

# ROBOTS AND AUTOMATION SYSTEMS

Reliable and Fast Part Handling

world of innovation



# WITTMANN ROBOTS

## Leading Worldwide with the Best Technology

Decades of application experience, innovative developments and more than 35,000 produced units 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.

### BUS technology

All sensors/actuators at the robot are directly wired to the intelligent control card under the robot hood.

#### Advantages:

- » Central operation via TeachBox.
- » Simple extension; adaptability.

### Demolding stroke (X-axis)

A large aluminum extrusion provides a stiff, vibration free foundation. The vertical arm is directly flanged on the cross tube. The linear bearings for horizontal stroke and demolding stroke are positioned in the main carriage next to each other to allow for high speed operation.

#### Advantages:

- » Reduction of vibrations.
- » Most precise insertion/removal.

### Powerful Servo Drive

Servo drives are used on all main axes.

### Horizontal stroke (Z-axis)

95% of all robots are working using a rack and pinion drive. This is avoiding expansions of the drive belt when acceleration and deceleration are taking place. Optimal lubrication and life span of the drive system due to the pinion's placement within a grease cage.

#### Advantage:

Expansion of the drive belt is avoided, especially in case of long strokes.

### Vertical stroke (Y-axis)

Massive aluminum or steel execution depending on the dimensions of the units. Always driven via rack and pinion drive or drive belt, telescopic axes are driven by a combination of both.

#### Advantages:

- » Torsional stiffness through high-strength construction.
- » B-axes can be directly integrated into the profile.
- » Possibility of placing the compressed air supply and the control lines internally.

### Rail guides

Low-maintenance execution for lubrication intervals of about 1 year.

### Additional Rotational Axes (optional)

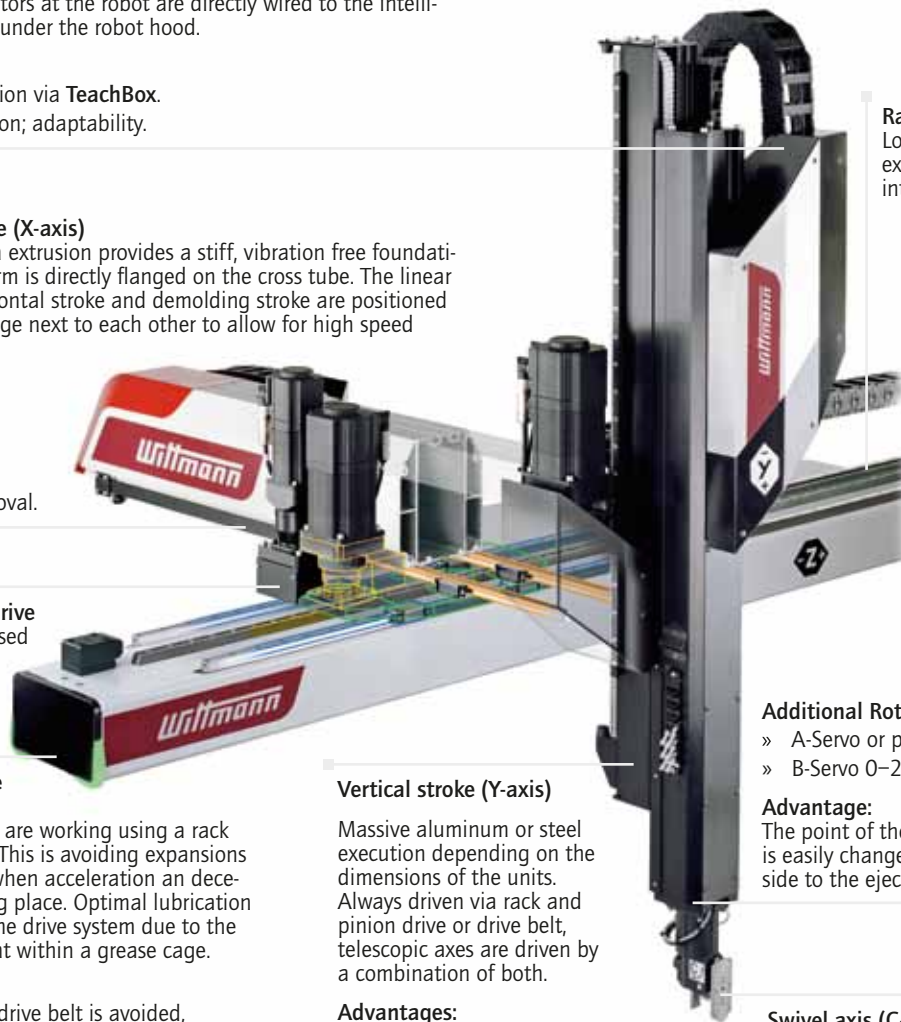
- » A-Servo or pneumatic.
- » B-Servo 0–270°.

#### Advantage:

The point of the removal activity is easily changeable from the nozzle side to the ejection side.

### Swivel axis (C-axis)

For nearly all scales equipped with locking bolts. This avoids the deviation when a decrease in pressure occurs.



# THE INNOVATIVE ROBOT CONCEPT

We have a wide range of robots that will meet the best of any of your design needs.

## Kick-forward design

- » No moving parts behind platen.
- » Clearance for obstructions such as dryer hoppers, catwalks, building columns.



## Kick-back design

- » Heavier Payload.
- » Less overall height.
- » Allows for oversized end-of-arm tool.



## 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.

# W8 pro Robot Series

**wittmann**

The new **pro** series takes the WITTMANN **W8** robot series to a whole new level of performance. – Countless improvements guarantee the highest efficiencies.

- » Rugged design of the robot.
- » Modularity of the robot mechanics and of the drive and control system architecture.
- » The elaborate modular WITTMANN robot design allows for an optimal cost/performance ratio.

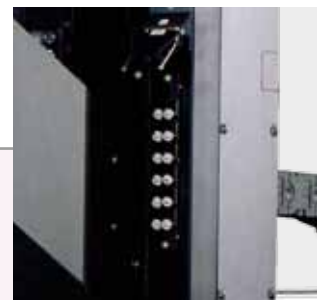
## Advantages:

- » Reinforced profiles for higher load rating and longer durability.
- » **ambiLED** indicator lamp for simple display of the robot's operating modes.
- » **EcoVacuum**: synchronized vacuum for optimizing the consumption of pressurized air.
- » Minimized number of cables in the cable chain through innovative decentralized arrangement of the electronic components.
- » Reduced noise emission through optimized cable chain.
- » Integrated energy storage for higher energy efficiency, creating typical savings of 20%.
- » Integrated connection technology for vacuum/gripper circuits.

## FEATURES

**ambiLED** indication lamp shows three different operating modes.

- 1. Green signal: robot works in automatic mode.
  - 2. Blue signal: manual intervention is necessary.
  - 3. Red signal: safety door open.
- » Integrated connection technology for vacuum and gripper circuits.
  - » Optimized cable chain.
  - » Integrated control cabinet
  - » for minimizing the space requirements beside the injection molding machine.





# 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, **TextEditor** 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.



QuickNew



QuickEdit



iVac

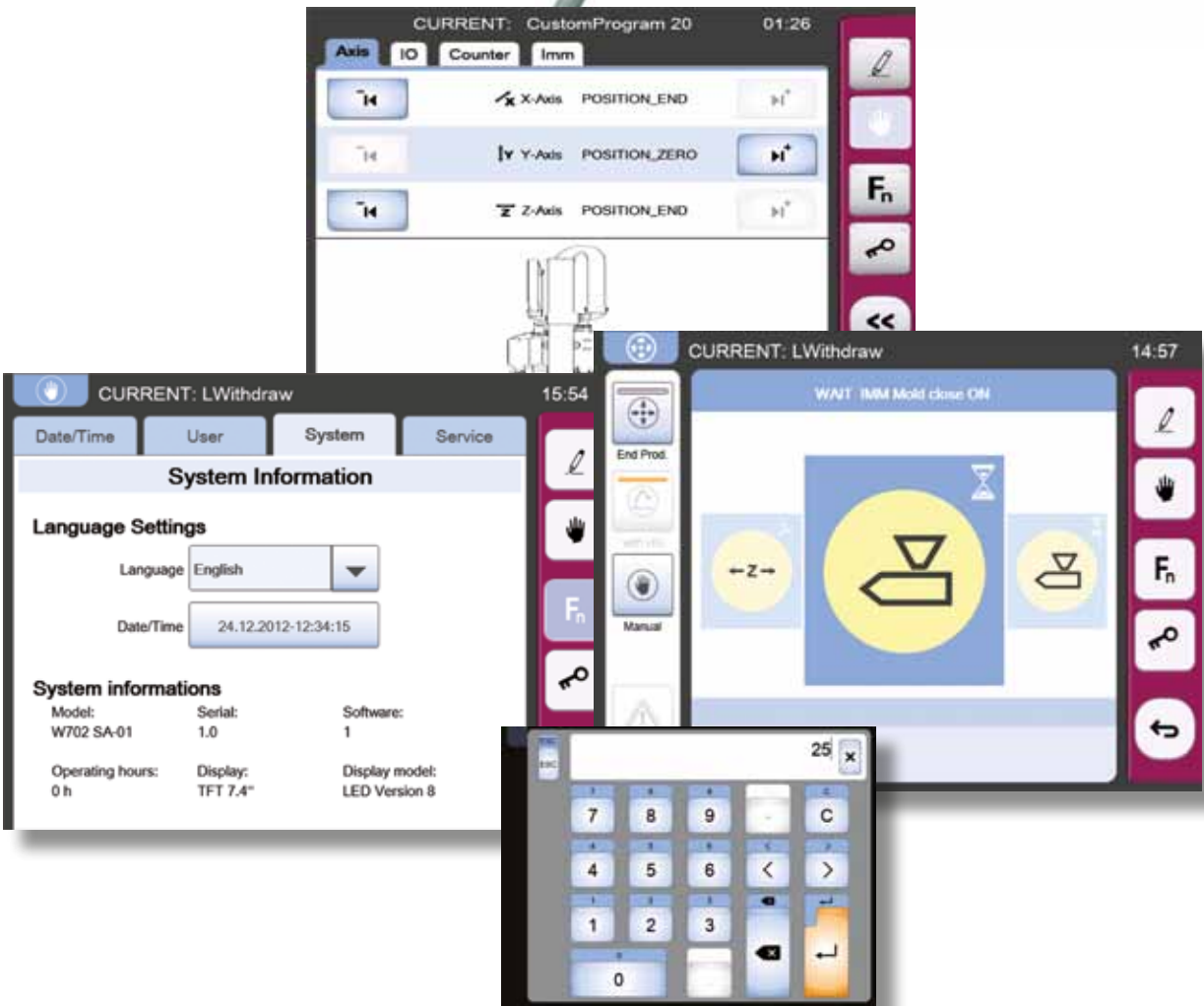
Texteditor

- » Ethernet interface for the connection to a companywide 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 openmotion.
- » 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.

# Net8 Sprue Picker Control



- » For WP80 and WS80 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.
- » The same languages as with the CNC8 control are available.



# SMALL ROBOTS

## Clamping Forces from 20 to 300 tons

In this range, WITTMANN offers robots of both concepts, units with fixed and moving demolding axis, but in most cases devices with fixed axis.

- » **W818**  
The universal 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.



- » **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. As a variation of the **W821**, the **W831** model with an extended demolding stroke of up to 800 mm is available.



- » **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**  
Design is comparable to the **W818** unit. Longer demolding axis for tandem molds. Offers the possibility of a double arm allowing to remove the sprue separately (3-platen-mold). The long X-axis is designed to also execute preparation steps.





# MIDDLE SERIES

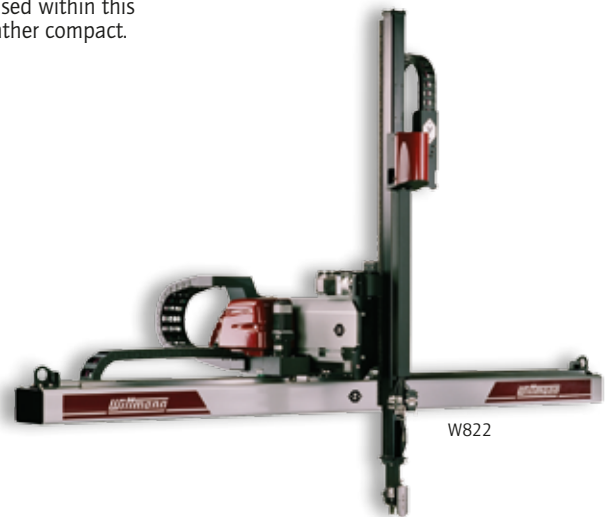
Clamping Forces from 300 to 1,200 tons

**wilmann**

Middle series robots are primarily units that are equipped with a moving demolding stroke. In the first line, this is due to the more complex grippers that are used within this range, and also to the need of keeping the overall height of the system rather compact.

» **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 pro**

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 35 kg (77 lbs) and offering a high torque C-axis rotation for placing. A popular robot for insert jobs.



» **W833 pro**

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.





# LARGE ROBOTS

## Clamping Forces from 1,200 to 4,000 tons

Large units are based nearly exclusively on the technology of the moving X-axis. In the first line, this is due to the massive grippers and additional rotating axes. As parts of automation cells, these units often are working together with more compact models to execute preparation or post-processing steps.

- » **W842 pro**  
For greater payload and versatility around molding machines of up to 800 tons of clamping force.
- » **W843 pro**  
The larger more substantial main beam and double walled kick stroke extrusion for 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.



- » **W853**  
For payloads up to 50 kg. The first unit coming with rack and pinion drive at the demolding axis. This leads to high positioning accuracy and to avoiding expansion of the drive belt at the same time.



- » **W873**  
For payloads of more than 100 kg. The construction elements of the complete robot system is made of steel. This allows for highest stiffness and life expectancy. This unit is especially suitable for the use with large injection molding machines.

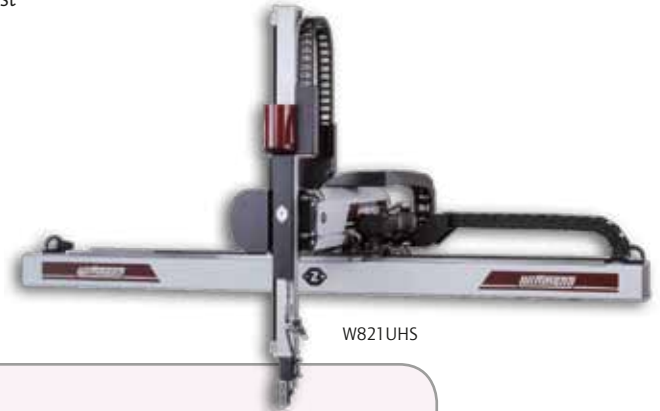


# FASTEST REMOVAL

**Wittmann**

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  $65\text{m/s}^2$ , 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.



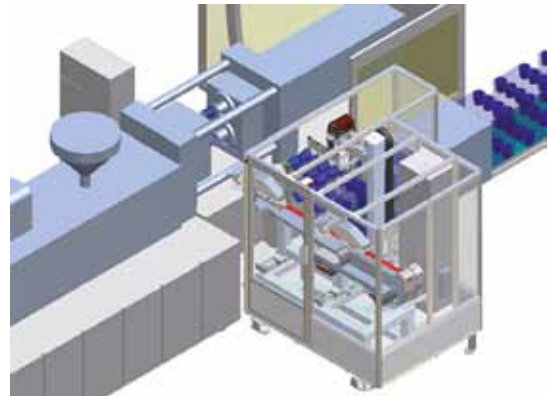
W821 UHS

## ADVANTAGES

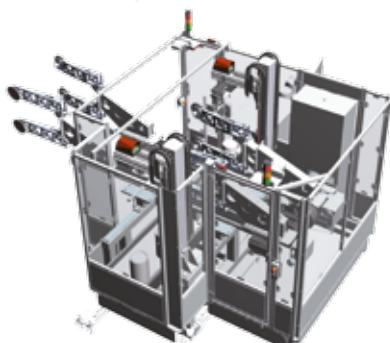
- » Highest productivity of the injection molding machine with the shortest cycle.
- » Minimizes all moving masses for the highest acceleration and deceleration.
- » The moving X-axis is further improving the dynamic of the units.

### » 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.



W823D



W837, execution with 2 Z-axes

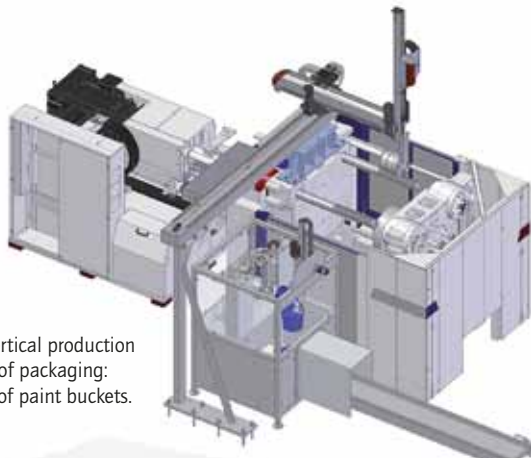
## ROBOTS FOR STACK MOLDS

On the one hand, for the automation of stack molds, robots with 2 vertical axes can be used; here, the construction is done over a fixed demolding axis (**W823D**). On the other hand – and for the realization of shortest cycle time – , removal systems can be used that are based on the **W837** unit. In this case, the basic system is executed with 2 horizontal axes that are doing the demolding of the parts.

# PACKAGING SOLUTIONS

## with IML Technology

In this field, the WITTMANN customers are focused on the planning and implementation of complete turnkey systems. Here, WITTMANN offers complete automation cells on the basis of horizontal and vertical parts removal units. These systems cover a wide range of use, from rather simple ones to highly complex systems that also include the handling of lids and camera control.



Example of a vertical production cell in the field of packaging: manufacturing of paint buckets.



**W837**  
Complete cell including camera control and stapling unit for food containers.



# SPRUE PICKERS

Clamping Forces from 25 to 300 tons

**wittmann**

**WP80** 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 molding 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.
- » **Mechanical Sprue Gripper**
  - with part monitoring.
- » **Options**
  - Venturi vacuum with part monitoring.
  - Parts gripper with 4 suction cups.



**WS80** servo picker for the space-saving removal and separation of sprues.

- » **Advantages:**
  - Simple change from one product to another.
  - High-dynamic capsuled for entry-times of less than 1 second.
  - Capable of being fully integrated into the injection molding machine.



# ADDITIONAL OPTIONS

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

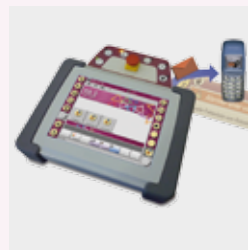


## CONTROL OF DOWNSTREAM EQUIPMENT

The universal WITTMANN TeachBox R8.3 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.





## Control CNC 8 + Teachbox R8

	W808	W818	W818T	W821	W822	W823	W828	W831
Payload	3	6	6	12	15	12	12	12
Fixed X-axis	●	●	●				●	
Movable X-axis				●	●	●		●
Single Y-axis	●	●		●	●		●	●
Telescopic Y-Axis			●			●		
Z-Stroke [mm]	1,250–2,000	1,250–2,500	1,250–2,500	1,250–4,000	1,250–4,000	1,250–4,000	1,500–3,000	2,000–5,000
X-Stroke [mm]	440	420–620	390–590	350–550	350–550	350–550	905–1,105	800
Y-Stroke [mm]	600–1,000	800–1,200	800–1,000	800–1,400	1,000–1,400	800–1,400	1,200–1,400	1,000–1,400

	W832 pro	W833 pro	W842 pro	W843 pro	W853	W873	W821 UHS	W832 UHS	W833 UHS
Handling load	25	15	25	35	50	125	3	7	5
Fixed X-axis									
Movable X-axis	●	●	●	●	●	●	●	●	●
Single Y-axis	●		●				●	●	
Telescopic Y-axis		●		●	●	●			●
Z-Stroke [mm]	2,000–5,000	2,000–5,000	2,500–6,000	2,500–6,000	3,000–6,000	5,000–8,000	1,500–2,500	2,000–4,000	2,000–4,000
X-Stroke [mm]	500–900	500–900	1,200	1,200	1,200–2,000	2000	500	500–900	500
Y-Stroke [mm]	1,200–1,600	1,200–1,800	1,400–1,600	1,600–2,600	2,400–3,000	2,800–3,600	800–1,200	1,200–1,600	1,200–1,400

The Wittmann logo is a stylized, italicized wordmark in a dark red color, set against a white background that is part of a red parallelogram shape.

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