

DONLY TRANSMISSION



东力齿轮箱

连铸专用齿轮箱

GEAR UNITS FOR CONTINUOUS CASTING MACHINERY

型号 Type DLLJJ / DLLZ

版本 Edition 2021

DONLY

驱 动 无 限 可 能

拉矫机齿轮箱

Gear Units For Withdrawal Straightening Unit



1. 拉矫机齿轮箱

Gear Units For Withdrawal Straightening Unit

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1.1 概述

拉矫机是连铸设备中的核心设备,其作用是将引锭杆送入结晶器,将铸坯从结晶器内拉出,并能实现将完全凝固或带液相的铸坯的矫直,保证矫直过程不影响铸坯质量。电机通过齿轮箱实现降速并完成输出转矩的转换,齿轮箱驱动拉矫辊实现引锭杆和铸坯移动。在连铸生产过程中,拉矫机一旦出现故障直接影响生产顺利进行,造成连铸生产的中断。齿轮箱的损坏是影响拉矫机使用寿命的主要因素之一。齿轮箱损坏的因素主要有齿轮疲劳强度不足、热功率不足和润滑不充分。为保障连铸线的顺利运行,提高生产效率,我公司开发了DLLJJ、DLLJL、DLLJT系列拉矫机专用齿轮箱。

1.2 主要特点

该类齿轮箱结构紧凑、体积小、重量轻,承载能力高、低噪音,低震动、运作平稳。箱体采用立式剖分结构,维修制造方便,外形美观;箱体采用焊接箱体,焊后进行退火处理,粗加工后进行时效处理,箱体应力消除彻底,长期使用不变形。箱体内部设有冷却水腔,采用工业用水循环冷却,从而大大改善了冷却效果,降低了齿轮箱工作温度。采用了多项创新技术、使整机运转的可靠性和寿命得到提高,传递扭矩增大,润滑得到改善。

齿轮材料采用优质低碳合金钢,渗碳淬火,齿面硬度 HRC57+4,齿轮采用磨齿工艺。

1.3 使用条件

高速轴转速不大于 1500 rpm。

齿轮箱齿轮传动圆周速度不大于 20m/s。

低于 0℃时,启动前润滑油应预热。

冷却水工作压力为 0.6 MPa,试验压力为 0.9 MPa,冷却水进口水温 ≤ 30℃。

1.1 General notes

Tension leveler is the core equipment of continuous casting equipment. Its function is to send the dummy bar into the mold, pull the slab out of the mold, and straighten the slab with complete solidification or liquid phase, so as to ensure that the straightening process does not affect the slab quality. The speed reduction of the motor is realized through the reducer and the conversion of output torque is completed. The reducer drives the tension straightening roller to move the dummy bar and billet. In the process of continuous casting production, once the tension leveler fails, it will directly affect the smooth progress of production and cause the interruption of continuous casting production. The damage of reducer is one of the main factors affecting the service life of tension leveler. The main damage factors of reducer are insufficient gear fatigue strength, insufficient thermal power and insufficient lubrication. In order to ensure the smooth operation of continuous casting line and improve production efficiency, our company has developed special reducers for DLLJJ, DLLJL and DLLJT series tension levelers.

1.2 Main features

This kind of reducer has the advantages of compact structure, small volume, light weight, high bear capacity, low noise, low vibration and stable operation. The box adopts vertical split structure, which is convenient for maintenance and manufacture and good in appearance; The housing is welded, annealed after welding and aging after rough machining. The stress of the housing is completely eliminated and will not deform after long-term use. A cooling water chamber is arranged inside the housing, which is cooled by industrial water circulation, so as to greatly improve the cooling effect and reduce the working temperature of the reducer. A number of innovative technologies are adopted to improve the reliability and service life of the whole machine, increase the transmission torque and improve the lubrication.

The gear is made of high-quality low-carbon alloy steel, carburized and quenched, and the tooth surface hardness is HRC57+4. The gear adopts gear grinding process.

1.3 Work conditions

The speed of high-speed shaft shall not be more than 1500 rpm.

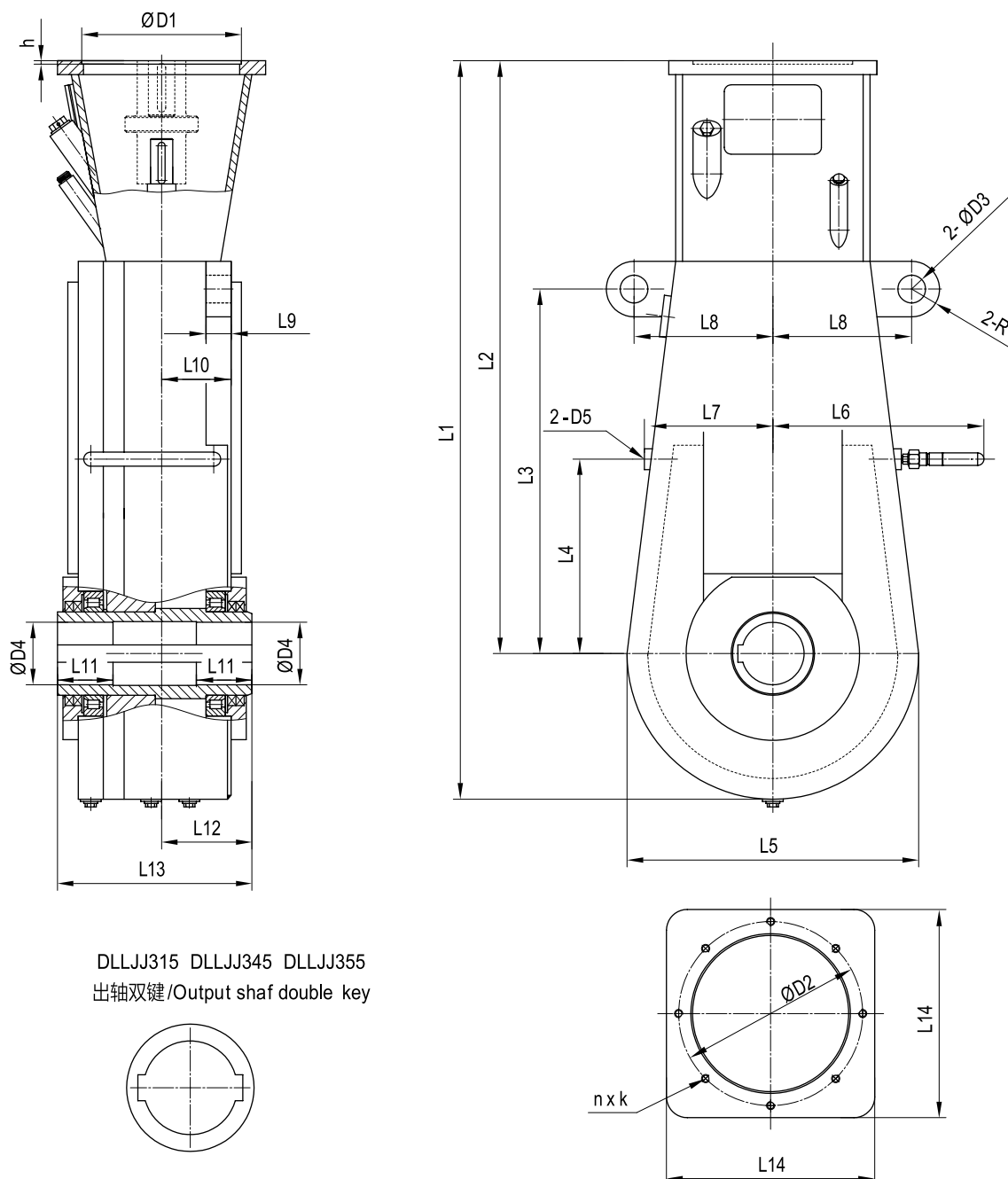
The peripheral speed of gear transmission of reducer shall not be more than 20m/s.

When the temperature is lower than 0℃, the lubricating oil shall be preheated before startup.

The working pressure of cooling water is 0.6 MPa, the test pressure is 0.9 MPa, and the inlet water temperature should not exceed 30℃.

2.1 DLLJJ 拉矫机齿轮箱技术性能及外形尺寸

2.1 DLLJJ technical performance and outline dimension of reducer



注：(1) 出轴、入轴键槽的尺寸按国家相关标准执行（GB1095）；

Note: (1) The dimensions of the keyways on the input shaft and output shaft shall be in accordance with the relevant national standards (GB1095).

(2) 润滑方式为飞溅润滑。

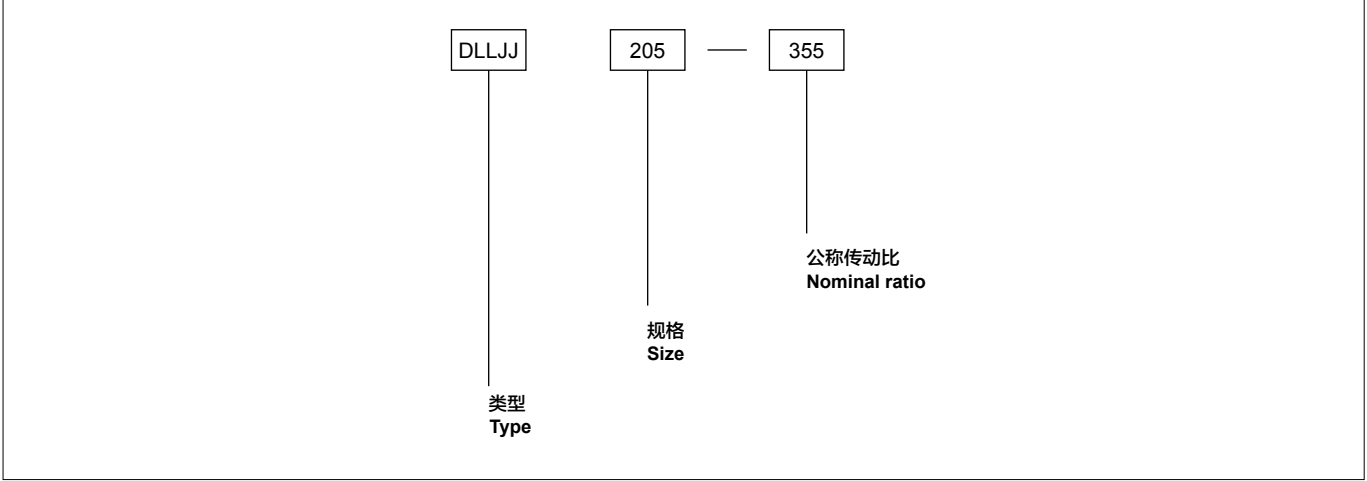
(2) The lubrication method is splash lubrication.

2.1 DLLJJ 拉矫机齿轮箱技术性能及外形尺寸

2.1 DLLJJ technical performance and outline dimension of reducer

型号示例

Model example



技术性能

Technical performance

规格 Size	205	225	260	315	345	355
最大输出转矩 Maximum output torque Nm	15470	21400	25200	36000	42500	52500
公称传动比 Nominal ratio	355 395 430 310	460 470	375 455	500	670 755	850

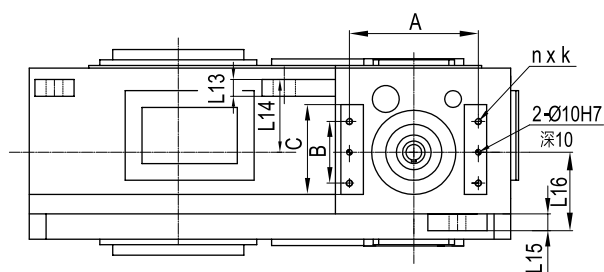
外形尺寸

Outline dimensions

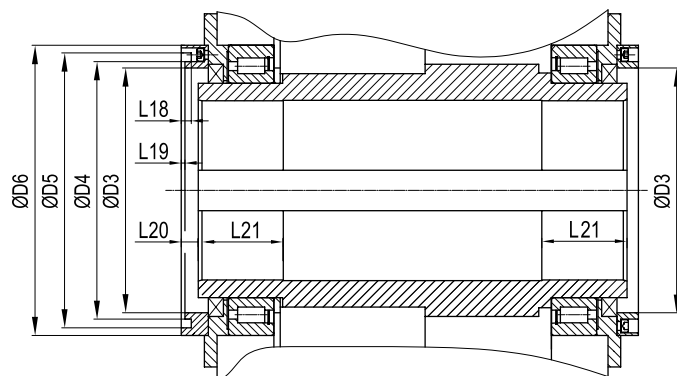
规格 Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
205	1065	855	525	280	420	305	185	200	36	100	80	130
225	1150	910	545	295	450	340	205	200	40	130	90	162
260	1190	935	605	250	510	370	230	220	40	130	105	165
315	1430	1130	500	370	600	370	270	260	50	135	115	190
345	1450	1150	755	500	700	370	275	280	40	135	125	190
355	1700	1310	890	710	700	420	320	300	50	167.5	135	200

规格 Size	L13	L14	D1(H7)	D2	D3(H7)	D4(H7)	进、出水口 Intake,outlet D5	h	nxk	R	润滑油量 lubricating oil quantity (L)	重量 Weight (kg)
205	280	300	230	265	40	90	Rc3/4	6	8xM12	40	25	350
225	324	300	230	265	40	110	Rc3/4	6	8xM12	40	30	430
260	330	300	230	265	40	130	Rc3/4	6	8xM12	40	35	490
315	380	350	250	300	50	140	Rc3/4	6	8xM12	50	80	710
345	380	350	250	300	55	158	Rc1	6	8xM12	60	80	880
355	400	350	250	300	70	168	Rc1	6	8xM12	75	120	1380

2.2 DLLJL technical performance and outline dimension of reducer



出轴局部/Section of output shaft structure



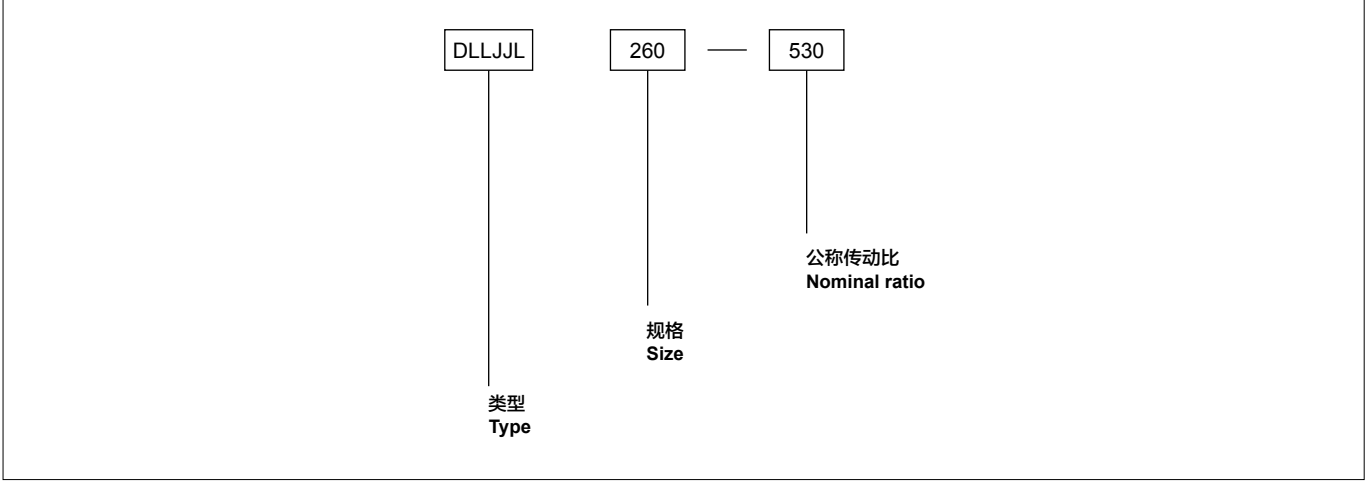
(2) The lubrication method is splash lubrication.

2.2 DLLJJL 拉矫机齿轮箱技术性能及外形尺寸

2.2 DLLJJL technical performance and outline dimension of reducer

型号示例

Model example



技术性能

Technical performance

规格 Size	260	280	315
最大输出转矩 Maximum output torque Nm	19500	38000	45500
公称传动比 Nominal ratio	530	540 830	700

外形尺寸

Outline dimensions

规格 Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
260	900	60	570	455	295	205	378	840	189	575	78	140	30
280	900	60	570	425	280	200	420	890	189	572	98	140	30
315	993	60	608	490	305	225	470.13	995	189			140	30

规格 Size	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	d1(k6)	D1(H7)	D2(H7)
260	150			407	8	3	13.5	90	190	380	28	40	100
280	130	30	140	367	8	3	13.5	115	170	340	28	40	120
315	130			391	8	3	13.5	125	182	364	28	40	130

规格 Size	D3	D4	D5	D6	进、出水口 Intake, outlet D7	A	B	C	nxk	R	润滑油量 lubricating oil quantity(L)	重量 Weight(kg)
260	174	184	198	210	Rc1/2					40	95	660
280	194	204	218	230	Rc1/2	230	110	160	4xM12	40	100	680
315	204	214	228	315	Rc1/2	230	110	160	4xM12	40	125	800

拉矫机齿轮箱技术性能及外形尺寸

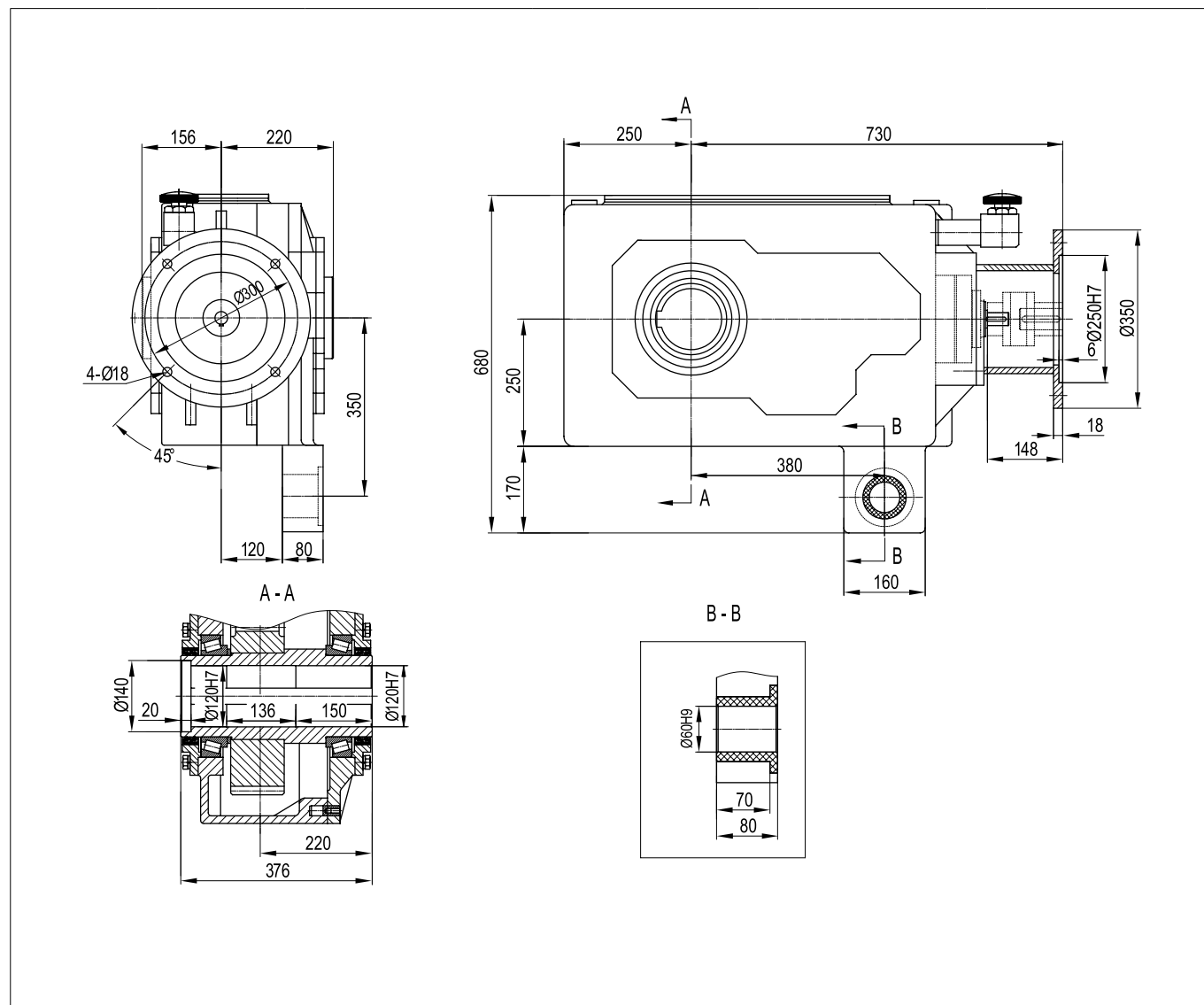
Technical Performance And Outline Dimension Of Reducer

2.3 DLLJJT 拉矫机齿轮箱技术性能及外形尺寸

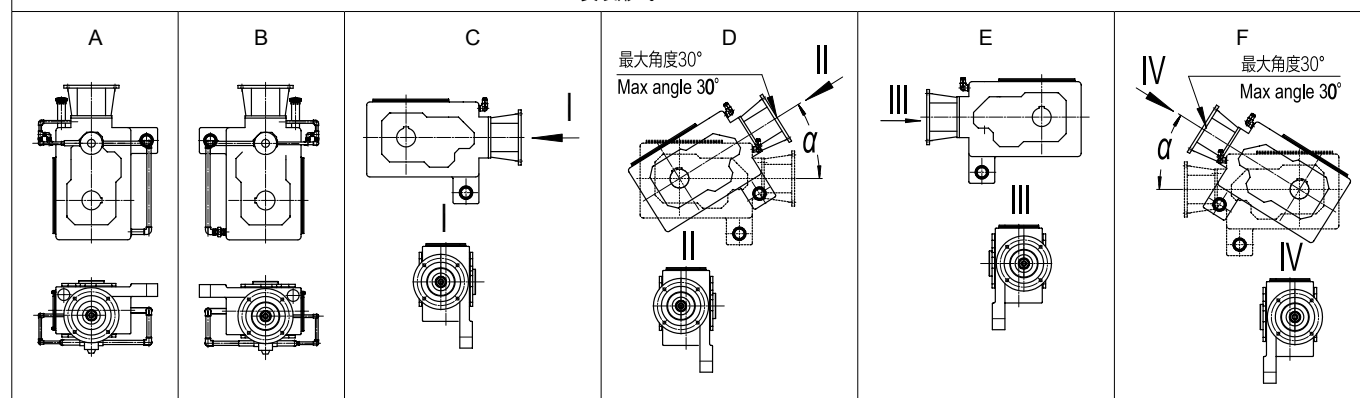
2.3 DLLJJT technical performance and outline dimension of reducer

2.3.1 DLLJJT240 拉矫机齿轮箱技术性能及外形尺寸

2.3.1 DLLJJT240 technical performance and outline dimension of reducer



安装形式 / Installation from



注:

- (1) 出轴、入轴键槽的尺寸按国家相关标准执行 (GB1095);
- (2) 安装形式 C、D、E、F 润滑方式为飞溅润滑, A、B 润滑方式为喷油润滑;
- (3) 齿轮箱无水冷却结构; D、F 两种安装形式的安装角度订货时需特殊注明。

Note:

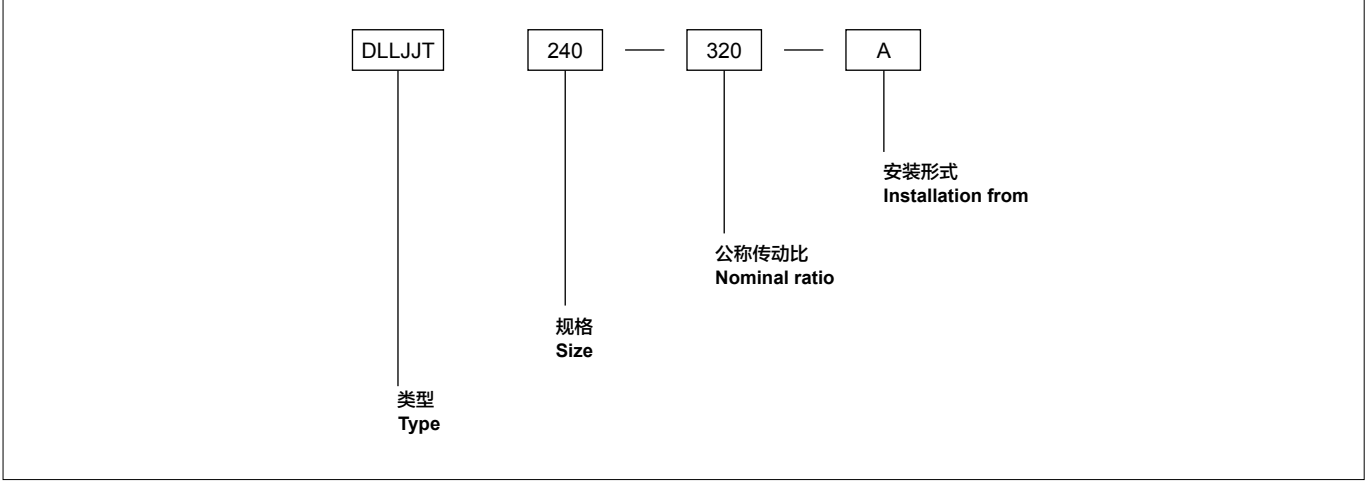
- (1) The dimensions of the keyways on the input shaft and output shaft shall be in accordance with the relevant national standards (GB1095).
- (2) Installation form C, D, E, F is splash lubrication, the lubrication mode A, B is oil spray lubrication.
- (3) The reducer has no water cooling structure; D, F the installation angle of the two installation forms shall be specially indicated when ordering.

2.3.1 DLLJJT240 拉矫机齿轮箱技术性能及外形尺寸

2.3.1 DLLJJT240 technical performance and outline dimension of reducer

型号示例

Model example



技术性能

Technical performance

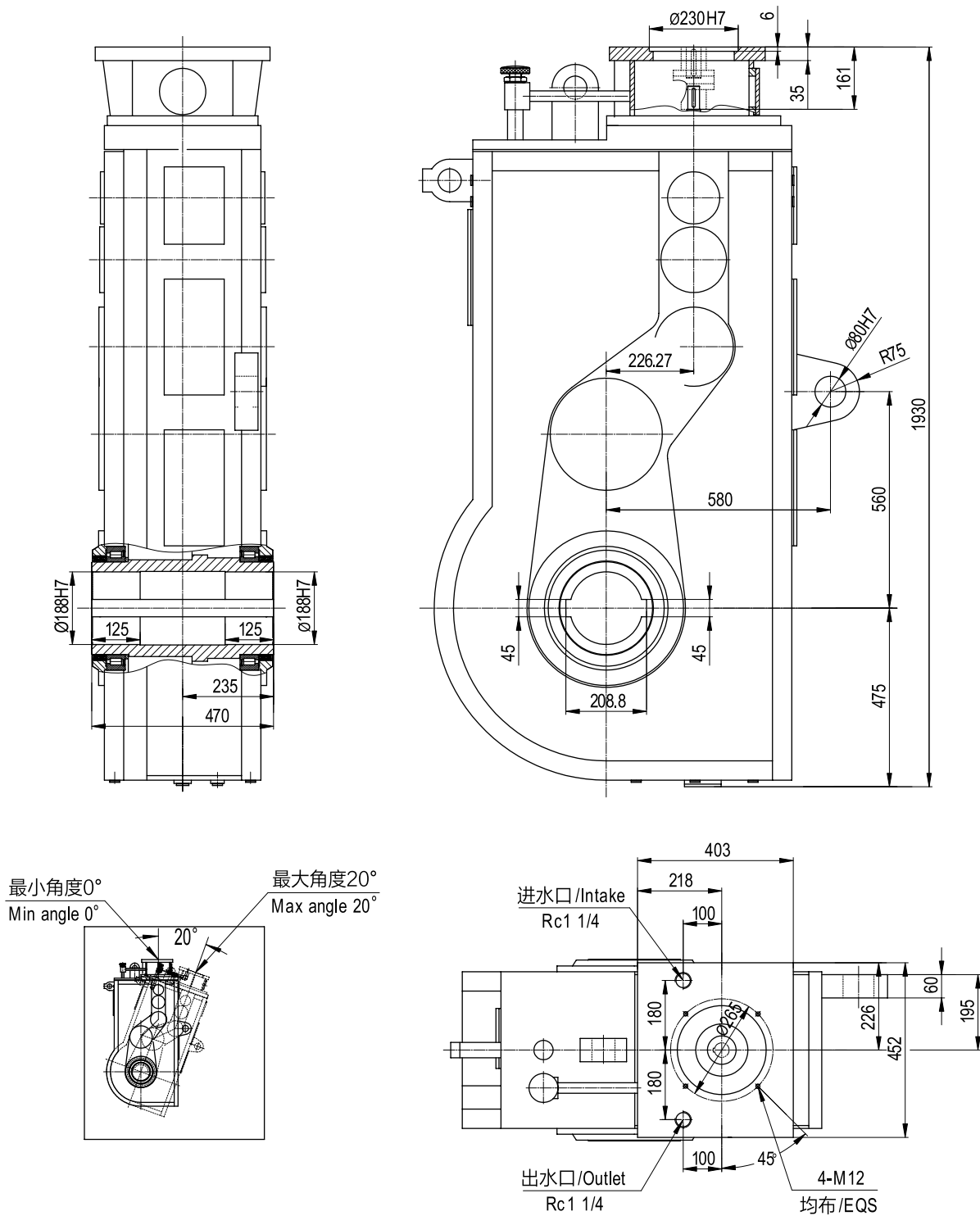
输入转速 Input speed r/min	970	970	970	970
公称传动比 Nominal ratio	220	250	280	320
最大输出转矩 Maximum output torque Nm	28000	28000	28000	28000
重量 Weight kg	600			

拉矫机齿轮箱技术性能及外形尺寸

Technical Performance And Outline Dimension Of Reducer

2.3.2 DLLJJT450 拉矫机齿轮箱技术性能及外形尺寸

2.3.2 DLLJJT450 technical performance and outline dimension of reducer



注：(1) 出轴、入轴键槽的尺寸按国家相关标准执行（GB1095）；

Note: (1) The dimensions of the keyways on the input shaft and output shaft shall be in accordance with the relevant national standards (GB1095).

(2) 润滑方式为飞溅润滑。

(2) The lubrication method is splash lubrication.

拉矫机齿轮箱技术性能及外形尺寸

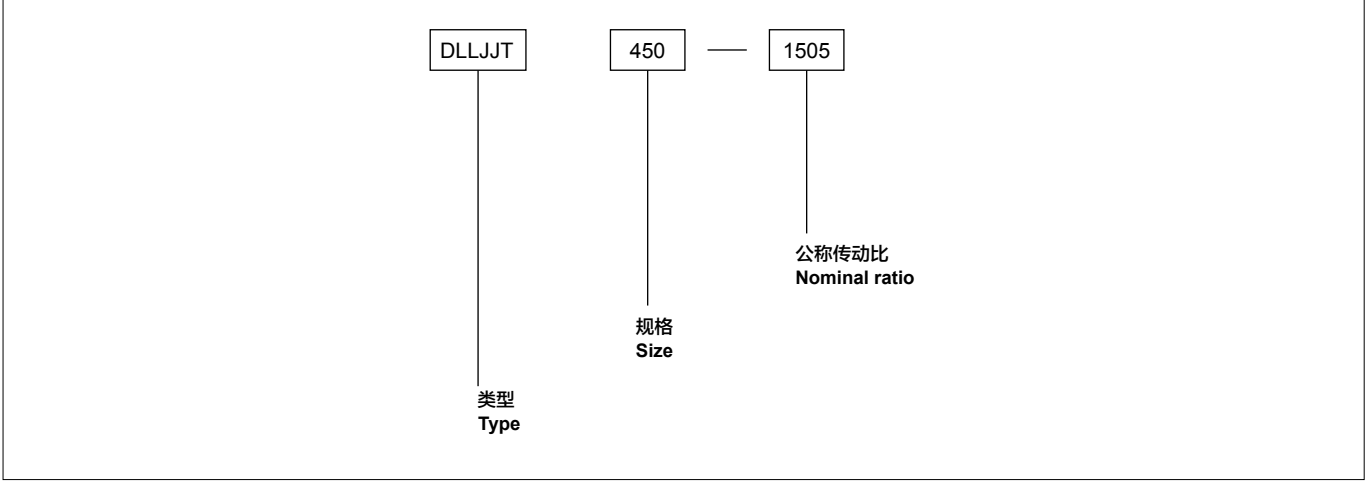
Technical Performance And Outline Dimension Of Reducer

2.3.2 DLLJJT450 拉矫机齿轮箱技术性能及外形尺寸

2.3.2 DLLJJT450 technical performance and outline dimension of reducer

型号示例

Model example



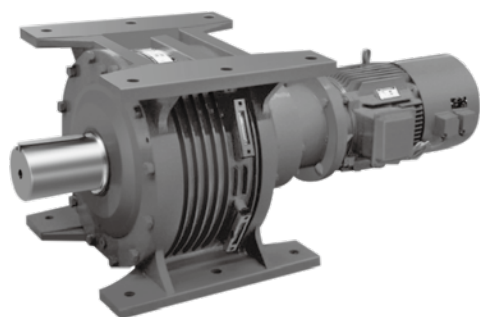
技术性能

Technical performance

公称传动比 Nominal ratio	1505
最大输出转矩 Maximum output torque Nm	91500
重量 Weight kg	2200

扇形段齿轮箱

Gear Units For Segment Drive



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1.1 产品特点

产品应用于冶金行业的扇形段连铸区域。

该类行星齿轮箱结构紧凑、重量轻、体积小、承载能力高、低噪声、低振动。

齿轮箱的行星轮、太阳轮采用优质低碳合金钢，精度等级 5~6 级 (GB10095-2001)。

齿轮箱润滑采用飞溅润滑，实现对齿轮和轴承的充分润滑。

扇形段齿轮箱一般为三级或四级行星，主要用于扇形段板坯连铸区域，齿轮箱通过输出端的半接手连接万向联轴器从而带动前端的驱动辊，一个连铸机上大约要布置十几组驱动装置，从前往后分为结晶区、拉坯区与矫直区。

1.1 Features

It's used in the sector continuous casting area of metallurgical industry.

The planetary gear units has compact structure, light weight, small volume, high ability of load, low noise and vibration.

The planetary gear and sun gear adopt high-quality alloy steel with carburizing and quenching. The accuracy of gears can reach grade 5-6(GB10095-2001).

The gear units adopts splash lubrication, which can lubricate the gear and bearing sufficiently.

Gear units for segment drive are generally three or four stage planets, which are mainly used in the continuous casting area for slab. The reducer is connected with the universal coupling by the half joint at the output end to drive the front drive roller. About a dozen of drives are arranged on a continuous casting device, which are divided into crystallization area, withdrawal area and straightening area from front to back.

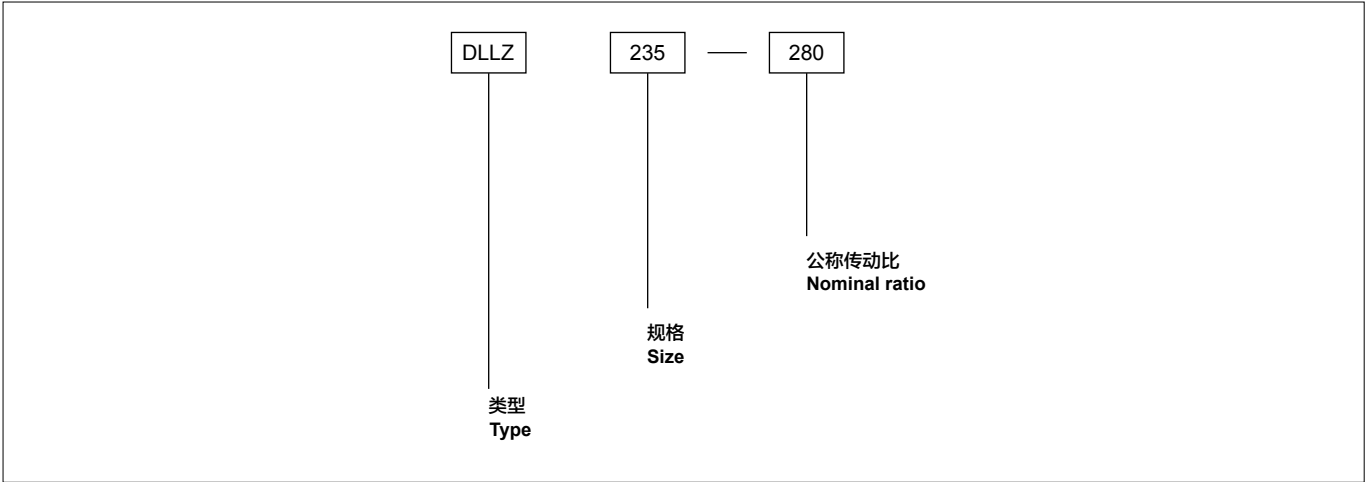
1.2 齿轮箱技术参数

1.2 Technical data

规格 Size	额定输出扭矩 Rated output torque Nm	输入转速 Input speed r/min	速比范围 Ratio range	润滑方式 Lubrication
DLLZ235	30000	750/1000/1500	200-367	飞溅润滑 Splash lubrication
DLLZ255	32000	750/1000/1500	200-326	
DLLZ270	48000	750/1000/1500	200-390	
DLLZ295	68000	750/1000/1500	200-485	
DLLZ315	80000	750/1000/1500	200-344	
DLLZ400	150000	750/1000/1500	200-450	

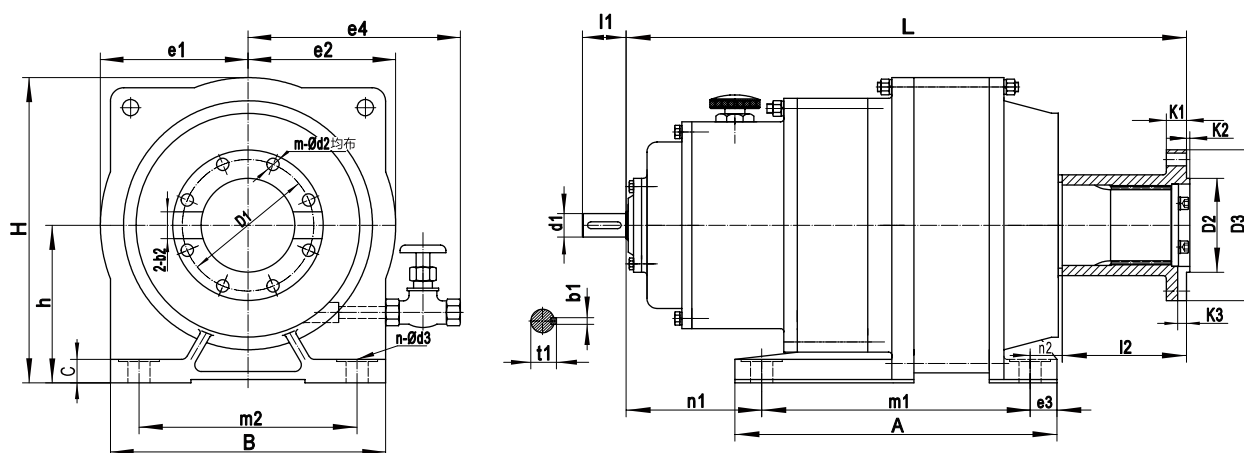
型号示例

Model example



1.3 齿轮箱外形尺寸

1.3 Outline dimensions



规格 Size	A	B	H	d1	l1	b1	t1	L	l2	d2	b2	m	D1	D2	D3	C
DLLZ235	480	410	455	35	65	10	38	835	185	19	40	8	192	140	225	35
DLLZ255	480	405	490	35	60	10	38	885	178	19	40	8	220	145	260	35
DLLZ270	370	500	567	40	82	12	43	946	170	19	40	8	213	140	245	30
DLLZ295	580	520	570	50	80	14	53.5	985	150	21	40	8	245	175	285	40
DLLZ315	470	580	630	55	82	16	59	989	181	21	40	8	245	170	285	40
DLLZ400	700	840	800	70	105	20	74.5	1252	220	25	70	10	345	235	390	45

规格 Size	K1	K2	K3	m1	m2	n1	n2	e1	e2	e3	e4	h	n	d3	重量 Weight kg
DLLZ235	30	5	13	400	325	202	48	220	220	40	320	235	4	33	480
DLLZ255	30	5	13	400	325	269	38	235	235	40	340	255	4	33	585
DLLZ270	30	5	12.5	300	390	426	50	240	240	35	360	270	4	33	620
DLLZ295	35	6	15.5	480	420	265	90	275	275	50	380	295	4	39	850
DLLZ315	30	7	9	370	460	378	60	290	290	50	450	315	4	39	900
DLLZ400	40	8	11	600	740	372	60	420	420	50	550	400	4	45	1847

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