-	-	-	-	9353	14944	18252	24606	35023	46433	78194	97410	121949
	160	-	-	-	-	-	-	9221	14945	18475	24759	35024	48555	78635	96328	125873
	180	-	-	-	-	-	-	9104	13056	17465	24519	35024	43256	77132	98044	120927
	200	-	-	-	-	-	-	9234	13149	17466	22514	33425	43258	62726	96624	117131
	224	-	-	-	-	-	-	9248	12165	17467	23447	33602	43258	76359	80768	121009
	250	-	-	-	-	-	-	9344	13414	17467	22612	35027	43260	78647	93583	117582
	280	-	-	-	-	-	-	9402	13508	17468	23466	35029	43263	78872	96118	120098
	315	-	-	-	-	-	-	9417	12520	17468	22330	32458	43264	77664	92182	117966
	355	-	-	-	-	-	-	9400	10924	17469	23119	35031	43264	78647	93908	117811
	400	-	-	-	-	-	-	9133	11927	17470	23212	35031	43264	66347	95500	120144
	450	-	-	-	-	-	-	9133	10786	17469	23505	35033	43264	76312	102936	116299
	500	-	-	-	-	-	-	-	14947	17470	-	35033	43268	-	102936	116291
560	-	-	-	-	-	-	-	13812	17469	-	35033	43270	-	102933	116292	

## NOMINAL POWER RATING (kW) - BEVEL HELICAL - DOUBLE STAGE

## TYPE B2/K2

i <sub>n</sub>	n1	n2	Gear unit Size											
			11	13	15	17	18	20	21	22	23	24	25	26
5	1500	300			63		166		544			988*		
	1000	200			53		111		366			738*		
	750	150			39		84		275			613		
5.6	1500	268		26	59		164		543	545		988*	1787*	
	1000	179		18	47		111		365	366		738*	1207*	
	750	134		13	36		84		275	276		613	911	
6.3	1500	238	15	26	56	94	144	297	440	544	763*	988*	1613*	1850*
	1000	159	10	17	43	70	108	200	338	366	581	738*	1205*	1380*
	750	119	7.5	13	30	56	84	151	263	275	475	613	910	1030
7.1	1500	211	15	26	56	94	144	281	431	544	763*	988*	1475*	1793*
	1000	141	10	17	40	70	108	200	331	366	581	738*	1113*	1310*
	750	106	7.5	13	30	56	83	150	250	275	475	613	900	1030
8	1500	188	11	24	50	81	144	256	400	543	763*	938*	1350*	1792*
	1000	125	7.1	16	34	56	108	194	306	366	581	700	1013*	1260*
	750	94	5.3	13	25	42	69	150	231	275	425	581	825	950
9	1500	167	9.2	23	45	80	125	238	363	494	675*	813*	1225*	1789*
	1000	111	6.2	15	30	53	95	181	275	357	494	638*	925*	1207*
	750	83	4.6	12	24	40	64	149	219	268	371	525	750	910
10	1500	150	8.0	20	40	74	115	206	319	431	586*	763*	1138*	1713*
	1000	100	5.4	14	28	49	78	152	244	319	392	581	775*	1188*
	750	75	4.1	10	21	37	58	115	194	239	295	475	638	888
11.2	1500	134	7.4	16	36	59	101	183	294	389	526*	700*	1050*	1500*
	1000	89	5.0	11	25	40	76	130	219	261	352	538	788	1009*
	750	67	3.8	8.0	19	31	51	98	175	196	264	438	588	758
12.5	1500	120	6.5	16	33	56	94	175	263	356	488	625*	950*	1225*
	1000	80	4.4	10	23	37	70	131	181	257	331	475	600	825
	750	60	3.1	7.8	16	28	45	95	138	188	238	338	456	625
14	1500	107	5.7	13	29	53	71	156	225	325	422	581	725*	975*
	1000	71	3.8	8.1	19	35	47	105	138	206	256	388	519	650
	750	54	2.9	6.1	14	27	35	75	100	144	181	294	388	500
16	1500	94	5.2	9.4	23	42	64	131	169	225	325	513	600	750*
	1000	63	3.5	6.3	14	28	40	79	101	151	188	313	438	513
	750	47	2.6	4.6	11	21	29	58	74	110	138	225	325	381
18	1500	83	4.1	7.5	16	33	58	114	151	225	282	439	578	720
	1000	56	2.8	4.9	11	22	39	76	101	150	188	293	385	480
	750	42	2.0	3.6	8.1	16	29	57	76	112	141	219	289	360
20	1500	75	3.8	7.0		33		103		225	254		520	648
	1000	50	2.5	4.7		22		68		149	169		347	432
	750	38	1.9	3.5		16		51		111	127		260	324
22.4	1500	67	3.5			29		92			227			579
	1000	45	2.4			19		60			151			386
	750	33	1.8			14		45			113			289

### Thermal Capacity (kW)

\*Requires forced feed lubrication.

Nominal Transmission Ratio i <sub>n</sub>	n1	Gear unit Size											
		11	13	15	17	18	20	21	22	23	24	25	26
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>													
5 to 11.2	1500	14	23	39	50	82	155	172	201	275	346	400	426
	1000	13	22	36	48	77	122	169	176	262	339	380	414
	750	11	20	32	46	69	108	163	154	257	325	360	412
12.5 to 22.4	1500	12	22	35	51	78	138	168	207	268	331	390	527
	1000	10	20	31	47	67	131	156	190	255	323	370	520
	750	8	18	29	43	63	125	150	188	249	317	350	513
<b>Thermal Capacity P2 (kw) for gear unit with fan cooling</b>													
5 to 11.2	1500	36	48	84	104	185	323	387	427	588	704	810	841
	1000	33	46	78	101	175	255	381	372	560	691	750	818
	750	28	40	69	95	148	212	326	299	500	624	700	774
12.5 to 22.4	1500	30	50	85	111	176	289	386	463	599	750	780	830
	1000	24	44	73	96	149	250	324	380	535	646	750	770
	750	20	41	67	87	139	239	312	375	523	635	700	750
<b>Thermal Capacity P3 (kw) for gear unit with cooling coil</b>													
5 to 22.4	1500	25	35	70	90	139	210	257	308	412	534	731	752
	1000	20	29	60	101	145	197	307	290	513	685	851	947
	750	20	35	69	90	140	204	251	333	392	522	732	908
<b>Thermal Capacity P4 (kw) for gear unit with fan and cooling coil</b>													
5 to 22.4	1500	37	53	97	122	203	344	408	468	637	792	900	1009
	1000	33	48	87	125	198	287	429	419	668	858	880	1089
	750	29	47	85	115	178	262	369	393	575	736	800	1047

## NOMINAL POWER RATING (kW) - BEVEL HELICAL - TRIPLE STAGE

## TYPE B3/K3

$i_n$	n1	n2	Gear unit Size												25	26			
			14	15	16	17	18	19	20	21	22	23	24						
20	1500	75		21				66						169			538*		
	1000	50		15				45						119			394		
	750	37		11				35						94			306		
22.4	1500	66		19	28			63	81					163	219*		500*	638*	
	1000	44		14	19			43	60					113	163		363	450	
	750	33		10	14			31	45					88	119		275	344	
25	1500	60	11	18	25	32		55	78	104				144	200*	259*	438*	563*	701*
	1000	40	8.0	12	17	21		38	53	69				100	138	173	319	394	468*
	750	30	5.9	8.8	13	16		29	40	52				75	106	130	244	300	351
28	1500	53	10	14	23	28		46	60	93				115	175*	233*	400	506*	625*
	1000	35	6.9	10	15	19		31	43	62				83	118	155	281	356	420*
	750	26	5.1	7.5	11	14		24	33	47				63	89	117	213	269	315
31.5	1500	47	8.8	13	16	25		41	55	86				106	150*	209*	363	481*	564*
	1000	31	6.0	8.8	11	17		28	39	58				74	104	140	250	319	377*
	750	23	4.5	6.9	8.2	13		21	29	43				55	78	105	188	238	283
35.5	1500	43	8.1	12	18	22		38	50	74				96	138	186*	325	431	500*
	1000	28	5.4	8.1	12	15		25	35	49				66	94	124	225	288	340*
	750	21	4.0	6.0	9.1	11		19	26	37				50	70	93	169	219	250
40	1500	37	7.5	11	16	20		34	45	65				86	123	162	294	388	450*
	1000	25	4.9	6.9	11	13		23	31	43				59	84	120	200	269	330
	750	18	3.6	5.5	8.0	10		18	24	32				45	65	82	156	194	230
45	1500	33	6.3	9.4	12	18		30	41	63				80	113	146	269	344	400*
	1000	22	4.4	6.3	8.0	12		20	28	41				53	75	97	181	225	265
	750	16	3.4	5.0	6.0	8.8		15	22	33				40	58	74	138	175	205
50	1500	30	5.8	8.8	13	16		26	38	53				71	100	130	244	306	360*
	1000	20	3.9	5.8	8.7	10		18	25	36				48	68	87	163	206	240
	750	15	3.0	4.4	6.6	7.9		14	19	27				36	51	65	124	150	180
56	1500	26	5.1	7.5	12	14		24	33	47				63	89	117	213	275	320
	1000	17	3.5	5.3	7.7	9.5		16	23	31				43	61	78	144	181	215
	750	13	2.6	3.9	5.7	7.1		13	18	23				33	46	59	110	138	165
63	1500	23	4.6	6.9	8.5	13		21	29	44				55	79	105	188	244	285
	1000	15	3.1	4.6	5.5	8.4		15	21	30				38	54	70	131	163	190
	750	11	2.4	3.5	4.2	6.4		11	16	23				29	40	52	98	123	145
71	1500	21	4.0	6.0	9.1	11		19	26	37				50	70	93	169	219	250
	1000	14	2.8	4.1	6.1	7.5		13	18	25				34	46	62	101	144	166
	750	10	2.1	3.1	4.6	5.6		9.4	15	19				25	34	47	74	108	125
80	1500	18	2.9		7.5	10		24	32					69	81		200	218	
	1000	12	2.5		5.3	6.7		17	22					46	54		135	146	
	750	9	1.9		3.9	5.0		13	16					34	41		101	110	
90	1500	16	2.9		5.7	8.9		22	33					58	73		176	197	
	1000	11	1.9		3.8	5.9		15	21					36	49		117	131	
	750	8	1.4		2.9	4.4		11	16					26	36		85	99	
100	1500	15	2.7			7.9				26					63				174
	1000	10	1.8			5.2				16					39				106
	750	7	1.3			3.9				12					29				78

\*Requires forced feed lubrication.

### Thermal Capacity (kW)

Nominal Transmission Ratio $i_n$	n1	Gear Unit Size													
		14	15	16	17	18	19	20	21	22	23	24	25	26	
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>															
20 to 35.5	1500	26	33	42	44	64	81	106	128	166	195	254	315	330	
	1000	23	29	36	40	61	75	95	125	150	166	239	280	295	
	750	21	25	33	36	56	69	87	119	148	158	229	260	285	
40 to 100	1500	23	30	40	45	60	75	87	120	154	159	239	285	300	
	1000	21	26	31	43	58	71	78	118	144	150	226	260	277	
	750	19	24	30	38	53	68	78	115	138	140	213	240	265	
<b>Thermal Capacity P2 (kw) for gear unit with fan cooling</b>															
20 to 35.5	1500	66	85	109	111	150	183	237	269	360	425	542	617	672	
	1000	59	75	95	100	143	169	213	263	325	363	510	586	601	
	750	58	73	90	95	138	156	193	237	288	313	451	527	535	
40 to 100	1500	59	75	101	112	144	175	208	265	319	325	488	600	620	
	1000	56	70	82	104	135	163	174	244	300	290	438	538	580	
	750	54	65	81	94	125	150	174	225	275	270	388	513	520	
<b>Thermal Capacity P3 (kw) for gear unit with cooling coil</b>															
20 to 100	1500	89	105	126	129	176	207	261	310	391	368	461	500	584	
	1000	85	102	116	119	167	200	235	300	375	324	445	475	522	
	750	84	96	111	110	150	188	220	287	370	313	436	450	517	
<b>Thermal Capacity P4 (kw) for gear unit with fan and cooling coil</b>															
20 to 100	1500	130	160	199	204	281	339	435	509	660	711	905	1111	1141	
	1000	121	148	178	187	268	320	391	495	611	614	860	1055	1021	
	750	117	140	168	174	248	297	360	463	580	564	803	1000	1011	

## NOMINAL POWER RATING (kW) - BEVEL HELICAL - QUADRUPLE STAGE

## TYPE B4/K4

$i_n$	n1	n2	Gear unit Size											
			17	18	19	20	21	22	23	24	25	26		
80	1500	18.8		18				48				154		
	1000	12.5		12				32				103		
	750	9.4		9				24				77		
90	1500	16.7		16				42				137		
	1000	11.1		10				28				91		
	750	8.3		8				21				69		
100	1500	15.0		14	19			38	51			123	164	
	1000	10.0		9	13			25	34			81	105	
	750	7.5		7	10			19	26			63	80	
112	1500	13.4	7.1	12	16	24		34	46	59		108	138	160
	1000	8.9	4.8	8.8	12	16		23	31	39		75	88	105
	750	6.7	3.6	6.3	8.8	12		18	24	29		55	66	83
125	1500	12.0	6.5	11	15	23		30	41	64		98	121	160
	1000	8.0	4.3	7.5	11	15		20	29	43		66	81	107
	750	6.0	3.3	5.8	8.1	11		15	21	32		50	60	80
140	1500	10.7	5.8	10	14	19		28	36	57		88	109	145
	1000	7.1	3.8	6.9	9.4	12		19	26	38		60	73	97
	750	5.4	2.9	5.1	6.9	9.4		14	20	28		45	55	73
160	1500	9.4	5.3	9.4	13	17		25	34	41		79	95	115
	1000	6.3	3.5	6.1	8.6	11		16	23	27		53	64	75
	750	4.7	2.6	4.5	6.3	8.4		13	18	21		40	49	58
180	1500	8.3	4.7	8.1	11	15		21	30	37		71	86	100
	1000	5.6	3.1	5.4	7.5	9.7		15	20	25		48	58	68
	750	4.2	2.3	4.0	5.6	7.3		11	15	19		36	44	51
200	1500	7.5	4.1	7.3	10	13		19	28	33		64	78	92
	1000	5.0	2.8	4.8	6.9	8.9		13	18	22		43	51	61
	750	3.8	2.1	3.6	5.2	6.7		10	14	17		33	38	44
225	1500	6.7	3.7	6.3	8.8	12		18	24	36		56	69	90
	1000	4.4	2.4	4.3	5.9	7.8		11	16	24		38	46	60
	750	3.3	1.9	3.3	4.5	5.8		8.8	12	18		29	35	45
250	1500	6.0	3.3	5.8	8.1	12		15	21	32		50	60	81
	1000	4.0	2.2	3.9	3.9	7.5		11	15	21		34	40	54
	750	3.0	1.6	2.9	2.9	5.6		8.1	11	16		25	30	41
280	1500	5.4	2.9	4.3	6.9	9.3		14	19	28		45	55	72
	1000	3.6	1.9	2.9	4.8	6.2		9.4	13	19		30	36	48
	750	2.7	1.4	2.0	3.4	4.7		6.9	9.9	14		23	28	36
315	1500	4.8	2.6	3.9	6.3	8.4		12	18	26		40	49	65
	1000	3.2	1.8	2.6	4.3	5.6		8.1	11	17		26	31	43
	750	2.4	1.3	1.9	3.2	4.2		6.3	8.8	13		20	25	32
355	1500	4.2	2.3	3.5	5.8	8.1		11	14	18		29	44	49
	1000	2.8	1.6	2.4	3.8	5.4		7.5	9.4	12		20	29	33
	750	2.1	1.2	1.6	2.9	4.0		5.5	6.9	9.1		15	21	25
400	1500	3.8	2.1	3.0	4.8	6.3		9.4	11	16		24	35	43
	1000	2.5	1.4	1.9	3.1	4.1		6.3	7.5	11		16	24	29
	750	1.9	1.0	1.5	2.4	3.1		4.6	5.6	8.1		12	18	21
450	1500	3.3	1.6		3.8	5.8			11	18			35	44
	1000	2.2	1.1		2.5	3.9			7.5	12			23	30
	750	1.7	0.9		1.9	2.9			5.6	8.9			18	21
500	1500	3.0	1.6		3.6	4.8			8.8	16			28	31
	1000	2.0	1.1		2.4	3.1			5.8	11			19	21
	750	1.5	0.9		1.8	2.4			4.3	8.0			14	15
560	1500	2.7	1.4		3.2	4.6			7.5	14			25	28
	1000	1.8	1.0		2.1	3.1			5.0	9.0			16	19
	750	1.3	0.8		1.6	2.3			3.8	6.8			13	14

### Thermal Capacity (kW)

Nominal Transmission Ratio $i_n$	n1	Gear Unit Size									
		17	18	19	20	21	22	23	24	25	26
<b>Thermal Capacity P1 (kw) for gear unit without cooling</b>											
80 to 560	1500	20	28	35	41	56	75	76	138	177	206
	1000	17	23	30	36	50	69	66	127	148	178
	750	17	20	29	36	44	56	62	118	142	177

## NOMINAL OUTPUT TORQUE RATING (NM)

Type	i <sub>N</sub>	Gear unit Size														
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26
B2/ K2	5	-	-	-	1947	-	-	5083	-	-	17515	-	-	46331	-	-
	5.6	-	953	-	2079	-	-	5647	-	-	19009	18884	-	44942	64853	-
	6.3	593	1049	-	2191	-	3890	5707	-	12250	17129	22077	30746	38384	63553	74035
	7.1	674	1166	-	2507	-	4489	6460	-	13061	19219	24445	35803	44379	66230	82626
	8	557	1172	-	2511	-	4247	6809	-	13436	19864	27681	39408	45512	68760	93670
	9	521	1253	-	2547	-	4687	7163	-	13876	20258	27978	39155	45263	68243	104527
	10	517	1273	-	2483	-	4975	7199	-	13423	19786	27456	37711	47730	72421	110392
	11.2	512	1087	-	2536	-	4341	6983	-	13385	20318	27630	38360	47332	74490	109825
	12.5	500	1209	-	2562	-	4571	7183	-	14241	20433	28117	38378	48496	69834	99685
	14	509	1081	-	2451	-	4962	6337	-	13597	17827	25495	32467	52244	64292	87542
	16	500	913	-	2072	-	4222	5695	-	11728	14650	22411	27909	43691	61120	76485
	18	456	808	-	1804	-	3869	6703	-	13328	16902	25441	32726	48900	64368	84173
	20	482	897	-	2555	-	4359	7996	-	13362	20368	28232	32650	65609	66207	83586
	22.4	485	-	-	2541	3780	4233	8502	11528	13171	22696	31038	33033	68682	90452	84765
B3/ K3	25	-	-	1797	2755	3880	5176	8430	12371	17382	21783	31530	43145	68465	88789	115832
	28	-	-	1736	2374	3991	4920	8016	10641	17433	19931	31038	43162	70108	89787	115888
	31.5	-	-	1717	2433	3217	5047	8057	11096	18253	21308	29420	43175	71500	96881	115931
	35.5	-	-	1688	2684	4075	5077	8253	11460	17442	20943	31126	43185	73029	97744	116412
	40	-	-	1807	2480	4071	5101	8147	11460	17446	20821	31197	43197	71712	98683	119768
	45	-	-	1761	2541	3380	5115	8162	11949	19079	21998	31684	43205	73834	98843	117278
	50	-	-	1742	2715	4065	5102	8047	11972	17878	21594	31530	43361	76290	94709	120352
	56	-	-	1779	2590	4066	5108	8232	11528	17453	21664	31481	43219	74490	96438	118628
	63	-	-	1815	2676	3246	5047	8301	11600	18790	22061	30891	43224	73966	99431	117120
	71	-	-	1688	2712	4072	5081	8253	12033	17457	21759	30560	43230	66288	97461	116200
	80	-	-	1445	-	3820	5151	8457	12097	17459	23239	34380	43236	76001	101867	116169
	90	-	-	1550	-	3221	5153	8730	12963	19657	22761	29571	43240	75277	99575	116185
100	-	-	1607	-	-	5131	8853	11963	16034	23704	31690	38357	75336	98590	103637	
B4/ K4	112	-	-	-	-	-	5111	8363	11528	17462	22730	32811	43799	75703	93113	116685
	125	-	-	-	-	-	5104	8974	11972	19096	23109	32515	54268	76900	94709	137900
	140	-	-	-	-	-	5120	8988	12193	17464	24512	32146	54729	77664	96438	137908
	160	-	-	-	-	-	5103	9101	12609	17464	23572	33098	43373	79630	96881	119902
	180	-	-	-	-	-	5110	8889	12893	17466	22799	33956	44141	78273	97744	118147
	200	-	-	-	-	-	5108	8920	12733	17466	23278	33425	44290	78813	95500	117809
	224	-	-	-	-	-	5117	8803	12674	17467	22730	33444	49127	79224	100673	122910
	250	-	-	-	-	-	5128	9174	9178	19296	23109	33501	49016	78872	94709	124453
	280	-	-	-	-	-	5108	7191	11972	17468	24512	33254	48467	79883	96438	121756
	315	-	-	-	-	-	5136	7584	12609	17468	22968	33098	49132	79630	95607	122921
	355	-	-	-	-	-	5111	7170	12893	19112	23246	31126	38839	62635	96328	104899
	400	-	-	-	-	-	4947	6981	11938	16182	21957	28650	38460	58947	89133	113793
	450	-	-	-	-	-	4540	-	10863	17469	-	31684	49138	-	102503	115898
	500	-	-	-	-	-	5036	-	11187	16080	-	26566	49153	-	85950	91822
560	-	-	-	-	-	5056	-	11362	17367	-	25923	46389	-	87610	93306	

## ACTUAL RATIO - HELICAL TYPE

## H1, H2, H3, H4/ S1, S2, S3, S4

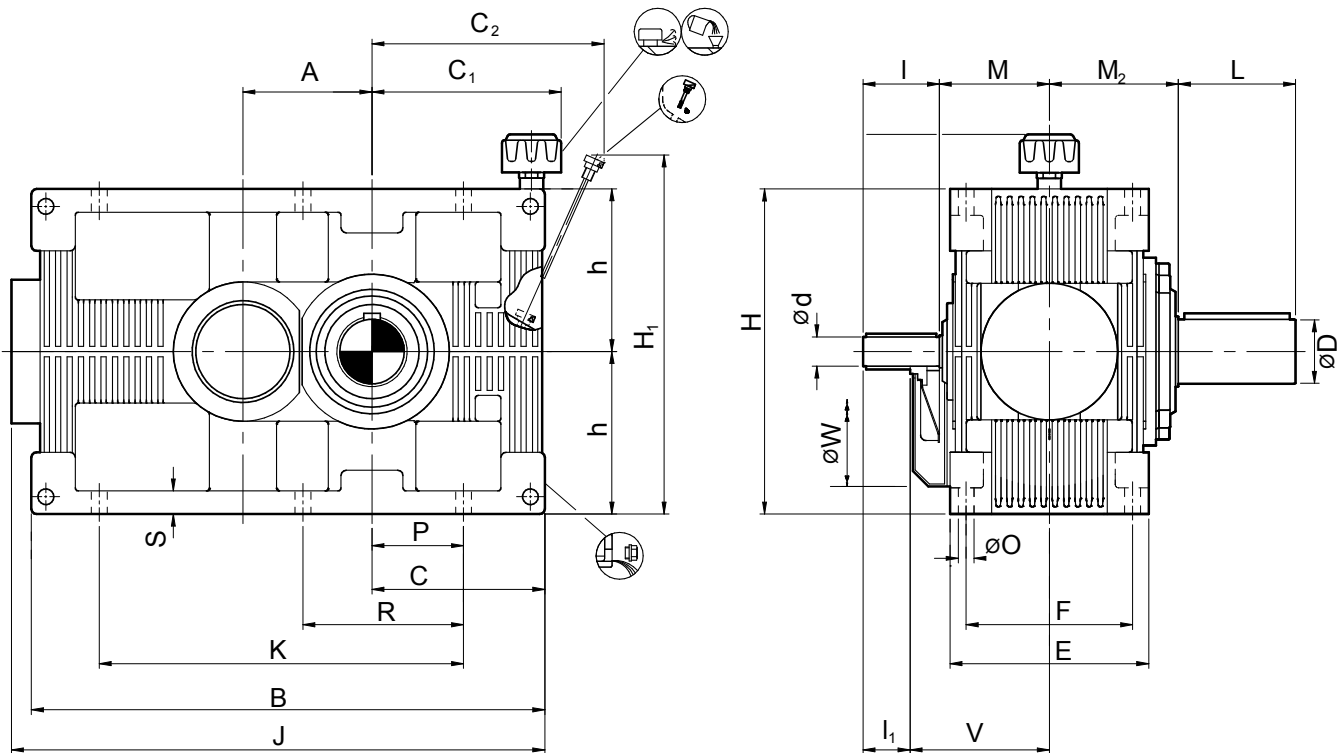
Type	$i_n$	Gear unit Size														
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26
H1/ S1	1.25	1.21	1.24	-	1.25	-	1.26	1.23	-	1.25	1.26	1.25	-	-	-	-
	1.4	1.38	1.39	-	1.35	-	1.39	1.42	-	1.38	1.40	1.40	-	-	-	-
	1.6	1.58	1.61	-	1.58	-	1.61	1.59	-	1.58	1.61	1.61	1.61	1.59	1.56	-
	1.8	1.82	1.82	-	1.79	-	1.78	1.76	-	1.82	1.77	1.77	1.77	1.83	1.78	1.81
	2	1.95	2.00	-	2.00	-	1.95	2.00	-	1.95	2.00	2.00	2.00	2.00	1.95	2.04
	2.24	2.29	2.24	-	2.25	-	2.26	2.22	-	2.26	2.21	2.24	2.24	2.24	2.20	2.27
	2.5	2.45	2.50	-	2.44	-	2.45	2.41	-	2.43	2.53	2.53	2.53	2.45	2.50	2.48
	2.8	2.78	2.83	-	2.75	-	2.78	2.71	-	2.79	2.75	2.72	2.80	2.67	2.85	2.79
	3.15	3.11	3.18	-	3.06	-	3.25	3.12	-	3.24	3.06	3.19	3.17	3.05	3.10	3.14
	3.55	3.53	3.53	-	3.50	-	3.75	3.53	-	3.65	3.50	3.53	3.69	3.53	3.53	3.62
	4	4.12	3.88	-	3.94	-	4.12	3.89	-	4.12	3.90	4.00	4.06	3.81	4.00	4.11
	4.5	4.47	4.38	-	4.44	-	4.61	4.50	-	4.59	4.39	4.45	4.56	4.38	4.38	4.59
5	5.06	5.00	-	5.00	-	5.28	4.88	-	5.11	5.00	5.00	5.05	4.82	5.00	5.06	
H2/ S2	5.6	-	-	5.31	5.56	5.56	5.89	5.57	5.65	5.80	5.57	5.57	5.69	5.68	5.60	5.78
	6.3	-	-	6.06	6.13	6.44	6.51	6.32	6.35	6.37	6.17	6.48	6.31	6.26	6.43	6.61
	7.1	-	-	6.93	6.79	7.29	7.43	7.06	7.16	7.39	7.00	7.13	7.21	7.06	7.09	7.38
	8	-	-	7.95	7.78	8.00	8.45	7.94	7.78	8.16	7.78	7.82	8.28	7.80	8.00	8.13
	9	-	-	8.54	8.75	8.94	9.49	8.60	8.95	8.96	8.44	9.00	8.89	8.93	8.95	9.18
	10	-	-	10.00	9.68	10.00	10.38	9.71	10.12	10.38	9.47	10.22	10.31	9.71	10.11	10.27
	11.2	-	-	10.72	10.91	11.33	11.39	10.80	11.00	11.24	10.91	11.06	11.06	10.80	10.89	11.59
	12.5	-	-	12.15	12.03	12.71	13.06	12.35	12.75	12.75	12.35	12.47	12.71	12.35	12.75	12.85
	14	-	-	13.59	13.56	14.12	14.86	13.92	13.88	14.91	13.61	14.12	14.74	13.76	14.12	14.53
	16	-	-	15.44	15.75	15.50	16.27	15.69	16.00	17.21	15.75	16.00	16.61	15.49	16.00	16.92
	18	-	-	18.01	17.09	17.50	18.44	17.65	18.00	18.89	17.09	17.78	18.76	17.65	17.80	18.62
	20	-	-	19.57	19.35	20.00	20.17	19.62	20.00	21.16	19.50	20.00	20.90	19.65	20.00	20.90
	22.4	-	-	22.13	21.82	22.12	22.77	22.11	22.75	24.22	21.49	22.12	23.28	21.90	23.00	23.17
H3/ S3	25	-	-	-	25.34	25.03	24.50	24.91	25.31	24.14	24.87	25.26	26.40	24.64	25.17	26.13
	28	-	-	-	26.60	27.48	27.65	27.45	29.18	27.03	27.79	28.63	29.41	27.45	28.52	28.96
	31.5	-	-	-	29.98	31.02	31.15	30.94	32.82	30.94	30.63	31.81	33.09	30.59	31.73	32.82
	35.5	-	-	-	34.82	34.59	36.01	34.86	34.71	35.42	35.44	35.71	36.62	34.42	36.08	36.36
	40	-	-	-	37.51	37.98	39.39	38.51	40.00	38.90	37.79	40.47	40.81	38.51	40.89	40.81
	45	-	-	-	42.28	42.88	44.45	43.40	45.00	43.56	47.64	44.97	45.46	42.91	45.49	45.24
	50	-	-	-	49.10	50.66	51.23	48.90	49.00	48.75	48.18	49.00	52.11	48.29	49.83	51.95
	56	-	-	-	55.24	55.62	56.04	52.71	56.47	53.53	54.90	55.53	58.06	52.71	56.47	58.31
	63	-	-	-	60.91	62.79	63.24	60.31	63.53	59.94	60.49	61.70	64.68	60.31	62.82	64.63
	71	-	-	-	68.66	71.76	70.70	67.97	70.59	68.82	70.00	69.41	68.41	67.20	70.59	73.24
	80	-	-	-	79.73	77.23	83.07	76.59	80.00	75.57	75.95	80.00	77.24	75.63	80.00	76.68
	90	-	-	-	-	84.79	93.75	89.42	90.00	84.63	94.14	88.89	86.07	87.35	89.00	86.07
	100	-	-	-	-	95.74	105.61	100.78	100.00	96.86	106.57	100.00	95.88	97.16	100.00	95.41
112	-	-	-	-	109.41	114.75	113.55	110.59	105.94	117.43	113.75	110.32	111.18	110.59	108.11	
H4/ S4	125	-	-	-	-	-	-	122.88	123.05	122.08	122.00	128.72	117.19	125.07	126.32	130.13
	140	-	-	-	-	-	-	138.48	141.82	138.41	134.43	145.88	134.61	139.37	143.16	144.22
	160	-	-	-	-	-	-	156.04	159.55	161.94	155.56	162.09	156.12	156.84	159.26	163.11
	180	-	-	-	-	-	-	173.30	170.06	186.86	171.16	176.47	175.99	170.03	178.55	189.94
	200	-	-	-	-	-	-	195.31	196.00	205.18	188.60	200.00	197.64	189.47	202.35	209.06
	224	-	-	-	-	-	-	220.07	220.50	229.77	218.24	222.22	223.14	213.22	225.12	234.65
	250	-	-	-	-	-	-	247.06	249.07	262.99	236.78	249.13	248.64	247.06	244.98	260.12
	280	-	-	-	-	-	-	278.43	287.06	287.90	268.05	282.35	276.97	275.29	277.65	294.74
	315	-	-	-	-	-	-	313.73	322.94	326.90	295.35	313.73	307.08	309.80	308.88	333.85
	355	-	-	-	-	-	-	352.94	358.82	374.17	341.76	352.94	342.17	352.94	347.06	370.09
	400	-	-	-	-	-	-	386.38	379.72	409.61	388.89	390.31	381.17	400.81	400.00	419.35
	450	-	-	-	-	-	-	434.67	437.65	432.73	421.93	442.35	433.52	456.62	445.00	440.92
	500	-	-	-	-	-	-	-	492.35	484.59	-	491.50	483.07	-	500.00	494.88
560	-	-	-	-	-	-	-	547.06	554.65	-	552.94	538.12	-	568.75	548.60	

# SERIES E

## ACTUAL RATIO - BEVEL HELICAL TYPE

## B2, B3, B4/ K2, K3, K4

Type	i <sub>n</sub>	Gear unit Size														
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26
B2/ K2	5	-	-	-	4.88	-	-	4.82	-	-	5.06	-	-	4.91	-	-
	5.6	-	5.67	-	5.50	-	-	5.41	-	-	5.50	5.44	-	5.33	5.70	-
	6.3	6.21	6.35	-	6.12	-	6.50	6.24	-	6.47	6.12	6.38	6.33	6.11	6.19	6.29
	7.1	7.06	7.06	-	7.00	-	7.50	7.06	-	7.29	7.00	7.06	7.38	7.06	7.05	7.24
	8	8.24	7.75	-	7.89	-	8.24	7.78	-	8.24	7.80	8.00	8.12	7.63	8.00	8.21
	9	8.95	8.75	-	8.89	-	9.22	9.00	-	9.18	8.78	8.90	9.11	8.75	8.75	9.18
	10	10.12	10.00	-	9.75	-	10.56	9.83	-	10.22	9.75	10.00	10.10	9.83	10.00	10.13
	11.2	10.88	10.79	-	10.99	-	11.56	10.83	-	11.50	10.86	11.14	11.44	10.62	11.14	11.50
	12.5	12.46	12.19	-	12.38	-	12.85	12.54	-	12.78	12.23	12.40	12.69	12.19	12.19	12.78
	14	14.09	13.93	-	14.00	-	14.70	14.12	-	14.24	14.00	13.93	14.07	14.12	13.93	14.10
	16	15.15	15.50	-	15.78	-	16.10	15.56	-	16.02	15.60	16.00	15.94	15.25	16.00	16.02
	18	17.89	17.50	-	17.78	-	18.44	18.00	-	18.35	17.56	17.80	18.22	17.50	17.50	18.35
	20	20.24	20.00	-	18.89	-	21.11	18.96	-	20.44	18.96	20.00	20.20	19.17	20.00	20.25
22.4	21.75	-	-	21.29	21.59	23.11	21.37	22.29	23.00	21.94	22.29	22.89	21.58	22.29	23.00	
B3/ K3	25	-	-	25.09	24.72	24.38	25.69	24.07	25.07	26.31	23.80	24.76	26.13	24.58	24.79	25.94
	28	-	-	27.26	27.12	27.86	28.10	27.22	27.86	29.47	27.22	27.86	29.11	27.53	27.86	29.11
	31.5	-	-	30.83	30.57	30.81	31.71	30.68	31.69	33.73	31.50	30.81	32.43	30.98	32.04	32.27
	35.5	-	-	33.13	35.50	35.00	35.73	34.57	36.00	36.92	34.18	35.56	36.49	35.29	35.60	36.57
	40	-	-	39.14	37.77	40.00	40.35	37.92	40.00	42.31	37.92	40.00	41.80	38.34	40.00	41.80
	45	-	-	44.26	42.58	44.24	45.53	42.73	45.50	48.43	43.88	44.24	46.57	43.15	46.00	46.34
	50	-	-	47.58	49.45	48.75	51.30	48.15	50.14	53.02	47.60	49.52	52.39	49.16	49.59	52.51
	56	-	-	54.52	54.24	55.71	56.20	54.44	55.71	58.94	54.44	55.71	58.23	55.06	55.71	58.23
	63	-	-	61.65	61.14	61.61	63.42	61.36	63.38	67.46	63.00	61.61	64.86	61.96	64.07	64.55
	71	-	-	66.27	71.00	70.00	71.45	69.14	72.00	73.85	68.35	71.11	72.97	70.59	71.20	73.14
	80	-	-	78.29	-	80.00	80.69	75.14	80.00	84.63	74.62	80.00	83.61	77.43	80.00	83.61
	90	-	-	88.53	-	88.47	91.07	87.26	91.00	96.86	84.26	88.47	93.14	86.28	92.00	92.68
	100	-	-	95.16	-	-	102.60	98.32	96.68	106.04	97.50	98.32	104.78	97.09	98.32	105.02
B4/ K4	112	-	-	-	-	-	112.53	110.61	111.43	115.53	105.78	111.43	116.09	110.61	111.43	116.37
	125	-	-	-	-	-	123.26	125.29	125.36	133.31	120.99	123.81	133.71	123.88	123.96	135.50
	140	-	-	-	-	-	139.69	141.18	139.29	146.38	140.00	139.29	150.96	139.41	139.29	149.15
	160	-	-	-	-	-	152.79	158.82	158.44	163.92	151.90	154.03	168.21	158.82	160.18	167.40
	180	-	-	-	-	-	172.43	174.52	180.00	187.62	168.52	177.78	187.38	172.55	178.00	185.57
	200	-	-	-	-	-	194.26	196.64	200.00	205.39	195.00	200.00	210.80	194.18	200.00	210.27
	224	-	-	-	-	-	219.39	221.22	227.50	235.37	211.57	221.18	216.76	221.22	230.00	214.16
	250	-	-	-	-	-	247.60	250.59	250.71	269.40	241.98	247.62	241.53	247.76	247.93	240.37
	280	-	-	-	-	-	278.94	282.35	278.57	294.92	280.00	278.57	269.06	278.82	278.57	266.46
	315	-	-	-	-	-	305.58	317.65	316.88	327.84	303.79	308.07	301.92	317.65	320.36	298.30
	355	-	-	-	-	-	344.86	346.52	360.00	375.24	343.64	355.56	336.42	342.19	356.00	334.80
	400	-	-	-	-	-	388.52	389.84	400.00	410.78	372.83	400.00	374.76	389.84	400.00	420.55
	450	-	-	-	-	-	438.78	-	455.00	470.74	-	442.35	433.52	-	460.00	428.33
	500	-	-	-	-	-	495.19	-	490.91	538.80	-	490.91	483.07	-	490.91	480.75
	560	-	-	-	-	-	557.87	-	558.41	589.84	-	542.89	538.12	-	564.55	532.92



Size	Input Shaft									Output Shaft			KG	3) ltr
	i = 1.25 - 3.55			i = 4 - 5			M	V	W	D	L	M <sub>2</sub>		
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>								
H1..11	25	100	50	20	100	50	150	200	180	32	60	120	35	2.5
H1..13	35	110	60	30	110	60	150	200	180	45	90	125	65	3.5
H1..15	50	130	80	40	130	80	160	210	230	55	90	135	115	7.5
H1..17	60	155	105	50	130	80	165	215	300	70	125	150	205	11
H1..18	70	155	105	55	135	85	190	240	300	80	150	170	275	17

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	K	O	P	R	S
H1..11	80	356	140	176	171	180	150	100	248	260	356	175	14	60	—	24
H1..13	100	435	155	192	195	190	150	125	295	330	435	220	14	75	—	24
H1..15	125	520	182	218	231	228	170	160	352	400	530	290	14	100	—	24
H1..17	160	640	220	248	282	250	210	200	432	480	652	350	18	120	—	32
H1..18	180	716	246	273	311	284	230	225	475	530	726	410	18	145	—	32

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

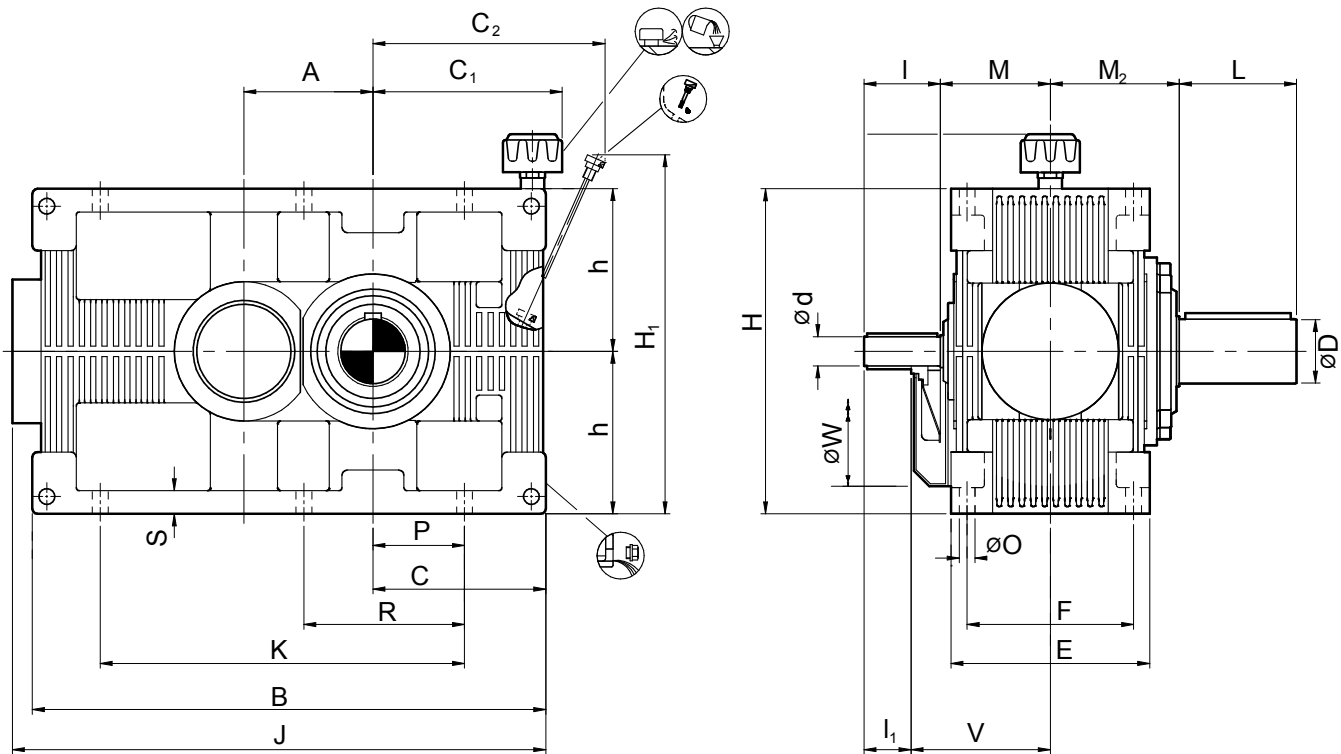


# SERIES E

## TYPE H1HN

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### SINGLE STAGE - SIZE 20 TO 26



Size	Input Shaft									Output Shaft			KG	ltr <sup>3)</sup>
	i = 1.25 - 3.55			i = 4 - 5			M	V	W	D	L	M <sub>2</sub>		
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>								
H1..20	85	180	130	70	155	105	215	265	380	100	175	210	495	28
H1..21	95	180	130	80	180	130	260	310	530	110	180	220	665	40
H1..22	105	220	170	90	180	130	270	320	530	120	200	230	900	54
H1..23	115	220	170	95	180	130	280	330	650	140	225	260	1215	67
H1..24	130	250	200	110	220	170	320	370	650	160	260	295	1630	115
H1..25	145	250	200	120	220	170	360	410	650	170	270	305	2205	130
H1..26	160	300	250	130	250	200	360	410	650	190	300	345	2975	165

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	K	O	P	R	S
H1..20	225	893	303	319	387	314	270	280	588	640	918	520	23	180	—	36
H1..21	250	995	335	374	435	385	310	315	664	720	1010	570	27	195	—	45
H1..22	280	1095	370	405	474	400	340	355	741	800	1110	630	27	215	370	45
H1..23	315	1250	425	442	537	450	380	400	831	890	1260	705	33	240	420	55
H1..24	355	1365	465	482	598	515	410	450	908	990	1380	810	33	280	480	55
H1..25	400	1505	510	528	670	535	460	500	1013	1090	1565	910	33	315	540	55
H1..26	450	1710	580	593	753	600	510	560	1137	1210	1765	1025	39	355	615	65

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

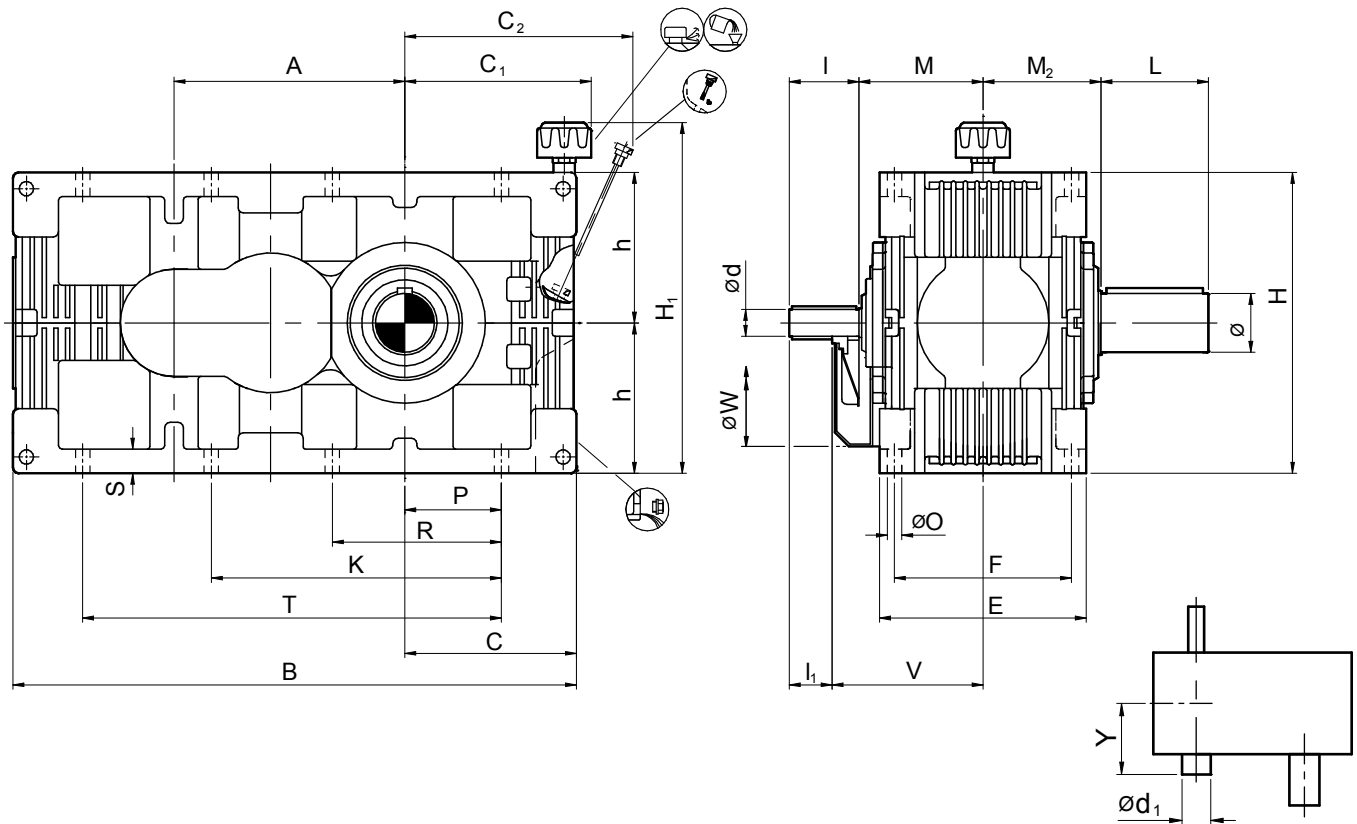
Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to ø50 k6; over ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick



Size	Input Shaft										Output Shaft			Back Stop		KG	l <sup>3)</sup> ltr			
	i = 5.6 - 12.5			i = 14 - 18			i = 22.4				M	V	W	D	L			M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>											
H2..14	25	100	—	20	100	—	20	100	—	140	—	—	48	95	125	95	190	85	3	
H2..15	30	110	—	25	100	—	—	—	—	155	—	—	55	95	135	110	210	115	4	
H2..16	35	110	65	30	110	65	20	100	55	155	200	270	60	130	145	135	220	165	5	
H2..17	45	130	85	35	110	65	25	100	55	160	205	300	70	135	150	140	230	220	6	
H2..18	50	130	85	40	130	85	—	—	—	180	225	300	80	160	170	150	250	300	10	

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
H2..14	190	488	162	198	194	190	150	125	278	330	—	14	80	140	24	310
H2..15	215	548	177	213	215	228	170	140	306	360	—	14	95	170	24	355
H2..16	240	615	195	228	231	233	190	160	327	400	—	14	110	195	24	400
H2..17	270	684	210	238	257	250	210	180	378	440	—	18	115	210	32	440
H2..18	305	764	236	263	281	284	230	200	404	480	—	18	135	240	32	505

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

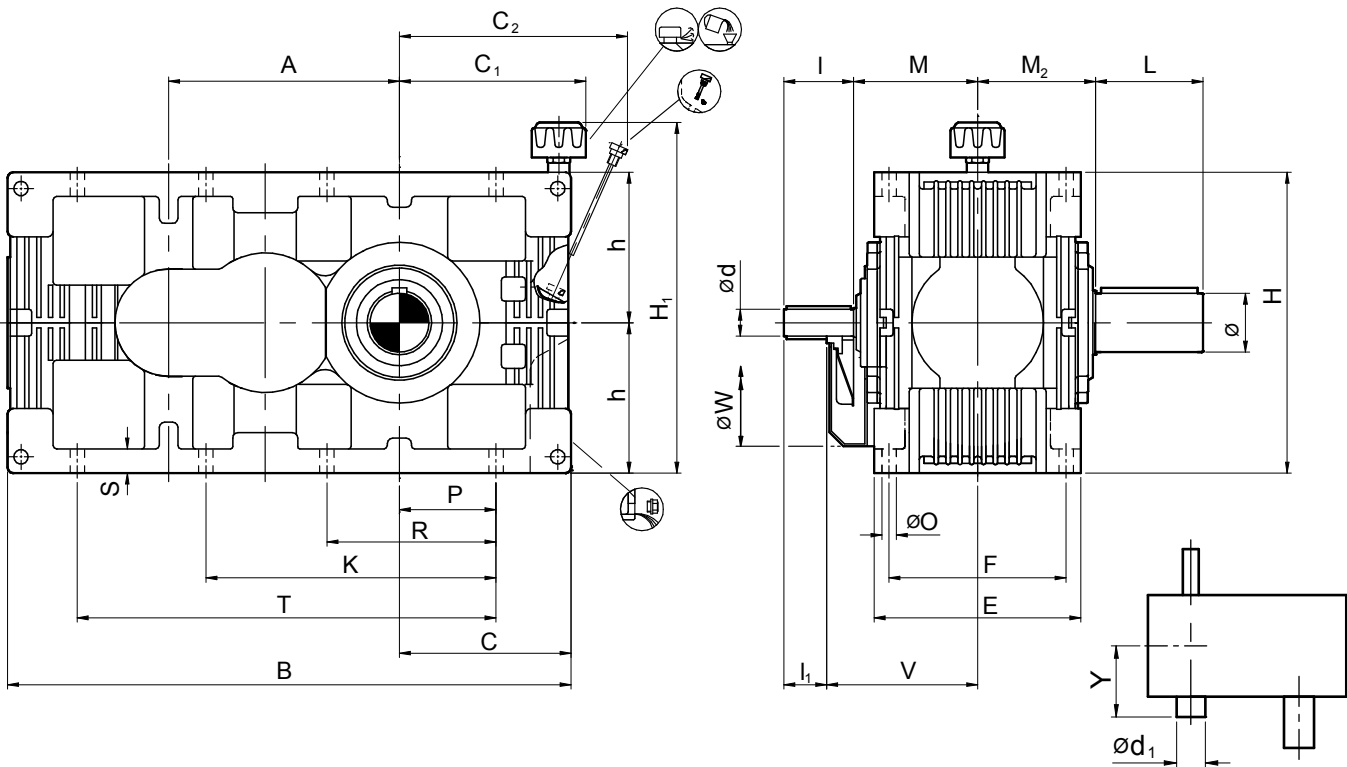
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE H2H

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### DOUBLE STAGE - SIZE 19 TO 26



Size	Input Shaft												Output Shaft			Back Stop		kg	l <sup>3)</sup>
	i = 5.6 - 12.5			i = 14 - 18			i = 22.4			M	V	W	D	L	M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>										
H2..19	55	135	85	45	130	80	35	110	60	195	245	320	90	165	180	175	280	405	13
H2..20	60	155	105	50	130	80	40	130	80	205	255	360	100	200	200	190	295	540	16
H2..21	70	155	105	55	135	85	—	—	—	245	295	360	110	200	220	210	335	735	24
H2..22	75	155	105	60	155	105	55	135	85	260	310	430	120	210	230	210	345	1015	33
H2..23	85	180	130	70	155	105	60	155	105	275	325	430	140	250	260	245	370	1365	46
H2..24	95	180	130	80	180	130	—	—	—	340	390	450	160	290	295	290	445	1845	65
H2..25	105	220	170	90	180	130	70	155	105	350	400	550	170	300	305	290	455	2515	90
H2..26	115	220	170	95	180	130	80	180	130	350	400	550	190	350	345	310	465	3390	120

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
H2..19	340	850	265	283	315	303	250	225	455	530	—	23	145	255	36	555
H2..20	385	945	288	304	345	314	270	250	496	580	—	23	165	290	36	635
H2..21	430	1050	320	359	394	385	310	280	572	650	—	27	180	315	45	705
H2..22	480	1170	355	390	429	400	340	315	635	720	—	27	200	355	45	785
H2..23	540	1335	405	422	481	450	380	355	705	800	—	33	220	405	55	875
H2..24	605	1465	435	452	541	515	410	400	795	890	—	33	245	450	55	975
H2..25	680	1605	475	493	591	535	460	450	865	990	—	33	280	510	55	1105
H2..26	765	1820	540	553	659	600	510	500	954	1090	940	39	315	575	65	1245

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

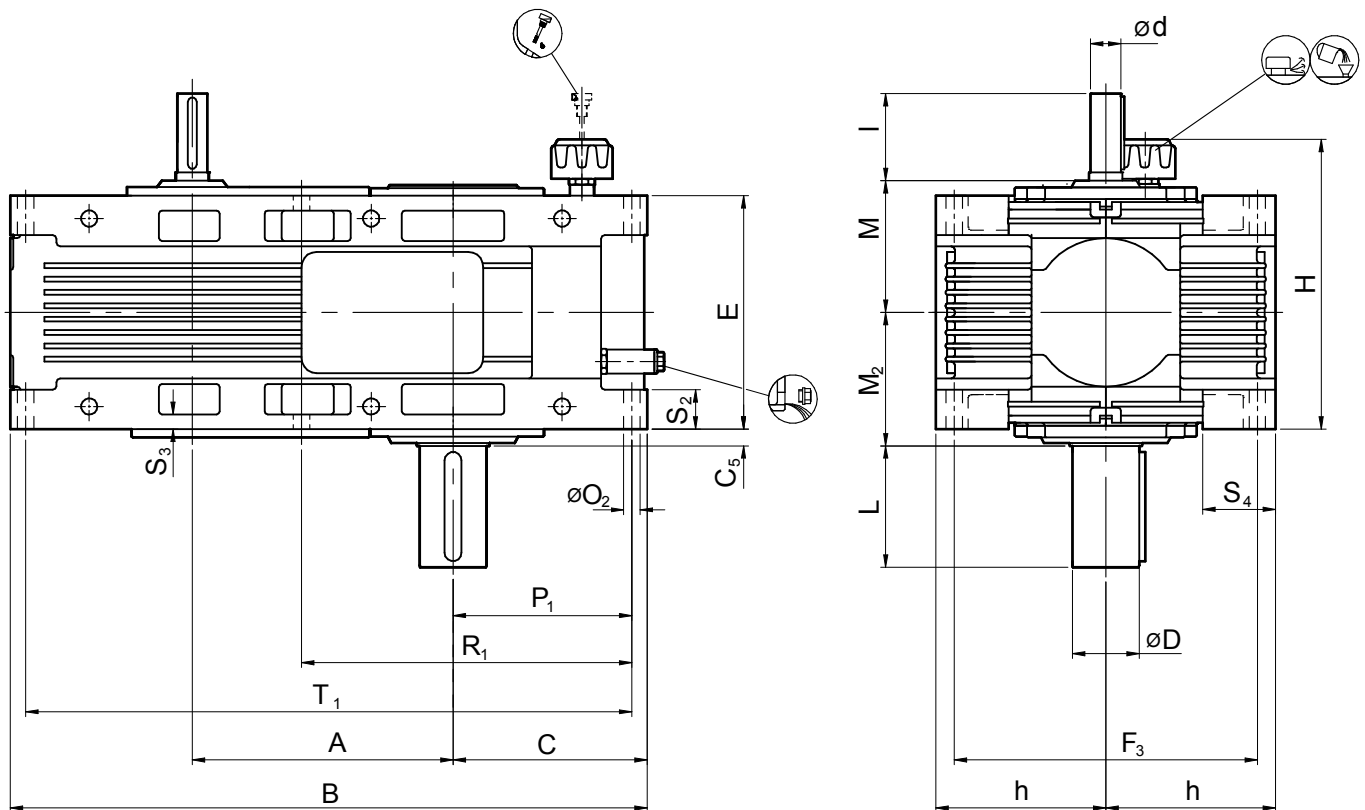
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

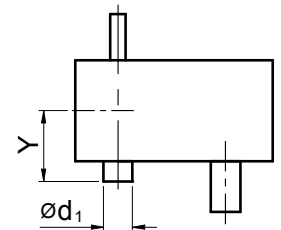
## TYPE H2V

### DOUBLE STAGE - SIZE 14 TO 18

### VERTICAL MOUNTING - HELICAL GEAR UNIT



Size	Input Shaft						Output Shaft					Back Stop		kg
	i = 5.6 - 12.5		i = 14 - 18		i = 22.4		M	D	L	M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
	d	l	d	l	d	l								
H2..14	25	100	20	100	20	100	140	48	95	125	95	190	85	
H2..15	30	110	25	100	—	—	155	55	95	135	110	210	115	
H2..16	35	110	30	110	20	100	155	60	130	145	135	220	165	
H2..17	45	130	35	110	25	100	160	70	135	150	140	230	220	
H2..18	50	130	40	130	—	—	180	80	160	170	150	250	300	



Size	Foundation															
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>	
H2..14	190	488	162	30	190	200	125	270	14	146	292	36	-	70	456	
H2..15	215	548	177	21	228	230	140	308	14	160	285	45	15	70	515	
H2..16	240	615	195	28.50	233	270	160	313	14	176	316	38	15	70	578	
H2..17	270	684	210	25	250	310	180	330	18	190	350	40	20	95	645	
H2..18	305	764	236	28	284	350	200	364	18	215	395	45	20	90	722	

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

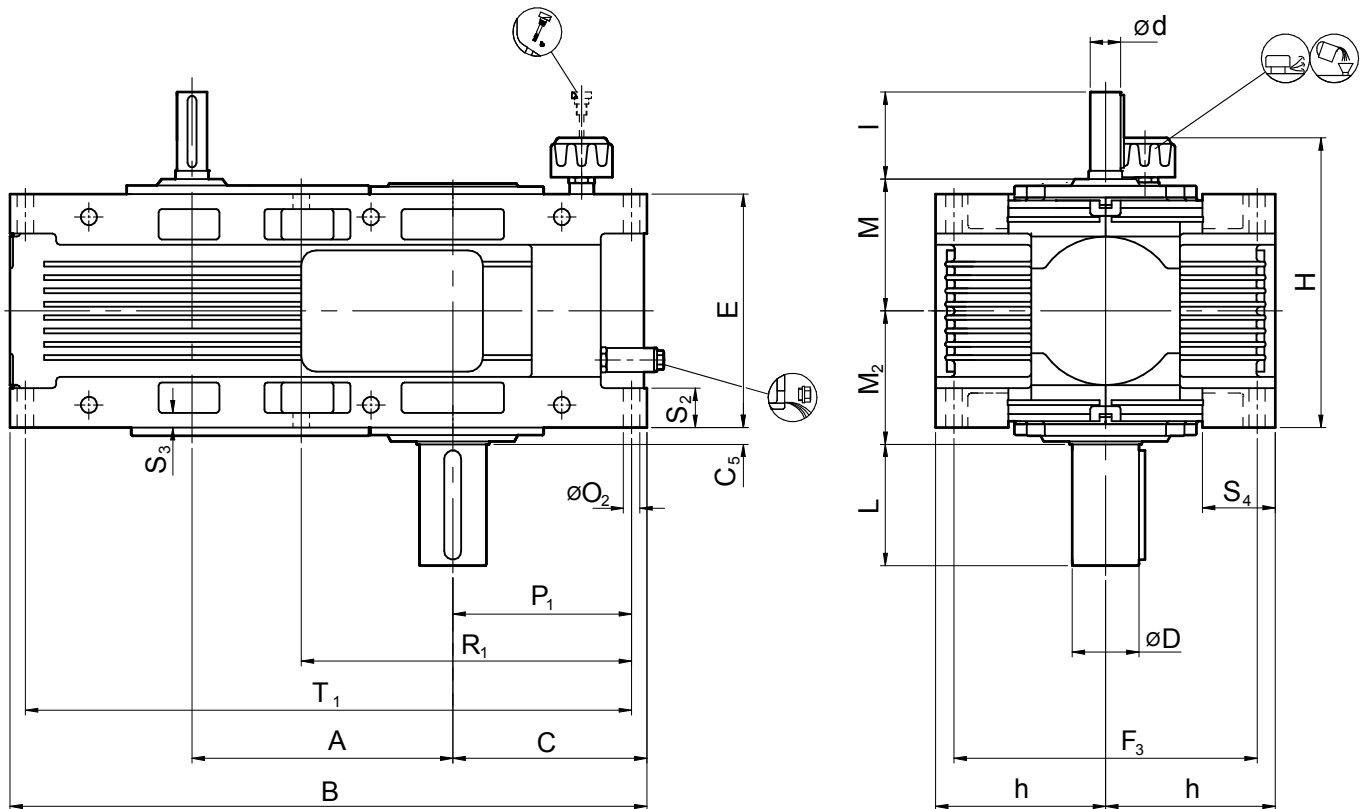
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

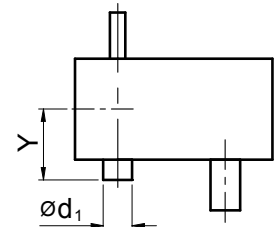
## TYPE H2V

### VERTICAL MOUNTING - HELICAL GEAR UNIT

### DOUBLE STAGE - SIZE 19 TO 26



Size	Input Shaft						Output Shaft			Back Stop		KG	
	i = 5.6 - 12.5		i = 14 - 18		i = 22.4		M	D	L	M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>		Y <sup>1)</sup>
	d	l	d	l	d	l							
H2..19	55	135	45	130	35	110	195	90	165	180	175	280	405
H2..20	60	155	50	130	40	130	205	100	200	200	190	295	540
H2..21	70	155	55	135	—	—	245	110	200	220	210	335	735
H2..22	75	155	60	155	55	135	260	120	210	230	210	345	1015
H2..23	85	180	70	155	60	155	275	140	250	260	245	370	1365
H2..24	95	180	80	180	—	—	340	160	290	295	290	445	1845
H2..25	105	220	90	180	70	155	350	170	300	305	290	455	2515
H2..26	115	220	95	180	80	180	350	190	350	345	310	465	3390



Size	Foundation															
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>	
H2..19	340	850	265	28.50	303	400	225	383	23	240	440	48.5	22	105	800	
H2..20	385	945	288	43	314	440	250	394	23	262	487	45	24	105	893	
H2..21	430	1050	320	27.5	385	500	280	475	27	295	545	65	28	120	1000	
H2..22	480	1170	355	30	400	560	315	490	27	325	605	60	28	120	1110	
H2..23	540	1335	405	35	450	630	355	540	33	370	685	70	35	150	1265	
H2..24	605	1465	435	37.5	515	700	400	605	33	398	753	87.5	35	150	1391	
H2..25	680	1605	475	37.5	535	800	450	625	33	436	836	80	35	150	1528	
H2..26	765	1820	540	45	600	890	500	700	39	495	945	100	45	175	1730	

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

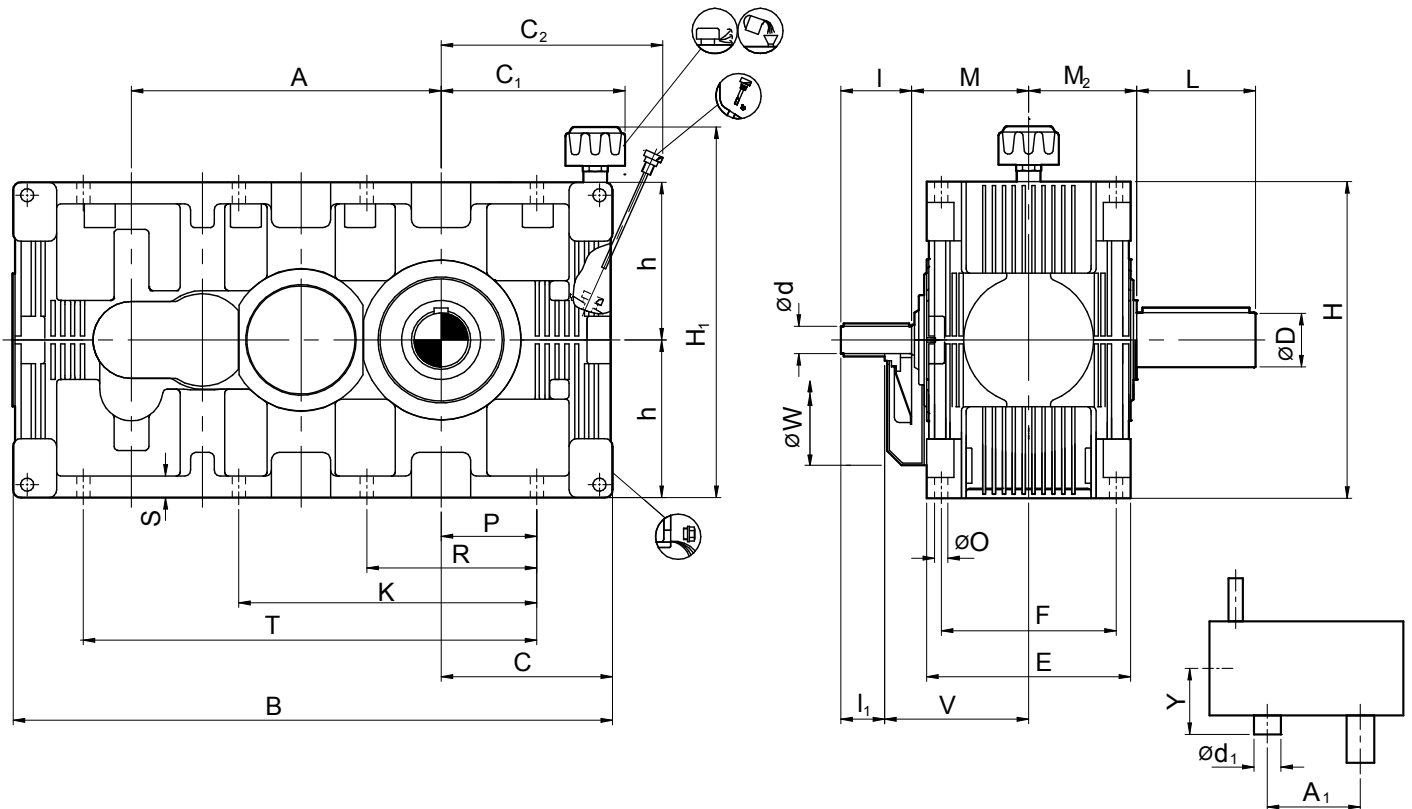
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE H3H

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 16 TO 18



Size	Input Shaft										Output Shaft			Back Stop			KG	l <sup>3)</sup> ltr						
	i = 20-50		i = 56-80		i = 112																			
	i = 25-63		i = 71-100		d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M	V	W			D	L	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M	V	W	D	L	M <sub>2</sub>	A <sub>1</sub>			d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>	KG	l <sup>3)</sup> ltr		
H3..16	24	100	50	19	100	50	19	100	50	155	200	270	60	130	145	240	95	215	180	9				
H3..17	28	100	50	24	100	50	19	100	50	160	205	270	70	135	150	270	95	215	240	10				
H3..18	30	110	60	25	100	50	—	—	—	180	225	300	80	160	170	305	140	265	325	12				

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
H3..16	311	631	175	231	195	233	190	160	327	400	—	14	110	195	24	450
H3..17	350	696	190	257	210	250	210	180	378	440	—	18	115	210	32	495
H3..18	395	787	215	281	236	284	230	200	404	480	—	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

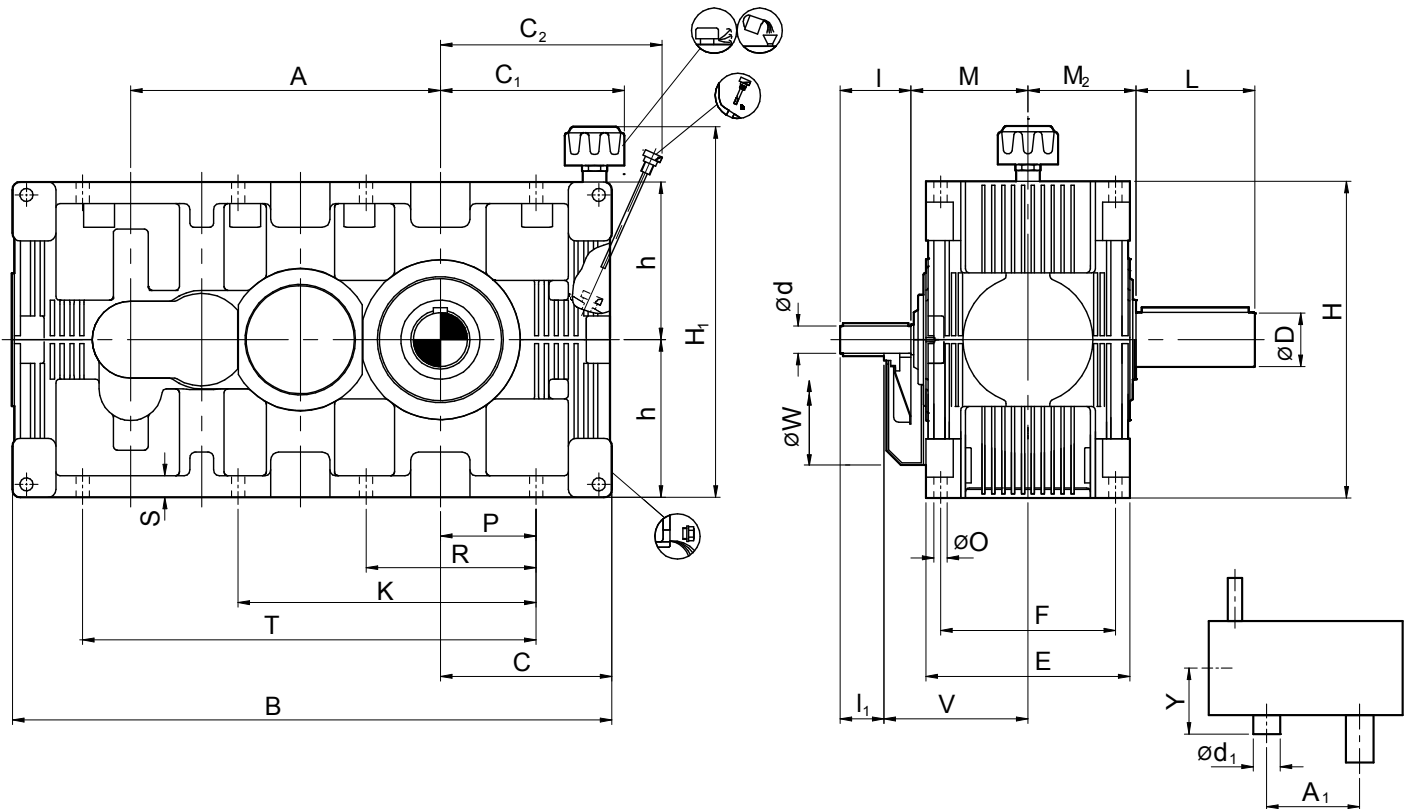
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE H3H

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 19 TO 26



Size	Input Shaft										Output Shaft			Back Stop			KG	l <sup>3)</sup> ltr		
	i = 20-50			i = 56-80			i = 112													
	i = 25-63			i = 71-100																
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>					d	l	l <sub>1</sub>	M	V	W			D	L
H3..19	35	110	60	30	110	60	25	100	50	190	240	320	90	165	180	340	150	265	445	16
H3..20	45	130	80	35	110	60	25	100	50	195	245	360	100	200	200	385	150	265	610	25
H3..21	50	130	80	40	130	80	—	—	—	240	290	360	110	200	220	430	190	340	810	32
H3..22	55	135	85	45	130	80	35	110	60	250	300	430	120	210	230	480	190	340	1080	43
H3..23	60	155	105	50	130	80	40	130	80	270	320	430	140	250	260	540	190	340	1455	61
H3..24	70	155	105	55	135	85	—	—	—	325	375	450	160	290	295	605	245	440	1950	85
H3..25	75	155	105	60	155	105	50	130	80	335	385	450	170	300	305	680	245	440	2655	120
H3..26	85	180	130	70	155	105	70	155	105	350	400	450	190	350	345	765	245	440	3525	170

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	O	P	R	S	T
H3..19	440	885	265	283	315	303	250	225	455	530	—	23	145	255	36	615
H3..20	495	987	288	304	345	314	270	250	496	580	—	23	165	290	36	705
H3..21	555	1098	320	359	394	385	310	280	572	650	—	27	180	315	45	780
H3..22	620	1220	355	390	429	400	340	315	635	720	—	27	200	355	45	880
H3..23	700	1377	405	422	481	450	380	355	705	800	655	33	220	405	55	985
H3..24	785	1520	435	452	541	515	410	400	795	890	740	33	245	450	55	1110
H3..25	880	1690	475	493	591	535	460	450	865	990	840	33	280	510	55	1245
H3..26	990	1920	540	553	659	600	510	500	954	1090	940	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

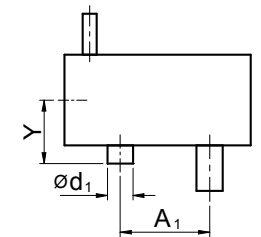
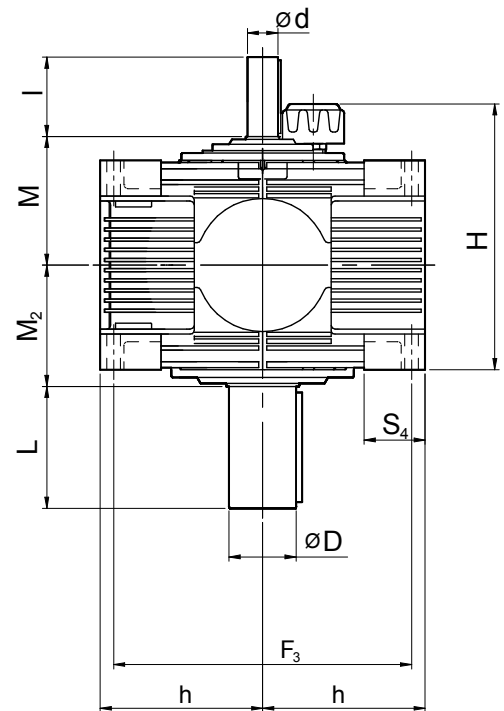
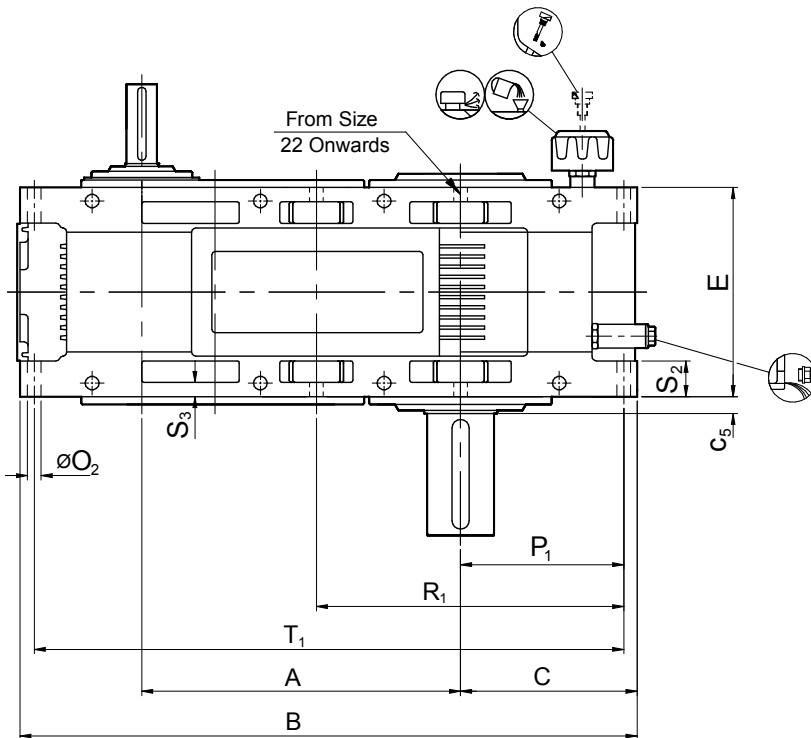
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE H3V

### TRIPLE STAGE - SIZE 16 TO 18

### VERTICAL MOUNTING - HELICAL GEAR UNIT



Size	Input Shaft							Output Shaft			Back Stop			KG
	i = 20-50		i = 56-80		i = 112									
	i = 25-63		i = 71-100											
	i = 25-71		i = 80-100											
d	l	d	l	d	l	M	D	L	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
H3..16	24	100	19	100	19	100	155	60	130	145	240	95	215	180
H3..17	28	100	24	100	19	100	160	70	135	150	270	95	215	240
H3..18	30	110	25	100	—	—	180	80	160	170	305	140	265	325

Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
H3..16	311	631	195	28.50	233	270	160	313	14	176	316	38	15	70	594
H3..17	350	696	210	25	250	310	180	330	18	190	350	40	20	90	655
H3..18	395	787	236	28	284	350	200	364	18	215	395	45	20	90	744

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level [maximum] marked on the dipstick

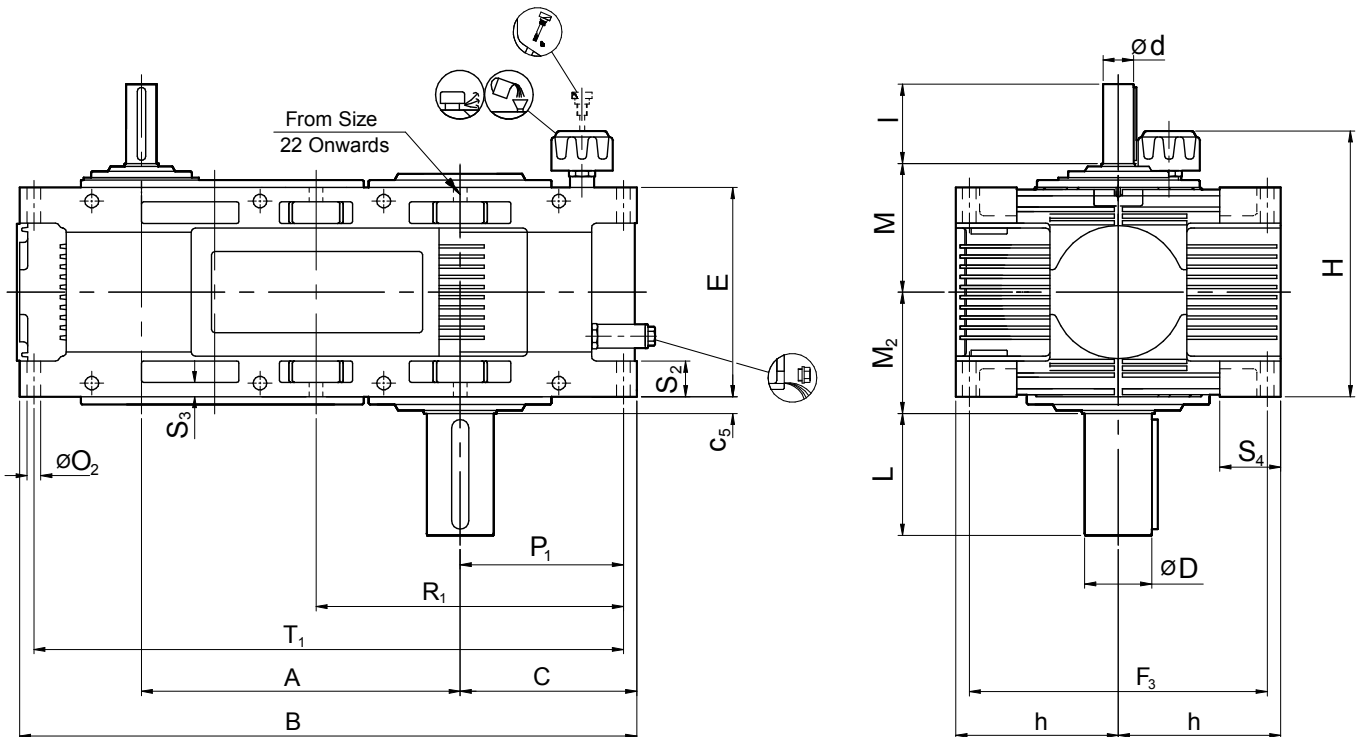


# SERIES E

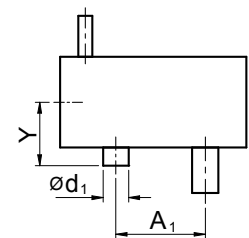
## TYPE H3V

### VERTICAL MOUNTING - HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 19 TO 26



Size	Input Shaft						Output Shaft			Back Stop		KG		
	i = 20-50		i = 56-80		i = 112									
	i = 25-63		i = 71-100											
	d	l	d	l			D	L	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>		Y <sup>1)</sup>	
H3..19	35	110	30	110	25	100	190	90	165	180	340	150	265	445
H3..20	45	130	35	110	25	100	195	100	200	200	385	150	265	610
H3..21	50	130	40	130	—	—	240	110	200	220	430	190	340	810
H3..22	55	135	45	130	35	110	250	120	210	230	480	190	340	1080
H3..23	60	155	50	130	40	130	270	140	250	260	540	190	340	1455
H3..24	70	155	55	135	—	—	325	160	290	295	605	245	440	1950
H3..25	75	155	60	155	50	130	335	170	300	305	680	245	440	2655
H3..26	85	180	70	155	70	155	350	190	350	345	765	245	440	3525



Size	Foundation															
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>	
H3..19	440	885	265	28.50	303	400	225	383	23	240	440	48.5	22	105	836	
H3..20	495	987	288	43	314	440	250	394	23	262	487	45	24	105	935	
H3..21	555	1098	320	27.50	385	500	280	475	27	295	545	65	28	120	1045	
H3..22	620	1220	355	30	400	560	315	490	27	325	605	60	28	120	1160	
H3..23	700	1377	405	35	450	630	355	540	33	370	685	70	35	150	1305	
H3..24	785	1520	435	37.5	515	700	400	605	33	398	753	87.5	35	150	1443	
H3..25	880	1690	475	37.5	535	800	450	625	33	436	836	80	35	150	1612	
H3..26	990	1920	540	45	600	890	500	700	39	495	945	100	45	175	1830	

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

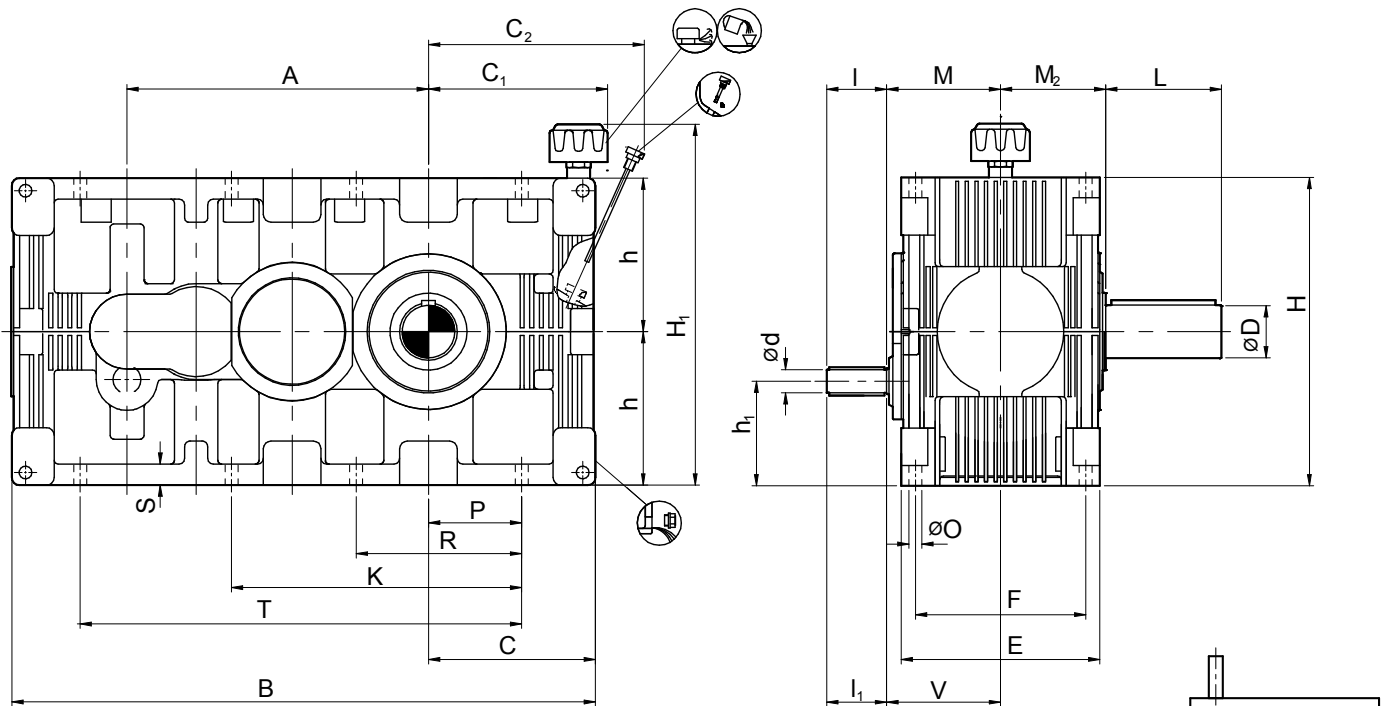
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE H4H

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### QUADRUPLE STAGE - SIZE 18 TO 26



Size	Input Shaft				Output Shaft			Back Stop			Kg	3) ltr		
	i = 90 - 225		i = 250 - 450											
	i = 125 - 355		i = 400 - 560		M	H <sub>1</sub>	D	L	M <sub>2</sub>	A <sub>1</sub>			d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
	d	l	d	l										
H4..18	20	50	19	50	170	137	80	160	170	395	95	255	325	15
H4..19	20	50	19	50	180	154	90	165	180	440	95	255	445	21
H4..20	20	50	20	50	190	170	100	200	200	495	95	255	610	25
H4..21	30	80	25	60	220	190	110	200	220	555	135	310	810	32
H4..22	35	80	25	60	230	215	120	210	230	620	135	310	1080	43
H4..23	40	110	35	80	260	245	140	250	260	700	140	310	1455	61
H4..24	40	110	40	110	295	275	160	290	295	785	175	415	1950	85
H4..25	45	110	45	110	305	310	170	300	305	880	175	415	2655	120
H4..26	50	110	50	110	345	340	190	350	345	990	190	415	3525	170

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
H4..18	395	787	236	263	281	284	230	200	404	480	—	18	135	240	32	565
H4..19	440	885	265	283	315	303	250	225	455	530	—	23	145	255	36	615
H4..20	495	987	288	304	345	314	270	250	496	580	—	23	165	290	36	705
H4..21	555	1098	320	359	394	385	310	280	572	650	—	27	180	315	45	780
H4..22	620	1220	355	390	429	400	340	315	635	720	—	27	200	355	45	880
H4..23	700	1377	405	422	481	450	380	355	705	800	655	33	220	405	55	985
H4..24	785	1520	435	452	541	515	410	400	795	890	740	33	245	450	55	1110
H4..25	880	1690	475	493	591	535	460	450	865	990	840	33	280	510	55	1245
H4..26	990	1920	540	553	659	600	510	500	954	1090	940	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

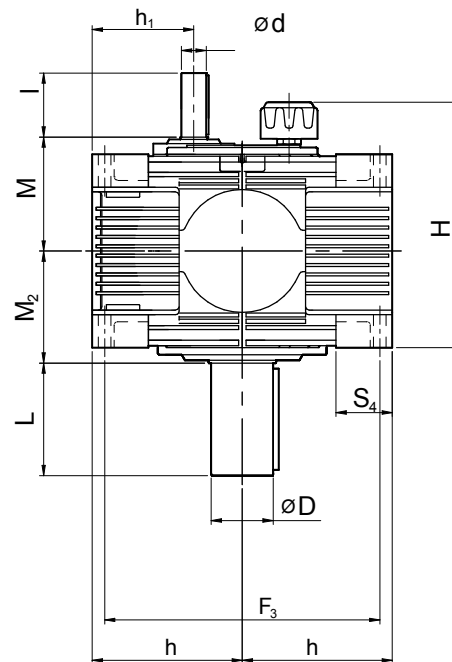
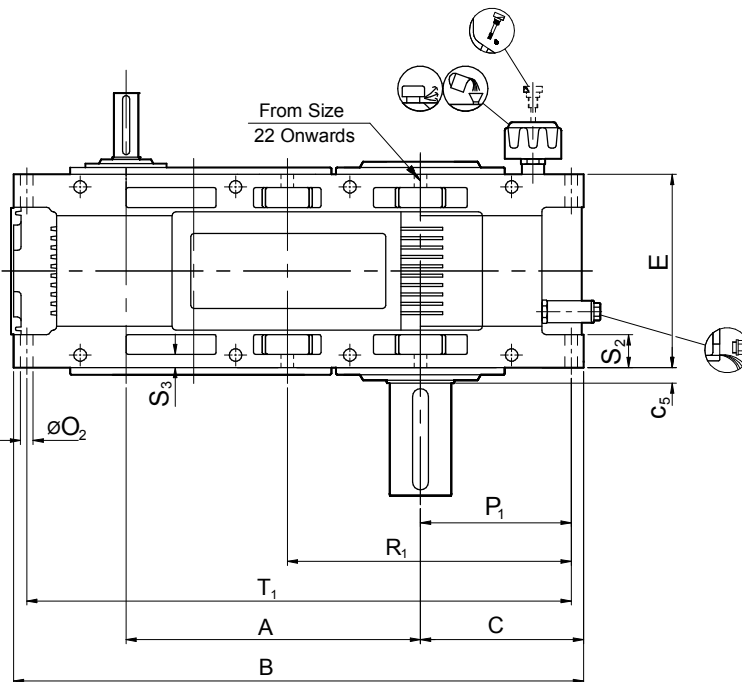
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

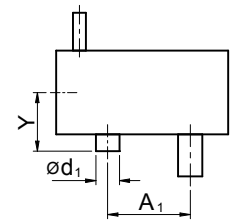
## TYPE H4V

### VERTICAL MOUNTING - HELICAL GEAR UNIT

### QUADRUPLE STAGE - SIZE 18 TO 26



Size	Input Shaft				Output Shaft			Back Stop			KG		
	i = 90 - 225		i = 250 - 450										
	i = 125 - 355		i = 400 - 560										
	d	l	d	l	M	H <sub>1</sub>	D	L	M <sub>2</sub>	A <sub>1</sub>		d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
H4..18	20	50	19	50	170	137	80	160	170	395	95	255	325
H4..19	20	50	19	50	180	154	90	165	180	440	95	255	445
H4..20	20	50	20	50	190	170	100	200	200	495	95	255	610
H4..21	30	80	25	60	220	190	110	200	220	555	135	310	810
H4..22	35	80	25	60	230	215	120	210	230	620	135	310	1080
H4..23	40	110	35	80	260	245	140	250	260	700	140	310	1455
H4..24	40	110	40	110	295	275	160	290	295	785	175	415	1950
H4..25	45	110	45	110	305	310	170	300	305	880	175	415	2655
H4..26	50	110	50	110	345	340	190	350	345	990	190	415	3525



Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
H4..18	395	787	236	28	284	350	200	364	18	215	395	45	20	90	744
H4..19	440	885	265	28.50	303	400	225	383	23	240	440	48.5	22	105	836
H4..20	495	987	288	43	314	440	250	394	23	262	487	45	24	105	935
H4..21	555	1098	320	27.50	385	500	280	475	27	295	545	65	28	120	1045
H4..22	620	1220	355	30	400	560	315	490	27	325	605	60	28	120	1160
H4..23	700	1377	405	35	450	630	355	540	33	370	685	70	35	150	1305
H4..24	785	1520	435	37.5	515	700	400	605	33	398	753	87.5	35	150	1443
H4..25	880	1690	475	37.5	535	800	450	625	33	436	836	80	35	150	1612
H4..26	990	1920	540	45	600	890	500	700	39	495	945	100	45	175	1830

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

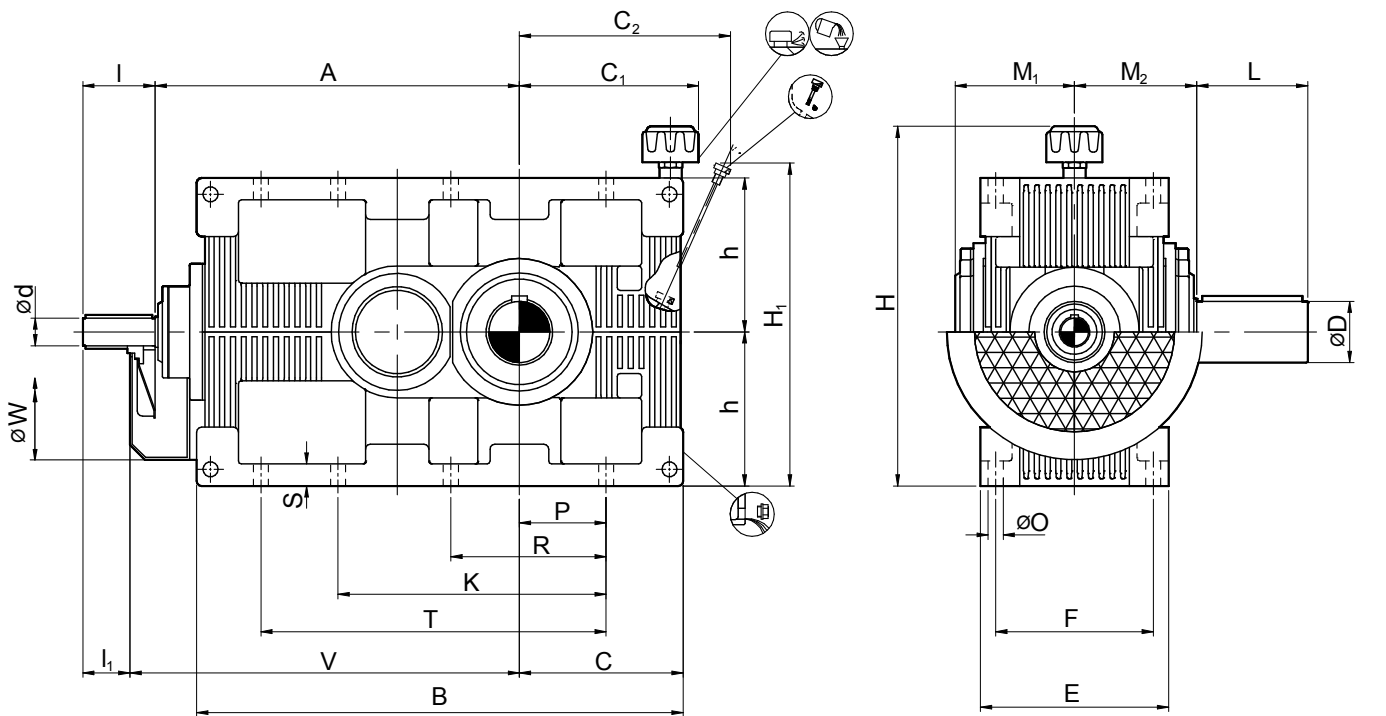
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B2H DOUBLE STAGE - SIZE 11 TO 18



Size	Input Shaft						V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>	kg	ltr <sup>3)</sup>
	i = 5-12.5		i = 14-18														
	i = 5.6-14		i = 16-20														
	i = 6.3-16		i = 18-22.4														
B2..11	19	90	40	19	90	40	325	210	32	55	94	105	80	95	180	40	2.5
B2..13	24	100	50	24	100	50	390	270	45	95	106	115	100	105	190	75	3.5
B2..15	32	110	60	28	100	50	465	300	55	95	127	135	125	140	255	135	6.0
B2..17	42	130	80	38	110	60	570	360	70	135	141	150	160	175	255	250	10.5
B2..18	48	130	80	42	130	80	635	360	80	160	158	170	180	190	305	330	16

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	O	P	R	S	T
B2..11	275	356	140	176	171	180	150	100	248	260	—	14	50	95	24	215
B2..13	340	435	155	192	195	190	150	125	295	330	—	14	65	120	24	270
B2..15	415	520	182	218	231	228	170	160	352	400	—	14	95	170	24	355
B2..17	520	640	220	248	282	250	210	200	432	480	—	18	115	210	32	440
B2..18	585	716	246	273	311	284	230	225	475	530	—	18	135	240	32	505

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

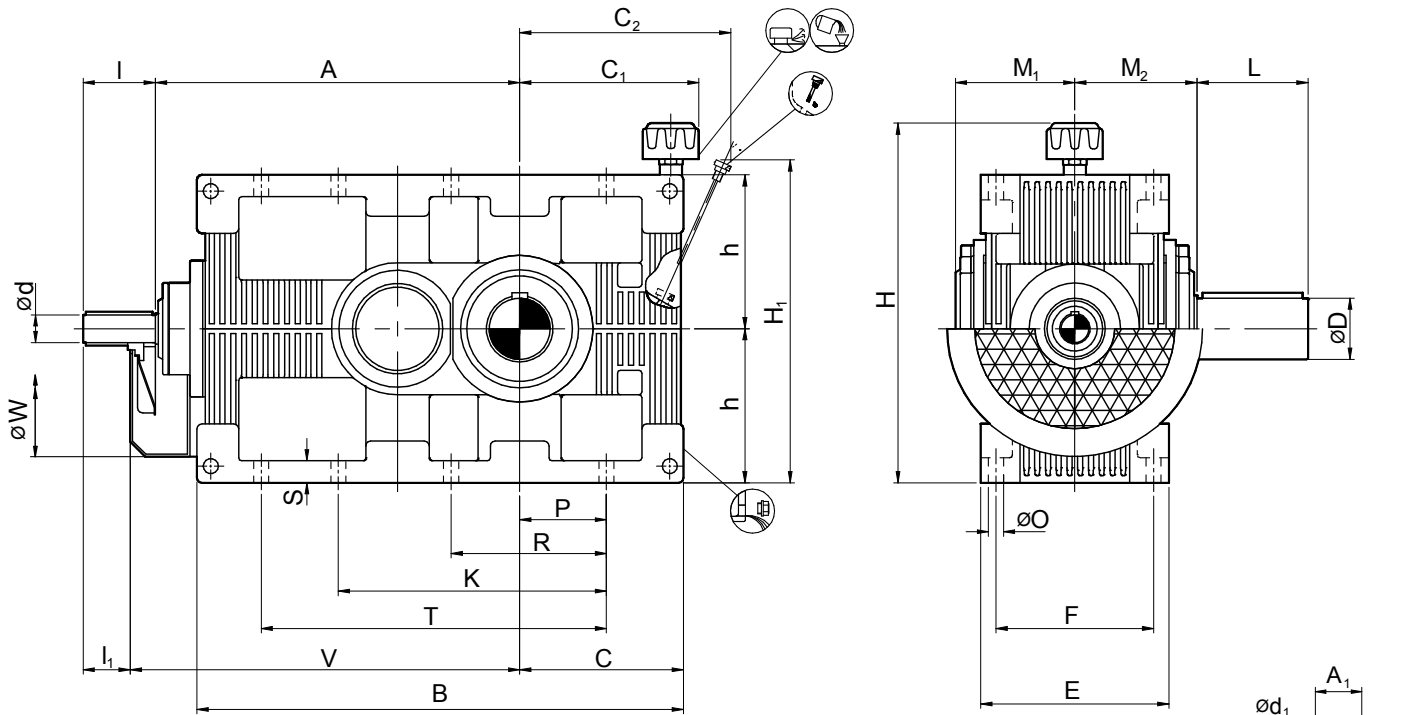
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B2H DOUBLE STAGE - SIZE 20 TO 26



Size	Input Shaft						Output Shaft				Back Stop			kg	ltr <sup>3)</sup>		
	i = 5-12.5		i = 14-18														
	i = 5.6-14		i = 16-20														
	i = 6.3-16		i = 18-22.4														
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
B2..20	58	135	85	52	135	85	770	460	100	200	176	200	225	210	305	595	24
B2..21	65	155	105	65	155	105	840	530	110	200	210	220	250	245	390	795	39
B2..22	70	155	105	70	155	105	925	550	120	210	220	230	280	290	390	1080	52
B2..23	85	180	130	80	180	130	1025	550	140	250	234	260	315	290	390	1455	65
B2..24	90	180	130	90	180	130	1135	650	160	290	283	295	355	310	470	1960	115
B2..25	100	220	170	100	220	170	1265	700	170	300	293	305	400	310	470	2650	130
B2..26	110	220	170	110	220	170	1415	700	190	350	306	345	450	400	470	3570	165

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
B2..20	720	893	303	319	387	314	270	280	588	640	—	23	165	290	36	635
B2..21	790	995	335	374	435	385	310	315	664	720	—	27	180	315	45	705
B2..22	875	1095	370	405	474	400	340	355	741	800	—	27	200	355	45	785
B2..23	975	1250	425	442	537	450	380	400	831	890	—	33	220	405	55	875
B2..24	1085	1365	465	482	598	515	410	450	908	990	—	33	245	450	55	975
B2..25	1215	1505	510	528	670	535	460	500	1013	1090	—	33	280	510	55	1105
B2..26	1365	1710	580	593	753	600	510	560	1137	1210	940	39	315	575	65	1245

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to  $\varnothing 50$  k6; over  $\varnothing 50$  m6.

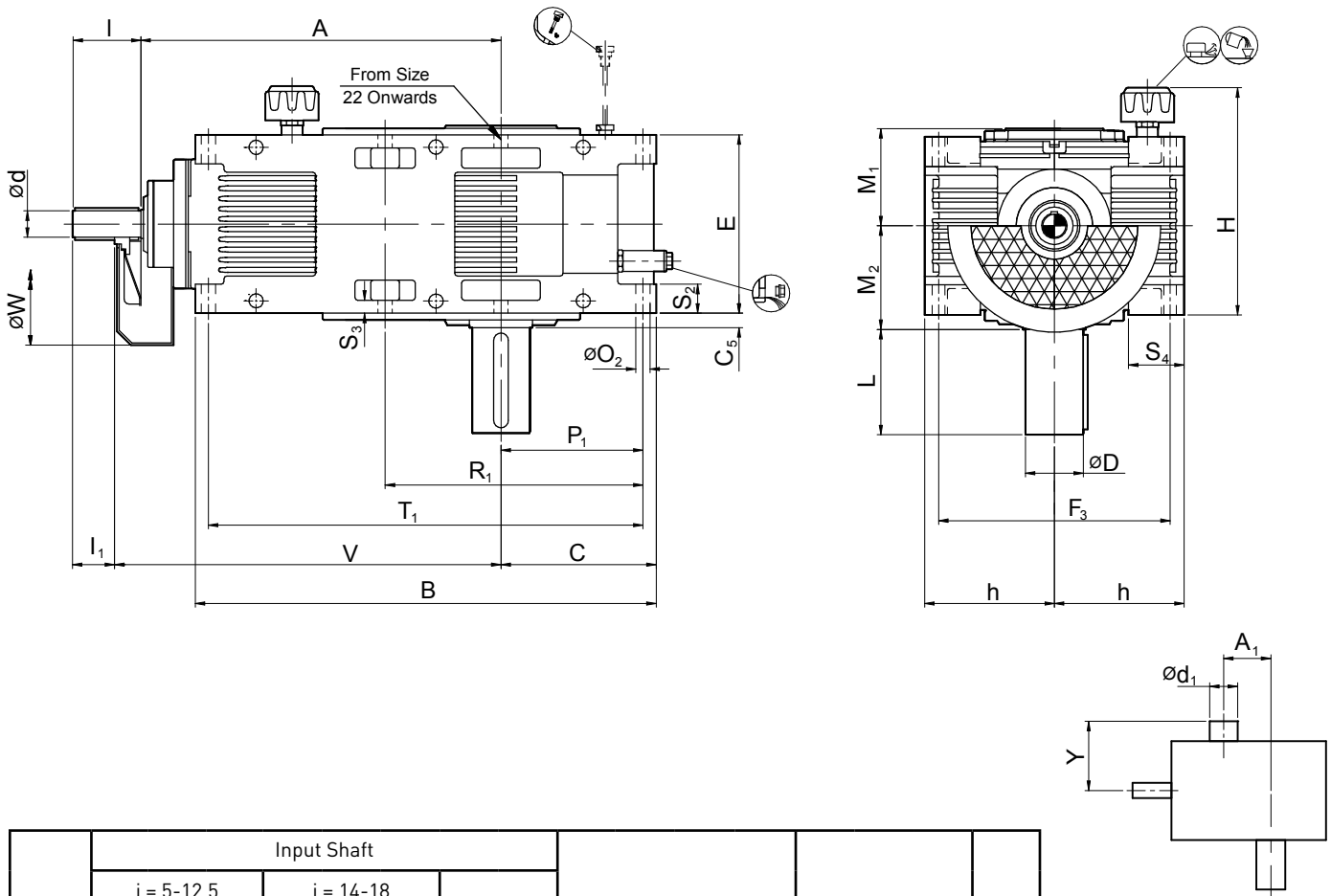
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B2V DOUBLE STAGE - SIZE 11 TO 18



Size	Input Shaft						V	W	Output Shaft				Back Stop			KG
	i = 5-12.5			i = 14-18					D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>	
	i = 5.6-14			i = 16-20												
	i = 6.3-16			i = 18-22.4												
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>											
B2..11	19	90	40	19	90	40	325	210	32	55	94	105	80	95	180	40
B2..13	24	100	50	24	100	50	390	270	45	95	106	115	100	105	190	75
B2..15	32	110	60	28	100	50	365	300	55	95	127	135	125	140	255	135
B2..17	42	130	80	38	110	60	570	360	70	135	141	150	160	175	255	250
B2..18	48	130	80	42	130	80	635	360	80	160	158	170	180	190	305	330

Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
B2..11	275	356	140	22.50	180	160	100	225	14	124	—	—	14	66	324
B2..13	340	435	155	20	190	210	125	270	14	140	—	—	15	66	406
B2..15	415	520	182	21	228	270	160	308	14	165	290	45	15	70	486
B2..17	520	640	220	25	250	350	200	330	18	202	362	40	20	90	604
B2..18	585	716	246	28	284	400	225	364	18	224	404	45	20	90	672

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

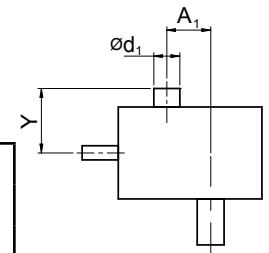
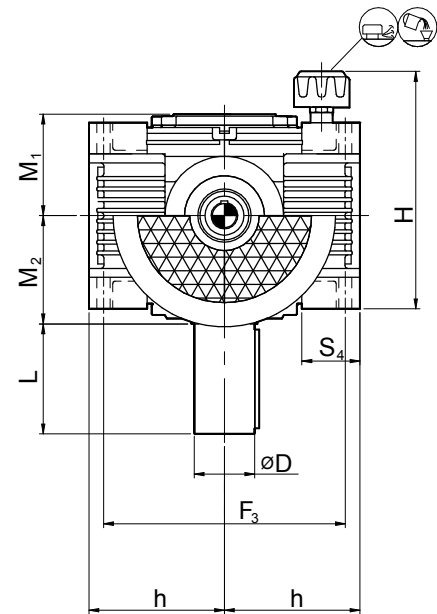
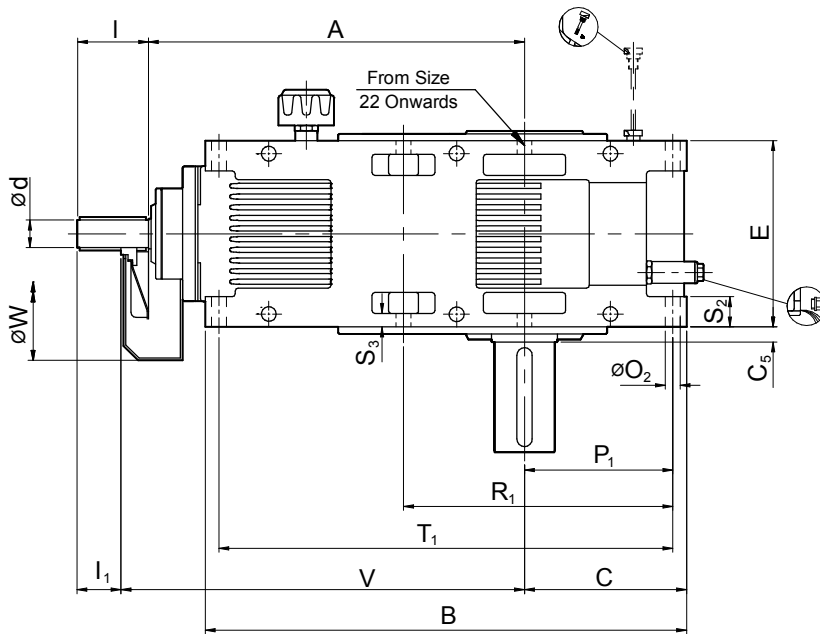
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B2V DOUBLE STAGE - SIZE 20 TO 26



Size	Input Shaft						Output Shaft		Back Stop		kg	ltr					
	i = 5-12.5			i = 14-18													
	i = 5.6-14			i = 16-20													
	i = 6.3-16			i = 18-22.4													
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
B2..20	58	135	85	52	135	85	770	460	100	200	176	200	225	210	305	595	18
B2..21	65	155	105	65	155	105	840	530	110	200	210	220	250	245	390	795	25
B2..22	70	155	105	70	155	105	925	550	120	210	220	230	280	290	390	1080	36
B2..23	85	180	130	80	180	130	1025	550	140	250	234	260	315	290	390	1455	51
B2..24	90	180	130	90	180	130	1135	650	160	290	283	295	355	310	470	1960	69
B2..25	100	220	170	100	220	170	1265	700	170	300	293	305	400	310	470	2650	95
B2..26	110	220	170	110	220	170	1415	700	190	350	306	345	450	400	470	3570	130

Size	Foundation															
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>	
B2..20	720	893	303	43	314	500	280	394	23	276	501	45	24	105	839	
B2..21	790	995	335	27.5	385	570	315	475	27	305	555	65	28	120	935	
B2..22	875	1095	370	30	400	640	355	490	27	339	619	60	28	120	1033	
B2..23	975	1250	425	35	450	720	400	540	33	386	701	70	35	150	1173	
B2..24	1085	1365	465	37.5	515	800	450	605	33	426	781	87.5	35	150	1287	
B2..25	1215	1505	510	37.5	535	900	500	625	33	474	874	80	35	150	1432	
B2..26	1365	1710	580	45	600	1010	560	700	39	532	982	100	45	175	1614	

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to  $\varnothing 50$  k6; over  $\varnothing 50$  m6.

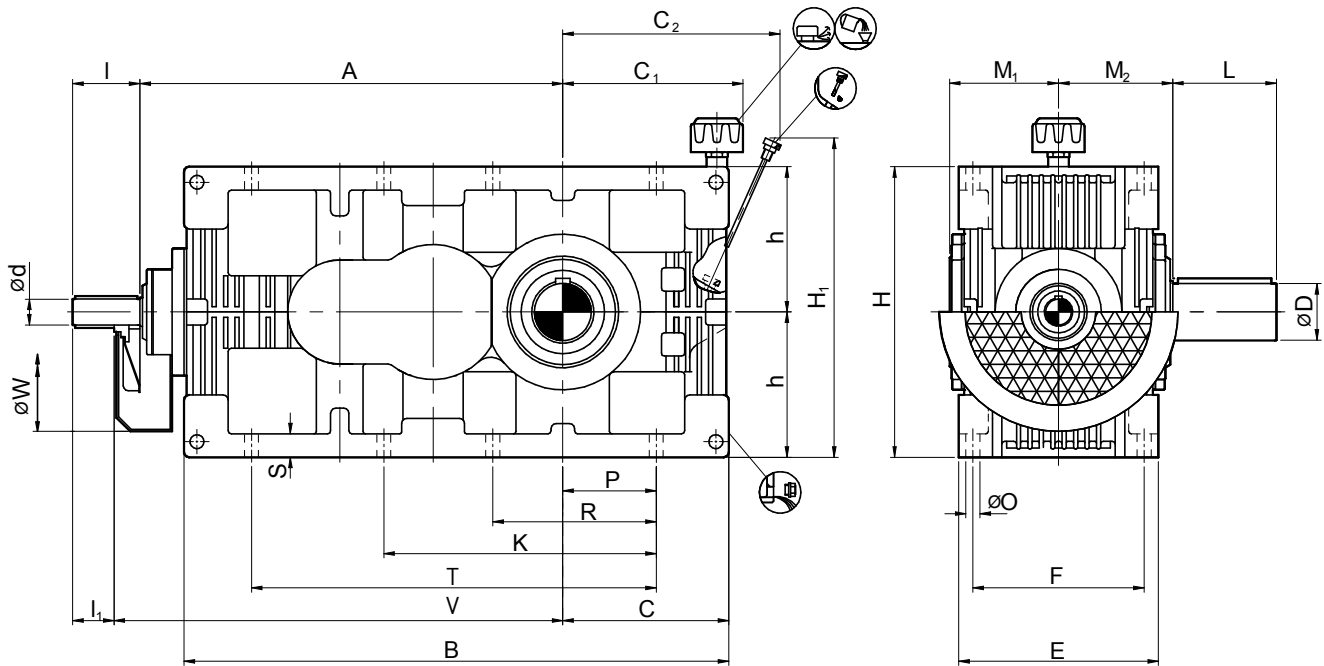
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B3H TRIPLE STAGE - SIZE 14 TO 18



Size	Input Shaft						Output Shaft				Back Stop			kg	ltr <sup>3)</sup>		
	i = 20-50			i = 56-71													
	i = 22.4-63			i = 71-90													
	i = 25-71			i = 80-100													
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>			d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
B3..14	19	90	40	19	90	40	435	240	48	95	106	125	190	90	180	105	4.5
B3..15	24	100	50	24	100	50	470	270	55	95	127	135	215	95	215	145	5.5
B3..16	24	100	50	24	100	50	530	300	60	130	133	145	240	95	215	195	8.5
B3..17	28	100	50	24	100	50	580	340	70	135	141	150	270	95	215	265	11
B3..18	32	110	60	28	100	50	645	360	80	160	158	170	305	140	265	355	15

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	O	P	R	S	T
B3..14	385	488	162	198	194	190	150	125	278	330	—	14	80	140	24	345
B3..15	420	548	177	213	215	228	170	140	306	360	—	14	95	170	24	395
B3..16	480	615	195	228	231	233	190	160	327	400	—	14	110	195	24	450
B3..17	530	684	210	238	257	250	210	180	378	440	—	18	115	210	32	495
B3..18	595	764	236	263	281	284	230	200	404	480	—	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

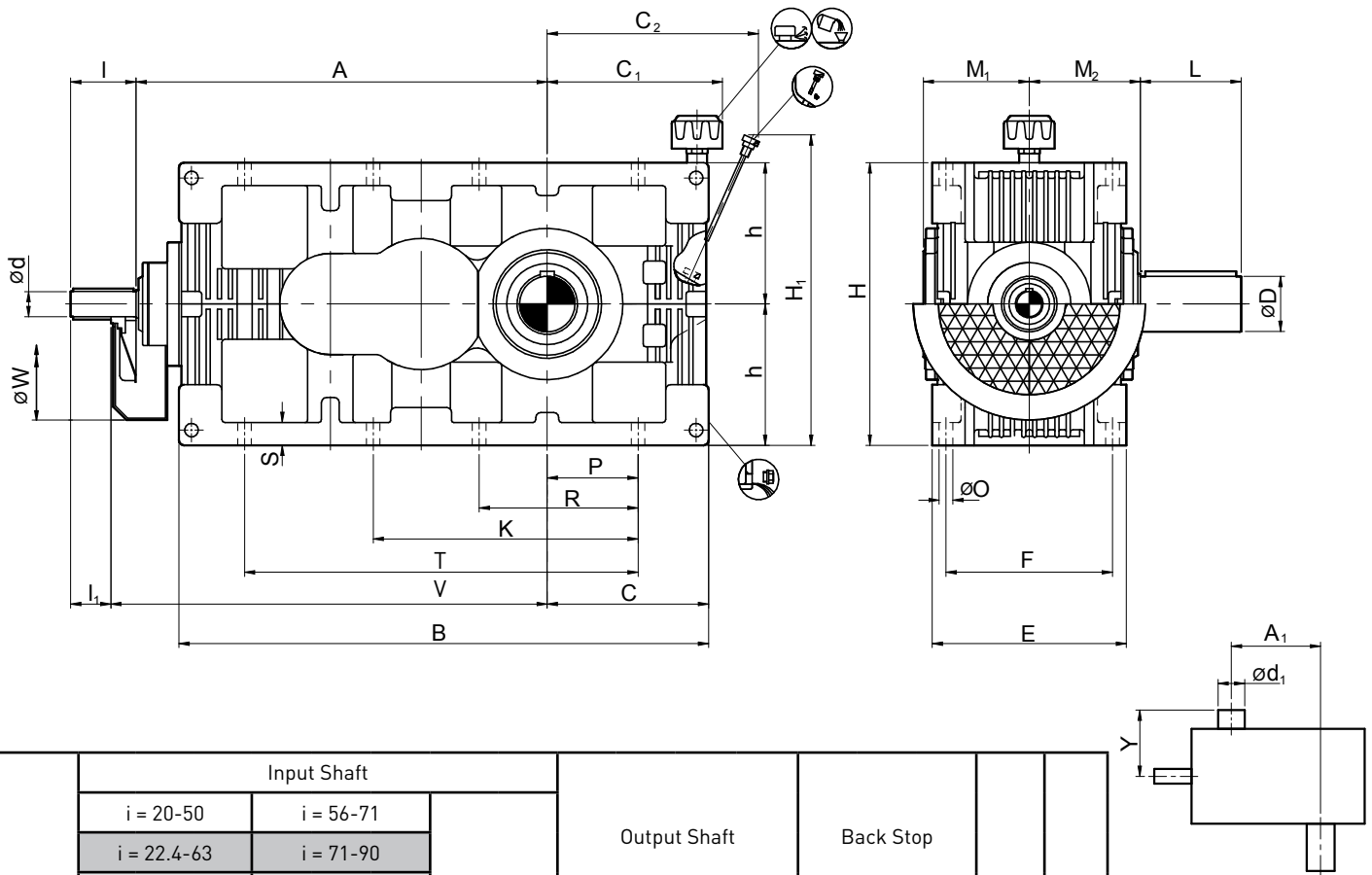
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick



# SERIES E

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B3H TRIPLE STAGE - SIZE 19 TO 26



Size	Input Shaft						Output Shaft				Back Stop			KG	ltr <sup>3)</sup>		
	i = 20-50			i = 56-71													
	i = 22.4-63			i = 71-90													
	i = 25-71			i = 80-100													
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
B3..19	38	110	60	32	110	60	710	360	90	165	171	180	340	150	265	480	21
B3..20	42	130	80	38	110	60	795	400	100	200	176	200	385	150	265	645	30
B3..21	48	130	80	42	130	80	885	460	110	200	210	220	430	190	340	870	37
B3..22	52	130	80	48	130	80	970	530	120	210	220	230	480	190	340	1170	50
B3..23	58	135	85	52	130	80	1085	550	140	250	234	260	540	190	340	1590	70
B3..24	65	155	105	65	155	105	1195	600	160	290	283	295	605	245	440	2145	95
B3..25	70	155	105	70	155	105	1325	650	170	300	293	305	680	245	440	2895	130
B3..26	85	180	130	80	180	130	1475	700	190	350	306	345	765	245	440	3885	185

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	O	P	R	S	T
B3..19	660	850	265	283	315	303	250	225	455	530	—	23	145	255	36	615
B3..20	745	945	288	304	345	314	270	250	496	580	—	23	165	290	36	705
B3..21	835	1050	320	359	394	385	310	280	572	650	—	27	180	315	45	780
B3..22	920	1170	355	390	429	400	340	315	635	720	—	27	200	355	45	880
B3..23	1035	1335	405	422	481	450	380	355	705	800	655	33	220	405	55	985
B3..24	1145	1465	435	452	541	515	410	400	795	890	740	33	245	450	55	1110
B3..25	1275	1605	475	493	591	535	460	450	865	990	840	33	280	510	55	1245
B3..26	1425	1820	540	553	659	600	510	500	954	1090	940	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

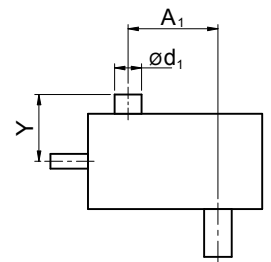
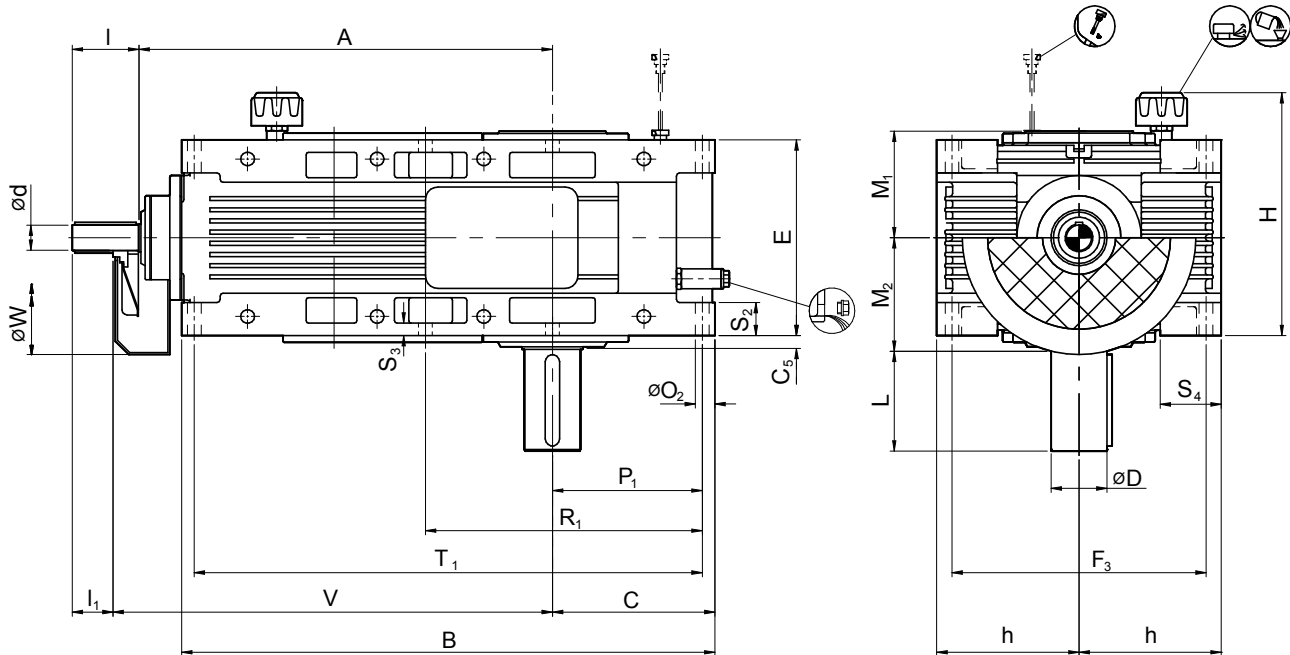
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B3V TRIPLE STAGE - SIZE 14 TO 18



Size	Input Shaft						Output Shaft				Back Stop		KG			
	i = 20-50			i = 56-71												
	i = 22.4-63			i = 71-90												
	i = 25-71			i = 80-100												
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
B3..14	19	90	40	19	90	40	435	240	48	95	106	125	190	90	180	105
B3..15	24	100	50	24	100	50	470	270	55	95	127	135	215	95	215	145
B3..16	24	100	50	24	100	50	530	300	60	130	133	145	240	95	215	195
B3..17	28	100	50	24	100	50	580	340	70	135	141	150	270	95	215	265
B3..18	32	110	60	28	100	50	645	360	80	160	158	170	305	140	265	355

Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
B3..14	385	488	162	30	190	200	125	270	14	146	292	36	—	70	456
B3..15	420	548	177	21	228	230	140	308	14	160	285	45	15	70	515
B3..16	480	615	195	28.50	233	270	160	313	14	176	316	38	15	70	578
B3..17	530	684	210	25	250	310	180	330	18	190	350	40	20	95	645
B3..18	595	764	236	28	284	350	200	364	18	215	395	45	20	90	722

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

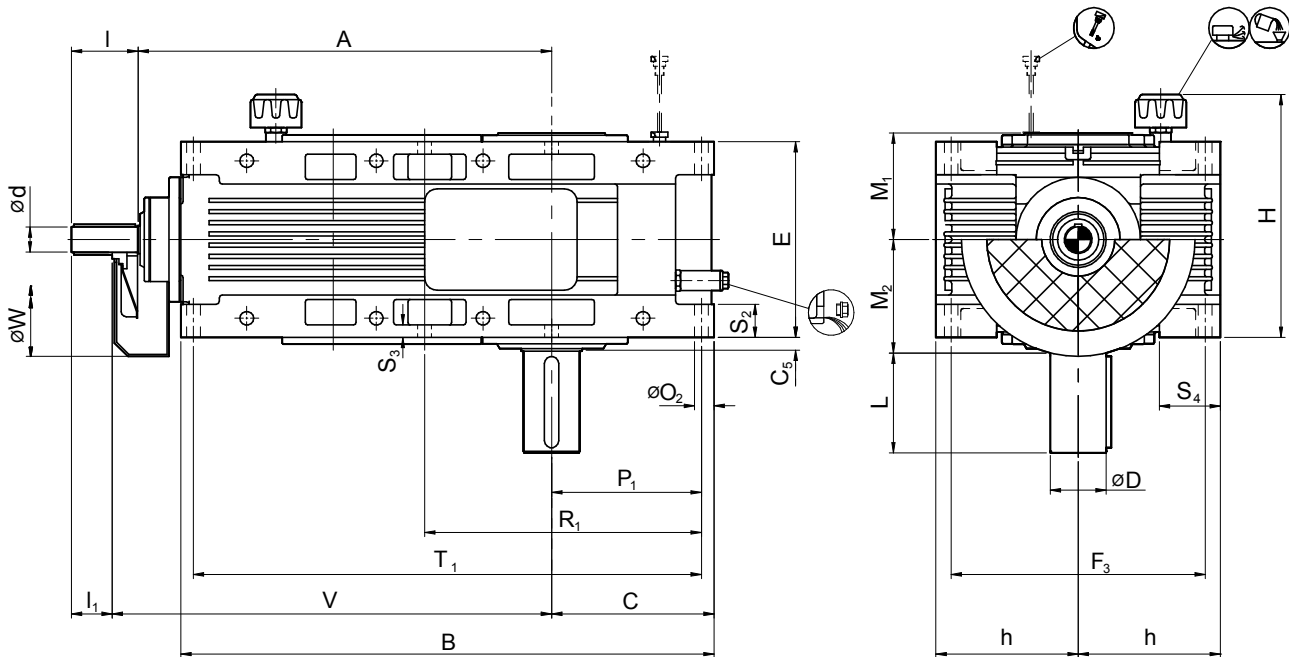
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

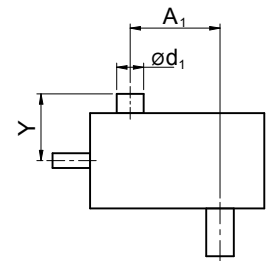
# SERIES E

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B3V TRIPLE STAGE - SIZE 19 TO 26



Size	Input Shaft						Output Shaft				Back Stop			KG		
	i = 20-50			i = 56-71												
	i = 22.4-63			i = 71-90												
	i = 25-71			i = 80-100												
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
B3..19	38	110	60	32	110	60	710	360	90	165	171	180	340	150	265	480
B3..20	42	130	80	38	110	60	795	400	100	200	176	200	385	150	265	645
B3..21	48	130	80	42	130	80	885	460	110	200	210	220	430	190	340	870
B3..22	52	130	80	48	130	80	970	530	120	210	220	230	480	190	340	1170
B3..23	58	135	85	52	130	80	1085	550	140	250	234	260	540	190	340	1590
B3..24	65	155	105	65	155	105	1195	600	160	290	283	295	605	245	440	2145
B3..25	70	155	105	70	155	105	1325	650	170	300	293	305	680	245	440	2895
B3..26	85	180	130	80	180	130	1475	700	190	350	306	345	765	245	440	3885



Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
B3..19	660	850	265	28.50	303	400	225	383	23	240	440	48.5	22	105	800
B3..20	745	945	288	43	314	440	250	394	23	262	487	45	24	105	893
B3..21	835	1050	320	27.50	385	500	280	475	27	295	545	65	28	120	1000
B3..22	920	1170	355	30	400	560	315	490	27	325	605	60	28	120	1110
B3..23	1035	1335	405	35	450	630	355	540	33	370	685	70	35	150	1265
B3..24	1145	1465	435	37.5	515	700	400	605	33	398	753	87.5	35	150	1391
B3..25	1275	1605	475	37.5	535	800	450	625	33	436	836	80	35	150	1528
B3..26	1425	1820	540	45	600	890	500	700	39	495	945	100	45	175	1730

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

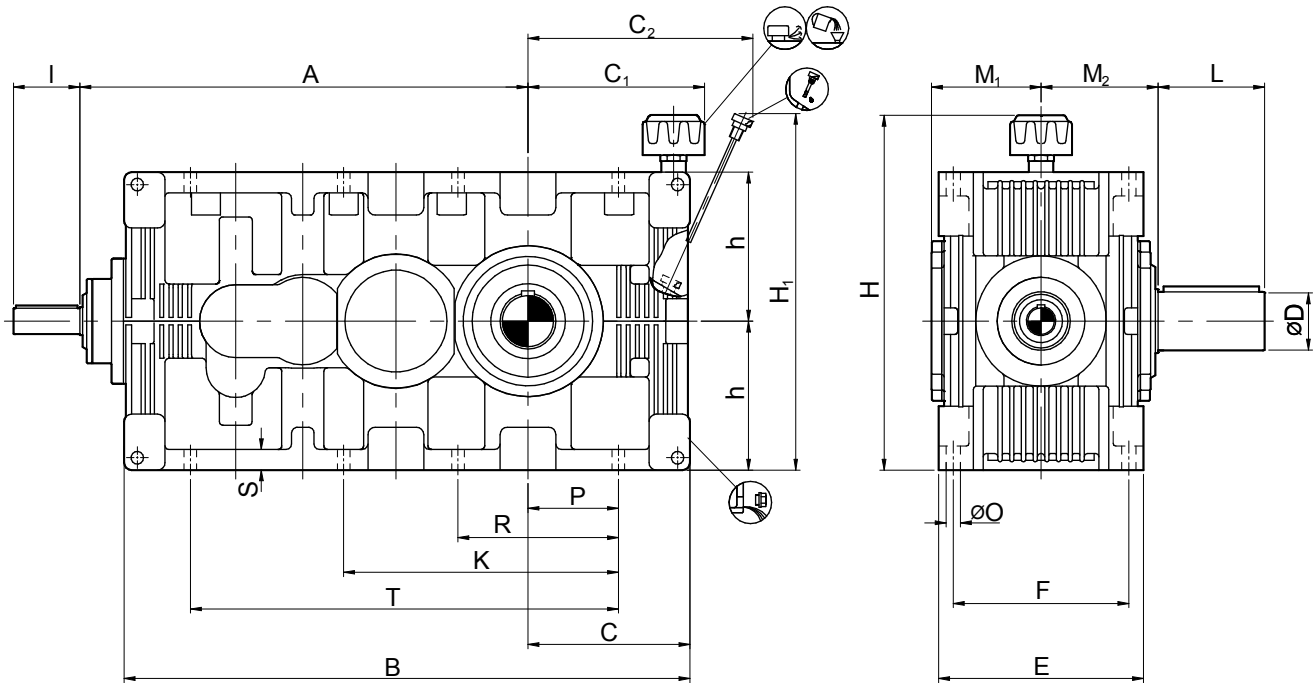
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B4H QUADRUPLE STAGE - SIZE 17 TO 18



Size	Input Shaft				Output Shaft				Back Stop			KG	ltr <sup>3)</sup>
	i = 80-225		i = 250-400		D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
	d	l	d	l									
B4..17	19	90	19	90	70	135	141	150	350	85	210	265	11
B4..18	24	100	24	100	80	160	158	170	395	95	255	355	15

Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	O	P	R	S	T
B4..17	545	696	210	238	257	250	210	180	378	440	—	18	115	210	32	495
B4..18	600	787	236	263	281	284	230	200	404	480	—	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

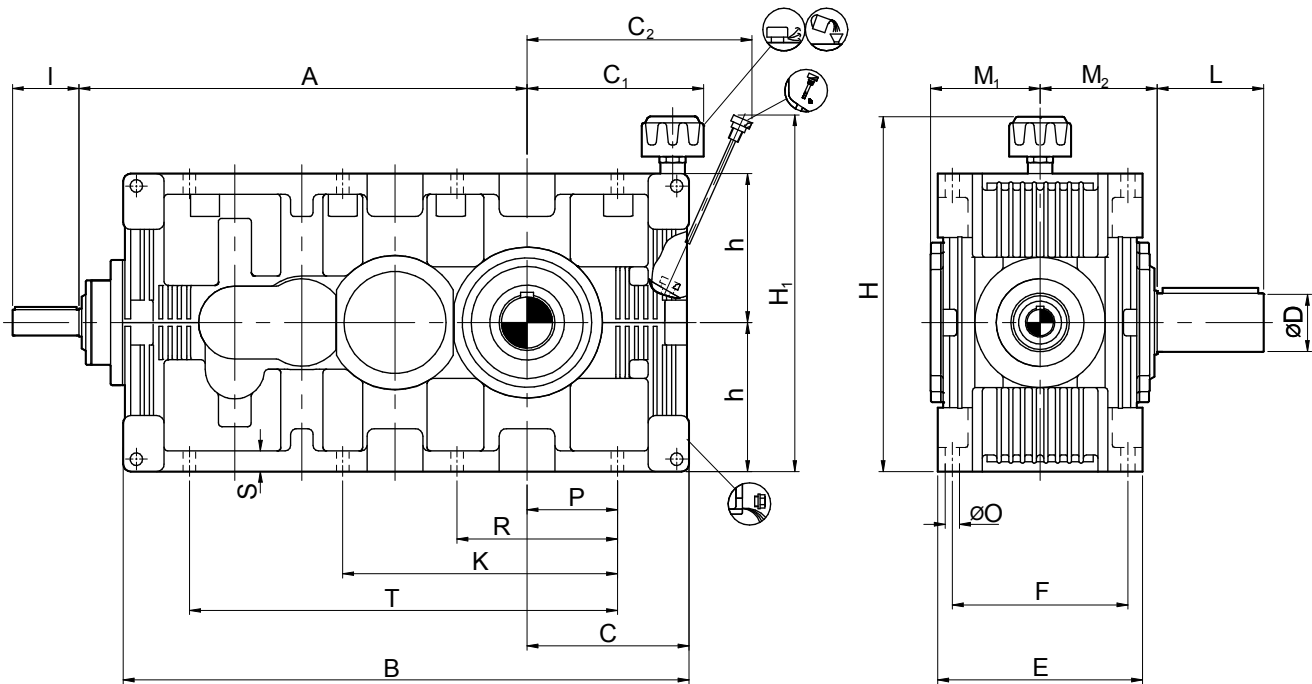
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level [maximum] marked on the dipstick

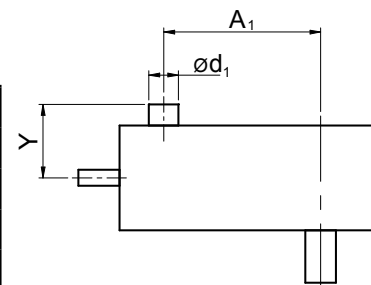
# SERIES E

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B4H QUADRUPLE STAGE - SIZE 19 TO 26



Size	Input Shaft				Output Shaft				Back Stop		KG	ltr <sup>3)</sup>	
	i = 80-225		i = 250-400										
	i = 100-315		i = 355-560										
	i = 112-400		i = 450-560										
	d	l	d	l	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
B4..19	24	100	24	100	90	165	171	180	440	95	255	480	21
B4..20	28	100	24	100	100	200	176	200	495	95	255	645	30
B4..21	32	110	28	100	110	200	210	220	555	135	310	870	37
B4..22	38	110	32	110	120	210	220	230	620	135	310	1170	50
B4..23	42	130	38	110	140	250	234	260	700	140	310	1590	70
B4..24	48	130	42	130	160	290	283	295	785	175	415	2145	95
B4..25	52	130	48	130	170	300	293	305	880	175	415	2895	130
B4..26	58	135	52	130	190	350	306	345	990	190	415	3885	185



Size	Foundation															
	A	B	C	C <sub>1</sub> <sup>2)</sup>	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	O	P	R	S	T
B4..19	680	885	265	283	315	303	250	225	455	530	—	23	145	255	36	615
B4..20	755	987	288	304	345	314	270	250	496	580	—	23	165	290	36	705
B4..21	845	1098	320	359	394	385	310	280	572	650	—	27	180	315	45	780
B4..22	940	1220	355	390	429	400	340	315	635	720	—	27	200	355	45	880
B4..23	1060	1377	405	422	481	450	380	355	705	800	655	33	220	405	55	985
B4..24	1190	1520	435	452	541	515	410	400	795	890	740	33	245	450	55	1110
B4..25	1320	1690	475	493	591	535	460	450	865	990	840	33	280	510	55	1245
B4..26	1485	1920	540	553	659	600	510	500	954	1090	940	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

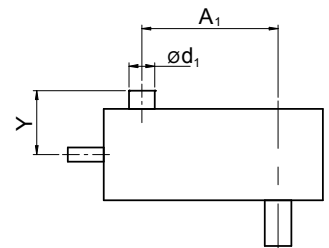
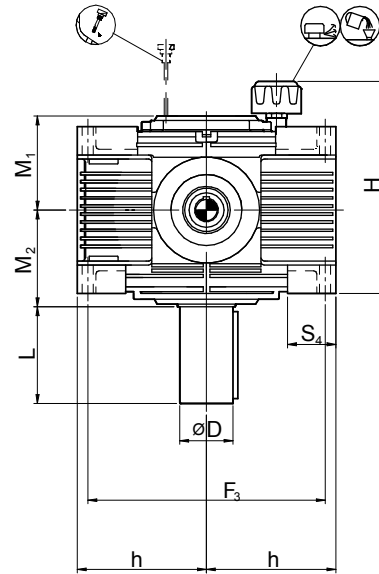
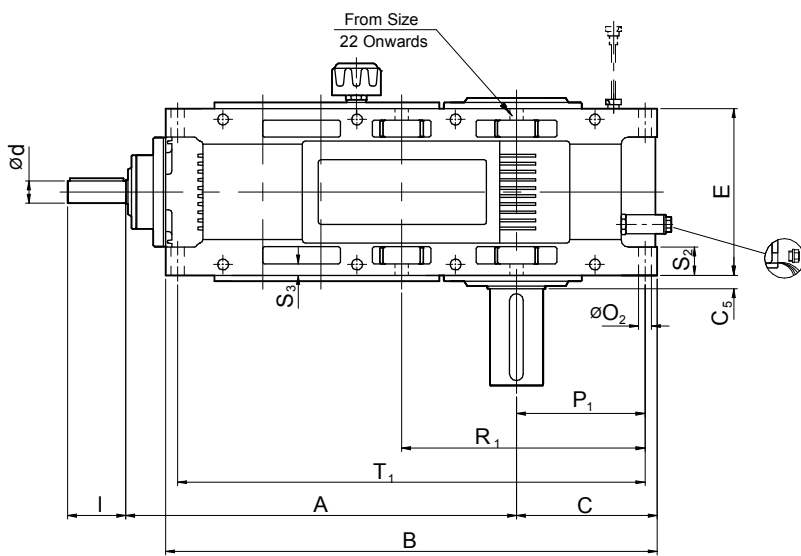
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B4V QUADRUPLE STAGE - SIZE 17 TO 18



Size	Input Shaft				Output Shaft				Back Stop			KG
	i = 80-225		i = 250-400		D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>	
	d	l	d	l								
B4..17	19	90	19	90	70	135	141	150	350	85	210	265
B4..18	24	100	24	100	80	160	158	170	395	95	255	355

Size	Foundation															
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T	
B4..17	545	696	210	25	250	310	180	330	18	190	350	40	20	90	655	
B4..18	600	787	236	28	284	350	200	364	18	215	395	45	20	90	744	

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

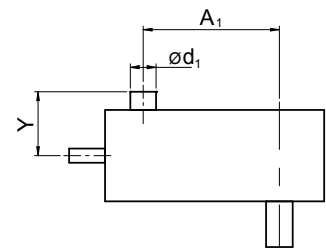
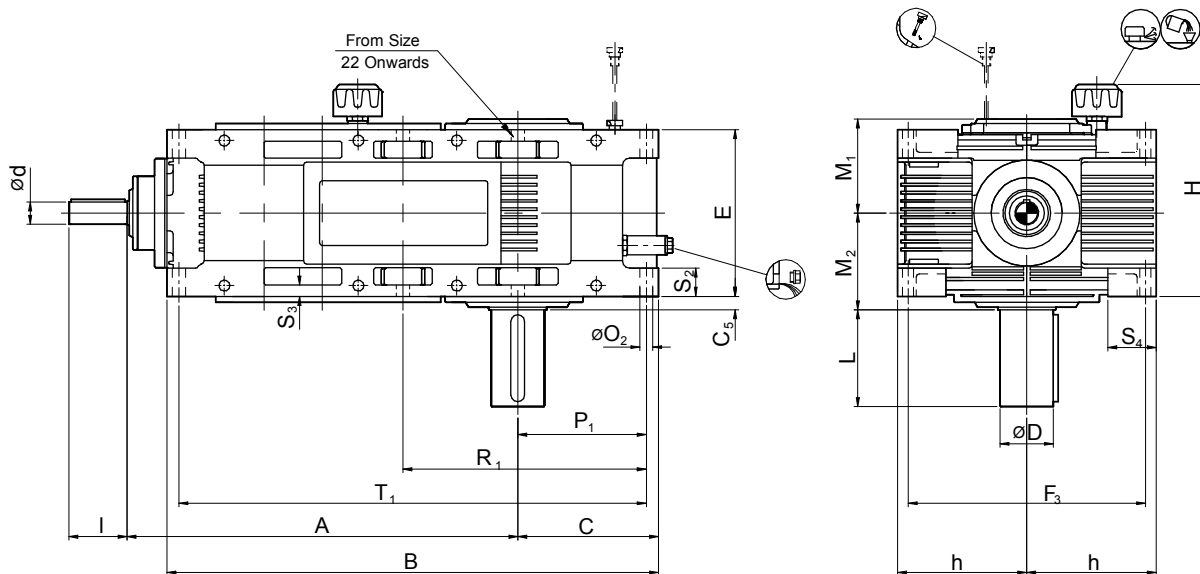
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## VERTICAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE B4V QUADRUPLE STAGE - SIZE 19 TO 26



Size	Input Shaft				Output Shaft				Back Stop			KG
	i = 80-225		i = 250-400									
	i = 100-315		i = 355-560									
	i = 112-400		i = 450-560									
d	l	d	l	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
B4..19	24	100	24	100	90	165	171	180	440	95	255	480
B4..20	28	100	24	100	100	200	176	200	495	95	255	645
B4..21	32	110	28	100	110	200	210	220	555	135	310	870
B4..22	38	110	32	110	120	210	220	230	620	135	310	1170
B4..23	42	130	38	110	140	250	234	260	700	140	310	1590
B4..24	48	130	42	130	160	290	283	295	785	175	415	2145
B4..25	52	130	48	130	170	300	293	305	880	175	415	2895
B4..26	58	135	52	130	190	350	306	345	990	190	415	3885

Size	Foundation														
	A	B	C	C <sub>5</sub>	E	F <sub>3</sub>	h	H <sup>2)</sup>	O <sub>2</sub>	P <sub>1</sub>	R <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	T <sub>1</sub>
B4..19	680	885	265	28.50	303	400	225	383	23	240	440	48.5	22	105	836
B4..20	755	987	288	43	314	440	250	394	23	262	487	45	24	105	935
B4..21	845	1098	320	27.50	385	500	280	475	27	295	545	65	28	120	1045
B4..22	940	1220	355	30	400	560	315	490	27	325	605	60	28	120	1160
B4..23	1060	1377	405	35	450	630	355	540	33	370	685	70	35	150	1305
B4..24	1190	1520	435	37.5	515	700	400	605	33	398	753	87.5	35	150	1443
B4..25	1320	1690	475	37.5	535	800	450	625	33	436	836	80	35	150	1612
B4..26	1485	1920	540	45	600	890	500	700	39	495	945	100	45	175	1830

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to  $\phi 50$  k6; over  $\phi 50$  m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

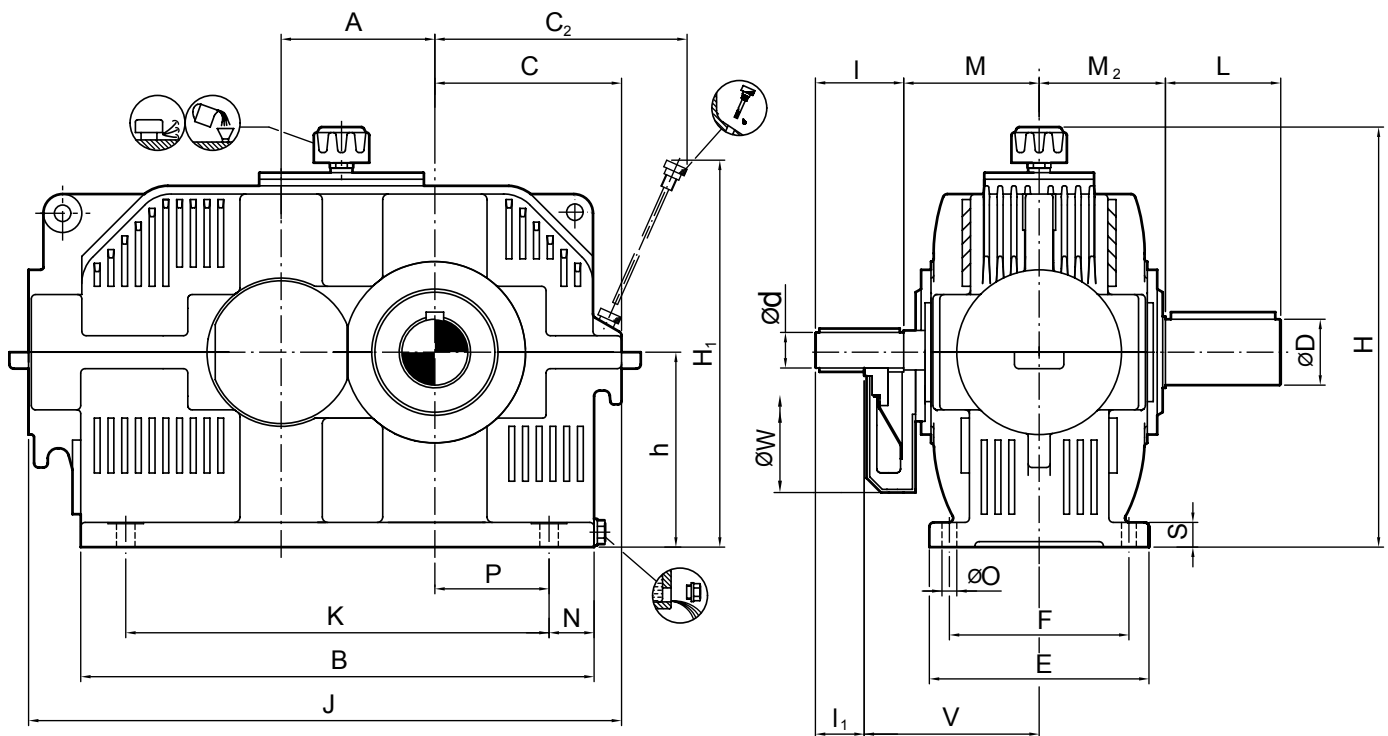
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE S1HN

### SINGLE STAGE - SIZE 11 TO 18

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT



Size	Input Shaft						Output Shaft			kg	ltr <sup>3)</sup>			
	i = 1.25 - 3.55			i = 4 - 5			M	V	W					
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>				D	L	M <sub>2</sub>		
S1..11	25	100	50	20	100	50	150	160	180	32	60	120	35	2.5
S1..13	35	110	60	30	110	60	150	200	180	45	90	125	65	3.5
S1..15	50	130	80	40	130	80	160	210	230	55	90	135	115	7.5
S1..17	60	155	105	50	130	80	165	215	300	70	125	150	205	11
S1..18	70	155	105	55	135	85	190	240	300	80	150	170	275	17

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	K	N	O	P	S
S1..11	80	268	115	171	180	150	100	248	290	331	175	36	14	60	24
S1..13	100	349	135	195	190	150	125	295	340	415	220	37	14	75	24
S1..15	125	432	165	231	228	170	160	352	410	513	290	38	14	100	24
S1..17	160	536	205	282	250	210	200	432	480	637	350	48	18	120	32
S1..18	180	600	220	311	284	230	225	475	525	700	410	43	18	145	32

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

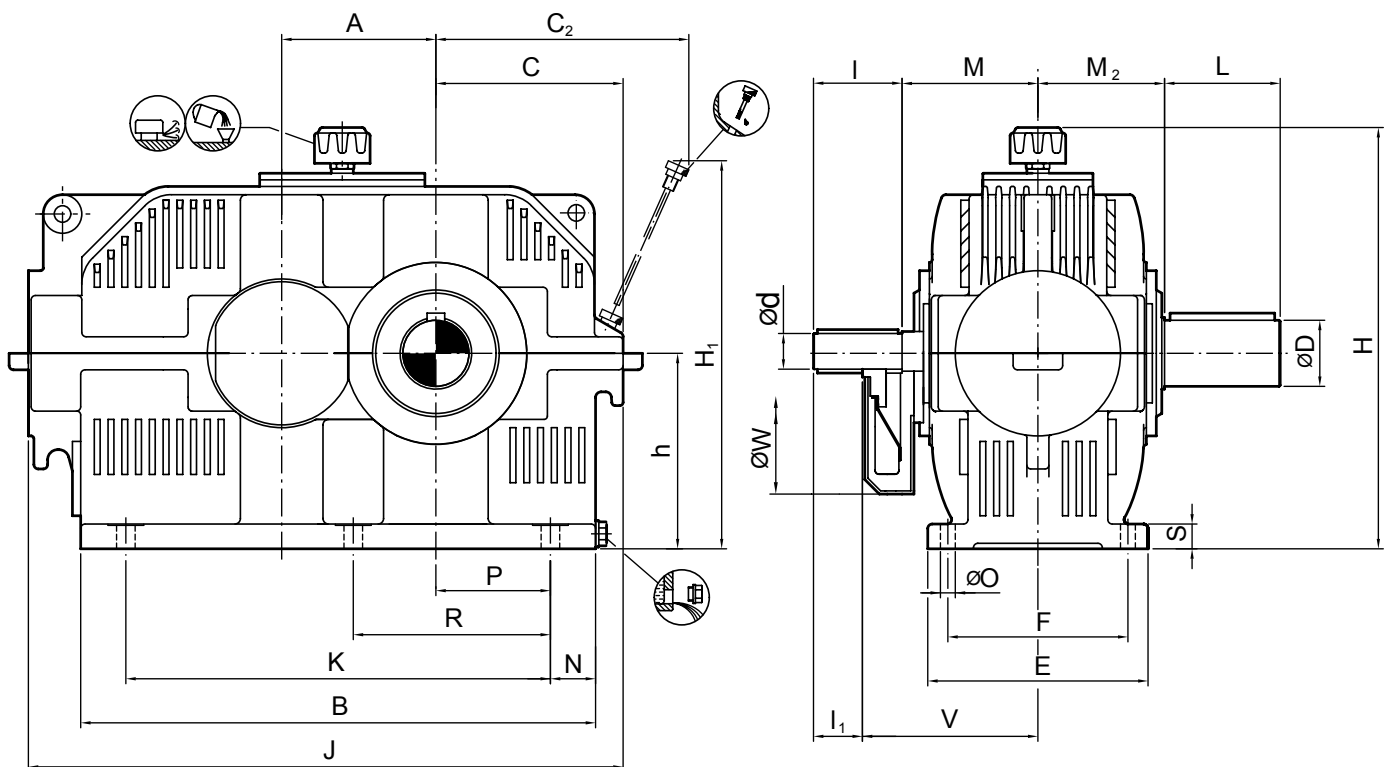


# SERIES E

## TYPE S1HN

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### SINGLE STAGE - SIZE 20 TO 26



Size	Input Shaft									Output Shaft			kg	3) ltr
	i = 1.25 - 3.55			i = 4 - 5			M	V	W	D	L	M <sub>2</sub>		
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>								
S1..20	85	180	130	70	155	105	215	265	380	100	175	210	320	28
S1..21	95	180	130	80	180	130	260	310	530	110	180	220	415	40
S1..22	105	220	170	90	180	130	270	320	530	120	200	230	570	54
S1..23	115	220	170	95	180	130	280	330	530	140	225	260	760	67
S1..24	130	250	200	110	220	170	320	370	530	160	260	295	1025	115
S1..25	145	250	200	120	220	170	360	410	600	170	270	305	1400	130
S1..26	160	300	250	130	250	200	360	410	600	190	300	345	1900	165

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	K	N	O	P	R	S
S1..20	225	755	275	387	314	270	280	588	620	890	520	54	23	180	—	36
S1..21	250	843	305	435	385	310	315	664	685	980	570	64	27	195	—	45
S1..22	280	935	340	474	400	340	355	741	760	1080	630	75	27	215	370	45
S1..23	315	1054	375	537	450	380	400	831	845	1210	705	87	33	240	420	55
S1..24	355	1169	425	598	515	410	450	908	940	1340	810	87	33	280	480	55
S1..25	400	1311	475	670	535	460	500	1013	1040	1530	910	98	33	315	540	55
S1..26	450	1476	535	753	600	510	560	1137	1150	1720	1025	108	39	355	615	65

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

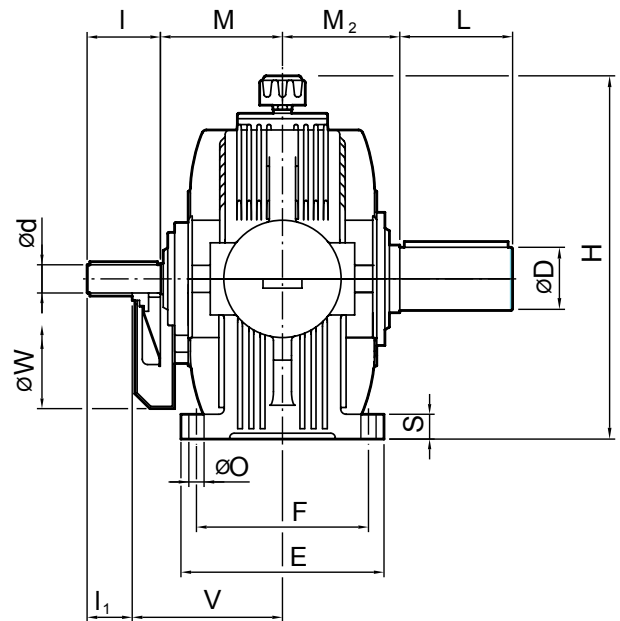
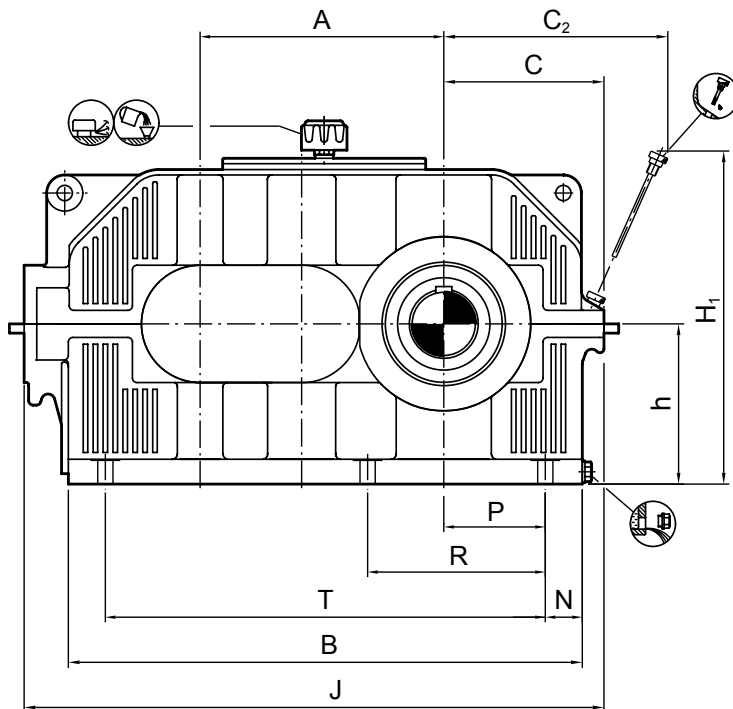
Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

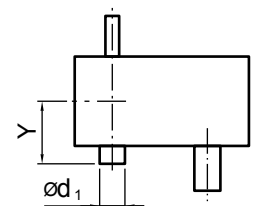
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick



Size	Input Shaft											Output Shaft			Backstop		kg	3) ltr	
	i = 5.6 - 12.5			i = 14 - 18															
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M	V	W	D	L	M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>			Y <sup>1)</sup>
	i = 5.6 - 12.5			i = 14 - 18			i = 22.4												
S2..14	25	100	55	20	100	55	20	100	55	140	185	210	48	95	125	95	190	58	3
S2..15	30	110	65	25	100	55	—	—	—	155	200	230	55	95	135	110	210	78	4
S2..16	35	110	65	30	110	65	20	100	55	155	200	270	60	130	145	135	220	110	5
S2..17	45	130	85	35	110	65	25	100	55	160	205	300	70	135	150	140	230	145	6
S2..18	50	130	85	40	130	85	—	—	—	180	225	300	80	160	170	150	250	200	10

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	N	O	P	R	S	T
S2..14	190	400	140	194	190	150	125	278	340	466	38	14	80	140	24	310
S2..15	215	460	155	215	228	170	140	306	370	526	38	14	95	170	24	355
S2..16	240	521	175	231	233	190	160	327	410	595	38	14	110	195	24	400
S2..17	270	580	190	257	250	210	180	378	450	664	43	18	115	210	32	440
S2..18	305	648	215	281	284	230	200	404	490	743	43	18	135	240	32	505



Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

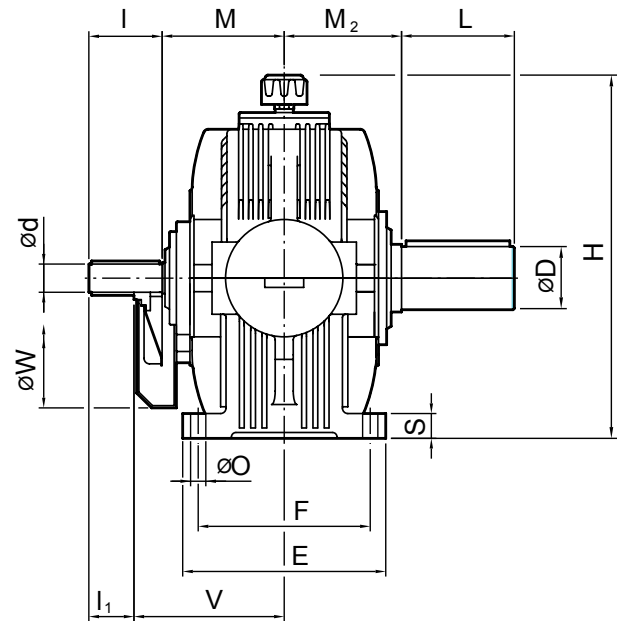
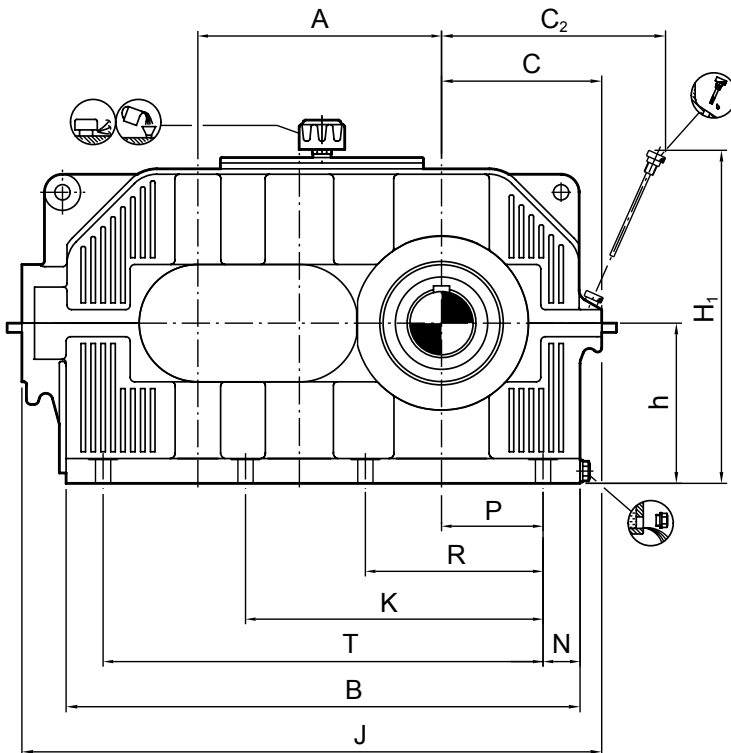
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE S2H

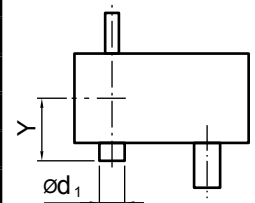
### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### SINGLE STAGE - SIZE 19 TO 26



Size	Input Shaft										Output Shaft			Backstop		kg	ltr		
	i = 5.6 - 12.5			i = 14 - 18			i = 22.4				D	L	M <sub>2</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>				
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M								V	W
S2..19	55	135	85	45	130	80	35	110	60	195	245	320	90	165	180	175	280	270	13
S2..20	60	155	105	50	130	80	40	130	80	205	255	360	100	200	200	190	295	360	16
S2..21	70	155	105	55	135	85	—	—	—	245	295	360	110	200	220	210	335	490	24
S2..22	75	155	105	60	155	105	55	135	85	260	310	430	120	210	230	210	345	675	33
S2..23	85	180	130	70	155	105	60	155	105	275	325	430	140	250	260	245	370	910	46
S2..24	95	180	130	80	180	130	—	—	—	340	390	450	160	290	295	290	445	1230	65
S2..25	105	220	170	90	180	130	70	155	105	350	400	550	170	300	305	290	455	1675	90
S2..26	115	220	170	95	180	130	80	180	130	350	400	550	190	350	345	310	465	2260	120

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	N	K	O	P	R	S	T
S2..19	340	716	240	315	303	250	225	455	540	825	53	—	23	145	255	36	555
S2..20	385	807	260	345	314	270	250	496	590	917	54	—	23	165	290	36	635
S2..21	430	898	290	394	385	310	280	572	650	1020	64	—	27	180	315	45	705
S2..22	480	1010	325	429	400	340	315	635	720	1140	75	—	27	200	355	45	785
S2..23	540	1139	355	481	450	380	355	705	800	1285	87	—	33	220	405	55	875
S2..24	605	1269	390	541	515	410	400	795	890	1420	92	—	33	245	450	55	975
S2..25	680	1411	440	591	535	460	450	865	990	1580	98	—	33	280	510	55	1105
S2..26	765	1586	490	659	600	510	500	954	1090	1775	108	940	39	315	575	65	1245



Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

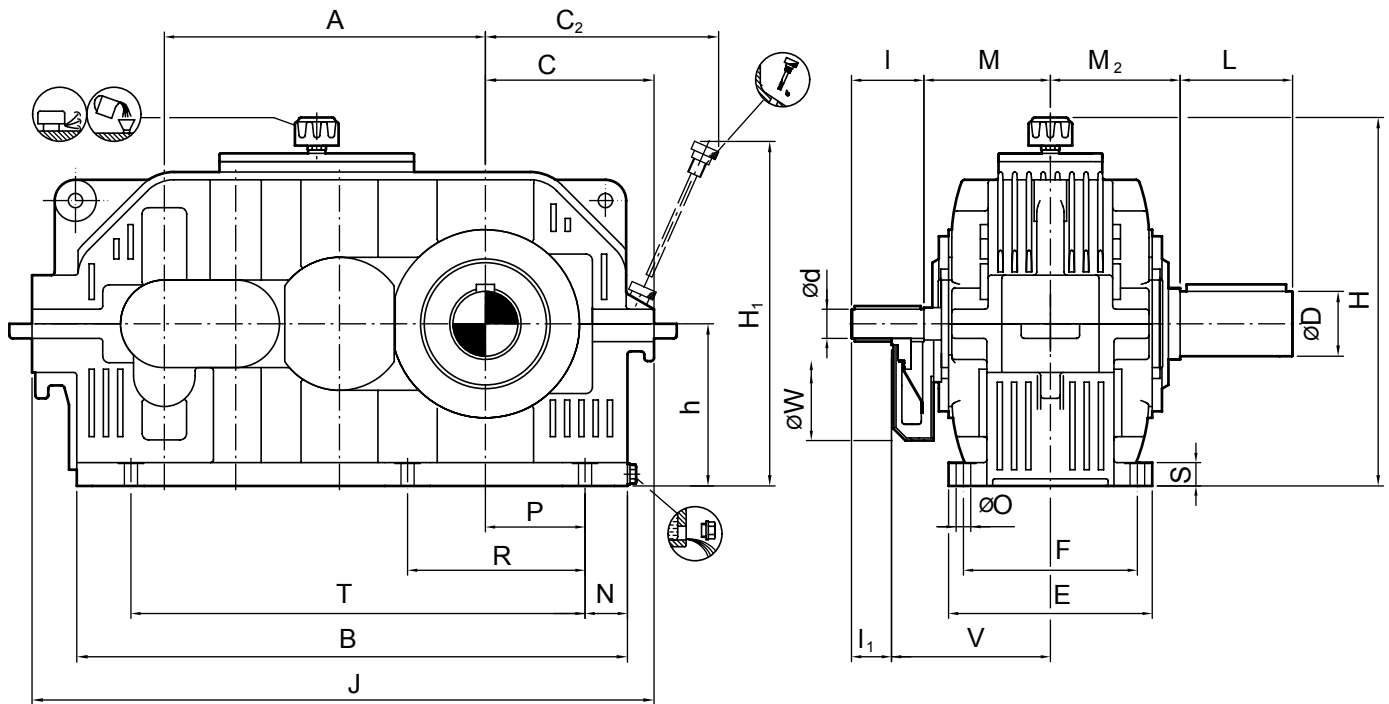
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE S3H

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 16 TO 18



Size	Input Shaft									Output Shaft			Backstop			kg	ltr <sup>3)</sup>			
	i = 20 - 50			i = 56 - 80			i = 112													
	i = 25 - 63			i = 71 - 100																
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M	V	W	D	L	M <sub>2</sub>			A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
S3..15	24	100	50	19	100	50	-	-	-	145	195	-	55	95	135	-	-	-	105	6
S3..16	24	100	50	19	100	50	19	100	50	155	205	270	60	130	145	240	95	215	120	9
S3..17	28	100	50	24	100	50	19	100	50	160	210	270	70	135	150	270	95	215	160	10
S3..18	30	110	60	25	100	50	-	-	-	180	230	300	80	160	170	305	140	265	215	12

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	N	O	P	R	S	T
S3..15	278	482	155	215	228	170	140	306	370	526	38	14	95	170	24	395
S3..16	311	537	175	231	233	190	160	327	410	591	38	14	110	195	24	450
S3..17	350	592	190	257	250	210	180	378	450	676	43	18	115	210	32	495
S3..18	395	671	215	281	284	230	200	404	490	766	43	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

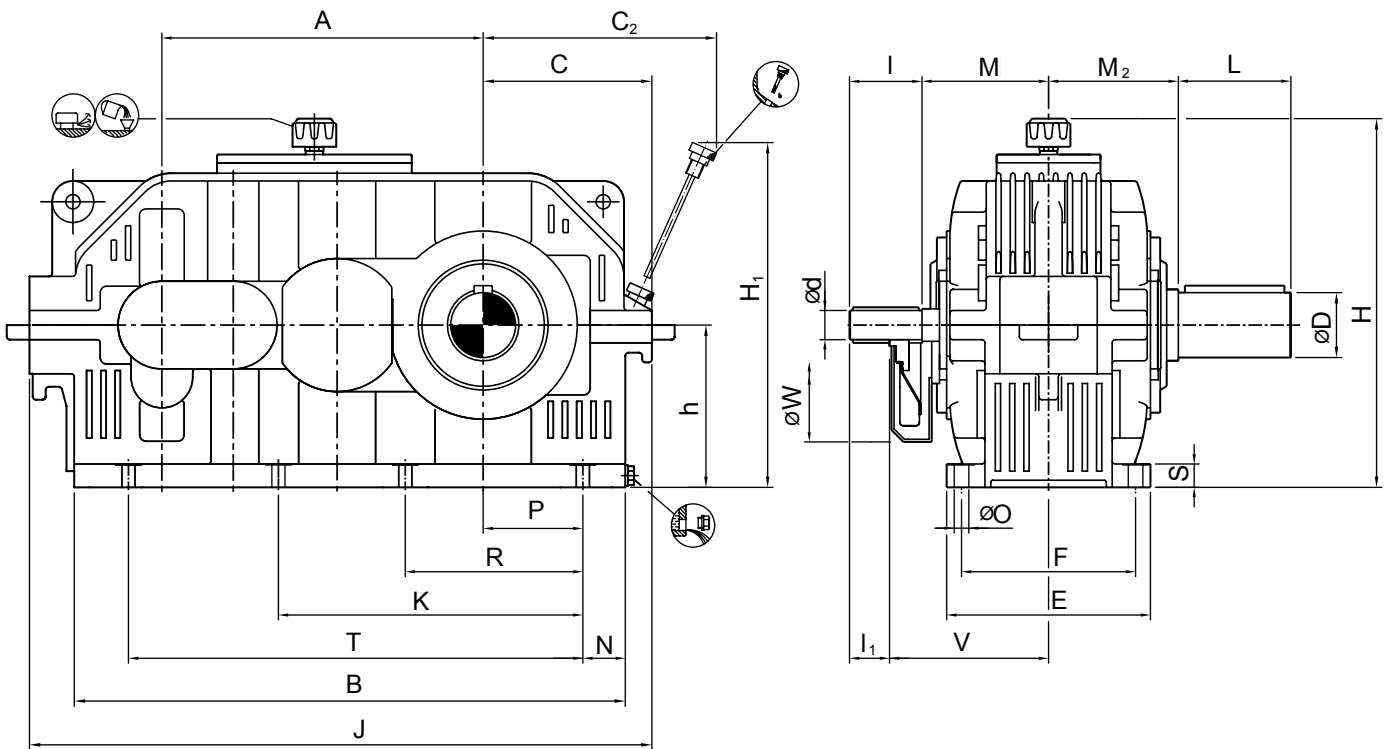
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

# SERIES E

## TYPE S3H

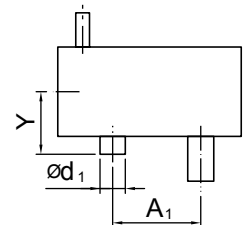
### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 19 TO 26



Size	Input Shaft									Output Shaft			Backstop			KG	ltr <sup>3)</sup>			
	i = 20 - 50			i = 56 - 80			i = 112													
	i = 25 - 63			i = 71 - 100																
	i = 25 - 71			i = 80 - 100																
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	M	V	W	D	L	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
S3..19	35	110	60	30	110	60	25	100	50	190	240	320	90	165	180	340	150	265	295	16
S3..20	45	130	80	35	110	60	25	100	50	195	245	360	100	200	200	385	150	265	405	25
S3..21	50	130	80	40	130	80	—	—	—	240	290	360	110	200	220	430	190	340	540	32
S3..22	55	135	85	45	130	80	35	110	60	250	300	430	120	210	230	480	190	340	720	43
S3..23	60	155	105	50	130	80	40	130	80	270	320	430	140	250	260	540	190	340	970	61
S3..24	70	155	105	55	135	85	—	—	—	325	375	450	160	290	295	605	245	440	1300	85
S3..25	75	155	105	60	155	105	50	130	80	335	385	450	170	300	305	680	245	440	1770	120
S3..26	85	180	130	70	155	105	70	155	105	350	400	450	190	350	345	765	245	440	2350	170

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	J	N	K	O	P	R	S	T
S3..19	440	751	240	315	303	250	225	455	540	860	53	—	23	145	255	36	615
S3..20	495	849	260	345	314	270	250	496	590	959	54	—	23	165	290	36	705
S3..21	555	946	290	394	385	310	280	572	650	1068	64	—	27	180	315	45	780
S3..22	620	1060	325	429	400	340	315	635	720	1190	75	—	27	200	355	45	880
S3..23	700	1181	355	481	450	380	355	705	800	1327	87	655	33	220	405	55	985
S3..24	785	1324	390	541	515	410	400	795	890	1475	92	740	33	245	450	55	1110
S3..25	880	1496	440	591	535	460	450	865	990	1655	98	840	33	280	510	55	1245
S3..26	990	1686	490	659	600	510	500	954	1090	1870	108	940	39	315	575	65	1400



Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

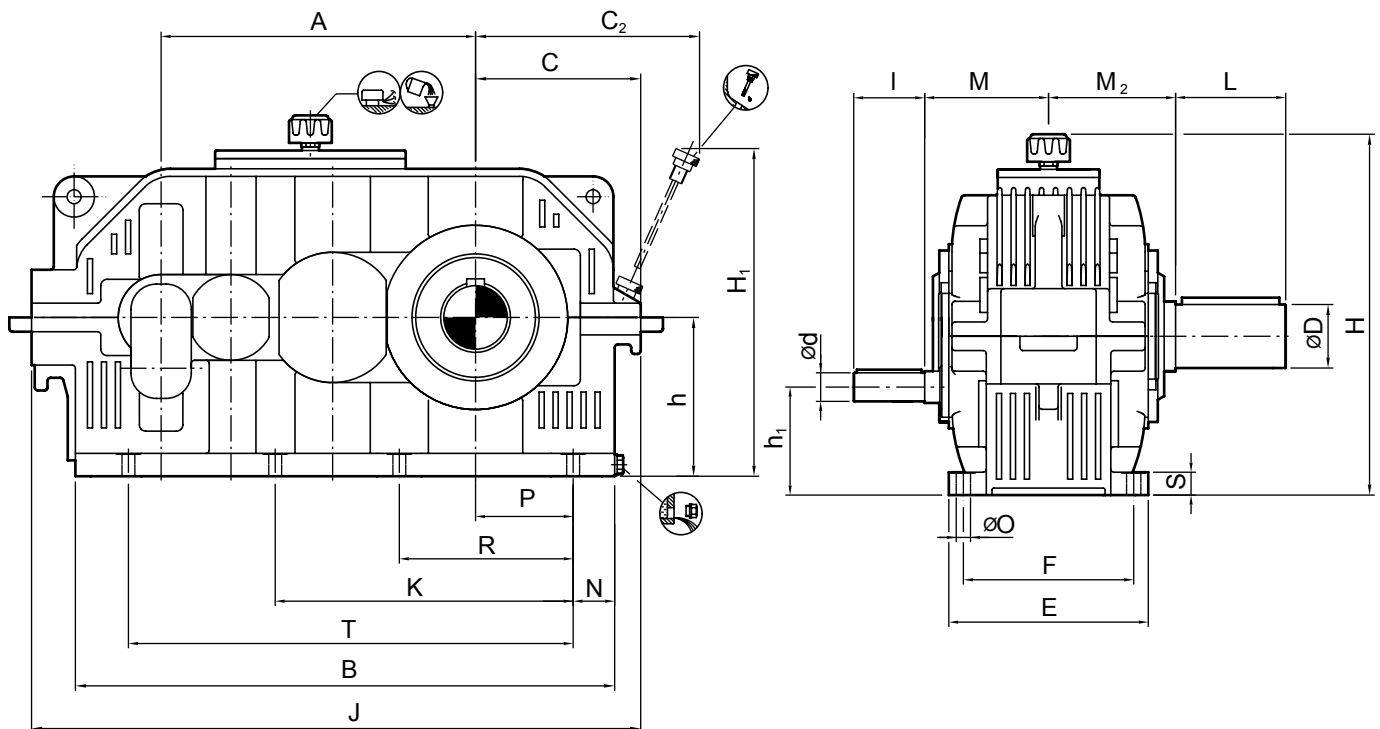
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

### HORIZONTAL MOUNTING - HELICAL GEAR UNIT

### QUADRUPLE STAGE - SIZE 18 TO 26



Size	Input Shaft				Output Shaft			Backstop			Weight	Lubricant Quantity		
	i = 90 - 225		i = 250 - 450											
	d	l	d	l	M	h <sub>1</sub>	D	L	M <sub>2</sub>	A <sub>1</sub>			d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
S4..18	20	50	19	50	170	137	80	160	170	395	95	255	215	15
S4..19	20	50	19	50	180	154	90	165	180	440	95	255	300	21
S4..20	20	50	20	50	190	170	100	200	200	495	95	255	405	25
S4..21	30	80	25	60	220	190	110	200	220	555	135	310	540	32
S4..22	35	80	25	60	230	215	120	210	230	620	135	310	720	43
S4..23	40	110	35	80	260	245	140	250	260	700	140	310	970	61
S4..24	40	110	40	110	295	275	160	290	295	785	175	415	1300	85
S4..25	45	110	45	110	305	310	170	300	305	880	175	415	1770	120
S4..26	50	110	50	110	345	340	190	350	345	990	190	415	2350	170

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	N	O	P	R	S	T
S4..18	395	671	215	281	284	230	200	404	490	43	18	135	240	32	565

Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	J	K	N	O	P	R	S	T
S4..19	440	751	240	315	303	250	225	455	540	860	—	53	23	145	255	36	615
S4..20	495	849	260	345	314	270	250	496	590	959	—	54	23	165	290	36	705
S4..21	555	946	290	394	385	310	280	572	650	1068	—	64	27	180	315	45	780
S4..22	620	1060	325	429	400	340	315	635	720	1190	—	75	27	200	355	45	880
S4..23	700	1181	355	481	450	380	355	705	800	1327	655	87	33	220	405	55	985
S4..24	785	1324	390	541	515	410	400	795	890	1475	740	92	33	245	450	55	1110
S4..25	880	1496	440	591	535	460	450	865	990	1655	840	98	33	280	510	55	1245
S4..26	990	1686	490	659	600	510	500	954	1090	1870	940	108	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

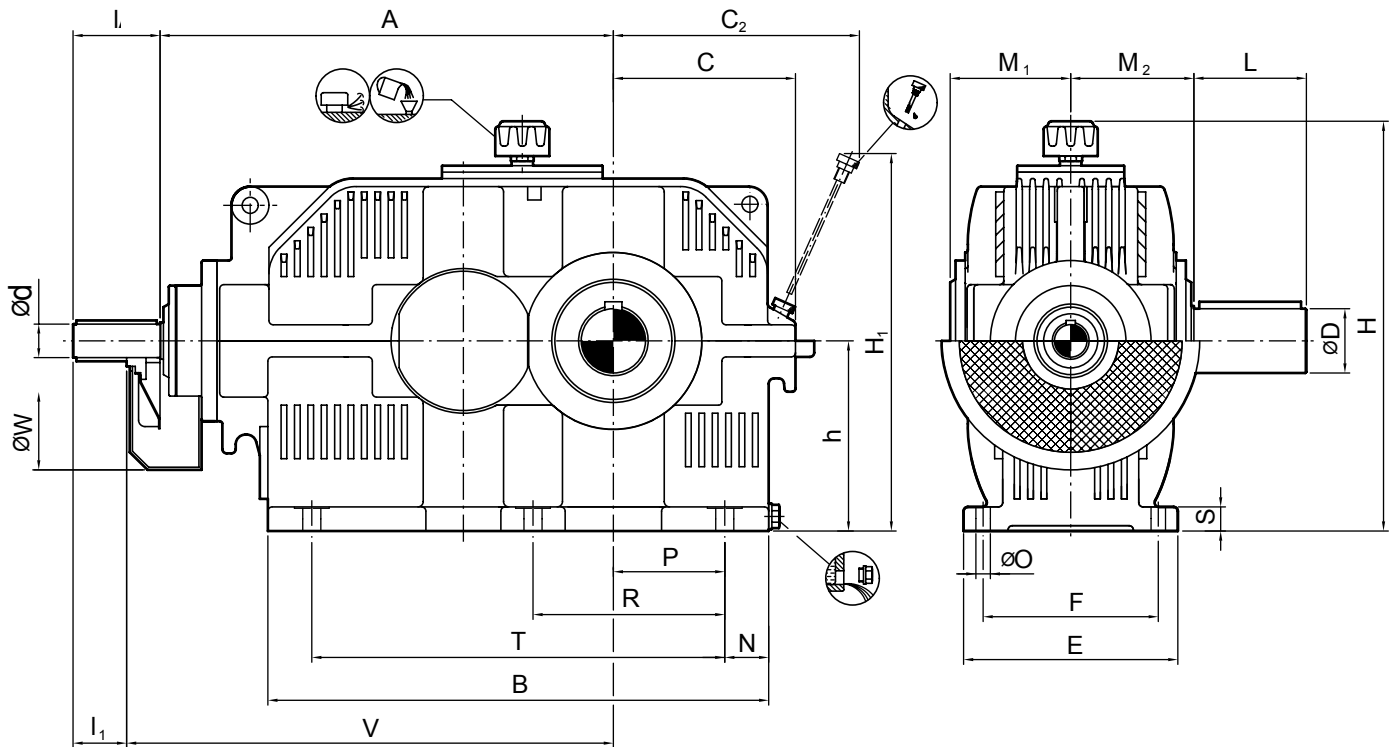
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

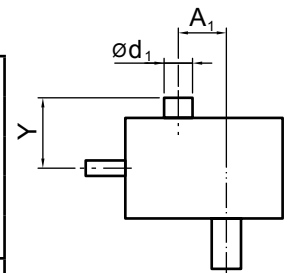
# SERIES E

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE K2H DOUBLE STAGE - SIZE 11 TO 18



Size	Input Shaft						Output Shaft				Backstop		KG	ltr <sup>3)</sup>			
	i = 5 - 12.5			i = 14 - 18			V	W	D	L	M <sub>1</sub>	M <sub>2</sub>			A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>
	i = 5.6 - 14			i = 16 - 20													
	i = 6.3 - 16			i = 18 - 22.4													
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>	KG	ltr <sup>3)</sup>			
K2..11	19	90	40	19	90	40	325	210	32	55	94	105	80	95	180	29	2.5
K2..13	24	100	50	24	100	50	390	270	45	95	106	115	100	105	190	52.5	3.5
K2..15	32	110	60	28	100	50	465	300	55	95	127	135	125	140	255	95	6
K2..17	42	130	80	38	110	60	570	360	70	135	141	150	160	175	255	174	10.5
K2..18	48	130	80	42	130	80	635	360	80	160	158	170	180	190	305	230	16



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	N	O	P	R	S	T
K2..11	275	268	115	171	180	150	100	248	290	46	14	50	95	24	215
K2..13	340	349	135	195	190	150	125	295	340	47	14	65	120	24	270
K2..15	415	432	165	231	228	170	160	352	410	43	14	95	170	24	355
K2..17	520	536	205	282	250	210	200	432	480	53	18	115	210	32	440
K2..18	585	600	220	311	284	230	225	475	525	53	18	135	240	32	505

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

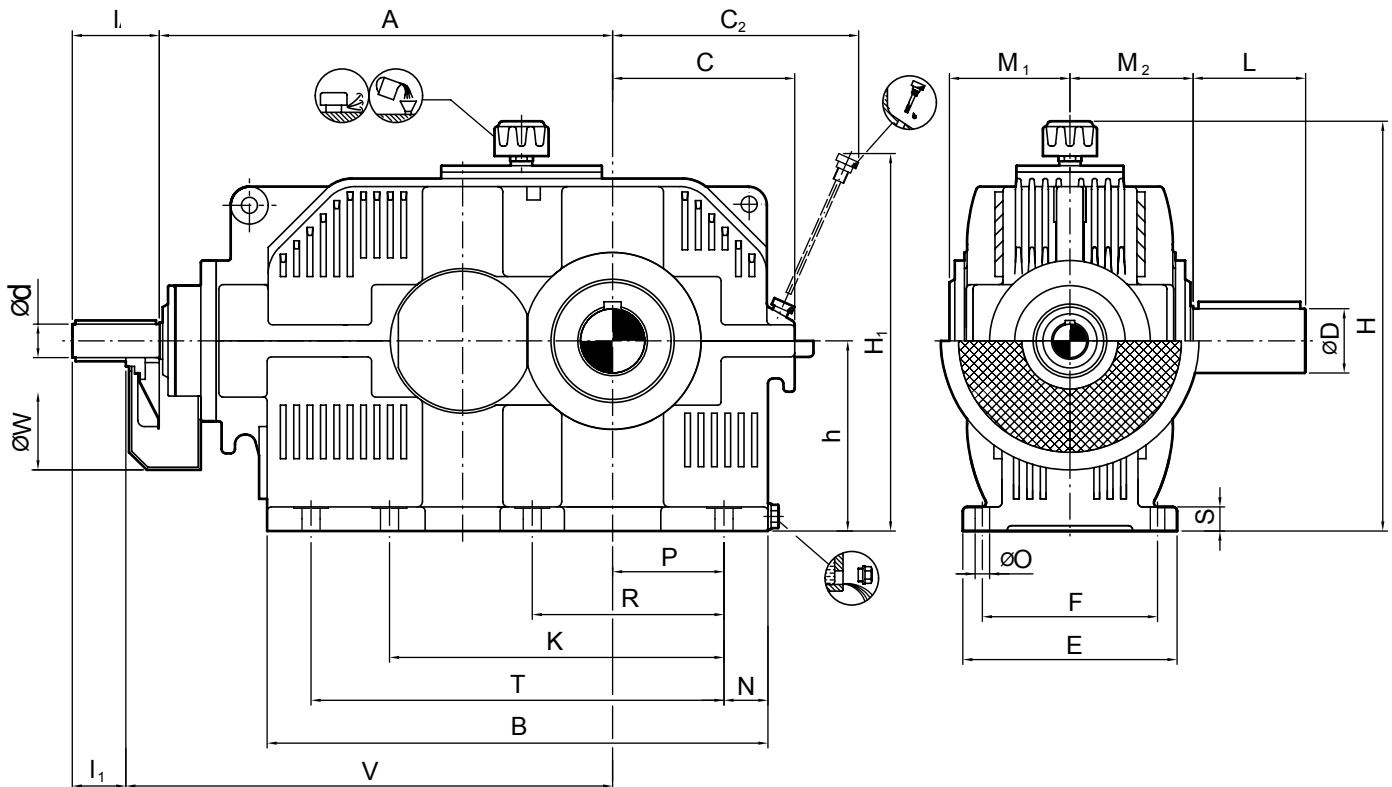
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

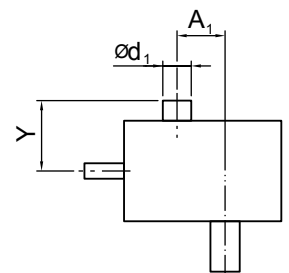
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE K2H DOUBLE STAGE - SIZE 20 TO 26



Size	Input Shaft						Output Shaft				Backstop			kg	ltr <sup>3)</sup>		
	i = 5 - 12.5			i = 14 - 18													
	i = 5.6 - 14			i = 16 - 20													
	i = 6.3 - 16			i = 18 - 22.4													
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
K2..20	58	135	85	52	130	80	770	460	100	200	176	200	225	210	305	415	27
K2..21	65	155	105	65	155	105	840	530	110	200	210	220	250	245	390	557	39
K2..22	70	155	105	70	155	105	925	550	120	210	220	230	280	290	390	756	52
K2..23	85	180	130	80	180	130	1025	550	140	250	234	260	315	290	390	1020	65
K2..24	90	180	130	90	180	130	1135	650	160	290	283	295	355	310	470	1370	115
K2..25	100	220	170	100	220	170	1265	700	170	300	293	305	400	310	470	1855	130
K2..26	110	220	170	110	220	170	1415	700	190	350	306	345	450	400	470	2500	165



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	N	O	P	R	S	T
K2..20	720	755	275	387	314	270	280	588	620	—	69	23	165	290	36	635
K2..21	790	843	305	435	385	310	315	664	685	—	79	27	180	315	45	705
K2..22	875	935	340	474	400	340	355	741	760	—	90	27	200	355	45	785
K2..23	975	1054	375	537	450	380	400	831	845	—	107	33	220	405	55	875
K2..24	1085	1169	425	598	515	410	450	908	940	—	122	33	245	450	55	975
K2..25	1215	1311	475	670	535	460	500	1013	1040	—	133	33	280	510	55	1105
K2..26	1365	1476	535	753	600	510	560	1137	1150	940	148	39	315	575	65	1245

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

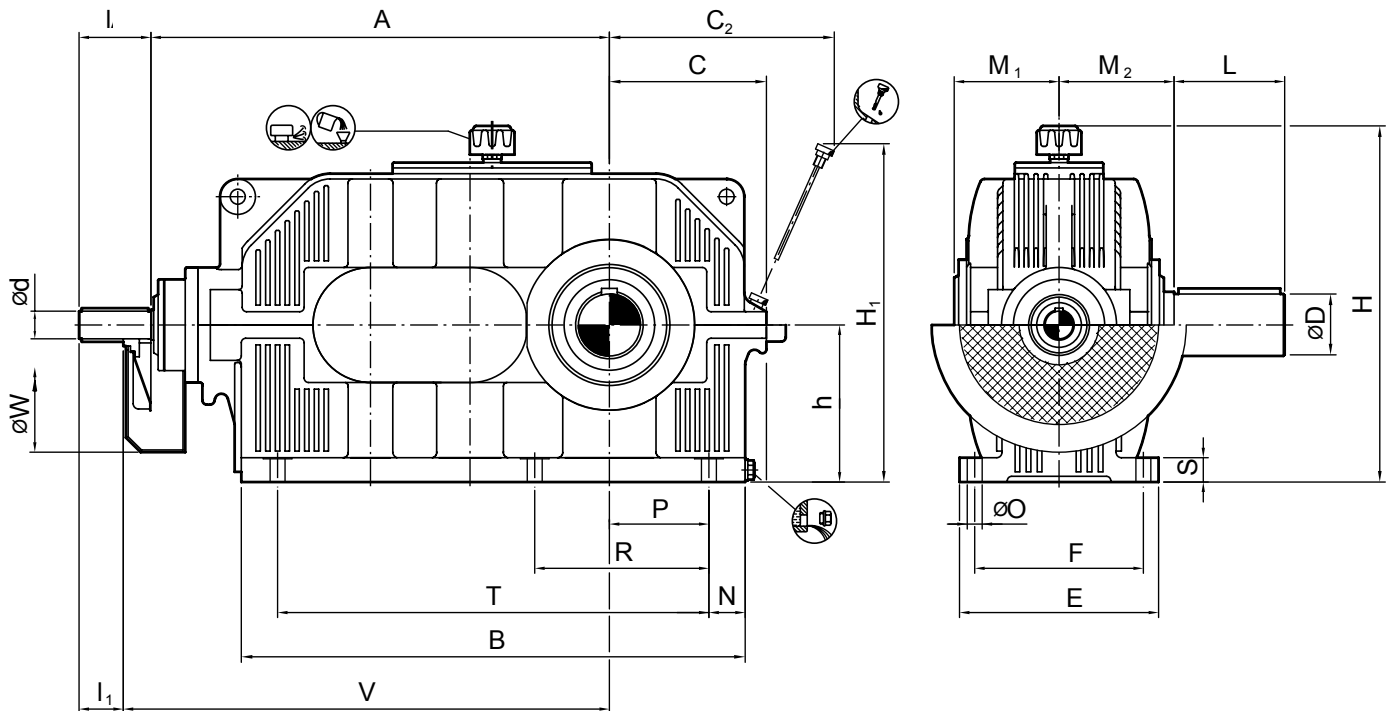


# SERIES E

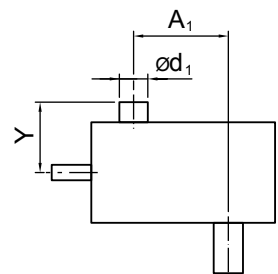
## TYPE K3H

### HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

### TRIPLE STAGE - SIZE 14 - 18



Size	Input Shaft						Output Shaft				Backstop			kg	3) ltr		
	i = 20 - 50			i = 56 - 71			D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>				
	i = 22.4 - 63			i = 71 - 90													
	i = 25 - 71			i = 80 - 100													
d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
K3..14	19	90	40	19	90	40	435	240	48	95	106	125	190	90	180	70	4.5
K3..15	24	100	50	24	100	50	470	270	55	95	127	135	215	95	215	95	5.5
K3..16	24	100	50	24	100	50	530	300	60	130	133	145	240	95	215	130	8.5
K3..17	28	100	50	24	100	50	580	340	70	135	141	150	270	95	215	175	11
K3..18	32	110	60	28	100	50	645	360	80	160	158	170	305	140	265	235	15



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	N	O	P	R	S	T
K3..14	385	400	140	194	190	150	125	278	340	38	14	80	140	24	345
K3..15	420	460	155	215	228	170	140	306	370	38	14	95	170	24	395
K3..16	480	521	175	231	233	190	160	327	410	38	14	110	195	24	450
K3..17	530	580	190	257	250	210	180	378	450	43	18	115	210	32	495
K3..18	595	648	215	281	284	230	200	404	490	43	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

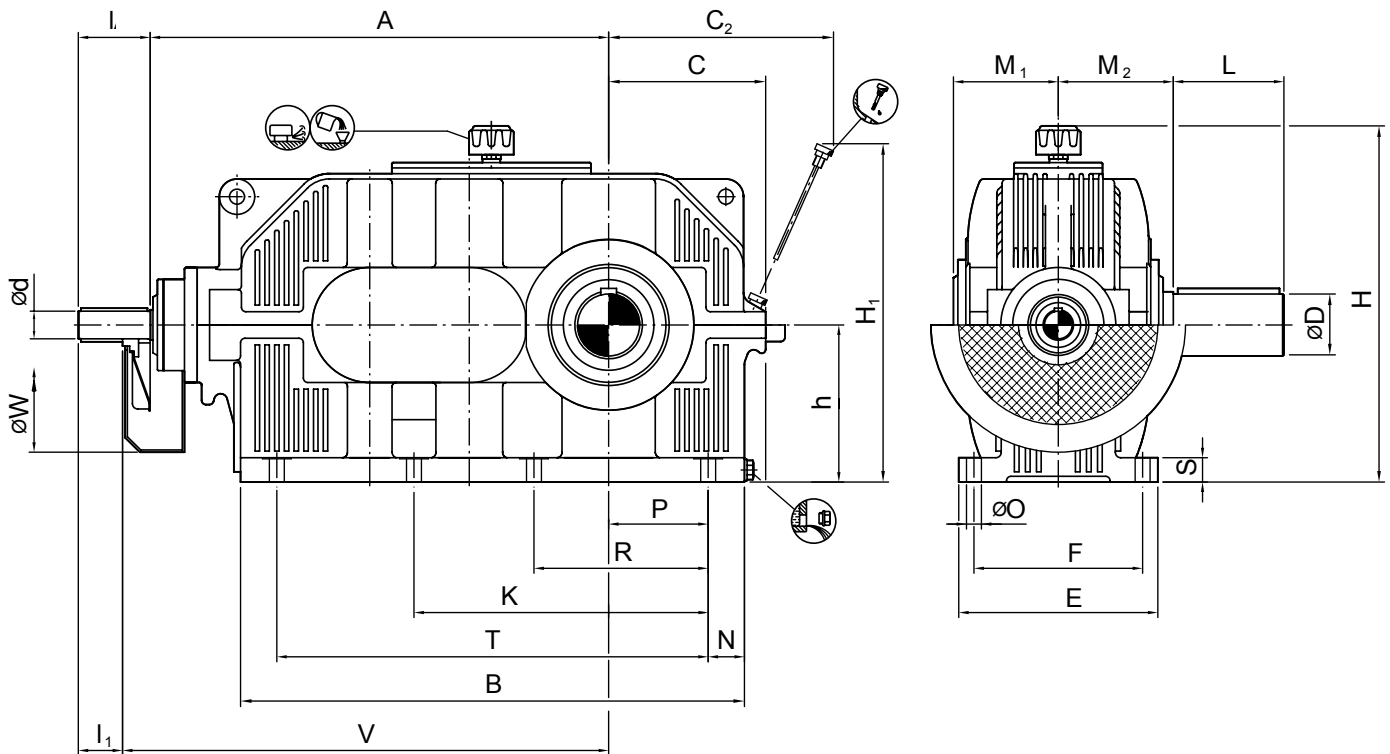
Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

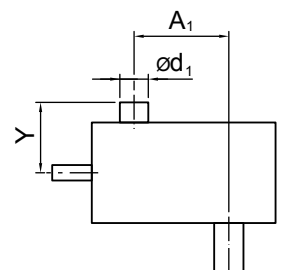
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick



Size	Input Shaft						Output Shaft				Backstop			kg	ltr <sup>3)</sup>		
	i = 20 - 50		i = 56 - 71														
	i = 22.4 - 63		i = 71 - 90														
	i = 25 - 71		i = 80 - 100														
	d	l	l <sub>1</sub>	d	l	l <sub>1</sub>	V	W	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>		
K3..19	38	110	60	32	110	60	710	360	90	165	171	180	340	150	265	320	21
K3..20	42	130	80	38	110	60	795	400	100	200	176	200	385	150	265	430	30
K3..21	48	130	80	42	130	80	885	460	110	200	210	220	430	190	340	580	37
K3..22	52	130	80	48	130	80	970	530	120	210	220	230	480	190	340	780	50
K3..23	58	135	85	52	130	80	1085	550	140	250	234	260	540	190	340	1060	70
K3..24	65	155	105	65	155	105	1195	600	160	290	283	295	605	245	440	1430	95
K3..25	70	155	105	70	155	105	1325	650	170	300	293	305	680	245	440	1930	130
K3..26	85	180	130	80	180	130	1475	700	190	350	306	345	765	245	440	2590	185



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sub>2</sub> <sup>2)</sup>	K	N	O	P	R	S	T
K3..19	660	716	240	315	303	250	225	455	540	—	53	23	145	255	36	615
K3..20	745	807	260	345	314	270	250	496	590	—	54	23	165	290	36	705
K3..21	835	898	290	394	385	310	280	572	650	—	64	27	180	315	45	780
K3..22	920	1010	325	429	400	340	315	635	720	—	75	27	200	355	45	880
K3..23	1035	1139	355	481	450	380	355	705	800	655	87	33	220	405	55	985
K3..24	1145	1269	390	541	515	410	400	795	890	740	92	33	245	450	55	1110
K3..25	1275	1411	440	591	535	460	450	865	990	840	98	33	280	510	55	1245
K3..26	1425	1586	490	659	600	510	500	954	1090	940	108	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

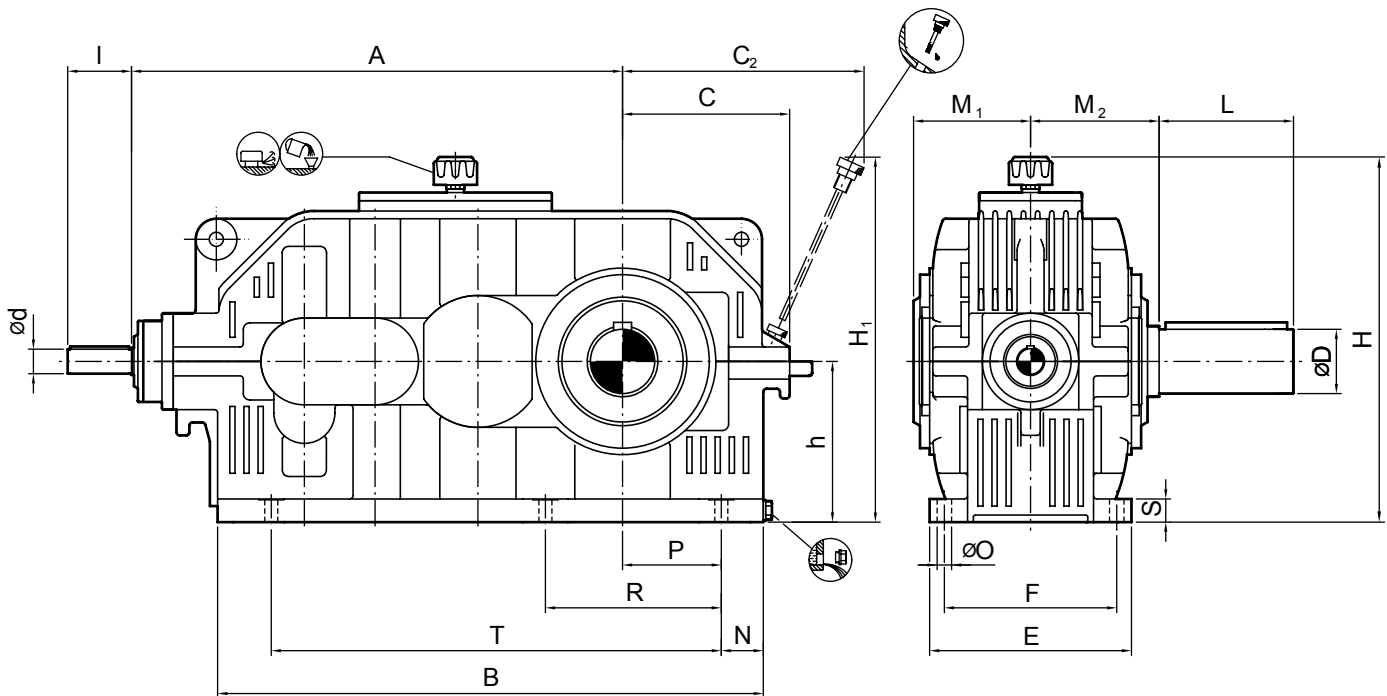
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

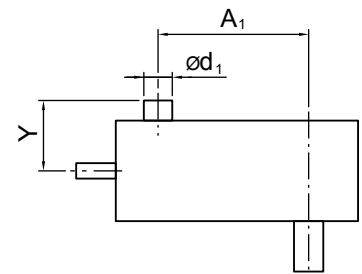
# SERIES E

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE K4H QUADRUPLE STAGE - SIZE 17 TO 18



Size	Input Shaft				Output Shaft				Backstop		KG	ltr <sup>3)</sup>	
	i = 80 - 225		i = 250 - 400		D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>			Y <sup>1)</sup>
	d	l	d	l									
K4..17	19	90	19	90	70	135	141	150	350	85	210	175	11
K4..18	24	100	24	100	80	160	158	170	395	95	255	235	15



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	N	O	P	R	S	T
K4..17	545	592	190	257	250	210	180	378	450	43	18	115	210	32	495
K4..18	600	671	215	281	284	230	200	404	490	43	18	135	240	32	565

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

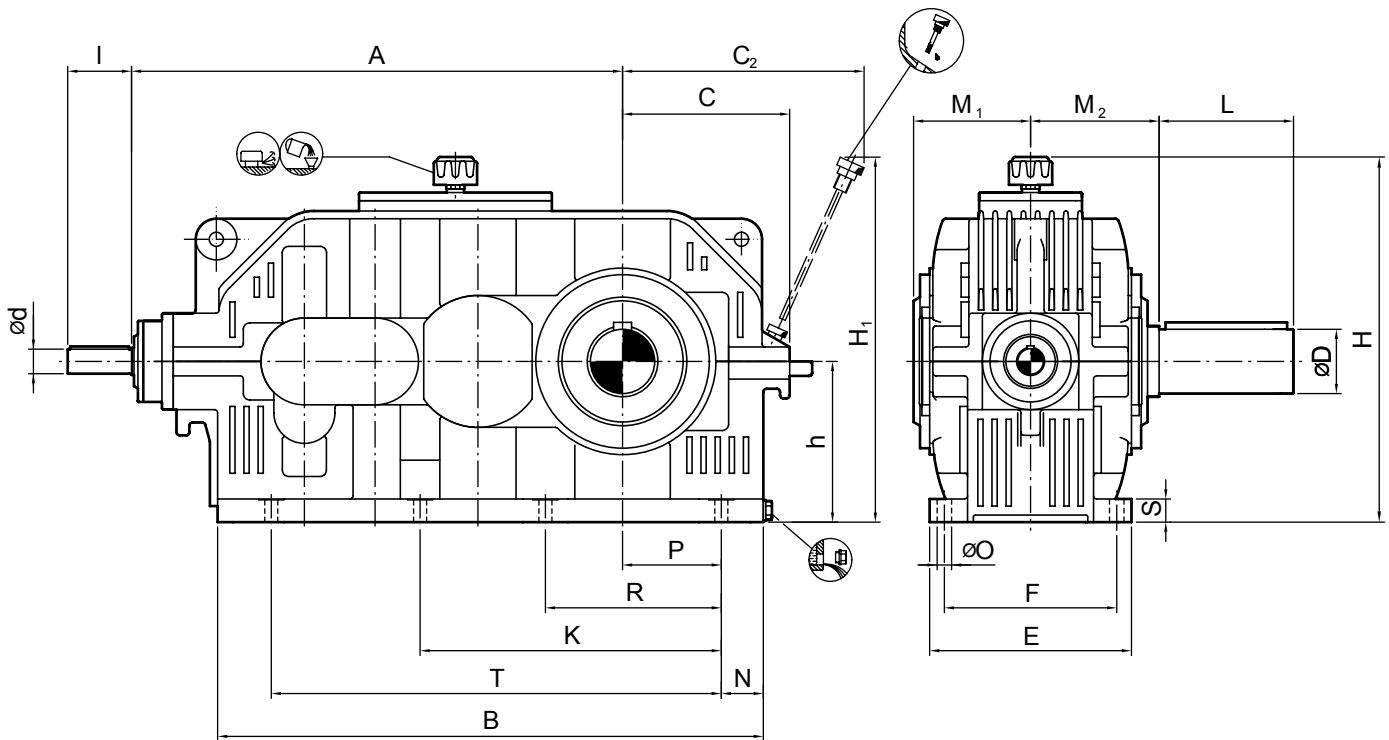
1) Maximum Dimensions; details according to order related documents

2) Approximate Values; exact values according to order related documents

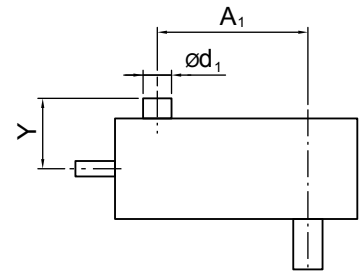
3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

## HORIZONTAL MOUNTING - BEVEL HELICAL GEAR UNIT

## TYPE K4H QUADRUPLE STAGE - SIZE 19 TO 26



Size	Input Shaft				Output Shaft				Backstop			kg	ltr <sup>3)</sup>
	i = 80 - 225		i = 250 - 400										
	i = 100 - 315		i = 355 - 560										
	i = 112 - 400		i = 450 - 560										
d	l	d	l	D	L	M <sub>1</sub>	M <sub>2</sub>	A <sub>1</sub>	d <sub>1</sub> <sup>1)</sup>	Y <sup>1)</sup>			
K4..19	24	100	24	100	90	165	171	180	440	95	255	320	21
K4..20	28	100	24	100	100	200	176	200	495	95	255	430	30
K4..21	32	110	28	100	110	200	210	220	555	135	310	580	37
K4..22	38	110	32	110	120	210	220	230	620	135	310	780	50
K4..23	42	130	38	110	140	250	234	260	700	140	310	1060	70
K4..24	48	130	42	130	160	290	283	295	785	175	415	1430	95
K4..25	52	130	48	130	170	300	293	305	880	175	415	1930	130
K4..26	58	135	52	130	190	350	306	345	990	190	415	2590	185



Size	A	B	C	C <sub>2</sub> <sup>1)</sup>	E	F	h	H <sub>1</sub> <sup>1)</sup>	H <sup>2)</sup>	K	N	O	P	R	S	T
K4..19	680	751	240	315	303	250	225	455	540	—	53	23	145	255	36	615
K4..20	755	849	260	345	314	270	250	496	590	—	54	23	165	290	36	705
K4..21	845	946	290	394	385	310	280	572	650	—	64	27	180	315	45	780
K4..22	940	1060	325	429	400	340	315	635	720	—	75	27	200	355	45	880
K4..23	1060	1181	355	481	450	380	355	705	800	655	87	33	220	405	55	985
K4..24	1190	1324	390	541	515	410	400	795	890	740	92	33	245	450	55	1110
K4..25	1320	1496	440	591	535	460	450	865	990	840	98	33	280	510	55	1245
K4..26	1485	1686	490	659	600	510	500	954	1090	940	108	39	315	575	65	1400

Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

1) Maximum Dimensions; details according to order related documents

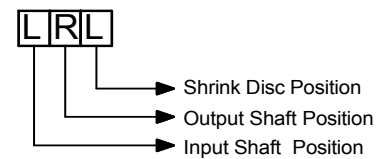
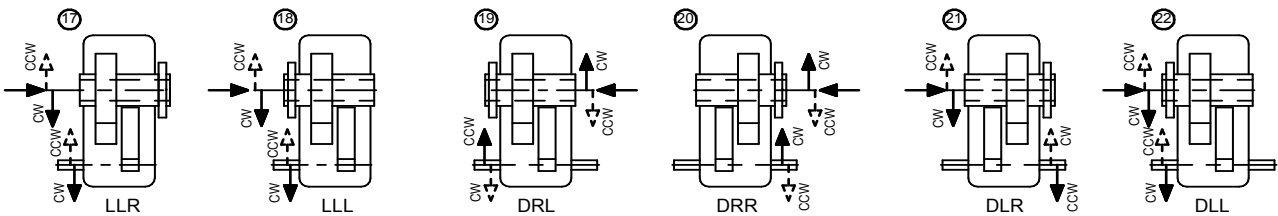
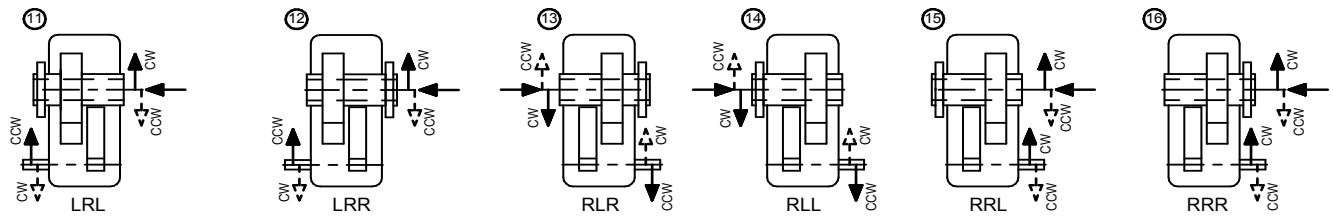
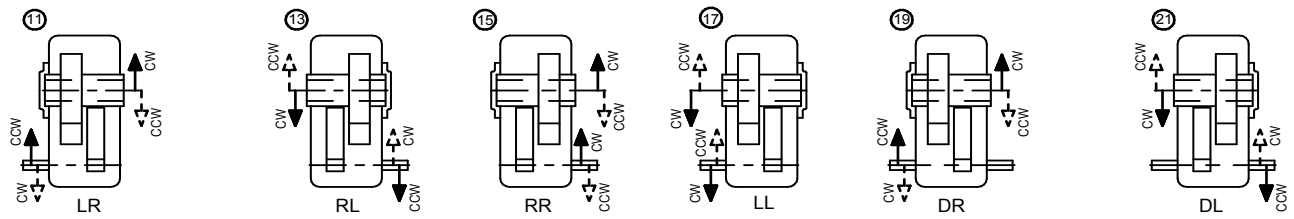
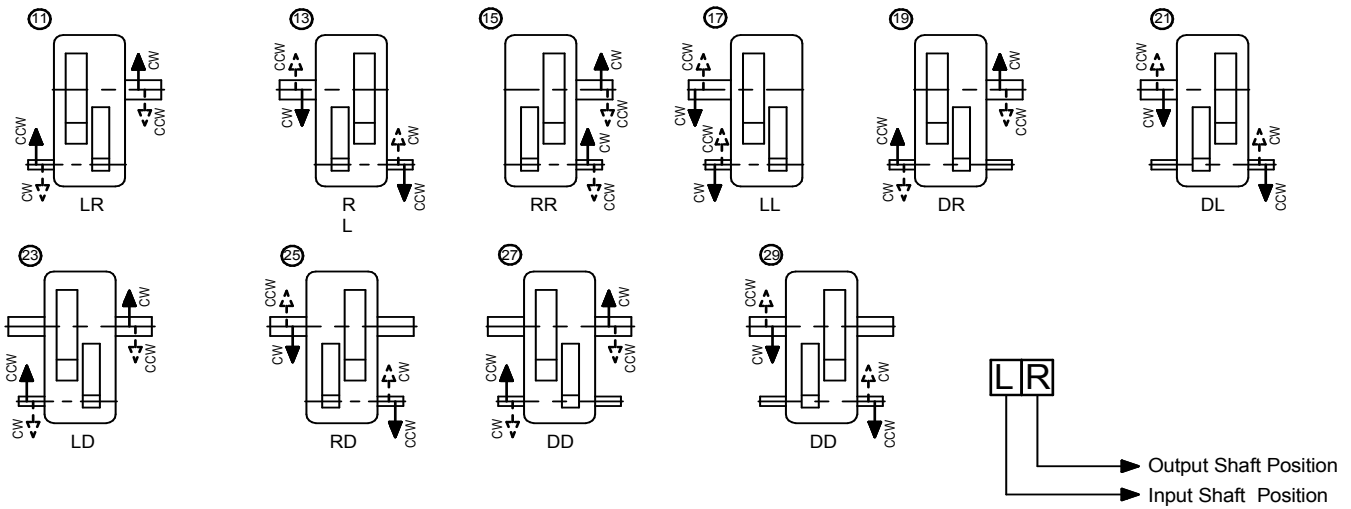
2) Approximate Values; exact values according to order related documents

3) Approximate Lubricant Quantity; - fill to level (maximum) marked on the dipstick

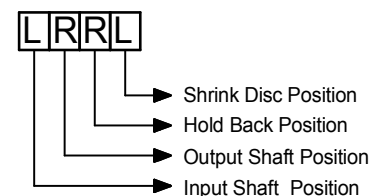
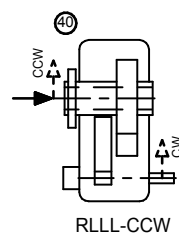
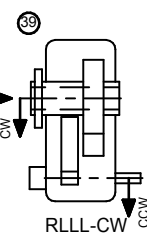
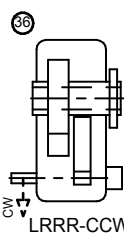
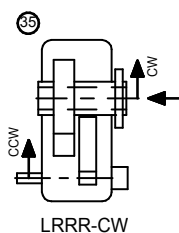
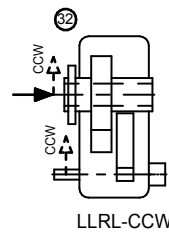
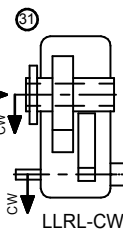
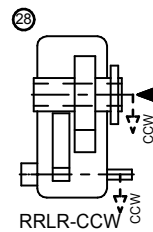
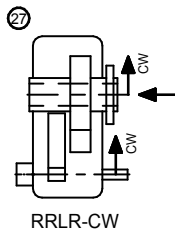
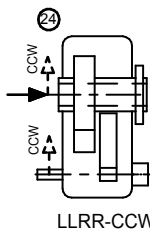
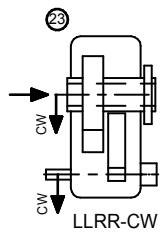
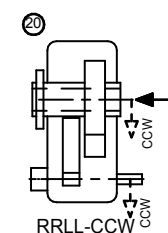
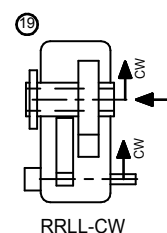
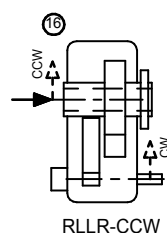
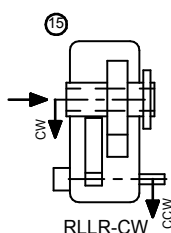
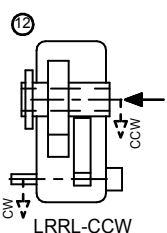
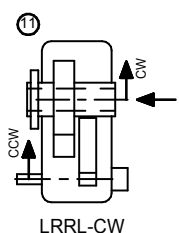
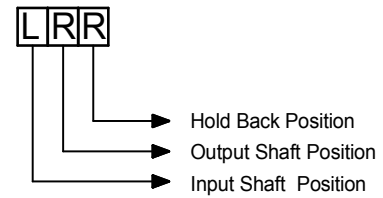
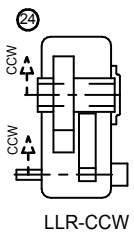
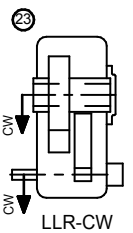
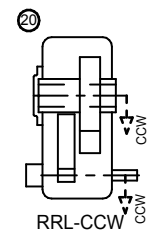
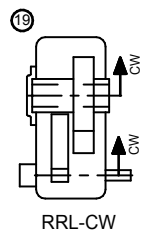
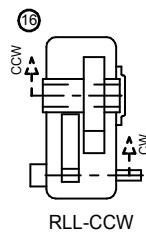
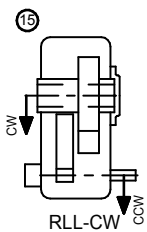
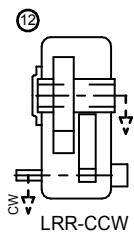
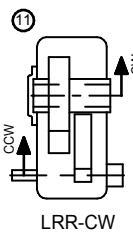
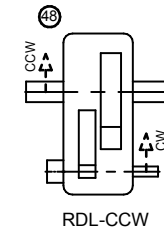
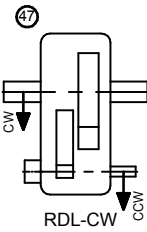
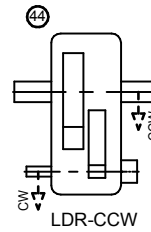
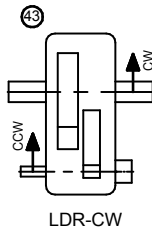
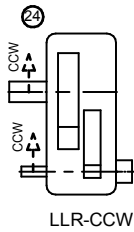
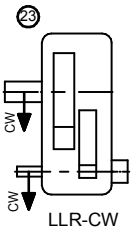
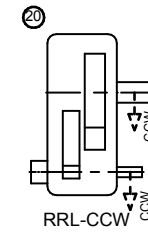
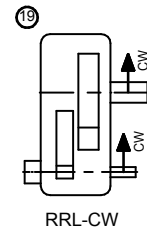
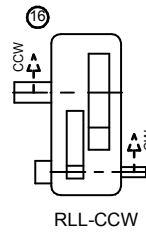
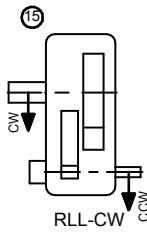
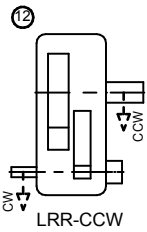
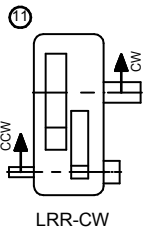
# SERIES E

## TYPE H2/S2 DOUBLE STAGE

### SHAFT ARRANGEMENT - HELICAL GEAR UNIT



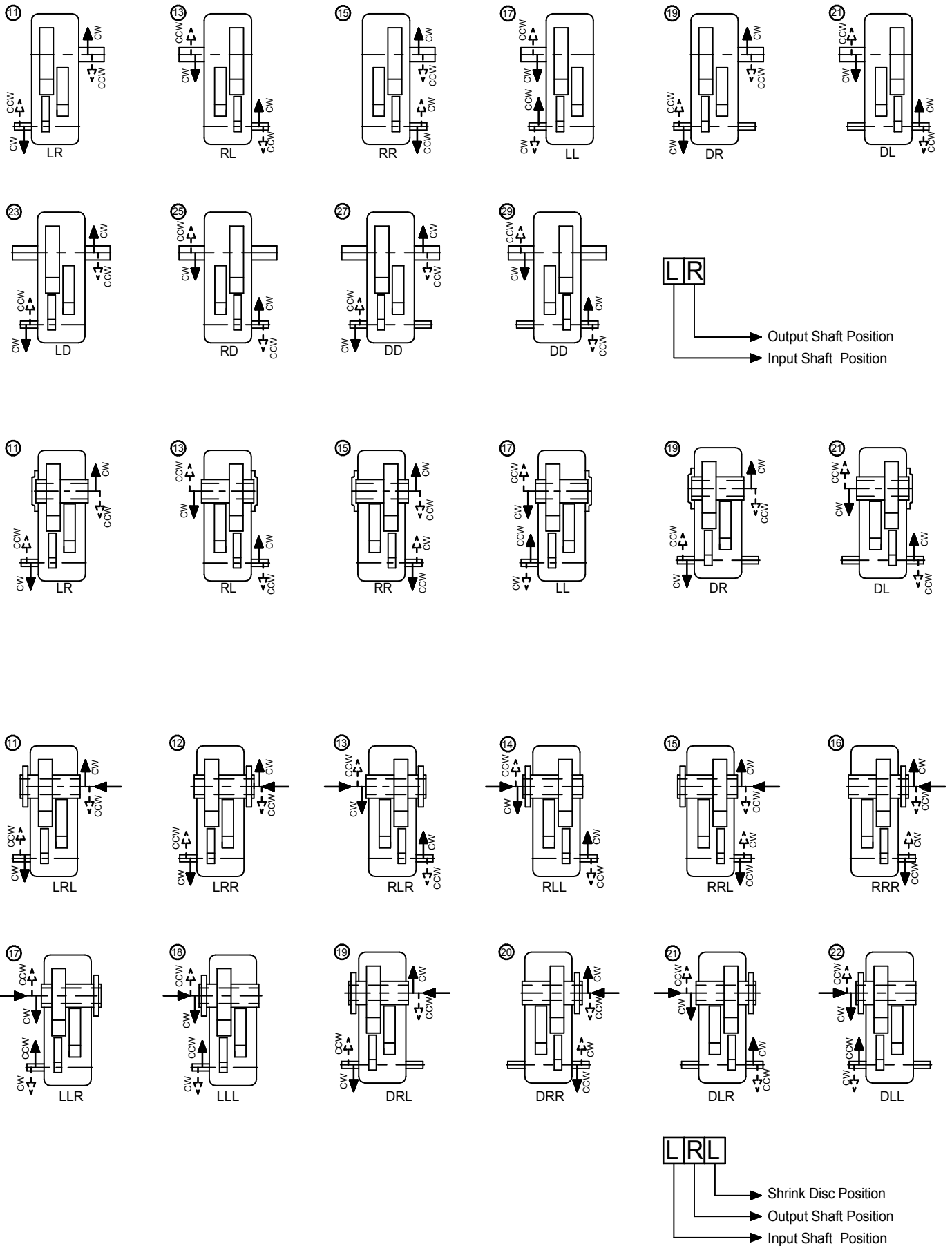
### SHAFT ARRANGEMENT - HOLDBACK - HELICAL GEAR UNIT



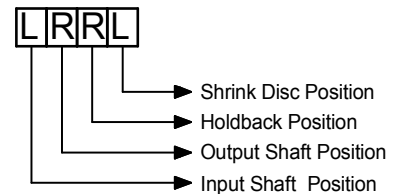
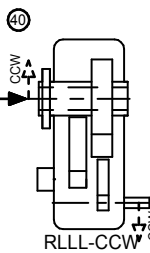
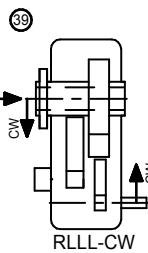
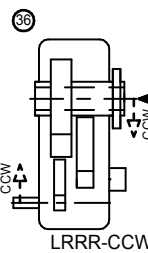
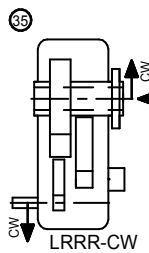
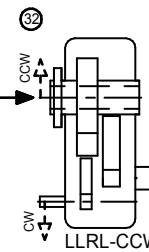
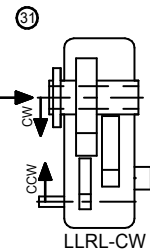
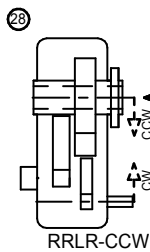
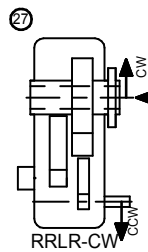
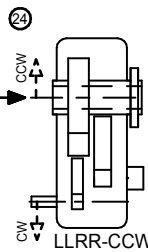
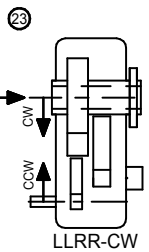
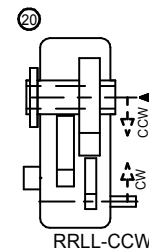
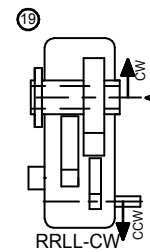
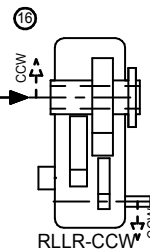
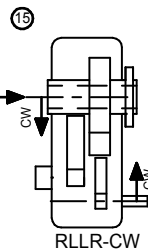
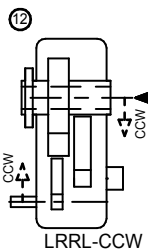
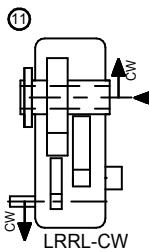
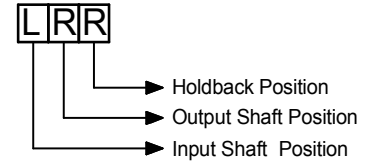
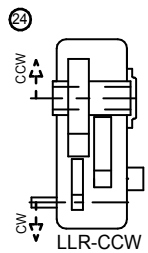
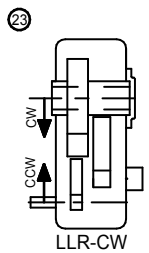
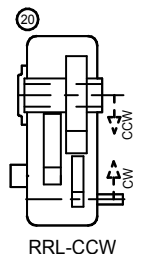
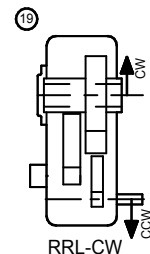
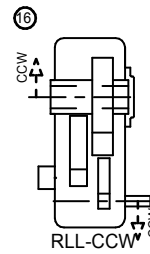
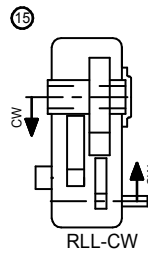
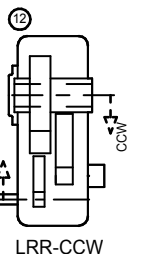
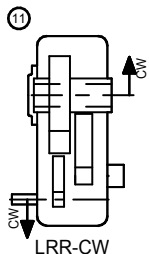
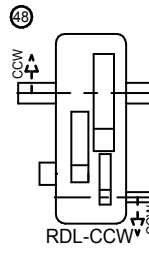
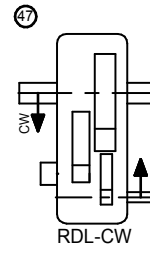
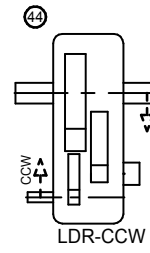
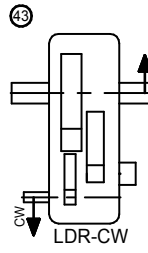
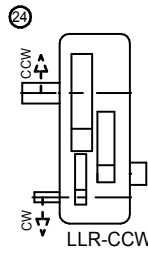
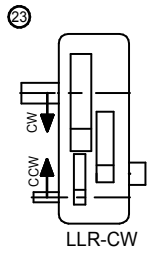
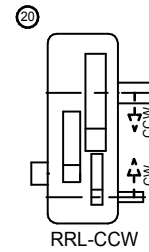
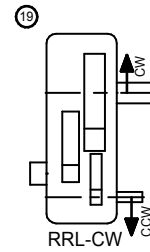
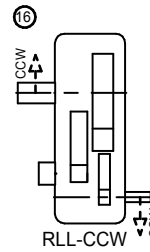
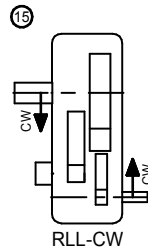
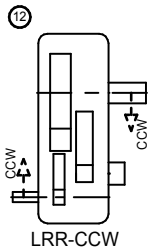
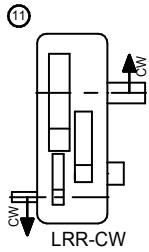
# SERIES E

## TYPE H3/S3 TRIPLE STAGE

### SHAFT ARRANGEMENT - HELICAL GEAR UNIT



### SHAFT ARRANGEMENT - HOLD BACK - HELICAL GEAR UNIT

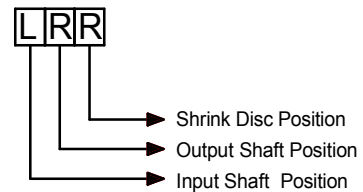
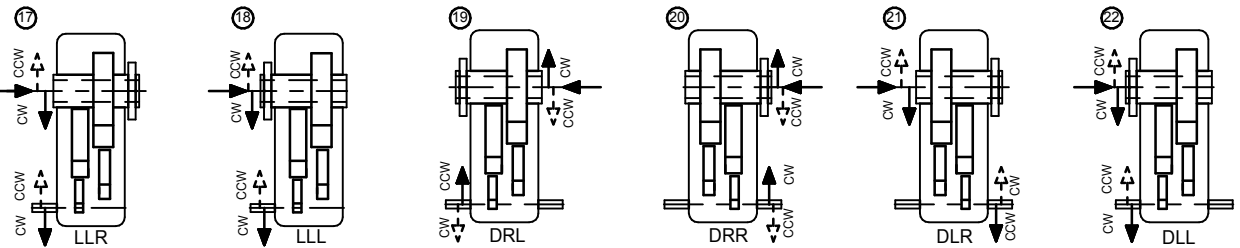
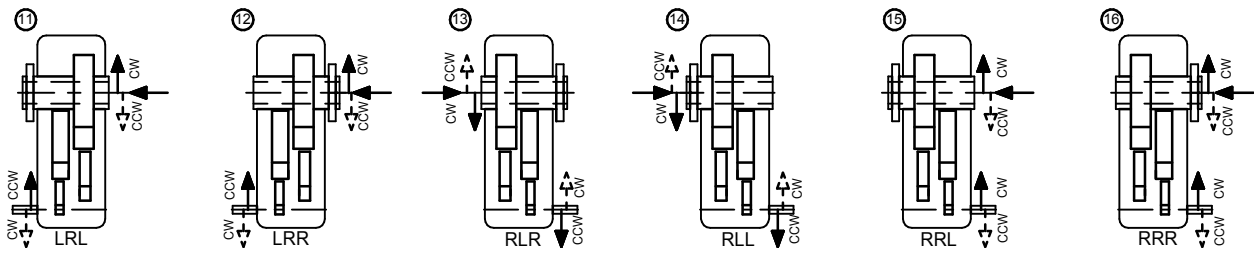
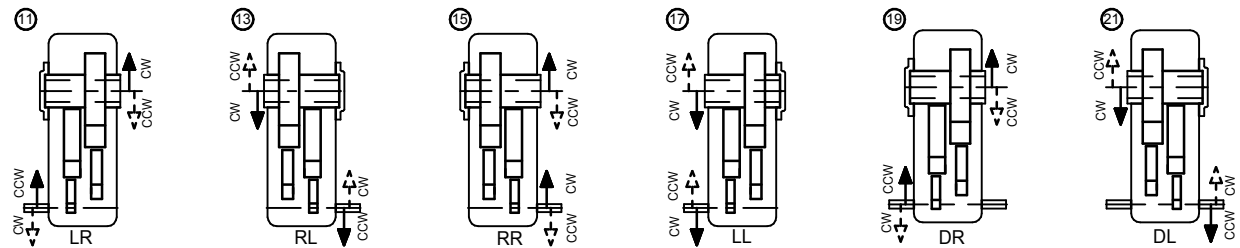
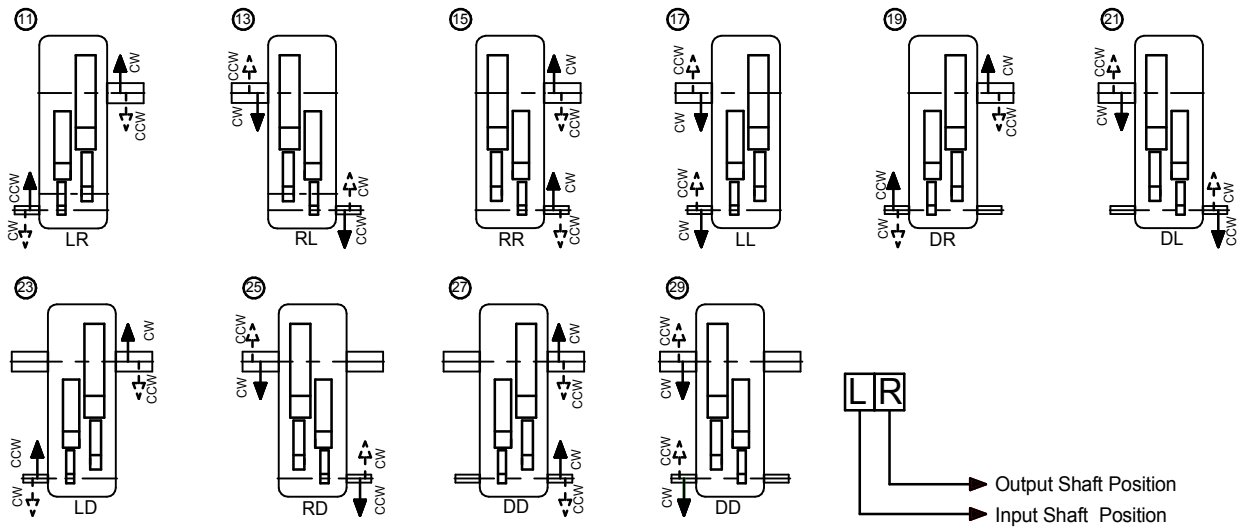




# SERIES E

## TYPE H4/S4 QUADRUPLE STAGE

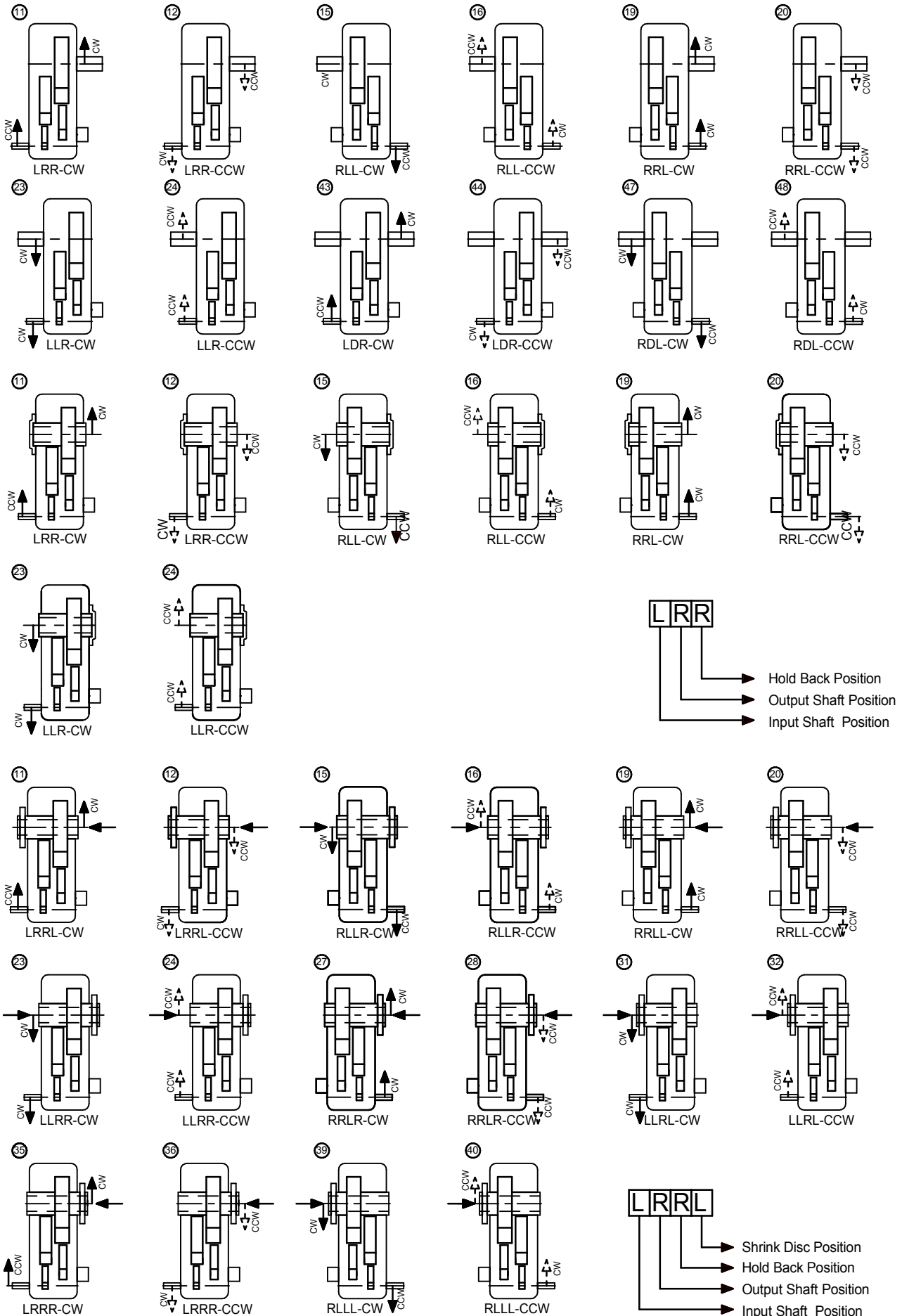
### SHAFT ARRANGEMENT - HELICAL GEAR UNIT



# SERIES E

## TYPE H4/S4 QUADRUPLE STAGE

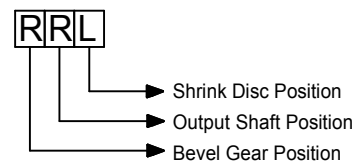
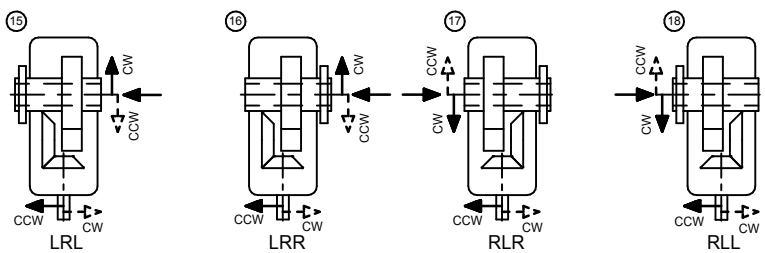
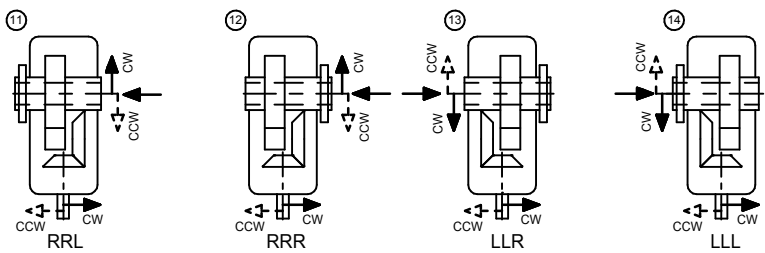
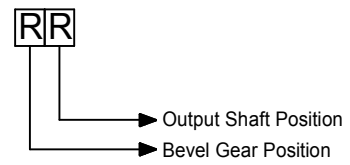
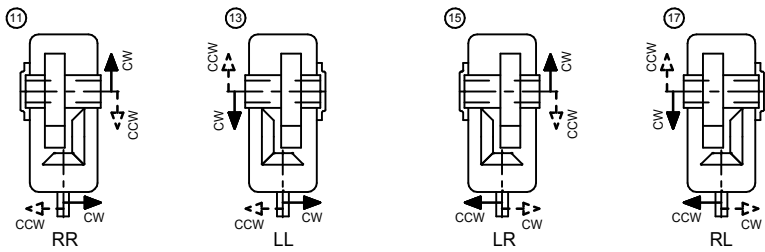
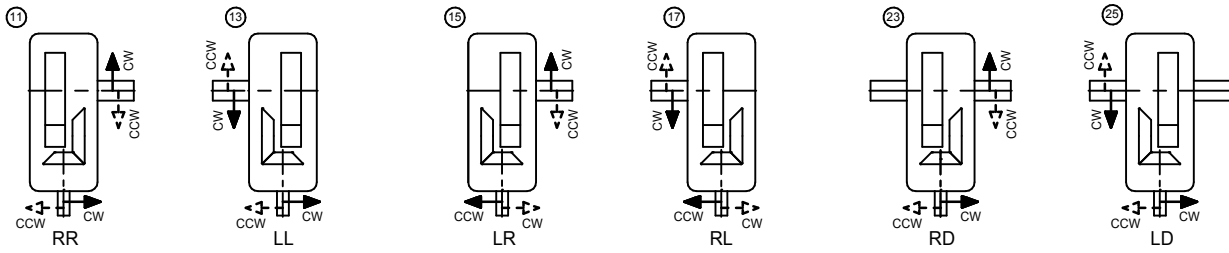
### SHAFT ARRANGEMENT - HOLDBACK - HELICAL GEAR UNIT



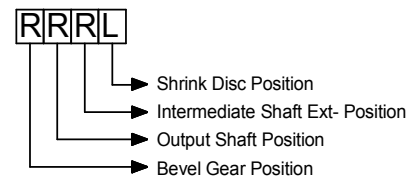
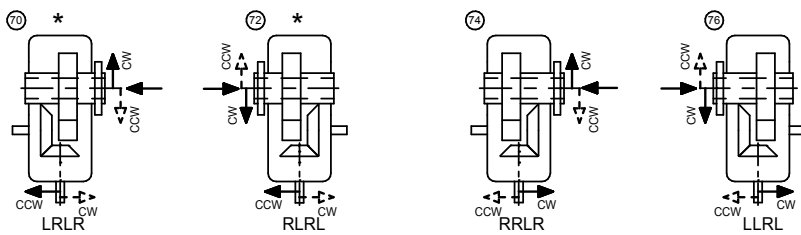
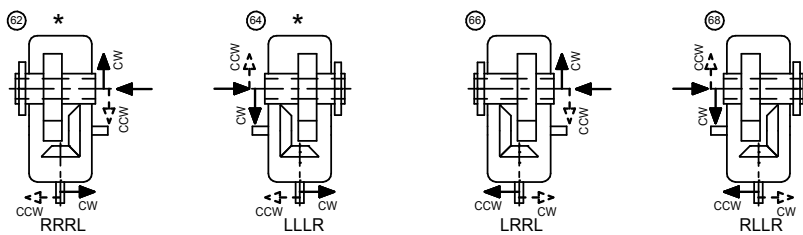
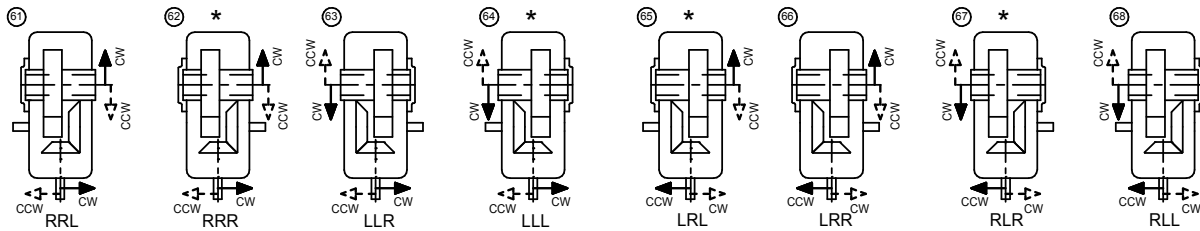
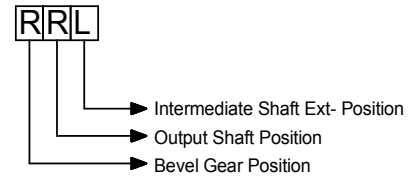
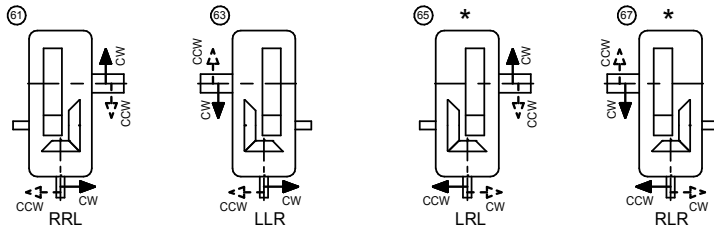
# SERIES E

## TYPE B2/K2 DOUBLE STAGE

### SHAFT ARRANGEMENT - BEVEL HELICAL GEAR UNIT



### SHAFT ARRANGEMENT - INT. EXTENSION - BEVEL HELICAL GEAR UNIT

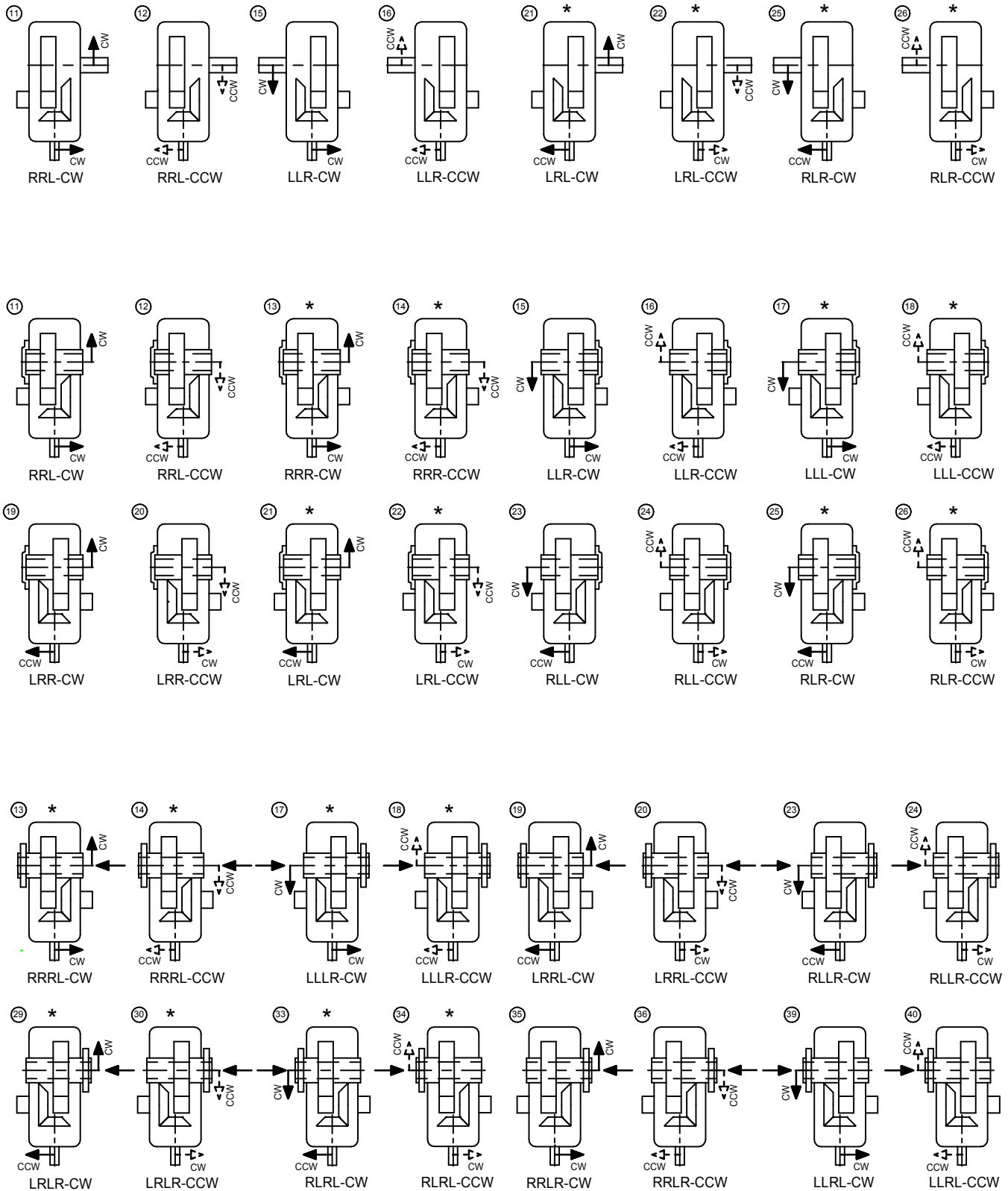


# SERIES E

## TYPE B2/K2

### DOUBLE STAGE

#### SHAFT ARRANGEMENT - HOLDBACK - BEVEL HELICAL GEAR UNIT



**RRL**

- Hold Back Position
- Output Shaft Position
- Bevel Gear Position

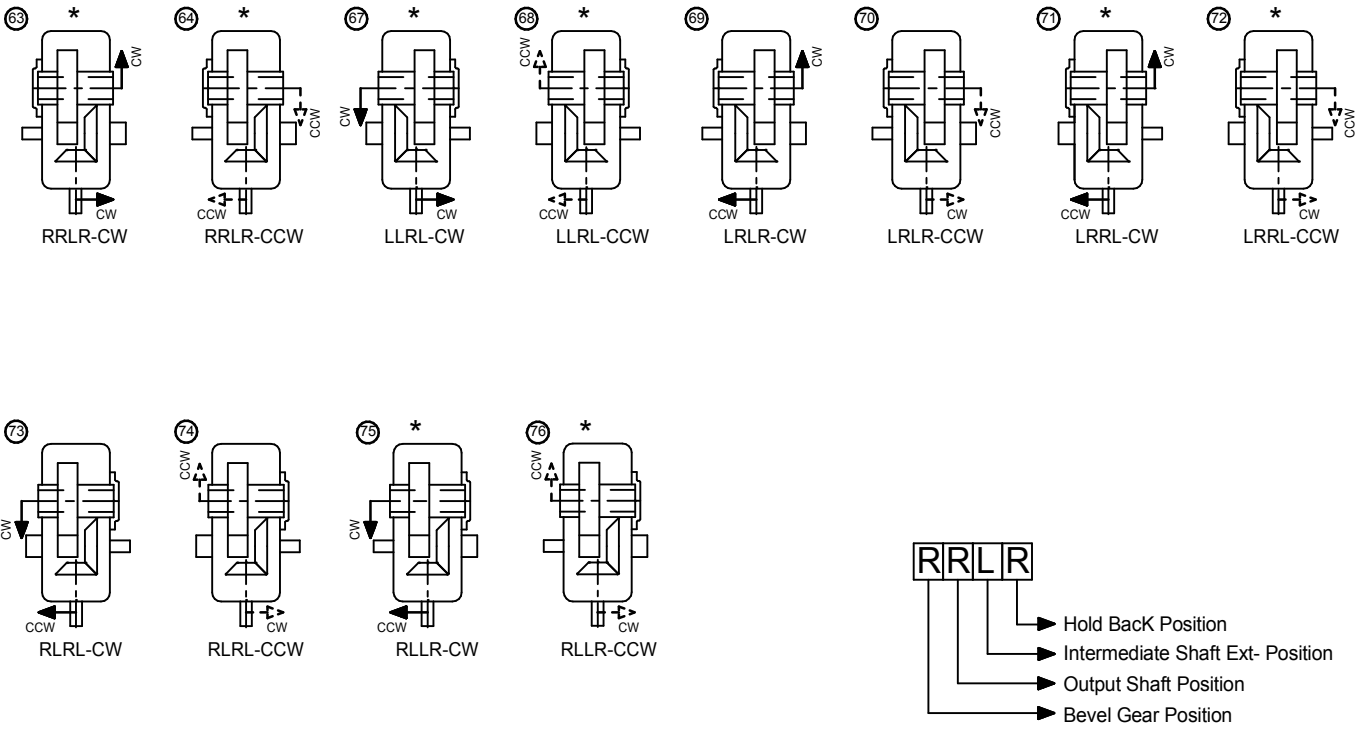
**RRRL**

- Shrink Disc Position
- Hold Back Position
- Output Shaft Position
- Bevel Gear Position

# SERIES E

## TYPE B2/K2 DOUBLE STAGE

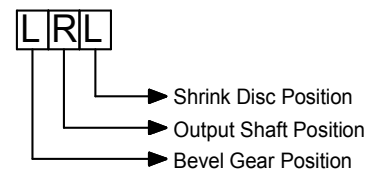
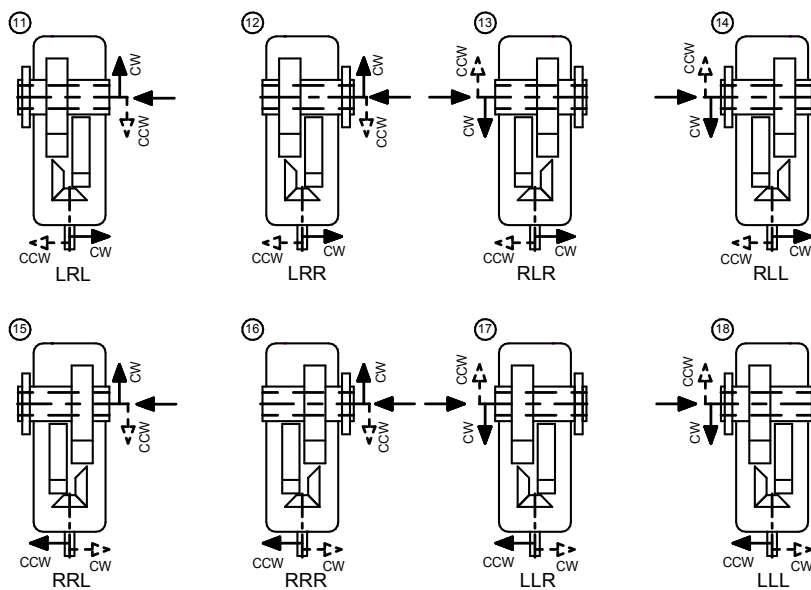
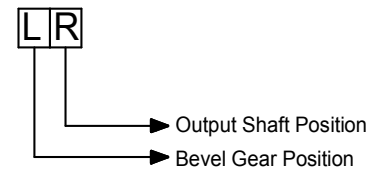
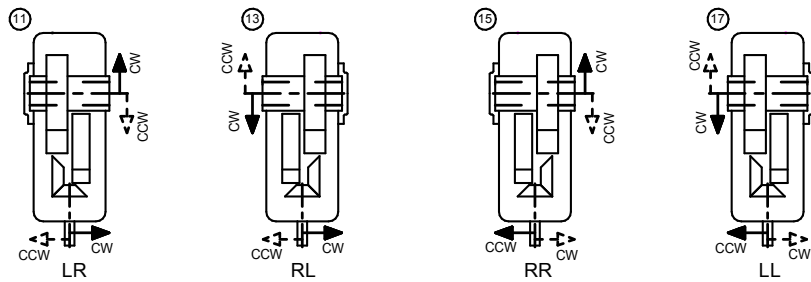
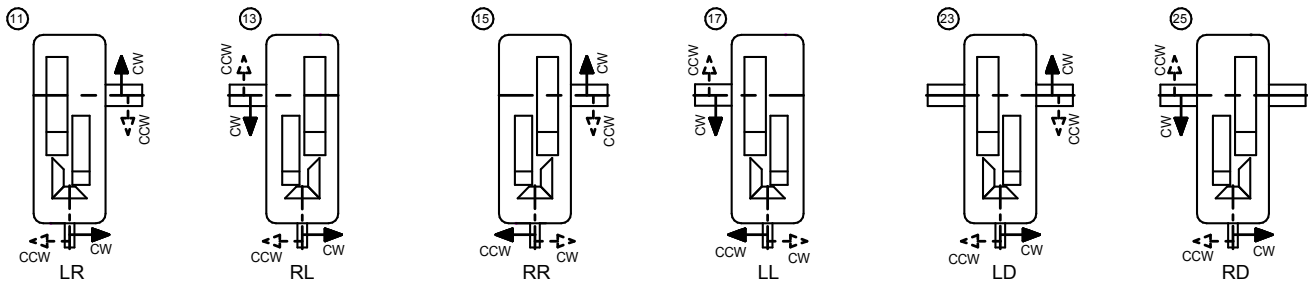
### SHAFT ARRANGEMENT - INT. EXT. & HOLDBACK - BEVEL HELICAL GEAR UNIT



# SERIES E

## TYPE B3/K3 TRIPLE STAGE

### SHAFT ARRANGEMENT - BEVEL HELICAL GEAR UNIT





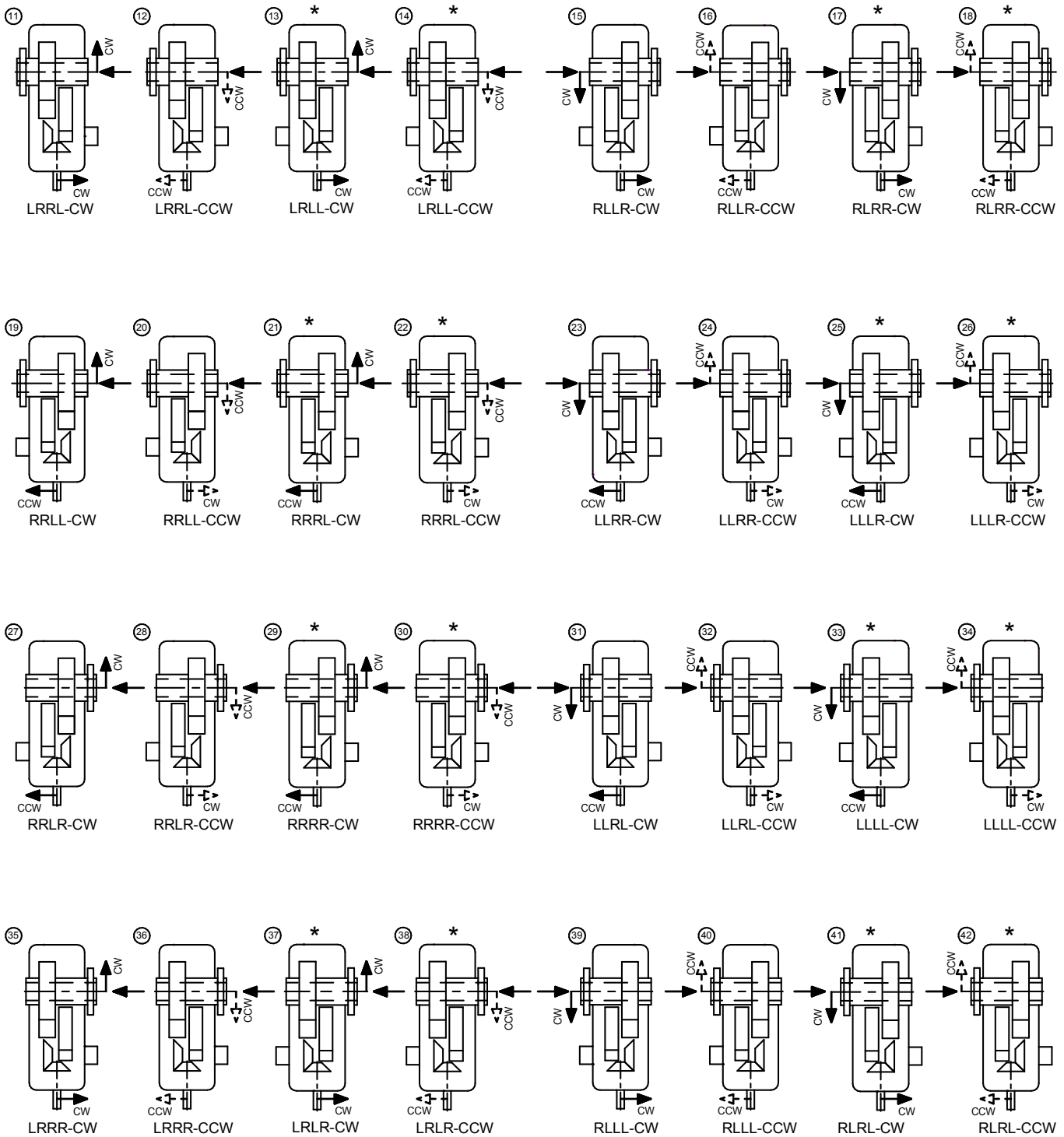


# SERIES E

## TYPE B3/K3

### TRIPLE STAGE

### SHAFT ARRANGEMENT - HOLDBACK - BEVEL HELICAL GEAR UNIT



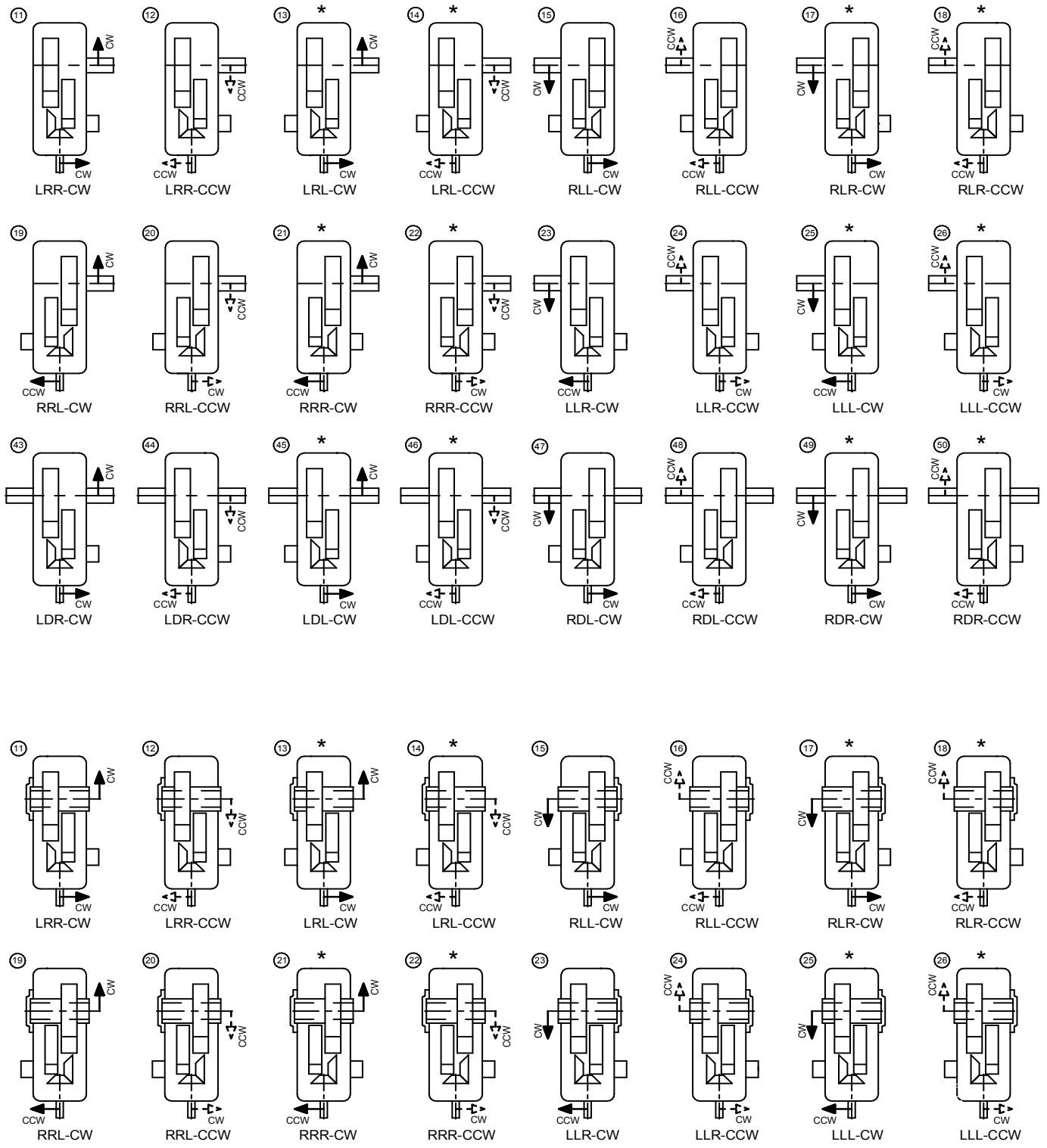
- Shrink Disc Position
- Hold Back Position
- Output Shaft Position
- Bevel Gear Position

# SERIES E

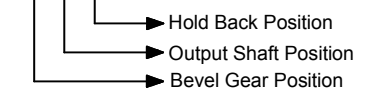
## TYPE B3/K3

### TRIPLE STAGE

#### SHAFT ARRANGEMENT - HOLDBACK - BEVEL HELICAL GEAR UNIT



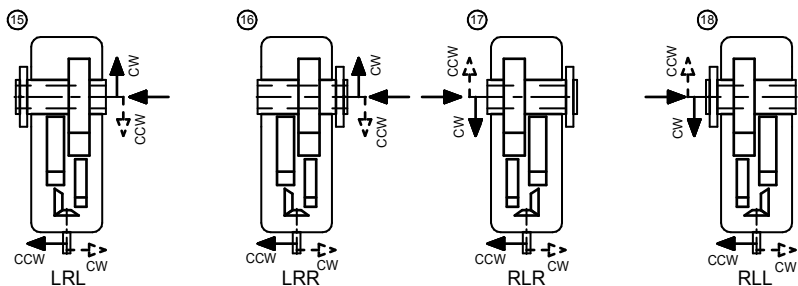
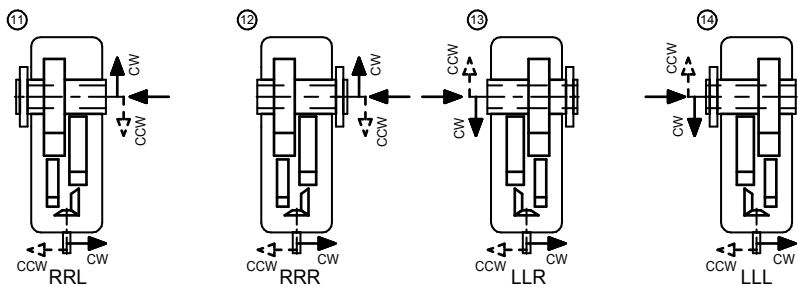
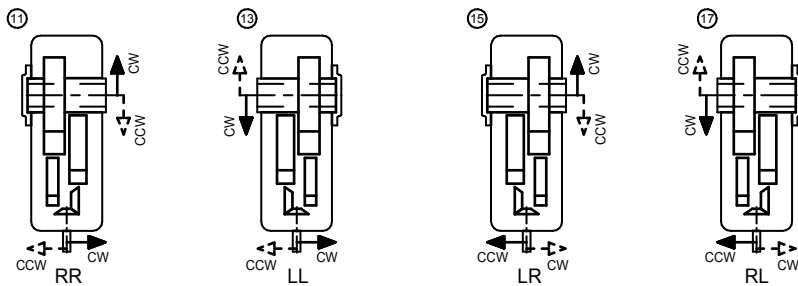
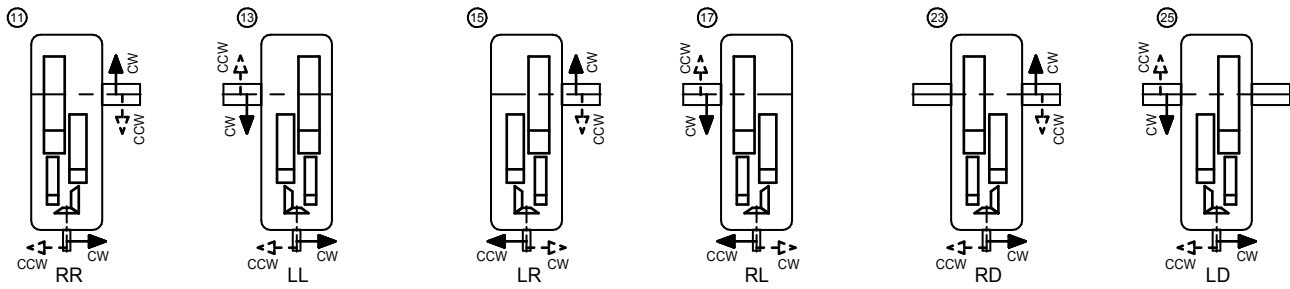
**LRR**



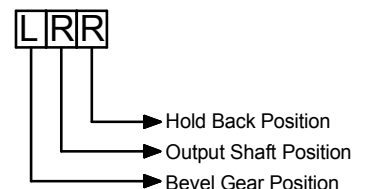
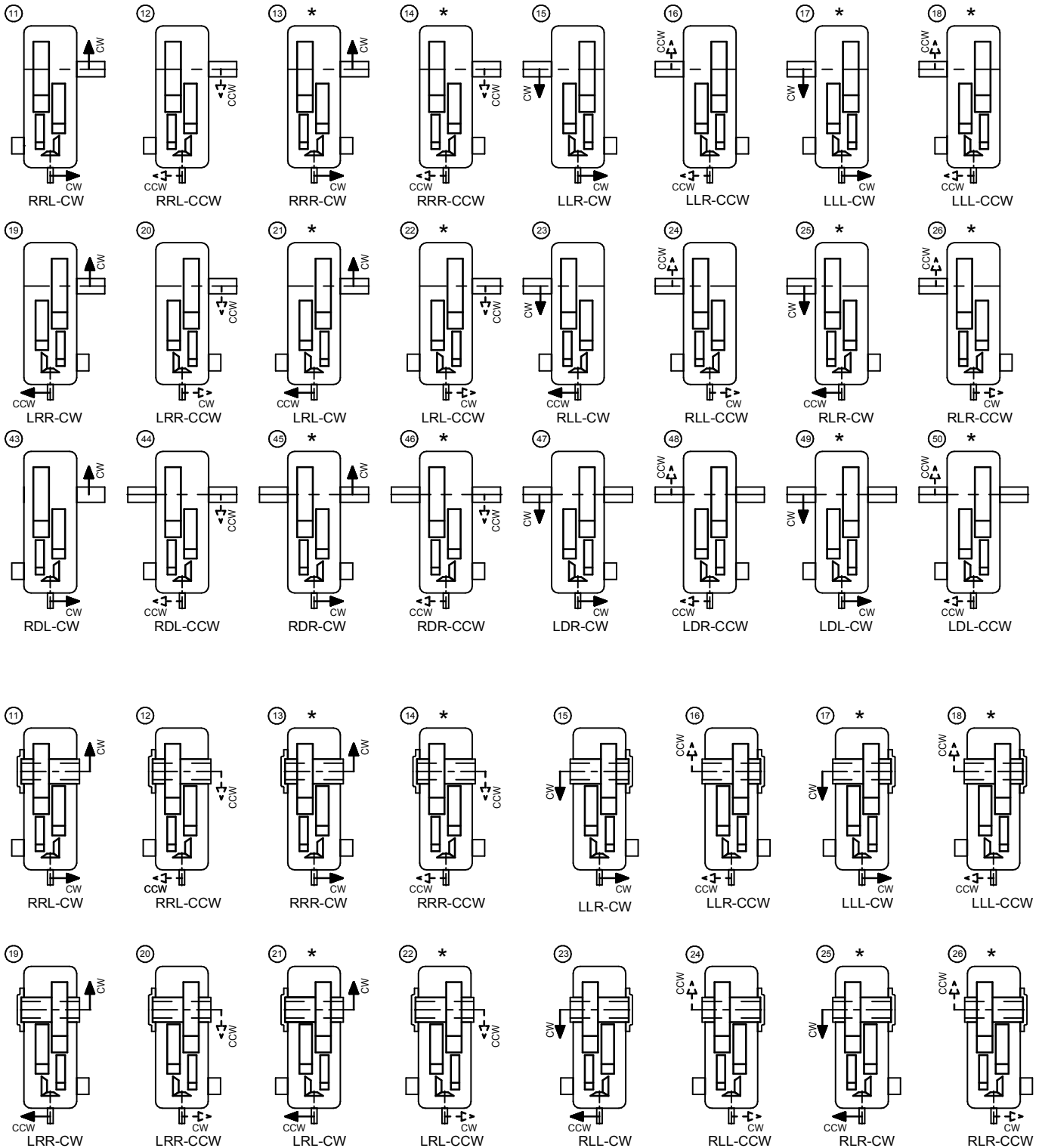
# SERIES E

## TYPE B4/K4 QUADRUPLE STAGE

### SHAFT ARRANGEMENT - BEVEL HELICAL GEAR UNIT



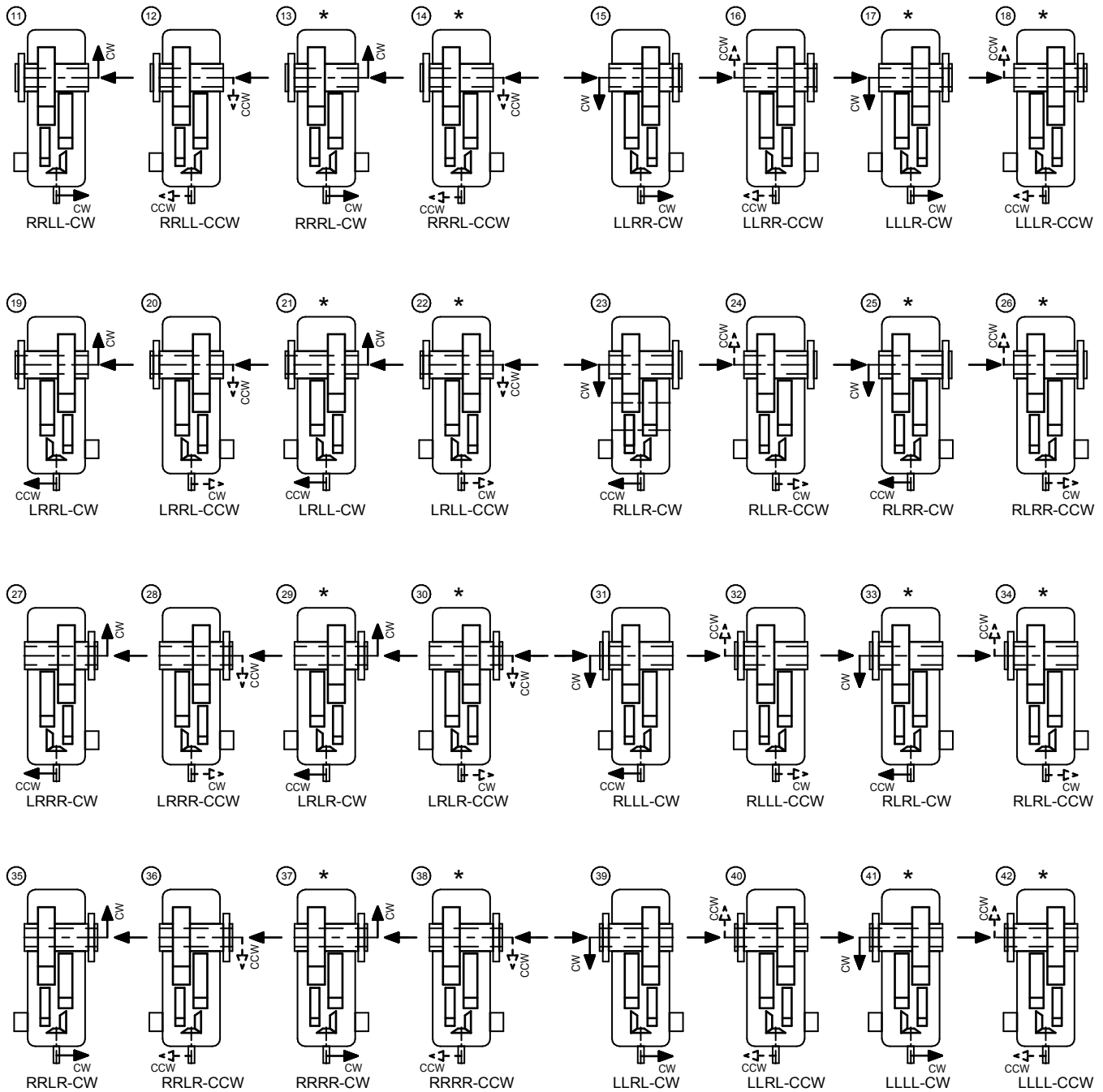
### SHAFT ARRANGEMENT - HOLD BACK - BEVEL HELICAL GEAR UNIT



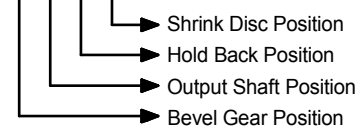
# SERIES E

## SHAFT ARRANGEMENT - HOLD BACK - BEVEL HELICAL GEAR UNIT

## TYPE B4/K4 QUADRUPLE STAGE



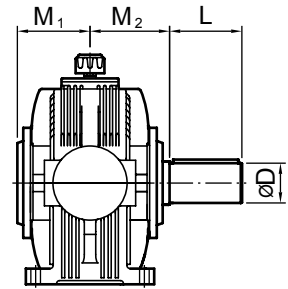
**RRLL**



## OUTPUT SHAFT OPTIONS

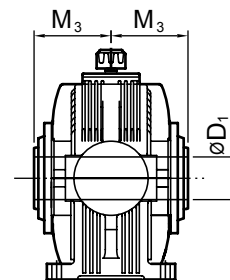
Size	Solid Output Shaft			
	D	L	M <sub>1</sub>	M <sub>2</sub>
11	32	55	93.5	105
13	45	95	106	115
14	48	95	106	125
15	55	95	127	135
16	60	130	132.5	145
17	70	135	141	150
18	80	160	158	170

Solid Output Shaft - (N)



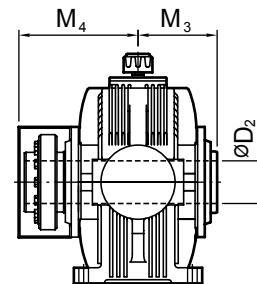
Size	Hollow Shaft Key	
	D <sub>1</sub>	M <sub>3</sub>
11	35	105
13	50	115
14	55	125
15	60	135
16	70	145
17	75	150
18	90	170

Hollow Output Shaft With Keyway - (K)



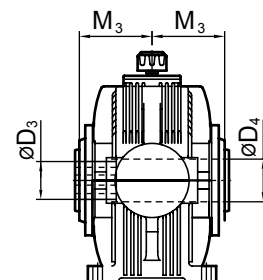
Size	Hollow Shaft (Shrink Disc)		
	D <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
14	60	120	200
15	65	135	215
16	75	145	235
17	80	150	250
18	95	170	280

Hollow Output Shaft With Shrink Disc - (D)



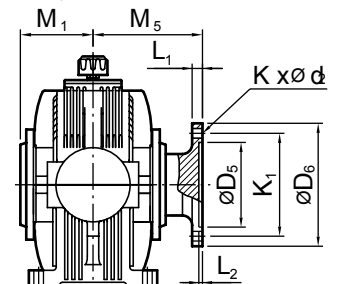
Size	Hollow Shaft (Spline)		
	D <sub>3</sub>	D <sub>4</sub>	M <sub>3</sub>
11	Dimension on Request		
13			
14			
15			
16			
17			
18			

Hollow Output Shaft With Spline - (S)



Size	Flanged Shaft							
	D <sub>5</sub>	D <sub>6</sub>	K <sub>1</sub>	K x Ø d <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	M <sub>1</sub>	M <sub>5</sub>
11	Dimension on Request							
13								
14								
15								
16								
17								
18								

Flanged Shaft - (F)



Modification of dimensions reserved.

Shaft ends with keys according to DIN 6885, part 1, Shape A.

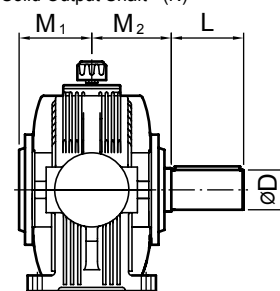
Shaft centering according to DIN 332, shape DS (with thread)

Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

## OUTPUT SHAFT OPTIONS

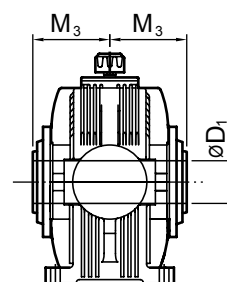
Size	Solid Output Shaft			
	D	L	M <sub>1</sub>	M <sub>2</sub>
19	90	165	170.5	180
20	100	200	176	200
21	110	200	210	220
22	120	210	220	230
23	140	250	234	260
24	160	290	282.5	295
25	170	300	292.5	305
26	190	350	305.5	345

Solid Output Shaft - (N)



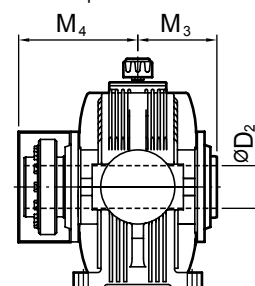
Size	Hollow Shaft Key	
	D <sub>1</sub>	M <sub>3</sub>
19	105	180
20	110	190
21	120	220

Hollow Output Shaft With Keyway - (K)



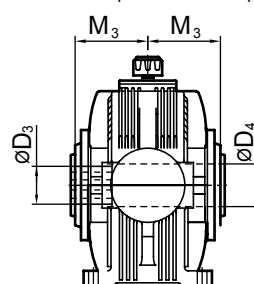
Size	Hollow Shaft (Shrink Disc)		
	D <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
19	105	180	300
20	115	190	315
21	125	220	360
22	140	230	395
23	160	260	445
24	180	295	485
25	200	305	515
26	220	345	575

Hollow Output Shaft With Shrink Disc - (D)



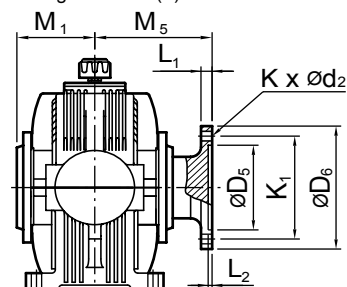
Size	Hollow Shaft (Spline)		
	D <sub>3</sub>	D <sub>4</sub>	M <sub>3</sub>
19	Dimension on Request		
20			
21			
22			
23			
24			
25			
26			

Hollow Output Shaft With Spline - (S)



Size	Flanged Shaft							
	D <sub>5</sub>	D <sub>6</sub>	K <sub>1</sub>	K x Ø d <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	M <sub>1</sub>	M <sub>5</sub>
19	Dimension on Request							
20								
21								
22								
23								
24								
25								
26								

Flanged Shaft - (F)



Modification of dimensions reserved.

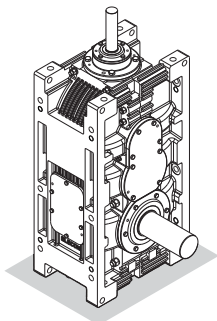
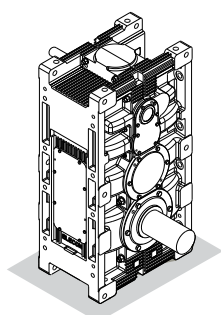
Shaft ends with keys according to DIN 6885, part 1, Shape A.

Shaft centering according to DIN 332, shape DS (with thread)

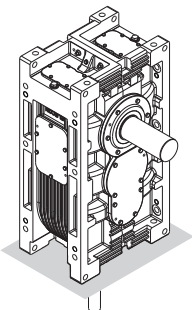
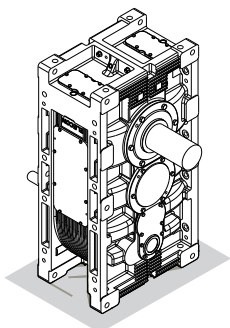
Tolerance field for shaft ends ISO fit, up to Ø50 k6; over Ø50m6.

## ALTERNATIVE CONFIGURATIONS

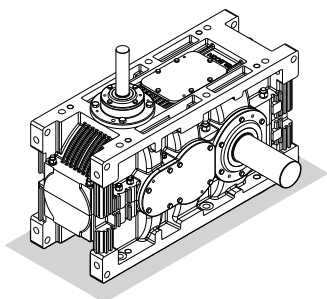
Series e also offers the following alternative configurations. Please contact our application engineers for details.



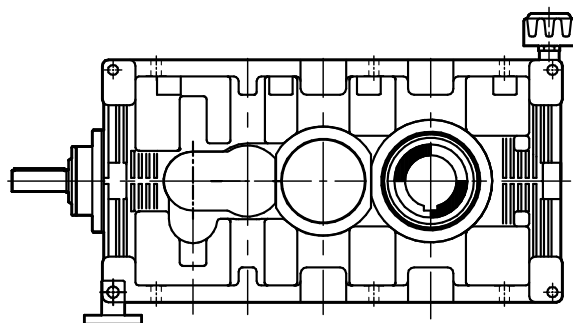
**Over Driven Applications**



**Under Driven Applications**



**Mounting Positions and Surfaces for  
Compact (Bevel-Helical) Gear Unit  
Version S**



**Torque Arm Mounting arrangement for  
Version S**

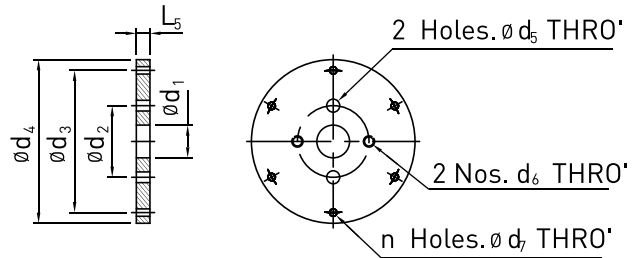
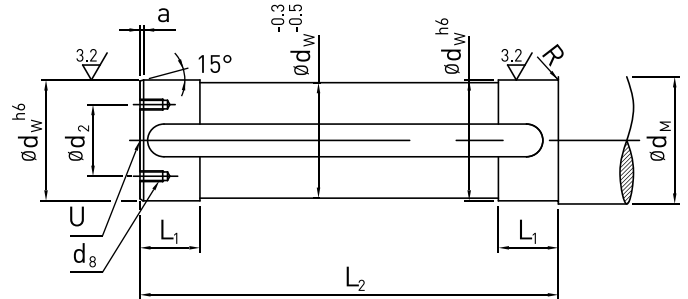
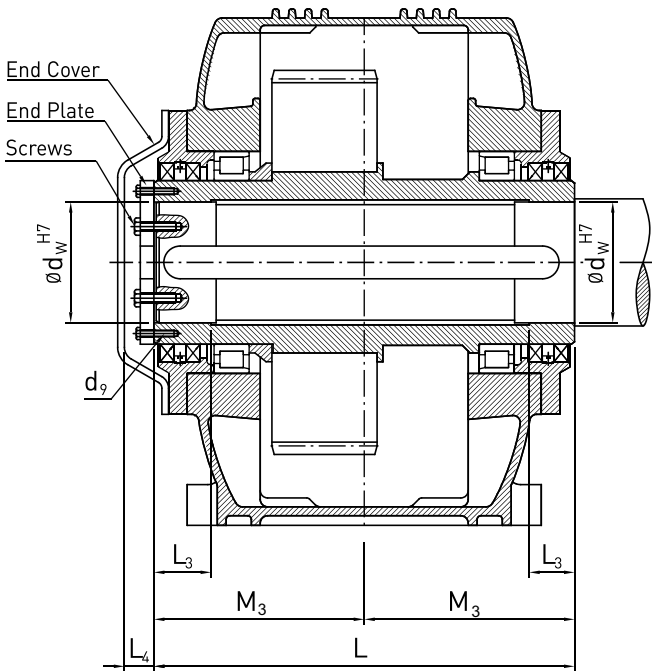
H4 / H3 / B4



# SERIES E

## HOLLOW OUTPUT SHAFT DESIGN WITH FITTED KEY

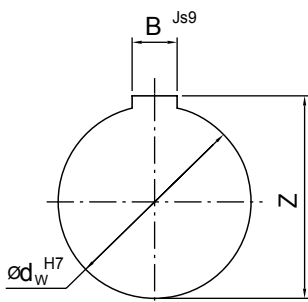
### HELICAL / BEVEL HELICAL GEAR UNITS



End Plate (Size 13 onwards)

Size	Hollow Shaft						Driven Machine Shaft								End Plate									
	$d_w$	L	$M_3$	$L_3$	$L_4$	$d_9$	$d_w$	$d_M$	$d_2$	$d_8$	$L_1$	$L_2$	a	R	U	$d_1$	$d_2$	$d_3$	$d_4$	$d_5$	$d_6$	$d_7$	n	$L_5$
11	35	210	105	30	23	M5 x 9	35	55	-	-	35	207	3	2.5	M10	-	-	-	-	-	-	-	-	-
13	50	230	115	45	23	M5 x 9	50	70	35	M8 x 16	50	227	3	2.5	M16	18	35	60	69.5	9	M8	5.5	4	8
14	55	240	120	50	25	M6 x 12	55	75	40	M8 x 16	55	237	4	2.5	M20	22	40	67.5	79	9	M10	6.6	4	8
15	60	270	135	55	25	M6 x 12	60	80	45	M10 x 20	60	267	4	2.5	M20	22	45	72.5	89	11	M10	6.6	6	8
16	70	290	145	65	25	M6 x 12	70	90	50	M10 x 20	70	287	4	2.5	M20	22	50	85	99	11	M10	6.6	6	8
17	75	300	150	70	30	M6 x 12	75	95	55	M10 x 20	75	297	5	4	M20	22	55	90	109	11	M10	6.6	6	10
18	90	340	170	85	30	M8 x 15	90	110	65	M10 x 20	90	337	5	4	M24	26	65	110	129	11	M10	9	4	10
19	105	360	180	100	32	M8 x 15	105	125	70	M12 x 25	105	357	5	4	M24	26	70	120	139	14	M12	9	4	10
20	110	380	190	110	32	M10 x 17	110	135	75	M12 x 25	115	377	5	4	M24	26	75	125	159	14	M12	11	4	12
21	120	440	220	120	32	M10 x 17	120	150	80	M12 x 25	130	437	6	6	M24	26	80	140	169	14	M12	11	4	12

Hollow Shaft Bore Details

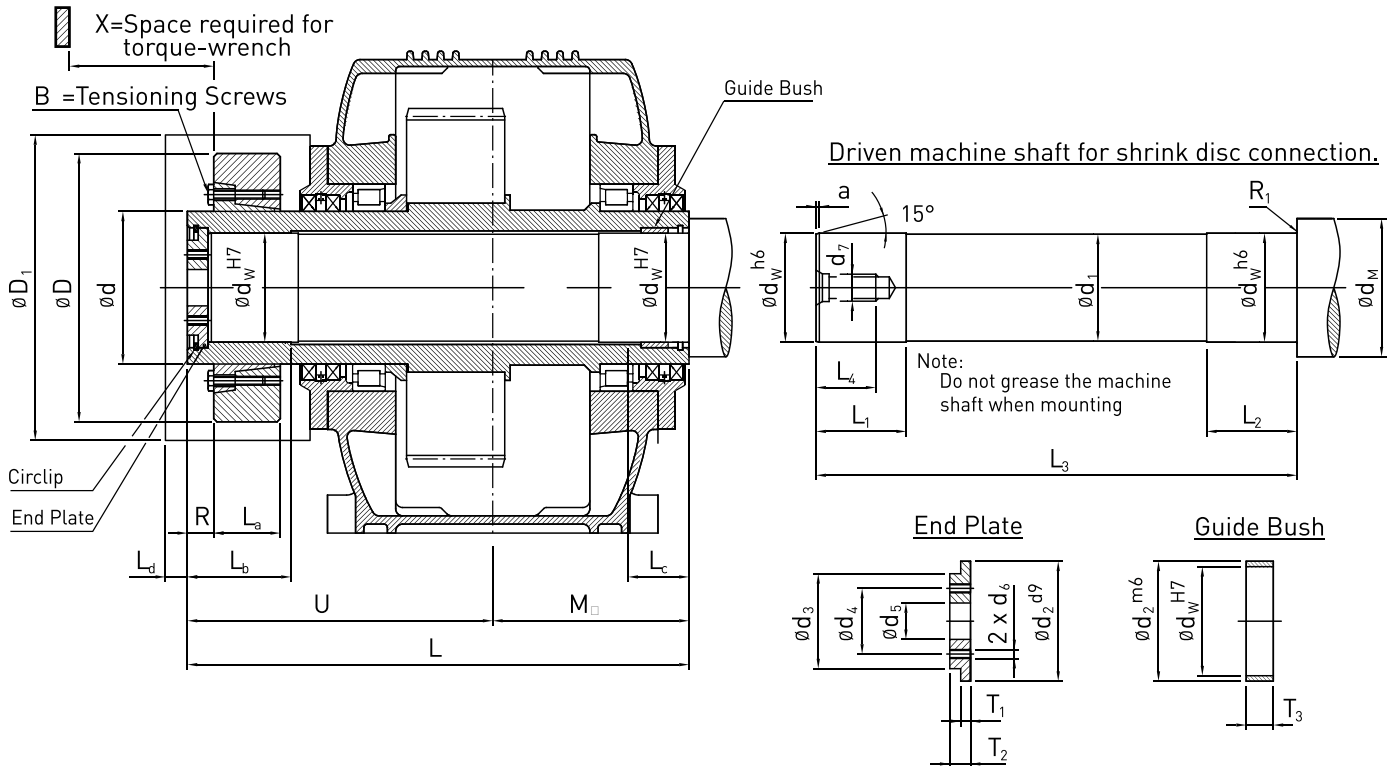


$d_w$	B	Z	tol. on Z
35	10	38.3	0.2
50	14	53.8	
55	16	59.3	
60	18	64.4	
70	20	74.9	
75	20	79.9	
90	25	95.4	
105	28	111.4	
110	28	116.4	
120	32	127.4	

$d_w$	tol. field	tol
35	H7	+0.025
50		
55		
60	H7	+0.030
70		
75		
90		
105	H7	+0.035
110		
120		

B	tol. field	tol
10	Js9	+0.018 -0.018
12		
14	Js9	+0.022 -0.022
16		
18		
20	Js9	+0.026 -0.026
25		
28		
32	28	+0.031 -0.031

### Standard Shaft Mounting Position



Size	Hollow Shaft							Shrink Disc										
	$d_w$	L	$L_b$	$L_c$	U	$M_3$	R	Type	D	d	$D_1$ (Approx)	$L_a$	$L_d$	$M_2$ (da Nm)	B	$M_a$ (da Nm)	KG	
14	60	300	50	30	180	120	17	80 - 60	141	80	175	31	20	319	M10	5.8	2.3	
15	65	330	55	35	195	135	17	90 - 65	155	90	190	38	20	540	M10	5.8	3.2	
16	75	360	65	40	215	145	20	100 - 75	170	100	215	43.5	20	720	M10	5.8	4.3	
17	80	380	80	41	230	150	26	110 - 80	185	110	225	49	20	1000	M12	10	5.8	
18	95	430	85	44	260	170	27	125 - 95	215	125	260	53.5	20	1650	M12	10	8.7	
19	105	460	95	49	280	180	32	140 - 105	230	140	270	58	20	2210	M14	16	10.3	
20	115	485	100	49	295	190	33	155 - 115	263	155	305	63	20	2950	M14	16	15.2	
21	125	555	120	68	335	220	35	165 - 125	290	165	335	68	25	4120	M16	24	21.5	
22	140	600	135	68	370	230	35	180 - 140	320	180	365	85.5	25	6400	M16	24	32.7	
23	160	680	155	73	420	260	37	220 - 160	370	220	415	105	25	10300	M20	47	53	
24	180	755	160	83	460	295	38	240 - 180	405	240	460	109	25	14000	M20	47	66	
25	200	795	180	88	490	305	46	260 - 200	430	260	495	120	25	18400	M20	47	82	
26	220	895	190	103	550	345	48	280 - 220	460	280	530	135	25	24000	M20	47	103	

Size	Driven Machine Shaft									End Plate							Guide Bush				
	$d_w$	$d_1$	$d_m$ (min)	$R_1$	$L_1$	$L_2$	$L_3$	$L_4$	$d_7$	a	$d_2$	$d_3$	$d_4$	$d_5$	$d_6$	$T_1$	$T_2$	$d_w$	$d_2$	$T_3$	Circlip
14	60	59.5	80	1.5	45	65	286	42	M20	4	65	48	35	22	M6	5	13	60	65	17	65 x 2.5
15	65	64.5	85	1.5	50	70	316	42	M20	4	70	53	40	22	M8	5	13	65	70	22	70 x 2.5
16	75	74.5	95	1.5	55	75	342	42	M20	4	80	60	45	22	M8	7	17	75	80	23	80 x 2.5
17	80	79.5	100	1.6	70	90	362	42	M20	5	85	65	50	22	M8	7	17	80	85	24	85 x 3
18	95	94.5	120	1.6	70	90	408	50	M24	5	100	75	55	26	M10	8	20	95	100	24	100 x 3
19	105	104.5	130	1.6	80	100	438	50	M24	5	110	85	60	26	M10	8	20	105	110	29	110 x 4
20	115	114.5	140	1.6	85	105	463	50	M24	5	120	90	65	26	M10	8	20	115	120	29	120 x 4
21	125	124.5	160	2.5	85	110	530	50	M24	6	130	100	65	26	M12	10	23	125	130	45	130 x 4
22	140	139.5	170	2.5	105	130	575	60	M30	6	145	110	75	33	M12	10	23	140	145	45	145 x 4
23	160	159.5	190	2.5	130	155	655	60	M30	6	165	120	80	33	M12	10	23	160	165	50	165 x 4
24	180	179.5	210	2.5	130	160	725	60	M30	6	185	125	85	33	M16	12	28	180	185	55	185 x 4
25	200	199.5	240	4	150	180	765	60	M30	8	210	140	95	33	M16	12	28	200	210	60	210 x 5
26	220	219.5	260	4	165	195	865	80	M36	8	225	160	110	39	M20	12	28	220	225	75	225 x 5

$M_a$  = Required tightening torque

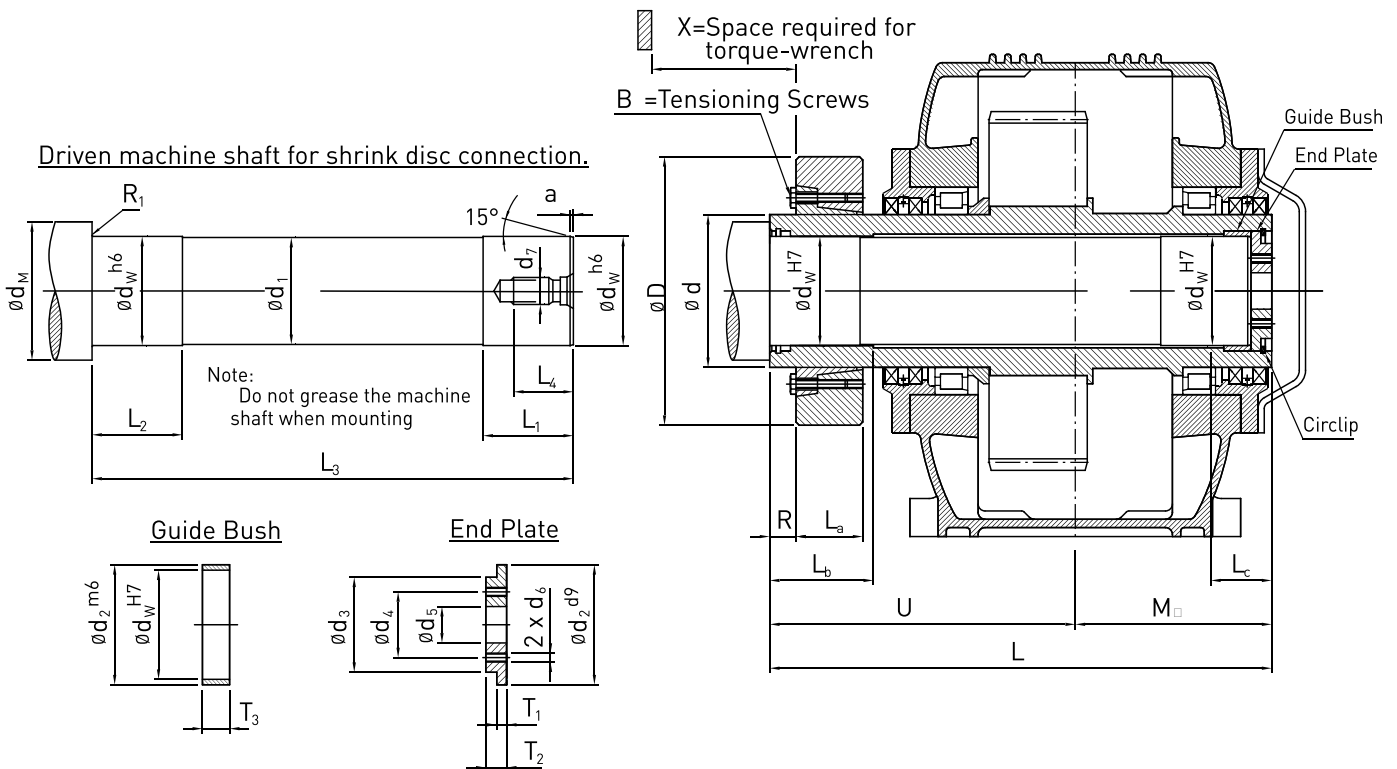
$M_t$  = maximum torque transmitted by shrink disc

# SERIES E

## HELICAL / BEVEL HELICAL GEAR UNITS

## HOLLOW OUTPUT SHAFT DESIGN WITH SHRINK DISC

### Alternate Shaft Mounting Option



Size	Hollow Shaft							Shrink Disc									
	$d_w$	L	$L_b$	$L_c$	U	$M_3$	R	Type	D	d	$D_1$ (Approx)	$L_a$	$L_d$	$M_2$ (da Nm)	B	$M_a$ (da Nm)	KG
14	60	300	50	30	180	120	17	80 - 60	141	80	175	31	20	319	M10	5.8	2.3
15	65	330	55	35	195	135	17	90 - 65	155	90	190	38	20	540	M10	5.8	3.2
16	75	360	65	40	215	145	20	100 - 75	170	100	215	43.5	20	720	M10	5.8	4.3
17	80	380	80	41	230	150	26	110 - 80	185	110	225	49	20	1000	M12	10	5.8
18	95	430	85	44	260	170	27	125 - 95	215	125	260	53.5	20	1650	M12	10	8.7
19	105	460	95	49	280	180	32	140 - 105	230	140	270	58	20	2210	M14	16	10.3
20	115	485	100	49	295	190	33	155 - 115	263	155	305	63	20	2950	M14	16	15.2
21	125	555	120	68	335	220	35	165 - 125	290	165	335	68	25	4120	M16	24	21.5
22	140	600	135	68	370	230	35	180 - 140	320	180	365	85.5	25	6400	M16	24	32.7
23	160	680	155	73	420	260	37	220 - 160	370	220	415	105	25	10300	M20	47	53
24	180	755	160	83	460	295	38	240 - 180	405	240	460	109	25	14000	M20	47	66
25	200	795	180	88	490	305	46	260 - 200	430	260	495	120	25	18400	M20	47	82
26	220	895	190	103	550	345	48	280 - 220	460	280	530	135	25	24000	M20	47	103

Size	Driven Machine Shaft									End Plate							Guide Bush				
	$d_w$	$d_1$	$d_m$ (min)	$R_1$	$L_1$	$L_2$	$L_3$	$L_4$	$d_7$	a	$d_2$	$d_3$	$d_4$	$d_5$	$d_6$	$T_1$	$T_2$	$d_w$	$d_2$	$T_3$	Circlip
14	60	59.5	80	1.5	45	65	286	42	M20	4	65	48	35	22	M6	5	13	60	65	17	65 x 2.5
15	65	64.5	85	1.5	50	70	316	42	M20	4	70	53	40	22	M8	5	13	65	70	22	70 x 2.5
16	75	74.5	95	1.5	55	75	342	42	M20	4	80	60	45	22	M8	7	17	75	80	23	80 x 2.5
17	80	79.5	100	1.6	70	90	362	42	M20	5	85	65	50	22	M8	7	17	80	85	24	85 x 3
18	95	94.5	120	1.6	70	90	408	50	M24	5	100	75	55	26	M10	8	20	95	100	24	100 x 3
19	105	104.5	130	1.6	80	100	438	50	M24	5	110	85	60	26	M10	8	20	105	110	29	110 x 4
20	115	114.5	140	1.6	85	105	463	50	M24	5	120	90	65	26	M10	8	20	115	120	29	120 x 4
21	125	124.5	160	2.5	85	110	530	50	M24	6	130	100	65	26	M12	10	23	125	130	45	130 x 4
22	140	139.5	170	2.5	105	130	575	60	M30	6	145	110	75	33	M12	10	23	140	145	45	145 x 4
23	160	159.5	190	2.5	130	155	655	60	M30	6	165	120	80	33	M12	10	23	160	165	50	165 x 4
24	180	179.5	210	2.5	130	160	725	60	M30	6	185	125	85	33	M16	12	28	180	185	55	185 x 4
25	200	199.5	240	4	150	180	765	60	M30	8	210	140	95	33	M16	12	28	200	210	60	210 x 5
26	220	219.5	260	4	165	195	865	80	M36	8	225	160	110	39	M20	12	28	220	225	75	225 x 5

$M_a$  = Required tightening torque

$M_t$  = maximum torque transmitted by shrink disc

## OUTPUT SHAFT EXTERNAL LOADS

### Maximum Permissible Overhung Loads

When a sprocket or gear etc. is mounted on the shaft, a calculation must be made to determine the overhung load and the results compared to the maximum permissible overhung loads tabulated. Overhung loads can be reduced by increasing the diameter of the sprocket or gear, etc. If the maximum permissible overhung load is exceeded, the sprocket or gear, etc. should be mounted on a separate shaft, flexibly coupled and supported in its own bearings.

The values tabulated are for the most unfavourable direction with the unit transmitting full rated power and with 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 (kN)

$$P = \frac{kW \times 9,500 \times K}{n^2 \times R}$$

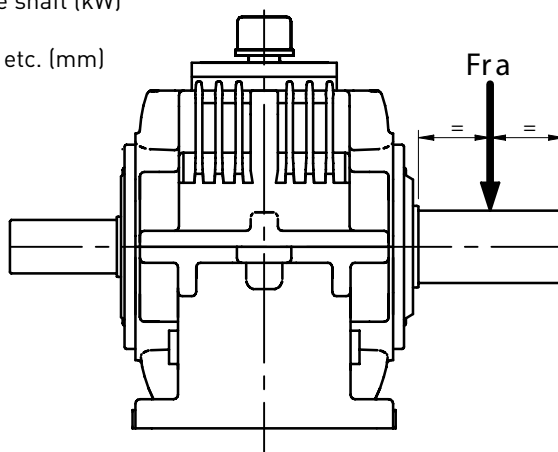
where

- P = equivalent overhung load (kN)
- kW = power transmitted by the shaft (kW)
- n<sup>2</sup> = speed of shaft (rpm)
- R = pitch radius of sprocket, etc. (mm)
- K = factor

### Overhung member

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

### K (factor)



### Maximum Permissible Output Shaft Overhung Load Fra (kN)

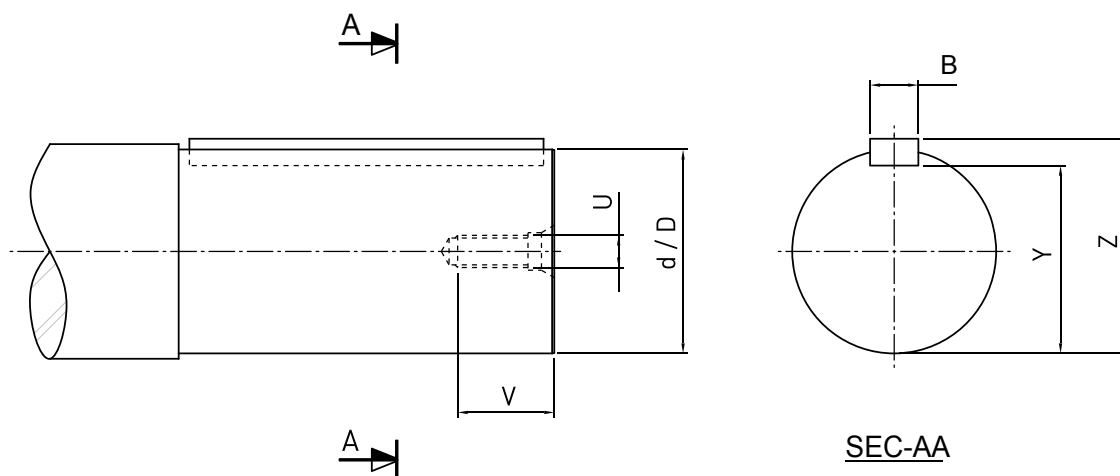
n <sup>2</sup> (rpm)	Unit Size												
	14	15	16	17	18	19	20	21	22	23	24	25	26
315	8.0	10	11	11	10	15	19	22	21	18	20	30	27
260	6.1	11	12	13	12	17	22	25	23	20	24	36	33
180	7	13	14	15	13	22	27	32	30	22	34	48	47
160	8	13	15	16	14	24	29	34	32	24	37	53	51
120	9	16	17	19	16	28	34	40	38	30	46	64	63
100	10	17	19	20	18	31	37	44	43	34	52	71	71
71	12	20	22	24	21	36	43	52	52	43	64	87	87
63	12	21	22	25	23	38	46	55	55	46	69	93	93
40	15	23	22	30	28	47	50	67	68	58	88	116	118
25	18	23	22	36	34	56	50	82	79	74	111	129	148
12	23	23	22	41	37	56	50	87	79	102	132	129	172
6	23	23	22	41	37	76	79	96	100	160	180	180	185

### Maximum Permissible Axial Load

No check is required if the axial load does not exceed 50% of the permissible overhung load.

When the axial load exceeds this value or there is a combination of axial and overhung loads please consult our Application Engineers.

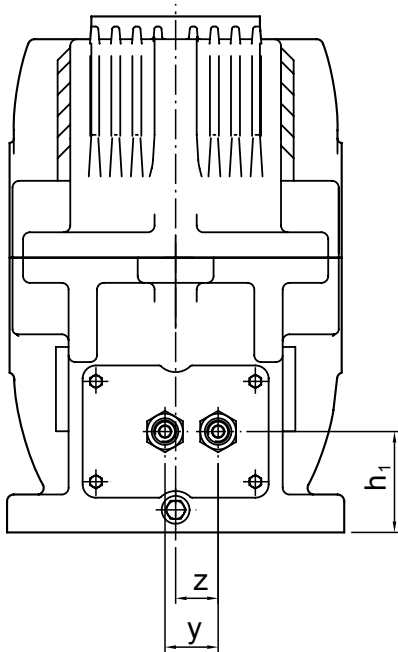
## SHAFT EXTENSION DETAILS



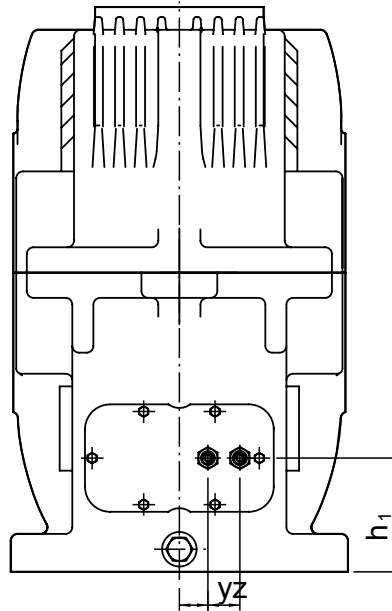
d / D	B	Y	Z	tol. on Z	U	V
19	6	15.5	21.5	-0.1	M6	16
20	6	16.5	22.5		M6	16
24	8	20	27		M8	19
25	8	21	28		M10	22
28	8	24	31		M10	22
30	8	26	33		M10	22
32	10	27	35		M12	28
35	10	30	38		M12	28
38	10	33	41		M12	28
40	12	35	43		M16	36
42	12	37	45		M16	36
45	14	39.5	48.5		M16	36
48	14	42.5	51.5	M16	36	
50	14	44.5	53.5	M16	36	
52	16	46	56	M20	42	
55	16	49	59	M20	42	
58	16	52	62	M20	42	
60	18	53	64	M20	42	
65	18	58	69	M20	42	
68	20	60.5	72.5	M20	42	
70	20	62.5	74.5	M20	42	
75	20	67.5	79.5	M20	42	
80	22	71	85	M20	42	
85	22	76	90	M20	42	
90	25	81	95	M24	50	
95	25	86	100	M24	50	
100	28	90	106	M24	50	
105	28	95	111	M24	50	
110	28	100	116	M24	50	
115	32	104	122	M24	50	
120	32	109	127	M24	50	
140	36	128	148	M30	60	
160	40	147	169	M30	60	
170	40	157	179	M36	80	
190	45	175	200	M36	80	

d / D	tol. field	tol
19-30	k6	+0.015 +0.002
32-50	k6	+0.018 +0.002
52-80	m6	+0.030 +0.011
85-120	m6	+0.035 +0.013
140-180	m6	+0.040 +0.015
190-250	m6	+0.046 +0.017

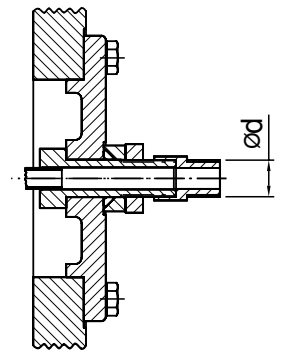
B	tol. field	tol
3-6	h9	0 -0.030
8-10		0 -0.036
12-18		0 -0.043
20-28		0 -0.052
32-50		0 -0.062



Size 17



Size 18 and above



Cooling Coil Connections

Size	S1			
	d	H <sub>1</sub> <sup>2)</sup>	y	z
11	Dimension on Request			
13				
15				
16				
17				
18				
20				
21				
22				
23				
24				
25				
26				

Size	S2, S3, S4, K2, K3 & K4			
	d	H <sub>1</sub> <sup>2)</sup>	y	z
11	Dimension on Request			
13				
14				
15				
16				
17				
18	3/8"	75	40	32
19	3/8"	88	40	28
20	3/8"	88	40	28
21	3/8"	110	40	40
22	3/8"	110	40	40
23	3/8"	110	40	40
24	1/2"	125	60	53
25	1/2"	125	60	53
26	1/2"	125	60	53

# SERIES E

## GD SQUARE VALUES (kg-m<sup>2</sup>) - H1, H2, H3, H4/ S1, S2, S3, S4

Type	i <sub>N</sub>	Gear unit Size																
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
H1/ S1	1.25	0.0110	0.0381	-	0.1171	-	0.3736	0.6788	-	1.9447	3.1712	5.4903	-	-	-	-		
	1.4	0.0096	0.0331	-	0.1034	-	0.3256	0.5967	-	1.7091	2.8137	4.8453	-	-	-	-		
	1.6	0.0084	0.0288	-	0.0914	-	0.2838	0.5246	-	1.5021	2.4966	4.2761	7.5047	13.7072	24.5190	-		
	1.8	0.0074	0.0251	-	0.0807	-	0.2474	0.4611	-	1.3202	2.2152	3.7737	6.4097	12.0608	21.4817	38.8289		
	2	0.0066	0.0225	-	0.0728	-	0.2229	0.4115	-	1.1754	1.9670	3.3594	5.9417	10.7405	19.2453	34.7051		
	2.24	0.0057	0.0201	-	0.0642	-	0.1974	0.3624	-	1.0437	1.7430	2.9678	5.2070	9.4628	17.1708	30.7868		
	2.5	0.0053	0.0176	-	0.0578	-	0.1775	0.3236	-	0.9308	1.5483	2.6808	4.6199	8.3181	15.0927	27.4575		
	2.8	0.0047	0.0155	-	0.0507	-	0.1563	0.2618	-	0.8321	1.3719	2.3846	4.1078	7.3197	13.4406	23.9837		
	3.15	0.0042	0.0138	-	0.0455	-	0.1389	0.2513	-	0.7322	1.2101	2.0733	3.6029	6.4733	11.7963	21.1103		
	3.55	0.0033	0.0111	-	0.0344	-	0.1085	0.1937	-	0.5787	0.9804	1.6860	2.9046	5.4212	9.7838	17.7320		
	4	0.0029	0.0098	-	0.0296	-	0.0947	0.1688	-	0.4977	0.8441	1.4502	2.5070	4.7576	8.5308	15.4682		
4.5	0.0026	0.0084	-	0.0257	-	0.0807	0.1451	-	0.4344	0.7397	1.2788	2.1729	4.0887	7.4270	13.3917			
5	0.0023	0.0074	-	0.0224	-	0.0708	0.1269	-	0.3794	0.6393	1.0965	1.8998	3.5340	6.3119	11.3897			
H2/ S2	5.6	-	-	0.0158	0.0295	0.0530	0.0970	0.1754	0.2827	0.5422	0.9295	1.5542	3.0090	5.1498	9.2019	16.2044		
	6.3	-	-	0.0135	0.0254	0.0449	0.0824	0.1491	0.2450	0.4536	0.8105	1.3527	2.5445	4.3722	7.6863	13.5713		
	7.1	-	-	0.0116	0.0218	0.0380	0.0699	0.1268	0.2123	0.3795	0.7067	1.1774	2.1516	3.7121	6.4203	11.3660		
	8	-	-	0.0099	0.0188	0.0330	0.0611	0.1113	0.1842	0.3272	0.9962	0.9962	1.8209	3.1782	5.5056	9.7374		
	9	-	-	0.0078	0.0150	0.0261	0.0489	0.0887	0.1475	0.2624	0.4778	0.7890	1.4477	2.4744	4.3944	7.5695		
	10	-	-	0.0074	0.0143	0.0249	0.0468	0.0848	0.1409	0.2501	0.4563	0.7520	1.3820	2.3663	4.1903	7.1912		
	11.2	-	-	0.0059	0.0114	0.0198	0.0375	0.0675	0.1122	0.2016	0.3705	0.5906	1.0835	1.8389	3.2372	5.6135		
	12.5	-	-	0.0057	0.0110	0.0191	0.0363	0.0651	0.1082	0.1938	0.3570	0.5672	1.0421	1.7708	3.1086	5.3753		
	14	-	-	0.0045	0.0086	0.0155	0.0261	0.0482	0.0809	0.1461	0.2621	0.4412	0.8091	1.4061	2.4413	4.2239		
	16	-	-	0.0039	0.0074	0.0134	0.0225	0.0416	0.0710	0.1280	0.2276	0.3791	0.6932	1.2030	2.0904	3.5957		
	18	-	-	0.0030	0.0056	0.0102	0.0170	0.0315	0.0533	0.0968	0.1761	0.2916	0.5363	0.9437	1.6269	2.7644		
	20	-	-	0.0029	0.0053	0.0099	0.0164	0.0288	0.0516	0.0936	0.1682	0.2823	0.5199	0.9437	1.6269	2.7644		
	22.4	-	-	0.0026	0.0049	0.0091	0.0158	0.0276	0.0504	0.0922	0.1653	0.2803	0.5179	0.9437	1.6269	2.7644		
	H3/ S3	25	-	-	-	-	-	-	-	0.0225	0.0413	0.0705	0.1263	0.2308	0.3925	0.7303	1.3073	2.1930
28		-	-	-	-	-	-	-	0.0195	0.0355	0.0608	0.1093	0.2000	0.3390	0.6258	1.1173	1.8748	3.3368
31.5		-	-	-	-	-	-	-	0.0198	0.0360	0.0615	0.1090	0.2008	0.3403	0.6398	1.1490	1.8940	3.4198
35.5		-	-	-	-	-	-	-	0.0140	0.0260	0.0443	0.0808	0.1473	0.2498	0.4603	0.8165	1.3610	2.5735
40		-	-	-	-	-	-	-	0.0110	0.0200	0.0343	0.0653	0.1150	0.1948	0.3605	0.6355	1.0770	1.9133
45		-	-	-	-	-	-	-	0.0103	0.0190	0.0323	0.0618	0.1085	0.1878	0.3395	0.5988	0.9855	1.7985
50		-	-	-	-	-	-	-	0.0080	0.0150	0.0263	0.0440	0.0823	0.1415	0.2623	0.4643	0.7860	3.7035
56		-	-	-	-	-	-	-	0.0068	0.0128	0.0220	0.0380	0.0700	0.1218	0.2243	0.3945	0.6665	3.2085
63		-	-	-	-	-	-	-	0.0073	0.0138	0.0240	0.0395	0.0748	0.1280	0.2390	0.4235	0.7093	1.2845
71		-	-	-	-	-	-	-	0.0063	0.0115	0.0200	0.0345	0.0640	0.1110	0.2058	0.3623	0.6058	1.0883
80		-	-	-	-	-	-	-	0.0053	0.0098	0.0178	0.0288	0.0545	0.0930	0.1750	0.3115	0.5100	0.9308
90		-	-	-	-	-	-	-	0.0053	0.0098	0.0178	0.0288	0.0545	0.0930	0.1750	0.3115	0.5100	0.9308
100		-	-	-	-	-	-	-	0.0045	0.0080	0.0150	0.0248	0.0386	0.0798	0.1520	0.2182	0.4403	0.8135
112		-	-	-	-	-	-	-	0.0038	0.0070	0.0148	0.0245	0.0353	0.0793	0.1510	0.2013	0.4420	0.8073
H4/ S4	125	-	-	-	-	-	-	-	-	-	0.0162	0.0297	0.0510	0.0936	0.1713	0.2862	0.5244	
	140	-	-	-	-	-	-	-	-	-	0.0135	0.0252	0.0432	0.0852	0.1452	0.2454	0.4509	
	160	-	-	-	-	-	-	-	-	-	0.0132	0.0246	0.0423	0.0831	0.1419	0.2394	0.4401	
	180	-	-	-	-	-	-	-	-	-	0.0105	0.0195	0.0342	0.0609	0.1077	0.1845	0.3405	
	200	-	-	-	-	-	-	-	-	-	0.0126	0.0237	0.0408	0.0804	0.1368	0.2301	0.4233	
	224	-	-	-	-	-	-	-	-	-	0.0102	0.0189	0.0330	0.0585	0.1038	0.1773	0.3273	
	250	-	-	-	-	-	-	-	-	-	0.0129	0.0240	0.0408	0.0741	0.1368	0.2265	0.4185	
	280	-	-	-	-	-	-	-	-	-	0.0111	0.0204	0.0354	0.0696	0.1182	0.1980	0.3675	
	315	-	-	-	-	-	-	-	-	-	0.0090	0.0162	0.0288	0.0501	0.0891	0.1521	0.2832	
	355	-	-	-	-	-	-	-	-	-	0.0075	0.0138	0.0243	0.0429	0.0762	0.1323	0.2445	
	400	-	-	-	-	-	-	-	-	-	0.0063	0.0117	0.0213	0.0360	0.0654	0.1107	0.2079	
	450	-	-	-	-	-	-	-	-	-	0.0063	0.0114	0.0204	0.0342	0.0651	0.1107	0.2076	
	500	-	-	-	-	-	-	-	-	-	0.0057	-	0.0174	0.0288	-	0.0951	0.1806	
	560	-	-	-	-	-	-	-	-	-	0.0045	-	0.0138	0.0240	-	0.0771	0.1455	

## GD SQUARE VALUES (kg-m<sup>2</sup>) - B2, B3, B4/K2, K3, K4

Type	i <sub>N</sub>	Gear unit Size														
		11	13	14	15	16	17	18	19	20	21	22	23	24	25	26
B2/ K2	5	-	-	-	0.0329	-	-	0.2005	-	-	1.1220	-	-	6.4715	-	-
	5.6	-	0.0114	-	0.0318	-	-	0.1929	-	-	1.0842	1.8418	-	6.2213	10.9504	-
	6.3	0.0038	0.0110	-	0.0306	-	0.1044	0.1856	-	0.5898	1.0478	1.7804	3.2670	5.9807	10.5095	20.1875
	7.1	0.0038	0.0105	-	0.0296	-	0.1001	0.1785	-	0.5673	1.0125	1.7210	3.1574	5.7494	10.0863	19.5288
	8	0.0036	0.0102	-	0.0285	-	0.0968	0.1724	-	0.5483	0.9789	1.6631	3.0548	5.5805	9.7674	18.9378
	9	0.0030	0.0083	-	0.0233	-	0.0783	0.1409	-	0.4449	0.7886	1.3380	2.4473	4.4955	7.8683	15.2442
	10	0.0024	0.0069	-	0.0192	-	0.0644	0.1164	-	0.3663	0.6435	1.0830	1.9863	3.6575	6.4106	12.4238
	11.2	0.0021	0.0057	-	0.0158	-	0.0525	0.0963	-	0.3015	0.5253	0.8841	1.6217	2.9885	5.2424	10.1013
	12.5	0.0018	0.0048	-	0.0131	-	0.0435	0.0807	-	0.2499	0.4317	0.7197	1.3122	2.4492	4.2938	8.2713
	14	0.0015	0.0041	-	0.0108	-	0.0362	0.0680	-	0.2100	0.3567	0.5903	1.0761	2.0273	3.5610	6.8516
	16	0.0014	0.0035	-	0.0092	-	0.0299	0.0567	-	0.1754	0.2991	0.4905	0.8919	1.6979	2.9880	5.7323
	18	0.0012	0.0030	-	0.0078	-	0.0254	0.0485	-	0.1488	0.2487	0.4044	0.7304	1.4079	2.4804	4.8758
	20	0.0011	0.0027	-	0.0173	-	0.0222	0.0870	-	0.1310	0.5048	0.3491	0.6252	2.9313	2.1473	4.1493
	22.4	0.0009	-	-	0.0165	0.0285	0.0194	0.0803	0.1498	0.1152	0.4795	0.8760	0.5352	2.7888	4.7188	3.5311
B3/ K3	25	-	-	0.0078	0.0130	0.0228	0.0388	0.0648	0.1180	0.2135	0.3815	0.6983	1.2320	2.1905	3.5663	6.6940
	28	-	-	0.0090	0.0153	0.0268	0.0415	0.0760	0.1383	0.2488	0.4418	0.8095	1.4475	2.5883	4.3400	7.9568
	31.5	-	-	0.0073	0.0120	0.0213	0.0323	0.0595	0.1090	0.1963	0.3515	0.6458	1.1413	2.0323	3.4060	6.1613
	35.5	-	-	0.0060	0.0098	0.0173	0.0265	0.0485	0.0885	0.1595	0.2863	0.5233	0.9300	1.6493	2.7660	5.0145
	40	-	-	0.0050	0.0080	0.0140	0.0215	0.0395	0.0718	0.1293	0.2340	0.4258	0.7548	1.3283	2.2255	4.0178
	45	-	-	0.0040	0.0065	0.0118	0.0175	0.0325	0.0588	0.1060	0.1935	0.3538	0.6210	1.0838	1.8013	3.2613
	50	-	-	0.0035	0.0055	0.0098	0.0145	0.0268	0.0483	0.0865	0.1603	0.2938	0.5110	0.8845	1.4708	2.6635
	56	-	-	0.0030	0.0045	0.0080	0.0120	0.0223	0.0398	0.0718	0.1340	0.2460	0.4233	0.7268	1.1975	2.1560
	63	-	-	0.0025	0.0038	0.0068	0.0100	0.0183	0.0335	0.0598	0.1130	0.2083	0.3553	0.6000	0.9820	1.7690
	71	-	-	0.0023	0.0033	0.0058	0.0085	0.0153	0.0278	0.0493	0.0943	0.1740	0.2965	0.5030	0.8160	1.4675
	80	-	-	0.0023	-	0.0058	0.0083	0.0234	0.0275	0.0490	0.1057	0.1730	0.2948	0.6429	0.8108	1.4575
	90	-	-	0.0020	-	0.0050	0.0073	0.0188	0.0238	0.0418	0.0847	0.1495	0.2498	0.5002	0.6688	1.1943
	100	-	-	0.0018	-	-	0.0063	0.0150	0.0210	0.0365	0.0678	0.1293	0.2198	0.3891	0.6774	1.0233
	B4/ K4	112	-	-	-	-	-	0.0093	0.0120	0.0168	0.0306	0.0543	0.0972	0.1716	0.3027	0.5274
125		-	-	-	-	-	0.0087	0.0108	0.0147	0.0270	0.0480	0.0855	0.1515	0.2661	0.4665	0.8379
140		-	-	-	-	-	0.0099	0.0117	0.0150	0.0276	0.0483	0.0939	0.1599	0.2745	0.4833	0.8631
160		-	-	-	-	-	0.0078	0.0093	0.0120	0.0219	0.0393	0.0693	0.1218	0.2124	0.3744	0.6711
180		-	-	-	-	-	0.0093	0.0105	0.0126	0.0234	0.0414	0.0810	0.1359	0.2313	0.4101	0.7293
200		-	-	-	-	-	0.0075	0.0084	0.0102	0.0186	0.0336	0.0591	0.1032	0.1782	0.3171	0.5658
224		-	-	-	-	-	0.0051	0.0057	0.0072	0.0129	0.0234	0.0402	0.0726	0.1257	0.2268	0.4020
250		-	-	-	-	-	0.0048	0.0054	0.0066	0.0120	0.0219	0.0372	0.0675	0.1161	0.2109	0.3729
280		-	-	-	-	-	0.0048	0.0054	0.0063	0.0114	0.0207	0.0351	0.0633	0.1083	0.1977	0.3486
315		-	-	-	-	-	0.0048	0.0051	0.0060	0.0108	0.0195	0.0330	0.0597	0.1023	0.1875	0.3300
355		-	-	-	-	-	0.0048	0.0051	0.0057	0.0102	0.0186	0.0315	0.0570	0.0978	0.1794	0.3156
400		-	-	-	-	-	0.0045	0.0048	0.0054	0.0099	0.0180	0.0303	0.0549	0.0936	0.1725	0.3027
450		-	-	-	-	-	0.0045	-	0.0054	0.0099	-	0.0303	0.0546	-	0.1722	0.3024
500		-	-	-	-	-	0.0045	-	0.0051	0.0096	-	0.0294	0.0534	-	0.1680	0.2943
560	-	-	-	-	-	0.0039	-	0.0045	0.0081	-	0.0246	0.0426	-	0.1353	0.2538	



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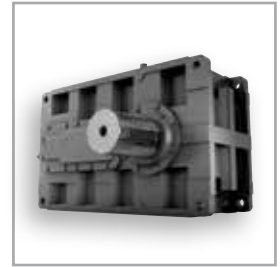
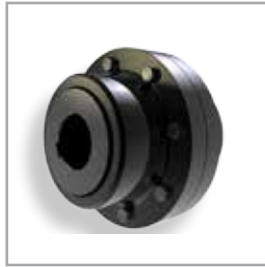
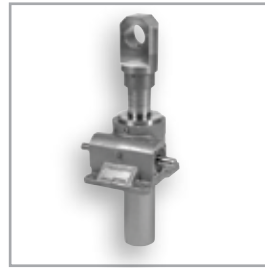
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