

TWGG II 系列三相无刷同步发电机

SERIES THREE-PHASE BRUSHLESS SYNCH-ROUNOUS GENERATOR

简介 INTRODUCTION:

TWGG II 系列三相交流无刷同步发电机是我公司在原TWGG系列的基础上, 结合国内外先进无刷发电机系列的设计和制造技术而自行开发的新一代发电机。该系列发电机体积小、质量轻、外观精致、可靠性高, 电气性能达到国际先进水平。

TWGG II 系列三相交流无刷同步发电机符合IEC国际电工委员会和GB755等相关标准, 适用于与柴油机配套组成柴油发电机组或移动电站, 使用于陆地、舰船、列车、宾馆等需要工频电源的场合。

TWGGII series three-phase brushless synchronous generators, by introducing and developing foreign and domestic advanced technology and design, are newly designed by our company on basis of our primary TWGG series. It possesses following features: small-size, light-weight, delicate appearance, reliable operation, the electrical properties of our product can reach up to the international advance level.

TWGGII series three-phase brushless synchronous generators are conformity to international IEC, GB755 and relevant standard. It is suitable to mach with the diesel engine. It can be used in land, boat, train, hotel and the places need industry power.

基本参数 MAIN PERFORMANCE INDEX:

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. 防滴漏结构 (IP22防护等级) 2. H级绝缘 3. 额定电压400V 4. 三相四线制 5. 稳态电压调整率$\leq \pm 1\%$ 6. 瞬态电压调整率$-15\% \sim +20\%$ 7. 电压波形畸变率THD$\leq 3\%$ 8. 电话谐波系数THF$\leq 2\%$ 9. 电话影响系数TIF≤ 50 10. 其它电压范围的发电机要根据用户需要制造 | <ol style="list-style-type: none"> 1. Drip-leak-proof structure: (IP22 protection class) 2. Insulation class H 3. Rated voltage 400v 4. Three phase four threads 5. Adjusting rate of stable voltage$\leq 1\%$ 6. Transient state voltage $\leq -15\% - +20\%$ 7. Wave aberration rate of voltage THD$\leq 3\%$ 8. Telephone harmony wave factor of telephone THF$\leq 2\%$ 9. Telephone effective factor of telephone TIF≤ 50 10. Voltage of other range depends on the costumer's request |
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使用环境 ENVIRONMENT CONDITIONS:

在下列环境下, 发电机能够额定运行。

- 1.海拔不超过1000米。
- 2.冷却空气温度258~313K(-15℃~40℃)。
- 3.相对湿度不超过90%。

Under the following environment, the generator could running continuously:

- 1.Altitude: not exceed 1000m.
- 2.Cooling air temperature:258-313k (-15℃-40℃).
- 3.Relative air humidity: not exceed 90%.

特征 FEATURES:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. 可靠的自动电压调节器励磁系统和任选的永磁发电机系统, 在各种情况下可提供恒定励磁。 2. 很容易与电网或其它发电机并联。 3. 经动平衡的转子, 带有密封的滚珠轴承, 具有单轴承和双轴承两种结构。 4. 安装简单, 维护保养方便; 具有极易操作的接线柱、旋转整流器和联轴器螺栓。 5. 多规格的过渡接套和单轴承盘片式联轴器。 6. 符合所有主导的陆用标准。 | <ol style="list-style-type: none"> 1. Reliable automatic voltage control exciting system, providing invariable excitation on all occasions. 2. Easy to be connected with power network or other generators. 3. Balance rotor with single or two sealed ball bearings. We have two structures of Single Bearing and double bearing. 4. Convenient installation and easy maintenance, easy access to terminal, rotating rectifier and coupling bolts. 5. Wide range of flange adaptor and single bearing coupling disc. 6. Meet all the main landing standards. |
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电气特征 ELECTRICAL CHARACTER:

励磁系统:

标准配置自动电压调节器(AVR)为: EA05A-3和EA04; SX440, SX460或MAX321为任选的自动电压调节器 (AVR)

主机定子通过AVR向励磁机定子提供电力。AVR中的高效率半导体器件确保输出电压从最初较低的剩磁电压逐渐增大至额定值。励磁机转子的输出功率通过三相全波桥式整流器输给主机转子。

该整流器两端并有压敏电阻, 抑制浪涌电压, 以免由诸如短路或者并联时相位失步而引起的冲击。励磁机定子带有磁钢, 可保证在任何情况下, 顺利起动。

所有AVR的稳态电压调整率 $\leq \pm 1\%$, SX440具有并联、低频保护, 外部电压调节等多种功能。

MAX321为带永磁发电机专用的AVR。

EXCITATION SYSTEM:

The standard AVR are EA05A-3,EA04; SX440, SX460 or MAX321(optional AVR)

The main stator provides power for excitation of the exciter field via AVR.

The high efficiency Semiconductor inside AVR will ensure the output voltage up to the rated max from the lower gradually.

Output power of exciter's rotor is input to that of mains through 3-phase full wave rectifier. Two ends of the rectifier are connected with permanent magnetic steel. It can make generator starting smoothly in any occasions.

All the adjusting rate of stable voltage of the AVR $\leq \pm 1\%$. SX440 has parallel connection, low frequency protection, exterior voltage adjustment and other function.

MAX321 is for the permanent magnetic motors.

电压调整率:

电压调整率是指允许发动机转速在4%以内的波动下、功率因数在0.8滞后与1之间、从空载到满载的电压变化(包括冷态至热态的变化)。可用AVR上的一个微调来调整电压。

VOLTAGE REGULATION:

Voltage regulation refers to the change of voltage from no-load with power factor ranging from 0.8 to 1 and 4%'s fluctuation of the speed of engine. Voltage is adjusted via potentiometer of AVR.

电气特性 ELECTRIC FEATURES:

绝缘和浸漆:

绝缘等级是“H”级。

所有绕制的零部件都是用专门研制的材料并采用特殊的工艺浸漆的, 为发电机在恶劣环境中运行提供保障。专门开发的树脂基材料为线圈和备旋转部件提供了高加工强度和高机械强度。

INSULATION:

Insulation class H

All the regulatory components are made up with special materials, also immersed in lacquer by peculiar tech. varnish and colophony materials are developed to strengthen the processing and machinery intensity of windings and revolving parts for protecting the generator work under corrosive environment.

绕组和电气性能:

所有发电机的定子采用高导磁性能冷轧硅钢板叠压而成、新型双层叠绕组, 结构坚固, 绝缘性能好。一个完全连续的阻尼绕组减少了并联时的振荡。这种新型绕组, 且极和齿都经过仔细精选的绕组抑制了输出电压的波形畸变。

WINDINGS AND ELECTRIC FEATURES:

All the generator stators adopt high magnetic conductivity energy cold rolling silicon steel plate to fold up, double winding, firmly structure, good insulating. Continuous damp windings abate surges. The poles and gears of the windings are carefully chosen and this helps to check the wave distortion of output voltage.

电话干扰:

THF (如BS EN 60034-1所定义) 小于2%。 TIF (如NEMA MG1-22所定义) 小于50。

PHONE INTERFERENCE:

THF (defined by BS EN 60034-1) $\leq 2\%$. TIF (defined by NEMA MG1-22) ≤ 50 .



无线电干扰:

无刷装置和高质量的AVR确保无线电传送时干扰很小。如果需要的话，可另外提供RFI抑制装置。

RADIO INTERFERENCE:

Brushless apparatus and quality AVR ensure little radio interference in transmission. RFI noise filter is also available.

机械特性 MECHANIC FEATURES:

外壳:

所有陆用发电机的标准型为IP22（NEMA1）。作为任选，可提供IP23的防护等级，但额定功率下降5%。船用发电机的标准型为IP23。作为任选件，可在发电机上装备空气过滤器，但额定值下降5%。

FRAME:

All industrial standard generator is IP22（NEMA1）. Also IP23 is an option, but rated power will decrease 5%, marine standard generator is IP23. air filter is an option ,but rated power of the generator will decrease 5% while it is installed.

轴和键:

所有发电机转子都经动平衡校验，校验振动比BS6861第1部分第2.5级中规定的最小值还要低。双支点发电机带一个半键校动平衡。

AXIS AND KEY:

All of the generator rotors should pass balance test, whose vibration are lower than the minimum of BS6861.P.1, G2.5. Two bearing generator has a half-key testing balance.

接线端子和接线盒:

标准的发电机是三相，并可对引至接线端子的接线头上，接线端子安装在发电机非驱动端的出线板上。在薄钢板制成的出线盒内有AVR，具有足够空间让用户布线。为易于操作，面板为拆卸式面板。

TERMINAL AND TERMINAL BOX:

The three-field generator has leads brought out to the terminals in the terminal box. The terminals are put on the non drive end. The box is equipped with removable panels.

过渡接套和联轴器:

TWG II 系列发电机都具有单轴承和双轴承两种结构。

TWG II 系列单轴承结构的过渡接套可选SAE#00、0、1/2、1、2、3、4、5；盘片式联轴器可选SAE#6.5、7.5、8、10、11.5、14、16、18、21。

TWG II 系列双支点结构的过渡接套可选SAE#00、0、1/2、1、2、3、4、5。

ENGINE ADAPTOR AND COUPLING:

TWG II series generators have two kinds construction.

TWG II series single-bearing, engine adaptor to SAE#00、0、1/2、1、2、3、4、5；coupling discs to SAE#6.5、7.5、8、10、11.5、14、16、18、21.

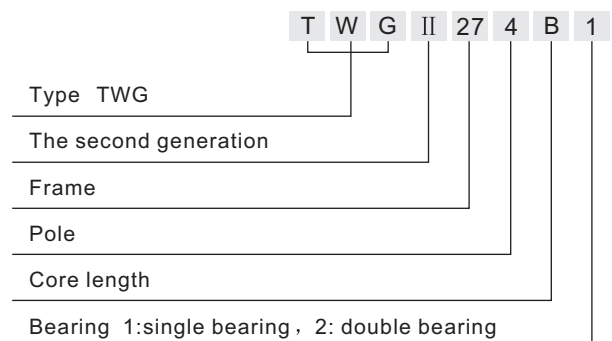
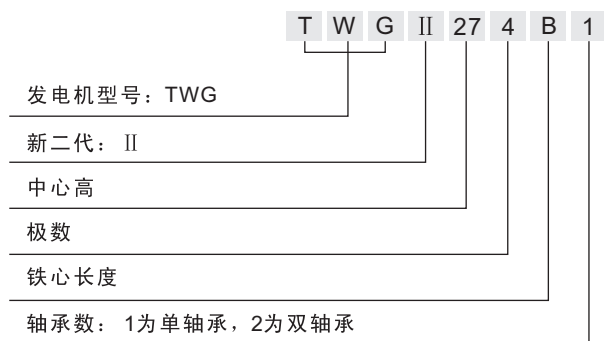
TWG II series double-bearing, engine adaptor to SAE#00、0、1/2、1、2、3、4、5.

可供选择的配置 OPTION FEATURES:

- 1.过渡联接套及可互换的盘式联轴器
- 2.单相
- 3.电压远程调整
- 4.IP23防护等级
- 5.空间加热器
- 6.热敏电阻

- 1.Adaptors and drive disks
- 2.Single phase
- 3.Remote voltage adjust
- 4.IP23 enclosure
- 5.Space heaters
- 6.Thermistors

产品型号定义 THE DEFINITION OF THE PRODUCT MODEL:



型号及容量 TYPE AND CAPACITY

型号 TYPE	额定功率 Rated Power (1500rpm 50HZ 400V)							净重 KG
	连续Continuous/40℃			备用Stand by/40℃		备用Stand by/27℃		
	H级125K			H级150K		H级163K		
	KVA	KW	η (%)	KVA	KW	KVA	KW	
TWG II 164B	9.4	8	78.8	11	8.8	12	9.6	90
TWG II 164C	12.5	10	80.6	13.8	11	15	12	96
TWG II 164D	15	12	81.2	17.5	14	20	16	100
TWG II 184E	20	16	84.5	22.5	18	25	20	120
TWG II 184F	25	20	86	27.5	22	30	24	150
TWG II 184G	30	24	86.3	32.5	26	35	28	160
TWG II 184H	37.5	30	86.6	40	32	41.3	33	216
TWG II 224B	42.5	34	87	45	36	47.5	38	250
TWG II 224C	50	40	88	52.5	42	55	44	270
TWG II 224D	60	48	88.6	62.5	50	65	52	290
TWG II 224E	72.5	58	90	77.5	62	80	64	320
TWG II 224F	85	68	90.2	87.5	70	91.3	73	360
TWG II 274B	100	80	90.4	106.3	85	110	88	395
TWG II 274C	117.5	94	90.8	127.5	102	131.3	105	420
TWG II 274D	140	112	91.5	145	116	150	120	470
TWG II 274E	160	128	92.3	170	136	175	140	510
TWG II 274F	181.3	145	92.5	187.5	150	193.8	155	560
TWG II 274G	200	160	93.3	212.5	170	220	176	610
TWG II 314B	250	200	92.4	270	216	275	220	850
TWG II 314C	300	240	92.7	320	256	330	264	915
TWG II 314D	350	280	93.3	370	296	400	320	960
TWG II 314E	394	315	93.5	418.8	335	437.5	350	1123
TWG II 354B	450	360	94.1	477.5	382	495	396	1275
TWG II 354C	500	400	94.4	515	412	530	424	1330
TWG II 354D	600	480	94.6	640	512	665	532	1530
TWG II 354E	662.5	530	94.8	700	560	725	580	1690
TWG II 404B	750	600	93.3	775	620	790	632	1960
TWG II 404C	800	640	93.6	825	660	840	672	1980
TWG II 404D	900	720	93.8	937.5	750	957.5	766	2040
TWG II 404E	1000	800	94.3	1030	824	1050	840	2210
TWG II 404F	1125	900	94.7	1162.5	930	1187.5	950	2430
TWG II 404G	1250	1000	95	1287.5	1030	1312.5	1050	2760

型号 TYPE	额定功率 Rated Power (1800rpm 60HZ 480V)						
	连续Continuous/40℃			备用Stand by/40℃		备用Stand by/27℃	
	H级125K			H级150K		H级163K	
	KVA	KW	η (%)	KVA	KW	KVA	KW
TWG II 164B	12.5	10	79	15	12	16.3	13
TWG II 164C	15.6	12.5	80.3	18.8	15	22.5	18
TWG II 164D	18.75	15	81.2	25	20	30	24
TWG II 184E	25	20	83.8	31.25	25	37.5	30
TWG II 184F	31.25	25	85.5	37.5	30	43.8	35
TWG II 184G	37.5	30	86.7	43.8	35	50	40
TWG II 184H	47.5	38	85.6	53.8	43	60	48
TWG II 224B	52.5	44	87.7	58.1	46.5	62.5	50
TWG II 224C	65	52	88.6	68.8	55	71.3	57
TWG II 224D	75	60	89.3	78.8	63	80	64
TWG II 224E	93.8	75	90.5	98.8	79	102.5	82
TWG II 224F	104	83	90.8	110	88	103.8	91
TWG II 274B	125	100	91	132.5	106	137.5	110
TWG II 274C	146	117	91.2	155	124	158.8	127
TWG II 274D	179	143	91.5	187.5	150	193.8	155
TWG II 274E	206	165	92.3	212.5	170	218.8	175
TWG II 274F	231	185	92.7	246.3	197	252.5	202
TWG II 274G	255	204	93.5	275	220	280	224
TWG II 314B	315	252	92.7	335	268	345	276
TWG II 314C	375	300	93.3	400	320	415	332
TWG II 314D	440	352	93.5	460	368	475	380
TWG II 314E	487.5	390	93.5	525	420	537.5	430
TWG II 354B	594	475	94.2	625	500	644	515
TWG II 354C	644	515	94.6	675	540	694	555
TWG II 354D	750	600	94.8	800	640	819	655
TWG II 354E	812.5	650	95	850	680	900	720
TWG II 404B	895	716	93.6	928.8	743	938.8	751
TWG II 404C	957.5	766	93.8	992.5	794	1000	800
TWG II 404D	1087.5	870	94.5	1125	900	1137.5	910
TWG II 404E	1197.5	958	94.8	1236.3	989	1250	1000
TWG II 404F	1325	1060	95.1	1350	1080	1387.5	1110
TWG II 404G	1448.8	1159	95.5	1497.5	1198	1513.8	1211

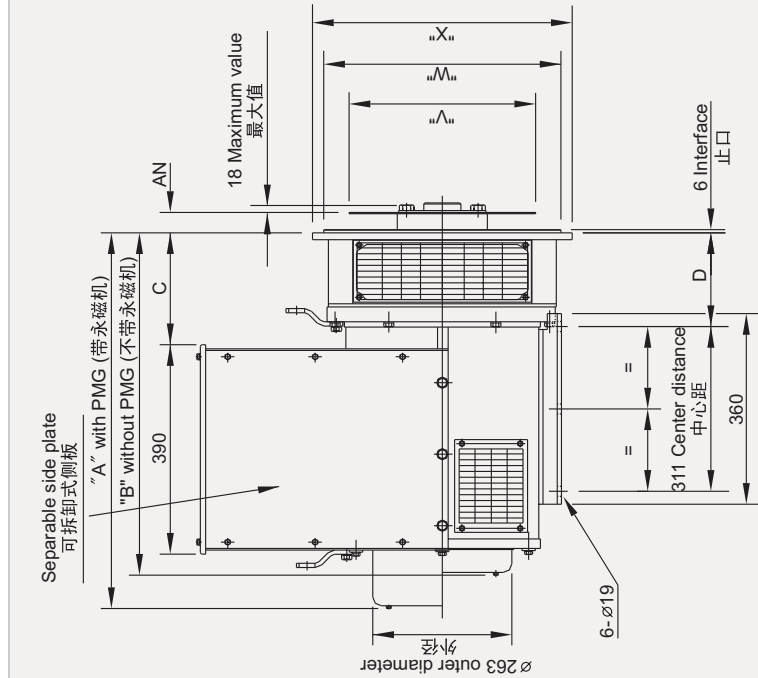
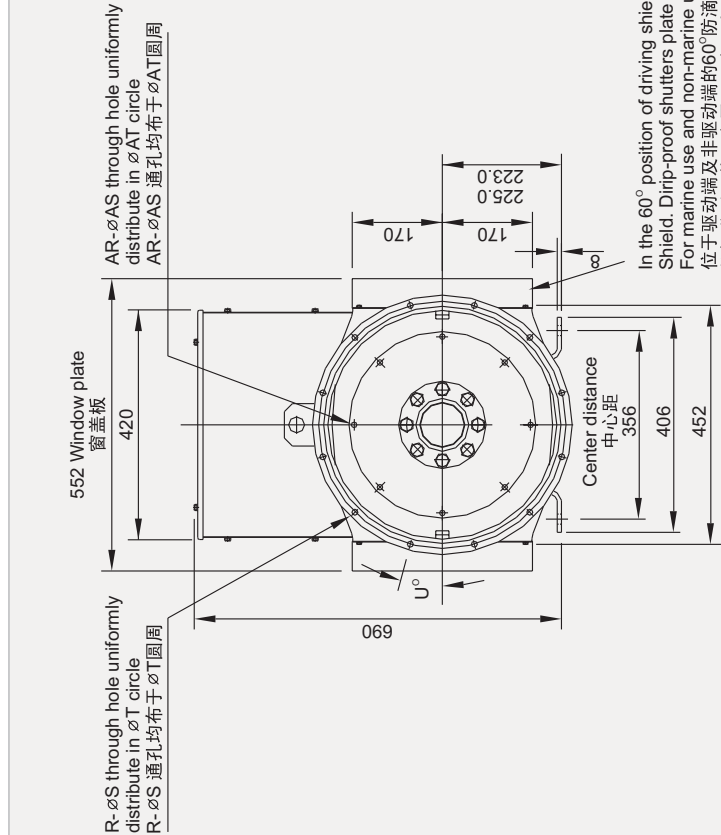
注：
所有额定值是基于环境温度最高40℃，海拔1000米以内。
不同环境温度下提供的备用功率不同。有关备用功率的定义参见ISO8528-3标准。
所有发电机都为4极，其它极数的发电机请与制造商联系。
其它电压范围的发电机要根据用户需要制造。

REMARK:
all the rated are on basis of environment temperature 40℃, altitude not exceeding 1000m.
Different temperature offers different standby power, the define of standby power is related to the standard of ISO8528-3.
All the motors are 4 poles, as to other pole generator, please contact the manufacture.
Generators in other voltage range depend on costumer's request.

尺寸 DIMENSION			
型号 MODEL	A	B	C
SAE#1 / SAE#2.3	TWG II224B 763/749	700/686	267/253
	TWG II224C 763/749	700/686	267/253
	TWG II224D 853/839	790/776	357/343
	TWG II224E 853/839	790/776	357/343
	TWG II224F 898/884	835/821	402/388

盘片式联轴器 DISC COUPLING						
S.A.E.No.	AN	AR	AS	AT	V	
8	61.9	6	11	244.5	263.4	
10	53.98	8	11	295.3	314.2	
11.5	39.68	8	11.5	333.4	352.3	
14	25.4	8	13.5	438.2	466.5	

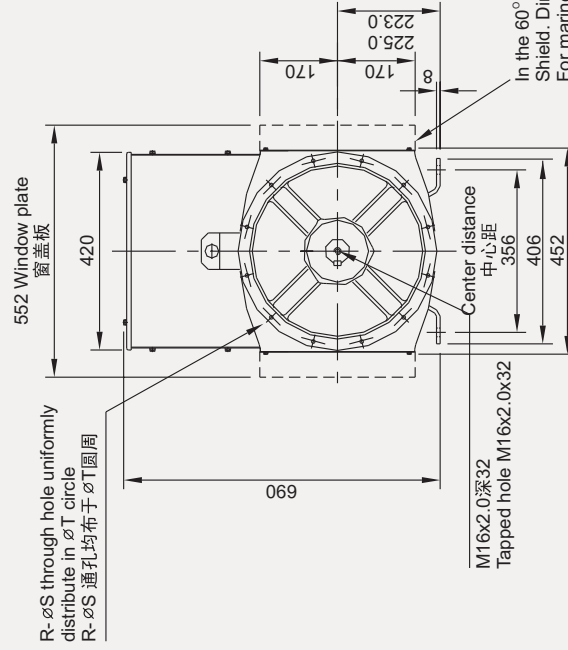
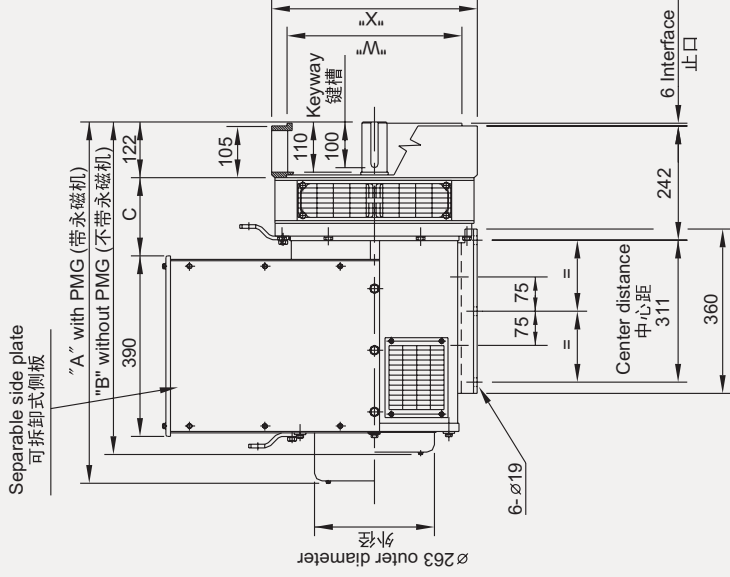
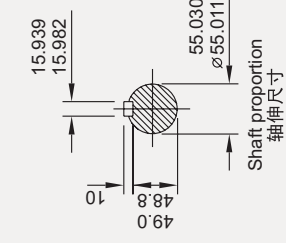
法兰式过渡接套 FLANGE										
S.A.E.No.	D	R	S	T	W	X				
1	191.3	12	12	530.2	511.1	553				
2	177	12	12	466.7	447.6	490				
3	177	12	12	428.6	409.5	451				
4	177	12	12	381.0	361.9	453				



In the 60° position of driving shield & non-driving Shield, Dirip-proof shutters plate is standard model. For marine use and non-marine use on request. 位于驱动端及非驱动端的60°防滴窗盖板是船用机的标准型, 若用户需要, 也可为非船用机提供。

尺寸 DIMENSION				
型号 MODEL	A	B	C	
TWG II 224B	831	768	218	
TWG II 224C	831	768	218	
TWG II 224D	921	858	308	
TWG II 224E	921	858	308	
TWG II 224F	1011	903	388	

法兰式过渡接套 FLANGE						
S.A.E.No.	R	S	T	W	X	
1	12	12	530.2	511.2	553	
2	12	12	466.7	447.6	495	
3	12	12	428.6	409.5	451	
4	12	12	381.0	361.9	403	
5	8	12	333.3	314.3	356	



In the 60° position of driving shield & non-driving Shield. Dirip-proof shutters plate is standard model For marine use and non-marine use on request.
位于驱动端及非驱动端的60°防滴窗盖板是船用机的标准型, 若用户需要, 也可为非船用机提供。