

Expert in power transmission for more than 60 years
60 多年专注于动力传动系统解决方案和客户服务



Planetary Gear Box 行星减速机

M2C
Made to Customer
为用户专业订制

Company profile

KPM Antriebstechnik is a manufacturing group with German technology. With more than 60 year experience in research, development, innovation and system design, KPM maintains a leading position in designing and manufacturing of power transmission products.

KPM Strengths:

- Designing all gear box with the most advanced material and heat treatment. KPM uses the highest quality bearing and seals according to German DIN standard.
- All gears are calculated, designed, stimulated and analyzed by sophisticated KISSSOFT and KIMOS.
- KPM has patent protected CAVEX[®] worm gearing.
- We can produce and provide Made to Costumer (M2C) and system solutions of power transmission.
- We offer highly flexible couplings manufactured with state of the art rubber vulcanization and two-mass torsional vibration calculation.

In the last six years in China, KPM has becomes the standard of high quality, high stability and high performance.

Planetary gear box catalogue

The catalogue presents the range of planetary gear box used in industrial and mobile applications of modular design and combines high performance with compact size. The many years experience by KPM planetary gear box testified high quality and reliability, simple installation and maintenance.

Main features:

- Aprogressive selection of sizes from 1000Nm to 450000Nm nominal torque.
- KL coaxial versions with up to 4 gear stages for ratios from 3.5 to 2000.
- KR right angle versions with up to 5 gear stages for ratios from 10 to 3000.
- Output versions: flanged gear box with female shaft, or shaft mounted with shrink disk or coupling; flanged gear box with male shaft; foot mounted version.
- Input with high speed shaft, suitable to electric and hydraulic motors, and multiple disc brake options.

Our products have been successfully applied in :

Transport, lifting, construction, agriculture, ship, ports and concrete conveying pump, truck crane and aerial work platform.

Our planetary speed reducer is also widely used in following industries: Sheet metal processing, metallurgy, plastic, sewage treatment, chemical, energy, mining and others.

公司简介

德国KPM传动是一家具有60多年研发、创新和领先设计的制造联合体，能够为用户提供专业机械动力传动的系统解决方案，始终处于该行业的领先地位。

我们的优势：

- 减速机的DIN标准设计及选材、先进的热处理技术、世界顶级品牌轴承和密封件。
- 行星轮系经过先进软件系统 (KISSSOFT& KIMOS)进行齿形计算、设计、模拟、分析和验证。
- 具有专利技术的尼曼齿形蜗轮蜗杆CAVEX[®]的制造及运用。
- 为用户专业订制的M2C提供减速机和动力传动系统方案。
- 高弹联轴器的橡胶硫化制造工艺及多质点扭振计算。

走入中国6年来，KPM品牌已成为行业高质量、高稳定性以及高性价比的标志。

行星齿轮减速机概述

本样本列出了德国KPM传动在工业及移动工况上使用的行星减速机系列。这里集合了紧凑、高性能模块化设计的全系列减速机。多年来的商业成功证实了产品的优良、可靠、简易安装和维护。KPM的行星减速机保证了各种工况的适宜运行和低噪音。

此系统的主要特点为：

- 不断增大的机型，额定扭矩从1000Nm到450000Nm。
- KL直线型直到4级传动，速比从3.5到2000。
- KR直角型直到5级传动，速比从10到3000。
- 输出形式：内孔输出的带法兰减速机，带锁紧盘的轴安装减速机或直接联轴。实心轴的带法兰减速机，地脚安装等。
- 输入形式：高速输入轴，电动，液压马达的接盘；多碟制动器等多种输入、输出选择和标准附件。

我们的产品被成功应用于：

运输、起重、建筑、农业、船舶、港口以及混凝土输送泵、汽车起重机和高空作业台等。

我们的行星减速机还被广泛应用于下列行业：钣金加工、冶金、污水处理、塑料工业、化工、能源、采矿等。

Commonly used symbols and units

常用符号和单位

Symbol 符号	Unit 单位	Description 说明	
F_{r2}	[N]	Radial load on output shaft	输出轴径向负载
F_{a2}	[N]	Axial load on output shaft	输出轴轴向负载
F_{r1}	[N]	Radial load on input shaft	输入轴径向负载
F_{a1}	[N]	Axial load on input shaft	输入轴轴向负载
f_s	-	Load factor	载荷系数
i_e	-	Effective reduction ratio	有效减速比
K_f	-	Output life correction factor	输出寿命修正系数
L_{min}	[mm]	Torque arm length	扭矩臂长度
M_{tmax}	[Nm]	Shrink disc torque	锁紧扭矩
T_f	[Nm]	Static braking torque	静态制动扭矩
T_1	[Nm]	Input torque	输入扭矩
T_2	[Nm]	Output torque	输出扭矩
T_{eq}	[Nm]	Equivalent torque	等效扭矩
T_{ISO}	[Nm]	ISO limit torque	ISO极限扭矩
T_{cont}	[Nm]	Continuous torque	持续扭矩
T_{max}	[Nm]	Maximum torque	最大扭矩
T_{imp}	[Nm]	Impact torque	冲击扭矩
T_M	[Nm]	Maximum load torque	最大负载扭矩
T_b	[Nm]	Static braking torque	静态制动扭矩
n_1	[RPM]	Input speed	输入速度
n_2	[RPM]	output speed	输出速度
n_{1max}	[RPM]	Maximum input speed	最大输入速度
n_{2max}	[RPM]	Maximum output speed	最大输出速度
$n_{1.h}$	[RPM.h]	Input speed and time indicator	输入持续时间指标
$n_{2.h}$	[RPM.h]	Output speed and time indicator	输出持续时间指标
h	[h]	Hour	小时
h_i	-	Percentage of time	时间百分率
P_1	[KW]	Input power	输入功率
P_2	[KW]	Output power	输出功率
P_d	[KW]	Power loss	损耗功率
P_t	[KW]	Thermal power	热功率
Q	[l.min ⁻¹]	Oil flow	油液流量
V	[cm ³]	Displacement	排量
X	[mm]	Distance	作用距离
η_m	-	Mechanical efficiency	机械效率
η_v	-	Volumetric efficiency	容积效率
η_t	-	Total efficiency	总效率
p	[bar]	Pressure	压力
p_b	[bar]	Maximum pressure	最大压力
p_{max}	[bar]	Total release of pressure	总释放压力

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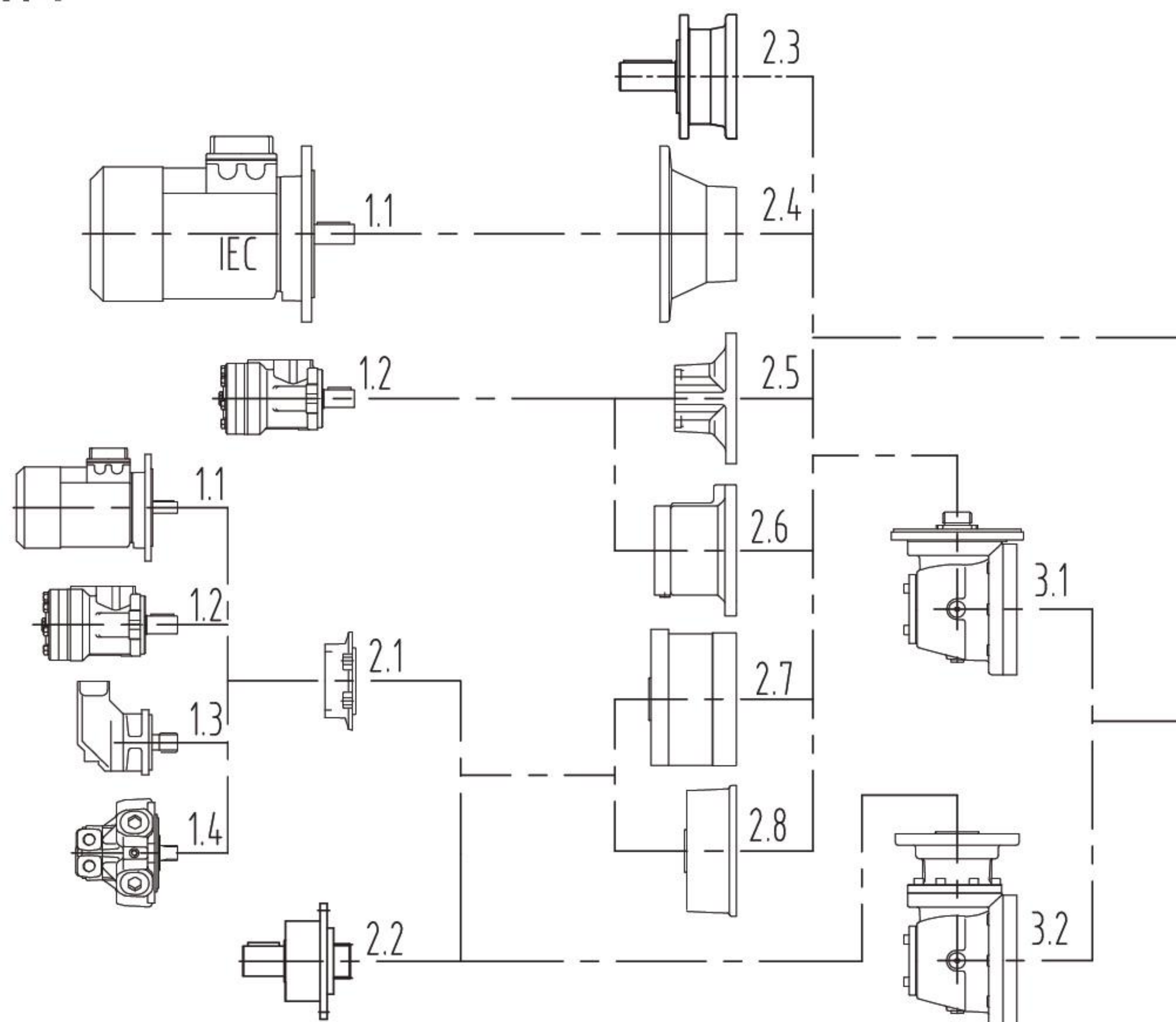
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1 DESCRIPTION OF GEAR BOX

结构组合图



1、Motors / 马达

1.1-Electric motor
电机

1.2-Orbit motor
摆线马达

1.3-Axial piston motor
轴向柱塞马达

1.4-Radial piston motor
径向柱塞马达

2、Inputs/输入端

2.1-motor coupling
马达接盘

2.2-Standard input-shaft connection
标准输入轴

2.3-Input shaft
输入轴

2.4-Electric motor coupling
电机法兰

2.5-Orbit motor flange
摆线马达法兰

2.6-Orbit motor static brake interface
摆线马达接口静态制动器

2.7-Standard input static brake
标准输入接口静态制动器

2.8-Standard input connections
标准输入接口

3、Reduction gear units / 齿轮减速单元

3.1-Bevel gear shaft directly enter
锥齿轮直接轴输入

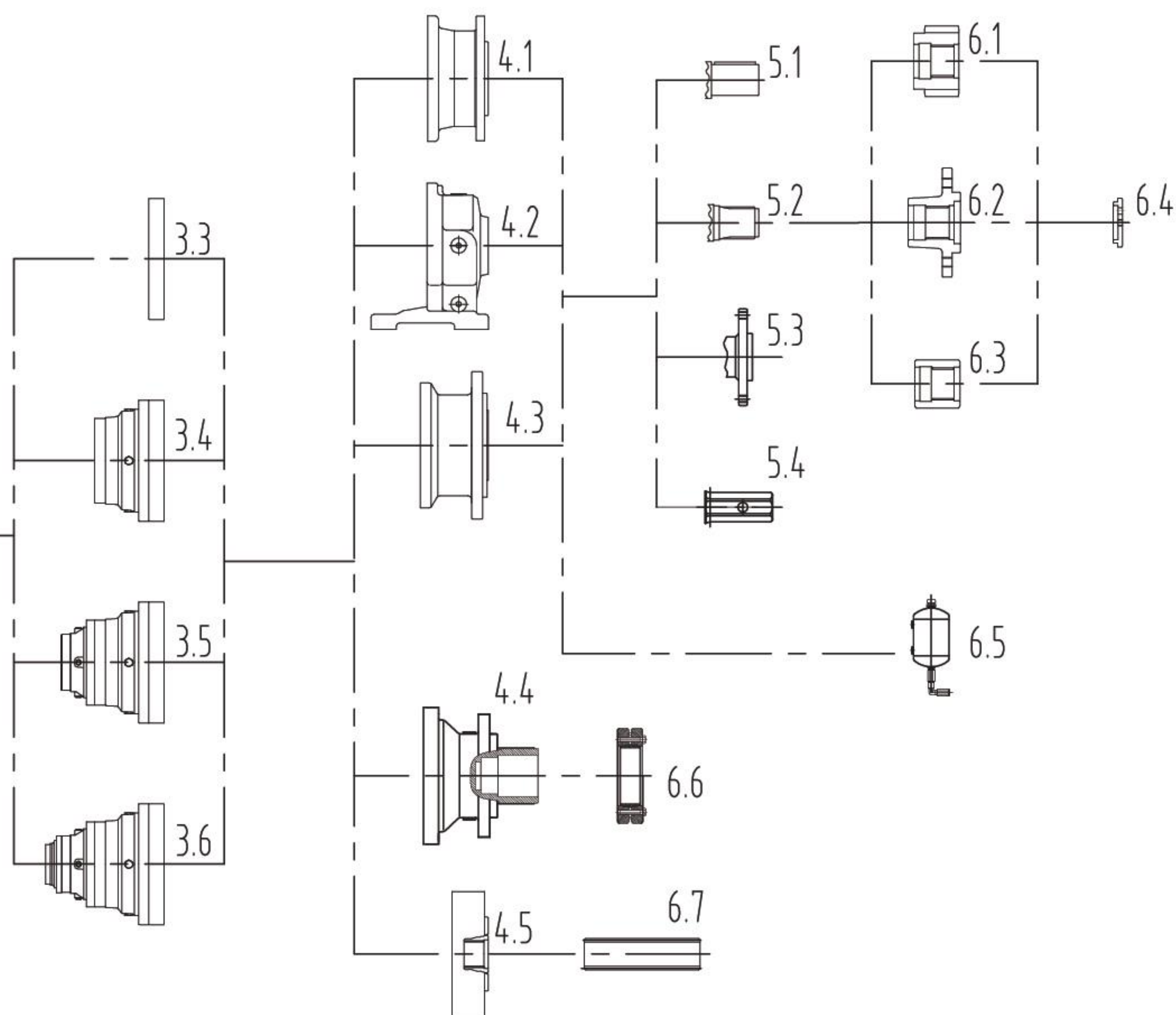
3.2-Bevel gear flange connection
锥齿轮法兰连接

3.3-Single-stage planetary reduction unit
单级行星减速单元

3.4-Two-stage planetary reduction unit
两级行星减速单元

3.5-Three-stage planetary reduction unit
三级行星减速单元

3.6-Four-stage planetary reduction unit
四级行星减速单元



4、Outputs / 输出端

4.1-"S"Output
"S"法兰输出

4.2-"B"Output
"B"底脚输出

4.3-"SA"Output
"SA"加强法兰输出

4.4-"SD" flange hollow shaft outputs
"SD"法兰空心轴输出

4.5-"H" flange hollow spline output
"H"法兰空心花键输出

5、Output shaft / 输出轴

5.1-Solid keyed shaft
平键输出轴

5.2-Splined male shaft
外花键输出轴

5.3-Flange output shaft
法兰盘输出轴

5.4-Hexagon shaft
六角输出轴

6、Accessories / 附件

6.1-Pinion
输出小齿轮

6.2-Drive flange
法兰盘

6.3-Splined bush
外圆衬套

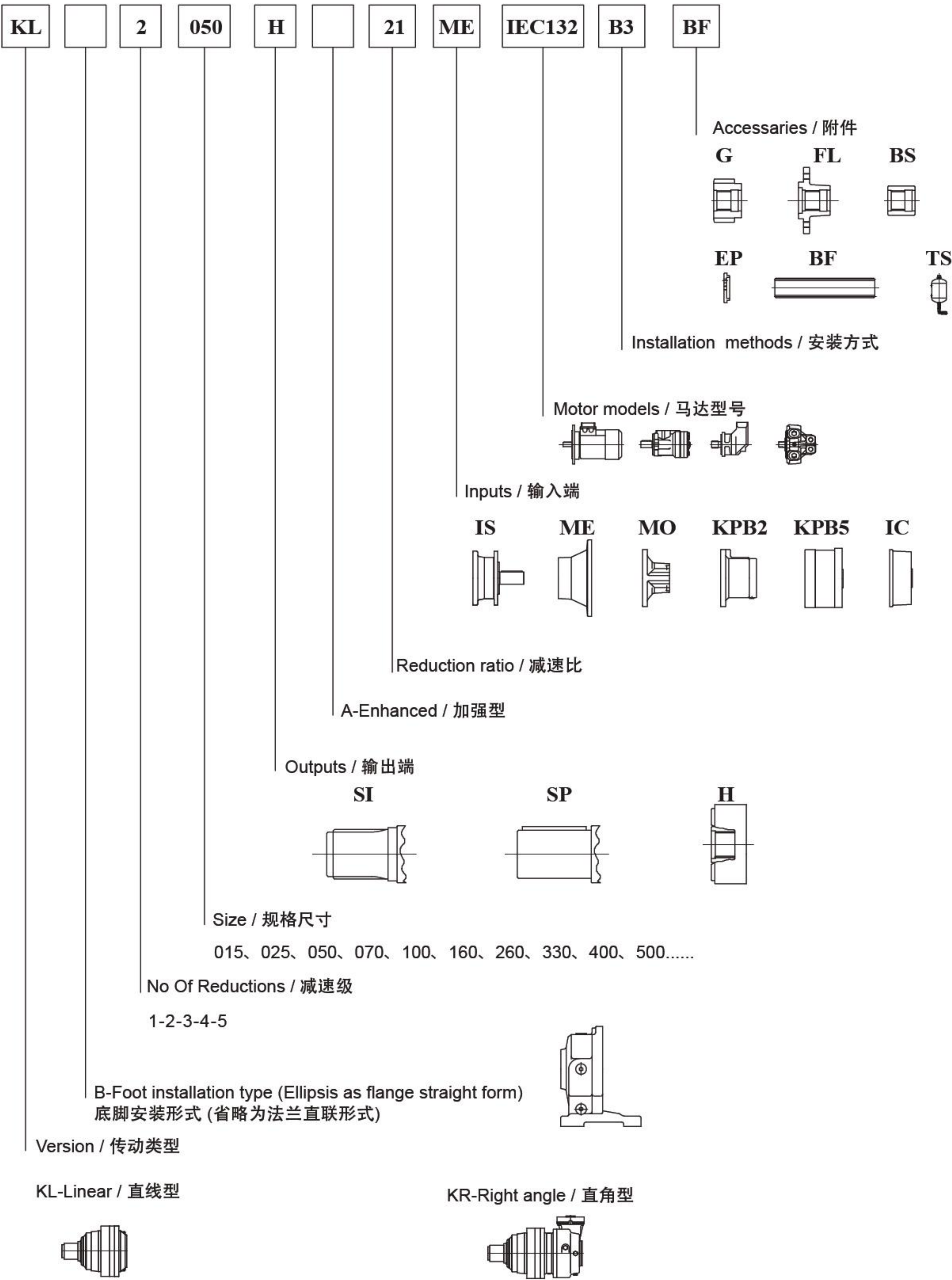
6.4-Pressing plate
压板

6.5-Oil storage tanks
储油罐

6.6-Friction shrink disc
胀紧盘

6.7-DIN spindle shaft
DIN花键接轴

2 ORDER NUMBER
订货编号



3 TECHNICAL DESCRIPTION

3.1 Reduction ratio i_{eff}

This is the ratio between input and output speed.

Contact KPM Antriebstechnik for the availability of more ratios.

3.2 Nominal power P_2 [KW]

This is the combination of the torque value relevant to 10000h operation at the output speed. In case the nominal power value in the application exceeds the relevant gear box thermal rating, an additional auxiliary oil cooling system must be added.

3.3 Nominal torque T_N [Nm]

This torque determines the size of gear box and corresponds to the limit torque according to ISO.(D.P.6336) of the strongest ratio of each size.

3.4 Max. torque $T_{2\text{MAX}}$ [Nm]

Max. permissible output torque, as peak or for short period of time.

Involving frequent starts or reversals, also the max. operational torque must be opportunely limited according to the fatigue resistance of the gears or shafts.

3.5 Output torque T_2 [Nm]

The output torque is referred. 10000 hours of operation, calculated according to ISO.(D.P.6336).

This value is for gear box with inline and right-angle versions according to the different input speeds.

3.6 Thermal rating P_T [KW]

The permitted power that can be transmitted continuously relevant to the max. permissible temperatures for the gear box.

技术描述

3.1 速比 i_{eff}

它是减速机输入与输出转速的比值。

若有更多速比需求，请联系KPM公司。

3.2 额定功率 P_2 [KW]

减速机一定输出转速和扭矩下运转10000h时的一个综合值在某些工况中，当减速机的额定功率大于热功率时，须提供辅助冷却回路。

3.3 额定扭矩 T_N [Nm]

定义减速机机型的常规扭矩值。根据ISO (D.P.6336)对应每个型号的最强速比的限定扭矩值。

3.4 最大扭矩 $T_{2\text{MAX}}$ [Nm]

作为峰值，或短期的最大允许扭矩。

对含有多次起动及反转的驱动类型的最大值。

工作扭矩须受限于齿或轴的疲劳强度。

3.5 输出扭矩 T_2 [Nm]

根据ISO(DP6336)标准，10000小时运转状态下计算出的减速机输出扭矩。

这里给出了不同输入转速下使用系数为1时直线型、垂直型减速机的输出扭矩值。

3.6 热功率 P_T [KW]

减速机能够连续运转的功率，在给定的运转条件下，对应于减速机的最大允许温度。

3.6 Thermal Rating P_T [KW]

The thermal ratings of the gear box are given in the tables summarizing the technical performance of the various reduction stages.

The values refer to a continuous use of the gear box:

- With splash lubrication and horizontally mounted
- At a gear box input speed of 1500min⁻¹
- At an ambient temperature of 20°C
- For a max. oil temperature of 80°C
- In the an open space

3.6.1 K-Factor

If the ambient temperature is different to 20°C, the gear box thermal rating can be adjusted to the specific application by K factor.

Hours of work per day	Ambient temperature[°C]				
	10°	20°	30°	40°	50°
10	1.15	1	0.85	0.7	0.6
8	1.25	1.1	1	0.85	0.7
6	1.4	1.25	1.1	1	0.85
4	1.6	1.4	1.25	1.1	1
2	1.8	1.6	1.4	1.25	1.1

3.6.2 U factor

If the input speed is different to 1500rpm, the thermal rating can be adjusted to be specific situation by U factor

	n_1 [rpm]			
	1750	1500	1000	500
U	0.94	1	1.05	1.1

3.6.3 T factor

If the gear box is located in a confined space or outdoors, the thermal rating can be modified by T factor.

	Small space	Large space	Outdoors
T	0.70	1.00	1.35

In the most general case the adequate thermal rating of the gear box will be:

$$P_{T1} = P \cdot K \cdot U \cdot T$$

The thermal rating must be higher than the power P to be transmitted in all operating cycle conditions. For selecting the circuits, see the Chapter: Lubrication.

$$P < P_{T1}$$

3.6 热功率 P_T [KW]

表中给出了不同级数的减速机的热功率，也总结了其技术性能。

此值基于减速机连续运转：

- 溅油润滑、水平安装
- 输入1500min⁻¹
- 环境温度20°C
- 最高油温80°C（VG150粘度）
- 在空旷的环境使用。

3.6.1 K系数：

对于减速机间隙工作或环境异于20°C，热功率值可借助于K系数来调整。

3.6.2 U系数：

若输入转速异于1500rpm，热功率可借U系数调整。

3.6.3 T 系数

若减速机位于紧凑或室外空间，热功率可借T系数调整。

这样通常情况下：

在所有的工作状态下，热功率都须大于额定功率；若热功率小于额定功率，即使为工作状态中的一部分，也要求附加强冷回路。

3.7 Torque

3.7.1 T_{iso} = Limit torque:

In continuous operation, according to the ISO DP633 gear and safety factor for the 1, calculated by the reducer torque transmission. The working life of the torque corresponding to the deceleration, which is equivalent to the 5×10^6 duty cycle under extreme conditions. This torque does not mean that sustained life, but it can be used to quickly select the maximum size of the reducer.

3.7.2 T_{cont} = Continuous torque:

In continuous operation, the torque transmitted. Reducer output speed "n" RPM, T_{cont} to ensure the continued life of the reducer for the "h" the continued the torque T_{cont} to functional form $n_2 \cdot h$.

3.7.3 T_{eq} = Equivalent torque:

T_{eq} =A constant torque value, which determines the duty cycle caused by the same duration. $T_{21} \dots T_{2n}$, gear box the known duration of h_i hours output speed n_{2i} transmit torque. Torque calculation equation is as follows:

$$T_{eq} = \sqrt[6.61]{\frac{n_{21} \cdot h_1}{n_2 \cdot h} \cdot T_{21}^{6.61} + \dots + \frac{n_{2n} \cdot h_n}{n_2 \cdot h} \cdot T_{2n}^{6.61}}$$

Among

$$n_2 \cdot h = \sum_{i=1}^n n_{2i} \cdot h_i$$

3.7.4 T_{imp} = Impact torque:

The maximum torque can transmitted in a short time.

3.8 Efficiency

η_m = Mechanical efficiency: the ratio of output power to input power; generally it is considered as equal to 0.97-0.98 in each reduction level, used to compensate for the loss of the reducer; it depends on various factors, such as speed, torque, reduction ratio, work location and lubrication.

3.9 Speed

n_1 = Input speed: the input speed of gear box.

n_{2max} = The maximum output speed: the maximum output speed: of the continuous operation of the reducer; match with the duty cycle, at or near maximum speed.

3.7 扭矩

3.7.1 T_{iso} = 极限扭矩:

在连续运转中, 根据ISODP633中的齿轮和安全系数为1时, 计算得到的减速机传递扭矩。该扭矩对应的减速机工作寿命, 相当于极端条件下 5×10^6 工作周期。这个扭矩不代表持续寿命, 但它用于快速选择最大尺寸的减速机。

3.7.2 T_{cont} = 持续扭矩:

在连续运转中, 减速机的可传递扭矩。在减速机输出转速为"n"RPM时, T_{cont} 保证了减速机持续寿命为"h"持续扭矩 T_{cont} 以 $n_2 \cdot h$ 的函数形式表示。

3.7.3 T_{eq} = 等效扭矩:

T_{eq} 表明了恒定扭矩的值, 它决定了工作周期导致的相同持续时间。如所知的 $T_{21} \dots T_{2n}$, 齿轮箱在持续时间 h_i 小时内以输出速度 n_{2i} 来传递扭矩。扭矩计算等式如下:

$$T_{eq} = \sqrt[6.61]{\frac{n_{21} \cdot h_1}{n_2 \cdot h} \cdot T_{21}^{6.61} + \dots + \frac{n_{2n} \cdot h_n}{n_2 \cdot h} \cdot T_{2n}^{6.61}}$$

其中:

$$n_2 \cdot h = \sum_{i=1}^n n_{2i} \cdot h_i$$

3.7.4 T_{imp} = 冲击扭矩:

减速机在短时间内能传递的扭矩的最大值。

3.8 效率

η_m =机械效率: 输出功率与输入功率的比值; 一般它被认为在每个减速级中等于0.97-0.98, 用来弥补减速机的损耗; 它取决于各种因素, 如速度、扭矩、减速比、工作位置和润滑。

3.9 速度

n_1 =输入速度: 减速机的输入速度。

n_{2max} =最大输出速度: 持续运转的减速机的最大输出速度; 与工作周期相匹配, 能达到或接近的最大转速。

3.10 Life factor

Factor resulting by multiplying angular speed at input (n_1) or output (n_2) by actual operating working hours(h), break times excluded.

$$Fn_1=(n_1 \cdot h)$$

$$Fn_2=(n_2 \cdot h)$$

Life factor is directly proportional to gear box rpm during the whole duty time.

3.10 使用寿命

3.10.1 $n_2 \cdot h$ = 输出持续时间指标:

输出速度和持续时间(小时为单位)的乘积, 不含停机时间。

$$Fn_1=(n_1 \cdot h)$$

$$Fn_2=(n_2 \cdot h)$$

寿命和减速机运转转速成正比。

4 SERVICE FACTOR

4.1 Application factor K_A

The application factor is defined by the type of prime motor and driven machine. This is the experience of the various applications and the variations of load, transmission impacts and uncertainly relative to the variation of parameters involved in the transmission of power.

If any special technical requirement, please consult KPM Antriebstechnik.

The following table gives several application factors:

Angetriebene Maschine K_A 工作机	Angetriebene Maschine K_A 工作机	Angetriebene Maschine K_A 工作机
Cranes 起重机	Cable reel 卷轴 1.25	Rubber 橡胶
Dry dock 干坞	Conveyors 输送机 1.25	Slitters 切机 1.25
Main Hoist 主提升 2.5	Cutter head drives 切割头驱动 2	Feeders 给料机
Auxiliary hoist 辅助提升 2.5	Screen drives 筛驱动 1.75	Apron 板式 1.25
Continuous screw operation 连续螺旋运转 1.75	Stackers 塔式 1.25	Belt 皮带 1.25
Intermittent screw operation 间隙螺旋运转 1.75	Winches 卷扬机 1.25	Boom Hoist 吊杆提升 2.5
Industrial Duty 工业负载	Elevators 升降机	Slewing Drive 回转 2.5
Main 主 2.5	Bucket 斗轮 1.25	Traction 索引 3
Auxiliary 辅 2.5	Escalators 扶梯 1	Container 集装箱
Main log 主木 1.75	Extruders 挤出机	Agitators / Mixer 搅拌机
Slab 厚板 1.75	General 一般 1.5	Pure liquids 纯液体 1
Transfer 传送 1.25	Plastics 塑料	Liquid and solids 固液体 1.25
Debarking drums 起货卷扬 1.75	Variable speed drive 变速驱动 1.5	Liquid-variable density 变粘度液体 1.25
Planer feed 给料 1.25	Fixed speed drive 定速驱动 1.75	Dredges 挖泥

4 服务系数

4.1 工况系数 K_A :

此系数由工作机和原动机的类型来定义。此值由不同工况的历史经验并考虑负载的变化及传输的冲击, 参数变化等不定因素而定出的实验数据。此中的原动机通常为电机或液压马达这样的标准驱动, 工作机的类型对定义 K_A 起到了决定性的作用。它乘以额定扭矩(或功率)后得到一参考值, 来和样本值比较。

对于特殊类别的原动机, 及设定寿命不同于10000小时, 请和KPM公司联系。

下表给出了一些工况参数值:

Angetriebene Maschine KA 工作机		Angetriebene Maschine KA 工作机		Angetriebene Maschine KA 工作机	
Worm conveyor 蜗轮输送机	1	Sand muller 粉砂机	1.25	Metal mills 冶金厂	
Uniformly loaded or fed 规则加载或给料	1	Conveyors-general pourpose 输送机		Reversing 转炉	2
Not uniform fed 不规则给料	1.25	Bridge 桥	3	Slab pushers 厚板推送	1.5
Reciprocating or shaker 直线往复或摇动	1.25	Trolley Travel 小车行走	3	Shears 剪床	2
Hoists 起升		Crusher 破碎机		Wire drawing 拖绳	1.25
Heavy duty 重载	1.75	Stone or ore 石头或矿石	1.75	Wire Winding machine 卷绳机	1.5
Medium duty 中型负载	1.25	Mills.rotary type 旋转磨机		Metal strip processing machinery 金属处理机	
Skip hoist 翻斗提升	1.25	Cement Kilns 水泥窑	1.5	Coilers & uncoilers 卷绳或放绳	1
Laundry 洗涤		Dryers & coolers 干燥和冷却	1.5	Edge trimmers 修棱	1.25
Tumblers 滚筒	1.25	Agitator(mixer) 搅拌	1.5	Flatteners 平整机	1.25
Washers 洗涤器	1.5	Screw 螺旋	1.25	Pinch rolls 箍筒机	1.25
Food industry 食品工业		Lumber industry 伐木		Scrap choppers 碎片切割	1.25
Cereal cooker 谷类加工	1	Conveyors-burner 锯屑输送	1.25	Shears 飞剪	2
Dough mixer 生面搅拌	1.25	Main or heavy duty 中或重载	1.5	Scum breakers 碎渣机	1.5
Meat grinders 碎肉	1.25	Vibrating 振动	2	Slow or rapid mixers 快/慢搅拌	1.5
Plastic industry 塑料工业		Size press 压型	1.25	Thickeners 稠化	1.5
Batch mixers 间隙搅拌	1.75	Super calender 超级抛光机	1.25	Vacuum filters 真空过滤	1.5
Continuous mixers 连续搅拌	1.5	Thickener(AC motor) 稠化（交流电机）	1.5	Agitator for pure liquors 纯液体搅拌	1.25
Calenders 抛光机	1.5	Thckener(DC motor) 稠化（直流电机）	1.25	Chipper 切	2
Rubber industry 橡胶工业		Transfers-chain 传送--链	1.5	Chip feeder 切机给料	1.5

Angetriebene Maschine KA 工作机

Coating rolls 着色筒	1.25
Conveyor 输送	
Chip.bark.chemical 碎片剥离	1.25
Log(including slab) 伐木 (含厚板)	2
Dryers 干燥机	
Paper machine 纸机	1.25
Conveyor type 输送机型	1.5
Screen 筛	
Washer(AC motor) 洗涤 (交流电机)	1.5
Washer(DC motor) 洗涤 (直流电机)	1.25
Clay working machine 土工作业	
Brick press 压砖	1.75

Angetriebene Maschine KA 工作机

Briquette machine 煤机	1.75
Compactors 压机	2
Sewage disposal equipment 污水处理设备	
Bar screens 格栅	1.25
Air washing 气洗	1
Rotary-stone or gravel 旋转-石或砂砾	1.25
Sugar industry 制糖业	
Beet slicer 甜菜切片	2
Cane knives 茎切刀	1.5
Mills(low speed end) 磨机 (低速端)	1.75

Cs factor

This factor covers the number of starts per hour of gear box.

系数 Cs:

此系数考虑了一定时间内的起停次数。

	Starts per hour			
	1-5	6-25	26-100	101-200
Cs	1	1.05	1.15	1.25

Temperature [°C]

The ideal operating temperature is between 45°C and 70°C. If any other temperature is required, please contact KPM Antriebstechnik.
See chapter: Lubrication.

温度[°C]

理想的运转温度是45°C至70°C，短时间可达80°C。让温度处于可控的最佳系统是使用附加的冷却系统。在低温(低于-15°C)或高温(80°C之上)须使用特殊油封、材料、油品。此特殊情况请事先沟通KPM公司并见润滑系统章节。

5 VERIFICATION

5.1 Gear Box output options

Each reducer, according to the ISO 0281 standard and sustained life L10 corresponding to $n_2 \cdot h = 100,000$ dynamic radial load torque given in the parameter list of the reducer.

Refer to different life dynamic radial load can be got from the table and adjusted by k_f factor.

Note the ultimate axial load, should not exceed the allowable range.

5.2 Output torque

Output torque must always be less than T_{max} . If equipped with a brake on the gear box or motor, you must ensure that the braking torque does not exceed the maximum torque of the gear box, of course, braking force should multiplied by 1.1. In considering the actual braking torque efficiency of the gear box must be cared.

5.3 Input speed

Should not exceed the maximum input speed of the gear box.

5 论证

5.1 减速机的输出选择

对每个减速机而言，根据ISO 0281标准与持续寿命L10相对应的 $n \cdot h = 100000$ 条件下，动态径向负载扭矩均在各减速机参数表中给出。

对不同的持续寿命来说，适用的动态径向负载可以通过表中所示的值和修正系数 K_f 的乘积来获得。

注意最终的轴向负载，必须确定它们不能超过最大的允许值范围。

5.2 输出扭矩

输出扭矩必须永远小于 T_{max} 。如果在减速机或马达上装有制动器，必须确保制动扭矩不超过减速机最大扭矩，当然制动器本身制动力须乘以1.1。在考虑实际的制动扭矩时，也必须注意减速机的效率。

5.3 输入速度

不得超过减速机的最大输入速度。

6 MOTOR SELECTION METHOD

6.1 Hydraulic drive

If you know the pressure of the hydraulic circuit (motor pressure difference may be from), the torque T_1 , the input speed of n_1 , hydraulic motors capacity must be greater than or equal to:

$$V = \frac{20 \cdot \pi \cdot T_1}{P \cdot \eta_m}$$

Where η_m is mechanical efficiency of the motor.

Flow is:

$$Q = \frac{V \cdot n_1}{1000 \cdot \eta_v}$$

Where η_v is volumetric efficiency of the motor. Please use the following table as a guide when choosing the hydraulic motor.

6 马达选择方法

6.1 液压驱动

如果知道液压回路压力（应就是马达的工作压力）、扭矩 T_1 、减速机所需的输入速度 n_1 ，那么液压马达的容量一定大于等于：

$$V = \frac{20 \cdot \pi \cdot T_1}{P \cdot \eta_m}$$

其中 η_m 是马达的机械效率。

必须的供给流量是：

$$Q = \frac{V \cdot n_1}{1000 \cdot \eta_v}$$

其中 η_v 为马达的容积效率。在选择液压马达时请用下表作为指导。

The average efficiency of the hydraulic motor 液压马达的平均效率						
Use 使用	Light 轻型		Medium-sized 中型		Heavy 重型	
Pressure(bar) 压力 (bar)	<175		75-200		200-450	
Motor type 马达类型	orbit motor 摆线马达	Gear Motor 齿轮马达	Radial piston motor 径向柱塞马达	Axial piston motors 轴向柱塞马达	Cam motor 凸轮马达	Shaft piston motors 轴身柱塞马达
Speed[rpm] 转速[rpm]	<700	<3000	<500	<4000	<200	<4000
η_m	0.80	0.85	0.90	0.92	0.90	0.92
η_v	0.90	0.87	0.96	0.96	0.95	0.96

6.2 Motor drive

With continuous load S1, we know (the CEI 2-3/IEC34-1 standard) know that the mechanical efficiency of the reducer η_m torque T_1 and the output speed n_2 , then the actual power of the electric motor must be greater than:

$$P = \frac{T_2 \cdot n_2}{9550 \cdot \eta_m}$$

Load classification for different loads must be determined corresponding to the (CEI 2-3/IEC34-1 standard); In such cases, we recommend to contact KPM in order to make better choices.

6.2 电机驱动

在持续的S1负载中(CEI 2-3/IEC34-1标准)知道减速机的机械效率 η_m 、扭矩 T_1 和输出速度 n_2 ，那么电机的实际功率一定大于：

$$P = \frac{T_2 \cdot n_2}{9550 \cdot \eta_m}$$

对于不同的负载必须确定对应于(CEI2-3/IEC34-1标准)的载荷分类；在这类情况下，建议与KPM联系，以便做更好的选择。

7 BRAKE CHOOSE

- Brake torque calculated on pilot pressure 0 bar.

Effective torque decreased in back pressure circuit should be calculation as following:

Effective torque = static torque X (opening pressure - back pressure) / opening pressure

- The brake torque must greater than or equal to the motor torque:

$$T_f \geq T_1$$

- The brake torque multiplied by the ratio and divided by the gear box mechanical efficiency must greater than or equal to the output torque:

$$T_f \cdot i_e / \eta_m \geq T_2$$

- Brake torque multiplied by the ratio and divided by the output mechanical efficiency, must not exceed 90% of the the gear box impact output torque:

$$T_f \cdot i_e / \eta_m < 0.9 T_{2imp}$$

Brake lubrication

- Gear box oil does not provide brake lubrication, so it must be injected (about 0.08L) viscosity index of ISO VG32 mineral oil, or other suitable lubricating oil.

7 制动器选择

必须考虑下列参数:

- 制动扭矩以先导压力0bar时计算为准; 在液压回路中背压情况下, 有效扭矩值的减少如下所示:

有效扭矩 = 静态扭矩X (开启压力-背压) / 开启压力

- 制动器扭矩必须大于或等于马达扭矩:

$$T_f \geq T_1$$

- 制动器扭矩乘以减速比再除以齿轮箱的输出机械效率, 必须大于或等于输出扭矩:

$$T_f \cdot i_e / \eta_m \geq T_2$$

- 制动器扭矩乘以减速比再除以减速机的输出机械效率, 必须不超过90%的减速机瞬时冲击输出扭矩:

$$T_f \cdot i_e / \eta_m < 0.9 T_{2imp}$$

制动器润滑

- 齿轮箱油液不提供制动器的润滑, 因此必须注入 (大约0.08升) 粘度指标为ISO VG32的矿物油, 或者换用其它合适的润滑油。

8 SHIPMENT CONDITION

The gear box are painted externally "red" or unpainted unless specified in the contract, special painting is required for particular aggressive conditions.

9 STORAGE CONDITION

Protect the shafts with anticorrosive protection liquids if storing. Store in a dry place with temperature between 0°C and +20°C Keep the packages away dirt, dust and damp.

10 INSTALLATION

The gear box must be carefully installed by well trained mechanic. The structures for fixing gear box must be rigid, perfectly flat machined unpainted support surfaces. Normal with driven shaft, and with centering to tolerance H8 The contact surfaces must be duly and perfectly greased.

The gear box must be carefully aligned with the driven shaft. For fixing, use screws of class min.10.9 with tightening at 75% yielding. During assembly, violent axial impacts must absolutely be avoided since they could damage the internal bearings In order to avoid misalignment, we recommend to use coupling connecting gear box and motor.

8 供货条件

除了合同上特别指明减速机出厂时外部涂红色油漆或不喷漆。若要用于特殊环境中，则需要特种漆。减速机外部的工作部件，如空心、实心的轴端，支持架，止口面等，须用防氧化油保护，减速机体内的零件已涂有防锈漆，运动件由防氧化油保护。除非合同上特别指定；减速机供货时不带润滑油。KPM的产品根据要求用盒子或托盘包装。除非合同中特别指明，KPM的产品用适合一般工业环境的材料包装。

9 存储条件

若产品储存，则须对露外部件进行防腐保护。应保存在0°C至20°C的干燥环境中。存储应远离脏、灰及潮湿环境。

10 安装

减速机须由经过培训的技工小心安装。
安装的结构必须稳固，平整未喷漆的支撑表面，通常对被驱动轴和止口面公差为H8。接触面须准时完好地涂脂。减速机须和被驱动轴仔细对中，特别是内孔花键输出轴，记住，不能承受任何外力。
固定，请使用至少10.9级的螺栓，并预紧到75%。安装时，轴向冲击严格禁止，因为这可能损坏内部轴承。
安装在平键输出轴上的控制件须根据“输出结构”的参数来使用。连接减速机和马达时，我们建议使用联轴器来弥补不对中。
当使用的机械元件不能弥补不对中时，请在安装时特别小心马达和减速机的对中。

11 LUBRICATION

KPM Antriebstechnik gear box are supplied without lubricant. Therefore, correct filling is important.

Fundamental characteristics of the oils

- Additives

- Viscosity at working conditions

The oil must lubricate the bearings and the gears and all components inside the box.

Additives:

In addition to the normal antifoaming and antioxidant additives, it is important to use lubricating oils with additives that provide EP (extreme pressure) and anti-wear properties, according to DIN51517-3CLP.

Viscosity:

Nominal viscosity is referred to a temperature of 40°C. but rapidly decreases with an increase in temperature. if the operating temperature is between 50°C and 70°C, a nominal viscosity can be chosen according to the following guide table ,choosing the highest viscosity if the highest temperature is foreseen.

N2[rpm]	50°C	70°C
$n_2 > 20$	VG 150	VG 220
$20 > n_2 > 5$	VG 220	VG 320
$5 > n_2$	VG 320	VG 460

Types of oils

The oils available generally belong to three big families.

1) Mineral oils

2) Poly-Alpha-Olefin synthetic oils (PAO)

3) Poly-Glycol synthetic oils (PG)

The choice of lubricants

Gear box with lower load and temperature , discontinuous operating cycle can be lubricated with mineral oil.

In cases of heavy use, when the gear box are very loaded and in a continuous way, it is recommended to use polyalphaolefin synthetic lubricants (PAO). poly-Glycol oils (PG) are used strictly in the applications with heavy sliding between contacts.

11 润滑

KPM减速机出厂时都不带润滑油，因此使用者在运转机器前必须正确注入润滑油。

选油时须考虑的重要性能：

油的基本特征

- 一般运转条件下的粘度

- 添加剂

在不同的动作条件下，油必须润滑轴承，齿轮及同一箱体中运转的所有元件：

添加剂：

除了一般的防泡化和防氧添加剂，根据DIN515173CLP标准，合理使用耐压和防腐损添加剂是很重要的。因此，转速越慢，越要使用耐压越强特性的润滑油(关系齿轮的SHC)。请记住，强压的损坏将造成油品化学成分的改变。

粘度：

通常粘度是指40°C时的运动粘度。温度升高、粘度迅速下降。

油的类型

市场上的油一般分为三类

1) 矿物油

2) 聚 α 烯烃合成油 (PAO)

3) 聚乙二醇合成油 (PG)。

润滑油的选择

使用的工况决定选择。减速机无特别的负载，非连续工作时，无大的温升范围，一般采用矿物油。若减速机重载且连续运转，温升较大，推荐用PAO。PG严格地限定使用在接触面有重压滑动的场合，如蜗杆。不同油品不能混用，但都不能与水混合，故须特别小心。这种现象是十分危险的，因它不易被发觉，但能十分迅速地降低油的润滑性能。

Oil change

Oil change the oil first after 100-150 hours operation. subsequently, change the oil every 2000-4000 hours, depending on application. Alternatively change oil once a year, check the oil level every month and top up as necessary.

Lubricating Oil Temperature

Recommended operating temperature -15°C - $+40^{\circ}\text{C}$

12 INDICATIONS OF OIL LEVEL WITHOUT AUXILIARY COOLING SYSTEM

Horizontal mounting

Position of oil level

With horizontal mounting of the gear box, the normal level for guaranteeing correct lubrication is at the centre line, Fig. D. It's easy to check oil level with a transparent oil tube.

For applications with very low output speed ($n_2 < 5\text{rpm}$), it is recommended to fix the level at a value higher than 50 to 100mm, Fig. If the output speed is extremely low ($n_2 < 1\text{rpm}$), or if no use for long time is foreseen, it is advisable to fill the entire box. In this case a special auxiliary tank must be provided. For any further technical support, please contact KPM Antriebstechnik.

润滑油的更换

齿轮箱在初始运转150小时后须更换一次润滑油, 然后根据齿轮箱工作状况, 在运转2000或4000小时后换油, 且至少每年更换一次。为了方便排空齿轮箱润滑油, 我们建议润滑油在温热时进行更换; 在灌注新油前须清洗干净齿轮箱内部。不同的润滑油不能混合在一起, 特别是矿物油和合成油。在齿轮箱运行一段时间后, 必须定期检查润滑油位, 如有必要请加满润滑油。

润滑油油温

标准齿轮箱推荐的运行温度为 -15°C - $+40^{\circ}\text{C}$

12 不带辅助冷却系统的油位图

水平安装

油位

对于水平安装的减速机, 保证正确润滑的正常油位在中心线, (见D部分图)。对特低输出转速($n_2 < 5\text{rpm}$), 建议油位高出(中心线)50至100mm(见D部分图)。用一个透明的油(见D部分图)可以很容易地检查油位。

若输出速度特别低 ($n_2 < 1\text{rpm}$)或停用时间长, 建议注满整箱。这时, 须加膨胀油杯。如需技术支持, 请联系KPM公司。

13 SELECTING THE REDUCTION GEARS

To choose a gear box, a given application and data is necessary.

- input speed n_1 [min^{-1}] ;
- required out speed n_{2r} [min^{-1}] ;
- required out torque T_{2r} [Nm] ;
- the duration required h_r [h] ;
- the service factor K_A , calculated on the basis of the application and conditions of use.

With these data, selection ratio required:

$$i_r = \frac{n_1}{n_{2r}}$$

the corrected output torque:

$$T_{2c} = T_{2r} \cdot K_A$$

and the duration factor:

$$f_{h-2} = n_{2r} \cdot h_r$$

Choose a gear size from the nominal torque table that has a nominal torque greater than T_{2c} .

Then, from the technical table (at the beginning of the size wanted) select a reduction ratio i near to i_r make sure that the transmissible output torque T_{2c} is greater than T_{2c} mean while check the $n_2 \cdot h$ related greater than or equal to the calculated f_{h-2} .

Example

You want to choose a linear reduction gear that works under following conditions:

- input speed $n_1 = 1000 \text{ min}^{-1}$
- required out speed $n_{2r} = 6.3 \text{ min}^{-1}$
- required out torque $T_{2r} = 3000 \text{ Nm}$
- the duration required $h_r = 10000 \text{ h}$
- service factor $K_A = 1.25$

13 产品选型

减速机的选型，一些给定的参数是必须的：

- 输入转速 n_1 [min^{-1}] ;
- 理论输出转速 n_{2r} [min^{-1}] ;
- 理论输出扭矩 T_{2r} [Nm] ;
- 理论适用寿命 h_r [h] ;
- 工况系数 K_A 由减速机的型号和使用环境决定。

根据这些参数，我们可以确定理论的减速比：

$$i_r = \frac{n_1}{n_{2r}}$$

修正后的输出扭矩：

$$T_{2c} = T_{2r} \cdot K_A$$

以及使用寿命参数：

$$f_{h-2} = n_{2r} \cdot h_r$$

从选型样本中选择减速机系列，使所选系列的减速机额定扭矩 T_{2n} 大于上述计算的修正后的输出扭矩 T_{2c} 。然后从选型样本的参数表内选择减速比 i ，使所选的速比接近需要的理论速比 i_r ，同时必须确保在使用寿命参数 $n_2 \cdot h$ 大于或等于计算值 f_{h-2} 的情况下，该速比对应的持续传递扭矩 T_{cont} 大于修正后的输出扭矩 T_{2c} 。

选型示例

如果您想选择一款直线型的减速机，其使用条件如下：

- 输入转速 $n_1 = 1000 \text{ min}^{-1}$
- 理论输出转速 $n_{2r} = 6.3 \text{ min}^{-1}$
- 理论输出扭矩 $T_{2r} = 3000 \text{ Nm}$
- 理论使用寿命 $h_r = 10000 \text{ h}$
- 工况系数 $K_A = 1.25$

The reduction ratio required is :

$$i_r = \frac{n_1}{n_{2r}} = \frac{1000}{6.3} = 158.73;$$

while the corrected torque is:

$$T_{2c} = T_{2r} \cdot K_A = 3000 \times 1.25 = 3750 \text{ Nm}$$

and the duration factor is equivalent to:

$$f_{h-2} = n_{2r} \cdot h_r = 6.3 \times 10000 = 63000$$

From the nominal torque table select a reduction gear size which has a nominal torque T_{2n} greater than T_{2c} . In this case the suitable size is 050.

In the technical table of the 050 size, there is a triple stage linear reduction gear (L3) with a 160.00 ratio, close to required, in the column relative $n_2 \cdot h = 100000 > f_{h-2}$. You can read the value of the applicable torque T_2 which is 4836 Nm.

则理论减速比为:

$$i_r = \frac{n_1}{n_{2r}} = \frac{1000}{6.3} = 158.73;$$

修正后的输出扭矩为:

$$T_{2c} = T_{2r} \cdot K_A = 3000 \times 1.25 = 3750 \text{ Nm}$$

使用寿命参数为:

$$f_{h-2} = n_{2r} \cdot h_r = 6.3 \times 10000 = 63000$$

从选型样本中选择减速机系列，使所选系列的减速机额定扭矩 T_{2n} 大于上述计算出的修正后的输出扭矩 T_{2c} 。本例中适合选用 050 系列。

在050系列减速机的技术参数表中，有一款减速比为160.00的直线型三级减速机(L3)，其速比最接近需要的理论速比；同时在使用寿命 $n_2 \cdot h = 100000 > f_{h-2}$ 的情况下，该速比对应的持续传递扭矩 T_{cont} 大于修正后的输出扭矩 T_{2c} 。从参数表中您可以读出所选减速机适用的扭矩为4836Nm。

14 RATIO TABLE

14 速比表

You can read the value of the applicable torque T_2 which is 4836 Nm.

从参数表中您可以读出所选减速机适用的扭矩为 4836Nm。

KL050

$T_2=5000\text{ Nm}$

	i	$T_{\text{cont}} [\text{Nm}]$						Pt	$n_{1\text{max}}$	T_b	
		$n_2 \cdot h$	$n_2 \cdot h$	$n_2 \cdot h$	$n_2 \cdot h$	$n_2 \cdot h$	$n_2 \cdot h$				
	1:	10000	25000	50000	100000	500000	1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.50	4834	4577	4423	4320	3857	3137	11	3100	1140	610
	4.13	5969	5660	5454	5351	3808	3087	11	3100		
	4.57	5394	5115	4929	4836	3441	2790	11	3100		
	5.17	4768	4521	4357	4275	3042	2466	11	3100		
	6.00	4108	3896	3754	3683	2621	2125	11	3100		
	7.25	3400	3224	3107	3048	2169	1759	11	3100		
L2	14.03	5646	5646	5454	5351	3808	3087	9	4000	520	
	18.27	5969	5660	5454	5351	3808	3087	9	4000	430	
	20.24	5394	5115	4929	4836	3441	2790	9	4000	340	
	22.88	4768	4521	4357	4275	3042	2466	9	4000	250	
	24.50	4260	4260	3728	3621	2876	2343	9	4000	250	
	29.97	4768	4521	4357	4275	3042	2466	9	4000	250	
	36.17	4768	4521	4357	4275	3042	2466	9	4000	160	
	41.14	4326	4326	3785	3677	2920	2379	9	4000	160	
	46.50	4768	4521	4357	4275	3042	2466	9	4000	160	
	54.00	4108	3896	3754	3683	2621	2125	9	4000	160	
L3	52.85	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	77.50	4834	4577	4423	4320	3857	3137	7.5	4000	160	
	89.90	4834	4577	4423	4320	3857	3137	7.5	4000	160	
	103.13	5969	5660	5454	5351	3808	3087	7.5	4000	160	
	114.29	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	138.77	5969	5660	5454	5351	3808	3087	7.5	4000	160	
	153.78	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	160.00	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	167.48	6052	6052	5296	5144	4085	3329	7.5	4000	160	
	173.81	4768	4521	4357	4275	3042	2466	7.5	4000	160	
	185.60	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	202.13	5027	5027	4398	4273	3393	2765	7.5	4000	160	
	220.50	4260	4260	3728	3621	2876	2343	7.5	4000	160	
	253.17	4768	4521	4357	4275	3042	2466	7.5	4000	160	
	288.00	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	325.50	4768	4521	4357	4275	3042	2466	7.5	4000	160	
L4	360.24	5646	5646	5454	5351	3808	3087	6	4000	160	
	400.09	4108	3896	3754	3683	2621	2125	9	4000	160	
	456.70	5969	5660	5454	5351	3808	3087	6	4000	160	
	499.13	5969	5660	5454	5351	3808	3087	6	4000	160	
	563.87	5394	5115	4929	4836	3441	2790	6	4000	160	
	639.38	5969	5660	5454	5351	3808	3087	6	4000	160	
	721.88	5969	5660	5454	5351	3808	3087	6	4000	160	
	821.33	5394	5115	4929	4836	3441	2790	6	4000	160	
	891.94	5394	5115	4929	4836	3441	2790	6	4000	160	
	1010.63	5969	5660	5454	5351	3808	3087	6	4000	160	
	1172.33	5969	5660	5380	5157	3808	3087	6	4000	160	
	1275.43	5394	5115	4929	4836	3441	2790	6	4000	160	
	1568.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	1851.43	5394	5115	4929	4836	3441	2790	6	4000	160	
	2016.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	2278.50	4768	4521	4357	4275	3042	2466	6	4000	160	
	2592.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	2929.50	4768	4521	4357	4275	3042	2466	6	4000	160	

Since this value is greater than torque T_{2c} the reduction gear box selected is suitable for working at the conditions required.

由于该值大于扭矩 T_{2c} ，所以选用的减速机是符合条件需求的。

Pag C .1		Pag C .9		Pag C .18		Pag C .27		Pag C .36		Pag C .44	
KL 015		KL 025		KL 050		KL 070		KL 100		KL 160	
i _e	T _{iso}	i _e	T _{iso}	i _e	T _{iso}	i _e	T _{iso}	i _e	T _{iso}	i _e	T _{iso}
1	3.40	1300	1	3.50	2100	1	3.50	7700	1	3.72	15000
	3.67	1400		4.13	2600		4.13	9500		4.09	16500
	4.43	1700		4.57	2400		5.17	7600		4.58	14700
	5.00	1400		5.17	2100		6.00	6500		5.25	12800
	5.80	1250		6.00	1800		7.25	5400		6.23	10800
	7.00	1500		7.25	1500						
	9.00	800									
2	12.47	1300	2	12.84	2900	2	12.25	7500	2	13.02	15000
	18.33	1400		18.27	2600		14.44	7700		14.32	16500
	22.14	1700		20.25	2400		17.02	9500		16.88	16500
	25.69	1750		22.88	2100		18.08	7400		18.70	16500
	31.00	1780		24.50	2100		21.31	8800		21.14	16500
	33.64	1250		29.97	2100		25.38	5300		21.81	10800
	39.86	1750		36.17	2100		27.43	8600		27.47	14700
	45.00	1400		41.14	2400		31.00	7600		33.20	13900
	52.20	1200		46.50	2100		37.46	7600		38.06	12800
	63.00	1000		54.00	1800		43.50	6500		45.17	10800
3	51.19	1300	3	52.85	2400	3	44.92	7500	3	44.27	15000
	62.33	1300		77.50	2100		49.00	7500		56.21	15000
	77.98	1400		89.90	2100		54.25	7500		71.59	16500
	86.85	1700		103.13	2600		63.94	7700		80.44	14700
	105.40	1300		114.29	2400		75.36	9500		89.00	15000
	128.43	1700		138.77	2600		80.08	7700		93.51	16500
	145.00	1400		153.78	2400		90.75	7600		109.55	14700
	175.00	1400		160.00	2400		109.37	9500		121.41	14700
	195.11	1200		167.48	2600		132.00	9500		147.95	16500
	217.00	1700		173.81	2100		143.55	7600		157.33	12800
	245.00	1400		185.60	2400		149.19	8800		165.61	14700
	284.20	1200		202.13	2600		165.33	8600		171.82	15000
	302.76	1200		220.50	2100		186.86	7600		189.88	12800
				253.17	2100		192.00	8400		207.61	12400
				288.00	2400		212.57	8600		220.50	12800
4	255.97	1300	4	325.50	2100	4	222.75	7600	4	232.38	13900
	263.68	1400					246.86	8400		247.26	14700
	276.05	1300		360.24	2600		269.16	6200		298.78	13900
	296.93	1300		400.09	1800		279.00	7600		342.56	12800
	320.22	1300		456.70	2600		337.13	7600			
	333.41	1300		499.13	2600					216.19	16500
	359.56	1400		563.87	2400		184.45	7500		256.06	15000
	404.60	1300		639.38	2600		276.30	9500		281.33	15000
	443.67	1600		721.88	2600		319.69	7700		311.77	15000
	460.75	1600		821.33	2400		354.29	7700		358.88	16500
	553.57	1300		891.94	2400		400.27	7700		401.63	16500
	616.73	1600		1010.63	2600		464.00	7700		463.50	14700
	765.00	1300		1172.33	2600		505.31	7700		463.50	14700
	948.60	1300		1275.43	2400		634.35	9500		506.39	15000
	1023.00	1400		1568.00	2400		792.45	8000		567.68	16500
	1258.60	1784		1851.43	2400		909.56	7700		654.55	16500
	1340.79	1784		2016.00	2400		1062.86	8600		711.03	16500
	1588.59	1784		2278.50	2100		1157.33	8600		801.01	15000
	1722.60	1400		2592.00	2400		1488.00	8600		906.19	13700
	2080.54	1784		2929.50	2100		1692.74	8600		1003.28	15000
							1913.14	8600		1103.32	16500
										1234.94	14700
										1331.59	16500
										1415.93	12800
										1543.50	12800
										1644.30	12800
										1730.84	14700
										1944.00	12800
										2091.43	13900
										2225.37	14700

Pag C .97			Pag C .106			Pag C .114			Pag C .122			Pag C .130			Pag C .139		
KL 1050			KL 1350			KL 1800			KL 2250			KL 2700			KL 3500		
	ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso
1	4.09	92200	1	3.83	110900	1	4.09	128600	1	3.83	183100	1	4.18	204500	1	3.83	373600
	5.25	71800		4.40	96500		5.25	100100		4.40	159300		4.89	174800		4.40	325200
2	16.54	92200	2	18.40	96500	2	16.54	128600	2	16.03	183100	2	17.49	204500	2	15.68	316000
	18.41	92200		21.51	96500		18.41	128600		18.74	183100		20.44	204500		18.00	325200
	20.94	92200		23.00	107200		20.94	128600		21.51	159300		23.90	174800		23.10	316000
	24.55	92200		26.40	96500		26.87	100100									
	31.50	71800					31.50	100100									
3	57.90	92200	3	65.58	110900	3	61.53	128600	3	59.19	183100	3	64.57	204500	3	57.90	353100
	68.23	92200		73.40	110900		67.67	128600		69.20	183100		78.69	204500		70.57	353100
	95.11	92200		80.02	96500		75.31	128600		75.78	183100		89.50	204500		80.25	315300
	125.61	92200		84.16	110900		84.29	128600		82.04	183100		96.64	174800		90.56	275100
	138.82	71800		96.60	96500		103.07	128600		95.91	183100		104.63	204500		102.99	275100
	189.00	71800		112.93	96500		103.07	128600		110.09	159300		122.32	174800		118.22	316000
				120.88	96500		114.70	128600		129.07	159300		143.41	174800		138.60	316000
				134.03	96500		123.03	114800									
4	218.08	92200	4	164.49	96500	4	130.45	128600	4	226.86	183100	4	225.99	204500	4	202.66	353100
	243.41	92200		256.91	110900		141.06	100100		244.15	183100		275.43	204500		239.55	353100
	294.55	92200		287.58	110900		152.94	128600		277.99	157700		322.00	204500		261.56	353100
	352.54	92200		335.55	110900		167.41	100100		312.58	183100		395.26	204500		291.09	353100
	401.99	71800		406.31	96500		196.27	100100		353.85	157700		426.39	204500		360.47	275100
	453.71	92200		443.37	110900		281.30	114800		391.52	183100		536.97	204500		408.00	325200
	504.94	92200		504.95	110900		317.93	114800		454.11	159300		633.78	204500		467.91	275100
	570.68	92200		579.60	96500		398.67	128600		506.00	183100		733.91	174800		571.73	315300
	649.01	92200		677.60	96500		454.07	114800		549.39	183100		860.44	174800		648.00	325200
	706.55	71800		713.32	110900		505.77	128600		611.42	183100					709.31	316000
	800.80	92200		846.58	110900		558.92	114800		701.80	159300					831.60	316000
	1168.74	71800		971.72	96500		629.61	128600		815.22	183100						
							738.15	114800		935.73	159300						
							831.60	128600									
							891.93	114800									
							945.74	128600									
							1108.79	128600									
							1213.69	100100									

Pag C .147		Pag C .2		Pag C .10		Pag C .19		Pag C .28		Pag C .37	
KL 4500		KR 015		KR 025		KR 050		KR 070		KR 100	
	ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso
1	3.83	317100	2	10.46	1300	2	10.77	4300	2	10.77	4500
	4.40	276000		11.28	1400		12.69	5300		11.62	4800
2	14.69	317100		13.63	1700		14.07	4800		12.69	5300
	16.87	317100		15.13	1700		15.62	4800		17.65	6700
	19.36	276000		17.08	1400		17.65	4200		19.73	6600
3	61.45	316200	3	19.82	1200	3	19.73	4200	3	25.80	7200
	71.84	317100		22.15	1200		22.91	3600		37.69	10500
	94.65	276000		26.73	1000		25.80	3600		40.68	10500
	101.20	316200		30.75	800		27.68	3000		44.42	10500
	116.16	276000		34.36	800		31.18	3000		47.95	1140
4	228.59	317100	3	35.57	1300	3	36.62	4300	3	52.36	9500
	281.37	317100		38.36	1300		39.49	4300		58.02	9500
	322.61	317100		41.37	1400		53.10	4800		72.67	9400
	370.30	317100		46.33	1300		56.21	5300		80.70	9400
	513.78	317100		51.45	1300		62.29	4800		90.18	9400
	589.74	276000		57.49	1300		69.17	4800		104.73	9400
	630.55	317100		62.64	1400		73.62	5300		143.02	8300
	723.76	276000		68.13	1700		77.30	4800		166.09	7200
				75.65	1700		81.58	4800		187.05	7200
				84.55	1700		87.27	4800			
				89.23	1400		91.35	5300		142.30	10500
				99.08	1400		98.64	4200		153.47	10500
				118.36	1700		114.42	4200		171.65	10500
				124.92	1200		123.57	4200		180.70	10500
				133.64	1400		143.08	4200		235.33	11400
				138.72	1200		166.15	3600		252.42	11400
				150.50	1400		184.50	3600		308.81	11400
				155.02	1200	4	124.49	2100	4	308.92	7400
				171.82	1400		134.26	2100		354.33	7700
				193.85	1000		144.79	2100		400.46	7700
							154.48	2100		422.34	8800
							201.22	2100		454.78	9500
							245.00	2100		504.00	9500
							307.16	2100		589.06	8600
							358.19	2100		631.27	8600
							402.28	2100		732.38	8800
							451.76	2900		828.55	7600
							506.28	2100		914.06	8600
							620.81	2600		1.19.14	6900
							708.75	2600		1138.91	6900
							887.91	2600			
							1026.10	2400			
							1099.64	2400			
							1159.71	2100			

Pag C .46			Pag C .53			Pag C .59			Pag C .66			Pag C .73			Pag C .81						
KR 160			KR 260			KR 330			KR 400			KR 500			KR 600						
	ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso		ie	Tiso				
2	11.73	6500	2	11.64	10900	2	11.65	47400	2	13.19	25200	3	58.39	32600	3	59.35	55700				
	12.90	7200		12.75	11900		12.75	24300		14.64	26000		66.95	37400		67.50	63400				
	14.44	8000		14.19	13300		14.19	27100		15.42	29400		74.30	37900		74.90	65000				
	16.03	8100		16.14	15100		16.14	30800		17.11	30400		80.55	36300		83.66	63100				
	18.38	9300		17.91	15500		17.91	31400		18.92	28000		84.74	42000		87.57	58500				
	20.52	9200		18.92	17700		18.92	26800		21.00	28000		94.04	42000		97.80	58500				
	21.81	10800		21.00	17900		21.00	26800		23.45	28000		100.57	42000		114.67	58500				
	24.36	10800		23.45	17600		23.45	26800		27.00	28000		109.60	47700		132.00	58500				
	28.04	10800		27.00	17900		27.00	26800					124.65	42000							
													143.49	42000							
								168.23	35800												
3	40.06	15000	3	39.76	16700	3	39.76	16700	3	60.39	33700	4	235.92	53200	4	250.90	58500				
	47.22	15000		46.86	19700		42.92	18000		67.02	34200		265.22	68500							
	51.92	16500		51.32	21600		46.86	19700		76.84	29200		299.16	68500							
	57.54	16500		64.28	26600		51.32	21600		80.95	34300		371.23	68500							
	65.03	16500		79.44	23900		64.28	27000		85.82	38700		405.25	58500							
	72.79	14700		88.77	23900		79.44	30500		89.83	34300		461.90	58500							
	80.70	16500		94.48	21000		88.77	30000		96.07	34300		512.90	58500							
	90.33	14700		104.91	21000		94.48	31400		106.62	34300		573.18	58500							
	103.57	12800		117.24	21000		104.91	31400		119.08	34300		619.76	58500							
	113.42	13900		126.77	21000		117.24	31400		137.08	34300		667.18	68500							
	130.05	12800		141.67	21000					168.23	28000		779.99	58500							
	145.33	12800		166.09	17900		4	139.17		36400	4		167.53	40100		4	615.51	42000	4	914.47	58500
	172.48	10800		187.05	17900			164.02		36400			197.45	40100			665.53	42000			
								193.31		36400			247.31	40100			711.32	42000			
								214.23		36400			301.99	40100			789.86	42000			
				234.61	39900	353.51		40100	882.69	42000											
				281.18	36400	405.31		40100	994.07	42000											
				300.46	36400	450.07		40100	1034.87	35800											
4	166.33	16500	4	139.17	23600	4	139.17	23600	4	502.96	40100	4	1165.47	35800							
	209.10	15000		164.02	23600		167.53	40100		554.52	34300										
	261.63	15000		193.31	23600		197.45	40100		607.74	40100										
	322.16	16500		214.23	23600		247.31	40100		662.20	34300										
	356.13	16500		234.61	26600		301.99	40100		710.50	34300										
	458.66	12800		281.18	23600		353.51	40100		800.16	34300										
	499.83	16500		300.46	23600		405.31	40100		949.64	34300										
	559.46	14700		326.30	26600		450.07	40100		1034.87	28000										
	600.70	12800		364.65	26600		502.96	40100		1165.47	28000										
	655.14	14700		405.82	23900		554.52	34300													
	754.77	15000		457.03	23900		607.74	40100													
	844.82	14700		511.68	26600		662.20	34300													
	915.56	14700		569.45	23900		710.50	34300													
	1020.82	13900		600.96	26600		800.16	34300													
	1140.78	13900		651.29	26600		949.64	34300													
				703.44	21000		1034.87	28000													
				756.33	26600		1165.47	28000													
				792.21	21000																
				849.99	21000																
				903.12	23900																
				957.26	21000																
				1027.08	21000																
				1204.16	17900																

Pag C .89			
KR 850			
	ie	Tiso	
3	59.35	55700	
	67.50	63400	
	74.90	65000	
	83.66	63100	
	87.57	68000	
	97.80	68000	
	114.67	68000	
	132.00	68000	
4	250.90	68000	
	265.22	79500	
	299.16	79500	
	371.23	79500	
	405.25	68000	
	461.90	68000	
	512.90	68000	
	573.18	68000	
	619.76	68000	
	667.18	79500	
	779.99	68000	
	914.47	68000	
	5	1163.35	79500
		1314.45	68000
1364.54		79500	
1415.03		79500	
1518.60		79500	
1617.05		79500	
1664.11		79500	
1717.32		79500	
1868.09		68000	
2200.50		79500	
2620.24		68000	

KL015
T₂=1500 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[kW]	[]	[Nm]	
L1	3.40							7.5	4000	430	
	3.67							7.5	4000	430	
	4.43							7.5	4000	520	
	5.00							7.5	4000	520	
	5.08							7.5	4000	340	
	7.00							7.5	4000	250	
	9.00							7.5	4000	160	
L2								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
L3								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
								7.5	4000		
L4				1367	1300	1300	1075		4000		
				1476	1400	1400	1160		4000		
				1367	1300	1300	1075		4000		
				1367	1300	1300	1075		4000		
		1367		1367	1300	1300	1075		4000		
		1367		1367	1300	1300	1075		4000		
		1476		1476	1400	1400	1160		4000		
		1367		1367	1300	1300	1075		4000		
		1476		1476	1600	1400	1160		4000		
		1367		1367	1600	1300	1075		4000		
		1923		1816	1300	1298	1058		4000		
		1476		1476	1600	1400	1160		4000		
		1367		1367	1300	1300	1075		4000		
		1367		1367	1300	1300	1075		4000		
		1476		1476	1400	1400	1160		4000		
		1923		1816	1784	1298	1058		4000		
		1923		1816	1784	1298	1058		4000		
		1923		1816	1784	1298	1058		4000		
		1476		1476	1400	1400	1160		4000		
		1923		1716	1784	1298	1058		4000		

$$T_{2max}=1.2 \cdot T_{n2}$$

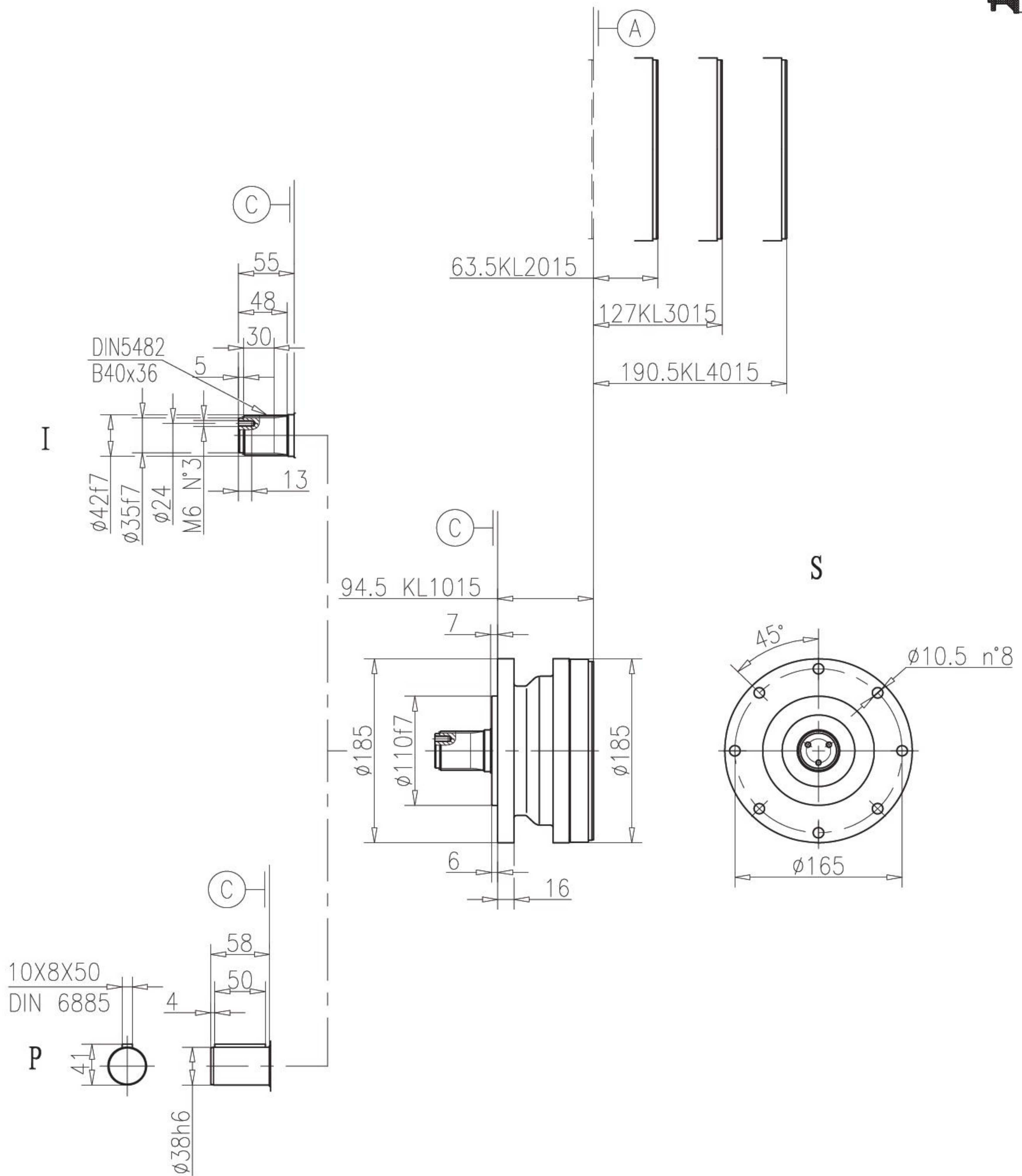
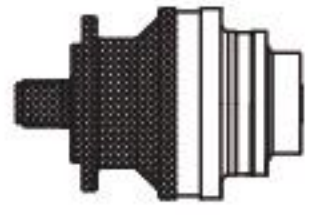
T₂=1500 Nm

KR015

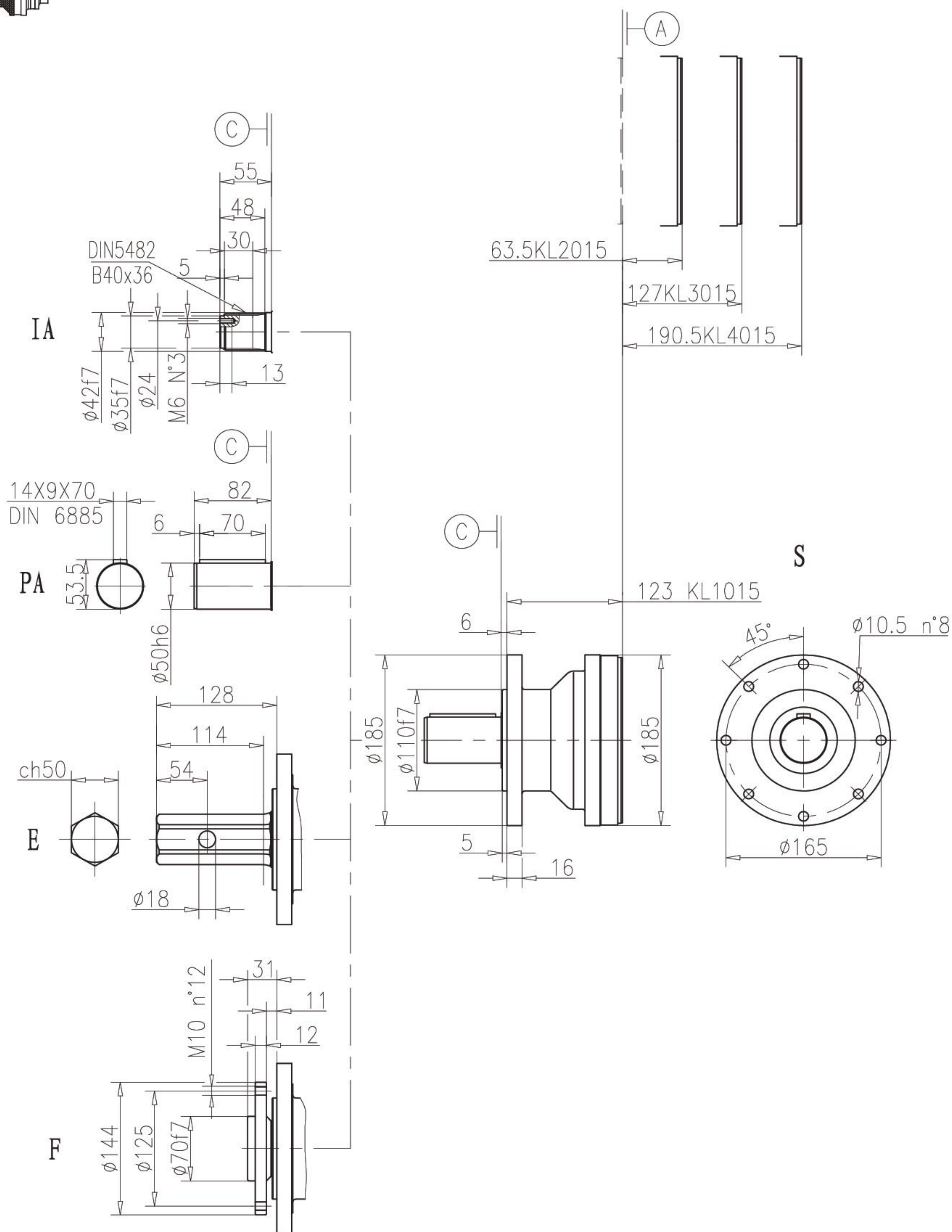
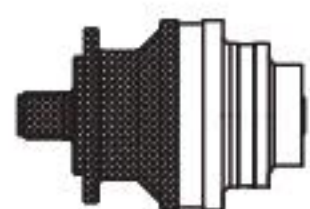
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	10.46	1367	1367	1367	1300	1300	1075	12	4000	160	
	11.28	1476	1476	1476	1400	1400	1160	12	4000	160	
	13.63	1923	1923	1816	1784	1298	1058	12	4000	160	
	15.13	1923	1923	1816	1784	1298	1058	12	4000	160	
	17.08	1704	1704	1491	1448	1150	937	12	4000	160	
	19.82	1469	1469	1285	1249	992	808	12	4000	160	
	22.15	1469	1469	1285	1249	992	808	12	4000	160	
	26.73	1217	1217	1065	1035	822	669	12	4000	160	
	30.75	947	947	828	805	639	521	12	4000	160	
	34.36	947	947	828	805	639	521	12	4000	160	
R3	35.57	1367	1367	1367	1300	1300	1075	12	4000	160	
	38.36	1367	1367	1367	1300	1300	1075	12	4000	160	
	41.37	1476	1476	1467	1400	1400	1160	12	4000	160	
	46.33	1367	1367	1367	1300	1300	1075	12	4000	160	
	51.45	1367	1367	1367	1300	1300	1075	12	4000	160	
	57.49	1367	1367	1367	1300	1300	1075	12	4000	160	
	62.64	1476	1476	1476	1400	1400	1160	12	4000	160	
	68.13	1923	1923	1816	1784	1298	1058	12	4000	160	
	75.65	1923	1923	1816	1784	1298	1058	12	4000	160	
	84.55	1923	1923	1816	1784	1298	1058	12	4000	160	
	89.23	1704	1704	1491	1448	1150	937	12	4000	160	
	99.08	1704	1704	1491	1448	1150	937	12	4000	160	
	118.36	1923	1923	1816	1784	1298	1058	12	4000	160	
	124.92	1469	1469	1285	1249	992	808	12	4000	160	
	133.64	1704	1704	1491	1448	1150	937	12	4000	160	
	138.72	1469	1469	1285	1249	992	808	12	4000	160	
	150.50	1704	1704	1491	1448	1150	937	12	4000	160	
	155.02	1469	1469	1285	1249	992	808	12	4000	160	
	171.82	1704	1704	1491	1448	1150	937	12	4000	160	
	193.85	1217	1217	1065	1035	822	669	12	4000	160	
R4	120.94	1367	1367	1367	1300	1300	1075	10	4000	160	
	134.29	1367	1367	1367	1300	1300	1075	10	4000	160	
	144.82	1367	1367	1367	1300	1300	1075	10	4000	160	
	174.91	1367	1367	1367	1300	1300	1075	10	4000	160	
	205.17	1367	1367	1367	1300	1300	1075	10	4000	160	
	245.70	1476	1476	1476	1400	1400	1160	10	4000	160	
	282.05	1476	1476	1476	1400	1400	1160	10	4000	160	
	303.38	1367	1367	1367	1300	1300	1075	10	4000	160	
	321.78	1476	1476	1476	1400	1400	1160	10	4000	160	
	363.31	1476	1476	1476	1400	1400	1160	10	4000	160	
	406.58	1367	1367	1367	1300	1300	1075	10	4000	160	
	458.08	1476	1476	1476	1400	1400	1160	10	4000	160	
	517.42	1367	1367	1367	1300	1300	1075	10	4000	160	
	588.92	1476	1476	1476	1400	1400	1160	10	4000	160	
	653.95	1476	1476	1476	1400	1400	1160	10	4000	160	
	709.50	1476	1476	1476	1400	1400	1160	10	4000	160	
	789.25	1476	1476	1476	1400	1400	1160	10	4000	160	
	858.46	1923	1923	1816	1784	1298	1058	10	4000	160	
	953.25	1923	1923	1816	1784	1298	1058	10	4000	160	
	1065.27	1923	1923	1816	1784	1298	1058	10	4000	160	
	1199.70	1923	1923	1816	1784	1298	1058	10	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

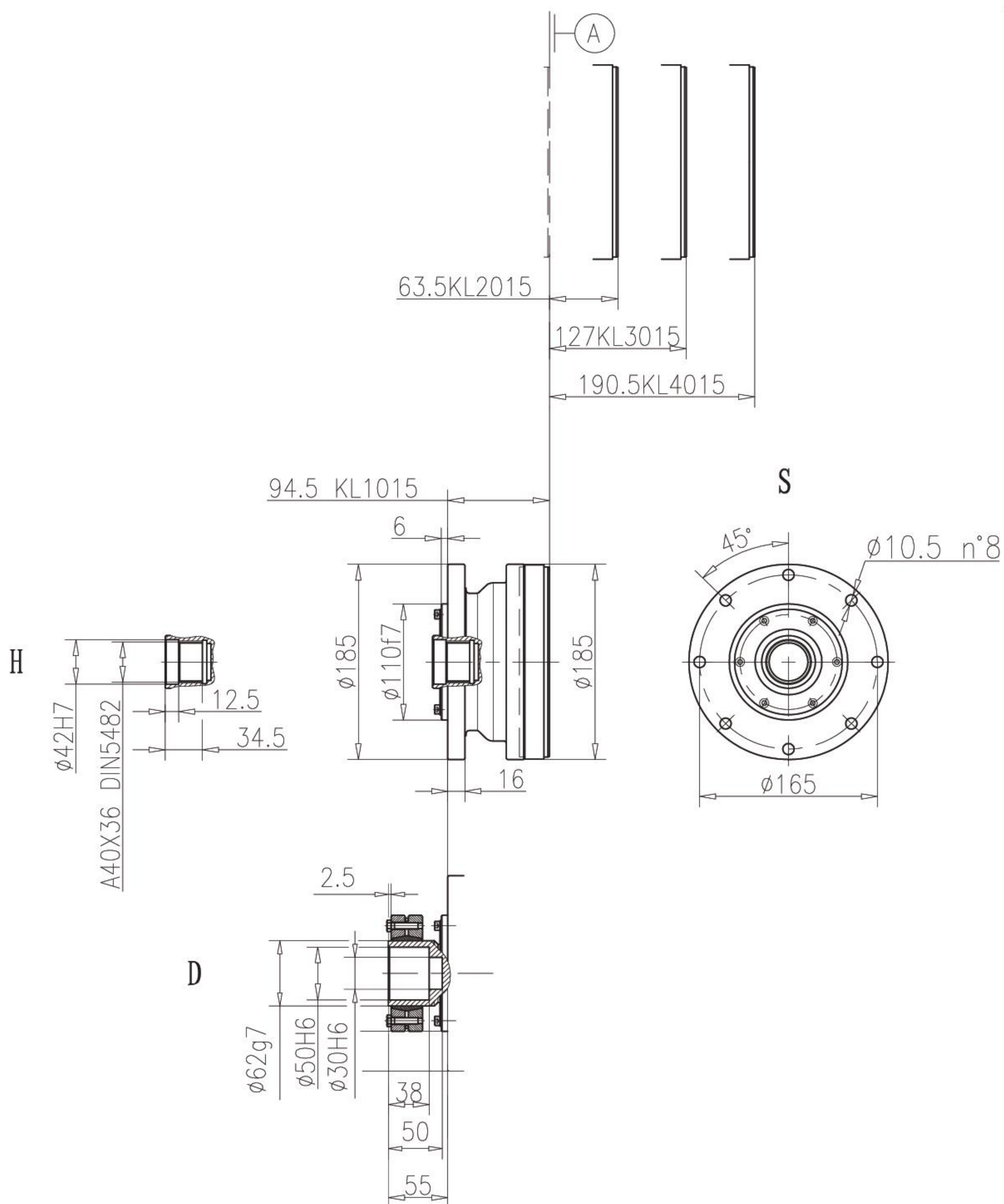
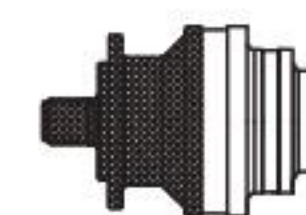
KL015



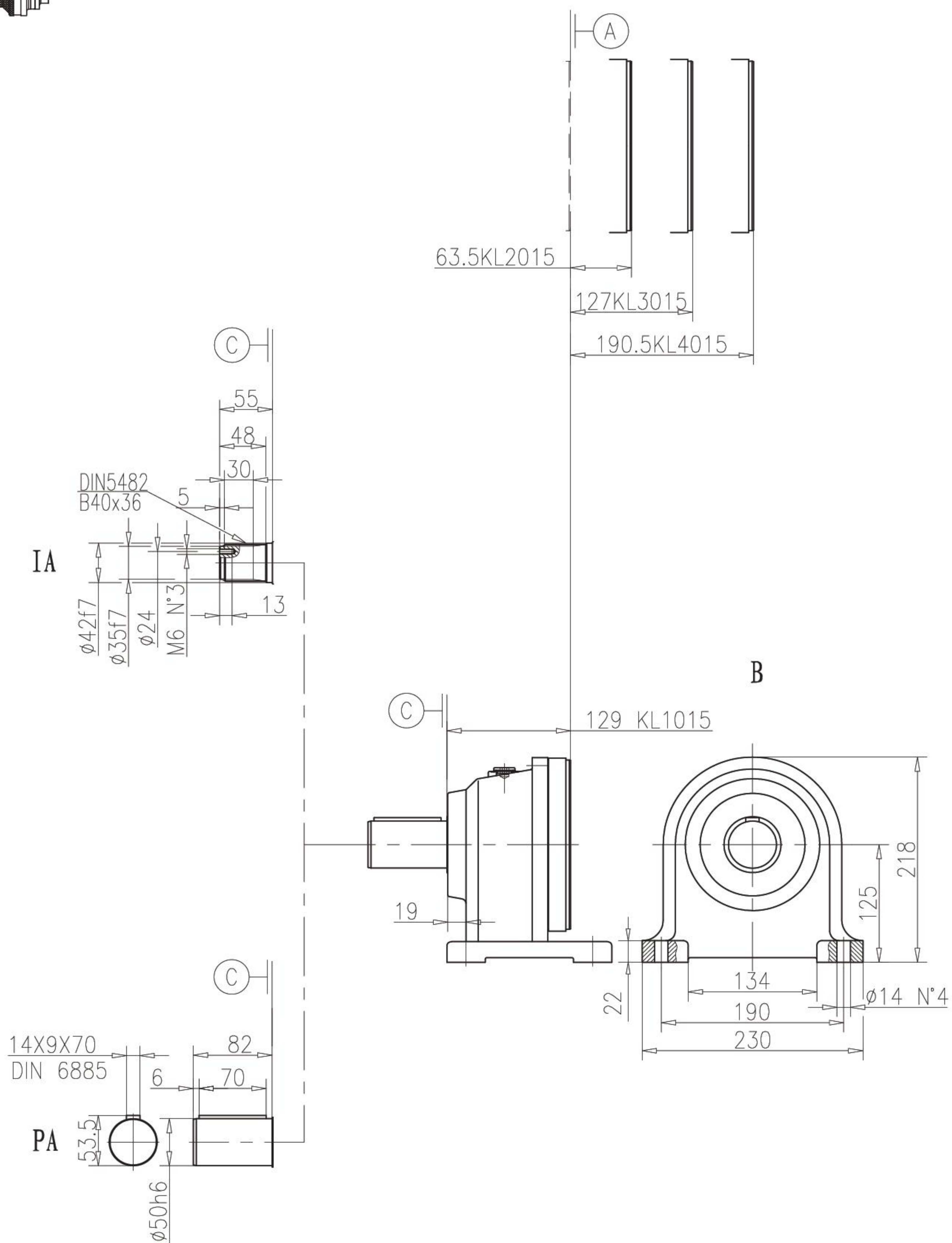
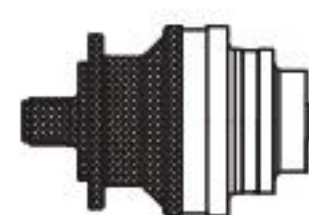
KL015



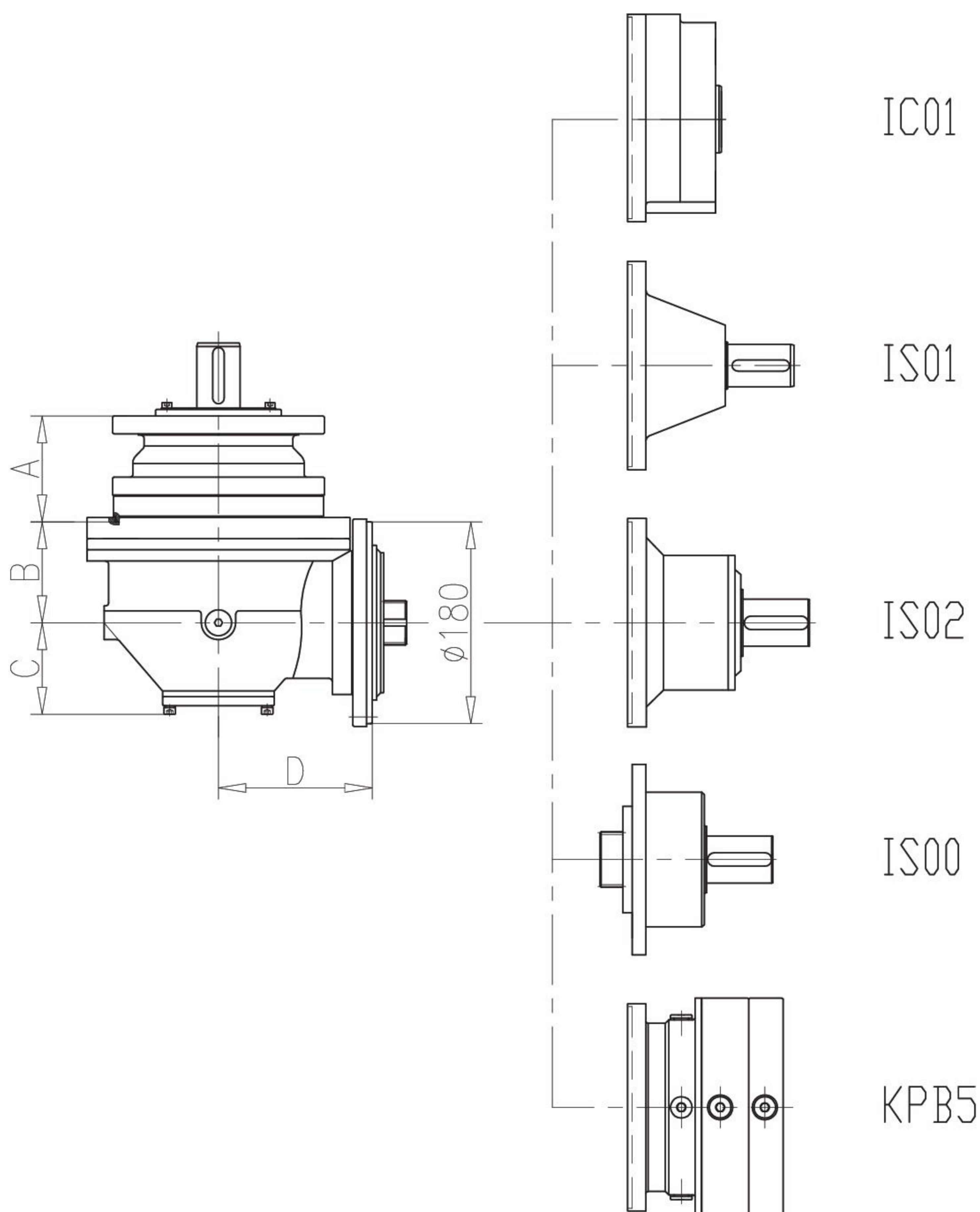
KL015



KL015

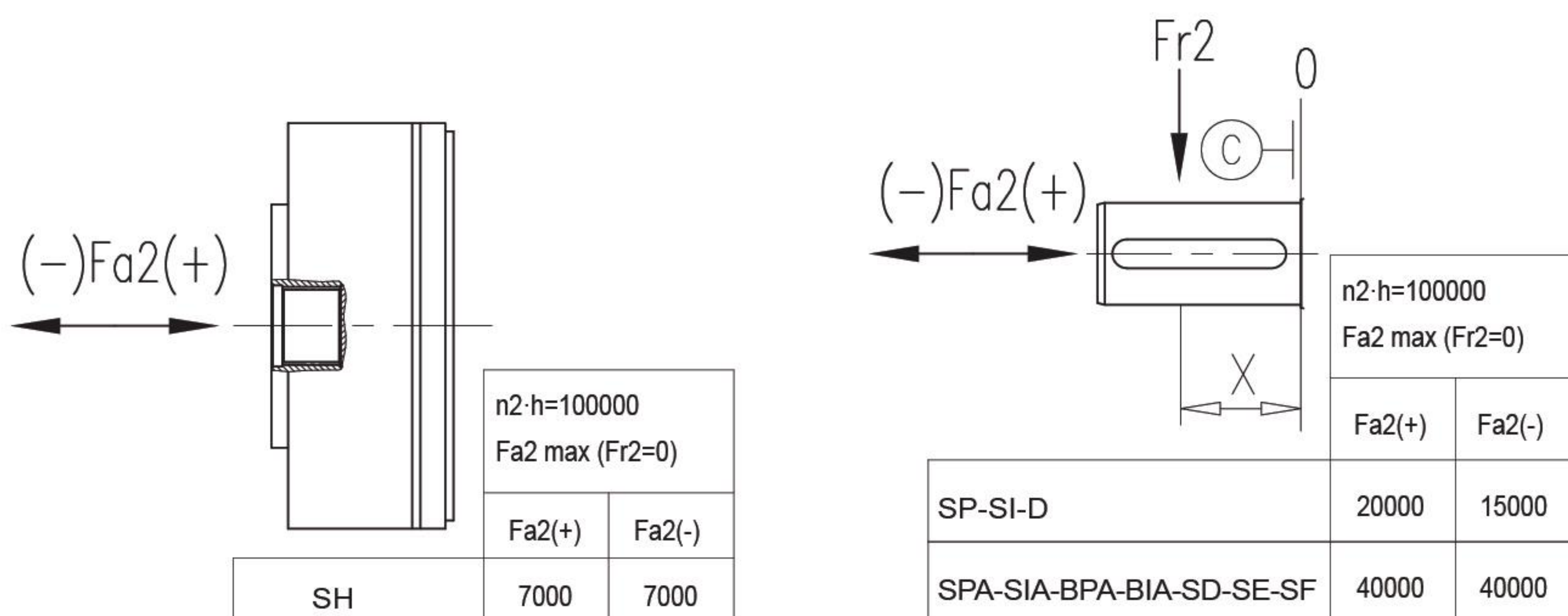
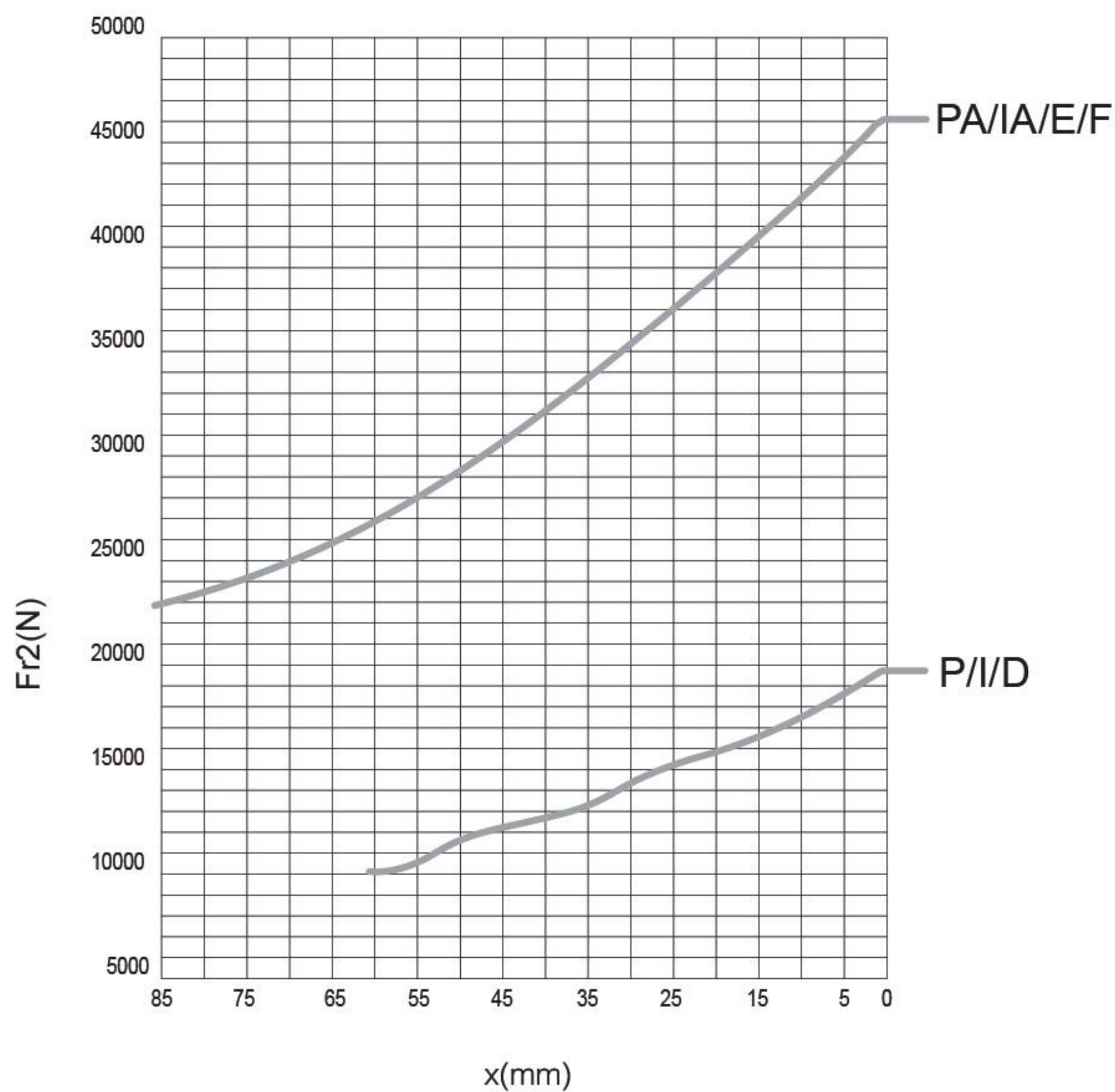
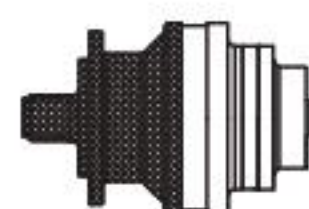


KR015



	A						B	C	D
	SP	SI	SPA	SIA	SH	BPA			
KR 2015	94.5	94.5	123	123	94.5	129	90	81.5	134.5
KR 3015	158	158	186.5	186.5	158	192.5	90	81.5	134.5
KR 4015	221.5	221.5	250	250	221.5	256	90	81.5	134.5

KL015



$n2 \cdot h$							
	20000	40000	60000	80000	100000	200000	400000
K_f	1.7	1.3	1.15	1.06	1	0.8	0.63

KL025
T₂=2500 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.50	2366	2263	2211	2160	2160	1800	11	3800	875	
	4.13	2984	2830	2727	2676	2212	1801	11	3800	875	
	4.57	2697	2557	2464	2418	1999	1627	11	3800	875	
	5.17	2384	2261	2178	2137	1767	1439	11	3800	700	
	6.00	2054	1948	1877	1842	1523	1240	11	3800	520	
	7.25	1700	1612	1553	1524	1260	1026	11	3800	430	
L2	12.84	3261	3092	2979	2923	2417	1968	9	4000	430	
	18.27	2984	2830	2727	2676	2212	1801	9	4000	250	
	20.25	2697	2557	2464	2418	1999	1627	9	4000	160	
	22.88	2384	2261	2178	2137	1767	1439	9	4000	160	
	24.50	2366	2263	2211	2160	2160	1439	9	4000	160	
	29.97	2384	2261	2178	2137	1767	1800	9	4000	160	
	36.17	2384	2261	2178	2137	1767	1439	9	4000	160	
	41.14	2697	2557	2464	2418	1767	1627	9	4000	160	
	46.50	2384	2261	2178	2137	1999	1439	9	4000	160	
	54.00	2054	1948	1877	1842	1523	1240	9	4000	160	
L3	52.85	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	77.50	2366	2263	2211	2160	2160	1800	7.5	4000	160	
	89.90	2366	2263	2211	2160	2160	1800	7.5	4000	160	
	103.13	2984	2830	2727	2676	2212	1801	7.5	4000	160	
	114.29	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	138.77	2984	2830	2727	2676	2212	1801	7.5	4000	160	
	153.78	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	160.00	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	167.48	2984	2830	2727	2676	2212	1801	7.5	4000	160	
	173.81	2384	2261	2178	2137	1767	1439	7.5	4000	160	
	185.60	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	202.13	2984	2830	2727	2676	2212	1801	7.5	4000	160	
	220.50	2366	2263	2211	2160	2160	1800	7.5	4000	160	
	253.17	2384	2261	2178	2137	1767	1439	7.5	4000	160	
	288.00	2697	2557	2464	2418	1999	1627	7.5	4000	160	
	325.50	2384	2261	2178	2137	1767	1439	7.5	4000	160	
L4	360.24	2984	2830	2727	2676	2212	1801	6	4000	160	
	400.09	2054	1948	1877	1842	1523	1240	6	4000	160	
	456.70	2984	2830	2727	2676	2212	1801	6	4000	160	
	499.13	2984	2830	2727	2676	2212	1801	6	4000	160	
	563.87	2697	2557	2464	2418	1999	1627	6	4000	160	
	639.38	2984	2830	2727	2676	2212	1801	6	4000	160	
	721.88	2984	2830	2727	2676	2212	1801	6	4000	160	
	821.33	2697	2557	2464	2418	1999	1627	6	4000	160	
	891.94	2697	2557	2464	2418	1999	1627	6	4000	160	
	1010.63	2984	2830	2727	2676	2212	1801	6	4000	160	
	1172.33	2984	2830	2727	2676	2212	1801	6	4000	160	
	1275.43	2697	2557	2464	2418	1999	1627	6	4000	160	
	1380.40	3261	3092	2979	2923	2417	1968	6	4000	160	
	1568.00	2697	2557	2464	2418	1999	1627	6	4000	160	
	1851.43	2697	2557	2464	2418	1999	1627	6	4000	160	
	2016.00	2697	2557	2464	2418	1999	1627	6	4000	160	
	2278.50	2384	2261	2178	2137	1767	1439	6	4000	160	
	2592.00	2697	2557	2462	2418	1999	1627	6	4000	160	
	2929.50	2384	2261	2178	2137	1767	1439	6	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

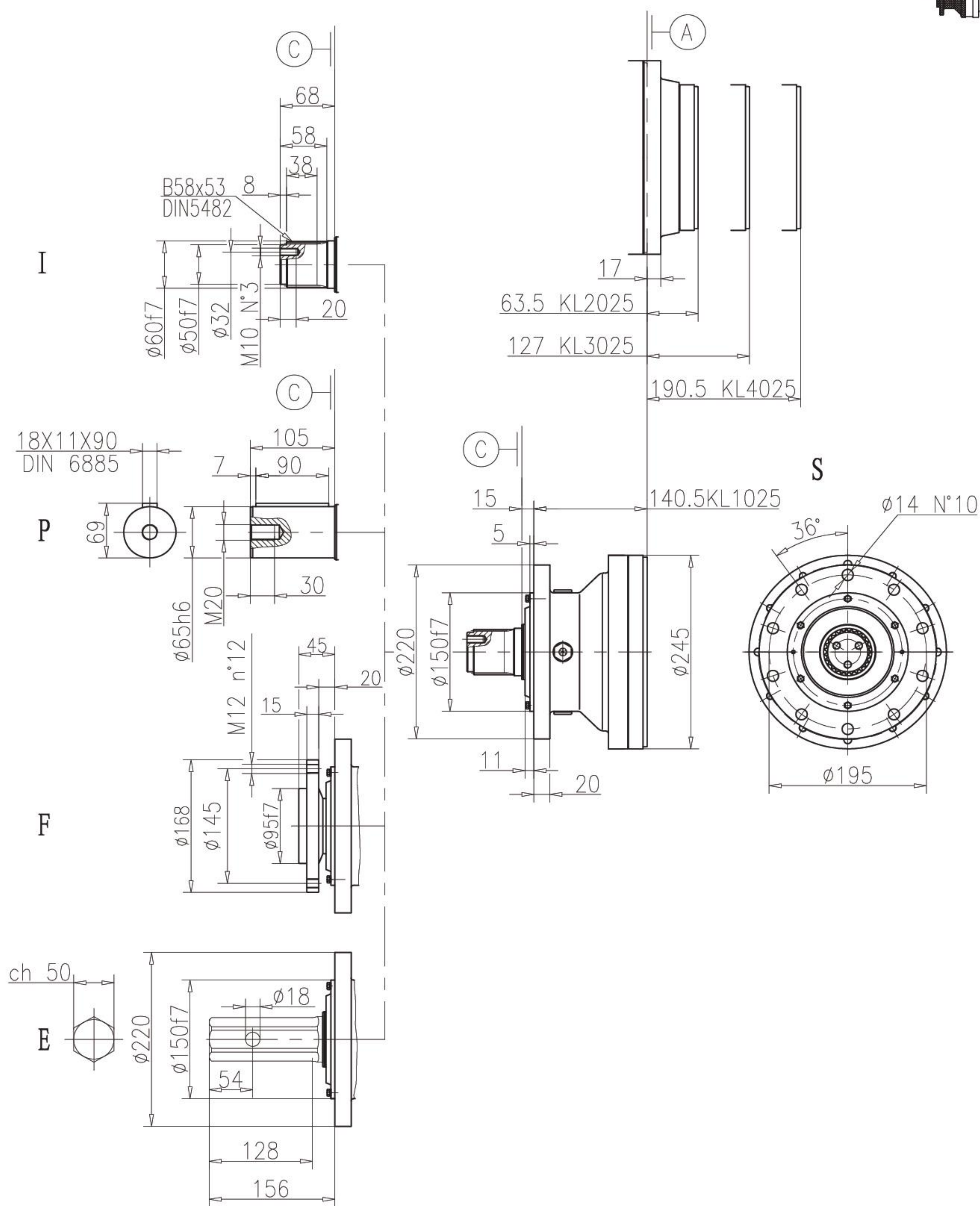
T₂=2500 Nm

KR025

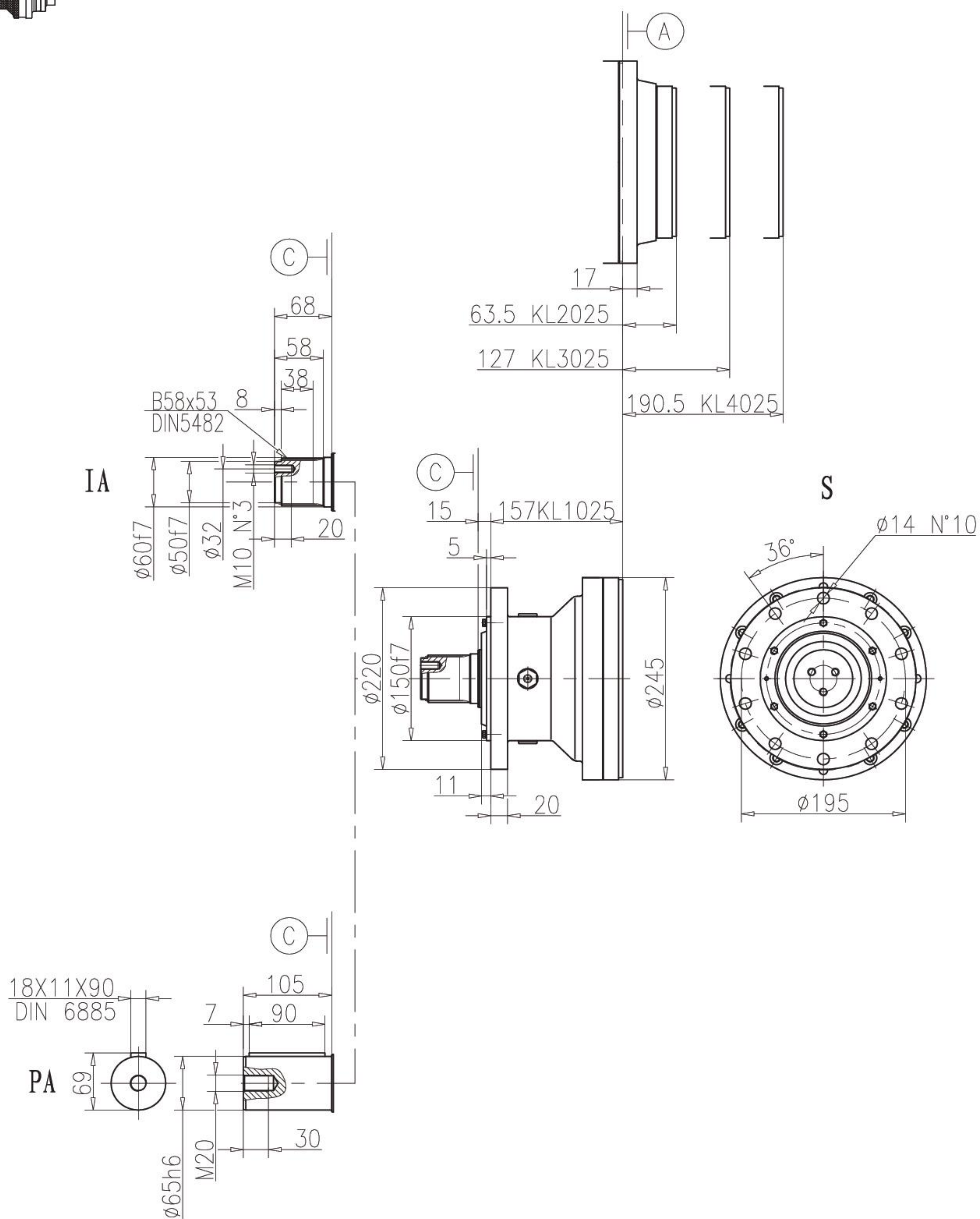
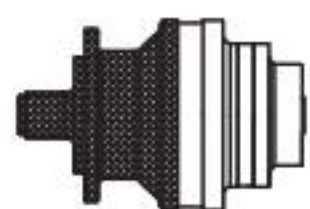
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	10.77	2366	2263	2211	2160	2160	1800	18	3800	430	
	12.69	2984	2830	2727	2676	2212	1801	18	3800	340	
	14.07	2697	2557	2464	2418	1999	1627	18	3800	250	
	15.62	2697	2557	2464	2418	1999	1627	18	3800	160	
	19.73	2384	2261	2178	2173	1767	1439	18	3800	160	
	22.91	2054	1948	1877	1842	1523	1240	18	3800	160	
	25.80	2054	1948	1877	1842	1523	1240	18	3800	160	
	27.68	1700	1612	1553	1524	1260	1026	18	3800	160	
	31.18	1700	1612	1553	1524	1260	1026	18	3800	160	
R3	36.62	2366	2263	2211	2160	2160	1800	14	4000	160	
	39.49	2366	2263	2211	2160	2160	1800	14	4000	160	
	53.01	2697	2557	2464	2418	1999	1627	14	4000	160	
	56.21	2984	2830	2727	2676	2212	1801	14	4000	160	
	62.29	2697	2557	2464	2418	1999	1627	14	4000	160	
	69.17	2697	2557	2464	2418	1999	1627	14	4000	160	
	73.62	2984	2830	2727	2676	2212	1801	14	4000	160	
	77.30	2697	2557	2464	2418	1999	1627	14	4000	160	
	81.58	2697	2557	2464	2418	1999	1627	14	4000	160	
	87.27	2697	2557	2464	2418	1999	1627	14	4000	160	
	91.35	2984	2830	2727	2676	2212	1801	14	4000	160	
	98.64	2384	2261	2178	2137	1767	1439	14	4000	160	
	114.42	2384	2261	2178	2137	1767	1439	14	4000	160	
	123.57	2384	2261	2178	2137	1767	1439	14	4000	160	
	143.08	2384	2261	2178	2137	1767	1439	14	4000	160	
	166.15	2054	1948	1877	1842	1523	1240	14	4000	160	
	184.50	2054	1948	1877	1842	1523	1240	14	4000	160	
R4	124.49	2366	2263	2211	2160	2160	1800	12	4000	160	
	134.26	2366	2263	2211	2160	2160	1800	12	4000	160	
	144.79	2366	2263	2211	2160	2160	1800	12	4000	160	
	154.48	2366	2263	2211	2160	2160	1800	12	4000	160	
	201.22	2366	2263	2211	2160	2160	1800	12	4000	160	
	245.00	2366	2263	2211	2160	2160	1800	12	4000	160	
	307.16	2366	2263	2211	2160	2160	1800	12	4000	160	
	358.19	2366	2263	2211	2160	2160	1800	12	4000	160	
	402.28	3261	3092	2979	2923	2417	1968	12	4000	160	
	451.76	3261	3092	2979	2160	2417	1968	12	4000	160	
	506.28	2366	2263	2211	2676	2160	1800	12	4000	160	
	620.81	2984	2830	2727	2676	2212	1801	12	4000	160	
	708.75	2984	2830	2727	2676	2212	1801	12	4000	160	
	887.91	2984	2830	2727	2676	2212	1801	12	4000	160	
	1026.10	2697	2557	2464	2418	1999	1627	12	4000	160	
	1099.64	2697	2557	2464	2418	1999	1627	12	4000	160	
	1159.71	2384	2261	2178	2137	1767	1439	12	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

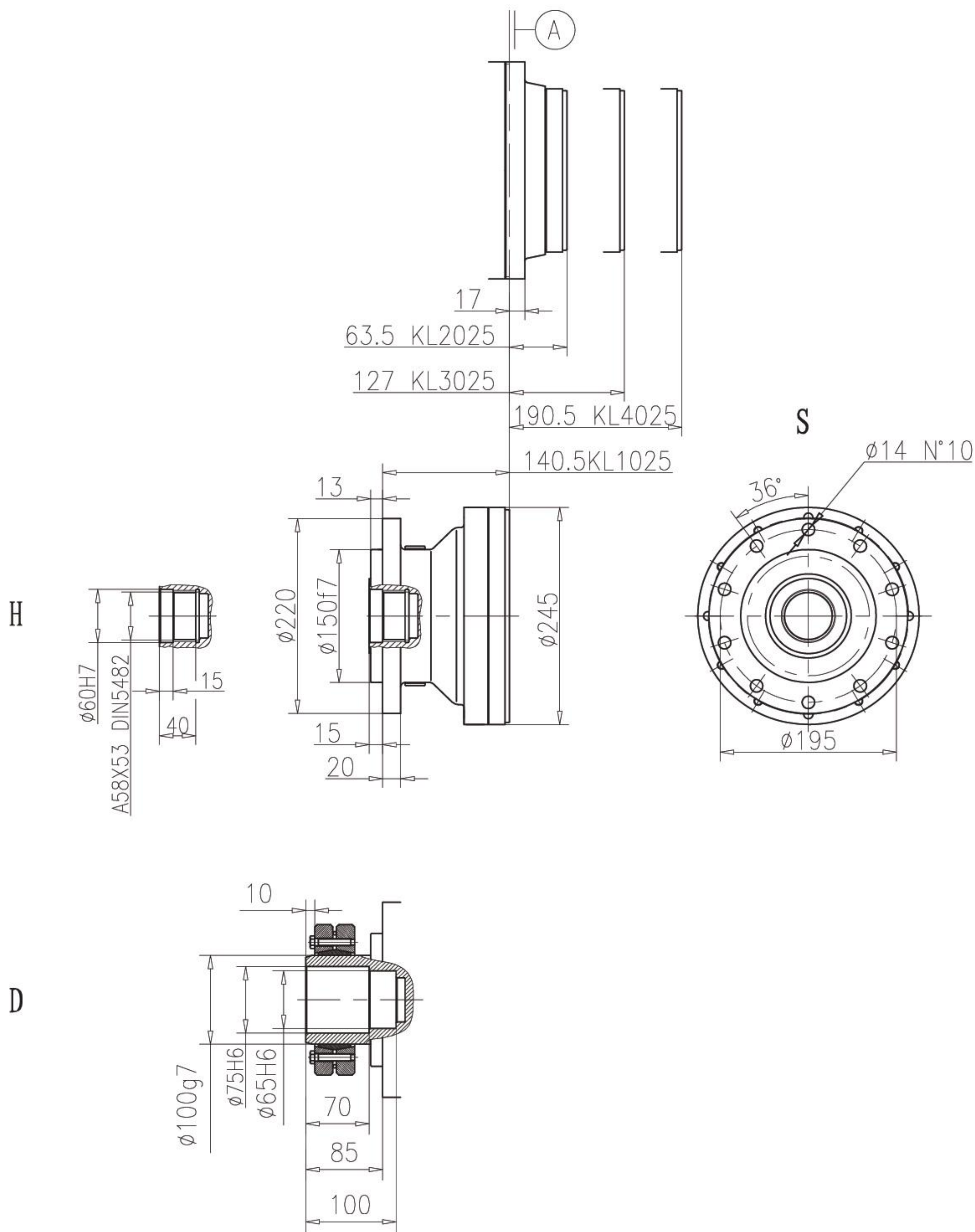
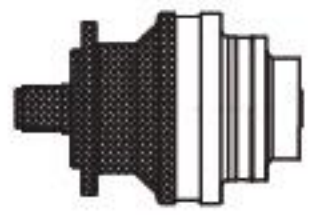
KL025



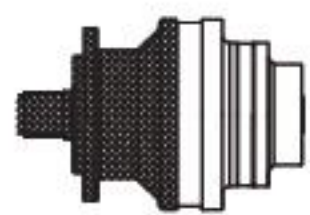
KL025



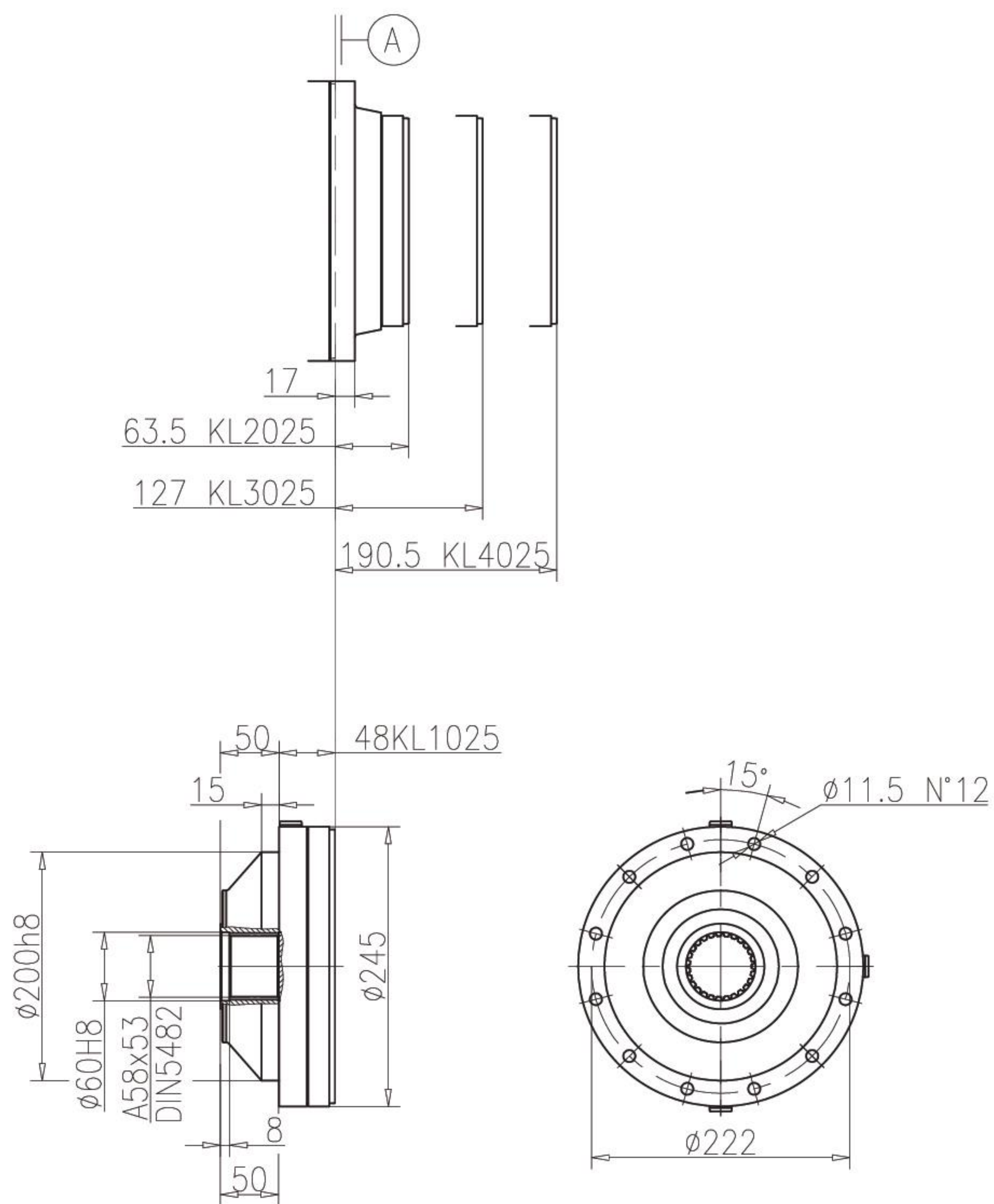
KL025



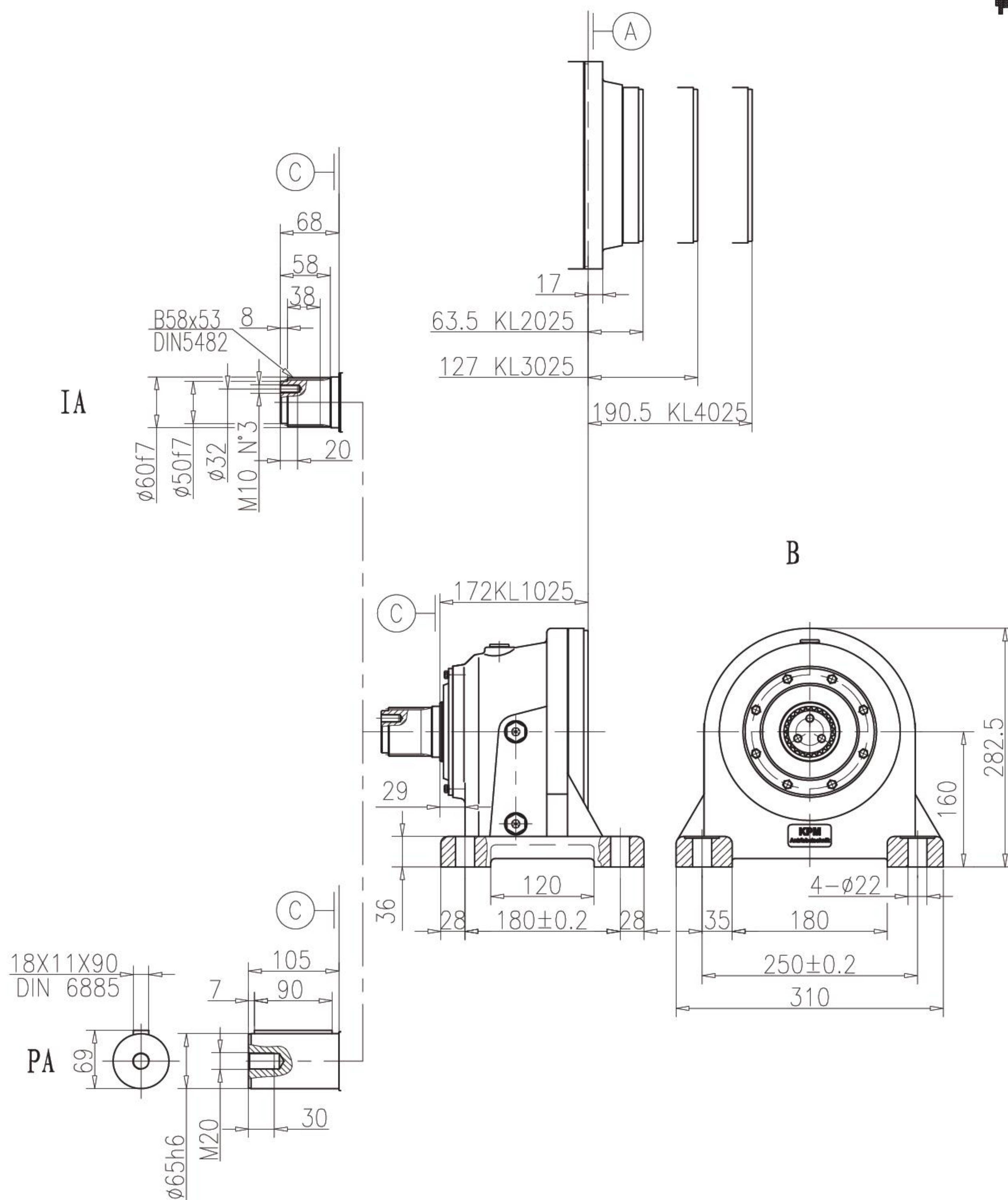
KL025



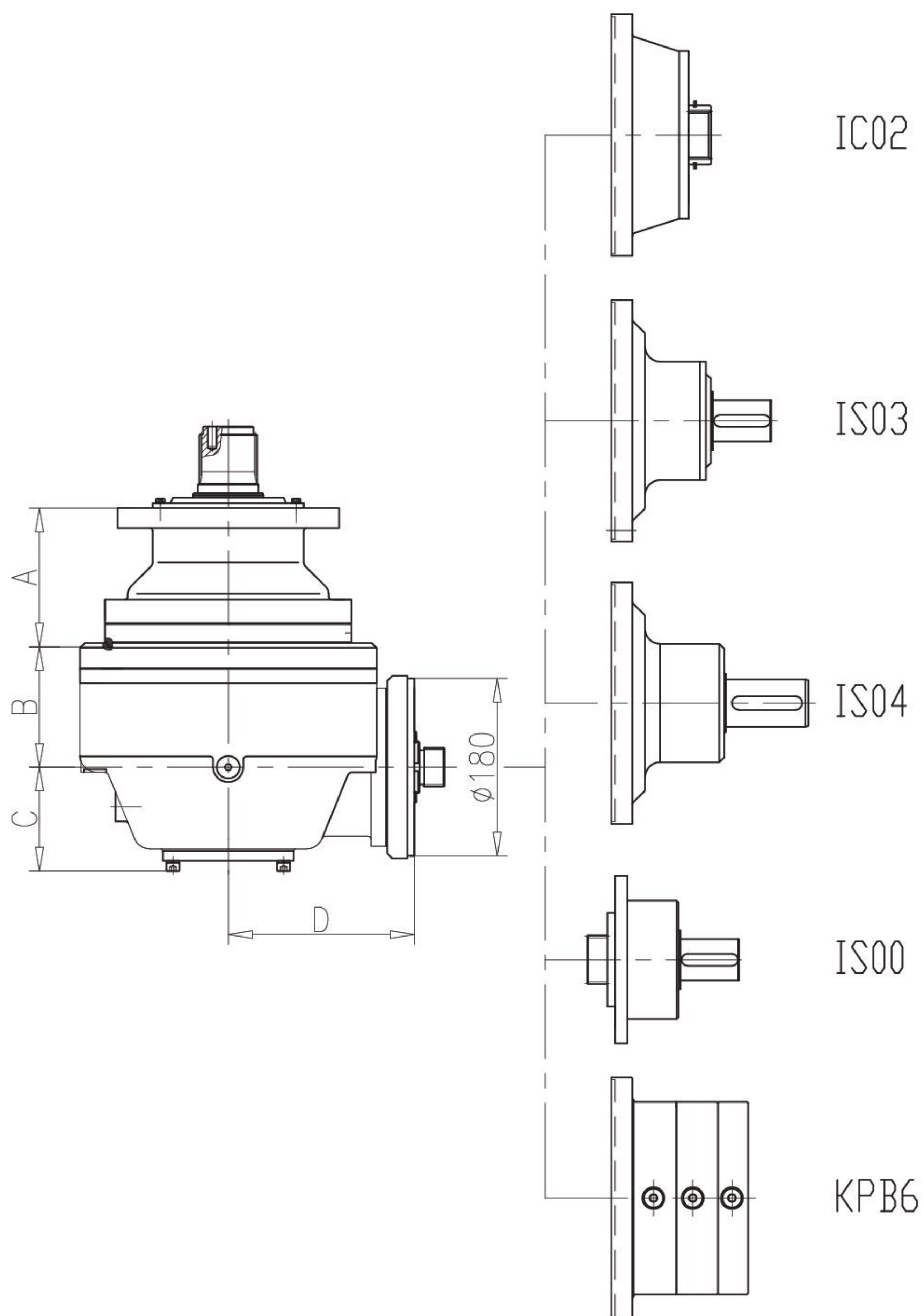
H



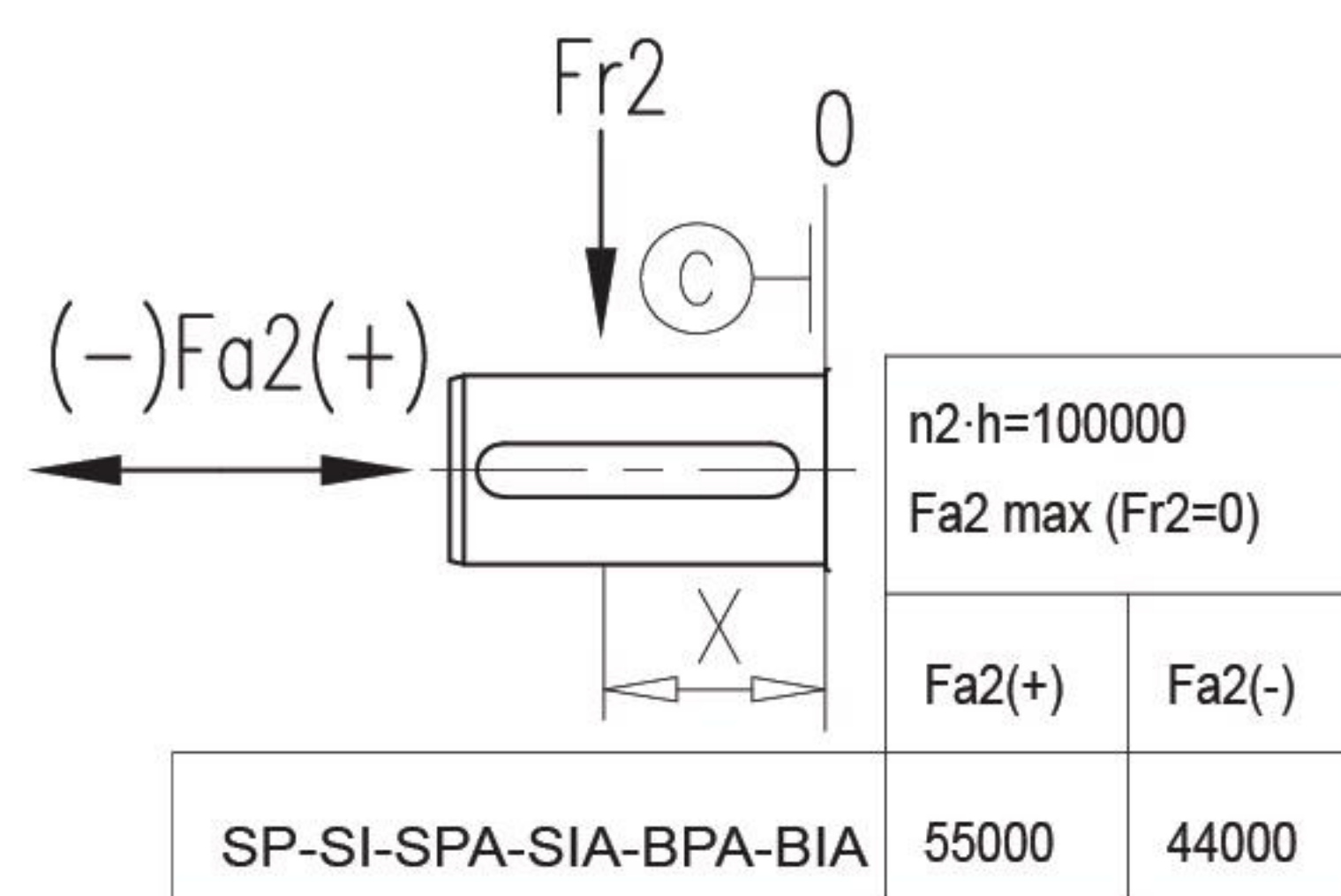
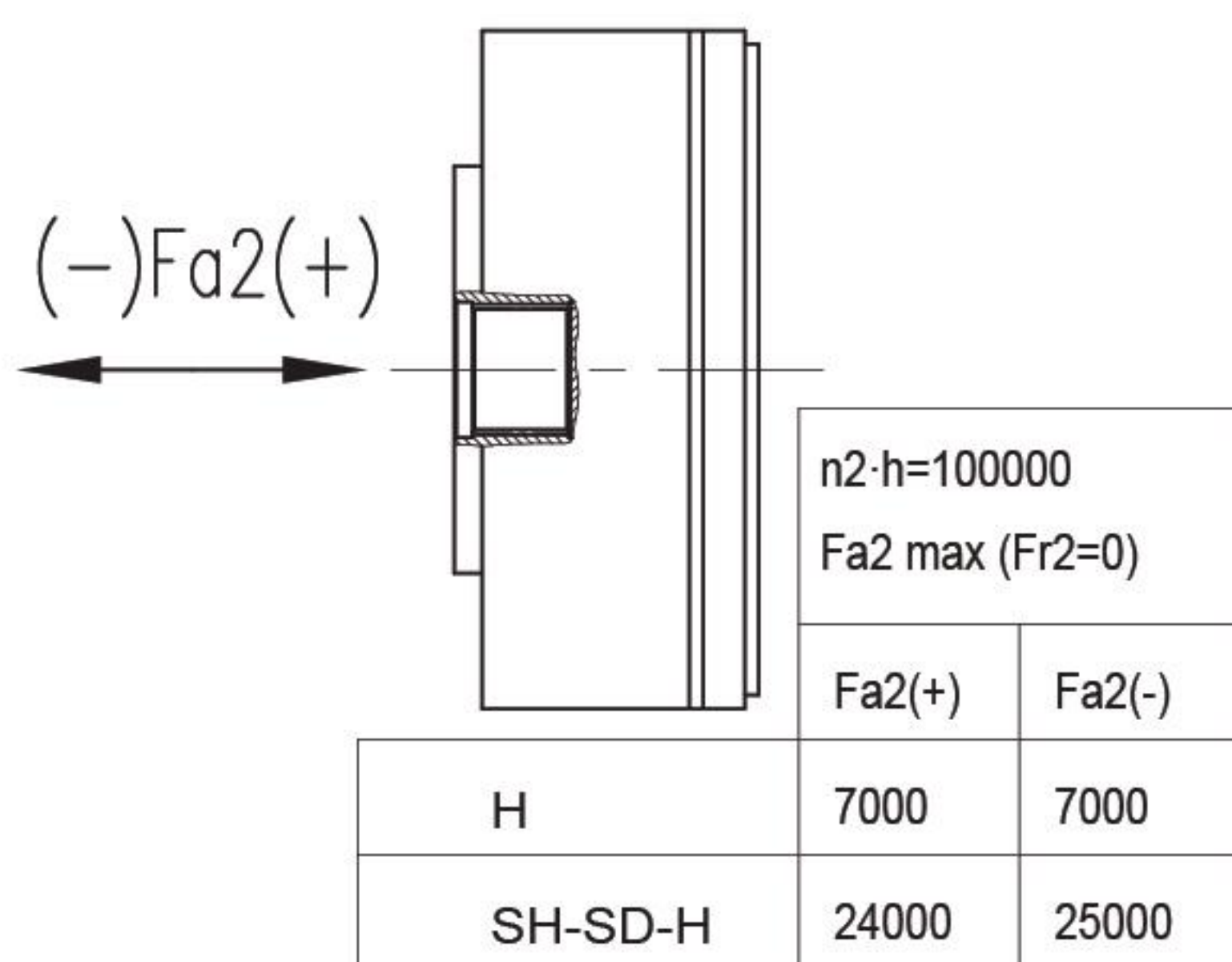
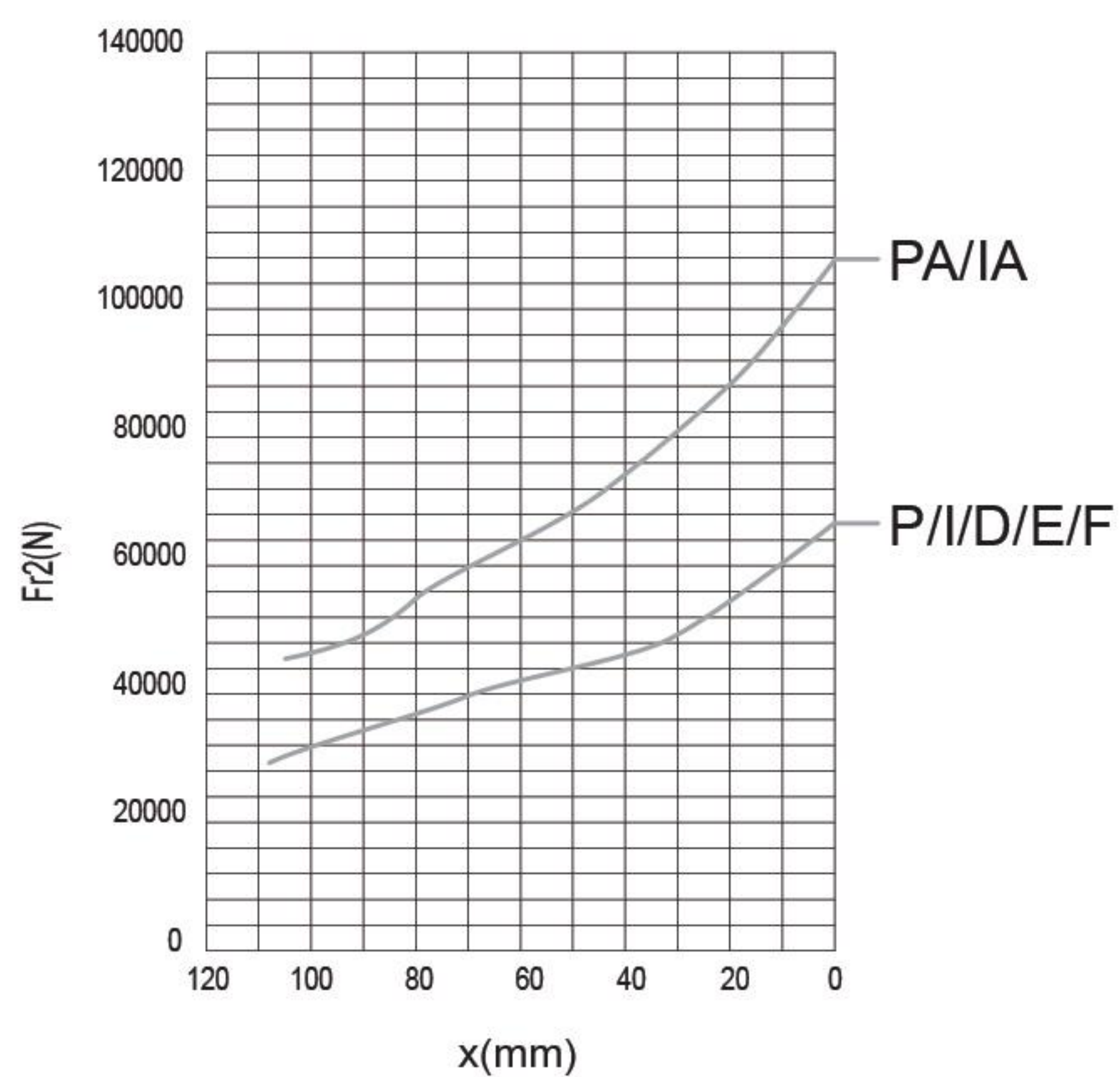
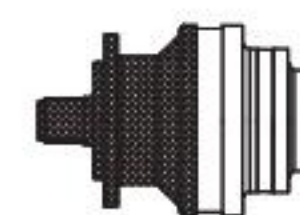
KL025



KR025



	A						B	C	D
	SP	SI	SPA	SIA	SH	BPA			
KR 2025	140.5	140.5	157	157	48	172	122	105	185
KR 3025	204	204	220.5	220.5	111.5	235.5	90	81.5	134.5
KR 4025	267.5	267.5	284	284	175	299	90	81.5	134.5



	$n_2 \cdot h$						
	20000	40000	60000	80000	100000	200000	400000
K_f	1.7	1.3	1.15	1.06	1	0.8	0.63

KL050
T₂=5000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.50	4834	4577	4423	4320	3857	3137	11	3100		
	4.13	5969	5660	5454	5351	3808	3087	11	3100		
	4.57	5394	5115	4929	4836	3441	2790	11	3100		
	5.17	4768	4521	4357	4275	3042	2466	11	3100	1140	
	6.00	4108	3896	3754	3683	2621	2125	11	3100	1140	
	7.25	3400	3224	3107	3048	2169	1759	11	3100	610	
L2	14.03	5646	5646	5454	5351	3808	3087	9	4000	520	
	18.27	5969	5660	5454	5351	3808	3087	9	4000	430	
	20.24	5394	5115	4929	4836	3441	2790	9	4000	340	
	22.88	4768	4521	4357	4275	3042	2466	9	4000	250	
	24.50	4260	4260	3728	3621	2876	2343	9	4000	250	
	29.97	4768	4521	4357	4275	3042	2466	9	4000	250	
	36.17	4768	4521	4357	4275	3042	2466	9	4000	160	
	41.14	4326	4326	3785	3677	2920	2379	9	4000	160	
	46.50	4768	4521	4357	4275	3042	2466	9	4000	160	
	54.00	4108	3896	3754	3683	2621	2125	9	4000	160	
L3	52.85	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	77.50	4834	4577	4423	4320	3857	3137	7.5	4000	160	
	89.90	4834	4577	4423	4320	3857	3137	7.5	4000	160	
	103.13	5969	5660	5454	5351	3808	3087	7.5	4000	160	
	114.29	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	138.77	5969	5660	5454	5351	3808	3087	7.5	4000	160	
	153.78	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	160.00	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	167.48	6052	6052	5396	5144	4085	3329	7.5	4000	160	
	173.81	4768	4521	4357	4275	3042	2466	7.5	4000	160	
	185.60	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	202.13	5027	5027	4398	4273	3393	2765	7.5	4000	160	
	220.50	4260	4260	3728	3621	2876	2343	7.5	4000	160	
	253.17	4768	4521	4357	4275	3042	2466	7.5	4000	160	
	288.00	5394	5115	4929	4836	3441	2790	7.5	4000	160	
	325.50	4768	4521	4357	4275	3042	2466	7.5	4000	160	
L4	360.24	5646	5646	5454	5351	3808	3087	6	4000	160	
	400.09	4108	3896	3754	3683	2621	2125	9	4000	160	
	456.70	5969	5660	5454	5351	3808	3087	6	4000	160	
	499.13	5969	5660	5454	5351	3808	3087	6	4000	160	
	563.87	5394	5115	2929	4836	3441	2790	6	4000	160	
	639.38	5969	5660	5454	5351	3808	3087	6	4000	160	
	721.88	5969	5660	5454	5351	3808	3087	6	4000	160	
	821.33	5394	5115	4929	4836	3441	2790	6	4000	160	
	891.94	5394	5115	4929	4836	3441	2790	6	4000	160	
	1010.63	5969	5660	5454	5351	3808	3087	6	4000	160	
	1172.33	5969	5660	5380	5157	3808	3087	6	4000	160	
	1275.43	5394	5115	4929	4836	3441	2790	6	4000	160	
	1568.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	1851.43	5394	5115	4929	4836	3441	2790	6	4000	160	
	2016.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	2278.50	4768	4521	4357	4275	3042	2466	6	4000	160	
	2592.00	5394	5115	4867	4728	3441	2790	6	4000	160	
	2929.50	4768	4521	4357	4275	3042	2466	6	4000	160	

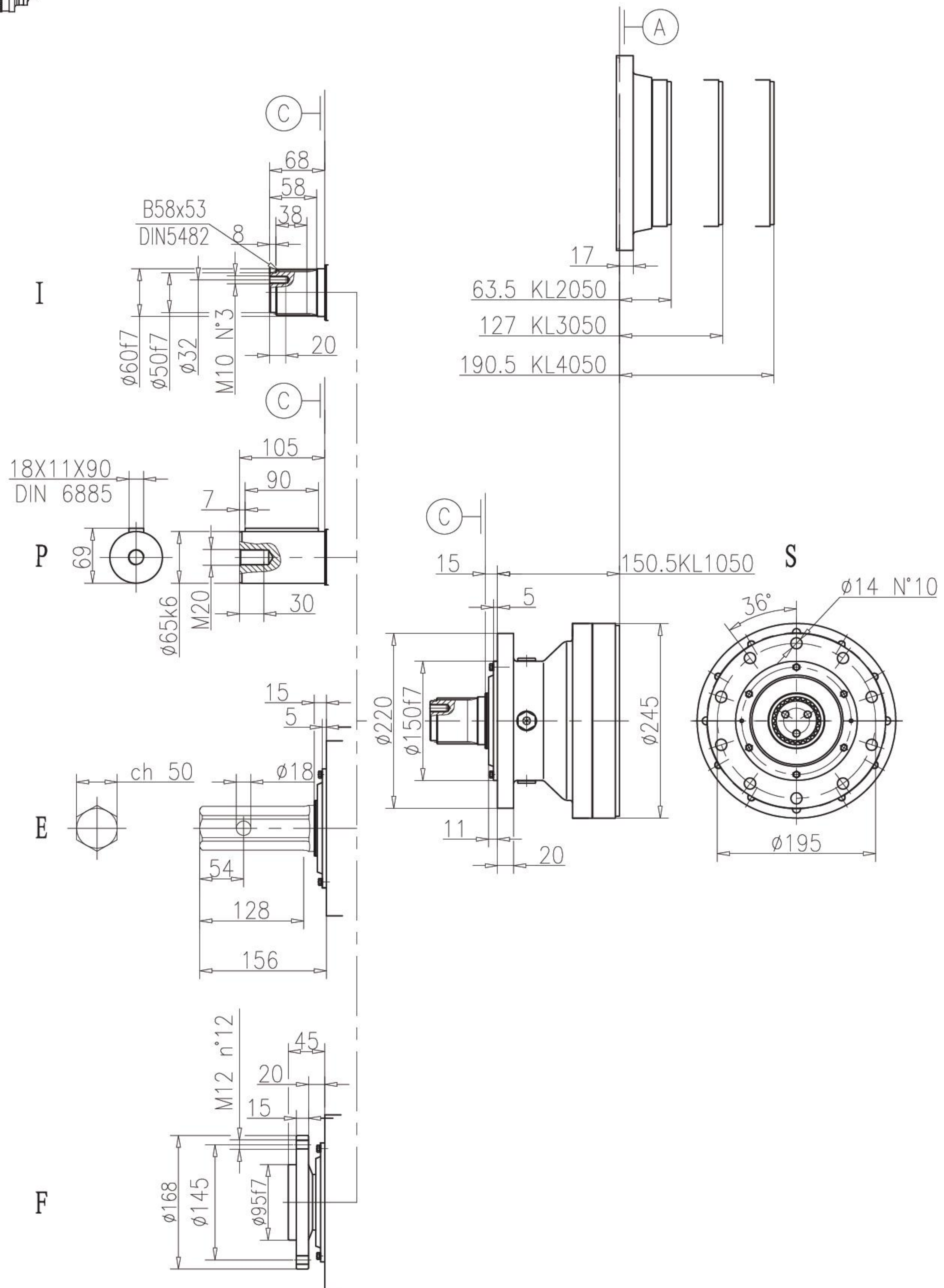
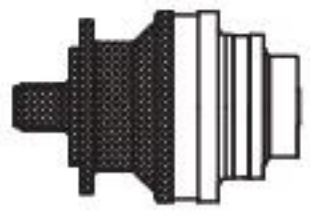
$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

KR050
T₂=5000 Nm

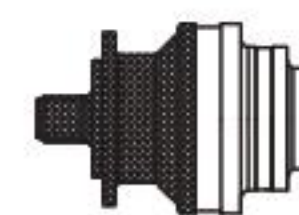
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	10.77	4532	4532	4423	4320	3857	3137	18	3800	520	
	12.69	5348	5348	5348	5348	3808	3087	18	3800	520	
	14.07	5394	5115	4929	4836	3441	2790	18	3800	520	
	15.62	5394	5115	4929	4836	3441	2790	18	3800	430	
	17.65	4768	4521	4357	4275	3042	2466	18	3800	340	
	19.73	4768	4521	4357	4275	3042	2466	18	3800	340	
	22.91	4108	3896	3754	3683	2621	2125	18	3800	250	
	25.80	4108	3896	3754	3683	2621	2125	18	3800	250	
	27.68	3400	3224	3107	3048	2169	1759	18	3800	160	
	31.18	3400	3224	3107	3048	2169	1759	18	3800	160	
R3	36.62	4785	4577	4423	4320	3857	3137	14	4000	160	
	39.49	4834	4577	4423	4320	3857	3137	14	4000	160	
	53.10	5394	5115	4929	4836	3441	2790	14	4000	160	
	56.21	5969	5660	5454	5351	3808	3087	14	4000	160	
	62.29	5394	5115	4929	4836	3441	2790	14	4000	160	
	69.17	5394	5115	4929	4836	3441	2790	14	4000	160	
	73.62	5969	5660	5454	5351	3808	3087	14	4000	160	
	77.30	5394	5115	4929	4836	3441	2790	14	4000	160	
	81.58	5394	5115	4929	4836	3441	2790	14	4000	160	
	87.27	5394	5115	4929	4836	3441	2790	12	4000	160	
	91.35	5969	5660	5454	5351	3808	3087	12	4000	160	
	98.64	4768	4521	4357	4275	3042	2466	12	4000	160	
	114.42	4768	4521	4357	4275	3042	2466	12	4000	160	
	123.57	4768	4521	4357	4275	3042	2466	12	4000	160	
	143.08	4768	4521	4357	4275	3042	2466	12	4000	160	
	166.15	4108	3896	3754	3683	2621	2125	12	4000	160	
	184.50	4108	3896	3754	3683	2621	2125	12	4000	160	
R4	124.49	4785	4577	4423	4320	3857	3137	12	4000	160	
	134.26	4785	4577	4423	4320	3857	3137	12	4000	160	
	144.79	4834	4577	4423	4320	3857	3137	12	4000	160	
	154.48	4785	4577	4423	4320	3857	3137	12	4000	160	
	201.22	4785	4577	4423	4320	3857	3137	12	4000	160	
	269.23	4834	4577	4423	4320	3857	3137	12	4000	160	
	306.93	4834	4577	4423	4320	3857	3137	12	4000	160	
	370.71	4834	4577	4423	4320	3857	3137	12	4000	160	
	451.76	6441	6184	5636	5475	4160	3373	12	4000	160	
	506.28	4834	4577	4423	4320	3470	2828	12	4000	160	
	620.81	5969	5660	5454	5351	3808	3087	12	4000	160	
	708.75	5969	5660	5454	5351	3808	3087	12	4000	160	
	815.31	5394	5115	4929	4836	3441	2790	12	4000	160	
	1026.10	5394	5115	4929	4836	3441	2790	12	4000	160	
	1099.64	5394	5115	4867	4728	3441	2790	12	4000	160	
	1159.71	4768	4521	4357	4275	3042	2466	12	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

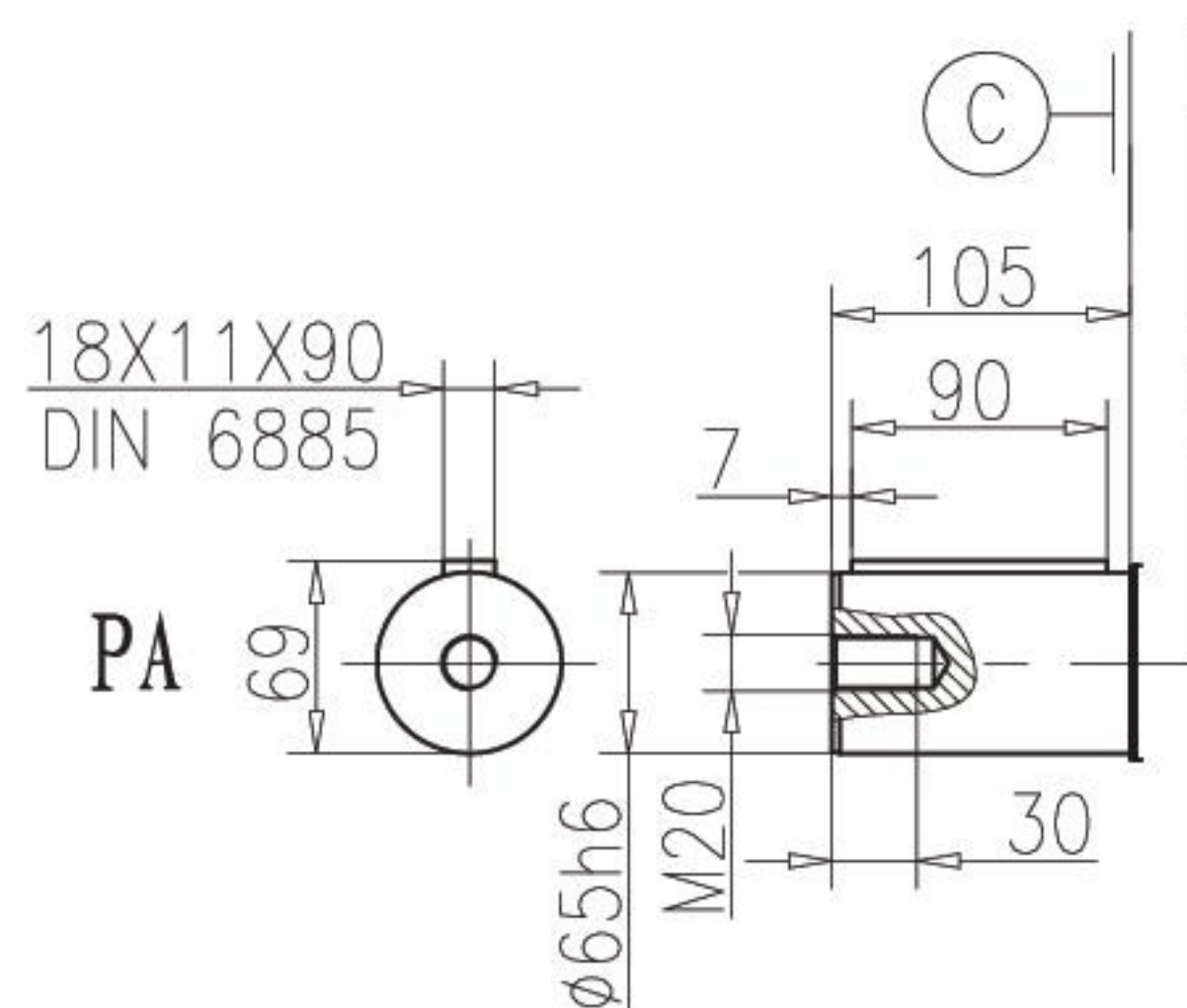
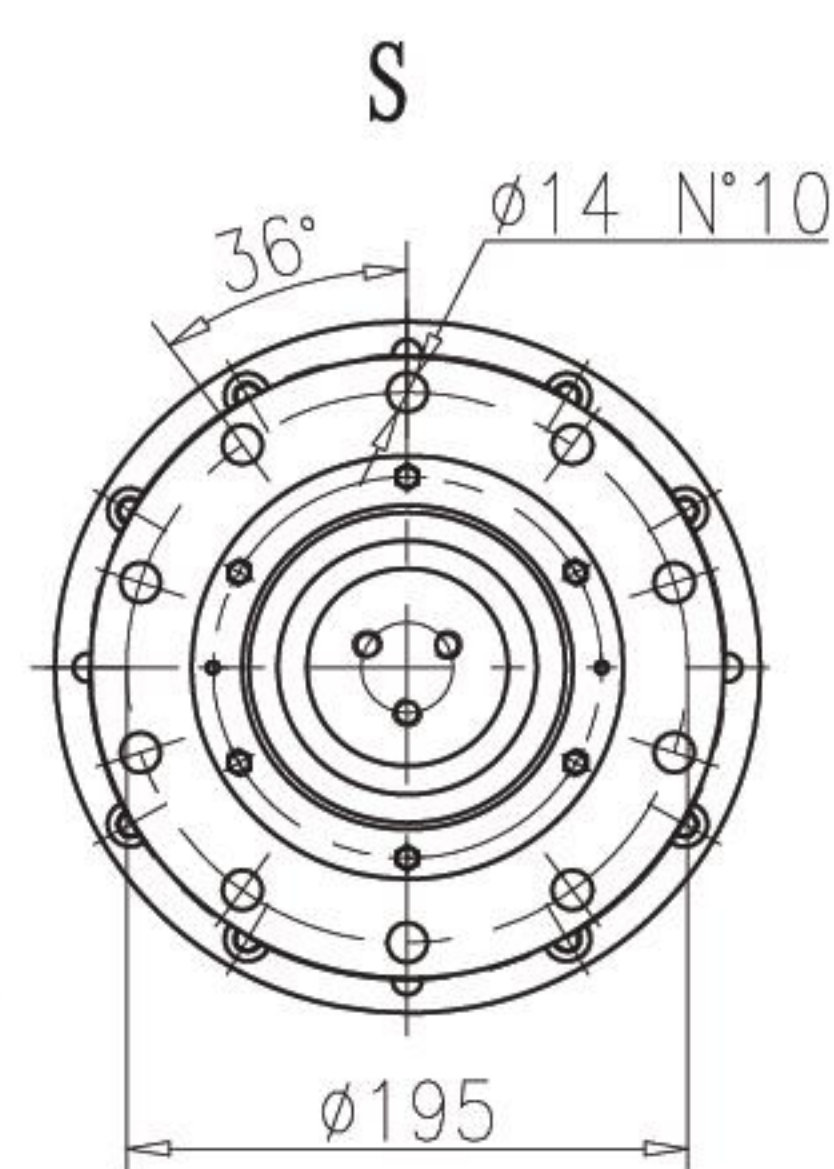
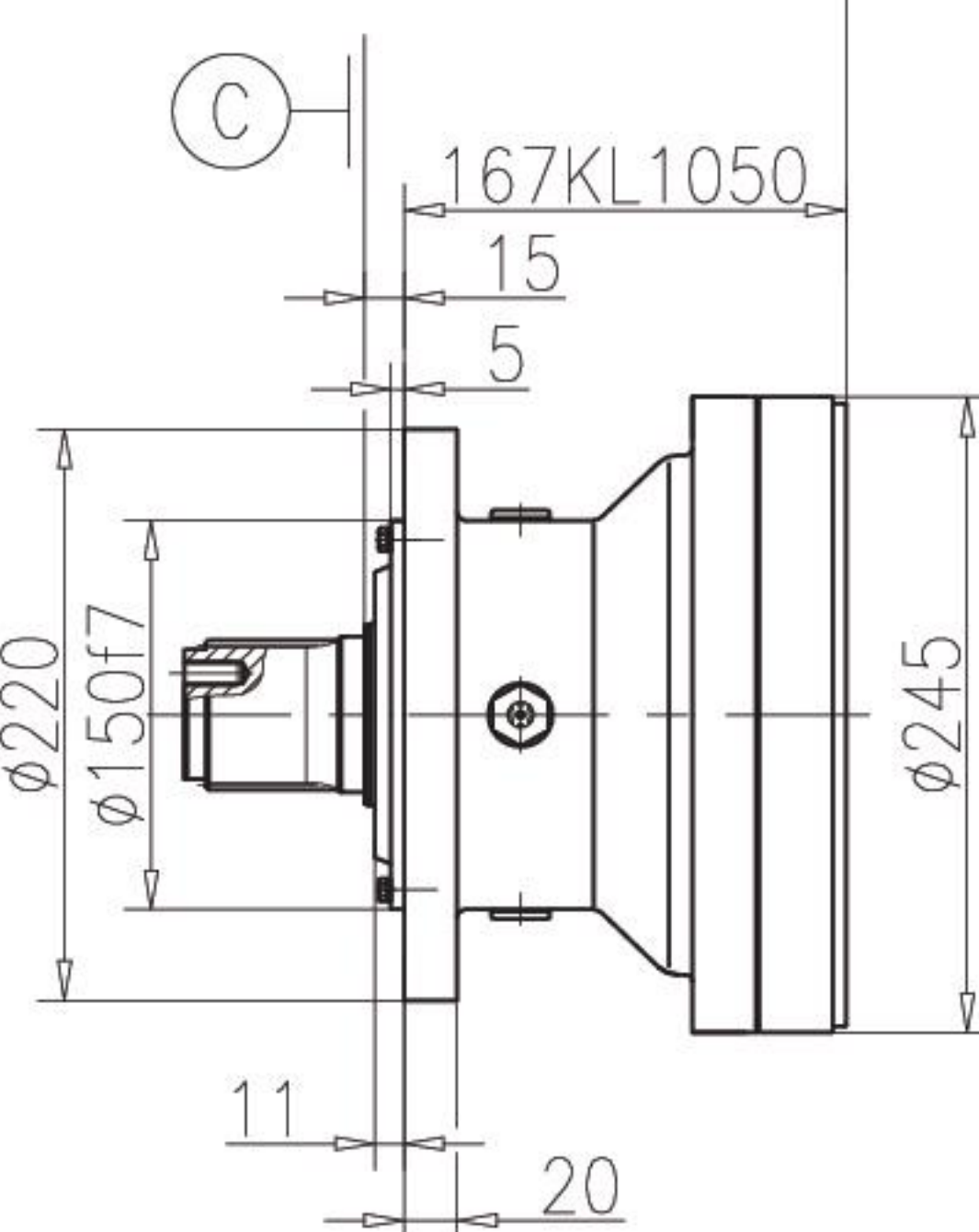
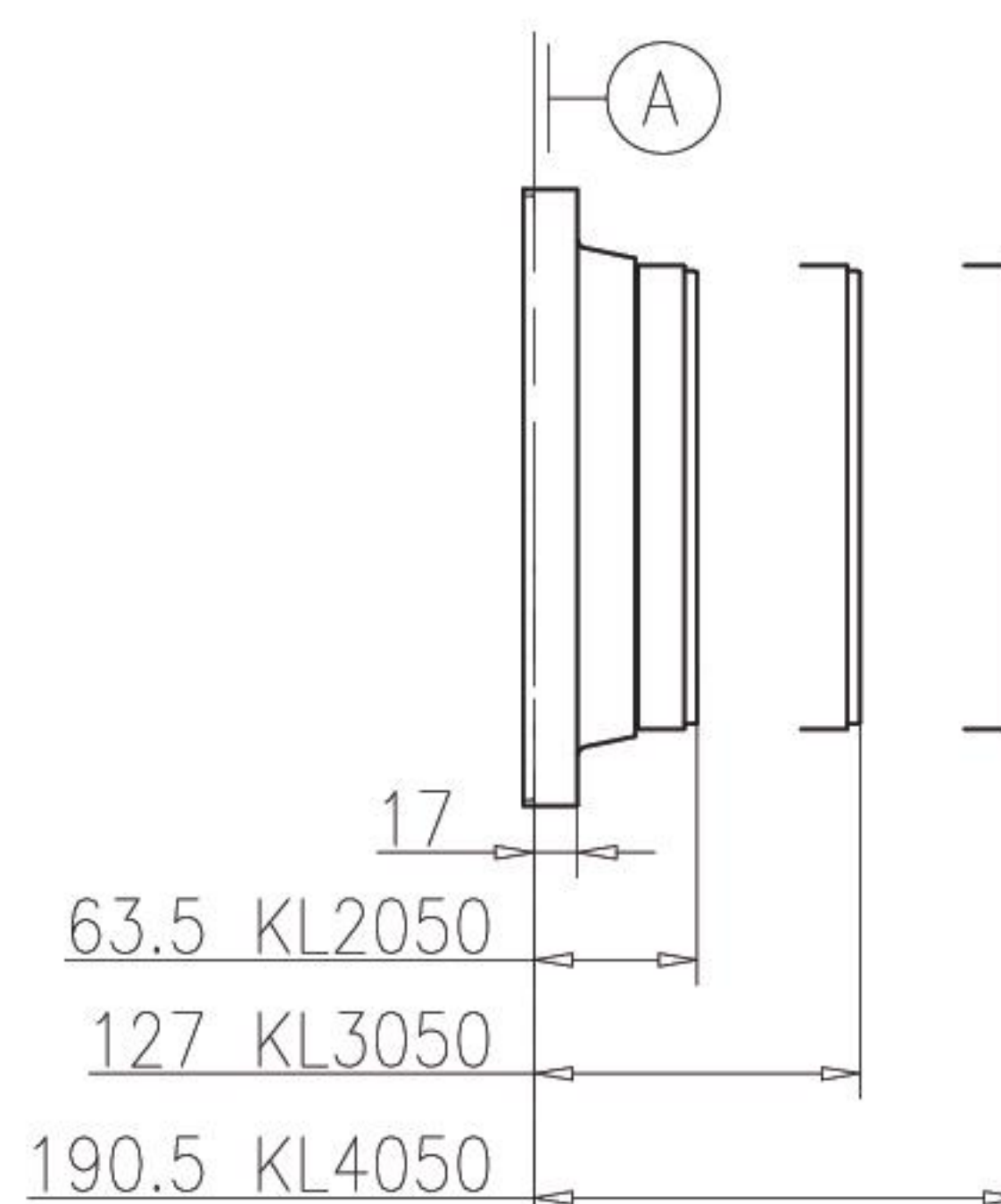
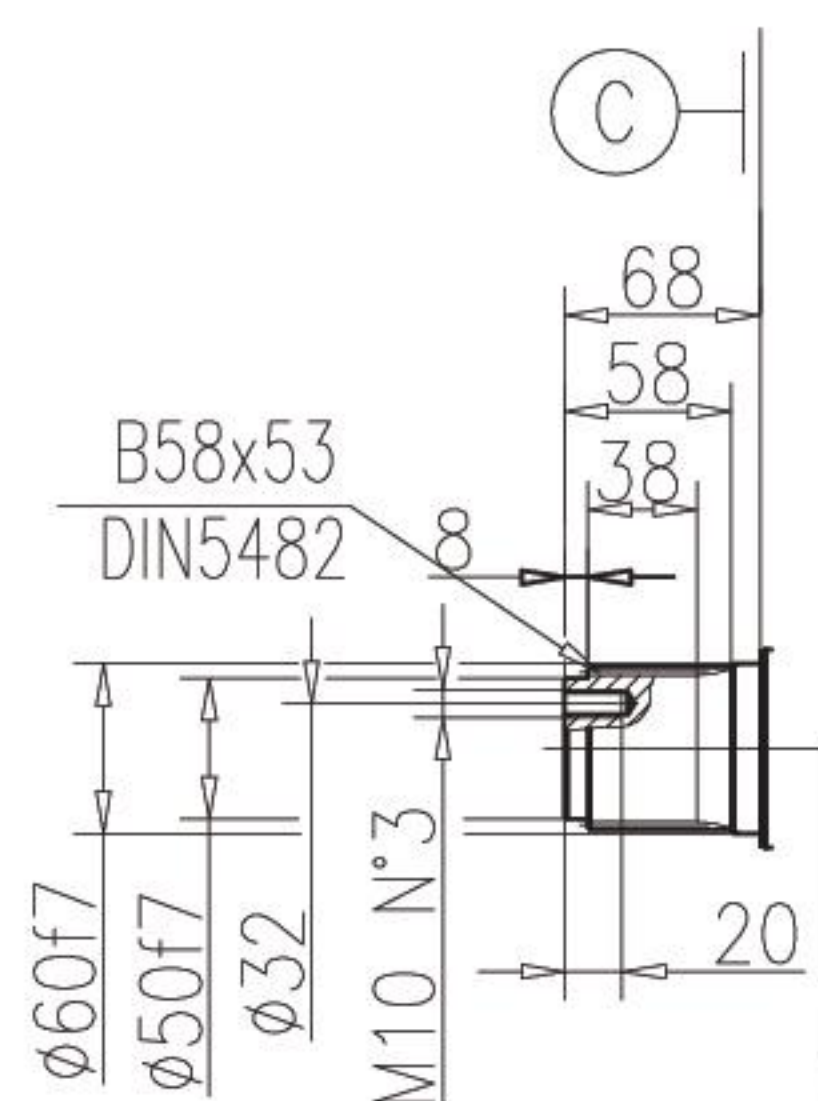
KL050



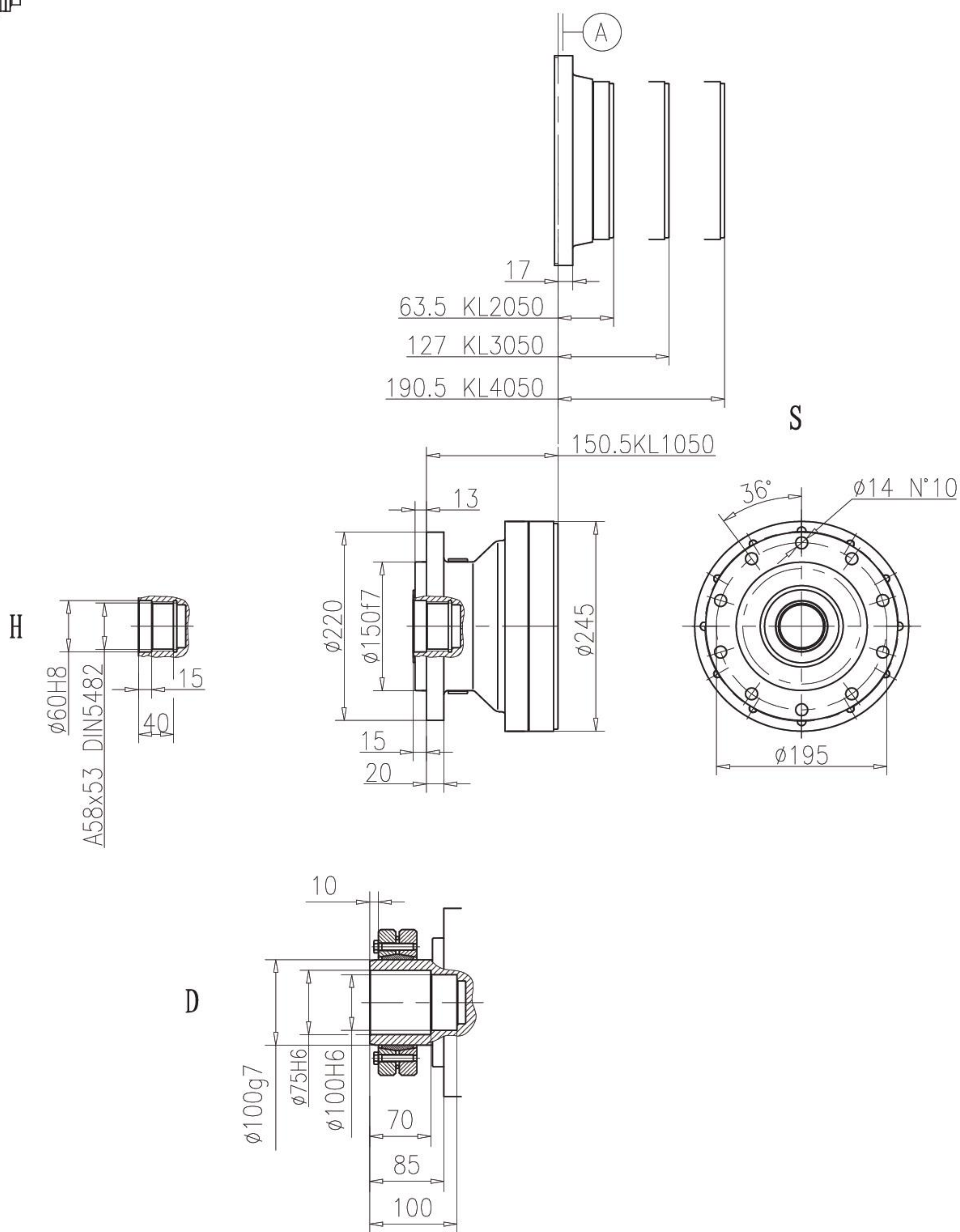
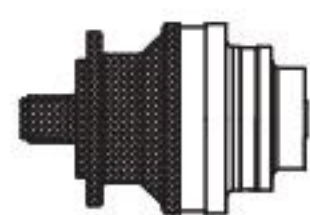
KL050



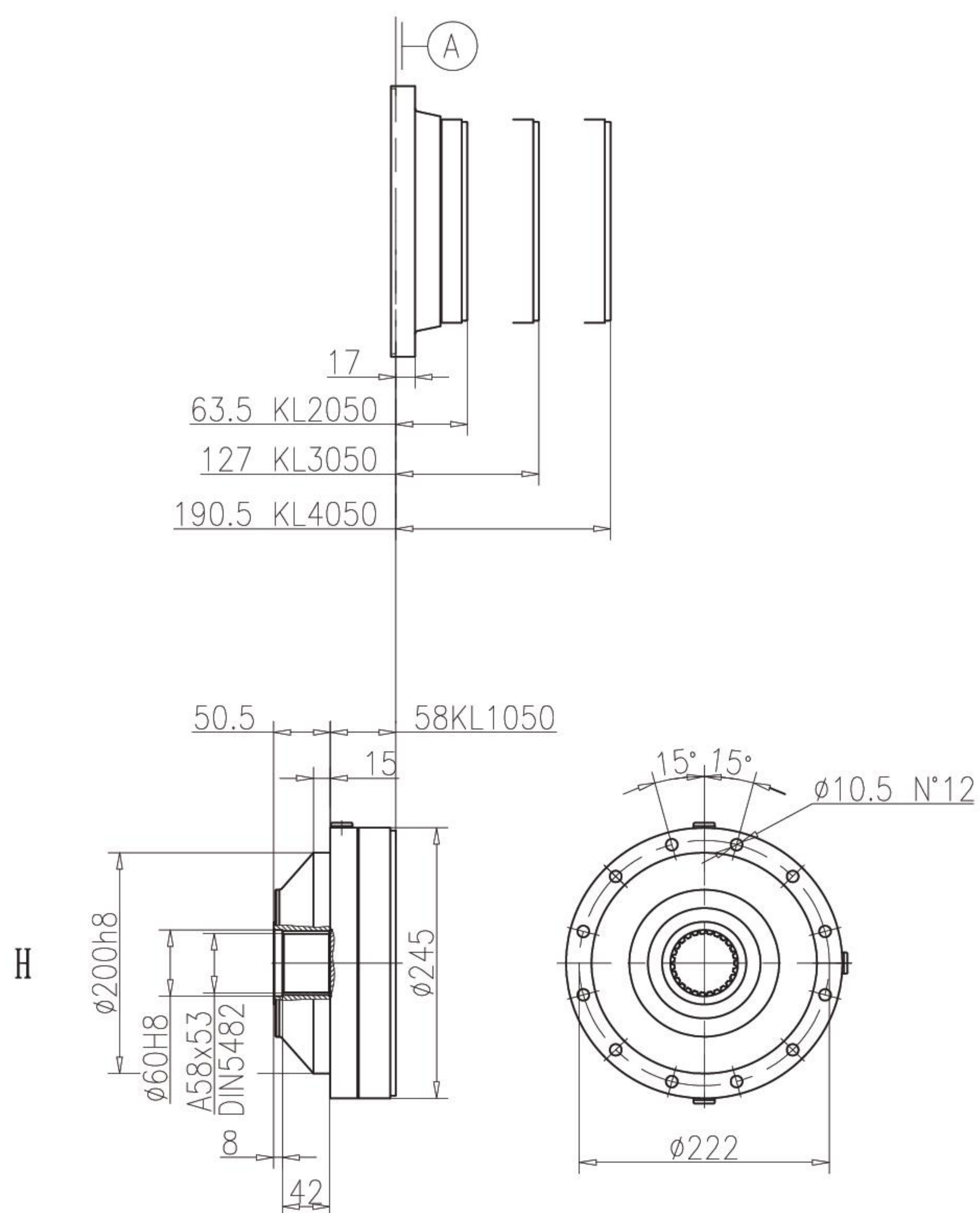
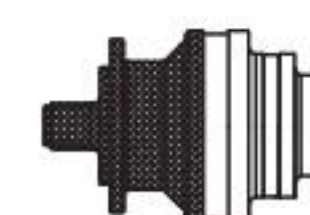
IA



KL050



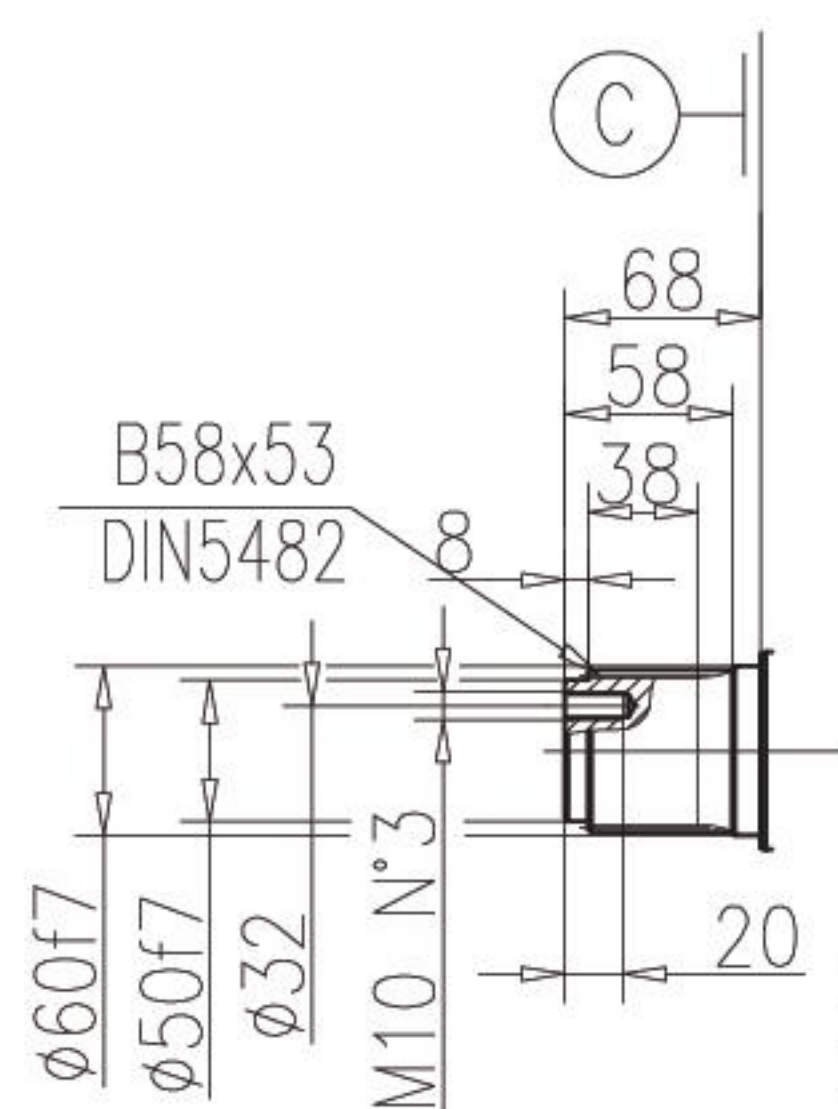
KL050



KL050

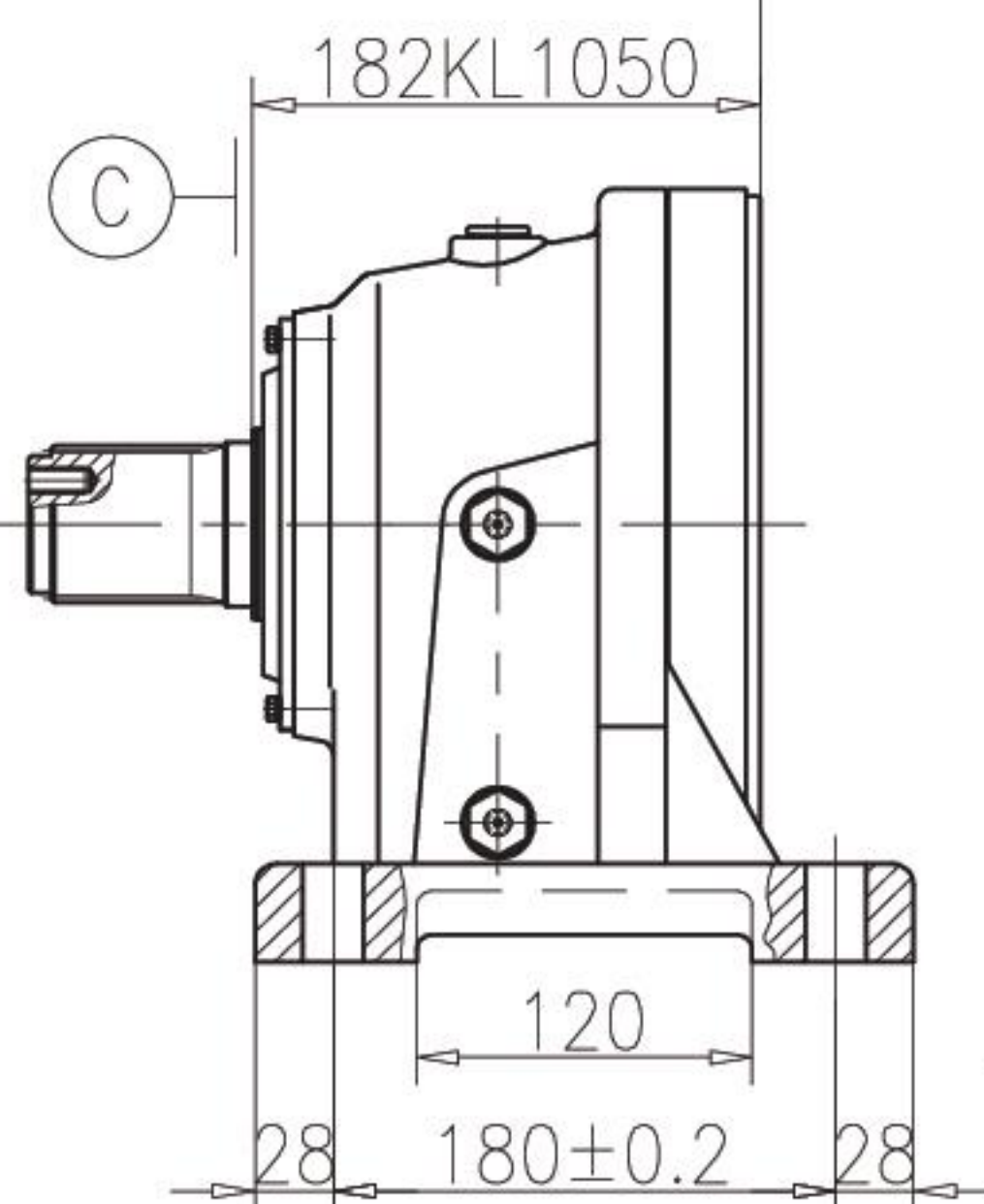
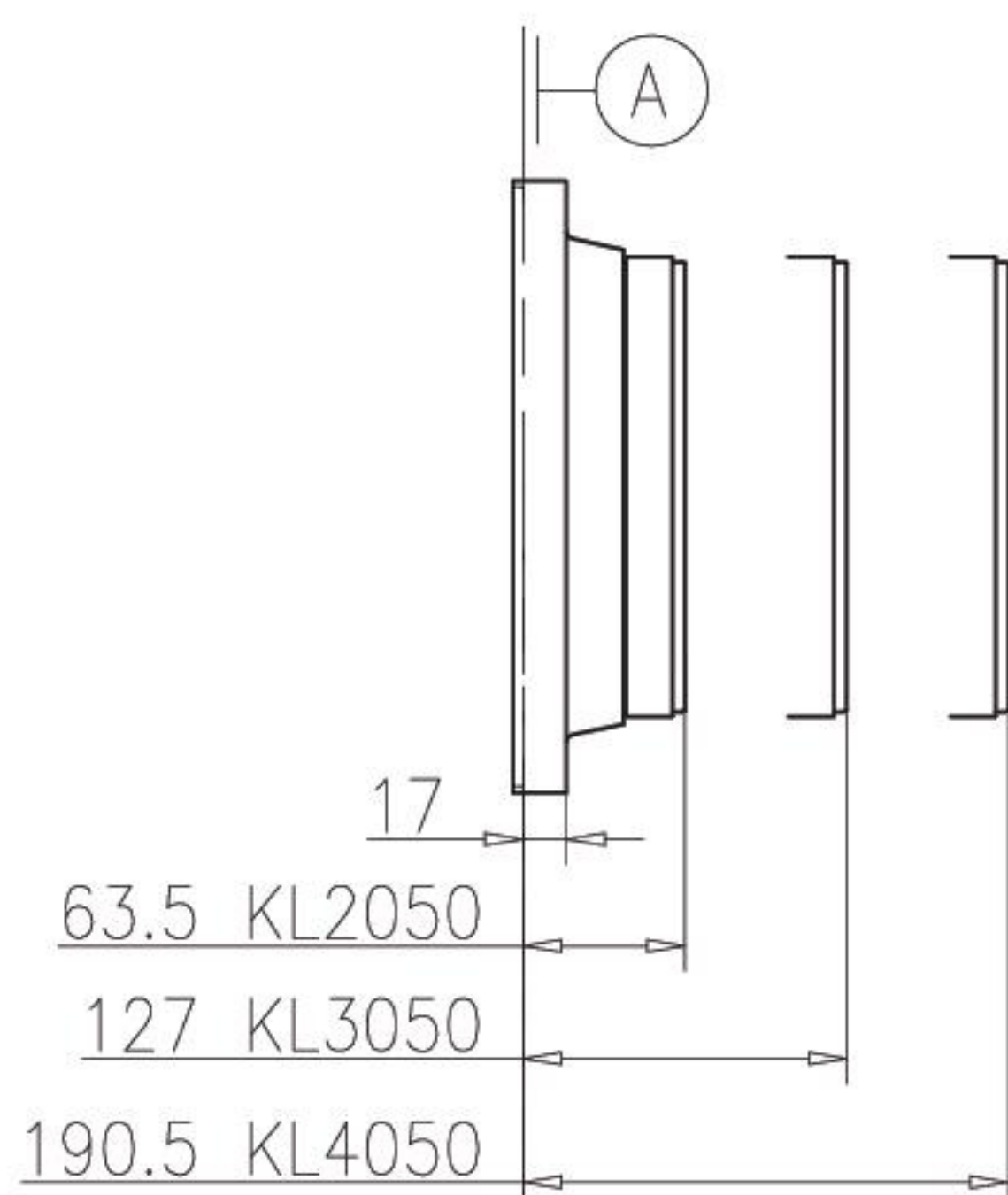
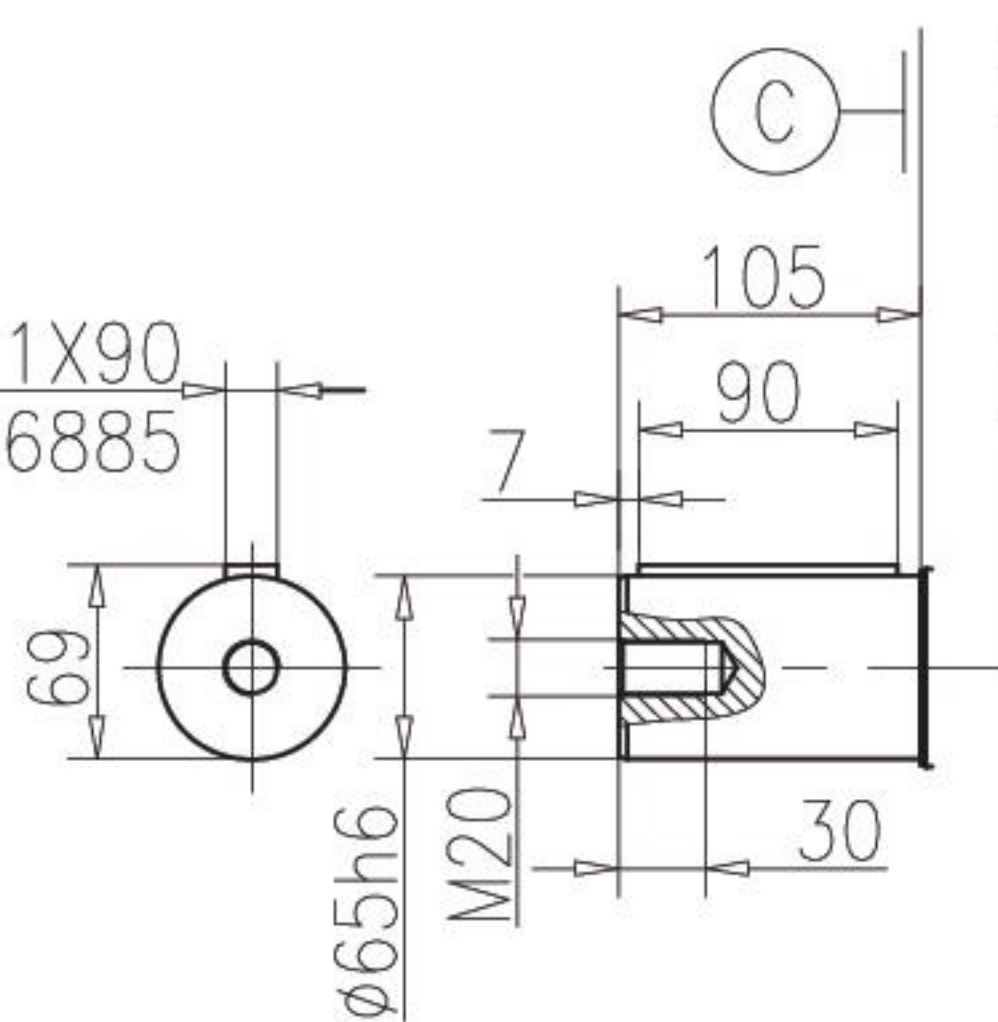


IA

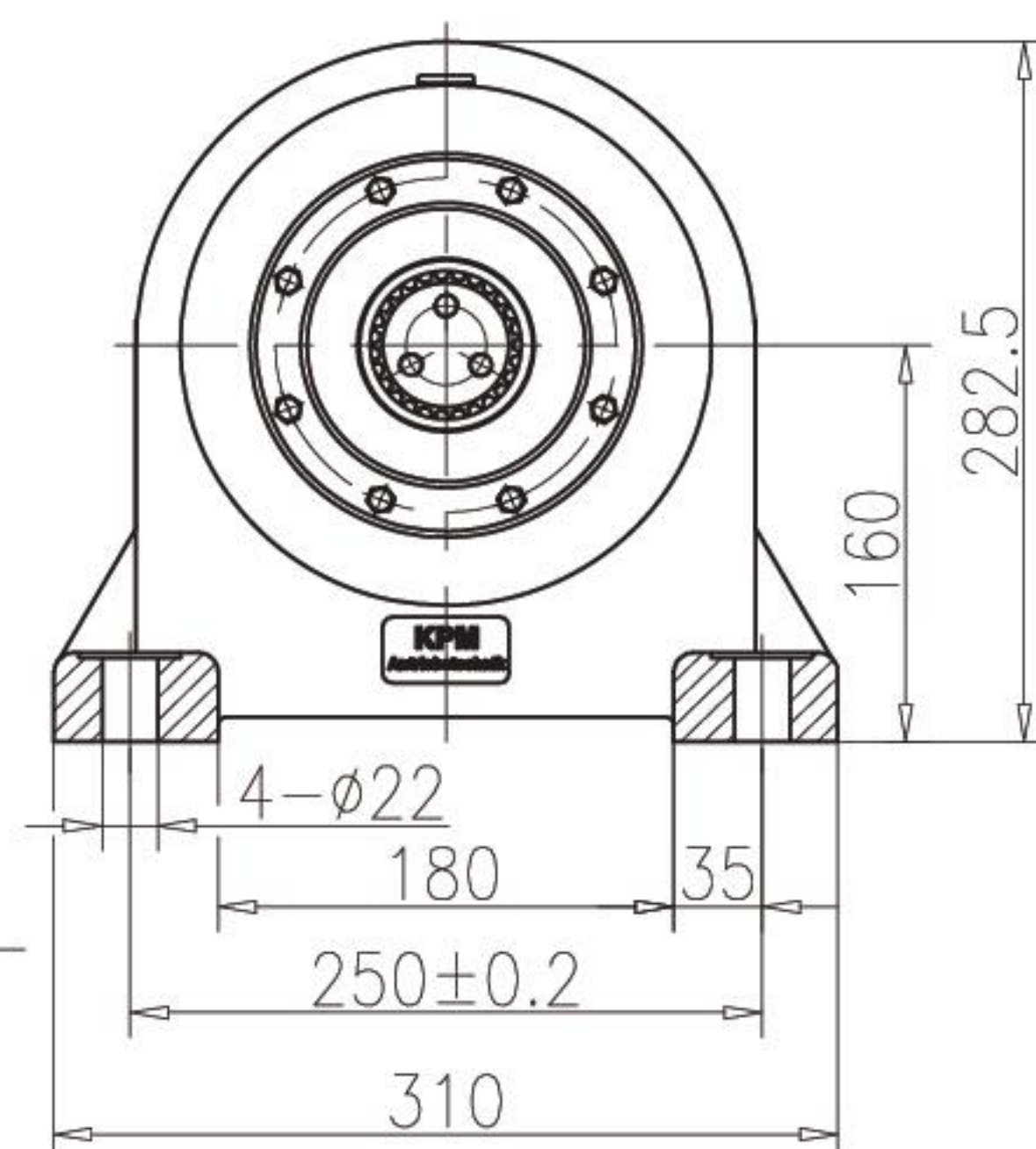


18X11X90
DIN 6885

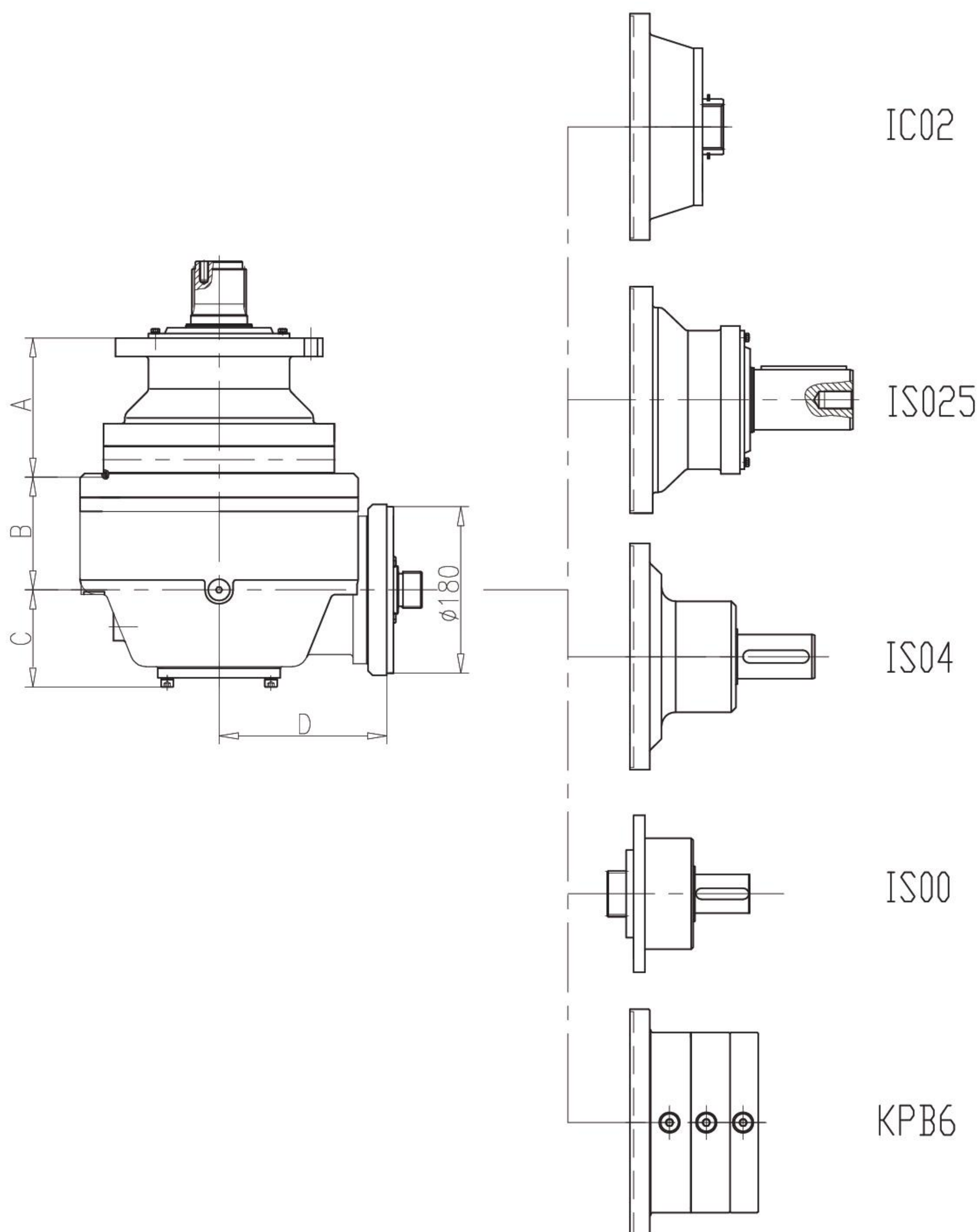
PA



B

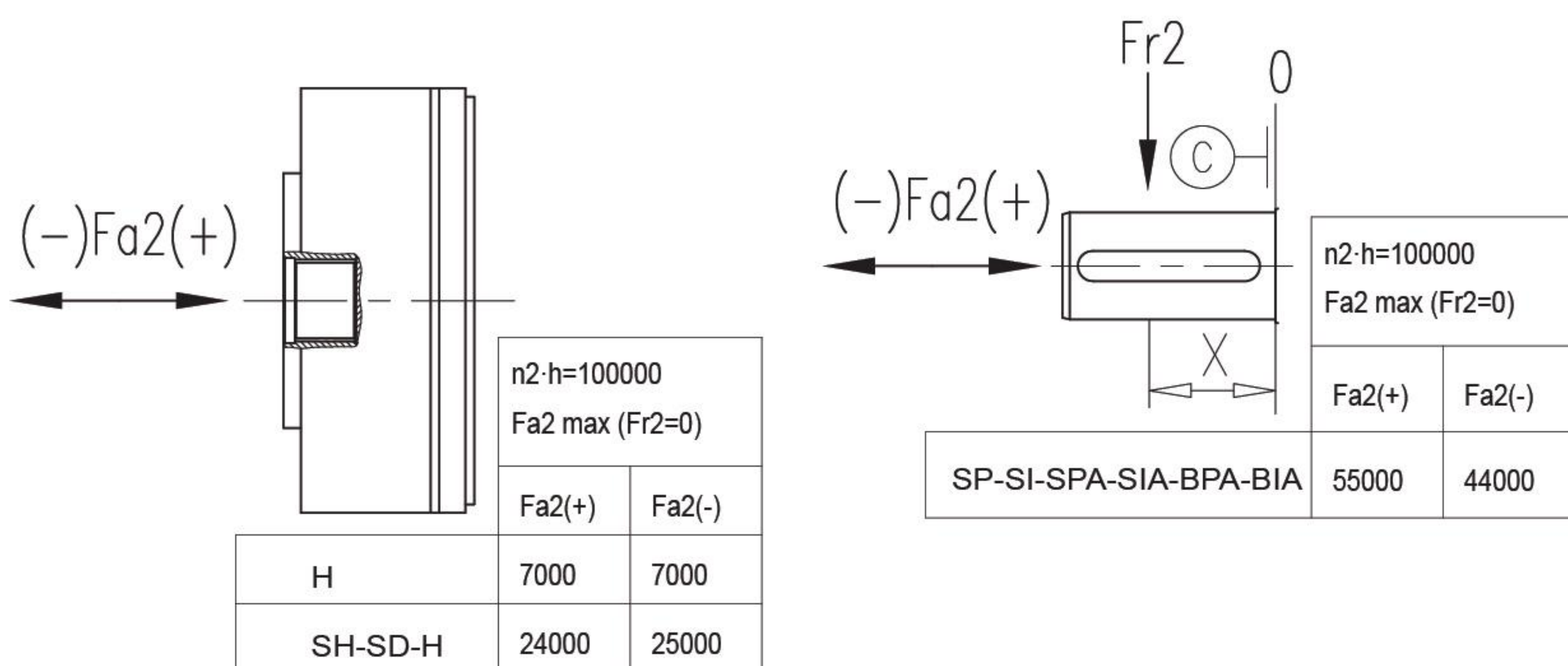
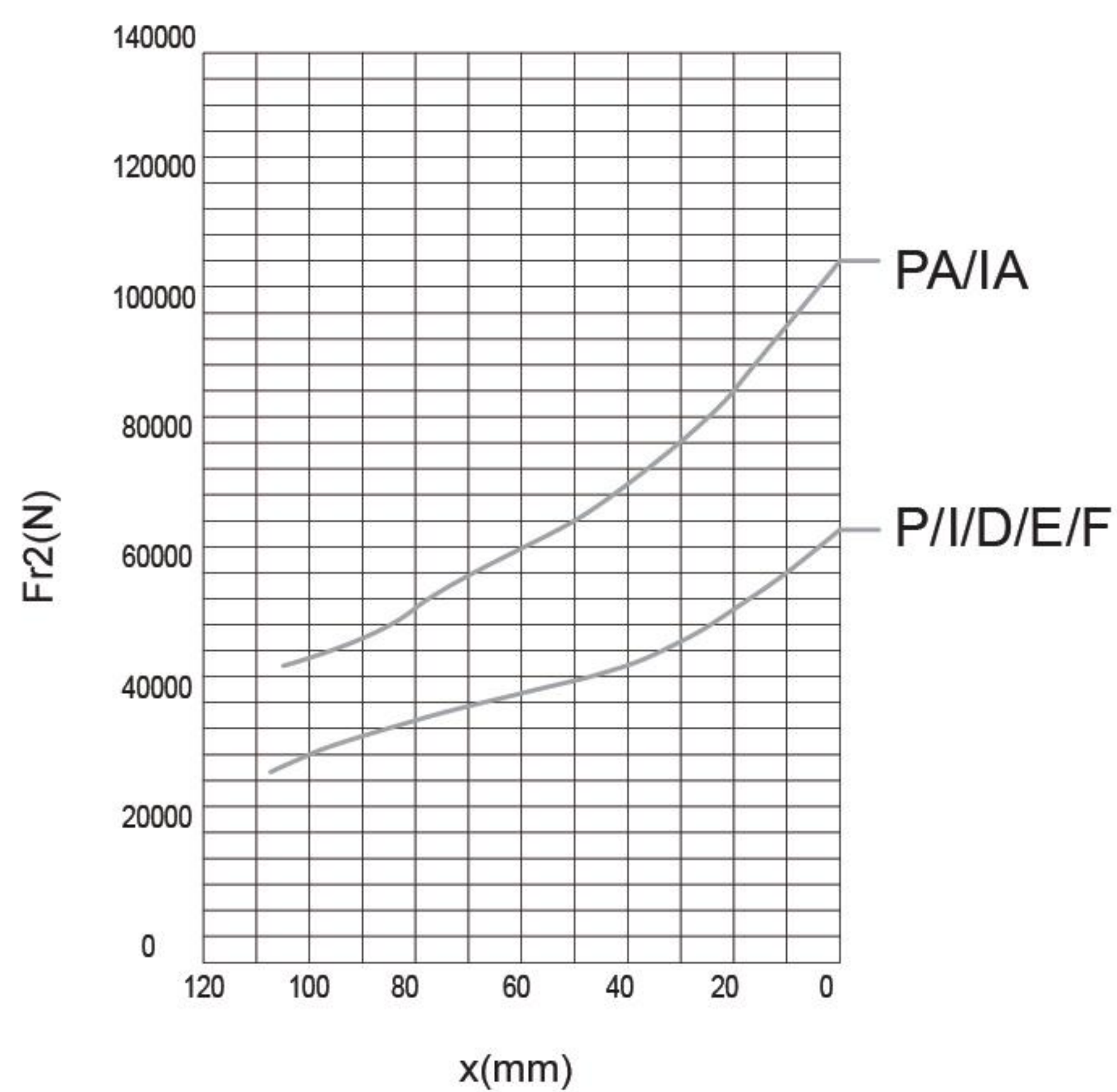
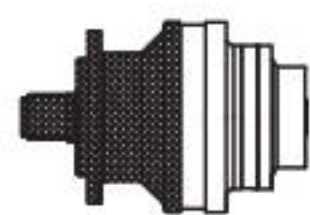


KR050



	A						B	C	D
	SP	SI	SH	SPA	SIA	BPA			
KR 2050	150.5	150.5	58	167	167	182	122	105	185
KR 3050	214	214	121.5	230.5	230.5	245.5	90	81.5	134.5
KR 4050	277.5	277.5	185	294	294	309	90	81.5	134.5

KL050



n2·h							
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL070
T₂=8500 Nm

	i 1:	T _{cont} [Nm]						P _t [kW]	n _{1max} [min ⁻¹]	T _b [Nm]	
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000				
L1	3.50	8496	8126	7920	7714	6246	5054	18	3000	1140	
	4.13	10291	9879	9673	9570	6174	4991	18	3000		
	5.17	8221	7892	7727	7645	4932	3987	18	3000		
	6.00	7083	6800	6658	6588	4250	3435	18	3000		
	7.25	5862	5628	5510	5452	3517	2843	18	3000		
L2	12.25	8280	7920	7740	7560	6246	5054	13	3800	875	
	14.44	8496	8126	7920	7714	6246	5054	13	3800	785	
	17.02	10291	9879	9673	9570	6174	4991	13	3800	700	
	18.08	8344	7912	7625	7481	6186	5035	13	3800	520	
	21.31	9846	9336	8997	8827	6174	4991	13	3800	430	
	25.38	5950	5642	5437	5334	4411	3591	13	3800	430	
	27.43	9279	8908	8723	8630	5568	4501	13	3800	430	
	31.00	8221	7892	7727	7645	4932	3987	13	3800	340	
	37.46	8221	7892	7727	7645	4932	3987	13	3800	340	
	43.50	7083	6800	6658	6588	4250	3435	13	3800	340	
L3	44.92	8280	7920	7740	7560	6246	5054	7.5	4000	250	
	49.00	8280	7920	7740	7560	6246	5054	7.5	4000	250	
	54.25	8280	7920	7740	7560	6246	5054	7.5	4000	250	
	63.94	8496	8126	7920	7714	6246	5054	7.5	4000	160	
	75.36	10291	9879	9673	9570	6174	4991	7.5	4000	160	
	80.08	8496	8126	7920	7714	6246	5054	7.5	4000	160	
	90.75	8484	8045	7752	7606	6174	4991	7.5	4000	160	
	109.37	10291	9879	9673	9570	6174	4991	7.5	4000	160	
	132.00	10291	9879	9673	9570	6174	4991	7.5	4000	160	
	143.55	8484	8045	7752	7606	6174	4991	7.5	4000	160	
	149.19	9846	9336	8997	8827	6174	4991	7.5	4000	160	
	165.33	9279	8908	8723	8630	5568	4501	7.5	4000	160	
	186.86	8221	7892	7727	7645	4932	3987	7.5	4000	160	
	192.00	9279	8908	8578	8416	5568	4501	7.5	4000	160	
	212.57	9279	8908	8723	8630	5568	4501	7.5	4000	160	
	222.75	8484	8045	7752	7606	6174	4991	7.5	4000	160	
	246.86	9279	8908	8578	8416	5568	4501	7.5	4000	160	
	269.16	7021	6658	6416	6295	5205	4237	7.5	4000	160	
	279.00	8221	7892	7727	7645	4932	3987	7.5	4000	160	
	337.13	8221	7892	7727	7645	4932	3987	7.5	4000	160	
L4	184.45	8280	7920	7740	7560	6246	5054	6	4000	160	
	276.30	10291	9879	9673	9570	6174	4991	6	4000	160	
	319.69	8496	8126	7920	7714	6246	5054	6	4000	160	
	354.29	8496	8126	7920	7714	6246	5054	6	4000	160	
	400.00	8496	8126	7920	7714	6246	5054	6	4000	160	
	464.00	8496	8126	7920	7714	6246	5054	6	4000	160	
	505.31	8496	8126	7920	7714	6246	5054	6	4000	160	
	545.42	10291	9879	9673	9570	6174	4991	6	4000	160	
	634.35	10291	9879	9673	9570	6174	4991	6	4000	160	
	792.45	9011	8545	8234	8079	6681	5438	6	4000	160	
	909.56	8496	8126	7920	7714	6246	5054	6	4000	160	
	1062.86	9279	8908	8723	8630	5568	4501	6	4000	160	
	1157.33	9279	8908	8723	8630	5568	4501	6	4000	160	
	1488.00	9279	8908	8723	8630	5568	4501	6	4000	160	
	1692.74	9279	8908	8723	8630	5568	4501	6	4000	160	
	1913.14	9279	8908	8723	8630	5568	4501	6	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

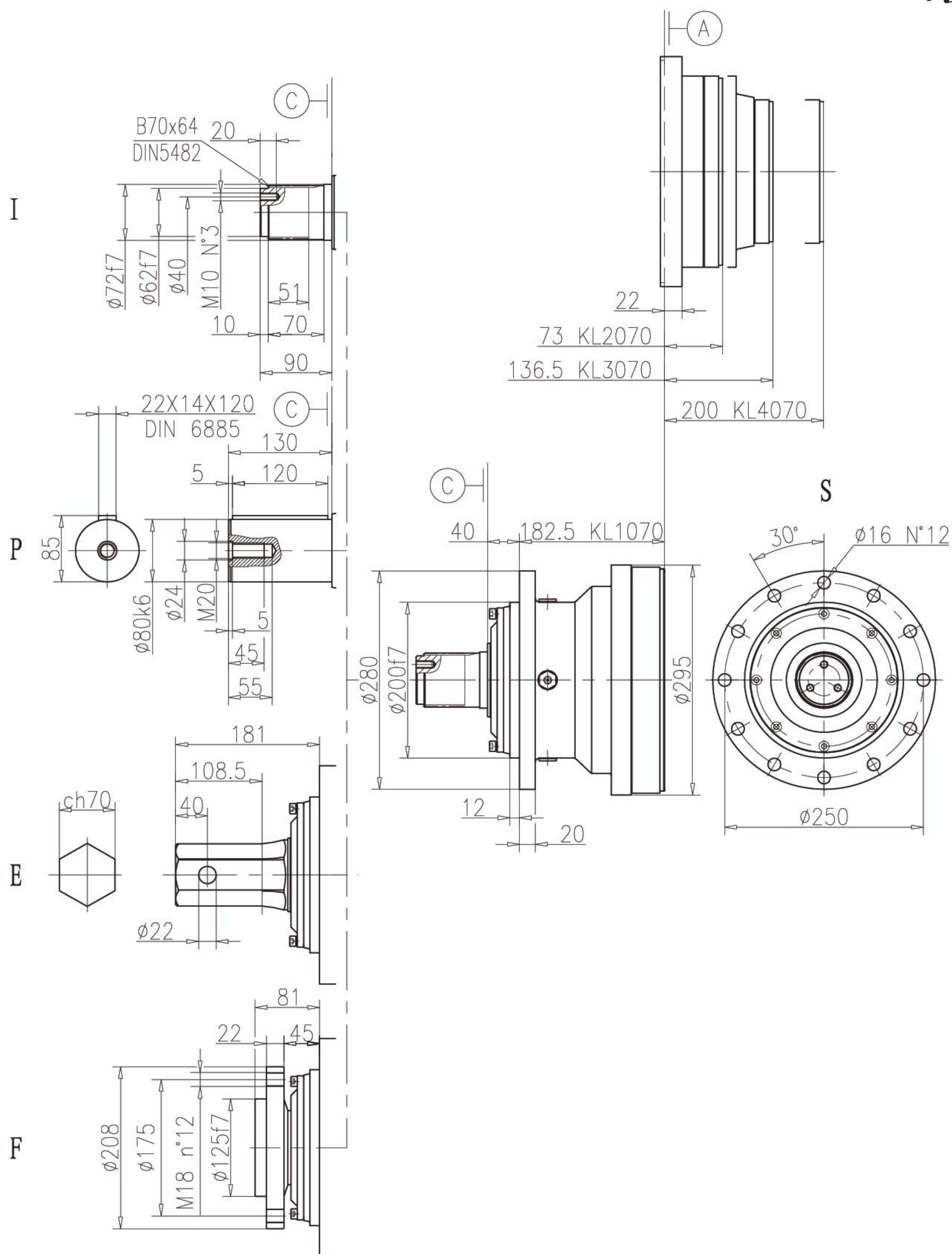
T₂=8500 Nm

KR070

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	10.77	4532	4532	4532	4532	4532	4532	18	3800	520	
	12.69	5348	5348	5348	5348	5348	4991	18	3800	520	
	14.09	5917	5917	5917	5917	5917	4991	18	3800	520	
	17.65	6781	6781	6781	6781	4932	3987	18	3800	520	
	19.73	6674	6674	6674	6674	4932	3987	18	3800	430	
	22.91	7083	6800	6658	6588	4250	3435	18	3800	430	
	25.80	7083	6800	6658	6588	4250	3435	18	3800	340	
	27.68	5862	5628	5510	5452	3517	2843	18	3800	340	
	31.18	5862	5628	5510	5452	3517	2843	18	3800	250	
R3	37.69	8280	7920	7740	7560	6246	5054	14	4000	340	
	44.42	8496	8126	7920	7714	6246	5054	14	4000	340	
	52.36	10291	9879	9673	9570	6174	4991	14	4000	250	
	58.02	10291	9879	9673	9570	6174	4991	14	4000	250	
	72.67	9279	8908	8723	8630	5568	4501	14	4000	160	
	80.70	9279	8908	8723	8630	5568	4501	14	4000	160	
	90.18	9279	8908	8723	8630	5568	4501	14	4000	160	
	104.73	9279	8902	8578	8416	5568	4501	14	4000	160	
	113.24	7769	7367	7099	6965	5568	4501	14	4000	160	
	126.55	7769	7367	7099	6965	5568	4501	14	4000	160	
	143.02	8221	7892	7727	7645	4932	3987	14	4000	160	
	166.09	7083	6800	6658	6588	4250	3435	14	4000	160	
	187.05	7083	6800	6658	6588	4250	3435	14	4000	160	
R4	142.30	8280	7920	7740	7560	6246	5054	12	4000	160	
	153.47	8280	7920	7740	7560	6246	5054	12	4000	160	
	207.14	8280	7920	7740	7560	6246	5054	12	4000	160	
	257.65	8496	8126	7920	7714	6246	5054	12	4000	160	
	308.92	8344	7912	7625	7481	6186	5035	12	4000	160	
	354.33	8496	8126	7920	7714	6246	5054	12	4000	160	
	400.46	8344	7912	7625	7481	6186	5035	12	4000	160	
	422.34	9846	9336	8997	8827	6174	4991	12	4000	160	
	454.78	10291	9879	9673	9570	6174	4991	12	4000	160	
	504.00	10291	9879	9673	9570	6174	4991	12	4000	160	
	589.06	9279	8908	8723	8630	5568	4501	12	4000	160	
	631.27	9279	8908	8723	8630	5568	4501	12	4000	160	
	732.38	9846	9336	8997	8827	6174	4991	12	4000	160	
	828.55	8221	7892	7727	7645	4932	3987	12	4000	160	
	914.06	9279	8908	8723	8630	5568	4501	12	4000	160	
	1019.14	7769	7367	7099	6965	5568	4501	12	4000	160	
	1138.91	7769	7367	7099	6965	5568	4501	12	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

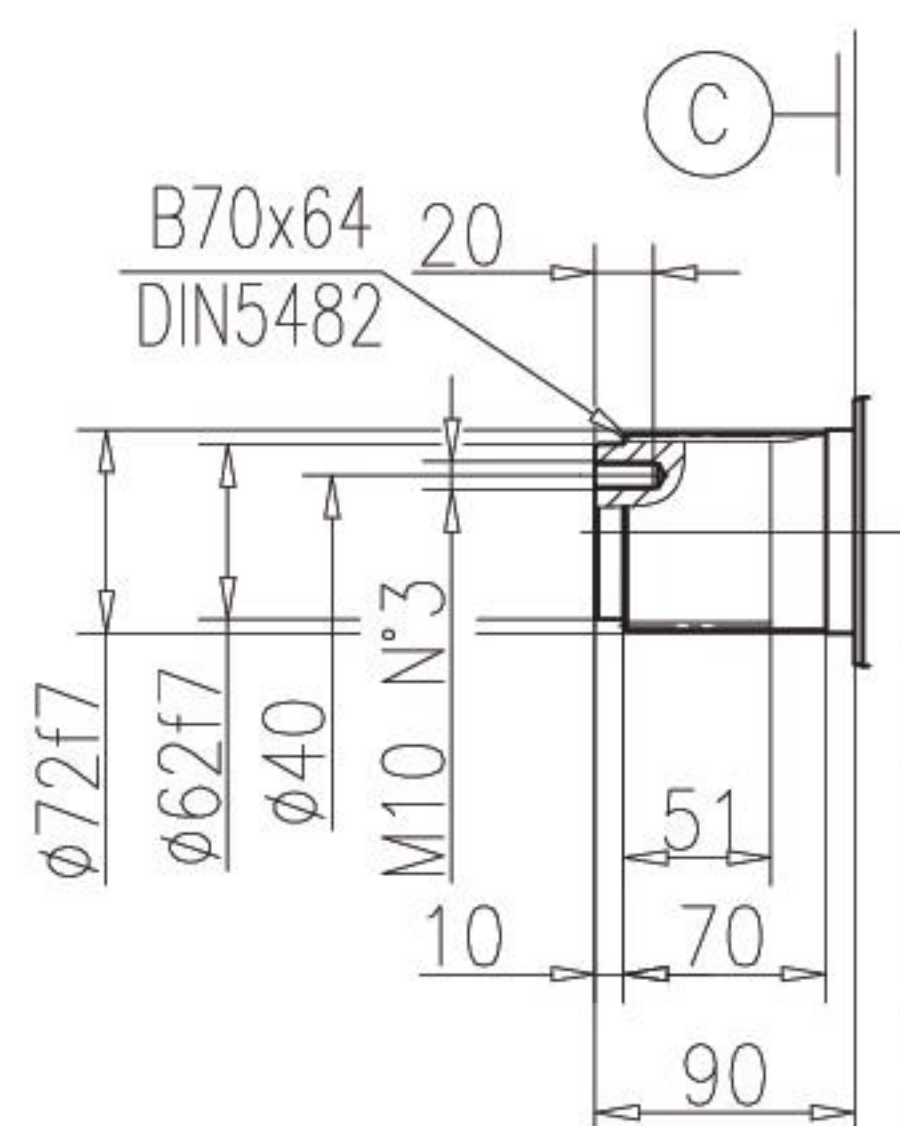
KL070



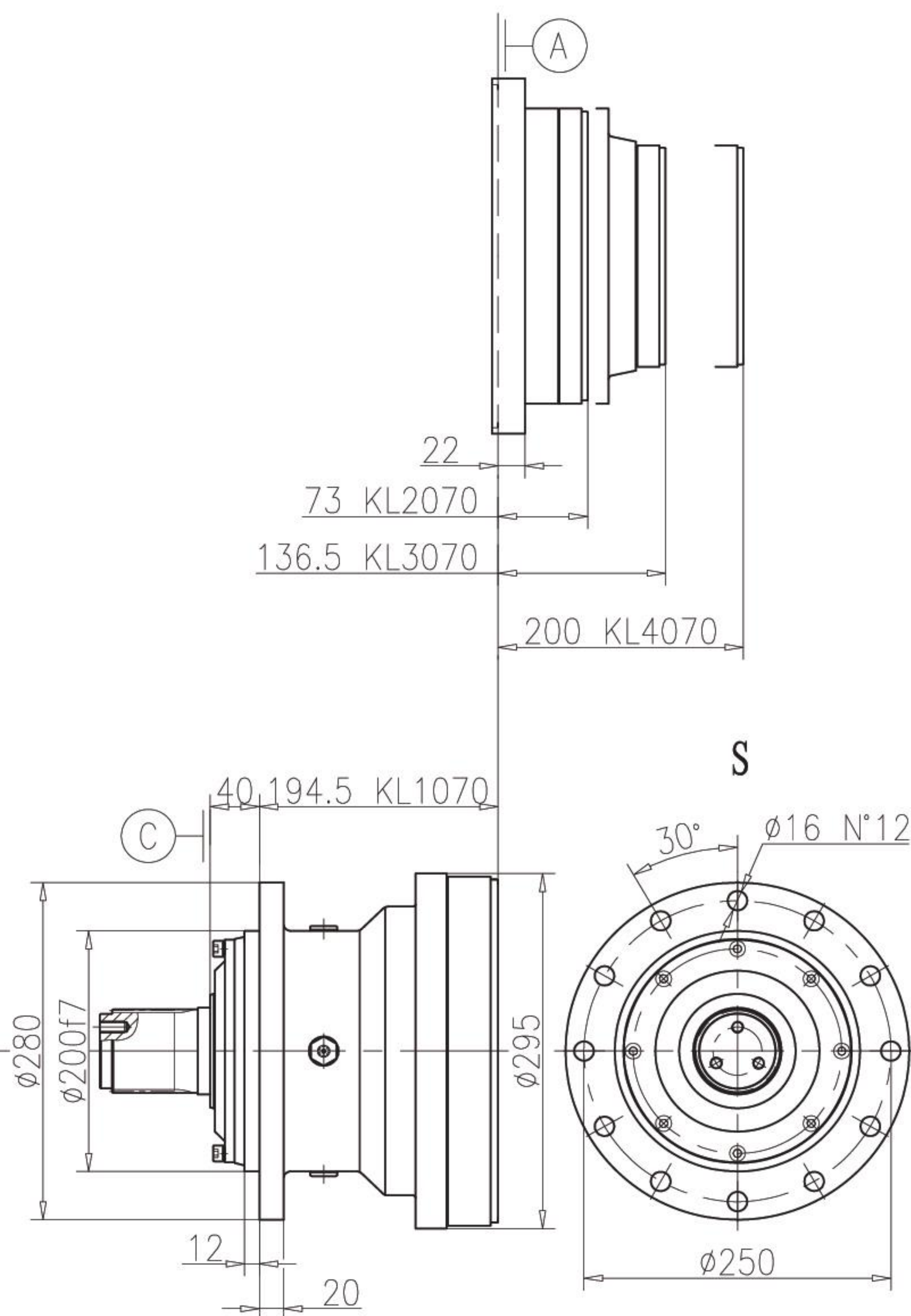
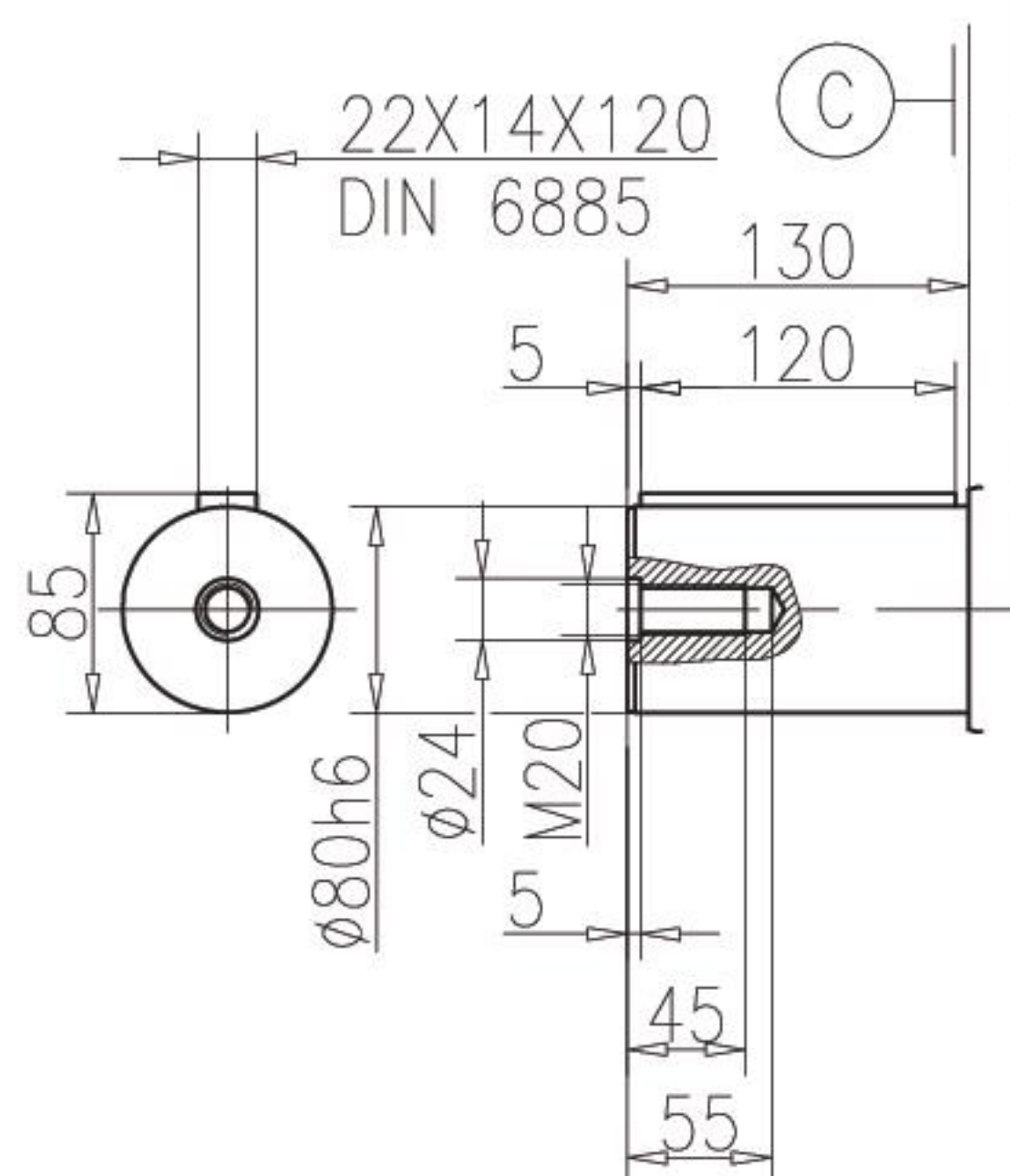
KL070



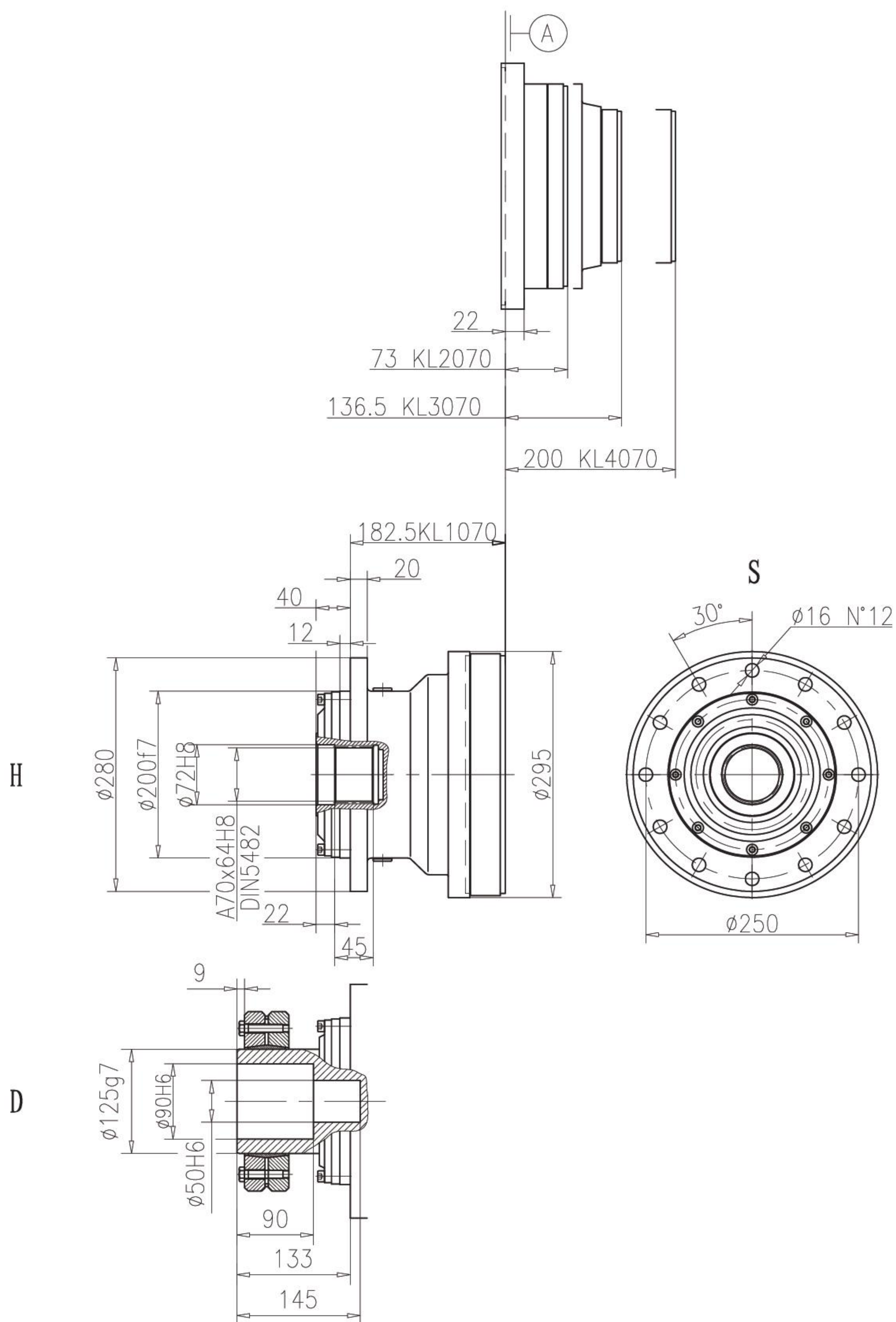
IA



PA



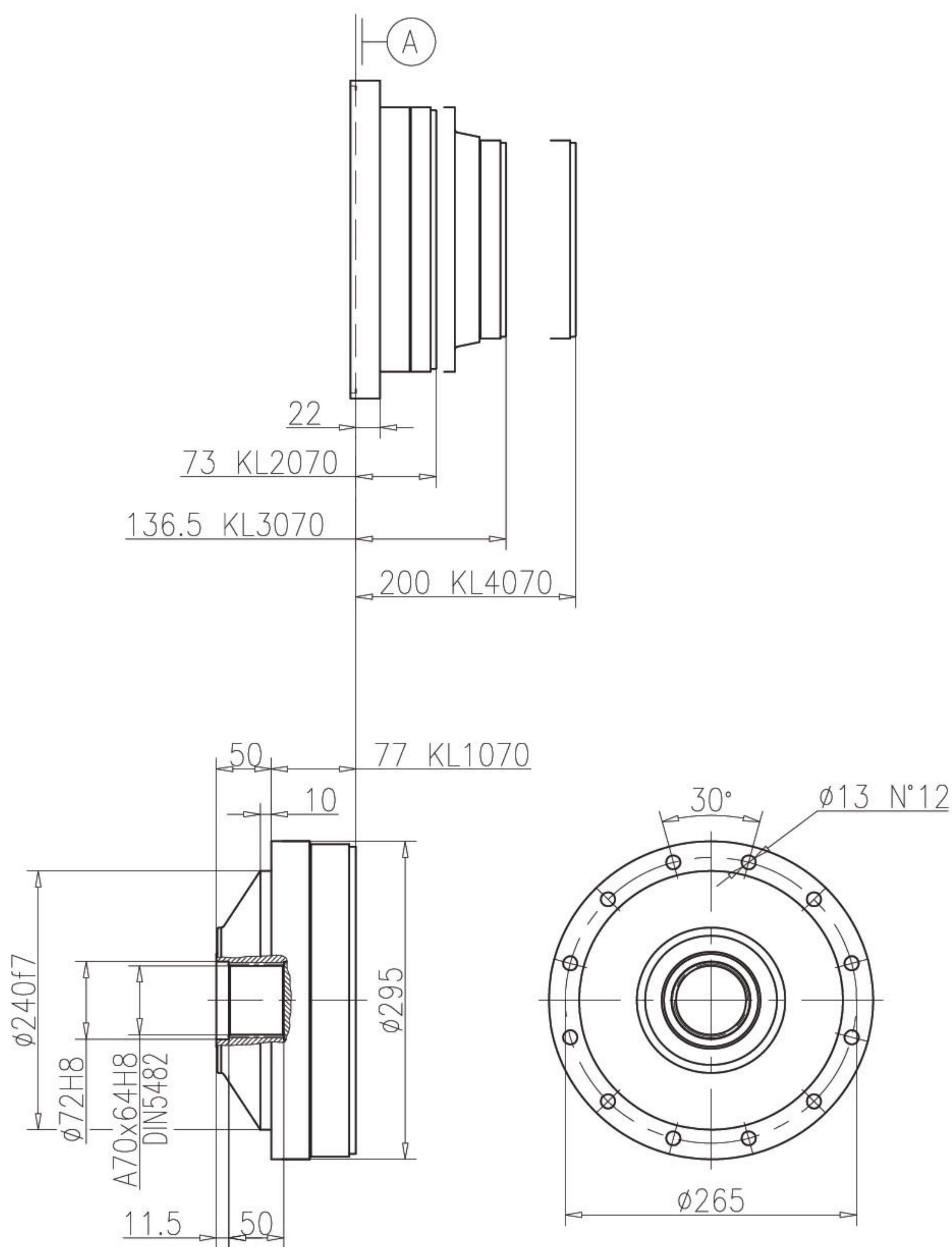
KL070



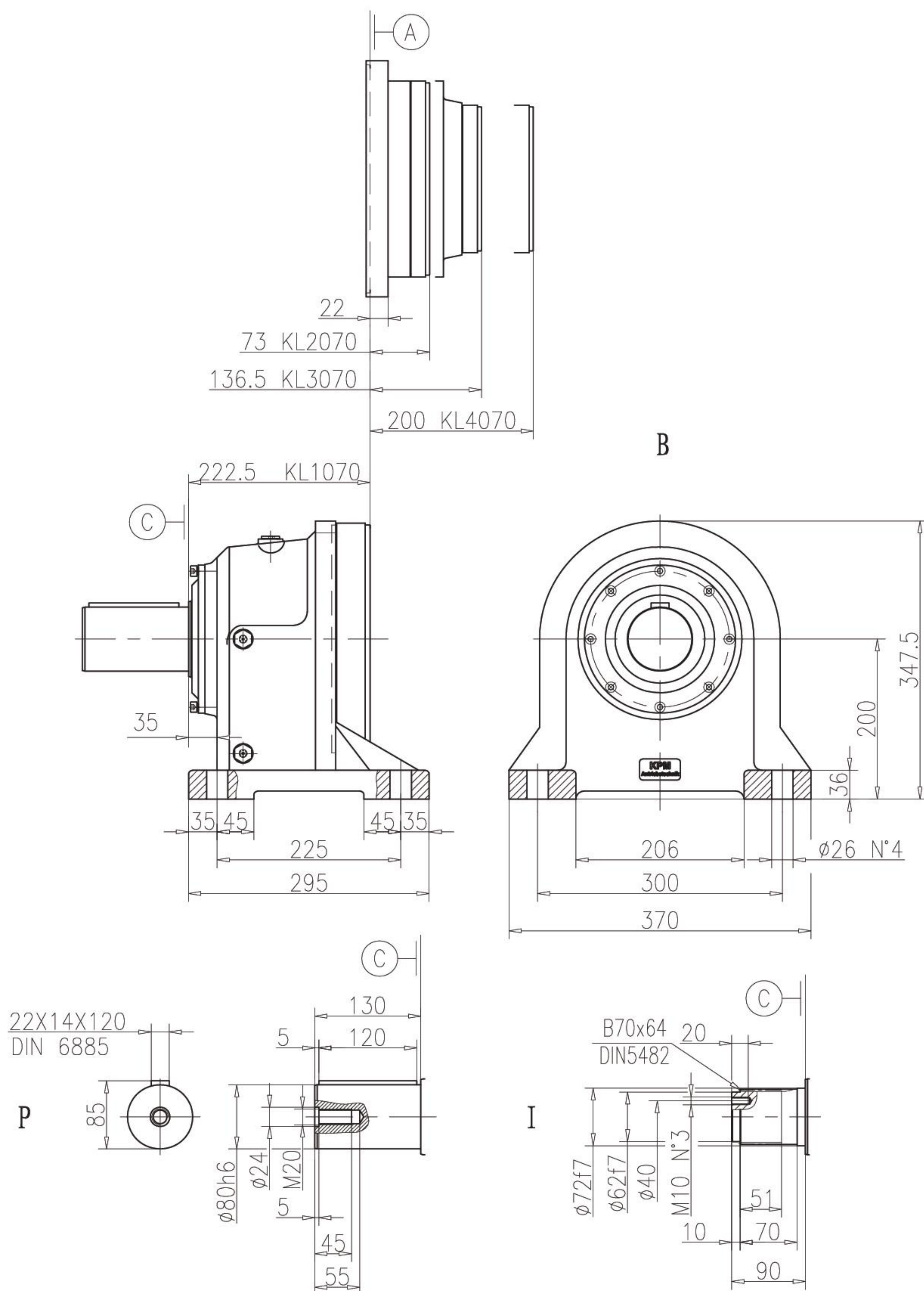
KL070



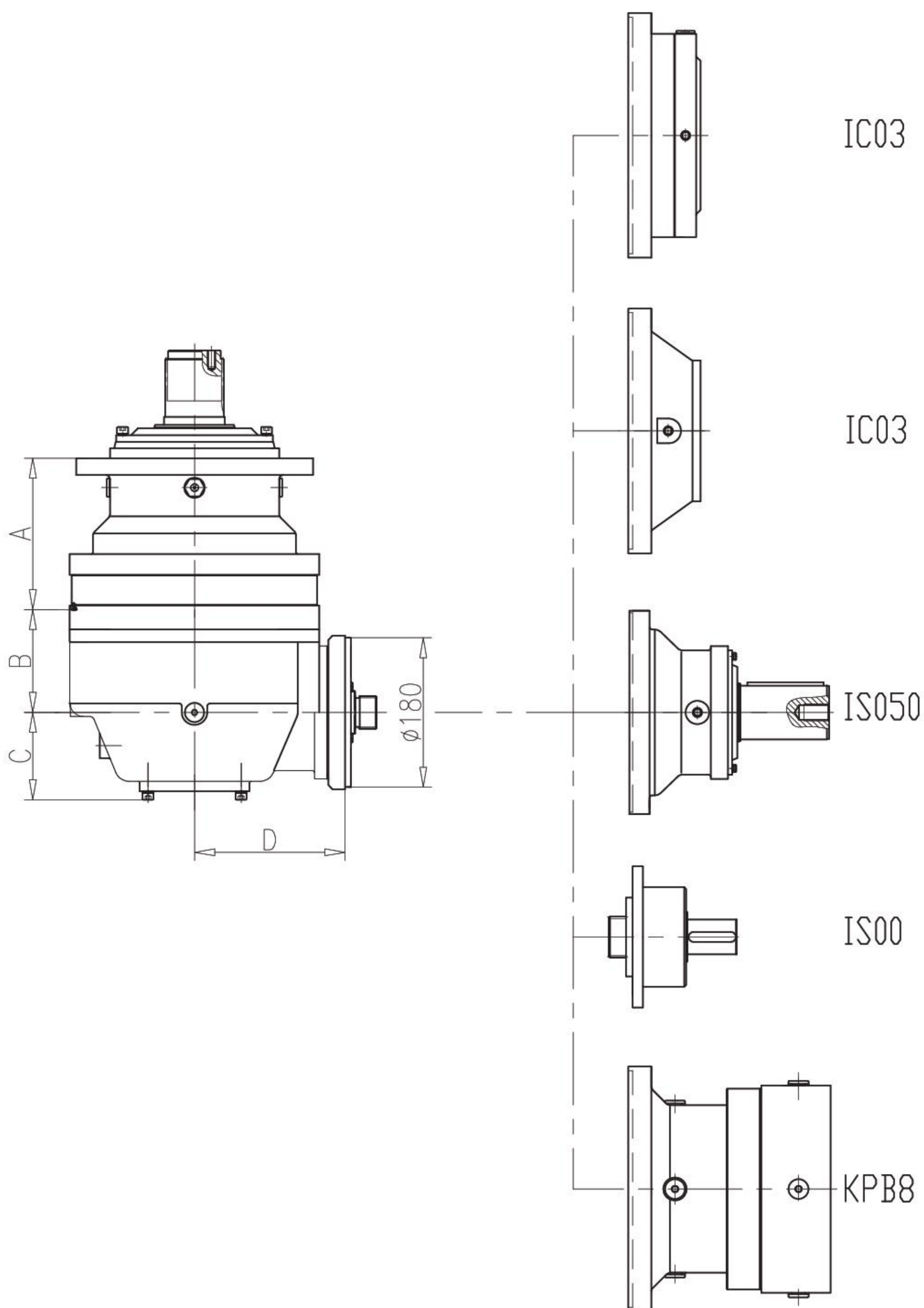
H



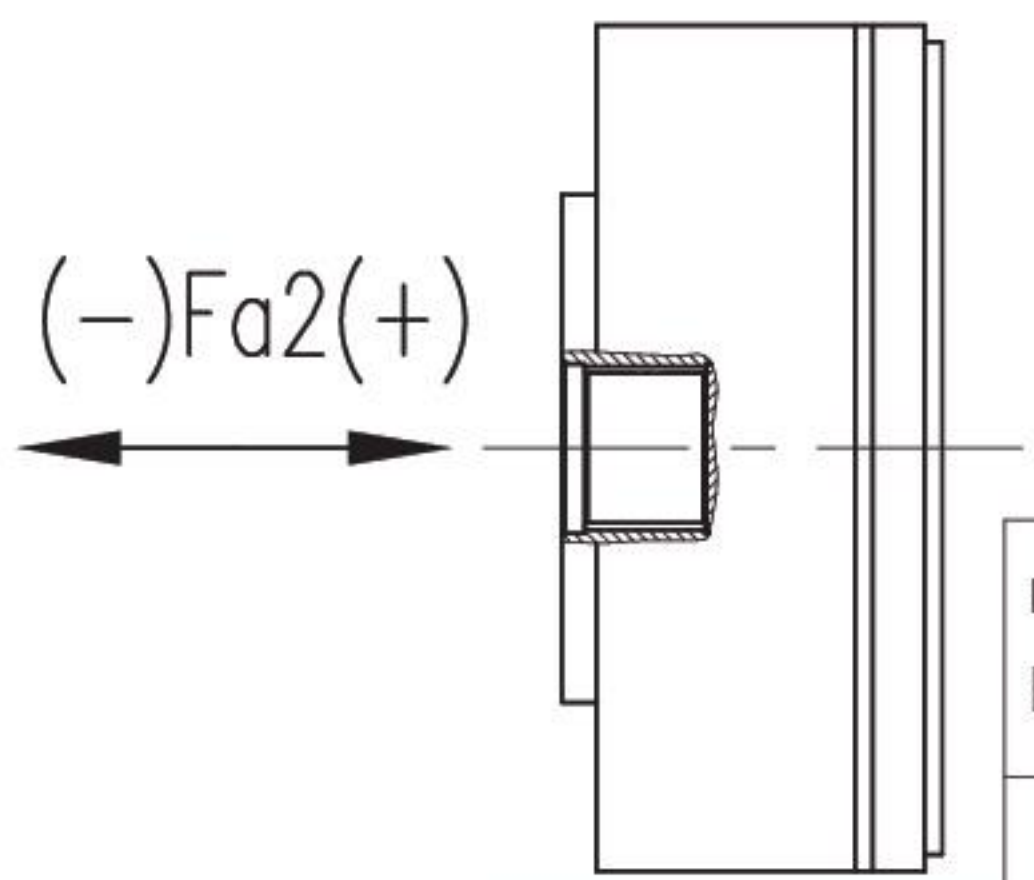
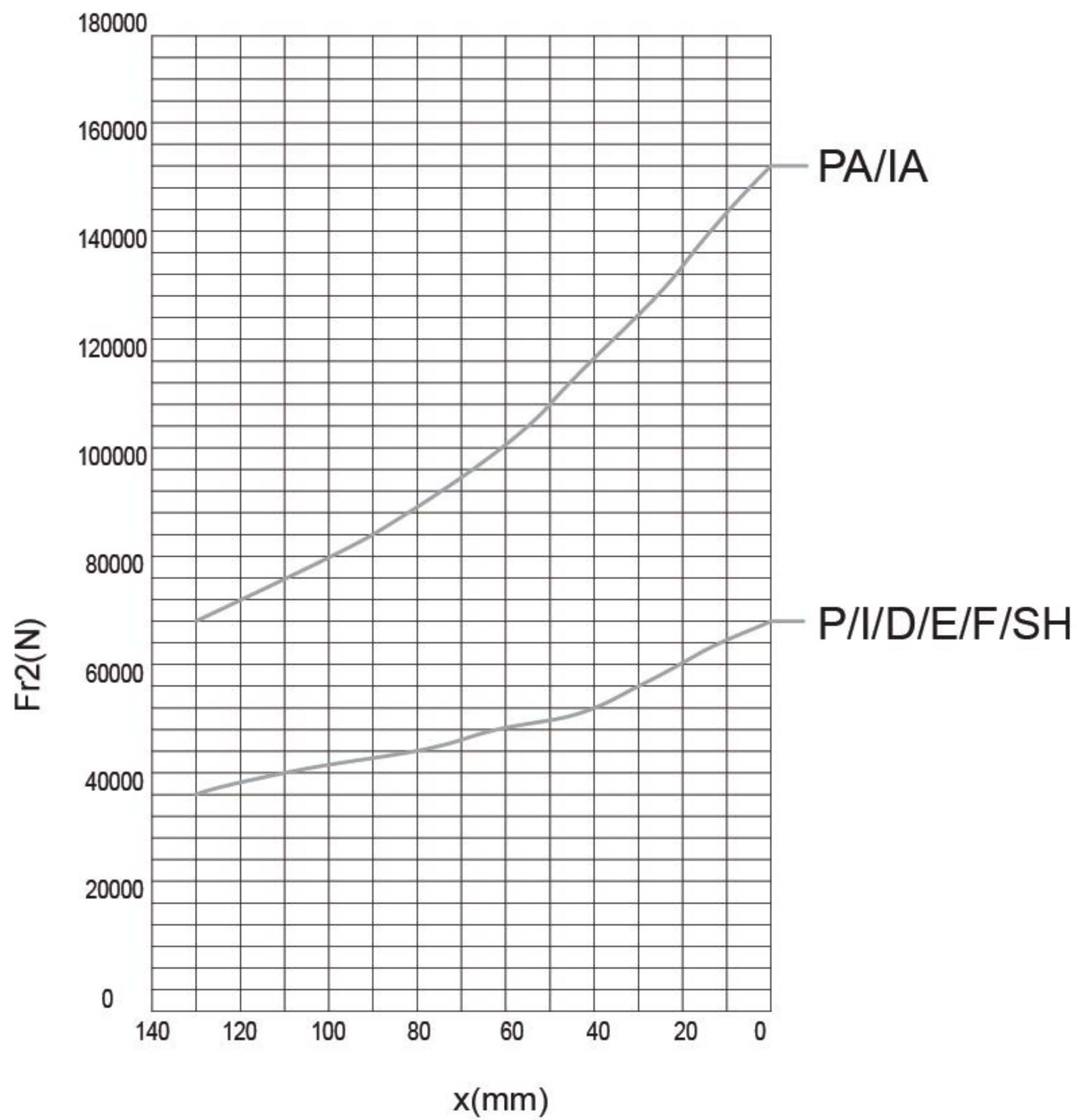
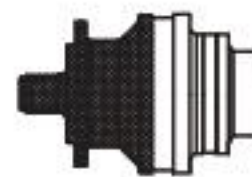
KL070



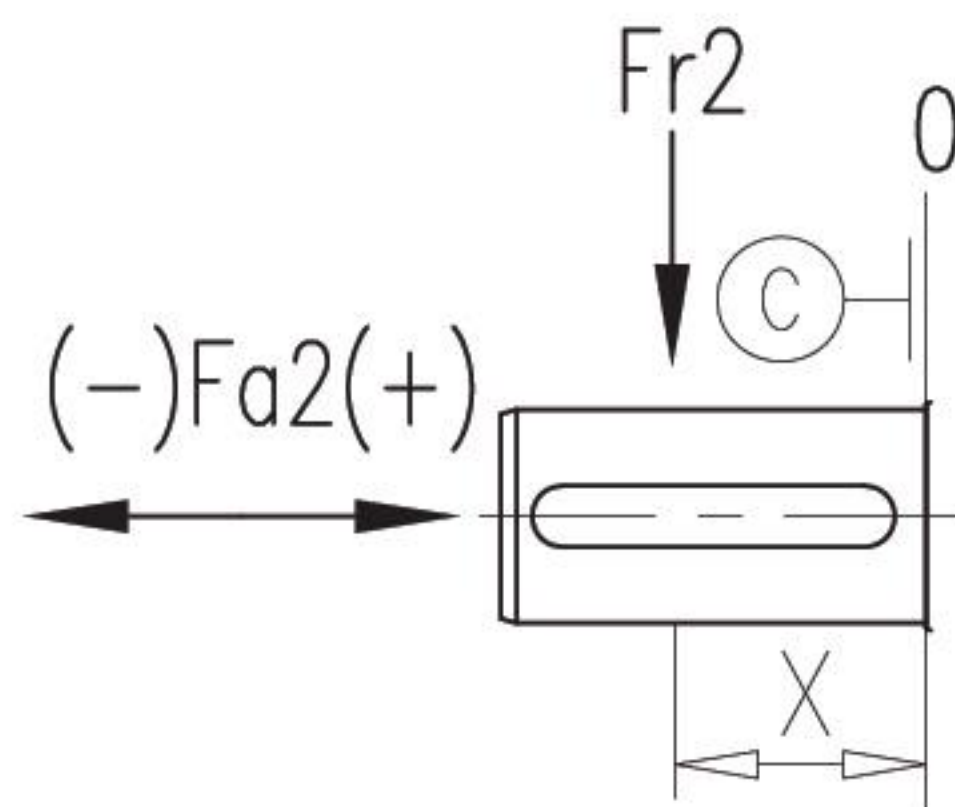
KR070



	A											B	C	D
	SP	SI	SE	SF	SD	SH	H	BP	BI	SPA	SIA			
KR 2070	182.5	182.5	182.5	182.5	182.5	182.5	77	222.5	222.5	194.5	194.5	124	105	185
KR 3070	255.5	255.5	255.5	255.5	255.5	255.5	150	295.5	295.5	267.5	267.5	122	105	185
KR 4070	319	319	319	319	319	319	213.5	359	359	331	331	90	81.5	134.5



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
H	25000	25000
SH-SD	45000	45000



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
SP-SI-SE-SF	70000	44000
SPA-SIA-BPA-BIA	120000	60000

n2·h							
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL100
T₂=10000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.50	14833	12912	11628	10596	7350	5970	31	2500		
	3.78	16020	13946	12559	11444	7806	6340	31	2500		
	4.13	14663	12765	11494	10474	7144	5803	31	2500		
	5.17	11713	10197	9182	8367	5707	4636	31	2500		
	6.00	10093	8786	7912	7210	4918	3994	31	2500		
L2	12.25	14833	12912	11628	10596	7350	5970	19.1	3100		
	14.44	14833	12912	11628	10596	7350	5970	19.1	3100		
	17.02	14663	12765	11494	10474	7144	5803	19.1	3100	1140	
	18.08	14833	12912	11628	10596	7350	5970	19.1	3100	1050	
	21.31	14663	12765	11494	10474	7144	5803	19.1	3100	875	
	25.38	11900	11284	10874	10596	7350	5970	19.1	3100	610	
	27.43	13251	11536	10388	9466	6457	5244	19.1	3100	610	
	31.00	11713	10197	9182	8367	5707	4636	19.1	3100	520	
	37.46	11713	10197	9182	8367	5707	4636	19.1	3100	430	
	43.50	10093	8786	7912	7210	4918	3994	19.1	3100	340	
L3	44.92	14833	12912	11628	10596	7350	5970	13.7	4000		430
	49.00	14833	12912	11628	10596	7350	5970	13.7	4000		430
	54.25	14833	12912	11628	10596	7350	5970	13.7	4000		340
	63.94	14833	12912	11628	10596	7350	5970	13.7	4000		250
	75.36	14663	12765	11494	10474	7144	5803	13.7	4000		250
	80.08	14833	12912	11628	10596	7350	5970	13.7	4000		250
	90.38	16020	13946	12559	11444	7806	6340	13.7	4000		250
	100.17	16020	13946	12559	11444	7806	6340	13.7	4000		250
	109.37	14663	12765	11494	10474	7144	5803	13.7	4000		160
	132.00	14663	12765	11494	10474	7144	5803	13.7	4000		160
	143.55	14663	12765	11494	10474	7144	5803	13.7	4000		160
	149.19	14663	12765	11494	10474	7144	5803	13.7	4000		160
	158.67	15530	13946	12559	11444	7806	6340	13.7	4000		160
	175.67	16020	13946	12559	11444	7806	6340	13.7	4000		160
	186.86	11713	10197	9182	8367	5707	4636	13.7	4000		160
	192.00	13251	11536	10388	9466	6457	5244	13.7	4000		160
	212.57	13251	11536	10388	9466	6457	5244	13.7	4000		160
	246.86	13251	11536	10388	9466	6457	5244	13.7	4000		160
	269.16	14042	12765	11494	10474	7144	5803	13.7	4000		160
	279.00	11713	10197	9182	8367	5707	4636	13.7	4000		160
	337.13	11713	10197	9182	8367	5707	4636	13.7	4000		160
L4	184.45	14833	12912	11628	10596	7350	5970	10.9	4000		160
	276.30	14663	12765	11494	10474	7144	5803	10.9	4000		160
	319.69	14833	12912	11628	10596	7350	5970	10.9	4000		160
	354.29	14833	12912	11628	10596	7350	5970	10.9	4000		160
	400.27	16020	13946	12559	11444	7806	6340	10.9	4000		160
	462.78	14833	12912	11628	10596	7350	5970	10.9	4000		160
	505.31	14833	12912	11628	10596	7350	5970	10.9	4000		160
	545.42	14663	12765	11494	10474	7144	5803	10.9	4000		160
	634.35	14663	12765	11494	10474	7144	5803	10.9	4000		160
	792.45	16020	13946	12559	11444	7806	6340	10.9	4000		160
	909.56	14833	12912	11628	10596	7350	5970	10.9	4000		160
	1062.86	13251	11536	10388	9466	6457	5244	10.9	4000		160
	1157.33	13251	11536	10388	9466	6457	5244	10.9	4000		160
	1488.00	13251	11536	10388	9466	6457	5244	10.9	4000		160
	1913.14	13251	11536	10388	9466	6457	5244	10.9	4000		160

$$T_{2max}=1.2 \cdot T_{n2}(n_2 \cdot h=10000)$$

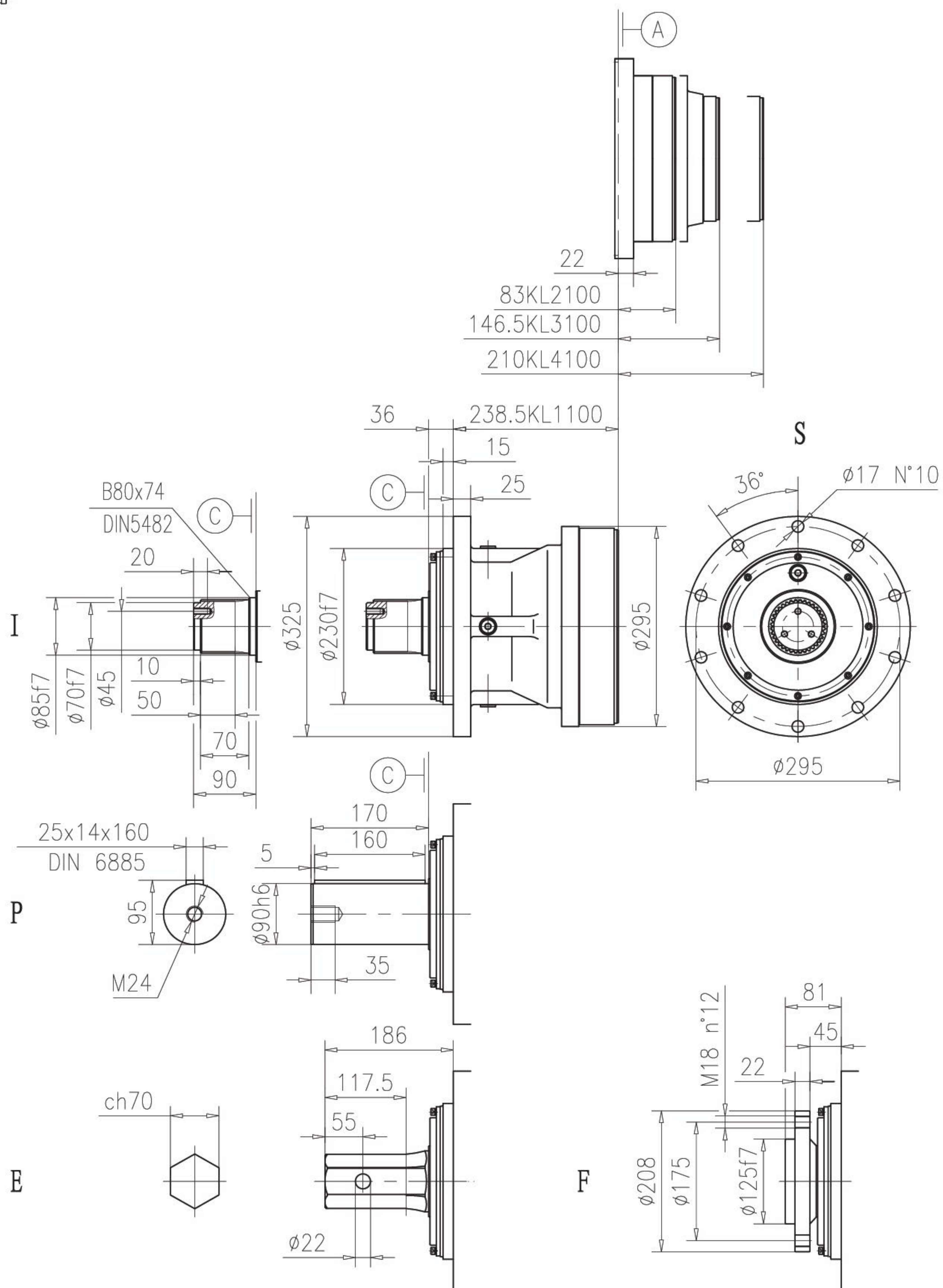
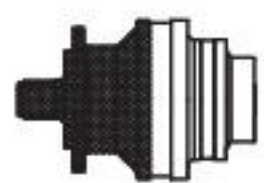
T₂=10000 Nm

KR100

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	10.77	4532	4532	4532	4532	4532	4532	20.5	3500	520	
	11.62	4894	4894	4894	4894	4894	4894	20.5	3500	520	
	12.69	5348	5348	5348	5348	5348	5348	20.5	3500	520	
	17.65	6781	6781	6781	6781	5707	4636	20.5	3500	520	
	19.73	6674	6674	6674	6674	5707	4636	20.5	3500	430	
	25.80	7714	7714	7714	7210	4918	3994	20.5	3500	430	
R3	37.69	14833	12912	11628	10596	7350	5970	11.5	3500	520	
	40.68	14833	12912	11628	10596	7350	5970	11.5	3500	520	
	44.42	14833	12912	11628	10596	7350	5970	11.5	3500	430	
	47.95	16020	13946	12559	11444	7806	6340	11.5	3500	430	
	52.36	14663	12765	11494	10474	7144	5803	11.5	3500	340	
	58.02	14663	12765	11494	10474	7144	5803	11.5	3500	340	
	72.67	13251	11536	10388	9466	6457	5244	11.5	3500	250	
	80.70	13251	11536	10388	9466	6457	5244	11.5	3500	250	
	90.18	13251	11536	10388	9466	6457	5244	11.5	3500	250	
	104.73	13251	11536	10388	9466	6457	5244	11.5	3500	160	
	143.02	11713	10197	9182	8367	5707	4636	11.5	3500	160	
	166.09	10093	8786	7912	7210	4918	3994	11.5	3500	160	
	187.05	10093	8786	7912	7210	4918	3994	11.5	3500	160	
R4	142.30	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	153.47	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	171.65	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	180.70	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	235.33	16020	13946	12559	11444	7806	6340	10.7	3500	160	
	252.42	16020	13946	12559	11444	7806	6340	10.7	3500	160	
	308.81	16020	13946	12559	11444	7806	6340	10.7	3500	160	
	354.33	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	400.46	14833	12912	11628	10596	7350	5970	10.7	3500	160	
	422.34	14663	12765	11494	10474	7144	5803	10.7	3500	160	
	454.78	14663	12765	11494	10474	7144	5803	10.7	3500	160	
	504.00	14663	12765	11494	10474	7144	5803	10.7	3500	160	
	589.06	13251	11536	10388	9466	6457	5244	10.7	3500	160	
	631.27	13251	11536	10388	9466	6457	5244	10.7	3500	160	
	670.73	16020	13946	12559	11444	7806	6340	10.7	3500	160	
	732.38	14663	12765	11494	10474	7144	5803	10.7	3500	160	
	828.55	11713	10197	9182	8367	5707	4636	10.7	3500	160	
	914.06	13251	11536	10388	9466	6457	5244	10.7	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

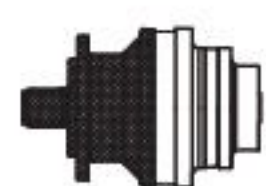
KL100



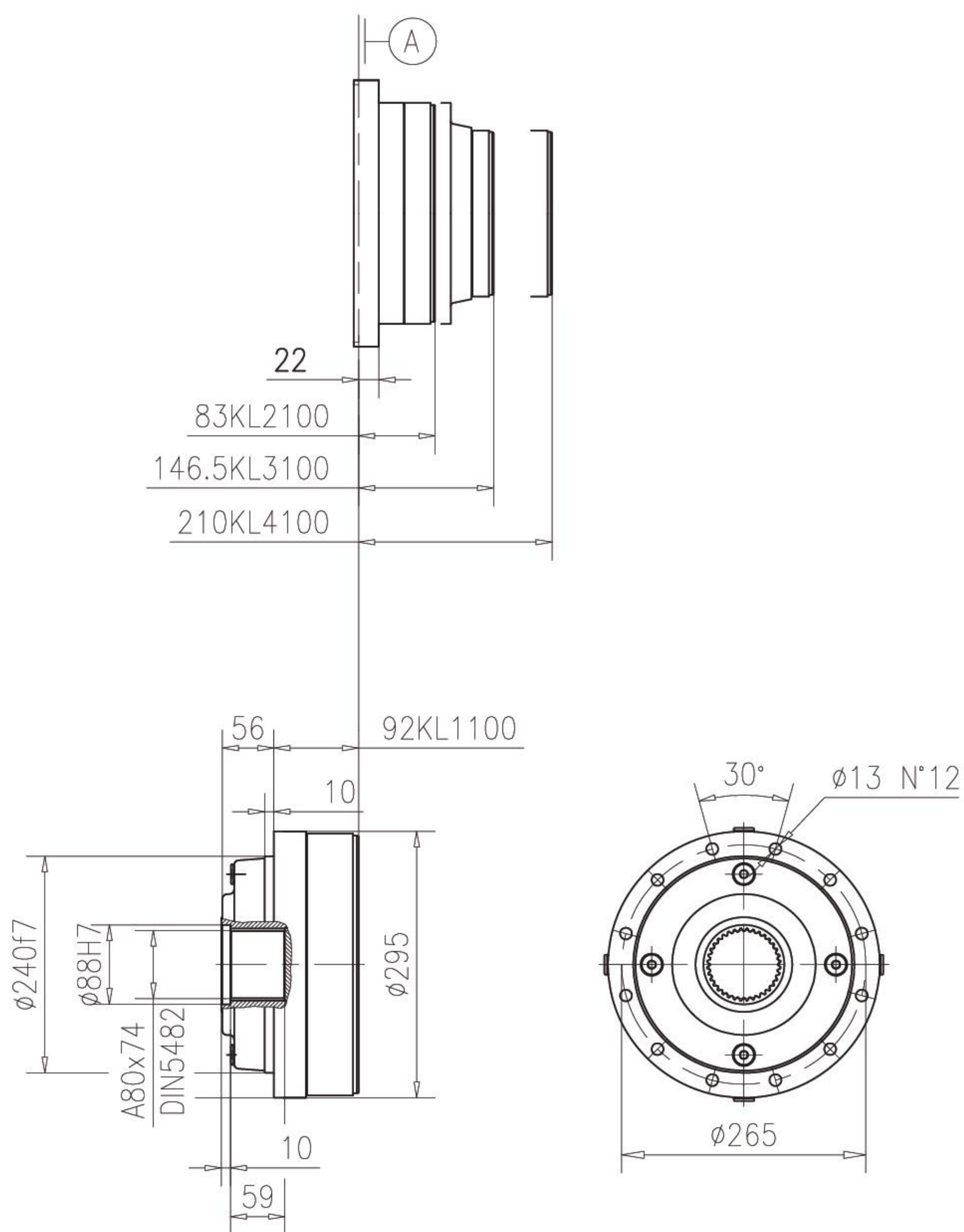
A technical drawing of a bolt and nut assembly. The bolt is shown in profile, with a hexagonal head and a threaded shank. The nut is shown in profile, with a hexagonal shape and a threaded bore. The bolt is inserted into the nut, and the threads are shown meshing. The drawing is a black and white line drawing with no shading.



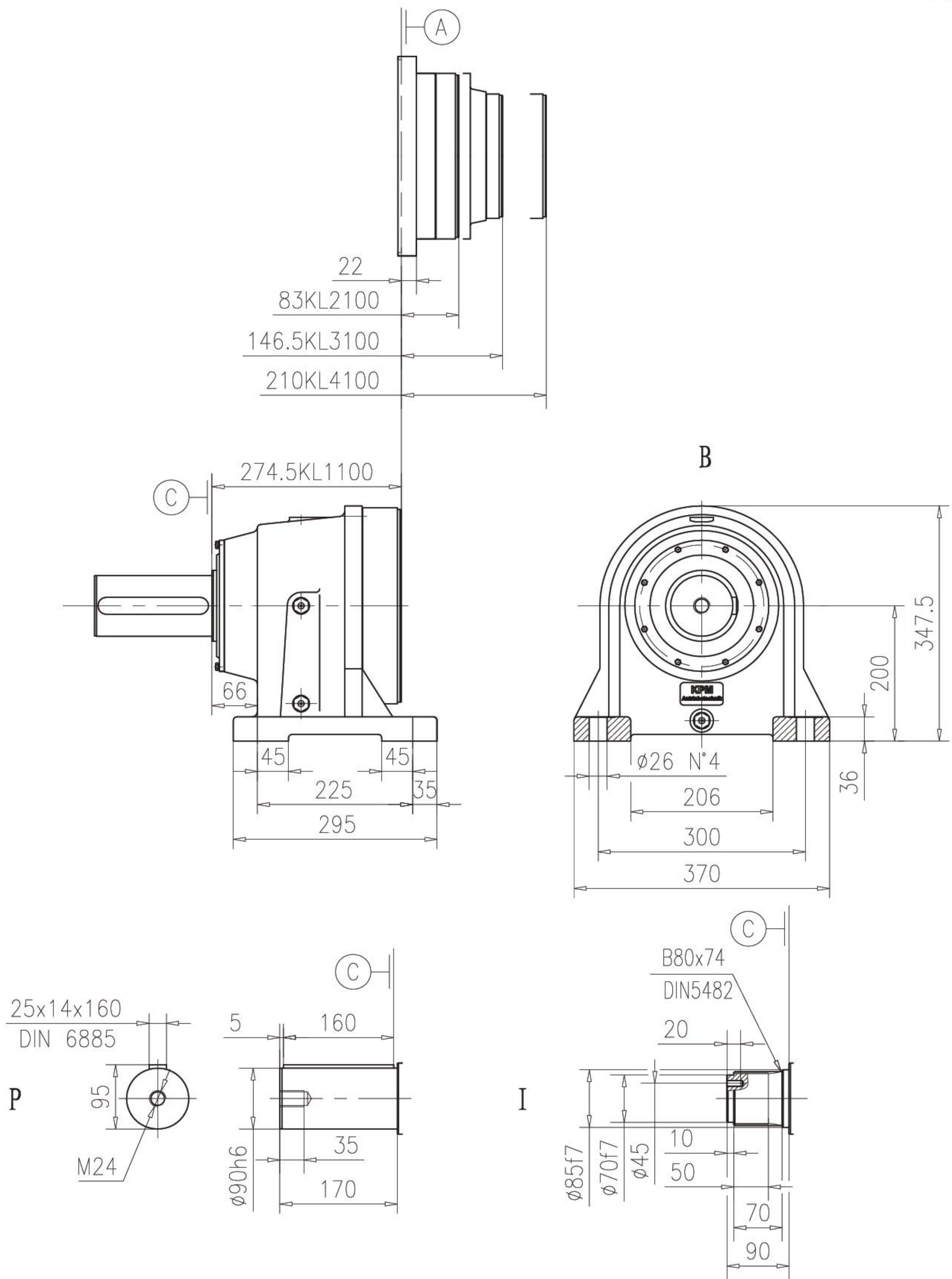
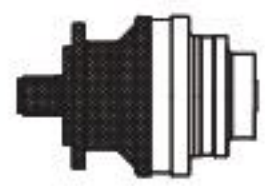
KL100



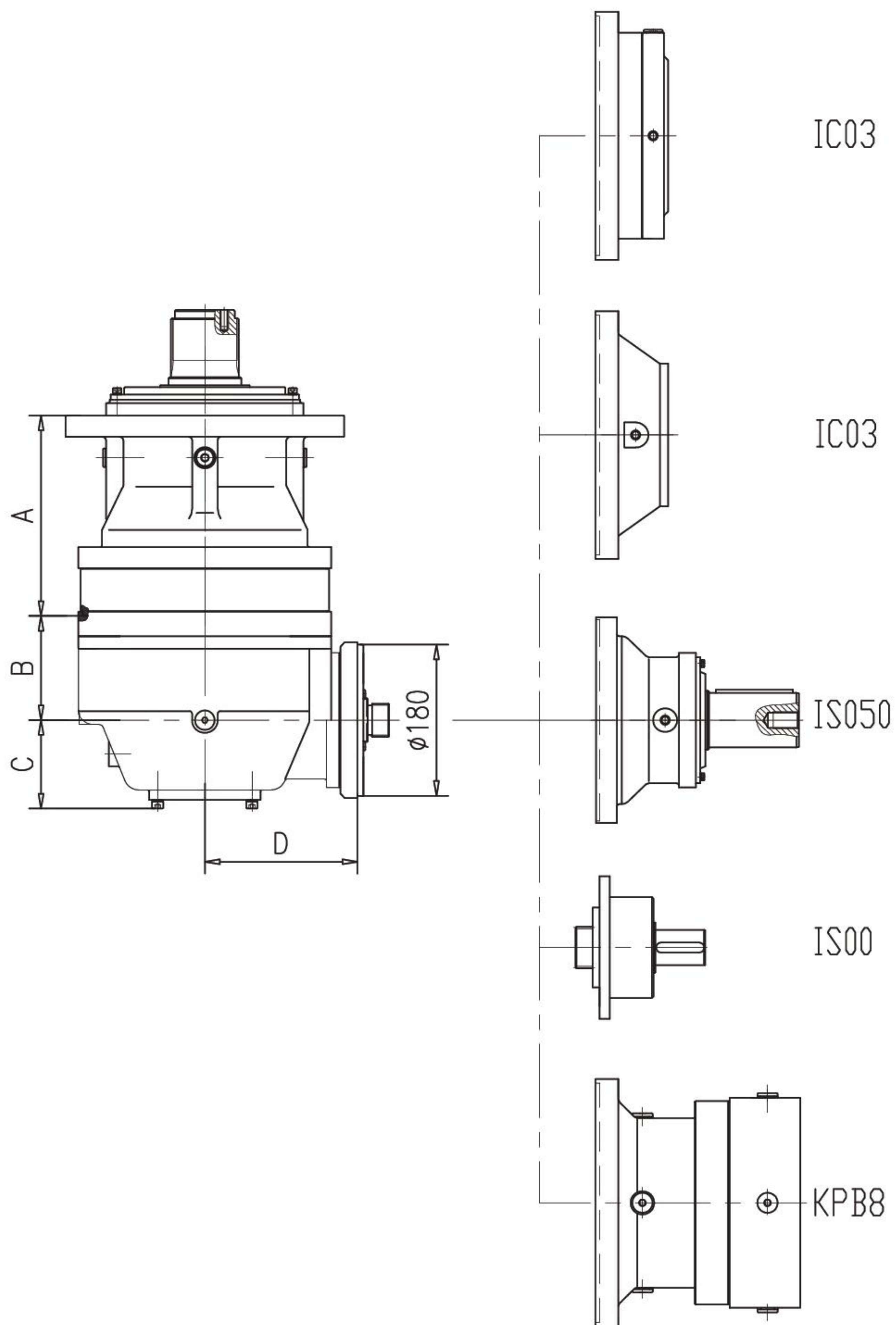
H



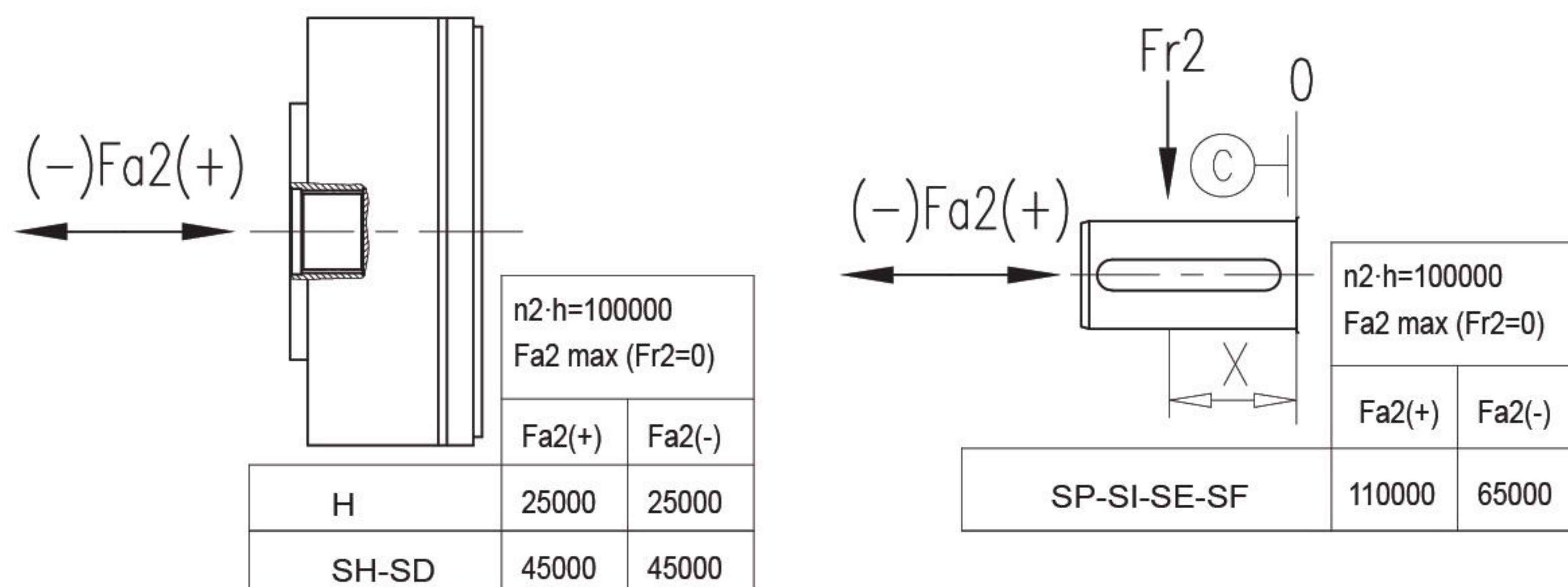
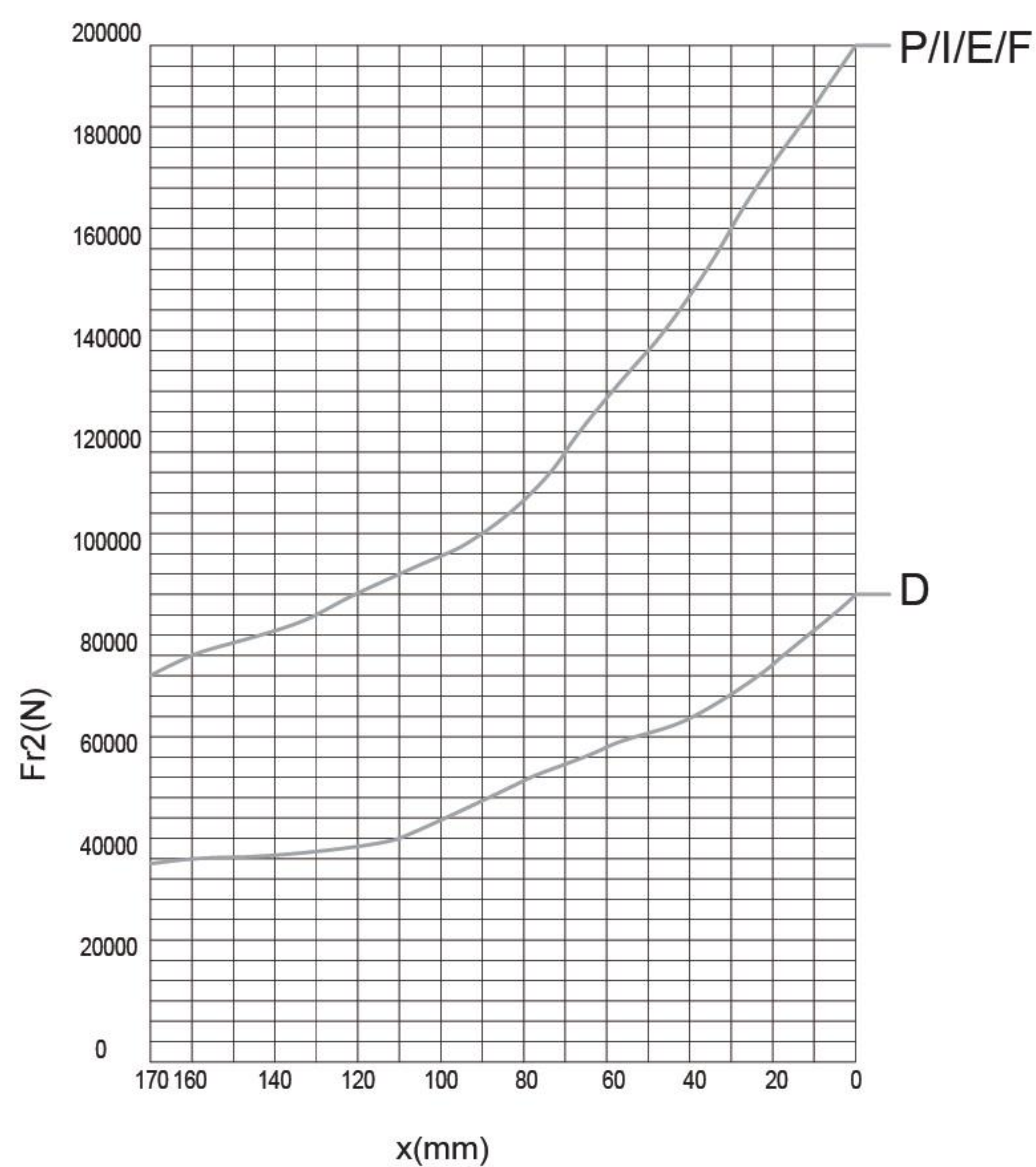
KL100



KR100



	A									B	C	D
	SP	SI	SE	SF	SD	SH	H	BP	BI			
KR 2100	238.5	238.5	238.5	238.5	212	212	92	274.5	274.5	124	105	185
KR 3100	321.5	321.5	321.5	321.5	295	295	175	357.5	357.5	122	105	185
KR 4100	385	385	385	385	358.5	358.5	238.5	421	421	90	81.5	134.5



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL160
T₂ = 16000Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.72	20470	17821	16048	15040	13048	10599	33	2400		
	4.09	22508	19594	17645	16537	14814	12033	33	2400		
	4.58	20100	17498	15757	14768	13229	10745	33	2400		
	5.25	17535	15265	13746	12883	11541	9374	33	2400		
	6.23	14777	12864	11584	10856	9726	7899	33	2400		
L2	13.02	17984	17027	16048	15040	13048	10599	21	3100		
	14.32	19772	18721	17645	16537	14814	12033	21	3100		
	16.88	22508	19594	17645	16537	14814	12033	21	3100		
	18.70	22061	19594	17645	16537	14073	11411	21	3100		
	21.14	19501	18492	17645	16537	12440	10087	21	3100		1140
	21.81	14777	12864	11584	10856	9726	7899	21	3100		875
	27.47	18816	17498	15757	14768	12003	9733	21	3100		875
	33.20	15572	14767	14230	13961	9934	8054	21	3100		610
	38.06	17535	15265	13746	12883	11387	9233	21	3100		520
	45.17	14777	12864	11584	10856	9726	7899	21	3100		430
L3	44.27	17798	17027	16048	15040	13048	10599	16.1	4000		520
	56.21	20470	17821	16048	15040	13048	10599	16.1	4000		430
	71.59	19772	18721	17645	16537	14814	12033	16.1	4000		340
	80.44	20100	17498	15757	14768	13229	10745	16.1	4000		340
	89.00	20470	17821	16048	15040	13048	10599	16.1	4000		340
	93.51	22061	19594	17645	16537	14073	11411	16.1	4000		340
	109.55	20100	17498	15757	14768	13229	10745	16.1	4000		250
	121.41	20100	17498	15757	14768	13229	10745	16.1	4000		250
	147.95	19501	18492	17645	16537	12440	10087	16.1	4000		160
	157.33	17535	15265	13746	12883	11541	9374	16.1	4000		160
	165.61	20100	17498	15757	14768	13229	10745	16.1	4000		160
	171.82	16803	15934	15355	15065	10719	8691	16.1	4000		160
	189.88	17535	15265	13746	12883	11541	9374	16.1	4000		160
	207.61	13906	13187	12707	12467	8871	7193	16.1	4000		160
	220.50	17535	15265	13746	12883	11541	9374	16.1	4000		160
	232.38	15572	14767	14230	13961	9934	8054	16.1	4000		160
	247.26	18816	17498	15757	14768	12003	9733	16.1	4000		160
	298.78	15572	14767	14230	13961	9934	8054	16.1	4000		160
	342.56	17535	15265	13746	12883	11387	9233	16.1	4000		160
L4	216.19	22061	19594	17645	16537	14073	11411	10.7	4000		160
	256.06	20065	17821	16048	15040	12800	10379	10.7	4000		160
	281.33	20470	17821	16048	15040	13048	10599	10.7	4000		160
	311.77	20065	17821	16048	15040	12800	10379	10.7	4000		160
	358.88	22508	19594	17645	16537	14814	12033	10.7	4000		160
	401.63	22508	19594	17645	16537	14814	12033	10.7	4000		160
	463.50	20100	17498	15757	14768	13229	10745	10.7	4000		160
	506.39	20470	17821	16048	15040	13048	10599	10.7	4000		160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

T₂ = 16000Nm

KL160

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L4	567.68	22508	19594	17645	16537	14814	12033	10.7	4000	160	
	654.55	22061	19594	17645	16537	14073	11411	10.7	4000	160	
	711.03	19501	18492	17645	16537	12440	10087	10.7	4000	160	
	801.01	20470	17821	16048	15040	13048	10599	10.7	4000	160	
	906.19	15283	14493	13966	13702	9750	7905	10.7	4000	160	
	1003.28	17737	16819	16048	15040	11315	9174	10.7	4000	160	
	1103.32	19501	18492	17645	16537	12440	10087	10.7	4000	160	
	1234.94	20100	17498	15757	14768	13229	10745	10.7	4000	160	
	1331.59	19501	18492	17645	16537	12440	10087	10.7	4000	160	
	1415.93	17535	15265	13746	12883	11541	9374	10.7	4000	160	
	1543.50	17535	15265	13746	12883	11541	9374	10.7	4000	160	
	1644.30	17535	15265	13746	12883	11541	9374	10.7	4000	160	
	1730.84	18816	17498	15757	14768	12003	9733	10.7	4000	160	
	1944.00	17535	15265	13746	12883	11541	9374	10.7	4000	160	
	2091.43	15572	14767	14230	13961	9934	8054	10.7	4000	160	
	2225.37	18816	17498	15757	14768	12003	9733	10.7	4000	160	

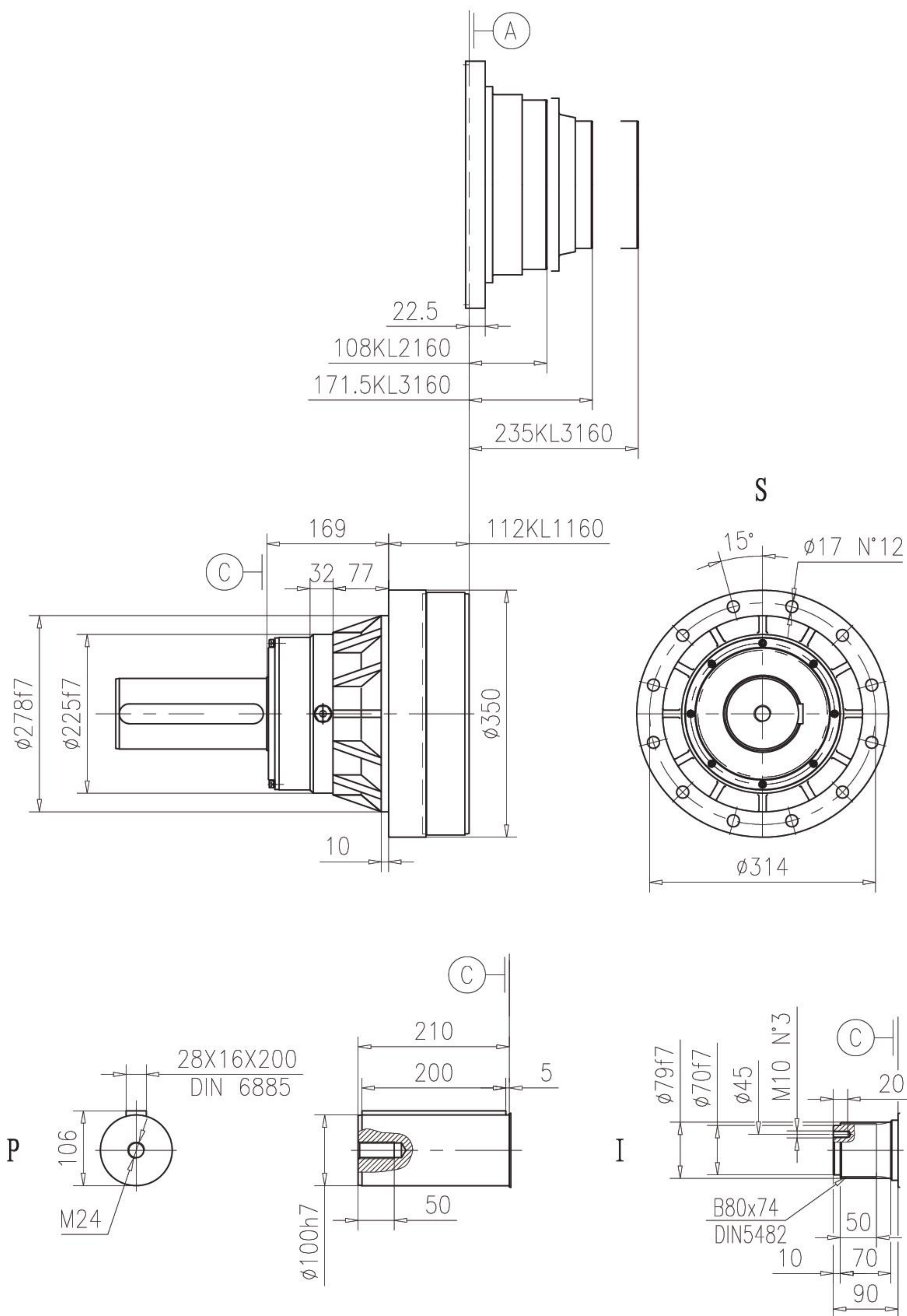
$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

KL160
T₂ = 16000Nm

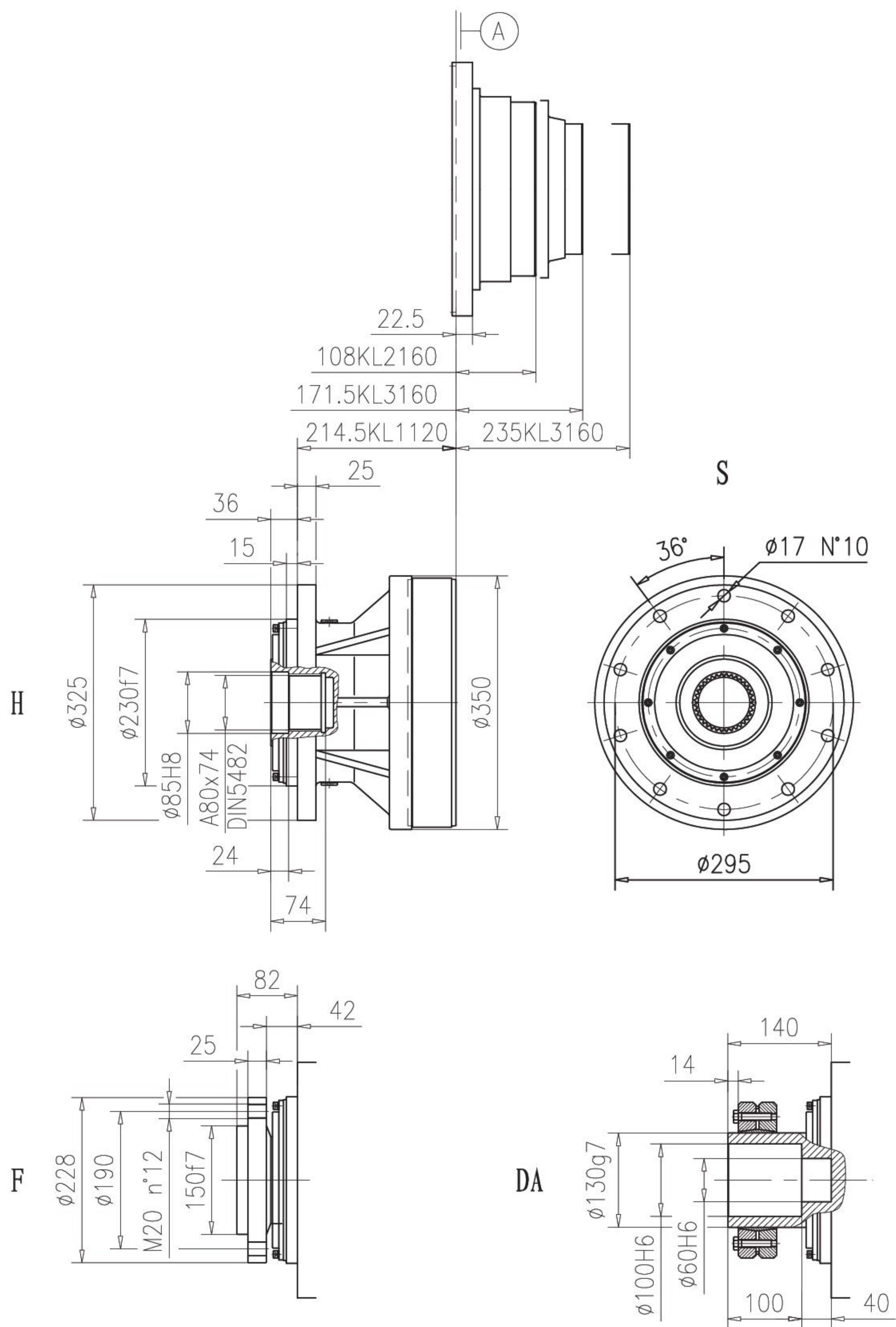
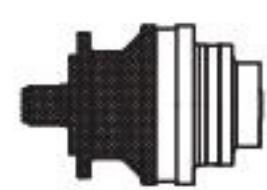
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	11.73	6567	6567	6567	6567	6567	6567	20.5	3500	700	
	12.90	7220	7220	7220	7220	7220	7220	20.5	3500	700	
	14.44	8086	8086	8086	8086	8086	8086	20.5	3500	700	
	16.03	8193	8193	8193	8193	8193	8193	20.5	3500	610	
	18.38	9391	9391	9391	9391	9391	9374	20.5	3500	610	
	20.52	9268	9268	9268	9268	9268	9268	20.5	3500	610	
	21.81	11144	11144	11144	10856	9726	7899	20.5	3500	610	
	24.36	10998	10998	10998	10856	9726	7899	20.5	3500	610	
	28.04	11509	11509	11509	10856	9726	7899	20.5	3500	520	
R3	40.06	16858	16858	16048	15040	13048	10599	11.5	3500	520	
	47.22	19893	17821	16048	15040	13048	10599	11.5	3500	520	
	51.92	21871	19594	17645	16537	14814	12033	11.5	3500	520	
	57.54	22061	19594	17645	16537	14073	11411	11.5	3500	520	
	65.03	19501	18492	17645	16537	12440	10087	11.5	3500	430	
	72.79	20100	17498	15757	14768	13229	10745	11.5	3500	340	
	80.70	19501	18492	17645	16537	12440	10087	11.5	3500	340	
	90.33	20100	17498	15757	14768	13229	10745	11.5	3500	340	
	103.57	17535	15265	13746	12883	11541	9374	11.5	3500	250	
	113.42	15572	14767	14230	13961	9934	8054	11.5	3500	250	
	130.05	17535	15265	13746	12883	11387	9233	11.5	3500	160	
	145.33	17535	15265	13746	12883	11387	9233	11.5	3500	160	
	172.48	14777	12864	11584	10856	9726	7899	11.5	3500	160	
R4	166.33	19569	18721	17645	16537	14814	12033	10.7	3500	160	
	209.10	20470	17821	16048	15040	13048	10599	10.7	3500	160	
	261.63	20065	17821	16048	15040	12800	10379	10.7	3500	160	
	322.16	22508	19594	17645	16537	14814	12033	10.7	3500	160	
	356.13	22061	19594	17645	16537	14073	11411	10.7	3500	160	
	458.66	17535	15265	13746	12883	11541	9374	10.7	3500	160	
	499.83	22061	19594	17645	16537	14073	11411	10.7	3500	160	
	559.46	20100	17498	15757	14768	13229	10745	10.7	3500	160	
	600.70	17535	15265	13746	12883	11541	9374	10.7	3500	160	
	655.14	20100	17498	15757	14768	13229	10745	10.7	3500	160	
	754.77	16803	15934	15355	15065	10719	8691	10.7	3500	160	
	844.82	18816	17498	15757	14768	12003	9733	10.7	3500	160	
	915.56	20100	17498	15757	14768	13229	10745	10.7	3500	160	
	1020.82	15572	14767	14230	13961	9934	8054	10.7	3500	160	
	1140.78	15572	14767	14230	13961	9934	8054	10.7	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

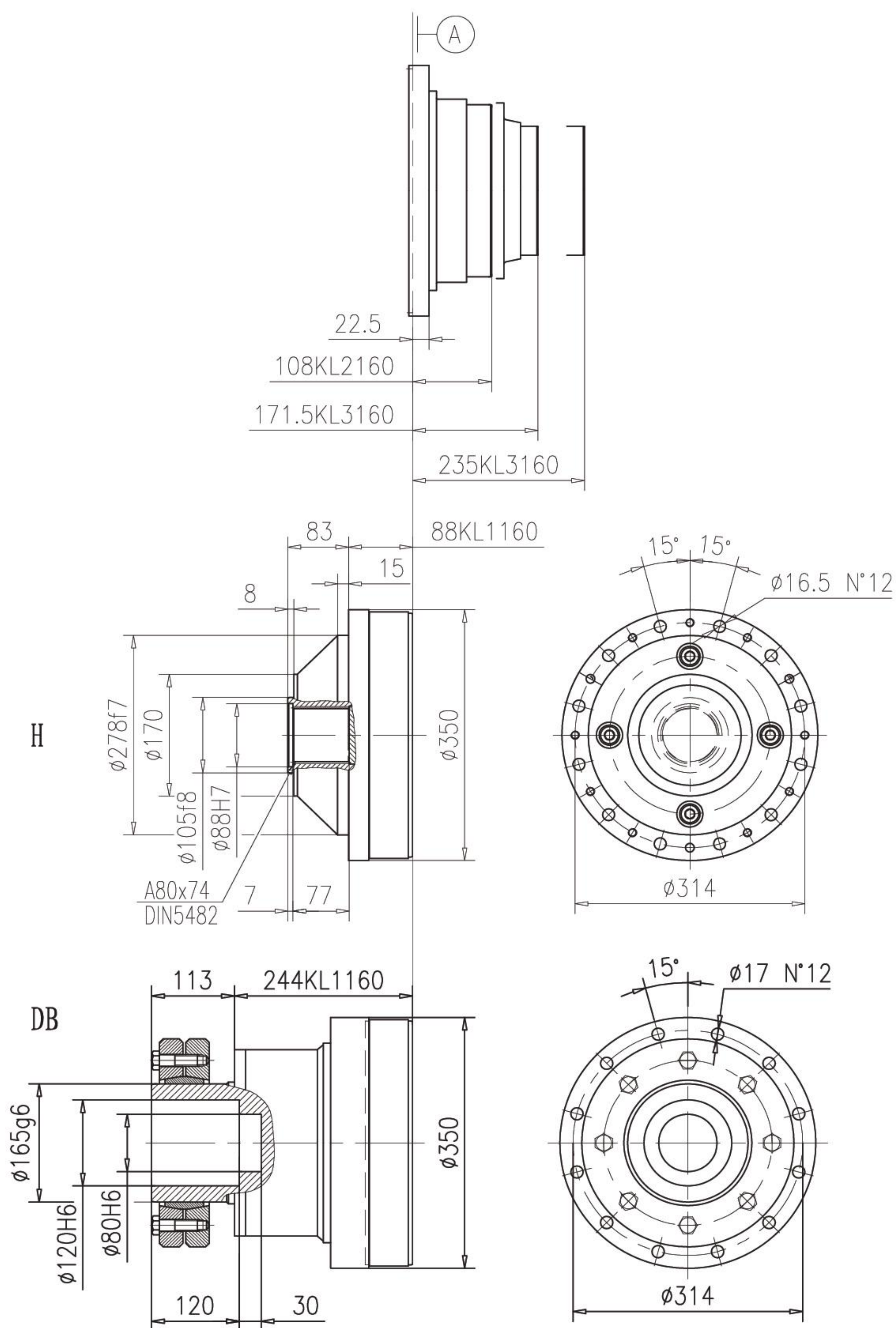
KL160



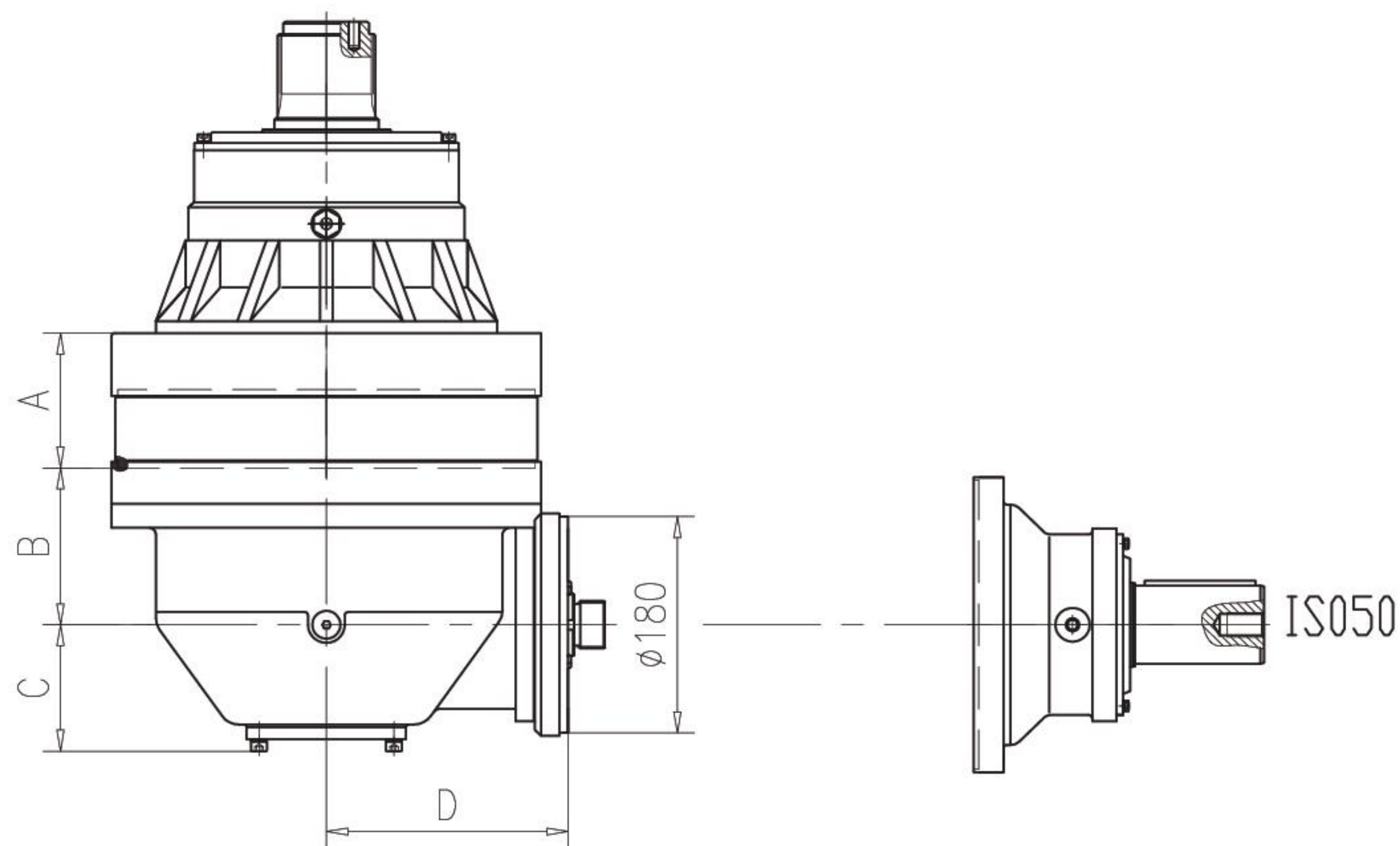
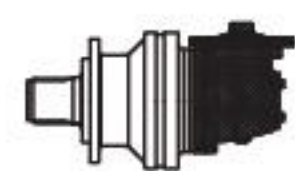
KL160



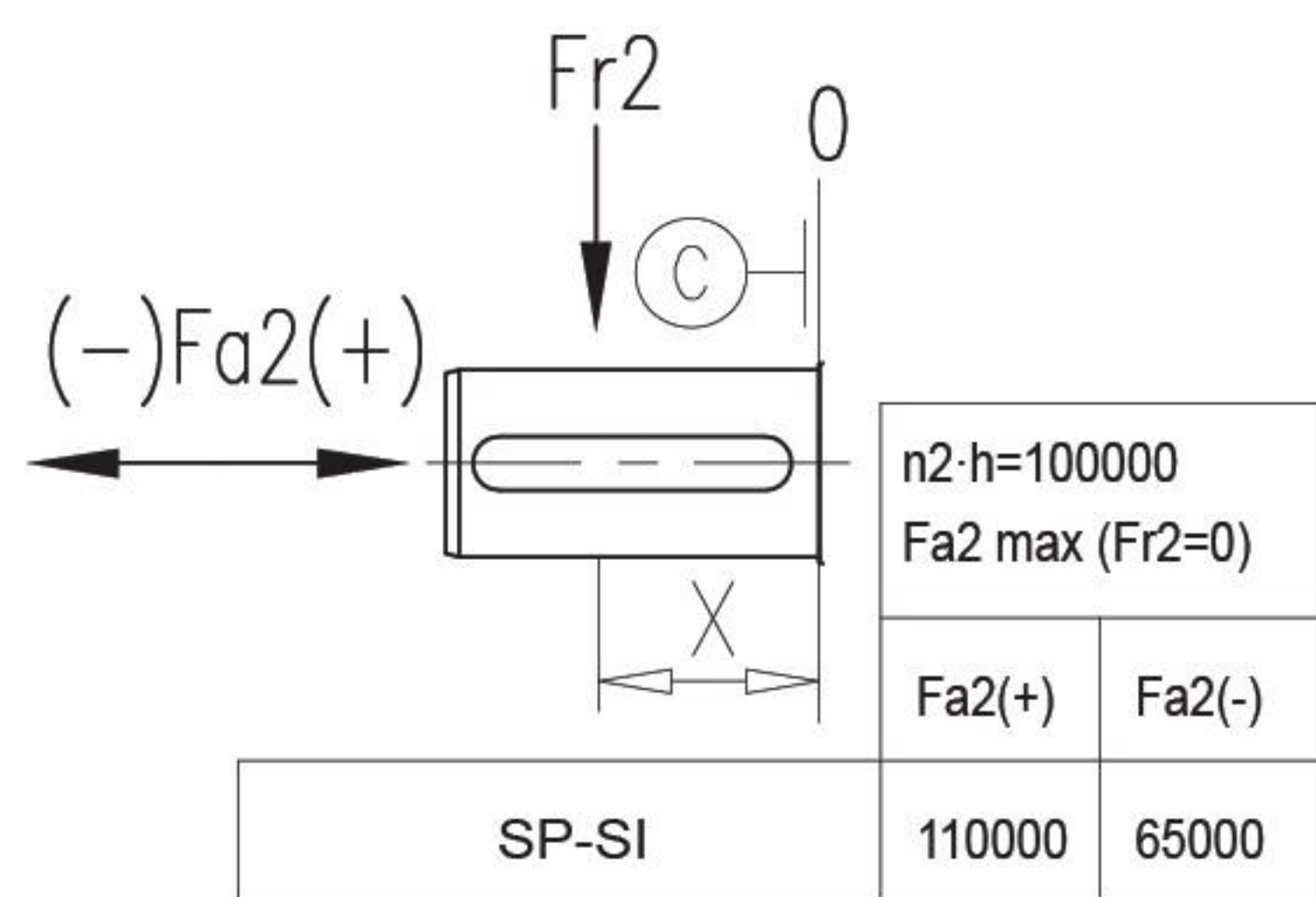
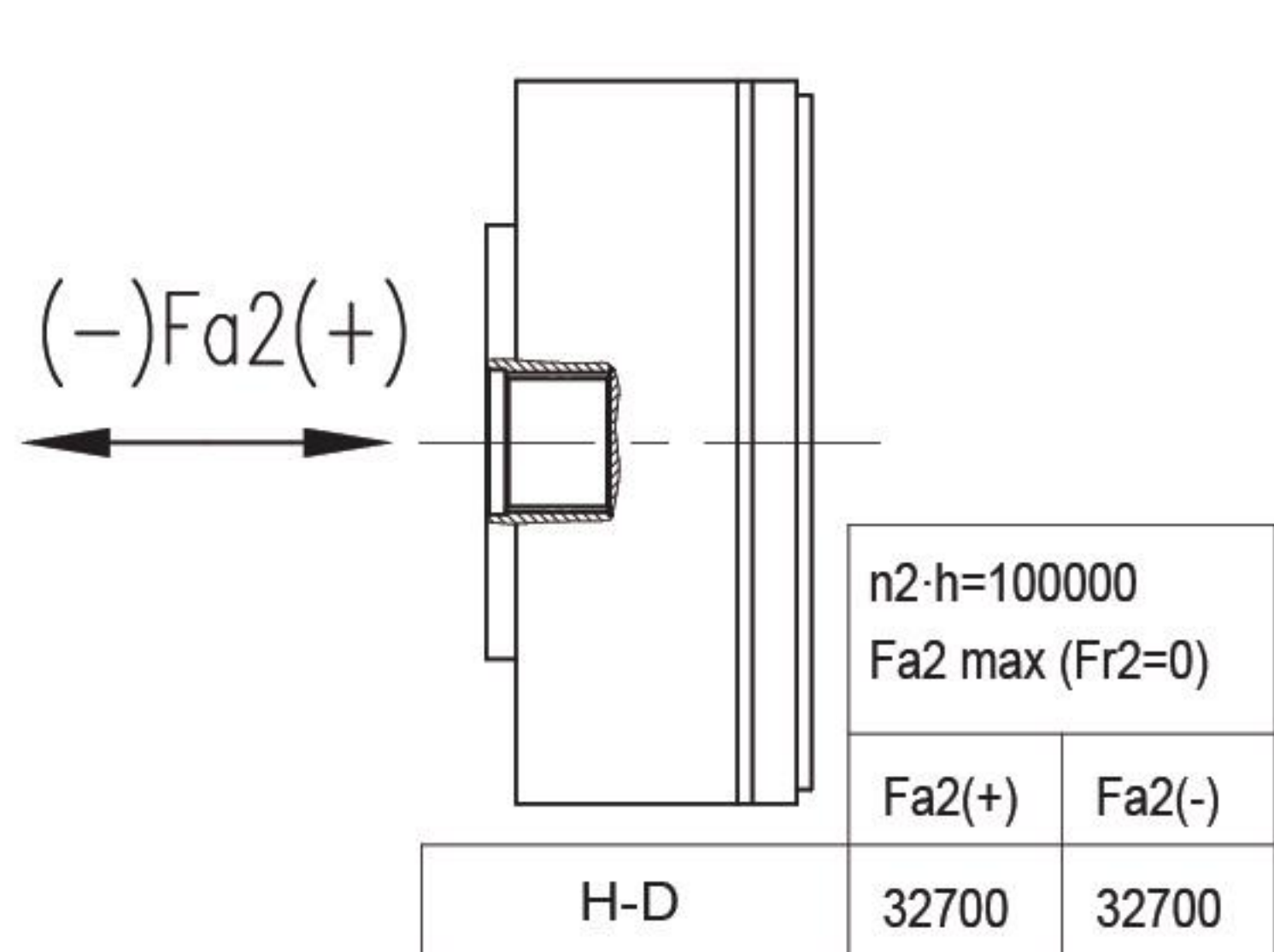
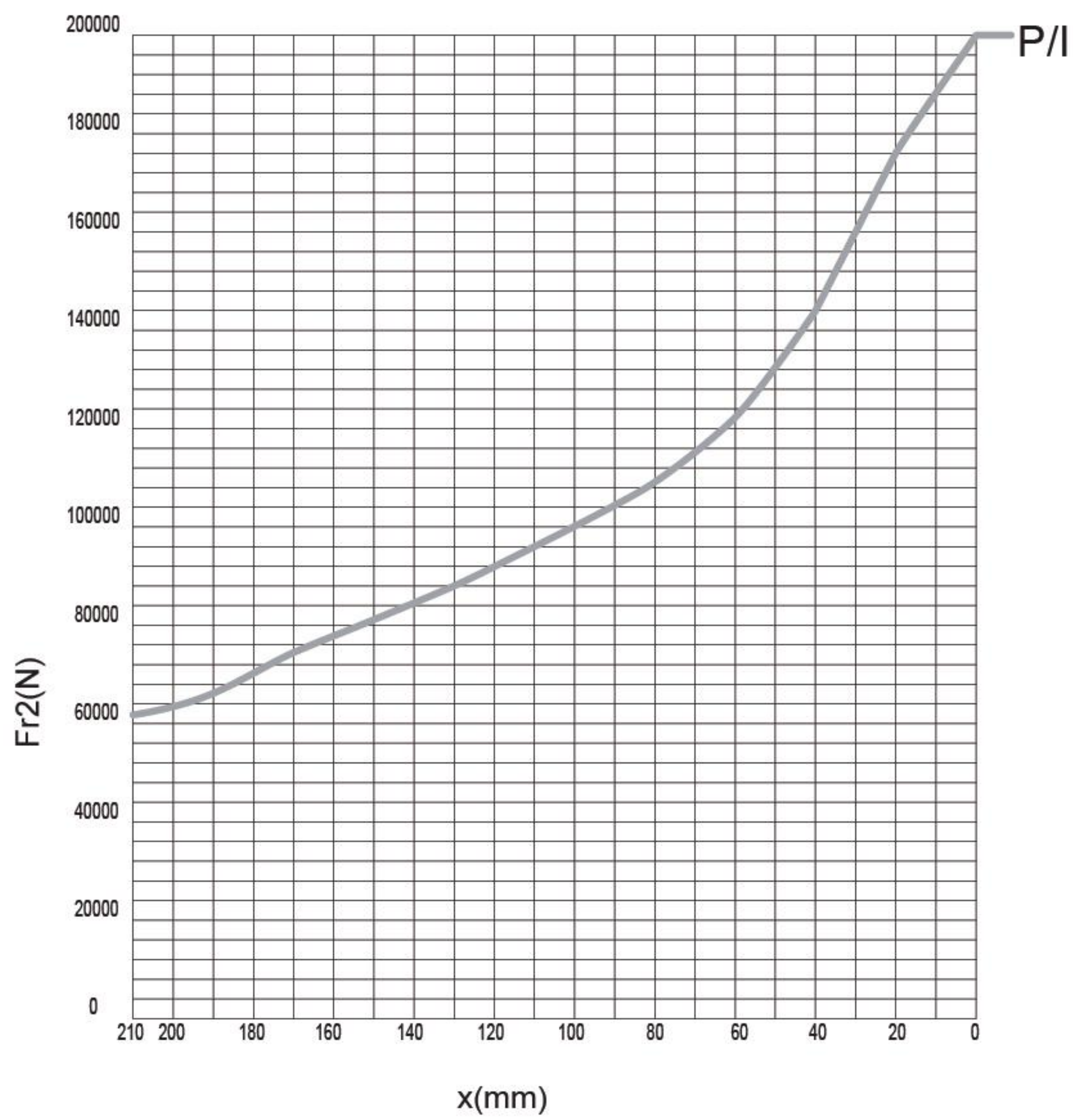
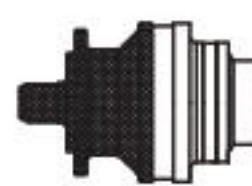
KL160



KR160



	A								B	C	D
	SP	SI	SE	SDB	SDA	SF	SH	H			
KR 2160	112	112	112	214.5	112	214.5	214.5	88	130.5	105	197
KR 3160	220	220	220	322.5	220	322.5	322.5	196	122	105	185
KR 4160	283.5	283.5	283.5	386	283.5	386	386	259.5	90	81.5	134.5



n2·h							
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL260
T₂ = 26000Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.69	33252	33252	29040	23609	14520	11860	35	2200		
	4.04	38335	33007	29499	26640	16504	13385	35	2200		
	4.50	34417	29633	26483	23917	14817	12017	35	2200		
	5.12	30249	26045	23276	21021	13022	10562	35	2200		
	6.00	25813	22225	19863	17938	11113	9013	35	2200		
L2	14.15	34324	32828	29499	26640	16504	13385	22	3000		
	16.68	38335	33007	29499	26640	16504	13385	22	3000		
	21.11	30249	26045	23276	21021	13022	10562	22	3000		
	26.44	30249	26045	23276	21021	13022	10562	22	3000		
	30.71	30249	26045	23276	21021	13022	10562	22	3000		
	32.63	26379	25324	24797	23917	14817	12017	22	3000		1140
	37.10	30014	26045	23276	21021	13022	10562	22	3000		960
	43.50	25813	22225	19863	17938	11113	9013	22	3000		960
L3	45.23	30553	29225	28561	23609	14520	11860	18	3800		875
	53.31	31350	29984	29040	23609	14520	11860	18	3800		785
	59.08	31350	29984	29040	23609	14520	11860	18	3800		700
	64.97	34417	29633	26483	23917	14817	12017	18	3800		700
	76.25	38335	33007	29499	26640	16504	13385	18	3800		520
	86.18	38335	33007	29499	26640	16504	13385	18	3800		430
	95.50	37489	33007	29499	26640	16504	13385	18	3800		340
	106.29	34417	29633	26483	23917	14817	12017	18	3800		340
	114.46	30334	29120	28514	23609	14520	11860	18	3800		340
	125.35	33211	31882	29499	26640	16504	13385	18	3800		250
	138.31	30334	29120	28514	23609	14520	11860	18	3800		250
	149.14	34417	29633	26483	23917	14817	12017	18	3800		250
	158.65	30249	26045	23276	21021	13022	10562	18	3800		250
	168.56	34417	29633	26483	23917	14817	12017	18	3800		250
	184.24	30249	26045	23276	21021	13022	10562	18	3800		250
	195.75	31875	29633	26483	23917	14817	12017	18	3800		160
	222.62	30249	26045	23276	21021	13022	10562	18	3800		160
	236.53	26379	25324	24797	23917	14817	12017	18	3800		160
	269.00	30014	26045	23276	21021	13022	10562	18	3800		160
L4	295.69	30789	29196	28134	23609	14520	11860	11	4000		160
	304.70	38335	33007	29499	26640	16504	13385	11	4000		160
	350.18	37489	33007	29499	26640	16504	13385	11	4000		160
	403.83	33252	32870	29040	23609	14520	11860	11	4000		160
	499.82	38335	33007	29499	26640	16504	13385	11	4000		160
	550.85	33252	33252	29040	23609	14520	11860	11	4000		160
	603.24	38335	33007	29499	26640	16504	13385	11	4000		160
	655.85	21956	20820	20063	19684	14520	11860	11	4000		160
	700.53	34274	32501	29499	26640	16504	13385	11	4000		160
	755.57	33211	31882	29499	26640	16504	13385	11	4000		160
	801.23	30334	29120	28514	23609	14520	11860	11	4000		160
	877.43	33211	31882	29499	26640	16504	13385	11	4000		160
	900.69	34274	32501	29499	26640	16504	13385	11	4000		160
	998.16	37489	33007	29499	26640	16504	13385	11	4000		160
	1110.86	34417	29633	26483	23917	14817	12017	11	4000		160
	1206.11	31387	29763	28681	26640	16504	13385	11	4000		160
	1342.29	34417	29633	26483	23917	14817	12017	11	4000		160
	1526.52	30249	26045	23276	21021	13022	10562	11	4000		160
	1725.29	30249	26045	23276	21021	13022	10562	11	4000		160
	2003.56	30249	26045	23276	21021	13022	10562	11	4000		160

$$T_{2max} = 1.2 \cdot T_{n2}(n_{2 \cdot h} = 10000)$$

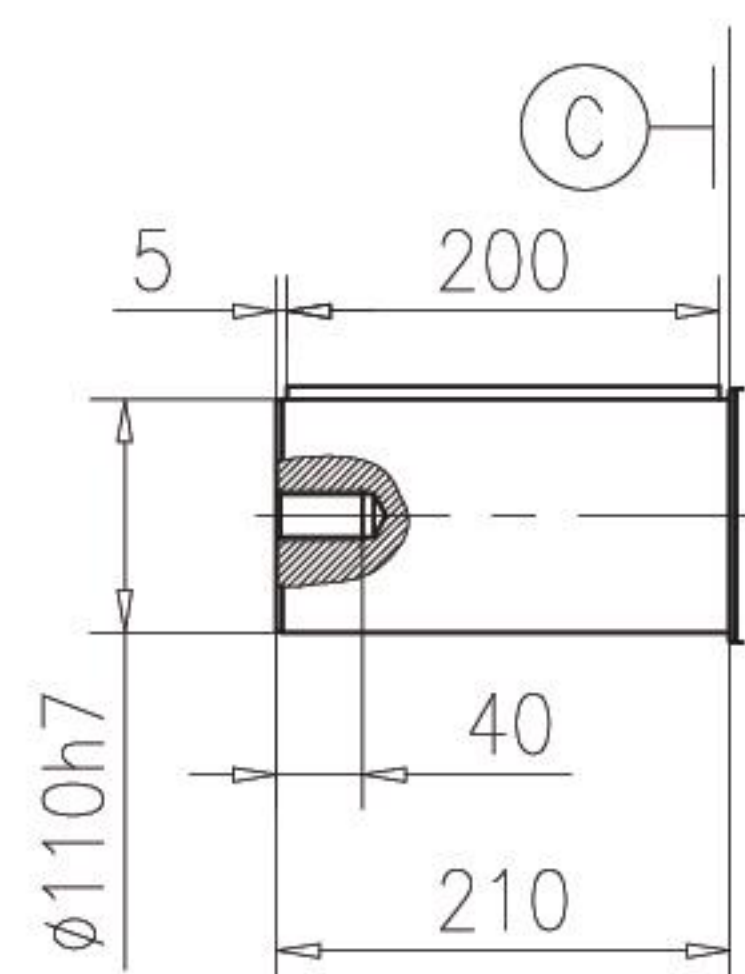
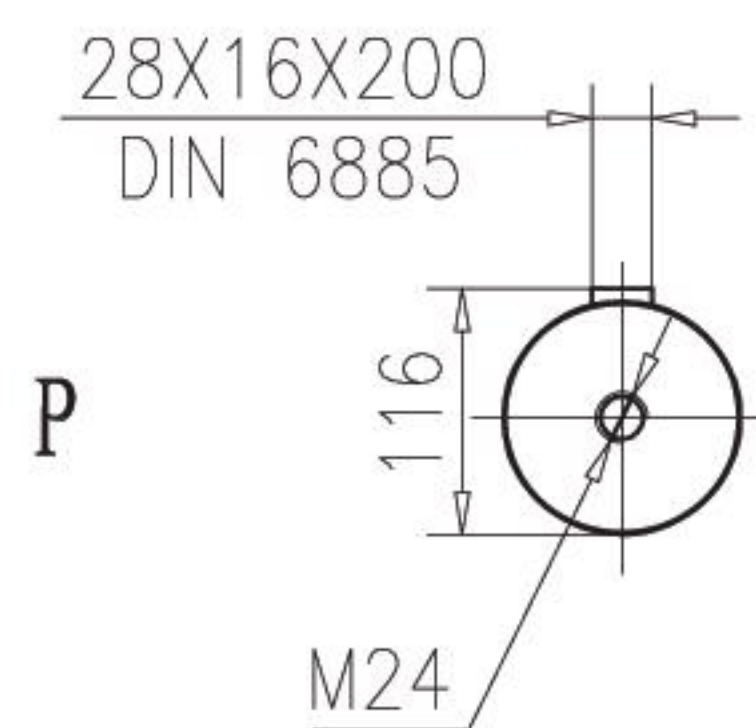
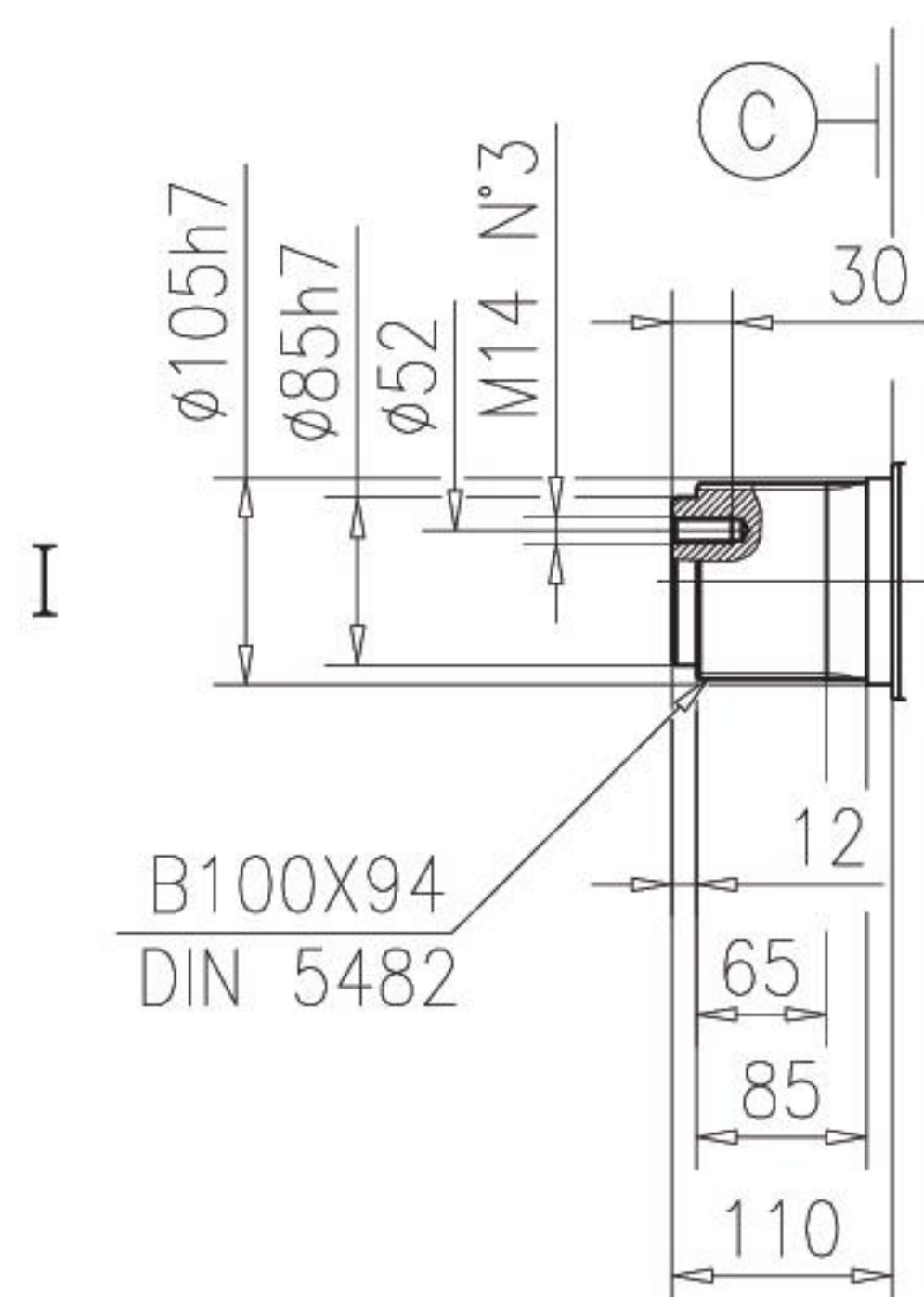
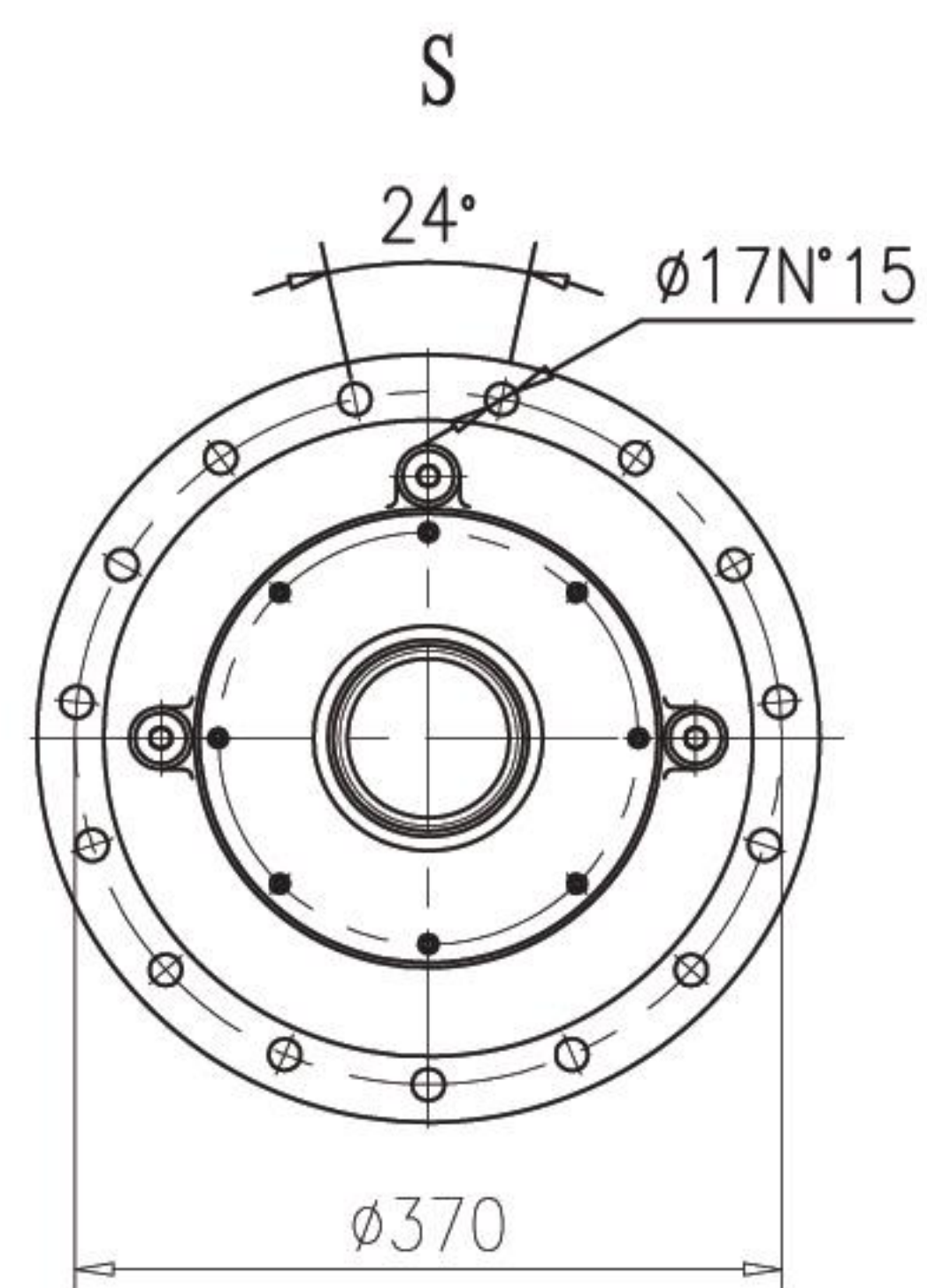
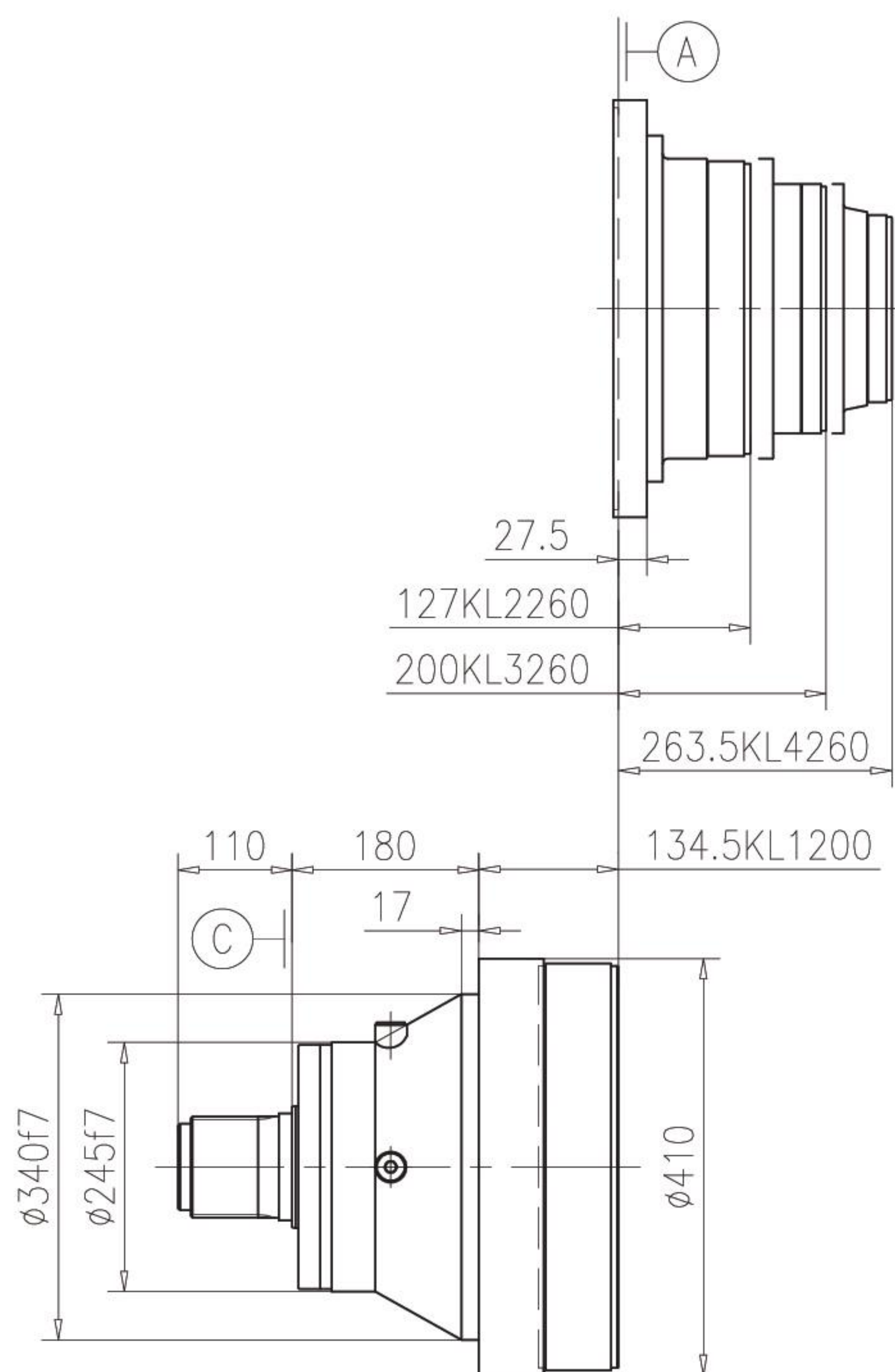
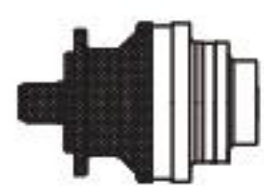
T₂ = 26000Nm

KR260

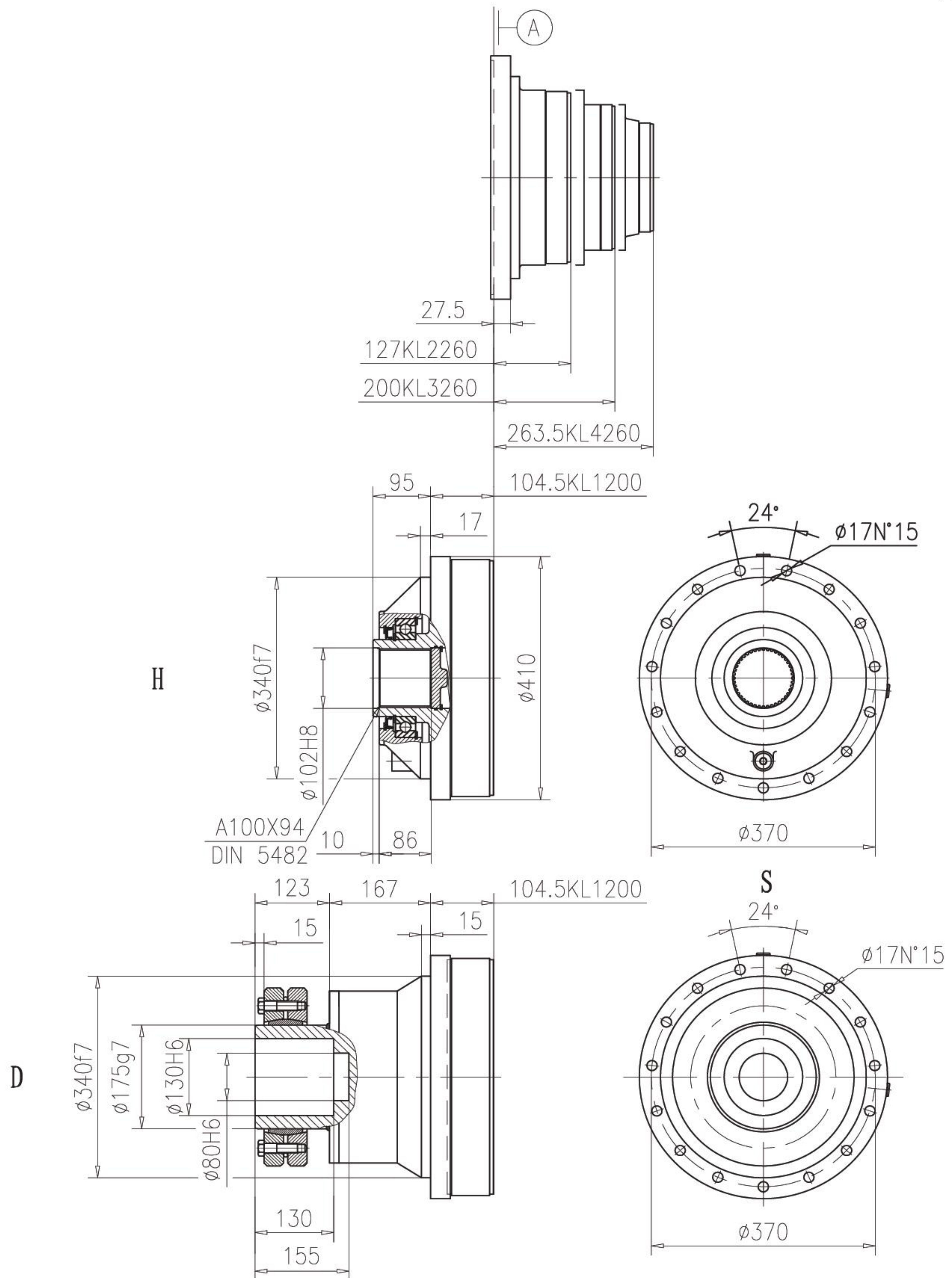
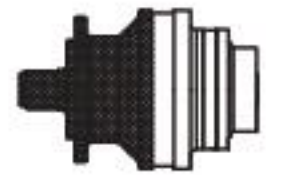
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R2	11.64	10942	10942	10942	10942	10942	10942	55	2500	1140	
	12.75	11980	11980	11980	11980	11980	11980	55	2500	1140	
	14.19	13344	13344	13344	13344	13344	12017	55	2500	1140	
	16.14	15182	15182	15182	15182	13022	10562	55	2500	1140	
	17.91	15562	15562	15562	15562	13022	10562	55	2500	1140	
	18.92	17792	17792	17792	17792	11113	9013	55	2500	1140	
	21.00	18236	18236	18236	17938	11113	9013	55	2500	1050	
	23.45	17698	17698	17698	17698	11113	9013	55	2500	960	
	27.00	18447	18447	18447	17938	11113	9013	55	2500	875	
R3	39.76	16722	16722	16722	16722	14520	11860	22	3800	520	
	46.86	19732	19732	19732	19732	14520	11860	22	3800	520	
	51.32	21604	21604	21604	21604	16504	13385	22	3800	520	
	64.28	27044	27044	27044	26640	16504	13385	22	3800	520	
	79.44	30517	29633	26483	23917	14817	12017	22	3800	520	
	88.77	30033	29633	26483	23917	14817	12017	22	3800	430	
	94.48	30249	26045	23276	21021	13022	10562	22	3800	430	
	104.91	30249	26045	23276	21021	13022	10562	22	3800	430	
	117.24	30249	26045	23276	21021	13022	10562	22	3800	340	
	126.77	30014	26045	23276	21021	13022	10562	22	3800	340	
	141.67	30014	26045	23276	21021	13022	10562	22	3800	340	
	166.09	25813	22225	19863	17938	11113	9013	22	3800	250	
	187.05	25813	22225	19863	17938	11113	9013	22	3800	250	
R4	139.17	30553	29225	28561	23609	14520	11860	15	4000	250	
	164.02	31350	29984	29040	23609	14520	11860	15	4000	250	
	193.31	33252	33252	29040	23609	14520	11860	15	4000	250	
	214.23	33252	33252	29040	23609	14520	11860	15	4000	250	
	234.61	38335	33007	29499	26640	16504	13385	15	4000	250	
	281.18	31350	29686	28606	23609	14520	11860	15	4000	250	
	300.46	33252	33252	29040	23609	14520	11860	15	4000	160	
	326.30	37489	33007	29499	26640	16504	13385	15	4000	160	
	364.65	37489	33007	29499	26640	16504	13385	15	4000	160	
	405.82	34417	29633	26483	23917	14817	12017	15	4000	160	
	457.03	34417	29633	26483	23917	14817	12017	15	4000	160	
	511.68	37489	33007	29499	26640	16504	13385	15	4000	160	
	569.45	34417	29633	26483	23917	14817	12017	15	4000	160	
	600.96	28617	27472	26900	26614	16504	13385	15	4000	160	
	651.29	33211	31882	29499	26640	16504	13385	15	4000	160	
	703.44	30249	26045	23276	21021	13022	10562	15	4000	160	
	756.33	28617	27472	26900	26614	16504	13385	15	4000	160	
	792.21	30249	26045	23276	21021	13022	10562	15	4000	160	
	849.99	30249	26045	23276	21021	13022	10562	15	4000	160	
	903.12	26379	25324	24797	23917	14817	12017	15	4000	160	
	957.26	30249	26045	23276	21021	13022	10562	15	4000	160	
	1027.08	30014	26045	23276	21021	13022	10562	15	4000	160	
	1204.16	25813	22225	19863	17938	11113	9013	15	4000	160	

$$T_{2max} = 1.2 \cdot T_{n2}(n_{2 \cdot h} = 10000)$$

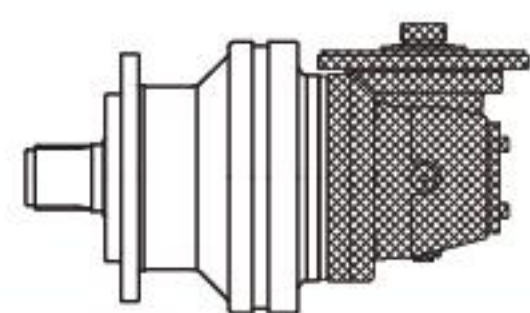
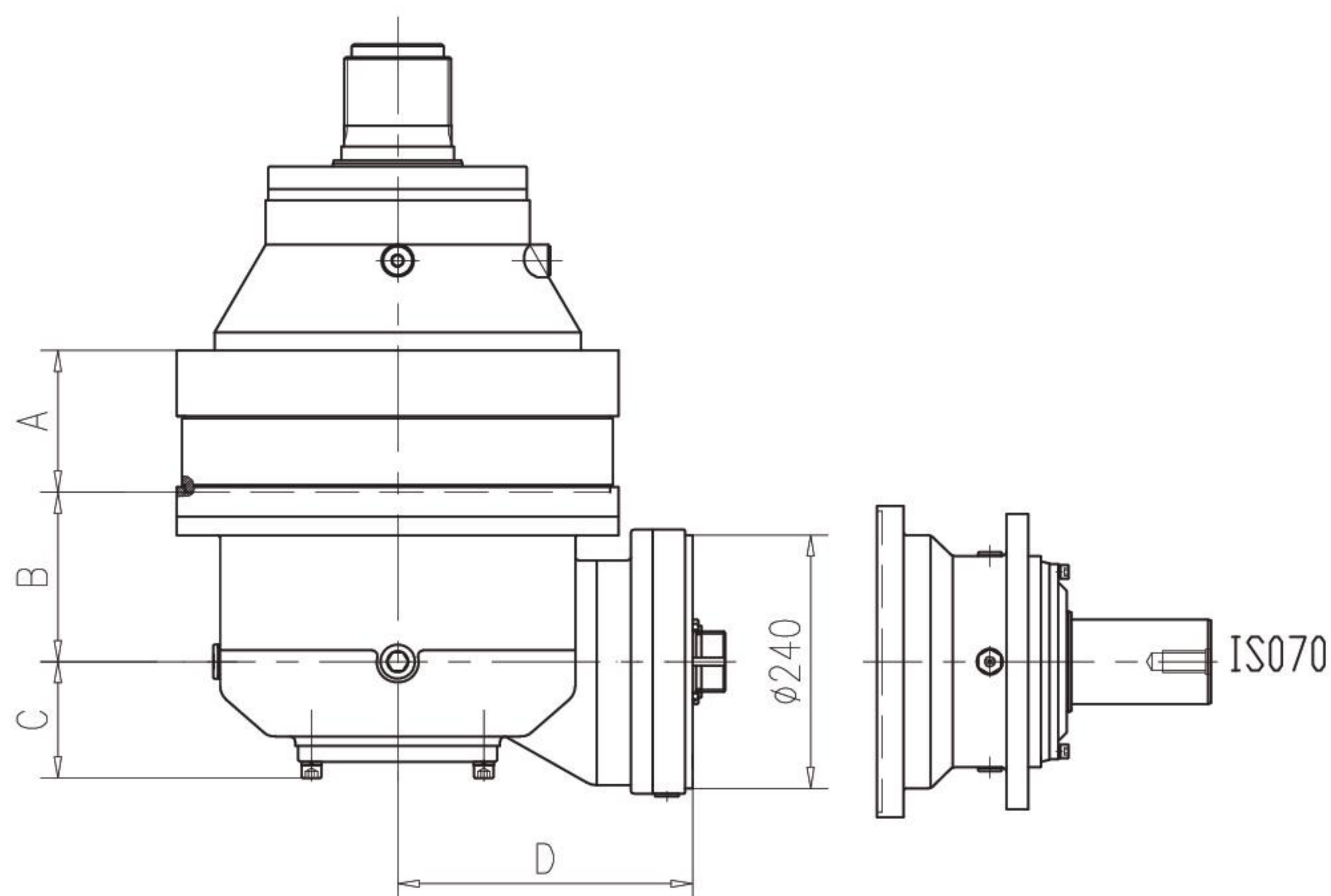
KL260



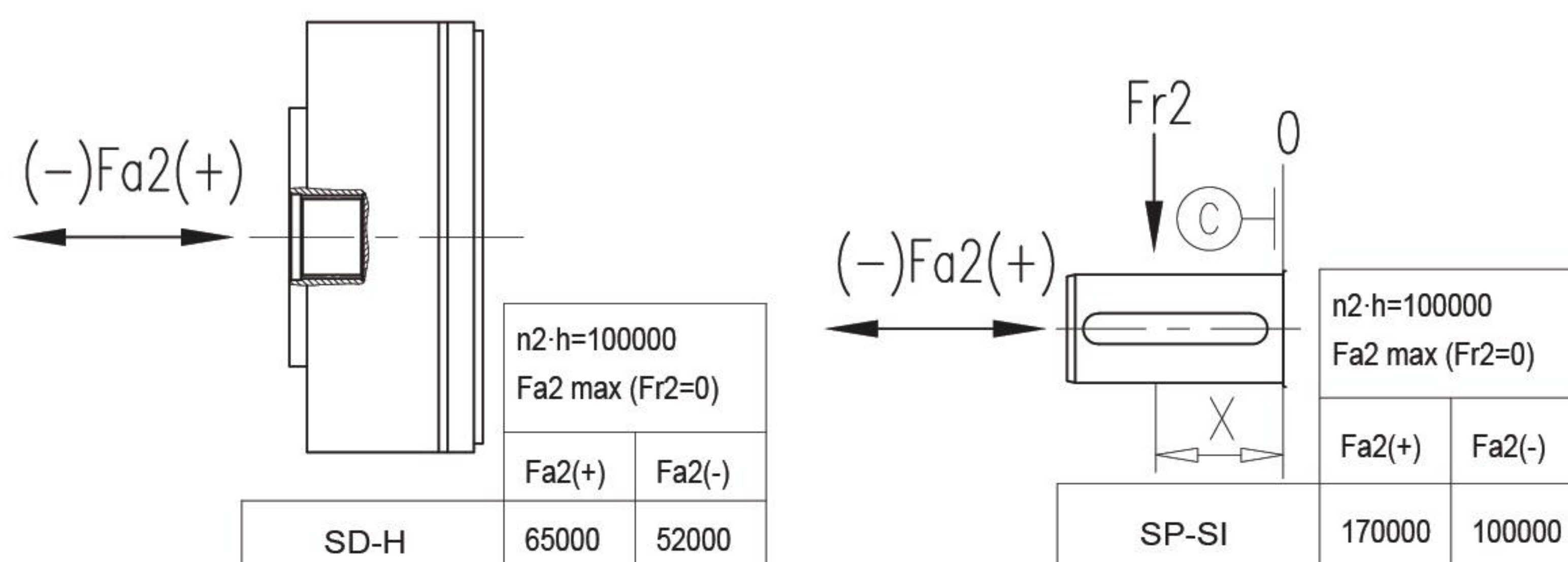
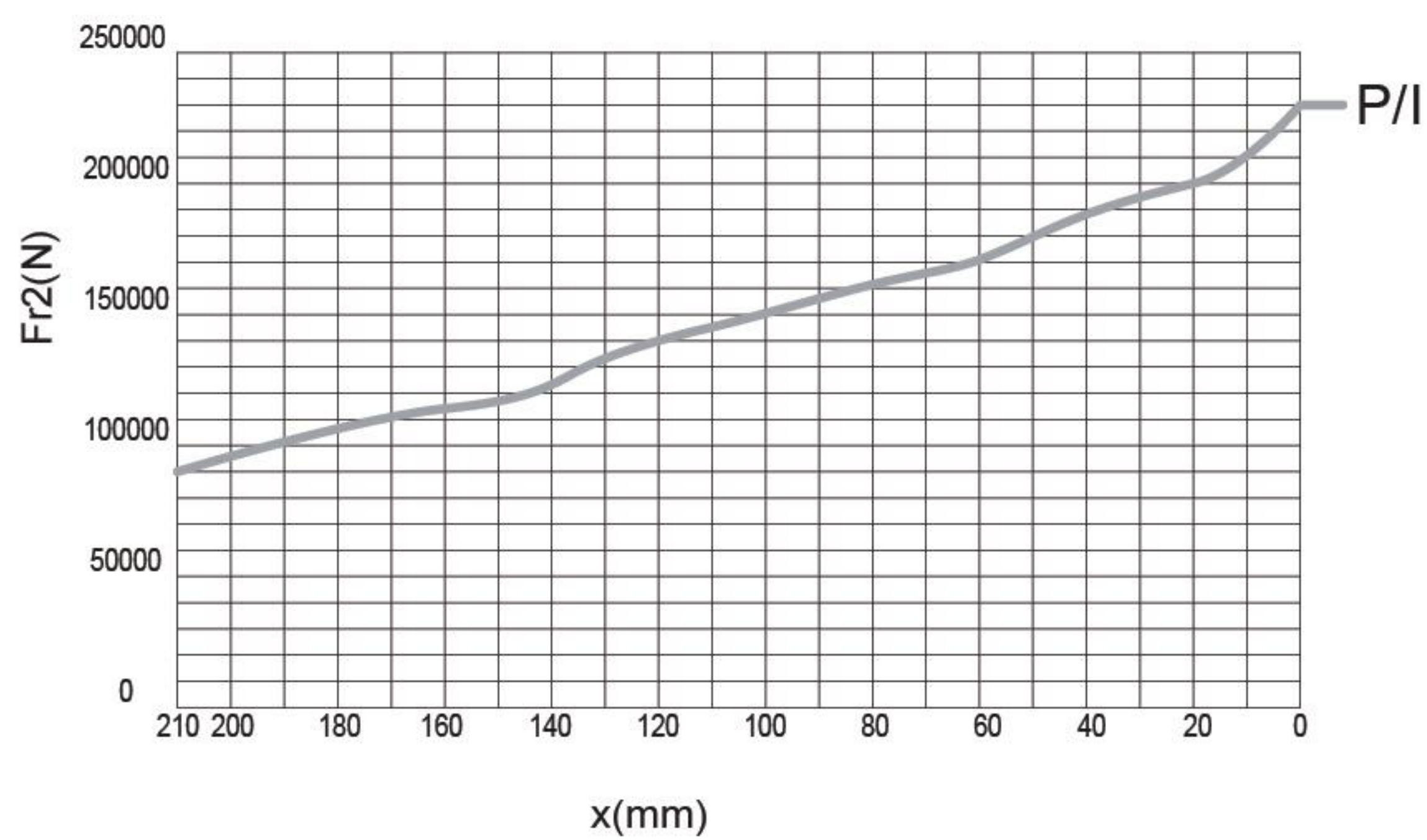
KL260



KR260



	A				B	C	D
	SP	SI	H	SD			
KR 2260	134.5	134.5	104.5	104.5	160.5	110	274
KR 3260	261.5	261.5	231.5	231.5	124	105	185
KR 3260	334.5	334.5	304.5	304.5	122	105	185



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL330
T₂=35000 Nm

	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000			
L1	3.69	47480	43721	39370	36455	27690	22491	35	2100	
	4.04	54985	47869	43105	39913	30436	24722	35	2100	
	4.50	49364	42976	38698	35833	27325	22195	35	2100	
	5.12	43387	37772	34012	31494	24016	19507	35	2100	
	6.00	37023	32232	29024	26875	20493	16646	35	2100	
L2	14.15	54985	47869	43105	39913	29693	24117	26	2500	
	16.68	54985	47869	43105	39913	29693	24117	26	2500	
	21.11	53534	46604	41966	38243	26085	21187	26	2500	
	26.44	43387	37772	34012	31494	24016	19507	26	2500	
	30.71	43387	37772	34012	31494	24016	19507	26	2500	
L3	45.23	47480	43721	39370	36455	27121	22028	18	3100	1140
	53.31	47480	43721	39370	36455	27121	22028	18	3100	1050
	59.08	47480	43721	39370	36455	27121	22028	18	3100	960
	63.77	47480	43721	39370	36455	27690	22491	18	3100	960
	73.12	54985	47869	43105	39913	29693	24117	18	3100	960
	86.18	54985	47869	43105	39913	28864	23444	18	3100	785
	95.50	53534	46604	41966	38243	26085	21187	18	3100	700
	106.29	49364	42976	38698	35833	27325	22195	18	3100	610
	114.46	43221	37626	33882	30876	21060	17106	18	3100	430
	125.35	47321	41195	37096	33804	23057	18728	18	3100	430
	138.31	43221	37626	33882	30876	21060	17106	18	3100	430
	148.50	37023	32232	29024	26875	20493	16646	18	3100	340
	158.65	43387	37772	34012	31494	24016	19507	18	3100	340
	168.56	49364	42976	38698	35833	25683	20860	18	3100	340
	184.24	43387	37772	34012	31494	24016	19507	18	3100	340
	195.75	45418	39538	35604	32445	22130	17975	18	3100	340
	222.62	43387	37772	34012	31494	24016	19507	18	3100	340
L4	210.97	47480	43721	39370	36455	26363	21413	11	4000	340
	219.97	53534	46604	41966	38243	26085	21187	11	4000	340
	245.03	43221	37626	33882	30876	21060	17106	11	4000	250
	319.16	47480	43721	39370	36455	27690	22491	11	4000	250
	350.18	53534	46604	41966	38243	26085	21187	11	4000	250
	403.83	47480	42566	38331	34930	23825	19351	11	4000	160
	450.74	49364	42976	38698	35833	27325	22195	11	4000	160
	499.82	54985	47869	43105	39913	28864	23444	11	4000	160
	550.85	47480	43721	39370	36455	26363	21413	11	4000	160
	603.23	54985	47869	43105	39913	28864	23444	11	4000	160
	710.30	47321	41195	37096	33804	23057	18728	11	4000	160
	795.43	43387	37772	34012	31494	24016	19507	11	4000	160
	900.68	54985	47869	43105	39913	28864	23444	11	4000	160
	998.16	53534	46604	41966	38243	26085	21187	11	4000	160
	1110.86	49364	42976	38698	35833	27325	22195	11	4000	160
	1231.24	40775	35496	31964	29128	19868	16137	11	4000	160
	1341.89	43387	37772	34012	31494	24016	19507	11	4000	160
	1517.06	49364	42976	38698	35833	25683	20860	11	4000	160
	1725.29	42766	37229	33525	30550	20838	16925	11	4000	160
	2003.56	43387	37772	34012	31494	24016	19507	11	4000	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

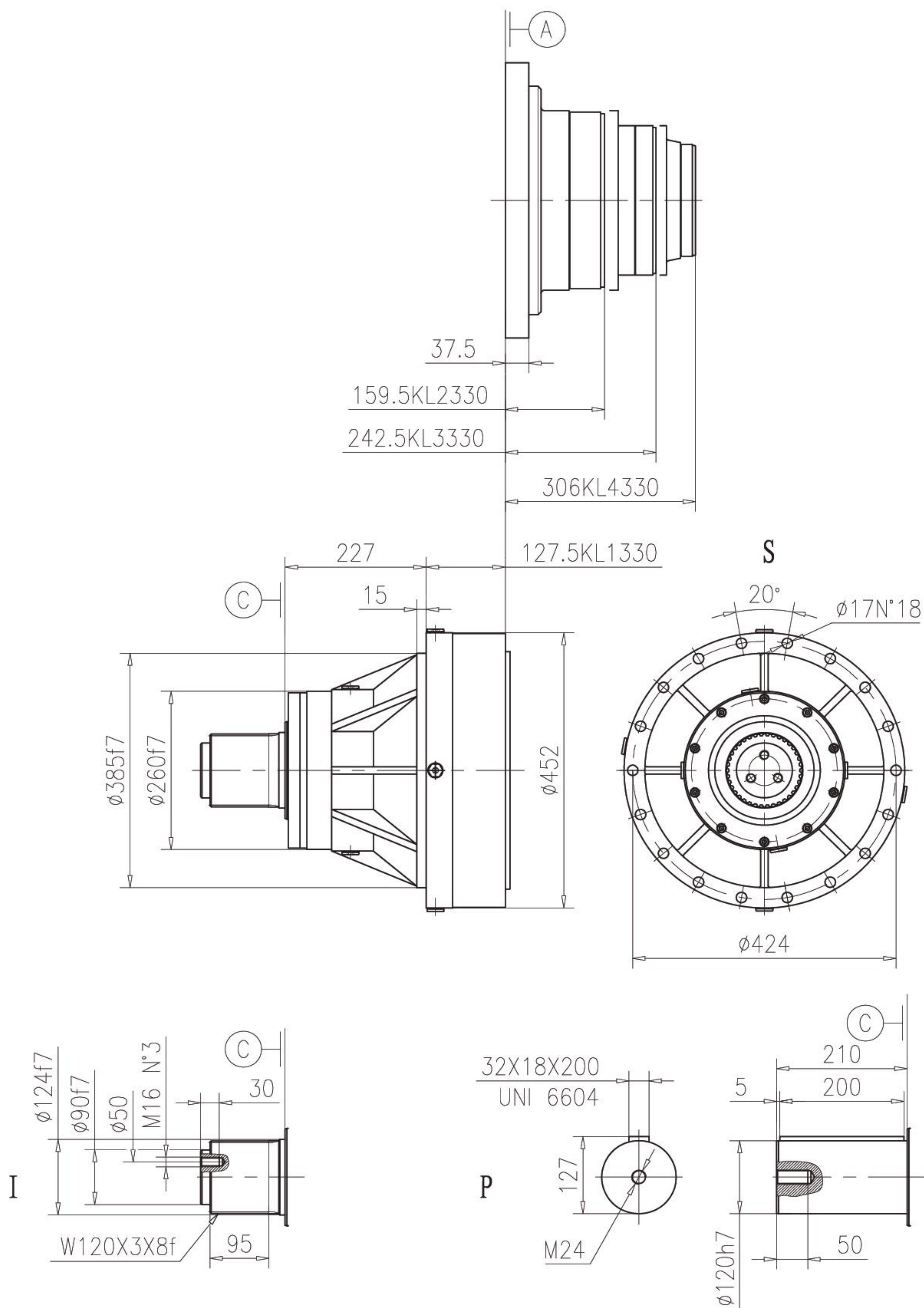
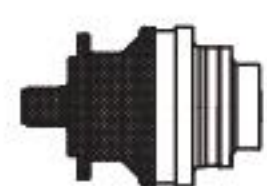
T₂=35000 Nm

KR330

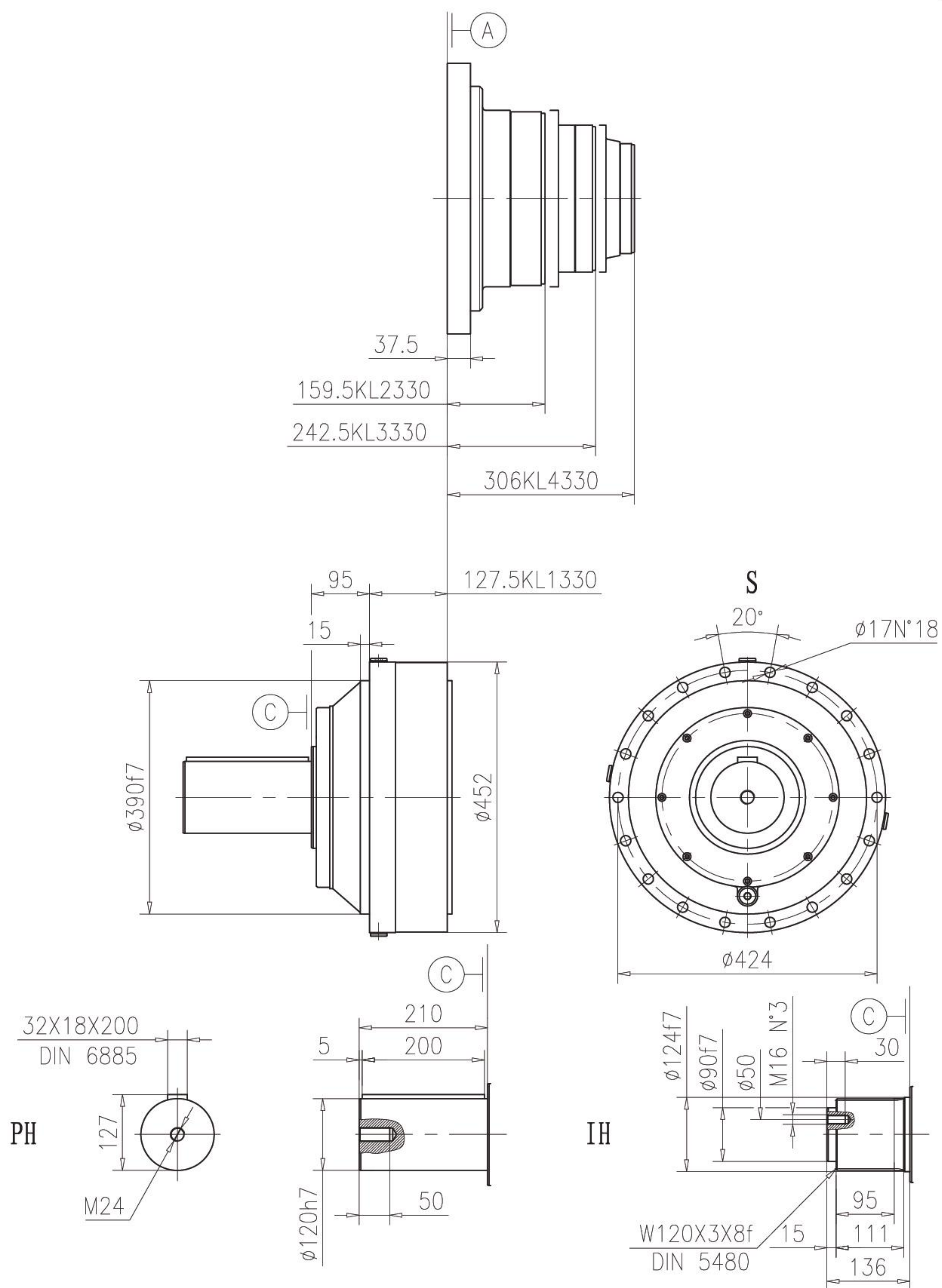
	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000			
R2	11.65	47480	47480	47480	47480	47480	47480	75	2500	
	12.75	24365	24365	24365	24365	24365	24365	75	2500	
	14.19	27140	27140	27140	27140	27140	22195	75	2500	
	16.14	30879	30879	30879	30879	24016	19507	75	2500	
	17.91	31908	31908	31908	31494	24016	19507	75	2500	
	18.92	36186	32232	29024	26875	20493	16646	75	2500	
	21.00	37023	32232	29024	26875	20493	16646	75	2500	
	23.45	37023	32232	29024	26875	20493	16646	75	2500	
	27.00	37023	32232	29024	26875	20493	16646	75	2500	
R3	39.76	16722	16722	16722	16722	16722	16722	40	3500	520
	42.92	18060	18060	18060	18060	18060	18060	40	3500	520
	46.86	19732	19732	19732	19732	19732	19732	40	3500	520
	51.32	21604	21604	21604	21604	21604	21604	40	3500	520
	64.28	27044	27044	27044	27044	23057	18728	40	3500	520
	79.44	30517	30517	30517	30517	25683	20860	40	3500	520
	88.77	30033	30033	30033	30033	25683	20860	40	3500	520
	94.48	39776	37772	34012	31494	24016	19507	40	3500	520
	104.91	40295	37772	34012	31494	24016	19507	40	3500	520
	117.24	39656	37772	34012	31494	24016	19507	40	3500	430
R4	139.17	47480	43721	39370	36455	27121	22028	22	3500	430
	164.02	47480	43721	39370	36455	27121	22028	22	3500	430
	193.31	47480	43721	39370	36455	26363	21413	22	3500	340
	214.23	47480	43721	39370	36455	26363	21413	22	3500	340
	234.61	54985	47869	43105	39913	28864	23444	22	3500	340
	281.18	47480	43721	39370	36455	26363	21413	22	3500	250
	300.46	47480	43721	39370	36455	26363	21413	22	3500	250
	326.30	53534	46604	41966	38243	26085	21187	22	3500	250
	364.65	53534	46604	41966	38243	26085	21187	22	3500	250
	405.82	49364	42976	38698	35833	27325	22195	22	3500	160
	457.03	49364	42976	38698	35833	27325	22195	22	3500	160
	600.96	40775	35496	31964	29128	19868	16137	22	3500	160
	651.29	47321	41195	37096	33804	23057	18728	22	3500	160
	703.44	43387	37772	34012	31494	24016	19507	22	3500	160
	756.33	40775	35496	31964	29128	19868	16137	22	3500	160
	792.21	43387	37772	34012	31494	24016	19507	22	3500	160
	849.99	43387	37772	34012	31494	24016	19507	22	3500	160
	957.26	43387	37772	34012	31494	24016	19507	22	3500	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

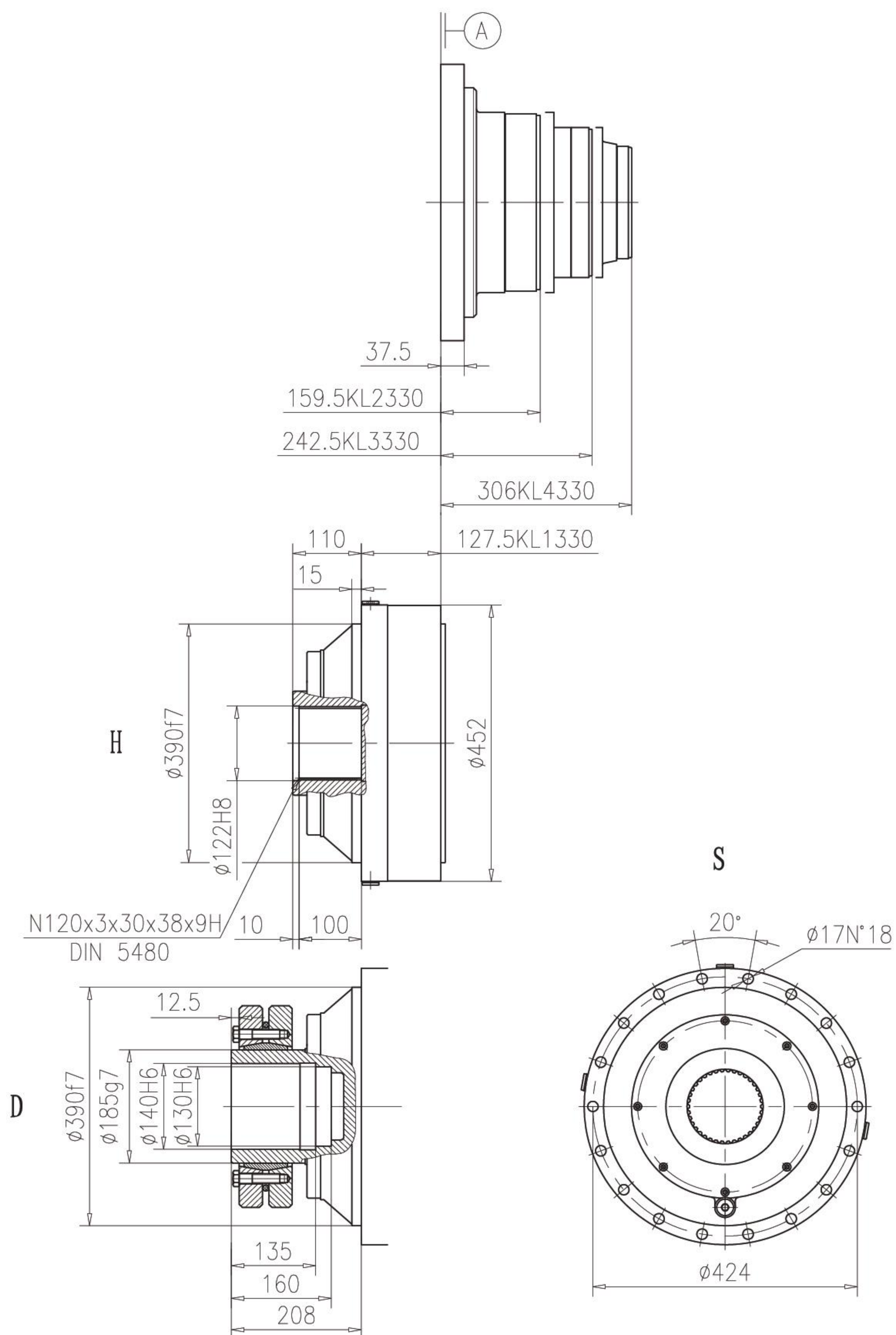
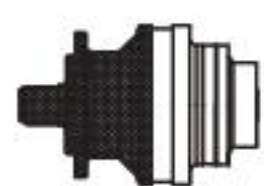
KL330



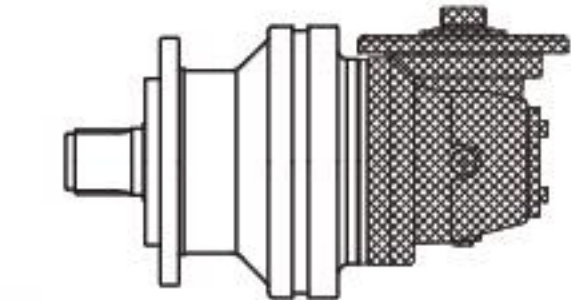
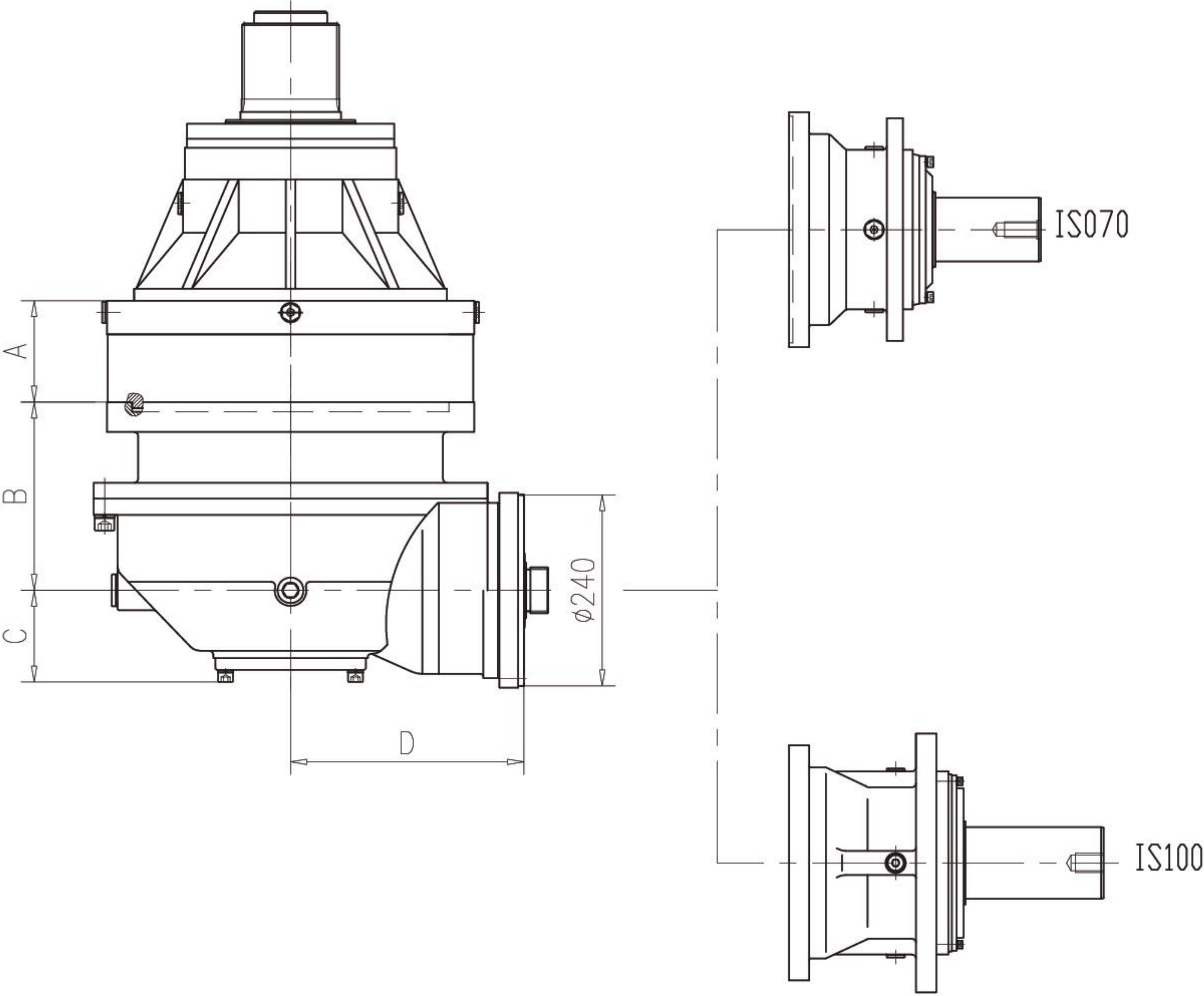
KL330



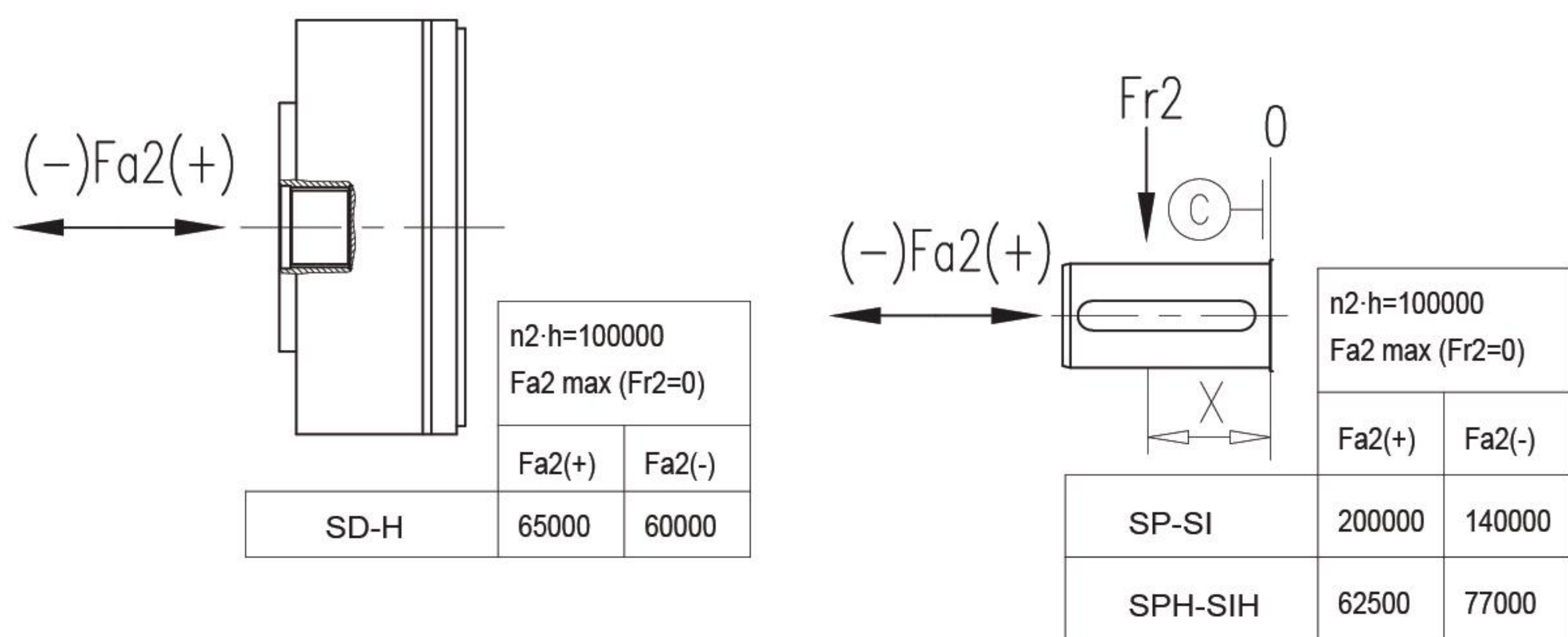
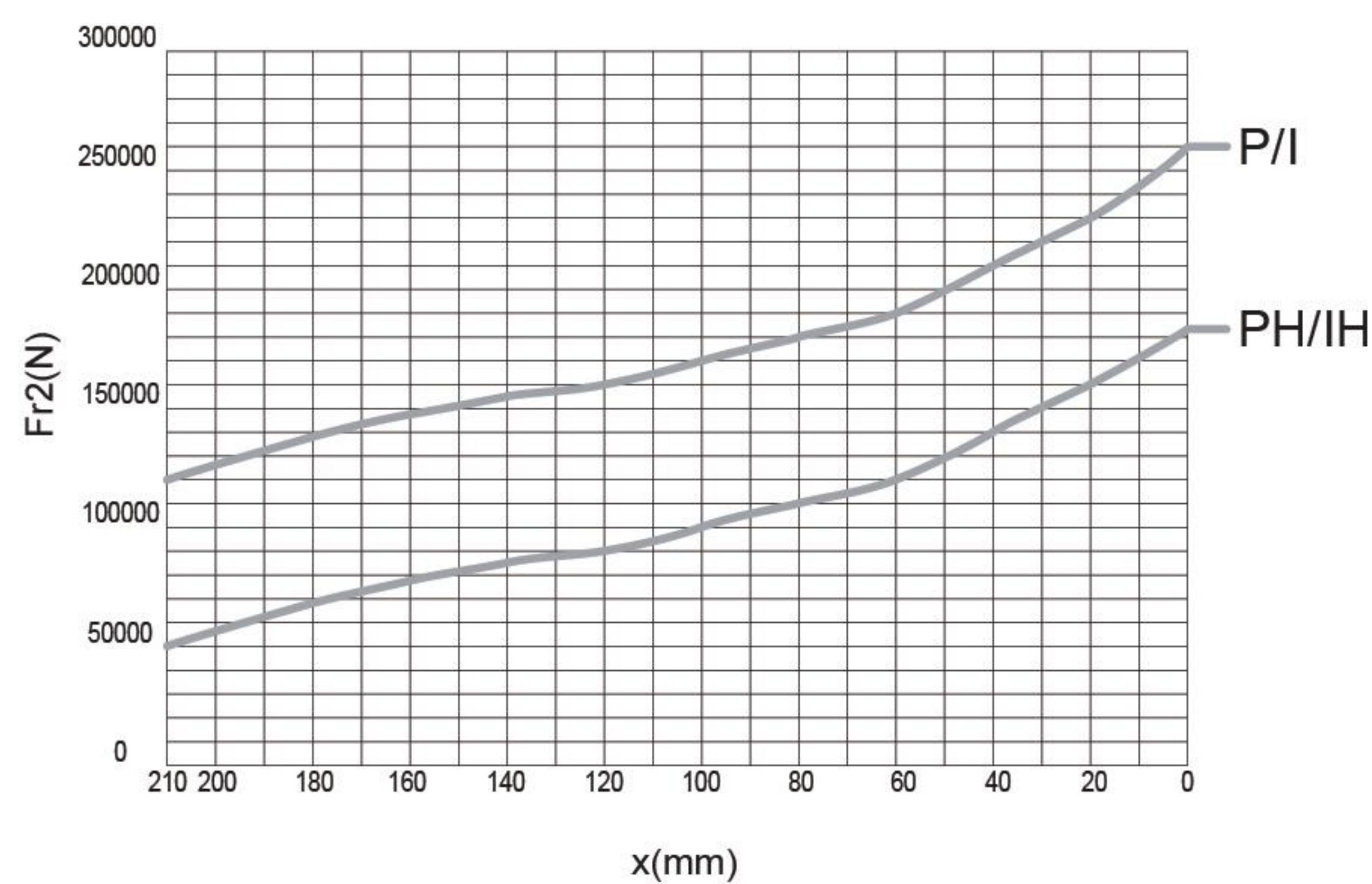
KL330



KR330



	A			B	C	D
	SP	SI	H			
KR 2330	127.5	127.5	127.5	236.5	115	287
KR 3330	287	287	287	124	105	185
KR 4330	370	370	370	122	105	185



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL400
T₂=45000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	4.18	54007	45843	40568	40191	24743	20096	35	1800		
	4.89	46166	39187	34678	34356	21150	17178	35	1800		
	6.00	37625	31938	28263	28000	17238	14000	35	1800		
L2	19.15	54007	45843	40568	40191	24743	20096	26	2500		
	21.95	54007	45843	40568	40191	24743	20096	26	2500		
	25.67	46166	39187	34678	34356	21150	17178	26	2500		
	27.47	37625	31938	28263	28000	17238	14000	26	2500		
	31.50	37625	31938	28263	28000	17238	14000	26	2500		
	37.38	37625	31938	28263	28000	17238	14000	26	2500		
L3	54.45	54007	45843	40568	40191	24743	20096	18	3800	1140	
	64.17	54007	45843	40568	40191	24743	20096	18	3800	1050	
	70.57	54007	45843	40568	40191	24743	20096	18	3800	960	
	78.99	54007	45843	40568	40191	24743	20096	18	3800	875	
	87.54	54007	45843	40568	40191	24743	20096	18	3800	785	
	92.34	46166	39187	34678	34356	21150	17178	18	3800	610	
	102.34	46166	39187	34678	34356	21150	17178	18	3800	610	
	113.43	54007	45843	40568	40191	24743	20096	18	3800	610	
	124.03	54007	45843	40568	40191	24743	20096	18	3800	520	
	138.83	54007	45843	40568	40191	24743	20096	18	3800	520	
	145.00	46166	39187	34678	34356	21150	17178	18	3800	430	
	159.17	54007	45843	40568	40191	24743	20096	18	3800	430	
	186.08	46166	39187	34678	34356	21150	17178	18	3800	340	
	220.85	46166	39187	34678	34356	21150	17178	18	3800	250	
L4	185.12	54007	45843	40568	40191	24743	20096	11	4000	430	
	218.18	54007	45843	40568	40191	24743	20096	11	4000	340	
	239.93	54007	45843	40568	40191	24743	20096	11	4000	250	
	296.80	54007	45843	40568	40191	24743	20096	11	4000	250	
	332.23	46166	39187	34678	34356	21150	17178	11	4000	160	
	372.19	54007	45843	40568	40191	24743	20096	11	4000	160	
	421.26	54007	45843	40568	40191	24743	20096	11	4000	160	
	458.12	54007	45843	40568	40191	24743	20096	11	4000	160	
	507.70	54007	45843	40568	40191	24743	20096	11	4000	160	
	552.91	54007	45843	40568	40191	24743	20096	11	4000	160	
	599.33	46166	39187	34678	34356	21150	17178	11	4000	160	
	653.37	54007	45843	40568	40191	24743	20096	11	4000	160	
	716.35	46166	39187	34678	34356	21150	17178	11	4000	160	
	804.23	54007	45843	40568	40191	24743	20096	11	4000	160	
	928.28	46166	39187	34678	34356	21150	17178	11	4000	160	
	1078.00	46166	39187	34678	34356	21150	17178	11	4000	160	
	1249.43	54007	45843	40568	40191	24743	20096	11	4000	160	
	1432.53	54007	45843	40568	40191	24743	20096	11	4000	160	
	1674.75	46166	39187	34678	34356	21150	17178	11	4000	160	
	1987.62	46166	39187	34678	34356	21150	17178	11	4000	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

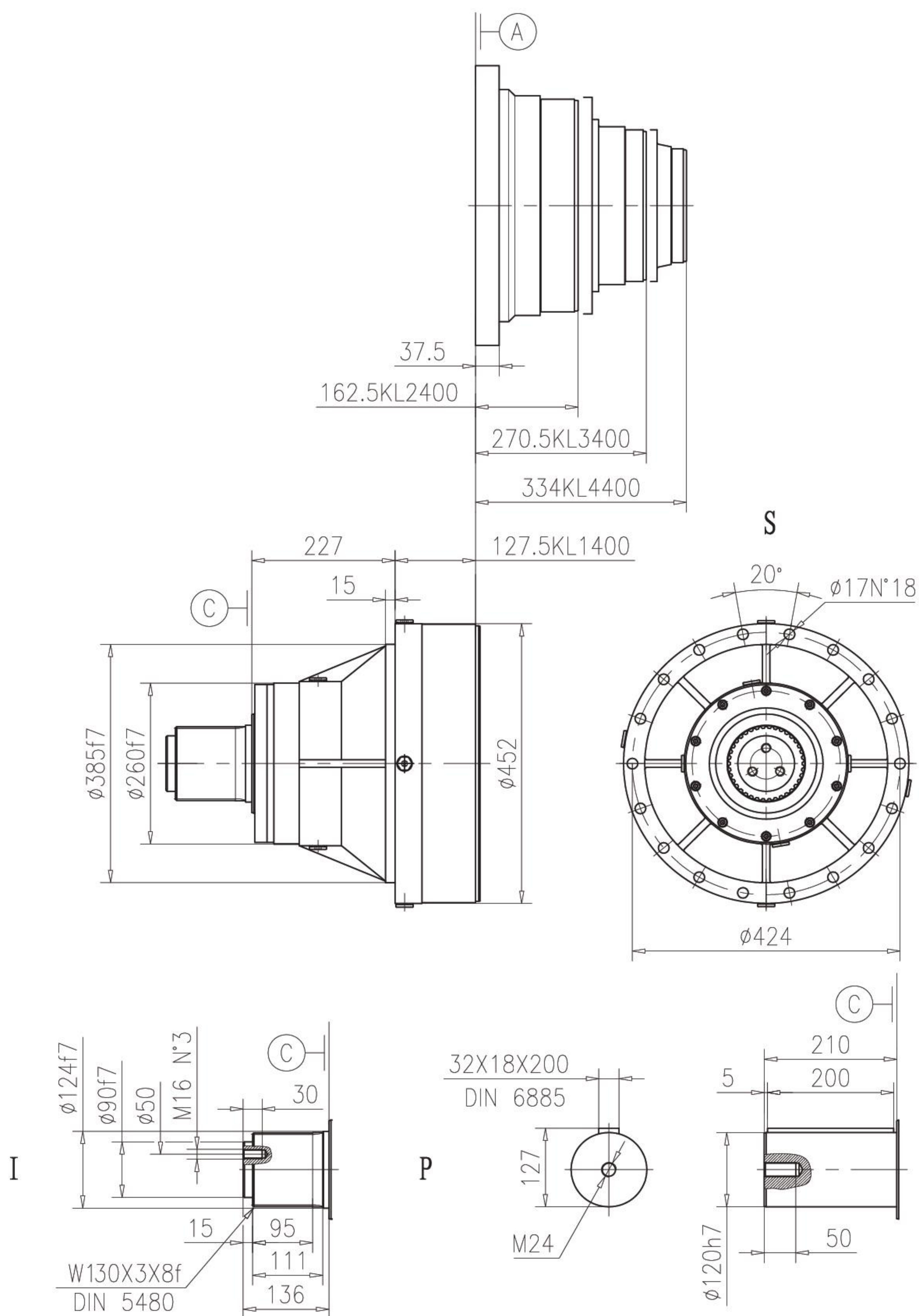
T₂=45000 Nm

KR400

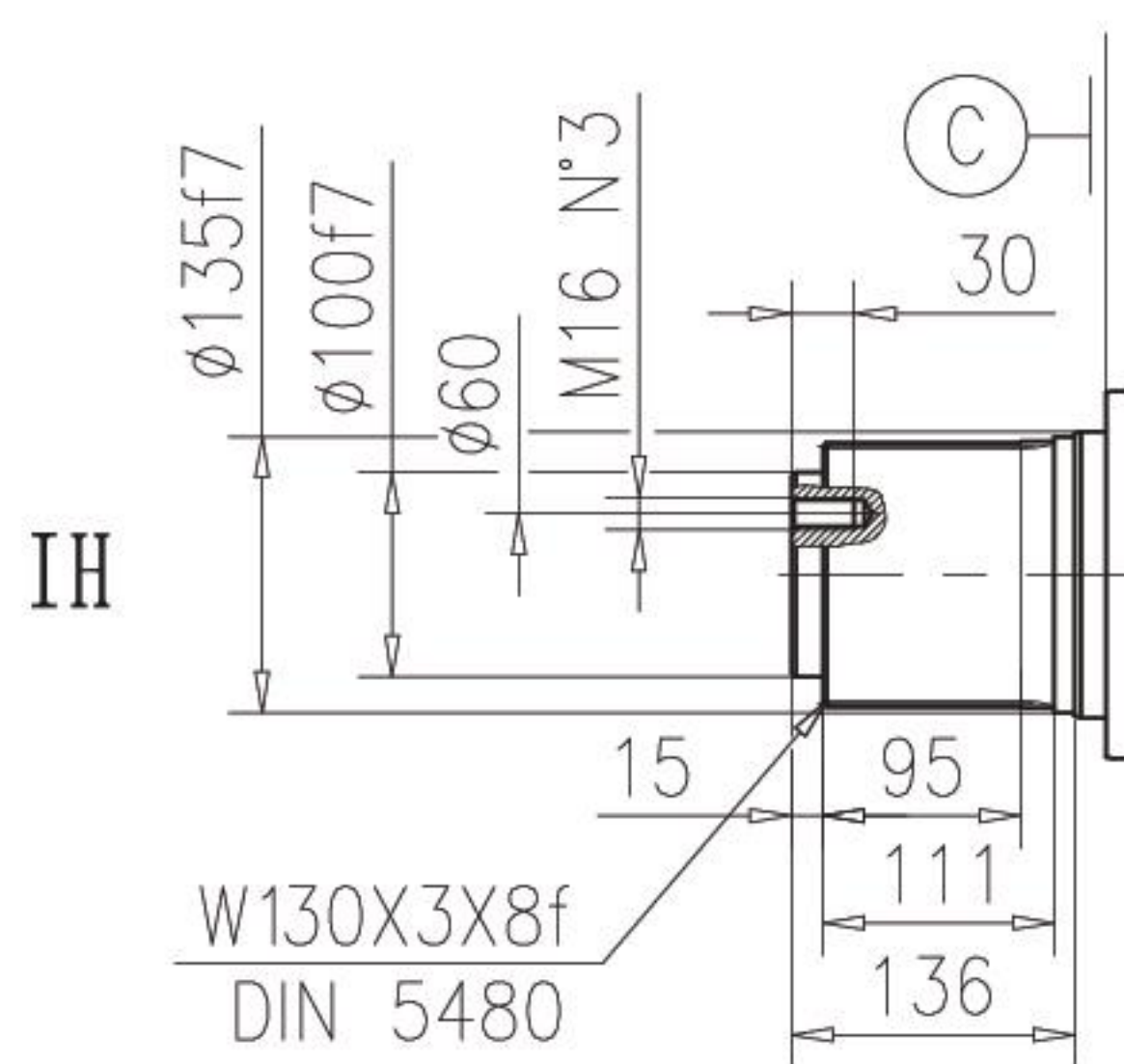
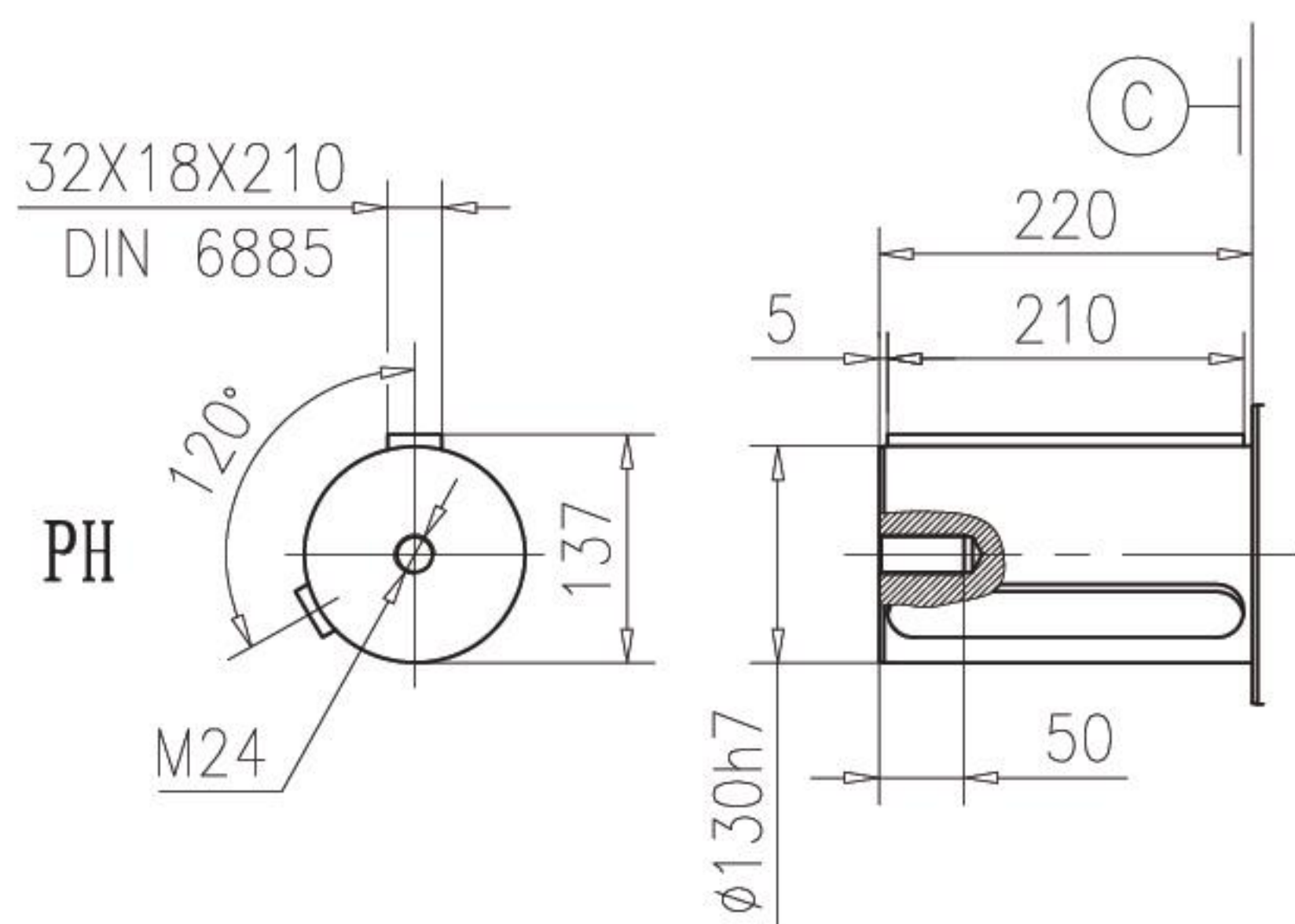
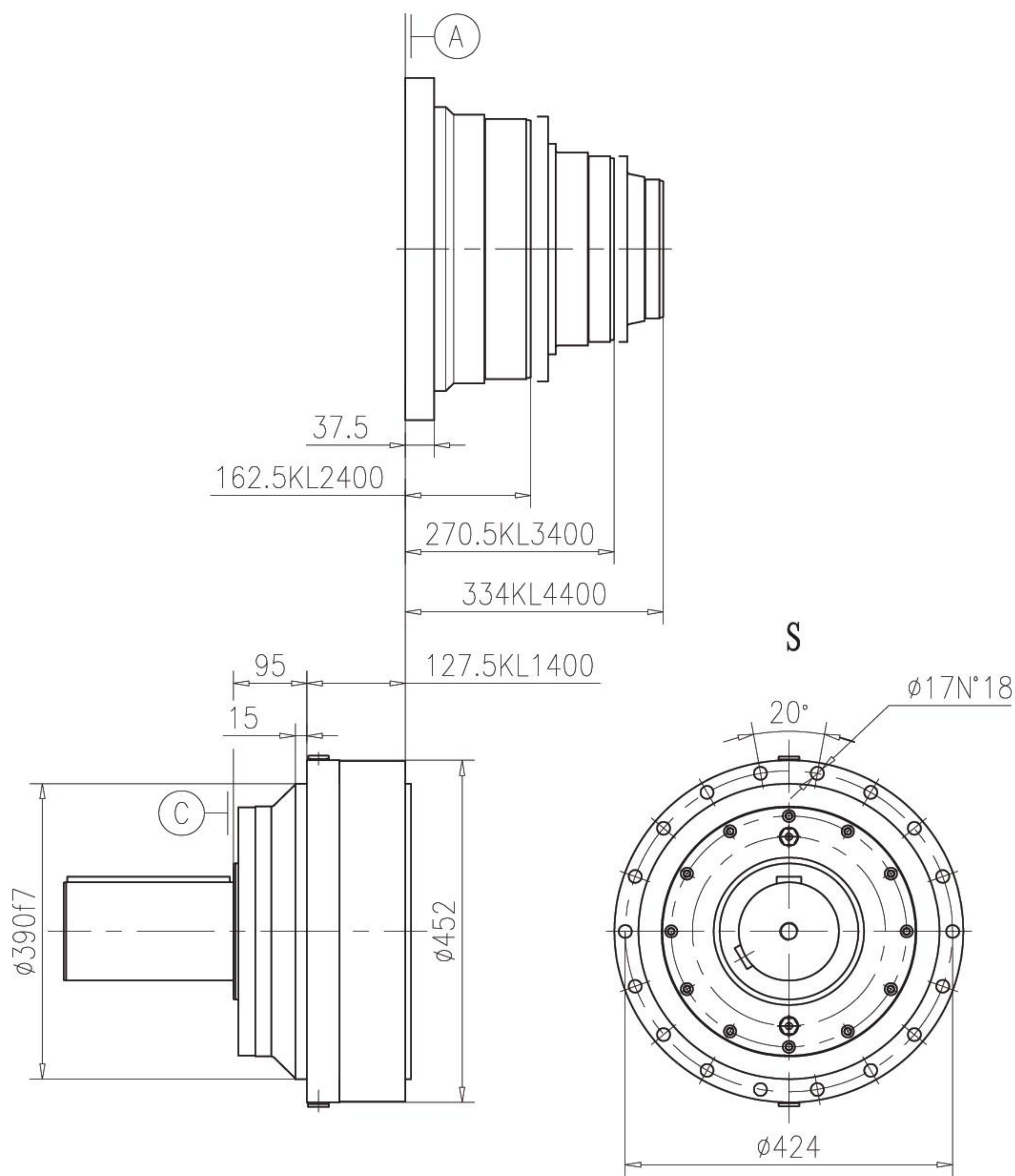
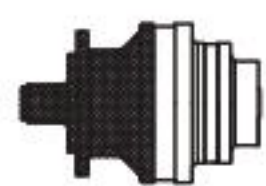
	i	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]	
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000				
R2	13.19	25210	25210	25210	25210	24743	20096	75	2500		
	14.64	26050	26050	26050	26050	24743	20096	75	2500		
	15.42	29492	29492	29492	29492	21150	17178	75	2500		
	17.11	30474	30474	30474	30474	21150	17178	75	2500		
	18.92	36186	31938	28263	28000	17238	14000	75	2500		
	21.00	37625	31938	28263	28000	17238	14000	75	2500		
	23.45	37128	31938	28263	28000	17238	14000	75	2500		
	27.00	37458	31938	28263	28000	17238	14000	75	2500		
R3	60.39	33798	33798	33798	33798	24743	20096	40	4000	700	
	67.02	34246	34246	34246	34246	24743	20096	40	4000	700	
	76.84	29255	29255	29255	29255	24743	20096	40	4000	520	
	80.95	45322	39187	34678	34356	21150	17178	40	4000	520	
	85.82	38742	38742	38742	38742	24743	20096	40	4000	520	
	89.83	45923	39187	34678	34356	21150	17178	40	4000	520	
	96.07	46166	39187	34678	34356	21150	17178	40	4000	520	
	106.62	46166	39187	34678	34356	21150	17178	40	4000	520	
	119.08	46166	39187	34678	34356	21150	17178	40	4000	430	
	137.08	46166	39187	34678	34356	21150	17178	40	4000	430	
	168.23	37625	31938	28263	28000	17238	14000	40	4000	430	
R4	167.53	54007	45843	40568	40191	24743	20096	22	4000	340	
	197.45	54007	45843	40568	40191	24743	20096	22	4000	340	
	247.31	54007	45843	40568	40191	24743	20096	22	4000	340	
	301.99	54007	45843	40568	40191	24743	20096	22	4000	160	
	353.51	54007	45843	40568	40191	24743	20096	22	4000	160	
	405.31	54007	45843	40568	40191	24743	20096	22	4000	160	
	450.07	54007	45843	40568	40191	24743	20096	22	4000	160	
	502.96	54007	45843	40568	40191	24743	20096	22	4000	160	
	554.52	46166	39187	34678	34356	21150	17178	22	4000	160	
	607.74	54007	45843	40568	40191	24743	20096	22	4000	160	
	662.20	46166	39187	34678	34356	21150	17178	22	4000	160	
	710.50	46166	39187	34678	34356	21150	17178	22	4000	160	
	800.16	46166	39187	34678	34356	21150	17178	22	4000	160	
	949.64	46166	39187	34678	34356	21150	17178	22	4000	160	
	1034.87	37625	31938	28263	28000	17238	14000	22	4000	160	
	1165.47	37625	31938	28263	28000	17238	14000	22	4000	160	

$$T_{2max} = 1.2 \cdot T_{n2}(n_{2 \cdot h} = 10000)$$

KL 400

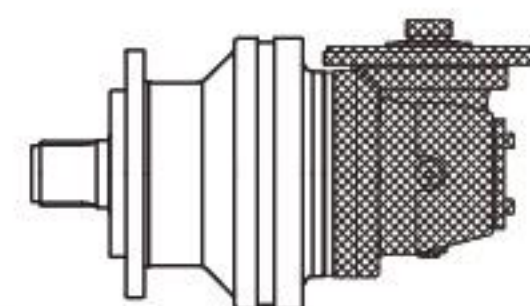
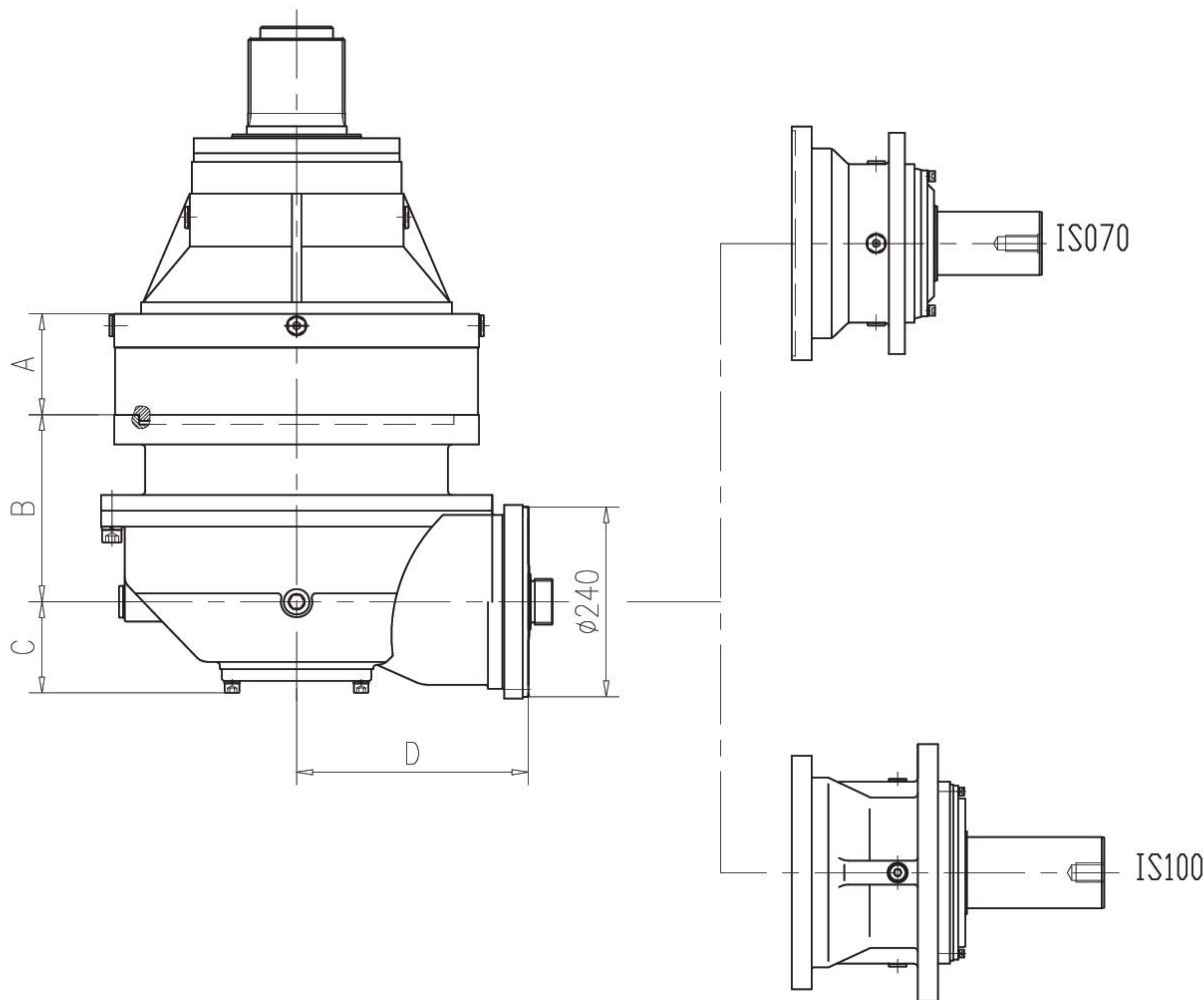
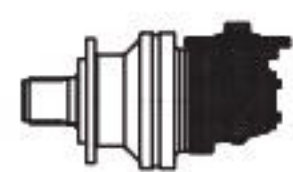


KL 400

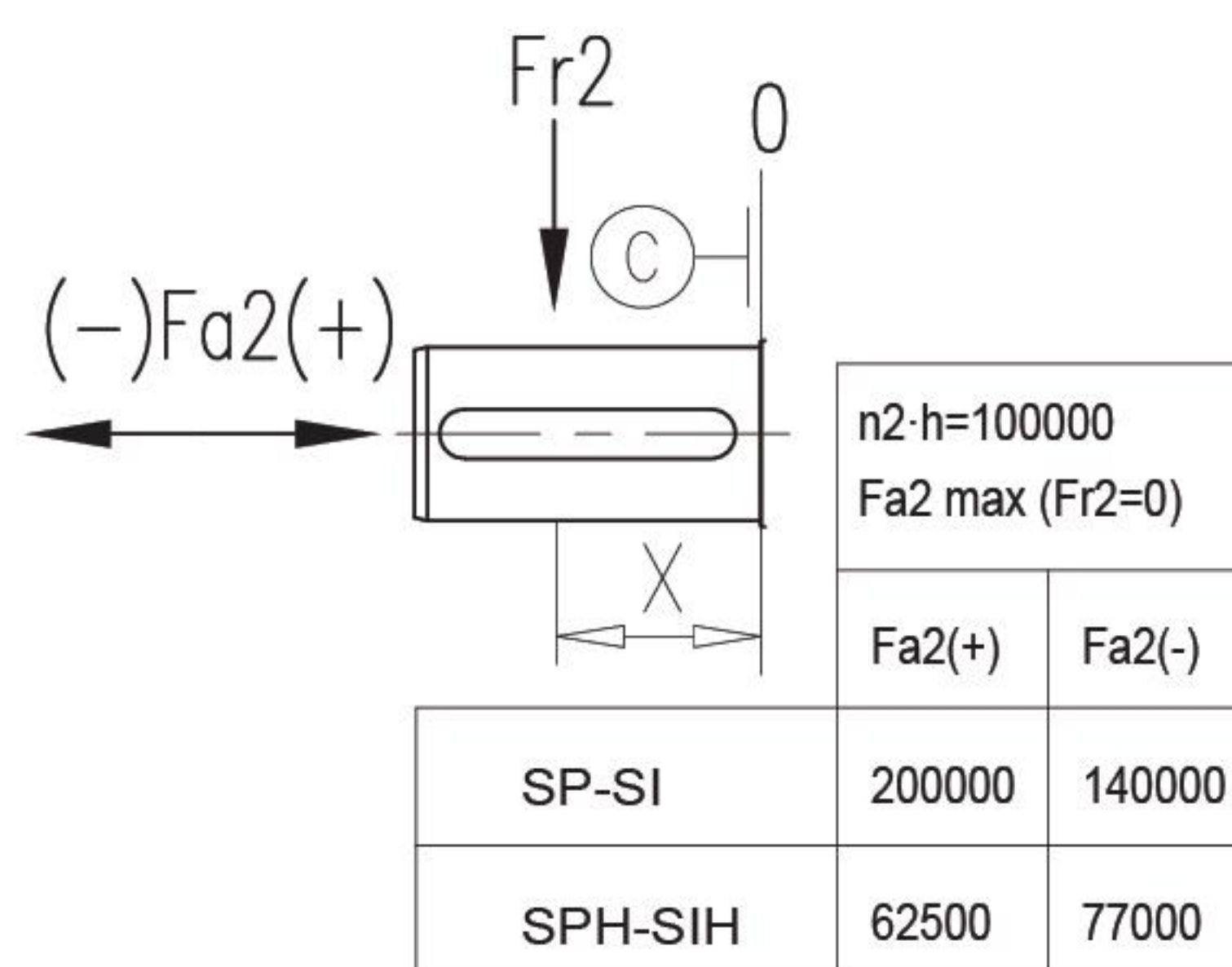
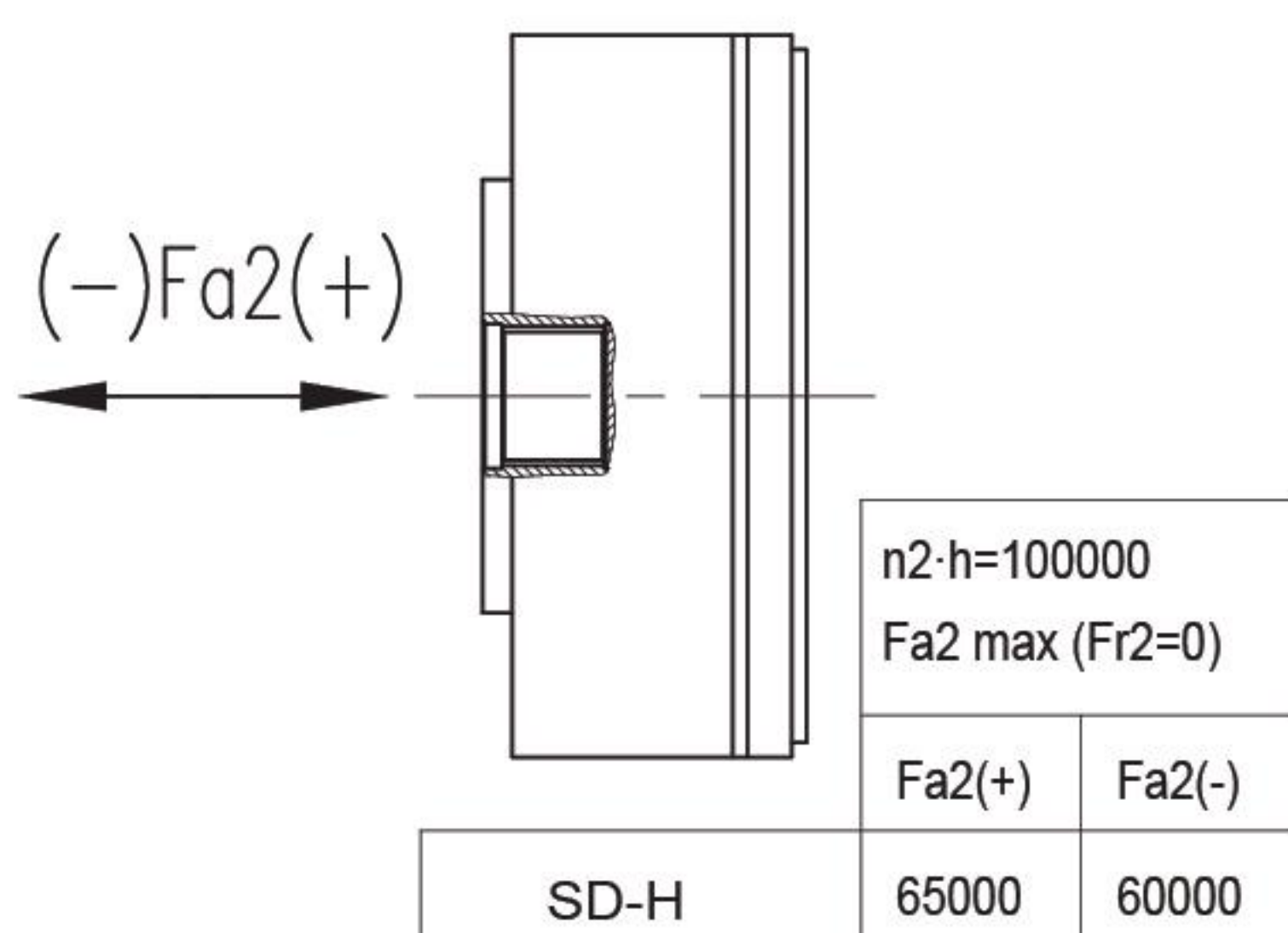
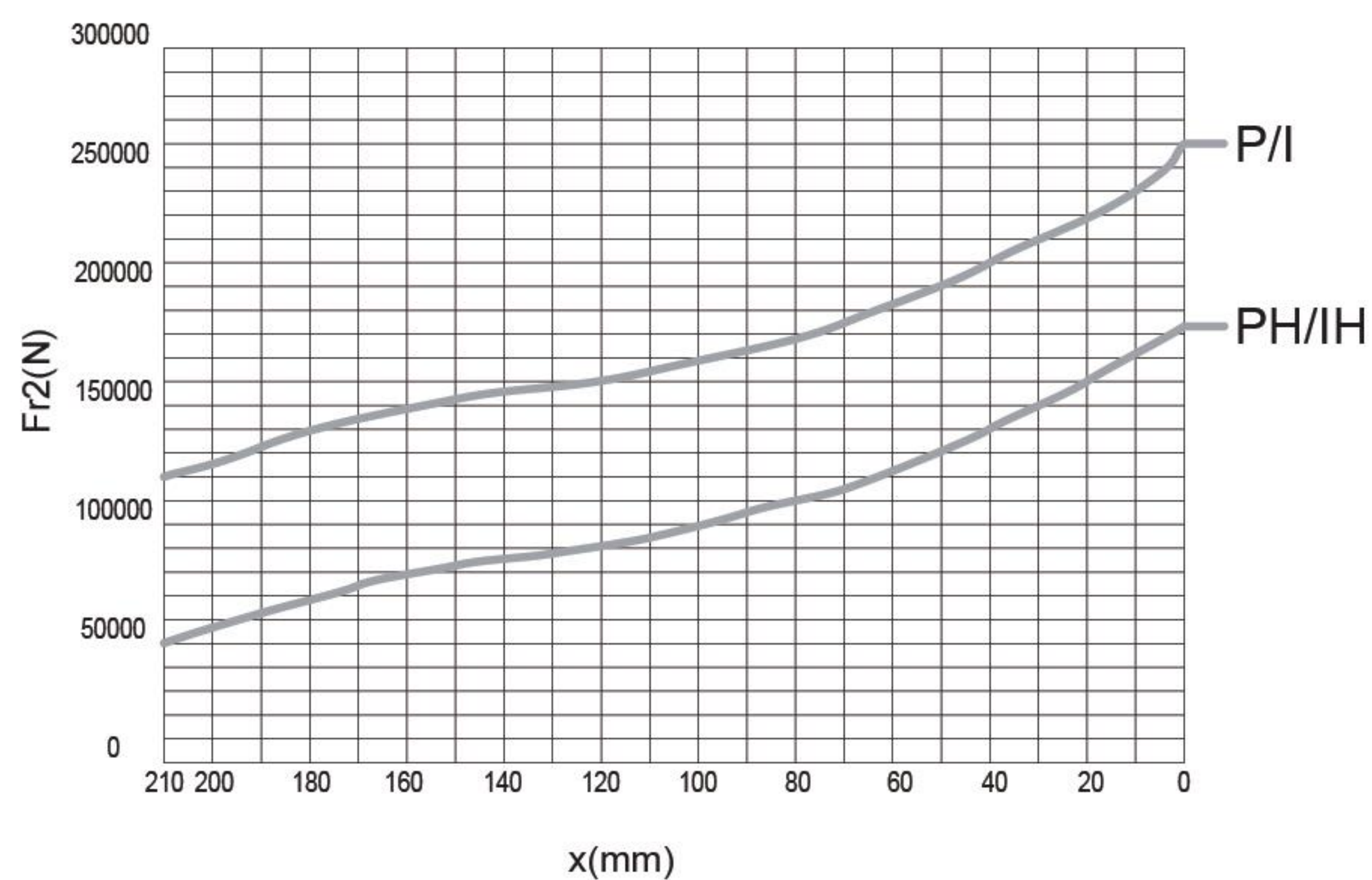




KR400



	A			B	C	D
	SP	SI	H			
KR 2400	127.5	127.5	127.5	236.5	115	287
KR 3400	290	290	290	130.5	105	197
KR 4400	398	398	398	122	105	185



n ₂ ·h							
	20000	40000	60000	80000	100000	200000	400000
K _f	1.7	1.3	1.15	1.06	1	0.8	0.63

KL500
T₂=50000 Nm

	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000			
L1	4.04	72222	62875	56617	53237	40567	32951	58.5	1800	
	4.50	64840	56448	50830	47795	36420	29582	58.5	1800	
	5.12	56988	49613	44674	42007	32010	26000	58.5	1800	
	6.00	48630	42336	38122	35846	27315	22187	58.5	1800	
L2	16.54	72222	62875	56617	53237	40567	32951	35.3	2400	
	18.51	72222	62875	56617	53237	40567	32951	35.3	2400	
	21.23	70841	61671	55534	52047	40567	32951	35.3	2400	
	25.19	59698	51970	46798	43860	39291	31914	35.3	2400	
	28.04	64840	56448	50830	47795	36420	29582	35.3	2400	
	31.89	56988	49613	44674	42007	32010	26000	35.3	2400	
	37.39	48630	42336	38122	35846	27315	22187	35.3	2400	
L3	52.65	72222	62875	56617	53237	40567	32951	25.1	3100	
	64.80	72222	62875	56617	53237	40567	32951	25.1	3100	
	75.62	72222	62875	56617	53237	40567	32951	25.1	3100	1140
	95.66	72222	62875	56617	53237	40567	32951	25.1	3100	960
	111.09	72222	62875	56617	53237	40567	32951	25.1	3100	785
	121.07	56988	49613	44674	42007	32010	26000	25.1	3100	610
	134.23	62911	59657	56617	53237	40133	32540	25.1	3100	610
	140.60	56988	49613	44674	42007	32010	26000	25.1	3100	610
	153.91	70841	61671	55534	52047	40567	32951	25.1	3100	610
	171.28	64840	56448	50830	47795	36420	29582	25.1	3100	520
	182.66	59698	51970	46798	43860	39291	31914	25.1	3100	430
	194.79	56988	49613	44674	42007	32010	26000	25.1	3100	430
	203.28	64840	56448	50830	47795	36420	29582	25.1	3100	430
	231.18	56988	49613	44674	42007	32010	26000	25.1	3100	340
L4	302.18	72222	62875	56617	53237	40567	32951	19.7	4000	340
	334.88	72222	62875	56617	53237	40567	32951	19.7	4000	340
	382.64	72222	62875	56617	53237	40567	32951	19.7	4000	250
	438.59	72222	62875	56617	53237	40567	32951	19.7	4000	250
	450.75	71656	62875	56617	53237	40567	32951	19.7	4000	250
	490.91	72222	62875	56617	53237	40567	32951	19.7	4000	250
	592.48	72222	62875	56617	53237	40567	32951	19.7	4000	160
	644.32	72222	62875	56617	53237	40567	32951	19.7	4000	160
	738.74	70841	61671	55534	52047	40567	32951	19.7	4000	160
	839.48	56180	53274	51337	50368	35839	29059	19.7	4000	160
	891.59	70841	61671	55534	52047	40567	32951	19.7	4000	160
	971.71	56988	49613	44674	42007	32010	26000	19.7	4000	160
	1045.72	64840	56448	50830	47795	36420	29582	19.7	4000	160
	1089.66	56988	49613	44674	42007	32010	26000	19.7	4000	160
	1189.25	56988	49613	44674	42007	32010	26000	19.7	4000	160
	1275.75	64840	56448	50830	47795	36420	29582	19.7	4000	160
	1385.14	70841	61671	55534	52047	40567	32951	19.7	4000	160
	1422.95	64840	56448	50830	47795	36420	29582	19.7	4000	160
	1541.53	64840	56448	50830	47795	36420	29582	19.7	4000	160
	1753.11	56988	49613	44674	42007	32010	26000	19.7	4000	160
	2080.62	56988	49613	44674	42007	32010	26000	19.7	4000	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

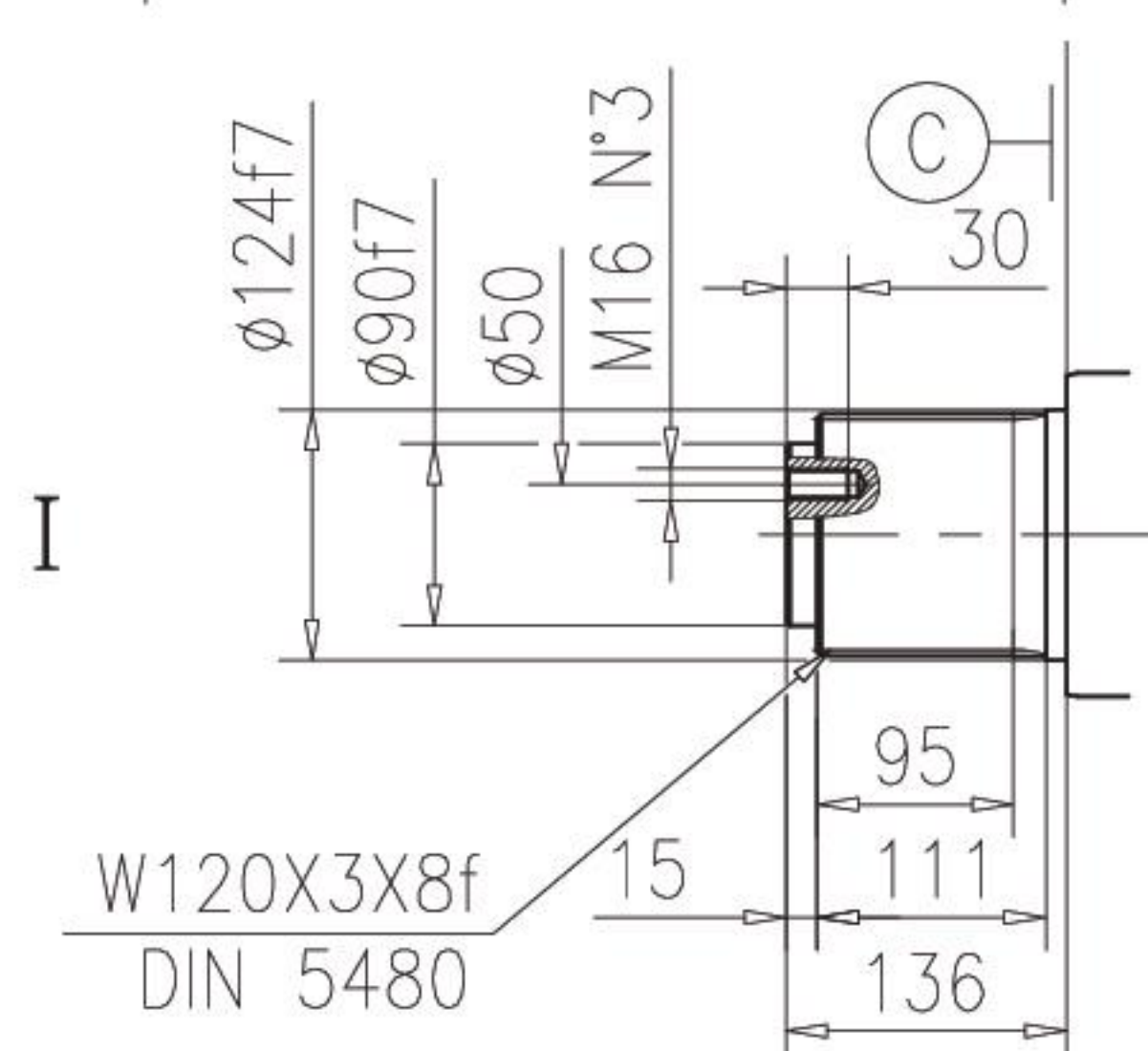
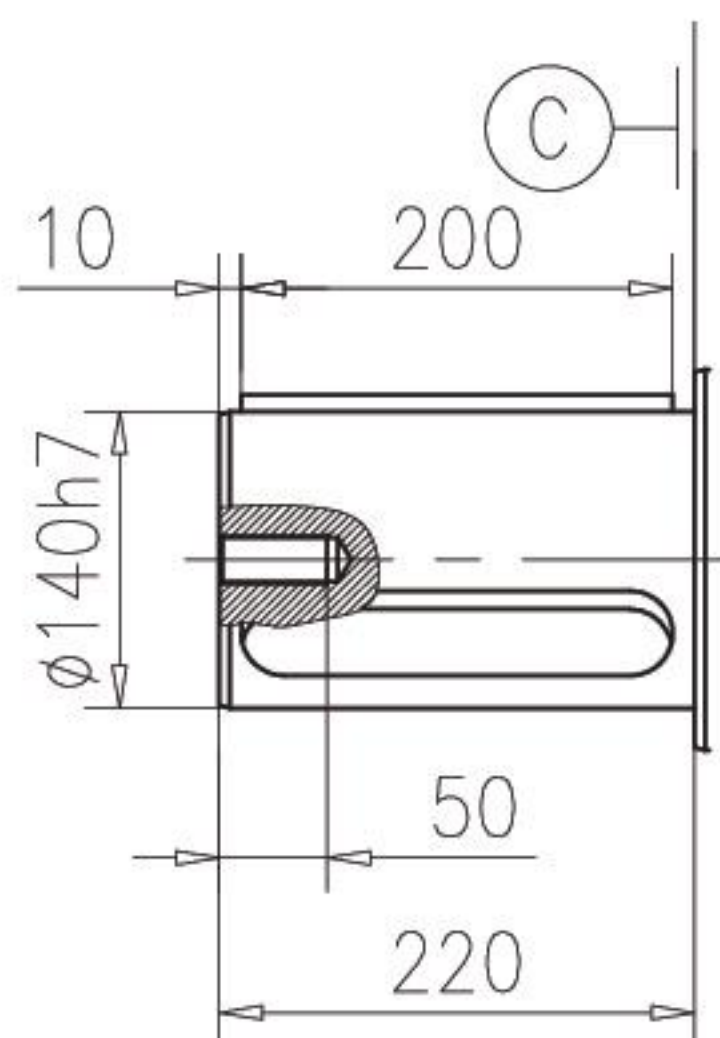
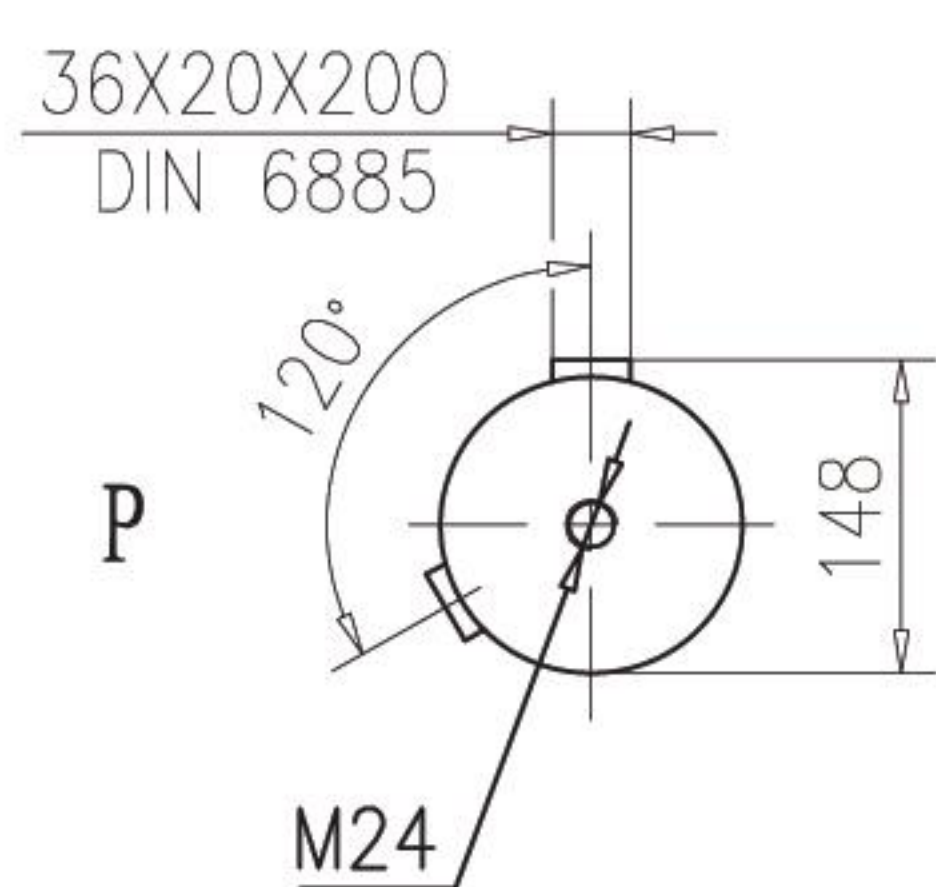
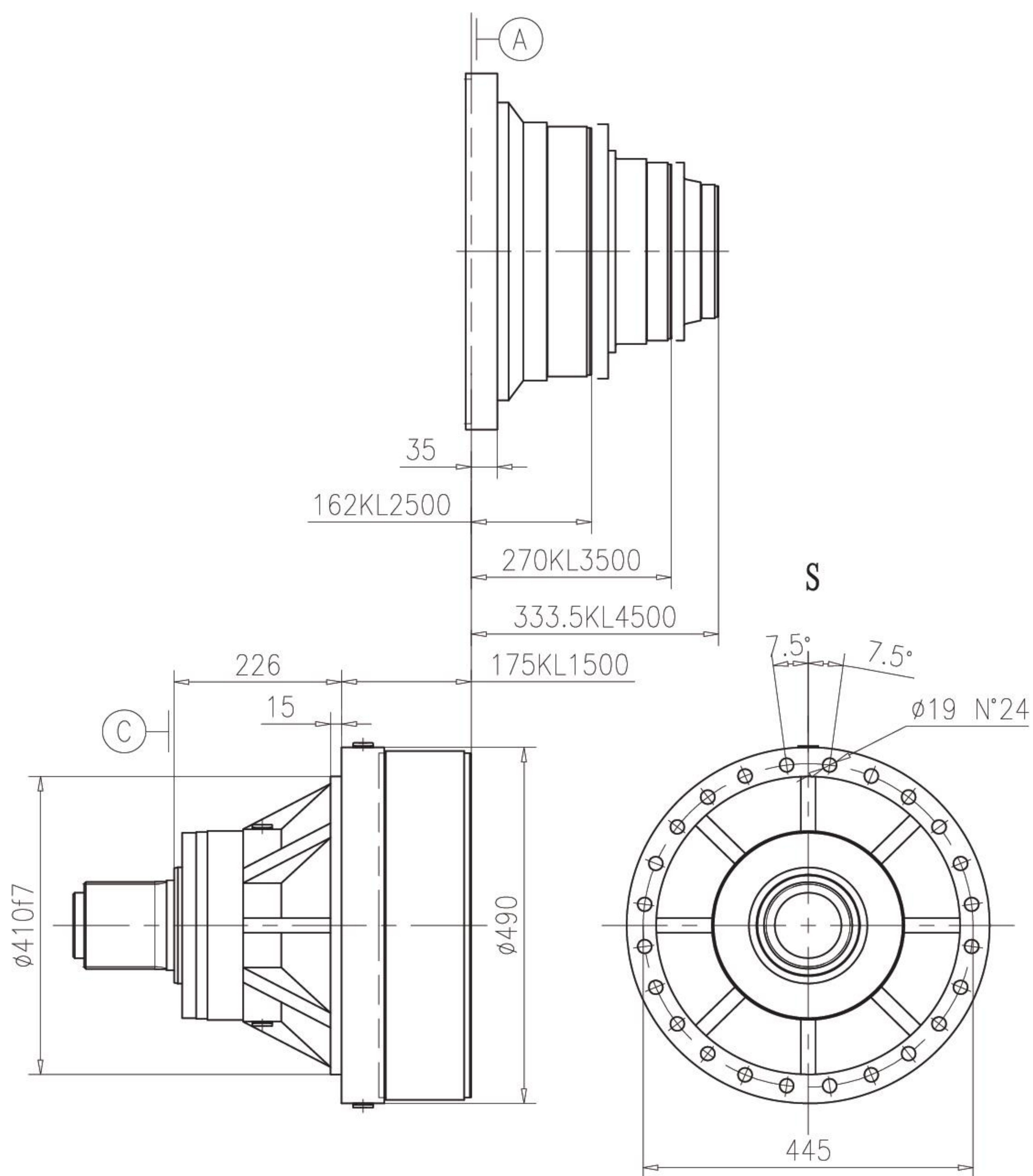
T₂=50000 Nm

KR500

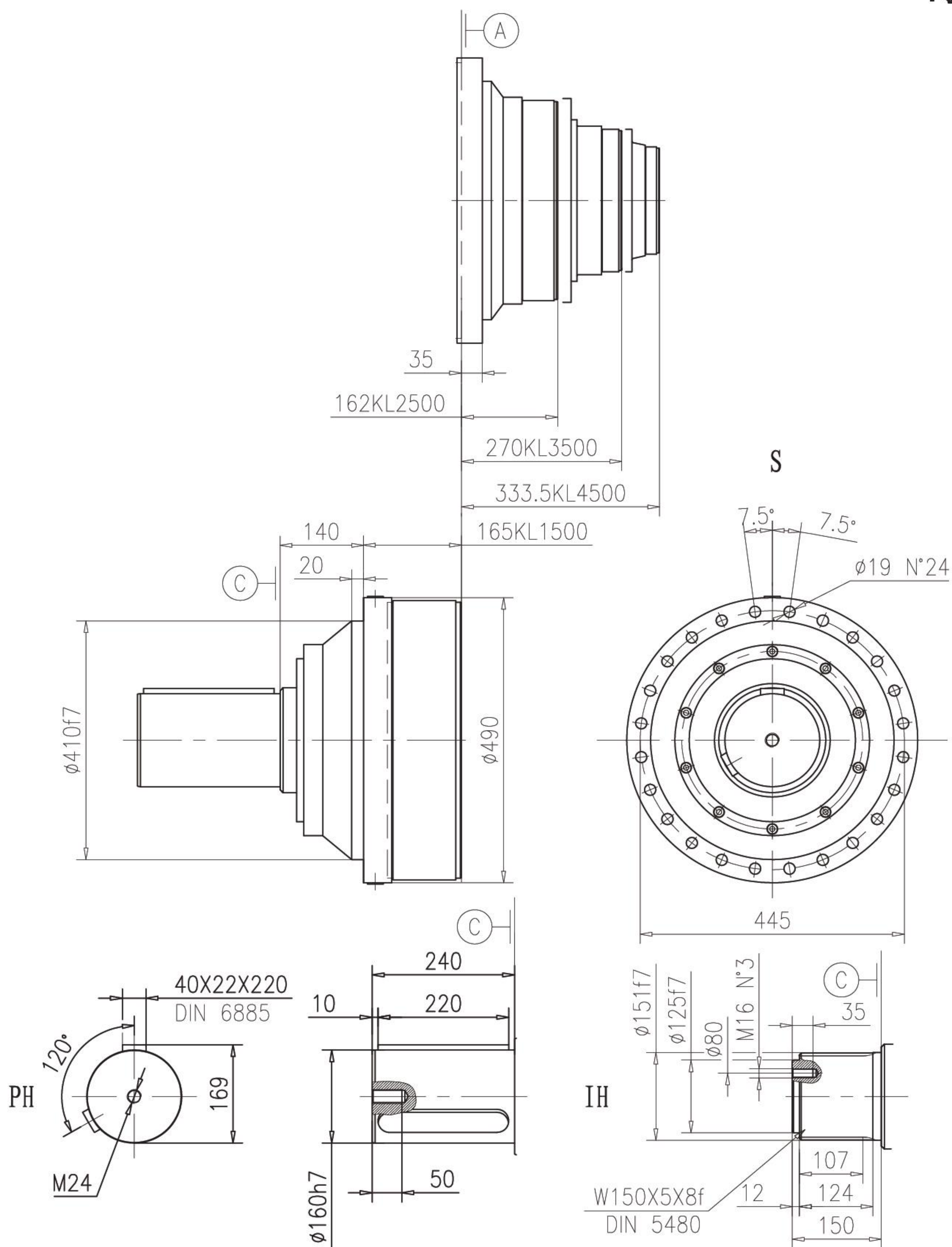
	i	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]	
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000				
R3	58.39	32666	32666	32666	32666	32666	32666	40	3500	700	
	66.95	37444	37444	37444	37444	37444	32651	40	3500	700	
	74.30	37940	37940	37940	37940	37940	32651	40	3500	700	
	80.55	36385	36385	36385	36385	36385	29582	40	3500	700	
	84.74	47454	47454	44674	42007	32010	26000	40	3500	700	
	94.04	48083	48083	44674	42007	32010	26000	40	3500	700	
	100.57	56312	49613	44674	42007	32010	26000	40	3500	700	
	109.60	49493	49493	49493	47795	36420	29582	40	3500	610	
	124.65	56312	49613	44674	42007	32010	26000	40	3500	610	
	143.49	56988	49613	44674	42007	32010	26000	40	3500	520	
	168.23	48630	42336	38122	35846	27315	22187	40	3500	520	
R4	235.92	72222	62875	56617	53237	40567	32951	22	3500	430	
	258.36	65965	57427	51712	48624	34926	28369	22	3500	340	
	294.34	72222	62875	56617	53237	40567	32951	22	3500	340	
	365.25	64840	56448	50830	47795	36420	29582	22	3500	250	
	406.49	64840	56448	50830	47795	36420	29582	22	3500	250	
	457.78	64840	56448	50830	47795	36420	29582	22	3500	250	
	510.41	64840	56448	50830	47795	36420	29582	22	3500	160	
	562.89	56988	49613	44674	42007	32010	26000	22	3500	160	
	615.51	56988	49613	44674	42007	32010	26000	22	3500	160	
	665.53	56988	49613	44674	42007	32010	26000	22	3500	160	
	711.32	56988	49613	44674	42007	32010	26000	22	3500	160	
	789.86	56988	49613	44674	42007	32010	26000	22	3500	160	
	882.69	56988	49613	44674	42007	32010	26000	22	3500	160	
	994.07	56988	49613	44674	42007	32010	26000	22	3500	160	
	1034.87	48630	42336	38122	35846	27315	22187	22	3500	160	
	1165.47	48630	42336	38122	35846	27315	22187	22	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

KL500

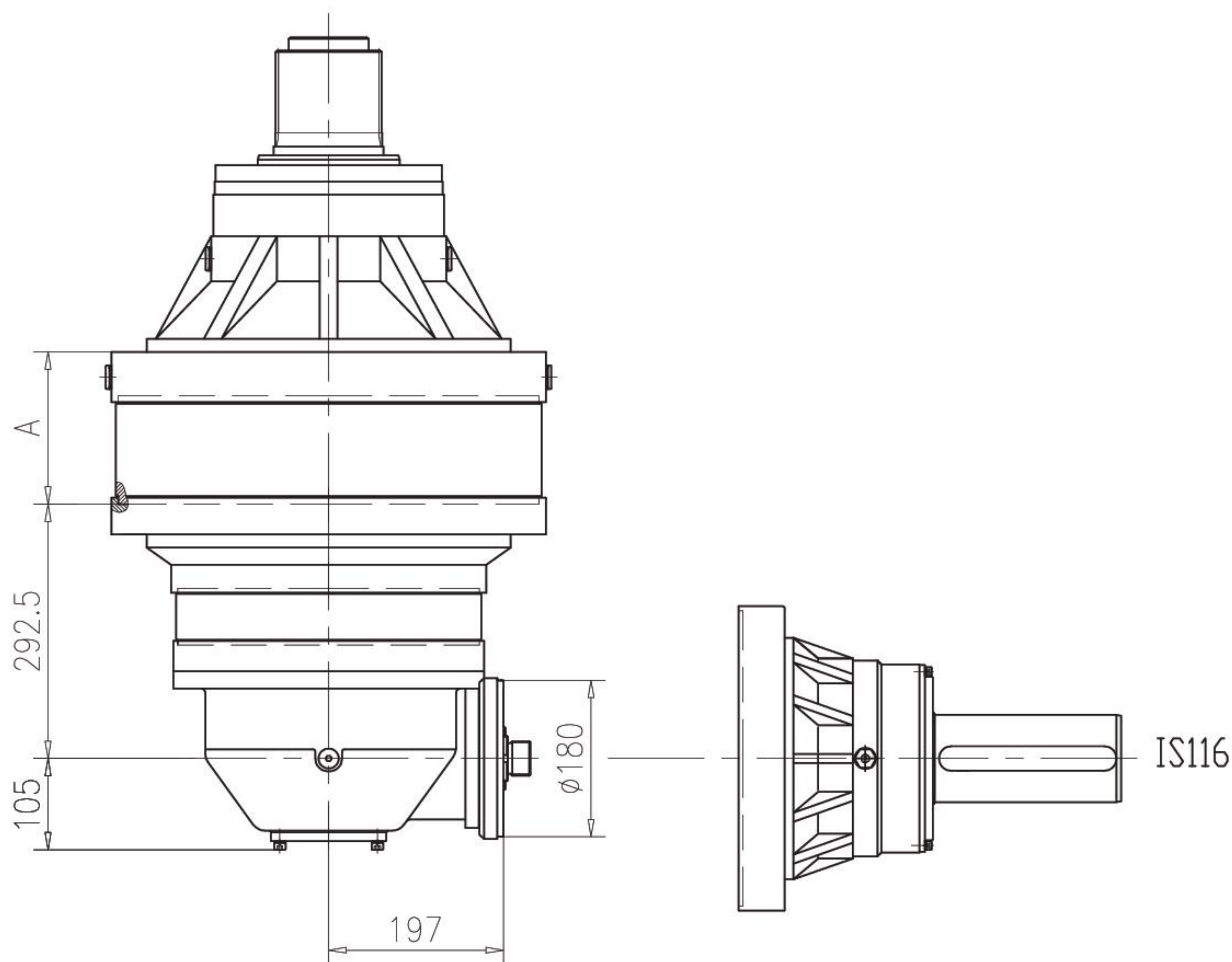


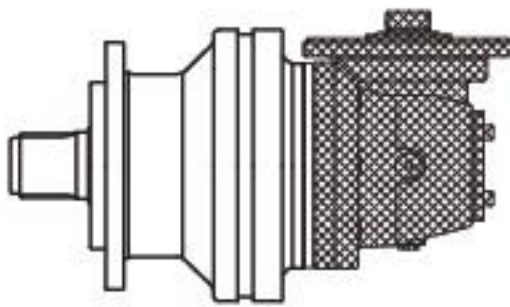
KL500



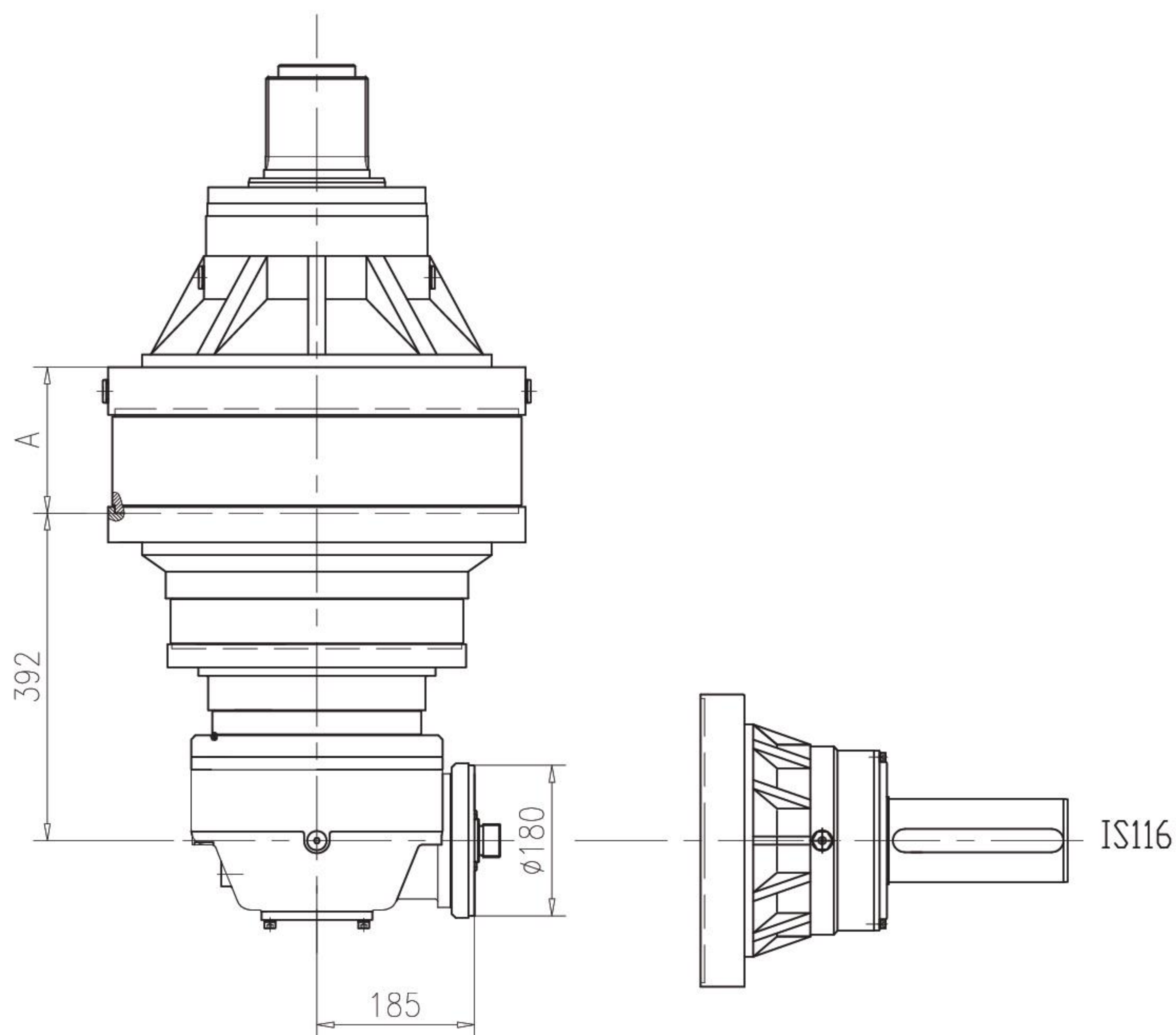


KR500

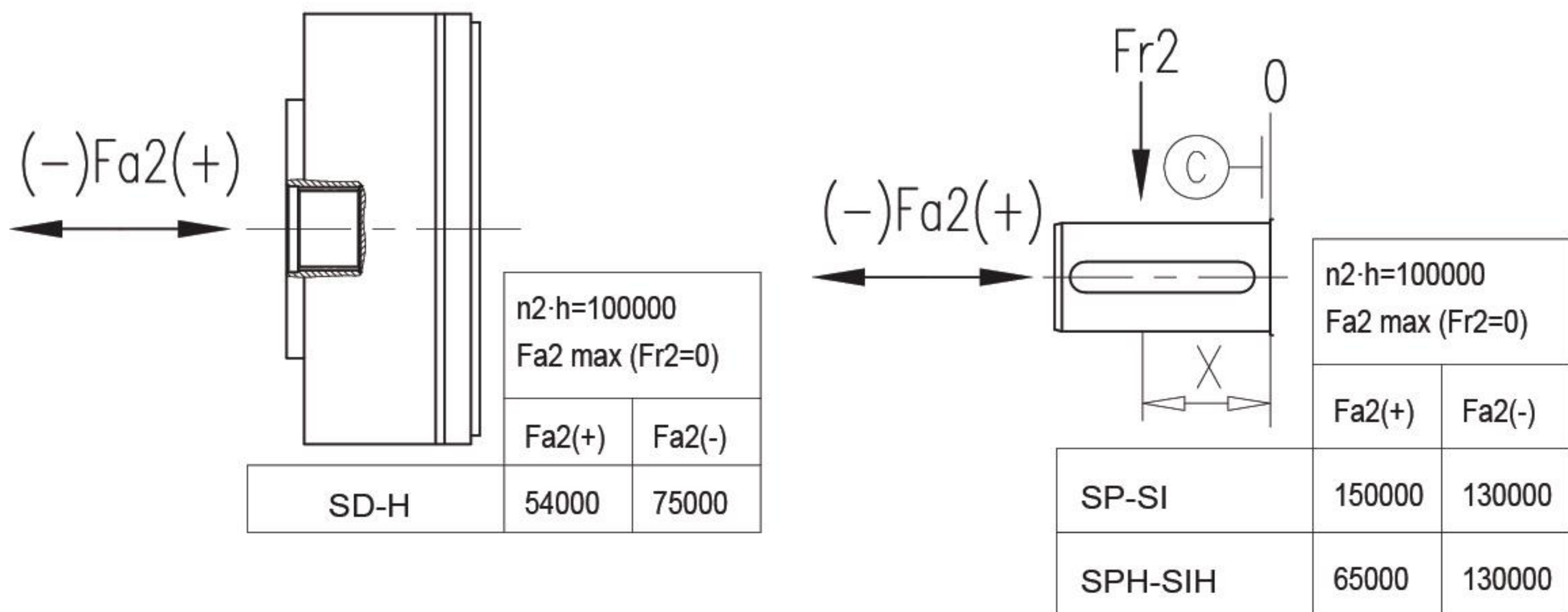
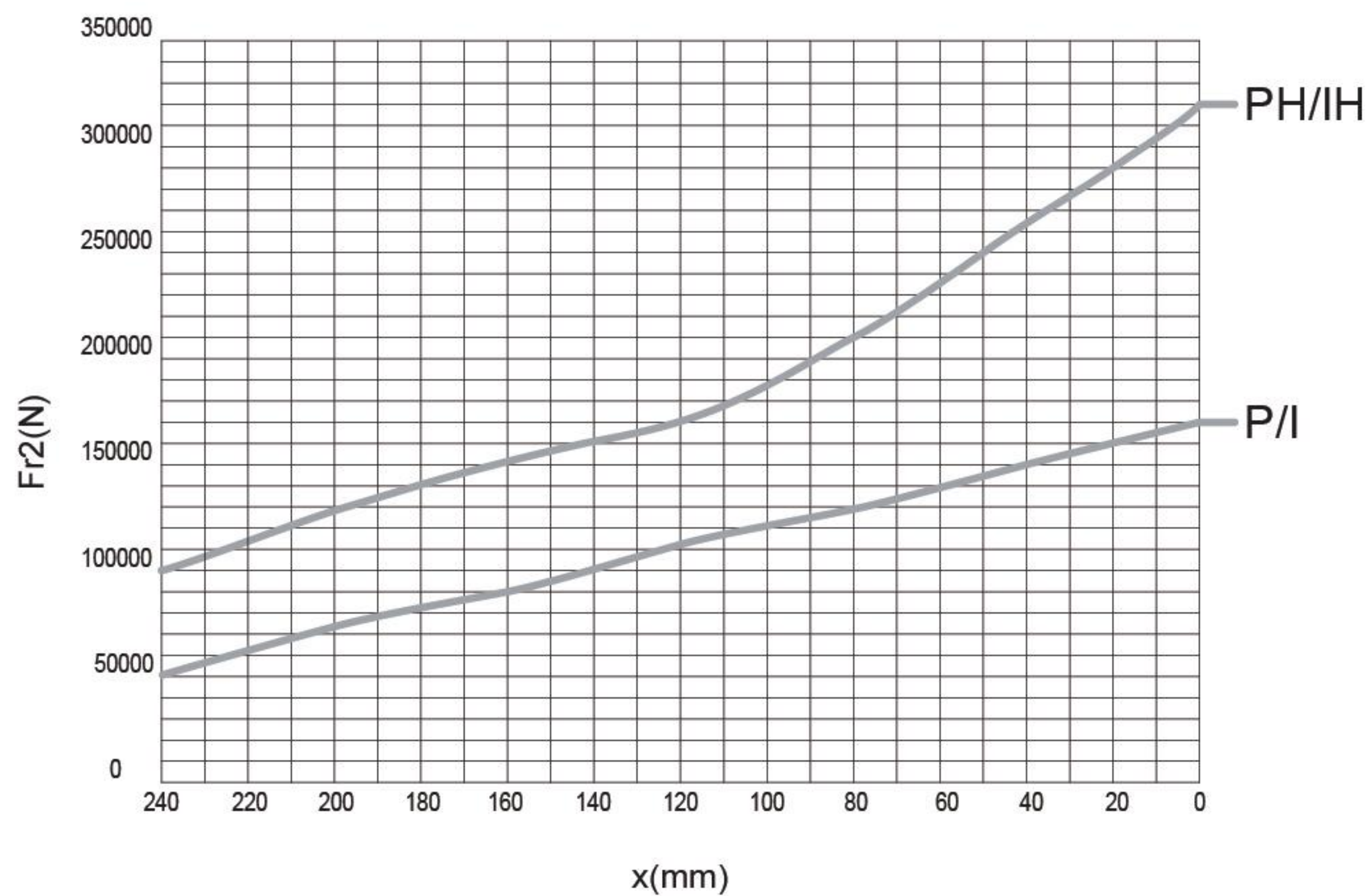
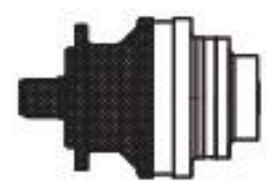


 KR 3500	A				
	SP	SI	SPH	SIH	H
	175	175	165	165	165

KR500



	A				
	SP	SI	SPH	SIH	H
KR 4500	175	175	165	165	165



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL600
T₂=60000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]
L1	4.18	92033	80122	72147	68516	45641	37072	58.5	1800	
	4.89	78670	68489	61672	58568	39014	31689	58.5	1800	
L2	15.44	92033	80122	72147	68516	45641	37072	43.2	2350	
	18.82	92033	80122	72147	68516	45641	37072	43.2	2350	
	19.77	78670	68489	61672	58568	39014	31689	43.2	2350	
	22.00	78670	68489	61672	58568	39014	31689	43.2	2350	
	25.02	78670	68489	61672	58568	39014	31689	43.2	2350	
	29.33	78670	68489	61672	58568	39014	31689	43.2	2350	
L3	97.23	92033	80122	72147	68516	45641	37072	30.9	2500	1140
	110.57	92033	80122	72147	68516	45641	37072	30.9	2500	1050
	128.41	92033	80122	72147	68516	45641	37072	30.9	2500	875
	143.32	78670	68489	61672	58568	39014	31689	30.9	2500	700
	150.12	78670	68489	61672	58568	39014	31689	30.9	2500	700
	155.16	92033	80122	72147	68516	45641	37072	30.9	2500	700
	181.39	78670	68489	61672	58568	39014	31689	30.9	2500	610
	212.67	78670	68489	61672	58568	39014	31689	30.9	2500	520
L4	244.13	92033	80122	72147	68516	45641	37072	24.2	3100	520
	399.38	92033	80122	72147	68516	45641	37072	24.2	3100	340
	451.38	92033	80122	72147	68516	45641	37072	24.2	3100	340
	502.34	92033	80122	72147	68516	45641	37072	24.2	3100	340
	560.42	92033	80122	72147	68516	45641	37072	24.2	3100	250
	603.43	78670	68489	61672	58568	39014	31689	24.2	3100	250
	655.17	78670	68489	61672	58568	39014	31689	24.2	3100	160
	704.90	92033	80122	72147	68516	45641	37072	24.2	3100	160
	801.65	92033	80122	72147	68516	45641	37072	24.2	3100	160
	900.71	78670	68489	61672	58568	39014	31689	24.2	3100	160
	937.19	78670	68489	61672	58568	39014	31689	24.2	3100	160
	1088.35	78670	68489	61672	58568	39014	31689	24.2	3100	160
	1315.09	78670	68489	61672	58568	39014	31689	24.2	3100	160
	1541.83	78670	68489	61672	58568	39014	31689	24.2	3100	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

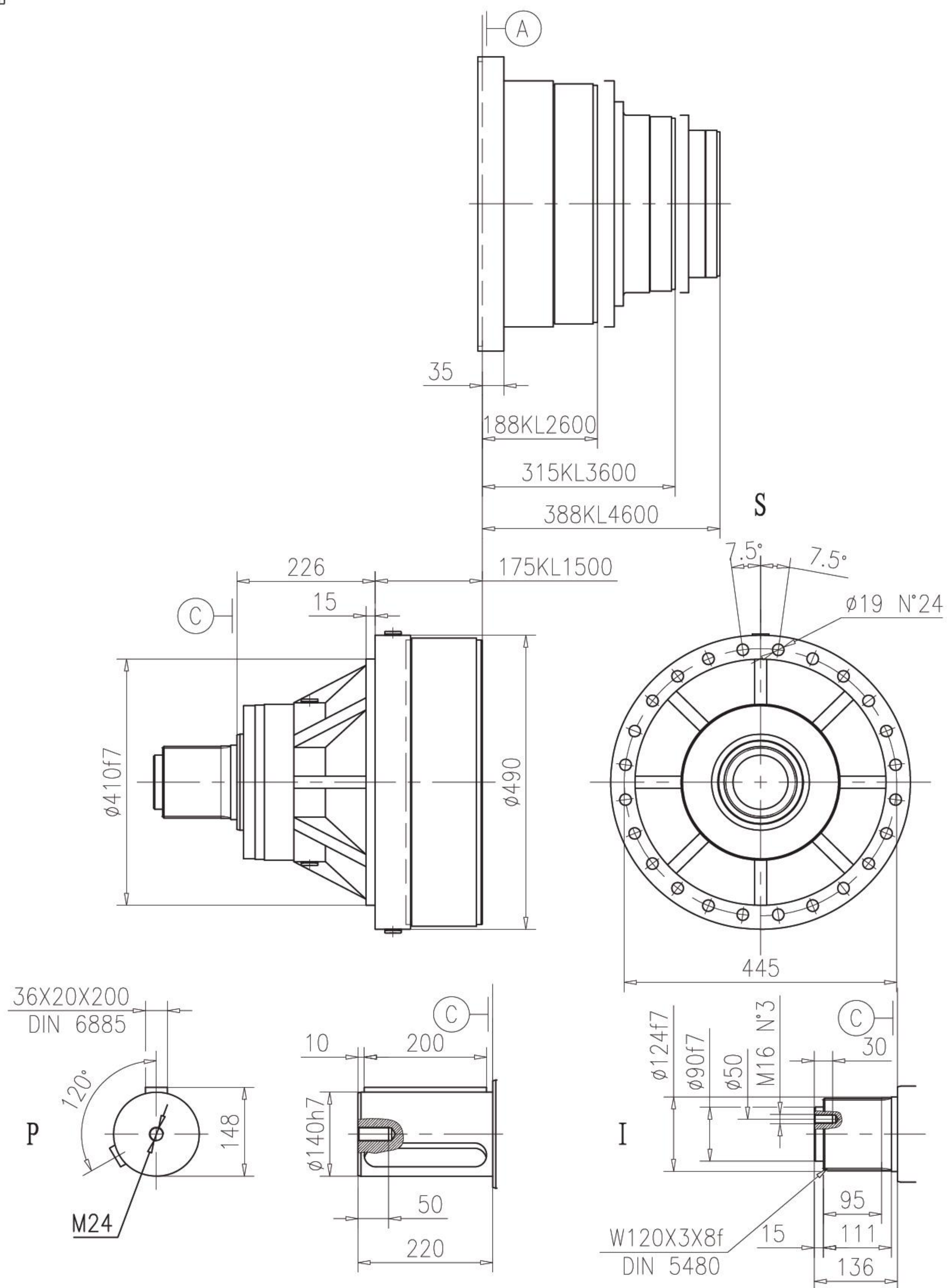
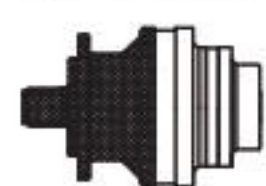
T₂=60000 Nm

KR600

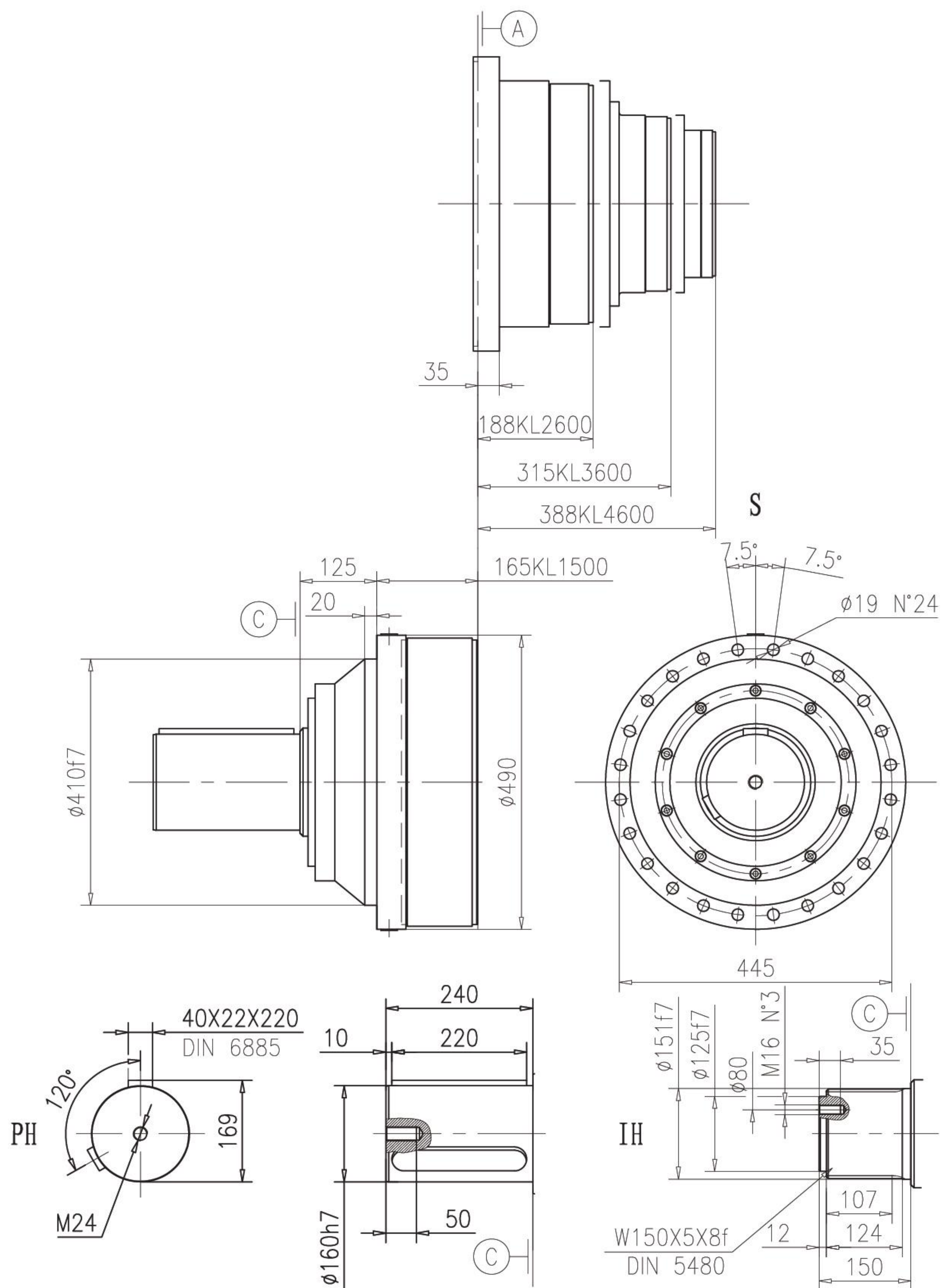
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]
R3	59.35	55777	55777	55777	55777	45641	37072	40	3500	1140
	67.50	63462	63462	63462	63462	45641	37072	40	3500	1140
	74.90	65048	65048	65048	65048	45641	37072	40	3500	1050
	83.66	63128	63128	63128	63128	45641	37072	40	3500	960
	87.57	76097	68489	61672	58568	39014	31689	40	3500	1050
	97.80	73851	68489	61672	58568	39014	31689	40	3500	960
	114.67	78670	68489	61672	58568	39014	31689	40	3500	875
	132.00	78670	68489	61672	58568	39014	31689	40	3500	785
R4	250.90	78670	68489	61672	58568	39014	31689	22	3500	430
	265.22	92033	80122	72147	68516	45641	37072	22	3500	430
	299.16	92033	80122	72147	68516	45641	37072	22	3500	430
	371.23	92033	80122	72147	68516	45641	37072	22	3500	340
	405.25	78670	68489	61672	58568	39014	31689	22	3500	250
	461.90	78670	68489	61672	58568	39014	31689	22	3500	250
	512.90	78670	68489	61672	58568	39014	31689	22	3500	250
	573.18	78670	68489	61672	58568	39014	31689	22	3500	160
	619.76	78670	68489	61672	58568	39014	31689	22	3500	160
	667.18	92033	80122	72147	68516	45641	37072	22	3500	160
	779.99	78670	68489	61672	58568	39014	31689	22	3500	160
	914.47	78670	68489	61672	58568	39014	31689	22	3500	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

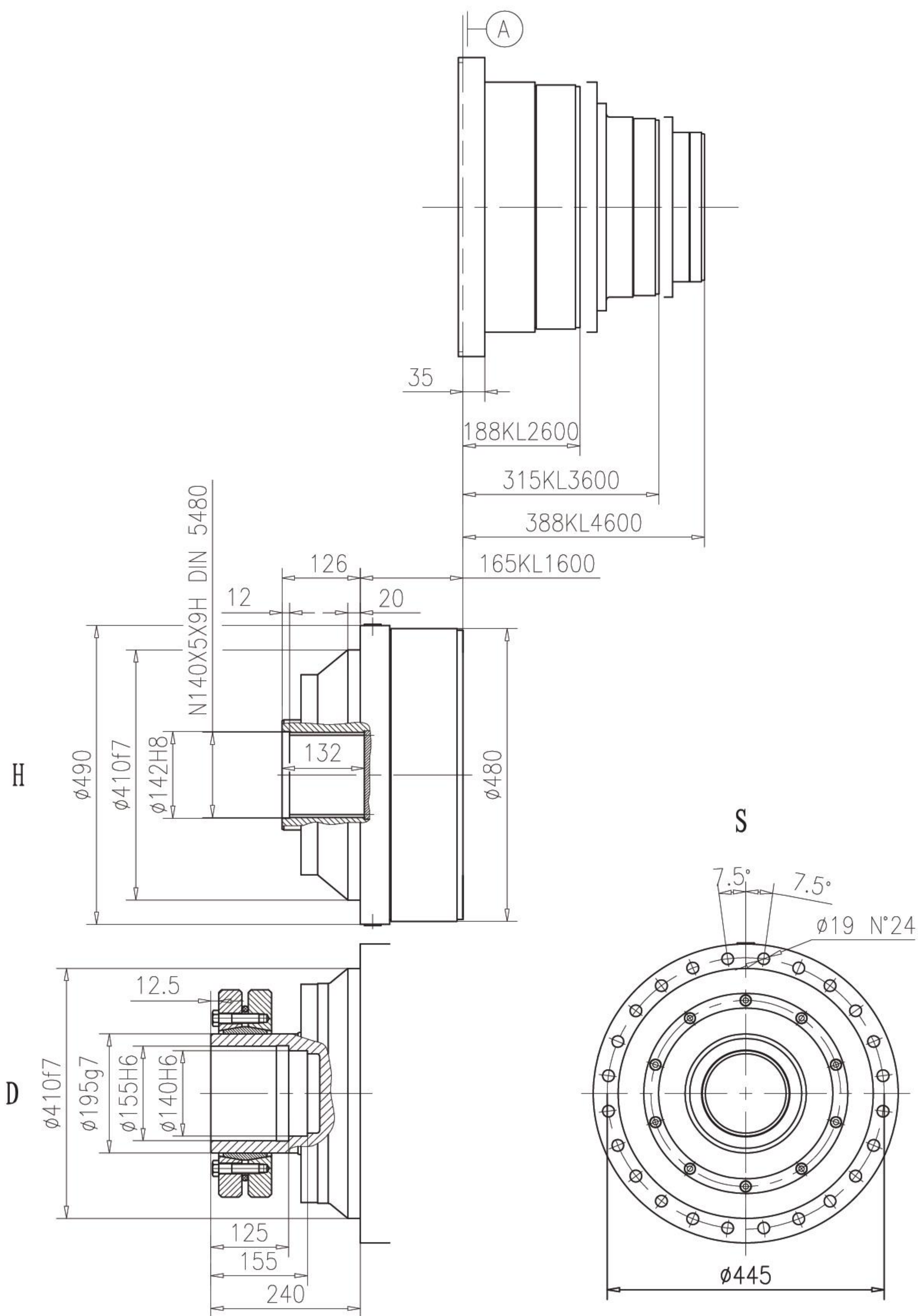
KL600



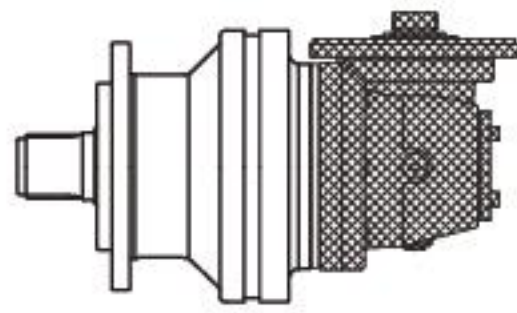
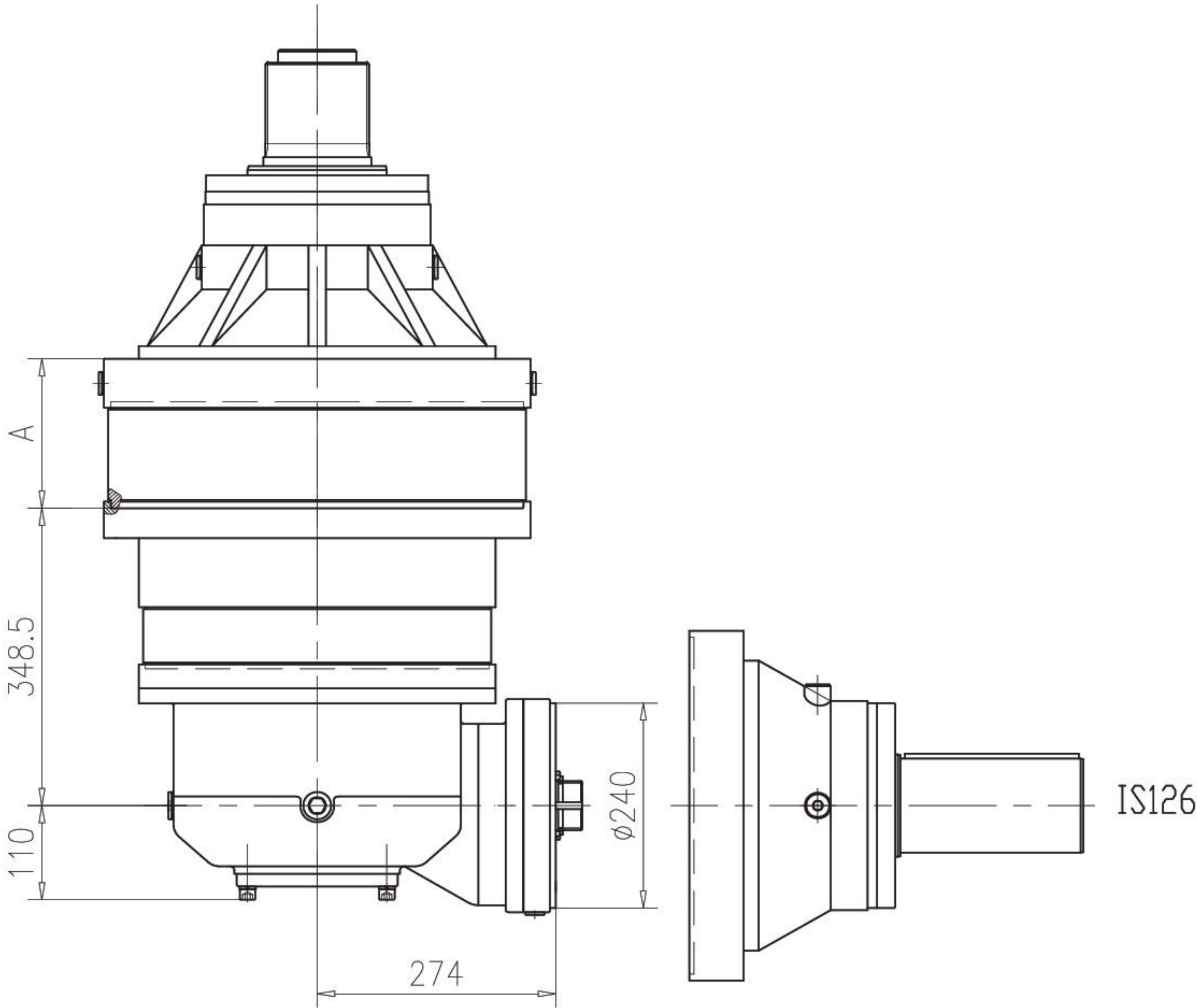
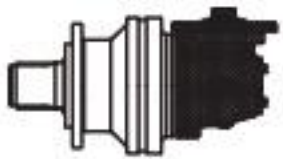
KL600



KL600

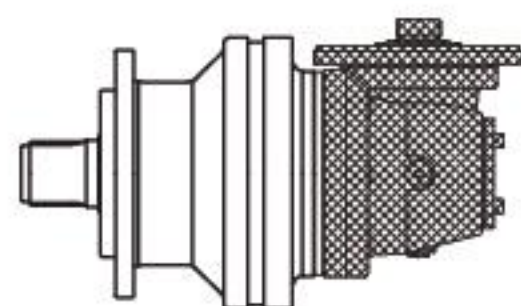
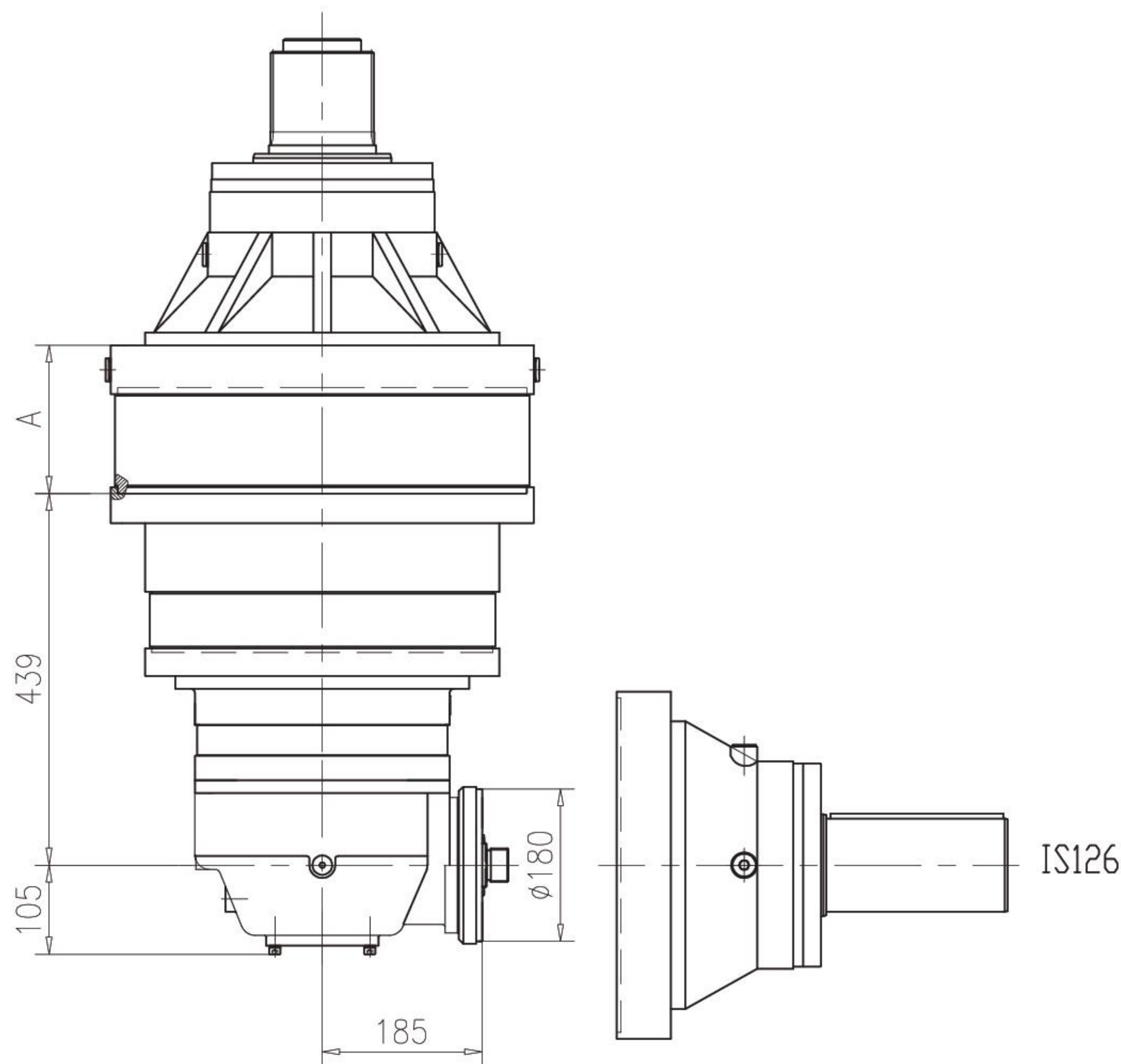


KR600

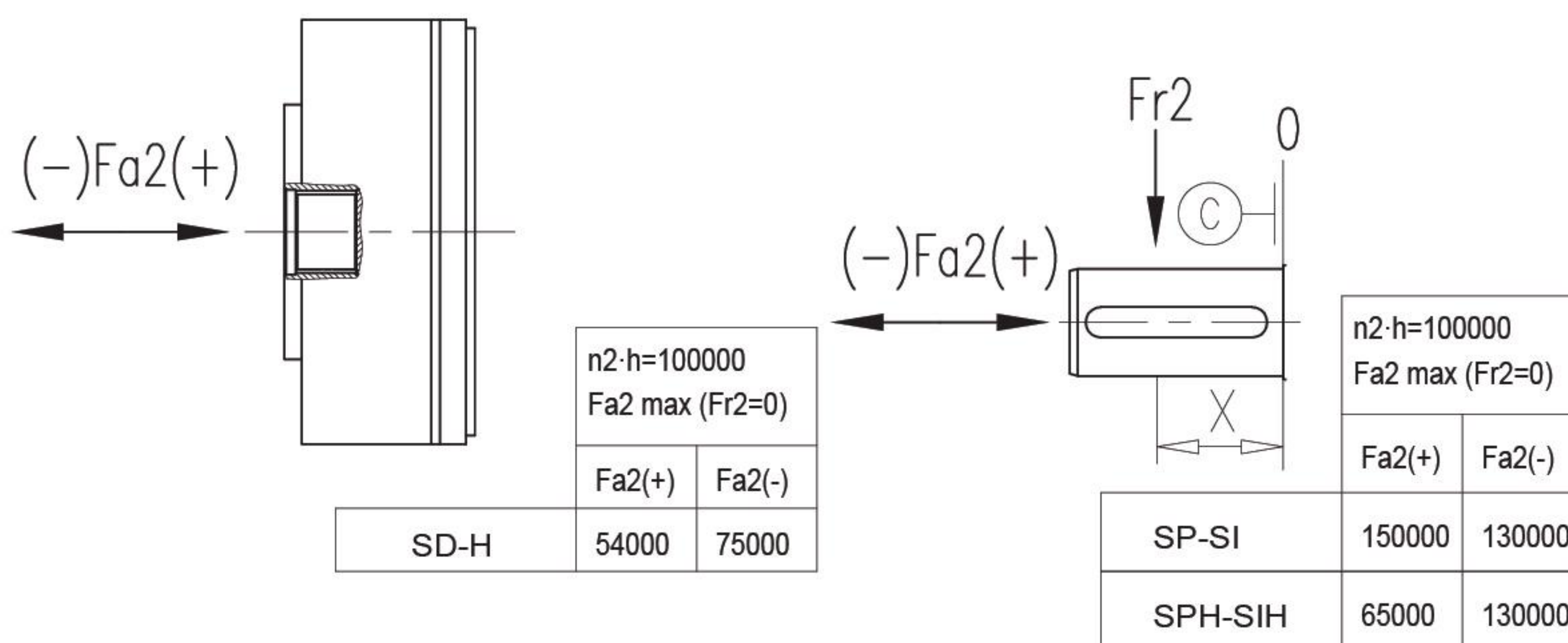


	A				
	SP	SI	SPH	SIH	H
KR 3600	175	175	165	165	165

KR600



	A				
	SP	SI	SPH	SIH	H
KR 4600	175	175	165	165	165



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL850

T₂=85000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]
L1	4.18	100989	88748	80588	79567	49985	40498	60	1500	
	4.89	86326	75863	68887	68015	42727	34618	60	1500	
L2	15.44	100989	88748	80588	79567	49985	40498	45	1800	
	16.91	100989	88748	80588	79567	49985	40498	45	1800	
	18.82	100989	88748	80588	79567	49985	40498	45	1800	
	21.40	100989	88748	80588	79567	49985	40498	45	1800	
	25.02	86326	75863	68887	68015	42727	34618	45	1800	
	29.33	86326	75863	68887	68015	42727	34618	45	1800	
L3	97.23	100989	88748	80588	79567	49985	40498	30	3000	
	110.57	100989	88748	80588	79567	49985	40498	30	3000	
	128.41	100989	88748	80588	79567	49985	40498	30	3000	1050
	143.30	86326	75863	68887	68015	42727	34618	30	3000	875
	150.12	86326	75863	68887	68015	42727	34618	30	3000	875
	155.16	100989	88748	80588	79567	49985	40498	30	3000	960
	181.39	86326	75863	68887	68015	42727	34618	30	3000	700
	212.67	86326	75863	68887	68015	42727	34618	30	3000	610
L4	244.13	100989	88748	80588	79567	49985	40498	18	3800	610
	399.38	100989	88748	80588	79567	49985	40498	18	3800	430
	451.38	100989	88748	80588	79567	49985	40498	18	3800	340
	502.34	100989	88748	80588	79567	49985	40498	18	3800	340
	560.42	100989	88748	80588	79567	49985	40498	18	3800	250
	603.43	86326	75863	68887	68015	42727	34618	18	3800	250
	655.17	86326	75863	68887	68015	42727	34618	18	3800	250
	704.90	100989	88748	80588	79567	49985	40498	18	3800	250
	801.65	100989	88748	80588	79567	49985	40498	18	3800	250
	900.71	86326	75863	68887	68015	42727	34618	18	3800	160
	937.19	86326	75863	68887	68015	42727	34618	18	3800	160
	1088.35	86326	75863	68887	68015	42727	34618	18	3800	160
	1315.09	86326	75863	68887	68015	42727	34618	18	3800	160
	1541.83	86326	75863	68887	68015	42727	34618	18	3800	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

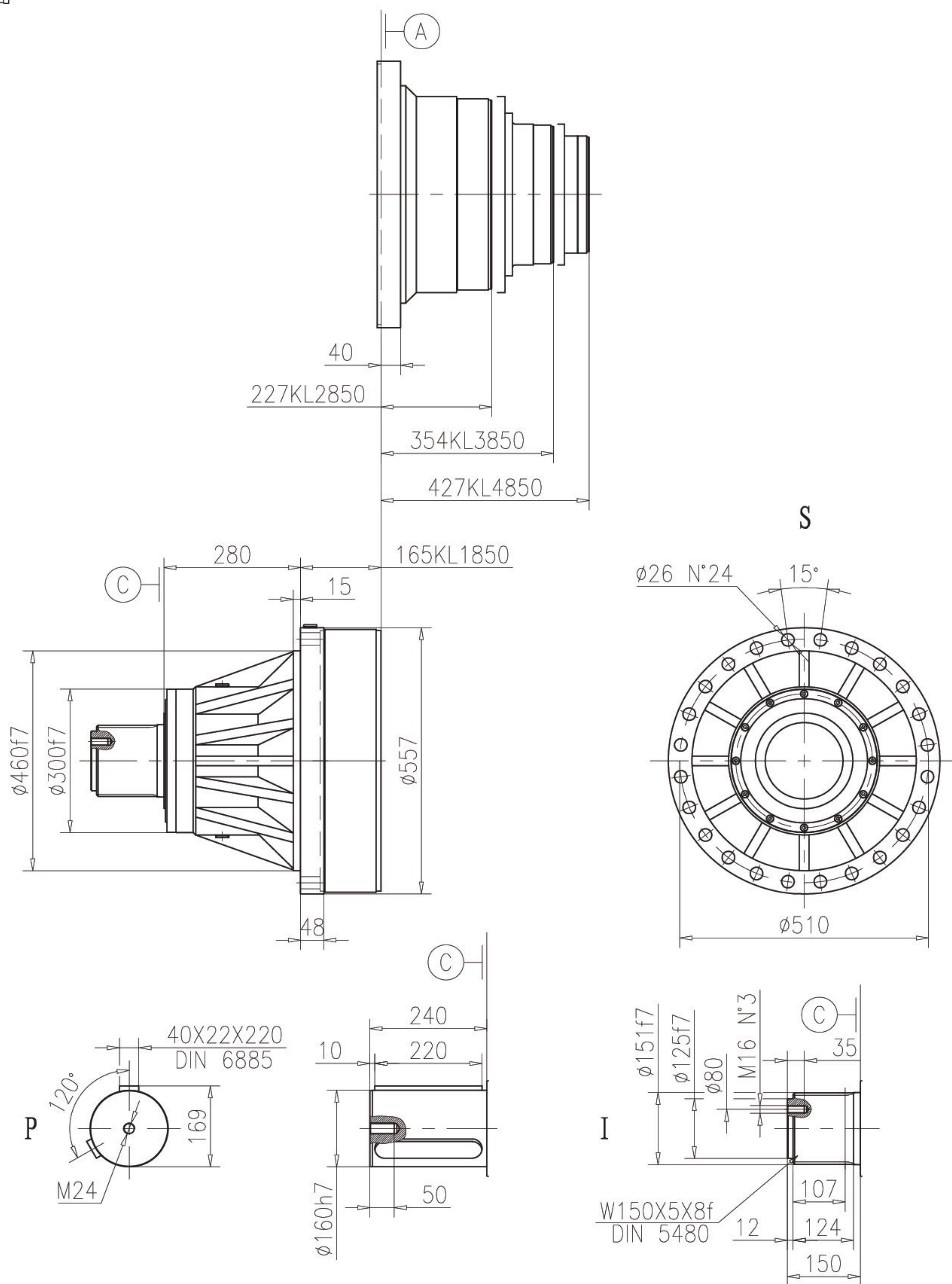
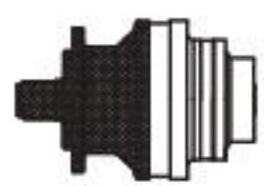
T₂=85000 Nm

KR850

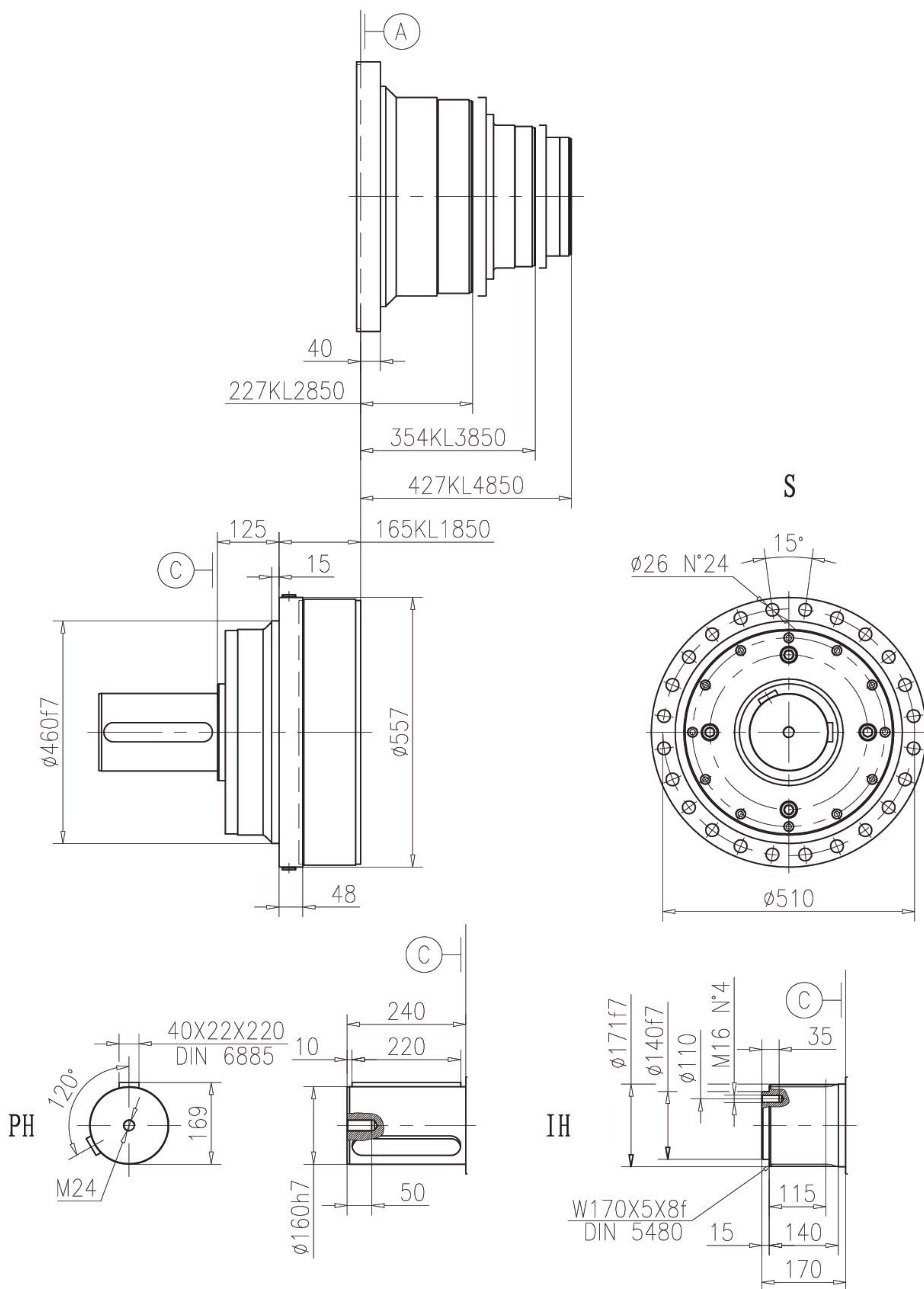
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]
R3	59.35	55777	55777	55777	55777	49985	40498	55	2500	1050
	67.50	63462	63462	63462	63462	49985	40498	55	2500	
	74.90	65048	65048	65048	65048	49985	40498	55	2500	
	83.66	63128	63128	63128	63128	49985	40498	55	2500	
	87.57	76097	75863	68887	68015	42727	34618	55	2500	
	97.80	73851	73851	68887	68015	42727	34618	55	2500	
	114.67	86326	75863	68887	68015	42727	34618	55	2500	
	132.00	86326	75863	68887	68015	42727	34618	55	2500	
R4	250.90	86326	75863	68887	68015	42727	34618	22	3800	520
	265.22	100989	88748	80588	79567	49985	40498	22	3800	610
	299.16	100989	88748	80588	79567	49985	40498	22	3800	430
	371.23	100989	88748	80588	79567	49985	40498	22	3800	430
	405.25	86326	75863	68887	68015	42727	34618	22	3800	340
	461.90	86326	75863	68887	68015	42727	34618	22	3800	340
	512.90	86326	75863	68887	68015	42727	34618	22	3800	250
	573.18	86326	75863	68887	68015	42727	34618	22	3800	250
	619.76	86326	75863	68887	68015	42727	34618	22	3800	250
	667.18	100989	88748	80588	79567	49985	40498	22	3800	250
	779.99	86326	75863	68887	68015	42727	34618	22	3800	160
	914.47	86326	75863	68887	68015	42727	34618	22	3800	160
R5	1163.35	100989	88748	80588	79567	49985	40498	18	3800	160
	1314.45	86326	75863	68887	68015	42727	34618	18	3800	160
	1364.54	100989	88748	80588	79567	49985	40498	18	3800	160
	1415.03	100989	88748	80588	79567	49985	40498	18	3800	160
	1518.60	100989	88748	80588	79567	49985	40498	18	3800	160
	1617.05	100989	88748	80588	79567	49985	40498	18	3800	160
	1664.11	100989	88748	80588	79567	49985	40498	18	3800	160
	1717.32	100989	88748	80588	79567	49985	40498	18	3800	160
	1868.09	86326	75863	68887	68015	42727	34618	18	3800	160
	2200.50	100989	88748	80588	79567	49985	40498	18	3800	160
	2620.24	86326	75863	68887	68015	42727	34618	18	3800	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

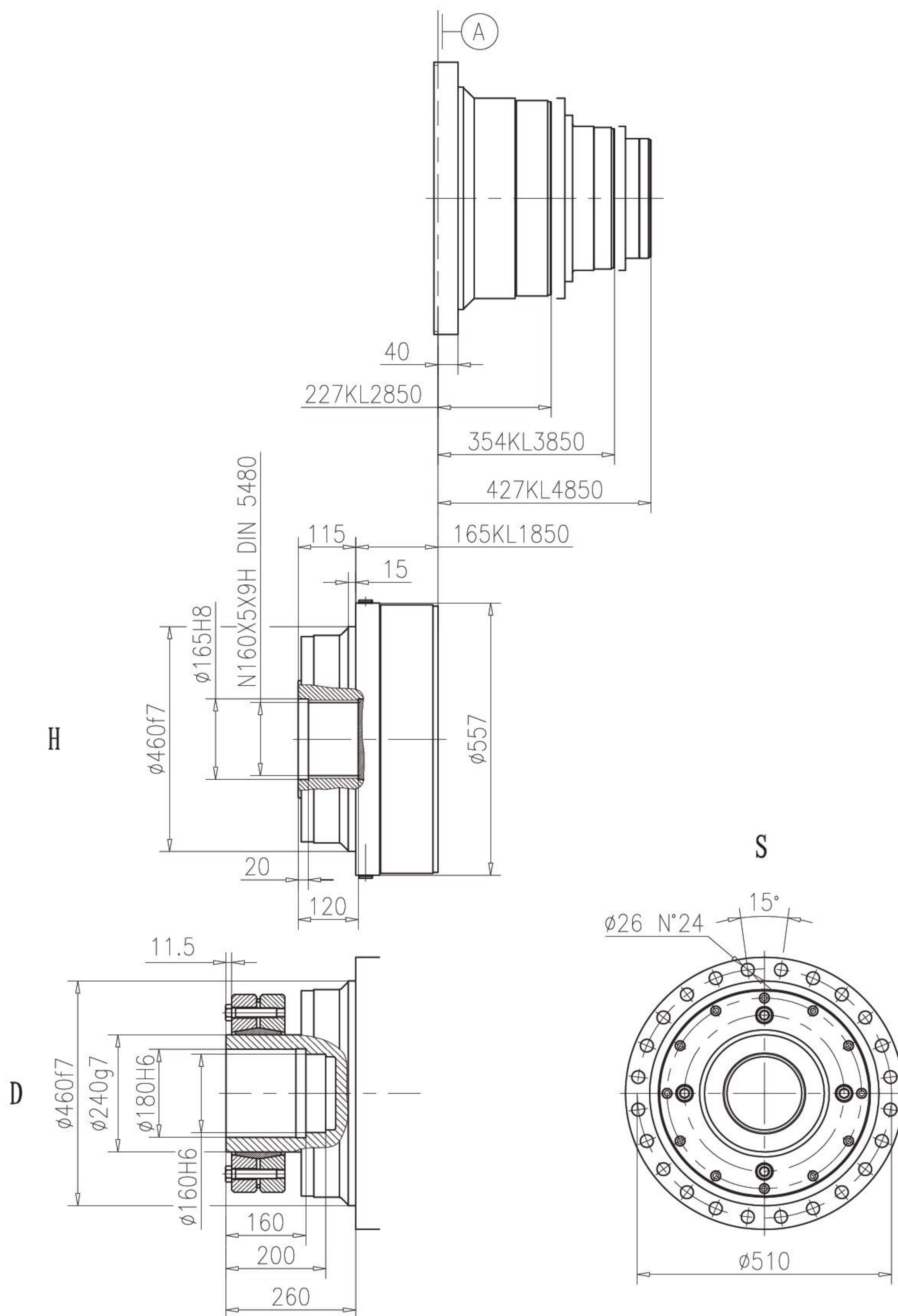
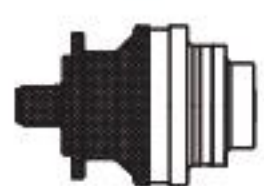
KL850



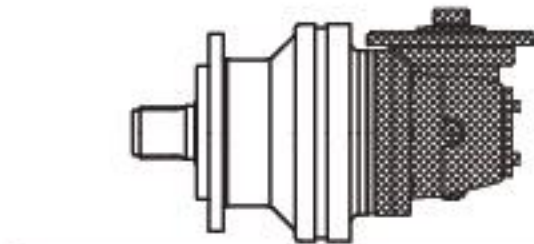
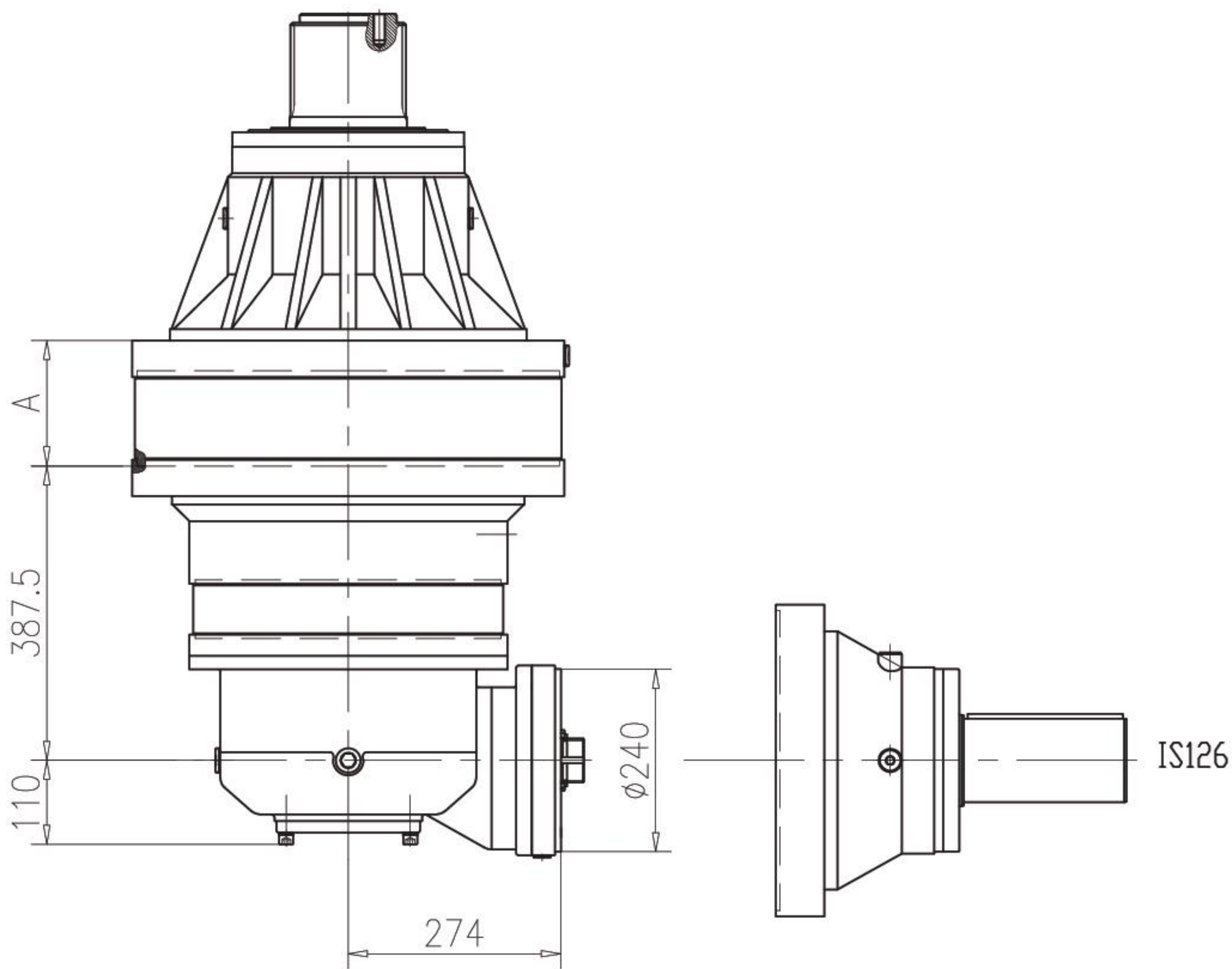
KL850



KL850

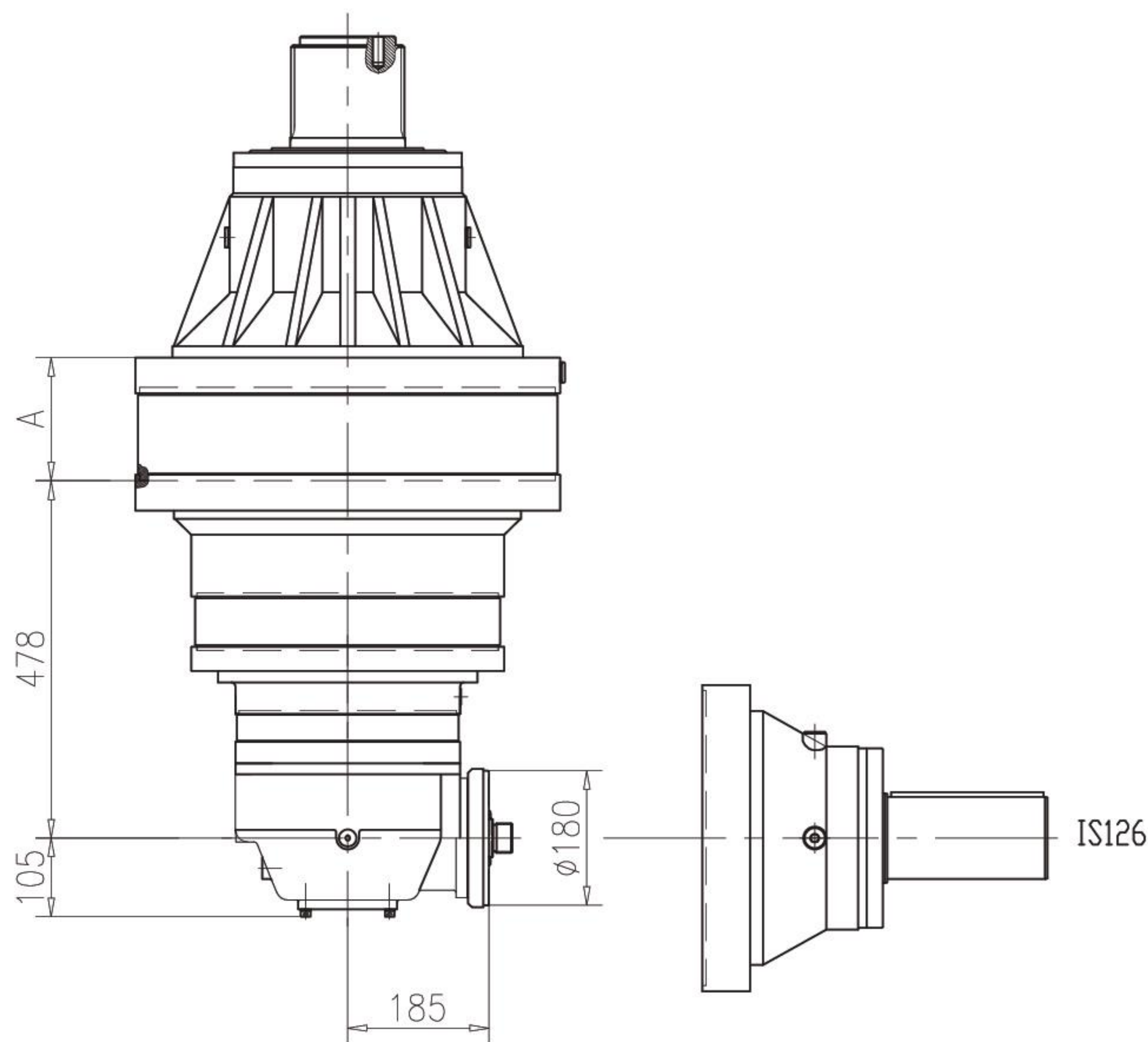


KR850



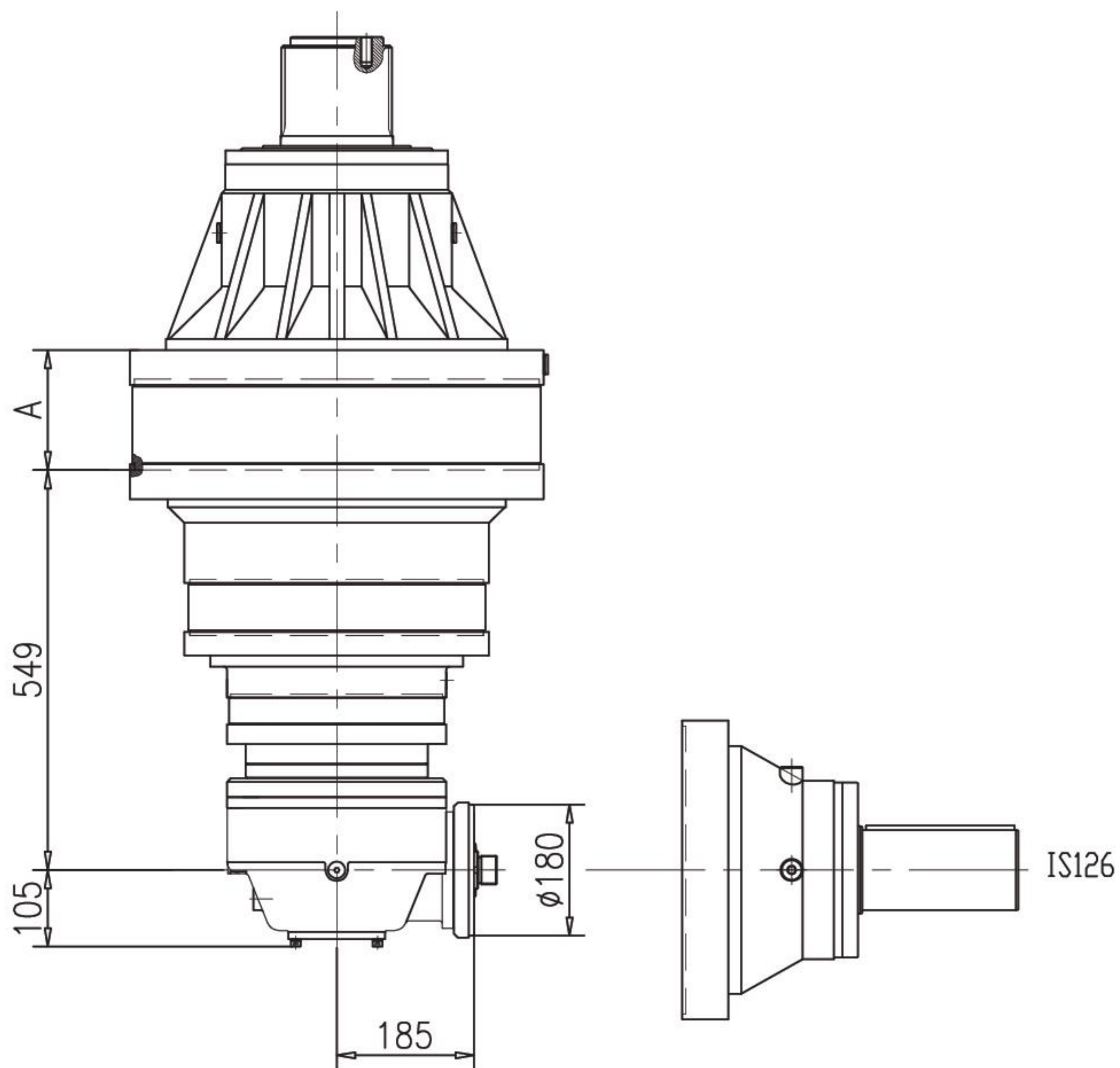
	A				
	SP	SI	SPH	SIH	H
KR 3850	165	165	165	165	165

KR850

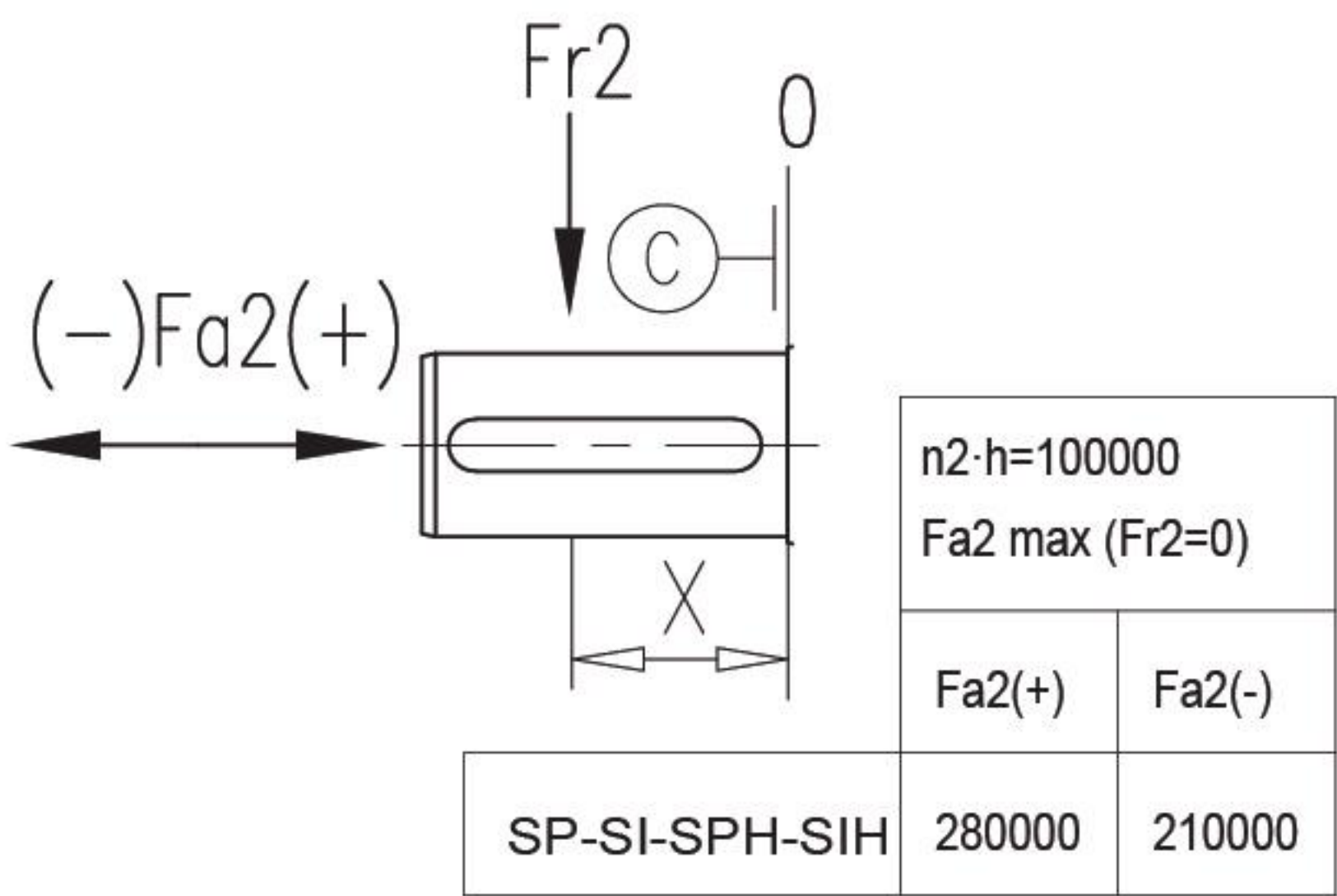
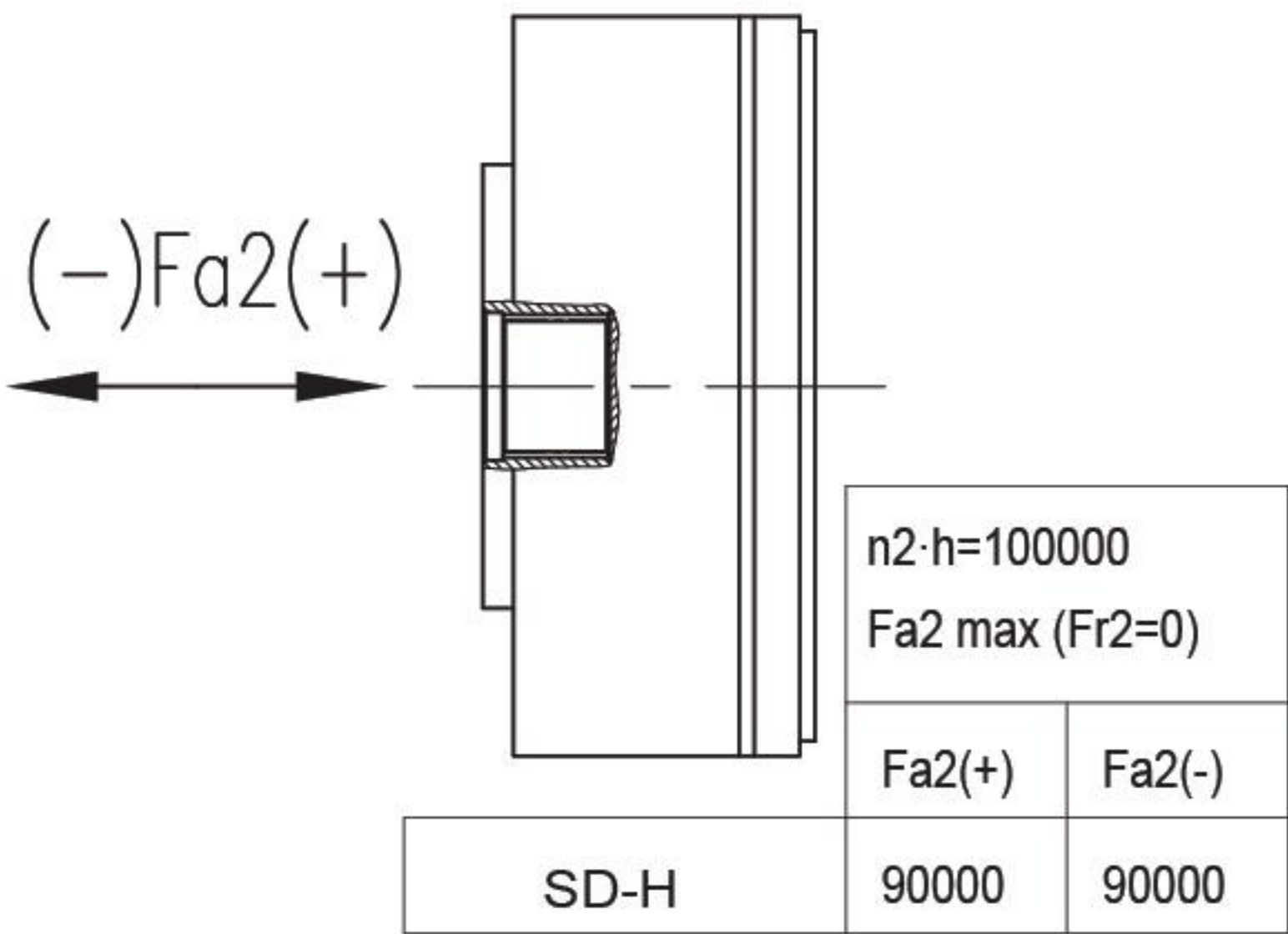
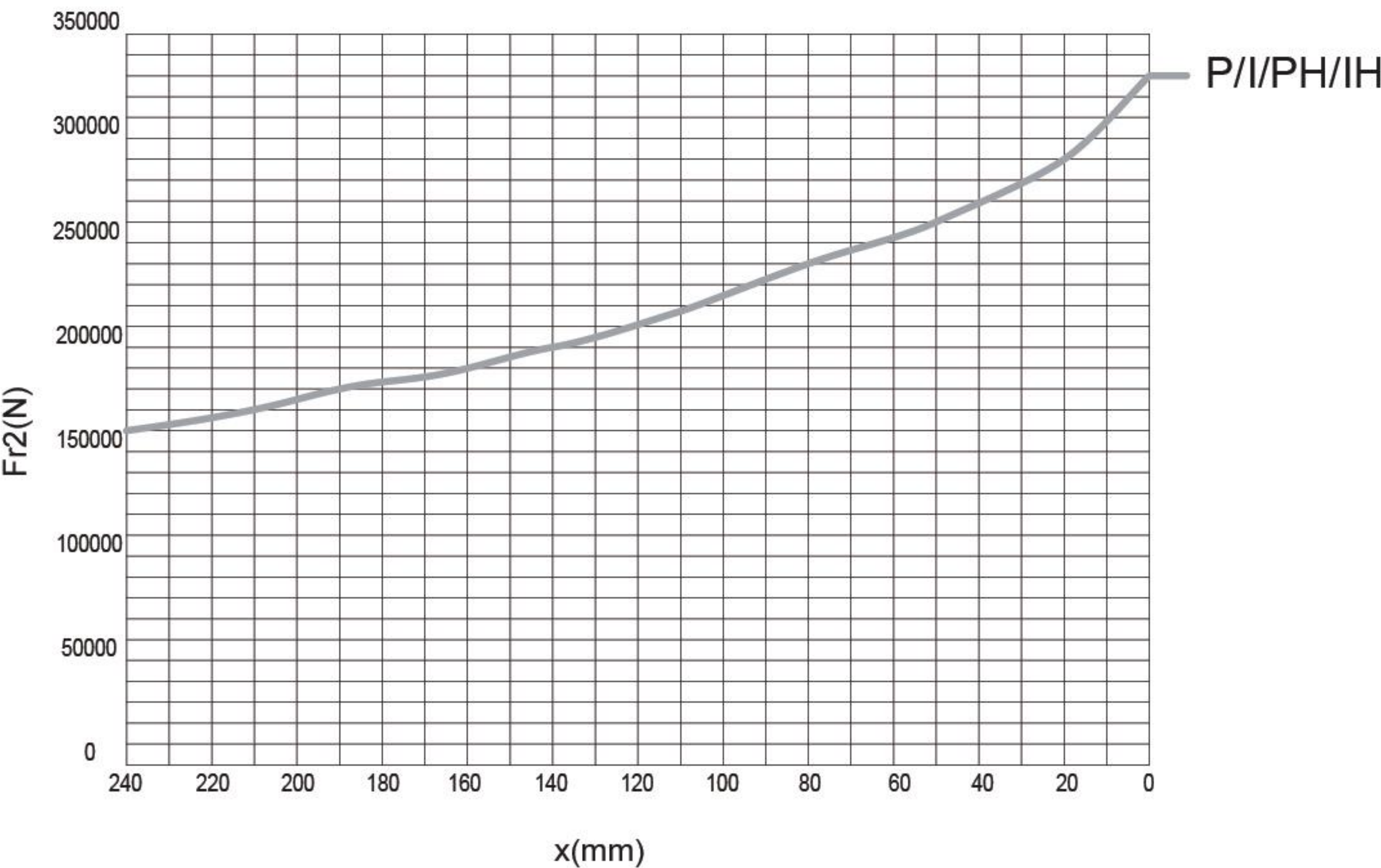


	A				
	SP	SI	SPH	SIH	H
KR 4850	165	165	165	165	165

KR850



	A				
	SP	SI	SPH	SIH	H
KR 5850	165	165	165	165	165



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL1050
T₂=105000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	4.09	125498	109255	98380	92206	70255	57065	87	1200		
	5.25	97769	85115	76643	71833	54732	44456	87	1200		
L2	16.54	125498	109255	98380	92206	70255	57065	51	2100		
	18.41	125498	109255	98380	92206	70255	57065	51	2100		
	20.94	125498	109255	98380	92206	70255	57065	51	2100		
	24.55	125498	109255	98380	92206	70255	57065	51	2100		
	31.50	97769	85115	76643	71833	54732	44456	51	2100		
L3	57.90	125498	109255	98380	92206	70255	57065	37	2500		
	68.23	125498	109255	98380	92206	70255	57065	37	2500		
	95.11	125498	109255	98380	92206	70255	57065	37	2500		
	125.61	125498	109255	98380	92206	70255	57065	37	2500		
	138.82	97769	85115	76643	71833	54732	44456	37	2500	1050	
	189.00	97769	85115	76643	71833	54732	44456	37	2500	785	
L4	218.08	125498	109255	98380	92206	70255	57065	28	3100	700	
	243.41	125498	109255	98380	92206	70255	57065	28	3100	610	
	294.55	125498	109255	98380	92206	70255	57065	28	3100	520	
	352.54	125498	109255	98380	92206	70255	57065	28	3100	520	
	401.99	97769	85115	76643	71833	54732	44456	28	3100	340	
	453.71	125498	109255	98380	92206	70255	57065	28	3100	430	
	504.94	125498	109255	98380	92206	70255	57065	28	3100	340	
	570.68	125498	109255	98380	92206	70255	57065	28	3100	340	
	649.01	125498	109255	98380	92206	70255	57065	28	3100	340	
	706.54	97769	85115	76643	71833	54732	44456	28	3100	250	
	800.80	125498	109255	98380	92206	70255	57065	28	3100	250	
	1168.74	97769	85115	76643	71833	54732	44456	28	3100	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

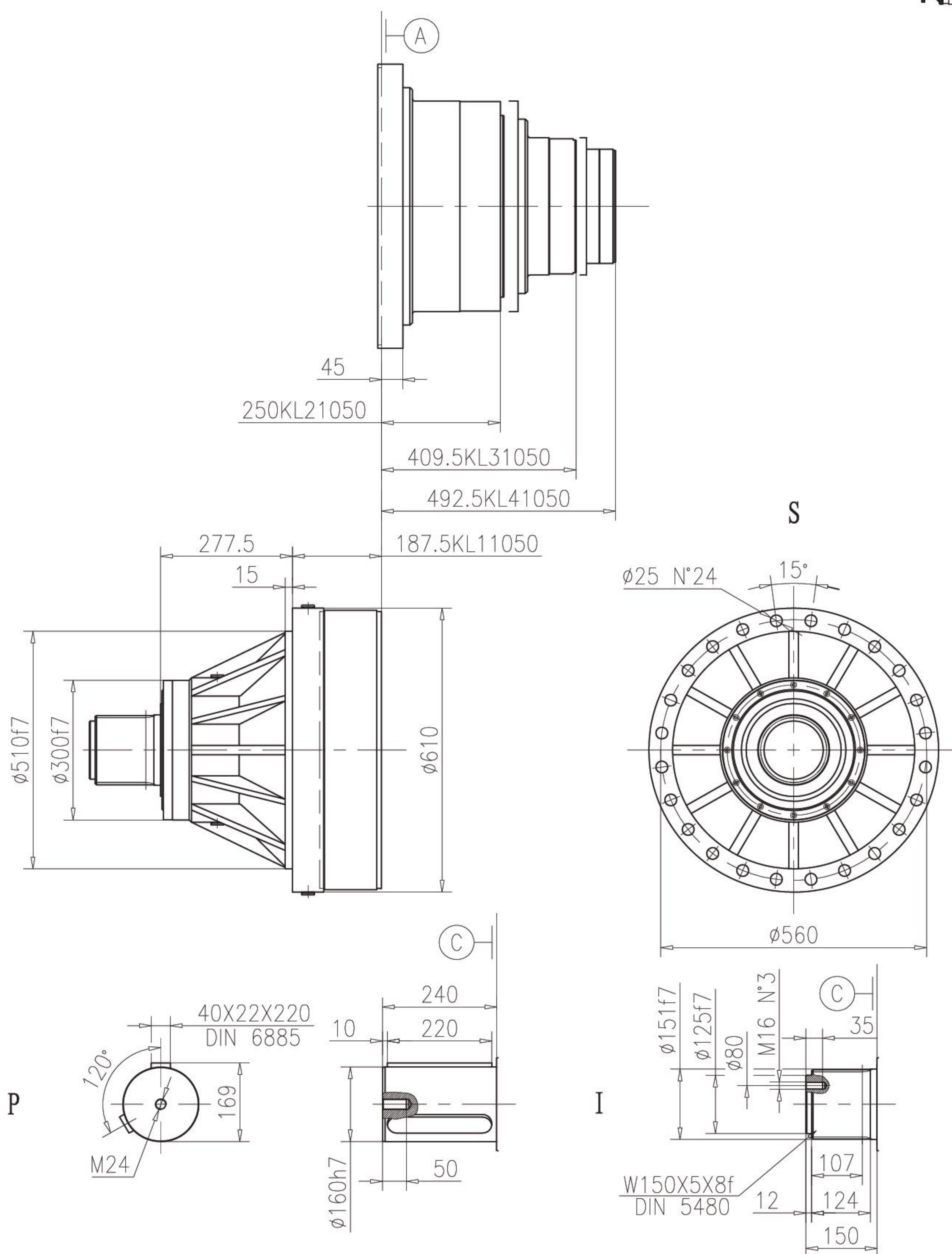
T₂=105000 Nm

KR1050

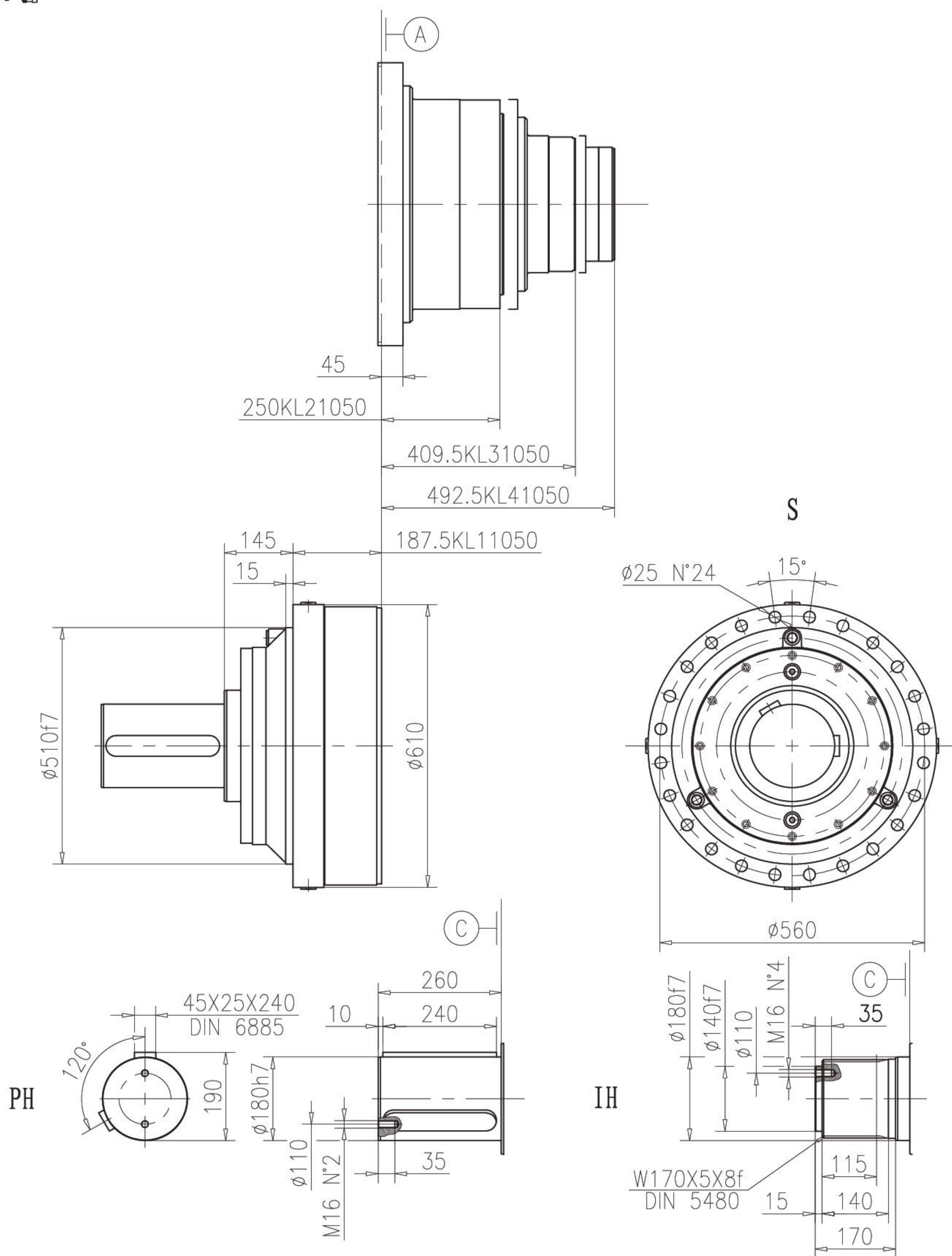
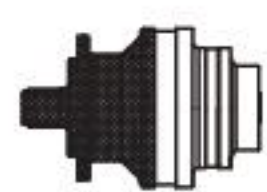
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R3	58.06	111001	109255	98380	92206	70255	57065	65	2500		
	66.03	125498	109255	98380	92206	70255	57065	65	2500		
	81.84	125498	109255	98380	92206	70255	57065	65	2500		
	105.03	97769	85115	76643	71833	54732	44456	65	2500		
	123.14	97769	85115	76643	71833	54732	44456	65	2500	1140	
	141.75	97769	85115	76643	71833	54732	44456	65	2500	960	
R4	209.95	97769	85115	76643	71833	54732	44456	29	3500	610	
	233.65	98421	98421	98380	92206	70255	57065	29	3500	520	
	259.45	99706	99706	98380	92206	70255	57065	29	3500	520	
	305.38	125498	109255	98380	92206	70255	57065	29	3500	520	
	363.16	122834	109255	98380	92206	70255	57065	29	3500	430	
	408.99	122339	109255	98380	92206	70255	57065	29	3500	430	
	465.12	125498	109255	98380	92206	70255	57065	29	3500	340	
	503.18	125498	109255	98380	92206	70255	57065	29	3500	340	
	562.31	125498	109255	98380	92206	70255	57065	29	3500	340	
	721.64	97769	85115	76643	71833	54732	44456	29	3500	160	
	812.70	97769	85115	76643	71833	54732	44456	29	3500	160	
R5	804.23	125498	109255	98380	92206	70255	57065	22	3500	250	
	858.80	125498	109255	98380	92206	70255	57065	22	3500	250	
	959.77	125498	109255	98380	92206	70255	57065	22	3500	250	
	1065.75	125498	109255	98380	92206	70255	57065	22	3500	160	
	1103.12	125498	109255	98380	92206	70255	57065	22	3500	160	
	1207.21	125498	109255	98380	92206	70255	57065	22	3500	160	
	1325.46	125498	109255	98380	92206	70255	57065	22	3500	160	
	1445.52	125498	109255	98380	92206	70255	57065	22	3500	160	
	1521.49	125498	109255	98380	92206	70255	57065	22	3500	160	
	1660.17	125498	109255	98380	92206	70255	57065	22	3500	160	
	1755.94	125498	109255	98380	92206	70255	57065	22	3500	160	
	1876.33	125498	109255	98380	92206	70255	57065	22	3500	160	
	2204.98	125498	109255	98380	92206	70255	57065	22	3500	160	
	2403.14	125498	109255	98380	92206	70255	57065	22	3500	160	
	2813.78	97769	85115	76643	71833	54732	44456	22	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

KL1050

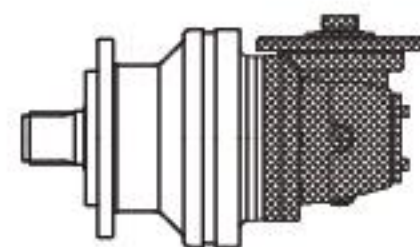
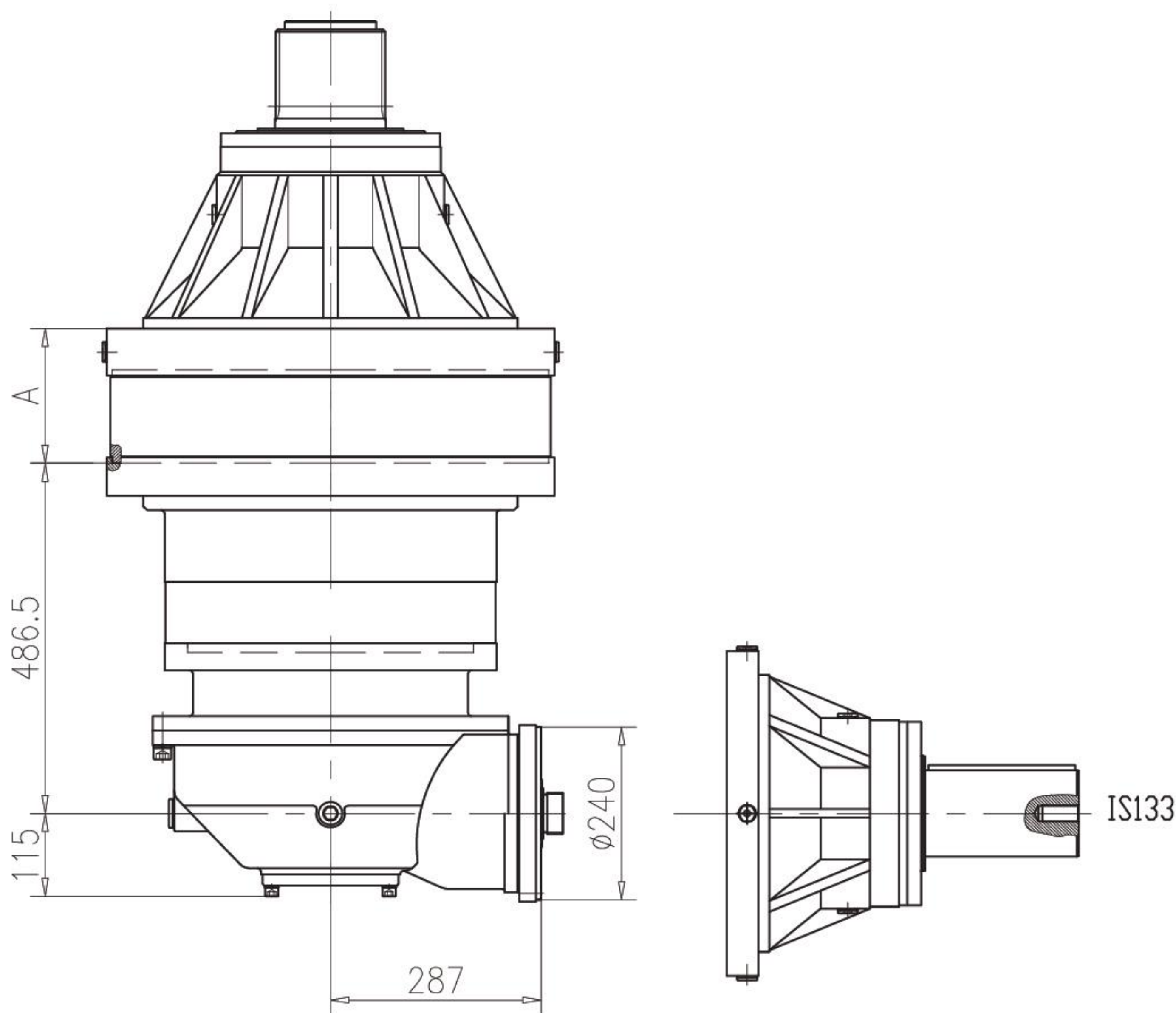


KL1050



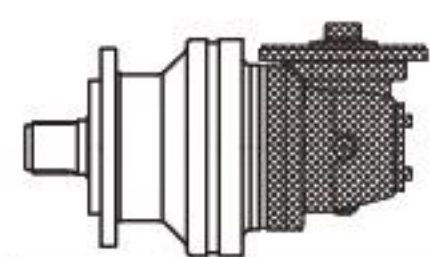
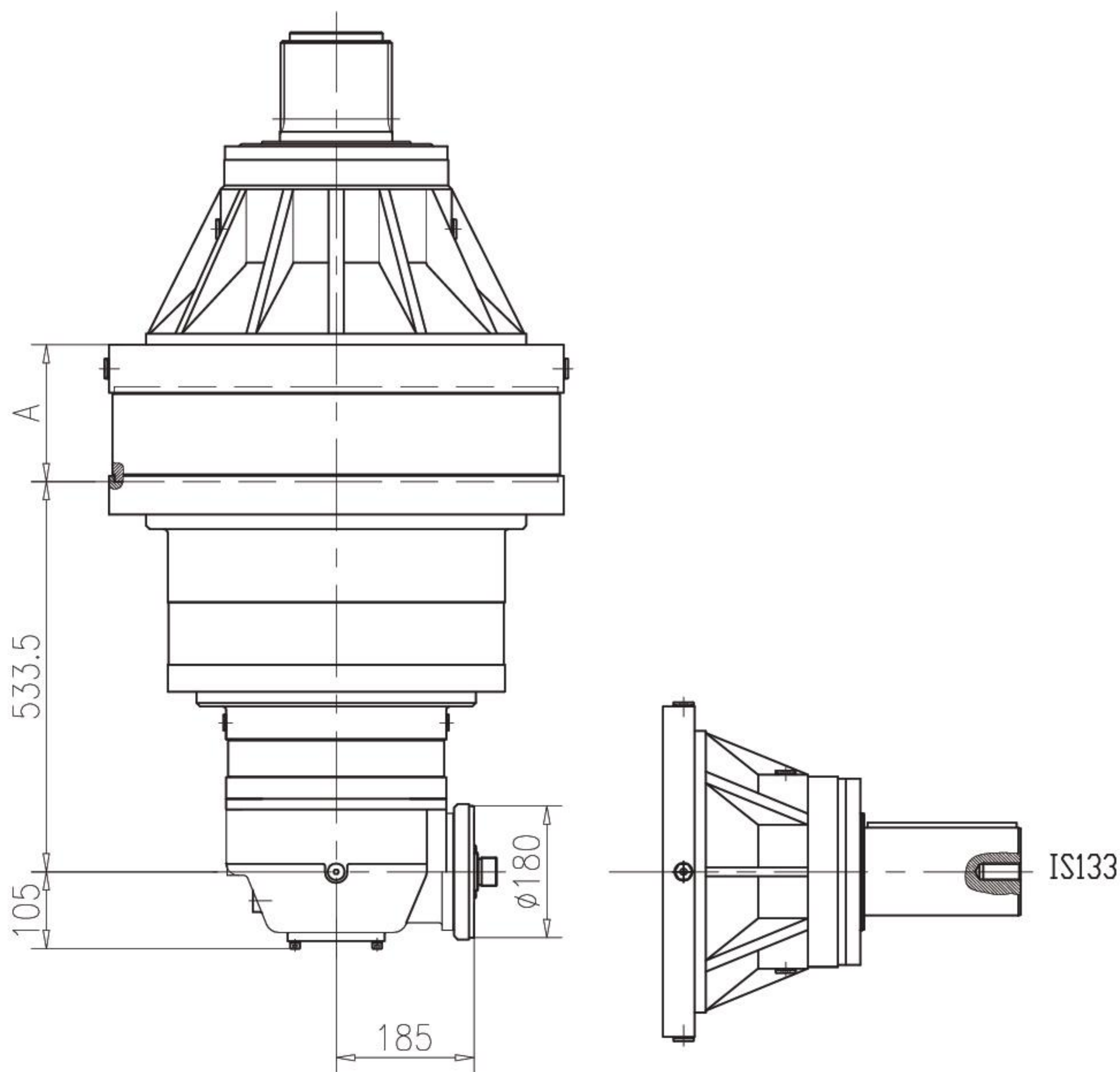


KR1050



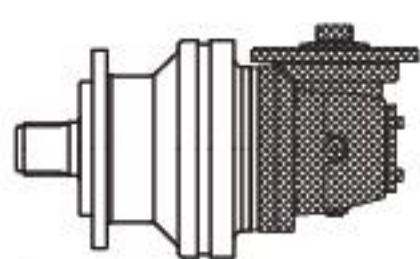
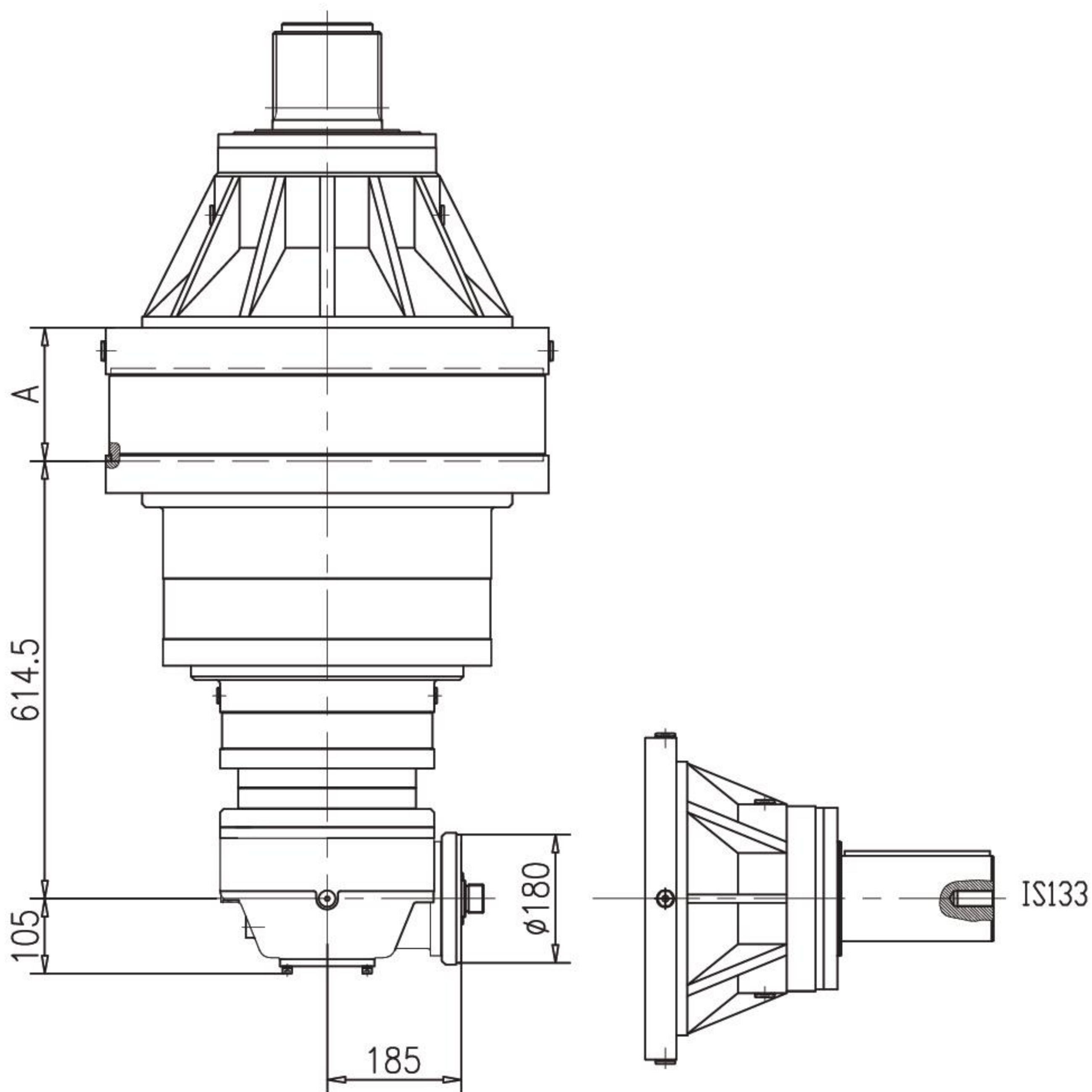
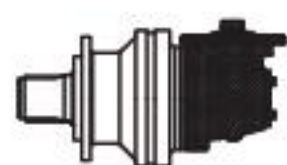
	A				
	SP	SI	SPH	SIH	H
KR 31050	187.5	187.5	187.5	187.5	187.5

KR1050



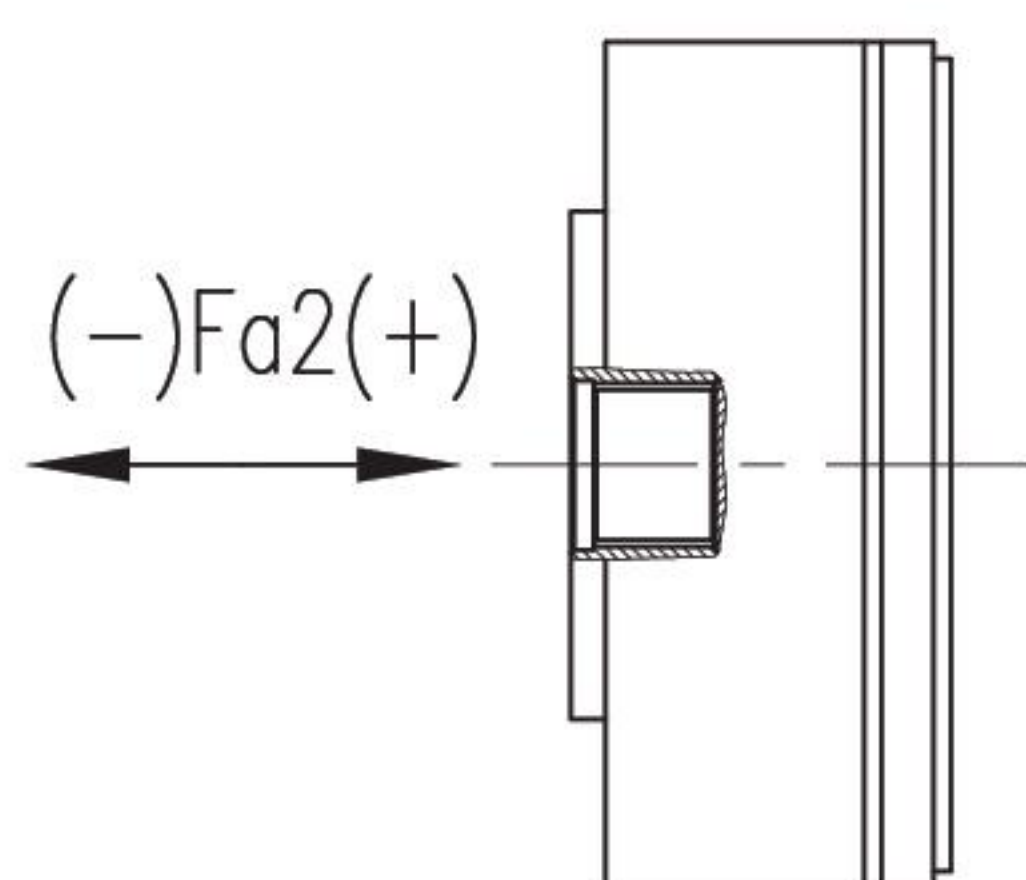
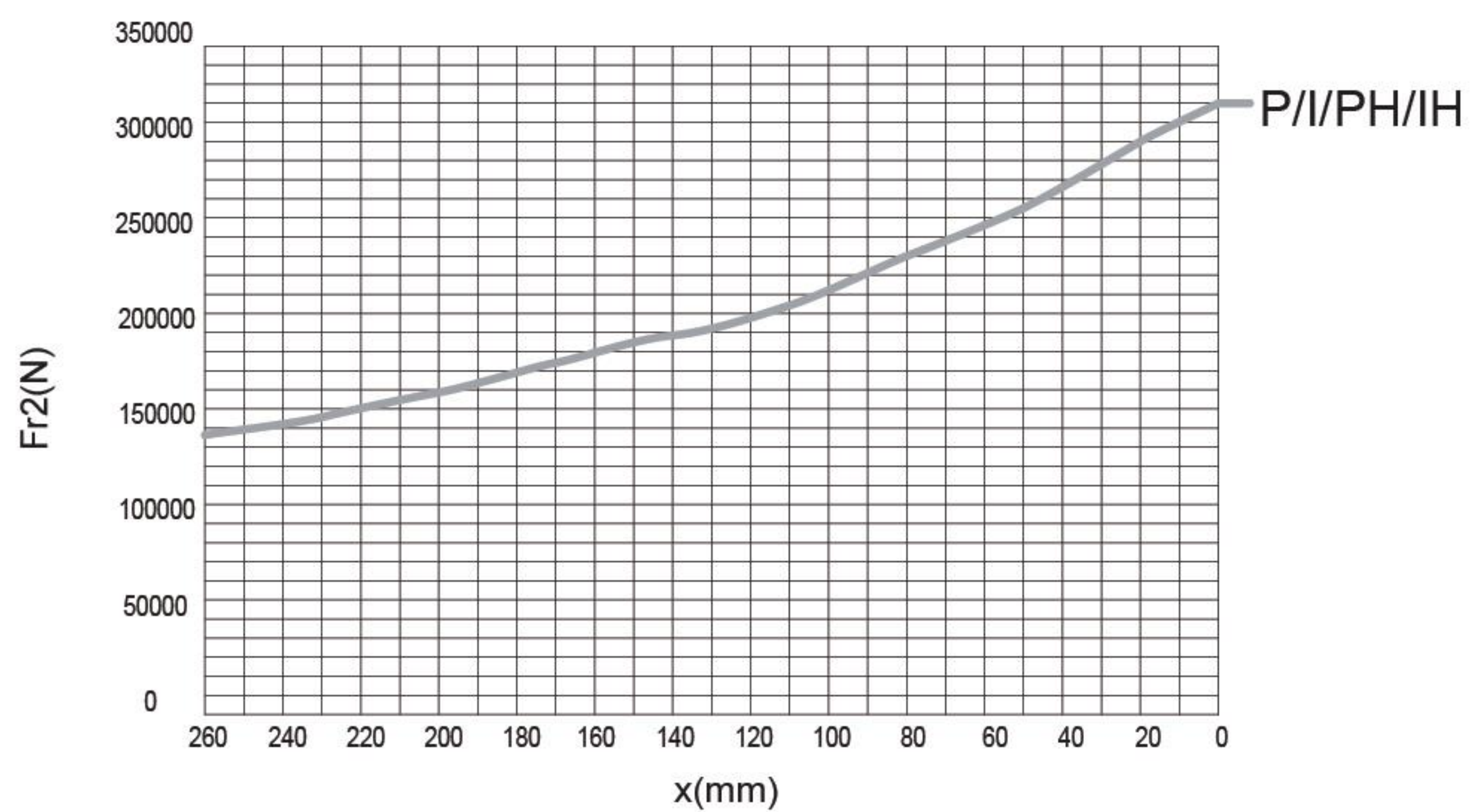
	A				
	SP	SI	SPH	SIH	H
KR 41050	187.5	187.5	187.5	187.5	187.5

KR1050

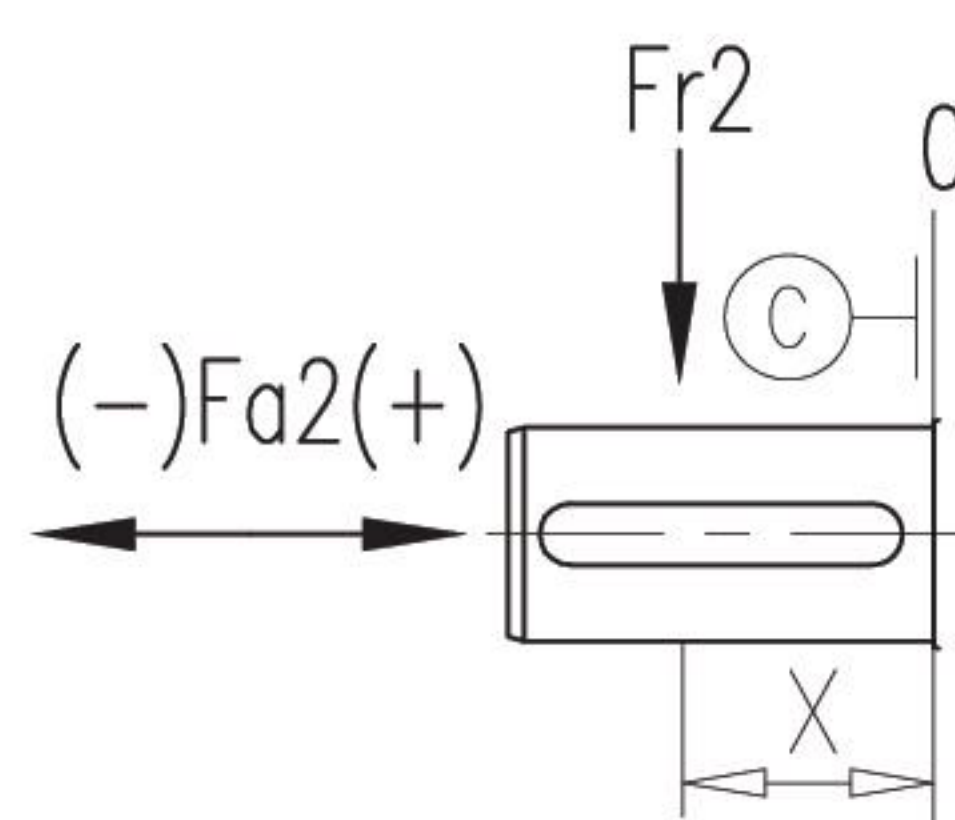


	A				
	SP	SI	SPH	SIH	H
KR 51050	187.5	187.5	187.5	187.5	187.5

KL1050



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
SD-H	90000	90000



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
SP-SI-SPH-SIH	280000	210000

n2·h							
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL1350
T₂=135000 Nm

	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]	
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000				
L1	3.83	149804	139817	125392	110966	73238	59922	87	1000		
	4.40	130398	121705	109148	96591	63750	52159	87	1000		
L2	18.40	130398	121705	109148	96591	63750	52159	54	1800		
	21.51	130398	121705	109148	96591	63750	52159	54	1800		
	23.00	144104	122321	108245	107240	66020	53620	54	1800		
	26.40	130398	121705	109148	96591	63750	52159	54	1800		
L3	65.58	149804	139817	125392	110966	73238	59922	38	2400		
	73.40	149804	139817	125392	110966	73238	59922	38	2400		
	80.02	130398	121705	109148	96591	63750	52159	38	2400		
	84.16	149804	139817	125392	110966	73238	59922	38	2400		
	96.60	130398	121705	109148	96591	63750	52159	38	2400		
	112.93	130398	121705	109148	96591	63750	52159	38	2400		
	120.88	130398	121705	109148	96591	63750	52159	38	2400		
	134.03	130398	121705	109148	96591	63750	52159	38	2400		
	164.49	130398	121705	109148	96591	63750	52159	38	2400	1140	
L4	256.91	149804	139817	125392	110966	73238	59922	30	3100	875	
	287.58	149804	139817	125392	110966	73238	59922	30	3100	785	
	335.55	149804	139817	125392	110966	73238	59922	30	3100	700	
	406.31	130398	121705	109148	96591	63750	52159	30	3100	520	
	443.37	149804	139817	125392	110966	73238	59922	30	3100	520	
	504.95	149804	139817	125392	110966	73238	59922	30	3100	430	
	579.60	130398	121705	109148	96591	63750	52159	30	3100	340	
	677.60	130398	121705	109148	96591	63750	52159	30	3100	340	
	713.32	149804	139817	125392	110966	73238	59922	30	3100	340	
	846.58	149804	139817	125392	110966	73238	59922	30	3100	250	
	971.72	130398	121705	109148	96591	63750	52159	30	3100	250	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

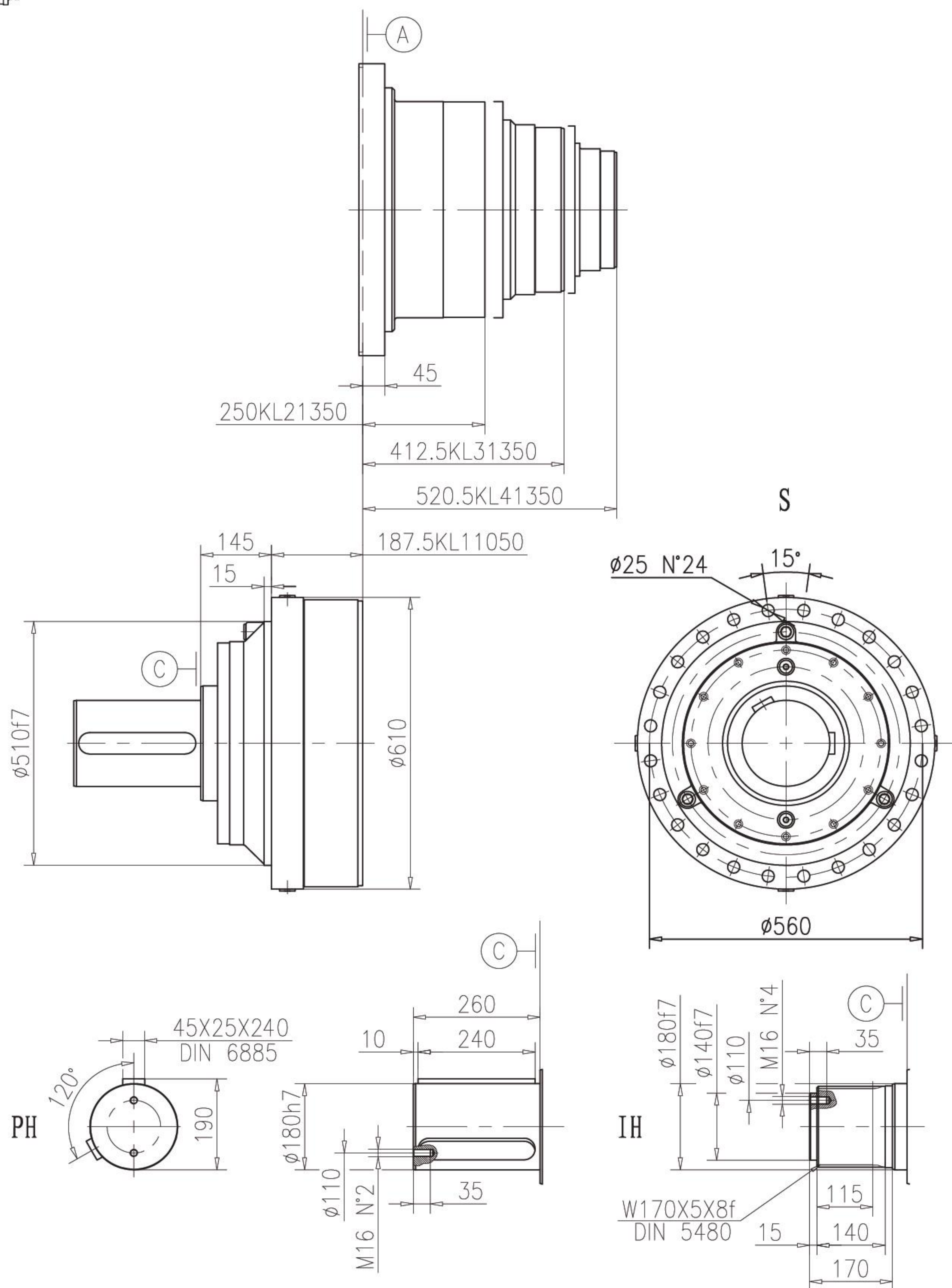
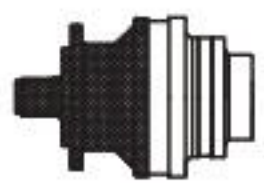
T₂=135000 Nm

KR1350

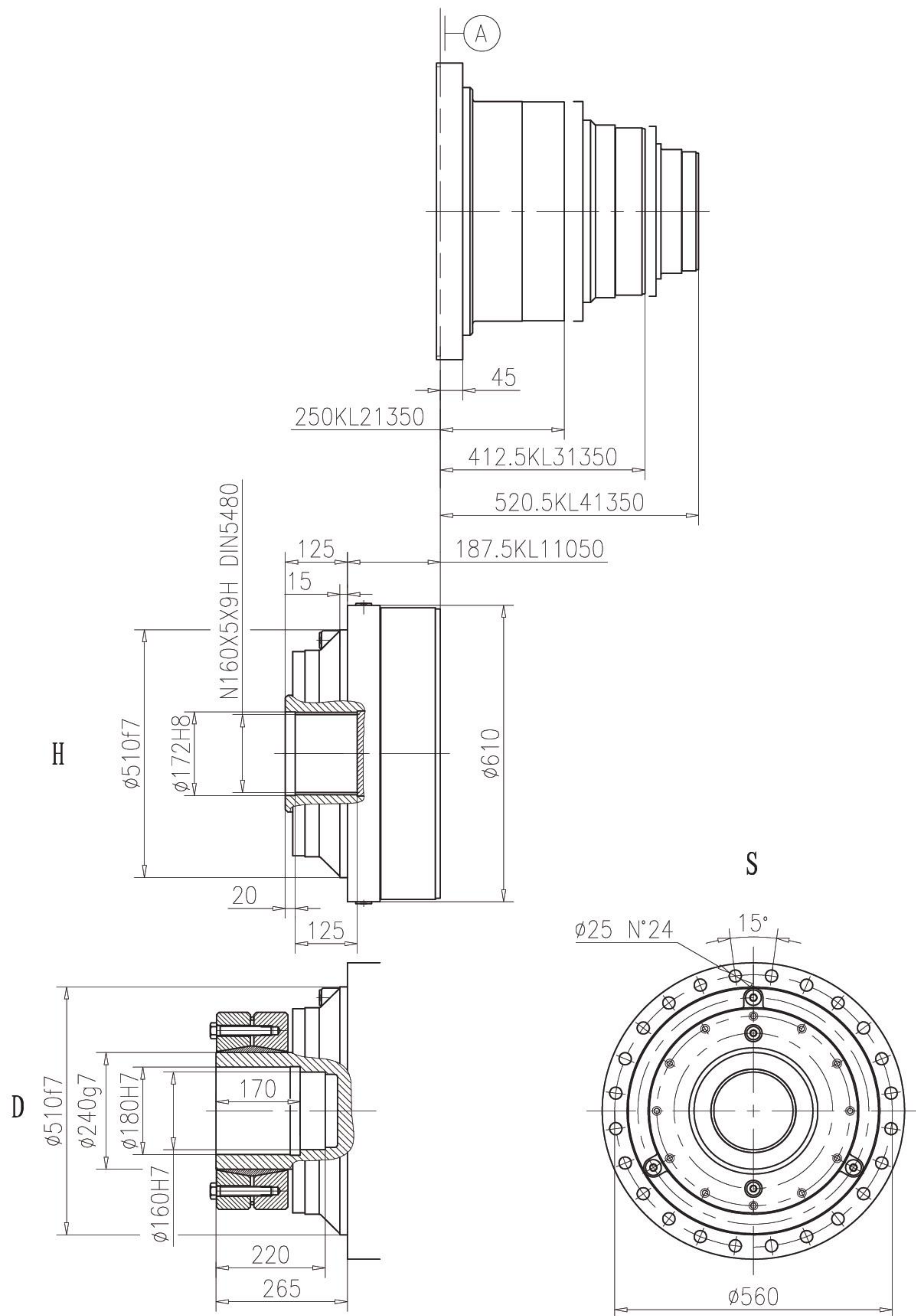
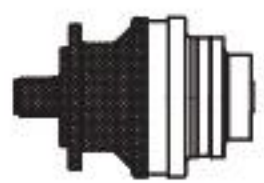
	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000			
R3	50.56	96553	96553	96553	96553	73238	59922	75	2500	
	56.11	99771	99771	99771	99771	73238	59922	75	2500	
	59.11	112953	112953	112953	112953	73238	59922	75	2500	
	65.59	116717	116717	116717	110966	73238	59922	75	2500	
	75.29	130398	121705	109148	96591	63750	52159	75	2500	
	84.09	130398	121705	109148	96591	63750	52159	75	2500	
	103.50	143464	122321	108245	107240	66020	53620	75	2500	
R4	208.71	106532	106532	106532	106532	73238	59922	45	3500	700
	265.42	148381	139817	125392	110966	73238	59922	45	3500	700
	286.93	129445	129445	125392	110966	73238	59922	45	3500	700
	300.35	149804	139817	125392	110966	73238	59922	45	3500	700
	344.36	149804	139817	125392	110966	73238	59922	45	3500	610
	384.61	149804	139817	125392	110966	73238	59922	45	3500	610
	442.75	149804	139817	125392	110966	73238	59922	45	3500	520
	508.20	130398	121705	109148	96591	63750	52159	45	3500	430
	603.14	130398	121705	109148	96591	63750	52159	45	3500	340
	740.22	130398	121705	109148	96591	63750	52159	45	3500	250
R5	832.34	149804	139817	125392	110966	73238	59922	38	3500	250
	922.43	149804	139817	125392	110966	73238	59922	38	3500	250
	1024.27	149804	139817	125392	110966	73238	59922	38	3500	250
	1146.47	149804	139817	125392	110966	73238	59922	38	3500	160
	1248.78	149804	139817	125392	110966	73238	59922	38	3500	160
	1338.18	149804	139817	125392	110966	73238	59922	38	3500	160
	1412.60	130398	121705	109148	96591	63750	52159	38	3500	160
	2016.97	149804	139817	125392	110966	73238	59922	38	3500	160
	2213.97	149804	139817	125392	110966	73238	59922	38	3500	160
	2436.00	134053	125116	112199	99299	65589	53663	38	3500	160
	2839.88	130398	121705	109148	96591	63750	52159	38	3500	160
	3067.27	149804	139817	125392	110966	73238	59922	38	3500	160
	3232.39	149804	139817	125392	110966	73238	59922	38	3500	160
	3320.54	130398	121705	109148	96591	63750	52159	38	3500	160

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

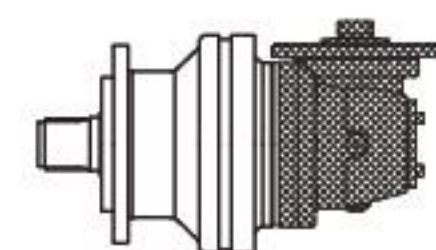
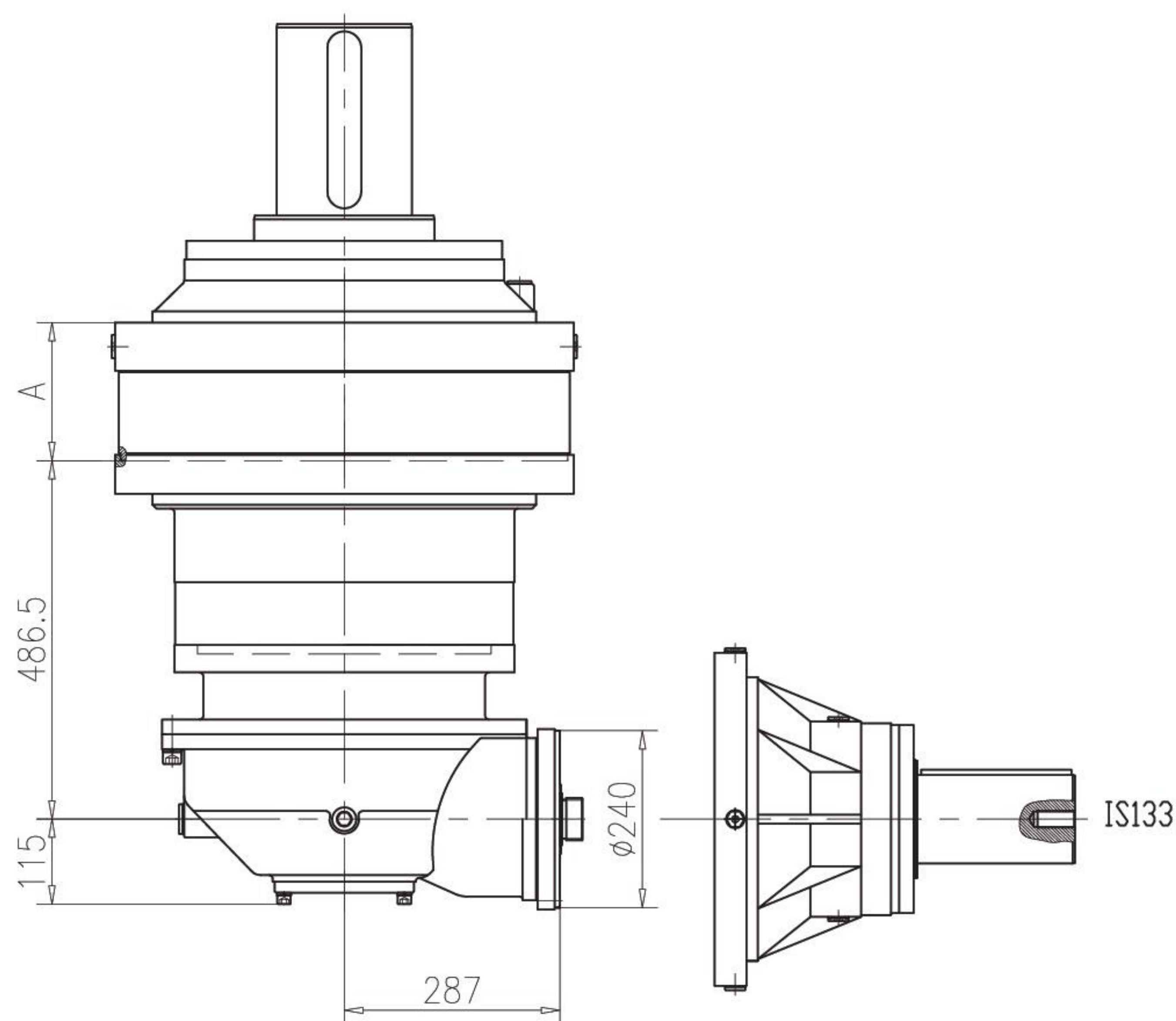
KL1350



KL1350

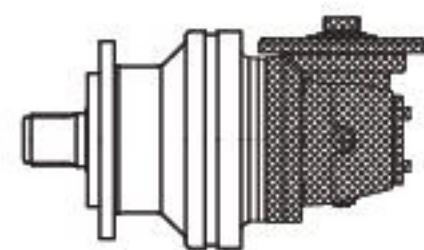
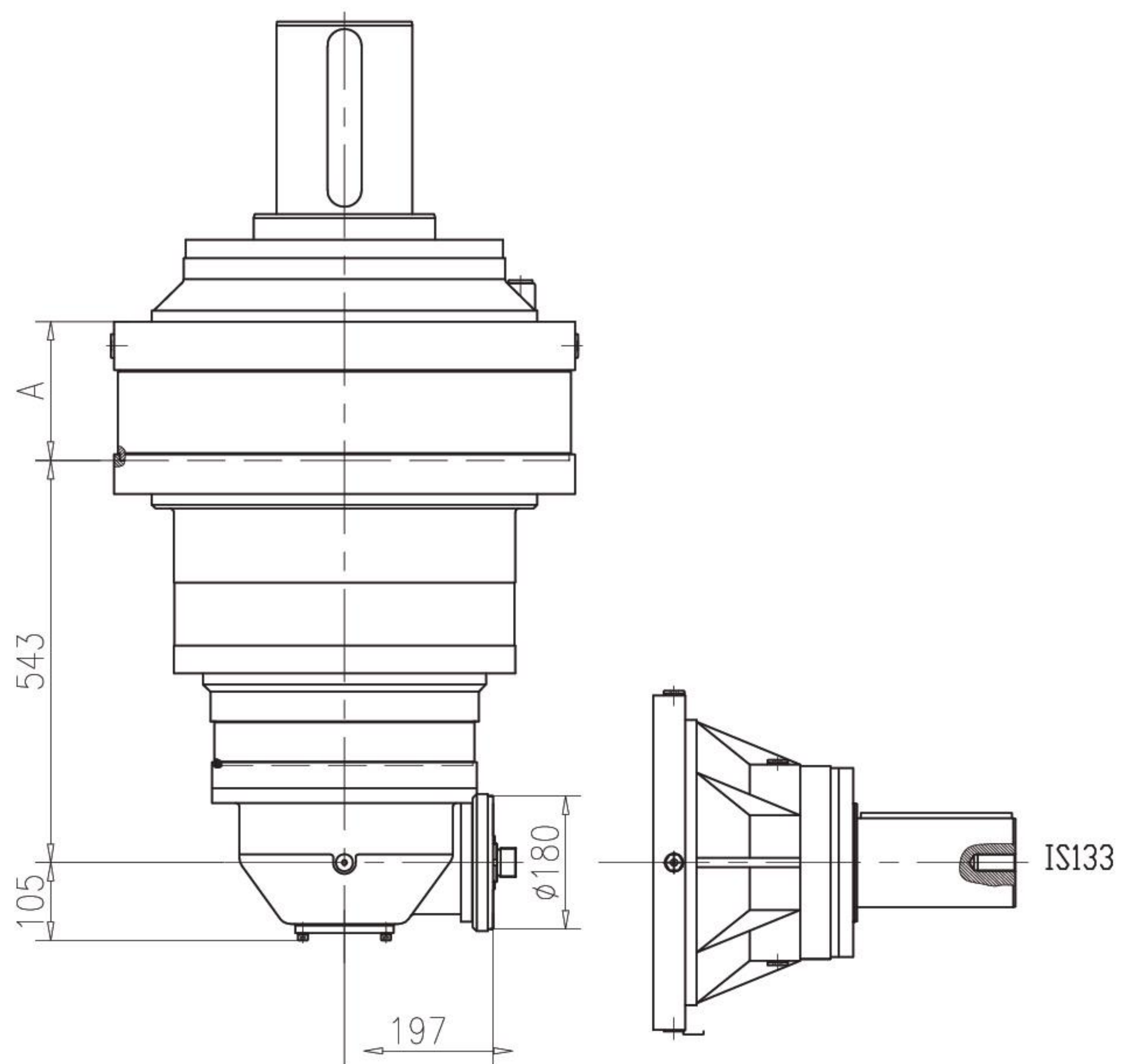
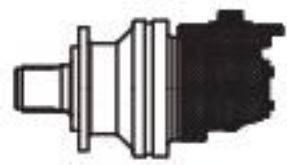


KR1350



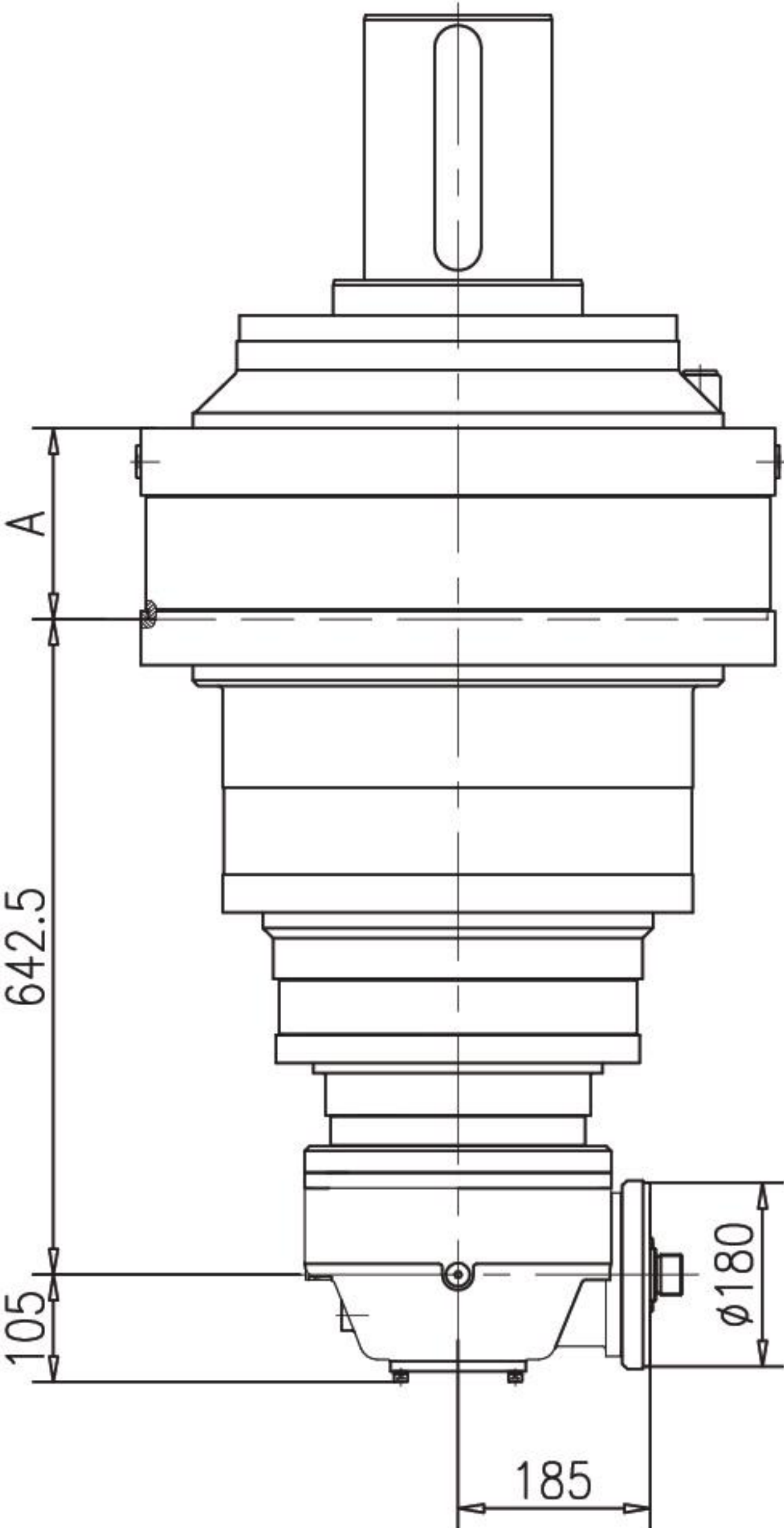
	A		
	SPH	SIH	H
KR 31350	187.5	187.5	187.5

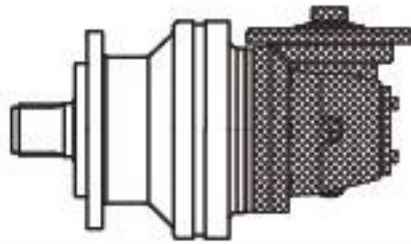
KR1350

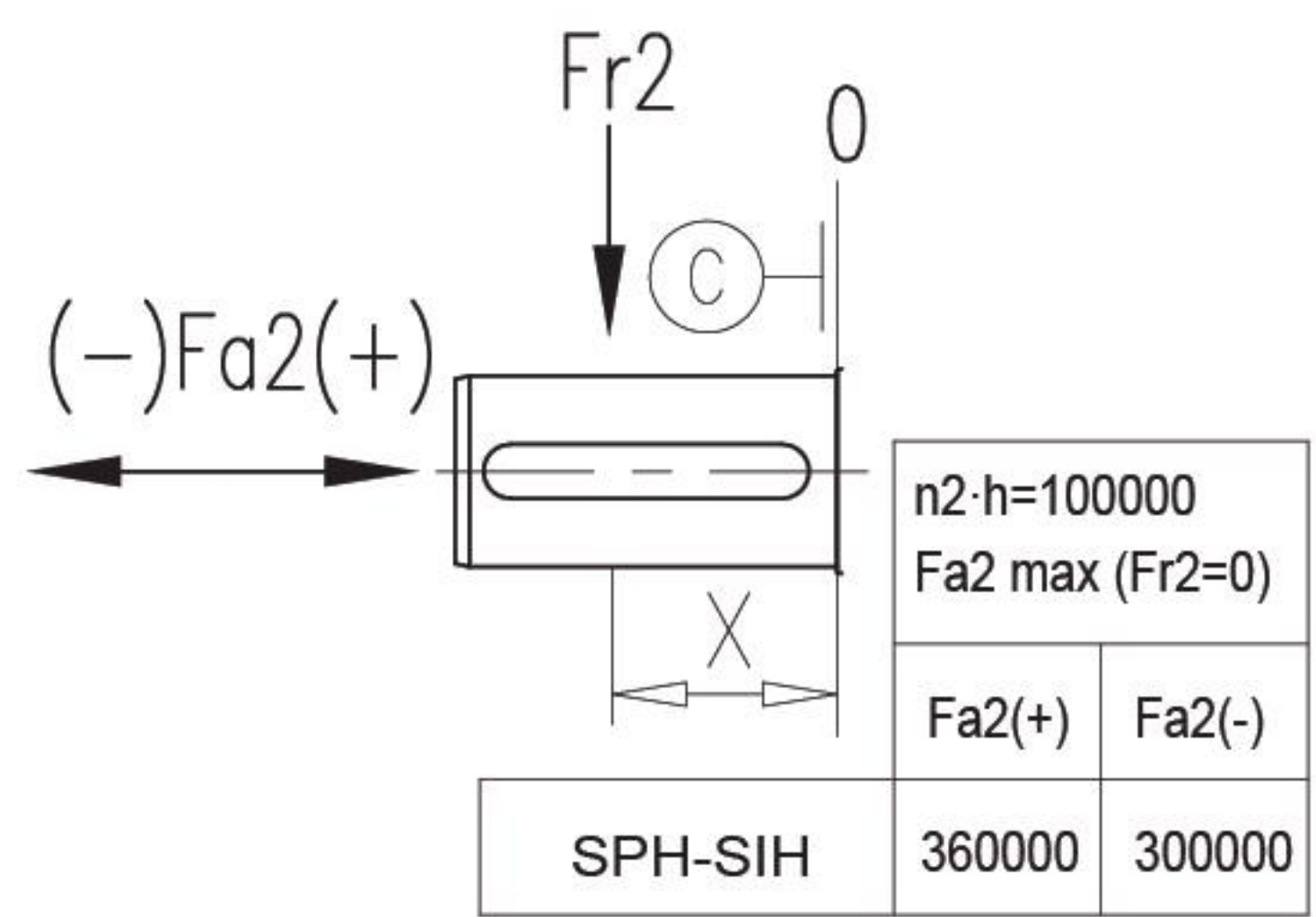
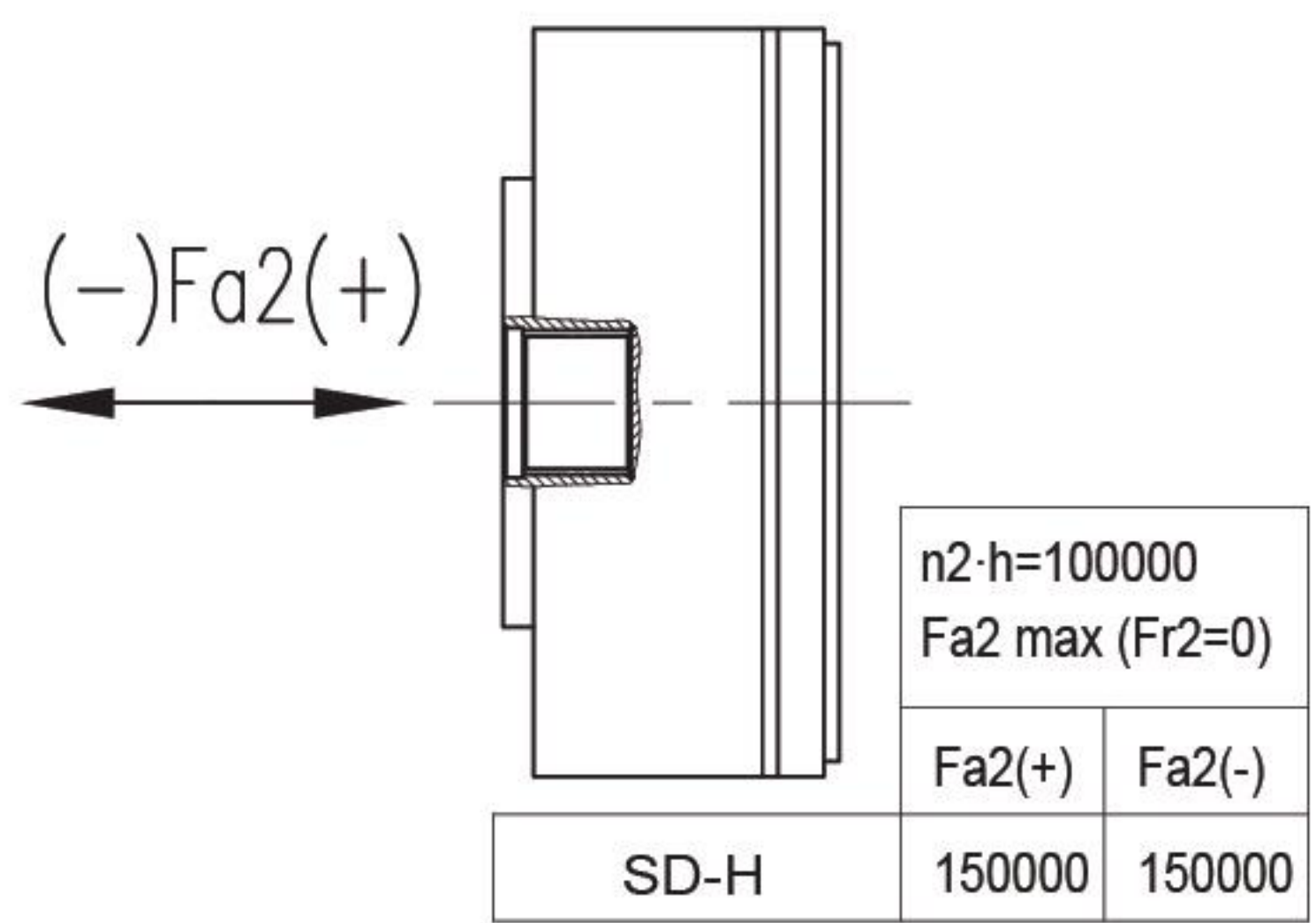
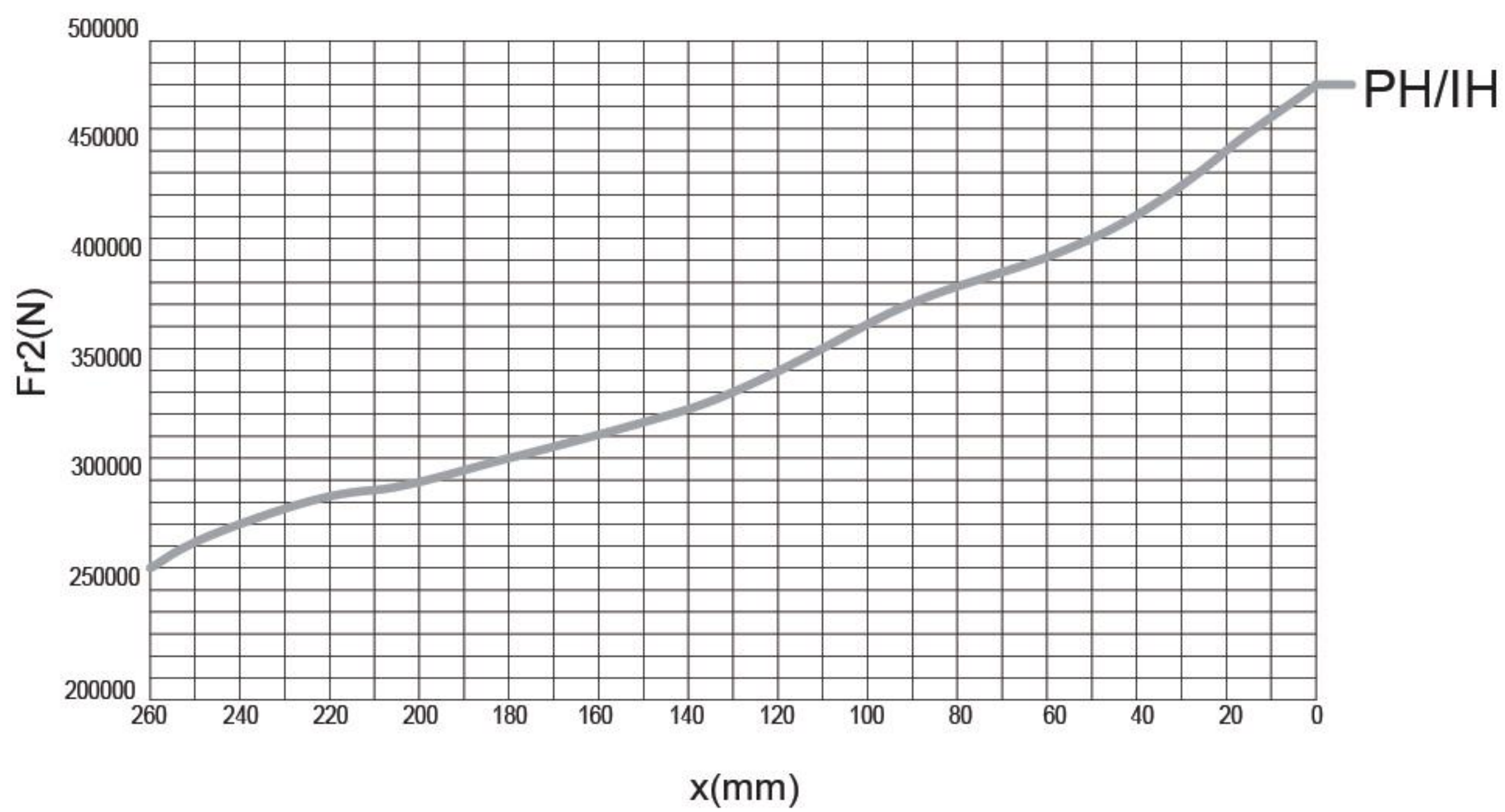
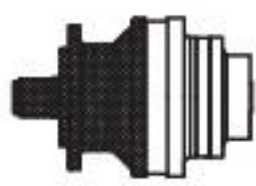


	A		
	SPH	SIH	H
KR 41350	187.5	187.5	187.5

KR1350



 KR 51350	A		
	SPH	SIH	H
	187.5	187.5	187.5



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL1800
T₂=180000 Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	4.09	200261	174343	156989	128603	79352	64453	117	800		
	5.25	156013	135822	122302	100188	61819	50212	117	800		
L2	16.54	200261	174343	156989	128603	79352	64453	69	1800		
	18.41	200261	174343	156989	128603	79352	64453	69	1800		
	20.94	200261	174343	156989	128603	79352	64453	69	1800		
	26.87	156013	135822	122302	100188	61819	50212	69	1800		
	31.50	156013	135822	122302	100188	61819	50212	69	1800		
L3	61.53	200261	174343	156989	128603	79352	64453	50	2400		
	67.67	200261	174343	156989	128603	79352	64453	50	2400		
	75.31	200261	174343	156989	128603	79352	64453	50	2400		
	84.29	200261	174343	156989	128603	79352	64453	50	2400		
	103.07	200261	174343	156989	128603	79352	64453	50	2400		
	114.70	200261	174343	156989	128603	79352	64453	50	2400		
	123.03	178836	155691	140194	114844	70862	57557	50	2400		
	130.45	200261	174343	156989	128603	79352	64453	50	2400		
	141.06	156013	135822	122302	100188	61819	50212	50	2400		
	152.94	198895	173154	155920	128603	79352	64453	50	2400		
	167.41	156013	135822	122302	100188	61819	50212	50	2400		
	196.27	156013	135822	122302	100188	61819	50212	50	2400	1140	
L4	281.30	182144	158571	141361	114821	70848	57546	39	3100	960	
	317.93	182144	158571	141361	114821	70848	57546	39	3100	875	
	398.67	200261	174343	156989	128603	79352	64453	39	3100	700	
	454.07	182144	158571	141361	114821	70848	57546	39	3100	610	
	505.77	200261	174343	156989	128603	79352	64453	39	3100	610	
	558.92	178836	155691	140194	114844	70862	57557	39	3100	520	
	629.61	200261	174343	156989	128603	79352	64453	39	3100	520	
	738.15	178836	155691	140194	114844	70862	57557	39	3100	340	
	831.60	200261	174343	156989	128603	79352	64453	39	3100	430	
	891.93	178836	155691	140194	114844	70862	57557	39	3100	340	
	945.74	200261	174343	156989	128603	79352	64453	39	3100	340	
	1108.79	198895	173154	155920	128603	79352	64453	39	3100	250	
	1213.69	156013	135822	122302	100188	61819	50212	39	3100	250	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

T₂=180000 Nm

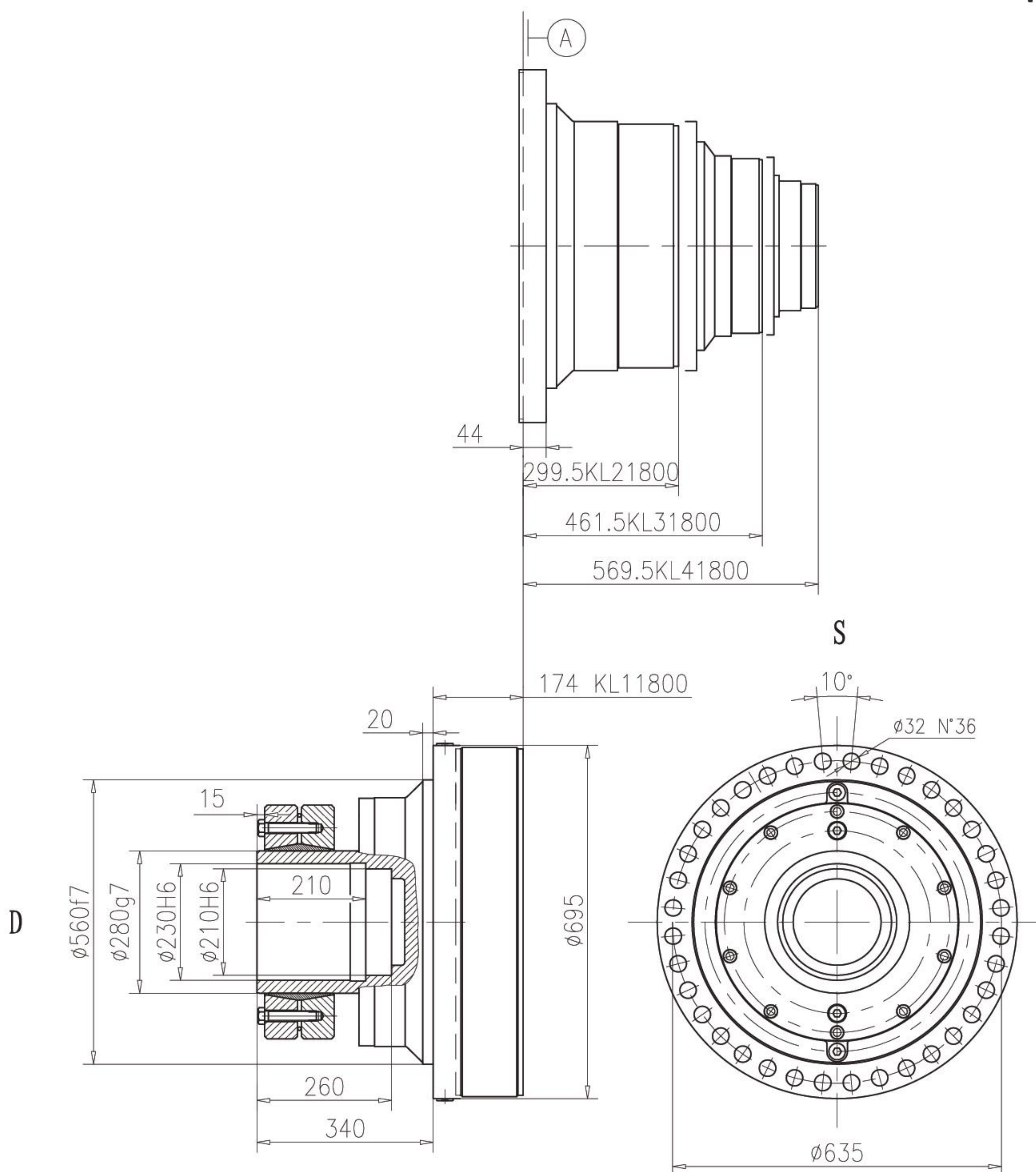
KR1800

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R3	66.03	126294	126294	126294	126294	79352	64453	90	2500		
	82.84	114902	114902	114902	114902	79352	64453	90	2500		
	94.21	130733	130733	130733	128603	79352	64453	90	2500		
	105.03	156013	135822	122302	100188	61819	50212	90	2500		
	123.14	156013	135822	122302	100188	61819	50212	90	2500		
	141.75	156013	135822	122302	100188	61819	50212	90	2500		
R4	265.10	135373	135373	135373	128603	79352	64453	50	3500	785	
	303.95	155176	155176	155176	128603	79352	64453	50	3500	785	
	349.82	178836	155691	141361	114821	70848	57546	50	3500	785	
	401.46	200261	174343	156989	128603	79352	64453	50	3500	700	
	456.56	200261	174343	156989	128603	79352	64453	50	3500	610	
	509.93	200261	174343	156989	128603	79352	64453	50	3500	610	
	553.61	178836	155691	140194	114844	70862	57557	50	3500	520	
	654.41	156013	135822	122302	100188	61819	50212	50	3500	340	
	753.33	156013	135822	122302	100188	61819	50212	50	3500	340	
	883.21	156013	135822	122302	100188	61819	50212	50	3500	250	
R5	781.01	182144	158571	141361	114821	70848	57546	42	3500	340	
	865.54	182144	158571	141361	114821	70848	57546	42	3500	340	
	955.86	200261	174343	156989	128603	79352	64453	42	3500	250	
	1126.48	200261	174343	156989	128603	79352	64453	42	3500	250	
	1255.41	182144	158571	141361	114821	70848	57546	42	3500	250	
	1457.89	182144	158571	141361	114821	70848	57546	42	3500	250	
	1622.49	182144	158571	141361	114821	70848	57546	42	3500	160	
	1784.27	200261	174343	156989	128603	79352	64453	42	3500	160	
	1981.28	200261	174343	156989	128603	79352	64453	42	3500	160	
	2214.11	200261	174343	156989	128603	79352	64453	42	3500	160	
	2493.51	200261	174343	156989	128603	79352	64453	42	3500	160	
	2707.33	200261	174343	156989	128603	79352	64453	42	3500	160	
	2818.40	178836	155691	140194	114844	70862	57557	42	3500	160	
	3012.99	200261	174343	156989	128603	79352	64453	42	3500	160	
	3174.06	178836	155691	140194	114844	70862	57557	42	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

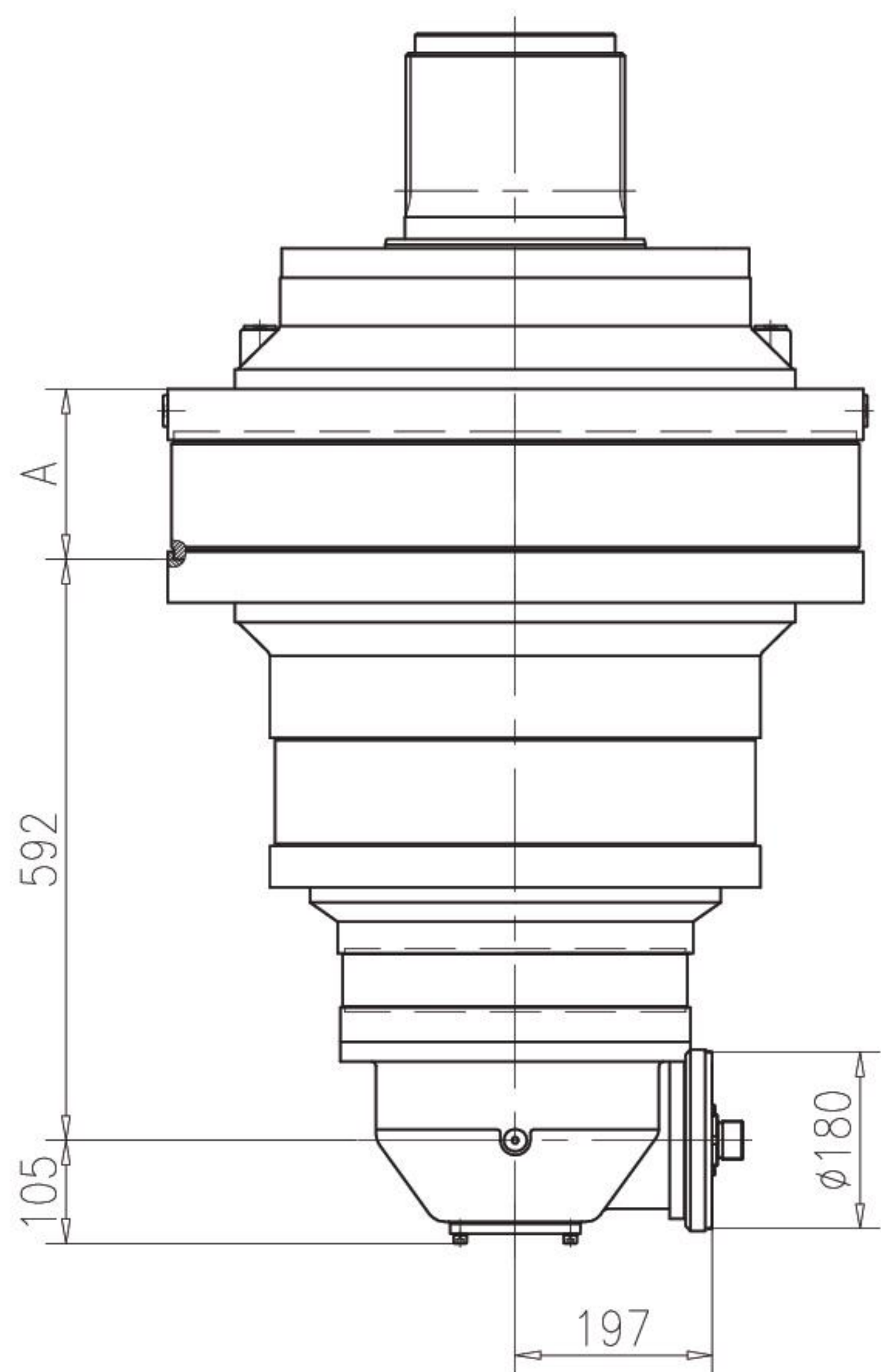


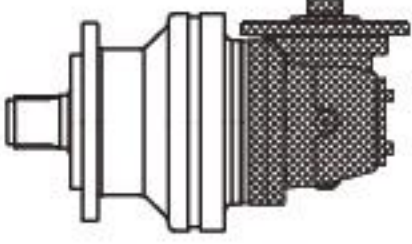
KL1800



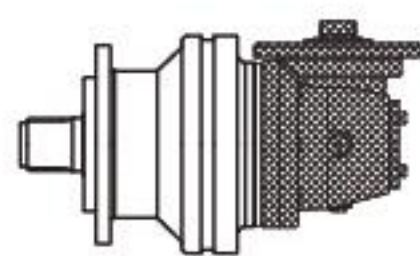
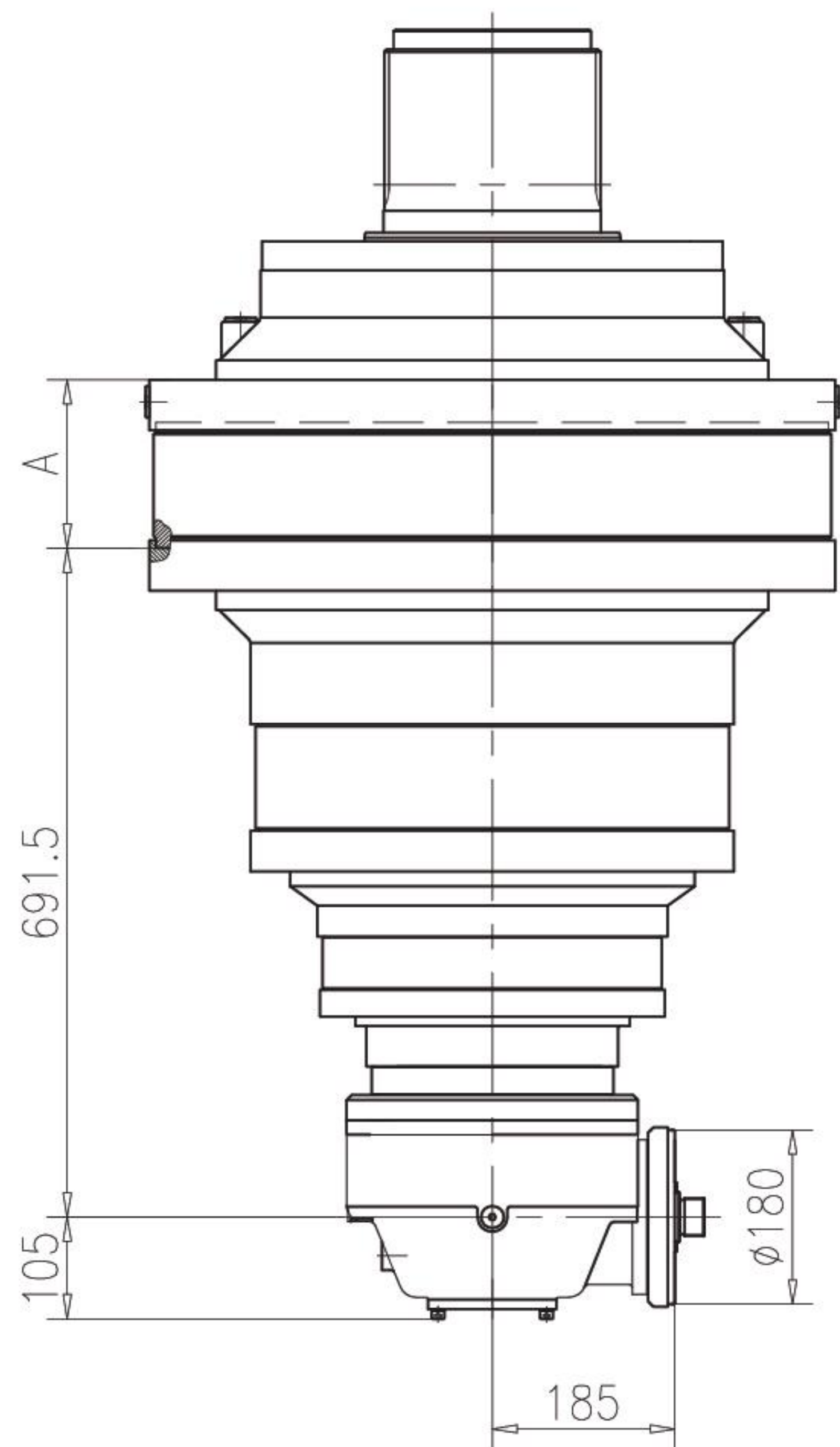
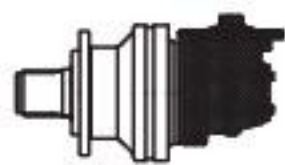


KR1800

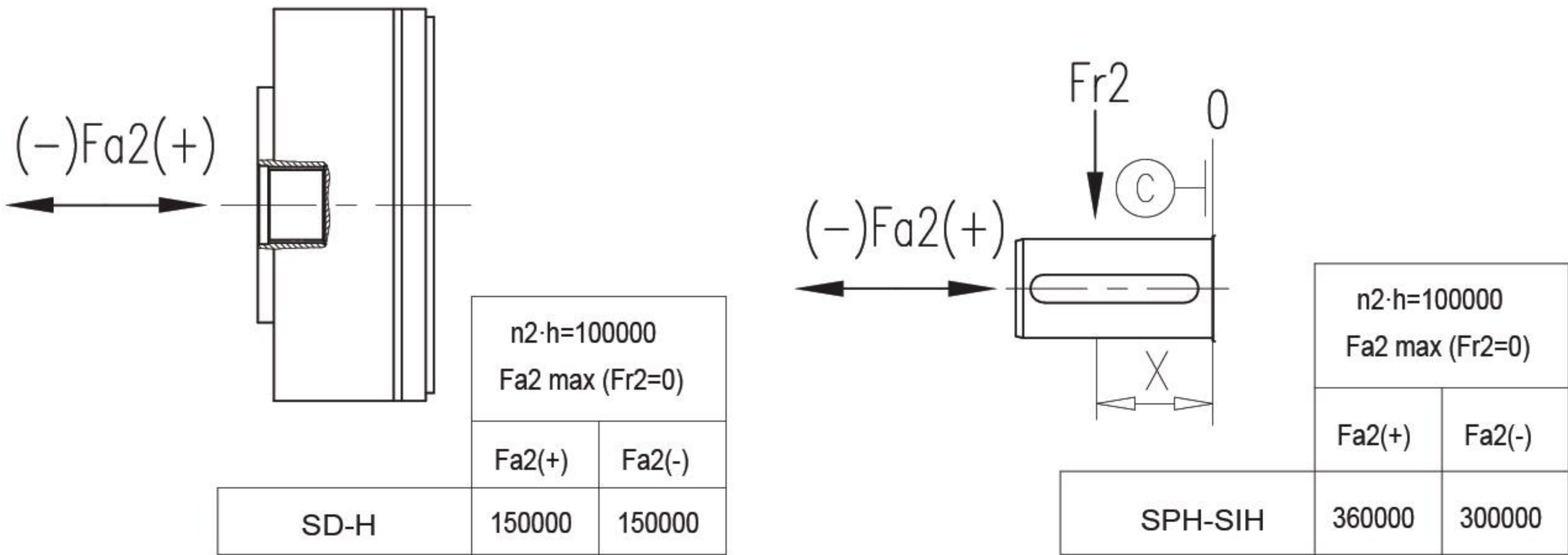
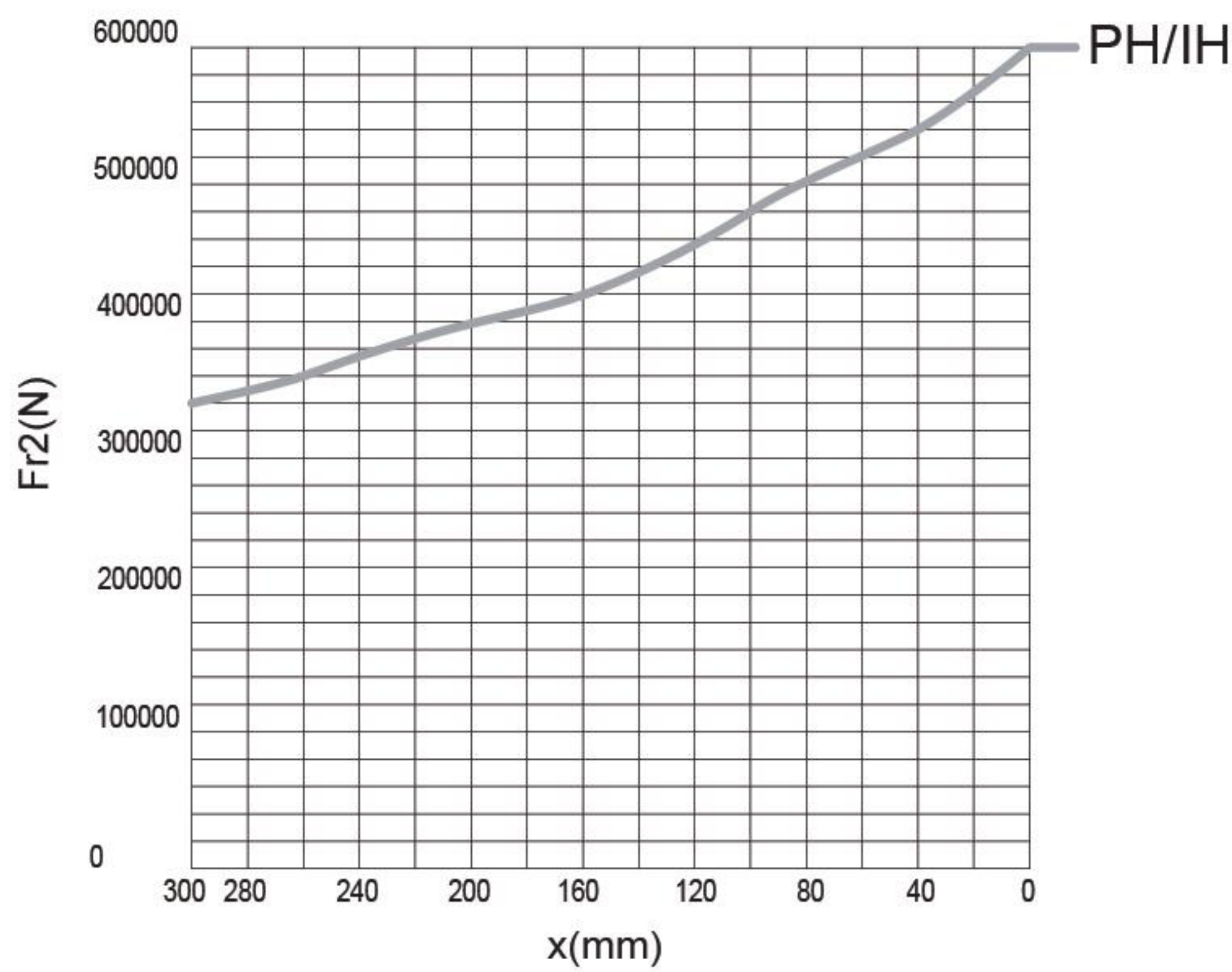


 KR 41800	A			
	SPH	SIH	H	SD
	174	174	174	174

KR1800



	A			
	SPH	SIH	H	SD
KR 51800	174	174	174	174



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL2250

T₂=225000Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.83	259338	225775	203302	183110	112985	91772	117	600		
	4.40	225742	196527	176965	159389	98349	79883	117	600		
L2	16.03	259338	225775	203302	183110	112985	91772	73	1800		
	18.74	259338	225775	203302	183110	112985	91772	73	1800		
	21.51	225742	196527	176965	159389	98349	79883	73	1800		
L3	59.19	259338	225775	203302	183110	112985	91772	53	2200		
	69.20	259338	225775	203302	183110	112985	91772	53	2200		
	75.78	259338	225775	203302	183110	112985	91772	53	2200		
	82.04	259338	225775	203302	183110	112985	91772	53	2200		
	95.91	259338	225775	203302	183110	112985	91772	53	2200		
	110.09	225742	196527	176965	159389	98349	79883	53	2200		
	129.07	225742	196527	176965	159389	98349	79883	53	2200		
L4	226.86	259338	225775	203302	183110	112985	91772	42	3000		
	244.15	259338	225775	203302	183110	112985	91772	42	3000		
	277.99	225742	196527	176965	159389	98349	79883	42	3000		
	312.58	259338	225775	203302	183110	112985	91772	42	3000		
	353.85	259338	234916	194171	157715	97315	79044	42	3000	1140	
	391.52	259338	225775	203302	183110	112985	91772	42	3000	960	
	454.11	225742	196527	176965	159389	98349	79883	42	3000	700	
	506.00	259338	225775	203302	183110	112985	91772	42	3000	700	
	549.39	259338	225775	203302	183110	112985	91772	42	3000	610	
	611.42	259338	225775	203302	183110	112985	91772	42	3000	520	
	701.80	225742	196527	176965	159389	98349	79883	42	3000	430	
	815.22	259338	225775	203302	183110	112985	91772	42	3000	520	
	935.73	225742	196527	176965	159389	98349	79883	42	3000	340	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

T₂=225000Nm

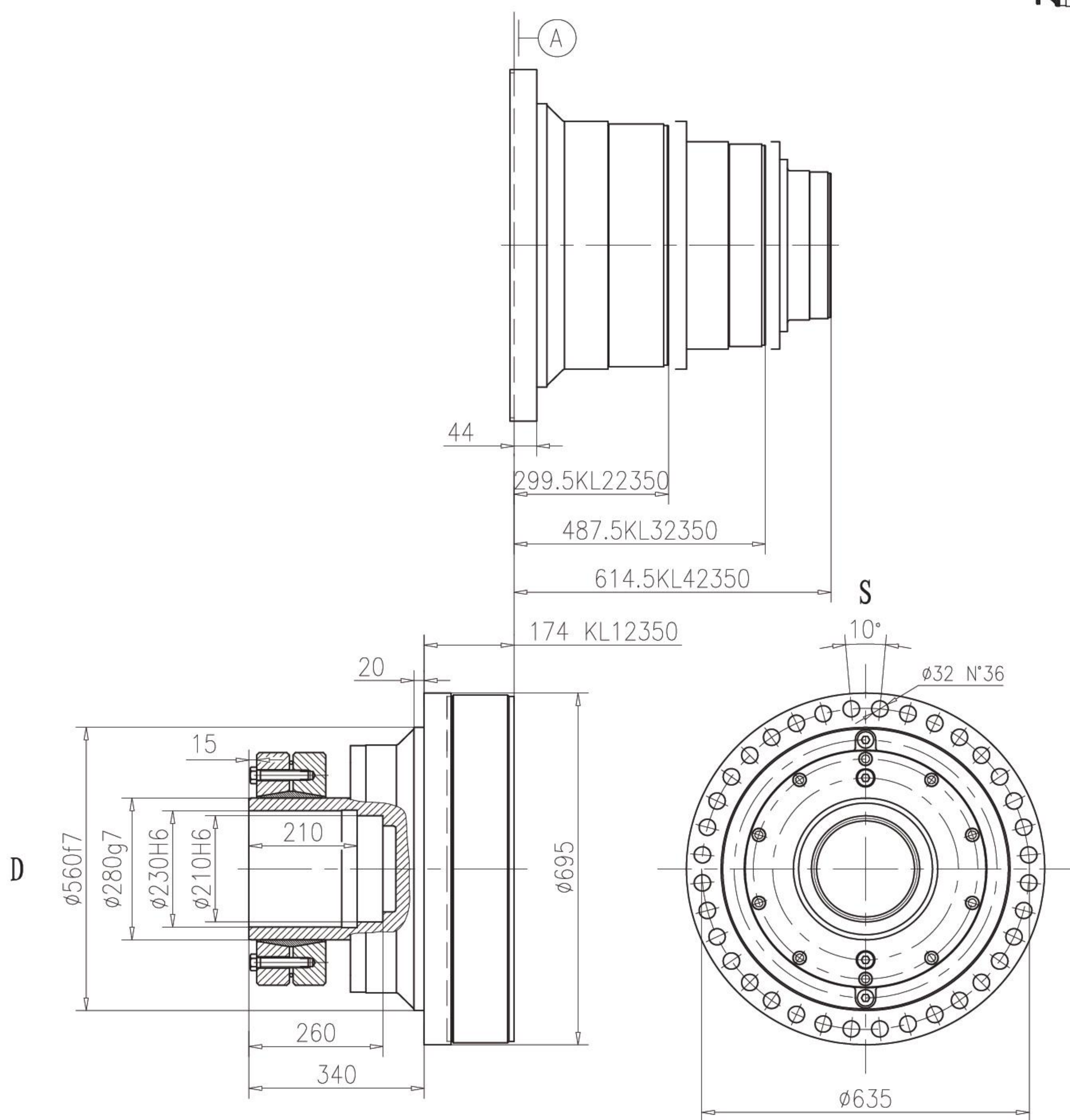
KL2250

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R4	227.51	213627	213627	203302	183110	112985	91772	50	3500	1140	
	258.73	243060	225775	203302	183110	112985	91772	50	3500	1140	
	302.48	259338	225775	203302	183110	112985	91772	50	3500	1050	
	347.20	225742	196527	176965	159389	98349	79883	50	3500	960	
	379.50	259116	225775	203302	183110	112985	91772	50	3500	960	
	407.06	225742	196527	176965	159389	98349	79883	50	3500	785	
	431.59	259338	225775	203302	183110	112945	91772	50	3500	875	
	451.73	225742	196527	176965	159389	98349	79883	50	3500	700	
	504.53	225742	196527	176965	159389	98349	79883	50	3500	700	
	580.80	225742	196527	176965	159389	98349	79883	50	3500	610	
R5	698.04	259338	225775	203302	183110	112985	91772	45	3500	520	
	776.85	259338	225775	203302	183110	112985	91772	45	3500	430	
	862.63	259338	225775	203302	183110	112985	91772	45	3500	430	
	915.58	259338	225775	203302	183110	112985	91772	45	3500	340	
	1016.67	259338	225775	203302	183110	112985	91772	45	3500	340	
	1146.67	259338	225775	203302	183110	112985	91772	45	3500	340	
	1273.41	259338	225775	203302	183110	112985	91772	45	3500	250	
	1423.05	259338	225775	203302	183110	112985	91772	45	3500	250	
	1609.20	259338	225775	203302	183110	112985	91772	45	3500	160	
	1701.18	259338	225775	203302	183110	112985	91772	45	3500	160	
	1943.33	225742	196527	176965	159389	98349	79883	45	3500	160	
	2150.57	225742	196527	176965	159389	98349	79883	45	3500	160	
	2429.45	225742	196527	176965	159389	98349	79883	45	3500	160	
	2654.92	259338	225775	203302	183110	112985	91772	45	3500	160	
	2840.23	225742	196527	176965	159389	98349	79883	45	3500	160	
	3047.39	225742	196527	176965	159389	98349	79883	45	3500	160	
	3197.09	225742	196527	176965	159389	98349	79883	45	3500	160	
	3431.94	225742	196527	176965	159389	98349	79883	45	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

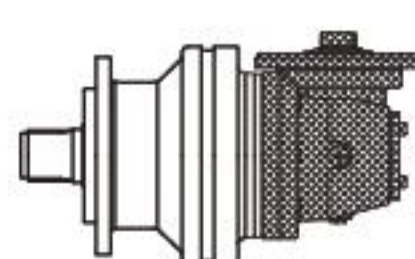
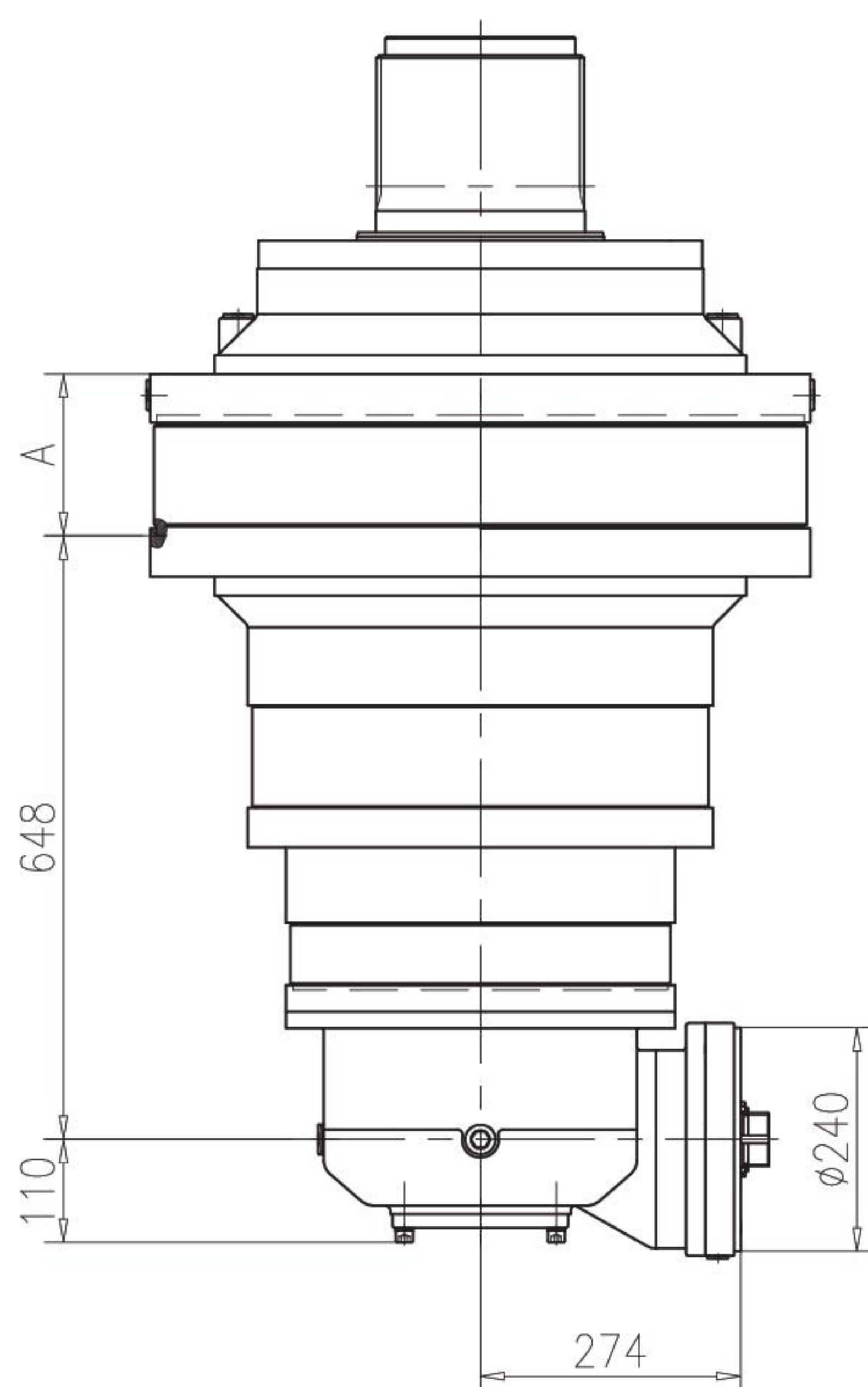
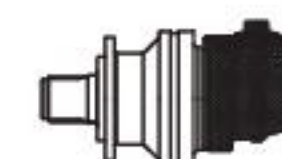


KL2250



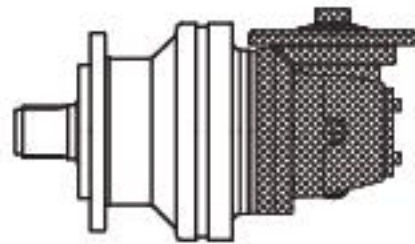
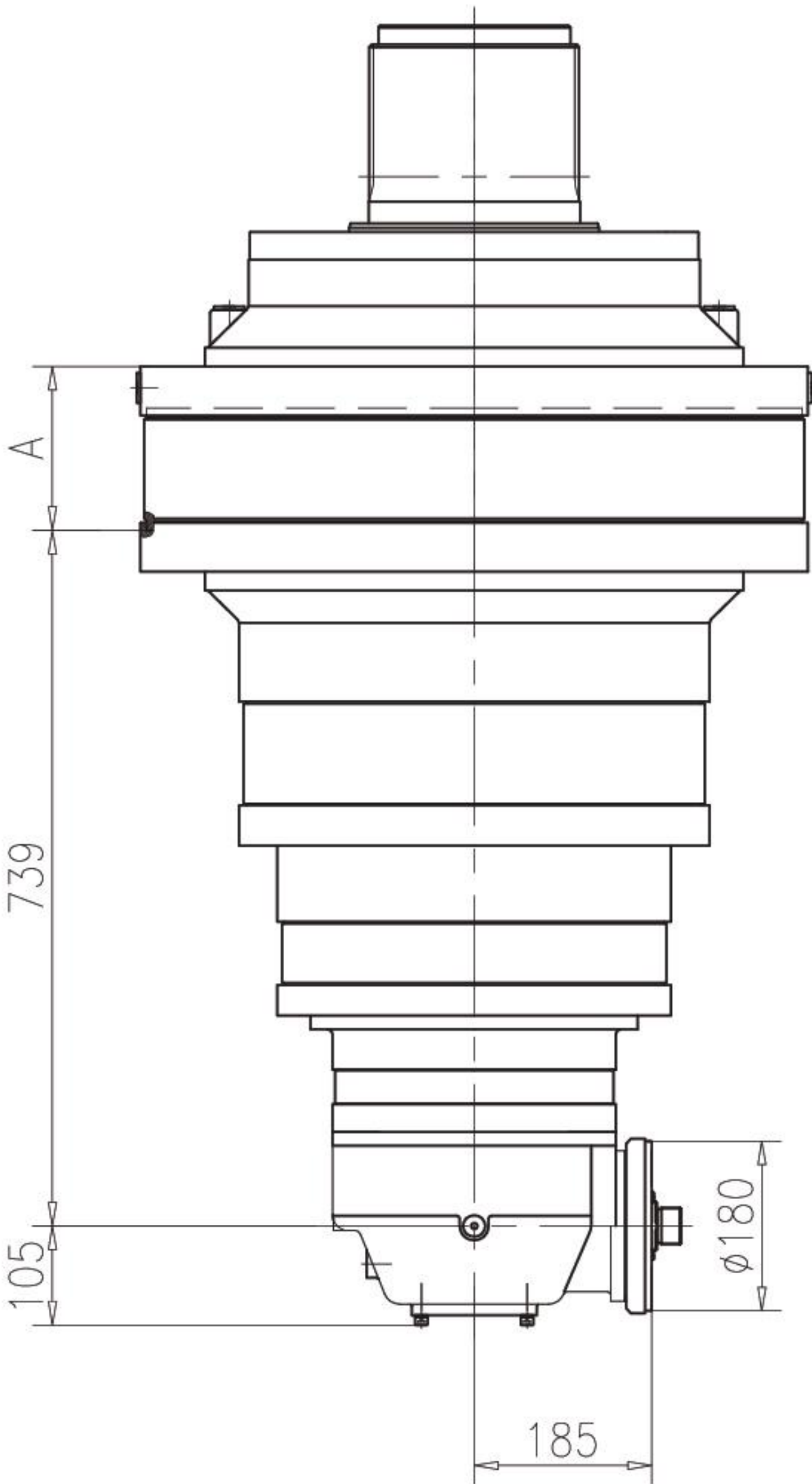
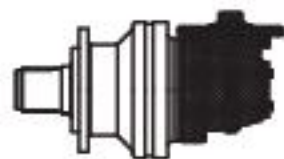


KR2250

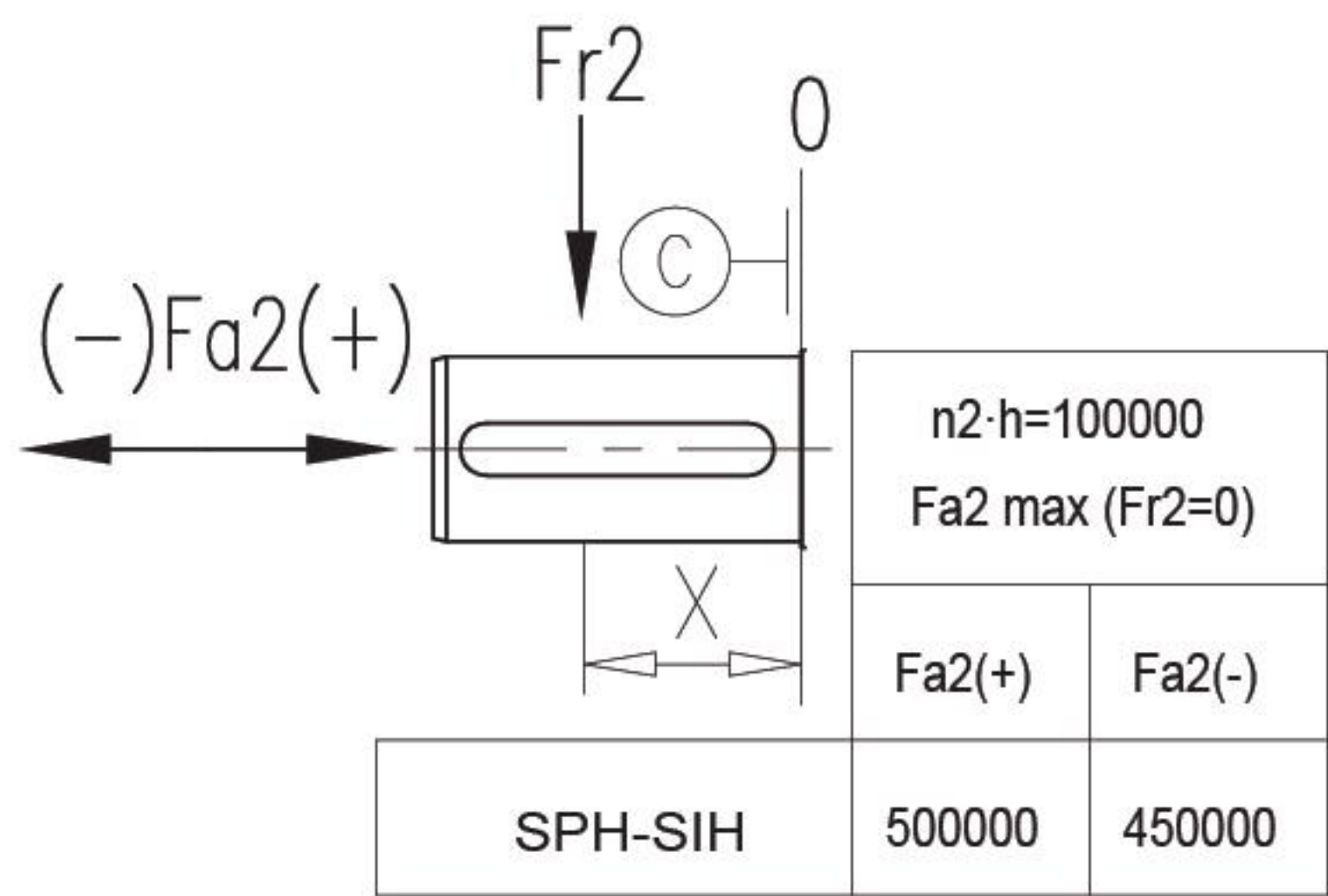
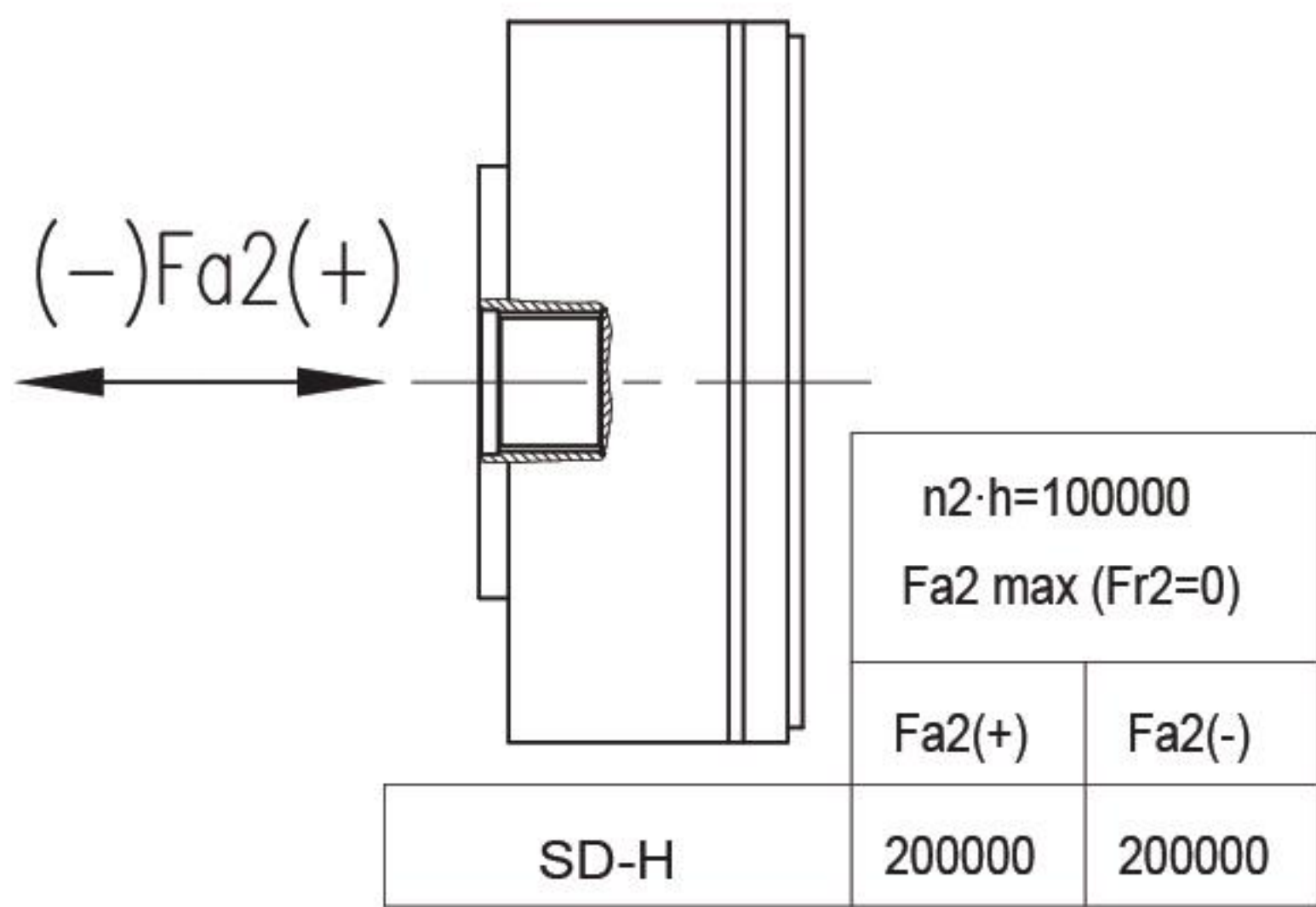
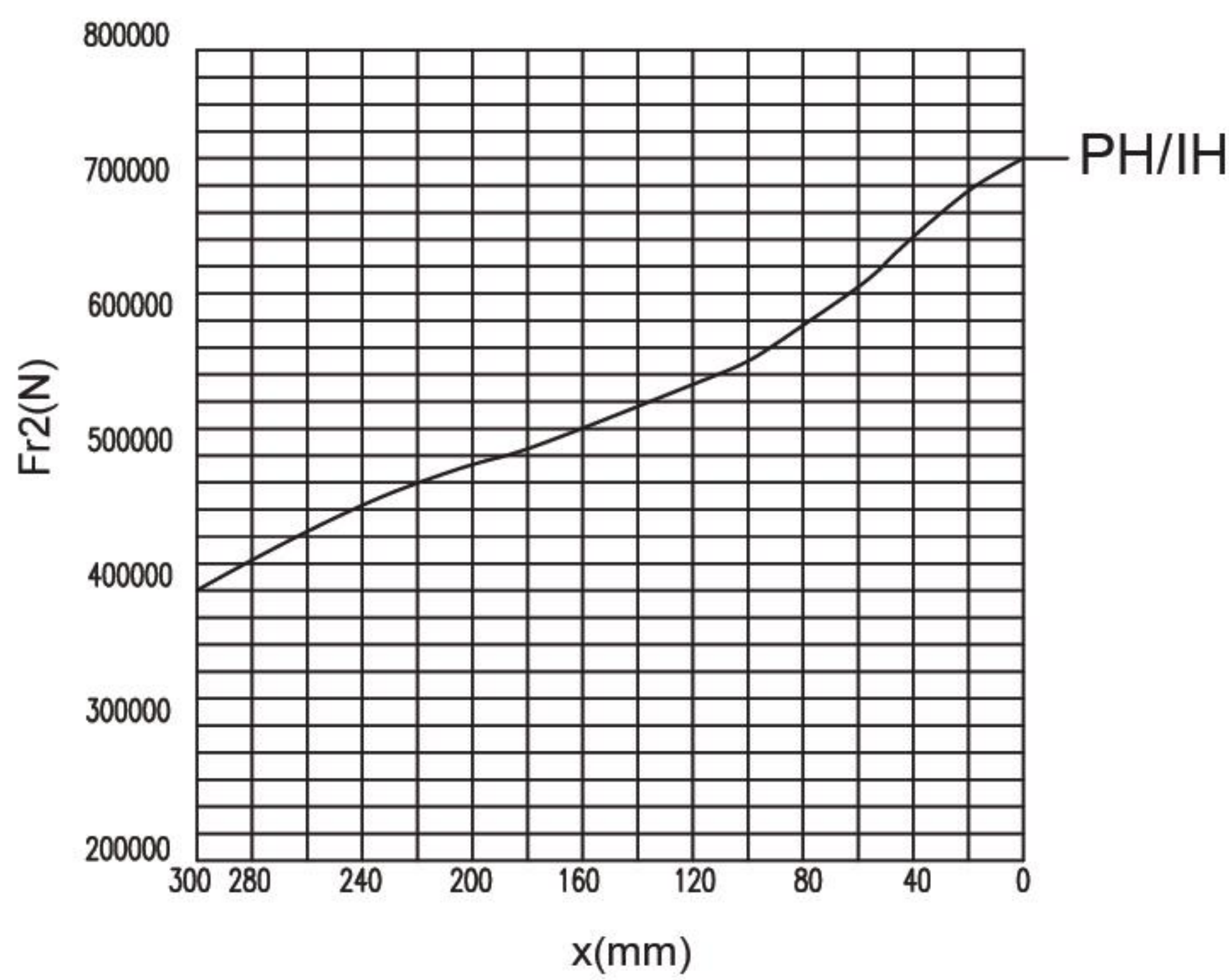


	A			
	SPH	SIH	H	SD
KR 42250	174	174	174	174

KR2250



	A			
	SPH	SIH	H	SD
KR 52250	174	174	174	174



n2·h							
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL2700

T₂=270000Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	4.18	272895	237576	213929	204548	155286	126132	120	400		
	4.89	233272	203081	182868	174849	132740	107818	120	400		
L2	17.49	272895	237576	213929	204548	155286	126132	75	1500		
	20.44	272895	237576	213929	204548	155286	126132	75	1500		
	23.90	233272	203081	182868	174849	132740	107818	75	1500		
L3	64.57	272895	237576	213929	204548	155286	126132	54	2100		
	78.69	272895	237576	213929	204548	155286	126132	54	2100		
	89.50	272895	237576	213929	204548	155286	126132	54	2100		
	96.64	233272	203081	182868	174849	132740	107818	54	2100		
	104.63	272895	237576	213929	204548	155286	126132	54	2100		
	122.32	233272	203081	182868	174849	132740	107818	54	2100		
	143.41	233272	203081	182868	174849	132740	107818	54	2100		
L4	225.99	272895	237576	213929	204548	155286	126132	43	2500		
	275.43	272895	237576	213929	204548	155286	126132	43	2500		
	322.00	272895	237576	213929	204548	155286	126132	43	2500	1050	
	395.26	272895	237576	213929	204548	155286	126132	43	2500	960	
	462.39	272895	237576	213929	204548	155286	126132	43	2500	875	
	536.97	272895	237576	213929	204548	155286	126132	43	2500	785	
	633.78	272895	237576	213929	204548	155286	126132	43	2500	610	
	733.91	233272	203081	182868	174849	132740	107818	43	2500	520	
	860.44	233272	203081	182868	174849	132740	107818	43	2500	430	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

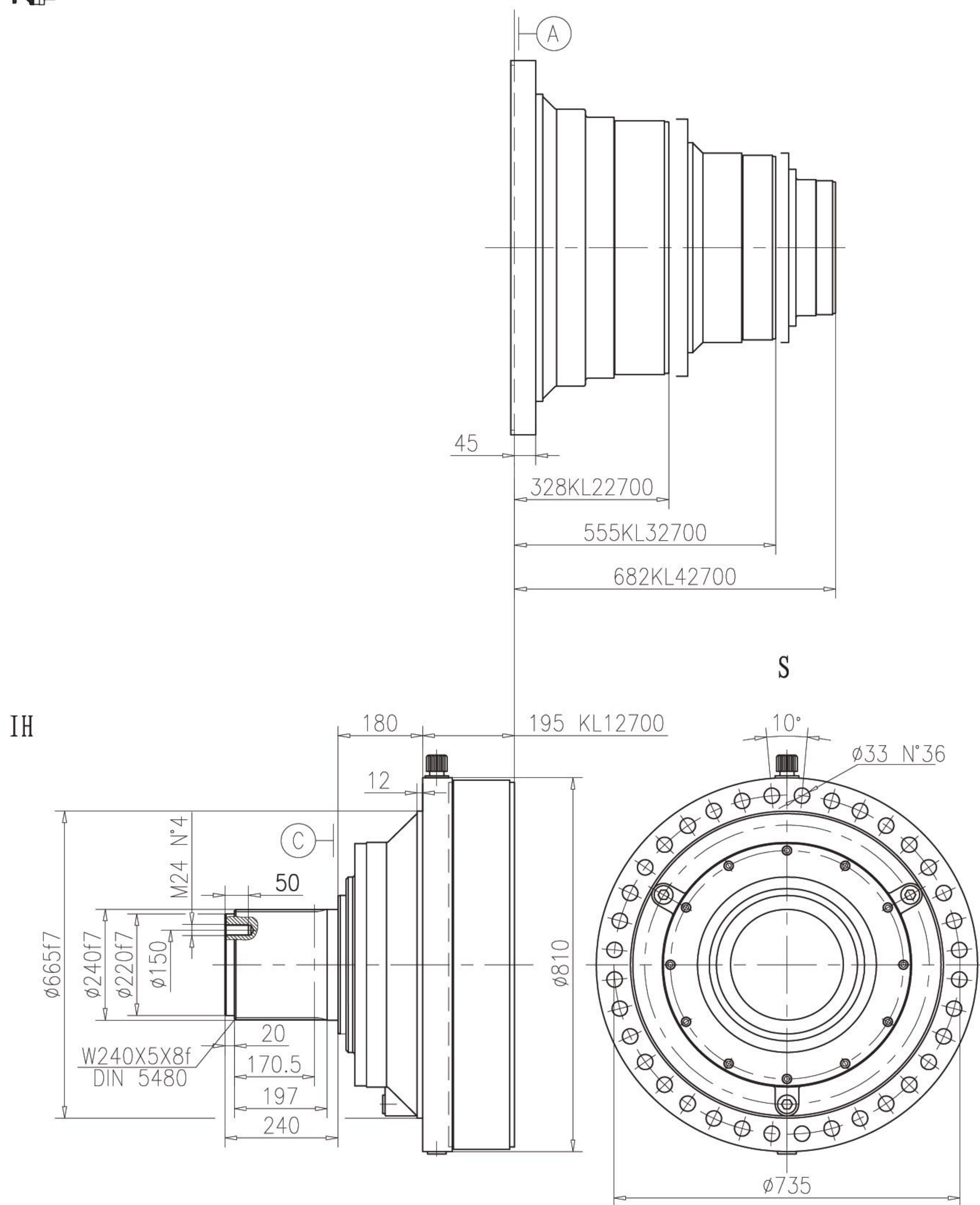
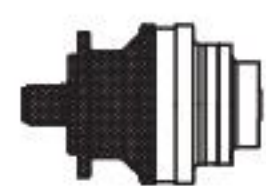
T₂=270000Nm

KR2700

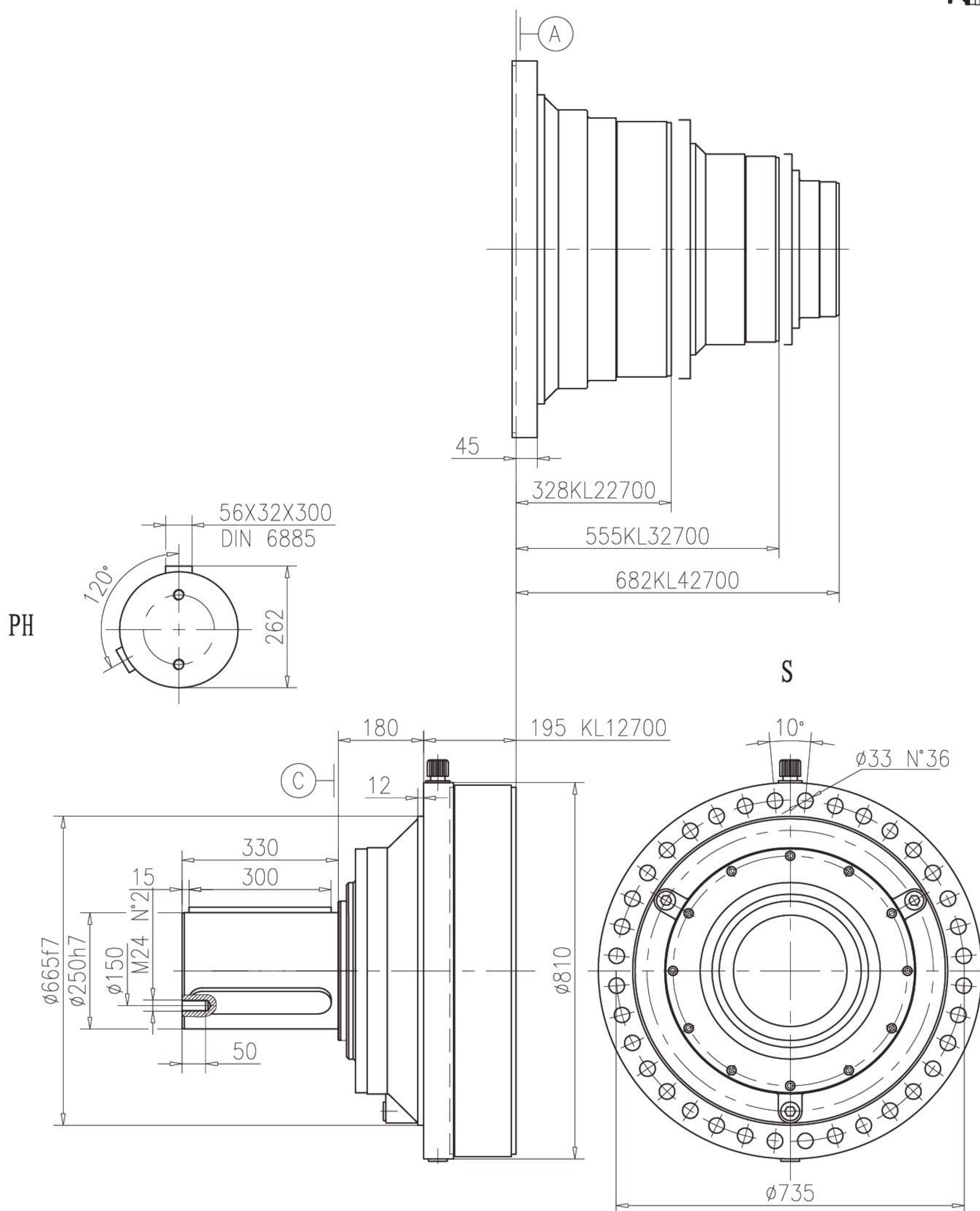
	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R4	247.49	272895	237576	213929	204548	155286	126132	80	3500		
	282.25	272895	237576	213929	204548	155286	126132	80	3500		
	313.23	272895	237576	213929	204548	155286	126132	80	3500	1050	
	366.20	272895	237576	213929	204548	155286	126132	80	3500	960	
	409.00	272895	237576	213929	204548	155286	126132	80	3500	960	
	434.90	233272	203081	182868	174849	132740	107818	80	3500	785	
	470.82	272895	237576	213929	204548	155286	126132	80	3500	875	
	501.93	233272	203081	182868	174849	132740	107818	80	3500	700	
	560.59	233272	203081	182868	174849	132740	107818	80	3500	610	
	645.33	233272	203081	182868	174849	132740	107818	80	3500	520	
R5	958.11	272895	237576	213929	204548	155286	126132	60	3500	430	
	1109.10	272895	237576	213929	204548	155286	126132	60	3500	340	
	1239.43	272895	237576	213929	204548	155286	126132	60	3500	340	
	1302.00	272895	237576	213929	204548	155286	126132	60	3500	340	
	1422.75	272895	237576	213929	204548	155286	126132	60	3500	250	
	1552.42	272895	237576	213929	204548	155286	126132	60	3500	250	
	1663.31	272895	237576	213929	204548	155286	126132	60	3500	250	
	1765.50	272895	237576	213929	204548	155286	126132	60	3500	250	
	1931.58	272895	237576	213929	204548	155286	126132	60	3500	250	
	2064.01	272895	237576	213929	204548	155286	126132	60	3500	160	
	2258.67	233272	203081	182868	174849	132740	107818	60	3500	160	
	2514.67	272895	237576	213929	204548	155286	126132	60	3500	160	
	2896.28	272895	237576	213929	204548	155286	126132	60	3500	160	
	3029.92	233272	203081	182868	174849	132740	107818	60	3500	160	
	3199.09	233272	203081	182868	174849	132740	107818	60	3500	160	
	3552.32	233272	203081	182868	174849	132740	107818	60	3500	160	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

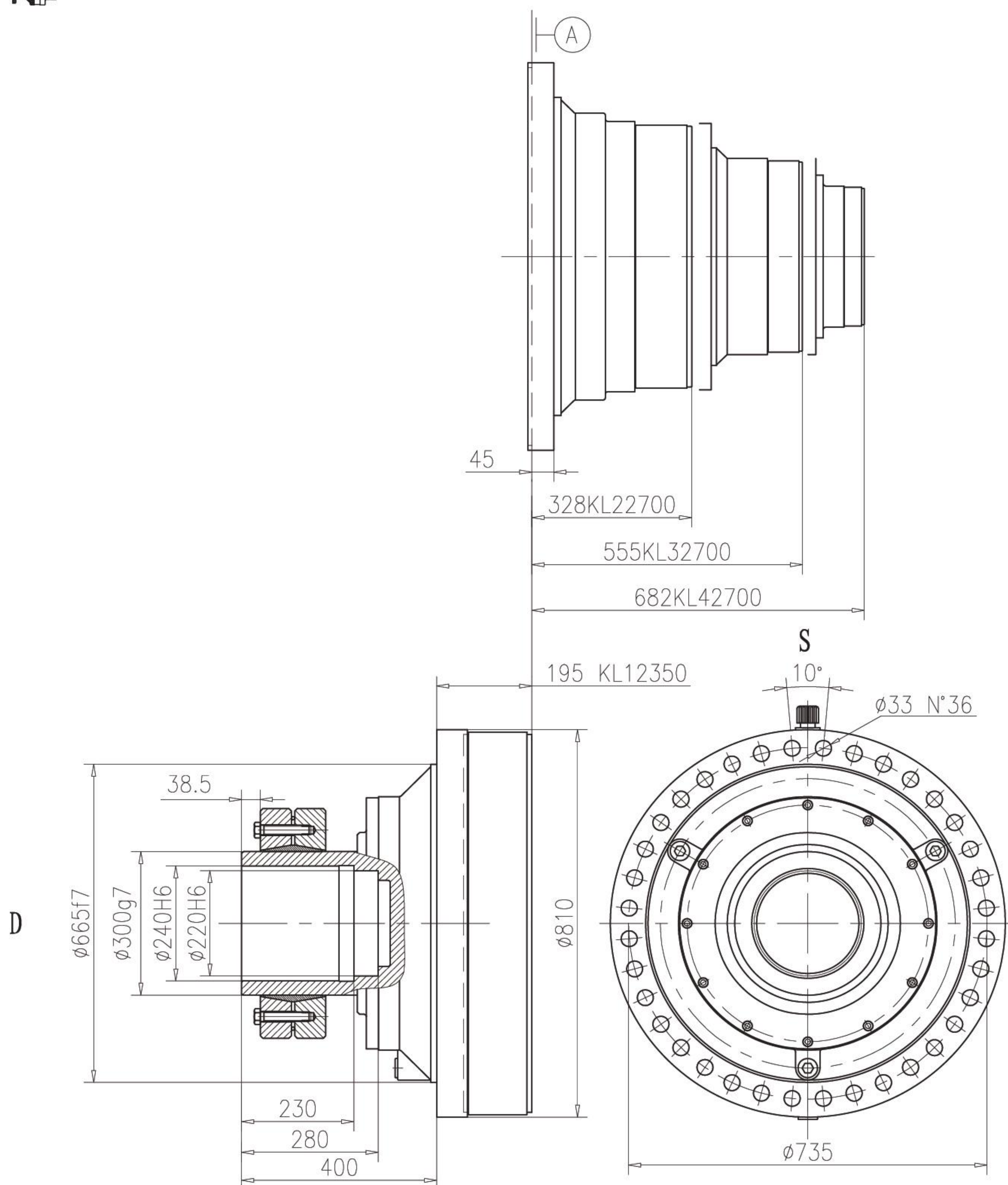
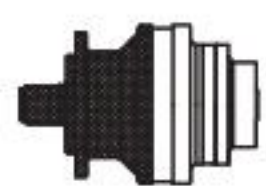
KL2700



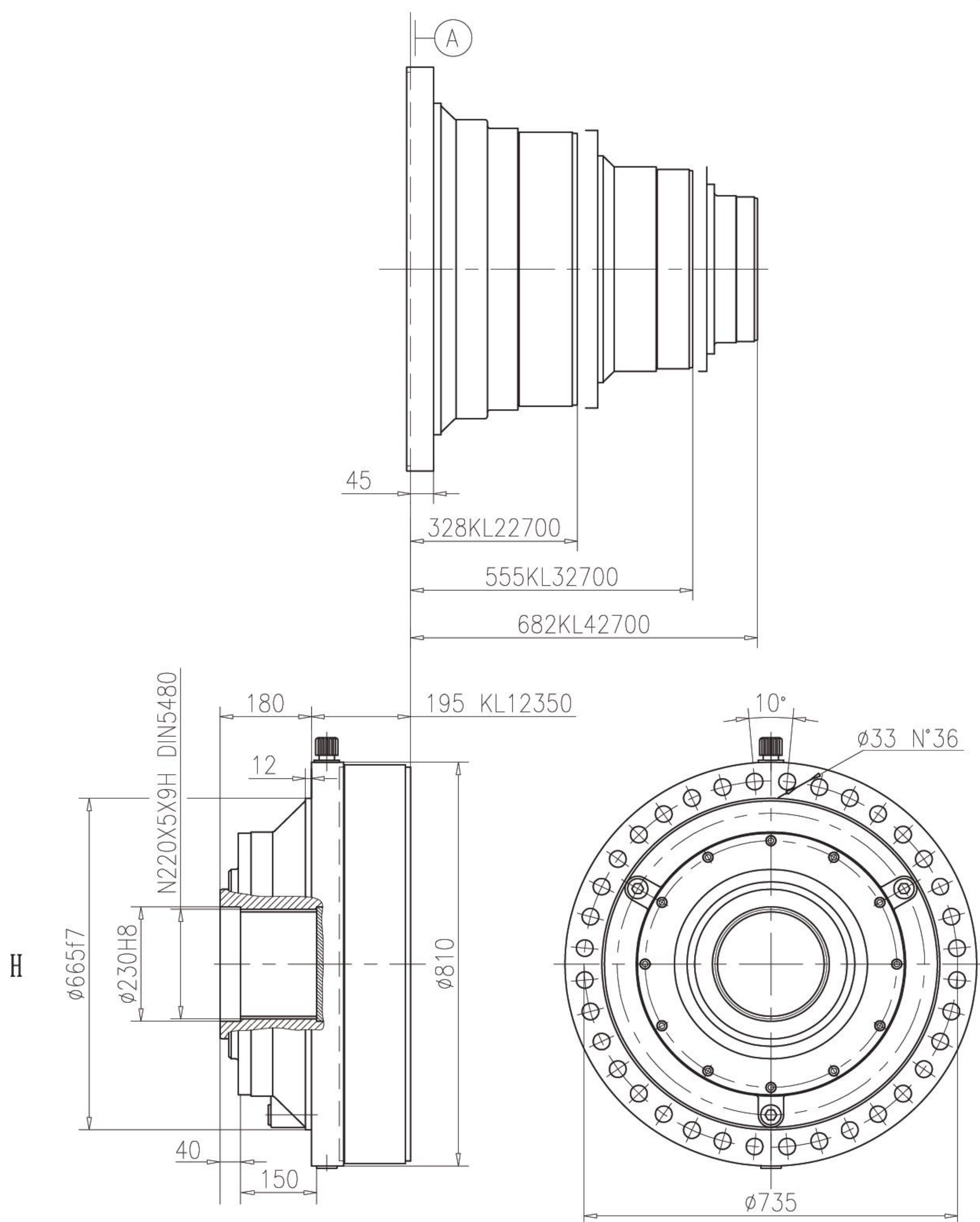
KL2700



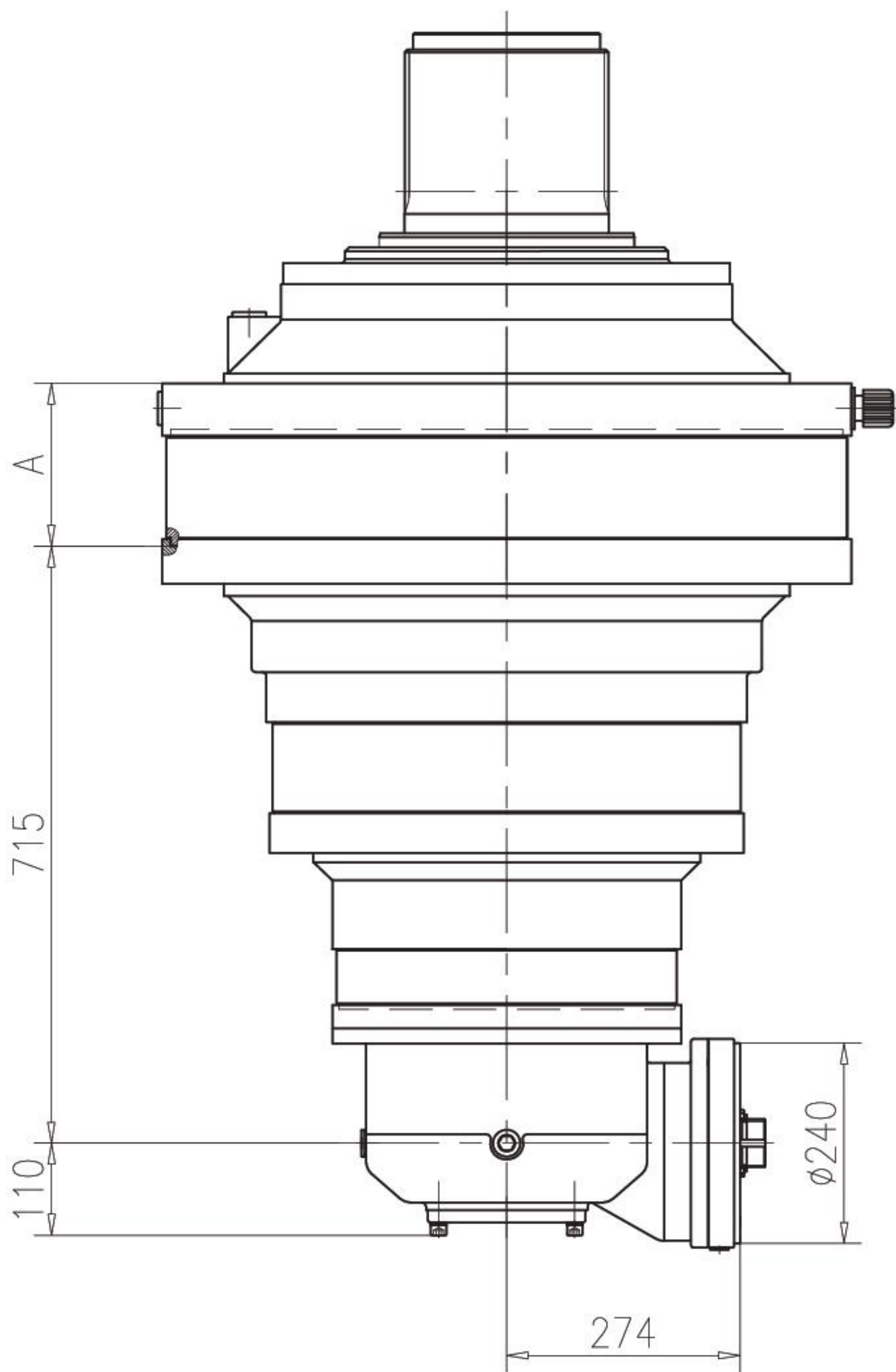
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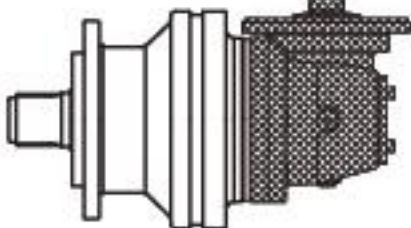


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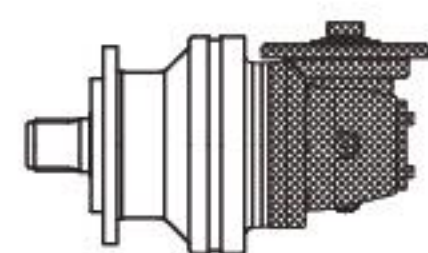
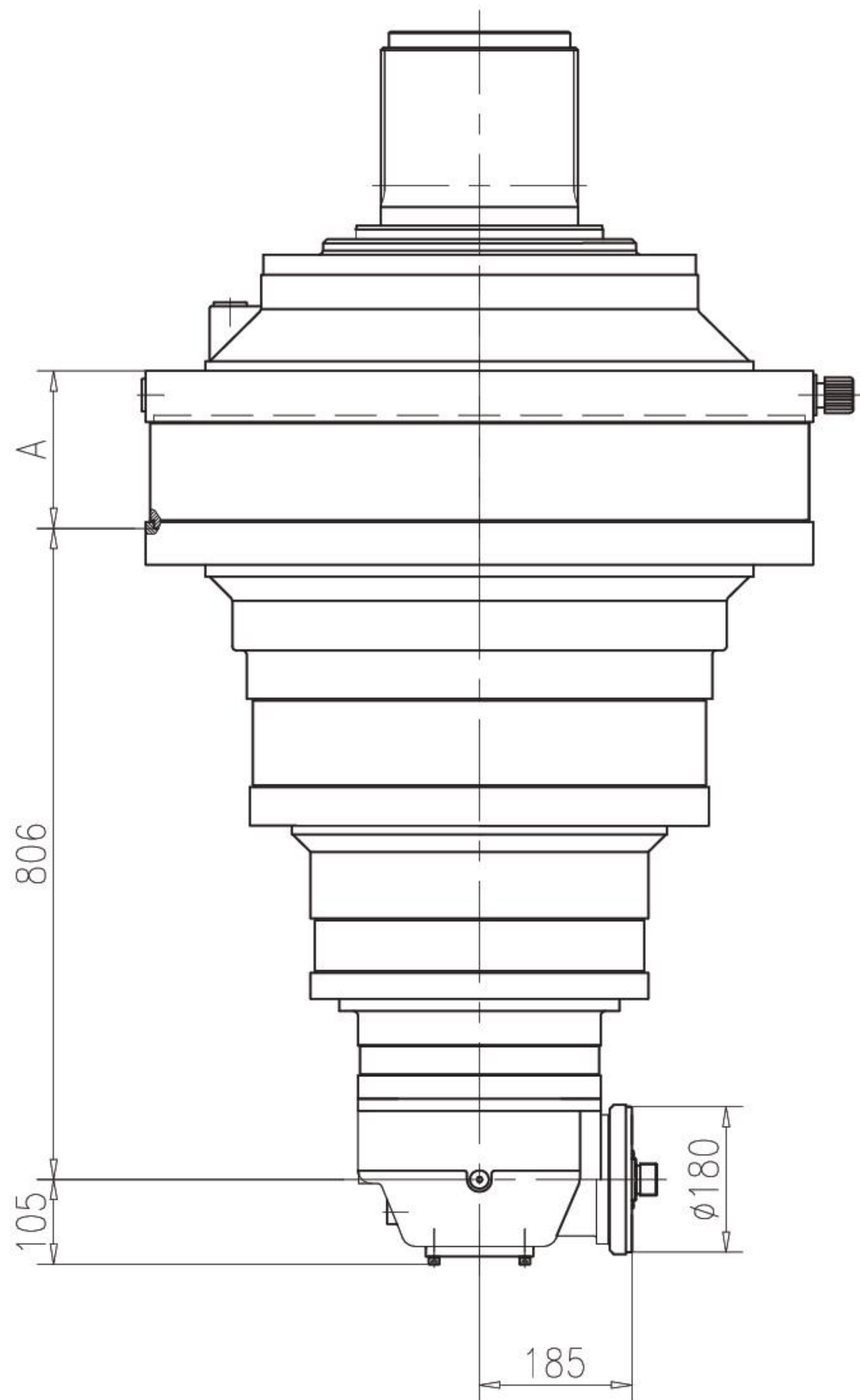
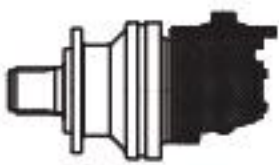


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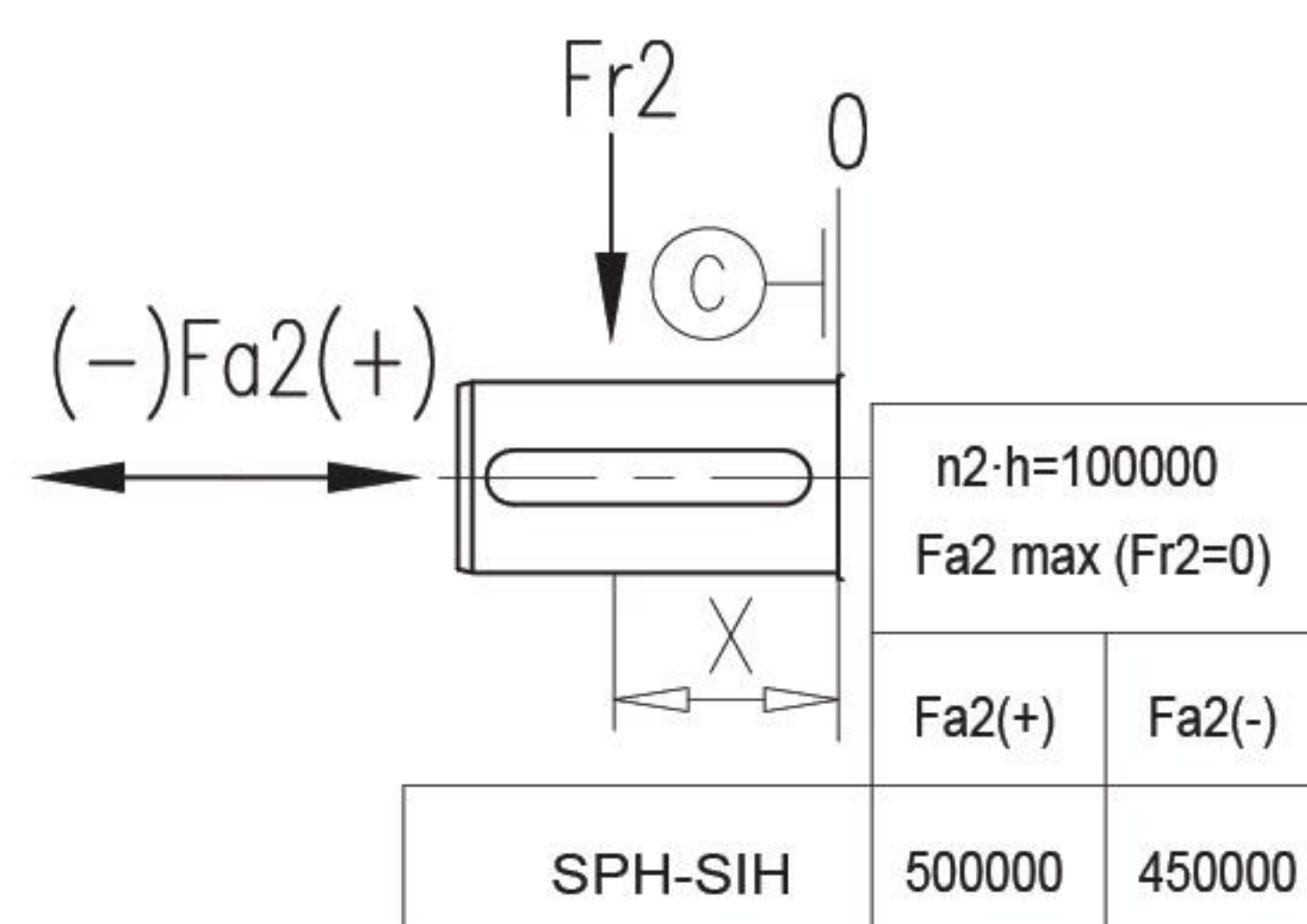
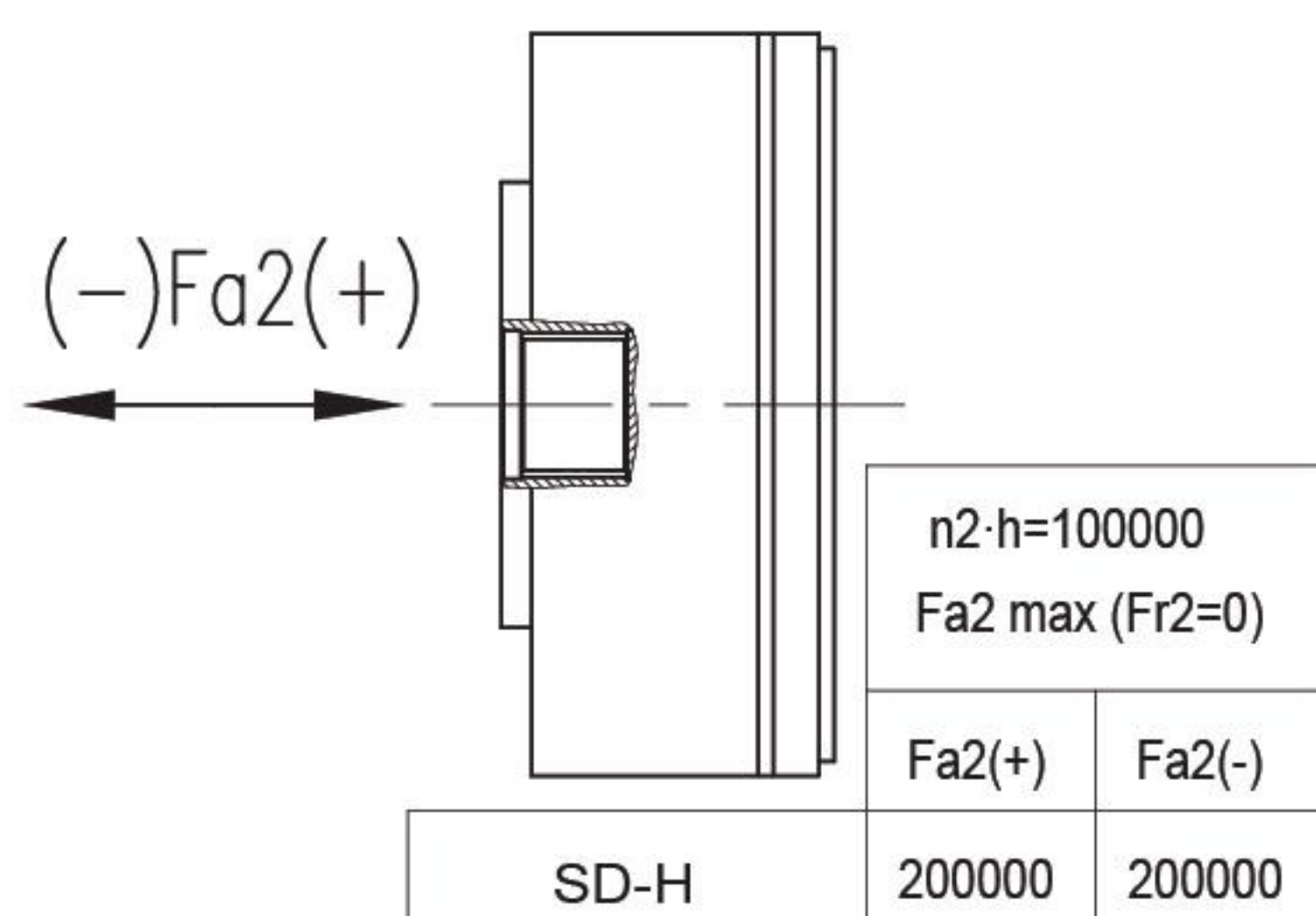
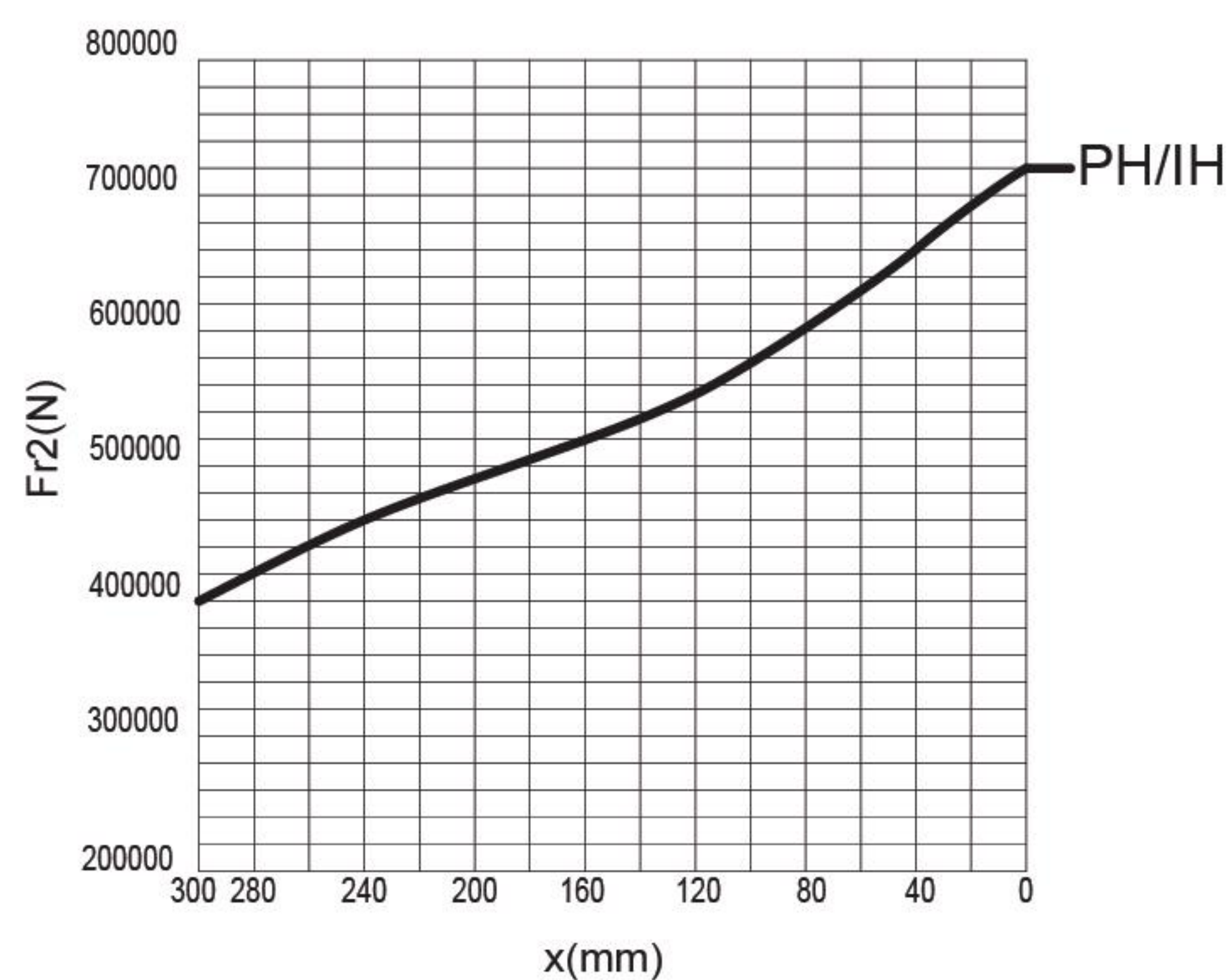


 KR 42700	A			
	SPH	SIH	H	SD
	195	195	195	195

KR2700



	A			
	SPH	SIH	H	SD
KR 52700	195	195	195	195



	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

KL3500
T₂ = 350000Nm

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
L1	3.83	512219	439906	391697	373619	230499	186809	184	300		
	4.40	445864	382918	340955	325218	200639	162609	184	300		
L2	15.70	384405	334652	301343	282431	215194	174791	113	1200		
	18.00	445864	382918	340955	325218	200639	162609	113	1200		
	23.10	430184	374506	337229	316065	200639	162609	113	1200		
L3	57.90	480658	418447	376797	353150	230499	186809	82	2100		
	70.57	480658	418447	376797	353150	230499	186809	82	2100		
	80.25	480658	418447	376797	353150	230499	186809	82	2100		
	90.56	374455	325990	293543	275120	209624	170266	82	2100		
	102.99	374455	325990	293543	275120	209624	170266	82	2100		
	118.22	430184	374506	337229	316065	200639	162609	82	2100		
	138.60	430184	374506	337229	316065	200639	162609	82	2100		
L4	202.66	480658	418447	376797	353150	230499	186809	64	2500		
	239.55	480658	418447	376797	353150	230499	186809	64	2500		
	261.56	480658	418447	376797	353150	230499	186809	64	2500		
	291.09	480658	418447	376797	353150	230499	186809	64	2500		
	360.47	374455	325990	293543	275120	209624	170266	64	2500		
	408.00	445864	382918	340955	325218	200639	162609	64	2500		
	467.91	374455	325990	293543	275120	209624	170266	64	2500	960	
	571.73	430184	374506	337229	316065	200639	162609	64	2500	960	
	648.00	445864	382918	340955	325218	200639	162609	64	2500	875	
	709.31	430184	374506	337229	316065	200639	162609	64	2500	875	
	831.60	430184	374506	337229	316065	200639	162609	64	2500	785	

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

T₂ = 350000Nm

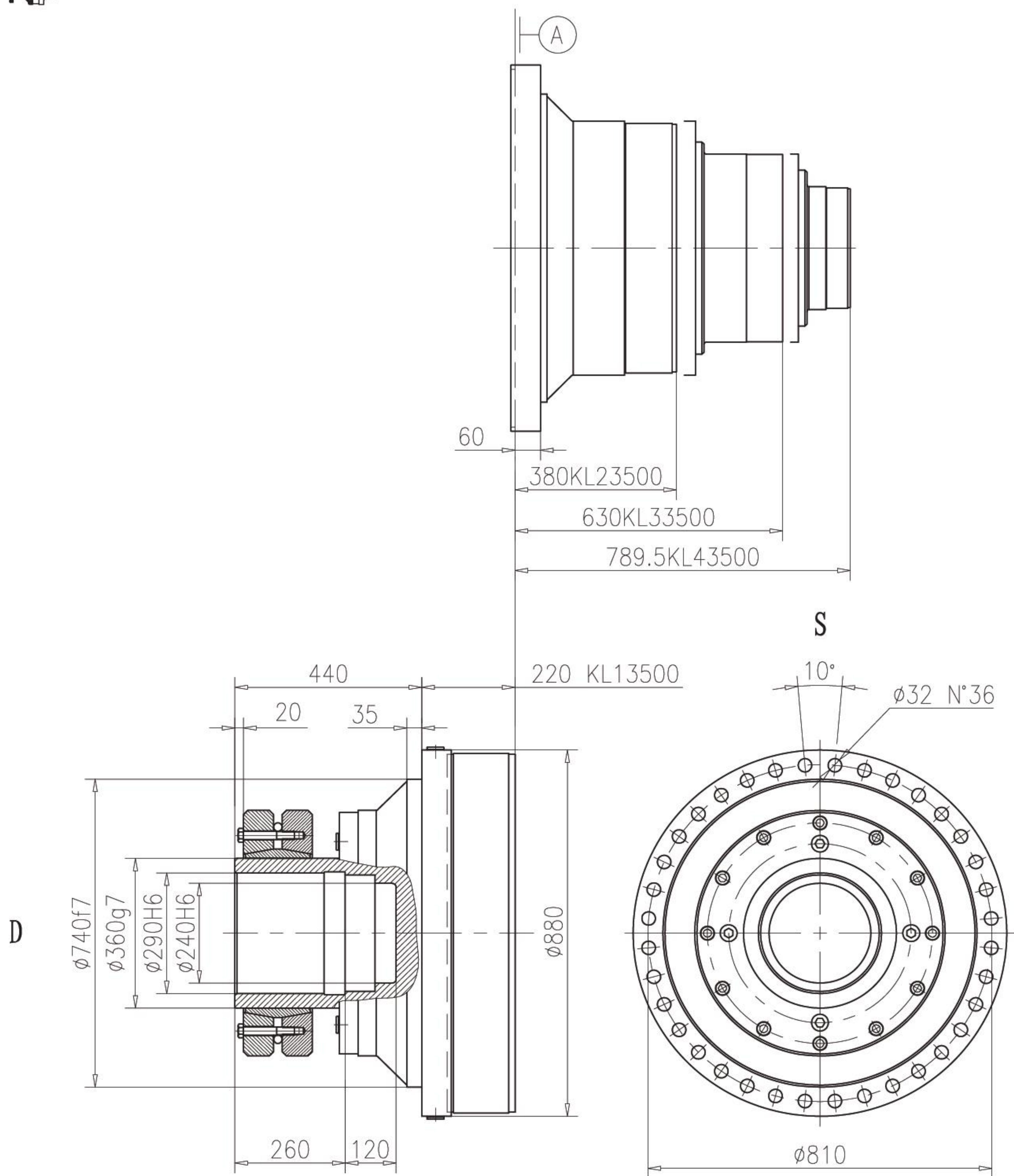
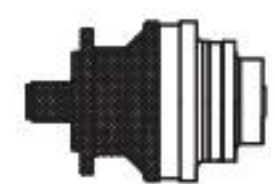
KR3500

	i	T _{cont} [Nm]						P _t	n _{1max}	T _b	
	1:	n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000	[KW]	[min ⁻¹]	[Nm]	
R4	222.56	384405	334652	301343	282431	215194	174791	95	2500		
	275.86	436199	418447	376797	353150	230499	186809	95	2500		
	313.72	480658	418447	376797	353150	230499	186809	95	2500		
	361.14	480658	418447	376797	353150	230499	186809	95	2500		
	437.12	430184	374506	337229	316065	200639	162609	95	2500		
	472.02	374455	325990	293543	275120	209624	170266	95	2500	960	
	541.08	430184	374506	337229	316065	200639	162609	95	2500	960	
	623.70	430184	374506	337229	316065	200639	162609	95	2500	875	
R5	804.81	338420	338420	338420	338420	230499	186809	70	3500	520	
	994.57	381873	381873	376797	353150	230499	186809	70	3500	520	
	1111.45	375818	375818	375818	353150	230499	186809	70	3500	430	
	1275.83	480658	418447	376797	353150	230499	186809	70	3500	520	
	1392.12	470455	418447	376797	353150	230499	186809	70	3500	430	
	1500.46	430184	374506	337229	316065	200639	162609	70	3500	430	
	1700.63	445864	382918	340955	325218	200639	162609	70	3500	340	
	1901.81	374455	325990	293543	275120	209624	170266	70	3500	340	
	2229.23	374455	325990	293543	275120	209624	170266	70	3500	250	
	2427.55	480658	418447	376797	353150	230499	186809	70	3500	250	

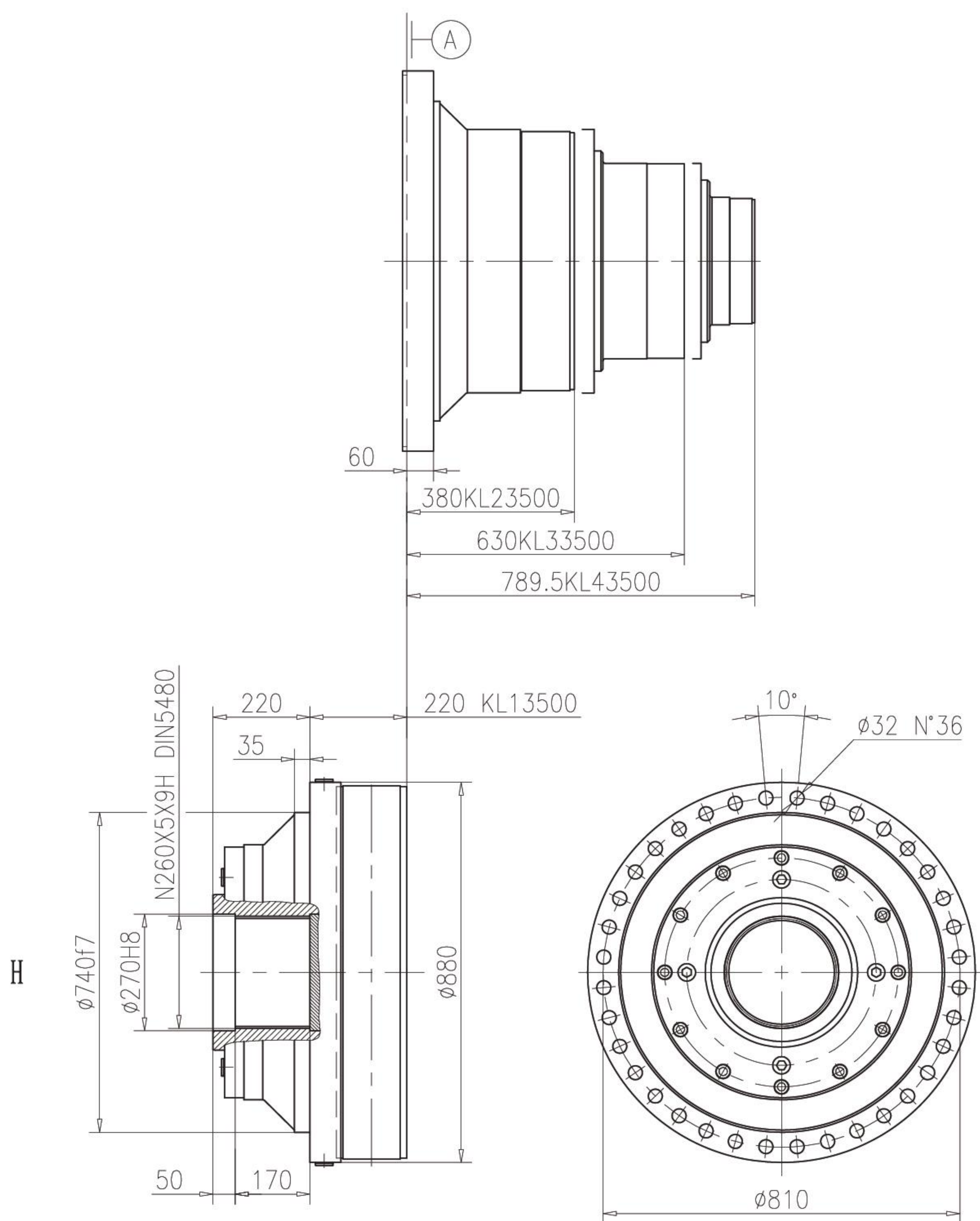
$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$



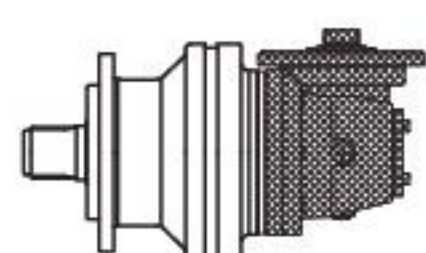
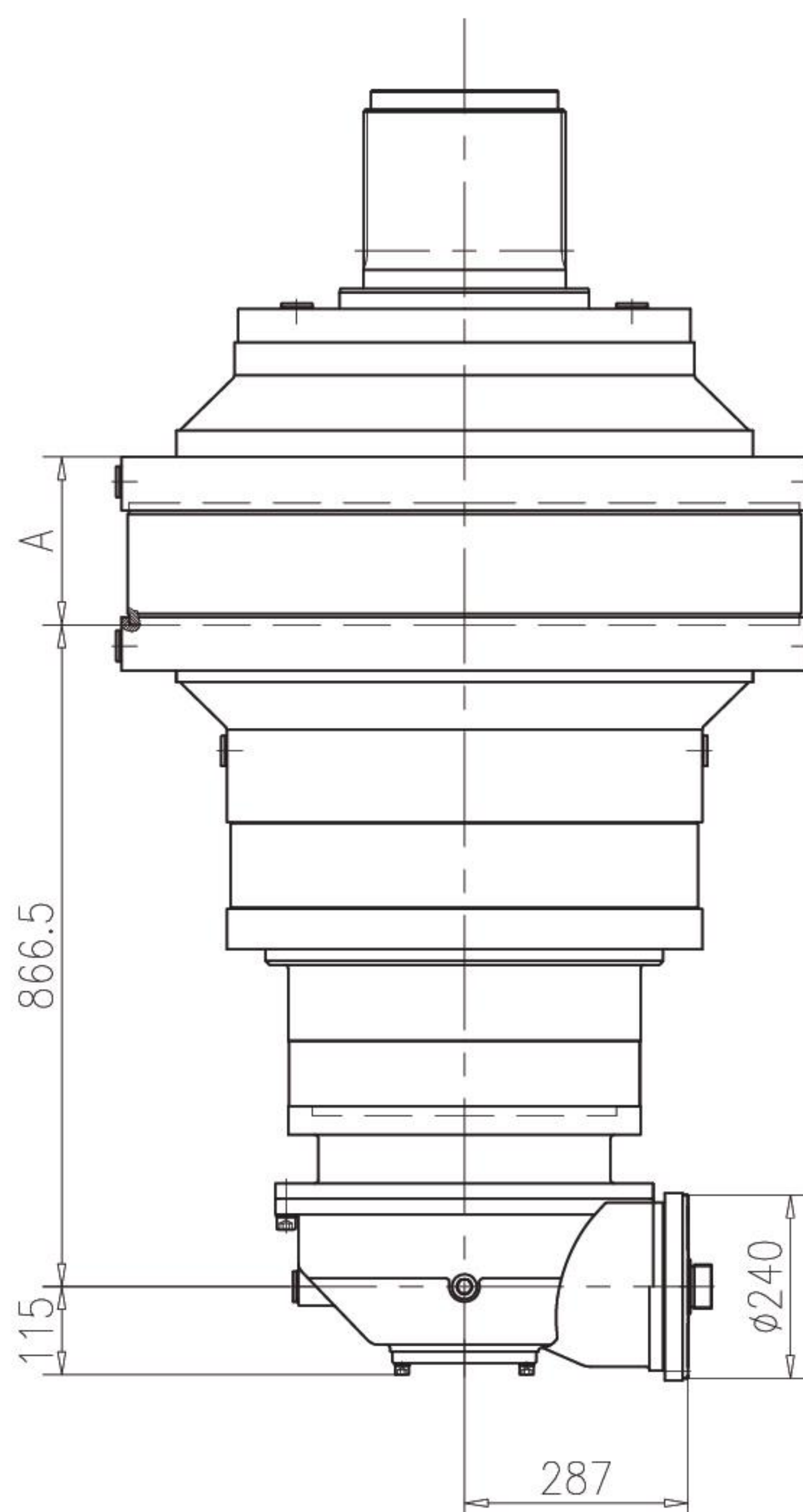
KL3500



KL3500

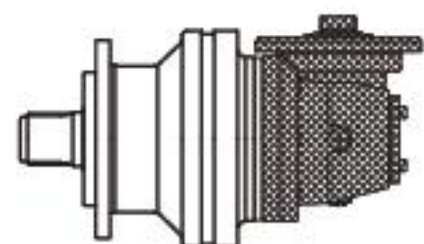
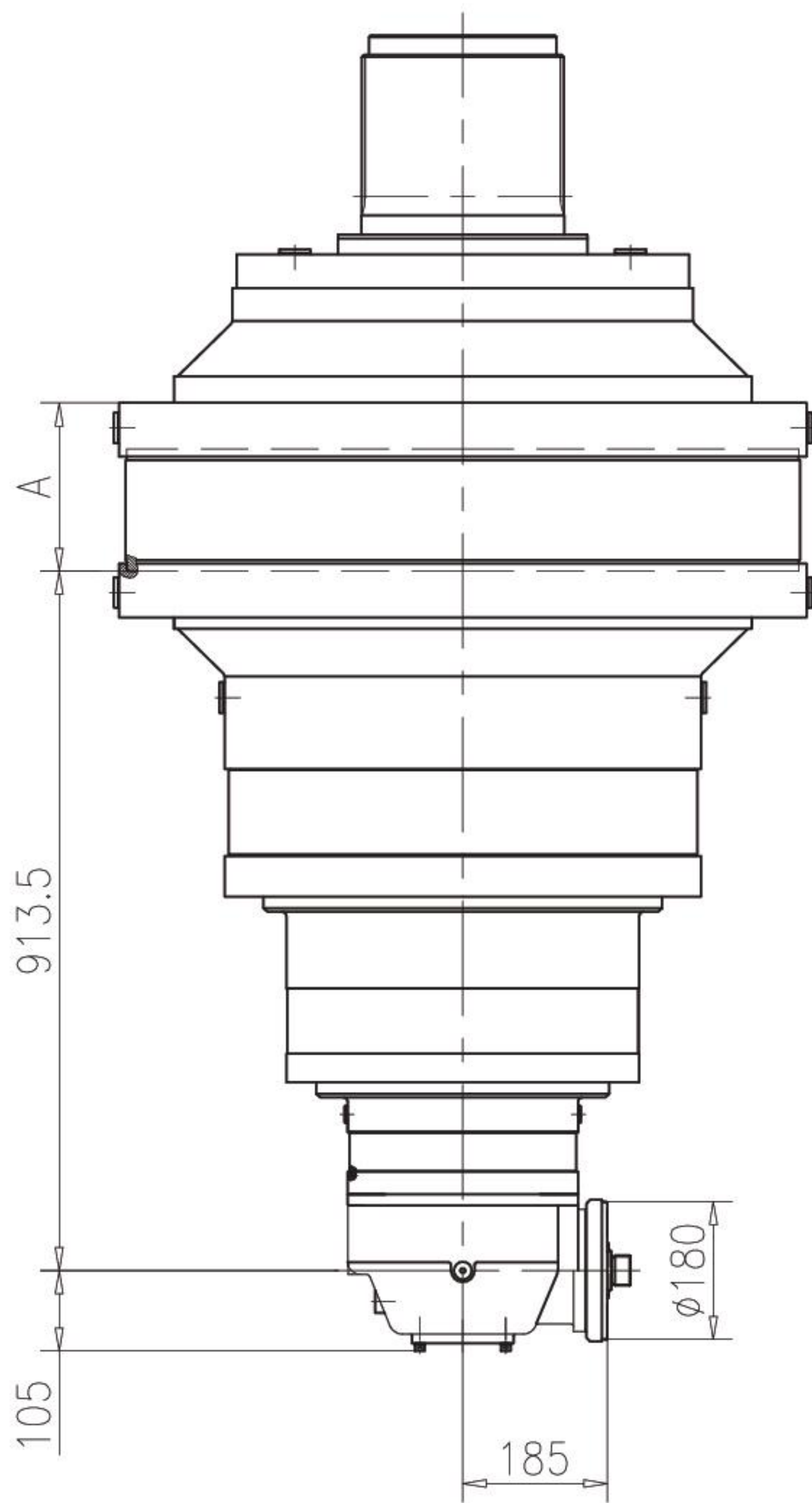
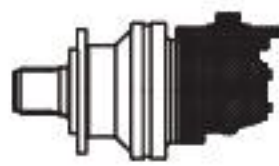


KR3500



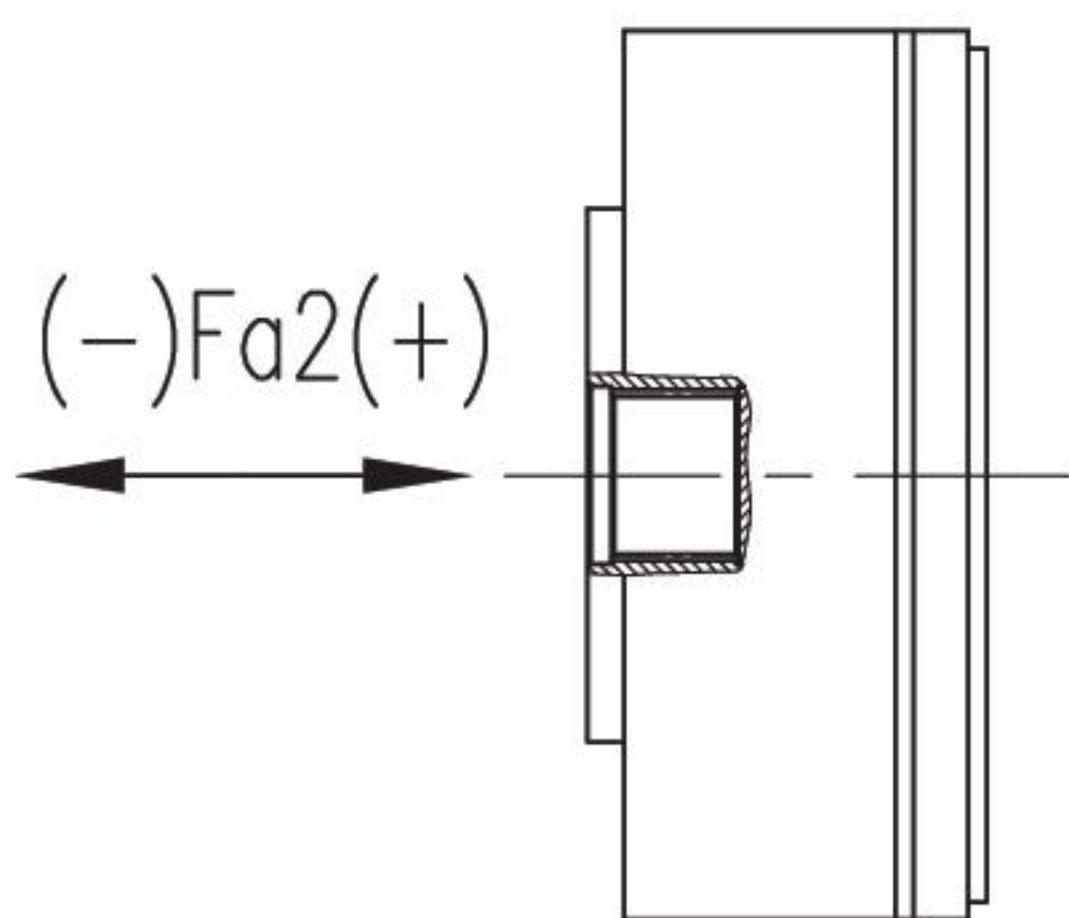
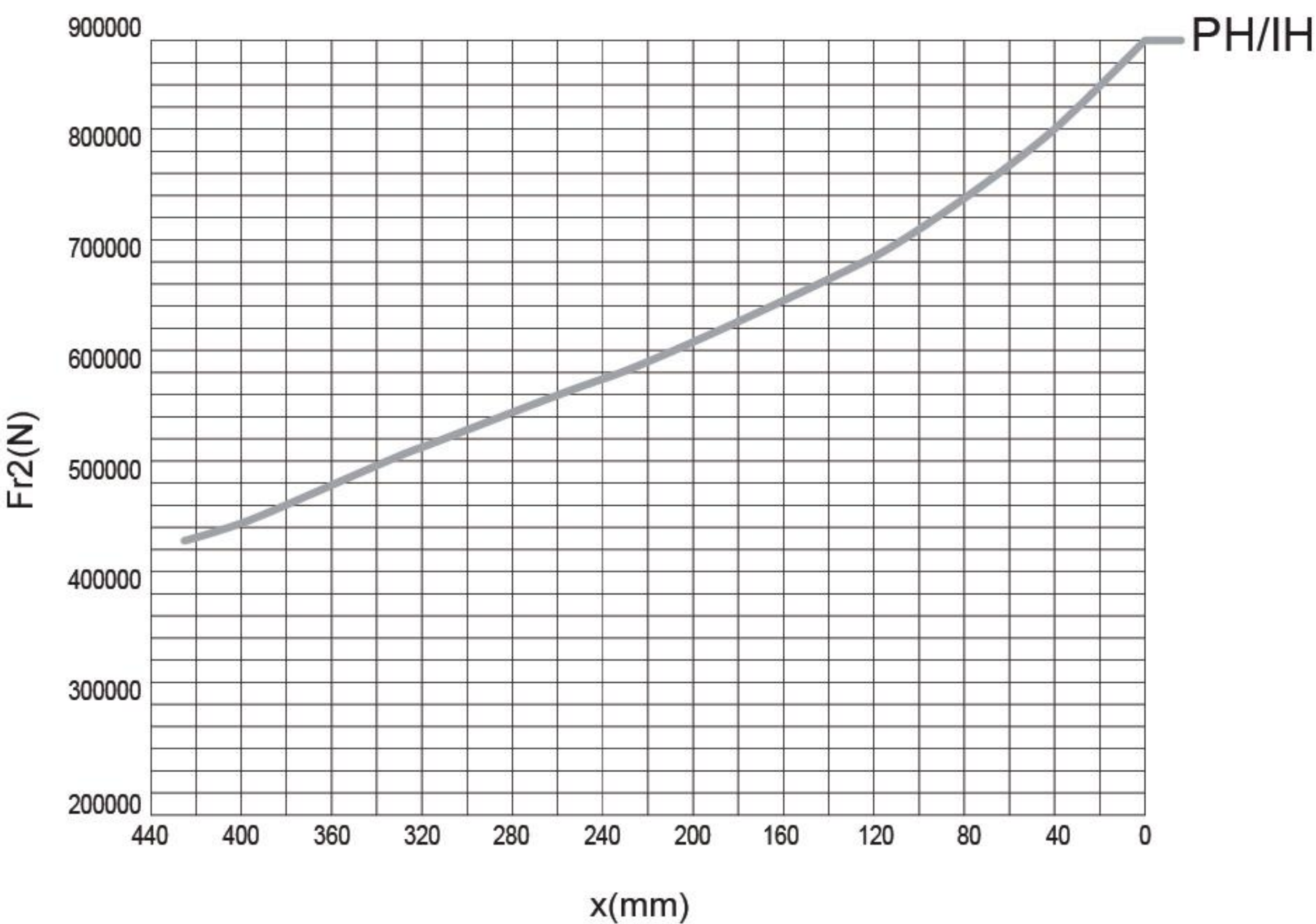
	A			
	SPH	SIH	H	SD
KR 43500	220	220	220	220

KR3500

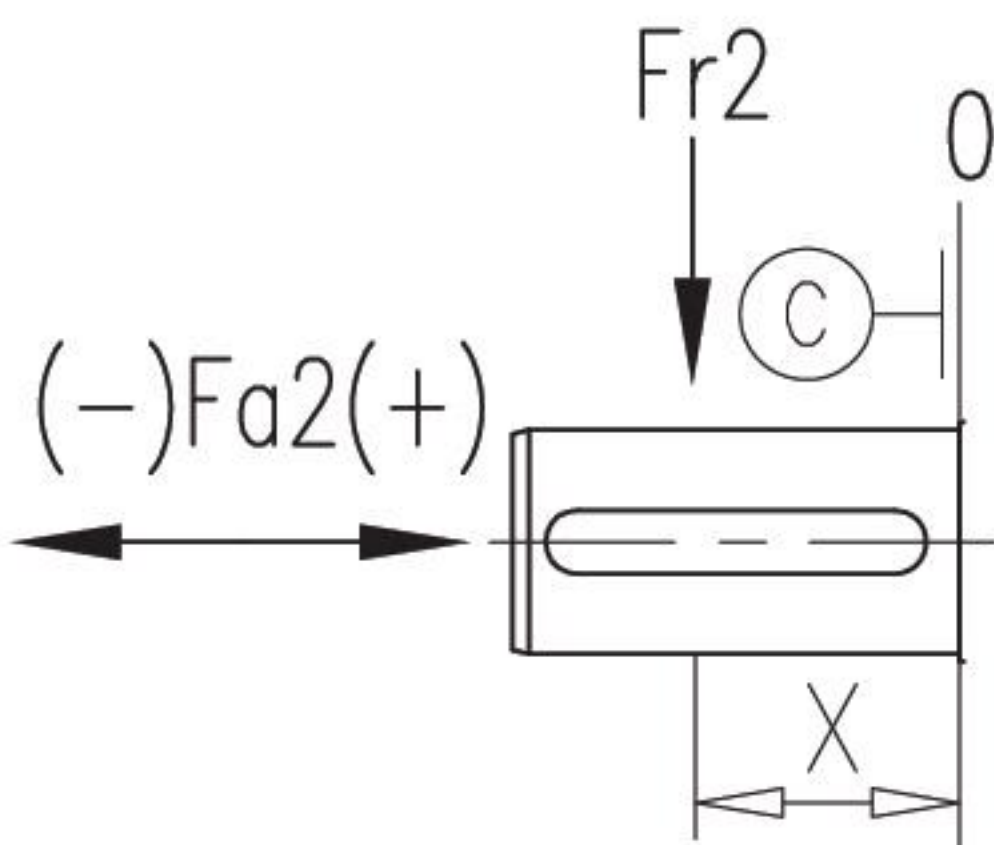


	A			
	SPH	SIH	H	SD
KR 53500	220	220	220	220

KL3500



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
SD-H	200000	200000



n2·h=100000 Fa2 max (Fr2=0)		
	Fa2(+)	Fa2(-)
SPH-SIH	500000	450000

Kf	n2·h						
	20000	40000	60000	80000	100000	200000	400000
	1.7	1.3	1.15	1.06	1	0.8	0.63

KL4500

T₂ = 450000Nm

	i	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000			
L1	3.83	507097	441468	390474	317163	195699	158957	221	200	
	4.40	441404	384277	339889	276075	170347	138364	221	200	
L2	14.69	507097	441468	390474	317163	195699	158957	135	1000	
	16.87	499423	441468	390474	317163	195699	158957	135	1000	
	19.36	441404	384277	339889	276075	170347	138364	135	1000	
L3	61.45	507097	441468	390474	317163	195699	158957	97	1800	
	71.84	507097	441468	390474	317163	195699	158957	97	1800	
	94.65	441404	384277	339889	276075	170347	138364	97	1800	
	101.20	499423	441468	390474	317163	195699	158957	97	1800	
	116.16	441404	384277	339889	276075	170347	138364	97	1800	
L4	228.59	507097	441468	390474	317163	195699	158957	76	2400	
	281.37	507097	441468	390474	317163	195699	158957	76	2400	
	322.61	507097	441468	390474	317163	195699	158957	76	2400	
	370.30	499423	441468	390474	317163	195699	158957	76	2400	
	513.78	499423	441468	390474	317163	195699	158957	76	2400	
	589.74	441404	384277	339889	276075	170347	138364	76	2400	960
	630.55	499423	441468	390474	317163	195699	158957	76	2400	960
	723.77	441404	384277	339889	276075	170347	138364	76	2400	785

$$T_{2max}=1.2 \cdot T_{n2}(n_{2 \cdot h}=10000)$$

T₂ = 450000Nm

KR4500

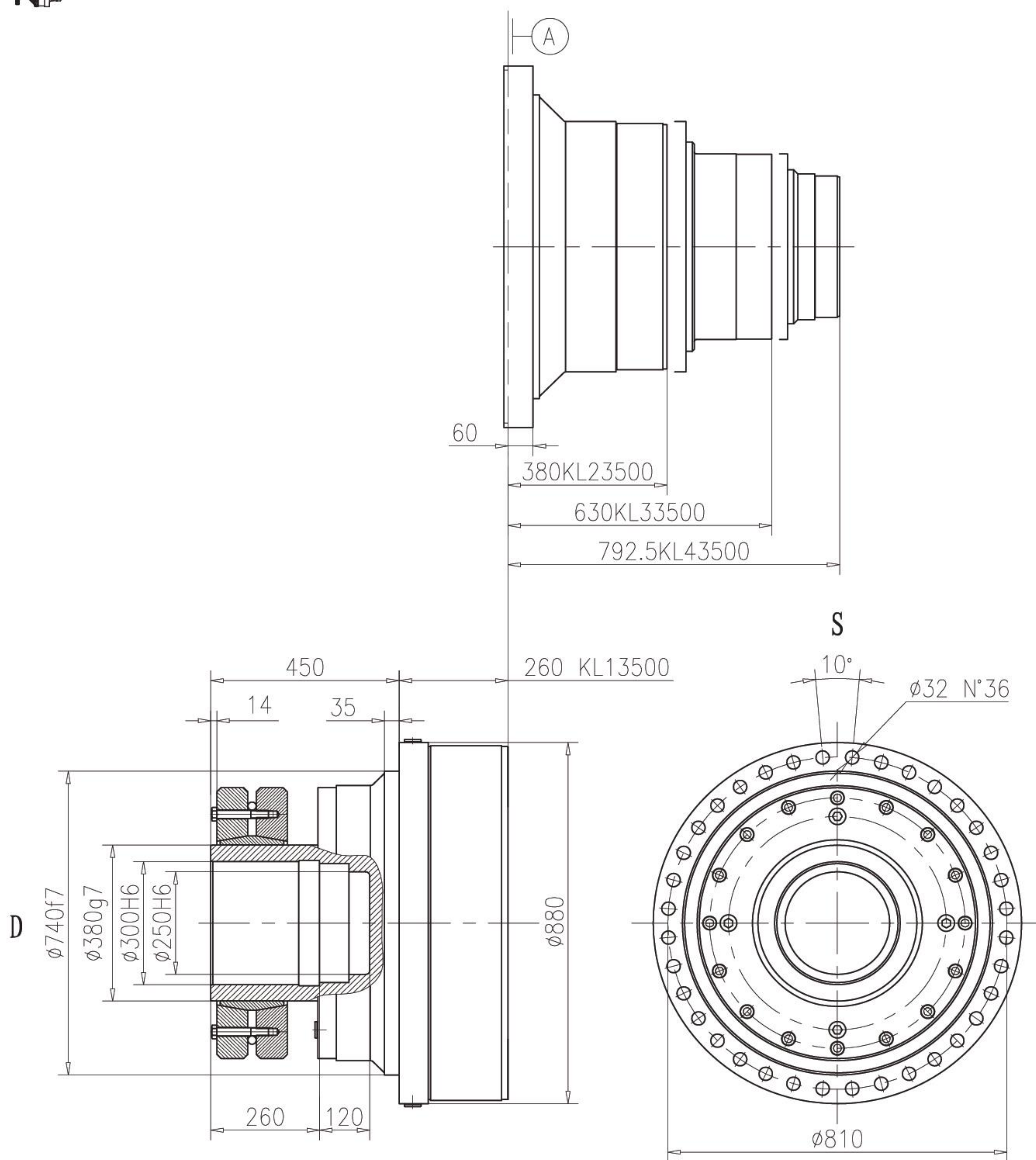
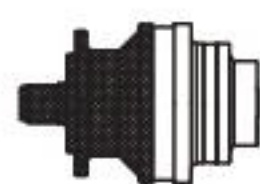
	i 1:	T _{cont} [Nm]						P _t [KW]	n _{1max} [min ⁻¹]	T _b [Nm]	
		n ₂ ·h 10000	n ₂ ·h 25000	n ₂ ·h 50000	n ₂ ·h 100000	n ₂ ·h 500000	n ₂ ·h 1000000				
R4	222.45	424832	424832	390474	317163	195699	158957	100	2500		
	260.06	496992	441468	390474	317163	195699	158957	100	2500		
	288.61	499423	441468	390474	317163	195699	158957	100	2500		
	308.58	507097	441468	390474	317163	195699	158957	100	2500		
	322.34	499423	441468	390474	317163	195699	158957	100	2500		
	371.07	499423	441468	390474	317163	195699	158957	100	2500		
	454.08	441404	384277	339889	276075	170347	138364	100	2500		
R5	800.07	408017	408017	390474	317163	195699	158957	75	3500	785	
	910.03	454136	395361	349693	284038	175260	142355	75	3500	700	
	1017.46	507097	441468	390474	317163	195699	158957	75	3500	700	
	1129.13	507097	441468	390474	317163	195699	158957	75	3500	700	
	1320.05	507097	441468	390474	317163	195699	158957	75	3500	610	
	1411.71	507097	441468	390474	317163	195699	158957	75	3500	520	
	1515.19	499423	441468	390474	317163	195699	158957	75	3500	520	
	1722.95	507097	441468	390474	317163	195699	158957	75	3500	430	
	1948.10	499423	441468	390474	317163	195699	158957	75	3500	430	
	2236.08	441404	384277	339889	276075	170347	138364	75	3500	340	
	2533.18	441404	384277	339889	276075	170347	138364	75	3500	250	

$$T_{2max} = 1.2 \cdot T_{n2}(n_{2 \cdot h} = 10000)$$

A technical drawing of a bolt and nut assembly. The bolt is shown in profile, with a hexagonal head and a threaded shank. The nut is shown in profile, with a hexagonal shape and a threaded interior. The bolt is inserted into the nut, and the threads are shown meshing.

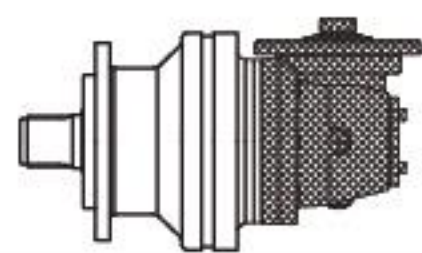
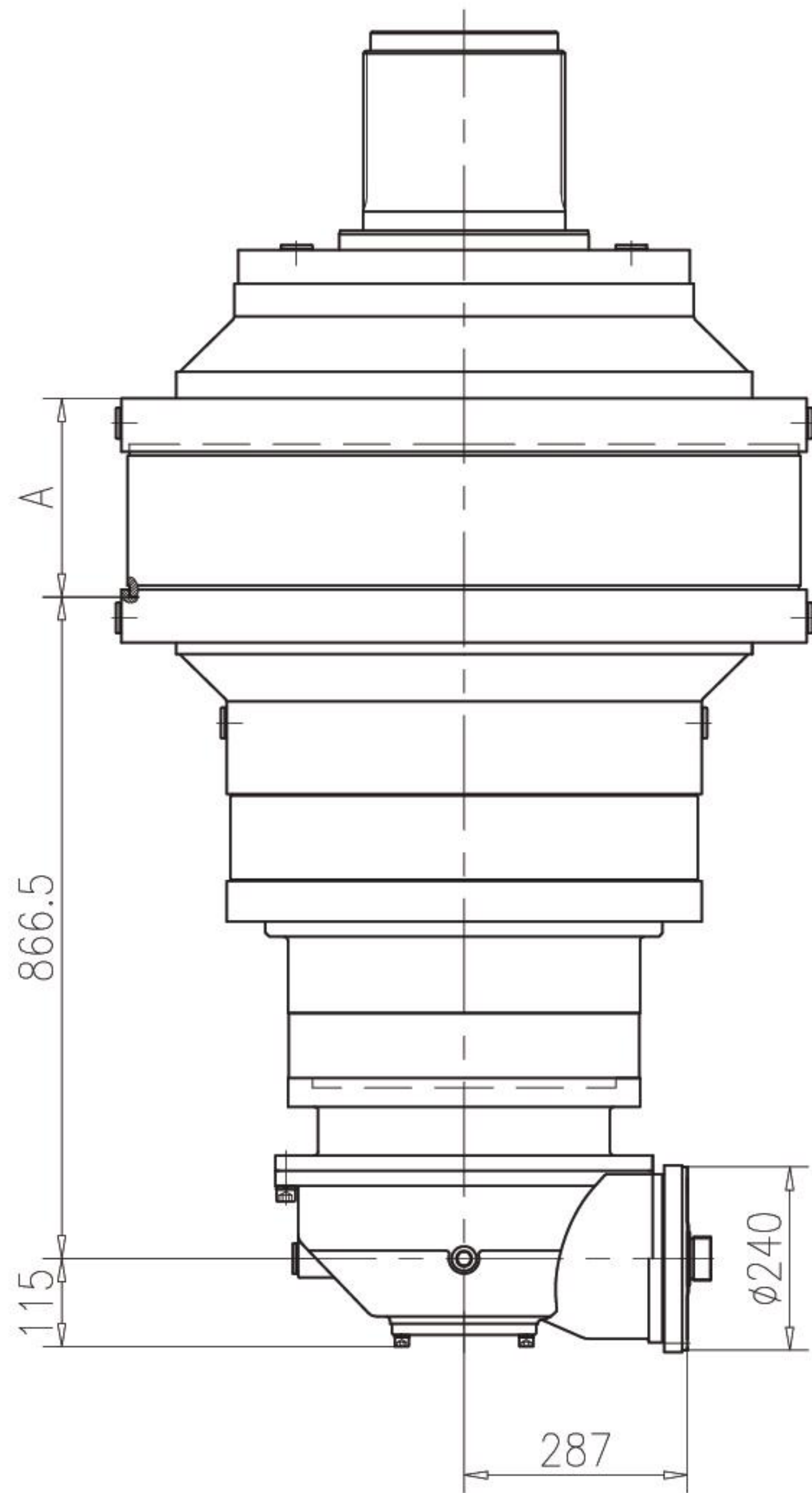


KL4500



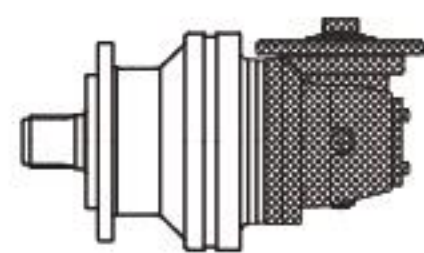
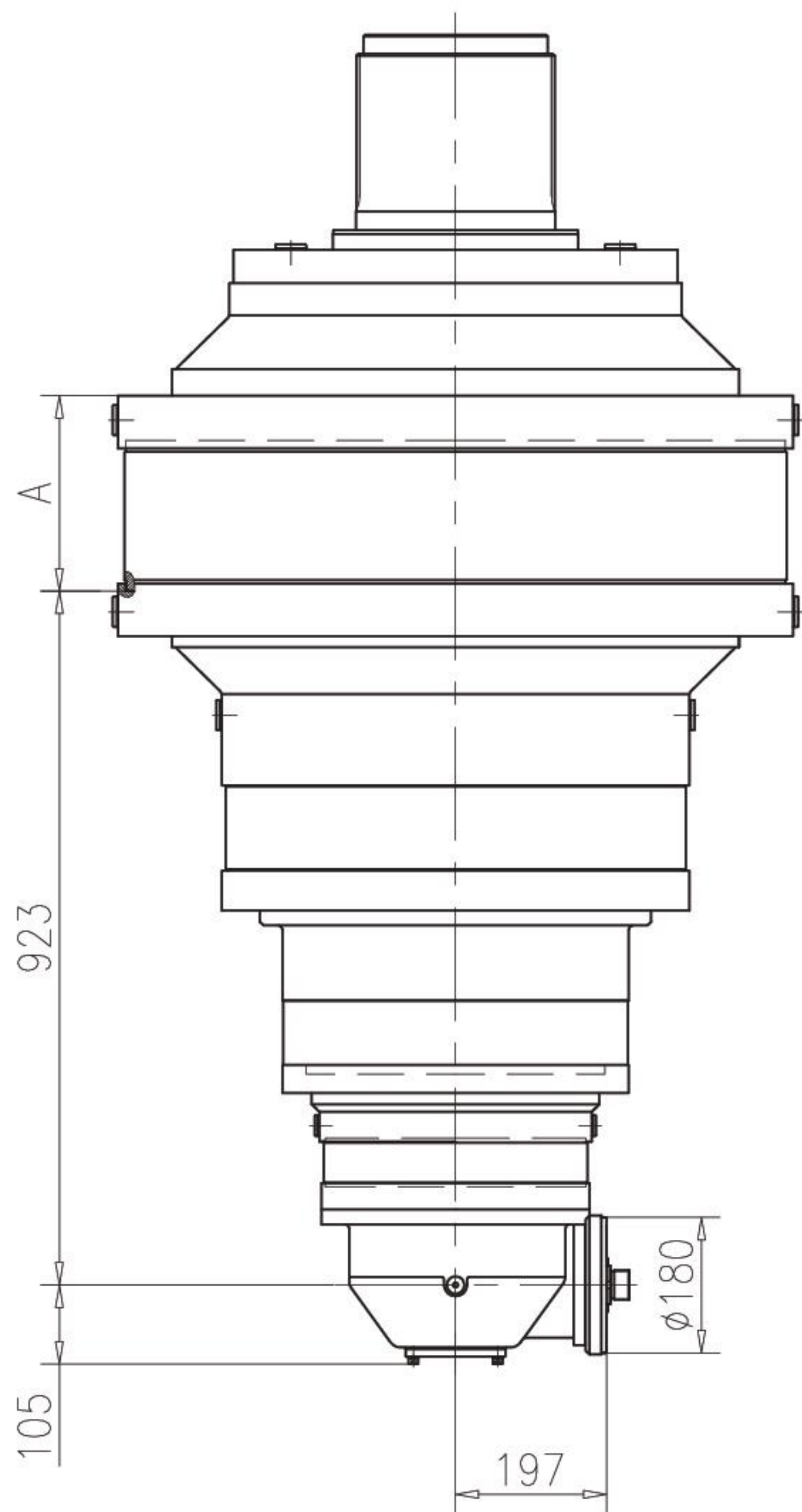


KR4500



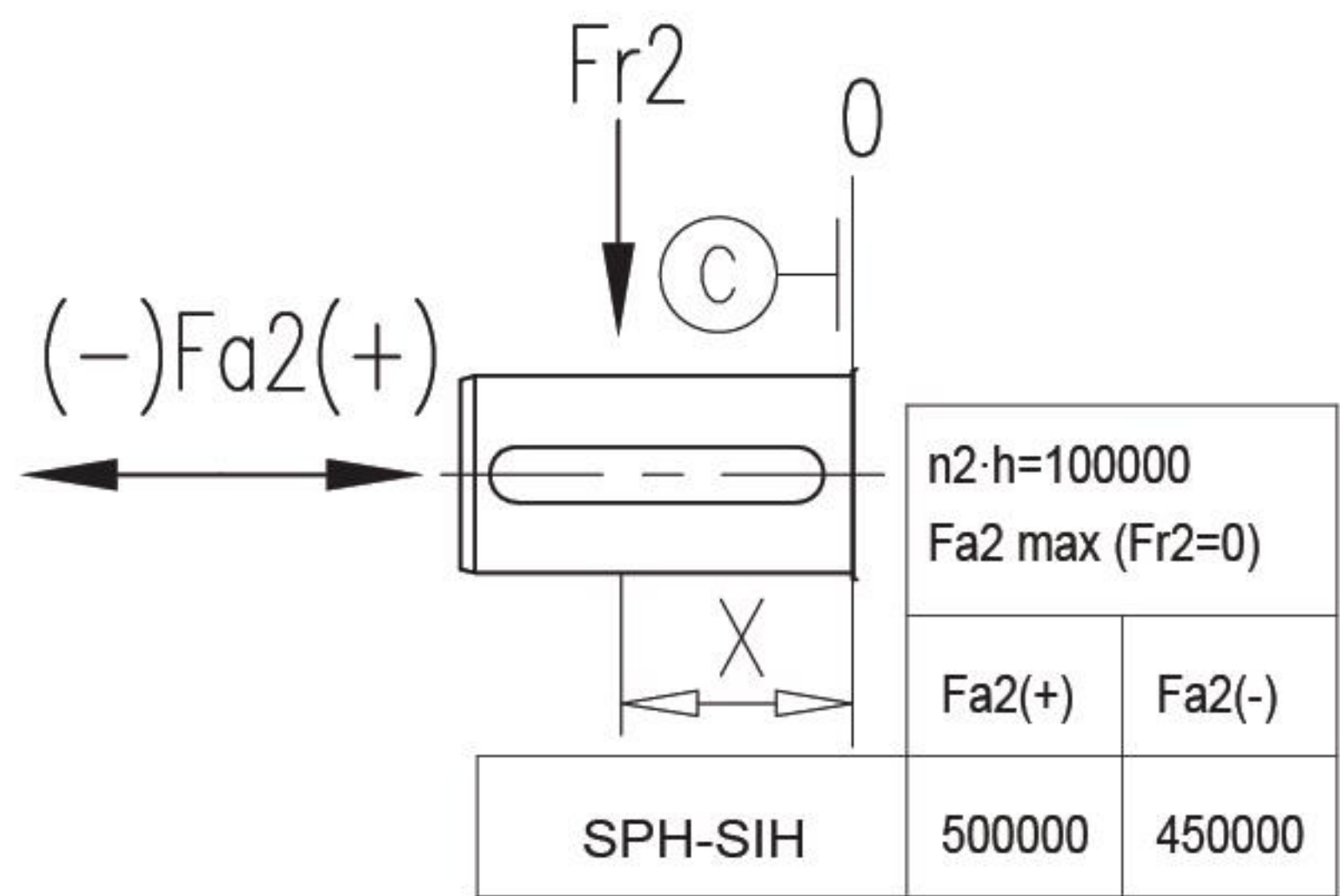
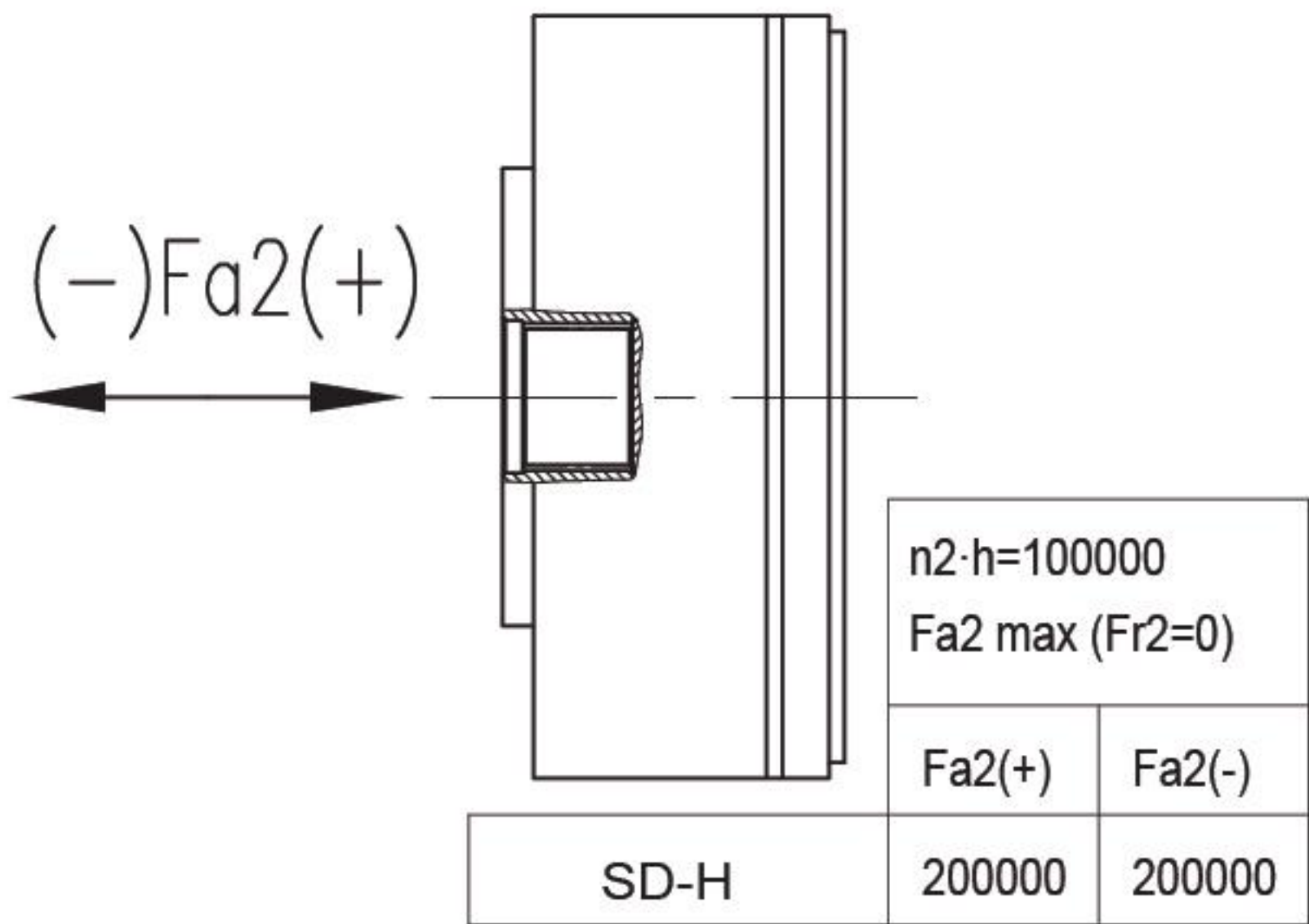
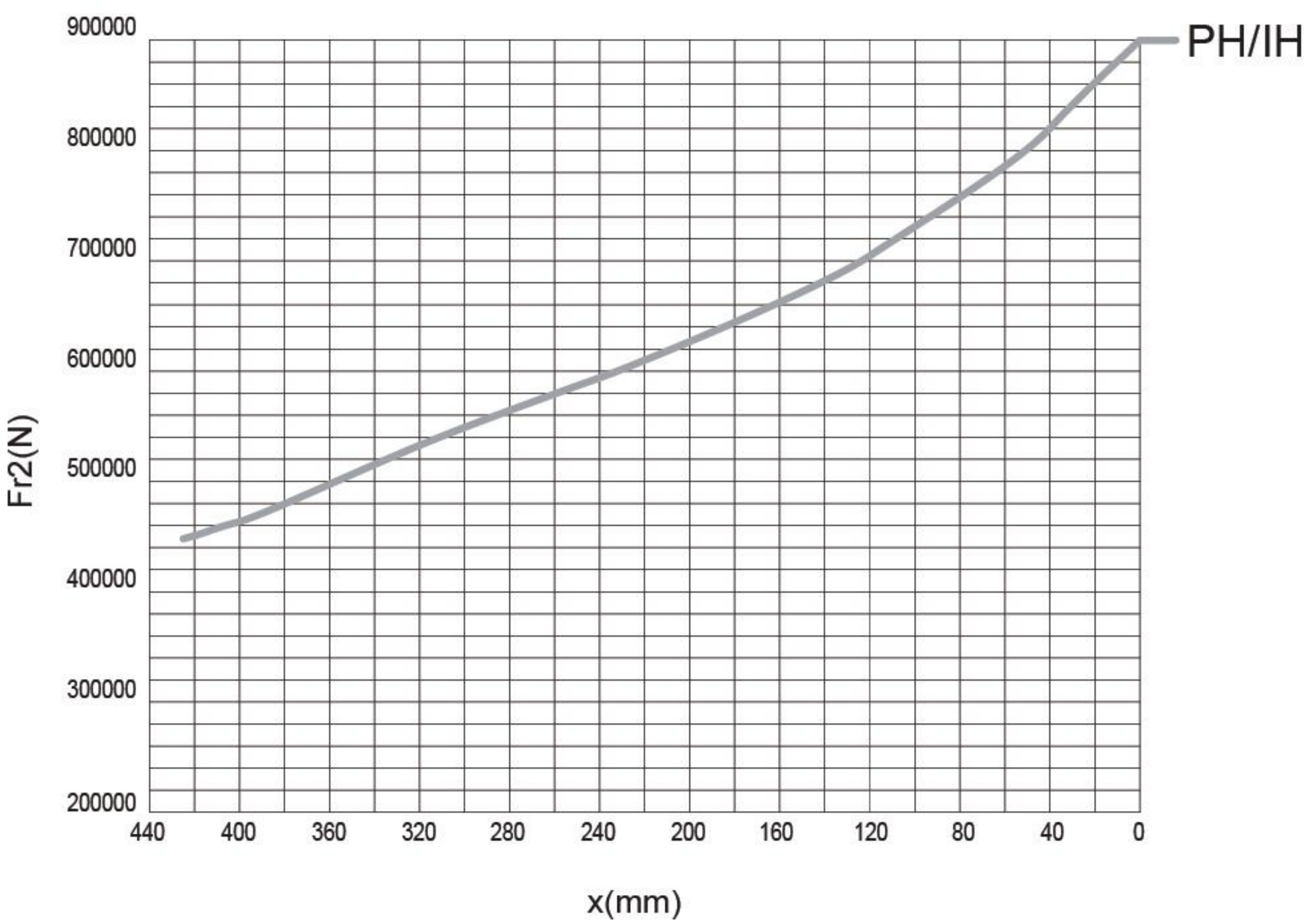
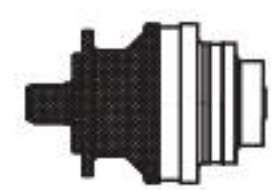
	A			
	SPH	SIH	H	SD
KR 44500	260	260	260	260

KR4500

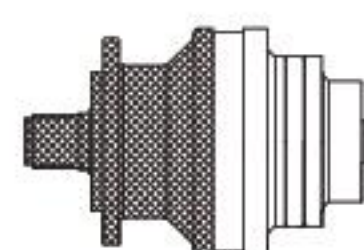
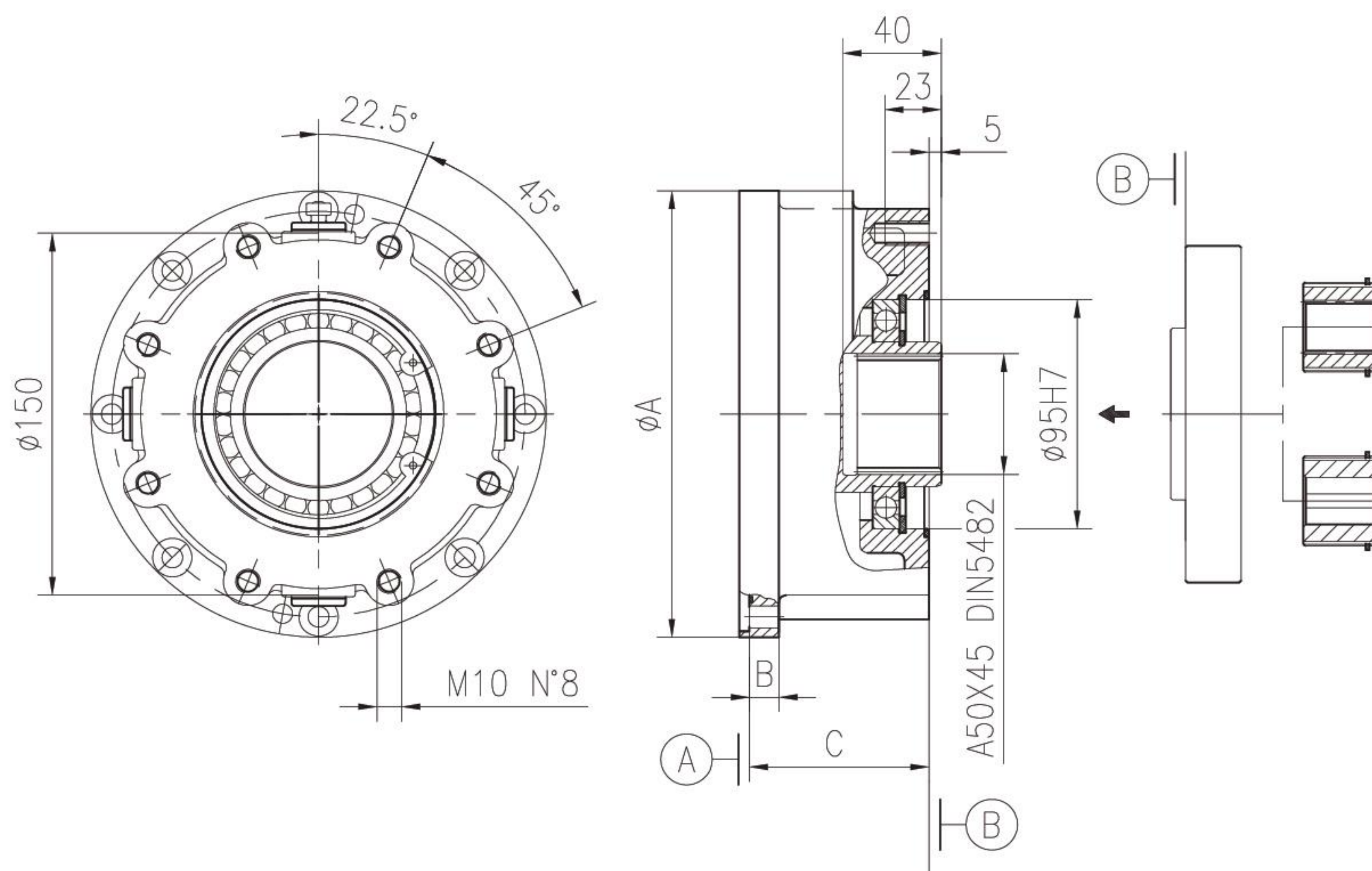
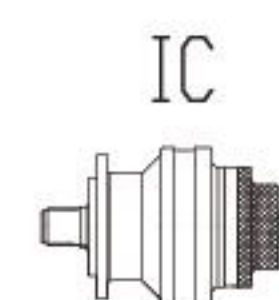


	A			
	SPH	SIH	H	SD
KR 54500	260	260	260	260

KL 4500

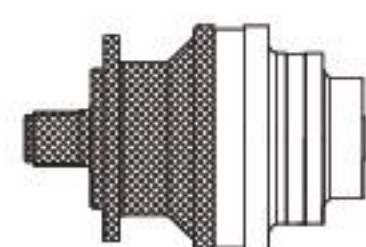
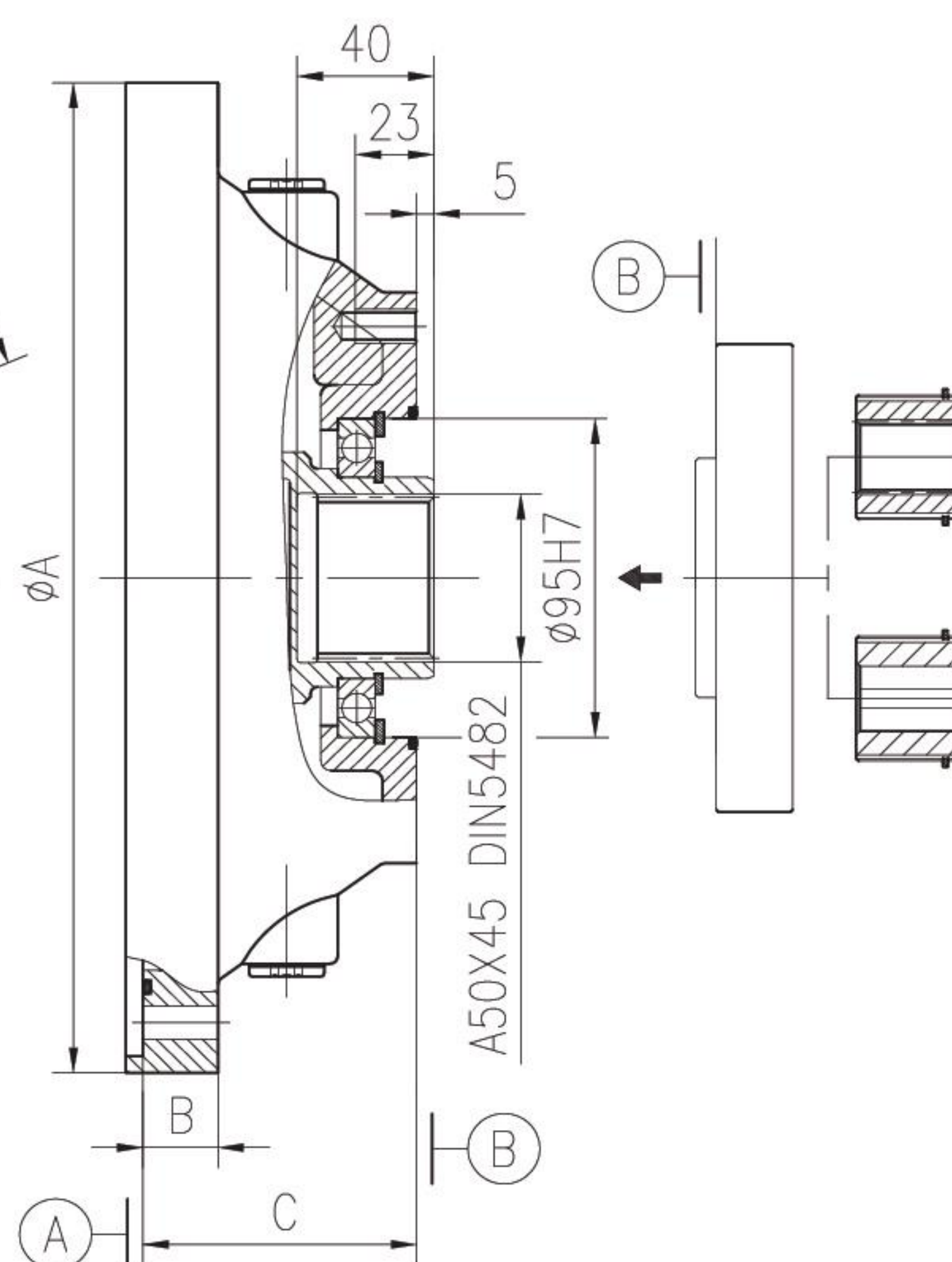
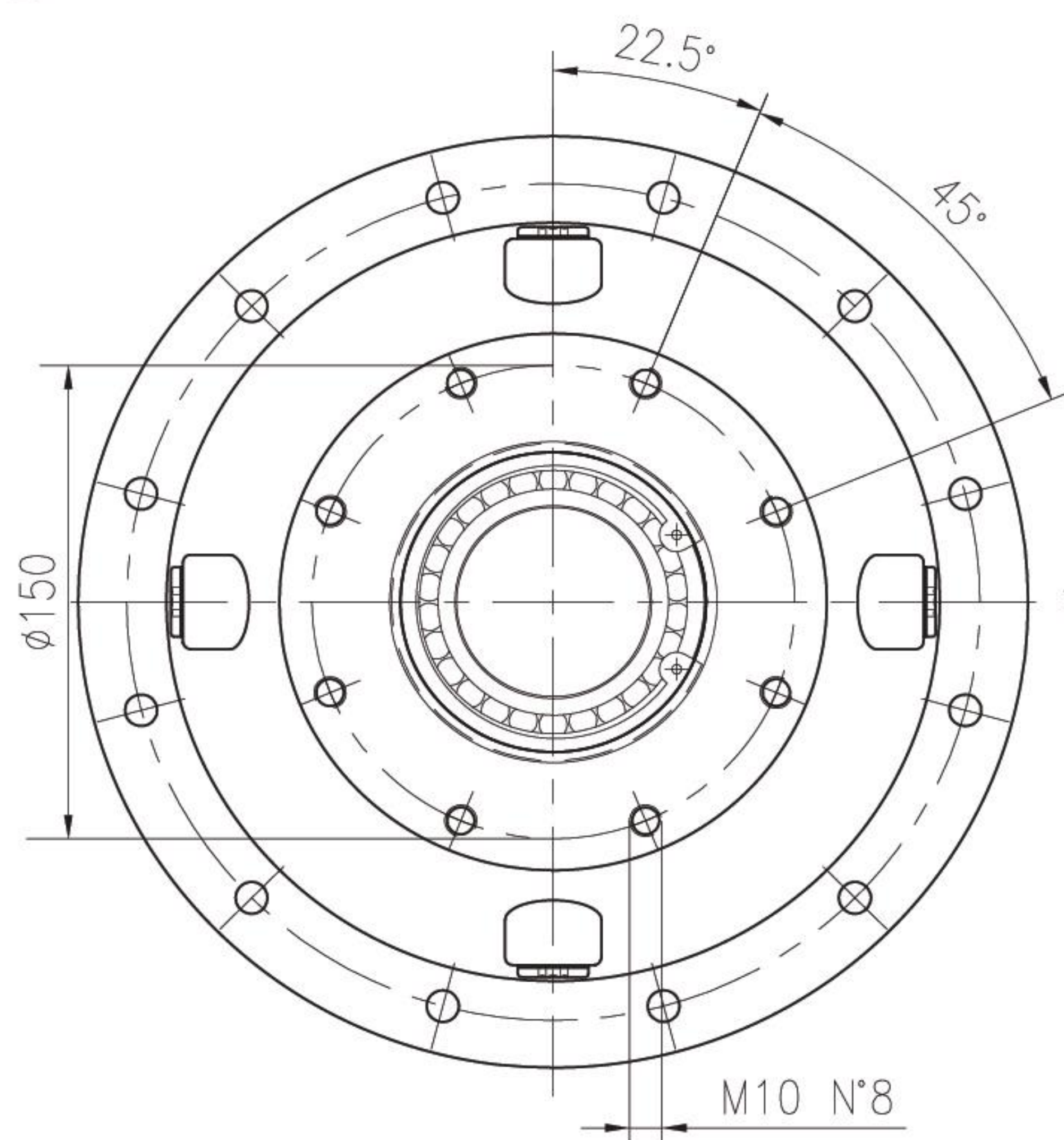


	n2·h						
	20000	40000	60000	80000	100000	200000	400000
Kf	1.7	1.3	1.15	1.06	1	0.8	0.63

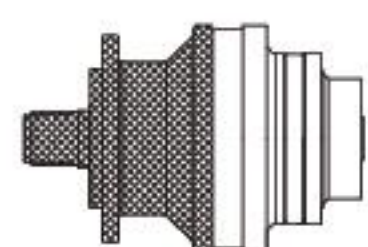
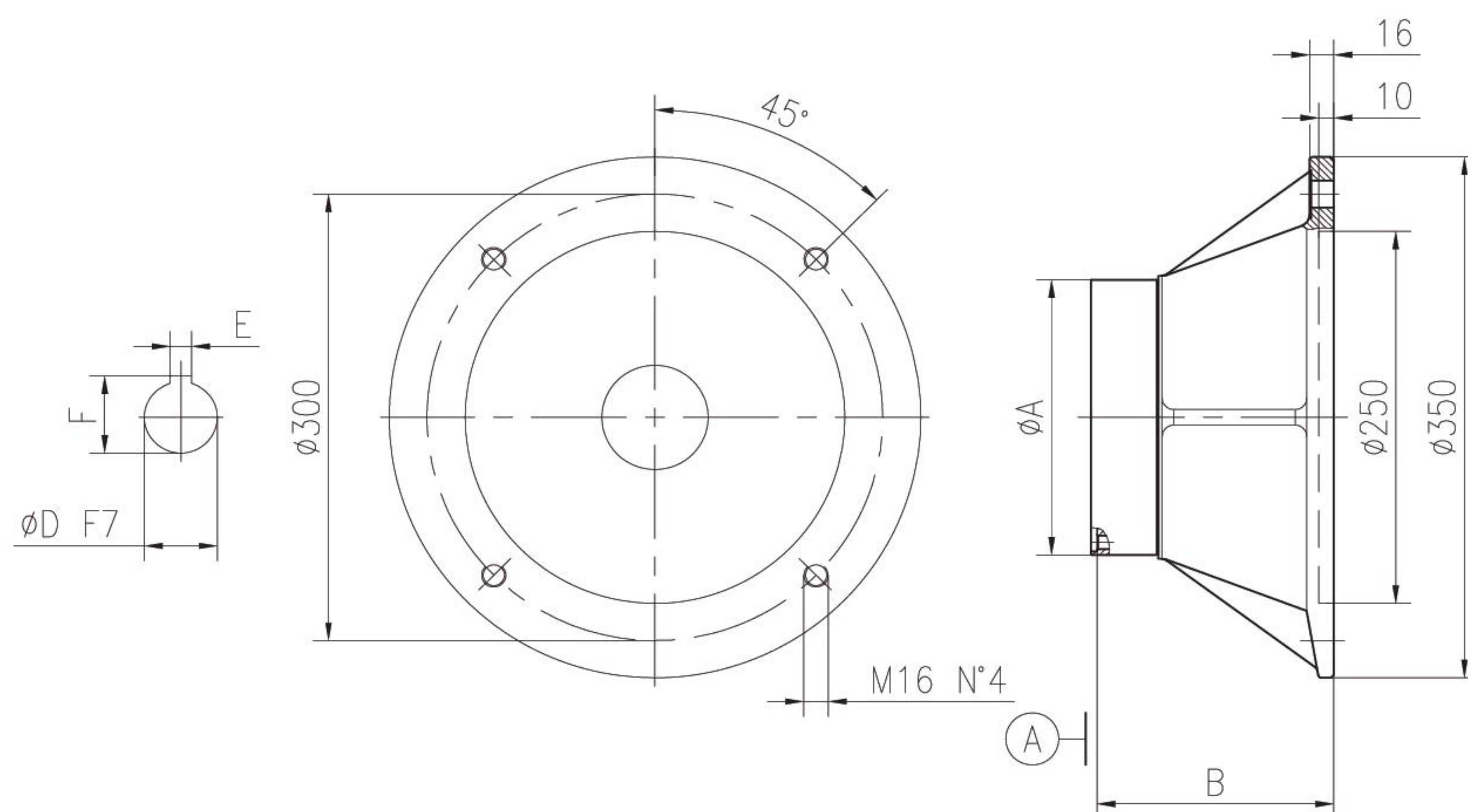
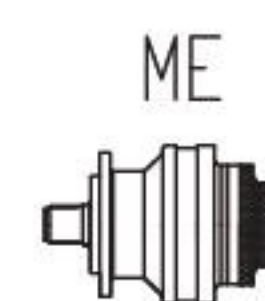


	$\varnothing A$	B	C	CODE
KL1015-2015-3015-4015	185	12	73	IC01
KL2025-3025-4025				
KL2050-3050-4050				
KL3070-4070				
KL3100-4100				
KL3120-4120				
KL3160-4160				
KL3180				
KL4260				
KL4330				
KL4400				
KL4500				

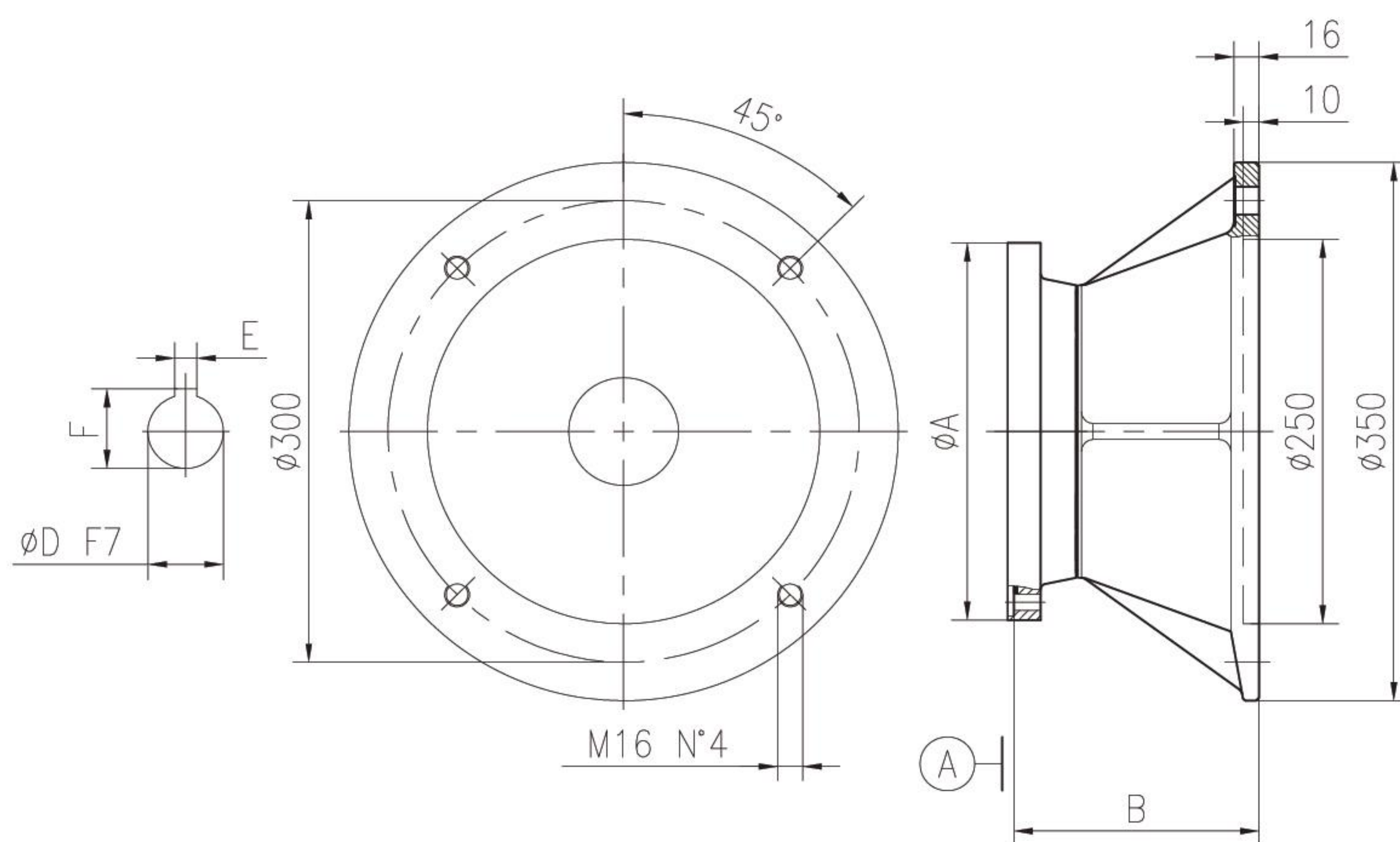
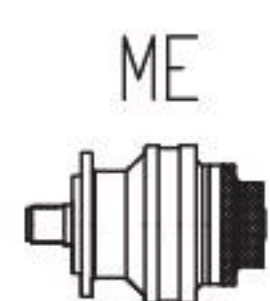
	$\varnothing A$	B	C	CODE
KL1025	245	17	73	IC02
KL1050				
KL2070				
KL2100				
KL2160				
KL3330				
KL3400				
KL3500				
KL4600				
KL4850				
KL41050				
KL41350				
KL41800				



	ØA	B	C	CODE
KL1070	295	22	80	IC03
KL1100				
KL2260				
KL2330				
KL3600				
KL3850				
KL31050				
KL31350				
KL31800				
KL43500				

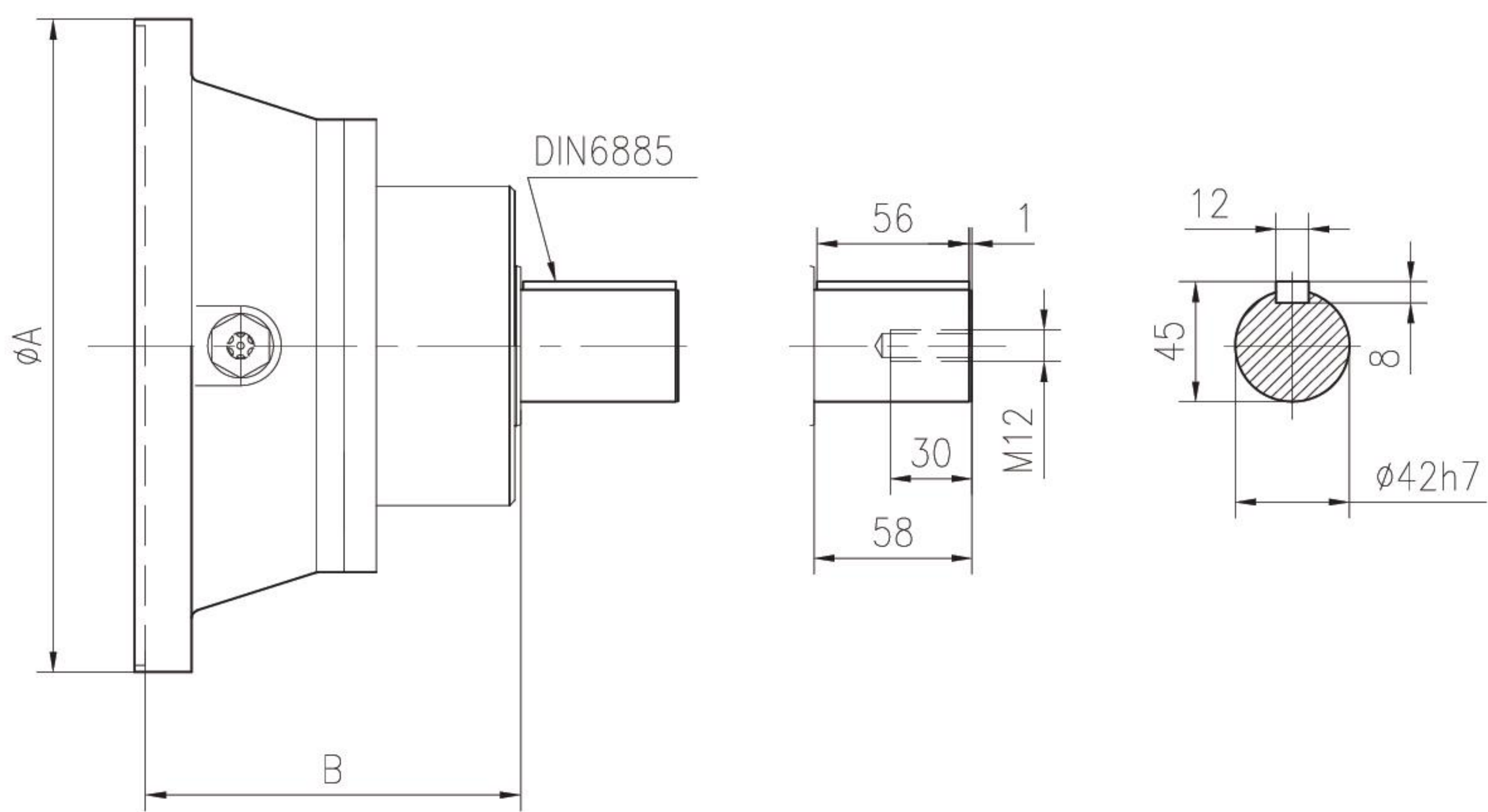
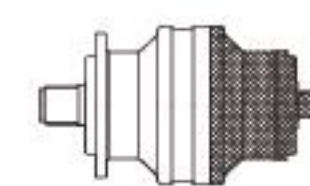


	TYPE	ϕA	B	ϕD	E	F	CODE
KL1015-2015-3015-4015	ME160	185	156	42	12	45.5	
KL2025-3025-4025							
KL2050-3050-4050							
KL3070-4070							
KL3100-4100							
KL3120-4120							
KL3160-4160							
KL3180							
KL4260							
KL4330							
KL4400	ME180	185	156	48	14	52	
KL4500							



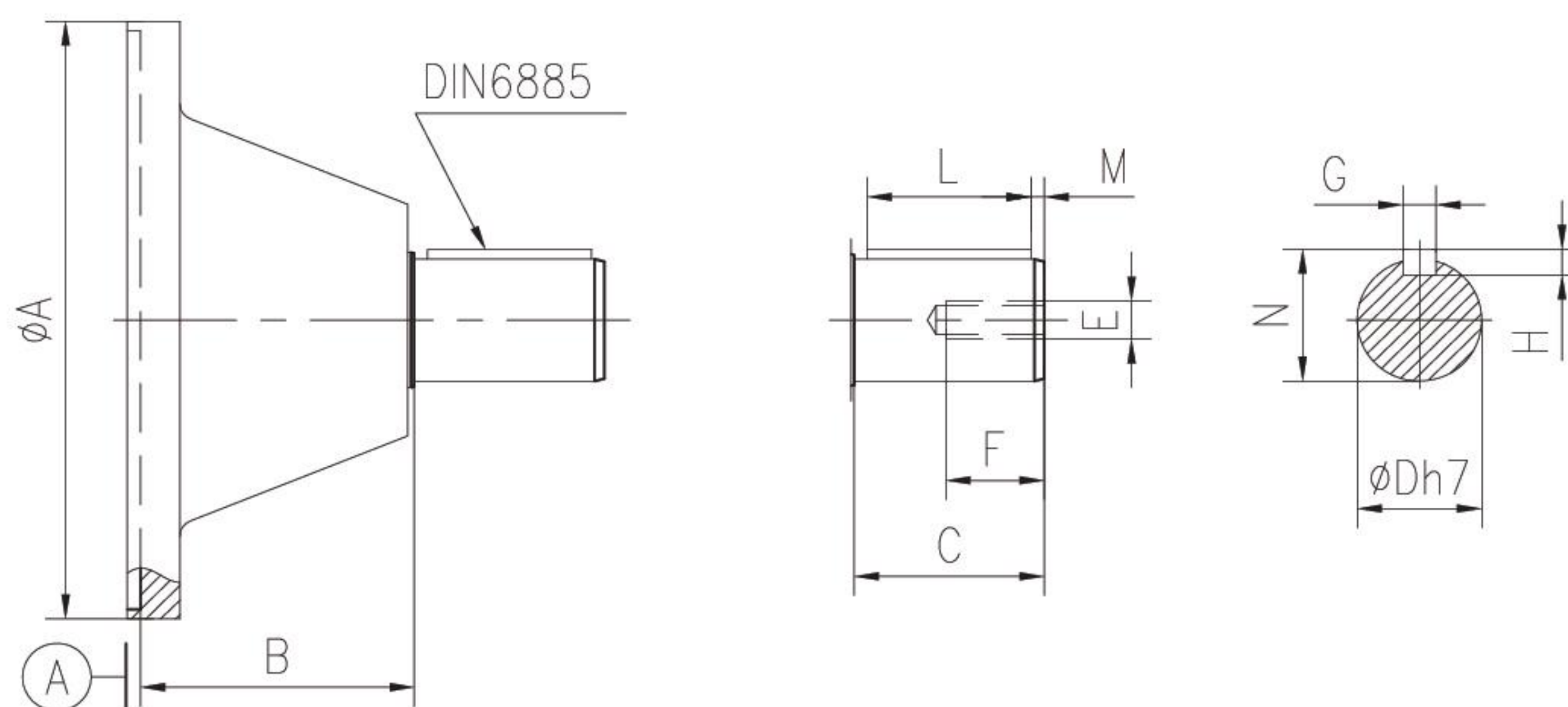
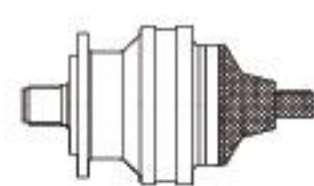
	TYPE	ØA	B	ØD	E	F	CODE
KL1025	ME160 ME180	245	156	42 48	12 14	45.5 52	
KL1050							
KL2070							
KL2100							
KL2120							
KL2160							
KL2180							
KL3330							
KL3400							
KL3500							
KL4600							
KL4850							
KL41050							
KL41350							
KL41800							

IS00



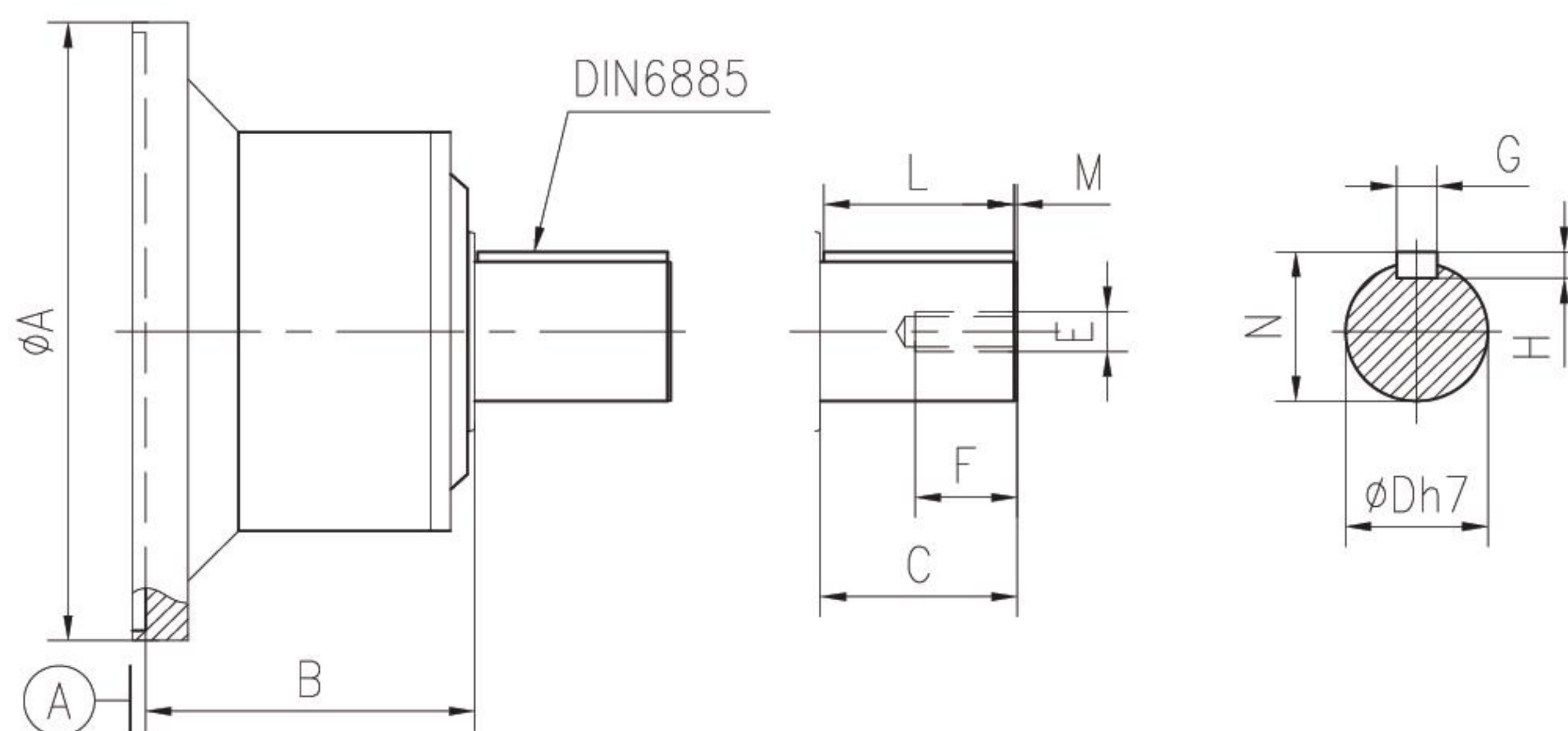
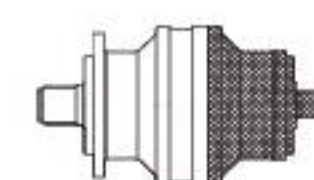
	TYPE	ϕA	B
KL1015-2015-3015-4015	IS00	185	138
KL2025-KL3025-KL4025-KL2050-KL3050-KL4050			
KL3070-KL4070-KL3100-KL4100-KL3160-KL4160			
KL3180-KL4180-KL4260-KL4330-KL4400-KL4500			
KL1025-KL2070-KL3260-KL4600-KL4850	IS00	245	138
KL1050-KL2100-KL2160	IS00	245	138
KL3330-KL3400-KL3500			
KL41050-KL41350-KL41800			
KL1070-KL2260-KL3600-KL3850	IS00	295	145
KL42250-KL42700			
KL1100-KL2330-KL31050	IS00	295	145
KL41350			

IS01



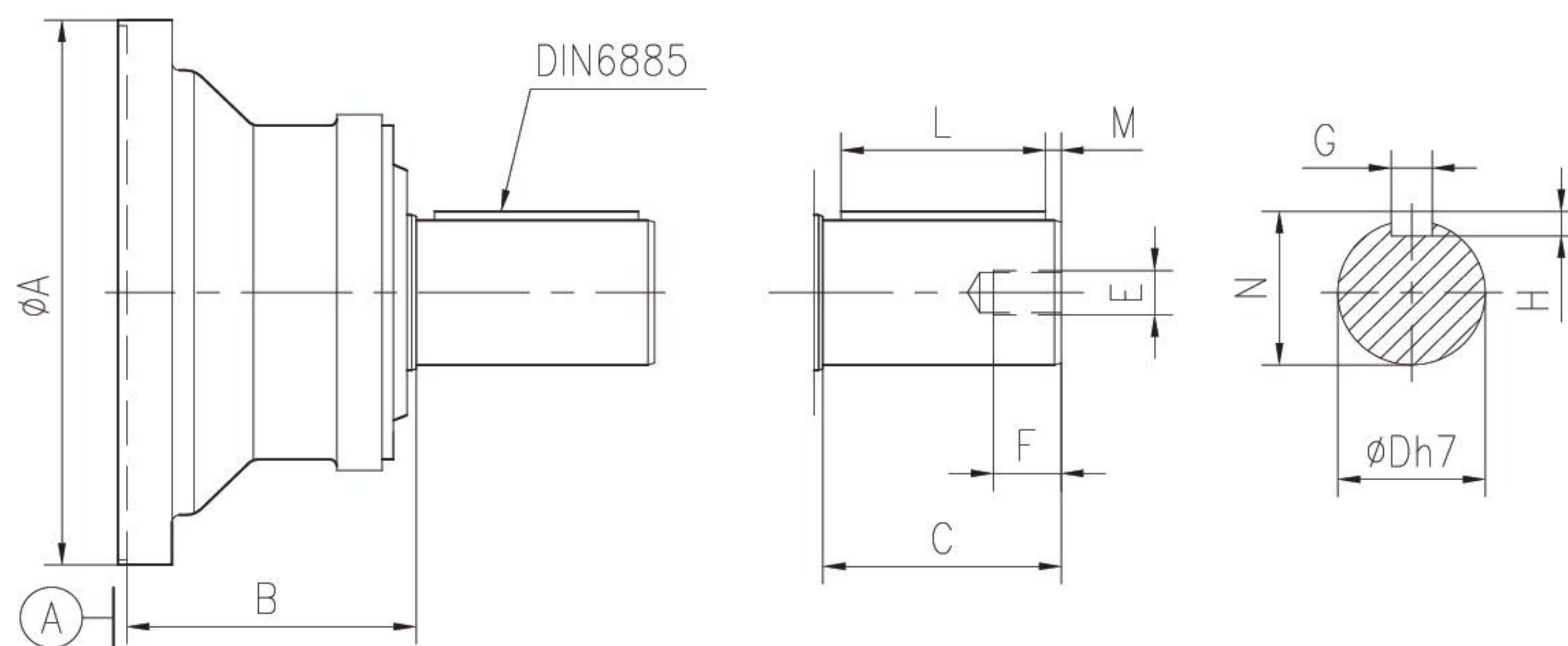
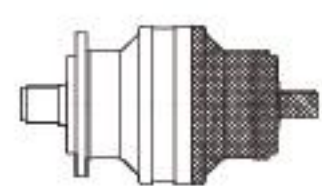
	TYPE	ØA	B	C	ØD	E	F	G	H	L	M	N
KL1015-2015-3015-4015	IS01	186	83.5	58	38	M12	30	10	8	50	4	41
KL2025-3025-4025												
KL2050-3050-4050												
KL3070-4070												
KL3100-4100												
KL3160-4160												
KL4260												
KL4330												
KL4400												
KL4500												

IS02-IS04



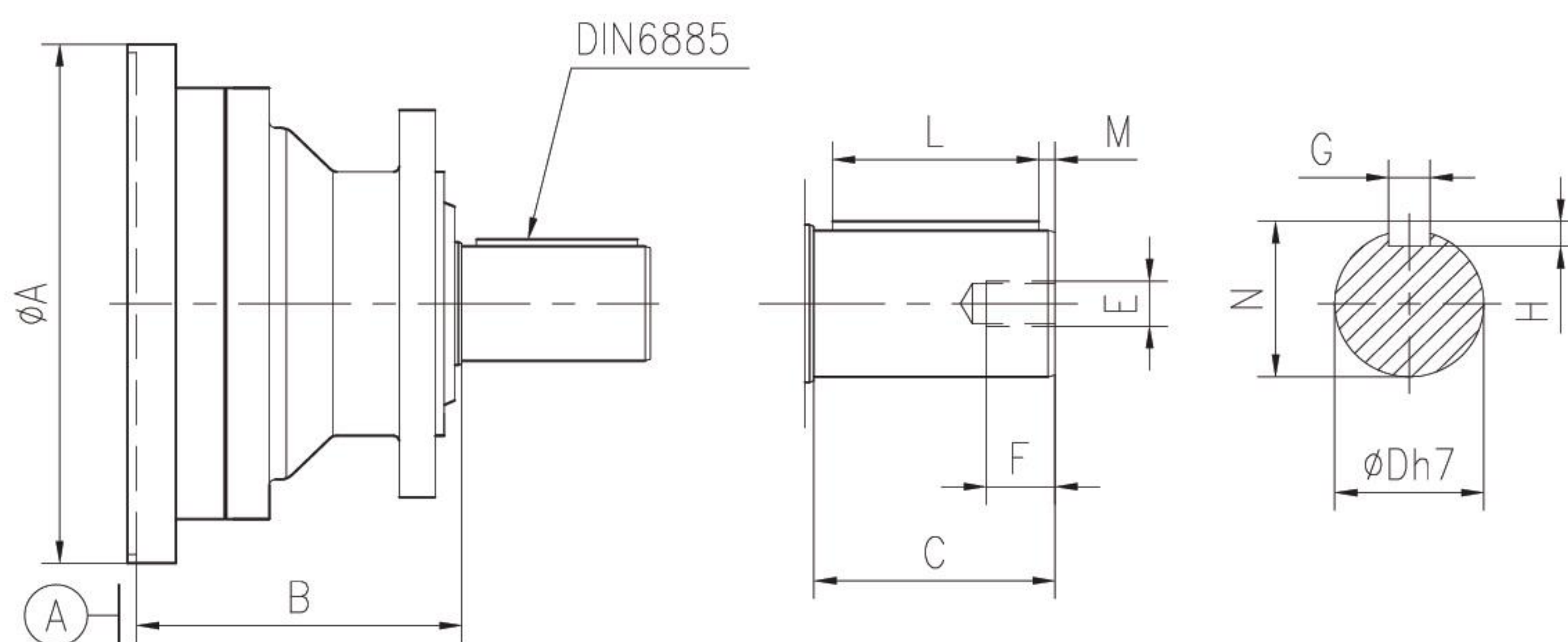
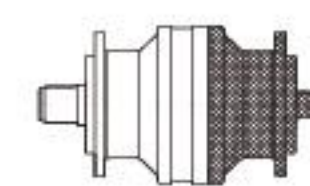
	TYPE	ØA	B	C	ØD	E	F	G	H	L	M	N
KL1015-2015-3015-4015	IS02	186	97	58	42	M12	30	12	8	56	1	45
KL2025-KL3025-KL4025-KL2050-KL3050-KL4050												
KL3070-KL4070-KL3100-KL4100-KL3160-KL4160												
KL3180-KL4180-KL4260-KL4330-KL4400-KL4500												
KL1025-KL2070-KL3260	IS03	245	97	58	42	M12	30	12	8	56	1	45
KL4600-KL4850												
KL1025-KL2070-KL3260-KL4600-KL4850	IS04	245	110	82	48	M12	30	14	9	70	6	51.5
KL1050-KL2100-KL2160												
KL3330-KL3400-KL3500												
KL41050-KL41350-KL41800												

IS025



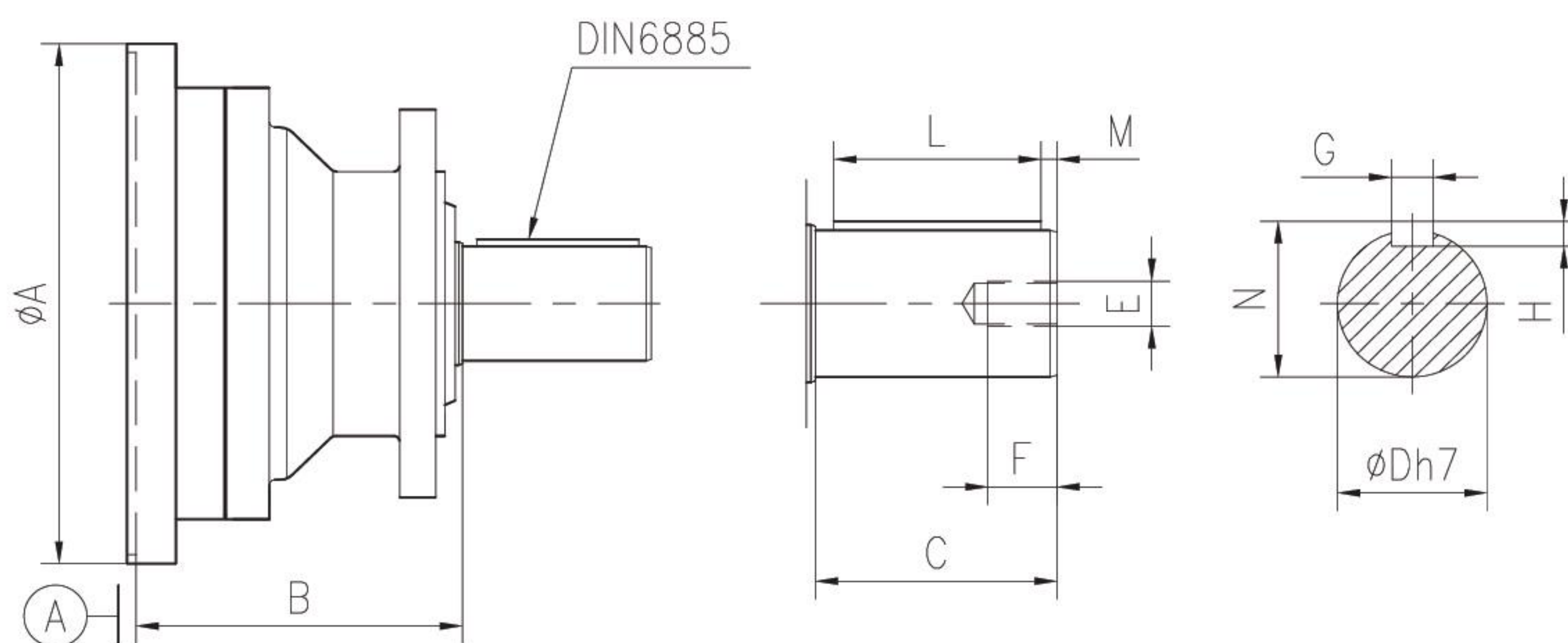
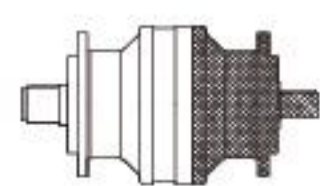
	TYPE	ØA	B	C	ØD	E	F	G	H	L	M	N
KL1050	IS025	245	127.5	105	65	M20	30	18	11	90	7	69
KL2100-2160												
KL3330-3400-3500												
KL41050-41350-41800												

IS050

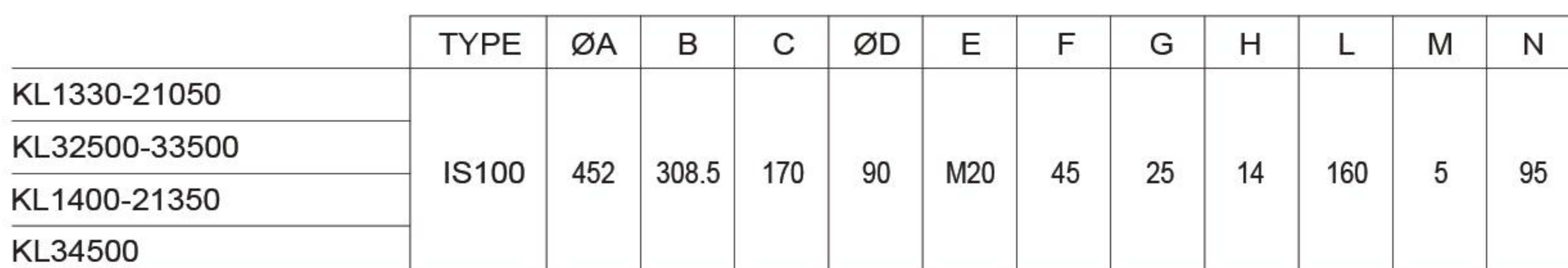


	TYPE	ØA	B	C	ØD	E	F	G	H	L	M	N
KL1070-2260-3600-3850	IS050	295	181.5	105	65	M20	30	18	11	90	7	69
KL42050												
KL1100-2330-31050												
KL42500-43500												
KL1160-2400-2500	IS050	350	206.5	105	65	M20	30	18	11	90	7	69
KL31350-31800												
KL44500												

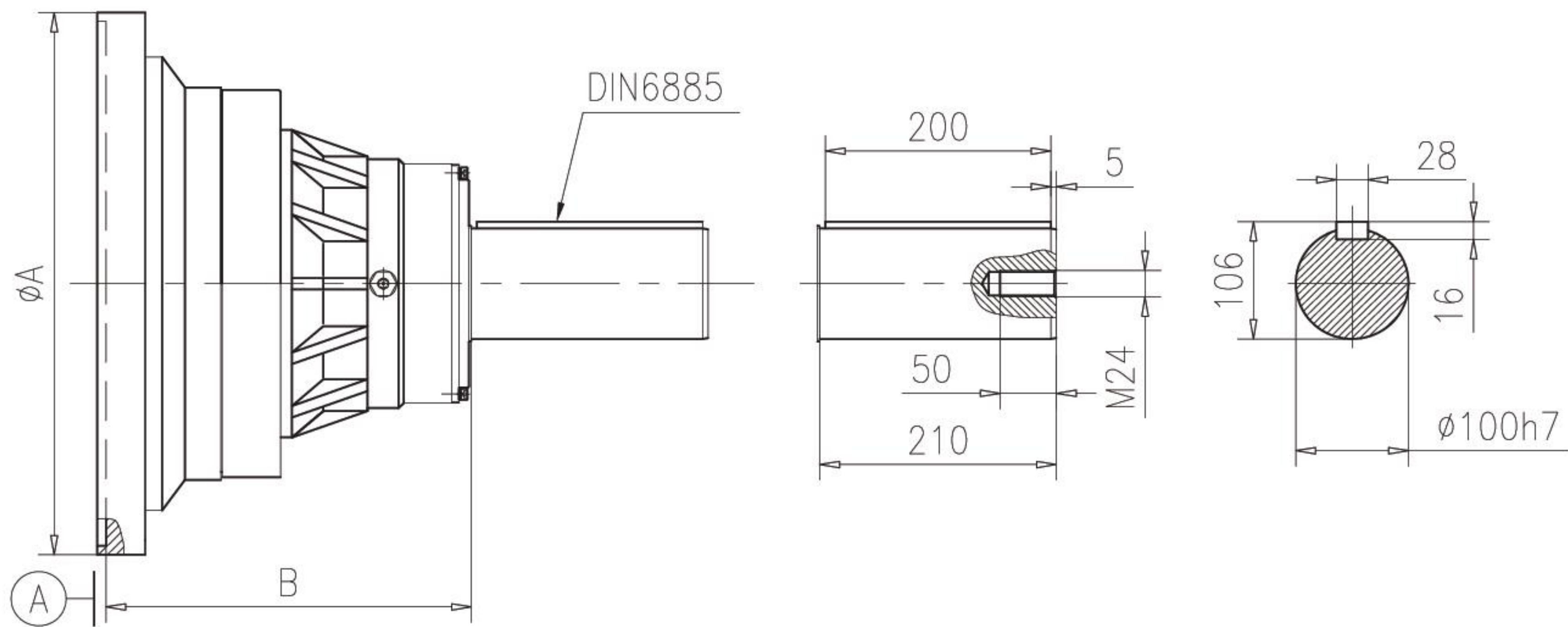
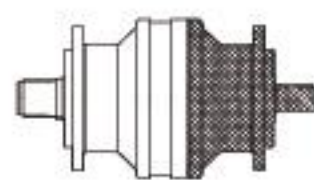
IS070



	TYPE	ØA	B	C	ØD	E	F	G	H	L	M	N
KL1260	IS070	410	266.5	130	80	M20	45	22	14	120	5	85
KL2600-2850												
KL32050												
KL1330-21050	IS070	452	271.5	130	80	M20	45	22	14	120	5	85
KL32500-33500												
KL1400-21350-34500												

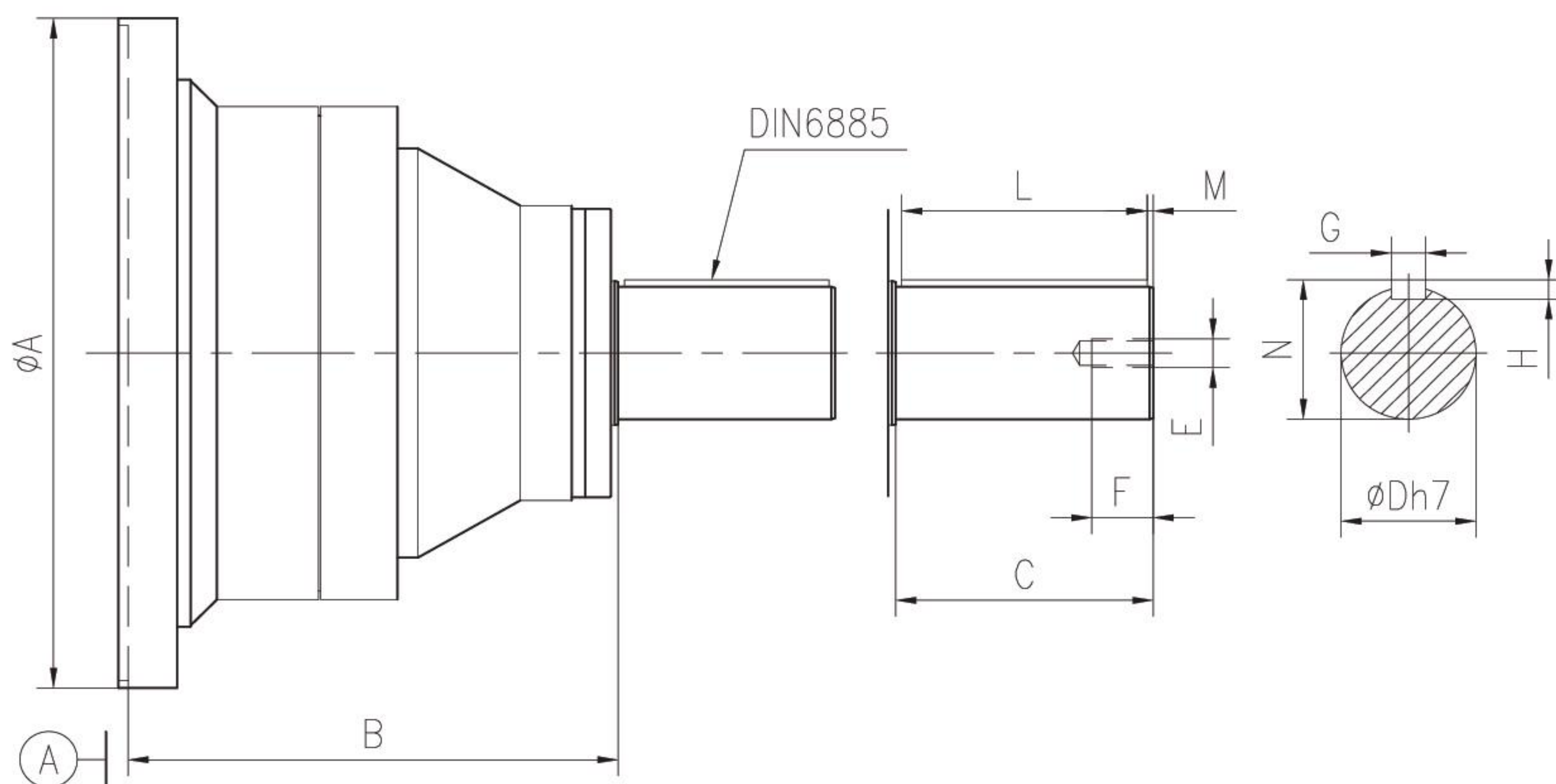
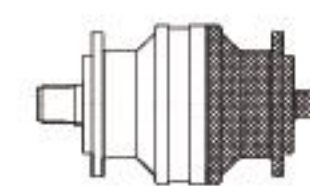


IS116



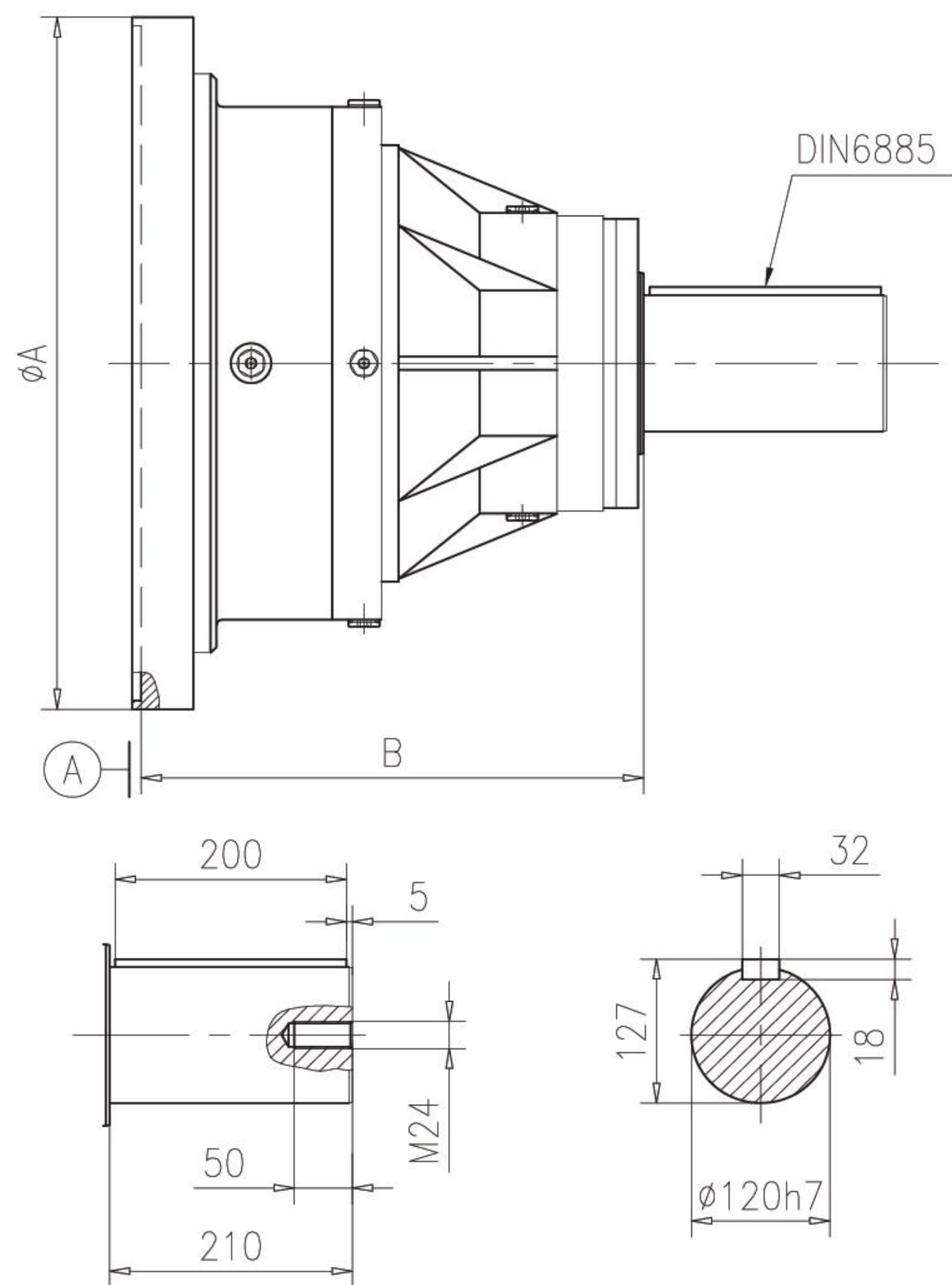
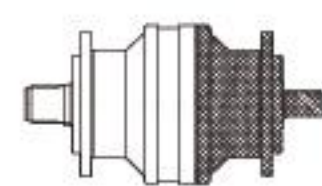
KL1500-KL21800	TYPE	ϕA	B
	IS116	490	324

IS126



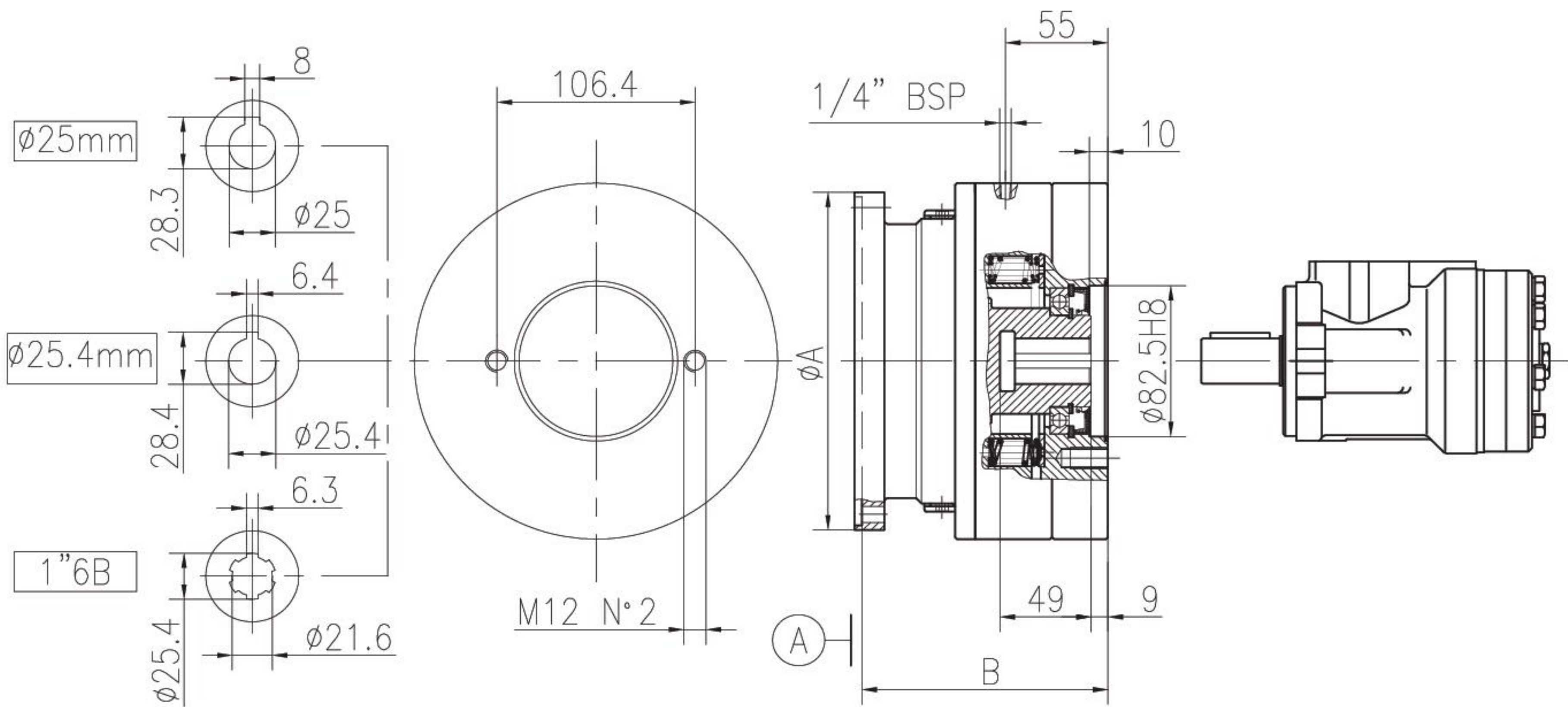
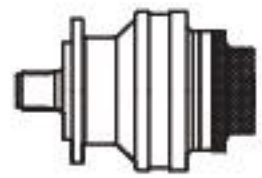
	TYPE	ϕA	B	C	ϕD	E	F	G	H	L	M	N
KL1600-22050	IS126	557	399.5	210	110	M24	50	28	16	200	5	116
KL1850-22500	IS126	490	360	210	110	M24	50	28	16	200	5	116

IS133



	TYPE	ϕA	B
KL11050-KL23500	IS133	610	434.5
KL11350-KL24500	IS133	610	434.5

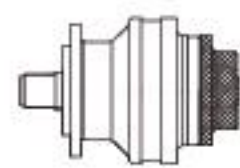
KPB1-KPB2



	ØA	B	CODE
KL1015-2015-3015-4015	185	132	KPB1
KL2025-3025-4025			
KL2050-3050-4050			
KL3070-4070			
KL3100-4100			
KL3160-4160			
KL4260			
KL4330			
KL4400			
KL4500			

	ØA	B	CODE
KL1025	245	132	KPB2
KL1050			
KL2070			
KL2100			
KL2160			
KL3330			
KL3400			
KL3500			
KL4600			
KL4850			
KL41050			
KL41350			
KL41800			

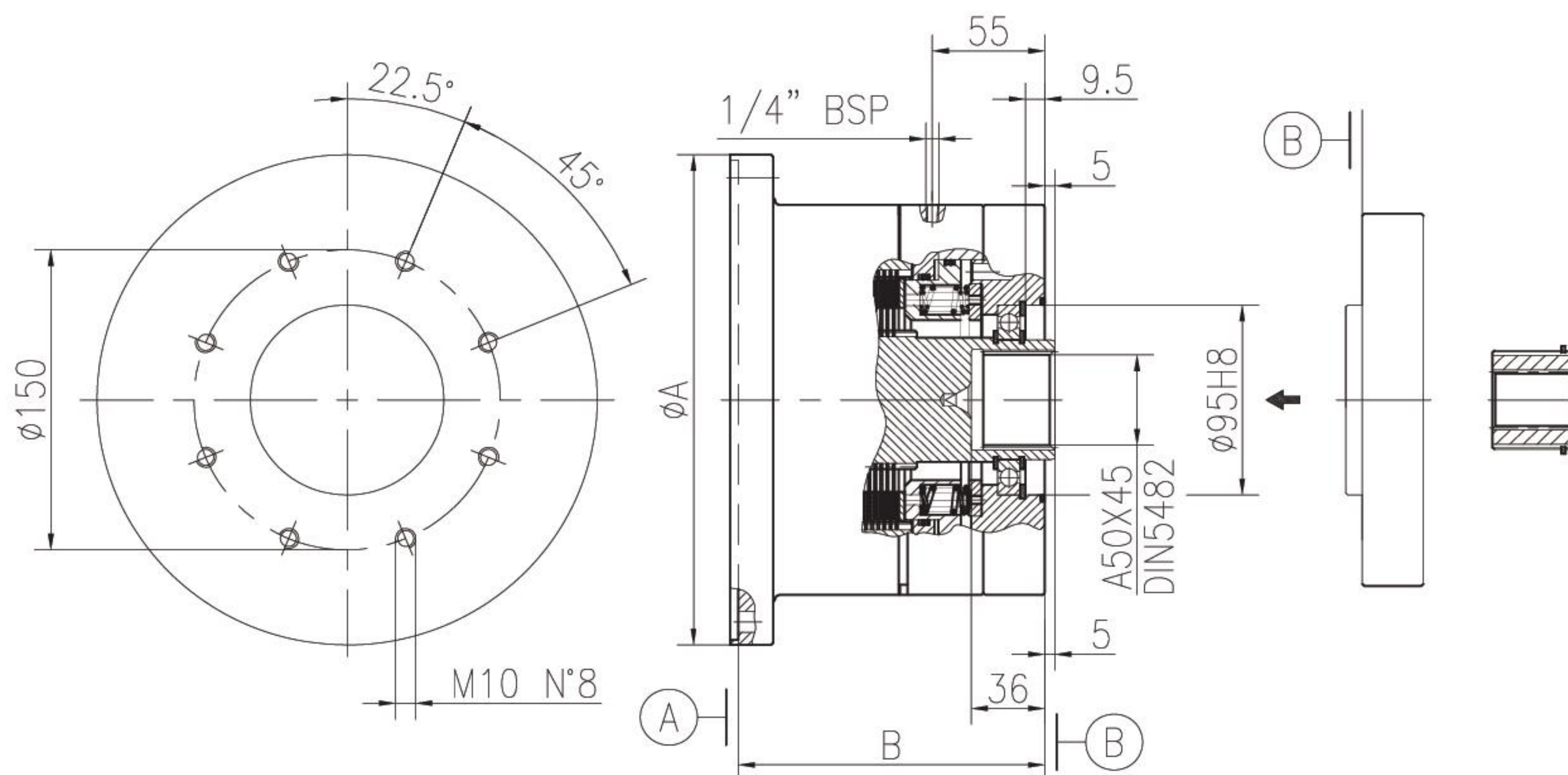
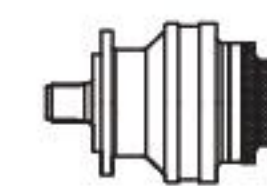
KPB1-KPB2



	KPB1/15	KPB1/25	KPB1/35	KPB1/45	KPB1/50	KPB1/60	
Tb (Nm)	160	250	340	430	520	610	± 5%
pb (bar)	22-25						
p max (bar)	300						
n1 max (rpm)	2500						

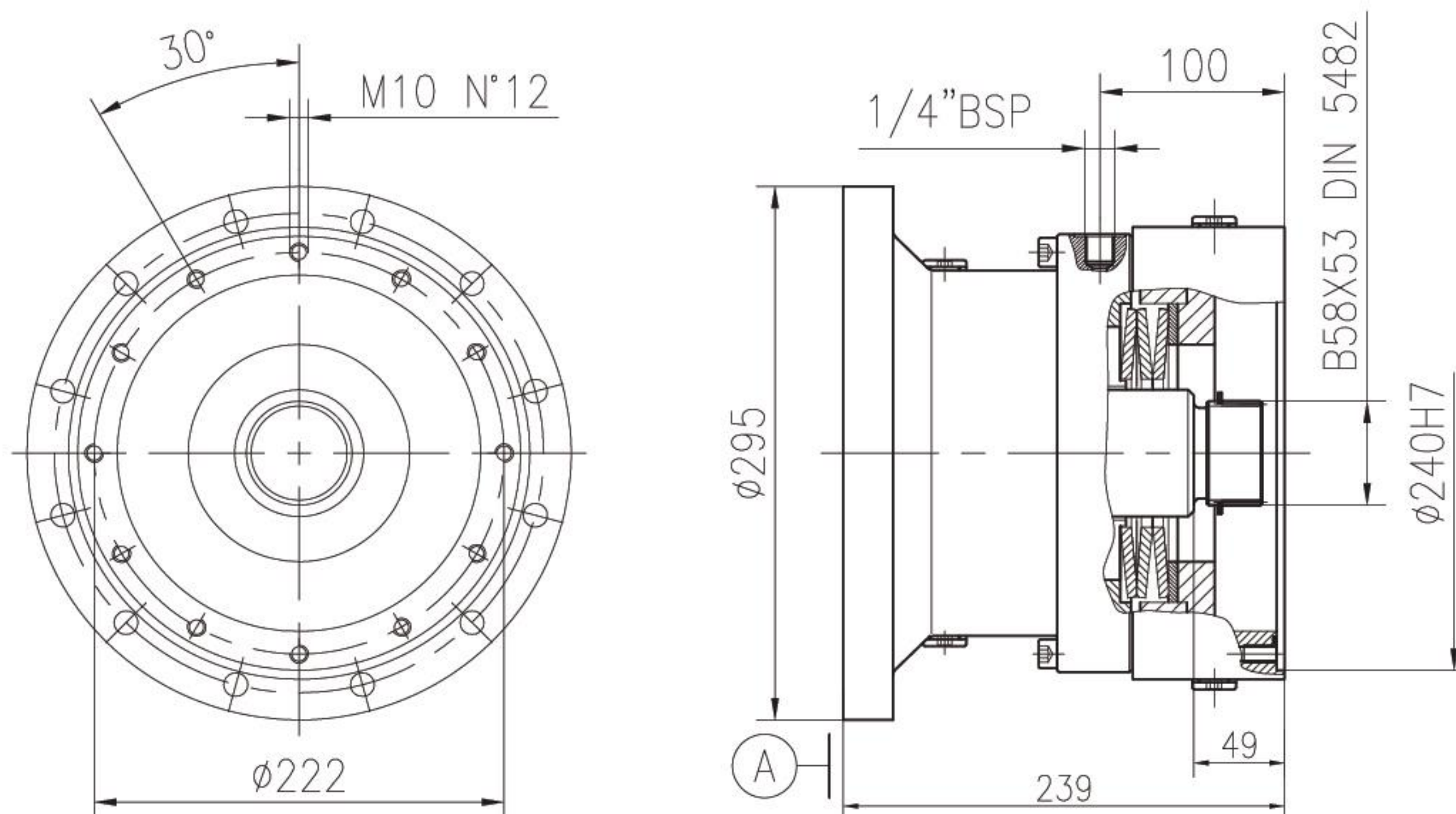
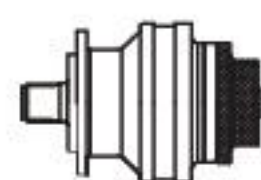
	KPB2/15	KPB2/25	KPB2/35	KPB2/45	KPB2/50	KPB2/60	
Tb (Nm)	160	250	340	430	520	610	± 5%
pb (bar)	22-25						
p max (bar)	300						
n1 max (rpm)	2500						

KPB5-KPB6

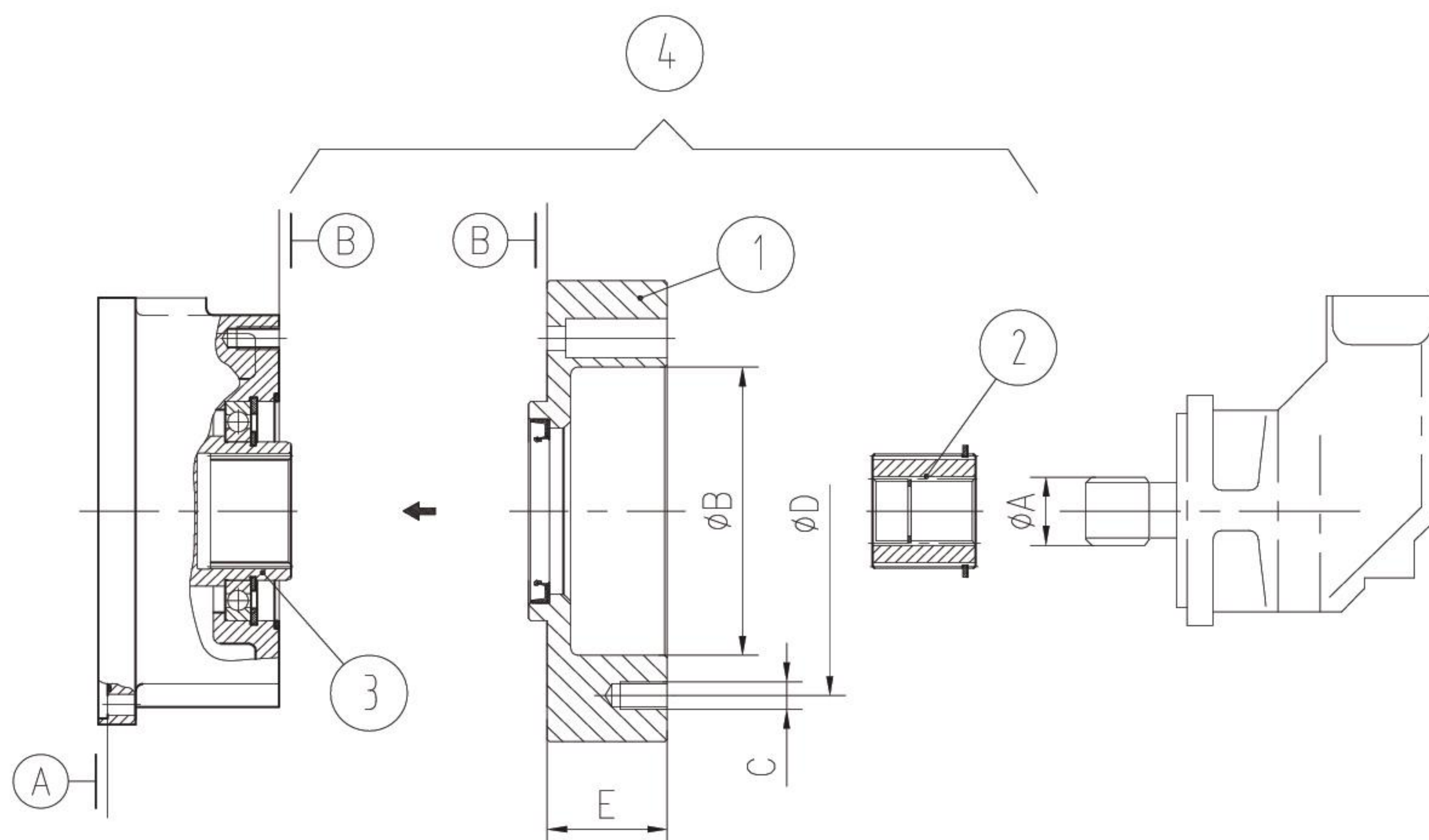


	ØA	B		KPB5/15	KPB5/25	KPB5/35	KPB5/45	KPB5/50	KPB5/60		
KL1025	245	150	Tb (Nm)	160	250	340	430	520	610	±5%	
KL1050											
KL2070			pb (bar)	22-25							
KL2100											
KL2160			p max (bar)	300							±5%
KL3330											
KL3400			n1 max (rpm)	2500							
KL3500											
KL4600											
KL4850						KPB5/70	KPB5/80	KPB5/90	KPB5/100	KPB5/110	KPB5/120
KL41050			Tb (Nm)	700	785	875	960	1050	1140	±5%	
KL41350											
KL41800			pb (bar)	22-25							
			p max (bar)	300							
			n1 max (rpm)	2500							

KPB8

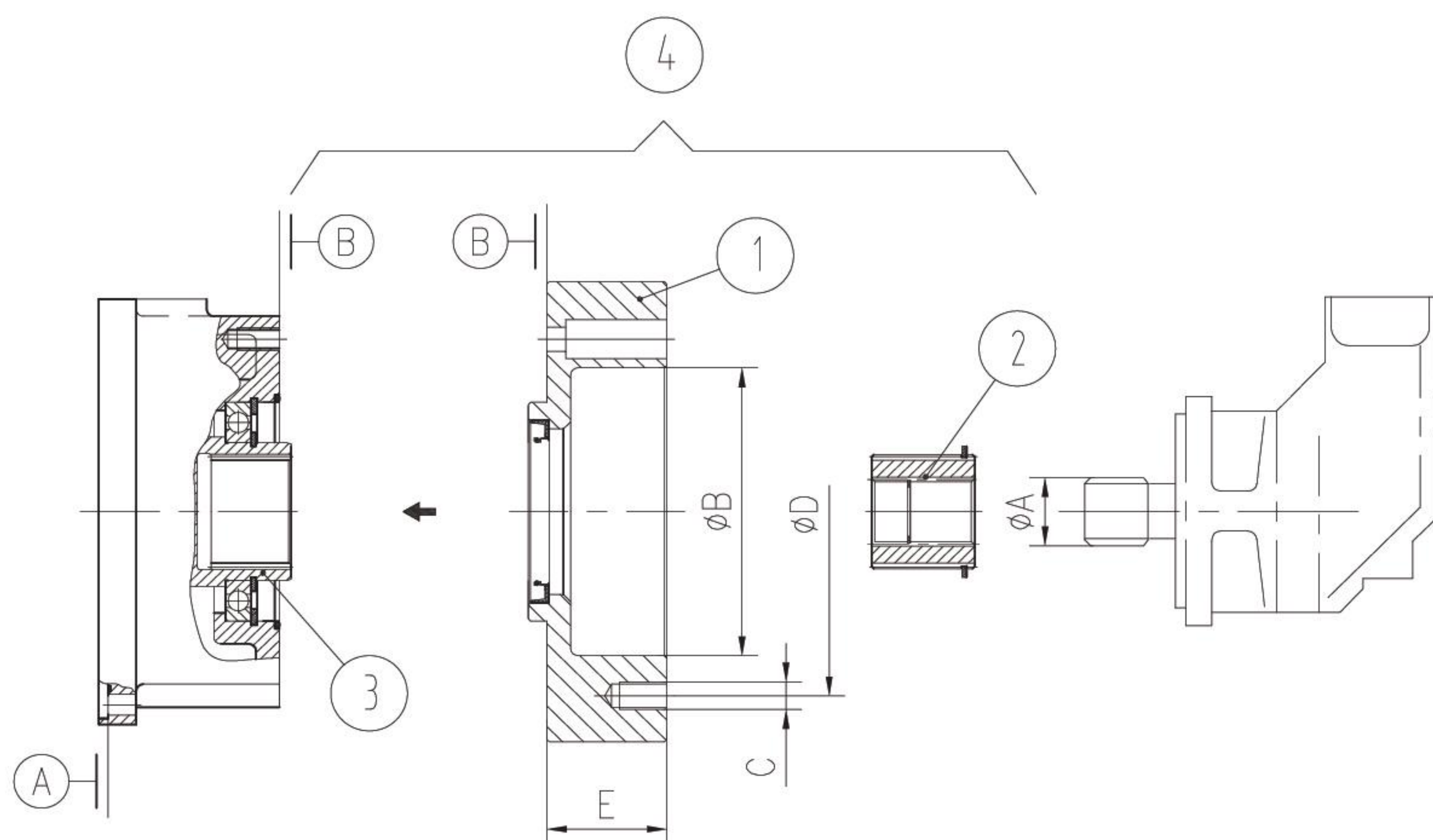


KL1070		KPB8/125	KPB8/150	KPB8/175	KPB8/200	KPB8/225	KPB8/250	
KL1100	Tb (Nm)	1250	1530	1740	1960	2250	2540	±5%
KL2260								
KL2330	pb (bar)	22-25						
KL3600								
KL3850	p max (bar)	300						
KL31050								
KL31350	n ₁ max (rpm)	2000						
KL31800								
KL43500								



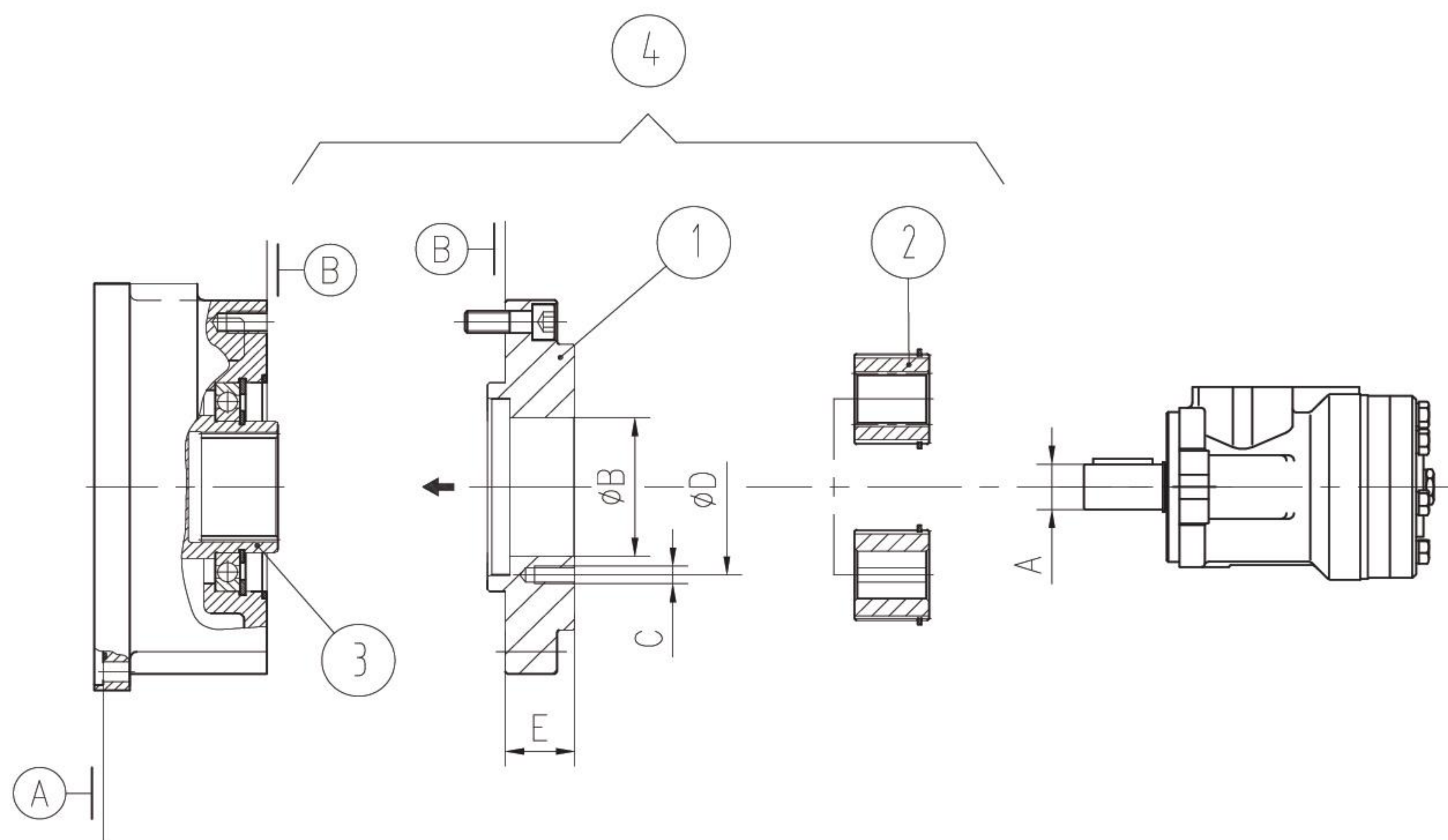
	A	ØB(H8)	C	ØD	E	1	2	3
015-51D060	W30x2x30x14	Ø125	M12	Ø160	51	015-51D060 (W30x2x30x14).1	B50x45 N30x2x30x14	A40x36-A50x45
015-51D060	W35x2x30x16	Ø125	M12	Ø160	51	015-51D060 (W30x2x30x14).1	B50x45 N35x2x30x16	A40x36-A50x45
015-51D080	W35x2x30x16	Ø140	M12	Ø180	51	015-51D080 (W35x2x30x16).1	B50x45 N35x2x30x16	A40x36-A50x45
015-51D080	W40x2x30x18	Ø140	M12	Ø180	51	015-51D080 (W35x2x30x16).1	B50x45 N40x2x30x18	A40x36-A50x45
015-51D080	W40x2x30x18	Ø160	M16	Ø200	59	015-51D110 (W40x2x30x18).1	B50x45 N40x2x30x18	A40x36-A50x45
015-51D110	W45x2x30x21	Ø160	M16	Ø200	59	015-51D110 (W40x2x30x18).1		A40x36-N45x2x30x21
015-51D160	W45x2x30x21	Ø180	M16	Ø224	66	015-51D160 (W45x2x30x21).1		A40x36-N45x2x30x21
015-51D160	W50x2x30x24	Ø180	M16	Ø224	66	015-51D160 (W45x2x30x21).1		A40x36-N50x2x30x24

	A	ØB(H8)	C	ØD	E	1	2	3
070-51D060	W30x2x30x14	Ø125	M12	Ø160	51	015-51D060 (W30x2x30x14).1	B50x45 N30x2x30x14	A58x53-A50x45
070-51D060	W35x2x30x16	Ø125	M12	Ø160	51	015-51D060 (W30x2x30x14).1	B50x45 N35x2x30x16	A58x53-A50x45
070-51D080	W35x2x30x16	Ø140	M12	Ø180	51	015-51D080 (W35x2x30x16).1	B50x45 N35x2x30x16	A58x53-A50x45
070-51D080	W40x2x30x18	Ø140	M12	Ø180	51	015-51D080 (W35x2x30x16).1	B50x45 N40x2x30x18	A58x53-A50x45
070-51D080	W40x2x30x18	Ø160	M16	Ø200	59	015-51D110 (W40x2x30x18).1	B50x45 N40x2x30x18	A58x53-A50x45
070-51D110	W45x2x30x21	Ø160	M16	Ø200	59	015-51D110 (W40x2x30x18).1		A58x53-N45x2x30x21
070-51D160	W45x2x30x21	Ø180	M16	Ø224	66	015-51D160 (W45x2x30x21).1		A58x53-N45x2x30x21
070-51D160	W50x2x30x24	Ø180	M16	Ø224	66	015-51D160 (W45x2x30x21).1		A58x53-N50x2x30x24

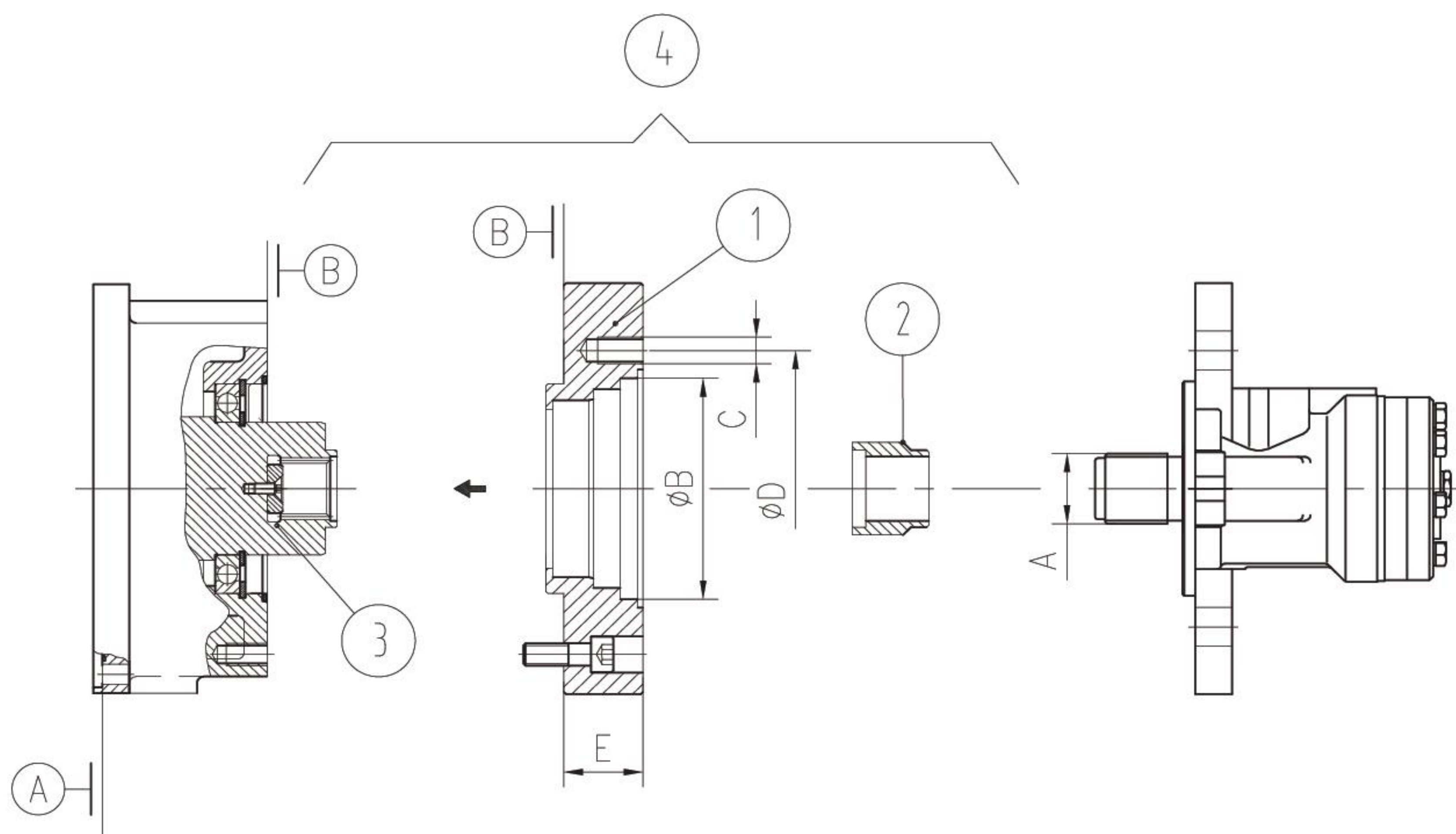


	A	ØB(H8)	C	ØD	E	1	2	3
015-51V060	Dp12-24Z14	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp12-24Z14	A40x36-A50x45
015-51V060	Dp16-32Z21	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp16-32Z21	A40x36-A50x45
015-51V080	Dp16-32Z23	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp16-32Z23	A40x36-A50x45
015-51V110	Dp8-16Z13	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A40x36-Dp8-16Z13
015-51V110	Dp16-32Z27	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A40x36-Dp16-32Z27
015-51V160	Dp8-16Z15	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A40x36-Dp8-16Z15
015-51V250	Dp8-16Z15	Ø165.075	M20	Ø317.491	48	015-51V250 (Dp8-16Z15).1		A40x36-Dp8-16Z15
015-51V250	Dp16-32Z27	Ø165.075	M20	Ø317.491	48	015-51V250 (Dp8-16Z15).1		A40x36-Dp16-32Z27

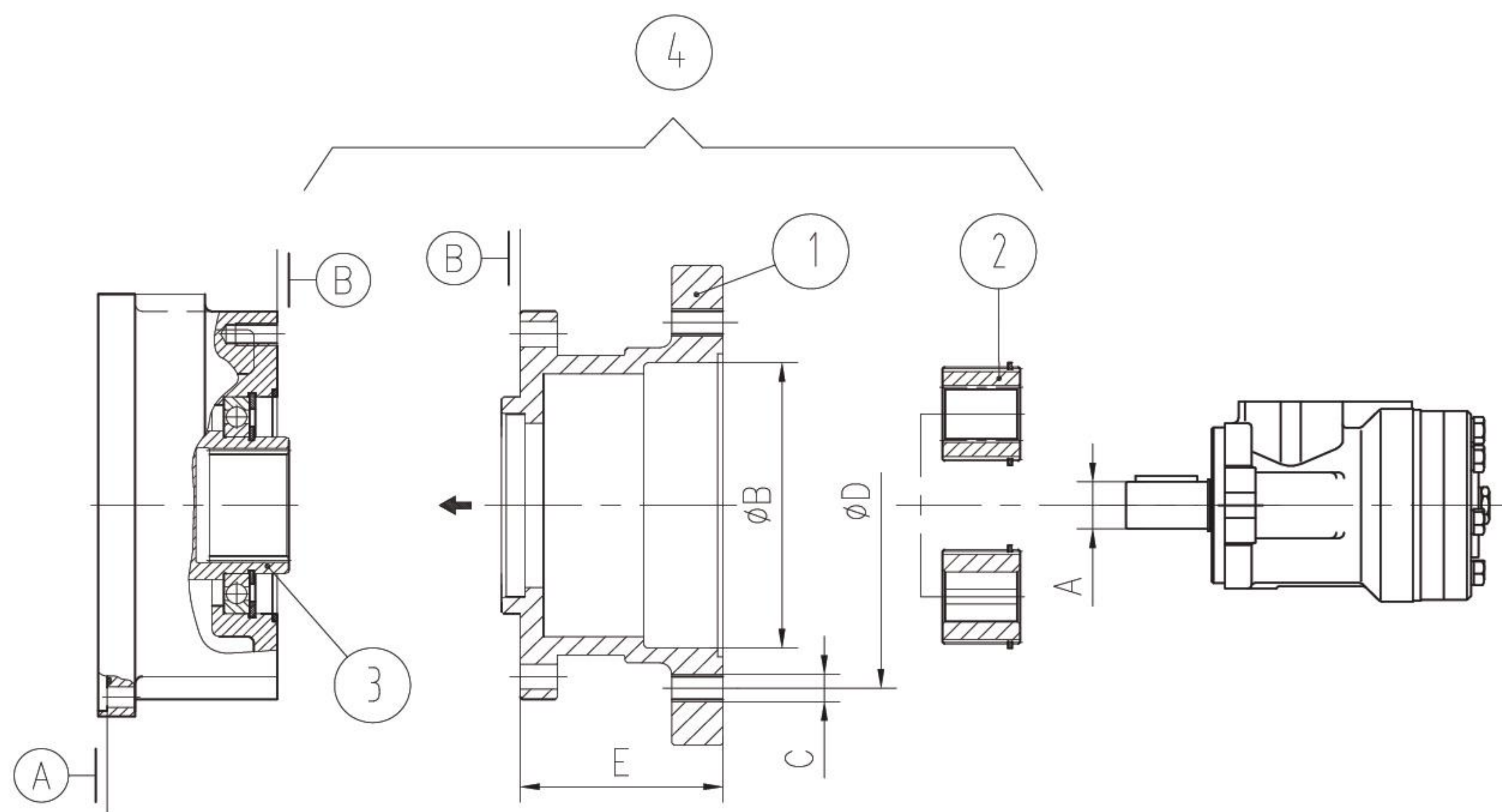
	A	ØB(H8)	C	ØD	E	1	2	3
070-51V060	Dp12-24Z14	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp12-24Z14	A58x53-A50x45
070-51V060	Dp16-32Z21	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp16-32Z21	A58x53-A50x45
070-51V080	Dp16-32Z23	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1	B50x45 Dp16-32Z23	A58x53-A50x45
070-51V110	Dp8-16Z13	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A58x53-Dp8-16Z13
070-51V110	Dp16-32Z27	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A58x53-Dp16-32Z27
070-51V160	Dp8-16Z15	Ø152.375	M20	Ø228.537	48	015-51V110 (Dp8-16Z13).1		A58x53-Dp8-16Z15
070-51V250	Dp8-16Z15	Ø165.075	M20	Ø317.491	48	015-51V250 (Dp8-16Z15).1		A58x53-Dp8-16Z15
070-51V250	Dp16-32Z27	Ø165.075	M20	Ø317.491	48	015-51V250 (Dp8-16Z15).1		A58x53-Dp16-32Z27
015-90M042	Dp16-32Z13	Ø101.6	M14	Ø146	28.5	015-90M042 (Dp16-32Z13).1	B50x45 Dp16-32Z13	A40x36-A50x45
015-90M042	Dp16-32Z15	Ø101.6	M14	Ø146	28.5	015-90M042 (Dp16-32Z13).1	B50x45 Dp16-32Z15	A40x36-A50x45
015-90M100	Dp8-16Z13	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1		A40x36-Dp8-16Z13
070-90M042	Dp16-32Z13	Ø101.6	M14	Ø146	28.5	015-90M042 (Dp16-32Z13).1	B50x45 Dp16-32Z13	A58x53-A50x45
070-90M042	Dp16-32Z15	Ø101.6	M14	Ø146	28.5	015-90M042 (Dp16-32Z13).1	B50x45 Dp16-32Z15	A58x53-A50x45
070-90M100	Dp8-16Z13	Ø127	M12 M14	Ø162	28.5	015-51V060 (Dp12-24Z14).1		A58x53-Dp8-16Z13
015-A6VM250	W50x2x30x24	Ø200	M20	Ø250	79	015-A6VM250 (W50x2x30x24).1		A40x36-N50x2x30x24
070-A6VM250	W50x2x30x24	Ø200	M20	Ø250	79	015-A6VM250 (W50x2x30x24).1		A58x53-N50x2x30x24



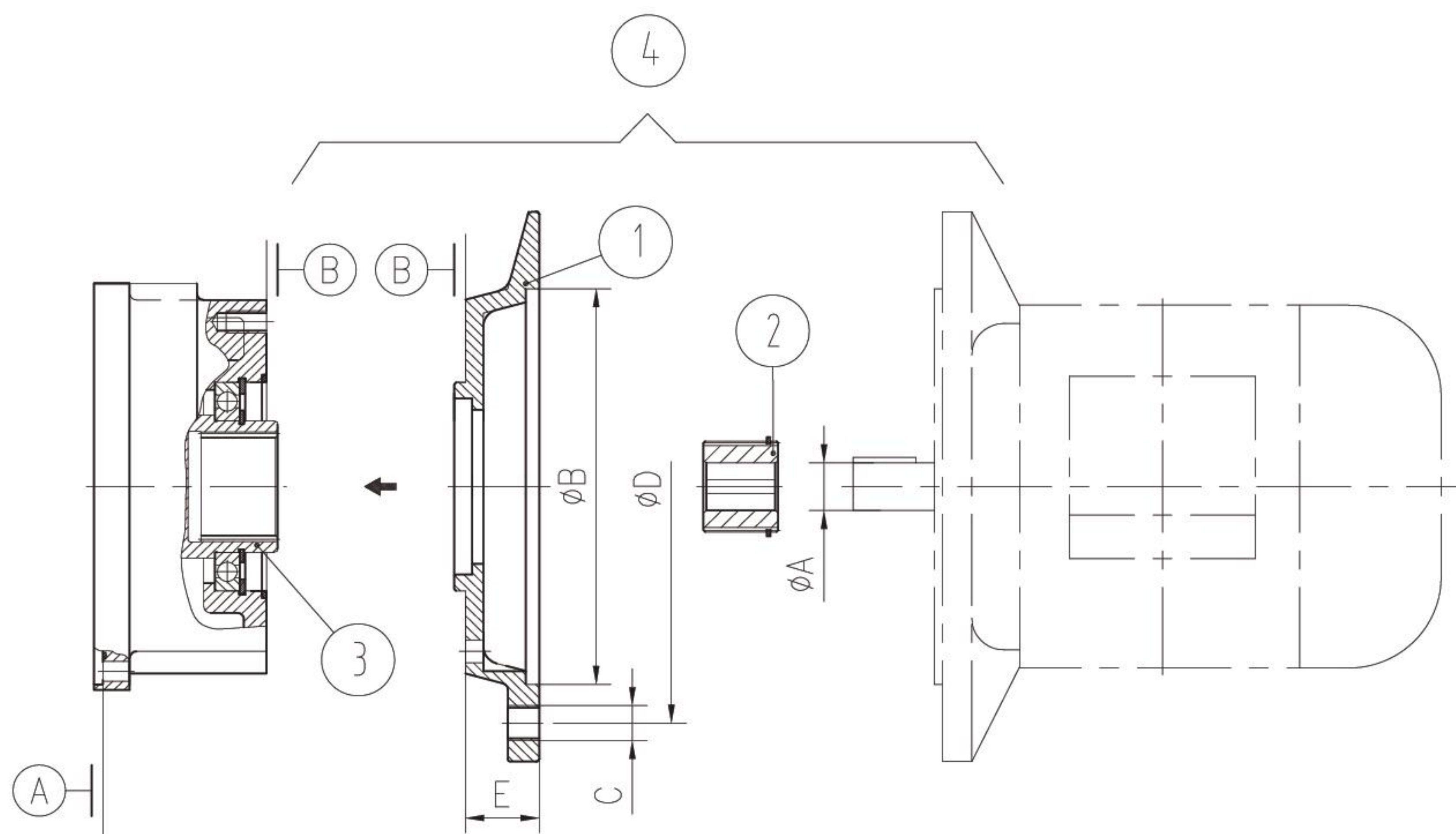
	A	ØB(H8)	C	ØD	E	1	2	3	4
015-OMM	Ø16	Ø63	M8	Ø80	31	015-OMM(Ø16).1	B50x45-Ø16	A40X36-A50x45	
070-OMM	Ø16	Ø63	M8	Ø80	31	015-OMM(Ø16).1	B50x45-Ø16	A58X53-A50x45	
015-OMP	SAE 1" 6B	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-SAE 1" 6B	A40X36-A50x45	
015-OMP	Ø25	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Ø25	A40X36-A50x45	
015-OMP	Ø25.4	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Ø25.4	A40X36-A50x45	
015-OMP	Ø32	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1		A40x36-Ø32x51	
070-OMP	SAE 1" 6B	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-SAE 1" 6B	A58X53-A50x45	
070-OMP	Ø25	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Ø25	A58X53-A50x45	
070-OMP	Ø25.4	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Ø25.4	A58X53-A50x45	
070-OMP	Ø32	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1		A58x53-Ø32x51	
015-OMS	Dp12/24 Z14	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Dp12/24 Z14	A40X36-A50x45	
015-OMS	Ø31.75	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1		A40x36-Ø31.75x51	
070-OMS	Dp12/24 Z14	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1	B50x45-Dp12/24 Z14	A58X53-A50x45	
070-OMS	Ø31.75	Ø82.5	M12	Ø106.4	40	015-OMP(Ø25).1		A58x53-Ø31.75x51	



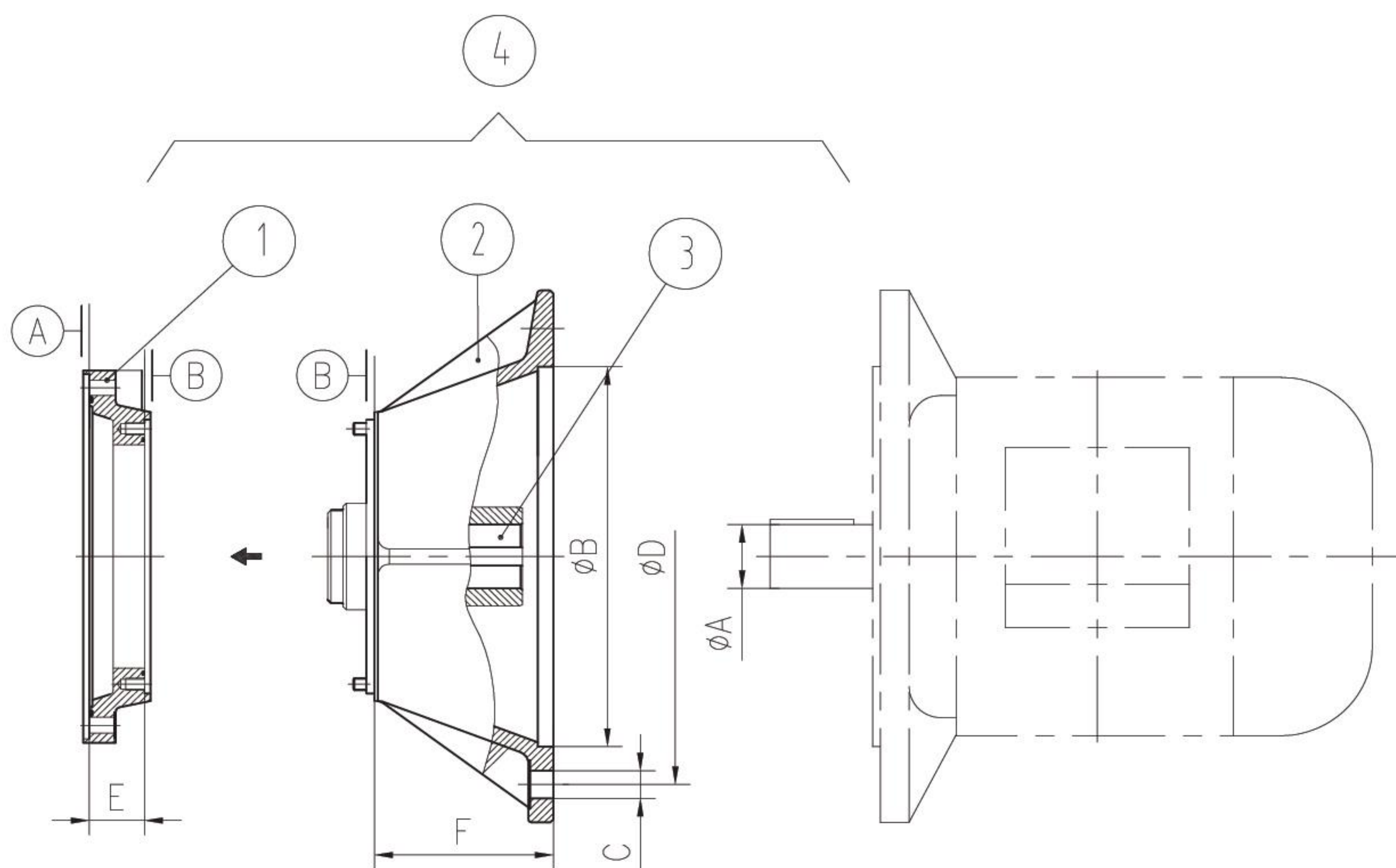
	A	ØB(H8)	C	ØD	E	1	2	3	4
015-OMSS	Dp12/24 Z12	Ø100	M12	Ø125	35	015-OMSS.1	015-OMSS.3	A40x36-Dp12/24Z12	
070-OMSS	Dp12/24 Z12	Ø100	M12	Ø125	35	015-OMSS.1	015-OMSS.3	A58x53-Dp12/24Z12	
015-OMTS	Dp12/24 Z16	Ø125	M12	Ø160	35	015-OMTS.1	015-OMTS.4	A40x36-Dp12/24Z16	
070-OMTS	Dp12/24 Z16	Ø125	M12	Ø160	35	015-OMTS.1	015-OMTS.4	A58x53-Dp12/24Z16	
015-OMVS	Dp10/20 Z16	Ø140	M12	Ø180	41	015-OMVS.1	015-OMVS.3	A40x36-Dp10/20Z16	
070-OMVS	Dp10/20 Z16	Ø140	M12	Ø180	41	015-OMVS.1	015-OMVS.3	A58x53-Dp10/20Z16	



	A	ØB(H8)	C	ØD	E	1	2	3	4
015-OMT	Dp12/24Z17	Ø125	M12	Ø160	87	015-OMT(Ø40).1	B50x45-Dp12-24Z17	A40X36-A40x36	
015-OMT	Ø38.1	Ø125	M12	Ø160	87	015-OMT(Ø40).1		A40x36-Ø38.1x69	
015-OMT	Ø40	Ø125	M12	Ø160	87	015-OMT(Ø40).1		A40x36-Ø40x69	
070-OMT	Dp12/24Z17	Ø125	M12	Ø160	87	015-OMT(Ø40).1	B50x45-Dp12-24Z17	A58X53-A50x45	
070-OMT	Ø38.1	Ø125	M12	Ø160	87	015-OMT(Ø40).1		A58x53-Ø38.1x69	
070-OMT	Ø40	Ø125	M12	Ø160	87	015-OMT(Ø40).1		A58x53-Ø40x69	

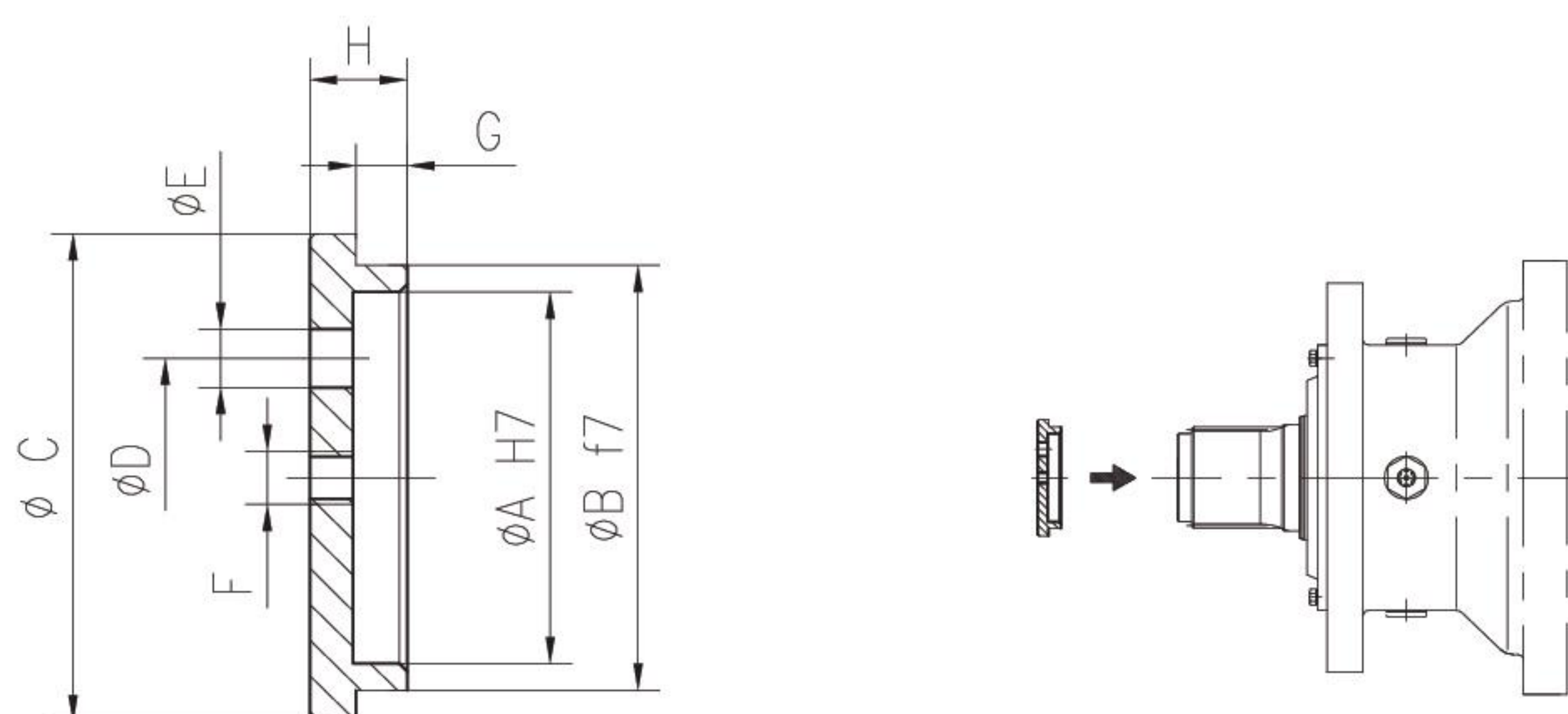


	ØA	ØB(H8)	C	ØD	E	1	2	3	4
015-IEC80	Ø19	Ø130	M10	Ø165	23	015-IEC90.1	B50x45-Ø19	A40X36-A50x45	
070-IEC80	Ø19	Ø130	M10	Ø165	23	015-IEC90.1	B50x45-Ø19	A58X53-A50x45	
015-IEC90	Ø24	Ø130	M10	Ø165	23	015-IEC90.1	B50x45-Ø24	A40X36-A50x45	
070-IEC90	Ø24	Ø130	M10	Ø165	23	015-IEC90.1	B50x45-Ø24	A58X53-A50x45	
015-IEC112	Ø28	Ø180	Ø15	Ø215	33	015-IEC112.1	B50x45-Ø28	A40X36-A50x45	
070-IEC112	Ø28	Ø180	Ø15	Ø215	33	015-IEC112.1	B50x45-Ø28	A58X53-A50x45	
015-IEC132	Ø38	Ø230	Ø15	Ø265	53	015-IEC132.1		A40x36-Ø38x75	
070-IEC132	Ø38	Ø230	Ø15	Ø265	53	015-IEC132.1		A58x53-Ø38x75	



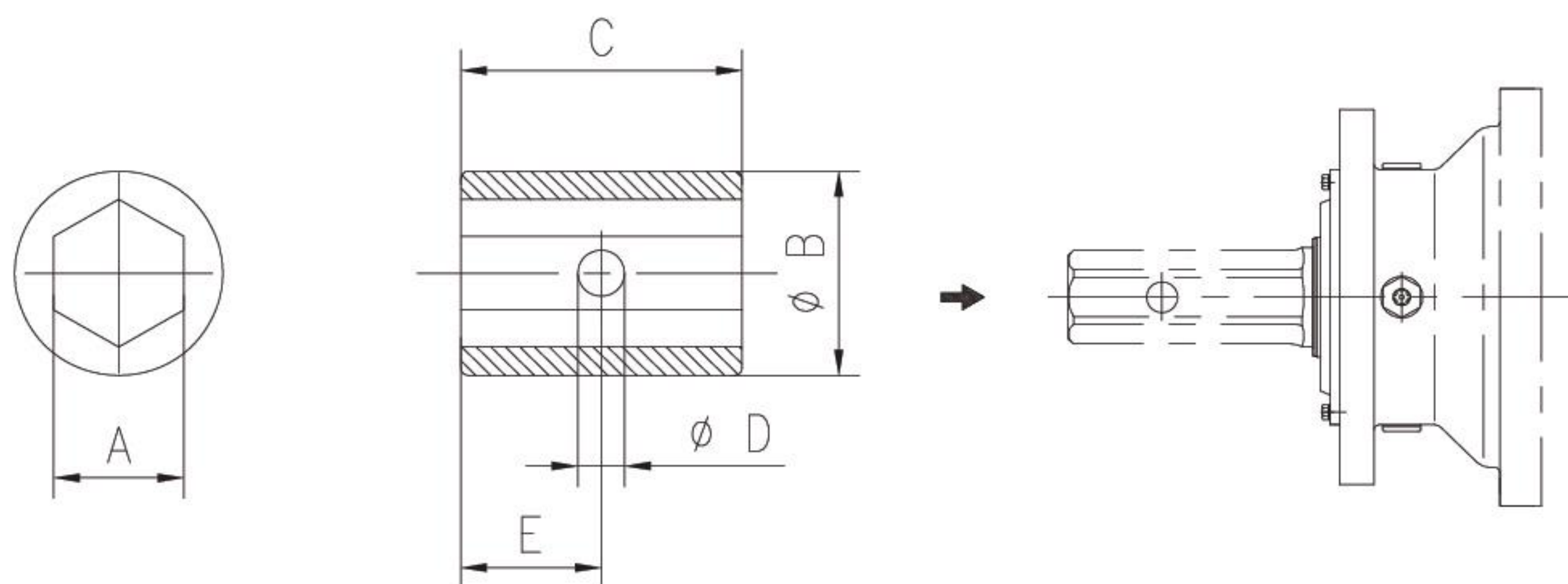
	$\varnothing A$	$\varnothing B(H8)$	C	$\varnothing D$	$E+F$	1	2	3	4
015-IEC160	$\varnothing 42$	$\varnothing 250$	$\varnothing 18$	$\varnothing 300$	156	KL20153.1a	015-IEC160.1	A40x36- $\varnothing 42$ x90	
050-IEC160	$\varnothing 42$	$\varnothing 250$	$\varnothing 18$	$\varnothing 300$	156	KL20503.1B	015-IEC160.1	A40x36- $\varnothing 42$ x90	
015-IEC180	$\varnothing 48$	$\varnothing 250$	$\varnothing 18$	$\varnothing 300$	156	KL20153.1a	015-IEC180.1	A40x36- $\varnothing 48$ x100	
050-IEC180	$\varnothing 48$	$\varnothing 250$	$\varnothing 18$	$\varnothing 300$	156	KL20503.1B	015-IEC180.1	A40x36- $\varnothing 48$ x100	

EP



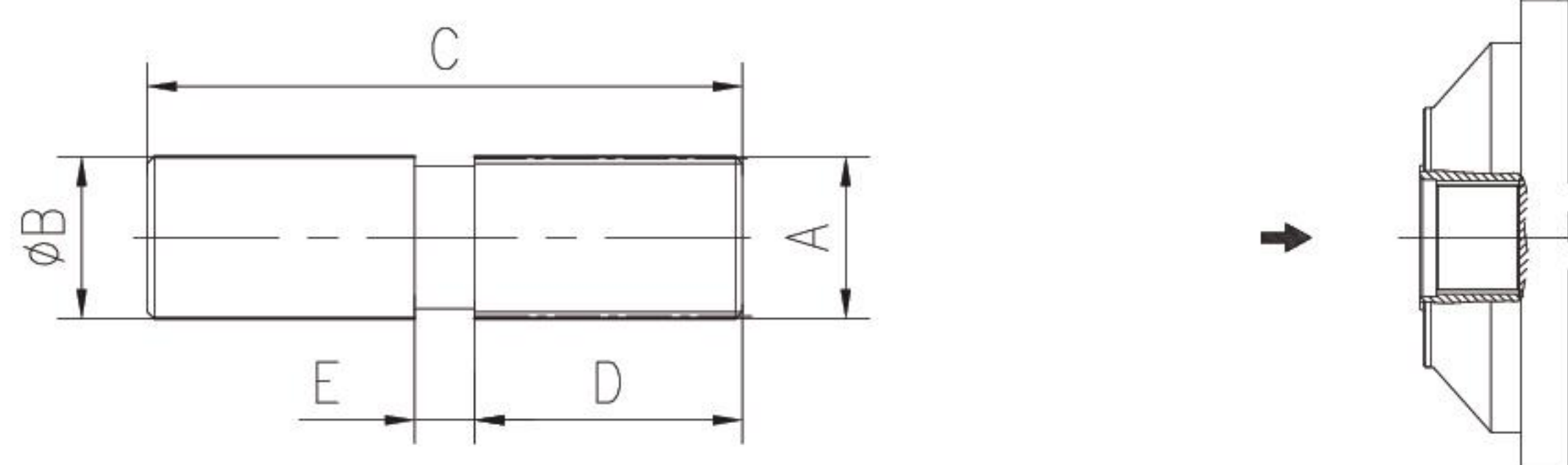
	ØA	ØB	ØC	ØD	ØE	F	G	H	
EP015	35	42	50	24	Ø6.5	M6	4.5	9.5	
EP025	50	60	70	32	Ø11	M10	7.5	14	
EP050									
EP070	62	72	82	40	Ø11	M10	9.5	18	
EP100									
EP160	70	80	92	45	Ø11	M10	9.5	18	
EP260	85	125	125	52	Ø15	M14	11.5	21	
EP330	90	130	140	50	Ø17	M14	14.5	22	
EP400									
EP500									
EP600									
EP850	125	151	170	80	Ø17	M14	11.5	25	
EP1050									
EP1350	140	180	200	110	Ø17	M14	14.5	30	
EP1800	200	230	260	150	Ø25	M24	19	45	
EP2250									
EP2700	220	250	280	150	Ø25	M24	19	45	
EP3500	240	270	300	200	Ø25	M24	24	50	
EP4500									

ES

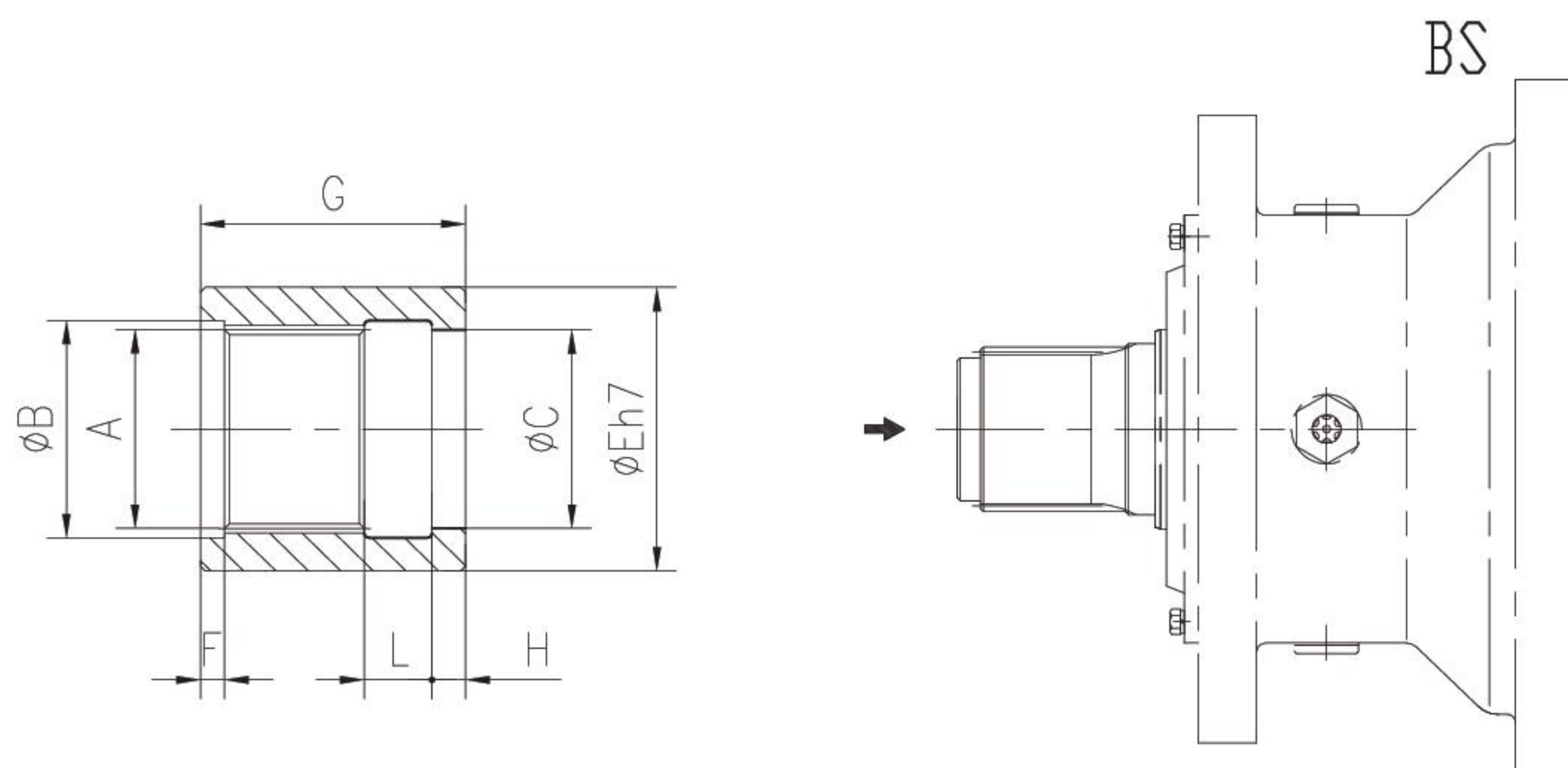


	VERSION	A	ØB	C	ØD	E	
	SR	50	80	108	18	54	
	SR	50	80	108	18	54	
	SR	50	80	108	18	54	
	SR	70	100	115	-	-	

BF

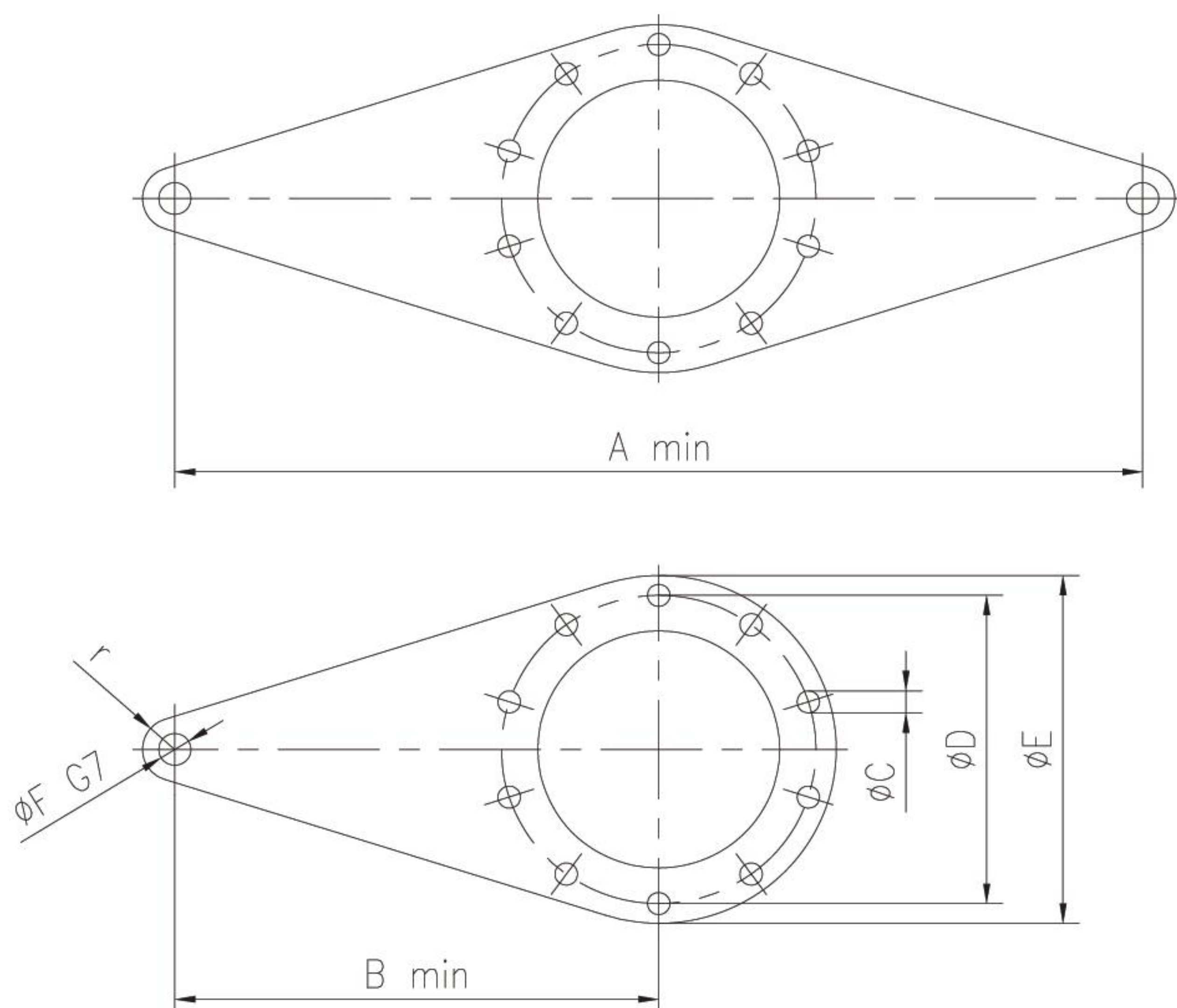


	VERSION	A	ØB	C	D	E
BF015	SH	B40x36 DIN 5482	39.5	300	142	16
BF025	SH	B50x45 DIN 5482	49.5	300	142	16
BF050	SH	B58x53 DIN 5482	57.5	300	142	16
BF070	SH	B70x64 DIN 5482	69.3	300	142	16
BF100	SH	B80x74 DIN 5482	79.3	300	142	16
BF160	SH	B80x74 DIN 5482	79.3	300	142	16
BF260	SH	W100x5x9e DIN 5480	99	300	142	22
BF330	SH	W120x5x9e DIN 5480	119	300	142	22
BF400	SH	W140x5x9e DIN 5480	139	300	142	22
BF500						
BF600						
BF850	SH	W160x5x9e DIN 5480	159	300	142	22
BF1050						
BF1350						
BF1800	SH	W200x5x9e DIN 5480	199	300	160	30
BF2250						
BF2700						
BF3500	SH	W260x5x9e DIN 5480	259	300	160	30
BF4500						

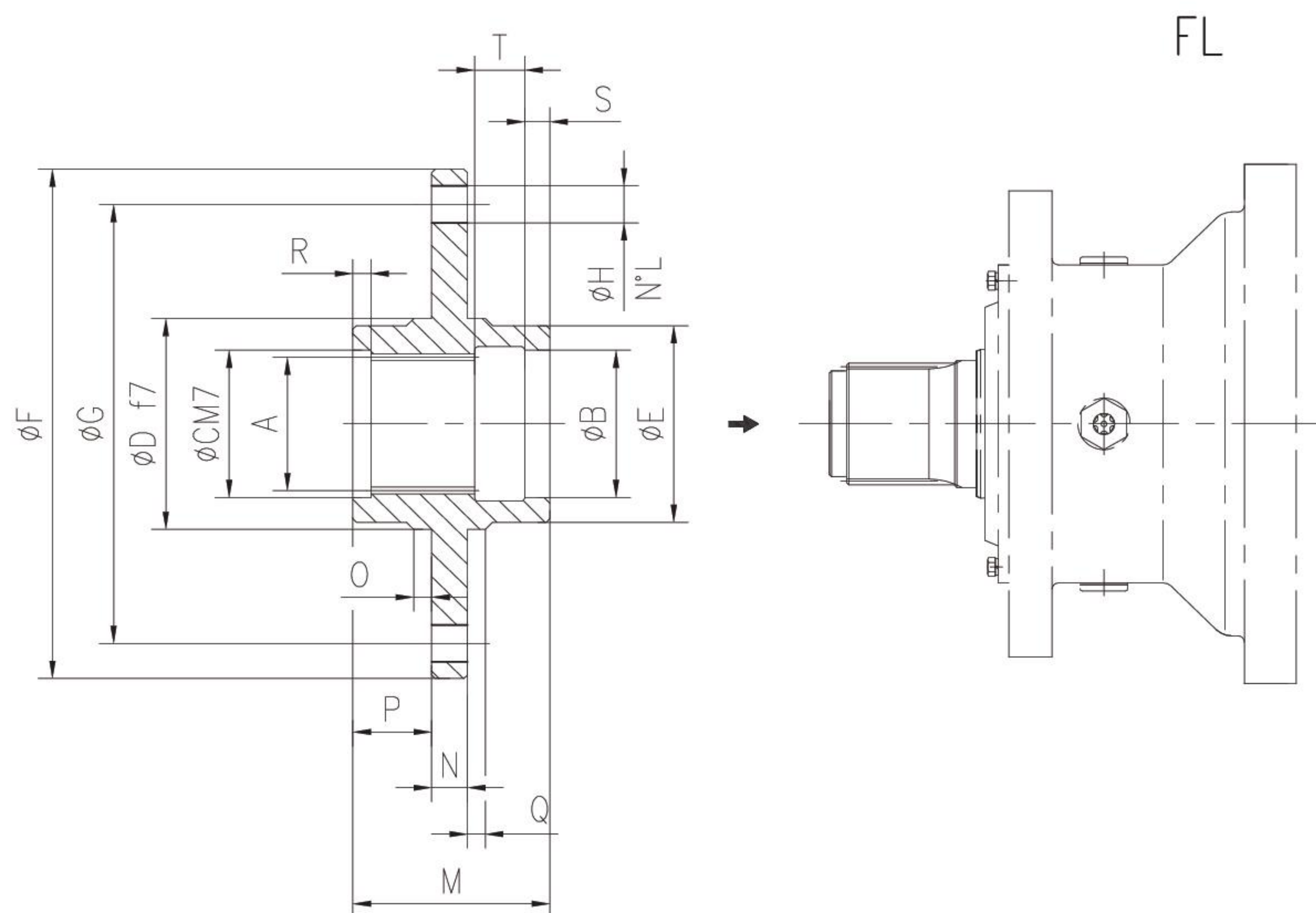


	VERSION	A	ØB	ØC	ØE	ØF	ØG	H	L
BF015	SI	A40x36 DIN 5482	42	42	60	5	55	7	14
BF025	SI	A50x45 DIN 5482	60	60	78	8	68	10	13
BF050	SI	A58x53 DIN 5482							
BF070	SI	A70x64 DIN 5482	72	72	95	10.5	90	10	21
BF100	SI	A80x74 DIN 5482	80	85	108	10.5	90	10	22
BF160	SI								
BF260	SI	A100x94 DIN 5482	105	105	136	12	110	13	15
BF330	SI	N120x3x9e DIN 5480	121	120	190	10	130	21	15
BF400									
BF500									
BF600									
BF850	SI	N150x5x9e DIN 5480	151	151	220	12	150	24	15
BF1050									
BF1350	SI	N170x5x9e DIN 5480	175	180	270	15	170	26	17
BF1800	SI	N220x5x9e DIN 5480	220	220	320	20	210	30	20
BF2250									
BF2700	SI	N240x5x9e DIN 5480	240	240	330	35	240	33	25
BF3500	SI	N260x5x9e DIN 5480	260	260	340	52	260	33	25
BF4500									

BR

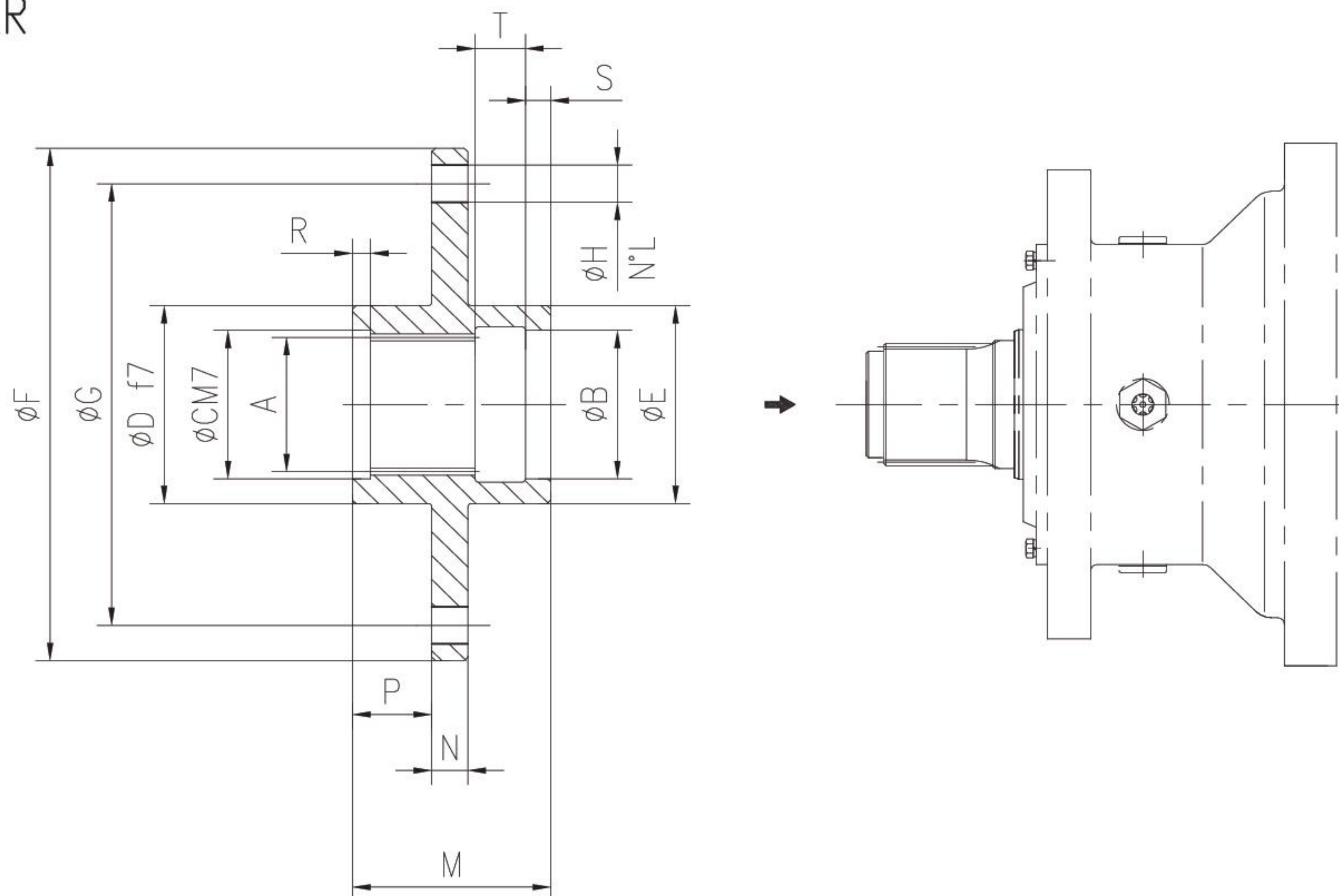


	VERSION	A	B	ØC	ØD	ØE	ØF	r	
015		400	200	Ø10.5X8	Ø165	Ø185	Ø20	20	
025		450	300	Ø14X10	Ø195	Ø220	Ø20	20	
050		500	300	Ø14X10	Ø195	Ø220	Ø25	25	
070		600	400	Ø16X12	Ø250	Ø280	Ø25	25	
100		800	500	Ø17X10	Ø295	Ø325	Ø25	25	
120		800	600	Ø17X10	Ø295	Ø325	Ø30	30	
180		1000	700	Ø17X10	Ø295	Ø325	Ø30	30	
260		1000	700	Ø17X15	Ø370	Ø410	Ø35	35	

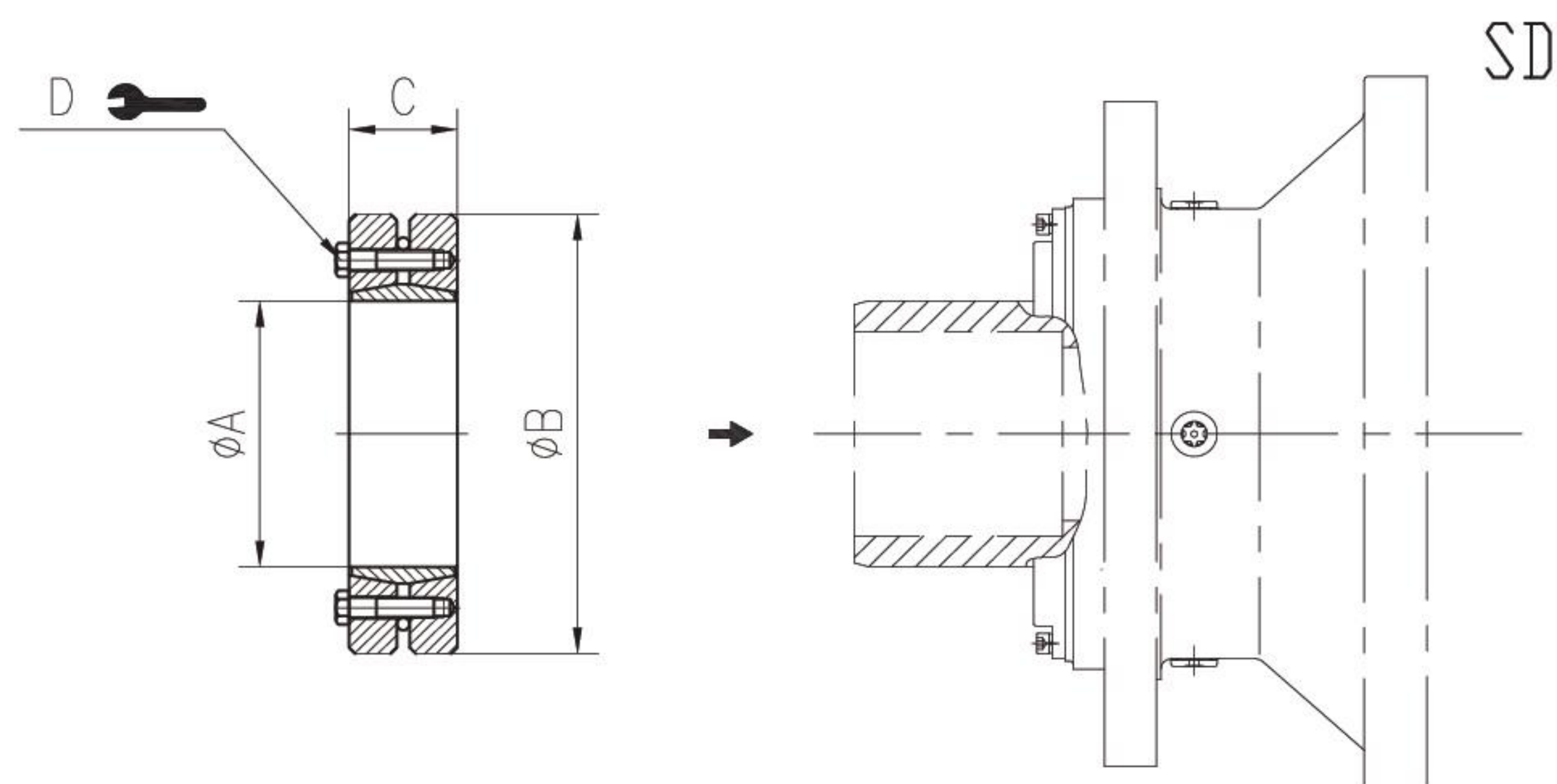


	VERSION	A	ØB	ØC	ØD	ØE	ØF	ØG	H	L	M	N	O	P	Q	R	S	T
FL015	SI	A40X36 DIN 5482	42	42	60	56	145	125	10.5	6x60°	55	10	5	22.5	5	5	7	14
FL025	SI	A58X53 DIN 5482	60	60	95	86	168	145	12.5	12x30°	68	12.5	5	27.75	5	8	10	13
FL050	SI	A80X74 DIN 5482	85	80	125	115	210	175	19	12x30°	90	20	10	35	10	10	10	22
FL100	SI	A100X94 DIN 5482	105	105	170	145	254	212	21	12x30°	110	24	10	39	10	12	15	22

FLR

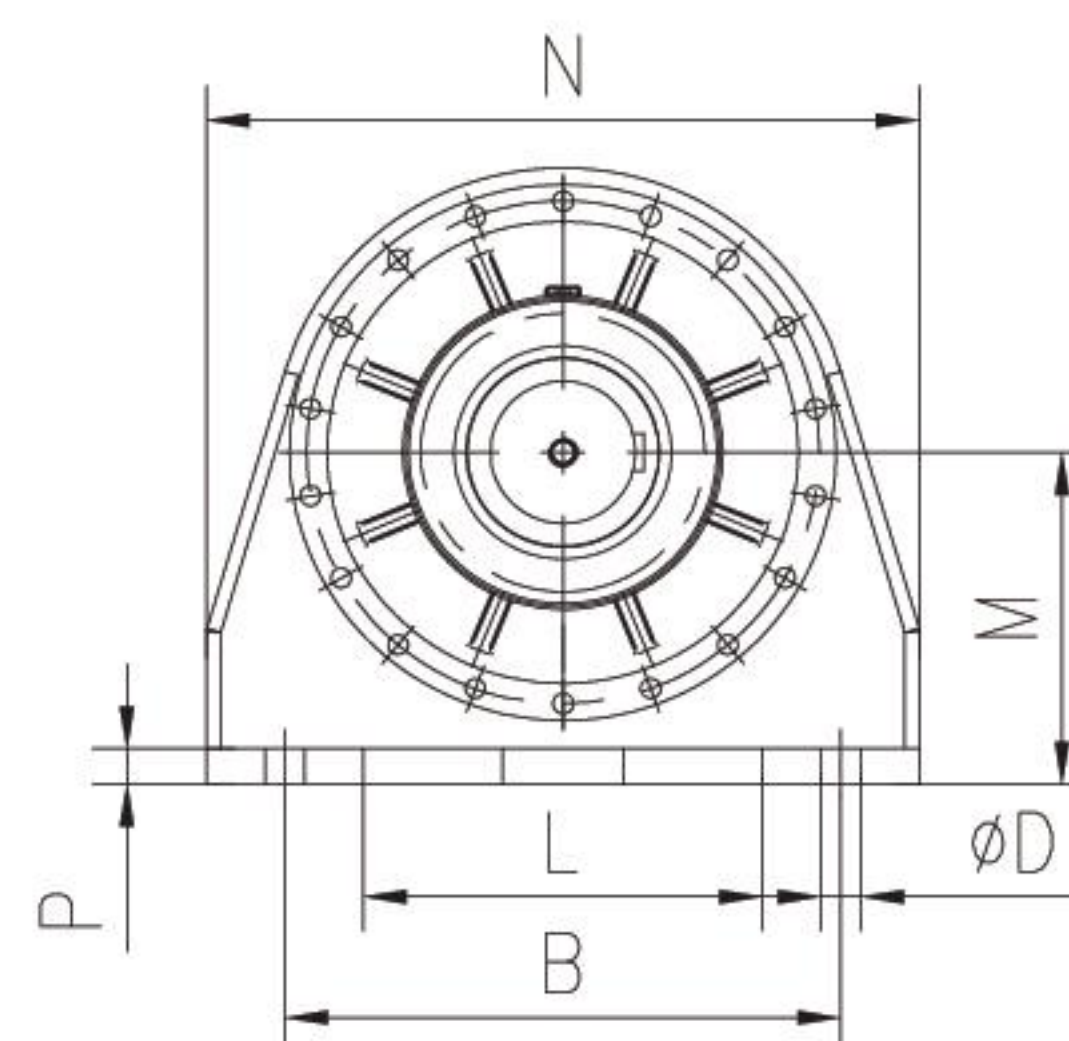
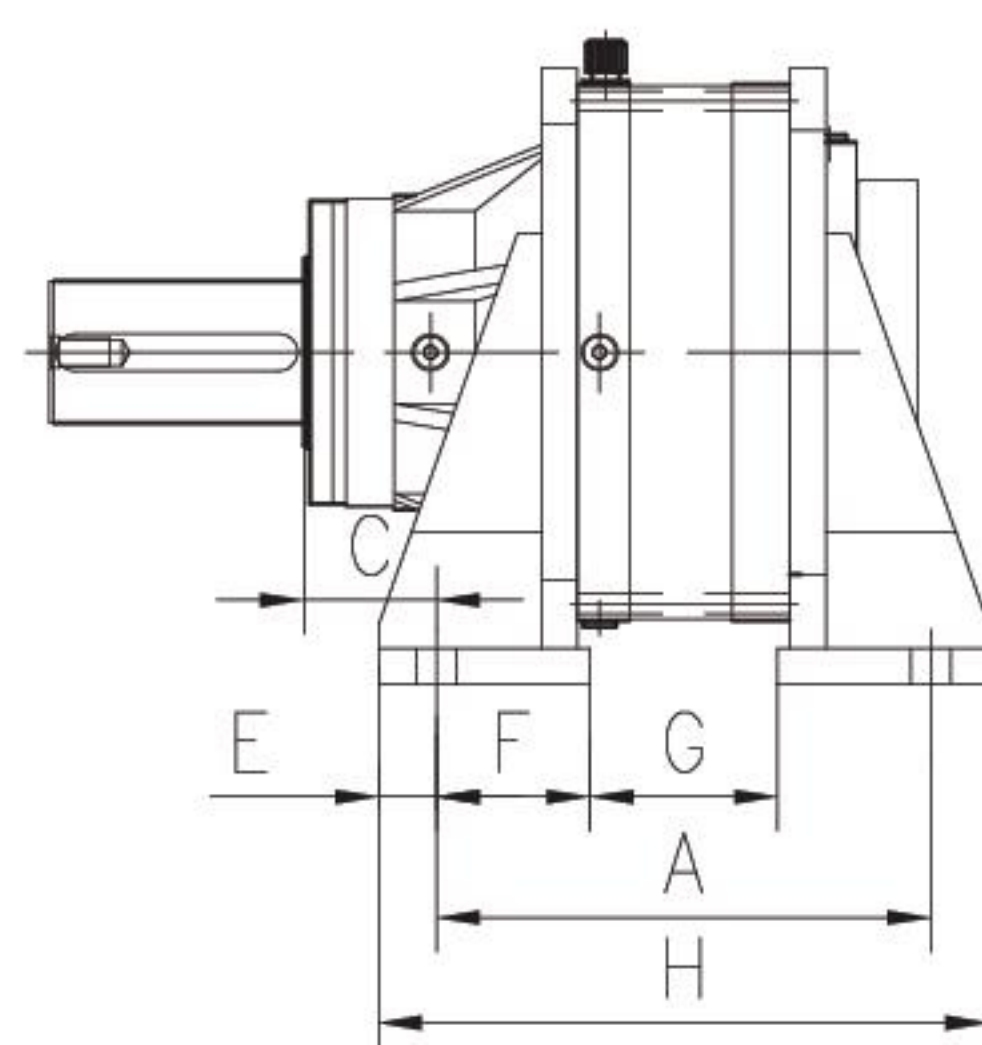


	VERSION	A	ØB	ØC	ØD	ØE	ØF	ØG	H	L	M	N	P	R	S	T
FLR015	SI	A40X36 DIN 5482	42	42	60	56	145	125	10.5	6x60°	55	10	7	5	7	14
FLR025	SI	A58X53 DIN 5482	60	60	95	88	168	145	12.5	12x30°	68	12.5	10	8	10	13
FLR050																
FLR070	SI	A70X64 DIN 5482	72	72	125	120	210	175	16	12x30°	90	20	15	10.5	10	21
FLR100	SI	A80X74 DIN 5482	85	80	125	115	210	175	19	12x30°	90	20	15	10	10	22
FLR130																
FLR200	SI	A100X94 DIN 5482	105	105	170	145	254	212	21	12x30°	110	24	20	12	15	22
FLR280	SI	N120X3X9H DIN 5480	121	121	200	180	310	260	25	12x30°	130	30	20	10	15	21
FLR400	SI	N130X3X9H DIN 5480	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLR600	SI	N150X3X9H DIN 5480	151	151	220	220	385	320	25	12x30°	150	40	25	12	18	27

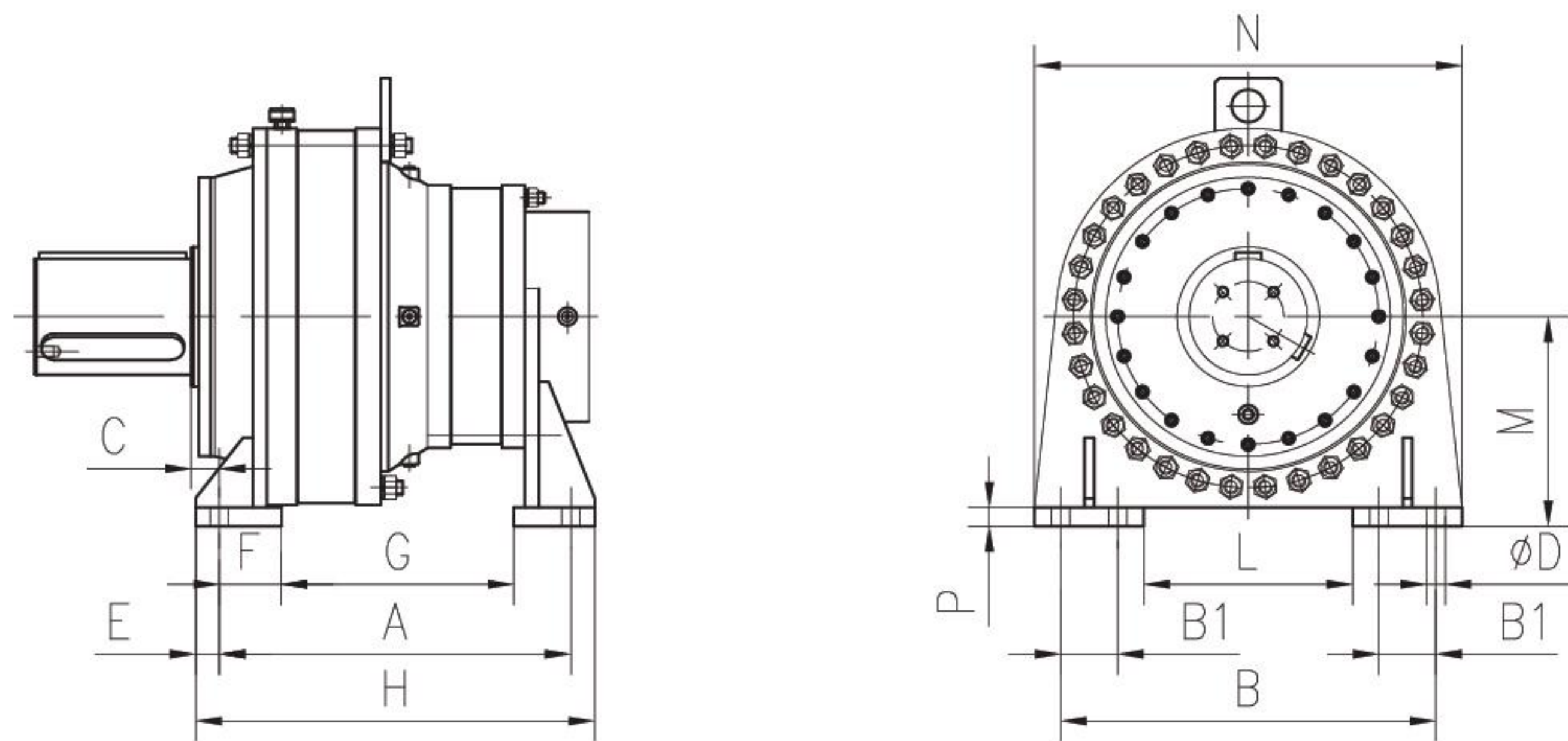


	VERSION	ØA	ØB	C	D	 Nm	Tmax
KL1015	SD	62	110	29	M6-10.9(10)	12 Nm	2000 Nm
KL1025-KL1050	SD	100	170	44	M8-10.9(12)	29 Nm	7500 Nm
KL1070-KL1160	SD	125	215	52	M8-10.9(12)	58 Nm	13000 Nm
KL1160	SD	130	215	52	M10-10.9(12)	58 Nm	18000 Nm
KL1160	SD	165	290	68	M16-10.9(8)	240 Nm	35000 Nm
KL1260	SD	175	300	71	M16-10.9(8)	240 Nm	44000 Nm
KL1330-KL1400	SD	185	330	85	M16-10.9(10)	240 Nm	60000 Nm
KL1500-KL1600	SD	195	340	85	M16-10.9(12)	240 Nm	76000 Nm
KL1850-KL11050	SD	240	405	107	M20-10.9(12)	490 Nm	156000 Nm
KL11350	SD	240	405	144	M20-10.9(12)	490 Nm	162000 Nm
KL11800-KL12250	SD	280	460	134	M20-10.9(16)	490 Nm	270000 Nm
KL12700	SD	300	480	134	M20-10.9(16)	490 Nm	270000 Nm
KL13500	SD	360	590	162	M20-10.9(24)	490 Nm	522000 Nm
KL14500	SD	380	660	168	M24-10.9(20)	840 Nm	610000 Nm

B

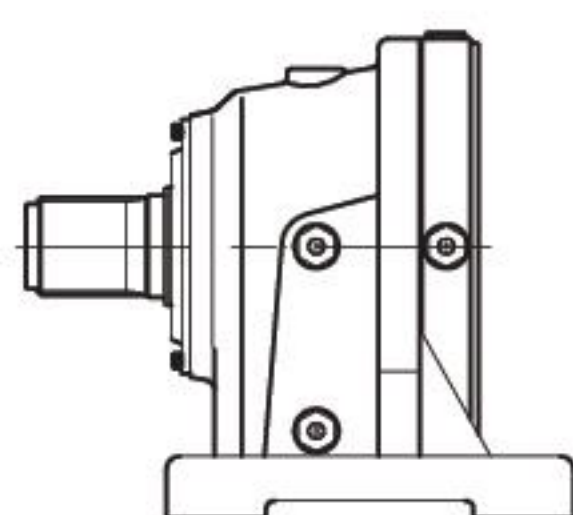


	VERSION	A	B	C	ØD	E	F	G	H	L	M	N	P	
160	KLB	312.5	356	80	Ø25X4	25	89	134.5	362.5	210	230	420	40	
180	KLB	322.5	356	80	Ø25X4	25	89	144.5	372.5	210	230	420	40	
330	KLB	409	460	110	Ø33X4	48	127	155	505	330	280	590	30	
400	KLB	409	460	110	Ø33X4	48	127	155	505	—	280	590	30	
500	KLB	380	510	141	Ø33X4	45	90	200	470	360	315	600	35	
600	KLB	380	510	141	Ø33X4	45	90	200	470	360	315	600	35	

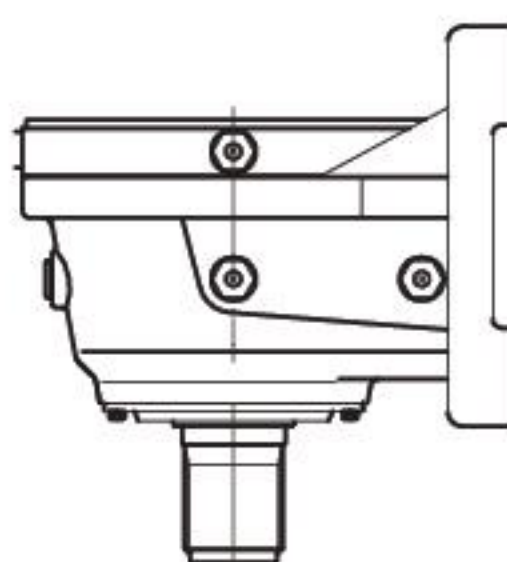


	VERSION	A	B	C	ØD	E	F	G	H	L	M	N	P	B1	
2500	KRB	740	790	60	Ø39X8	50	130	490	840	440	450	900	40	120	

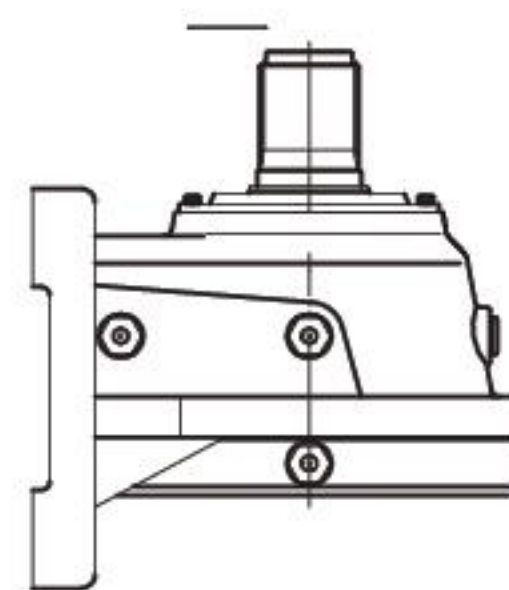
Installation position 安装位置



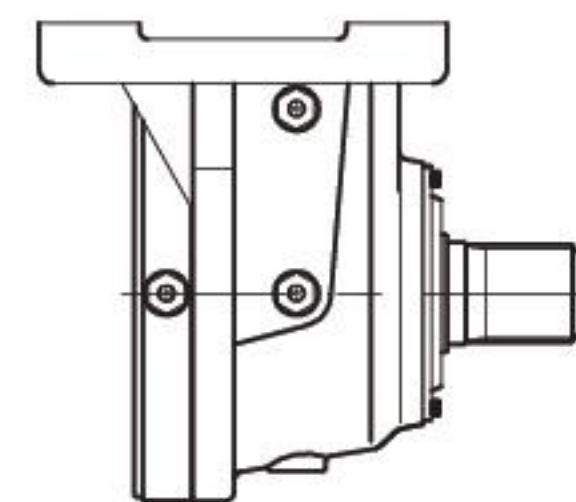
B5



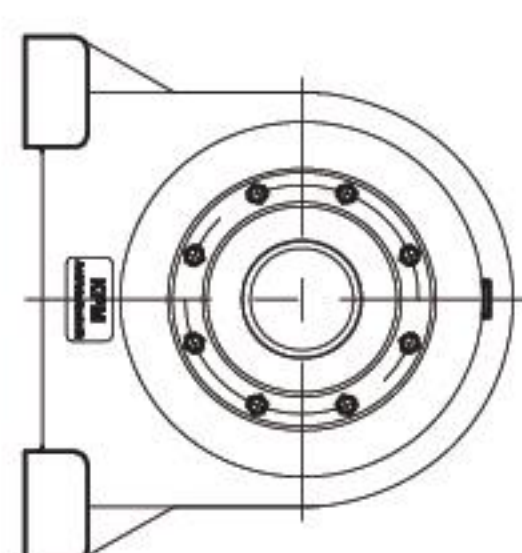
V1



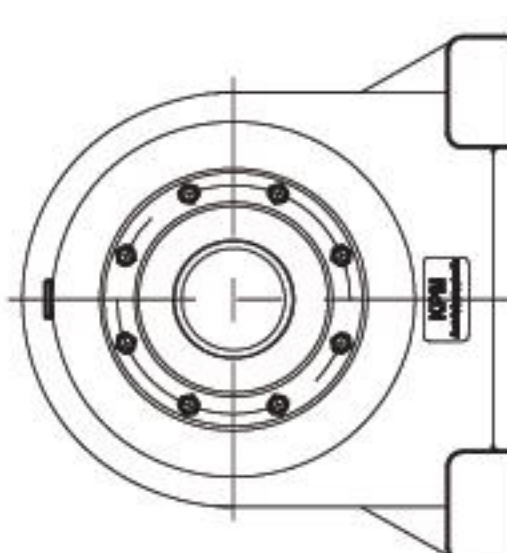
V3



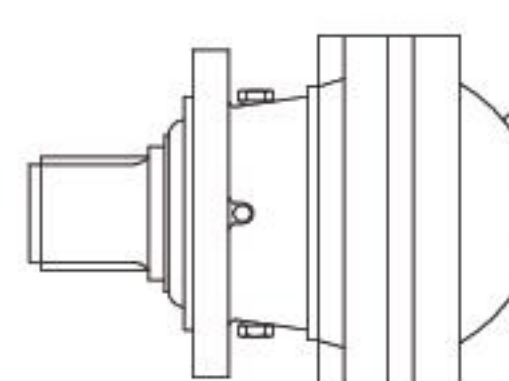
B8



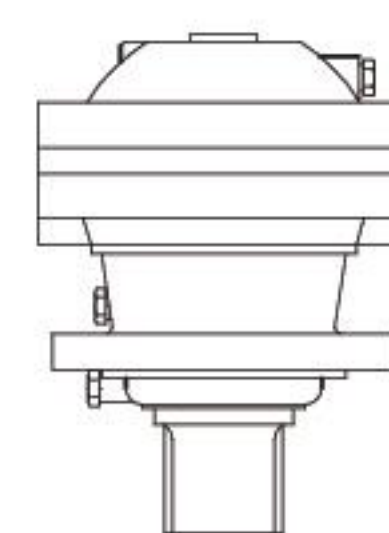
B6



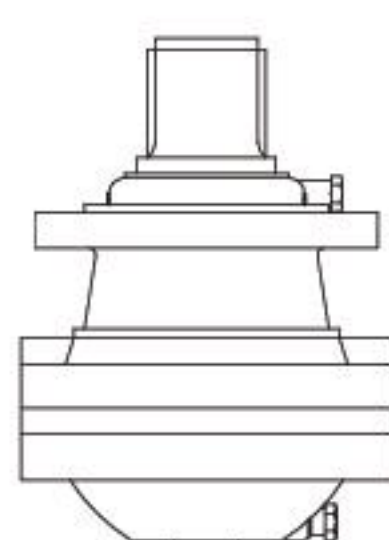
B7



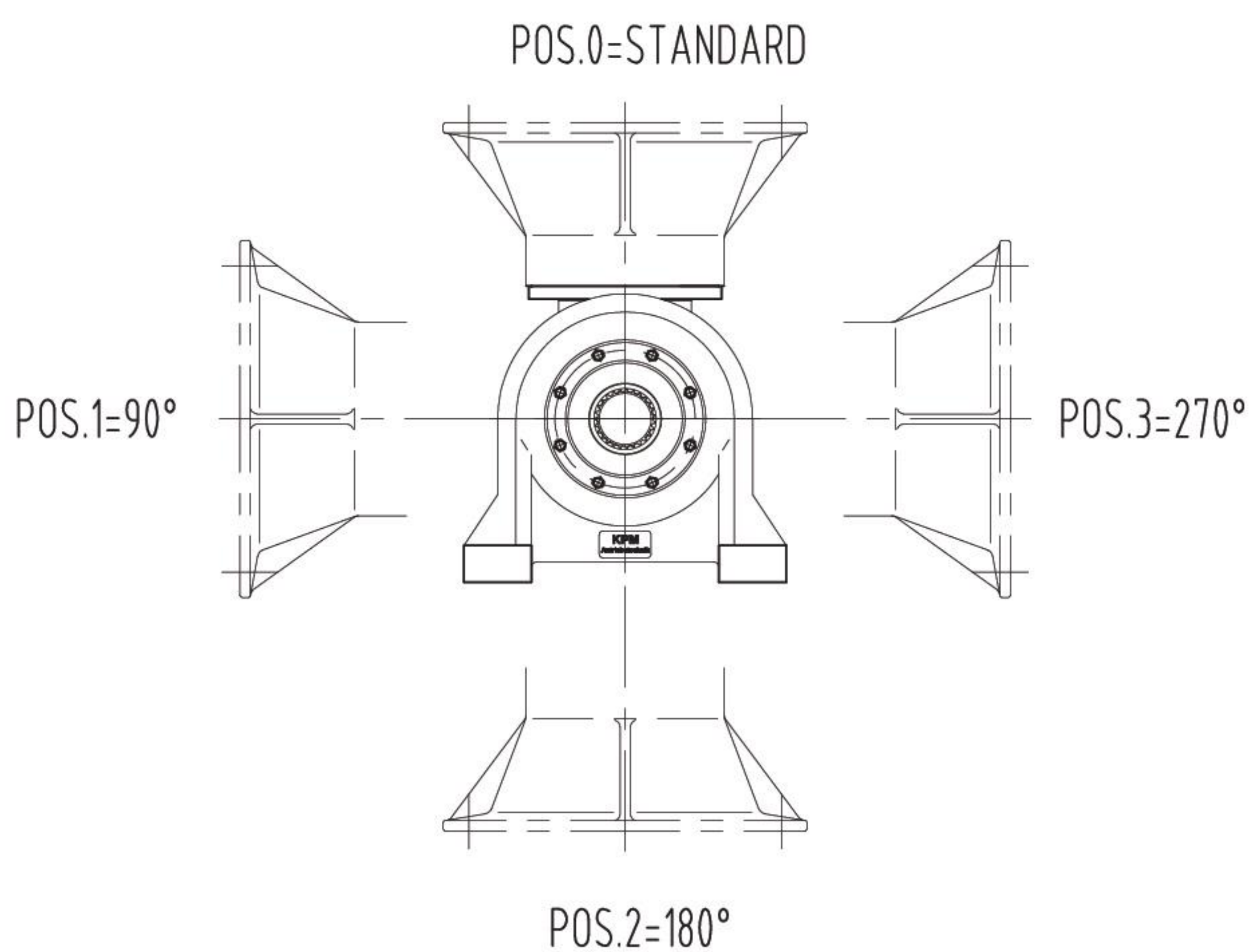
B3

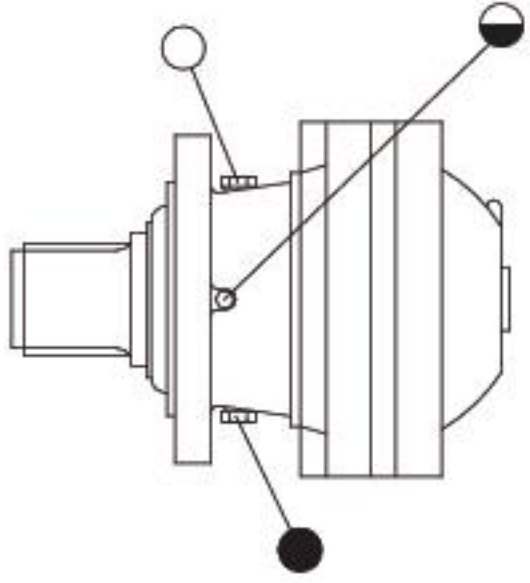
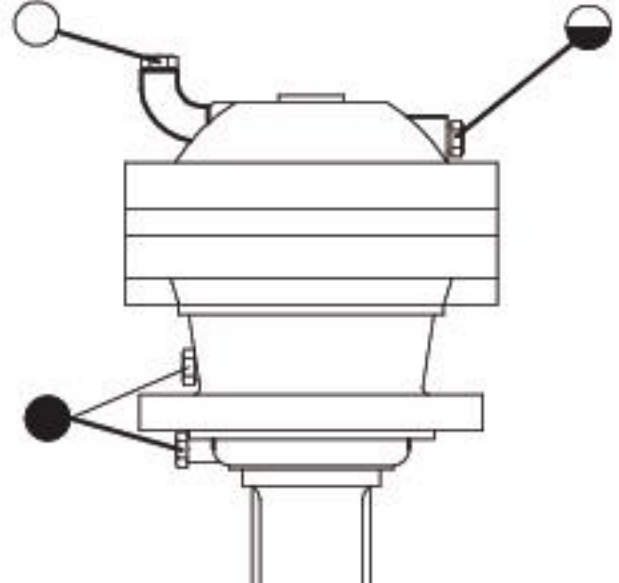
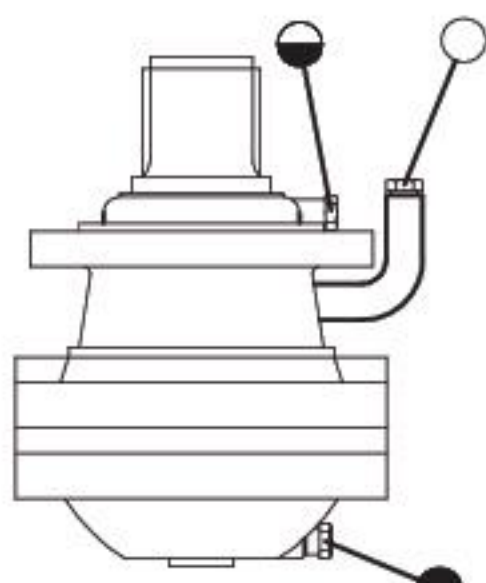
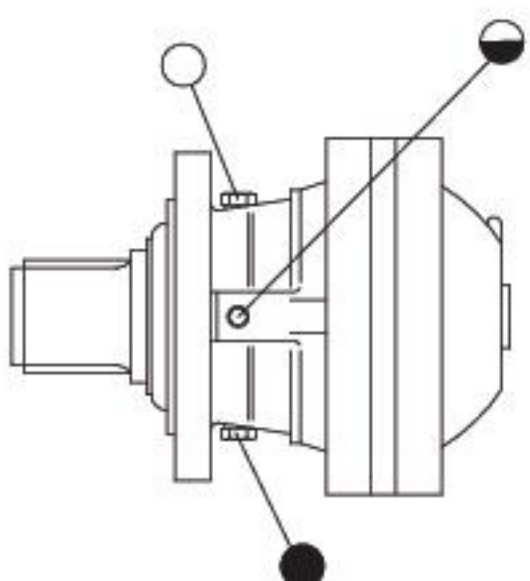
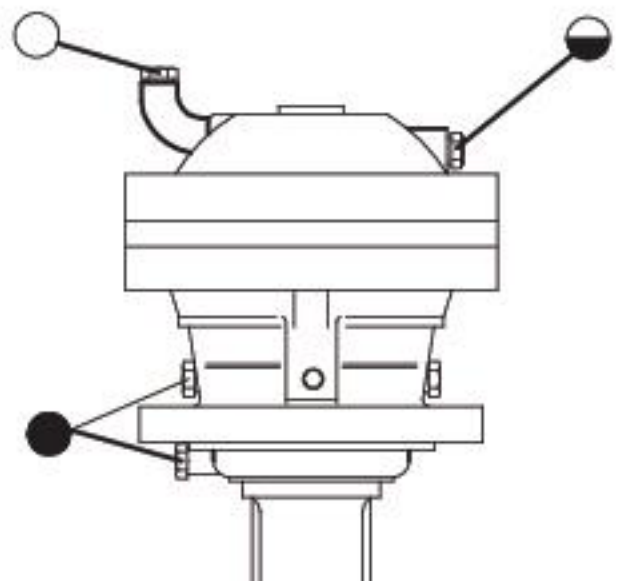
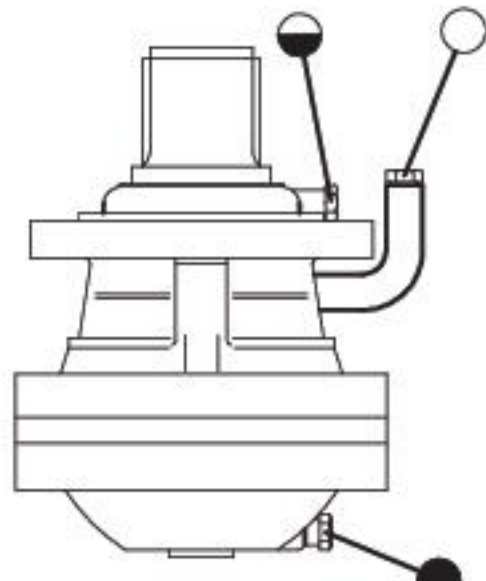
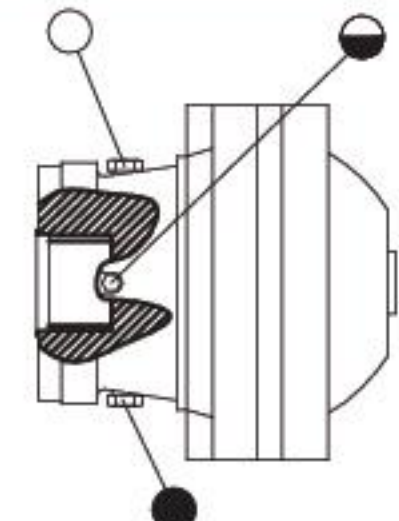
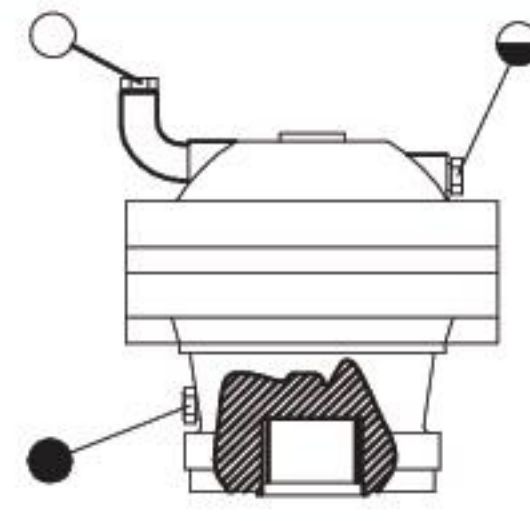
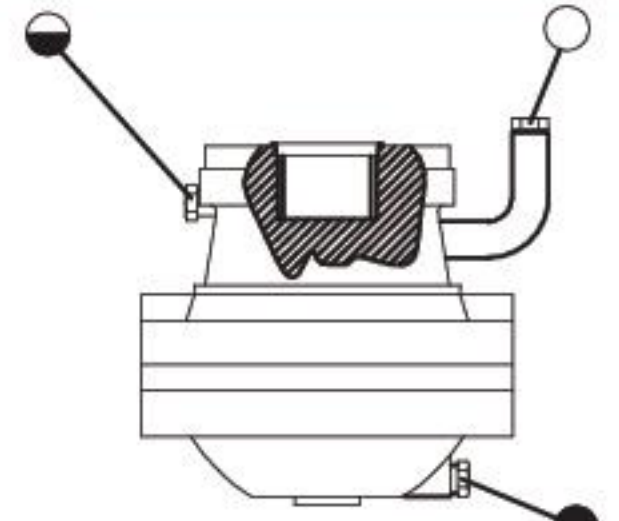
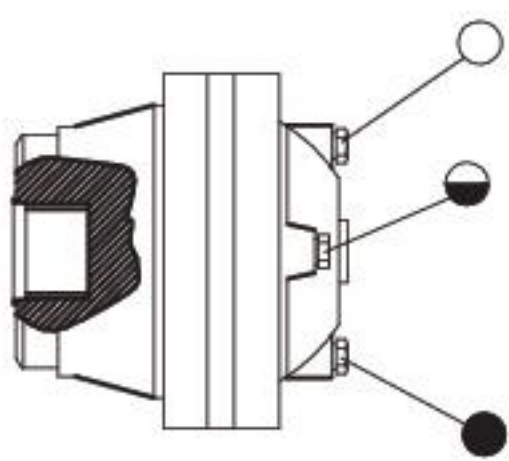
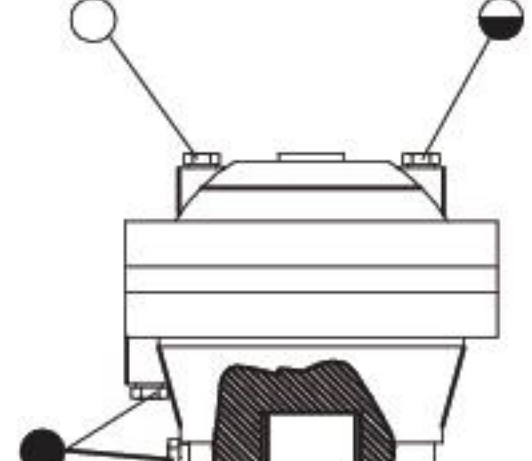
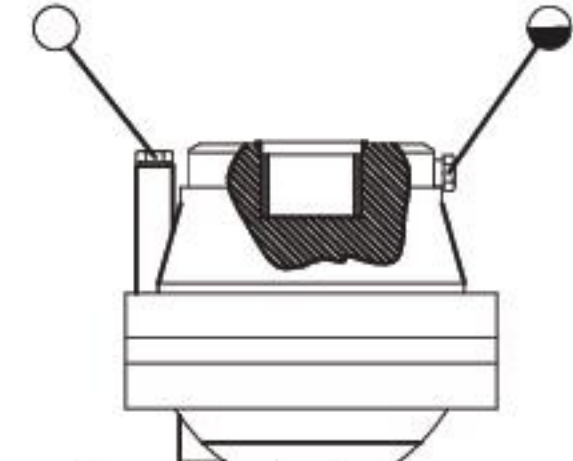


V5



V6

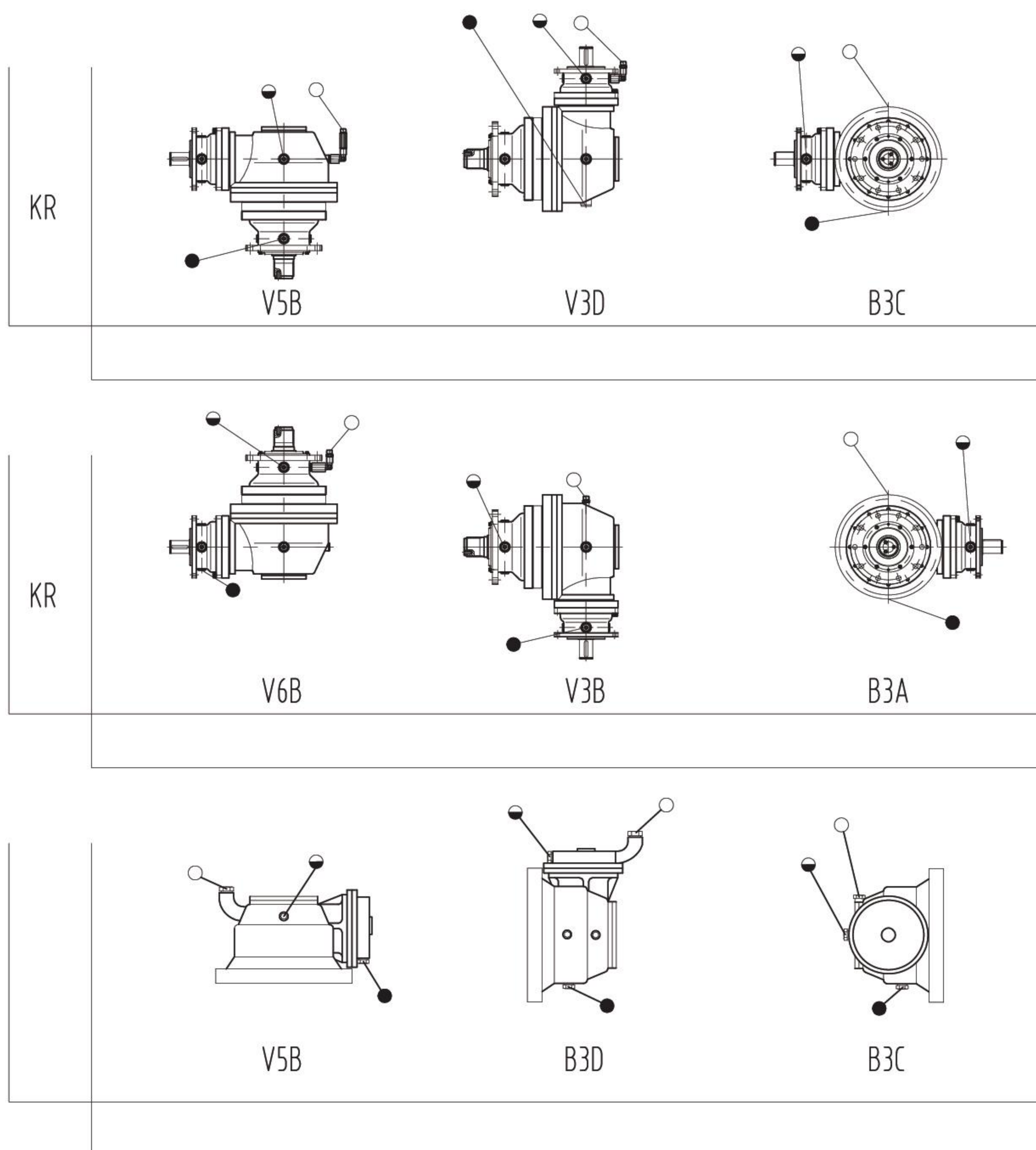


KL			
	B3	V5	V6
KL-A			
	B3	V5	V6
KL-H			
	B3	V5	V6
KL-H			
	B3	V5	V6

○ Breather and filling plug
通气和加油塞

◐ Oil level plug
油位计

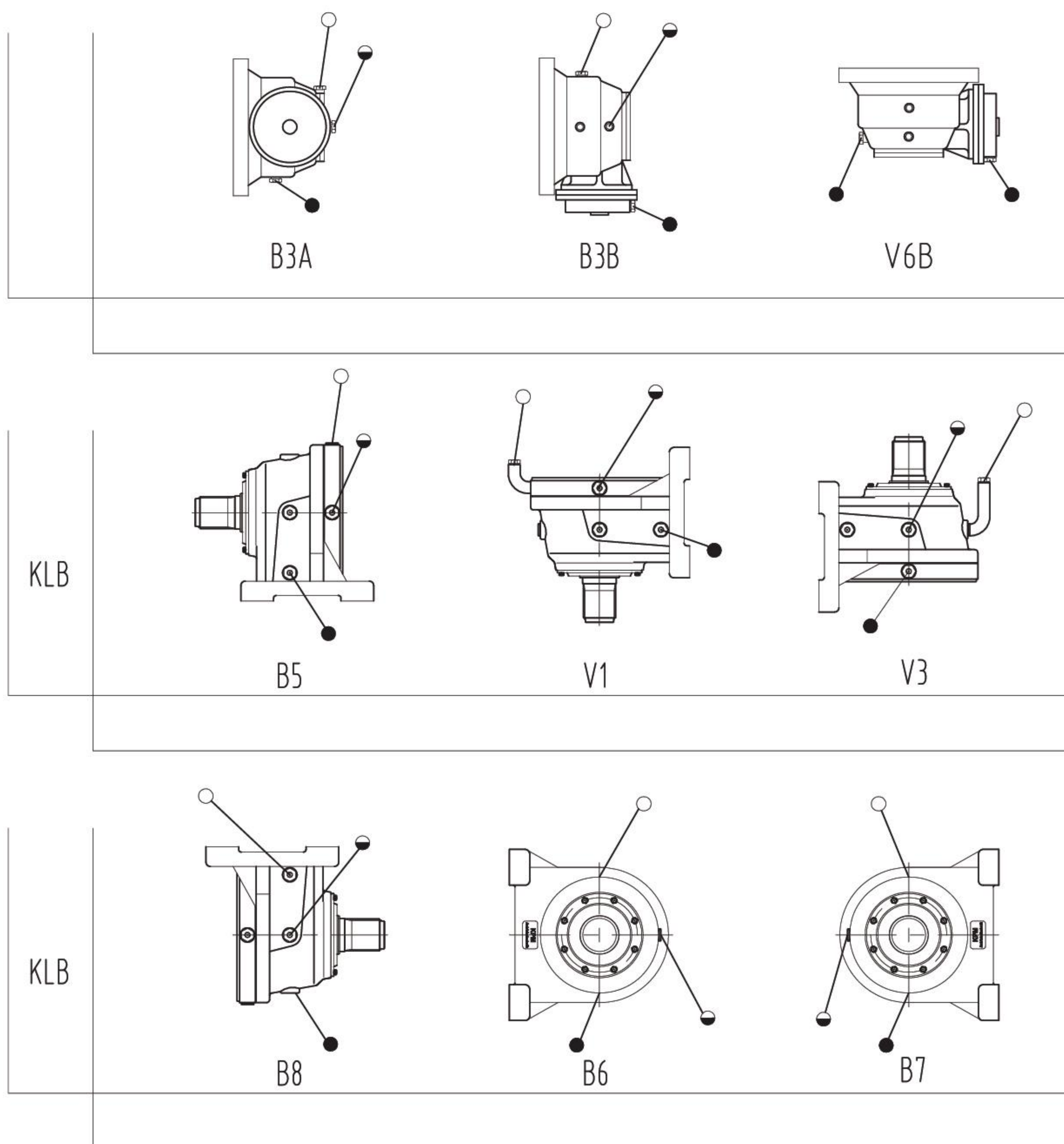
● Drain plug
放油塞



○ Breather and filling plug
通气 and 加注塞

◐ Oil level plug
油位计

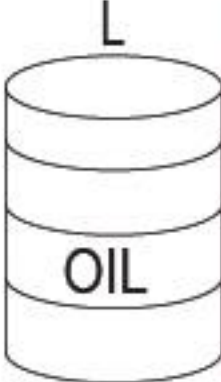
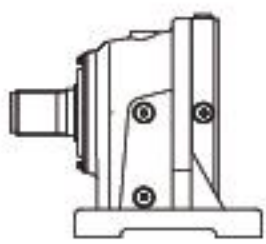
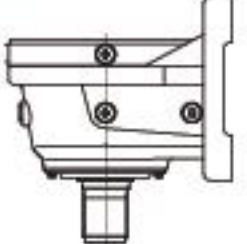
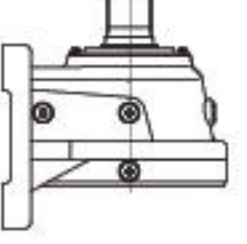
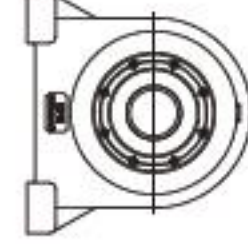
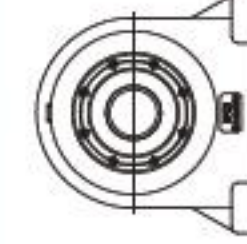
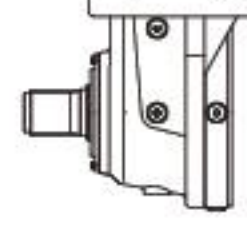
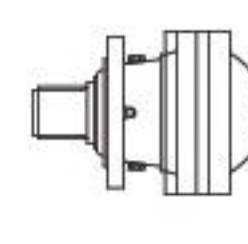
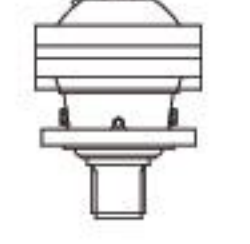
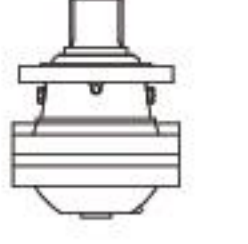
● Drain plug
放油塞

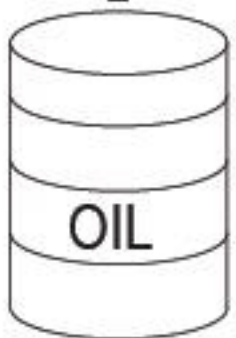
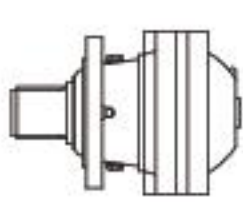
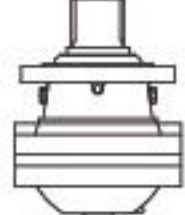


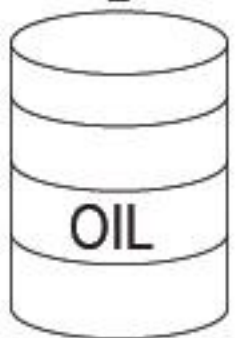
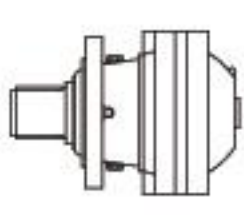
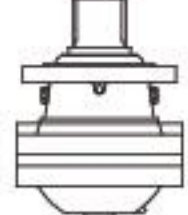
○ Breather and filling plug
通气和加注塞

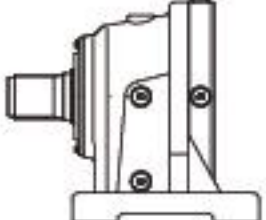
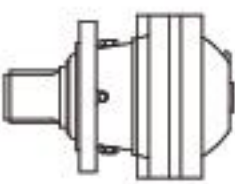
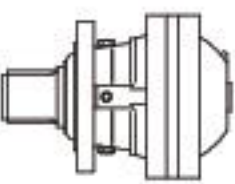
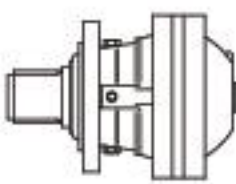
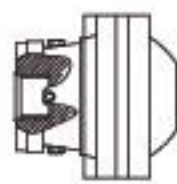
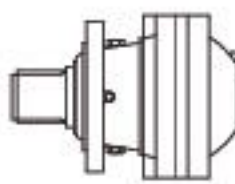
◐ Oil level plug
油位计

● Drain plug
放油塞

	B5	V1	V3	B6	B7	B8	B3	V5	V6
									
KL1015	0.8	1.6	1.6	0.7	0.7	0.8	0.5	1.0	1.0
KL2015	1.0	2.0	2.0	0.9	0.9	1.0	0.7	1.4	1.4
KL3015	1.2	2.4	2.4	1.1	1.1	1.2	0.9	1.8	1.8
KL4015	1.4	2.8	2.8	1.3	1.3	1.4	1.1	2.2	2.2
KL1025	1.5	3.0	3.0	1.4	1.4	1.5	1.0	2.0	2.0
KL2025	1.8	3.6	3.6	1.7	1.7	1.8	1.3	2.6	2.6
KL3025	2.0	4.0	4.0	1.9	1.9	2.0	1.5	3.0	3.0
KL4025	2.2	4.4	4.4	2.1	2.1	2.2	1.7	3.4	3.4
KL1050	1.6	3.2	3.2	1.5	1.5	1.6	1.1	2.2	2.2
KL2050	2.0	4.0	4.0	1.9	1.9	2.0	1.5	3.0	3.0
KL3050	2.3	4.6	4.6	2.2	2.2	2.3	1.8	3.6	3.6
KL4050	2.5	5.0	5.0	2.4	2.4	2.5	2.0	4.0	4.0
KL1070	2.4	4.8	4.8	2.3	2.3	2.4	1.6	3.2	3.2
KL2070	2.8	5.6	5.6	2.7	2.7	2.8	2.0	4.0	4.0
KL3070	3.1	6.2	6.2	3.0	3.0	3.1	2.3	4.6	4.6
KL4070	3.3	6.6	6.6	3.2	3.2	3.3	2.5	5.0	5.0
KL1100							2.4	4.8	4.8
KL2100							3.1	6.2	6.2
KL3100							3.5	7.0	7.0
KL4100							3.8	7.6	7.6
KL1160							2.6	5.2	5.2
KL2160							3.3	6.6	6.6
KL3160							3.7	7.4	7.4
KL4160							4.0	8.0	8.0
KL1260							3.7	7.4	7.4
KL2260							4.6	9.2	9.2
KL3260							5.0	10.0	10.0
KL4260							5.3	10.6	10.6
KL1330							4.0	8.0	8.0
KL2330							5.5	11.0	11.0
KL3330							6.0	12.0	12.0
KL4330							6.3	12.6	12.6
KL1400							7.0	12.0	10.0
KL2400							9.0	14.0	12.0
KL3400							10.0	15.0	13.0
KL4400							11.0	16.0	14.0

L 	B3 V5 V6		
			
KL1500	5.2	10.4	10.4
KL2500	6.5	13.0	13.0
KL3500	7.1	14.2	14.2
KL4500	7.5	15.0	15.0
KL1600	7.2	14.4	14.4
KL2600	8.5	17.0	17.0
KL3600	9.7	19.4	19.4
KL4600	10.1	20.2	20.2
KL1850			
KL2850	17.0	25.0	21.0
KL3850	19.0	27.0	23.0
KL4850	20.0	28.0	24.0
KL11050	8.7	17.4	17.4
KL21050	10.0	20.0	20.0
KL31050	11.2	22.4	22.4
KL41050	11.5	23.0	23.0
KL11350	15.0	30.0	30.0
KL21350	16.4	32.8	32.8
KL31350	17.6	35.2	35.2
KL41350	18.1	36.2	36.2

L 	B3 V5 V6		
			
KL11800	21.0	42.0	42.0
KL21800	23.4	46.8	46.8
KL31800	24.8	49.6	49.6
KL41800	25.2	50.4	50.4
KL12250	21.0	42.0	42.0
KL22250	23.4	46.8	46.8
KL32250	24.8	49.6	49.6
KL42250	25.2	50.4	50.4
KL12700	30.0	60.0	60.0
KL22700	32.4	64.8	64.8
KL32700	33.8	67.6	67.6
KL42700	34.2	68.4	68.4
KL13500	42.5	85.0	85.0
KL23500	46.5	93.0	93.0
KL33500	47.9	95.8	95.8
KL43500	48.7	97.4	97.4

	B	SI	SIA	SR	SH		
 Kg							
KL1015	23	20		20	16	18	
KL2015	27	24		24	20	22	
KL3015	31	28		28	24	26	
KL4015	35	32		32	28	30	
KL1025	42	37	37		33	36	
KL2025	49	44	44		40	43	
KL3025	53	48	48		44	47	
KL4025	57	52	52		48	51	
KL1050	45	40	40		36	39	
KL2050	52	47	47		43	46	
KL3050	56	51	51		47	50	
KL4050	60	55	55		51	54	
KL1070	80	70			65	68	
KL2070	89	79			74	77	
KL3070	93	83			78	81	
KL4070	97	87			82	85	
KL1100					70	73	
KL2100					79	82	
KL3100					83	86	
KL4100					87	90	
KL1160	130	115			85	95	105
KL2160	142	127			97	107	117
KL3160	149	134			104	114	124
KL4160	153	138			108	118	128
KL1260	155	135			110		
KL2260	185	165			140		
KL3260	194	174			149		
KL4260	198	178			153		

 Kg	B
KL1330	180
KL2330	225
KL3330	237
KL4330	244
KL1400	180
KL2400	225
KL3400	237
KL4400	244
KL1500	230
KL2500	290
KL3500	302
KL4500	309
KL1600	240
KL2600	300
KL3600	312
KL4600	319
KL1850	370
KL2850	405
KL3850	450
KL4850	462
KL11050	519
KL21050	635
KL31050	662
KL41050	673
KL11350	685
KL21350	805
KL31350	855
KL41350	871
KL11800	1150
KL21800	1332
KL31800	1391
KL41800	1407
KL12250	1150
KL22250	1344
KL32250	1403
KL42250	1419

 Kg	
KL12700	1210
KL22700	1405
KL32700	1465
KL42700	1480
KL13500	1950
KL23500	2283
KL33500	2399
KL43500	2426

15 PROCESS OF QUICK DIAGNOSE ON SIDE 减速箱现场快速诊断(体检)流程



快速反应24小时内到达现场



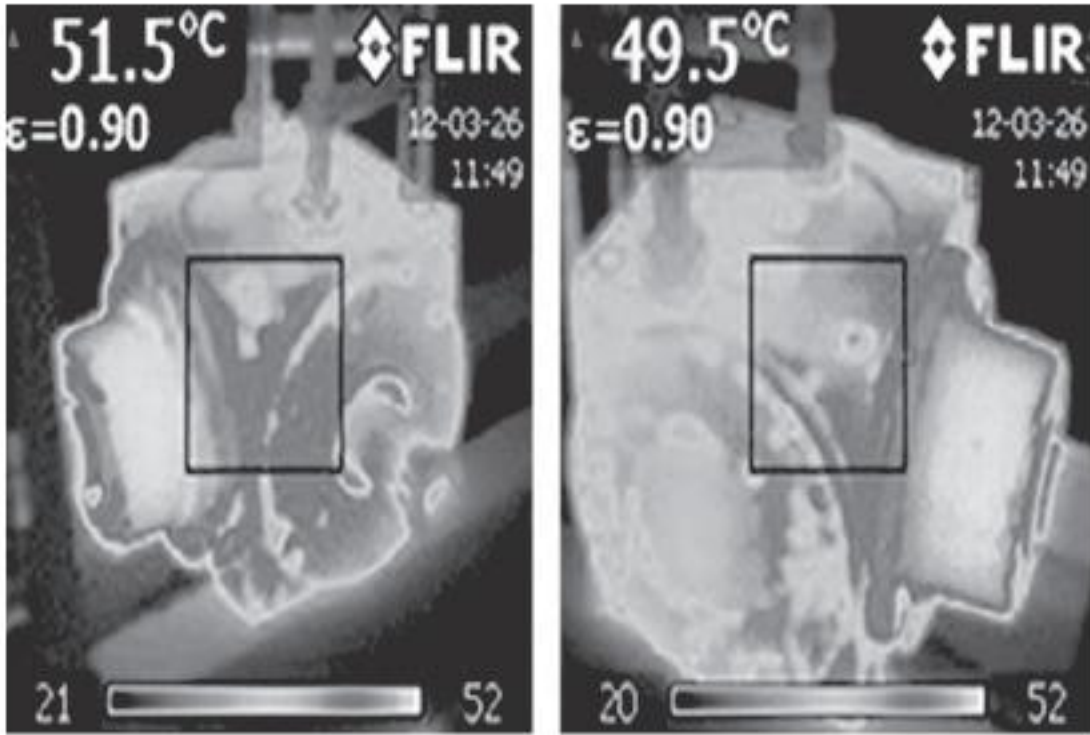
减速箱运行时的热图像检测



不用拆卸减速箱诊断过程中



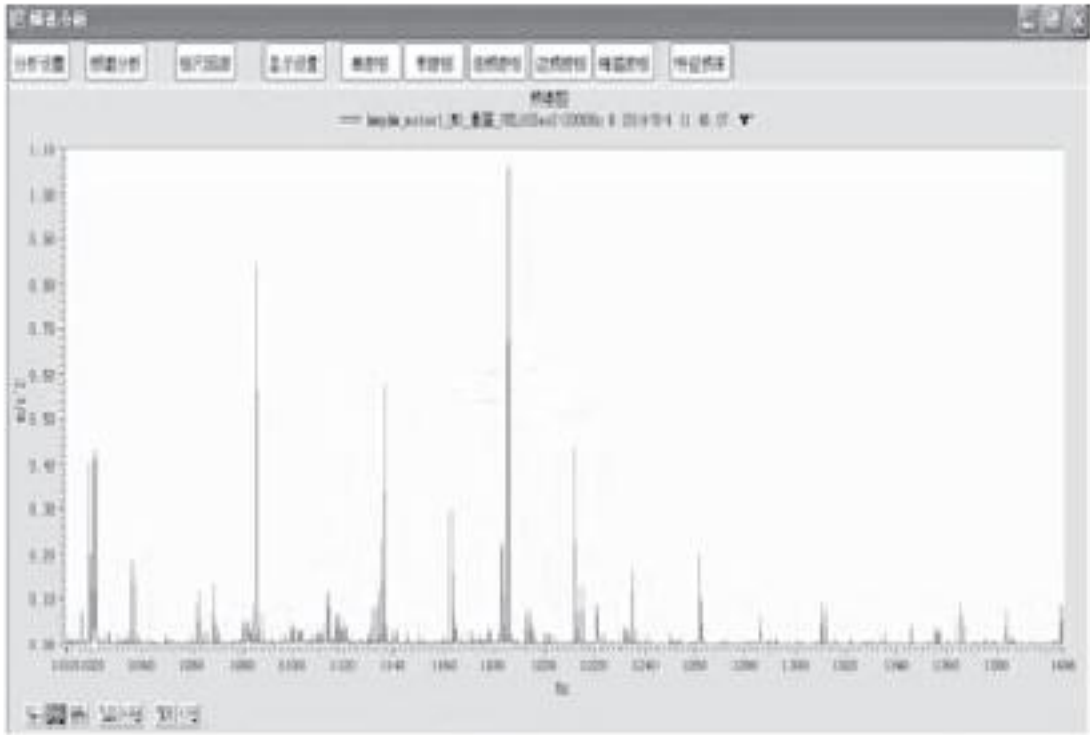
现场振动分析操作过程中



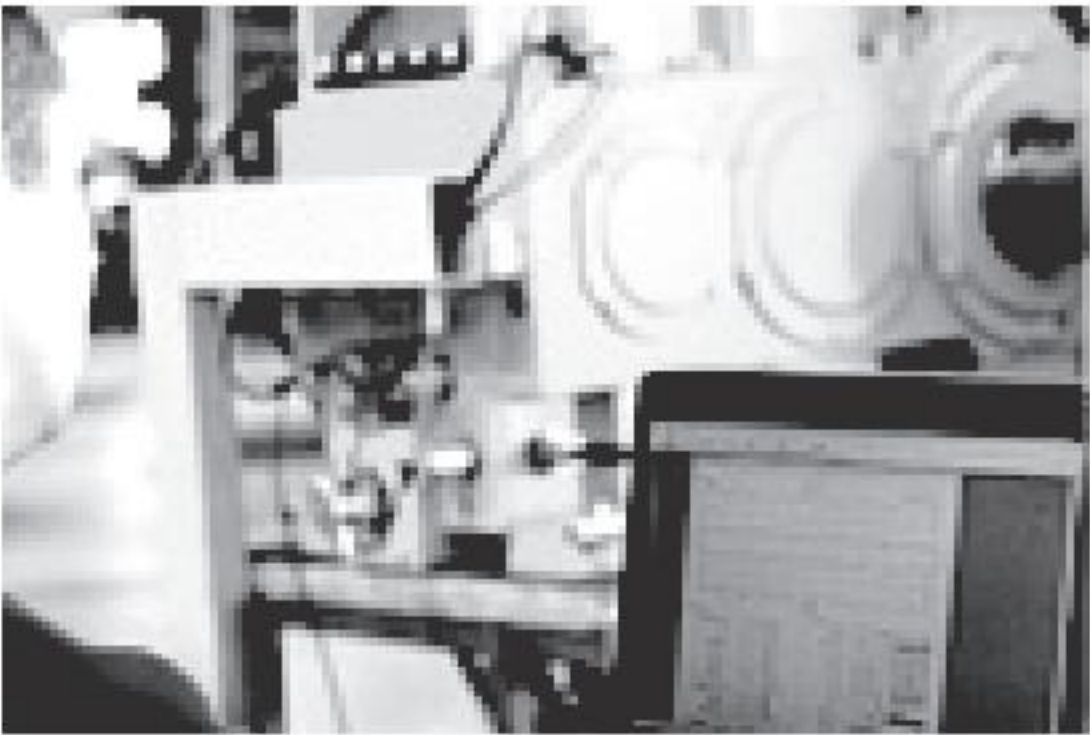
减速箱的热图像



带照片的检测文档



振动频谱分析报告



减速箱现场各项数据结果分析，提供
评估报告和维修建议

16 COUPLING PRODUCT SERIES

联轴器系列产品

Highly flexible coupling 高弹性联轴器



Torsionally rubber disc couplings
齿式高弹联轴器



Couplings with cardan shaft
盘式高弹联轴器



Shafts for test benches
双向高弹联接轴(测试台架用)



Tyre couplings
轮胎式高弹联轴器

Torque range 扭矩范围
15 nm – 100 000 nm

Flexible coupling 弹性联轴器 (橡胶体)



Claw couplings
爪型弹性联轴器



Torsionally flexible flywheel couplings
飞轮爪型弹性联轴器



Titoni couplings
梅花弹性联轴器



Pin couplings
弹性套柱销联轴器

Torque range 扭矩范围
20 nm – 1 000 000 nm

Rigid coupling 刚性联轴器



Grid couplings
蛇簧联轴器



Torsion stiff metallic couplings
膜片式联轴器



Gear couplings
鼓型齿联轴器



Universal joint couplings
万向联轴器

Torque range 扭矩范围
50 nm – 8 800 000 nm

17 GEAR BOX PRODUCT LINE

齿轮箱系列产品

Gear Box 齿轮减速机



Helical gear box
平行轴减速机



Bevel-helical gear box
直交轴减速机



Right angle gear box
圆锥齿轮减速机



Gear motor
齿轮马达

Torque range 扭矩范围
600 Nm – 1 500 000 Nm

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Single worm gear box
单级蜗轮蜗杆减速机



Double worm gear box
双级蜗轮蜗杆减速机

Torque range 扭矩范围
600 Nm – 500 000 Nm

Planetary gear box 行星减速机



Coaxial planetary gear box
直线型行星减速机



Orthogonal planetary gear box
直角型行星减速机



Winches planetary gear box
卷扬行星减速机

Torque range 扭矩范围
600 Nm – 1 500 000 Nm

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