



### Yuanda Robot: Technical Specification

Maximum payload	7 kg
Reach	Maximum reach 850 mm Maximum reach 1000 mm (with 5 kg payload)
Vision	Integrated 2D vision with two high-power LEDs
Sensitivity	Torque sensors in each axis
Machine learning and AI	Integrated neural processing unit (NPU)
Repeatability	0.05 mm
Typical velocity (TCP)	1.2 m/s
Maximum velocity (TCP)	2.0 m/s
Joint angle limits	Max. $\pm 220^\circ$ (depending on configuration)
Maximum joint velocity	150 $^\circ$ /sec
Weight	29 kg
Protection class (robot and controller)	IP 54
Power supply	100–250 VAC, 47–63 Hz
Average power consumption	250 W
Maximum current	8 A @ 230 VAC
Environmental conditions	Temperature: 5–40 $^\circ$ C Humidity: 80 % RH (non-condensing)
Safety functions	ES: Emergency Stop including STO, SBC According to EN ISO 10218-1, EN ISO 13849-1 PI d, Cat. 3

The following safety functions will be available from start of production. A software update (supplied

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after certification, free of charge) will be necessary to comply with PL d, Cat. 3. The certification according to EN ISO 10218-1 and EN ISO 13849-1 PL d, Cat. 3 is in Q3/2020.

ED: Enabling Device

OM: Operating Mode

SLDS: Safely Limited Drive Speed

SLDP: Safely Limited Drive Position

SLDT: Safely Limited Drive Torque

SLRP: Safely Limited Robot Power

SLCP: Safely Limited Cartesian Position

SLCO: Safely Limited Cartesian Orientation

SLCS: Safely Limited Cartesian Speed

SLCF: Safely Limited Cartesian Force

PS: Protective Stop

including STO, SBC, SS1, SS2

Customisable Safe I/Os

Controller

16 DI, 16 DO, 4 AI, 4 AO, Ethernet

8 SafeDI, 4 SafeDO (safe Ins- and Outs)

Integrated OPC UA-Gateway (flexibly expandable thanks to the integrated Python-API)

Media flange (2 A maxium current)

M8-Interface (8 Pin):

2 DI, 1 DO, 2 AI/ModbusRTU, 1DI/O/IOLink

Spring-probe-interface (wireless connection):

2 DI, 3 DO, 2 AI/ModbusRTU, 1DI/O/IOLink

(Modbus and IOLink available from Q3/2020)

M8-Interface (6 Pin):

Ethernet-Interface (available from Q3/2020)

Communication and protocols

Hand controller

Emergency stop

Enabling button

Operation mode switch

ON/OFF button

User interface

Device independent programming interface (browser based)



### **Collaborative Yuanda Robot: Software Functionality (excerpt)**

- Contact/collision detection, collision reaction, environmental interaction
- Monitoring and avoidance of self-collision
- Zero gravity hand guiding
- Remote control (jogging, step-jogging) in different coordinate systems (robot, joint, tool, camera and customisable coordinate systems)
- Browser based, graphical robot user interface
  - Application manager (management of user-apps)
  - Programmable robot motions
    - Cartesian motions
    - PTP motions
    - Time-optimised positioning
    - Continuous blending of motion commands
  - Creation and management of user coordinate systems
  - Logic commands (if, wait, repeat, loop, group etc.)
  - Integrated vision commands
    - QR tag detection/localisation
    - Object detection/localisation
    - Object classification
    - Quality inspection and good/bad distinction
  - Palletising macros (1D-, 2D- and 3D-pattern)
  - I/O control (digital and analogue I/Os)
  - Variable manager (creation, integration and management)

- Customisable tool interface with integration of arbitrary robot tools (gripper, screwdriver, glue dispenser, measuring equipment and customer specific tooling)
- Integrated Python-API including graphical UI-builder for
  - Development and graphical integration of customer specific functions
  - Realisation of communication protocols
  - Implementation of one's own vision algorithms
  - ...
- Definition and monitoring of custom working range (safe limitation of working range)
- Integrated digital twin for on-/ and offline visualisation and simulation
- Camera streaming including display of additional information
- Simulation mode for testing of programmes before usage (based on the integrated digital twin)
- Optional addition of external safety equipment (radar, light curtain etc.)