

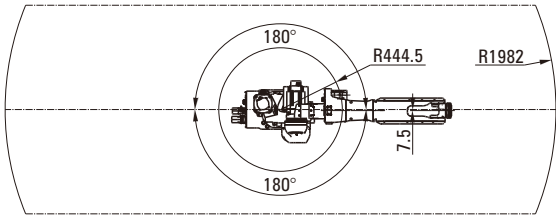
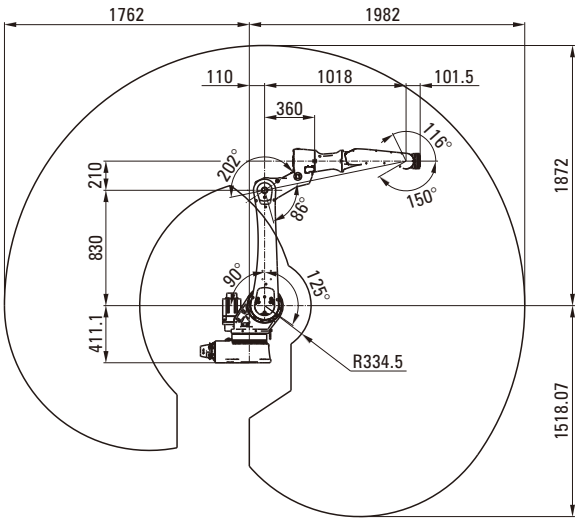
# ZDFT1220工业机器人

## INDUSTRIAL ROBOT

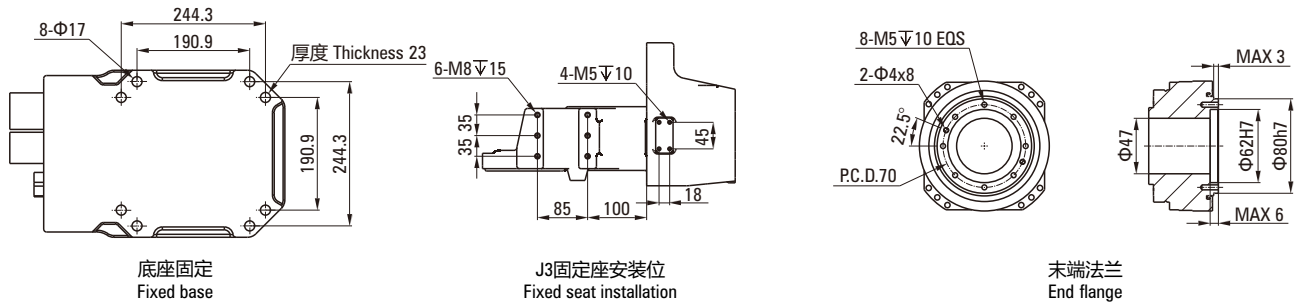


| 机器人型号 Robot model                        |          | ZDFT1220                                                            |
|------------------------------------------|----------|---------------------------------------------------------------------|
| 自由度 Freedom                              |          | 6                                                                   |
| 放置方式 Position                            |          | 地面安装、吊顶安装<br>Ground installation and suspended ceiling installation |
| 最大动作速度<br>Maximum operating speed        | J1轴 Axis | 175°/sec                                                            |
|                                          | J2轴 Axis | 120°/sec                                                            |
|                                          | J3轴 Axis | 180°/sec                                                            |
|                                          | J4轴 Axis | 265°/sec                                                            |
|                                          | J5轴 Axis | 210°/sec                                                            |
|                                          | J6轴 Axis | 260°/sec                                                            |
| 最大动作范围<br>Maximum operating range        | J1轴 Axis | ±180°                                                               |
|                                          | J2轴 Axis | -125°~+90°                                                          |
|                                          | J3轴 Axis | -86°~+202°                                                          |
|                                          | J4轴 Axis | ±170°                                                               |
|                                          | J5轴 Axis | -150°~+116°                                                         |
|                                          | J6轴 Axis | ±360°                                                               |
| 最大活动半径 Maximum activity radius           |          | 1980mm                                                              |
| 末端最大负载 Maximum end load                  |          | 12Kg                                                                |
| 本体重量 Body weight                         |          | 约 About 198Kg                                                       |
| 容许力矩<br>Allowable torque                 | J4       | 22N·m                                                               |
|                                          | J5       | 22N·m                                                               |
|                                          | J6       | 9.8N·m                                                              |
| 容许惯性力矩<br>Allowable moment of inertia    | J4       | 0.65kg·m <sup>2</sup>                                               |
|                                          | J5       | 0.65kg·m <sup>2</sup>                                               |
|                                          | J6       | 0.17kg·m <sup>2</sup>                                               |
| 重复定位精度 Repeatability                     |          | ±0.08mm                                                             |
| 机器人底座尺寸 Robot base size                  |          | 300×420mm                                                           |
| 环境温度 Ambient temperature                 |          | 0~45℃                                                               |
| 相对湿度 Relative humidity                   |          | 20~80%RH                                                            |
| 大气压力 Atmospheric pressure                |          | 89KPa~106KPa ( 海拔1000m以下 )<br>Altitude below 1000m                  |
| 振动、冲击、碰撞<br>Vibration, impact, collision |          | ≤0.5G                                                               |
| 防护等级 Protection grade                    |          | IP54 ( 腕部 Wrist IP65 )                                              |

工作范围图 Work scope diagram



## ■ 安装接口图 Installation interface diagram



## ■ 连杆相对于坐标系的惯性张量 Inertia tensor of the connecting rod relative to the center of mass

| 对象 Object                     | 基座 Base                     | 旋转座部件<br>Rotating seat<br>components | 大臂部件<br>Boom components     | 小臂固定座部件<br>Small arm fixed seat<br>components | 小臂部件<br>Small arm<br>components | 腕部 Wrist                    |
|-------------------------------|-----------------------------|--------------------------------------|-----------------------------|-----------------------------------------------|---------------------------------|-----------------------------|
| 参照 Consult                    | 坐标系0<br>Coordinate system 0 | 坐标系1<br>Coordinate system 1          | 坐标系2<br>Coordinate system 2 | 坐标系3<br>Coordinate system 3                   | 坐标系4<br>Coordinate system 4     | 坐标系5<br>Coordinate system 5 |
| $I_{xx}$ (Kgmm <sup>2</sup> ) | /                           | $2.1 \times 10^6$                    | $9.4 \times 10^5$           | $1.0 \times 10^6$                             | $2.1 \times 10^6$               | $2.0 \times 10^4$           |
| $I_{yy}$ (Kgmm <sup>2</sup> ) | /                           | $2.7 \times 10^6$                    | $1.2 \times 10^7$           | $5.6 \times 10^5$                             | $2.1 \times 10^6$               | $1.0 \times 10^4$           |
| $I_{zz}$ (Kgmm <sup>2</sup> ) | /                           | $1.6 \times 10^6$                    | $1.1 \times 10^7$           | $1.4 \times 10^6$                             | $4.5 \times 10^4$               | $1.7 \times 10^4$           |

## ■ 关节耦合 Joint coupling

| 关节 Joint                                                                 | J1-J2 | J2-J3 | J3-J4 | J4-J5 | J4-J6 | J5-J6 |
|--------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|
| 耦合关系式 (耦合系数)<br>Coupling relationship equation<br>(Coupling coefficient) | /     | /     | /     | /     | /     | 35    |

## ■ 减速机参数 Reducer parameters

| 型号 Model                                                           | 100C  | 250BX | 42D  | 32谐波 Harmonic | 20谐波 Harmonic | FBS32 |
|--------------------------------------------------------------------|-------|-------|------|---------------|---------------|-------|
| 减速机减速比<br>Reducer reduction ratio                                  | 36.75 | 111   | 105  | 50            | 80            | 30    |
| 综合减速比<br>Comprehensive reduction ratio                             | 102.9 | 111   | 104  | 102           | 128           | 105   |
| 额定输出转速 (r/min)<br>Rated output speed                               | 15    | 15    | 15   | 25            | 25            | 25    |
| 额定转矩 (N·m) Rated torque                                            | 980   | 1078  | 412  | 76            | 25            | 25    |
| 启动、停止容许转矩 (N·m)<br>Permissible torque for starting<br>and stopping | 2450  | 2695  | 1029 | 216           | 56            | 56    |
| 瞬时最大转矩 (N·m)<br>Instantaneous maximum torque                       | 4900  | 5390  | 2058 | 382           | 98            | 98    |
| 力矩刚性 (N·m) Moment rigidity                                         | 2450  | 2940  | 1660 | /             | /             | /     |
| 瞬时最大力矩 (N·m)<br>Instantaneous maximum torque                       | 4900  | 5880  | 3320 | /             | /             | /     |

## ■ 电机参数 Motor parameters

| 关节 Joint                                                     | J1                                                                   | J2   | J3   | J4   | J5   | J6   |
|--------------------------------------------------------------|----------------------------------------------------------------------|------|------|------|------|------|
| 电机型号 Motor model                                             | 130                                                                  | 180  | 130  | 60   | 50   | 50   |
| 额定功率 (kW) Rated power                                        | 2                                                                    | 3    | 1.5  | 0.4  | 0.2  | 0.2  |
| 额定电压 (V) Rated voltage                                       | 220                                                                  |      |      |      |      |      |
| 额定电流 (A) Rated current                                       | 10                                                                   | 18   | 7    | 2.6  | 1.5  | 1.5  |
| 额定转矩 (N·m) Rated torque                                      | 6.36                                                                 | 14.3 | 4.77 | 1.27 | 0.63 | 0.63 |
| 额定转速 (r/min) Rated speed                                     | 3000                                                                 | 2000 | 3000 | 3000 | 3000 | 3000 |
| 最大转速 (r/min) Maximum speed                                   | 3000                                                                 | 2200 | 3100 | 4500 | 4500 | 4500 |
| 转子惯量 (*10e-4kgm <sup>2</sup> )<br>Rotor inertia              | 16.5                                                                 | 51   | 9    | 0.4  | 0.2  | 0.2  |
| 线反电势系数 (V/Krpm) Line back<br>electromotive force coefficient | 50.5                                                                 | 52.8 | 48   | 33   | 30   | 30   |
| 极对数 Number of pole pairs                                     | 5                                                                    |      |      |      |      |      |
| 编码器 Encoder                                                  | 17位多圈绝对值 多摩川协议 17 bit multi turn insulation value Tamagawa agreement |      |      |      |      |      |