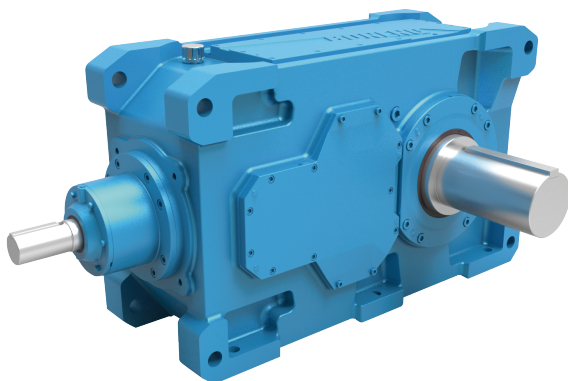


# ***BONENG***

H Helical Gearbox & B Bevel-helical Gearbox



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**H Helical Gearbox &  
B Bevel-helical Gearbox**

07/2021

**BONENG**

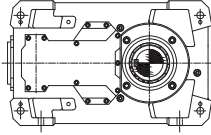
## Gearbox type

H204~H218      B204~B218

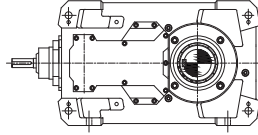
H305~H318      B304~B318

H407~H418      B405~B418

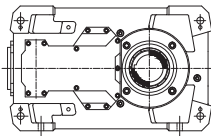
H...HS



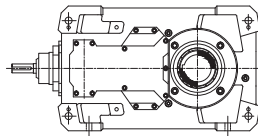
B...HS



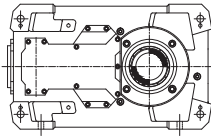
H...HH



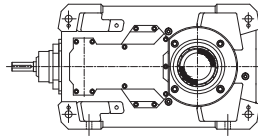
B...HH



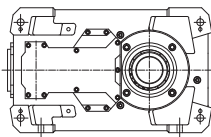
H...HD



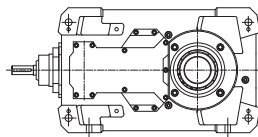
B...HD



H...HK



B...HK



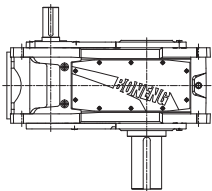
## Gearbox type

H204~H218      B204~B218

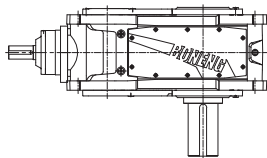
H305~H318      B304~B318

H407~H418      B405~B418

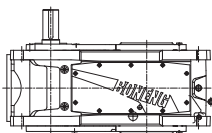
H...VS



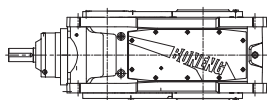
B...VS



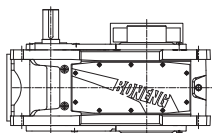
H...VH



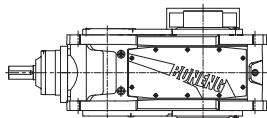
B...VH



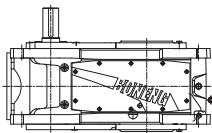
H...VD



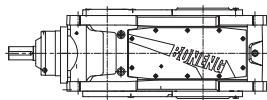
B...VD



H...VK



B...VK



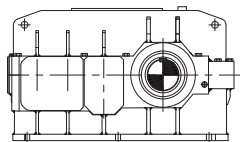
## Gearbox type

H219~H226

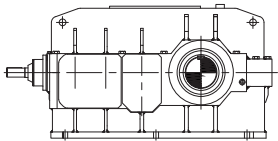
H319~H326 B319~B326

H419~H426 B419~B426

H...HS



B...HS



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## Important notes

During installation, please pay attention to the safety notes and warning in this book!



Suggestions and useful information



Harmful situations:

Possible result: damage transmission device and the environment



- ◆ If you conform to the regulations in this manual, there won't be any fault, at the same time, it can satisfy the requirements of quality defect claim. So before the transmission device starts working, please read this instruction.
- ◆ This instruction book contains important installation and maintenance notes, please keep this instruction book in a place near the device for reference;

# 1 Safety information

Safety information mainly involve the applications of gearmotor. When running gearmotor, please note the relevant notes.

- ◆ This instruction is an integral part of the gearmotor supplied.
- ◆ All persons involved in the installation, operation, maintenance and repair of the gearmotor must have read the instructions and comply with them.
- ◆ This series gearmotor designed according to FEM standard, safe to use after delivery. It's forbidden to change the gear units and protective piece.
- ◆ No overload running, Reduce the using time in special environment (high temperature, high elevation). Strongly advice quip the overload limited which will guarantee the safe running.
- ◆ Conforming to the instruction strictly is a necessity for realizing non-fault running and performing any quality assurance requirement.
- ◆ Under the premise of conforming to instruction, please pay attention to:
  - National (Local) regulations for relevant safety and accident preventions;
  - Special regulations and requirements of relevant devices;
  - Warning and safety mark on device.
- ◆ The following situations will cause human injury and property loss:
  - Incorrect running;
  - Wrong installation or operation;
  - Dismantle the protect cover or housing against the instructions.
- ◆ Any damage or stop caused by disregarding this instruction book will not be responsible by the company.
- ◆ To seek for technical advance, we reserve the rights to modify the instructions. With continuous improvements, we will further improve its performance and safety performances on the foundation of keeping the basic characteristics.

## 2 Technical information

### 2.1 The name plate information

⊕ <b>BONENG</b> ⊕	
Type	①
n <sub>2</sub>	② RPM
P <sub>1</sub> ③ kW	T <sub>2</sub> ④ N • m
n <sub>1</sub> ⑤ RPM	i ⑥
Oil ⑦	Wt. ⑧ kg
NO. ⑨	Date ⑩
⊕ ⊕	

- ① Product type
- ② Output speed (only for directly connected motor)
- ③ Rated input power kW (it means motor power for directly connected motor)
- ④ Rated output torque N • m
- ⑤ Rated input speed RPM (it means motor speed for directly connected motor)
- ⑥ Nominal ratio
- ⑦ Lubrication oil viscosity
- ⑧ Weight
- ⑨ Product number
- ⑩ Production date

◆ Data on nameplate are very important, please read them carefully and keep them clean. When services are needed, please provide the product number, used time and fault details.

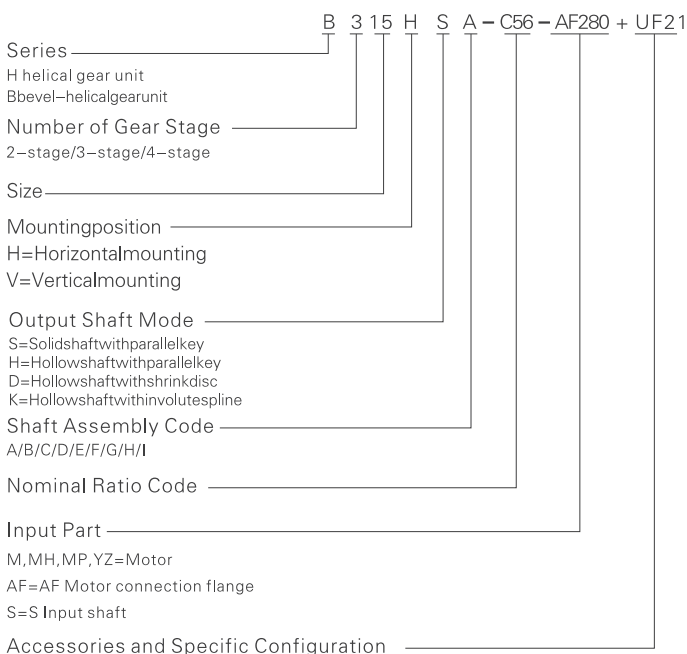


## 2.2 Type description

### 2.2.1 Product range:

H204~H226	B204~B218
H305~H326	B304~B326
H407~H426	B405~B426

Type designation:



Accessories code recommended on the catalog.

◆Type designation is only for reference, special type, please consult.

## 2.3 Noise level of gearbox

- ◆ Noise level conforms to relevant national standard, industrial standard and enterprise standard.
- ◆ Inspection of noise is done according to sound density theory, it is inspected in a distance of 1 meter (the surface noise region).
- ◆ Noise level is tested when gearbox is under good working situation with regulated rated input speed  $n_1$  and rated input power  $p_1$  stated on the name plate. If several figures are given, the highest speed and power values apply.
- ◆ If the repeated measurement can't get the final result, you should apply the inspection result obtained from the test platform of our company.

Measurement of surface noise level doesn't include the noise of accessories of lubrication device

### 2.3.1 Noise level of the helical gearbox without fan (H series):

Measuring-surface noise level LPA in dB(A) for helical gearbox without fan																											
Type	Ratio	Speed r/min	Size																								
			3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
H2	6.3	1500	-	71	74	75	76	77	79	79	80	81	81	82	84	85	85	86	-	-	-	-	-	-	-	-	
	-	1000	-	66	69	70	71	72	74	74	75	76	76	77	80	80	80	81	83	83	84	-	-	-	-	-	
	10	750	-	63	66	67	67	69	70	71	72	73	73	74	76	77	77	78	80	80	81	81	81	-	-	-	
	11.2	1500	-	69	72	73	74	75	77	77	78	79	79	80	82	83	83	84	-	-	-	-	-	-	-	-	
	-	1000	-	64	67	68	69	70	72	72	73	74	74	75	77	78	78	79	81	81	82	82	83	83	-	-	
	16	750	-	61	64	65	66	67	69	69	70	71	71	72	74	75	75	76	77	78	79	79	79	79	80	81	
	18	1500	-	66	69	70	71	72	74	74	75	76	77	78	80	80	81	82	83	84	84	85	-	-	-	-	
	-	1000	-	61	64	65	66	68	69	69	70	71	72	73	75	75	76	77	78	79	79	80	80	81	81	82	
	28	750	-	1)	61	62	63	64	66	66	67	68	69	70	72	72	73	73	75	75	76	76	77	77	78	78	
H3	22.4	1500	-	-	68	69	73	74	74	75	77	77	78	79	81	81	82	83	83	84	85	86	86	87	-	-	
	-	1000	-	-	63	65	68	69	69	71	72	73	73	74	76	77	77	78	79	79	81	81	81	82	83	83	
	35.5	750	-	-	60	61	65	66	65	67	69	69	70	71	73	73	74	75	75	76	77	78	78	79	79	80	
	40	1500	-	-	65	67	70	71	71	73	74	75	76	76	78	79	79	80	81	81	83	83	84	84	-	-	
	-	1000	-	-	1)	62	65	66	66	68	69	70	71	72	73	74	75	76	77	78	78	79	79	80	80	80	
	63	750	-	-	1)	1)	62	63	63	65	66	67	67	68	70	71	71	72	73	73	75	75	76	76	77	77	
	71	1500	-	-	62	64	67	68	68	70	71	72	73	74	76	76	77	78	78	79	80	81	81	82	82	83	
	-	1000	-	-	1)	1)	62	63	63	65	66	67	68	69	71	71	72	73	73	74	75	76	76	77	77	78	
	112	750	-	-	1)	1)	1)	1)	1)	62	63	64	65	66	68	68	69	70	70	71	72	72	73	73	74	75	
H4	100	1500	-	-	-	-	66	67	68	69	70	71	72	73	75	75	76	76	77	78	78	78	79	80	81	81	
	-	1000	-	-	-	-	62	63	63	64	65	66	67	68	70	70	71	72	72	73	73	74	74	76	76	77	
	140	750	-	-	-	-	1)	1)	1)	61	62	63	64	64	66	67	68	68	69	69	70	70	71	72	73	73	
	160	1500	-	-	-	-	64	65	66	66	68	68	69	70	72	73	73	74	74	75	75	76	76	78	78	79	
	-	1000	-	-	-	-	1)	60	61	62	63	64	64	65	67	68	68	69	70	70	71	71	72	73	74	74	
	250	750	-	-	-	-	1)	1)	1)	1)	60	61	61	62	64	64	65	66	66	67	67	68	68	70	70	71	
	280	1500	-	-	-	-	61	62	63	64	65	66	67	67	69	70	70	71	72	72	73	73	74	75	76	76	
	-	1000	-	-	-	-	1)	1)	1)	1)	60	61	62	63	64	65	66	66	67	68	68	68	69	70	71	72	
	450	750	-	-	-	-	1)	1)	1)	1)	1)	1)	1)	1)	61	62	62	63	64	64	65	65	65	67	68	68	

1) LPA < 60dB(A)

### 2.3.2 Noise level of helical gearbox (H···) with fan :

Measuring-surface noise level LPA in dB(A) for helical gearbox without fan																										
Type	Ratio	Speed r/min	Size																							
			3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
H2	6.3	1500	-	75	76	77	80	81	82	84	85	86	88	90	92	94	96	96	-	-	-	-	-	-	-	-
		1000	-	69	71	72	74	75	77	79	80	81	83	84	85	86	87	88	88	89	90	-	-	-	-	-
		750	-	66	68	69	70	72	73	75	76	77	79	80	81	82	83	83	84	84	85	85	86	-	-	-
	10	1500	-	73	75	77	79	80	81	82	85	88	90	91	92	93	95	95	-	-	-	-	-	-	-	-
		1000	-	68	69	70	72	73	75	77	79	80	82	83	84	85	85	86	86	87	87	87	88	88	-	-
		750	-	64	66	67	69	70	71	73	74	76	78	79	79	80	81	81	82	82	83	83	83	84	84	85
	16	1500	-	71	73	75	77	78	80	82	84	86	87	90	91	92	93	94	94	95	95	95	-	-	-	-
		1000	-	65	67	68	71	72	73	75	77	78	80	81	82	83	83	84	85	85	86	86	86	87	87	
		750	-	62	64	65	67	68	69	71	73	74	75	77	78	79	79	80	80	81	81	81	82	82	82	83
	28	1500	-	71	73	75	77	78	80	82	84	86	87	90	91	92	93	94	94	95	95	95	-	-	-	-
		1000	-	65	67	68	71	72	73	75	77	78	80	81	82	83	83	84	85	85	86	86	86	87	87	
		750	-	62	64	65	67	68	69	71	73	74	75	77	78	79	79	80	80	81	81	81	82	82	82	83
H3	22.4	1500	-	-	71	72	75	75	77	77	80	80	81	81	84	84	84	85	-	-	-	-	-	-	-	
		1000	-	-	65	66	69	70	71	72	74	75	75	75	78	78	78	79	-	-	-	-	-	-	-	
		35.5	750	-	-	62	62	66	67	67	68	70	70	71	72	74	74	75	76	-	-	-	-	-	-	-
	40	1500	-	-	70	71	73	74	76	76	79	79	80	80	83	82	83	83	-	-	-	-	-	-	-	
		1000	-	-	64	65	67	68	69	70	73	73	73	74	77	77	77	77	-	-	-	-	-	-	-	
		63	750	-	-	62	62	63	64	65	66	69	69	69	70	72	73	73	73	-	-	-	-	-	-	-
	71	1500	-	-	70	70	72	72	75	75	78	78	78	78	82	82	82	82	-	-	-	-	-	-	-	
		1000	-	-	64	64	65	66	68	69	71	72	72	72	75	75	75	76	-	-	-	-	-	-	-	
		112	750	-	-	61	61	62	62	64	65	67	67	68	68	71	71	71	72	-	-	-	-	-	-	-

### 2.3.3 Noise level of the bevel–helical gearbox without fan (B···):

Measuring–surface noise level LPA in dB(A) for bevel–helical gearbox without fan																											
Type	Ratio	Speed r/min	Size																								
			3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
B2	5	1500	72	75	78	80	82	83	84	86	87	88	89	90	93	-	-	-	-	-	-	-	-	-	-	-	
		1000	66	70	72	73	76	77	78	79	81	82	83	84	86	88	89	-	-	-	-	-	-	-	-	-	
	8	750	1)	63	65	66	69	71	72	73	74	75	77	78	80	82	83	84	-	-	-	-	-	-	-	-	
		1500	67	71	74	75	77	79	80	81	83	84	85	86	87	89	-	-	-	-	-	-	-	-	-	-	
	9	1000	61	65	67	69	72	73	74	76	77	78	80	81	82	83	85	86	-	-	-	-	-	-	-	-	
		750	1)	1)	60	63	65	66	67	69	71	72	73	74	76	77	78	79	-	-	-	-	-	-	-	-	
	14	1500	63	66	69	71	72	74	75	77	78	80	81	82	85	85	-	-	-	-	-	-	-	-	-	-	
		1000	1)	61	63	65	67	68	69	71	72	74	75	77	79	80	81	81	-	-	-	-	-	-	-	-	
	22.4	750	1)	1)	1)	1)	60	62	63	64	66	67	68	70	72	73	74	75	-	-	-	-	-	-	-	-	
		12.5	1500	65	68	71	74	75	76	77	79	81	83	84	85	86	87	87	88	89	90	91	92	-	-	-	
	B3	-	1000	1)	63	66	68	69	70	72	73	75	77	78	80	80	81	82	82	84	85	86	86	88	89	90	-
			750	1)	1)	1)	61	62	64	65	66	68	71	71	73	73	74	75	75	77	78	79	79	81	82	83	84
31.5		1500	60	65	67	70	71	71	72	74	77	79	80	81	82	83	83	84	86	86	88	88	-	-	-	-	
		1000	1)	1)	62	65	65	66	66	69	71	73	75	76	76	77	77	78	80	81	82	83	84	85	86	87	
56		750	1)	1)	1)	1)	1)	1)	1)	62	65	67	68	69	70	70	71	72	74	74	75	76	78	80	80	80	
		1500	1)	61	64	70	67	68	68	70	73	75	76	78	78	79	80	82	83	84	84	-	-	-	-	-	
63		1000	1)	1)	1)	63	62	62	62	65	68	70	71	72	73	73	74	75	76	77	78	79	81	81	83	83	
		750	1)	1)	1)	1)	1)	1)	1)	61	63	64	65	66	67	67	68	70	70	72	72	74	75	76	76		
B4		80	1500	-	-	64	65	67	68	70	72	75	76	77	79	80	81	82	83	84	85	86	86	87	88	87	89
			1000	-	-	1)	1)	61	63	64	67	69	70	72	73	74	75	76	77	78	79	80	80	81	82	82	83
		125	750	-	-	1)	1)	1)	1)	1)	1)	62	64	65	66	68	68	69	71	71	72	73	74	74	75	75	76
			1500	-	-	60	61	63	65	66	68	71	72	73	75	76	77	78	79	80	81	82	82	83	84	85	86
	140	1000	-	-	1)	1)	1)	1)	61	63	65	67	68	69	71	71	72	74	75	75	76	77	78	78	79	80	
		750	-	-	1)	1)	1)	1)	1)	1)	1)	61	62	64	65	66	67	68	69	69	70	71	72	73	73	73	
	224	1500	-	-	1)	1)	1)	62	63	65	67	69	70	71	73	73	75	76	77	77	78	79	80	80	81	82	
		1000	-	-	1)	1)	1)	1)	1)	1)	62	63	64	66	67	68	69	70	71	72	73	73	74	75	76	77	
	400	750	-	-	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	1)	61	62	63	64	65	66	66	67	68	69	70	

1) LPA < 60dB(A)

### 2.3.4 Noise level of bevel–helical gearbox (B···) with fan :

Measuring–surface noise level LPA in dB(A) for bevel–helical gearbox without fan																										
Type	Ratio	Speed r/min	Size																							
			3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20	22	23	24	25	26
B2	5	1500	73	76	79	81	83	84	85	87	88	89	91	92	94	-	-	-	-	-	-	-	-	-	-	-
		1000	67	71	73	74	77	78	79	80	82	82	84	85	87	89	90	-	-	-	-	-	-	-	-	-
		750	61	64	66	67	70	71	72	73	75	76	77	78	81	82	83	85	-	-	-	-	-	-	-	-
	8	1500	70	73	75	76	78	81	82	83	84	85	86	87	88	90	-	-	-	-	-	-	-	-	-	-
		1000	63	67	68	70	73	74	75	77	79	80	81	82	83	84	86	87	-	-	-	-	-	-	-	-
		750	1)	61	62	64	66	67	68	70	72	73	74	75	77	78	79	80	-	-	-	-	-	-	-	-
	9	1500	67	71	74	76	78	79	80	81	83	84	87	88	89	90	-	-	-	-	-	-	-	-	-	-
		1000	60	64	67	68	70	72	73	74	78	79	80	81	82	83	84	84	-	-	-	-	-	-	-	-
		750	1)	1)	61	63	65	67	68	69	71	72	73	73	74	74	75	76	-	-	-	-	-	-	-	-
	14	1500	67	71	74	76	78	79	80	81	83	84	87	88	89	90	-	-	-	-	-	-	-	-	-	-
		1000	60	64	67	68	70	72	73	74	78	79	80	81	82	83	84	84	-	-	-	-	-	-	-	-
		750	1)	1)	61	63	65	67	68	69	71	72	73	73	74	74	75	76	-	-	-	-	-	-	-	-
6	1500	67	71	74	76	78	79	80	81	83	84	87	88	89	90	-	-	-	-	-	-	-	-	-	-	
	1000	60	64	67	68	70	72	73	74	78	79	80	81	82	83	84	84	-	-	-	-	-	-	-	-	
	750	1)	1)	61	63	65	67	68	69	71	72	73	73	74	74	75	76	-	-	-	-	-	-	-	-	
B3	12.5	1500	69	72	75	77	79	80	81	82	83	85	88	89	90	91	93	93	93	93	95	95	-	-	-	-
		1000	62	65	68	69	71	72	73	74	77	78	80	82	83	83	84	85	86	86	88	88	88	89	90	91
		750	1)	1)	63	64	66	68	69	70	71	73	74	75	76	77	78	78	79	79	81	81	82	84	85	85
	31.5	1500	67	69	72	73	74	75	77	79	82	84	86	87	88	89	90	91	92	92	93	93	-	-	-	-
		1000	1)	63	65	66	67	69	71	72	73	75	77	78	79	80	81	82	83	83	85	86	86	87	88	89
		750	1)	1)	1)	1)	62	64	65	67	69	70	71	72	73	74	75	76	77	77	79	79	80	81	82	82
	56	1500	66	68	70	71	73	74	75	78	81	83	85	86	87	88	89	90	91	91	92	92	-	-	-	-
		1000	1)	61	63	64	66	68	69	71	73	75	77	78	79	80	71	81	82	82	83	84	84	85	86	86
		750	1)	1)	1)	1)	61	63	64	66	67	68	70	71	72	73	74	74	75	75	77	77	78	79	79	80
	63	1500	66	68	70	71	73	74	75	78	81	83	85	86	87	88	89	90	91	91	92	92	-	-	-	-
		1000	1)	61	63	64	66	68	69	71	73	75	77	78	79	80	71	81	82	82	83	84	84	85	86	86
		750	1)	1)	1)	1)	61	63	64	66	67	68	70	71	72	73	74	74	75	75	77	77	78	79	79	80
90	1500	66	68	70	71	73	74	75	78	81	83	85	86	87	88	89	90	91	91	92	92	-	-	-	-	
	1000	1)	61	63	64	66	68	69	71	73	75	77	78	79	80	71	81	82	82	83	84	84	85	86	86	
	750	1)	1)	1)	1)	61	63	64	66	67	68	70	71	72	73	74	74	75	75	77	77	78	79	79	80	

1)LPA < 60dB(A)

### 2.4 Temperature rising

- ◆When the ambient temperature is 40°C, the running gearbox oil temperature is not exceeded 85°C.
- ◆The allowable working temperature range of lubricating oil for gearbox is roughly as follows:  
 Mineral oil is about -10°C~+90°C (Up to +100°C at moment);  
 Synthetic oil is about -20°C~+100°C (Up to +110°C at moment);

## 2.5 Notes

### (Following notes is related to the use of gearbox):

- ◆ When installed outdoor, direct sunlight should be avoided, otherwise concentrated heat will affect the gearbox performance.
- ◆ The gearbox performance. must not be cleaned using high–pressure cleaning equipment.
- ◆ All work such as inspection, maintenance and installation on gearbox should be done when gearbox is not in operation.
- ◆ No welding work should be done on gearbox, the gear– box musn’ t be used as an earthing point for welding work. Welding will cause irreparable damage to fine gear wheel and bearings.
- ◆ If any changes are found during operation (for example, over heating or abnormal noise, etc), you should switch off driving device immediately.
- ◆ All the rotating components should be equipped with protective cover to prevent accidental contact of staffs,such as couplings, hydraulic coupler, gear wheel, driving belt wheel, etc.
- ◆ You should conform to the instructions on gearbox, for example, nameplate, arrow of the direction, etc. These nameplates and marks must be kept free from dirt and paint out all times.
- ◆ During assembly or disassembly work, the damaged bolts should be changed with new bolts with the same strength and category.
- ◆ The bad results caused by unreasonable application of couplings, self–modification to gearbox and application of the components of other companies are not included in “three–guarantee” services.
- ◆ Depending on operation conditions of gearbox, the surface, lubrication oil and components of gearbox may reach high temperature, avoid being burnt.
- ◆ When changing lubrication oil, take care to prevent scalding by hot oil.
- ◆ Gearbox should be laid on dry wooden foundation with no vibration and be covered well. When storing the gearbox and any independent components, you should take anti–rust measures, avoid rusting, the gearbox should not be piled together when stored.
- ◆ Unless there are other regulations in ordering contract, gearbox should not be stored or work in sites with strong acid, alkali, low temperature, high temperature and heavy polluted air, damp and the places with chemical articles.
- ◆ When shifting the gearbox, take care to avoid the shaft ends knocked, otherwise the gearbox may be damaged. When lifting, don't use the front threads at the shaft ends to attach eyebolts for transport.
- ◆ Spare parts must be purchased from BONENG.

## 3 Installation and dismantlement

### 3.1 Notes before installation



- ◆ Confirm the gearbox in good condition(no damage during transporting or storing);
- ◆ Confirm site environment conforms to nameplate content;
- ◆ Standard ambient temperature of gearbox:  
–20°C~+40°C; no oil, acid, harmful gas, steam, radioactive substances. etc;
- ◆ If the storage time of the gear box is more than one year, the service life of the lubricant in the bearing will be shortened.



- ◆ Installing outdoor should avoid direct sunshine. In case of concentrated heat to influence smooth running of gearbox;
- ◆ Special gearbox: allocated according to ambient condition;
- ◆ During planning period, you should reserve enough space to maintain or repair;
- ◆ If the gearbox is fitted with a fan, there should be sufficient space for air intake.

### 3.2 Preparations

- ◆ Completely clean the preservative and pollutants, etc on the surface of input/output shaft and flange; be sure not to damage the oil sealing by solvents immersion;
- ◆ If the gearbox is stored for more than one year, the life of lubricant in bearing will be shortened;
- ◆ Preparation of tools/materials: one group of spanner, torque spanner, assembly clamp tools, input and output fastening device, lubricant (anti-rust oil), medium of sealing bolts (thread locking adhesives).

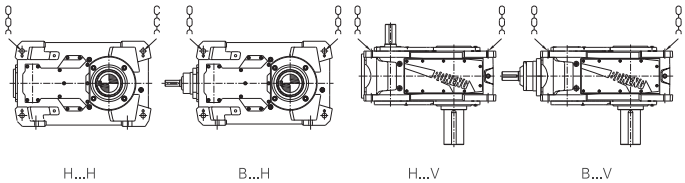
### 3.3 Installation of gearbox

#### Foundation

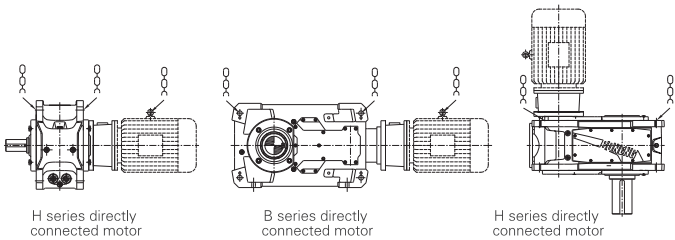
- ◆ Prepare rigid foundation or stable platform to install transmission device, at the same time, you should consider that the position of all parts will not change even if maximum torque is loaded on box.
- ◆ The foundation of gearbox should be horizontal and leveled. It must be designed in such a way that no resonance vibrations are set up and no vibration are transmitted from adjacent foundations steel structures on which the box is to be mounted must be rigid. It must be designed according to the mass and torque taking into account the forces acting on the gearbox.
- ◆ Fastening bolts or nuts must be tightened to the prescribed torque. For the correct torque, we recommend customer to use the bolts of the minimum strength class 8.8.

#### Lifting position

For the gearbox not installed with accessories, you should apply the four holes on gearbox to lift.



For gearbox installed with other accessories (such as motor and foundation), an additional attachment point may be required:

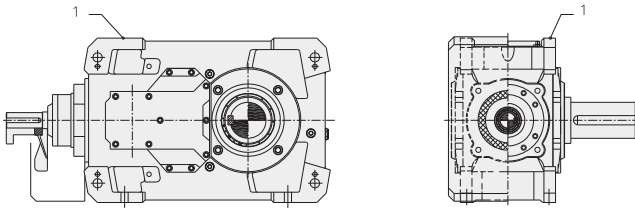


Note: Forbid to use the shaft end screw as the hoisting point after it is installed with hoisting ring.



## Installation procedures of gearbox:

- ◆ The initial alignment of the gearbox (the position marked in diagram) in a horizontal direction is done by the surfaces of the inspection of assembly cover:



1 Initial alignment surface

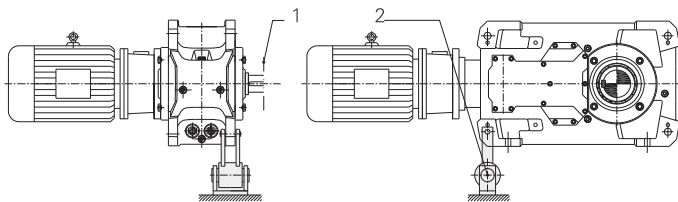
- ◆ The final fine alignment with the assemblies on the in-and-output side must be carried out accurately, by the shaft axes using:
  - Ruler • spirit level • dial indicator • feeler gauge, etc ;
- ◆ Only then should the gearbox be fastened and re-check the alignment situation.

Instruction: the precision degree of alignment is a very important factor to determine lifespan of shaft, bearing, couplings. Ensure the alignment tolerance to be zero.

According to different installation forms, you should pay attention to:

- ◆ For foundation installation, central height should be correct aligned, when connecting couplings, you should calibrate the coaxiality of the two shafts; for flexible couplings, the flotation value should not exceed the permissible range of couplings, for rigid connection, you should ensure form tolerance of each installation and connection; you should ensure shaft with enough rigidity for long shaft connection.
- ◆ When installing flange, protruding (or concave) steps should inosculate with housing. For flange installation and ollow shaft connection, ensure the contour and position tolerance for connection.
- ◆ When installing torque arm, hollow shaft should be exactly aligned with the machine shaft, machine shaft swiveling and the gearbox vibration shouldn't exceed the flexible range, the arm should be fixed and tightened. Torque arm should be installed in the gearbox side, ensure no force. As showed in diagram:
- ◆ When solid shaft is installed with coupling, belt pulleys gear, chain wheels and sprocket, etc, please don't make heavy clicking. The outer screw hole of output shaft should be pressed into connecting piece. Belt pulleys, gear wheels, and pug mill should consider about the radial force.

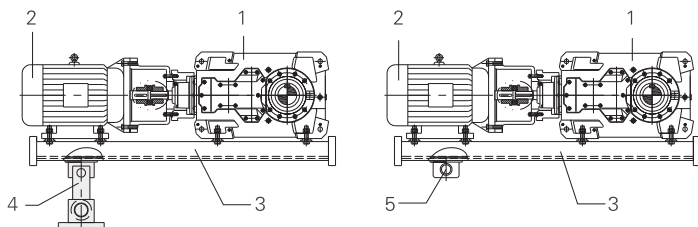
Torque arm installed on gearbox



1 Driven machine side

2 Flexible support

Torque arm installed on foundation of gearbox



1 Gearbox

2 Motor

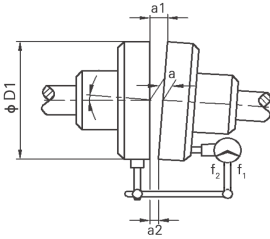
3 Foundation

4 Torque arm

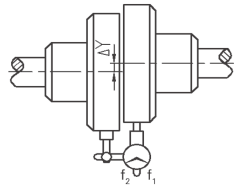
5 Arm support

### 3.4 Assembly of coupling

- ◆ The input drive end of gearbox should apply flexible coupling or hydraulic coupling.
- ◆ When output shaft of gearbox is solid shaft, you should apply flexible coupling.
- ◆ If rigid coupling or other input and output elements which generate additional radial force or axial force (for example, gear wheel, belt wheel, fly wheel, hydraulic coupling, etc) are to be used, this should be marked in contract.
- ◆ When input shaft is connected with driving shaft, ensure input shaft has the same axial center with driving shaft. Coaxiality deviation will increase mechanical vibration, cause damage to bearing and influence gear wheel contact. As shown in the following diagram, after input shaft is connected with driving shaft through coupling, you should adjust it with meter, after relevant inspection parameter satisfies the requirements in the following table “Coaxiality accuracy table”, the equipment can be used.



Angle deviation inspection



Deviation inspection

Coaxiality accuracy table:

Outer diameter	n<500r/min		500 ~ 1500r/min		>1500r/min	
	a1-a2	$\Delta Y$	a1-a2	$\Delta Y$	a1-a2	$\Delta Y$
$D \leq 100$	0.05	0.05	0.04	0.04	0.03	0.03
$100 < D \leq 200$	0.06	0.06	0.05	0.05	0.04	0.04
$200 < D \leq 400$	0.12	0.10	0.10	0.08	0.08	0.06
$400 < D \leq 800$	0.20	0.16	0.16	0.12	0.12	0.10

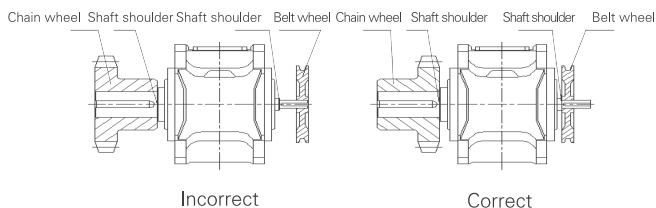


Instruction:

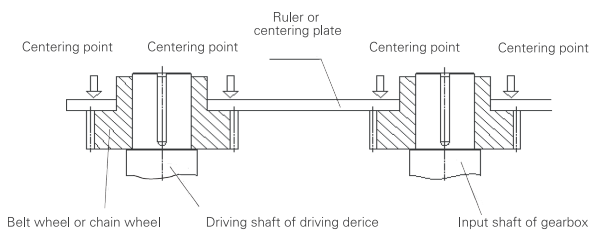
When circular velocity of coupling outer diameter is 30m/s or below, it should be statically balanced. When circular velocity of outer diameter exceeds 30m/s, it must be dynamically balanced.

### 3.5 Assembly of belt wheel or chain wheel

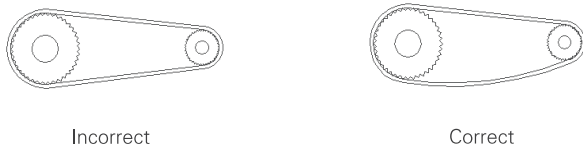
- ◆ When input shaft and output shaft of gearbox are installed with belt wheel or chain wheel, make sure the force transmission part of belt wheel or chain wheel be close to shaft shoulder as possible. As shown in the following diagram:



- ◆ When installing belt wheel or chain wheel, ensure input shaft is centered to driving device, ensure maximum axial deviation tolerance value of the four centering points in diagram be 1mm every 1000mm.

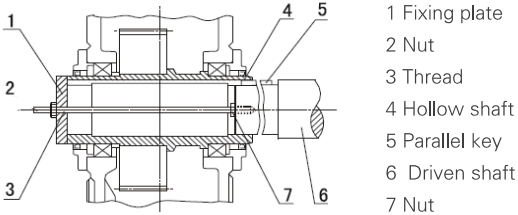


- ◆ When installing belt wheel or chain wheel, ensure belt wheel and chain with certain tonus.



### 3.6 Assembly of hollow shaft of gearbox

- ◆ When hollow shaft is connected with solid shaft clean and put anti-rust oil (hollow shaft must be exactly aligned with the machine shaft). Instead of the nuts and bolts shown in diagram, other types of equipment such as a hydraulic lifting equipment can be used.

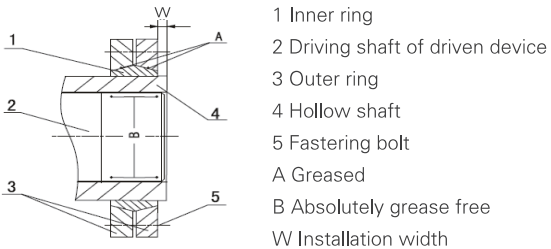


- ◆ When hollow shaft of gearbox is equipped with locking plate, you should first cover locking plate on hollow shaft, then finish the installation of driving shaft of driven device, you should not screw the fastening bolts on locking plate before installing the driving shaft of driven device.



→The locking plate being supplied can be directly installed, you can't tear it down before the first stress.

→Before installing locking plate, ensure the bore of hollow shaft and the machine shaft must be absolutely free of grease in the area of the shrink disk seat.



- ◆ When screwing the bolts on locking plate, it is forbidden to screw it according to adjacent order, you should screw fastening bolts along with equilateral triangle order according to installation requirements of locking plate. During each circulated screwing process, each bolt can only screw 1/4 circle.

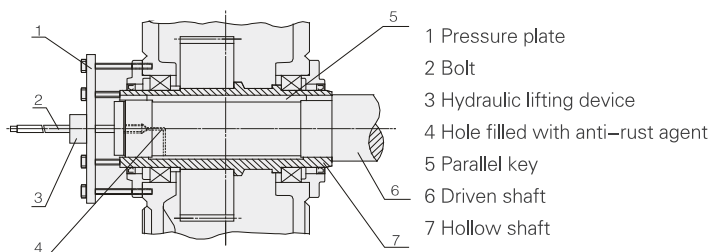
- ◆ Generally fixing bolts adopt 8.8 level, In case of high temperature or vibration impact, please take anti-loosing measures on screw joints. The screw torque of each fastening bolt as follows:

Bolt dimension ( mm )	Tighten torque ( N · m )	Bolt size ( mm )	Tighten torque ( N · m )
M6	15	M30	2000
M8	36	M36	3560
M10	72	M42	5720
M12	123	M48	8640
M16	295	M56	13850
M20	580	M64	14300
M24	1000	M72	20800

### 3.7 Disassembly of hollow shaft of gearbox

#### Disassembly of hollow shaft

Depending on the facilities available on site, the gear-box can be forced off the machine shaft using forcing screws in and end plate, a central threaded spindle or preferably a hydraulic lifting box. Each end face of hollow shaft are equipped with 2 screw holes to screw in bolts used to fixing end plate.



Note:

The pressure plate and auxiliary plate are not in the range of delivery. (Arrangement and dimension of screw hole of hollow shaft end can refer to technical diagram of BONENG)

When disassembling the hollow shaft of gearbox equipped with locking plate, the loosening of locking plate is reversed to fastening direction. Finish disassembly of driving shaft of driven device according to the above method after tearing down locking plate.

When disassembling locking plate, you should pay attention :



→It is forbidden to loose bolts according to the adjacent order.

→When outer ring of locking plate can't separate from inner ring, you can screw a few bolts into disassembly screw, separate inner ring from outer ring.

### **3.8 Assembly of accessories**

- ◆ The technical data of the involved accessories can refer to equipment list of specific order.
- ◆ Electrical and controlling device should be wired according to instruction of device supplier.
- ◆ For operation and maintenance, The operating instructions provided specifically for the order's instruction.

#### **Gearbox equipped with cooling coil**

- ◆ Before connecting cooling coil of cooling water, first take the blocking head off from the joint of cooling coil, completely washed spiral pipe to clean the dirty things.
- ◆ Install inflow and outflow pipe of cooling water, the pressure should not be larger than 0.8MPa.

#### **Gearbox equipped with water cooling lubrication oil**

- ◆ Before connecting cooling coil of cooling water, the end cap on water pipe should be taken down and washed clean.
- ◆ Install inflow and outflow pipeline of cooling water. For water flow direction and joint position, please consult.
- ◆ Electrically connect pressure inspection device.

#### **Gearbox equipped with heating device**

- ◆ connect temperature monitor.
- ◆ Electrically connect heating element.

#### **Gearbox equipped with oil temperature measuring device**

- ◆ Electrically connect resistive thermometer with evaluating instrument (be prepared by customers).

#### **Gearbox equipped with oil-level monitoring**

- ◆ Electrically connect oil-level monitor.

#### **Gearbox equipped with speed transmitter**

- ◆ Electrically connect speed transmitter.

### 3.9 Final work

- ◆ After installing gearbox, check all screw connections for tight fit.
- ◆ After screwing down fasteners, you should check whether the alignment changes.
- ◆ Inspect whether the removed devices are installed according to device list and the attached drawing.






## 4 Installation information

### 4.1 H&B installation position information

- ◆ The mounting position details and type selection of gearbox, please refer BONENG selection manual (H&B series).

### 4.2 H&B Installation direction diagram

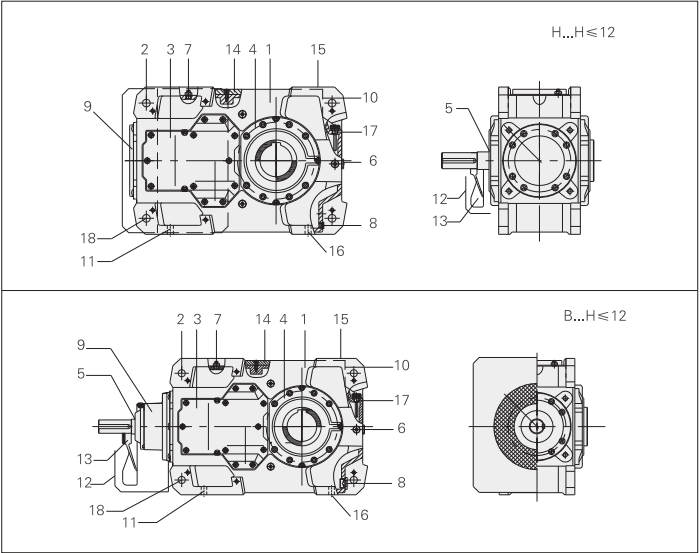
- ◆ Symbols used in installation direction pages of gear– box and their meanings:

Symbol		Meaning	
		Breather	Oil inlet
		Oil ruler	Oil glass
		Oil drain plug	

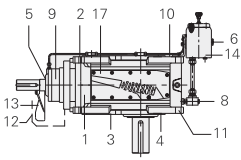


### 4.3 General information

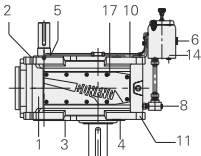
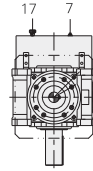
The housing is equipped with adequately dimensioned lifting eyes, inspection and assembly cover with appropriate dimensions. The lubrication oil height in gearbox can be inspected with inspection oil ruler or observation oil lens. The housing is equipped with oil drain ruler, oil plug, oil lens and a vent cap.



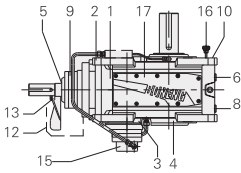
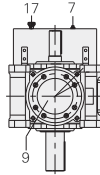
- |                               |                                 |
|-------------------------------|---------------------------------|
| 1 Housing                     | 10 Nameplate                    |
| 2 Lifting eyes                | 11 Fastener of gearbox          |
| 3 Cover                       | 12 Fan cover                    |
| 4 Cover                       | 13 Fan                          |
| 5 Oil seal                    | 14 Inspection or assembly cover |
| 6 Oil indicator               | 15 Alignment surface            |
| 7 Vent cap                    | 16 Alignment thread             |
| 8 Oil plug                    | 17 Oil filler/oil ruler         |
| 9 Cover or bearing foundation | 18 Fastener of torque arm       |



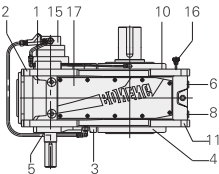
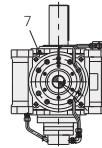
B...V ≤ 12 (Compensation oil tank cap )



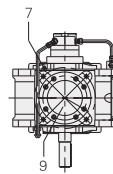
H...V ≤ 12 (Compensation oil tank cap )



B...V ≤ 12 (Shaft end oil pump )



H...V ≤ 12 (Shaft end oil pump )



- |                 |                               |                                 |
|-----------------|-------------------------------|---------------------------------|
| 1 Housing       | 7 Vent cap                    | 13 Fan                          |
| 2 Lifting eyes  | 8 Oil plug                    | 14 Additional oil box           |
| 3 Cover         | 9 Cover or bearing foundation | 15 Shaft end oil pump           |
| 4 Cover         | 10 Nameplate                  | 16 Oil filler/oil ruler         |
| 5 Oil seal      | 11 Fastener of gearbox        | 17 Inspection or assembly cover |
| 6 Oil indicator | 12 Fan cover                  |                                 |

## 5 Lubrication/Cooling/Heating

### 5.1 Lubrication

Lubrication selection:

- ◆ Under the premise of the same viscosity level and category, you can choose internationally famous brand.  
If you need to change the recommended viscosity level, please consult.
- ◆ The following table lists the lubrication oil brand and ambient temperature corresponding to product specification.

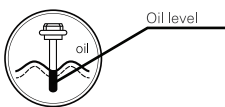
Ambient temperature <sup>°C</sup>	-20 <sup>°C</sup> ~ +40 <sup>°C</sup>	+30 <sup>°C</sup> ~ +50 <sup>°C</sup>
Viscosity brand number	VG320	VG460



- When ambient temperature is lower than -10<sup>°C</sup>, you have to use synthetic oil.
- To ensure lifespan of the products, we recommend synthetic oil.
- When ambient temperature exceeds the above range, please consult technical department of BONENG.

Quantity of lubrication oil fill:

- ◆ This quantity is a recommended value. According to the difference of gearbox level and ratio, the oil filling quantity is different. Please pay attention to oil ruler or oil glass scale as the indication of oil filling.



Oil ruler



Oil glass

- ◆ For the products without oil ruler, oil filling quantity should according to product catalogue.
- ◆ For products of the same type, under different installation directions, the oil filling quantity is different.
- ◆ The following table lists suggested oil filling quantity for different installation directions of various series.

Oil quantity table ( L )																		
Size	H2..H	H3..H	H4..H	B2..H	B3..H	B4..H	H2..V		H3..V		H3..V		B2..V		B3..V		B3..V	
	①	①	①	①	①	①	②	③	②	③	②	③	②	③	②	③	②	③
3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	10	—	—	10	9	—	25	—	—	—	—	—	28	—	28	—	—	—
5	15	15	—	16	14	16	23	10	35	13	—	—	41	20	32	12	36	15
6	16	17	—	19	15	18	27	11	37	15	—	—	50	23	35	13	40	16
7	27	28	25	31	25	30	58	22	60	25	50	20	75	35	52	22	60	30
8	30	30	27	34	28	33	62	25	72	30	60	25	90	38	67	28	70	35
9	42	45	48	48	40	48	100	42	100	40	95	38	115	53	115	48	110	60
10	45	46	50	50	42	50	110	46	110	45	110	45	135	60	125	52	130	67
11	71	85	80	80	66	80	160	60	170	66	165	65	190	86	180	75	180	75
12	76	90	87	95	72	90	180	70	190	75	180	75	215	95	200	85	195	85
13	135	160	130	140	130	145	—	80	—	115	—	95	—	100	—	95	—	130
14	140	165	140	155	140	150	—	90	—	126	—	105	—	110	—	110	—	150
15	210	235	230	220	210	230	—	140	—	180	—	150	—	145	—	165	—	200
16	215	245	235	230	220	235	—	150	—	190	—	160	—	160	—	190	—	235
17	290	305	290	320	290	295	—	175	—	190	—	190	—	210	—	210	—	215
18	300	315	305	335	300	305	—	185	—	200	—	200	—	220	—	240	—	250
19	320	420	360	—	380	480	—	—	—	—	—	—	—	—	—	—	—	—
20	340	450	380	—	440	550	—	—	—	—	—	—	—	—	—	—	—	—
21	370	500	440	—	460	600	—	—	—	—	—	—	—	—	—	—	—	—
22	400	560	480	—	490	650	—	—	—	—	—	—	—	—	—	—	—	—
23	430	620	520	—	530	710	—	—	—	—	—	—	—	—	—	—	—	—
24	450	650	550	—	600	810	—	—	—	—	—	—	—	—	—	—	—	—
25	760	735	880	—	640	1000	—	—	—	—	—	—	—	—	—	—	—	—
26	680	935	780	—	880	1150	—	—	—	—	—	—	—	—	—	—	—	—

① Oil pond splash lubrication

③ Forced lubrication

② Pressure lubrication

④ The data above are mean values

Lubrication method

◆ Oil immersion lubrication:

When installing gearbox vertically, all the gear teeth and bearings are immersed in lubrication oil. When temperature rises and lubrication grease expands, the space needed is provided by the additional oil box jointed with gearbox by bolts.

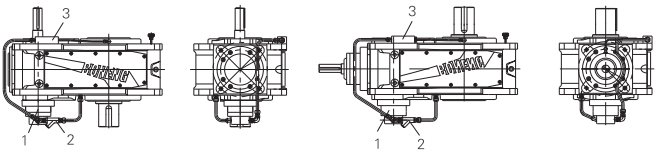
◆ Splash lubrication:

When installing gearbox horizontally, all the gear teeth and bearings are adequately splash-lubricated with oil brought by gears.

For non horizontal installation, when the speed of bearing and circumferential velocity of gear rise, splash lubrication system may be replaced or supported by a pressure lubrication system.

◆ Lubrication system realized by additional devices:

When the speed of bearing or teeth peripheral is too high, splash lubrication has to be changed into forced lubrication system. Forced lubrication system includes shaft end pump or motor oil pump, filter, pipework. The direction of oil inlet and outlet flow from shaft end pumps is independent of the direction of gearbox rotation.



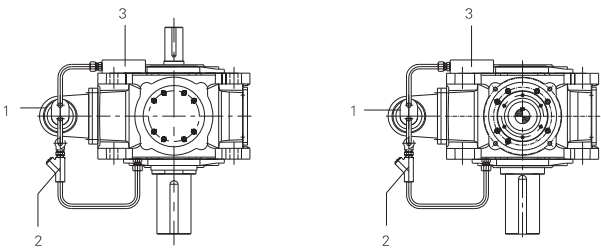
H...V ≤ 12 (Shaft end pump )

B...V ≤ 12 (Shaft end pump )

1 Shaft end pump

2 Filter

3 Oil distributing device



1 Motor pump

2 Filter

3 Oil distributing device

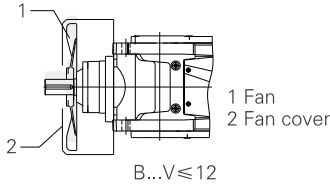


Note: Before starting the gearbox equipped with a motor pump, the pump must be operated.

## 5.2 Cooling

### Fan

Fan is mounted on a high-speed shaft of gearbox, it is protected by a cover and accidental contact. This fan absorbs air from the grilling on protective cover, then blow it to the air path on the side of gearbox. It hereby dissipates a certain amount of heat from the housing.



### Instruction:

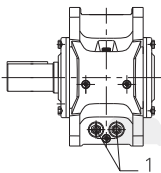
For the gearbox installed with fan, you should leave enough space to let air in when installing couplings or other components.

The correct dimension for the space being left is shown in the dimension diagram of gearbox documents.

Keep the fan clean. If the fan or the housing are dirty, cooling efficiency will be reduced.

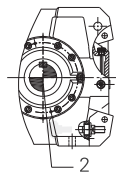
### Cooling coil

The position of cooling coil is inside the oil box of gearbox. In cooling spiral pipe is cooling water. Cooling water is provided by users. Either fresh water, seawater or brackish water can be used for cooling. When cooling water flows through cooling spiral pipe, the heat will be transmitted to cooling water from cooling spiral pipe, thus removing heat from the system.



1 Water ports

B../H.. ≤ 12



2 Output shaft

Flow of the cooling water ( l/min)

Type	Size																	
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20-26
H2.H/B3.H	-	4	4	4	4	4	8	8	8	8	8	8	8	8	8	8	On request	On request
H3.H	-	-	4	4	4	4	4	4	8	8	8	8	8	8	8			
B2.H	-	4	8	4	8	4	8	8	8	8	8	8	8	8	8			
B4.H/H4.H	-	-	4	4	4	4	4	4	8	8	8	8	8	8	8			

Type	Size																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19-26	
H2.V/B3.V	4	4	4	4	4	8	8	8	8	8	8	8	8	8	8	On request	
H3.V	-	4	4	4	4	4	4	8	8	8	8	8	8	8			
B2.V	4	8	4	8	4	8	8	8	8	8	8	8	8	8			
B4.V/H4.V	-	4	4	4	4	4	4	8	8	8	8	8	8	8			

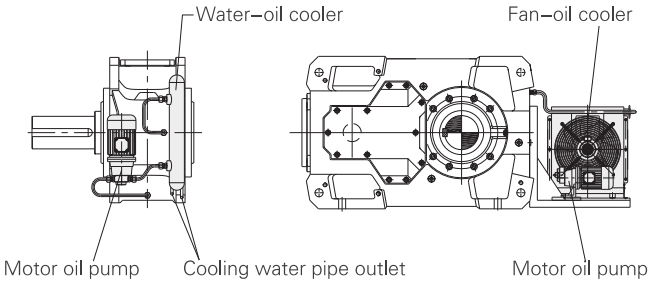


Note:

Cooling water can flow through gearbox from any direction. The pressure of cooling water should not exceed 0.8MPa. If the gearbox is being with drawn from service for a long time or the water may freezed, the cooling water should be drained off. Blow moisture with compressed air. The end of cooling spiral pipe must not be twisted, otherwise the spiral pipe will be damaged. Locking screw can't be tightened or demounted because the cooling spiral pipe will be damaged.

## Cooling of cooling device

Gearbox with cooling device is designed to cool the lubrication oil, thus completing heat dissipation. Common cooling device: air cooling device and water cooling device, as shown in the diagram:



Air cooling device utilizes the surrounding air to cool, according to the difference of volume flow, lubrication oil flows through cooling device from one path or several paths, air blows through these paths from fan, getting cooling effect.



Instruction:

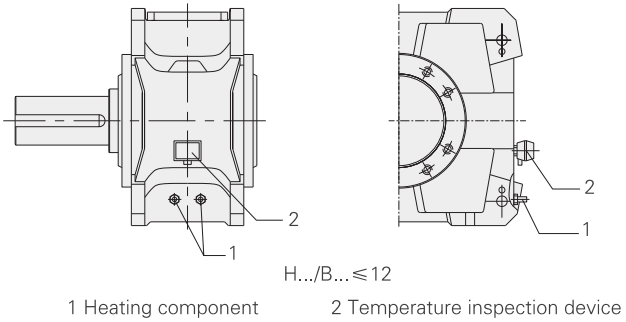
For the gearbox equipped with air cooling device, please ensure the air circulation from being impeded. The minimum distance from adjacent components and walls can be seen in diagrams in gearbox documents.

The principle of water cooling device is the same with air cooling device, the medium of cooling is changed from air into water. To ensure the best cooling effect, you should conform to the flow direction of cooling device. The inlet and outlet of cooling water should not be changed. Cooling water pressure should not exceed 0.8MPa. If the gearbox is stopped for a long time, or the water has a danger of freezing. Drain off the cooling water. You should blow moisture with compressed air.



## 5.3 Heating

At low temperature, it may be necessary to heat the lubrication oil in gearbox before starting the driving device of gearbox. Sometimes, it's need to heat the lubrication oil during operation. In these situations, you should equip one or two heating components. These heating components transfers electric energy into heat energy, thus heating the lubrication oil. Heating component is located in protective cover pipe inside the housing, so it's not necessary need to discharge lubrication oil in gearbox cabinet when changing heating component.

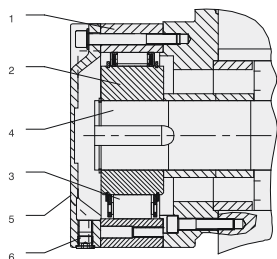


Note:

You can only connect power source of heating component when it is immersed in lubrication oil, otherwise, there may be fire danger. If you install heating component afterwards, the maximum heating capacity on the surface of heating component should not exceed 0.8W/cm<sup>2</sup>.

## 5.4 Backstop

In some situations, the gearbox should equip mechanical backstop. This can make gearbox run to one direction during operation. The rotation direction is marked in input and output end of gearbox with arrow. Backstop mechanism is installed on mounting flange plate of gearbox, it is sealed, with no oil leakage. It is united with lubrication oil circulation system.



- 1 Outer ring of backstop device
- 2 Inner ring of backstop device
- 3 Cage with sprogs
- 4 Shaft (install flange plate)
- 5 Cover
- 6 Residual-oil drain for backstop device



Note:

To avoid damaging backstop device or gearbox, the motor should not run to the forbidden direction, pay attention to the instruction on gearbox. Before motor wiring, you should determine rotation direction of three-phase power source with a phase-sequence indicator, connect motor wire according to the regulated rotation direction.

## 6 Application

### 6.1 Fill the lubrication oil

- ◆ Our products are not filled with lubrication oil when delivered. You should fill lubrication oil according to instruction book before running.

On the position marked with this symbol, fill lubrication oil into gearbox.

## 6.2 Check the device

- ◆ Check oil level, cooling of lubrication oil or the sealingness of oil supply system.
- ◆ Inspect the status of cooling device and check the shut-off valve.
- ◆ For the gearbox equipped with backstop device, inspect whether wiring of motor is correct.
- ◆ Inspect whether shaft sealing is effective.
- ◆ Check whether the rotating components contact with other components.

## 6.3 Start

- ◆ For the gearbox equipped with motor oil pump, make sure open oil pump motor before starting the device.
- ◆ Check whether the running direction under free status is correct (supervise whether there is abnormal grinding noise when the shaft is running).
- ◆ During running inspection, you should ensure no output component on shaft, open relevant supervision and protection device at the same time.
- ◆ If there is abnormal running phenomenon (for example, temperature rise, noise, vibration, etc), you should turn off the motor and check out the reason.
- ◆ Contact with BONENG when necessary.

# 7 Checks and maintenance


## 7.1 Check and maintenance regularly

- ◆ Users should make regular maintenance to gearbox. Check the status of lubrication oil regularly, clean vent cap, fan, cooling coil and the surface of gearbox, keep the gearbox clean, ensure normal running of gearbox.

## 7.2 Periods of checks and maintenance

Check oil temperature	Daily
Check abnormal noise of gearbox	Daily
Check oil level	Monthly
Check for leaks gearbox	Monthly
Check oil for water content	After working 400 hours, at least once a year

First oil change after starting	After working 400 hours
Subsequent oil changes	After every 5000 hours
Clean oil filter	Every 3 months
Clean ventilation cap	Every 3 months
Clean fan, fan cowl and gearbox cabinet	Do with oil changing
Check cooling coil for deposits	About every 2 years, do with oil changing
Check lubrication oil air cooler	Do with oil changing
Check lubrication oil water cooler	Do with oil changing
Check tightness of fastening bolts	The first time after changing oil, then change oil every two times
Full-aspect inspection to gearbox	About every 2 year, do with oil changing
Clean ventilation screw	Every 3 months

 The listed periods are determined on working condition of gearbox. These periods are average values under the following conditions:

- Daily working hour: 24 hours
- Loading factor: 100%
- Speed of input device 1800 RPM
- Maximum temperature 90°C (only mineral oil)
- 100°C (only synthetic oil)

## 7.3 Notes for checks and maintenance:

- ◆ Cut off power source, prevent electric shock, wait for cooling of gearbox.
- ◆ Inspection of oil level: screw down oil ruler, inspect oil level. Products which use oil glass refer the oil glass level and fill the oil to the middle level of oil glass.
- ◆ Oil inspection: remove oil drain plug, take some samples, inspect oil viscosity index; if the oil is not clean, change it.
- ◆ Oil changing:
  - It is forbidden to mix different lubricants.
  - After cooling, oil viscosity will increase, it is harder to drain off oil. change before cooling.
  - Put an oil picking plate under oil plug, tear down oil plug/oil ruler/vent cap, install oil plug after removing oil.
  - Inject new oil of the same brand, oil quantity should be the same with installation direction (see nameplate); if the brand number is different, consult after-sales department.
  - Inspect oil level at oil ruler or oil glass, install oil ruler and vent cap.

## 8 Fault treatment

### 8.1 Fault, reason and measures

Maintenance work should be done by qualified staff

Fault	Reason	Measure
Big noise at the fastener of gearbox	Fastener looses	Tighten bolt/nut to regulated torque. Replace the damaged bolt/nut.
Noise change of gearbox	Teeth of gear is damaged	<b>Contact with customer service department.</b> → Check all the gears, change the damaged components.
	Bearing interval is too large	<b>Contact with customer service department.</b> →Adjust bearing interval.
	Bearing is damaged	<b>Contact with customer service department.</b> →Change the damaged bearings.
Operating temperature is too high	Oil level in cabinet is too high.	Check oil level, if necessary, adjust it.
	Oil is too old	<b>Contact with customer service department.</b> →Check the last time of oil changing, if necessary, change it.
	Oil is badly contaminated.	<b>Contact with customer service department</b> →Change oil
	On gearbox equipped with lubrication oil cooling system: Flow of coolant is too low or too high	Adjust the valve of inflow and outflow pipelines. Check free flow of water cooling device.
	Temperature of coolant is too high	Check the temperature and adjust according to requirements
	Oil flows through water cooling device is too low, reason: Oil filter is seriously clogged	Clean oil filter
	Mechanical fault of oil pump	<b>Contact with customer service department.</b> →Check whether the function of oil pump is normal. →Repair or change into a new one.
	On gearbox equipped with fan: Air inlet and/or cabinet of fan cover are badly contaminated	Clean fan cover and cabinet
Gearbox equipped with cooling coil: Residues dirt in cooling coil	<b>Contact with customer service department.</b> →Clean or change cooling coil.	

Fault	Reason	Measure
Temperature of bearing is too high	Oil level in gearbox cabinet is too high or too low	Check oil level under room temperature and topup oil according to requirements
	Oil is too old	<b>Contact with customer service department.</b> →Check the last time of oil changing.
	Mechanical fault of oil pump	<b>Contact with customer service department.</b> →Check whether oil pump works normally. Repair or change a new oil pump
	Bearing is damaged	<b>Contact with customer service department.</b> →Check the data obtained from vibration measurement by operators →Check and change bearing according to requirements
Amplitude of bearing rises	Bearing is damaged	<b>Contact with customer service department.</b> →Check and change bearing according to requirements.
	Gear is damaged	<b>Contact with customer service department.</b> →Check and change gear according to requirements.
Temperature of backstop device is too high Backstop is ineffective.	Backstop device is damaged.	<b>Contact with customer service department.</b> →Check and change backstop device according to requirements.
Gearbox leaks oil	Sealing at cabinet cover or joint is not good	Check sealing part and the joint, if necessary, change into a new one. Seal the joint part.
	Radial shaft sealing ring is ineffective.	<b>Contact with customer service department.</b> →Change into a new radial sealing.
There is water in oil	Oil fams in pump	Check water contamination with test tube. Analyze oil in lab.
	Lubrication oil cooler or cooling coil is ineffective	<b>Contact with customer service department.</b> →Find out and repair the leaking part. →Change cooler or cooling coil.
	Gearbox occurs the cold air from ventilation, thus forming frost.	Protect the gearbox with appropriate thermal insulation material. Close air outlet or change its direction on structure.
Pressure supervision device alarms (gear–box equipped with pressure lubrication, lubrication oil water cooling device and air cooling device)	Oil pressure is less than 0.5bar	Check oil height under room temperature, fill in oil according to requirements,Check oil filter, change according to requirements. Contact with customer service department. →Check whether oil pump function is normal. →Repair or change oil pump.
Indicator of double changingfilter sends alarms	Double changing filter clogged	Change the filter according to instructions, remove clogged filter element and clean it.
Fault of oil supply system		Check the instructions of oil supply system in instruction book.

For the faults can't be removed by customers, please contact with after-sales department of the company.

## 9 After-sales service

For the various kinds of transmission devices, if there is any quality problem, don't tear down components, you should illustrate the situation, then contact with after-sales department of the company, confirm about the problems, then apply ideal method to deal with them.

Type: \_\_\_\_\_

Production date: \_\_\_\_\_

Number: \_\_\_\_\_

Time being used: \_\_\_\_\_

Site or main machine name: \_\_\_\_\_

Manufacturer of main machine: \_\_\_\_\_

Quality problem description: \_\_\_\_\_

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User company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

Postcode: \_\_\_\_\_ Contact: \_\_\_\_\_

After-sales service telephone of Boneng: \_\_\_\_\_

Fax : \_\_\_\_\_

NOTE: \_\_\_\_\_

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**BONENG**