SCAPE
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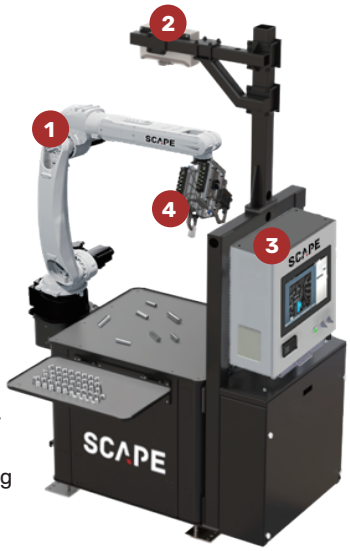
SCAPE CNC MACHINE TENDING

SCAPE CNC Tending is designed to optimize loading and unloading processes in machining applications. Equipped with 3D vision technology, it ensures efficient and accurate part handling by picking components from organized or randomly placed material frames. The solution focuses on placing parts with high precision into CNC machines, enabling flexible production, reducing reliance on manual labor, and enhancing both production efficiency and quality.



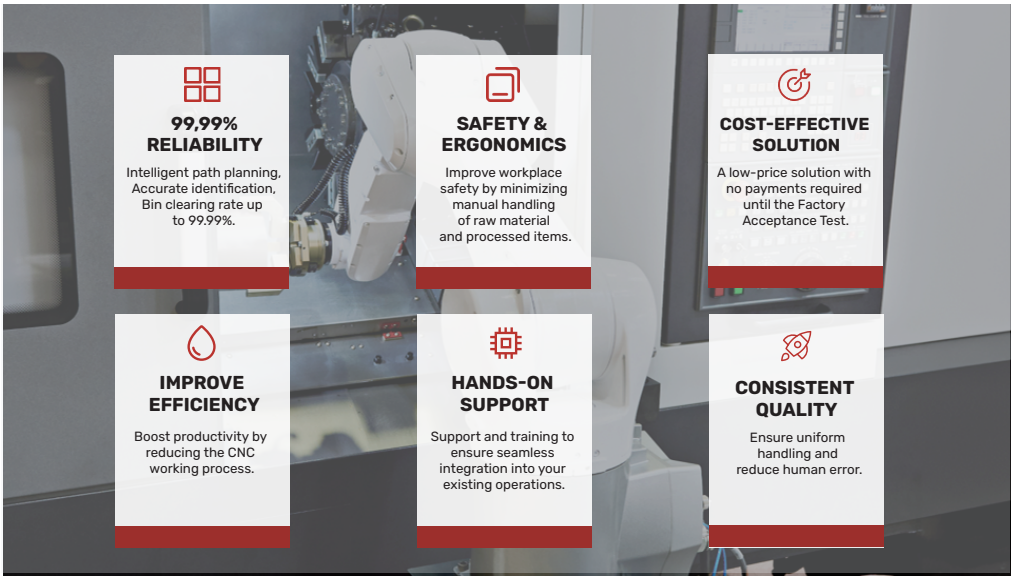
1 SCAPE Robot
Powerful and flexible SCAPE Robot programming language offering high accuracy, speed, stability, and intelligent path planning for enhanced productivity and flexibility.

2 SCAPE Industrial 3D Scanner
High-quality data acquisition enables the efficient handling of various material parts, making it ideal for deep-frame grabbing and bin-picking applications.

4 SCAPE Tool Units & Grippers
Gripper assemblies, including suction cups, magnetic grippers, and finger-type grippers, are mounted on guide rods or cylinders. They are commonly used for precise handling of material parts from bins and boxes.

3 SCAPE Vision Controller
Enables easy visualization, adjustment, and optimization of the workflow guiding your robot application.

APPLICATION ADVANTAGE



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Don't miss out the opportunity.
Get in touch with our experts and discuss your application today!

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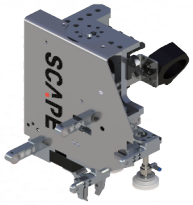
PRODUCT CONFIGURATIONS

Product Option	SCAPE CNC TENDING SMALL LOAD	SCAPE CNC TENDING MEDIUM LOAD	SCAPE CNC TENDING HEAVY LOAD	SCAPE CNC TENDING CUSTOM
Introduction	For small-load robot applications. Ideal for meeting the loading and unloading requirements of small-sized parts.	For medium-load robot applications. Ideal for meeting the loading and unloading requirements of medium-sized parts.	For heavy-load robot applications. Ideal for meeting the loading and unloading requirements of large-sized parts.	Customized to meet specific requirements for complex scenarios. (Scape has extensive expertise in handling custom project demands.)
Features				
Part weight (Recommended)	1KG	3KG	10KG	As needed
Maximum adaptive depth of gripper	100 mm	160 mm	200 mm	As needed
Incoming material status	Random / layered / stacked			
Part placement	High precision delivery into fixture			
SCAPE Robot Units Overview				
DOF	6			
Reach	1602 mm	2013 mm	1617 mm	As needed
Repeatability	±0.05 mm	±0.05 mm	±0.05 mm	As needed
Payload (Recommended)	10 kg	20 kg	30 kg	As needed
SCAPE Tool Units Overview	✓ incl. ○ option – not available			
Tool Units	 TU10-11/12	 TU20-01	 TU30-01	 Custom
Maximum number of gripper components allowed to be installed — TA11-01/03	2/4	-	-	○
Maximum number of gripper components allowed to be installed — TA11-11/13/14/16	-	3	-	○
Maximum number of gripper components allowed to be installed — TA11-21/23/24/26	-	-	3	○
TCP	✓	✓	✓	✓
SCAPE Vision Solutions Overview	✓ incl. ○ option – not available			
OP18-12 PRO C-M 3D Scanner OP18-13 PRO C-L 3D Scanner OP18-14 PRO C-XL 3D Scanner OP18-35 Ultra-L 3D Scanner OP18-36 Ultra-XL 3D Scanner	✓ (Determine the 3D scanner specifications based on the actual scene/bin size)			
OP11-03 3D Orientation Control including SL13-11/12 Camera and Lights	○	○	○	○
SCAPE Controller PC Overview	✓ incl. ○ option – not available			
PC22-01 Vision Controller	✓			
SW10 Bin-Picking Software	✓			

Note: Please refer to the "TU10/TU20/TU30/TA11 - Hardware Installation - Tool Units and Grippers - Compact, Standard, Large", or contact Scape staff.

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CASE

TNDA Gas Equipment - 3D Vision-Guided Machine Tending of Valve Covers

1. **SCAPE Industrial 3D Scanner**
2. **SCAPE 2D Camera**
3. **SCAPE Robot**
4. **SCAPE Vision Controller**

LOADING AND UNLOADING OF VALVE COVERS FROM 2 CNC MACHINES

THE SOLUTION PERFORMS 3D VISUAL IDENTIFICATION OF THE PART IN THE BIN, GUIDING THE ROBOT TO PICK IT AND PLACE IT ONTO A ROTARY TABLE. NEXT, A 2D CAMERA IDENTIFIES THE POSITION OF THE PRESSURE RELIEF VALVE HOLE. BASED ON THIS DATA, THE ROBOT ORIENTS THE WORKPIECE TO THE CORRECT ANGLE FOR FEEDING INTO THE MACHINE. THE ROBOT THEN GRASPS THE PART AND PLACES IT INTO THE LATHE FOR PROCESSING. ONCE THE VALVE COVER IS PROCESSED, THE ROBOT PLACES IT IN AN ORGANIZED MANNER ON THE RECEIVING PALLET.

APPLICATION RESULTS

THE CUSTOMER'S FACTORY HAS BEEN OPERATIONAL FOR THREE YEARS, AND WITH SCAPE 3D VISION TECHNOLOGY, INTELLIGENT OPERATIONS ARE NOW ACHIEVABLE, LEADING TO A SIGNIFICANT IMPROVEMENT IN OPERATIONAL EFFICIENCY. THE MODULAR HARDWARE AND SOFTWARE DESIGN ENABLE QUICK AND SEAMLESS DEPLOYMENT.

CYCLE TIME:	3 MIN - PARTS THAT DO NOT REQUIRE THREADED HOLE 4 MIN - PARTS THAT REQUIRE THREADED HOLE MACHINING
PART WEIGHT AND DIMENSIONS:	4 KG (MAX); 249 MM IN DIAMETER
PART DELIVERY:	HIGH PRECISION DELIVERY INTO FIXTURE
PART:	ALUMINUM VALVE COVER - DISORDERED STACKED IN THE SAME DIRECTION

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