浙江华年电机股份有限公司
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浙江华年股份有限公司
ZheJiang WaLand Electrical Motor Co., LTD

UDL系列无级变速器
Series Stepless Speed Variator

企业简介

浙江华年电机股份有限公司座落于钱塘工业园区，是一家专业从事SWL、RV、KRV双曲面减速机、四大系列齿轮减速机及三相异步电动机等产品研发与生产的国家高新技术企业。公司拥有一批国内外先进的传动机械生产设备和精密的检测设备，成立了杭州市高新技术研究开发中心。经过多年的发展，我们骄傲的被业界誉为质量提升最快、销售持续增长最稳定的传动设备制造商。目前，公司已在嘉兴海宁购置41000多平方米土地进行新厂房的建设，并取名为浙江誉球机械有限公司，扩大了公司的整体规模。

公司本着专业、高效、稳重、创新的理想，拥有实力雄厚技术精湛的管理队伍，产品先后被评为“杭州市著名商标”、“杭州市名牌”的荣誉称号，不断提升了我们的产品在传动领域的知名度。目前产品广销全国各地及世界发达国家。

“科技生活，以人为本”公司一直以此作为经营产品和服务客户的核心理念，不断为客户提供高品质的传动设备，为客户提供传动领域的解决方案，与客户同谋共赢！

BRIEF INTRODUCTION

ZheJiang Waland Electric Motor Co.,Ltd.is located in Qiantang Industrial Park, is a professional engaged in SWL, RV, KRV hyperboloid reducer, four series gear reducer and three-phase asynchronous motor and other products R & D and production of National high-tech enterprises. The company has a number of domestic and foreign advanced transmission machinery production equipment and precision testing equipment, the establishment of Hangzhou high-tech research and development center. After years of development, we are proud to be the industry as the fastest improving quality, sales growth of the most stable transmission equipment manufacturers. At present, the company has purchased more than 41,000 square meters of land in Jiaxing Haining for the construction of a new factory building, and named it Zhejiang Yuqiu Machinery Co., Ltd., which has expanded the overall scale of the company.

In line with the ideals of professionalism, efficiency, stability and innovation, the company has a strong and skilled management team. The product has been awarded the honorary title of "Hangzhou Famous Trademark" and "Hangzhou Famous Brand". Has continuously increased the visibility of our products in the drive field. At present, the products are widely sold throughout the country and developed countries in the world.

"Technology life, people-oriented" company has always used this as the core concept of operating products and service customers, continuously provide high-quality transmission equipment for customers, provide customers with solutions in the field of transmission, and cooperate with customers for win-win results!

PRODUCTION & EQUIPMENT
生产车间及检测设备

拥有先进而完善的检验设备,为零件及整机作精密的检测。

have advanced and perfect inspecting equipment to inspect the spare parts and whole machine precisely.

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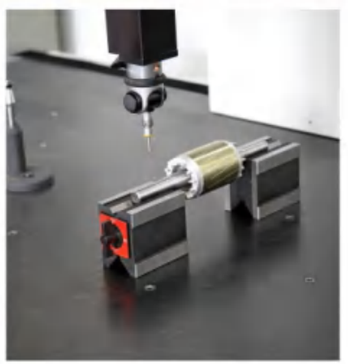
通过ISO9001:2015国际体系认证



1 无级变速器 / STEPLESS SPEED VARIATOR

1.1 无级变速器简介 / Brief introduction to stepless speed variator

UDL 系列无级变速器的设计，融合了国内外的先进技术，产品有以下主要特点：

1. 调速精度高：达0.5–1转。
2. 变速范围大，输出速比可在1:1.4至1:7之间任意变化。
3. 强度高，寿命长。
4. 调速方便。
5. 可持续工作运转，且可正反方向运转，运转平稳，性能稳定，噪音低。
6. 全密封，对环境要求低。
7. 机构紧凑，体积小。
8. 采用优质铝合金压铸成型，外形美观，重量轻，永不生锈。
9. 适应性好。UDL 系列无级变速器可与各种减速机组合，实现低速无级变速。

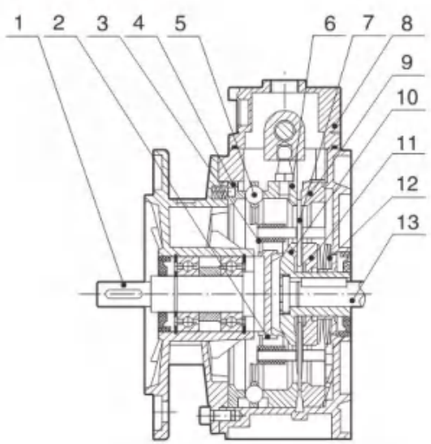
UDL 系列无级变速器可广泛用于食品、包装、化工、制药、塑料、造纸、机床、交通以及各种需高速的自动生产线、输送线、装配流水线，是您机器上理想的伙伴。

The design of UDL series stepless speed variator compromises the advanced technology both at home and abroad. The products include the following main characteristics:

1. High speed–regulating precision: up to 0.58–1 rotation.
2. Large speed– changing range: The speed ratio ranges from 1:1.4 to 1:7 freely.
3. High in strength and long in service life.
4. Convenient to regulate the speed.
5. Continuous in running, front–to–back in running direction, smooth in driving, stable in performance and low in noise.
6. Full in sealing and suitable for any environment.
7. Compact in structure and small in volume.
8. Made of high–quality aluminium alloy diecast into forming, good–looking in appearance, light in weight and it never gets rusty.
9. Good in adaptataion: UDL series stepless speed variators can be combined with all kinds of speed reducers, as to achieve low stepless speed–changing.

UDL series stepless speed variators are widely used for foodstuffs, ceramics, packing, chemicals, pharmacy, plastics, paper–making, machine–tools, communications,and all kinds of automatic lines, pipelines and assembly lines which need speed–regulation It is a good companion for your production.

1.2 结构 / Structure



1. 输出轴 Output shaft
2. 行星架 Planet carrier
3. 滑块 Friction bearing–planet disk
4. 调整轨 Cam ring
5. 钢珠环 Ball ring
6. 滑动轨 Adjustable annulus ring
7. 行星轮 Planet disk
8. 操作盒 Control cover
9. 固定轨 Fixed annulus ring
10. 太阳轮 Fixed sun race
11. 太阳轮片 Adustable sun race
12. 蝶形弹簧 Belleville spring
13. 电机轴 Motor shaft

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1.3 型号说明 / Model illuminate

1.3.1 无级变速器 / Stepless speed variator

UD L 0.75 B5 B5
① ② ③ ④ ⑤

No	说 明	Comments
1	无级变速器代号	Code of stepless speed variator
2	1). L : 铝合金机壳 2). 不标注时为铸铁机壳	1). L : Aluminium alloy casing 2). No mark means cast iron casing
3	电机功率	Motor power
4	1). B3 : 底脚安装机型 2). B5 : 法兰安装机型	1). B3 : Foot–mounted model 2). B5 : Flange–mounted model
5	安装方位代号	Code of installation positon

1.3.2 无级变速器与齿轮减速器组合 / Combination of stepless speed variator and gear speed reducer

UDL 0.75 C B5 B5
① ③ ② ④ ⑤

No	说 明	Comments
1	铝合金机壳无级变速器代号	Code of stepless speed variator with aluminium alloy casing
2	电机功率	Motor power
3	齿轮减速器代号	Code of gear reducer
4	1). B3 : 底脚安装机型 2). B5 : 法兰安装机型	1). B3 : Foot–mounted model 2). B5 : Flange–mounted model
5	安装方位代号	Code of installation positon

1.4 产品图片 / Product picture

UDL..B3

UDL..B5

1.5 性能参数 / Performance parameter

1.5.1 UDL系列无级变速器性能参数 / Performance table for udl series speed variator

(n1=140 r/min)

	型号 Model	i	n_2[r/min]	M_2[Nm]
0.18KW	UDL0.18	1.6 ~ 8.2	880 ~ 170	1.5 ~ 3
0.37KW	UDL0.37	1.4 ~ 7	1000 ~ 200	3 ~ 6
0.55KW	UDL0.55	1.4 ~ 7	1000 ~ 200	4 ~ 8
0.75KW	UDL0.75	1.4 ~ 7	1000 ~ 200	6 ~ 12
1.1KW	UDL1.1(UD1.1)	1.4 ~ 7	1000 ~ 200	9 ~ 18
1.5KW	UD1.5	1.4 ~ 7	1000 ~ 200	12 ~ 24
2.2KW	UD2.2	1.4 ~ 7	1000 ~ 200	18 ~ 36
3.0KW	UD3.0	1.4 ~ 7	1000 ~ 200	24 ~ 48
4.0KW	UD4.0	1.4 ~ 7	1000 ~ 200	32 ~ 64
5.5KW	UD5.5	1.4 ~ 7	1000 ~ 200	45 ~ 90
7.5KW	UD7.5	1.4 ~ 7	1000 ~ 200	59 ~ 118

1.5.2 无级变速器与齿轮减速器组合性能参数 / Performance table for stepless speed variator & gear speed reducer

(n1=140 r/min)

型号 Model	i	n_2[r/min]	M_2[Nm]
UDL0.18-CB3	5	176 ~ 34	7 ~ 15
UDL0.37-CB3	5	200 ~ 40	15 ~ 30
UDL0.55-CB3	5	200 ~ 40	30 ~ 60

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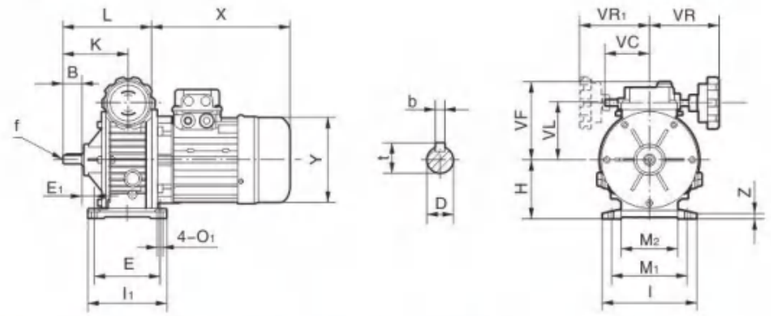
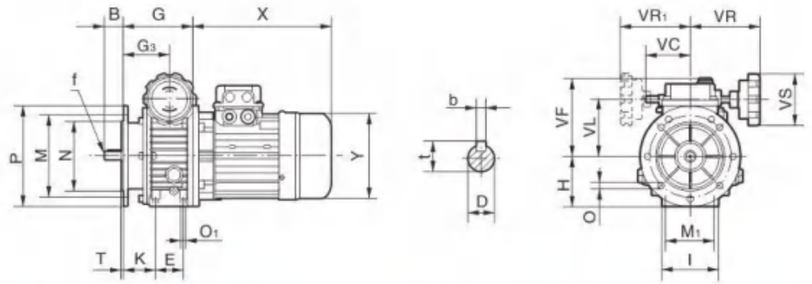
1.6 外形尺寸图表 / Outline dimension sheet

1.6.1 B3型 / Model



	B	D_{j6}	E	E_1	H	I	I_1	K	L	M_1	M_2	O_1	VC	VF	VL	VR	VR_1	VS	b	f	t	X	Y	Z
UDL0.18B3	23	11	105	18	80	145	120	88	136	110	71	9	71	111	78	110	110	85	4	–	12.5	200	120	10
UDL0.37B3	30	14	104	21.5	93	149	125	104	140	120	96	9	71	123	90	110	110	85	5	M6	16	227	141	12
UDL0.75B3	40	19	125	32	113	190	150	126	179	160	135	11	79	140	107	110	110	110	6	M6	21.5	268	160	13
UDL/UD1.1B3	40	24	105	35	100	207	130	136	187	160	115	13	–	124	102	150	–	110	8	M8	27	265	195	15
UD1.5B3	50	24	115	59	123	240	150	165	238	190	140	13	–	150	122	123	–	85	8	M8	27	290	195	15
UD2.2B3	60	28	230	20	150	300	270	191	268	245	190	14	–	188	156	180	–	110	8	M8	33	320	215	25
UD3.0B3	60	28	230	20	150	300	270	191	268	245	190	14	–	188	156	180	–	110	8	M8	33	320	215	25
UD4.0B3	60	28	230	20	150	300	270	191	268	245	190	14	–	188	156	180	–	110	8	M8	33	340	240	25
UD5.5B3	70	35	250	33	200	365	290	201	319	315	245	18	–	–	192	192	–	110	10	M10	38	395	275	30
UD7.5B3	70	35	250	33	200	365	290	201	319	315	245	18	–	–	192	192	–	110	10	M10	38	435	275	30

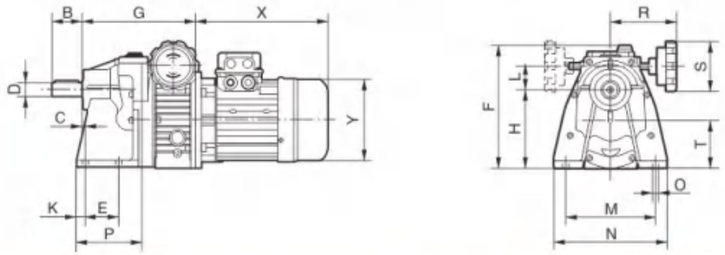
1.6.2 B5型 / Model



	B	D_{j6}	G	G_3	H	I	M	M_1	N	O	O_1	P	T	K	VC	VF	VL	VR	VR_1	VS	b	f	t	X	Y
UDL0.18B5	23	11	50	113	64.5	70	72	115	95	9	M6	140	3.5	46	71	111	78	110	110	85	4	–	12.5	200	120
UDL0.37B5	30	14	40	110	74	80	90	130	110	9	M8	160	3.5	56	71	123	90	110	110	85	5	M6	16	227	141
UDL0.75B5	40	19	58	139	85.5	100	98	165	130	11	M8	200	3.5	60	79	140	107	110	110	110	6	M6	21.5	268	160
UDL/UD1.1B5	40	24	–	147	95	98	207	165	130	11	–	200	3.5	–	–	124	102	150	–	110	8	M8	27	265	195
UD1.5B5	50	24	–	188	115	108	241	165	130	11	–	200	3.5	–	–	150	122	123	–	85	8	M8	27	290	195
UD2.2B5	60	28	–	208	131	128	270	215	180	15	–	250	4	–	–	188	156	180	–	110	8	M8	33	320	215
UD3.0B5	60	28	–	208	131	128	270	215	180	15	–	250	4	–	–	188	156	180	–	110	8	M8	33	320	215
UD4.0B5	60	28	–	208	131	128	270	215	180	15	–	250	4	–	–	188	156	180	–	110	8	M8	33	340	240
UD5.5B5	70	35	–	244	131	200	–	300	250	19	–	350	5	–	–	–	192	192	–	110	10	M10	38	395	275
UD7.5B5	70	35	–	244	131	200	–	300	250	19	–	350	5	–	–	–	192	192	–	110	10	M10	38	435	275

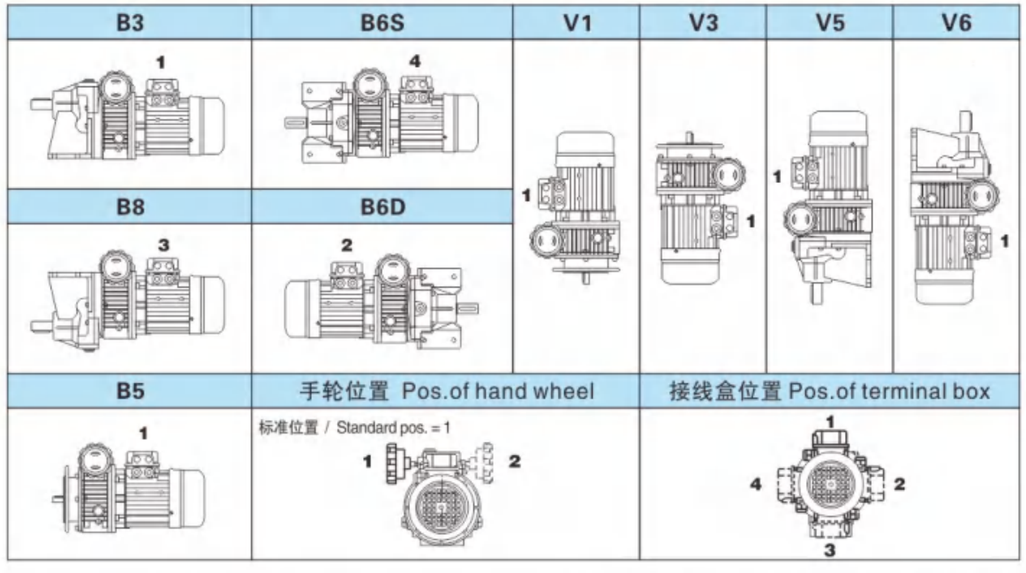
1.6.3 无级变速器一级齿轮减速器组合底脚式外形及安装尺寸B3

Combined outline & installation sizes for stepless speed variator & gear speed reducer with foot screws



型号 Model	B	C	D	E	F	G	H	Y	L	M	N	O	P	R	S	T	X	K
UDL0.18CB3	40	18	19	45	162	189	108	120	33	115	130	9	80	110	85	66	200	16
UDL0.37CB3	50	6	24	70	187	190	130	141	39	150	190	10	110	100	85	79	227	15
UDL0.75CB3	60	7	28	70	228	225	160	160	46	165	210	12	130	130	110	99	268	25

1.7 安装方位图 / *Installation positions diagram*



- 如对接线盒位置有特殊要求，请在下单时如上图所示来指定接线盒安装方位，否则接线盒的位置按标准位置1形式提供。
- 如没有特殊要求，一般按出厂的标准位置B3或B5形式提供。
- 如需要特殊的安装位置，请与我们技术服务人员联系。

- For special requirements, orders must specify the position of the terminal box with reference to the diagram. Unless otherwise specified the terminal box, the position of that will be mounted as shown in the diagram for the mounting position.
- Unless specified otherwise, the standard positions are B3 or B5.
- For positions not envisaged, it is necessary to call our Technical Service.

1.8 使用与保养 / *Operation & maintenance*

1. 轴伸形式全部为圆柱形，按《圆柱形轴伸》GB1569-1990选定，键联接按《普通平键》GB1095-2003选定。

2. 联轴器与电动机联接时应使轴线保持同心，安装误差不应大于所用联轴器的允许误差值。

3. 输出轴装联轴器或带轮时，用轴端螺孔压入，或加热装配，严禁锤击！

4. 机械无级变速器不宜用于可能超负荷或堵转使用场合。

5. 调速应在运转中进行，严禁停车转动调速手轮！

6. 操作盒下的两端调速限位螺钉已调整好，请勿再动！

7. 本机不宜工作在高于40℃的环境中，温升不得高于45℃。关于本机的温升，请看下面介绍：

变速器采用四极电机时，此时部件在跑合（空车运转）开始时，温度高于正常工作的环境温度约40-50℃。跑合60-80小时后，温升逐渐下降，此后温度高于环境温度20℃，并保持稳定的温升。跑合时高的温升影响正常允许的工作条件，但对部件的使用寿命并无有害影响。

8. 变速器采用润滑油油浴润滑。润滑油牌号为Ub-3x，使用前请检查油位。

9. 出厂前润滑油已加入，首次使用2000小时后应更换润滑油，以后每隔5000小时换一次油。

10. 变速器内润滑油应保持在油标的三分之二高度，用户应经常检查油位高度，严禁在润滑不良的情况下使用。操作盒上透气螺母出厂时为防止搬运中漏油已旋紧，运转时须松开，严禁未松开使用！

1. The shapes of shaft extension are all cylindrical. It is subject to GB1569-1990 Cylindrical shaft extension. The key joint refers to GB1095-2003 Ordinary flat key.

2. The shaft lines should be kept concentric when the coupling is connected with a motor. The installtion error should be no more than the tolerance value of the coupling.

3. When the output shaft is installed with the coupling or belt wheel, the should be pressed into the screw hole on shaft end. Or assembled by heating. No hammering on it!

4. The mechanical stepless speed variator is not used in such an occasion where overload or running-blockage happen to occur.

5. Speed-regulation should be effected in running. Do not turn the hand wheel of speed-regulation when the machine shops!

6. The limit screws of speed-regulation on two ends under the operation box are well adjusted, Please don't touch them!

7. This set is not suited to work in the environment over40℃, especially no more than 45℃ when the temperature rises. In regard to its temperature rise, please read the explanation as follows:

If a 4-pole motor is used for the speed variator, the temperature under running-in (empty running) is 40-50℃ higher than that of norma l working environment. A fter running-in up to 60-80 hours, the temperature rise will go down gradually. From that time on, it is 20℃ higher than of environment; and the temperature will keep on rising stably. The high temperature rise in running will affect normal permissive working condition, but it won't bring any bad effects to the service life of parts.

8. This liquid lubricating oil is used for the speed variator. Its trade mark is Ub-3x. Please check up the oil level before use.

9. The machine is filled with lubricating oil before leaving factory. When it starts to work up to 2000 hours for the first time, its lubricating oil should be replaced, changing the lubricating oil every 5000 hours later.

10. The lubricating oil level inside the speed variator should be kept at the height of two-third in the oil scale. Users should usually check the height of oil level. It is staricly prohibited to operate it when short of lubricating oil. The air screw nut on the operating box is screwed up for preventing from oil leakage in moving before leaving factory. It should be loosed when it starts to run. It is strictly forbiddden to use it before loosing!

2 润滑油 / LUBRICATION

工作环境温度不在表中范围内时，请与我们技术服务人员联系。

- 当工作环境温度低于-30℃或高于60℃时，要使用特殊材质的油封
- 当工作环境温度低于0℃时，必须考虑下列情况；

→选用的电机必须在低温下能正常工作；

→ 电机的功率必须满足在低温下有较大启动扭矩要求；

→如果减速器箱体的材质是铸铁，在温度-15℃以下时，箱体会变得很脆，要注意尽量避免撞击；

→在开始使用阶段时，由于润滑油的粘度很高，可能会产生一些问题，所以刚开始启动时最好让它空载运转几分钟;

减速器运行大约10,000小时后，应更换润滑油，换油频率按减速器实际运行情况和工作环境条件而定;

- TNRV025、030、040、050、063、075、090、 105、VF30、44、49规格的减速器在出厂时已加注了润滑油，可以按照样本中安装方位所提到的方位安装。V5或V6安装时，请与我们技术服务人员联系;
- 减速器TNRV110、130和150规格在出厂时已加注了矿物润滑油(SHELL Omala OIL 460);
- 无级变速器在出厂时也加注了矿物润滑油(广研Ub-3x);
- 减速器TNRV110、130、150规格的安装方位在下单时要说明，否则润滑油量按B3方位提供;
- TNRV系列的减速器，在特定的工作环境，需配排气阀（可选配件）。
- PC已加注了耐用的合成油润滑油（SHELL TEVELAOIL 320），因此能够安装成任何方位.

In cases of ambient temperatures not envisaged in the table, call our Technical Service.

- In the case of temperatures under –30℃ or over 60℃ it is necessary to use oil seals with special material.
- For operating ranges with temperatures under 0℃ it is necessary to consider the following:

→ The motors need to be suitable for operation at the envisaged ambient temperature.

→ The power of the electric motor needs to be adequate for exceeding the higher starting torques required.

→ In the case of reduction units with a cast–iron case, pay attention to impact loads since cast iron may have problems of fragility at temperatures under –15℃.

→ During the early stages of service, problems of lubrication may arise due to thehigh level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load .

The oil needs to be changed after approxi–mately 10,000 hours. This period depends on the type of service and the environment where the reduction unit works.

- The reduction units size TNRV 025–030–040–050–063–075–090–105, VF30–44–49 are supplied complete with lubricant ,and I can therefore be mounted in any position envisaged in the catalogue. V5/V6 for which you should call our Technical Service to assess the conditions of use.
- The reduction units size 110, 130 and 150 are supplied complete with lubricant, mineral oil, (SHELL TEVELA OIL 320).
- The variator speed are supplied complete with lubricant, mineral oil (GUANGYAN Ub–3x).
- For sizes 110 , 130 ,150 it is necessary to specify the position, otherwise the reduction units are supplied with the quantity of oil relating to pos. B3.
- TNRV series worm gearbox should mount breather plug (optional parts) under special working condition.
- PC is supplied complete with life–long lubricant, synthetic oil (SHELL TEVELA OIL 320), and can therefore be mounted in all the positions.

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2.1 润滑油选用表 / Lubrications oil chosen table

	℃ -50 0 +50 +100	ISO	SHELL	eni	ESSO	MOBIL	CASTROL	BP	广研	
TNRV025~105 PC063~090 VF30~49	-25 +50	VG320	Tivela OIL S320	Telium VSF320	S220	Glygoyle 30	Alphasyn PG320	Energol SG-XP320		合成油 Synthetic oil
TNRV110~150	-5 +40	VG460	Omala OIL460	Blasia 460	Spartan EP460	Mobilgear 634	Alpha MAX 460	Energol GR-XP460	CKE460	矿物油 Mineral oil
	-15 +25	VG220	Omala OIL220	Blasia 220	Spartan EP220	Mobilgear 630	Alpha MAX 220	Energol GR-XP220		
UDL	-25 +40	VG32	A.T.F.DXRON	A.T.F.DXRON	A.T.F.DXRON	A.T.F.220	TQ.DXRON Ⅱ	Autran DX	Ub-3x	矿物油 Mineral oil

2.2 润滑油加注量 / Lubrications fill quantity

单位:升（L）

	B3	B6	B7	B8	B1、V5	B3、V6
TNRV 025	0.023					
TNRV 030	0.05					
TNRV 040	0.1					
TNRV 050	0.15					
TNRV 063	0.3					
TNRV 075	0.5					
TNRV 090	1					
TNRV 105	1.6					
TNRV 110	3	2.5	2.5	2.2	3	2.2
TNRV 130	4.5	3.5	3.5	3.3	4.5	3.3
TNRV 150	7.0	5.4	5.4	5.1	7.0	5.1
PC063	0.05					
PC071	0.07					
PC080	0.15					
PC090	0.16					
UDL0.18	0.13				0.2	
UDL0.37	0.15				0.25	
UDL0.55	0.33				0.45	
UDL0.75	0.33				0.45	
UD1.1	0.8				1	
UD1.5	0.8				1	
UD2.2	1.2				1.2	
UD3.0	1.2				1.2	
UD4.0	1.2				1.2	
	B3	B6	B7	B8	B1、V5	B3、V6
VF30	0.045	0.045	0.045	0.045	0.045	0.045
VF44	0.075	0.075	0.075	0.075	0.075	0.075
VF49	0.12	0.12	0.12	0.12	0.12	0.12

表格规定的加注量为参考值，准确值的变化与传动比和安装方式有关。

The fill quantity in the table is referenced, the exact value velating to the ratio and mounting positions.

3 定货须知 / NOTICE FOR ORDERING

1. 定货时请根据使用需要的转速范围，输出转矩，结构形式，对照性能参数表、TNRV、VF系列尺寸表、安装和操作方位图，合理选择机型，写明型号标记（下单时是否带电机请说明,一般按不带电机供应）。定货时选择的安装方位应与实际安装方位一致，不然容易造成漏油影响使用寿命，若安装方位特殊请另加说明。

2. 定货时请尽量选用本目录内的标准产品，如有特殊要求或配用特殊电机请附加说明。

1. Please refer to the sheet of performance parameter、TNRV series dimensions, Mounting and operation positions diagram, make reasonable choice of model, and write down model mark to your required revolution scope ,output torque and structural form on ordering (when ordering, you should show whether the reducers are equipped with motors, otherwise reducers arent supplied with motors).

2. Please make the best choice of standard products in this catalogue, and give an additional explanation for your special requirement and motors.

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备忘录