DENSO
Crafting the Core

Medical and Pharmaceutical Robot

VS-050S2 Series

Contributes to automation of medical product/device manufacturing and drug preparation

Maximum reach	520mm
Maximum payload	4kg
Cycle time	0.35 sec

Resistant to sterile environments

Robot for use in sterilized/clean environments that employ H_2O_2 gas 35% density(dry/wet), UV exposure, etc.

Resists Contamination

The smooth surface prevents adherence of dust and dirt. The robot arm is constructed without external screws to maintain a high sanitation level.
Cleanness: ISO Class 5
Protection level: Wrist IP67, Unit IP65

Authentication

- Design compliant with GMP* (product management and quality control standards) * GMP Grade A
- cUL certified product (UL standard/Canada CSA standard) also available
- Hygiene proven through in testing by the Fraunhofer Institute (Report No. DE 1409-725)

IPA Fraunhofer TESTED® DEVICE
DENSO WAVE Inc.
Robot VS050S2-AV6-R1
Report No. DE 1409-725

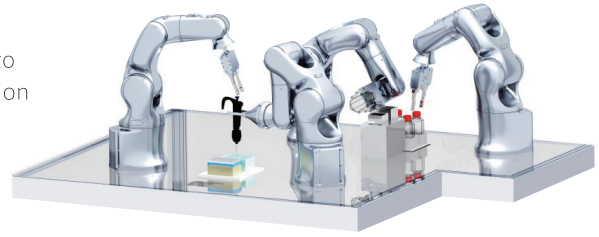
Isolation (Suitability for sealed environments)

Cables and connector panels are positioned on the bottom for installation in sealed and quarantine environments.

Examples of Applications

Automation of cell culture

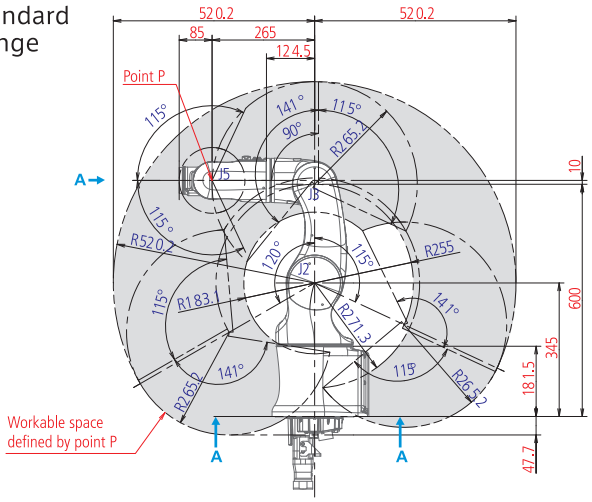
- Robots reproduce the movements of skilled workers accurately to realize the automation of high-quality cell culture without variation in quality caused by multiple workers.
- Use of robots prevents contamination by human workers and eliminates the possibility of workers' exposure to hazards to realize a clean and safe system.
- Human workers' manipulations of general-purpose apparatus, such as pipetting and cap opening, can be reproduced accurately.

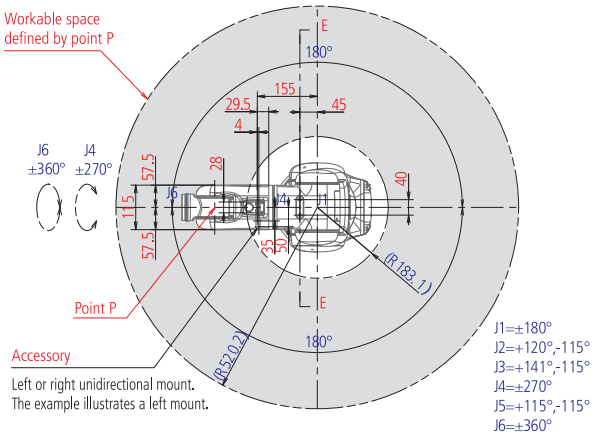


Scan for a video of an automated cell culture system

Dimensions / Motion range

Standard flange



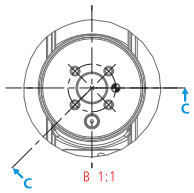


Specifications

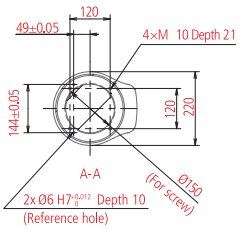
Item		Specifications
Model		VS-050S2
Axes		6
Position detection method		Absolute encoder
Drive motor / brake		All-axis AC servo motor, all-axis brake provided
Total arm length (1st arm + 2nd arm)		520 (255+265) mm
Maximum motion area (Point P)		520mm
Minimum motion radius (Point P)		183.5mm
Motion range	J1 (1st axis)	±180° (*3)
	J2 (2nd axis)	+120°, −115°
	J3 (3rd axis)	+141°, −115°
	J4 (4th axis)	±270°
	J5 (5th axis)	±115° (*4)
	J6 (6th axis)	±360°
Maximum payload		4kg
Maximum joint speed	J1	425deg/sec
	J2	283.33deg/sec
	J3	309.35deg/sec
	J4	425deg/sec
	J5	272.96deg/sec
	J6	680deg/sec
Cycle time (*1)		0.35sec
Position repeatability (at the center of end-effector mounting face) (*2)		±0.02mm
Maximum allowable moment of inertia	J4,J5	0.2kgm²
	J6	0.05kgm²
Maximum allowable moment	J4,J5	6.66Nm
	J6	3.13Nm
Signal line/air piping solenoid valve (option)	Signal line	10-core (*5, 6)
	Air piping solenoid valve	Solenoid valve (2- position, double-solenoid) x 2
Electric gripper connection flange specification-A (option)		25-core (17 + 8) (*6)
Air source	Operating pressure	0.20~0.39MPa
	Maximum allowable pressure	0.49MPa
Noise (A-weighted equivalent continuous sound pressure level)		65 dB or lower
Environmental resistance	Hydrogen peroxide environment	35% Hydrogen peroxide steam (dry/wet)
	Protection level	Wrist: IP67, Unit: IP65
	Cleanness	ISO Class 5
Weight		Approx. 34 kg

*1: Time required for a robot to move 1 kg payload between two points 300 mm apart at a height of 25 mm
*2: Position repeatability is the precision at constant ambient temperature
*3: Motion range is limited when mounted to a wall. Inquire for details.
*4: When electric gripper connection flange specification-A is selected, the J5 motion range is +110, -102.
*5: This wire (proximity sensor wire and other signal wires) has 4 cores if electric gripper connection flange specification-A is also selected.
*6: Allowable current is limited.

Detailed drawing of end-effector mounting face (Standard Flange) (View A)



Detailed drawing of base mounting face (Top view)



Options

Electric gripper connection flange specification-A

Internal mount with a gripper cable up to the flange. Suitable for clean environments, eliminates interference with peripherals

External mount battery

Optional external mount battery for improved maintainability and battery replacement

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