

# PRECISEFLEX 400 -- 3Kg负载

## 安全协作型SCARA机械手

PF400是全球第一台真正内建安全碰撞机制的SCARA机械手。不同于一般的协作型机械手借助于力传感器来辅助实现人机协同的工作模式，PF400机械手通过特别的运动控制算法，经由控制器来约束机械手在非正常碰撞状态下的安全工作，从而实现安全协作的功能。经TUV认证，即使工作在全速状态下的PF400机械手，也不会因为意外碰撞对人或设备造成重大伤害。这个特点使得PF400型机械手适用于开放性或者轻量保护的人机混合自动化工作环境，与产线员工肩并肩地协同工作。

PF400型机械手一体集成了电机、驱控器、线缆、电源，设计紧凑轻巧，无控制柜，使用装配方便。特别改进的SCARA运动模型使PF400能够在紧凑的工作单元内达到安静高效的运动覆盖。PF400采用绝对值编码器，当碰撞暂停后，可原地重启恢复运动。

此外，PF400内置的运动控制器亦提供了许多增值功能，如手持拖动示教、视觉集成、传送带集成等，同时其内建的Web Server使得用户可以利用手机/平板透过浏览器对PF400进行控制与操作。

安全、可靠、高效、1.2m的Z轴行程、可直流驱动。。PF400型机械手适用于人机混处、工作空间紧凑等自动化应用场景，典型应用如：

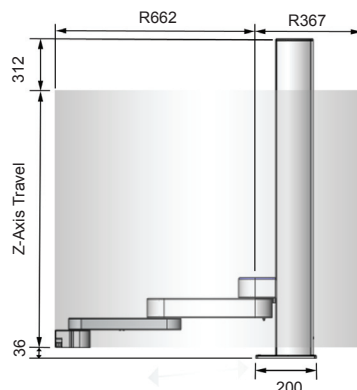
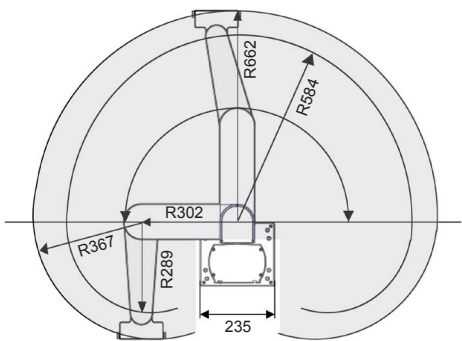
1. 测试、分析自动化
2. 在线物料搬运
3. 堆高式作业--测试墙、工件预装配
4. AGV搭载的物料转移

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PF400机械手由美国Precise Automation公司研发、生产，上海韩陆机器人技术有限公司在国内提供销售、维修与支持。PA公司的创始人Bruce Shimano与Brian Carlisle是全球知名的机器人专家，发明了Vicarm与PUMA机器人，参与及创建了Unimation、Adept等美国机器人公司。

General Specifications	Range & Features
<b>Range of Motion &amp; Resolution</b>	
J1 (Z) Axis	400 mm standard, 750 mm or 1160 mm options available
J2 Axis	+/- 90 degrees
J3 Axis	+/- 167 degrees
J4/Theta Axis	+/- 970 degrees with servo gripper, +110/-470 with mounting flange
Gripper	Robots purchased without a gripper include a standard ISO mounting flange. Pneumatic facilities for single or dual valve grippers are optionally available. In addition, an optional integrated servo gripper is available. The servo gripper has 40 mm of travel and can be outfitted with user developed fingers for holding a variety of different size parts. Software can control squeeze force (between approximately 0-60N for close force, 0-30N for open force) and open/close speed. Safety features include: (1) protection against dropping parts when robot is powered down or e-stop pressed (gripper provides 7-10N of close force when motor power is off) and (2) detection of when a part is being held by the gripper.
Maximum reach	No gripper version: 584 mm to center of ISO mounting flange Servo gripper version: 662 mm end of finger mounts
Repeatability	+/- 90 $\mu$ m overall in x, y & z directions at 18-22 degrees C
<b>Performance and Payload</b>	
Maximum Acceleration	0.2G with 1 kg payload
Maximum Speed	500mm/sec in Z, 1,500mm/sec in horizontal plane with 1kg payload
Maximum Payload	3kg including gripper, 2.5kg with typical 0.5kg gripper
Motors	Brushless DC servo motors with absolute encoders on axes J1-J4, no motion during homing.
Collaborative Forces	All Precise collaborative robots exert forces that fall within the force guidelines for collaborative robots as defined by the recent ISO/TS 15066 Standard on Collaborative Robots. Even maximum speed collisions in free space are well under the ISO force limits for operator safety. However, in order to use a robot in an application without safety shields, the application as a whole (including end effectors, operation methods, objects being handled and obstacles in the workcell) must be evaluated for safety. For more information on the evaluation of applications and workcells without safety shields, please contact Precise Automation.
General Safety	Robot has designed in Category 3 safety features including dual independent E-stop channels as a standard feature
Cycle Time	25 x 300 x 25 mm pick and place cycle with 1 kg payload: 1.4 sec
<b>Interfaces</b>	
General Communications	RS-232 channel, 10/100 Mbps Ethernet port, dual E-stop input, all available on Facilities Panel at the robot base
Digital I/O Channels	Eight optically isolated inputs and eight optically isolated outputs available on Facilities Panel. Additional remote I/O available via Precise RIO modules or 3 <sup>rd</sup> party MODBUS/TCP devices
Air Lines	Air lines are provided when optional pneumatic facilities for single or dual valve grippers are ordered
Operator Interface	Web based operator interface supports local or remote control via browser connected to embedded web server
Programming Interface	Three methods available: Guidance Motion (simple GUI for non-programmers using teach and repeat methods), embedded Guidance Programming Language (standalone, modeled after Visual Basic.Net), PC control using open source TCP/IP Command Server operated via Ethernet connection (TCP).
Required Power	Input range: 90 to 264 VAC, single phase, 50-60 Hz, 365 watts maximum
Weight	20 kg for 400 mm travel version
<b>Linear Rail Option</b>	
Configurations	Any model of the PF3400 can be mounted on the Linear Rail with all of the robot's interfacing cables routed internally in the Rail.
Repeatability	+/- 50 $\mu$ m
Maximum Speed	700 mm/sec
Dimensions	1 M travel version – 1.37 m long x 0.23 m deep x 0.12 m high 1.5 M travel version – 1.87 m long x 0.23 m deep x 0.12 m high 2 M travel version – 2.37 m long x 0.23 m deep x 0.12 m high



PF3400 Robot on Linear Rail



*automate with ease*