

CNC Robots



WITTMANN Named a "Best Buy" for Robots

Technology working for you.

Wittmann
world of innovation

The Innovative Robot Concept

Decades of application experience and innovative developments have made the WITTMANN robots what they are today – the best robots for the plastics industry! Well planned detailed solutions and state-of-the-art components allow highest reliability, shortest cycles and long intervals between maintenance.

SmartBus Technology

All sensors/actuators are directly wired to the intelligent control card under the robot hood. The connection to the control cabinet and the Teach Pendant is a simple Bus-cable.

- Total flexibility in the production of injection molded parts
- Single point programming through robot TeachBox
- Safe investment with ability to exchange peripheral system at any time.

Kick Stroke Beam

A large aluminum extrusion provides a stiff, vibration free foundation for the vertical arm. The reduced moveable mass allows high acceleration and deceleration for extremely short cycle times. The bearings for horizontal stroke and kick stroke are positioned in the main carriage next to each other to provide optimum stiffness and minimum vibration for high speed operation, allowing precise insertion and removal.

Powerful Servo Drive

Servo drives are used on all 3 main axes.

Z-axis (horizontal stroke)

All larger robots including the W821 model are driven in the Z-axis via rack and pinion with built in lubrication chamber for high speeds and long life operation. The rack and pinion drive guarantees precise positioning also with long strokes, avoiding the flexibility of long belts.

Rugged Steel Beam

Precision machined for perfect alignment of rails and rack.

C-axis (standard)

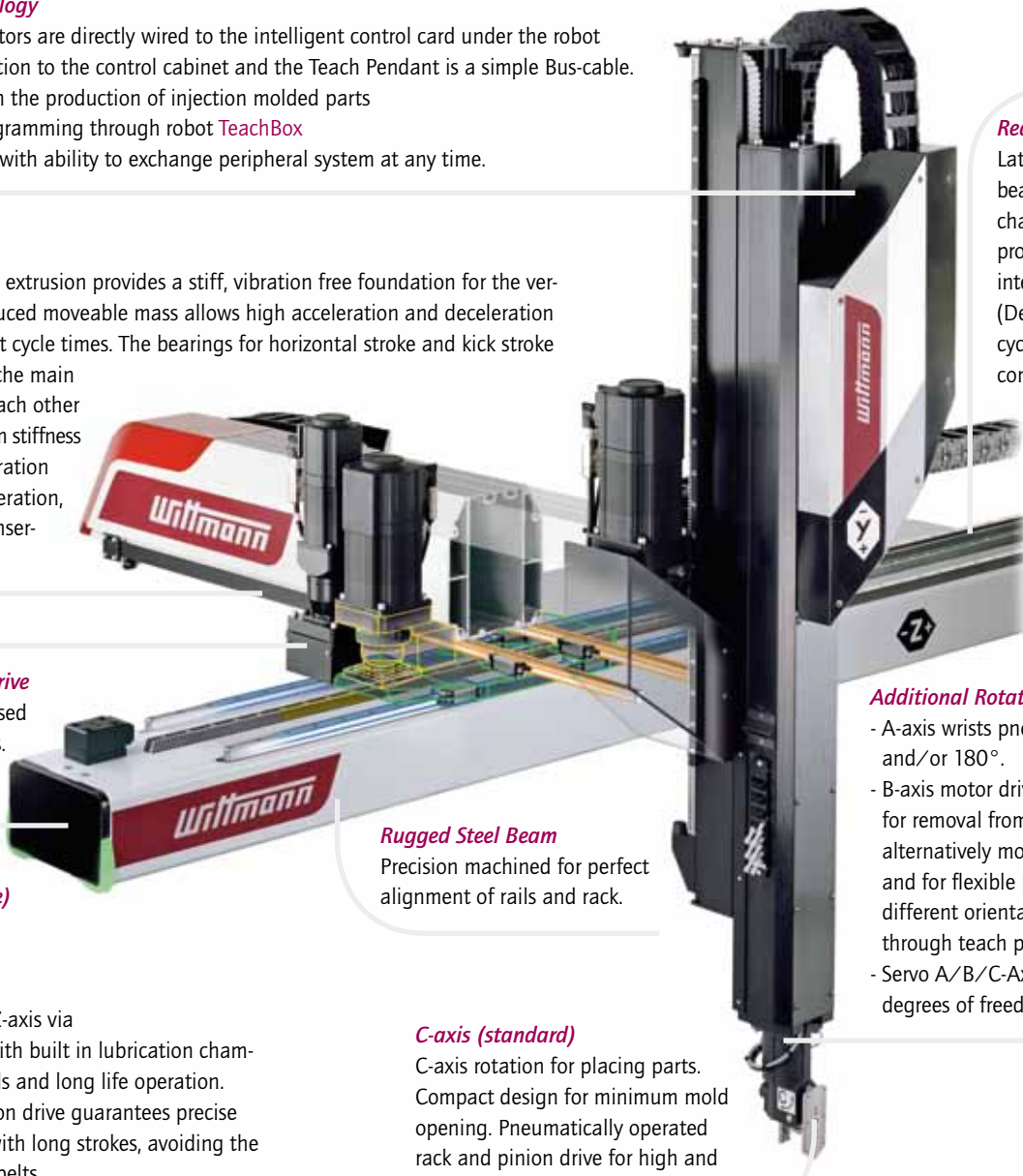
C-axis rotation for placing parts. Compact design for minimum mold opening. Pneumatically operated rack and pinion drive for high and constant torque during rotation.

Reduced Maintenance

Latest technology in ear bearings with lubrication chains as a standard, providing lubrication intervals up to one year! (Depending upon robot cycle and operating conditions.)

Additional Rotational Axes (optional)

- A-axis wrists pneumatic 0–90° and/or 180°.
- B-axis motor driven 0–270° rotation for removal from fixed or alternatively movable platen side and for flexible placing of parts in different orientation. Programming through teach pendant.
- Servo A/B/C-Axes for up to six degrees of freedom.



Integrated Control Cabinet

Use of state-of-the-art compact servo modules integrated on the robot itself eliminates the need for an external control cabinet. The integrated control cabinet is mounted behind the horizontal axis for valuable space savings in the molding shop.

- Space saving
- Short motor and encoder cables
- Less cables and connections to fail
- Highest reliability of robot operation

The integrated control cabinet allows electrical connection of external I/O-modules via a bus cable for the direct control of all attached peripheral equipment.

CNC8 Robot Control and TeachBox R8

The control offers the user a comfortable graphical user interface via the Touch Screen TeachBox for direct selection of all functions. To avoid unintended operation, the TeachBox can be unplugged from the sub-pendant which contains the main operating functions of the robot. Teach programs can either be saved via the integrated USB-port – on the memory stick provided – or on an integrated flash card memory.

Advantages

- Shortest training time for personnel.
- Free programming of every robot operation.
- Infinite diagnostic possibilities of the robot functions.
- Integrated observation of maintenance intervals.
- Different programming levels for the respective user profile.

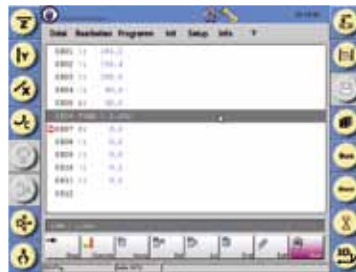


Total Flexibility

The control system offers 2 levels of operator interface as standard. **QuickEdit** for the modification of a few select commands and, **Text Editor** for ultimate programming freedom. This allows any arbitrary robot sequence to be programmed via simple, intuitive menu navigation. Neither editor needs command codes, the designated functions are executed directly at the robot and are transferred via one keystroke into the program. The naming of the peripheral inputs and outputs, cylinders, grippers, and vacuum cycles facilitates the readability and allows for a clearly arranged program structure. Pick & Place and other simple programs can be defined using the new **QuickNew** function. **QuickNew** is an animated programming tool that supports the user in setting up a **QuickEdit** program.



QuickEdit –
Filtered steps for minimum adjustment



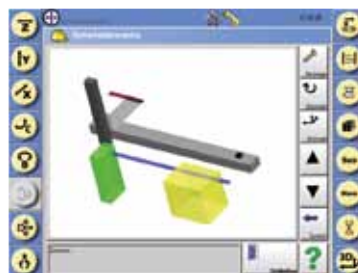
Text Editor –
Ultimate flexibility in programming



QuickNew –
Defining simple programs

Additional Features of the CNC8 Control

- Ethernet interface for the connection to a company wide intranet or internet.
- **EcoMode**: automatic optimization of axes velocities outside of the mold for smooth operation of the robot.
- **SmartRemoval**: shortest part removal time through acceleration of the vertical arm during mold open motion.
- Freely programmable safety areas: the user can define the areas of robot motion to avoid collisions with components of the IMM during manual mode.
- **iVac**: allows programming of limit values for the vacuum in order to provide part recognition in the end-of-arm-tooling.



Safety Area



iVac

W702 Sprue Picker

For the removal of sprues and parts from the injection molding machine. The solid construction allows fast movement with low vibration for precise removal.

■ X-axis (kick-stroke)

- Heavy-duty linear rails and recirculating ball bearings.
- Swivel base to rotate the arm behind the fixed platen for mold changes and locating pin to precisely reposition arm for part removal.

■ Y-axis (vertical stroke) 0–550mm (21.7") or 700mm (27.6")

- Adjustable stroke.
- Pneumatic shock absorbers.
- Locking cylinder to prevent the arm from drifting down into the mold in the event of air pressure loss.
- The Y-axis is also equipped with a heavy-duty switch as an additional interlock before the mold can close.
- Energy chain for less wear of tubing.

■ Z-axis (pivot)

- Freely adjustable from 45°–95°.
- Simple changeover from rear side to operator side placement.

■ B-axis (90° tooling rotation)

- Rotation is made automatically when pivoting the Z-axis out of the press.

■ Mechanical Sprue Gripper

with part monitoring.

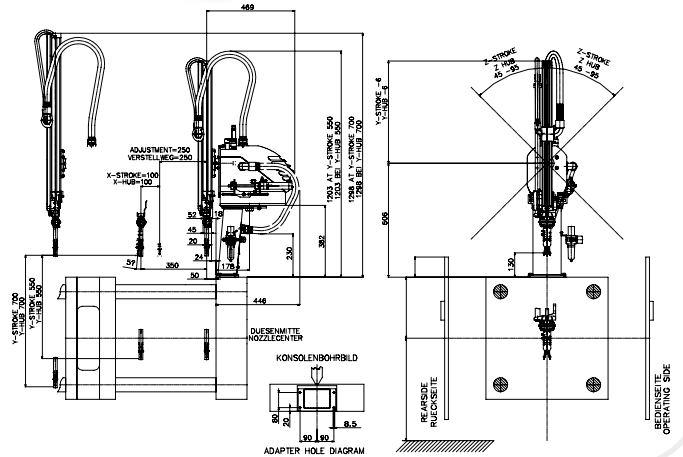
■ optional

- Venturi vacuum with part monitoring.
- Parts gripper with 4 suction cups.

W702



Gripper can be inclined for optimal sprue removal



SA7 Control

- For W702 sprue picker.
- Easy to use interface with graphical LCD display. Arrangement of buttons and symbols is similar to the CNC TeachBox for easier use by the operators.
- Simple sequence start.
- Simple Teach-In programming of the entire program sequence, including all movements, strokes, time settings and molding machine interface.
- 4 standard programs for easy setup.
- Up to 50 additional individual programs can be taught and stored.
- Standard molding machine interface (SPI & E12).
- Full diagnostics with text error messages.
- Different languages are included and can be selected: English, German, French, Spanish, Chinese, etc.



SA7 teach pendant with graphical LCD display



Easy access for service

The Innovative Series of Small Robots

The robot models as well as the **W808**, **W818** and **W818T** are perfectly suited for smaller molding machines up to 200 tons clamping force.

This line of robots has a common fixed kick stroke design. The rugged, specially reinforced aluminum profile is attached directly to the main carriage so that nothing is sticking out towards the injection unit. Even on small molding machines there is no possibility of collision with the hopper.

The rugged lightweight vertical arm is guided by high capacity linear bearings to allow fast movement with minimum vibration, for precise insert and part removal applications.

W808 3-Axis High-Speed Series

The smallest model in the 3-axis servo robot line designed for mounting on molding machines up to 120 tons clamping force.

- Motorized servo drives on all 3 main axes.
- Compact construction of the vertical axis and the highly integrated wrist rotation allow handling of parts with the minimum amount of mold open space.
- High performance servo drives and high grade linear rails on all axes permit high velocities and the shortest part removal times.
- Many additional features of the entire robot series are available as options including: vacuum and gripper circuits and different I/O modules for the control of complex peripheral equipment.

3-Axis High-Speed Series	
Robot	W808
Horizontal stroke Z-axis max. mm	2,000
Vertical stroke Y-axis max. mm	1,000 Single vertical axis
Kick stroke X-axis max. mm	440
Kick stroke reach max. mm	600
Control Cabinet	integrated
Handling load parts-gripper max. kg	3



W808

W818 Universal Series

The optimum robot providing flexible automation for your current and future requirements on smaller molding machines.

- High performance robots featuring servo motor drives for all three main axes.
- Optional rotational axes allow additional flexibility.
- Extremely smooth operation with lowest noise.
- Minimum part removal times are essential for the highest productivity of the automation cell e.g. production of thin wall components. The vertical arms of the W818 and W818T model robots are stiff but lightweight ribreinforced aluminum profiles, driven via belt by a servo motor, thus reducing the moving mass.



W818

W818T with Telescopic Vertical Axis

Incorporating the same basic design as the W818 with 3 servo driven main axes.

- Vertical axis with telescopic stroke for low overall height.
- Perfect for smaller molding machines in production halls with low ceiling heights.
- Extremely quiet operation for lowest noise.
- Very compact telescopic arm design for small mold opening height and fast removal times.



W818T

W818TS

The W818 and W818T model robots are available with a double-arm option having an additional servo driven vertical arm and gripper finger for the removal of sprues from 3-plate molds.



W818TS

Small Series				
Robot	W818	W818S	W818T	W818TS
Horizontal stroke	2,500	2,500	2,500	2,500
Z-axis max. mm				
Vertical stroke	1,200	1,200	1,000	1,000
Y-axis max. mm	Single vertical axis	Single vertical axis	Telescopic axis	Telescopic axis
Kick stroke	620	420	590	390
X-axis max. mm				
Kick stroke reach max. mm	800	800	790	790
Control Cabinet	integrated	integrated	integrated	integrated
Handling load parts-gripper max. kg	6	6	6	6

The Advanced Robot Series

All larger robots – starting from the W821 models – are designed with a moveable kick-stroke beam which is guided directly in the main carriage. The reduced moving mass allows high acceleration and deceleration for extremely short cycle times.

W821 – W831 The Compact Series

- **W821**
 The vertical arm consists of a rigid aluminum extrusion and guided by heavy-duty linear bearings and driven by a servomotor via belt to allow high speeds and short removal times.
- **W823**
 Telescopic Vertical Axis: The gripper is mounted in front of the telescopic arm allowing for a very short length, for minimum overall height and fast movements.
- **W828**
- **W831**
 The W831 use the same vertical arm design as is used for the W821 but with horizontal strokes up to 800 mm. Due to the high operating speeds of the vertical arm and payloads up to 12 kg, the W831 is one of our bestsellers for machines up to 500 tons.

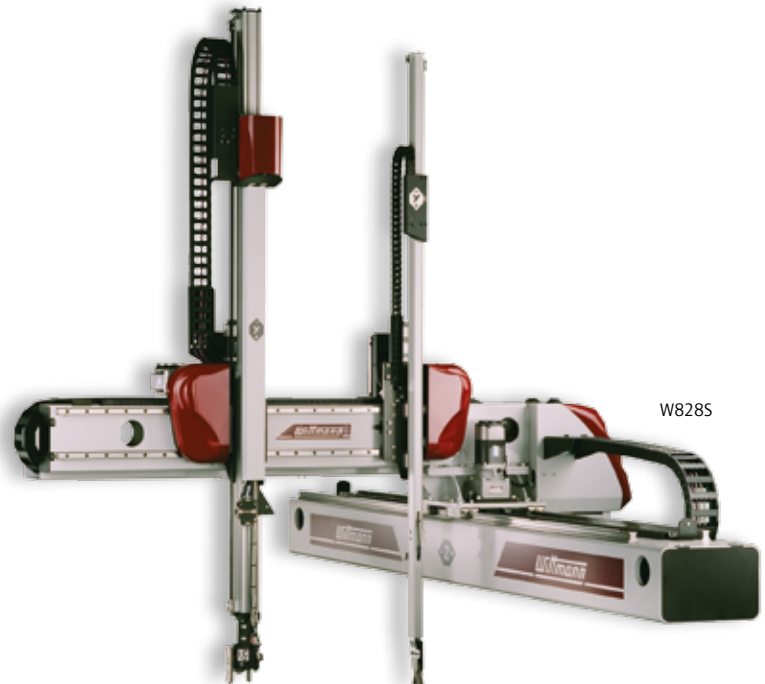


W823

W821



W831



W828S

Compact/Middle Series					
Robot	W821	W823	W828	W828S	W831
Horizontal stroke Z-axis max. mm	4,000	4,000	3,000	3,000	5,000
Vertical stroke Y-axis max. mm	1,400 Single vertical axis	1,400 Telescopic axis	1,400 Single vertical axis	1,400 Single vertical axis	1,400 Single vertical axis
Kick stroke X-axis max. mm	550	550	1,104	930	800
Kick stroke reach max. mm	775	820	1,300	1,300	1,025
Handling load parts- gripper max. kg	12	12	12	12	12

W822 – W832 *The Middle Series*

W822

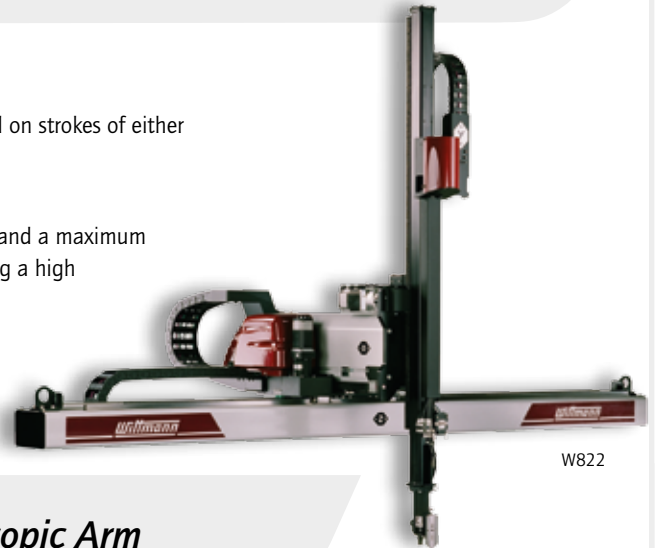
Rack and pinion drive for the vertical axis. The W822 can handle 15 kg of payload on strokes of either 1,000 mm or 1,200 mm and 12 kg when fitted with the 1,400 mm axis option.

W832

The vertical arm is a rigid aluminum extrusion with two high load linear bearings and a maximum length of 1,600 mm (63"). Designed for payloads up to 25 kg (44 lbs) and offering a high torque C-axis rotation for placing, the W832 is a popular robot for insert jobs.

W842

For greater payload and versatility around mid-sized molding machines of up to 800 tons of clamping force and higher.



W822

W833 – W843 *The Middle Series with Telescopic Arm*

All larger robots beginning with the W833 models are equipped as standard with our patented telescopic vertical arm. The main vertical arm is driven via rack and pinion. The front arm is driven at double the speed via a belt.

- Minimum overall height of the robot.
- Double speed of the end-of-arm-tooling and short in/out times.
- Long vertical strokes for palletizing.

W833

Gripper and part weight up to 15 kg (33 lbs) with a maximum vertical stroke of 1,800 mm (71"). Therefore best suited for flexible automation on injection molding machines up to approximately 750 tons.

W843

The larger more substantial main beam and double walled kick stroke extrusion allow handling payloads up to 35 kg (77 lbs) and vertical strokes up to 2,600 mm (102") for palletizing on pallets located on the shop floor.



W833

W853 – W873 *The Large Series*

Intended for large molding machines and payloads of 50 kg (110 lbs) to 125 kg (275 lbs). The kick-stroke beam as well as the vertical telescopic arm, are constructed of thin walled steel tubes to allow fast movement with minimum vibration.

Options:

- Servo driven rotational axes for secondary requirements.
- A variety of additional gripper and vacuum circuits for complex automation.

ADDITIONAL INFORMATION ABOUT OUR COMPREHENSIVE OPTIONAL FEATURES AVAILABLE ON REQUEST.



W853

Middle/Large Series

Robot	W822	W832	W833	W842	W843	W853	W873
Horizontal stroke Z-axis max. mm	4,000	5,000	5,000	6,000	6,000	6,000	10,000
Vertical stroke Y-axis max. mm	1,400 Single vertical axis	1,600 Single vertical axis	1,800 Telescopic axis	1,600 Single vertical axis	2,600 Telescopic axis	3,000 Telescopic axis	3,000/3,600 Telescopic axis
Kick stroke X-axis max. mm	550	900	900	1,200	1,200	1,500/2,000	2,000
Kick stroke reach max. mm	790	1,190	1,290	1,490	1,625	2,040	2,800
Handling load parts-gripper max. kg	15	25	15	25	35	75	125/60

Robots for Fastest Removal

The ultra high speed robot series has been developed to achieve the fastest part removal times and allows mold open times of less than 1 second. In order to constantly achieve these short removal times over the long term, the vertical axis is activated directly over a planetary gear box engaging with a generously dimensioned tooth belt. This guarantees direct transfer of forces as well as minimizing the moving masses.

For mechanical absorption of the high acceleration and deceleration forces of up to 65m/s^2 , the vertical axis is designed with an extremely torsion stable kick stroke which is internally reinforced with ribs. The vertical axis consists of an aluminum profile which by means of finite element analysis, is designed for the lightest weight and highest stiffness.

— **Advantages:**

- Highest productivity of the injection molding machine with the shortest cycle.
- Minimizes all moving masses for the highest acceleration and deceleration.

Fastest Removal			
Robot	W821 UHS	W832 UHS	W833 UHS
Horizontal stroke Z-axis max. mm	4,000	5,000	5,000
Vertical stroke Y-axis max. mm	1,200 Single vertical axis	1,600 Single vertical axis	1,400 Telescopic axis
Kick stroke X-axis max. mm	500	900	900
Kick stroke reach max. mm	790	1,190	1,290
Handling load parts-gripper max. kg	3	7	5



Rotational Servo Axes A/B/C

For applications with additional degrees of freedom, WITTMANN supplies optional servo rotational axes around all 3 principle axes. Programming with increments of 0.01° ensures extremely fine adjustment.

— **Servo A-axis**

Allows the wrist flip to independently position the end-of-arm tooling and molded parts, i.e. in the mold area as well as during placement.

— **Servo B-axis**

Allows rotation of the end-of-arm tooling in the mold area between the fixed and flexible adapter plate and the arbitrary orientation of parts with a flip-down gripper during placement.

— **Servo C-axis**

Allows removal of molded parts from the moving as well as the fixed mold halves and the arbitrary presentation to downstream equipment.

— **Advantages:**

- Compact mechanical design minimizes mold open.
- Highly dynamic servo motors and precise planetary gearboxes enable extremely fast movements.



Robots for Fastest Horizontal Removal and Stack Molds

WITTMANN offers a range of horizontal robots for the removal of thin wall parts with cycle times of less than 6 seconds.

W8XH

The horizontal side entry axis is driven by a SCARA type rotational movement. The gripper platen is synchronized for extremely fast, servo driven linear in/out movement of the gripper. This system provides very stable high speed operation with low vibration and requires minimum floor space next to the molding machine. The vertical axis and kick stroke are also servo-driven.

W837

The larger W837 model has been developed for fastest horizontal axis motion on molding machines up to 700 tons clamping force. This side entry robot can handle a payload of up to 50 kg for each horizontal axis.

(Robots with CNC8 control are named W8 robots.)



W8XH



W837

Horizontal Removal			
Robot	W8XH-900	W8XH-1200	W837
Horizontal stroke Z-axis max. mm	900	1,200	3,000
Vertical stroke Y-axis max. mm	300	600	—
Kick stroke X-axis max. mm	300	500	—
Kick stroke reach max. mm	550	750	—
Handling load parts-gripper max. kg	1.5	1.5	50

Top Entry Robots for Stack Molds

Robots with two servo driven vertical arms for the automation of stack molds on medium molding machines up to approximately 400 tons clamping force. All robot models feature a fixed kick stroke beam. Both vertical arms are telescopic arms (like a W823 robot) with a payload of 3 to 20 kg.

Stack Mold				
Robot	W818D	W823D	W844D	W846D
Horizontal stroke Z-axis max. mm	2,500	5,000	6,000	6,000
Vertical stroke Y-axis max. mm	1,000 Single vertical axis	1,200 Single vertical axis	1,600 Single vertical axis	2,000 Telescopic axis
Kick stroke X-axis max. mm	400 – 2 x 200	700 – 2 x 350	600 – 2 x 300	600 – 2 x 300
Kick stroke reach max. mm	800	1,200	1,200	1,200
Control Cabinet	integrated	integrated	integrated	integrated
Handling load parts-gripper max. kg	3	10	20	20

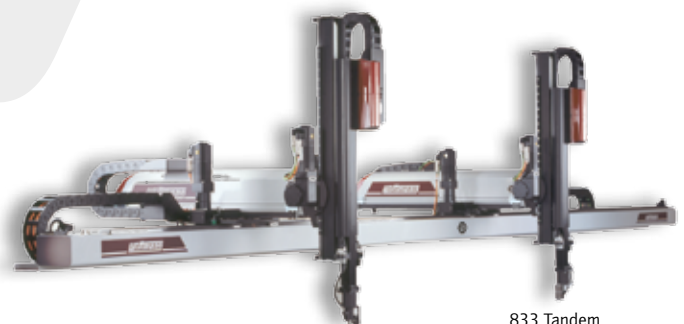


W823D

Special Applications

WITTMANN supplies the optimum robot for your specific application.

- Two robots can be mounted on one horizontal axis.
- Extra long horizontal axes.
- External control cabinet to connect amounts of peripheral inputs and outputs.



833 Tandem

RFID – Tooling Recognition

Technology based on “Radio Frequency Identification” (RFID) is used on WITTMANN robots to identify end-of-arm tooling and select the correct teach program for fail-proof operation. Another innovation by WITTMANN!

An RFID reader is mounted inside the plate of the wrist axis and detects without any contact a unique 64-bit identification number in a transponder fixed to the respective end-of-arm tooling. Based on the unique ID the control system automatically selects the right teach program.

Advantages:

- Eliminates errors by operators.
- Avoids damage to molds and downstream equipment.



Control of Downstream Equipment

The universal WITTMANN TeachBox R8.2 robot control systems provide multiple enhancements and interfaces for the integration of peripheral and downstream equipment. This increases the performance of the overall system and allows central access to all functions via the robot TeachBox.

Examples of interfaces

- Up to 8 independent signals for programmable conveyor indexing.
- Control of up to 32 vacuum and simultaneously 32 gripper circuits for the realisation of complicated end-of-arm tooling functions.
- Extensions of the control with decentralized I-/O modules on the robot and in the control cabinet.
- Connection of external decentralized I-/O modules via CAN-Bus.
- Mirroring of the TeachBox across Intranet/Internet via VNC.
- Email function.
- R8 CLI – Interface for connection with ERP system





Technology working for you.

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