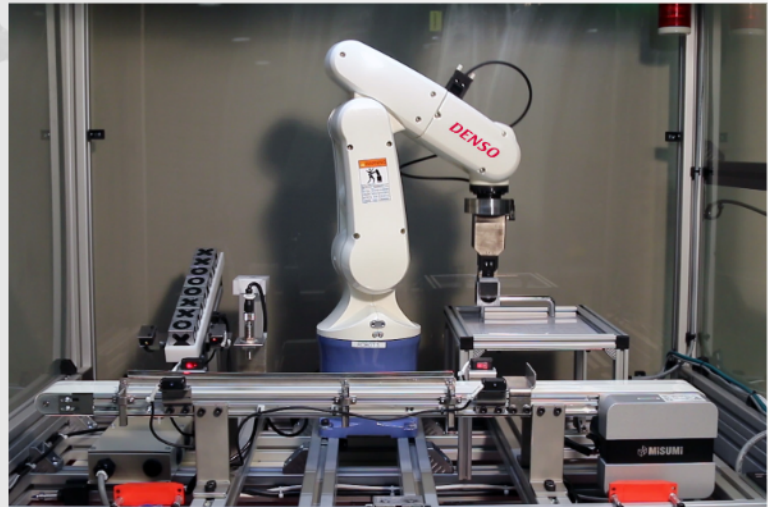


DENSO Automation Trainer



- Teaches principles of automation
- Industry-standard components
- Customizable and user-friendly
- Options include:
 - Camera and vision system
 - Machine-tool integration

DENSO
robotics

DENSO Automation Trainer

The DENSO Automation Trainer is an industrial production and control system designed to demonstrate the operation, control and integration of workcell modules. The trainer is supplied with a set of standard routines and configurations that can be modified and customized to meet the specific needs of the training requirements.

Curriculum courseware includes hands-on applications that walk the user through the setup and programming of the DENSO Automation Trainer using a computer or supplied teach pendant. The software included with the robot allows offline simulation of the routine and presents the user with a 3-D visualization of the robot and environment. The routine and program can also be modified in real-time operation mode.

The trainer is constructed with an extruded aluminum frame and is mounted on lockable industrial casters for ease of mobility as well as safety, which is of primary concern. The system is integrated with emergency-door circuits as well as a deadman switch on the main controller and the handheld teach pendant. The frame is housed in Plexiglas® and includes doors that prevent operation of the robot unless the safety interlocks are engaged with the doors closed.

Best in its class.

All components, including the DENSO robot, are of industrial grade. The six-axis robot, which is used in industrial environments such as automotive, medical, pharmaceutical and general manufacturing, has a standard cycle time of less than 1.0 sec, repeatability of ± 0.02 mm and a maximum payload of 2 kg. The robot weighs only 12 kg and has a footprint of only 160 x 160 mm, facilitating installation and integration. The robot's motors, which are absolute AC encoded, are 80 W or less and the total capacity of the motors is 300 W or less, saving energy. The compact controller is the smallest in its class.

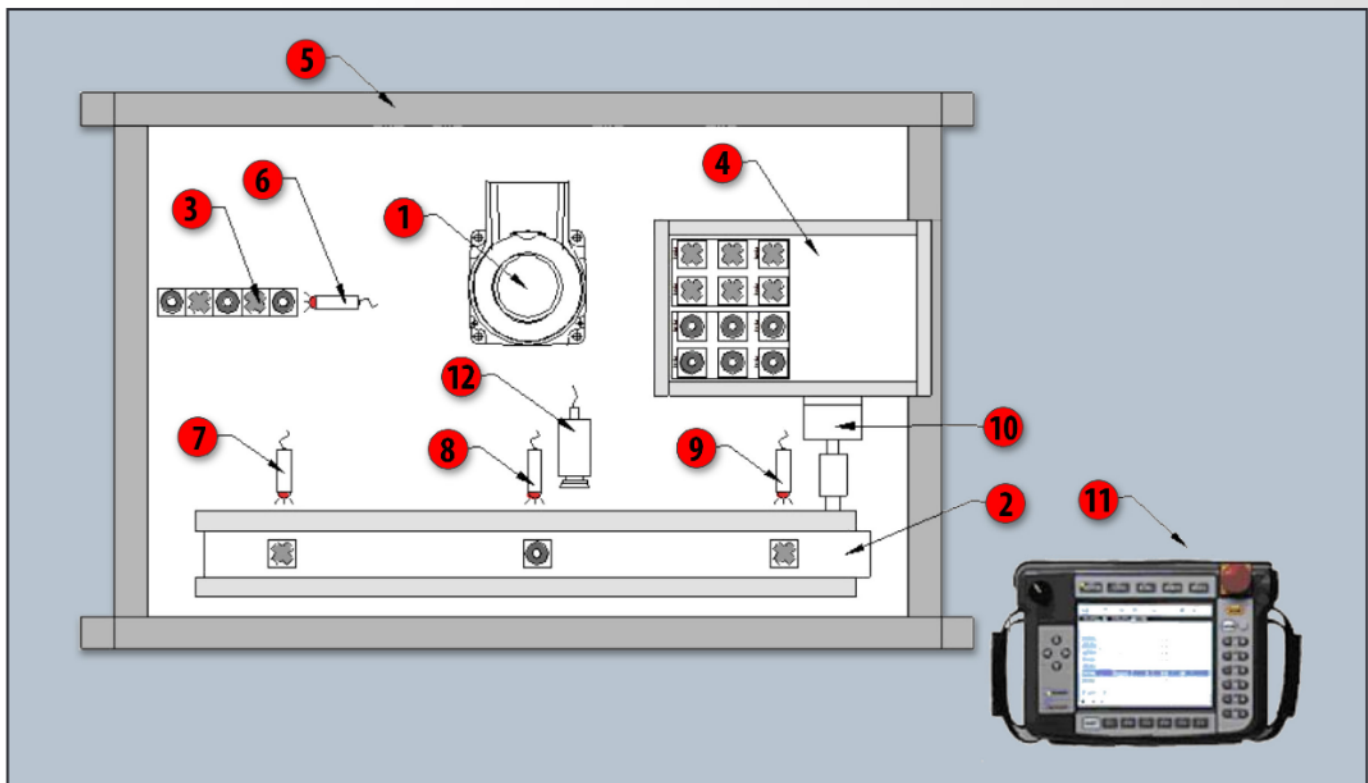


DENSO Automation Trainer

The Process.

In the default configuration included with the trainer the components are a selection of aluminum blocks of two different types (Xs and Os). The process of sorting starts with parts that are loaded into a gravity-fed parts magazine (3). A proximity sensor (6) at the end signals the controller that a part is loaded. The six-axis robot (1), mounted on the support table (5), removes the part and places it on the waiting conveyor (2). The part-present-at-drop sensor (7) signals the PLC to start the conveyor. The part travels through to a proximity sensor (8) to signal the

optional vision system (12) to trigger. If the optional camera is not used, a proximity sensor is mounted on the conveyor, just above the passing part. As the part passes under the sensor, it will be identified as an X or an O. The part then moves a set distance to the end of the conveyor and is positioned so that the part-present-at-pick sensor (9) signals that the part is ready for the robot to pick. The part is then moved to the parts pallet (4) for storage and positioned according to the feedback from the vision-system/ID sensor.



Features:

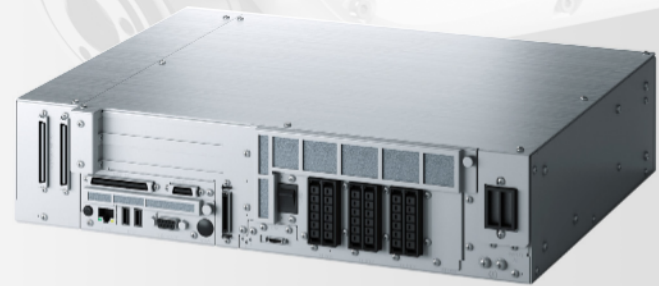
- | | | |
|------------------------|--------------------------------------|--------------------------------------|
| 1. DENSO VP-6242 robot | 5. Table support | 9. Part-present-at-pick sensor |
| 2. 36-in conveyor | 6. Part-present-at-chute sensor | 10. Conveyor motor and coupling |
| 3. Parts chute | 7. Part-present-at-drop sensor | 11. Teach pendant and operator panel |
| 4. Parts pallet | 8. Part-present-at-ID station sensor | 12. Vision system (optional) |

DENSO Automation Trainer

RC8A Industrial Robot Controller

Enhanced machine-operator interfaces linking to a highly functional pendant equipped with functions for robot teaching, real-time monitoring and program editing.

- High performance
- Compact design
- Fully expandable
- ANSI compliant
- CE compliant



ITEM			SPECIFICATIONS						
Robot series			VP-6242						
Model (RC8A)			VP-G series						
Controllable axes			6						
Control system			PTP, CP 3-dimensional linear, 3-dimensional circular						
Drive system			All axes: Full-digital AC servo						
Language used			DENSO robot language (conforming to SLIM)						
Memory capacity			3.25 MB (equivalent to 10,000 steps, 30,000 points)						
Teaching system			<table border="0"> <tr> <td>1) Remote teaching</td> <td>1) Direct teaching</td> </tr> <tr> <td>2) Numerical input (MDI)</td> <td>2) Remote teaching</td> </tr> <tr> <td></td> <td>3) Numerical input (MDI)</td> </tr> </table>	1) Remote teaching	1) Direct teaching	2) Numerical input (MDI)	2) Remote teaching		3) Numerical input (MDI)
1) Remote teaching	1) Direct teaching								
2) Numerical input (MDI)	2) Remote teaching								
	3) Numerical input (MDI)								
External signals (I/O)	Standard I/O	Mini I/O	Input: 8 user open points + 11 fixed system points Output: 8 user open points + 12 fixed system points (Note: The global type of the controller cannot use system-fixed emergency-stop I/Os.)						
		Hand I/O	Input: 6 fixed system points + Output: 5 fixed system points						
	Safety I/O (only on global type)		Input: 6 fixed system points + Output: 5 fixed system points						
	Ethernet/IP board		Input: 128 points Output: 128 points						

DENSO Automation Trainer

Teach Pendant TP-RC8-1

MODEL NUMBER • TP-RC8-1

MAIN SPECIFICATIONS

DISPLAY	Color liquid-crystal display with backlight, 640 x 480 pixels
POWER SOURCE	24 V (supplied by controller)
OPERATION	Robot STOP button, deadman switch, jog dial, motor power ON/OFF key, AUTO/MANUAL selector switch, R-SEL key M-MOD key, SPEED key, cursor keys, STOP key, OK key, CANCEL key
INSTALLATION CONDITION	Temperature: 0 to 40 °C; humidity: 90% RH or less (no condensation allowed)
EXTERNAL	260 mm H x 186 mm W x 50 mm D
WEIGHT	Approx. 1 kg
CABLE LENGTH	4 m, 8 m, 12 m
Specifications subject to change without notice.	



Robotic Software – Wincaps III offline programming software



Three-position deadman switch
Deadman switch designed with safety in mind

Jog dial
Jog dial suitable for commencing new lines and adjusting numeric values

Sheet key
Sheet keys that fully utilize fingertip feel

Program window

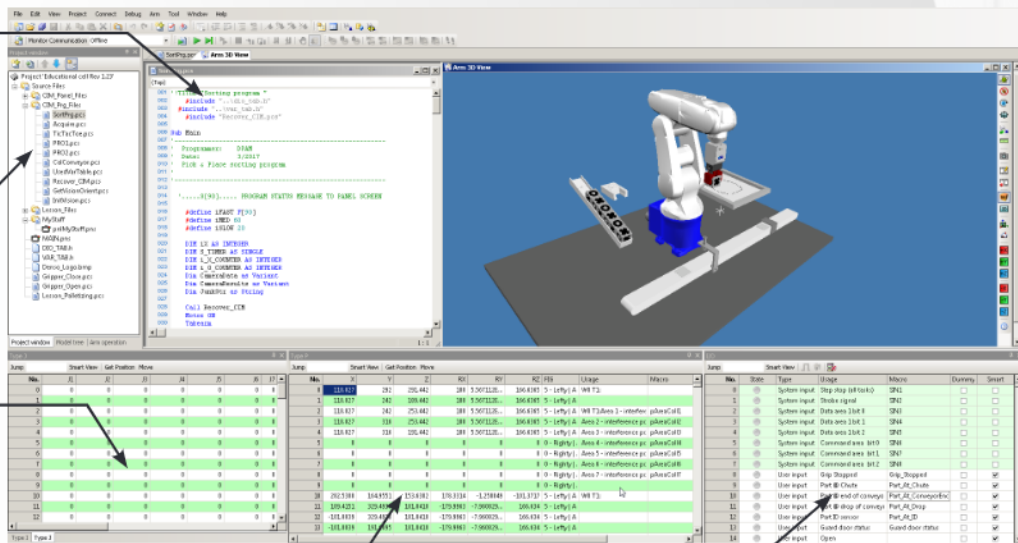
- Programs
- Arm 3D View

Project window

- Program tree
- Arm tree

Output window

- Compilation results
- Debug information
- Search results



Position table window

I/O window

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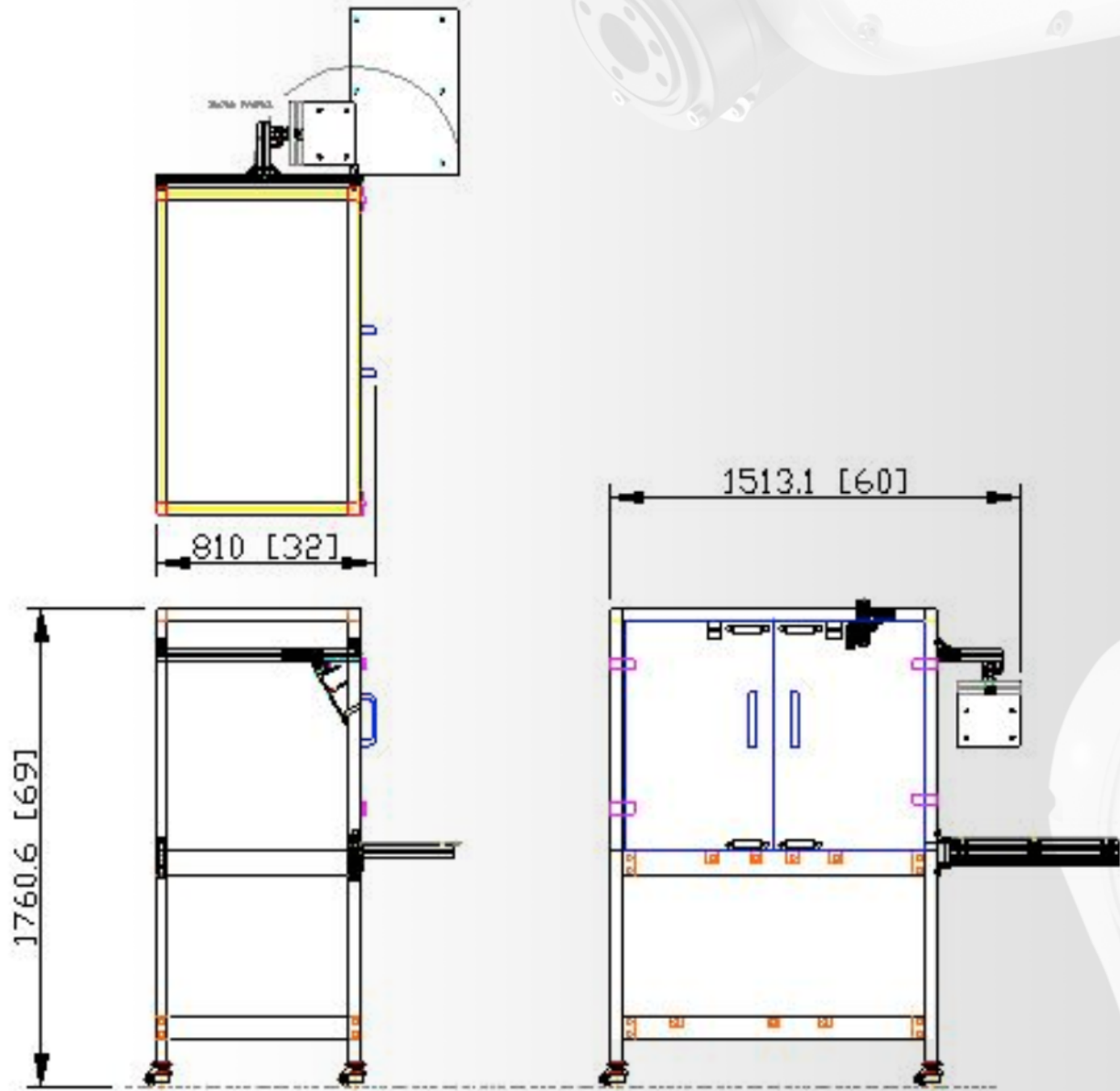
DENSO Automation Trainer

DENSO's Wincaps III offline programming software is designed to assist users in developing and troubleshooting programs on a PC. It offers 3-D simulation tools to quickly lay out automation workcells. By creating peripherals such as grippers, conveyors, pallets, etc., the user can determine obstacle clearances and verify reach. Robot actions can be simulated without actually operating the robot, allowing programs to be developed efficiently and safely from the initial stage of development. The robot's motions are dynamically recreated in 3-D solid rendering that can be viewed in near real-time using RS232C or Ethernet connections. The software also provides monitoring of I/O signals to simulate communications between the controller and external devices during operation, programming and simulation.



DENSO Automation Trainer

Q-CIM-101-6 Dimensions



DENSO Automation Trainer

Ordering Information.

Description Reconfigurable DENSO Automation Trainer with DENSO VP-6242G six-axis robot

Includes:

- DENSO VP-6242/RC8A robot (requires teach pendant)
 - Six-axis robot
 - 2.5-kg payload
 - RC8A robot controller
 - TP-RC8-1 color-display teach pendant
- End-effector tool for robot
- Wincaps III robot programming software
- Support stand
 - Extruded-aluminum frame
 - Lockable industrial casters
 - 36-in conveyor
 - Sensor package
 - Gravity parts feeder
 - Door safety-interlock
- Controls package
 - Rockwell Automation CompactLogix™ PLC standard. (Optional PLCs upon request.)
 - Enclosure with disconnect switch
 - 110 V AC power input
 - PLC programming software
 - Cognex In-Sight® Micro series vision system
 - Course curriculum
- Installation and training
 - Includes two-day training.

Optional Items:

Customer-specified PLC
Additional advanced onsite training and integration available
UL and CE Certification
ISO Level 4 safety option
Maintenance contract



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