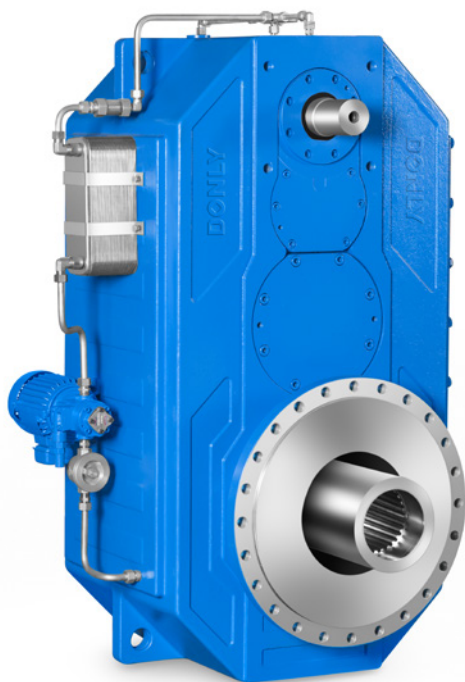


DONLY TRANSMISSION



东力齿轮箱

注塑机齿轮箱

GEAR UNITS FOR INJECTION MOLDING MACHINES

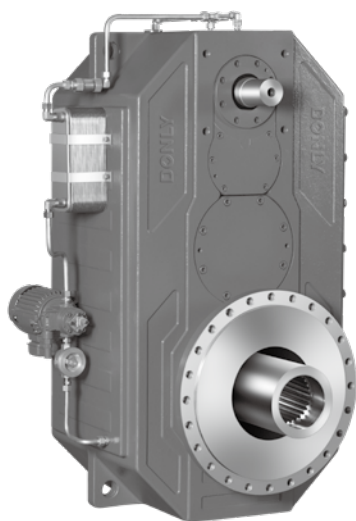
型号 Type DLG..A

版本 Edition 2021

DONLY

驱 动 无 限 可 能

DLG..A 注塑机齿轮箱 Gear Units For Injection Molding Machines



DONLY

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概述

1.1 概述

DLG 系列齿轮箱主要是为了驱动注塑机上的塑化螺杆而开发的。这些拥有平行轴的齿轮箱，由于其特殊的配置设计和制造，非常适合于高额定扭矩的传输以及承受高速运转，不仅噪音低而且提供超过 95% 以上的工作效率。

在输入（电动机）和输出（连接驱动螺杆和料仓）的黄金距离设计采用多级减速结构，使得空间足以整合包括电动机、齿轮箱、螺杆和料仓完整的系统以成“U”型设计，节省空间并能发挥最大效益。

1.2 产品特点

箱体

箱体材质采用高品质的铸铁，运用有限元分析，优化箱体的承载，有效的加强筋设计增加箱体的刚度，降低了噪音，并保证了齿轮和轴承的最佳运动状态。

齿轮

齿轮采用高品质低碳合金钢，经渗碳淬火及磨齿工艺，齿面硬度达 HRC58~62，精度达 6 级以上。加大的齿根圆角半径，适宜的轮齿修形，提高了齿轮接触性能，同时实现低噪声和高传动效率。

轴承

优质品牌轴承，确保运行的可靠性和高的运转效率。

法兰和轴

可直接取代注塑机传统的油压系统

为了便于 DLG 系列的齿轮箱安装于注塑机上，入轴法兰和入轴为标准配备，其连接方式与传统的油压马达系统相同。这种设计让客户能在短时间内不用修改任何主机上的零件即可将传统油压系统替换为电动机械传动方式。

另可依据客户的特殊要求，制造非标的出入轴法兰和出入轴的齿轮箱。

出入轴法兰采用铸铁制造，出轴采用优质调质钢制造。

Product Description

1.1 General introduction

DLG series gear units are mainly developed to drive plasticizing screws on injection molding machines. These parallel shaft gear units, designed and manufactured for their special configurations, are ideally suited for high torque transmission and high speed operation, with low noise and over 95% efficiency.

The golden distance between input shaft (electric motor) and output shaft (joint with driven-screw and silo) is designed by using an idler wheel structure to extended the center distance, in order to make room for a U-type complete system including motors, gear units, screws and silos , save space and maximize efficiency.

1.2 Product features

Housing

The housing is made of high quality cast iron. Finite element analysis is use to optimize the structure and bearing performance of the housing. Intensive reinforcing ribs are designed to increase the stiffness, reduce noise and ensure the best operation condition of gears and bearings.

Gears

All gears are made of high-quality low-carbon alloy steel. The hardness of the tooth surface will reach 58-62HRC by carburizing and quenching, gear grinding accuracy will reach over 6-class after grinding. The gear contact performance is improved by increasing root fillet radius and suitable gear modification, so as to achieve low noise and high efficiency.

Bearing

High quality brand bearing is used, ensuring the reliability and high efficiency of operation.

Flanges and drive shafts

interchangeable with the hydraulic system

In order to facilitate mounting of the gear boxes of the DLG series to the injection presses, the standard version is supplied complete with fange and drive-shaft having the same fittings which are normally used for the typical hydraulic motor systems. This construction enables the customer to prepare the electromechanical solution within a short time without any modification on the machine, thus having an alternative solution to the hydraulic version, On request, the gear units can be supplied with special fange and drive-shaft according to the customer's drawing. The connection fanges on the output are made of nodular cast-iron and the output shafts are made of tempered steel.

概述

使用系数

样本额定功率是依据使用系数 $KA=1$ 计算。为能选择最适当的齿轮箱，我们建议选择服务系数在 1.5–2 之间的齿轮箱。

润滑

DLG 系列的齿轮箱常用的安装方式为 A（齿轮箱是立式而输入轴是在上方，与设备螺杆平行）。

在安装方式为 A 时，齿轮箱仅需要飞溅润滑即可良好运行。但为控制齿轮箱温度，建议对 250–360 较大号的齿轮箱，选用电动泵进行强制润滑，此方式可降低齿轮箱内的油位高度，减小搅油损失，进而降低温度，而且可以确保输入轴的轴承得到充分的润滑。

齿轮箱必须在试机前加入适量的润滑油，油量以齿轮箱箱体的油位计为准。

第一次的更换润滑油必须在 300 个工作小时后进行（试运转时期）。之后每次更换润滑油必须在每 4000 个工作小时后进行。

请勿将不同品牌的合成润滑油混合使用；如需更换润滑油类型，更换前需彻底清洗齿轮箱。

冷却方式

电机泵和热交换器

齿轮箱运转产生的大量热量 (kcal) 必须被消除，在热功率不足的情况下，必须使用电机泵和热交换器。主要增加热交换效率的参数如下：

冷却水导入时的水温
每分钟的耗水量（升）
电机泵每分钟的送油量（升）
热交换器的规格

对上列任何一数据做调整即可解决现有的热功率问题，这是非常有效的方式而且可满足大多数不同的需求。

Product Description

Service factor

The sample rated power is calculated based on the service factor $KA=1$. In order to choose the most suitable gear units, we suggest to choose the gear units with a service factor between 1.5 and 2.

Lubrication

DLG series gear units are usually used in the mounting position A, in which the Gear units is vertical and the input shaft is parallel to the machine screw at the top).

In this mounting position A, the gear units can run well only by splash lubrication. However, in order to properly control the temperature of the gear units, it is recommended to forcefully lubricate the gear units of larger size from 250 to 360 by using an electric pump. This method can reduce the oil level, and then reduce the Churning loss and temperature. Moreover this method can ensure that the input shaft bearings are fully lubricated.

Appropriate amount of lubricant oil must be added before testing the gear units. The oil amount should be in accordance with the oil level gauge.

The first time oil changing must be carried out after 300 operation hours (run-in period). The next oil-changes must be done every 4000 operation hours.

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear units a through clean-out.

Type of cooling

Electric pump and heat exchanger

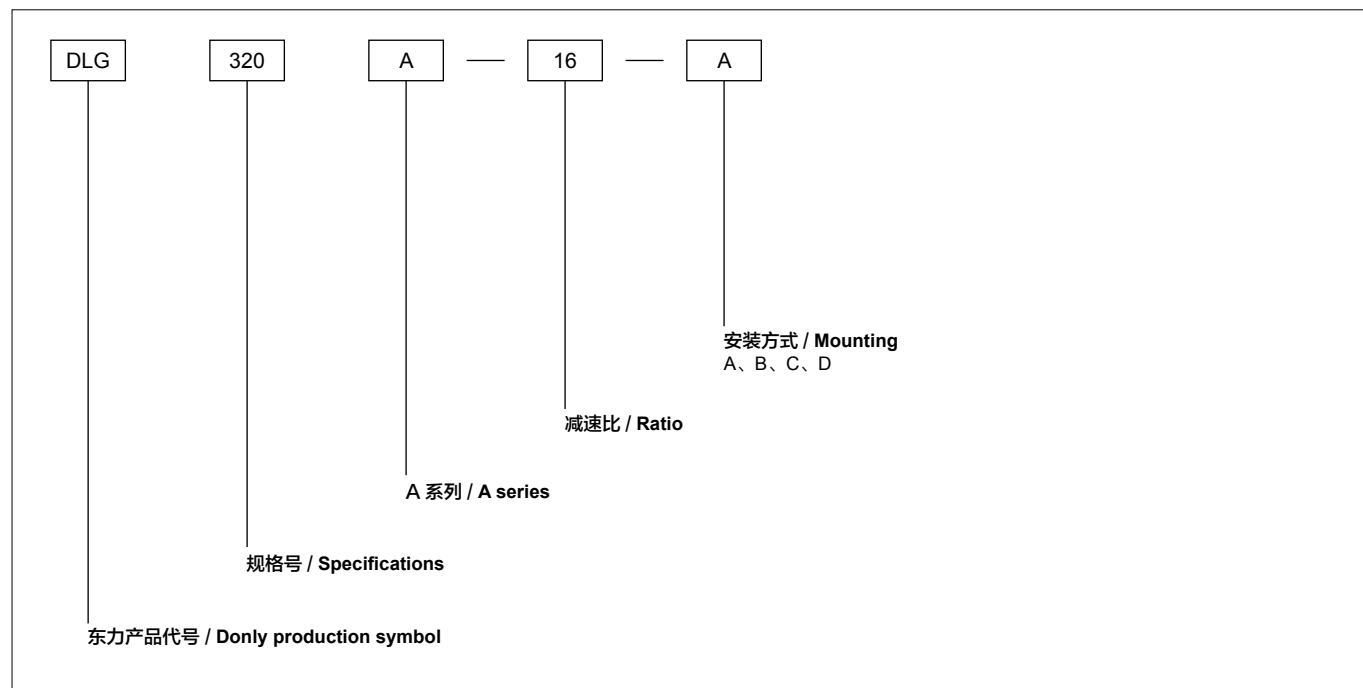
Sometimes a large heat quantity (kcal) must be dissipated. For this purpose, an electric pump and an external heat-exchanger must be used. The main parameters for increasing the heat dissipation are as follows:

-Water intake temperature
-Water quantity in liters for minute
-Delivery rate in liters for minute of the oil pump
-Size of the heat exchanger

Any intervention on these parameters can resolve any existing thermal problems. This solution is very efficient and satisfies the most different requirements.

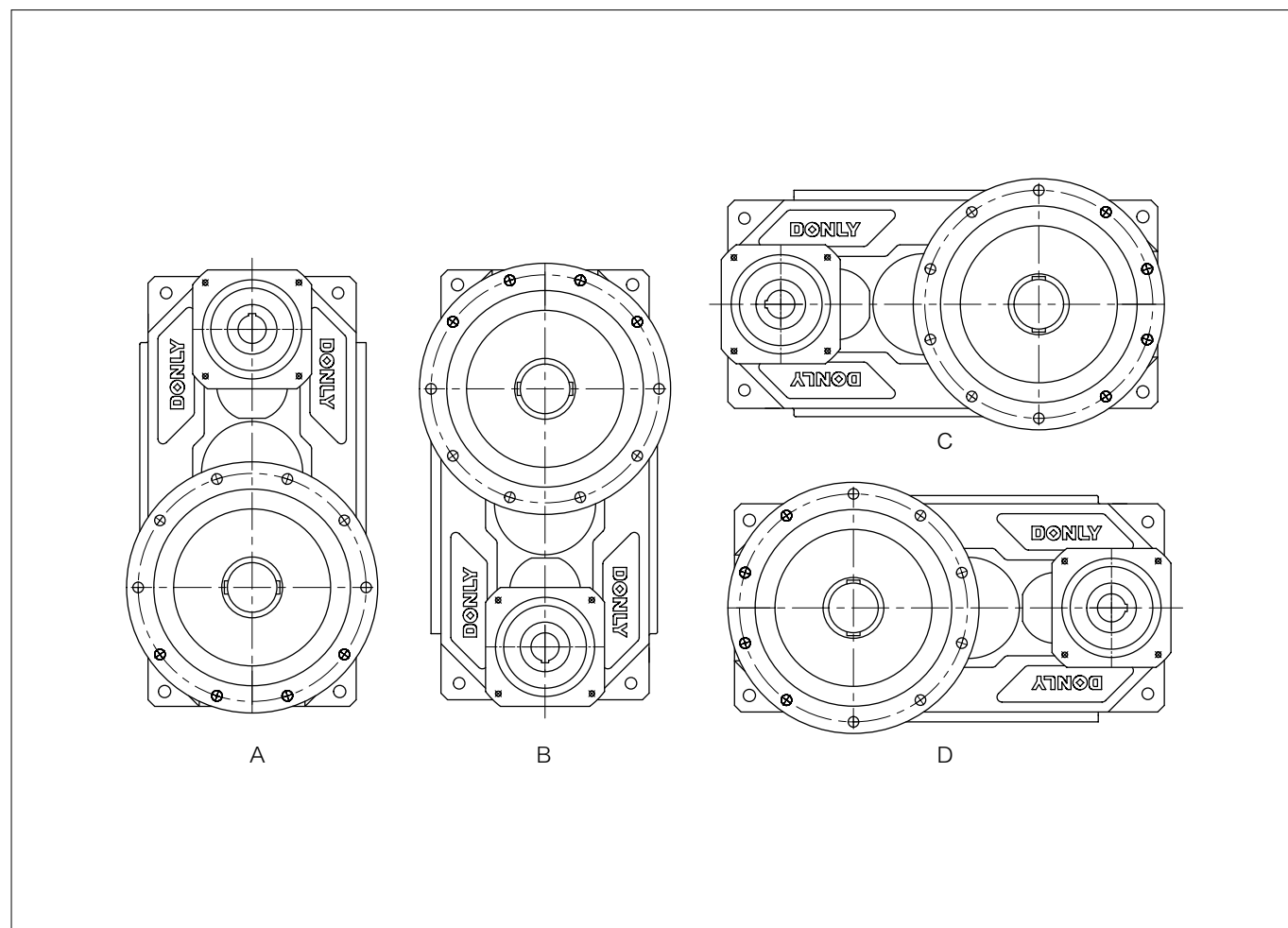
2.1 型号表示方法

2.1 Type designation



2.2 安装方式

2.2 Mounting arrangement



功率及额定扭矩

Power&Nominal Torque

2.3 功率及额定扭矩

2.3 Power&nominal torque

n1	齿轮箱规格 / Gear unit sizes																			
	200A					225A					250A					320A				
	i _n	n2	Mn	Pn	Pt	i _n	n2	Mn	Pn	Pt	i _n	n2	Mn	Pn	Pt	i _n	n2	Mn	Pn	Pt
rpm		rpm	Nm	kW	kW		rpm	Nm	kW	kW		rpm	Nm	kW	kW		rpm	Nm	kW	kW
2600	6.3	413	8395	374	51	6.3	413	11990	513	67	6.3	413	24254	1026	108	6.3	413	30490	1351	139
2200		349	8658	326	51		349	12365	448	67		349	25011	895	108		349	31443	1179	139
1800		286	8701	268	51		286	12427	368	67		286	25138	736	108		286	31602	970	139
1500		238	8745	225	51		238	12490	308	67		238	25264	617	108		238	31761	812	139
2600	8	325	11010	374	51	8	325	14616	513	67	8	325	29915	1026	108	8	325	40119	1351	139
2200		275	11353	326	51		275	15073	448	67		275	30849	895	108		275	41373	1179	139
1800		225	11411	268	51		225	15149	368	67		225	31005	736	108		225	41582	970	139
1500		188	11468	225	51		188	15225	308	67		188	31161	617	108		188	41791	812	139
2600	10	260	12697	353	51	10	260	16949	479	67	10	260	33398	909	108	10	260	48976	1351	139
2200		220	13094	308	51		220	17478	418	67		220	34441	793	108		220	50507	1179	139
1800		180	13160	253	51		180	17568	343	67		180	34615	652	108		180	50762	970	139
1500		150	13226	212	51		150	17656	288	67		150	34789	546	108		150	51017	812	139
2600	12.5	208	12716	270	51	12.5	208	17482	380	67	12.5	208	34318	783	108	12.5	208	51134	1160	139
2200		176	13114	236	51		176	18029	332	67		176	35391	683	108		176	52733	1012	139
1800		144	13180	194	51		144	18120	273	67		144	35569	562	108		144	53000	833	139
1500		120	13245	162	51		120	18211	229	67		120	35748	471	108		120	53266	697	139
2600	16	163	12771	222	51	16	163	17618	296	67	16	163	34766	596	108	16	163	50894	876	139
2200		138	13170	194	51		138	18168	258	67		138	35852	520	108		138	52485	765	139
1800		113	13236	159	51		113	18260	212	67		113	36033	427	108		113	52750	629	139
1500		94	13304	133	51		94	18352	178	67		94	36214	358	108		94	53015	527	139
2600	20	130	12959	179	51	20	130	17553	233	67	20	130	35650	475	108	20	130	52142	723	139
2200		110	13364	156	51		110	18101	204	67		110	36764	415	108		110	53772	631	139
1800		90	13432	129	51		90	18192	167	67		90	36950	341	108		90	54043	519	139
1500		75	13500	108	51		75	18284	140	67		75	37135	286	108		75	54314	435	139
2600	25	104	12474	137	51	25	104	17552	188	67	25	104	34607	394	108	25	104	51876	559	139
2200		88	12864	120	51		88	18100	164	67		88	35689	344	108		88	53497	488	139
1800		72	12928	98	51		72	18192	135	67		72	35869	283	108		72	53767	401	139
1500		60	12994	82	51		60	18283	113	67		60	36049	237	108		60	54037	336	139
2600	31.5	83	12833	114	51	31.5	83	17662	151	67	31.5	83	34909	299	108	31.5	83	51004	453	139
2200		70	13324	99	51		70	18224	132	67		70	36000	261	108		70	52598	395	139
1800		57	13302	82	51		57	18316	109	67		57	36183	214	108		57	52863	325	139
1500		48	13368	68	51		48	18408	91	67		48	36364	179	108		48	53129	272	139
2600	40	65	12886	89	51	40	65	17765	118	67	40	65	35138	235	108	40	65	51304	355	139
2200		55	13289	78	51		55	18320	103	67		55	36236	205	108		55	52969	309	139
1800		45	13356	64	51		45	18412	85	67		45	36419	168	108		45	53236	254	139
1500		37.5	13423	53	51		37.5	18505	71	67		37.5	36602	141	108		37.5	53505	213	139
2600	50	52	12979	69	51	50	52	18166	100	67	50	52	35314	195	108	50	52	51761	279	139
2200		44	13385	60	51		44	18733	87	67		44	36417	171	108		44	53379	243	139
1800		36	13452	49	51		36	18828	72	67		36	36601	140	108		36	53648	200	139
1500		30	13519	41	51		30	18922	60	67		30	36785	117	108		30	53917	167	139

注意:

Pt 值是在室温 30℃、连续运转时所能承受的最大热功率，若热功率大于表列数据时，则必须选用强制冷却系统。

Pn 值为额定扭矩，是在安全系数等于 1 的基础上所计算出的数值。选型时请保证安全系数大于 1.5，若入轴转速 n1 高于 2600rpm，请与我们技术部门联络。

Attention:

Maximum input power at ambient temperature of 30℃ . If a higher input power is required, please ask for forced cooling.

The indicated Pn is the nominal power calculated with factor SF(AGMA)=1. To calculate the maximum transmittable power please consider service factor SF(AGMA)>1.5. For input speed higher than 2600 rpm please contacts up.

2.3 功率及额定扭矩

2.3 Power&nominal torque

n1	齿轮箱规格 / Gear unit sizes														
	360A					400A (敬请垂询 / On request)					450A (敬请垂询 / On request)				
	i _N	n2	Mn	Pn	Pt	i _N	n2	Mn	Pn	Pt	i _N	n2	Mn	Pn	Pt
rpm		rpm	Nm	kW	kW		rpm	Nm	kW	kW		rpm	Nm	kW	kW
2200	6.3	349	42777	1631	170	6.3	349	64328	2412	211	6.3	349	84172	3154	174
1800		286	42993	1341	170		286	64653	1984	211		286	84596	2594	274
1500		238	43210	1123	170		238	64978	1661	211		238	85022	2172	274
2200	8	275	56190	1631	170	8	275	80167	2412	211	8	275	106099	3154	274
1800		225	56474	1341	170		225	80571	1984	211		225	106635	2594	274
1500		188	56758	1123	170		188	80976	1661	211		188	107170	2172	274
2200	10	220	70650	1631	170	10	220	103718	2364	211	10	220	137791	3154	274
1800		180	71008	1341	170		180	104243	1994	211		180	138487	2594	274
1500		150	71364	1123	170		150	104767	1628	211		150	139182	2172	274
2200	12.5	176	73384	1398	170	12.5	176	104635	1924	211	12.5	176	131415	2542	274
1800		144	73754	1150	170		144	105164	1582	211		144	132079	2090	274
1500		120	74125	963	170		120	105692	1325	211		120	132742	1750	274
2200	16	138	75671	1068	170	16	138	104276	1475	211	16	138	143847	2167	274
1800		113	76053	878	170		113	104802	1213	211		113	144574	1782	274
1500		94	76435	736	170		94	105329	1016	211		94	145299	1493	274
2200	20	110	73234	885	170	20	110	106987	1212	211	20	110	159150	1792	274
1800		90	73605	728	170		90	107528	997	211		90	159953	1474	274
1500		75	73974	609	170		75	108068	835	211		75	160757	1234	274
2200	25	88	74040	671	170	25	88	103610	994	211	25	88	148941	1343	274
1800		72	74414	552	170		72	104134	818	211		72	149692	1104	274
1500		60	74789	462	170		60	104657	685	211		60	150444	925	274
2200	31.5	70	76167	551	170	31.5	70	104896	751	211	31.5	70	145931	1112	274
1800		57	76551	453	170		57	105426	618	211		57	146669	914	274
1500		48	76936	380	170		48	105956	517	211		48	147405	766	274
2200	40	55	76809	427	170	40	55	107553	652	211	40	55	147155	873	274
1800		45	77197	351	170		45	108096	536	211		45	147808	718	274
1500		37.5	77585	294	170		37.5	108639	449	211		37.5	148641	601	274
2200	50	44	75646	328	170	50	44	100340	466	211	50	44	148198	674	274
1800		36	76028	269	170		36	100847	383	211		36	148947	555	274
1500		30	76410	226	170		30	101354	321	211		30	149696	465	274
2200	63	35	74131	273	170	63	35	106929	378	211	63	35	148855	560	274
1800		29	74505	225	170		29	107468	311	211		29	149608	461	274
1500		24	74880	188	170		24	108009	260	211		24	150359	386	274

注意:

Pt 值是在室温 30℃、连续运转时所能承受的最大热功率，若热功率大于表列数据时，则必须选用强制冷却系统。

Pn 值为额定扭矩，是在安全系数等于 1 的基础上所计算出的数值。选型时请保证安全系数大于 1.5，若入轴转速 n1 高于 2600rpm，请与我们技术部门联络。

Attention:

Maximum input power at ambient temperature of 30℃ . If a higher input power is required, please ask for forced cooling.

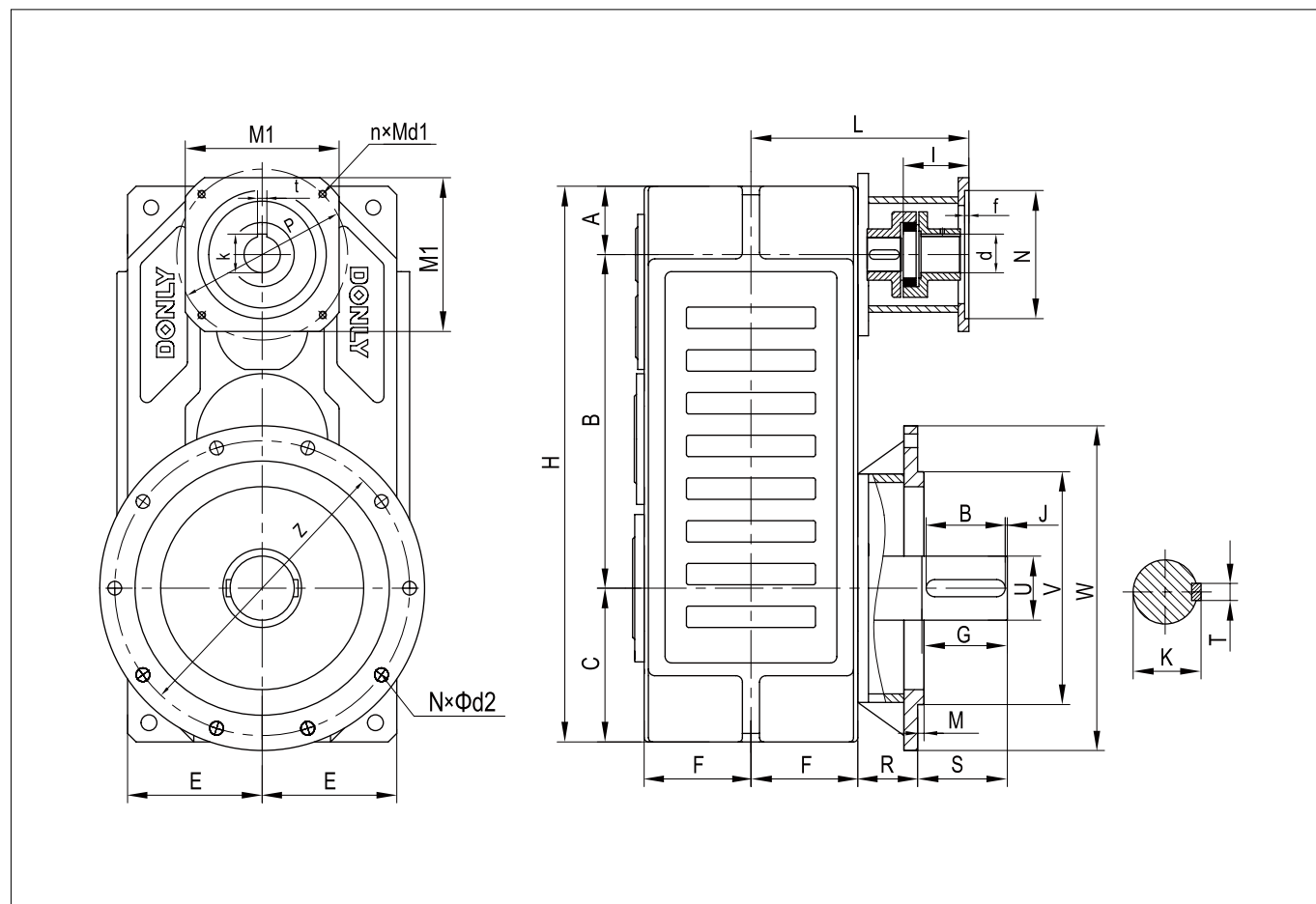
The indicated Pn is the nominal power calculated with factor SF(AGMA)=1. To calculate the maximum transmittable power please consider service factor SF(AGMA)>1.5. For input speed higher than 2600 rpm please contacts up.

外形尺寸

Outline Dimensions

3.1 外形尺寸

3.1 Outline dimensions



尺寸 / Size	A	B	C	E H10	F	H	Weight / kg	Oil / L
200A	100	485	225	200	165	810	500	28
225A	112	545	250	225	180	907	700	41
250A	160	650	350	335	225	1160	1200	85
320A	160	781	360	315	250	1301	1500	100
360A	180	867	400	355	285	1447	2000	170

尺寸 / Size	M1	P	n×Md1	N	f	d	t	k	l	L
200A	264	300	4×M16	250	6	55	16	59.3	114	365
225A	360	400	4×M18	300	7	85	22	90.4	140	440
250A	360	400	4×M18	300	10	85	22	90.4	145	493
320A	360	400	4×M18	300	7	85	22	90.4	155	510
360A	360	400	4×M18	300	8	85	22	90.4	180	600

尺寸 / Size	W	V	Z	N×Φd2	R	S	M	U	T	K	B	J	G
200A	470	381	419	5×Φ22	105	165	10	85	24	93	125	5	140
225A	570	457	521	5×Φ20	150	187	10	85	24	93	140	5	152
250A	690	501	630	7×Φ32	140	170	10	100	28	106	170	5	190
320A	760	545	690	10×Φ32	140	210	15	150	40	159	185	5	200
360A	760	545	690	10×Φ32	150	220	10	150	40	159	195	5	210

注意:

上述重量为参考数据, 会因减速比、法兰大小和其他的配备不同而改变。
上表所列油量是依据安装形式 A 和飞溅润滑的齿轮箱为基准, 其他安装方式所需油量可依方向的不同而变化, 也可因强制润滑使用轴端或电机泵而减少。

Attention:

The weights have to be considered a guideline and may vary according to the reduction ratio and the accessories required.
The oil quantity has to be considered as reference and is applicable for gear units in mounting position A and splash lubrication. The quantity varies according to the mounting position and decreases if the lubrication is of the forced type when a pump or a motor-driven pump is used.

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