WGT

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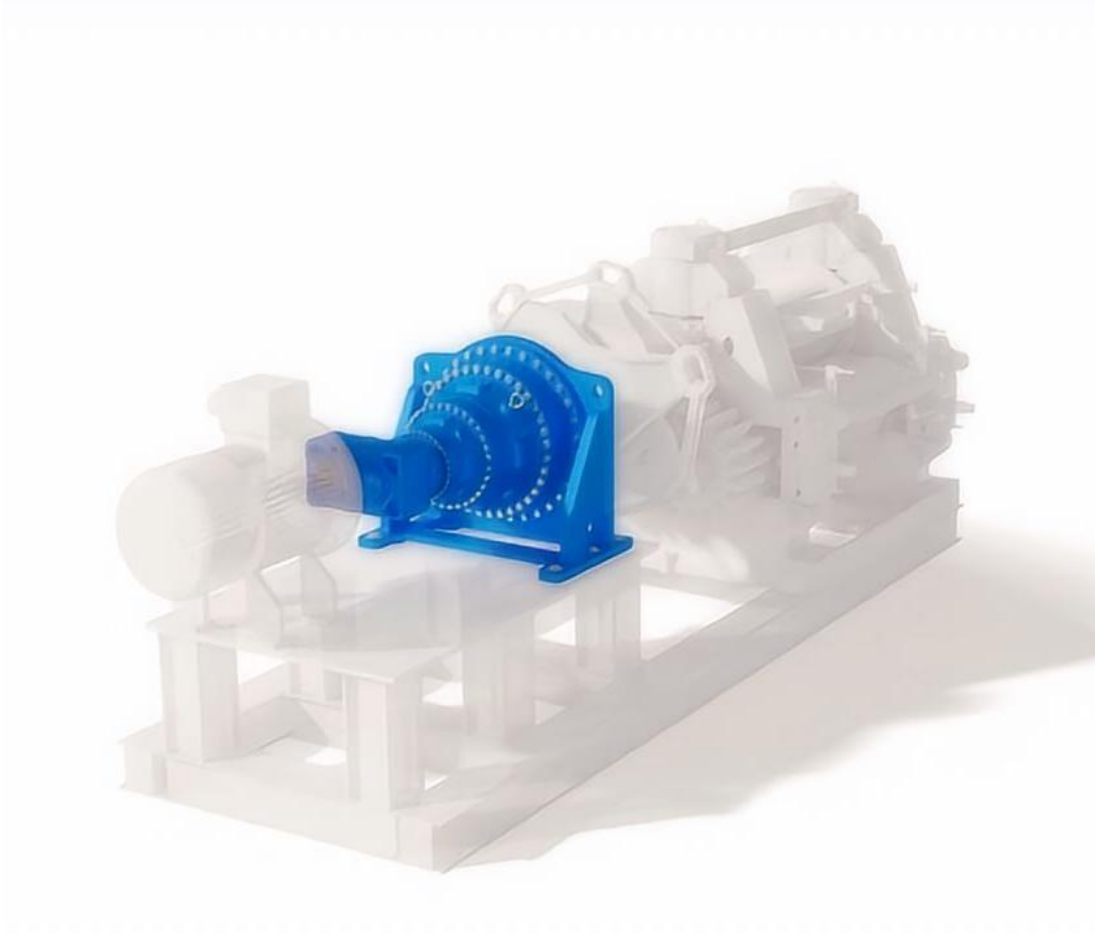
Sugar Mill Planetary Gearbox



WGT | WEIGAO TRANSMISSION CHINA

1 Product Introduction

WGT Sugar Mill Planetary Gearbox: Core Drive Solution for Sugar Mill Press Units

As the power core of sugar production lines, WGT planetary gearboxes are specially designed for main press drive systems and feed reduction devices. This series supports 2–6 sets of modular configurations, delivering stable torque output from power source to press rolls via motor drive and high-precision couplings.

- **Ultra-compact**: High power density design significantly reduces volume and weight compared with traditional reducers, lowering installation loads.
- **Heavy-duty & high-torque**: Engineered for shock loads in sugarcane/beet pressing, providing exceptional torque capacity for uninterrupted operation.
- **Harsh condition adaptability**: Reinforced gear hardness and sealing structure ensure outstanding reliability in high-dust, high-humidity environments.

Model Nomenclature

WGT P3P705E-160

- WGT: WEIGAO TRANSMISSION CHINA
- P: Single-motor drive industrial planetary reducer
- SP: Dual-motor drive industrial planetary reducer
- 3P: 3-stage planetary gear drive (input-output coaxial)
- 705: Specification (max rated standard value, kN·m)
- B: Solid output shaft with parallel key
- C: Involute splined hollow shaft
- D: Involute splined solid shaft
- E: Solid square output shaft
- H: Hollow output shaft with shrink disk
- 160: Nominal transmission ratio
- B: Foot-mounted design

Sample Model:

WGT P3P5645E-160

2 Performance Features

Overall Features

- Torque capacity: 705kNm – 8940kNm
- Lubrication: Forced oil lubrication, requires independent oil station
- Mounting type: Horizontal mounting

Gearbox Housing

- Material: High-grade ductile iron, resin sand molding
- Design: Finite element simulation optimized for rigidity and strength
- Machining: High-precision CNC machining, smooth appearance, good vibration absorption, low noise

Gears

- Material: High-grade alloy steel
- Process: Double-sided grinding, precision ISO1328 Grade 6 or higher
- Treatment: Ring gear quenched and tempered; other gears carburized and quenched
- Design: Multi-parameter optimized for strength, efficiency and transmission error

Bearings

- Type: Rolling bearings, international renowned brands
- Service life: L10h meets user requirements
- Cooperation: Stable long-term supply, complete model range

Planet Carrier

- Material: High-grade ductile iron
- Design: Finite element optimized for rigidity and strength
- Inspection: Coordinate measuring machine ensures machining accuracy

3 Selection Guide

Symbol Description

Symbol	Description
f1	Working machine factor
f2	Prime mover factor
f3	Load characteristic factor
i	Actual transmission ratio
iN	Rated transmission ratio
iS	Required transmission ratio
n1	Input speed (rpm)
n2	Output speed (rpm)
PN	Gearbox calculated power (kW)
Perf.	Required power (kW)
P2eq	Gearbox equivalent power (kW)
P2	Working machine power (kW)
T2r	Required output torque (kNm)
T2	Working machine torque (kNm)
T2N	Rated output torque (kNm)
T2max	Max output torque (kNm)

Selection Steps

1. Determine transmission ratio → Select structure type
2. Calculate power: PN ≥ P1 × f1 × f2 × f3

3. Calculate output torque: T2 = 9.55 × PN / n2
4. Select specification by max output torque from table
5. Check lubricating oil volume; oil station capacity ≥ gearbox oil volume

Selection Factors

Table 1 Working Machine Factor f1

Working Machine Type	≤0.5h	>0.5–10h	≥10h
Sugarcane chopping / grinding / crystallizer	1	1.3	1.7
Beet chopping / washing machine	0.9	1.1	1.3

Table 2 Prime Mover Factor f2

Prime Mover	Factor
Motor / hydraulic motor / steam turbine	1.00
Multi-cylinder piston engine	1.25
Single-cylinder piston engine	1.50

Table 3 Load Characteristic Factor f3

Load Type	1–5 times/h	6–30 times	31–100 times	>100 times
Unidirectional load	0.5	0.65	0.7	0.85
Shock load	0.7	0.95	1.1	1.25

Selection Example

Given:

- Motor: P1=1200kW, n1=750rpm
- Press: P2=1160kW, n2=5.2rpm, 24h operation

1. Transmission ratio 【iS= n1/n2】: i=750/5.2≈144.23 → Select iN=140

2. Calculate power 【PN≥Perf.=P2×f1×f2×f3】: PN=1160×1.7×1×1.25=2465kW
3. Output torque 【T2r=9.55× PN/n2】: T2=9.55×2465/5.2≈4527kNm
4. Selection: P3P4650-140
5. Lubrication: Oil station flow 250L/min

4 Specification Information

Table 4 Rated / Max Output Torque

Specification	Rated T2N(kNm)	Max T2max(kNm)
P3P705	350	705
P3P1065	500	1065
P3P1320	650	1320
P3P1664	800	1664
P3P2034	1000	2034
P3P2403	1200	2403
P3P3080	1500	3080
P3P3640	1800	3640
P3P4650	2300	4650
P3P5645	2800	5645
P3P6465	3200	6465
P3P7725	3800	7725
P3P8940	4400	8940

Table 5 Actual Transmission Ratio i

Specification	112	125	140	160	180	200	225	250
P3P705	115.90	125.56	136.97	158.60	177.26	205.25	229.40	254.88
P3P1065	111.07	125.55	137.51	160.43	177.96	207.61	219.83	240.28
P3P1320	111.04	124.36	141.32	163.64	182.89	211.77	223.53	242.97
P3P1664	114.54	123.70	140.57	162.77	177.56	205.60	229.79	251.55
P3P2034	109.21	128.20	140.41	160.00	179.41	204.44	225.97	238.52
P3P2403	113.81	133.60	146.32	166.74	180.75	205.97	227.65	240.30
P3P3080	115.97	125.25	142.33	164.81	175.82	203.58	227.53	246.90
P3P3640	112.65	126.73	144.83	160.08	177.02	195.65	218.67	247.83
P3P4650	112.28	125.23	141.57	155.05	180.89	198.12	231.14	244.74
P3P5645	113.96	123.08	139.86	161.95	181.00	209.58	221.22	245.80
P3P6465	111.78	126.36	138.40	161.46	176.84	206.31	218.45	249.50
P3P7725	109.39	123.07	140.65	155.46	182.02	201.18	224.84	245.29
P3P8940	111.41	125.34	143.25	158.32	183.04	202.30	226.10	246.20

5 Overall Dimensions & Lubricating Oil Flow

Specifications P3P705~P3P2403

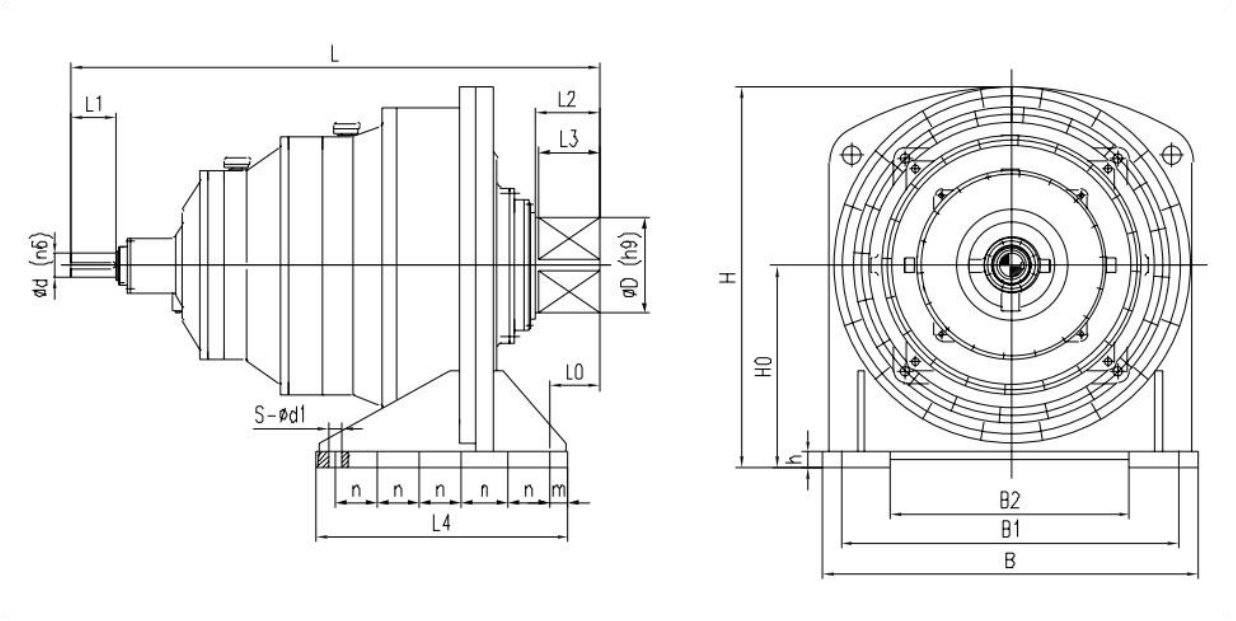


Table 6 P3P705~P3P2403 Overall Dimensions (mm) & Lubrication Flow (L/min)

Specification	L	B	H	H0	d	D	L1	L2	L3	L0	L4	m	n	h	B1	B2	S	d1	Flow
P3P705	2165	1600	1595	850	90	350	170	230	220	365	1000	70	215	75	1460	900	10	62	125
P3P1065	2425	1700	1730	910	110	380	210	260	250	380	1100	70	240	90	1560	1000	10	62	140
P3P1320	2540	1800	1825	965	110	450	210	290	280	395	1200	100	250	90	1640	1000	10	70	150
P3P1664	2580	1920	1940	1030	120	450	210	290	280	390	1200	100	250	90	1760	1100	10	70	150
P3P2034	2880	2040	2080	1110	130	520	250	350	330	250	1450	100	250	95	1840	1240	12	70	160
P3P2403	2905	2170	2190	1170	130	520	250	350	330	255	1450	100	250	95	1960	1360	12	70	170

Note: Input shaft with single key connection, GB/T 1096; Oil inlet/outlet ports customized per oil station.

Specifications P3P3080~P3P8940

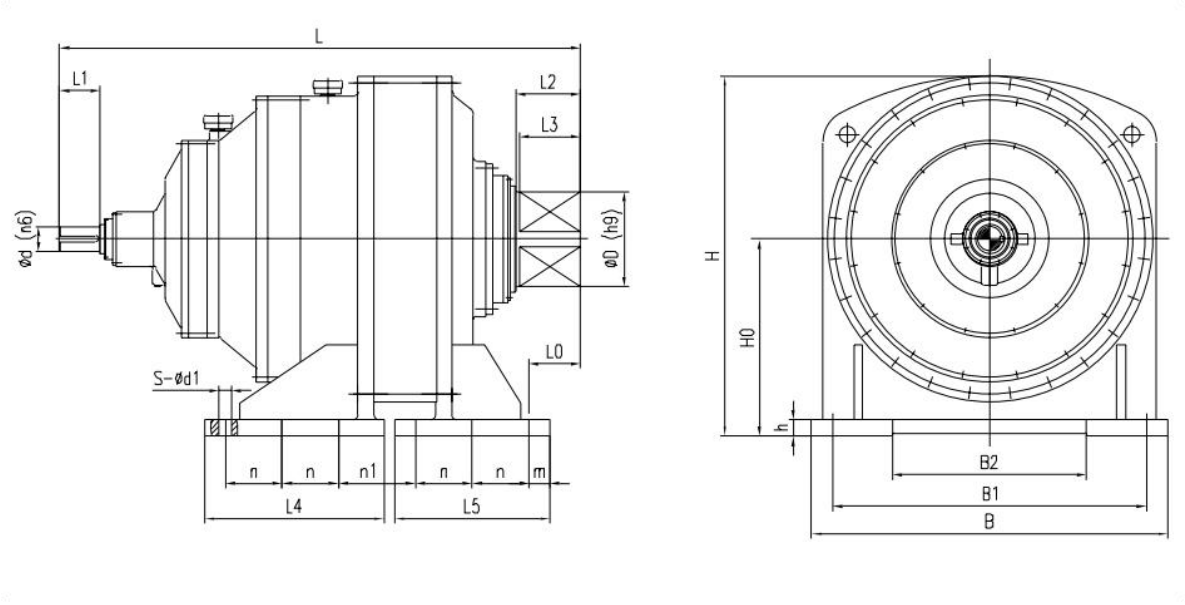


Table 7 P3P3080~P3P8940 Overall Dimensions (mm) & Lubrication Flow (L/min)

Specification	L	B	H	H0	d	D	L1	L2	L3	L0	L5	m	n	n1	h	B1	B2	S	d1	Flow
P3P3080	3110	2010	2130	1175	150	550	250	370	350	260	930	130	350	440	100	1810	1210	12	80	190
P3P3640	3220	2200	2220	1215	150	590	250	400	380	300	960	130	350	470	100	1940	1240	12	80	205
P3P4650	3550	2300	2380	1300	160	620	300	420	400	290	1060	130	400	525	110	2050	1300	12	90	230
P3P5645	3620	2500	2510	1350	180	660	300	440	420	280	1080	130	420	540	120	2260	1500	12	90	250
P3P6465	3770	2600	2625	1400	180	660	300	440	420	270	1120	130	430	590	120	2360	1600	12	90	250
P3P7725	3985	2800	2800	1500	200	700	350	470	450	310	1200	150	450	600	120	2500	1600	12	105	270
P3P8940	4140	2900	2900	1560	200	740	350	500	480	345	1200	150	450	640	130	2600	1700	12	105	300

Note: Input shaft with single key connection, dimensions per GB/T 1096.
Oil inlet/outlet port dimensions per oil station requirements.

Output Interface Dimensions

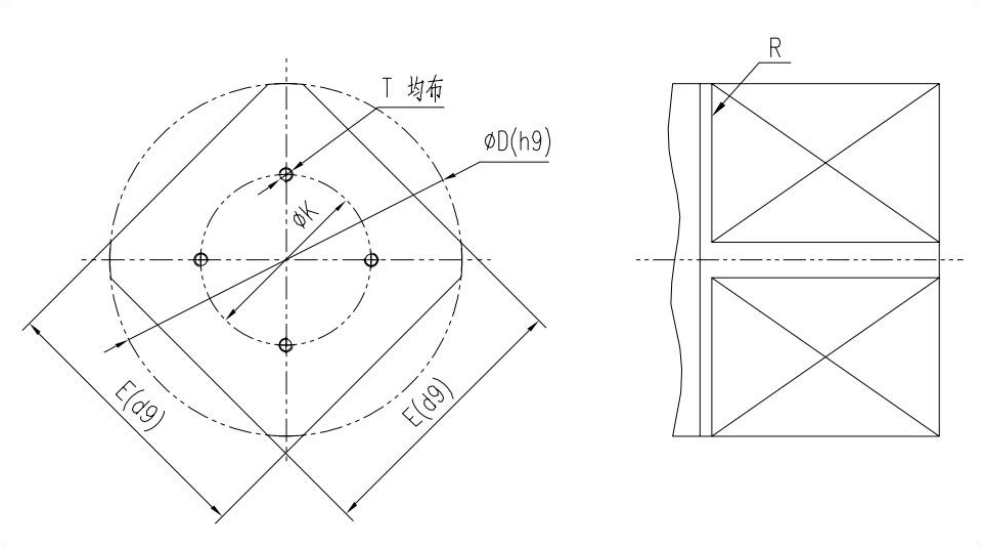
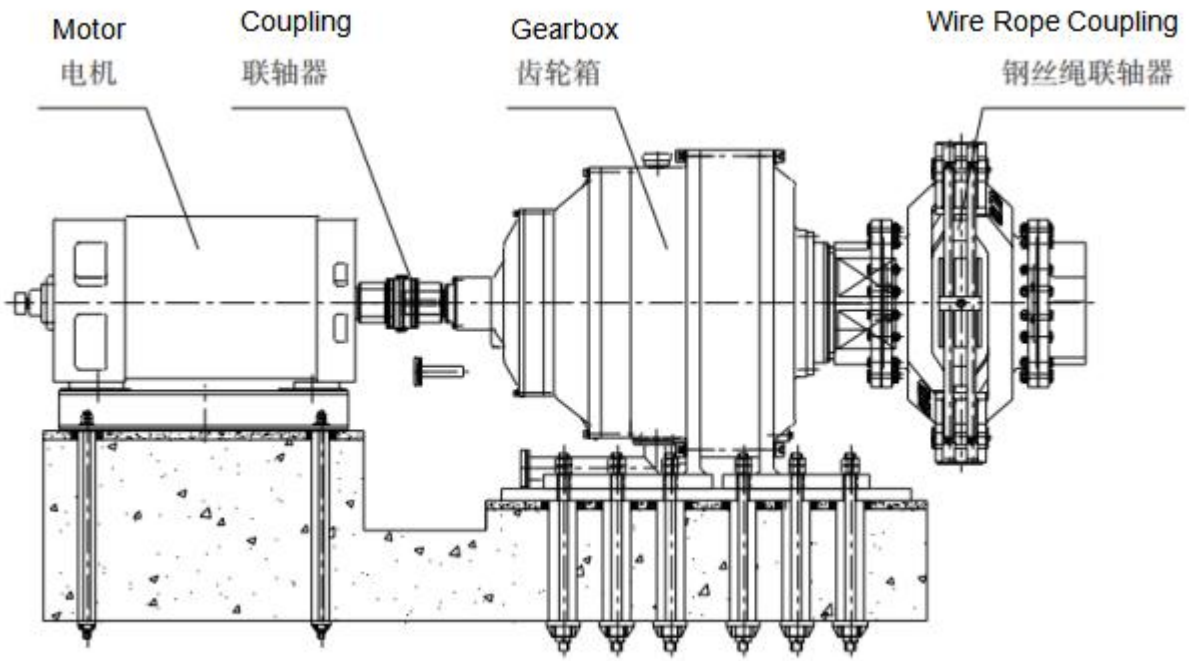
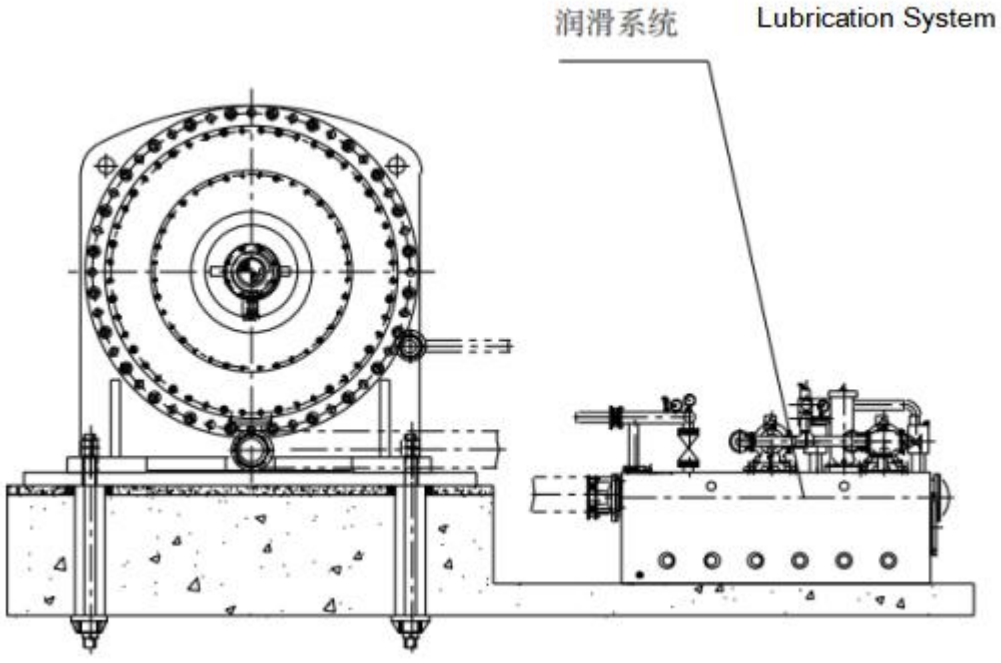


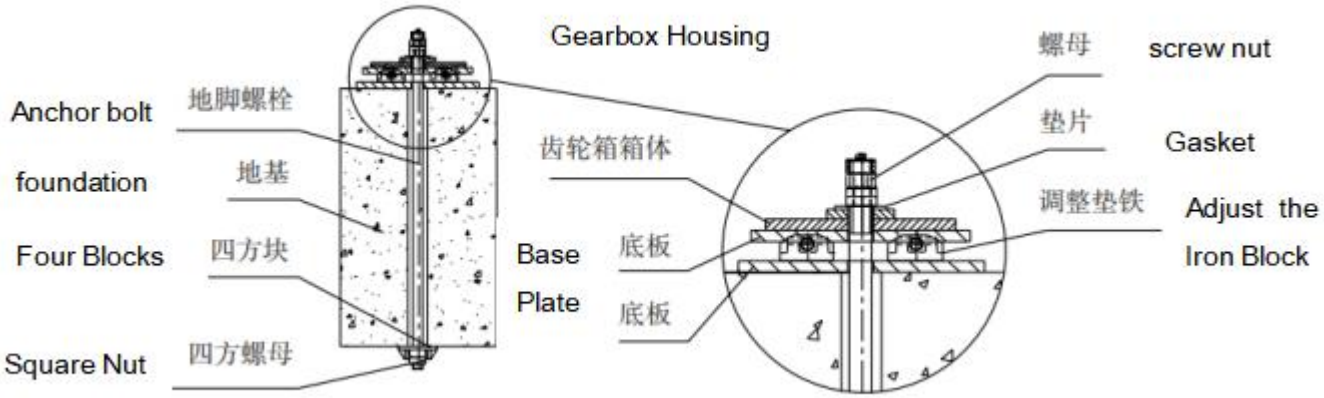
Table 8 Output Interface Dimensions (mm)

Specification	D(h9)	E(d9)	K	T	R
P3P705	350	280	200	4-M24×45	R5
P3P1065	380	300	200	4-M24×45	R5
P3P1320	450	360	250	4-M24×45	R5
P3P1664	450	360	250	4-M24×45	R5
P3P2034	520	410	300	4-M30×60	R5
P3P2403	520	410	300	4-M30×60	R5
P3P3080	550	430	300	4-M30×60	R10
P3P3640	590	460	340	4-M30×60	R10
P3P4650	620	480	360	4-M36×70	R10
P3P5645	660	520	360	4-M36×70	R10
P3P6465	660	520	360	4-M36×70	R10
P3P7725	700	550	420	4-M48×90	R10
P3P8940	740	580	420	4-M48×90	R10

6 Complete System Solutions







We provide full drive systems including:

- Mounting accessories: Anchor bolts, nuts, adjusting pads, gaskets, base plates
- Drive: Electric motor
- Coupling: Input coupling, output coupling (wire rope coupling)
- Lubrication: Lubricating oil station