

# Henrob Die Changer

Adding flexibility to your manufacturing by providing the ability to change dies automatically

Atlas Copco



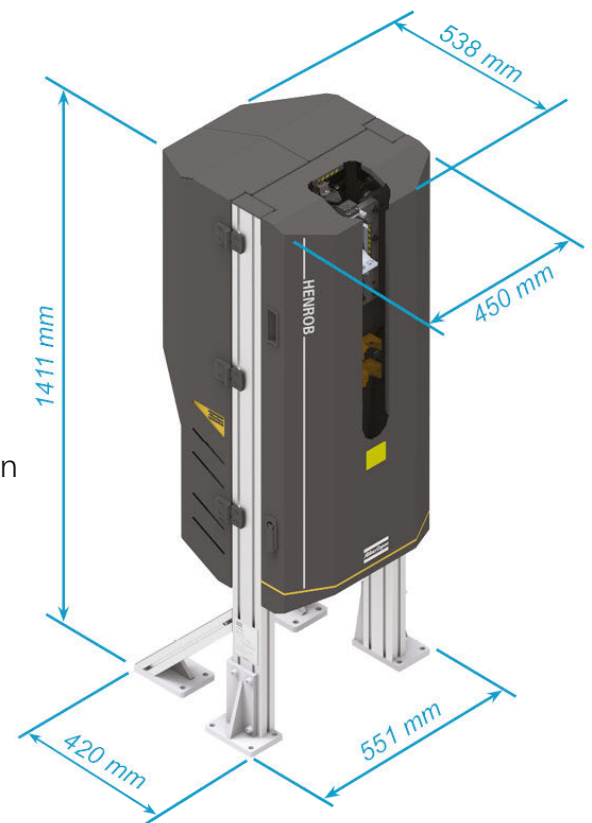
## Industrial Assembly Solutions

### *Install a variety of joints from a single setting system*

The Henrob Die Changer has been designed to provide additional flexibility to your Henrob self-pierce riveting (SPR) equipment. The ability to change dies automatically results in a higher variety of riveted joints produced by a single setting system.

Additionally, in conjunction with the digital die check camera, the die changer can replace broken dies or dies that have reached their designed life, thereby improving the overall performance of equipment and reducing the level of intervention required by OEM maintenance teams.

The die changer can be applied to most automated SPR production cells, typically those configured with more than one rivet type or otherwise in cells with the primary purpose of a maintenance tool for exchanging and replacing dies.



### Benefits at a glance



**Improved efficiency** – Fast automatic die changing and multiple joints in the same operation



**Reduced total cost of ownership** – More processes can be performed at one station without the need for multiple robots or systems



**Enhanced user experience** – Operators do not need to enter an automated cell and minimal manual preventative maintenance is required

## Henrob Die Changer

### Features & benefits

*The Henrob Die Changer offers the best-in-class changing time of less than 5 seconds*

- The die changer can be used to either replace worn / broken dies or allow die changing to a different type to improve flexibility in the rivet joining process
- The dies are locked into the die post so full manipulation of the equipment on the end of a robot is not a concern
- Options are available to use diameter 20mm dies which have extended life at higher forces
- The compact footprint of the die changer allows it to fit easily into your production cell
- Poka-yoke packaging of the dies will become available in 2019

#### Die head availability

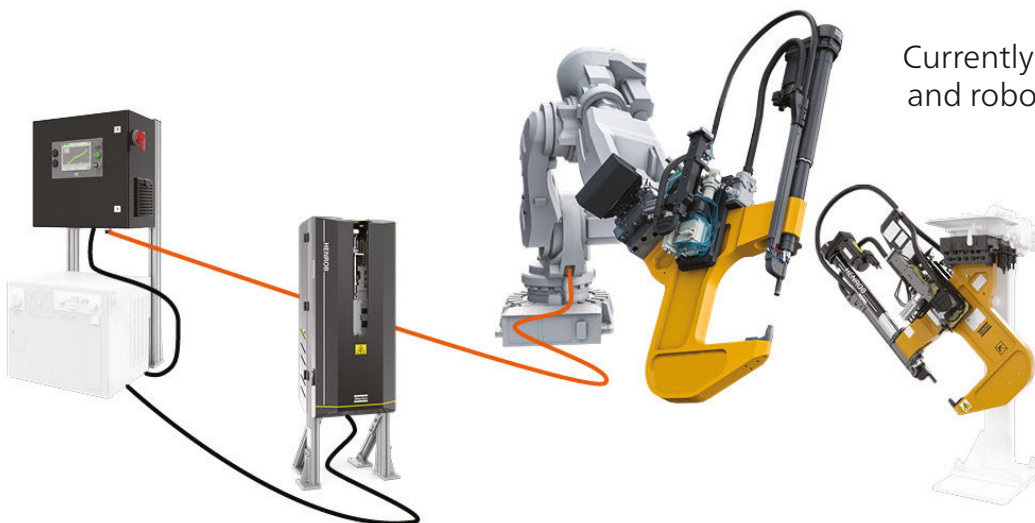
Ø20 Die head - 5mm rivets

Ø18 Die head - 5mm rivets

Ø18 - 5mm Poka-yoke packaging option available TBD

#### Target market

This product is intended to increase the flexibility of highly automated and complex production lines. It is also useful in prototype environments or in SPR systems configured with one die type to be replaced at scheduled preventative maintenance intervals.



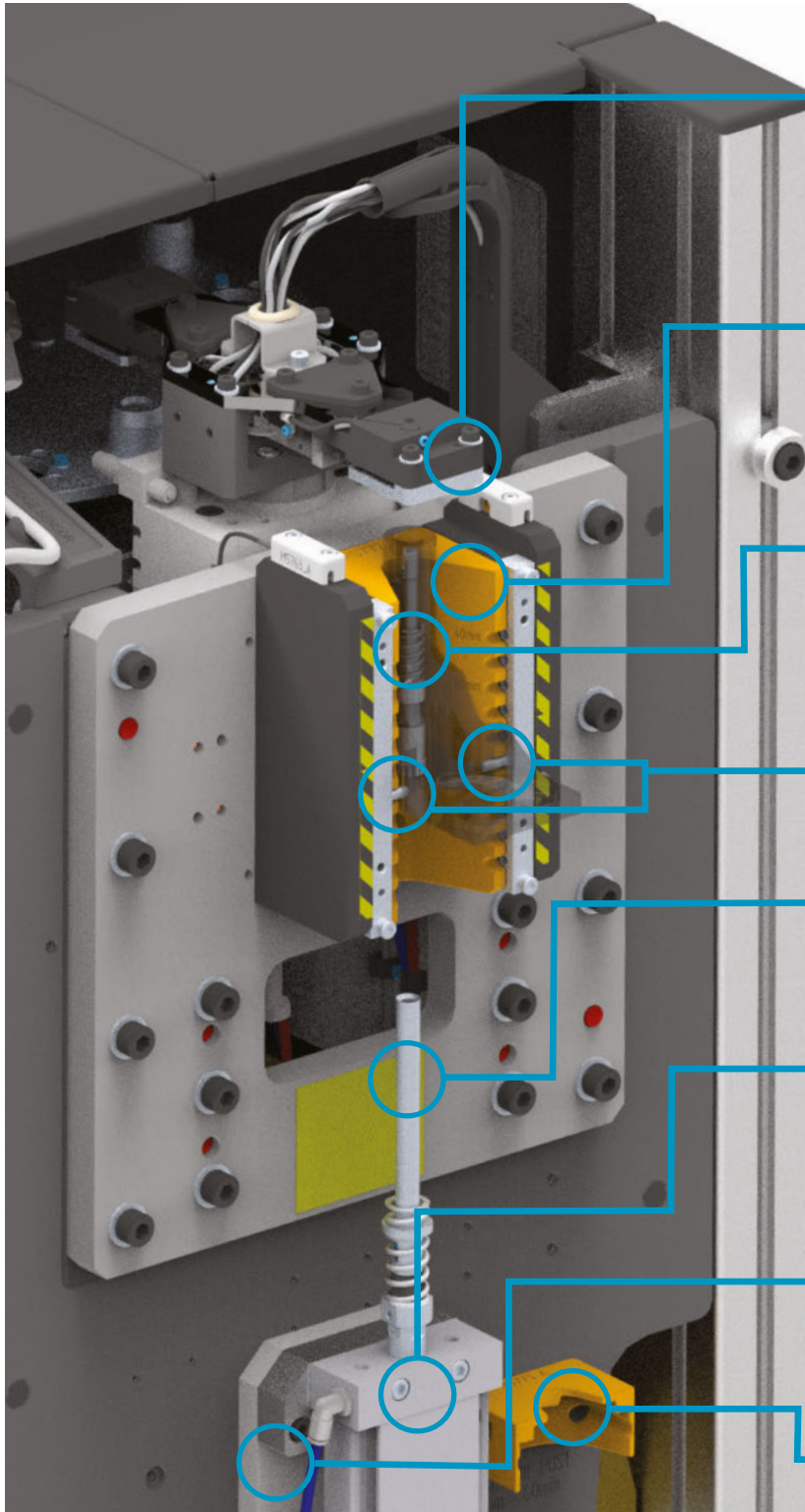
Currently only one SPR control panel and robot can be configured per die changer. In the future, the

Atlas Copco SPR development team will be adding a software feature that will allow multiple robots to exchange dies on one die changer stand.

*The Die Changer communicates directly with the robot via Ethernet – a robot command/signal bitmap is provided to control the Die Changer independently of the SPR setting system*

## Components

*These components can be adjusted to configure the die changer for different SPR system designs*



### **Gripper assembly**

*Device to grip and remove die*

Depending on the diameter of the head, these components need to be changed to suit the die type

### **Die post locator adapter**

The die post locator has to be selected for the correct die post according to the configuration table

### **Die post**

Example of a typical L-shaped die post in the location where it will enter the die changer when mounted to the tool

### **Adjustable hard stop pins**

Two die post pins that can be adjusted up and down depending on the L-shaped die post height being used

### **Die ejection assembly**

Mounted on the die ejection cylinder with a maximum stroke of 125mm

### **Die ejection cylinder**

Extends the die ejection assembly and raises the internal release pin

### **Height adjustment plate**

The die ejection cylinder is mounted to a plate that allows it to be repositioned according to the C-frame size and die post length

### **Additional die post locator adapters**

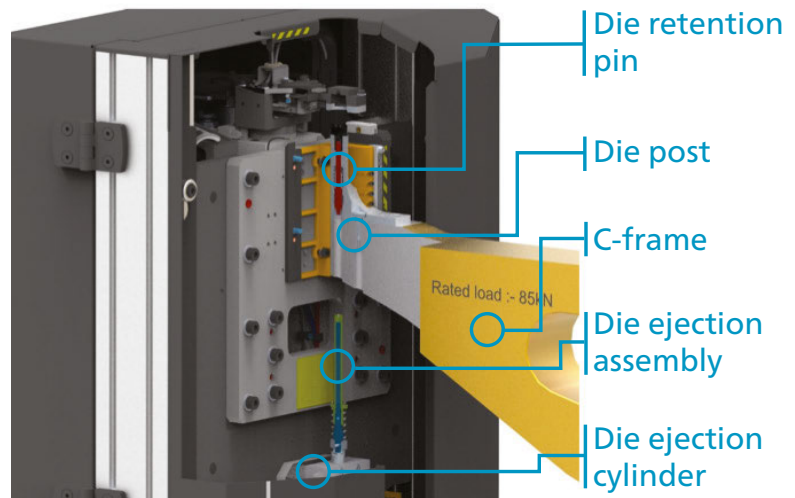
For the different types of posts listed in the configuration table (ex L-shaped and rocket-shaped)

## Henrob Die Changer

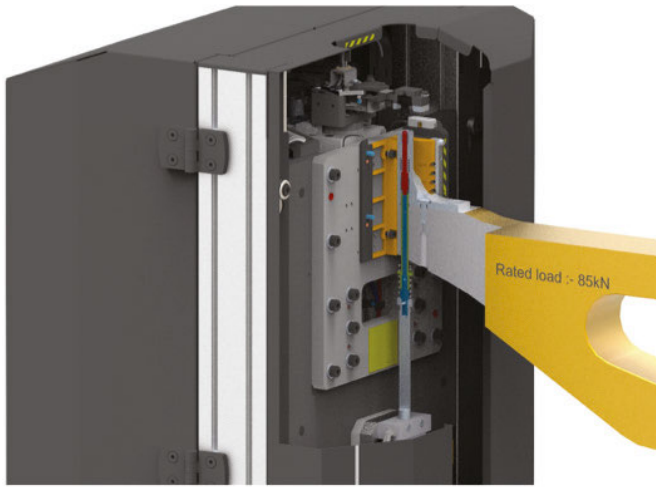
### Die changing action

#### Starting position

The die is locked into the die post and the die ejection assembly is mounted on the die ejection cylinder, engaging with the mechanism inside the die post to either release or lock the die in place.



The die ejection assembly (blue) positioned below the C-frame as it enters the docking area



Gripper mechanism lowers to remove die from post

#### Die contact

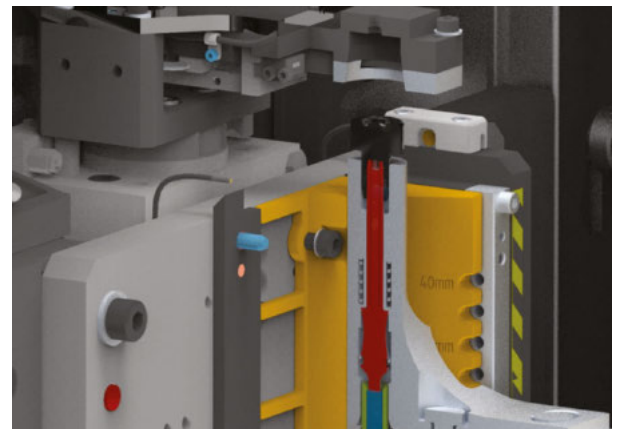
As the die ejection cylinder extends, the ejection assembly (blue) moves forward into the C-frame and die post.

The die ejection assembly makes contact with the die retention pin (red) and raises the die above the post to allow it to be captured by the gripper assembly.

#### Die exchange

Die retention pin (red) hits a hard stop allowing the internal pin of the die ejection assembly (blue) to continue its travel. The internal pin presses the plunger on the die retention pin actuating the ball-lock mechanism and allowing the die to be removed.

As the die ejection assembly lowers, the mechanism works in the reverse direction and locks the die in place. With the die locked in place, the SPR tool head has no restrictions on articulation and movement.



Die unlocked and ready to change

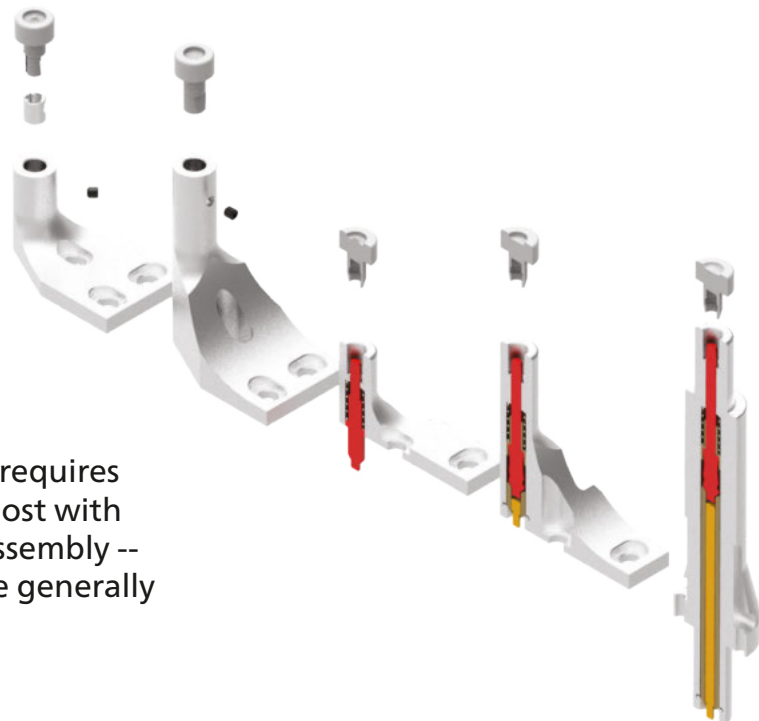
## Basic configurations

Config-uration	65kN C-frame	85kN C-frame	Ø 18mm Die	Ø 20mm Die	L-shaped die post Ø 18mm	Rocket-shaped die post Ø 18mm	L-shaped die post Ø 20mm	Rocket-shaped die post Ø 20mm
1	X		X		X			
2	X		X			X		
3		X	X		X			
4		X	X			X		
5		X		X			X	
6		X		X				X

The above configuration table shows some of the components that are included in the package supplied. Once the C-frame sizes are known, a second level of selection can be configured. Due to the vast array of SPR setting configurations there are a number of fitting arrangements that need to be made to suit each C-frame design.

Inquire or request that the die type you need is released, as the shank of the die is not the same as a conventional die shank and not all dies are currently available.

*Note: The die changer system can not work with a wear plate. There is a minimum die post height of 40mm.*



Utilizing the Die Changer requires replacing a standard die post with a quick-change die post assembly -- the external envelopes are generally unaffected.