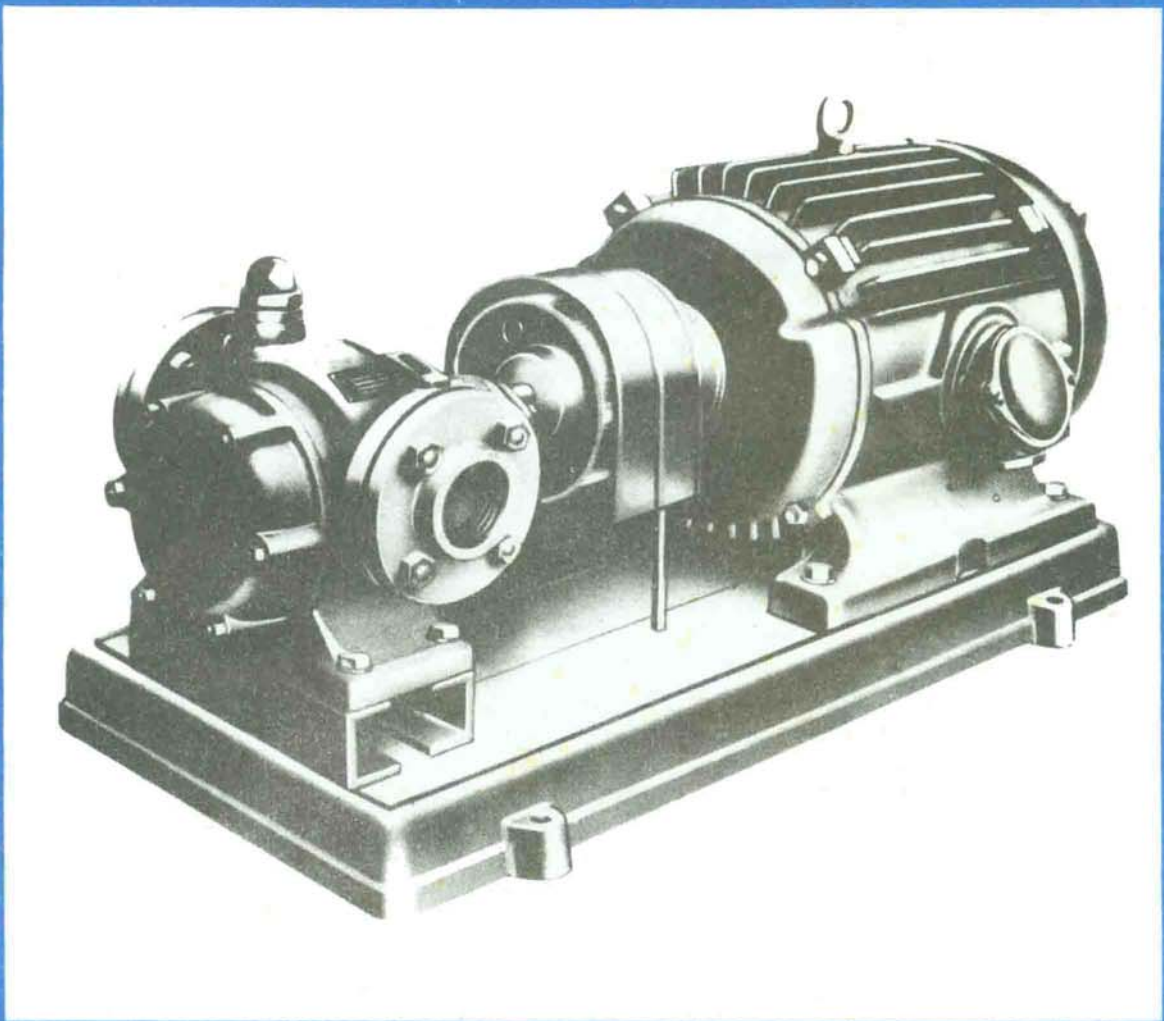




Low-Pressure  
Rotary  
Gear Pumps **ZPG**



**P.T. ANEKAMAKMUR TEKNIK NUSAJAYA**



# ROTOR<sup>®</sup>

They are suitable also for lubricating - and cooling systems of different machines and installations ( machine tools, combustion engines, etc.), for low-pressure drives and various other purposes.

## DESIGN

Two precision-milled gear wheels (driving and driven gears) rotate in the pump casing. During rotation, the gears lock the liquid in the suction casing between the pump casing and the teeth flute and convey it to the discharge casing. The gears then press the liquid into the discharge branch.

The driving shaft is located above the driven shaft and ends on one side outside the casing with a cylindrical part with a key for fixing the coupling. Shaft at both ends are supported on bearing bushes lubricated by the liquid being pumped. The relief of the rotor from the radial thrust and the packing from the liquid pressure is attained by suitable inner modifications respecting the operation conditions of the individual pump types. The stuffing box with cord packing prevents the penetration of the pumped liquid around the driving shaft.

## SAFETY DEVICE

The ZPG pumps have the safety valves installed directly in the casing. On the rated pressure being exceeded the safety valve will release the handled liquid back into the suction casing through the inner channel in the pump casing.

## DRIVE

The ZPG gear pumps are designed basically for direct coupling usually to an electric motor, and located together on a common bedplate. At lower speeds, i. e., below 735 RPM, the drive is provided either by an electric motor with built-in transmission in the shield, or by a special transmission box between the motor and the pump.

The driving shaft of the pump can be loaded by torque only. The radial and axial thrusts of the prime mover are eliminated.

## DIRECTION OF ROTATION

The ZPG pumps rotate usually in the clockwise direction (viewed from the drive side). On special requirement, however, the pumps can be supplied in anti-clockwise execution, with opposite flow direction of the liquid. No pump can be used for both directions of rotation.

## MATERIAL

The pumps are supplied in execution designated LO, having the pump casing of cast iron, and the gear wheels and shafts of steel. The bearing bushes of the ZPG Type are made of steel with centrifugally cast bronze lining.

## SELECTION OF SPEED

General rules:

- lower revolutions will be required for denser liquids with higher viscosity, for liquids with lower lubricating ability and longer working periods
- higher speeds are permissible for thinner liquids with low viscosity and good lubricating ability to benefit from the maximum pump pressure.

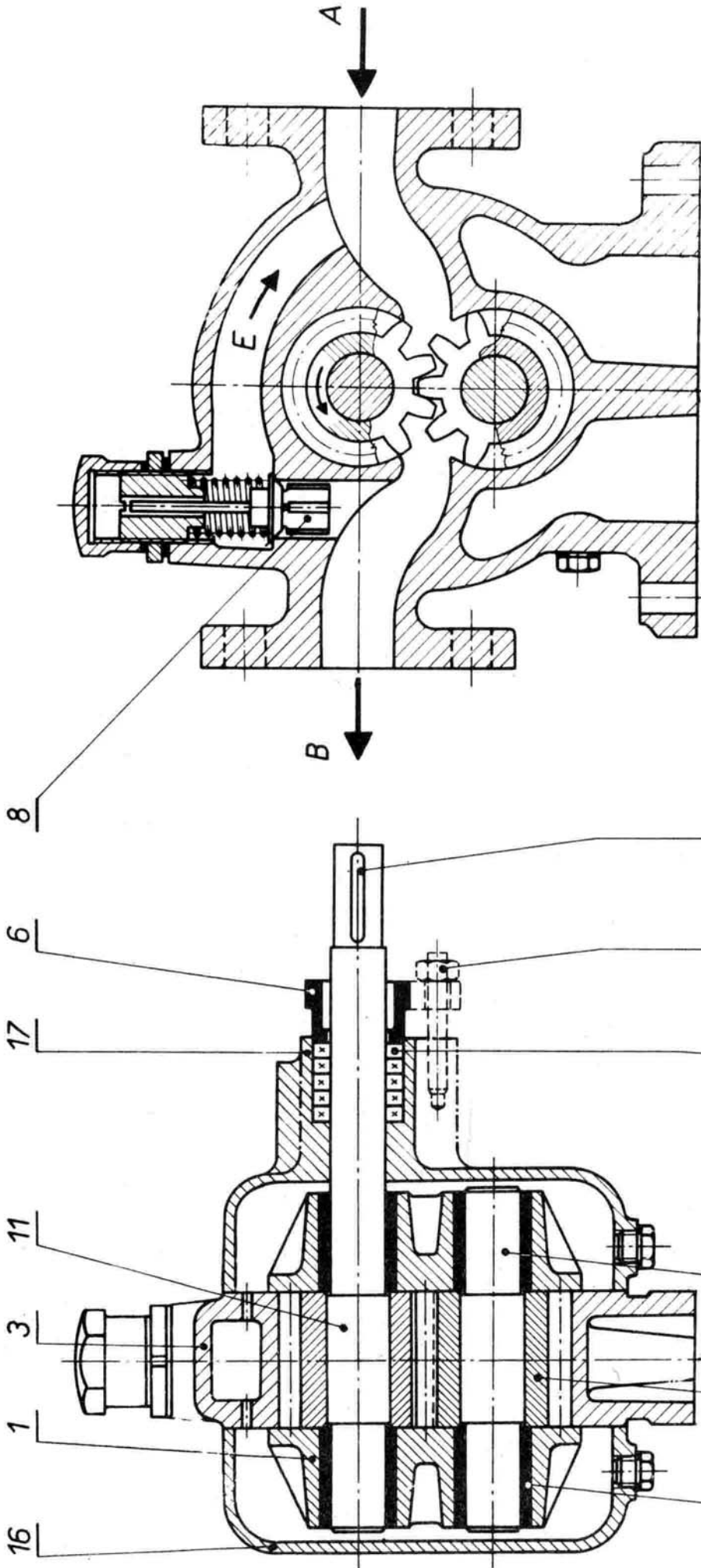
The approximate range of speeds for different liquids according to the size of the pump and working pressure is as follows:

- max. 1000 RPM for current lubricating and cooling oils and other thin self-lubricating liquids up to a viscosity of approx. 40 - 10<sup>0</sup>E (in order of smallest to largest type of pump)
- max. 750 RPM for denser self-lubricating liquids up to a viscosity of approx. 150 - 30<sup>0</sup>E (same order)
- max. 500 - 200 RPM for heavy oils, tar, molasses, glue, varnishes, syrups, and other liquids of higher viscosities (same order).

The ZPG gear pumps are designed for pumping and conveying thin and dense liquids at low operation pressures of up to 6 kg/sq. cm and of up to 80<sup>0</sup> C temperature, having lubricating abilities and not containing fractions of solid or abrasive substances or impurities.

## APPLICATION

The ZPG rotary gear pump are intended for pumping and handling of lubricating and engine oils, fuel, kerosene, edible fats and oils, suds, molasses, tar, varnishes, syrups, lyes, water glass and other viscous self-lubricating liquids in different industries.



- |                |                             |                         |
|----------------|-----------------------------|-------------------------|
| 1 shield       | 7 coupling key              | 13 stuffing box screw   |
| 2 bearing bush | 8 safety valve              | 16 cover lid            |
| 3 pump casing  | 10 gear wheel               | 17 stuffing box housing |
| 5 driven shaft | 11 driving shaft            | A suction               |
| 6 gland        | 12 packing for stuffing box | B discharge             |
|                |                             | E by-pass channel       |



# MAIN TECHNICAL DATA

Type of pump	Branch dia. mm		Deliv- ery head H kg/cm <sup>2</sup>	Viscosity of the pumped liquid										Speed RPM	Max. speed RPM	Weight o. pump kg	
				5 °E		10 °E		20 °E		50 °E		100 °E					
	suc- tion	disch.		Q l/min	N kW	Q l/min	N kW	Q l/min	N kW	Q l/min	N kW	Q l/min	N kW				
ZPG-4	32	32	2					28	0,33	29	0,4	29,5	0,45	280	1000	32	
			4					24	0,45	26	0,55	27	0,62				
			6					20	0,58	23	0,7	24,5	0,82				
			2			51	0,45	52	0,55	52,5	0,7	53	0,8				480
			4			47,5	0,7	49	0,85	50,5	0,93	51,5	1,05				
			6			44	1	46,5	1,1	48	1,2	50	1,03				
			2	74	0,6	76	0,7	77	0,82	78	0,93	79	1,07				720
			4	66	0,9	70	1,05	73	1,15	75	1,26	76	1,4				
			6	57	1,3	63	1,4	67	1,5	71	1,6	73	1,7				
			2	100	0,85	102	1	104	1,2	105	1,4						930
			4	89	1,25	94	1,45	98	1,6	101	1,8						
			6	78	1,7	86	1,85	92	2,05	97	2,2						
ZPG-5	40	40	2					45	0,5	46	0,6	47	0,7	280	1000	37	
			4					42	0,7	44	0,85	45,5	0,95				
			6					40	1	42	1,1	44	1,2				
			2			77	0,7	78	0,8	79	1	80	1,2				480
			4			71	1,05	73	1,15	75	1,3	77	1,4				
			6			85	1,4	89	1,5	92	1,6	94	1,7				
			2	112	0,85	115	1,05	117	1,2	118	1,35	119	1,5				720
			4	100	1,4	105	1,55	110	1,7	113	1,85	115	2				
			6	90	2	96	2,1	102	2,25	107	2,4	110	2,55				
			2	145	1,1	149	1,3	152	1,55	154	1,75						930
			4	132	1,8	140	2	144	2,2	148	2,4						
			6	120	2,5	130	2,7	137	2,9	143	3,1						
ZPG-6	50	50	2			62	0,6	63	0,7	63,5	0,85	64	1,1	300	1000	52	
			4			56	0,8	58	0,9	60	1,1	61	1,2				
			6			50	1,05	53	1,15	56	1,25	58	1,35				
			2	103	0,8	105	1	106	1,2	108	1,4	109	1,7				500
			4	93	1,2	96	1,4	99	1,5	102	1,7	105	1,9				
			6	83	1,6	88	1,75	92	1,9	96	2	100	2,3				
			2	150	1,1	153	1,35	155	1,6	156	1,9	158	2,2				720
			4	136	1,7	142	1,9	146	2,1	150	2,4	153	2,7				
			6	122	2,4	132	2,5	138	2,7	144	2,9	147	3,2				
			2	200	1,7	205	2	210	2,5								960
			4	185	2,5	192	2,75	200	3,1								
			6	170	3,4	180	3,6	190	3,9								
ZPG-7	65	65	2	80	0,65	81,5	0,8	83	0,92	84	1,1	85	1,35	300	1000	67	
			4	70	0,9	73	1,05	76	1,2	79	0,85	81	1,55				
			6	60	1,2	65	1,3	69	1,4	74	1,5	77	1,7				
			2	135	1	137	1,25	139	1,5	141	1,75	143	2,1				500
			4	120	1,5	126	1,7	129	1,9	132	2,15	137	2,4				
			6	105	2	113	2,2	118	2,4	124	2,6	132	2,8				
			2	195	1,4	200	1,75	202	2,1	205	2,4						720
			4	176	2,2	185	2,4	189	2,7	195	3						
			6	156	2,9	170	3,1	176	3,3	185	3,6						
			2	265	1,8	268	2,2	273	2,75								960 <sup>x)</sup>
			4	240	2,8	250	3,2	260	3,6								
			6	215	3,85	230	4,2	245	4,5								

Type of pump	Branch dia. mm suc-tion   disch.		Deliv-ery head H kg/cm <sup>2</sup>	Viscosity of the pumped liquid										Speed RPM	Max. speed RPM	Weight of pump kg		
				5 °E		10 °E		20 °E		50 °E		100 °E						
				Q l/min	N kW	Q l/min	N kW	Q l/min	N kW	Q l/min	N kW	Q l/min	N kW					
ZPG- 8	80	80	2	190	1,4	193	1,7	195	2,1	198	2,4	200	2,9	300	750	88		
			4	170	2,1	180	2,3	183	2,6	187	2,9	190	3,2					
			6	155	2,8	165	3	170	3,2	176	3,4	180	3,6					
			2	320	2,4	326	2,8	330	3,4	332	3,8	335	4,4				500	
			4	290	3,6	307	3,9	313	4,4	320	4,7	325	5,2					
			6	265	4,8	288	5,1	297	5,4	305	5,7	315	6					
			2	465	3,3	470	3,8	475	4,7	480	5,4							720
			4	435	5,2	450	5,6	460	6,3	465	6,8							
			6	408	7	425	7,3	440	7,8	450	8,2							
ZPG - 9	100	100	2	240	1,6	242	2	245	2,5	258	2,9	250	3,3	300	750	105		
			4	215	2,5	225	2,8	230	3,2	235	3,5	240	3,9					
			6	190	3,4	205	3,7	215	3,9	220	4,2	225	4,5					
			2	410	2,8	415	3,3	420	4,1	424	4,7	425	5,3				500	
			4	375	4,3	390	4,7	400	5,4	410	5,85	415	6,4					
			6	340	5,8	365	6,2	380	6,7	395	7	400	7,4					
			2	590	4	600	4,7	610	5,8									720
			4	550	6,3	575	6,8	590	7,7									
			6	510	8,6	550	9	570	9,8									
ZPG-10	100	100	2	420	3,4	435	4	440	4,8	445	5,5	450	6,3	300	750	160		
			4	375	5,2	405	5,7	418	6,3	430	7	440	7,7					
			6	330	6,9	375	7,4	395	7,9	410	8,6	425	9,1					
			2	720	5,5	735	6,8	745	9,1	750	11,2							500
			4	660	8,3	690	9,4	710	10,8	725	12,5							
			6	605	11,8	650	11,8	675	12,6	700	13,7							
			2	1050	6,7	1070	7,7	1080	11									720 <sup>xx</sup>
			4	985	11	1020	11,5	1050	14,6									
			6	925	18	975	15,2	1015	18									

Q...delivery

N...pump shaft input

\*)for heavy and severe operation conditions, the speed selection is limited to max. 720 RPM (type ZPG-7)

\*\*\*)for heavy and exacting operation condition, the speed selection is limited to 500 RPM (type ZPG-10)

Explanations (refer to the dimensional sketch of the ZPG pump):

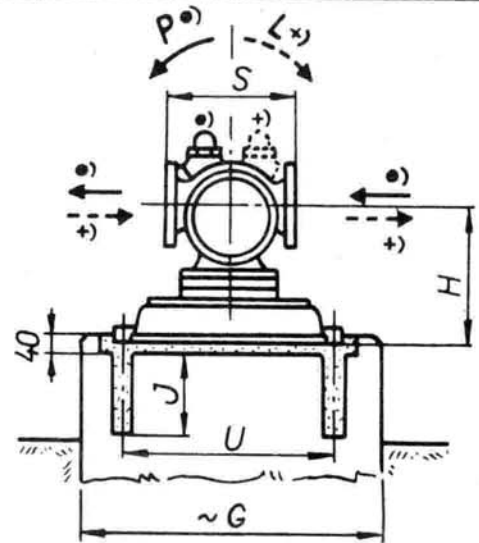
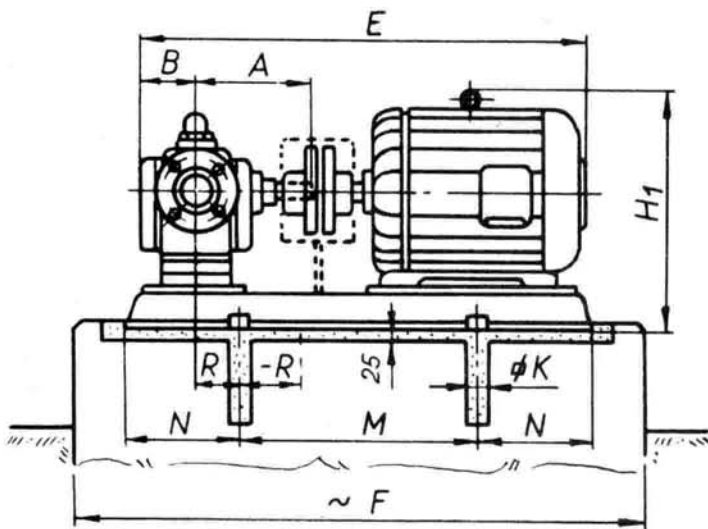
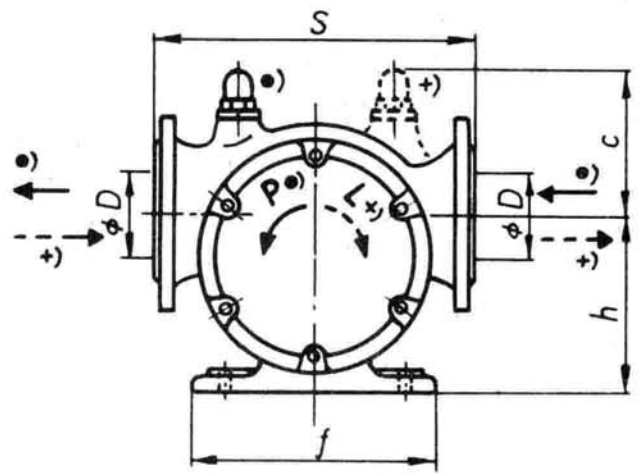
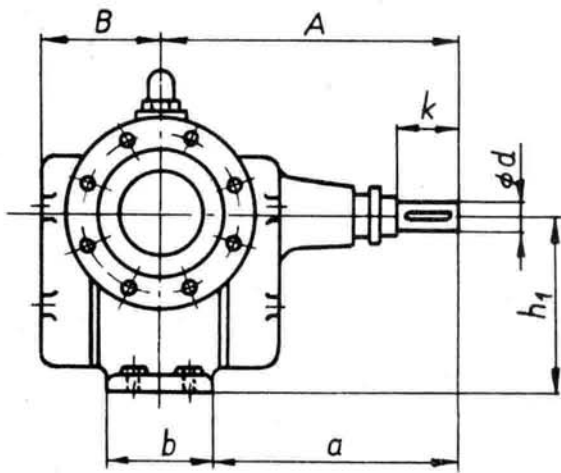
P - clockwise execution - liquid flow marked ●)

L - anti-clockwise execution - liquid flow marked †)

The foundation dimensions (F, G) depends on the bedplate dimensions and, are therefore, indicated for information only.

Dimensions not mentioned are variable in relation to the type and size of motor and consequently the size of the bedplate.

Dimensions in mm



Type of pump	Standard execution													
	a	b	c	d	f	h	h <sub>1</sub>	k	A	B	D	F	G	S
ZPG-4	170	60	115	22	220	150	150	40	230	85	32	850-1000	500-600	250
ZPG-5	155	90	115	22	220	150	150	40	245	100	40	850-1000	500-600	250
ZPG-6	170	100	145	28	275	175	175	50	275	110	50	1000-1200	600-800	300
ZPG-7	155	135	165	28	275	175	175	50	290	130	65	1000-1200	600-800	300
ZPG-8	196	115	150	35	275	190	190	60	311	130	80	1200-1500	600-800	340
ZPG-9	211	115	150	35	275	190	190	60	326	140	100	1200-1500	600-800	340
ZPG-10	248	115	200	50	400	280	280	80	363	145	100	1200-1500	650-850	500