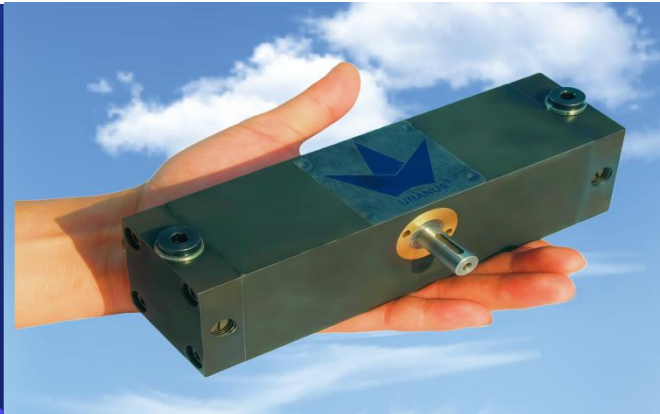
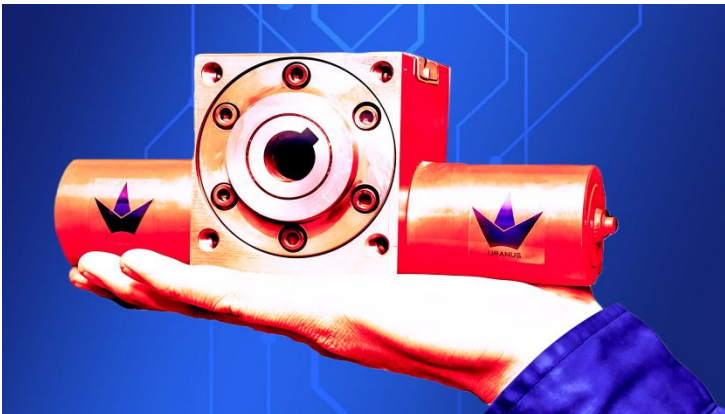
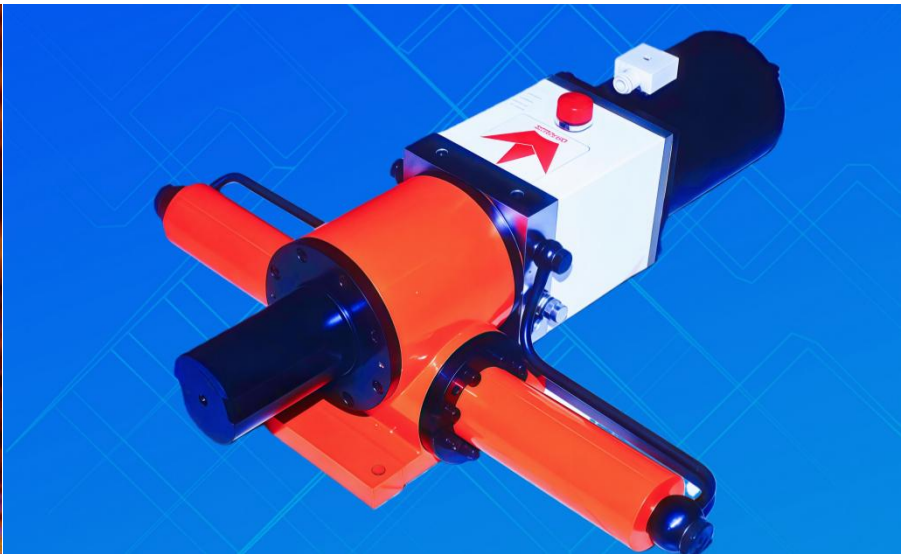


## Photo of Gear and rack swing hydraulic cylinder





# **Gear-Rack Rotary Hydraulic Actuator**

## **Overview**

A gear-rack rotary hydraulic actuator converts hydraulic energy into oscillating or angular motion. The linear reciprocating motion of the hydraulic cylinder drives the rack, which engages with the pinion gear to generate bidirectional rotation. The cylinder force is mechanically amplified into torque through the rack-and-pinion transmission, and the swing angle is proportional to the rack stroke, achieving 0°–720° rotation.

The actuator consists of a pinion shaft, rack piston, cylinder body, and sealing system. Common mounting types include flange and foot mounting. Structural types include single-rack and double-rack designs, available in multiple series and sizes to meet different torque requirements. End-of-stroke cushioning (approx. 15° per end) ensures smooth operation.

## **Key Performance Advantages**

### **1. High Torque Output**

Torque is proportional to working pressure, and with the mechanical amplification of the rack-and-pinion system, the actuator can deliver up to 1,150,000 Nm (e.g., UBZ320). Suitable for heavy-duty industrial applications.

### **2. Precision Control**

With optional rotary encoders or displacement sensors, the actuator forms a closed-loop servo system:

- Backlash  $\leq 10$  arc-minutes
- Position repeatability  $\leq 0.05^\circ$

Ideal for automation and high-precision positioning.

### **3. Compact Design & Easy Maintenance**

Optional integrated hydraulic power pack allows plug-and-play installation, remote control, and PLC/PC operation.

## **Applications**

### **Steel & Metallurgy**

- Ladle tilting
- Wire-rod mill swing arms
- Coil flippers and turnover machinery

### **Marine & Energy**

- Naval fin stabilizers
- Steering mechanisms
- Subsea valve actuators (up to 2300 m depth)

### **Special Equipment**

- Torque loading test rigs
- Sweeper truck tilting mechanisms
- Garbage compactor drives

### **Automation**

- Rotary indexing tables
  - Robotic rotary joints
  - Automated production lines
-

## **UB Series Gear-Rack Rotary Actuator**

UB series actuators are independently developed by URANUS Hydraulic Machinery and adopted as **JB/ZQ4713-98** national heavy-machinery standard. We have delivered tens of thousands of UB actuators worldwide.

### **Features**

- Mounting: Flange / Foot
- Structure: Single-rack / Double-rack
- 8 series × 10 bore sizes × 10 models
- Rated pressure: **16 MPa / 25 MPa / 31.5 MPa**
- Low starting pressure ( $\leq 1.5$  MPa), high efficiency
- Wide temperature range **-50°C to +260°C**
- Excellent sealing & long service life

### **Fluid Compatibility**

Works with mineral oil, emulsion, water-glycol, phosphate ester, etc. (Specify when ordering.)

### **Maintenance**

Generally maintenance-free. Annual lubrication recommended. If minor leakage occurs, return oil to the tank; replace seals only when torque no longer meets requirements.

### **Hydraulic Power Pack Option**

Ideal for single-actuator systems:

- Factory-filled and pre-set relief valves
- Independent torque adjustment for CW/CCW directions
- Fully enclosed reservoir

- Not recommended for ambient temperature  $>80^{\circ}\text{C}$

## **Custom Designs Available**

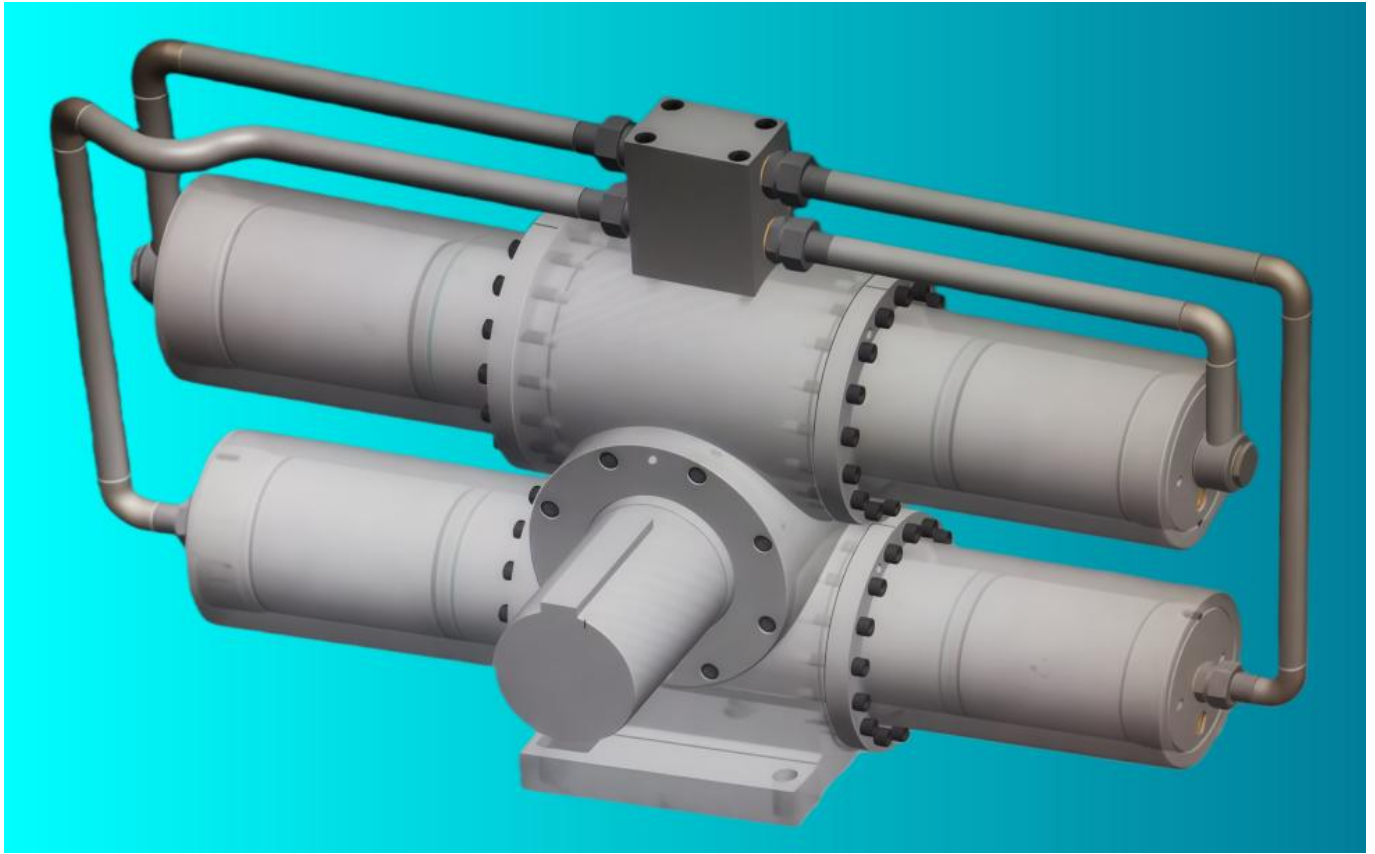
We offer customized solutions, including:

1. **Servo rotary actuators** (starting pressure  $<0.5\text{ MPa}$ , backlash  $\leq 0.02$ , repeatability  $\leq 0.05^{\circ}$ )
2. Ultra-large torque ( $>1,150,000\text{ Nm}$ ) and micro-actuators ( $<1\text{ kg}$ )
3. Special outputs: dual-shaft, combined shaft/boring, spline shaft, spline bore
4. Special mounting: twin-clevis, single-side flange
5. Angle fine-adjustment mechanisms
6. Built-in check valves, counterbalance valves for single/double chamber

## **\*\*Product Examples:\*\***

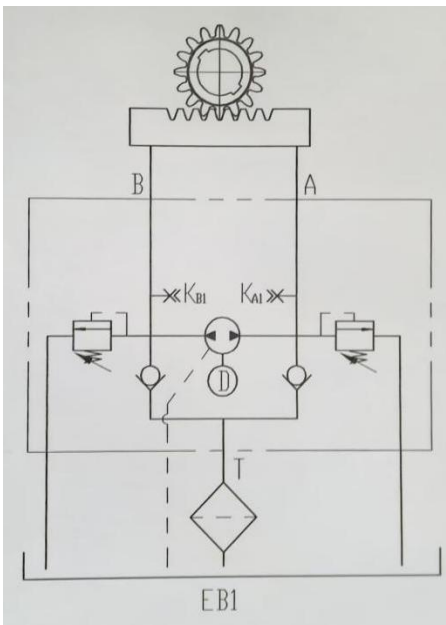
### **1. Swing Hydraulic Cylinder UBJZS140-172°**

- Bore : 140 mm
- Angle: 172°
- Mounting Method: Foot Bracket
- Type: Double Rack
- Output : Double Parallel Key Shaft
- Shaft Diameter: 145e8 mm
- End Cushioning Angle: 12°
- Torque: 40,996 Nm
- Rated Pressure: 16 MPa   - Test Pressure: 21 MPa
- Working Fluid: Hydraulic Oil



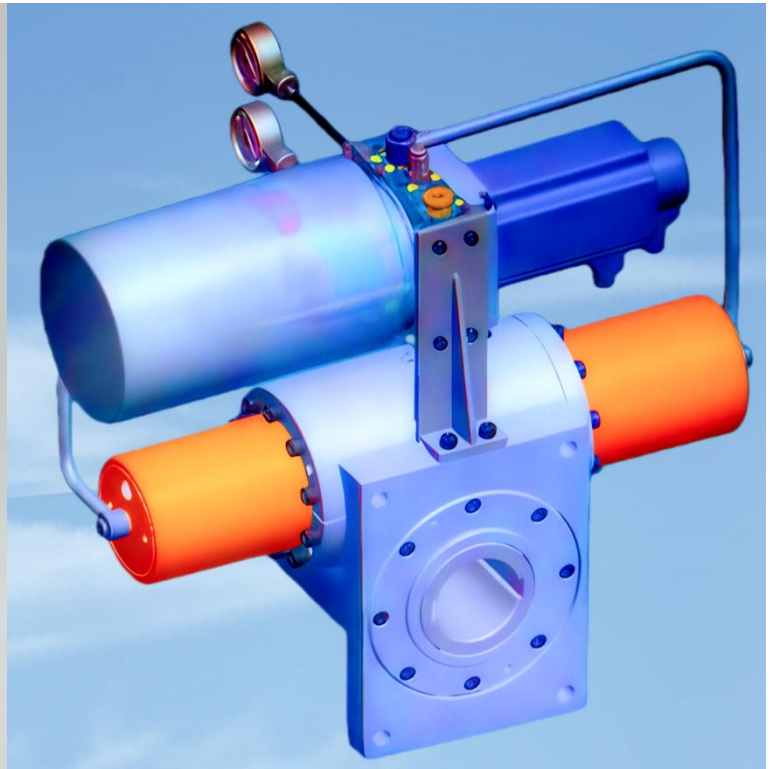
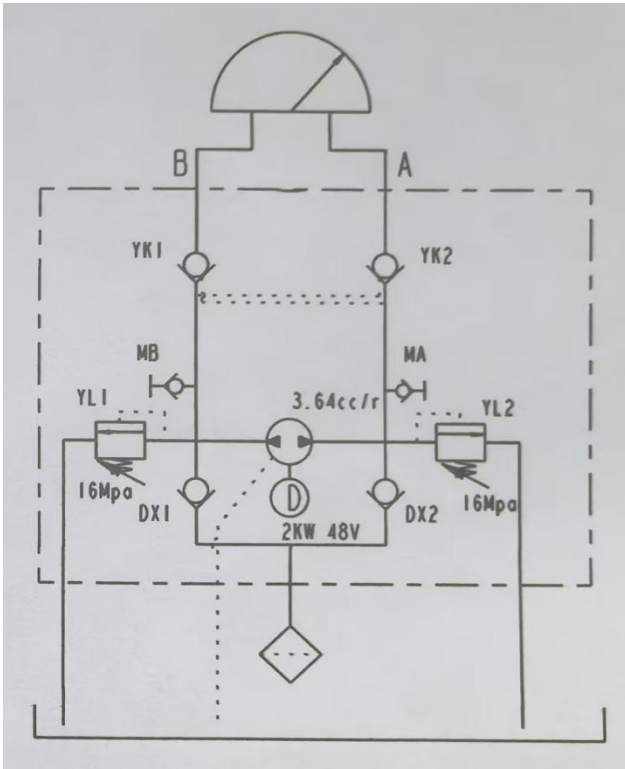
## 2. Electric Swing Cylinder UBFKD40-90° HP01

- Bore : 40 mm - Angle: 90° - Torque: 2,480 Nm
- Mounting Method: Flange - Type: Single Rack
- Output Method: 4 Parallel Key Bore  $\phi 50^{+0.03}_0$  mm - End Cushioning Angle: 15°
- Hydraulic Power Pack
  - Rated Pressure: 21 MPa - Rated Flow: 1.6 L/min - Motor Power: 0.75 kW, 380V AC



## 3. DC Motor Gate Control System UBFKD100-95° +UP16X6BEG

- Bore : 100 mm - Angle: 95° - Mounting Method: Flange - Type: Single Rack
- Output : 2 Parallel Key Bore  $\phi 85H7$  mm - Torque: 8,320 Nm - End Cushioning Angle: 15°
- Hydraulic Power Pack
  - Rated Pressure: 16 MPa - Rated Flow: 6 L/min - Motor Power: 2 kW, 48V DC
  - Working Fluid: Hydraulic Oil

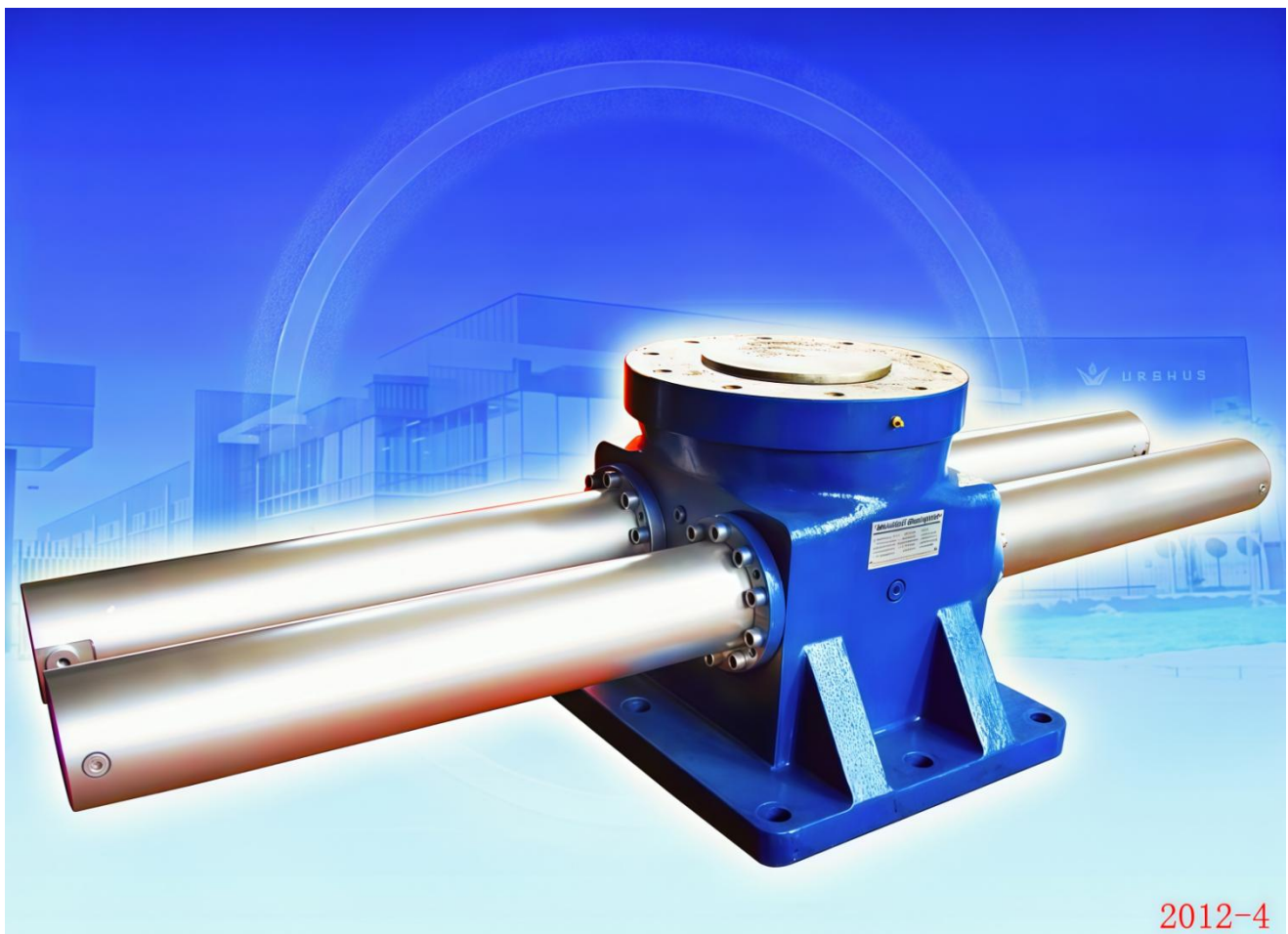


#### 4. Swing Cylinder for Forestry Crane UBTZSJ80-380° H

Bore : 80 mm Angle: 380° Mounting Method: Foot Bracket Type: Double Rack

Output Method: Flange Shaft

Rated Pressure: 19 MPa Test Pressure: 22 MPa Torque: 15,280 Nm Working Fluid: Hydraulic Oil



Here are the product samples of the UB series and UBZ series

# 摆 动 液 压 缸

## Hydraulic Rotary Actuator



U R A N U S

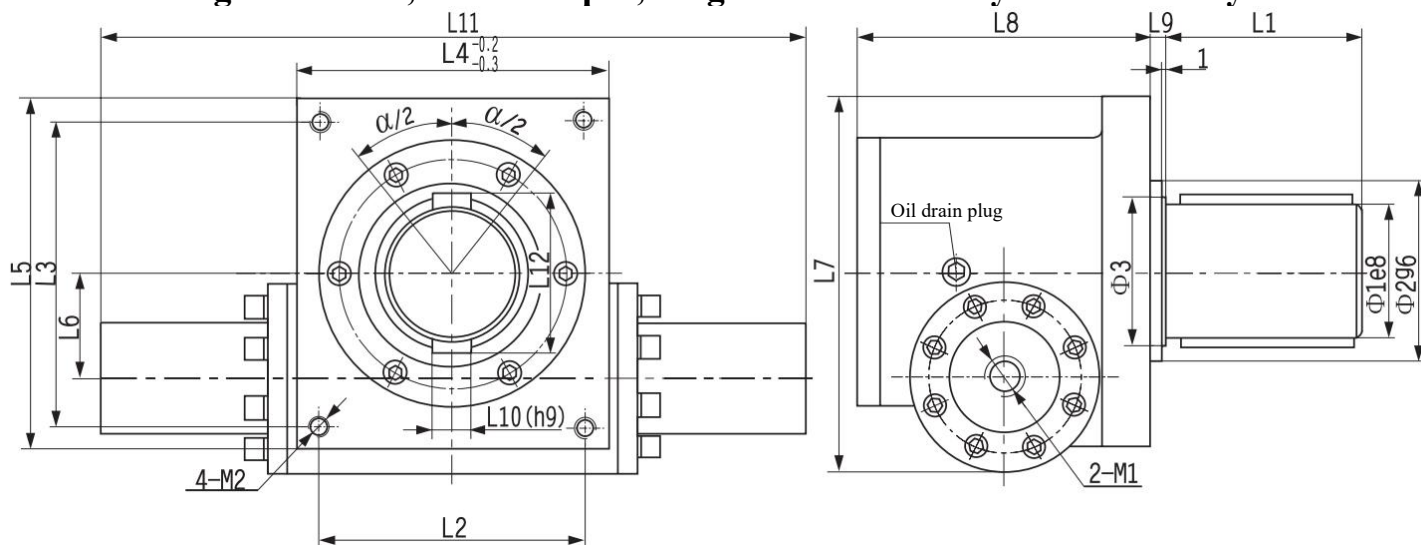




**Basic Specifications Table for UB Series Rack-and-Pinion Hydraulic Rotary Actuator  
(JB/ZQ4713-2006)**

| Structure                                         | Connection method | Model        |             | Cylinder diameter (mm) | Output Torque (Nm) (P: Operating Pressure Mpa) | Output Torque at P=16 MPa (Nm) | Oil Volume per Degree of Rotation (L/°) | Swing Speed with Hydraulic Power Unit (°/s) (Non-cushion) |      |     |     |     |     |     |     |     |     |     |
|---------------------------------------------------|-------------------|--------------|-------------|------------------------|------------------------------------------------|--------------------------------|-----------------------------------------|-----------------------------------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                   |                   | Shaft Output | Hole Output |                        |                                                |                                |                                         | P01                                                       | P02  | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P10 | P11 |
| Single-rack                                       | Flange            | UBFZD40      | UBFKD40     | 40                     | 55 (P-1.5)                                     | 798                            | 0.00097                                 | 26                                                        | 34   | 48  | 60  | 72  | 86  | 98  | 120 | 140 | 172 | 240 |
|                                                   | Foot              | UBJZD40      | UBJKD40     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD50      | UBFKD50     | 50                     | 98 (P-1.5)                                     | 1421                           | 0.00171                                 | 15                                                        | 19   | 27  | 34  | 41  | 49  | 55  | 68  | 80  | 97  | 136 |
|                                                   | Foot              | UBJZD50      | UBJKD50     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD63      | UBFKD63     | 63                     | 171 (P-1.5)                                    | 2480                           | 0.00299                                 | B                                                         | 11   | 16  | 20  | 23  | 28  | 32  | 39  | 46  | 56  | 78  |
|                                                   | Foot              | UBJZD63      | UBJKD63     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD80      | UBFKD80     | 80                     | 302 (P-1.4)                                    | 4409                           | 0.00526                                 | 4.8                                                       | 6    | 9   | 11  | 13  | 16  | 18  | 22  | 26  | 31  | 44  |
|                                                   | Foot              | UBJZD80      | UBJKD80     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD100     | UBFKD100    | 100                    | 566 (P-1.3)                                    | 8320                           | 0.00987                                 | 2.5                                                       | 3    | 4.7 | 5.9 | 7   | 8.4 | 9.6 | 11  | 14  | 17  | 23  |
|                                                   | Foot              | UBJZD100     | UBJKD100    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD125     | UBFKD125    | 125                    | 994 (P-1.3)                                    | 14612                          | 0.01735                                 | 1.4                                                       | 2    | 2.7 | 3.3 | 4   | 4.8 | 5.5 | 6.7 | 7.9 | 9.6 | 13  |
|                                                   | Foot              | UBJZD125     | UBJKD125    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD140     | UBFKD140    | 140                    | 1385 (P-1.2)                                   | 20498                          | 0.02418                                 | 1                                                         | 1.4  | 1.9 | 2.4 | 2.9 | 3.4 | 3.9 | 4.8 | 5.6 | 6.9 | 9.6 |
|                                                   | Foot              | UBJZD140     | UBJKD140    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD160     | UBFKD160    | 160                    | 2010 (P-1.2)                                   | 29748                          | 0.03509                                 | 0.7                                                       | 0.9  | 1.3 | 1.7 | 2   | 2.4 | 2.7 | 3.3 | 3.9 | 4.7 | 6.6 |
|                                                   | Foot              | UBJZD160     | UBJKD160    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD180     | UBFKD180    | 180                    | 2748 (P-1.1)                                   | 40945                          | 0.04797                                 | 0.5                                                       | 0.7  | 1   | 1.2 | 1.5 | 1.7 | 2   | 2.4 | 2.8 | 3.5 | 4.9 |
|                                                   | Foot              | UBJZD180     | UBJKD180    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZD200     | UBFKD200    | 200                    | 3958 (P-1.0)                                   | 59370                          | 0.06909                                 | 0.3                                                       | 0.5  | 0.6 | 0.8 | 1   | 1.2 | 1.4 | 1.6 | 2   | 2.4 | 3.2 |
|                                                   | Foot              | UBJZD200     | UBJKD200    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
| Double-rack                                       | Flange            | UBFZS40      | UBFKS40     | 40                     | 110 (P-1.5)                                    | 1595                           | 0.00193                                 | 13                                                        | 17   | 24  | 30  | 36  | 43  | 49  | 60  | 70  | 81  | 120 |
|                                                   | Foot              | UBJZS40      | UBJKS40     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS50      | UBFKS50     | 50                     | 196 (P-1.5)                                    | 2842                           | 0.00343                                 | 7.5                                                       | 9.5  | 14  | 17  | 20  | 24  | 23  | 34  | 40  | 49  | 68  |
|                                                   | Foot              | UBJZS50      | UBJKS50     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS63      | UBFKS63     | 63                     | 342 (P-1.5)                                    | 4959                           | 0.00598                                 | 4                                                         | 5.5  | 8   | 10  | 12  | 14  | 16  | 19  | 23  | 28  | 39  |
|                                                   | Foot              | UBJZS63      | UBJKS63     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS80      | UBFKS80     | 80                     | 604 (P-1.4)                                    | 8818                           | 0.01053                                 | 2.4                                                       | 3    | 4.5 | 5.5 | 6.5 | 8   | 9   | 11  | 13  | 16  | 22  |
|                                                   | Foot              | UBJZS80      | UBJKS80     |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS100     | UBFKS100    | 100                    | 1132 (P-1.3)                                   | 16640                          | 0.01974                                 | 1.3                                                       | 1.6  | 2.3 | 3   | 3.5 | 4.2 | 4.8 | 5.9 | 7   | 8.4 | 12  |
|                                                   | Foot              | UBJZS100     | UBJKS100    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS125     | UBFKS125    | 125                    | 1988 (P-1.3)                                   | 29224                          | 0.03470                                 | 0.7                                                       | 1    | 1.3 | 1.7 | 2   | 2.4 | 2.7 | 3.8 | 3.9 | 4.8 | 6.7 |
|                                                   | Foot              | UBJZS125     | UBJKS125    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS140     | UBFKS140    | 140                    | 2770 (P-1.2)                                   | 40996                          | 0.04836                                 | 0.5                                                       | 0.7  | 1   | 1.2 | 1.4 | 1.7 | 2   | 2.4 | 2.8 | 3.4 | 4.8 |
|                                                   | Foot              | UBJZS140     | UBJKS140    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS160     | UBFKS160    | 160                    | 4020 (P-1.2)                                   | 59496                          | 0.07018                                 | 0.3                                                       | 0.5  | 0.7 | 0.8 | 1   | 1.2 | 1.3 | 1.6 | 1.9 | 2.3 | 3.3 |
|                                                   | Foot              | UBJZS160     | UBJKS160    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS180     | UBFKS180    | 180                    | 5496 (P-1.1)                                   | 81890                          | 0.09593                                 | 0.2                                                       | 0.3  | 0.5 | 0.6 | 0.7 | 0.8 | 1   | 1.2 | 1.4 | 1.7 | 2.4 |
|                                                   | Foot              | UBJZS180     | UBJKS180    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
|                                                   | Flange            | UBFZS200     | UBFKS200    | 200                    | 7916 (P-1.0)                                   | 118740                         | 0.13817                                 | 0.1                                                       | 0.2  | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 1   | 1.2 | 1.6 |
|                                                   | Foot              | UBJZS200     | UBJKS200    |                        |                                                |                                |                                         |                                                           |      |     |     |     |     |     |     |     |     |     |
| Hydraulic power unit motor power (kW) (380V 50Hz) |                   |              |             |                        |                                                |                                |                                         | 0.55                                                      | 0.75 | 1.1 | 1.5 | 1.5 | 2   | 2   | 2.2 | 3   | 4   | 4   |

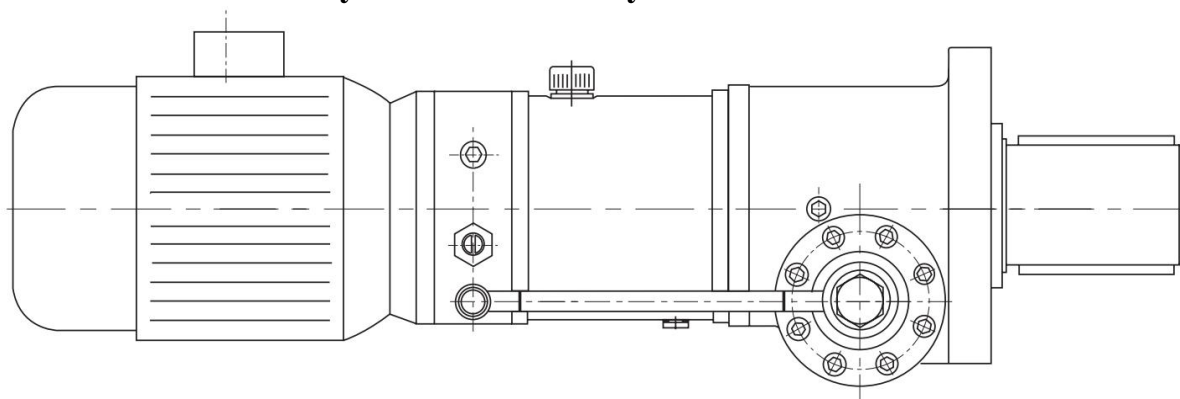
## UBFZD Flange-Mounted, Shaft Output, Single-Rack Series Hydraulic Rotary Actuator



$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

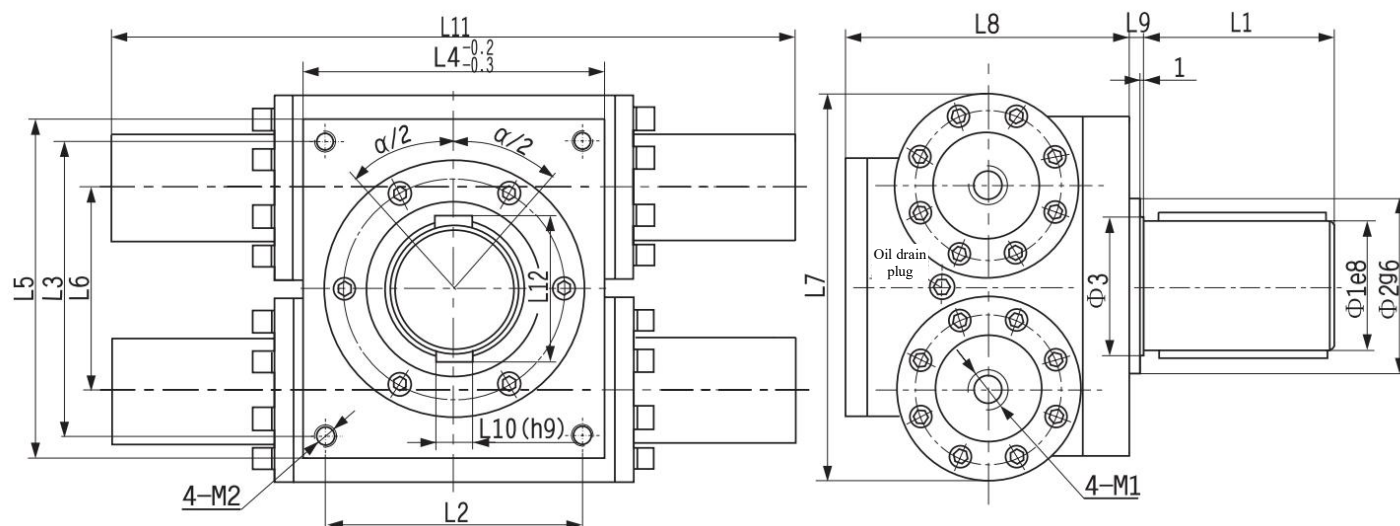
| Model    | Φ1  | Φ2  | Φ3  | L1  | L2  | L3  | L4  | L5  | L6  | L7  | L8  | L9 | L10 | L11              | L12 | M1      | M2 × Hole Depth |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|------------------|-----|---------|-----------------|
| UBFZD40  | 70  | 95  | 75  | 105 | 140 | 160 | 164 | 184 | 55  | 197 | 154 | 6  | 20  | $233+1.54\alpha$ | 79  | M22×1.5 | M12×20          |
| UBFZD50  | 80  | 105 | 85  | 125 | 146 | 185 | 170 | 210 | 66  | 231 | 163 | 6  | 22  | $254+1.75\alpha$ | 90  | M22×1.5 | M12×20          |
| UBFZD63  | 90  | 115 | 95  | 140 | 164 | 200 | 194 | 232 | 72  | 253 | 190 | 6  | 25  | $275+1.92\alpha$ | 100 | M27×2   | M16×25          |
| UBFZD80  | 95  | 125 | 100 | 150 | 175 | 225 | 205 | 257 | 86  | 292 | 212 | 8  | 25  | $328+2.09\alpha$ | 105 | M27×2   | M16×25          |
| UBFZD100 | 115 | 145 | 120 | 165 | 194 | 265 | 234 | 306 | 100 | 343 | 244 | 8  | 32  | $370+2.51\alpha$ | 129 | M33×2   | M20×30          |
| UBFZD125 | 125 | 155 | 130 | 170 | 230 | 285 | 274 | 334 | 116 | 390 | 284 | 8  | 32  | $417+2.83\alpha$ | 139 | M42×2   | M24×35          |
| UBFZD140 | 145 | 180 | 150 | 200 | 240 | 305 | 286 | 354 | 125 | 418 | 290 | 10 | 36  | $423+3.14\alpha$ | 161 | M42×2   | M24×35          |
| UBFZD160 | 165 | 200 | 170 | 220 | 255 | 330 | 315 | 390 | 140 | 464 | 314 | 10 | 40  | $484+3.49\alpha$ | 183 | M48×2   | M30×45          |
| UBFZD180 | 175 | 220 | 180 | 240 | 330 | 380 | 390 | 440 | 152 | 518 | 380 | 12 | 45  | $578+3.77\alpha$ | 195 | M48×2   | M30×45          |
| UBFZD200 | 195 | 240 | 200 | 260 | 365 | 440 | 425 | 500 | 170 | 578 | 438 | 12 | 45  | $610+4.40\alpha$ | 215 | M48×2   | M30×45          |

### Outline Drawing of Flange-Mounted, Shaft Output, Single-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit





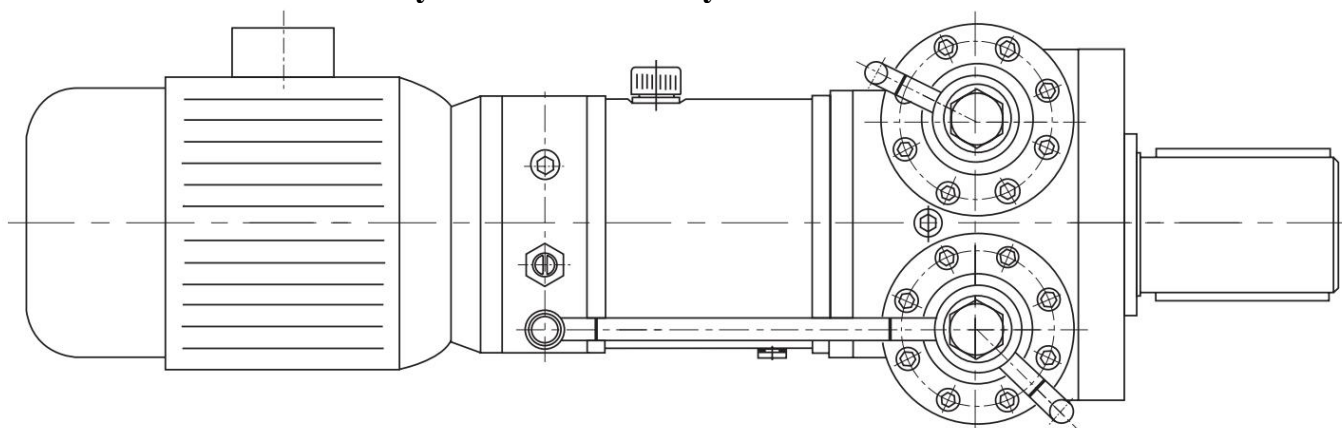
## UBFZS Flange-Mounted, Shaft Output, Double-Rack Series Hydraulic Rotary Actuator



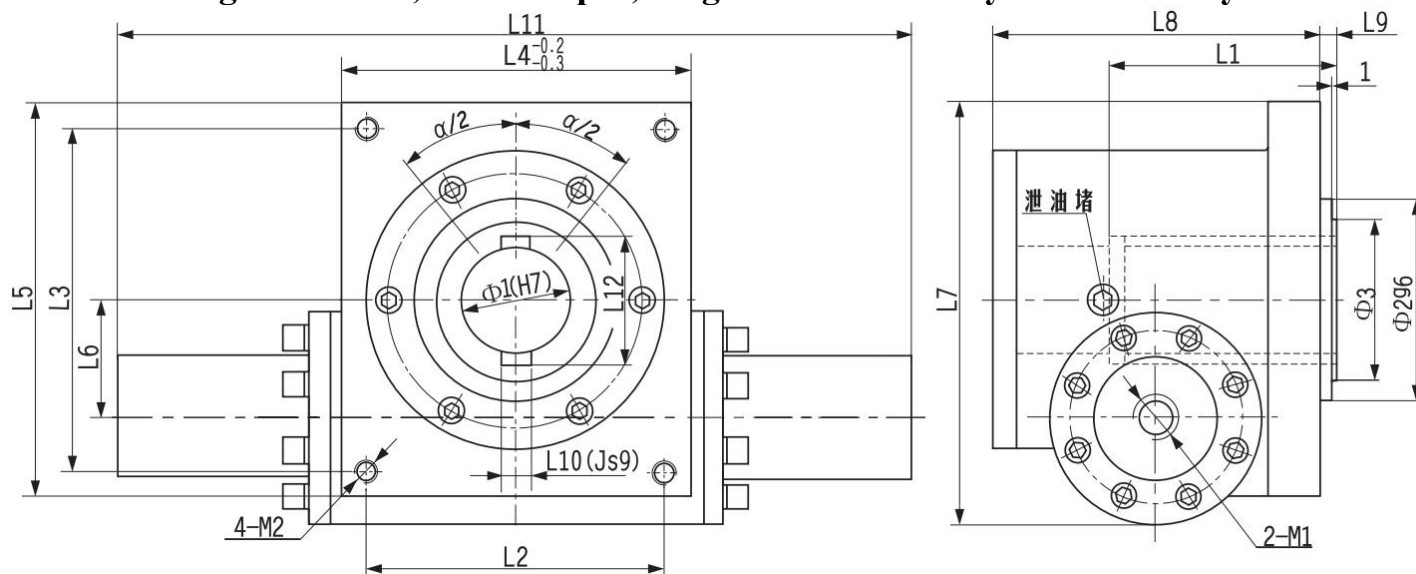
$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1  | L2  | L3  | L4  | L5  | L6  | L7  | L8  | L9 | L10 | L11              | L12 | M1               | M2 $\times$ Hole Depth |
|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|------------------|-----|------------------|------------------------|
| UBFZS40  | 70       | 95       | 75       | 105 | 140 | 160 | 164 | 184 | 110 | 210 | 154 | 6  | 20  | $233+1.54\alpha$ | 79  | M22 $\times$ 1.5 | M12 $\times$ 20        |
| UBFZS50  | 80       | 105      | 85       | 125 | 146 | 185 | 170 | 210 | 132 | 252 | 163 | 6  | 22  | $254+1.75\alpha$ | 90  | M22 $\times$ 1.5 | M12 $\times$ 20        |
| UBFZS63  | 90       | 115      | 95       | 140 | 164 | 200 | 194 | 232 | 144 | 274 | 190 | 6  | 25  | $275+1.92\alpha$ | 100 | M27 $\times$ 2   | M16 $\times$ 25        |
| UBFZS80  | 95       | 125      | 100      | 150 | 175 | 225 | 205 | 257 | 172 | 327 | 212 | 8  | 25  | $328+2.09\alpha$ | 105 | M27 $\times$ 2   | M16 $\times$ 25        |
| UBFZS100 | 115      | 145      | 120      | 165 | 194 | 265 | 234 | 306 | 200 | 380 | 244 | 8  | 32  | $370+2.51\alpha$ | 129 | M33 $\times$ 2   | M20 $\times$ 30        |
| UBFZS125 | 125      | 155      | 130      | 170 | 230 | 285 | 274 | 334 | 232 | 446 | 284 | 8  | 32  | $417+2.83\alpha$ | 139 | M42 $\times$ 2   | M24 $\times$ 35        |
| UBFZS140 | 145      | 180      | 150      | 200 | 240 | 305 | 286 | 354 | 250 | 482 | 290 | 10 | 36  | $423+3.14\alpha$ | 161 | M42 $\times$ 2   | M24 $\times$ 35        |
| UBFZS160 | 165      | 200      | 170      | 220 | 255 | 330 | 315 | 390 | 280 | 538 | 314 | 10 | 40  | $484+3.49\alpha$ | 183 | M48 $\times$ 2   | M30 $\times$ 45        |
| UBFZS180 | 175      | 220      | 180      | 240 | 330 | 380 | 390 | 440 | 304 | 596 | 380 | 12 | 45  | $578+3.77\alpha$ | 195 | M48 $\times$ 2   | M30 $\times$ 45        |
| UBFZS200 | 195      | 240      | 200      | 260 | 365 | 440 | 425 | 500 | 340 | 656 | 438 | 12 | 45  | $610+4.40\alpha$ | 215 | M48 $\times$ 2   | M30 $\times$ 45        |

## Outline Drawing of Flange-Mounted, Shaft Output, Double-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit



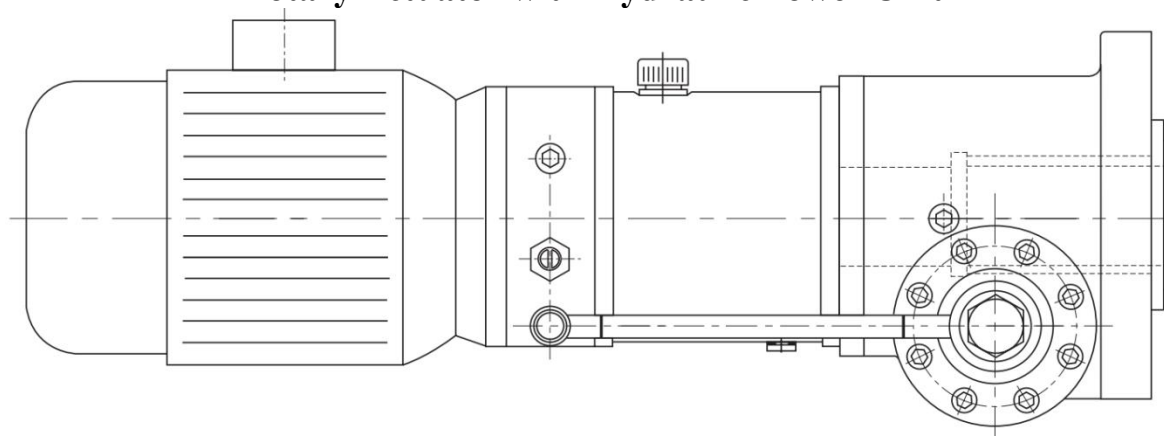
## UBFKD Flange-Mounted, Hole Output, Single-Rack Series Hydraulic Rotary Actuator



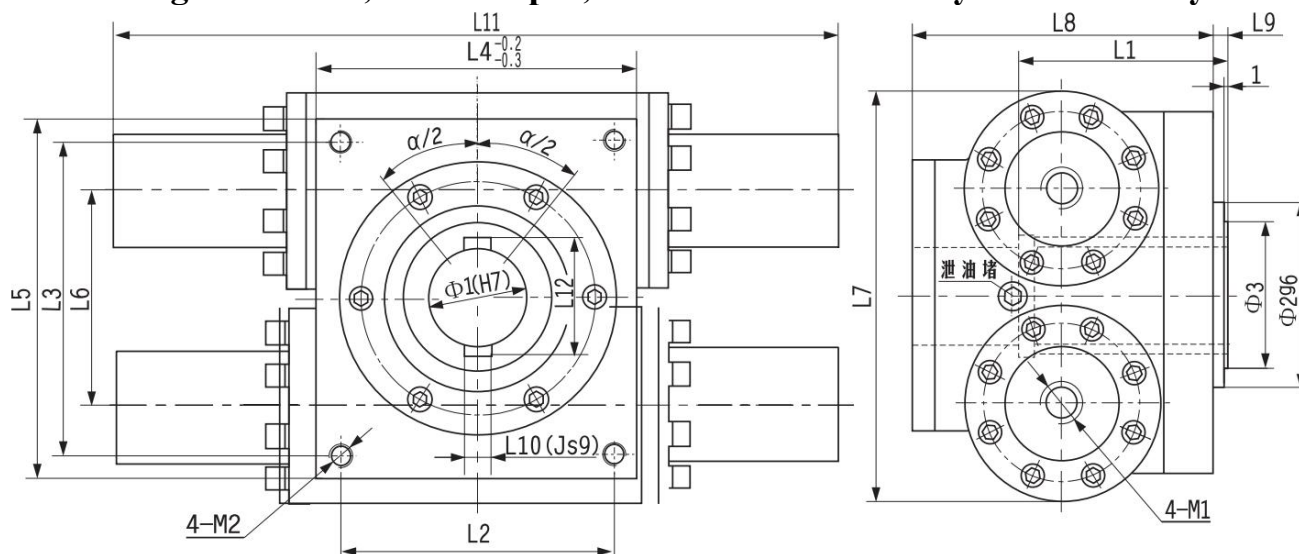
$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1      | L2      | L3      | L4      | L5      | L6  | L7      | L8      | L9 | L10 | L11                  | L12   | M1      | M2 × Hole Depth |
|----------|----------|----------|----------|---------|---------|---------|---------|---------|-----|---------|---------|----|-----|----------------------|-------|---------|-----------------|
| UBFKD40  | 50       | 95       | 75       | 10<br>5 | 14<br>0 | 16<br>0 | 16<br>4 | 18<br>4 | 55  | 19<br>7 | 15<br>4 | 6  | 14  | 233+1.54<br>$\alpha$ | 57.6  | M22×1.5 | M12×2<br>0      |
| UBFKD50  | 60       | 105      | 85       | 12<br>5 | 14<br>6 | 18<br>5 | 17<br>0 | 21<br>0 | 66  | 23<br>1 | 16<br>3 | 6  | 18  | 254+1.75<br>$\alpha$ | 68.8  | M22×1.5 | M12×2<br>0      |
| UBFKD63  | 65       | 115      | 95       | 14<br>0 | 16<br>4 | 20<br>0 | 19<br>4 | 23<br>2 | 72  | 25<br>3 | 19<br>0 | 6  | 18  | 275+1.92<br>$\alpha$ | 73.8  | M27×2   | M16×2<br>5      |
| UBFKD80  | 70       | 125      | 100      | 15<br>0 | 17<br>5 | 22<br>5 | 20<br>5 | 25<br>7 | 86  | 29<br>2 | 21<br>2 | 8  | 20  | 328+2.09<br>$\alpha$ | 79.8  | M27×2   | M16×2<br>5      |
| UBFKD100 | 85       | 145      | 120      | 16<br>5 | 19<br>4 | 26<br>5 | 23<br>4 | 30<br>6 | 100 | 34<br>3 | 24<br>4 | 8  | 22  | 370+2.51<br>$\alpha$ | 95.8  | M33×2   | M20×3<br>0      |
| UBFKD125 | 90       | 155      | 130      | 17<br>0 | 23<br>0 | 28<br>5 | 27<br>4 | 33<br>4 | 116 | 39<br>0 | 28<br>4 | 8  | 25  | 417+2.83<br>$\alpha$ | 100.8 | M42×2   | M24×3<br>5      |
| UBFKD140 | 105      | 180      | 150      | 20<br>0 | 24<br>0 | 30<br>5 | 28<br>6 | 35<br>4 | 125 | 41<br>8 | 29<br>0 | 10 | 28  | 423+3.14<br>$\alpha$ | 117.8 | M42×2   | M24×3<br>5      |
| UBFKD160 | 120      | 200      | 170      | 22<br>0 | 25<br>5 | 33<br>0 | 31<br>5 | 39<br>0 | 140 | 46<br>4 | 31<br>4 | 10 | 32  | 484+3.49<br>$\alpha$ | 134.8 | M48×2   | M30×4<br>5      |
| UBFKD180 | 125      | 220      | 180      | 24<br>0 | 33<br>0 | 38<br>0 | 39<br>0 | 44<br>0 | 150 | 51<br>8 | 38<br>0 | 12 | 32  | 578+3.77<br>$\alpha$ | 139.8 | M48×2   | M30×4<br>5      |
| UBFKD200 | 140      | 240      | 200      | 26<br>0 | 36<br>5 | 44<br>0 | 42<br>5 | 50<br>0 | 170 | 57<br>8 | 43<br>8 | 12 | 36  | 610+4.40<br>$\alpha$ | 156.8 | M48×2   | M30×4<br>5      |

## Outline Drawing of Flange-Mounted, Hole Output, Single-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit



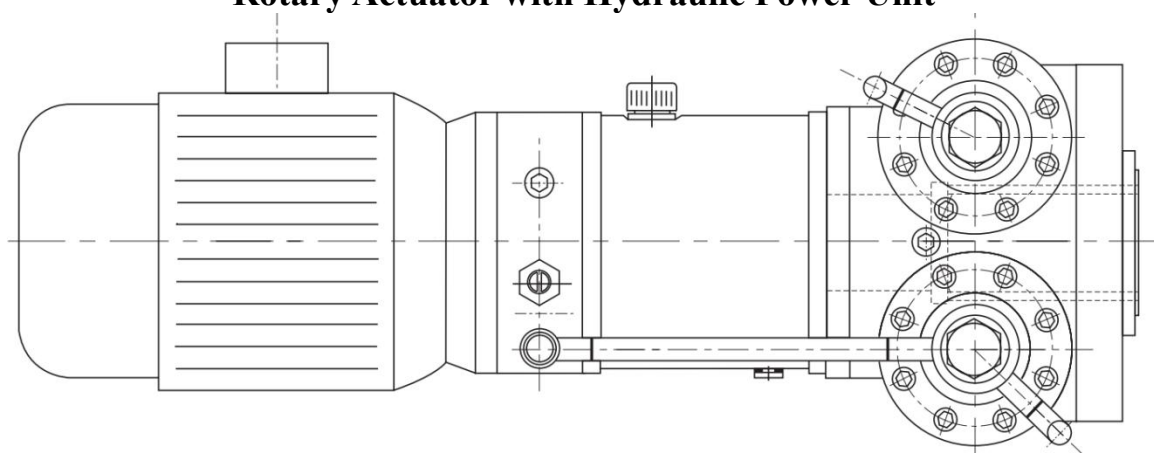
## UBFKS Flange-Mounted, Hole Output, Double-Rack Series Hydraulic Rotary Actuator



$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

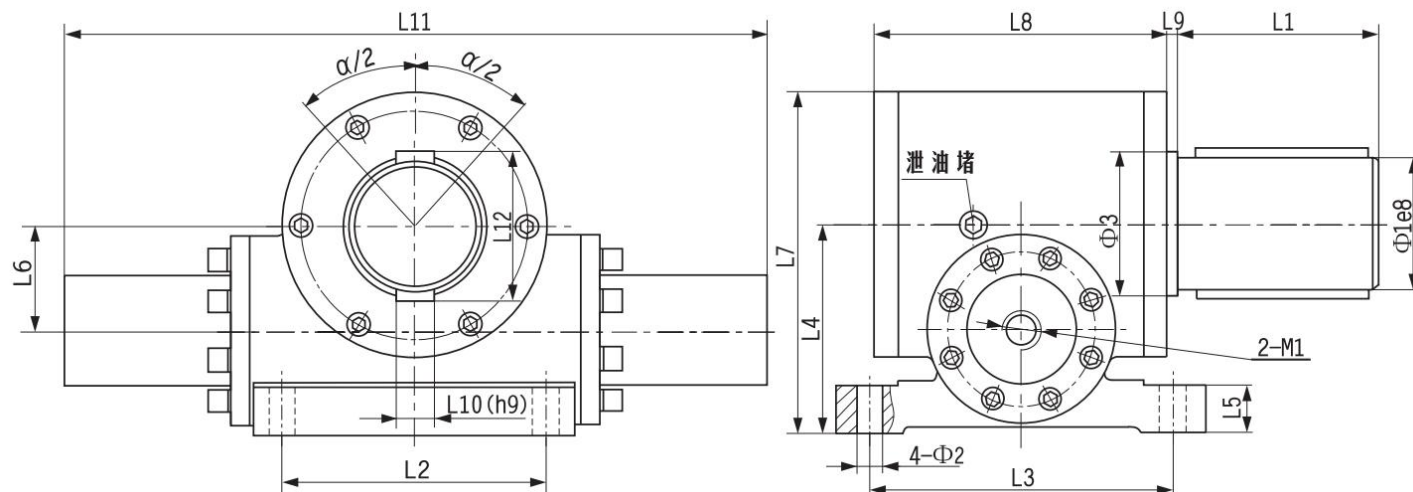
| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1  | L2  | L3  | L4  | L5  | L6  | L7  | L8  | L9 | L10 | L11              | L12   | M1               | M2 $\times$ Hole Depth |
|----------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|------------------|-------|------------------|------------------------|
| UBFKS40  | 50       | 95       | 75       | 105 | 140 | 160 | 164 | 184 | 110 | 210 | 154 | 6  | 14  | $233+1.54\alpha$ | 57.6  | M22 $\times$ 1.5 | M12 $\times$ 20        |
| UBFKS50  | 60       | 105      | 85       | 125 | 146 | 185 | 170 | 210 | 132 | 252 | 163 | 6  | 18  | $254+1.75\alpha$ | 68.8  | M22 $\times$ 1.5 | M12 $\times$ 20        |
| UBFKS63  | 65       | 115      | 95       | 140 | 164 | 200 | 194 | 232 | 144 | 274 | 190 | 6  | 18  | $275+1.92\alpha$ | 73.8  | M27 $\times$ 2   | M16 $\times$ 25        |
| UBFKS80  | 70       | 125      | 100      | 150 | 175 | 225 | 205 | 257 | 172 | 327 | 212 | 8  | 20  | $328+2.09\alpha$ | 79.8  | M27 $\times$ 2   | M16 $\times$ 25        |
| UBFKS100 | 85       | 145      | 120      | 165 | 194 | 265 | 234 | 306 | 200 | 380 | 244 | 8  | 22  | $370+2.51\alpha$ | 95.8  | M33 $\times$ 2   | M20 $\times$ 30        |
| UBFKS125 | 90       | 155      | 130      | 170 | 230 | 285 | 274 | 334 | 232 | 446 | 284 | 8  | 25  | $417+2.83\alpha$ | 100.8 | M42 $\times$ 2   | M24 $\times$ 35        |
| UBFKS140 | 105      | 180      | 150      | 200 | 240 | 305 | 286 | 354 | 250 | 482 | 290 | 10 | 28  | $423+3.14\alpha$ | 117.8 | M42 $\times$ 2   | M24 $\times$ 35        |
| UBFKS160 | 120      | 200      | 170      | 220 | 255 | 330 | 315 | 390 | 280 | 538 | 314 | 10 | 32  | $484+3.49\alpha$ | 134.8 | M48 $\times$ 2   | M30 $\times$ 45        |
| UBFKS180 | 125      | 220      | 180      | 240 | 330 | 380 | 390 | 440 | 304 | 596 | 380 | 12 | 32  | $578+3.77\alpha$ | 139.8 | M48 $\times$ 2   | M30 $\times$ 45        |
| UBFKS200 | 140      | 240      | 200      | 260 | 365 | 440 | 425 | 500 | 340 | 656 | 438 | 12 | 36  | $610+4.40\alpha$ | 156.8 | M48 $\times$ 2   | M30 $\times$ 45        |

### Outline Drawing of Flange-Mounted, Hole Output, Double-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit





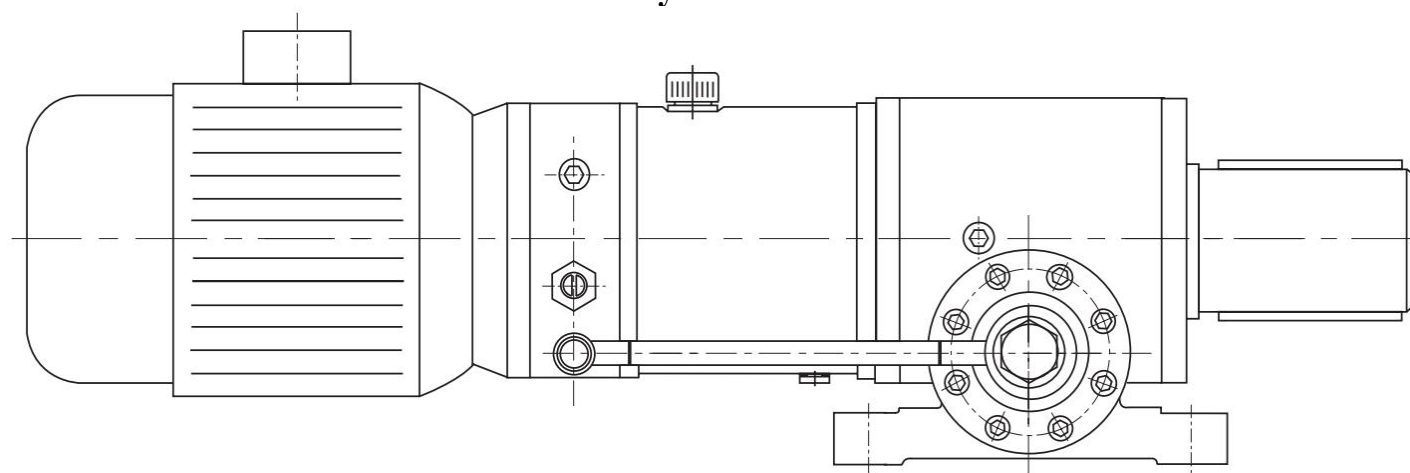
## UBJZD Foot-Mounted, Shaft Output, Single-Rack Series Hydraulic Rotary Actuator



$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

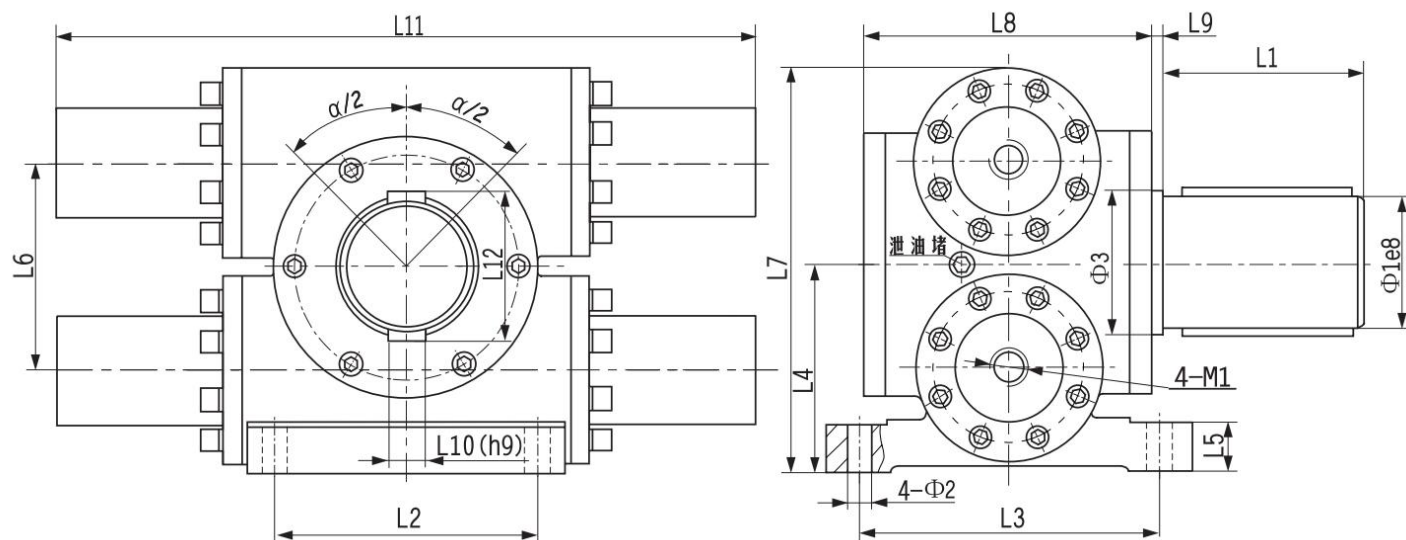
| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1  | L2  | L3  | L4  | L5 | L6  | L7  | L8  | L9 | L10 | L11              | L12 | M1      |
|----------|----------|----------|----------|-----|-----|-----|-----|----|-----|-----|-----|----|-----|------------------|-----|---------|
| UBJZD40  | 70       | 13.5     | 75       | 105 | 140 | 160 | 110 | 25 | 55  | 188 | 154 | 6  | 20  | $233+1.54\alpha$ | 79  | M22×1.5 |
| UBJZD50  | 80       | 13.5     | 85       | 125 | 146 | 185 | 131 | 25 | 66  | 215 | 163 | 6  | 22  | $254+1.75\alpha$ | 90  | M22×1.5 |
| UBJZD63  | 90       | 17.5     | 95       | 140 | 164 | 200 | 142 | 35 | 72  | 236 | 190 | 6  | 25  | $275+1.92\alpha$ | 100 | M27×2   |
| UBJZD80  | 95       | 17.5     | 100      | 150 | 175 | 225 | 168 | 35 | 86  | 267 | 212 | 8  | 25  | $328+2.09\alpha$ | 105 | M27×2   |
| UBJZD100 | 115      | 22       | 120      | 165 | 194 | 265 | 195 | 35 | 100 | 306 | 244 | 8  | 32  | $370+2.51\alpha$ | 129 | M33×2   |
| UBJZD125 | 125      | 26       | 130      | 170 | 230 | 285 | 228 | 40 | 116 | 354 | 284 | 8  | 32  | $417+2.83\alpha$ | 139 | M42×2   |
| UBJZD140 | 145      | 26       | 150      | 200 | 240 | 305 | 246 | 40 | 125 | 377 | 290 | 10 | 36  | $423+3.14\alpha$ | 161 | M42×2   |
| UBJZD160 | 165      | 33       | 170      | 220 | 255 | 330 | 274 | 45 | 140 | 415 | 314 | 10 | 40  | $484+3.49\alpha$ | 183 | M48×2   |
| UBJZD180 | 175      | 33       | 180      | 240 | 330 | 380 | 303 | 45 | 152 | 475 | 380 | 12 | 45  | $578+3.77\alpha$ | 195 | M48×2   |
| UBJZD200 | 195      | 33       | 200      | 260 | 365 | 440 | 333 | 45 | 170 | 520 | 438 | 12 | 45  | $610+4.40\alpha$ | 215 | M48×2   |

## Outline Drawing of Foot-Mounted, Shaft Output, Single-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit





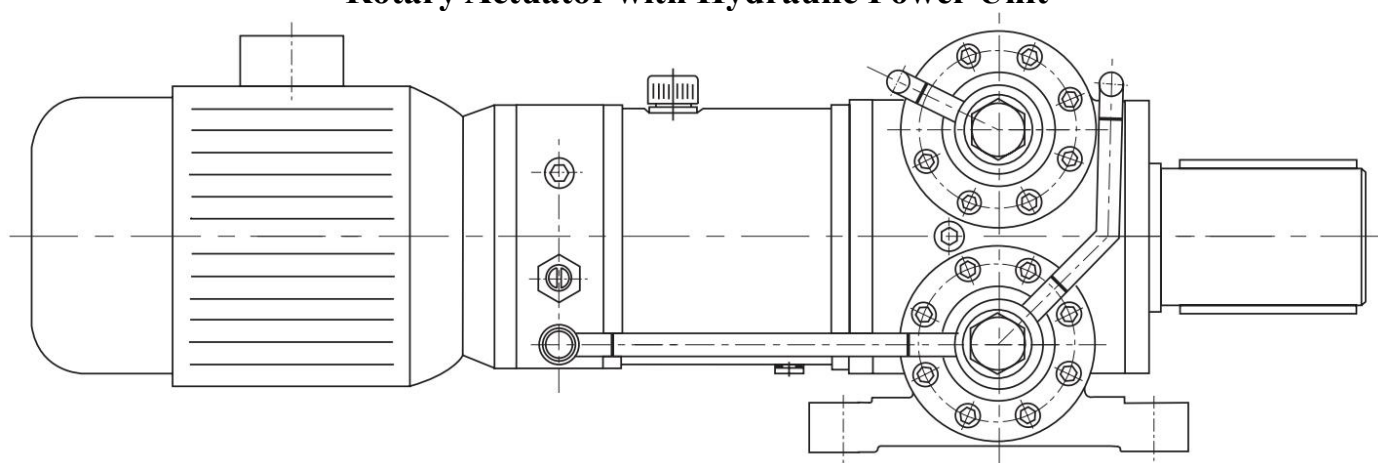
## UBJZS Foot-Mounted, Shaft Output, Double-Rack Series Hydraulic Rotary Actuator



$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

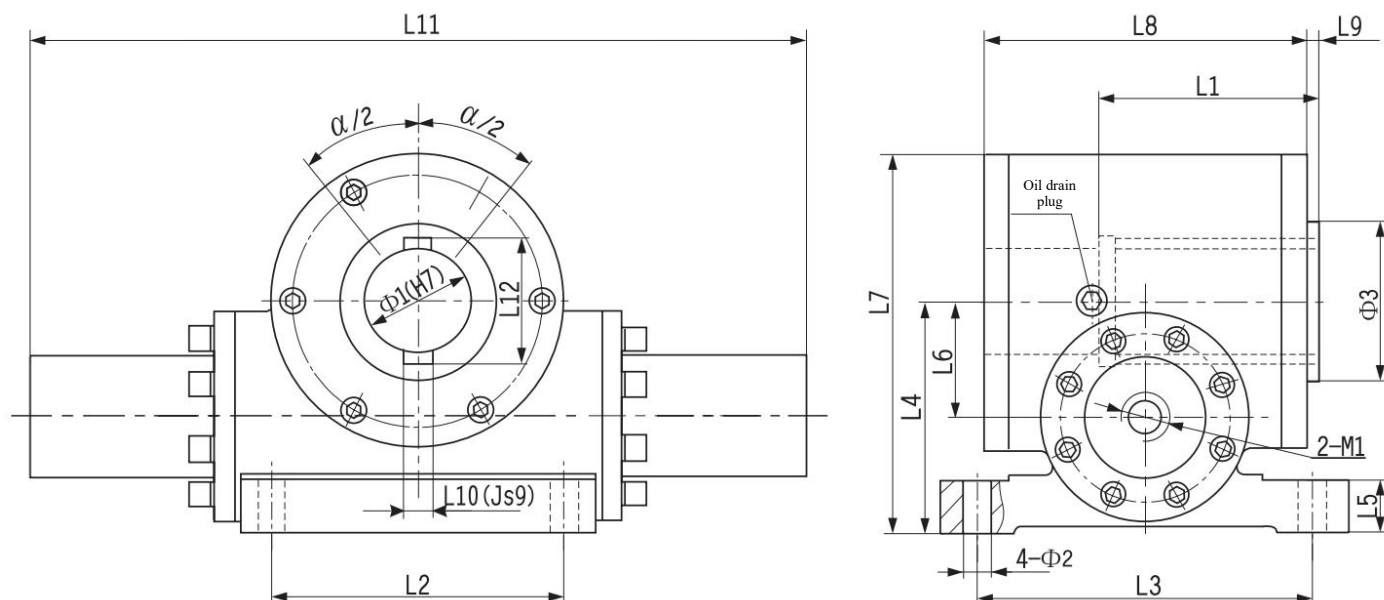
| Model    | Φ1  | Φ2   | Φ3  | L1  | L2  | L3  | L4  | L5 | L6  | L7  | L8  | L9 | L10 | L11              | L12 | M1      |
|----------|-----|------|-----|-----|-----|-----|-----|----|-----|-----|-----|----|-----|------------------|-----|---------|
| UBJZS40  | 70  | 13.5 | 75  | 105 | 140 | 160 | 110 | 25 | 110 | 215 | 154 | 6  | 20  | $233+1.54\alpha$ | 79  | M22×1.5 |
| UBJZS50  | 80  | 13.5 | 85  | 125 | 146 | 185 | 131 | 25 | 132 | 257 | 163 | 6  | 22  | $254+1.75\alpha$ | 90  | M22×1.5 |
| UBJZS63  | 90  | 17.5 | 95  | 140 | 164 | 200 | 142 | 35 | 144 | 279 | 190 | 6  | 25  | $275+1.92\alpha$ | 100 | M27×2   |
| UBJZS80  | 95  | 17.5 | 100 | 150 | 175 | 225 | 168 | 35 | 172 | 332 | 212 | 8  | 25  | $328+2.09\alpha$ | 105 | M27×2   |
| UBJZS100 | 115 | 22   | 120 | 165 | 194 | 265 | 195 | 35 | 200 | 385 | 244 | 8  | 32  | $370+2.51\alpha$ | 129 | M33×2   |
| UBJZS125 | 125 | 26   | 130 | 170 | 230 | 285 | 228 | 40 | 232 | 451 | 284 | 8  | 32  | $417+2.83\alpha$ | 139 | M42×2   |
| UBJZS140 | 145 | 26   | 150 | 200 | 240 | 305 | 246 | 40 | 250 | 487 | 290 | 10 | 36  | $423+3.14\alpha$ | 161 | M42×2   |
| UBJZS160 | 165 | 33   | 170 | 220 | 255 | 330 | 274 | 45 | 280 | 543 | 314 | 10 | 40  | $484+3.49\alpha$ | 183 | M48×2   |
| UBJZS180 | 175 | 33   | 180 | 240 | 330 | 380 | 303 | 45 | 304 | 601 | 380 | 12 | 45  | $578+3.77\alpha$ | 195 | M48×2   |
| UBJZS200 | 195 | 33   | 200 | 260 | 365 | 440 | 333 | 45 | 340 | 661 | 438 | 12 | 45  | $610+4.40\alpha$ | 215 | M48×2   |

## Outline Drawing of Foot-Mounted, Shaft Output, Double-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit





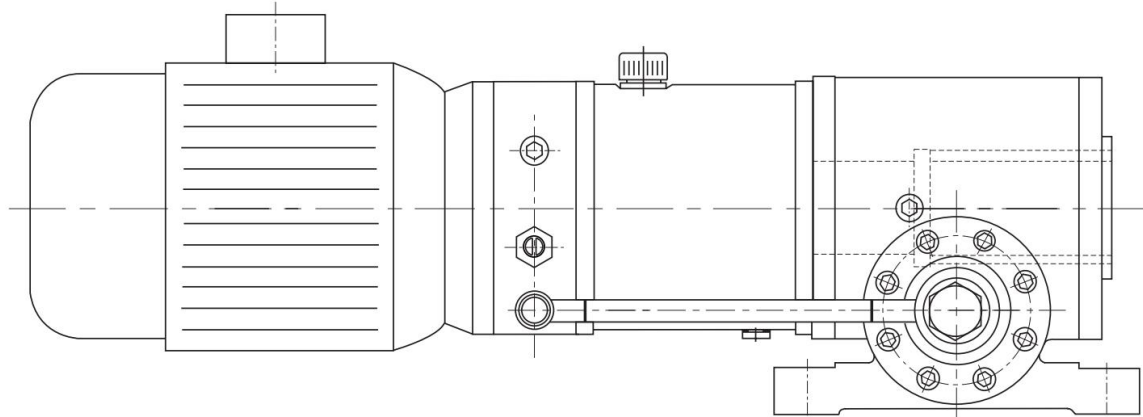
## UBJKD Foot-Mounted, Shaft Output, Double-Rack Series Hydraulic Rotary Actuator



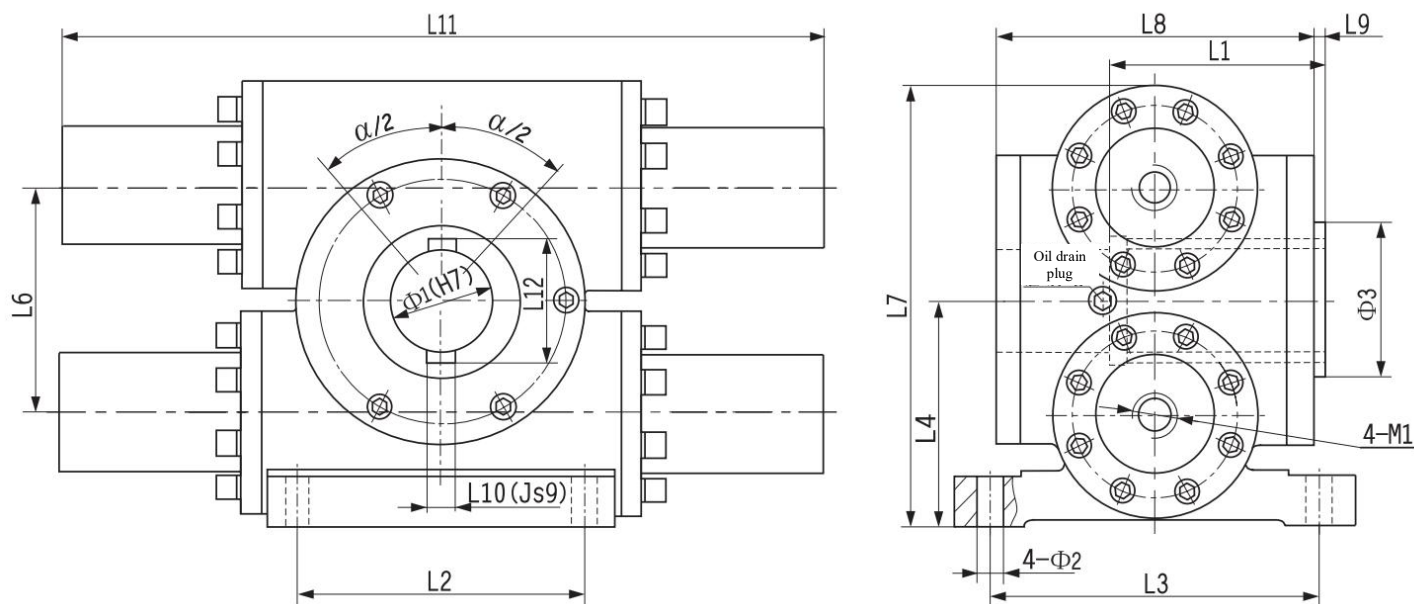
$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1  | L2  | L3  | L4  | L5 | L6  | L7  | L8  | L9 | L10 | L11              | L12   | M1      |
|----------|----------|----------|----------|-----|-----|-----|-----|----|-----|-----|-----|----|-----|------------------|-------|---------|
| UBJKD40  | 50       | 13.5     | 75       | 105 | 140 | 160 | 110 | 25 | 55  | 188 | 154 | 6  | 14  | $233+1.54\alpha$ | 57.6  | M22×1.5 |
| UBJKD50  | 60       | 13.5     | 85       | 125 | 146 | 185 | 131 | 25 | 65  | 215 | 163 | 6  | 18  | $254+1.75\alpha$ | 68.8  | M22×1.5 |
| UBJKD63  | 65       | 17.5     | 95       | 140 | 164 | 200 | 142 | 35 | 72  | 236 | 190 | 6  | 18  | $275+1.92\alpha$ | 73.8  | M27×2   |
| UBJKD80  | 70       | 17.5     | 100      | 150 | 175 | 225 | 168 | 35 | 86  | 267 | 212 | 8  | 20  | $328+2.09\alpha$ | 79.8  | M27×2   |
| UBJKD100 | 85       | 22       | 120      | 165 | 194 | 265 | 195 | 35 | 100 | 306 | 244 | 8  | 22  | $370+2.51\alpha$ | 95.8  | M33×2   |
| UBJKD125 | 90       | 26       | 130      | 170 | 230 | 285 | 228 | 40 | 116 | 354 | 284 | 8  | 25  | $417+2.83\alpha$ | 100.8 | M42×2   |
| UBJKD140 | 105      | 26       | 150      | 200 | 240 | 305 | 246 | 40 | 125 | 377 | 290 | 10 | 28  | $423+3.14\alpha$ | 117.8 | M42×2   |
| UBJKD160 | 120      | 33       | 170      | 220 | 255 | 330 | 274 | 45 | 140 | 415 | 314 | 10 | 32  | $484+3.49\alpha$ | 134.8 | M48×2   |
| UBJKD180 | 125      | 33       | 180      | 240 | 330 | 380 | 303 | 45 | 152 | 475 | 380 | 12 | 32  | $578+3.77\alpha$ | 139.8 | M48×2   |
| UBJKD200 | 140      | 33       | 200      | 260 | 365 | 440 | 333 | 45 | 170 | 520 | 438 | 12 | 36  | $610+4.40\alpha$ | 156.8 | M48×2   |

## Outline Drawing of Foot-Mounted, Hole Output, Single-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit



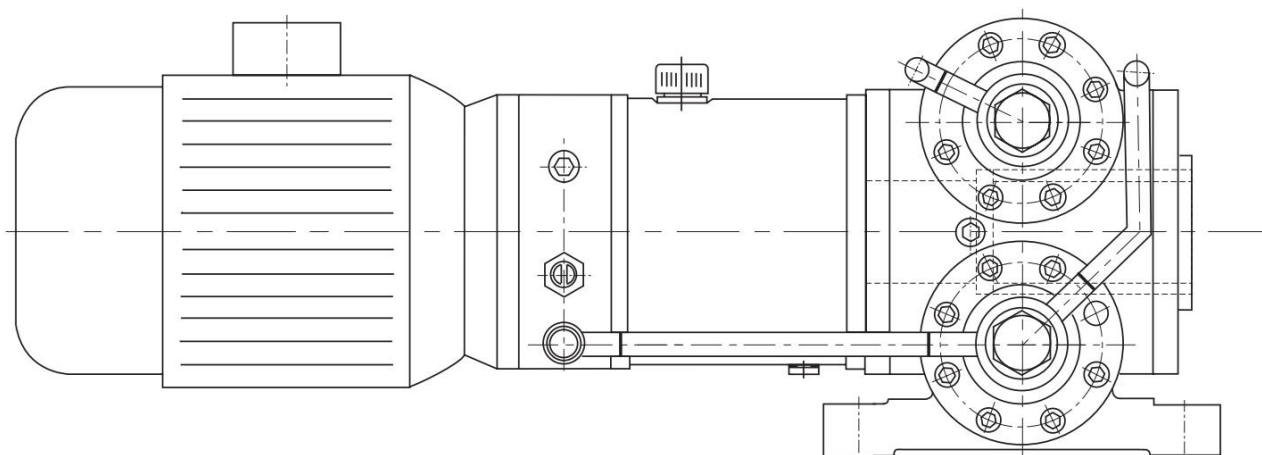
## UBJKS Foot-Mounted, Hole Output, Double-Rack Series Hydraulic Rotary Actuator



$\alpha$ : Swing angle, determined by the customer's requirements (within the range  $0^\circ$  to  $720^\circ$ , with an angle tolerance of  $\pm 1^\circ$ ). For higher precision or angle fine-tuning, please specify when ordering.

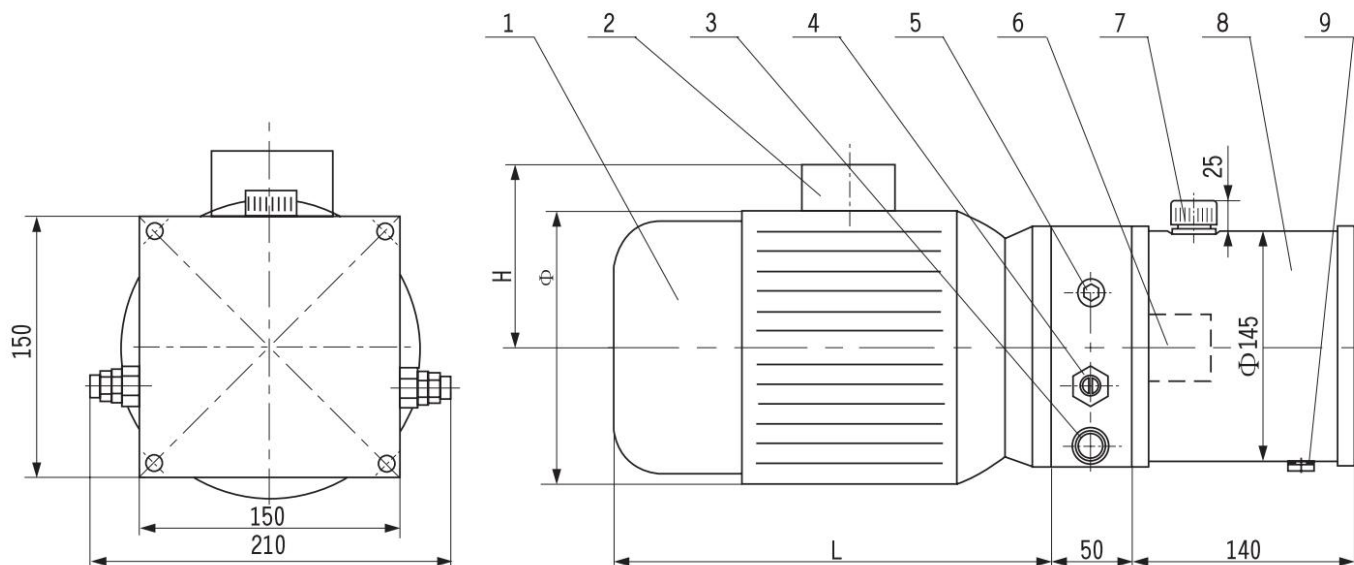
| Model    | $\Phi 1$ | $\Phi 2$ | $\Phi 3$ | L1  | L2  | L3  | L4  | L5 | L6  | L7  | L8  | L9 | L10 | L11              | L12   | M1      |
|----------|----------|----------|----------|-----|-----|-----|-----|----|-----|-----|-----|----|-----|------------------|-------|---------|
| UBJKS40  | 50       | 13.5     | 75       | 105 | 140 | 160 | 110 | 25 | 110 | 215 | 154 | 6  | 14  | $233+1.54\alpha$ | 57.6  | M22×1.5 |
| UBJKS50  | 60       | 13.5     | 85       | 125 | 146 | 185 | 131 | 25 | 132 | 257 | 163 | 6  | 18  | $254+1.75\alpha$ | 68.8  | M22×1.5 |
| UBJKS63  | 65       | 17.5     | 95       | 140 | 164 | 200 | 142 | 35 | 144 | 279 | 190 | 6  | 18  | $275+1.92\alpha$ | 73.8  | M27×2   |
| UBJKS80  | 70       | 17.5     | 100      | 150 | 175 | 225 | 168 | 35 | 172 | 332 | 212 | 8  | 20  | $328+2.09\alpha$ | 79.8  | M27×2   |
| UBJKS100 | 85       | 22       | 120      | 165 | 194 | 265 | 195 | 35 | 200 | 385 | 244 | 8  | 22  | $370+2.51\alpha$ | 95.8  | M33×2   |
| UBJKS125 | 90       | 26       | 130      | 170 | 230 | 285 | 228 | 40 | 232 | 451 | 284 | 8  | 25  | $417+2.83\alpha$ | 100.8 | M42×2   |
| UBJKS140 | 105      | 26       | 150      | 200 | 240 | 305 | 246 | 40 | 250 | 487 | 290 | 10 | 28  | $423+3.14\alpha$ | 117.8 | M42×2   |
| UBJKS160 | 120      | 33       | 170      | 220 | 255 | 330 | 274 | 45 | 280 | 543 | 314 | 10 | 32  | $484+3.49\alpha$ | 134.8 | M48×2   |
| UBJKS180 | 125      | 33       | 180      | 240 | 330 | 380 | 303 | 45 | 304 | 601 | 380 | 12 | 32  | $578+3.77\alpha$ | 139.8 | M48×2   |
| UBJKS200 | 140      | 33       | 200      | 260 | 365 | 440 | 333 | 45 | 340 | 661 | 438 | 12 | 36  | $610+4.40\alpha$ | 156.8 | M48×2   |

## Outline Drawing of Foot-Mounted, Hole Output, Double-Rack Series Hydraulic Rotary Actuator with Hydraulic Power Unit



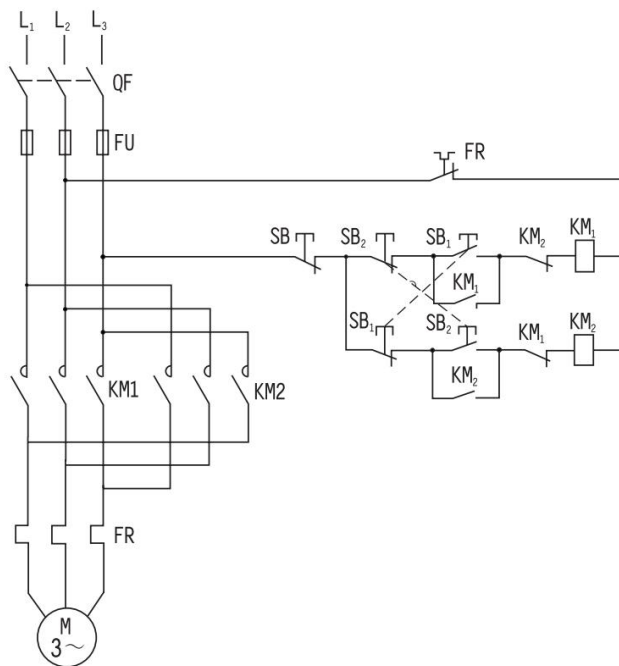
## UB Series Rack-and-Pinion Rotary Actuator Hydraulic Power Unit

### I. Outline Drawing



1. Motor (380V 50Hz), 2. Junction box, 3. Hydraulic port, 4. Relief valve, 5. Check valve, 6. Hydraulic pump, 7. Oil filler port, 8. Oil tank, 9. Oil drain plug

### II. Motor Wiring Diagram



QF —— 主开关  
 FU —— 熔断器  
 FR —— 热继电器  
 M —— 三相电机  
 SB —— 总停按钮  
 SB1 —— 启动按钮1  
 SB2 —— 启动按钮2  
 KM1 —— 交流接触器1  
 KM2 —— 交流接触器2

### III. Technical Specifications

| Model                  | P01        | P02  | P03  | P04 | P05 | P06 | P07 | P08  | P09 | P10  | P11 |
|------------------------|------------|------|------|-----|-----|-----|-----|------|-----|------|-----|
| Flow Rate (l/min)      | 1.5        | 2    | 2.8  | 3.5 | 4.2 | 5   | 5.7 | 7    | 8.2 | 10   | 14  |
| 3-phase<br>AC<br>motor | Power (kW) | 0.55 | 0.75 | 1.1 | 1.5 | 2.0 | 2.2 | 3.0  | 4.0 |      |     |
|                        | RPM r/min  | 1400 |      |     |     |     |     | 1420 |     | 1440 |     |
|                        | Φ mm       | 165  | 165  | 180 | 180 | 180 | 220 | 220  |     | 240  |     |
|                        | H mm       | 120  | 120  | 130 | 130 | 130 | 180 | 180  |     | 190  |     |
|                        | L mm       | 275  | 275  | 280 | 305 | 310 | 370 | 370  |     | 380  |     |
| Weight (kg)            | 27         | 28   | 32   | 35  | 40  | 48  | 52  | 83   |     |      |     |