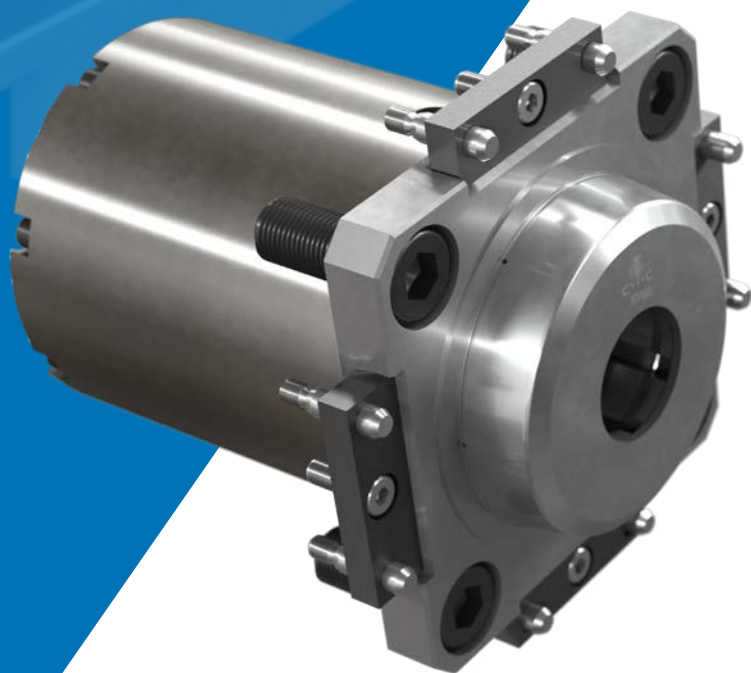


CYTAB



CLAMPING SYSTEMS
FOR THE CAR BODY CONSTRUCTION

COMPONENTS
PERFECTION.



MADE IN GERMANY



CyTab Clamping Systems

for universal joining and mounting processes

CYTEC Zylindertechnik GmbH has developed and produced a wide range of self locking clamping systems based at its business location in Jülich. Our engineering as well as our fabrication department possesses big know how and experience in this area.

CYTEC's clamping systems are characterised by high reliability and are used in many industrial applications very successfully.

Fields of application:

- **in the automotive industry** for framing units, gripper systems for welding and handling robots, gripper bars for press lines.
- **in universal mechanical engineering** for automatic exchange of spindles and machining heads on tool machines, zero point clamping systems, mould locking on forming dies, locking units on injection mould machines, tool clamping systems.

The CyTab clamping systems play a central role in the automotive industry in automatic welding and mounting lines. Well known vehicle manufacturers use these systems for years very successfully to support an operational safe, flexible and cost saving production. A continuous further development of these systems guarantees to meet the permanently growing demands.



100% failsafe

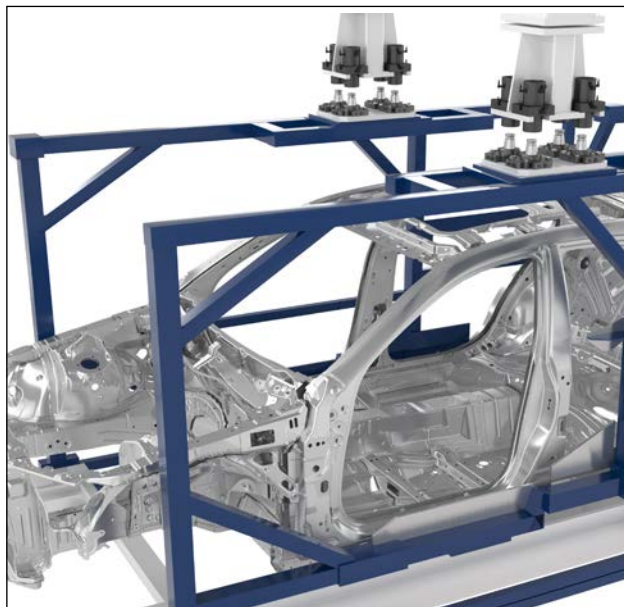
High clamping and holding forces

Self locking in clamped position

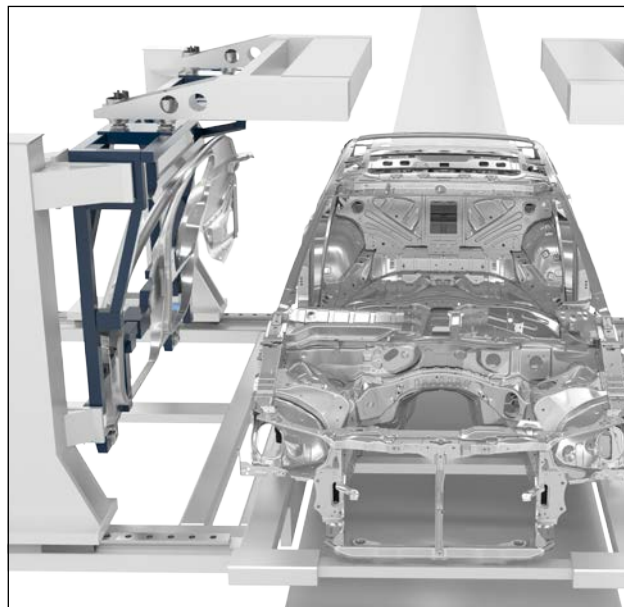
High repetition accuracy

Wide application range in the automotive industry

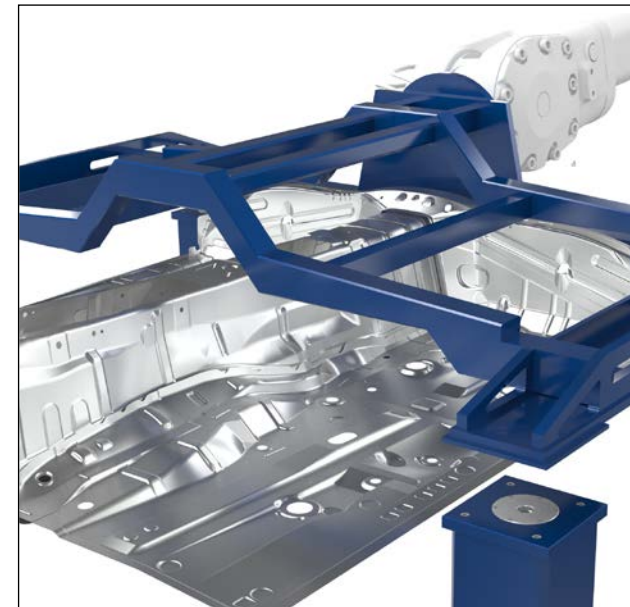
TRANSFER



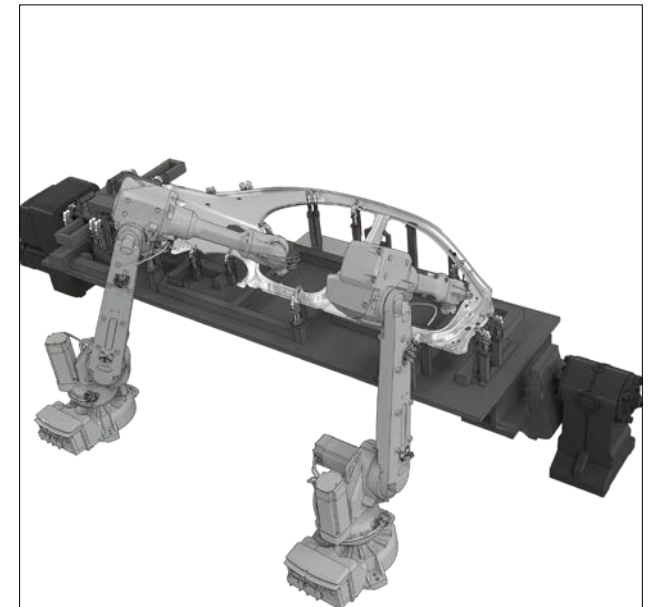
FRAMING

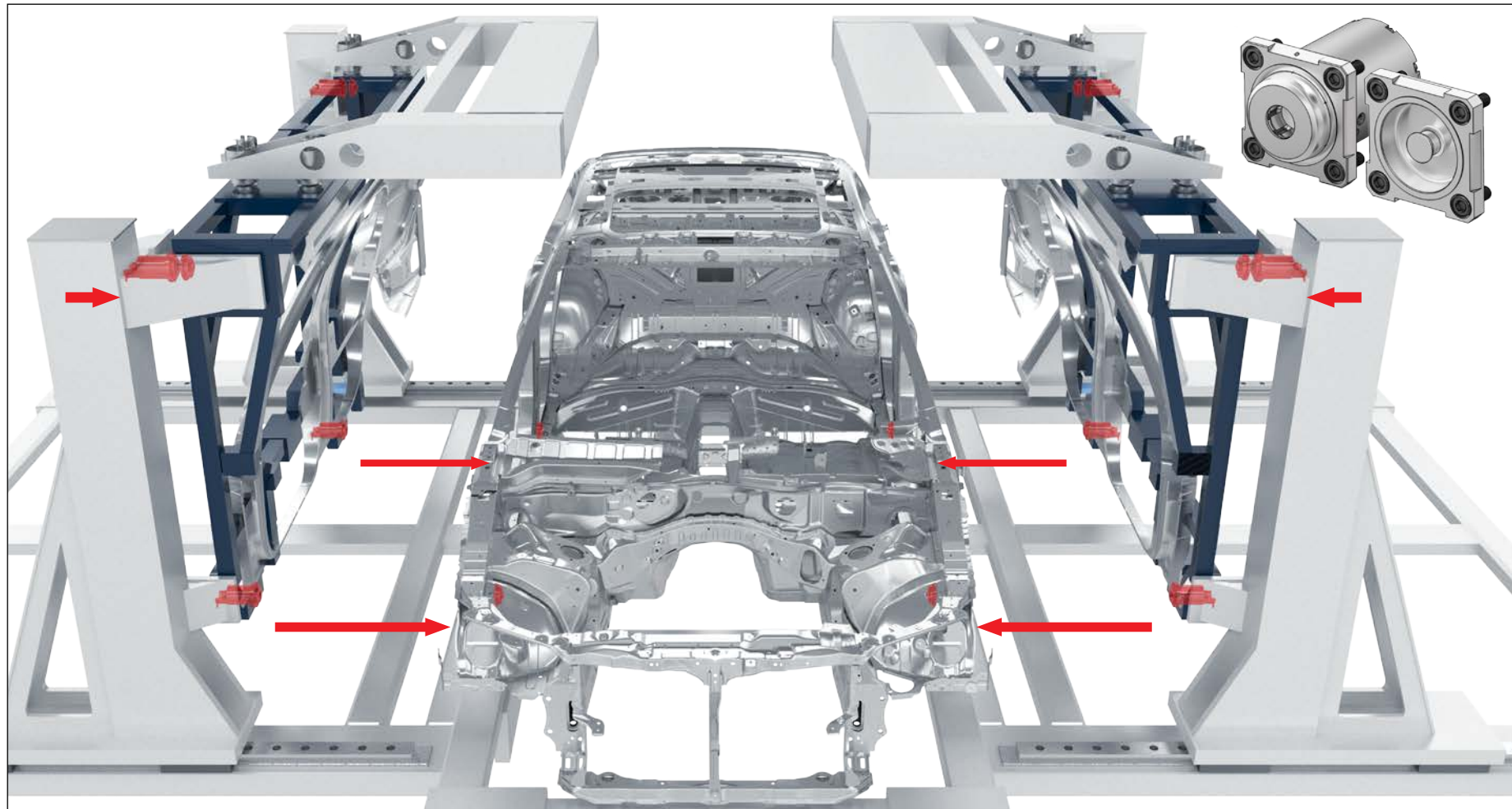


GRIPPER BARS



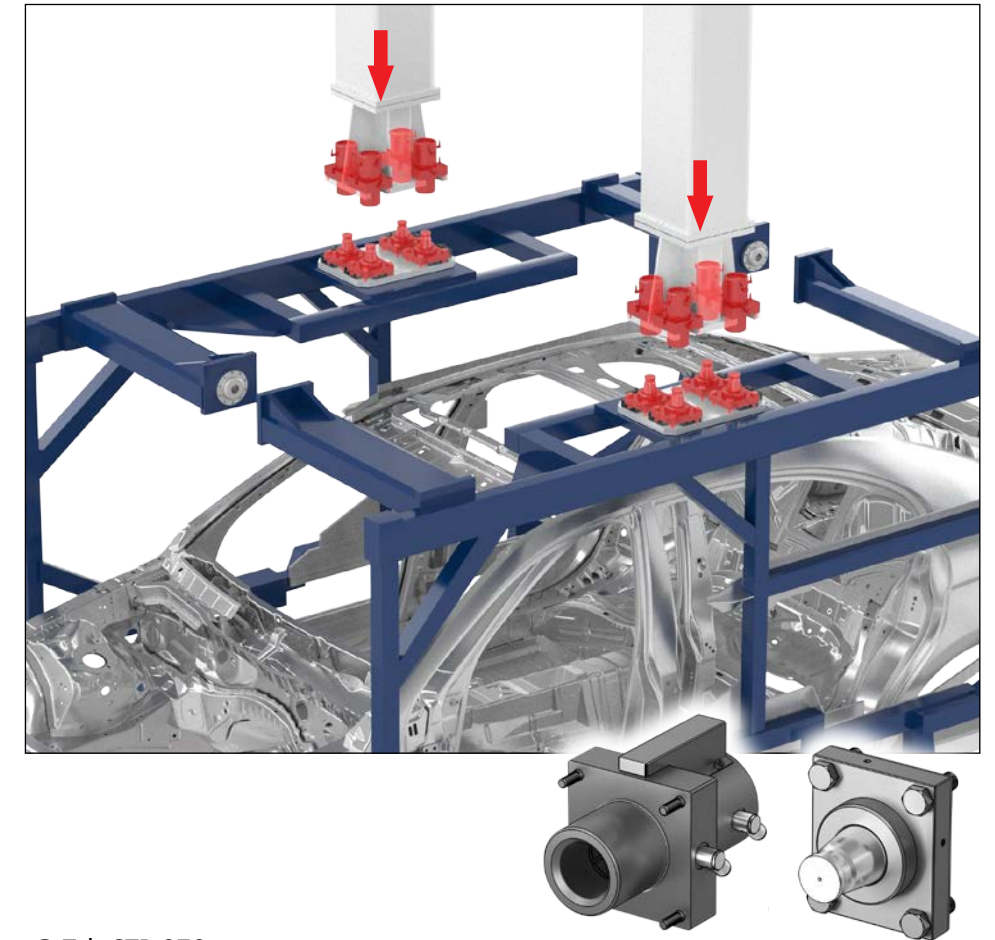
SWIVEL BRIDGES





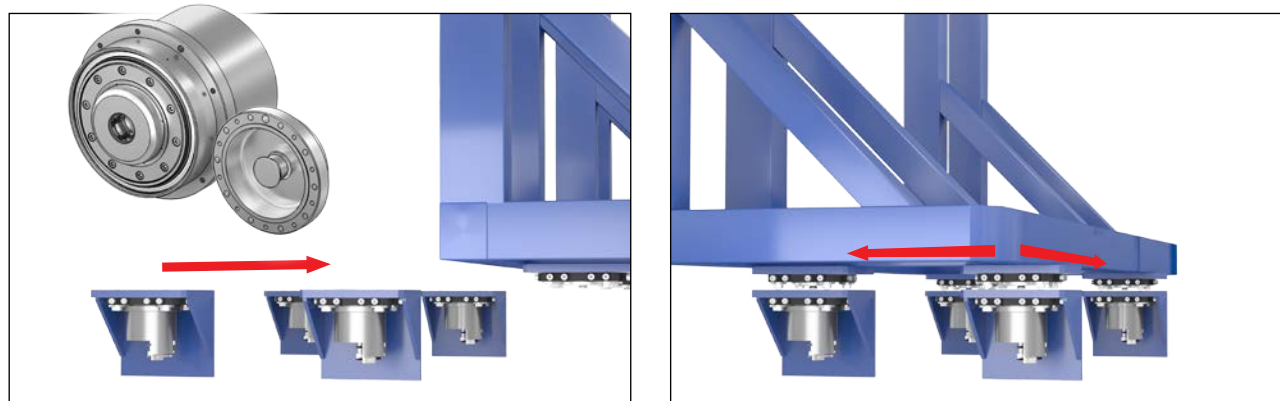
Single/multi framing, robot framing -

CyTab clamping systems are designed for these applications and fulfill optimally and reliably the high technical demands.



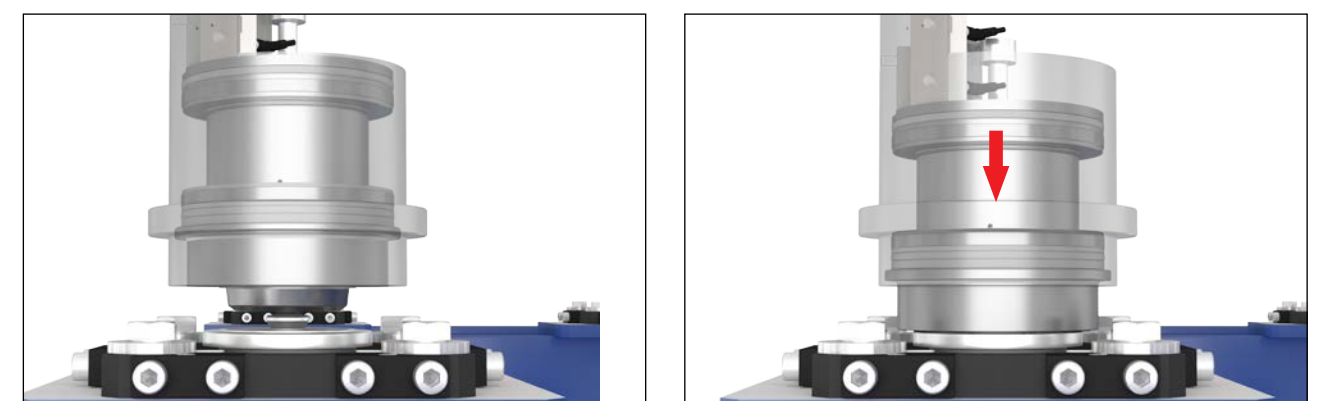
CyTab STP-070

For the frame transfer with vertical axes, we offer the unit STP-070. The high rigidity of the system enables a compact arrangement of the clamping units regarding the required safety in case of an abrupt emergency stop of the machine.



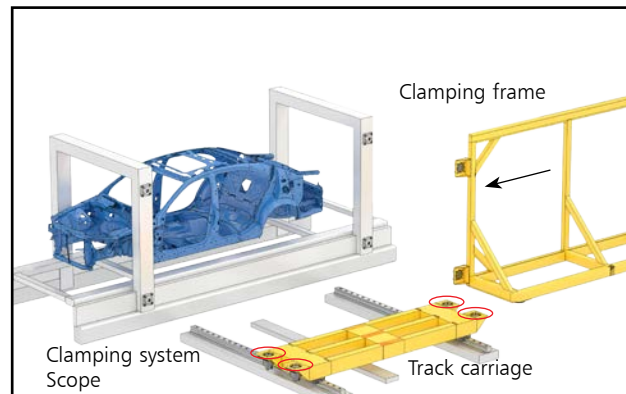
CyTab STP-090-Scope

The special clamping unit STP-090-Scope has an integrated stroke function which substitutes the vertical feed of the mounting frame. After releasing, the unit retracts so that the frame o. s. can be moved - **cost saving** - **time saving** - with high repeatability.



Transfer of hanging frames with CyTab-Scope: in case of reduced ceiling height the transfer can be executed without Z stroke. The frame is fed in Y(X) direction. There is a gap between frame and clamping unit which enables an even lining. Then the unit moves out and clamps the frame sided flange. With that the same accuracy is achieved that is guaranteed by the standard CyTab unit.

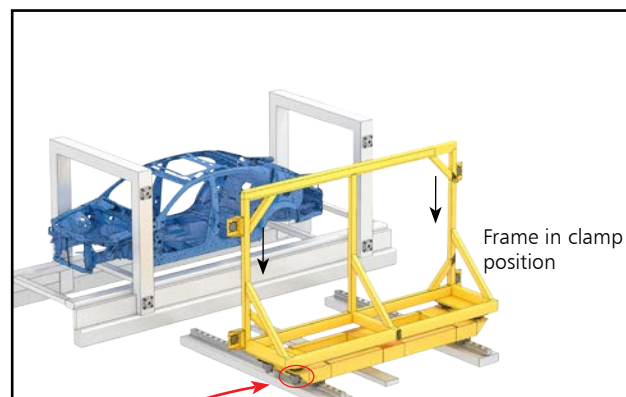
FRAME TRANSFER I



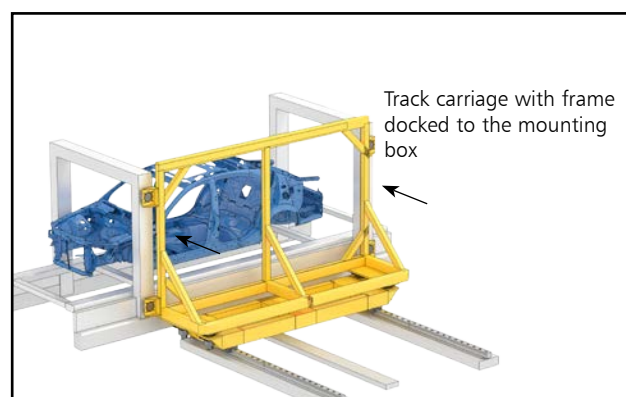
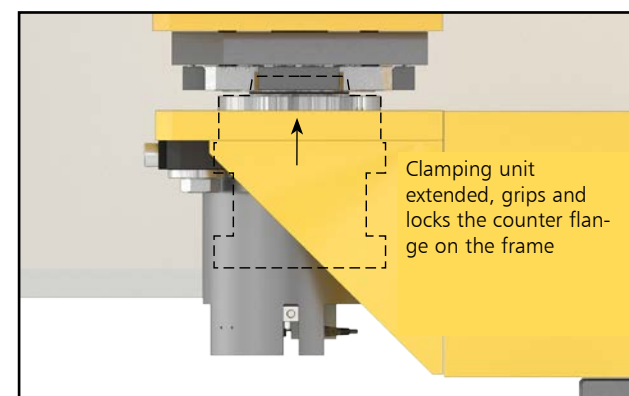
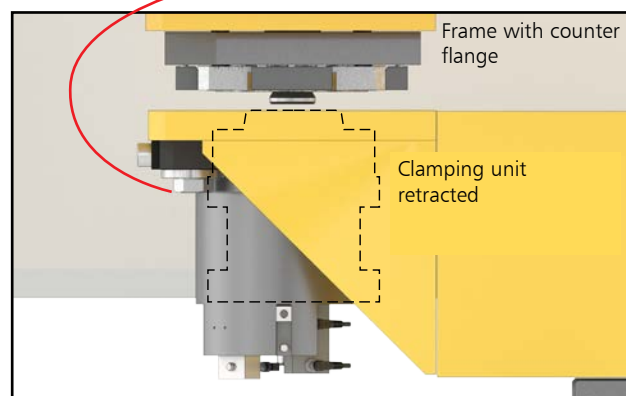
CyTab STP-090 Scope

The clamping frame is fed from the stock station via linear transfer above the track carriage and locked. The track carriage is equipped with 4-8 CyTab Scope clamping systems, the corresponding flanges are mounted to the frame.

The CyTab Scope clamping unit pulls into the flanges on the frame, is positioned and locks the frame to the carriage. The advantage is that the carriage has not to be lifted simultaneously. The frames can be positioned very easily via roller or sliding guides under the bottom of the carriages.

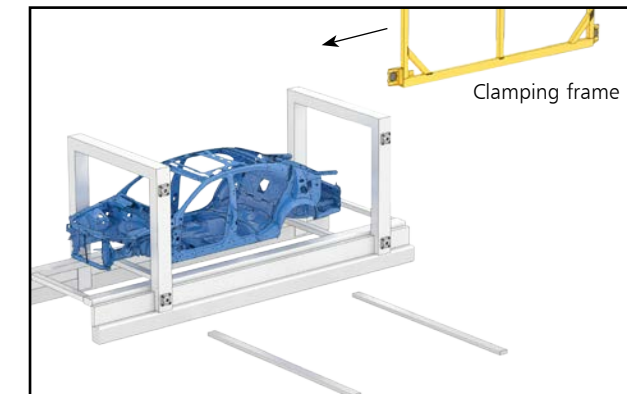


In the following clamping process, the clamping unit is pressurised and grips the flange-bolt with its collet chuck. The complete function **"gripping • centering • locking"** takes place automatically in a single reproducible process. Because of the positive locking the interface is mechanically very stable.



The clamping frame is locked to the carriage very precisely and with high rigidity. The repeatability lies in one hundredth millimeter range.

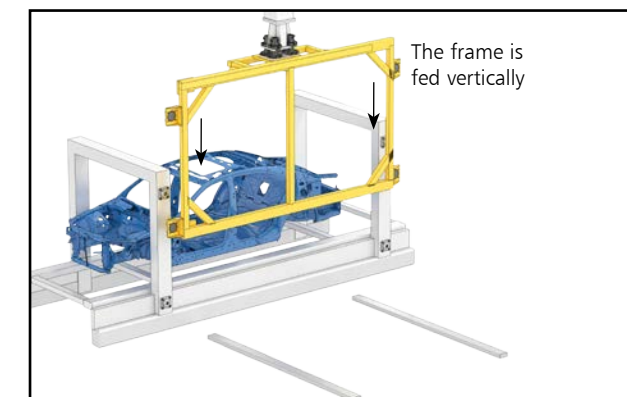
FRAME TRANSFER II



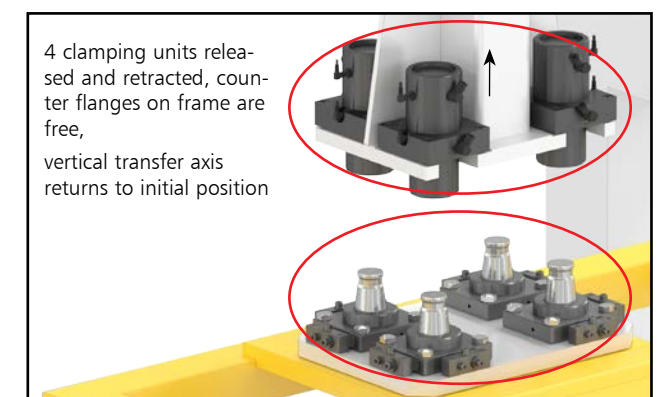
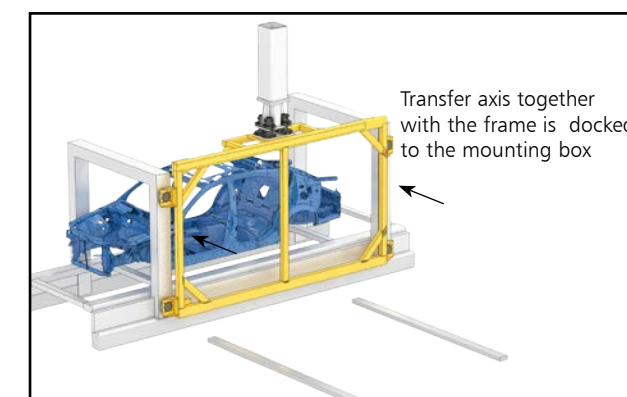
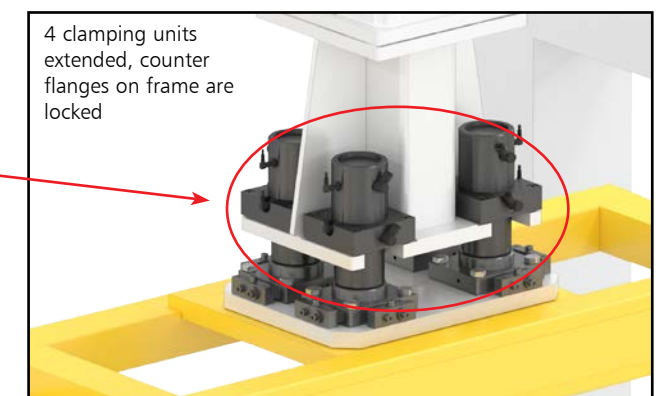
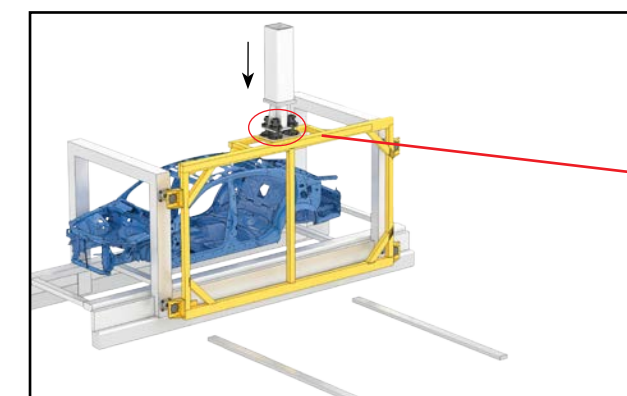
CyTab STP-070

The clamping frame is fed from the stock station via vertical axis and positioned. The transfer axis is equipped with a group of four 4 STP-070 clamping units which lock the corresponding counter flanges on the frame.

The compact arrangement of the clamping units enables a high rigidity of the system, especially important for failsafe function in case of an abrupt emergency stop.



Here also the complete function **"gripping • centering • locking"** takes place automatically in a single reproducible process. Because of the positive locking the interface is mechanically very stable.

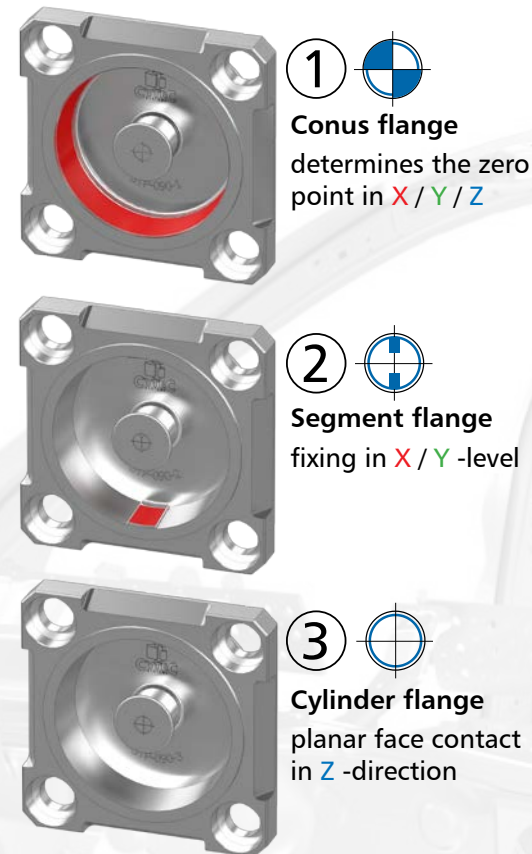


Precise positioning

Using multiple CyTab clampers, highest precision with positioning of frames is guaranteed by means of three different counter flanges:

- **Type 1 Conus flange:** for fix point indexing, and so determines the zero point of the complete system in all three axes X/Y/Z.
- **Type 2 Segment flange:** avoids a twist of the system around the zero point (conus flange) and fixes the frame in X/Y-level.
- **Type 3 Cylinder flange:** with conus and segment flange the frame is centered optimally in X/Y-level. The cylinder flange has no centering function and enables perfect alignment in Z direction by means of planar face contact.

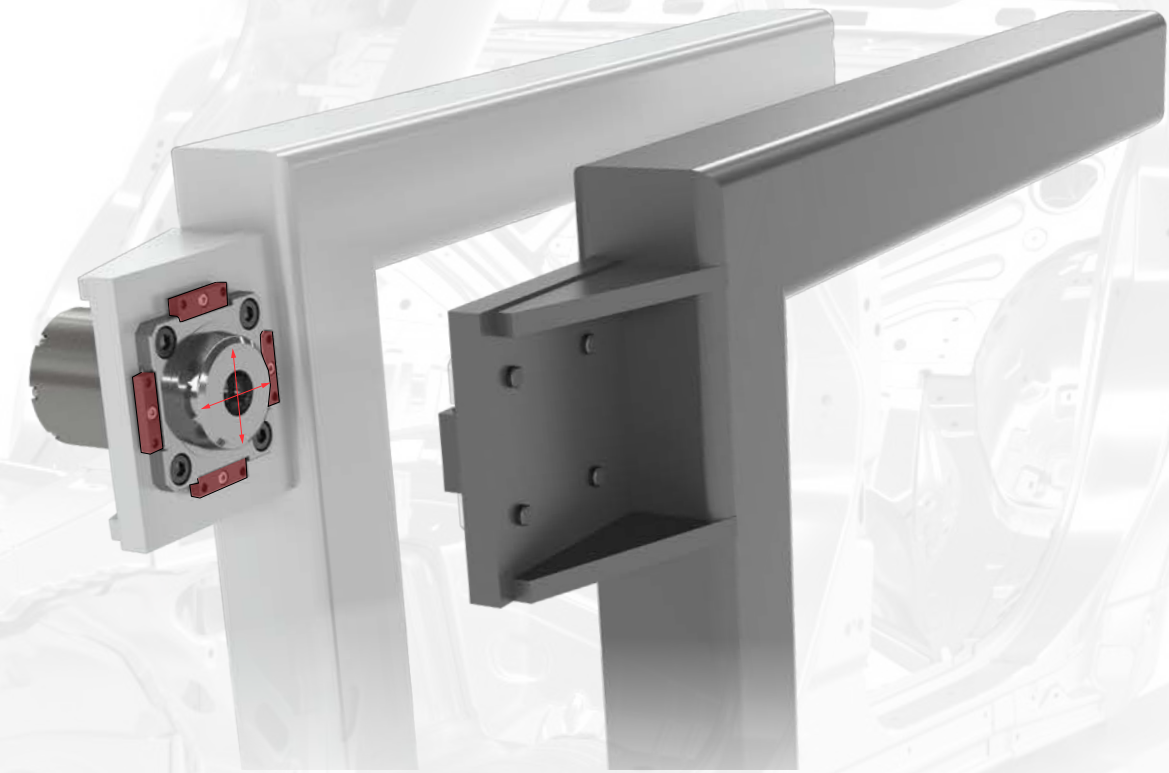
The here displayed example shows the arrangement of four clamping units with flanges, as is used in most common cases. If a higher clamping force is required, additional units can be applied, which are equipped with cylinder flanges.



X/Y/Z alignment and fixing

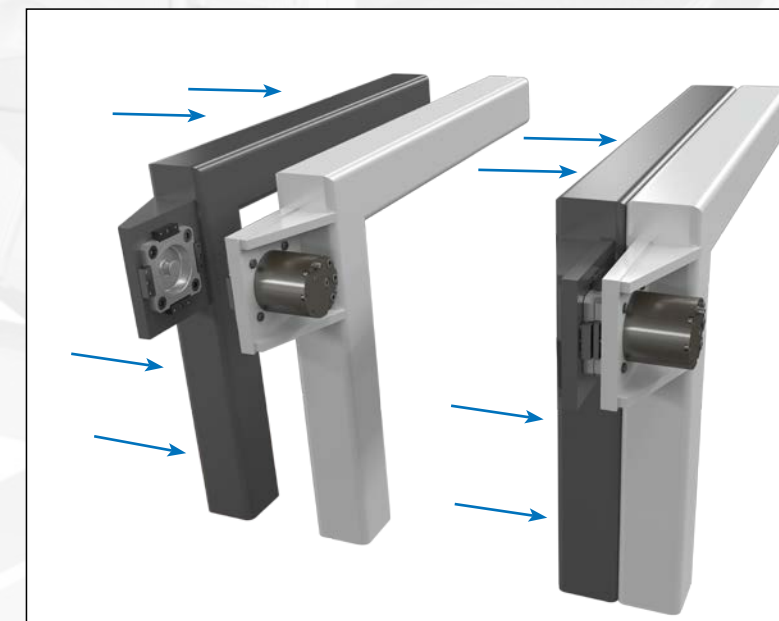
Regarding the mounting of production lines the factor time always plays a big role. Because of fabrication tolerances, the clamping units must be positioned exactly, to ensure that they work properly during the following operation and that the required accuracy is achieved.

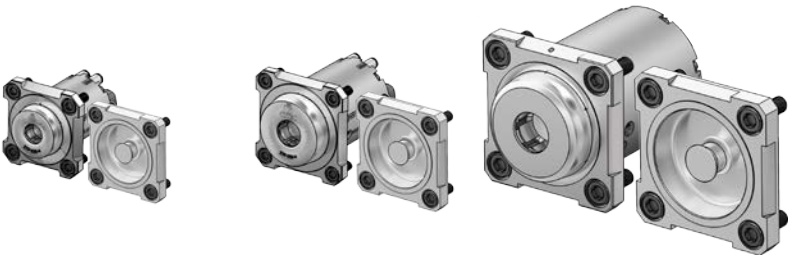
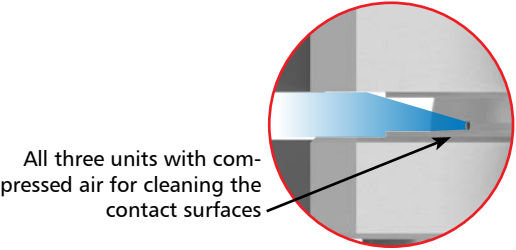
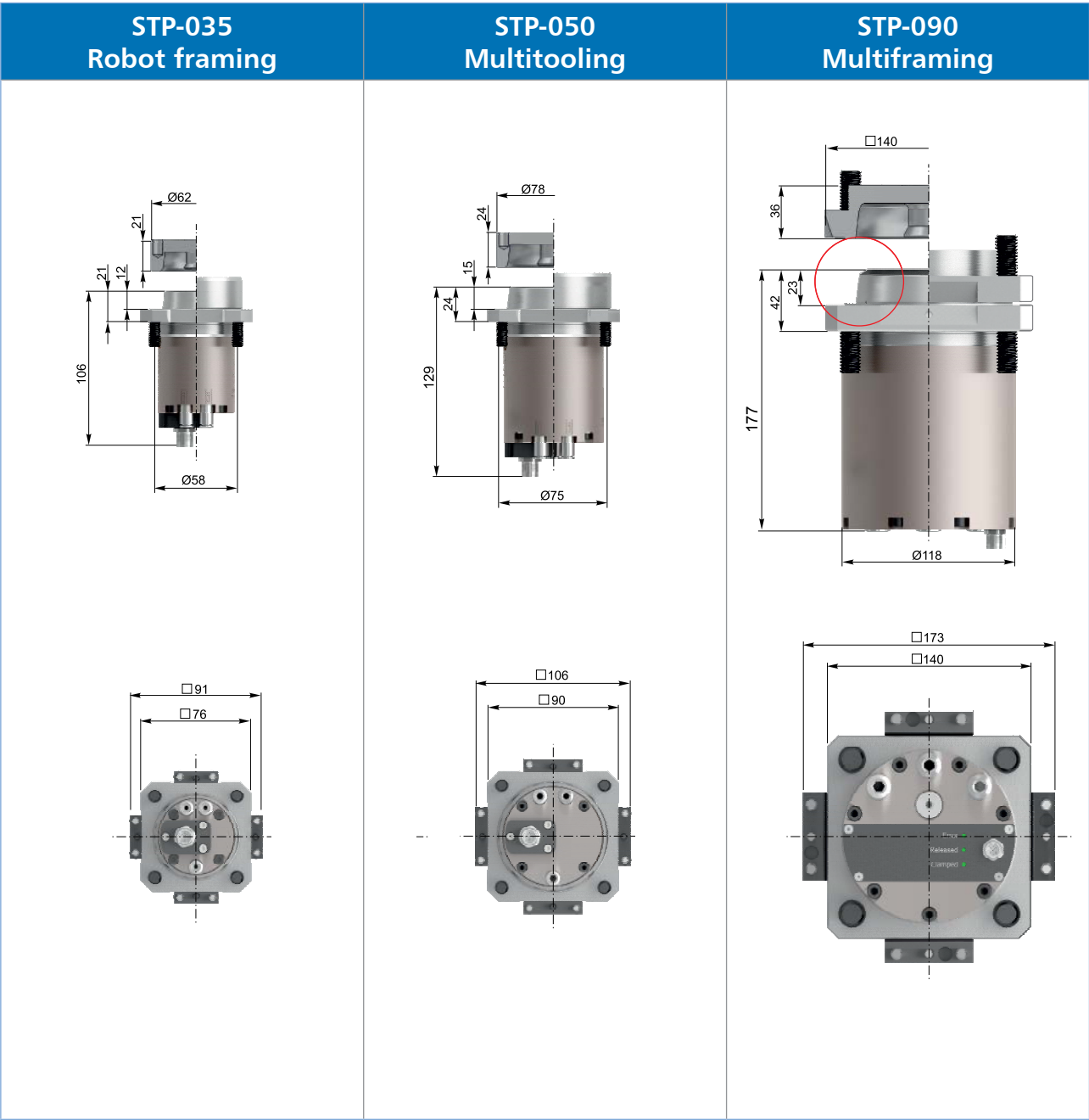
Proper alignment is facilitated using the optionally adjustment units which enable quick positioning and alignment of clamping units and corresponding counter flanges.



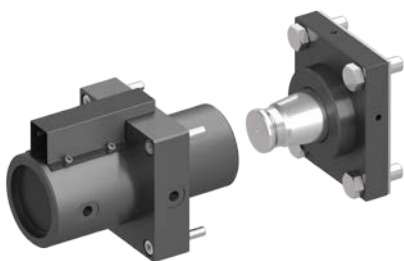
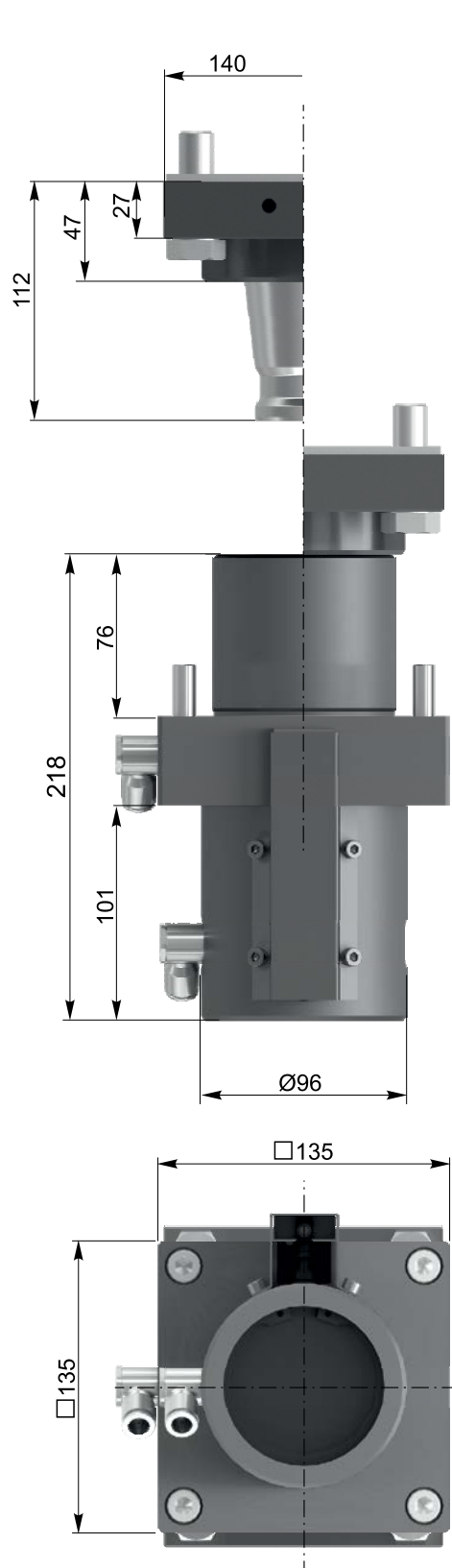
Clamping cycle

The CyTab units combine several operation steps in one functional cycle: positioning, alignment and fixation of the frame. Another feature is the possibility to bridge long distances between clamping unit and flanges, so that the requirements for the feed accuracy are not too high.

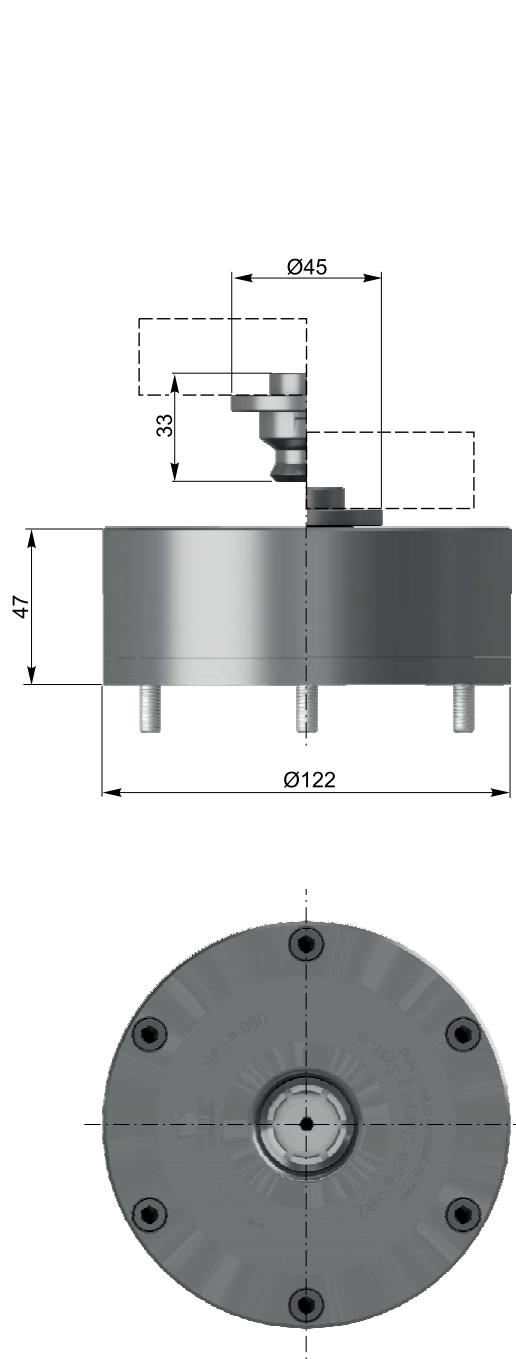




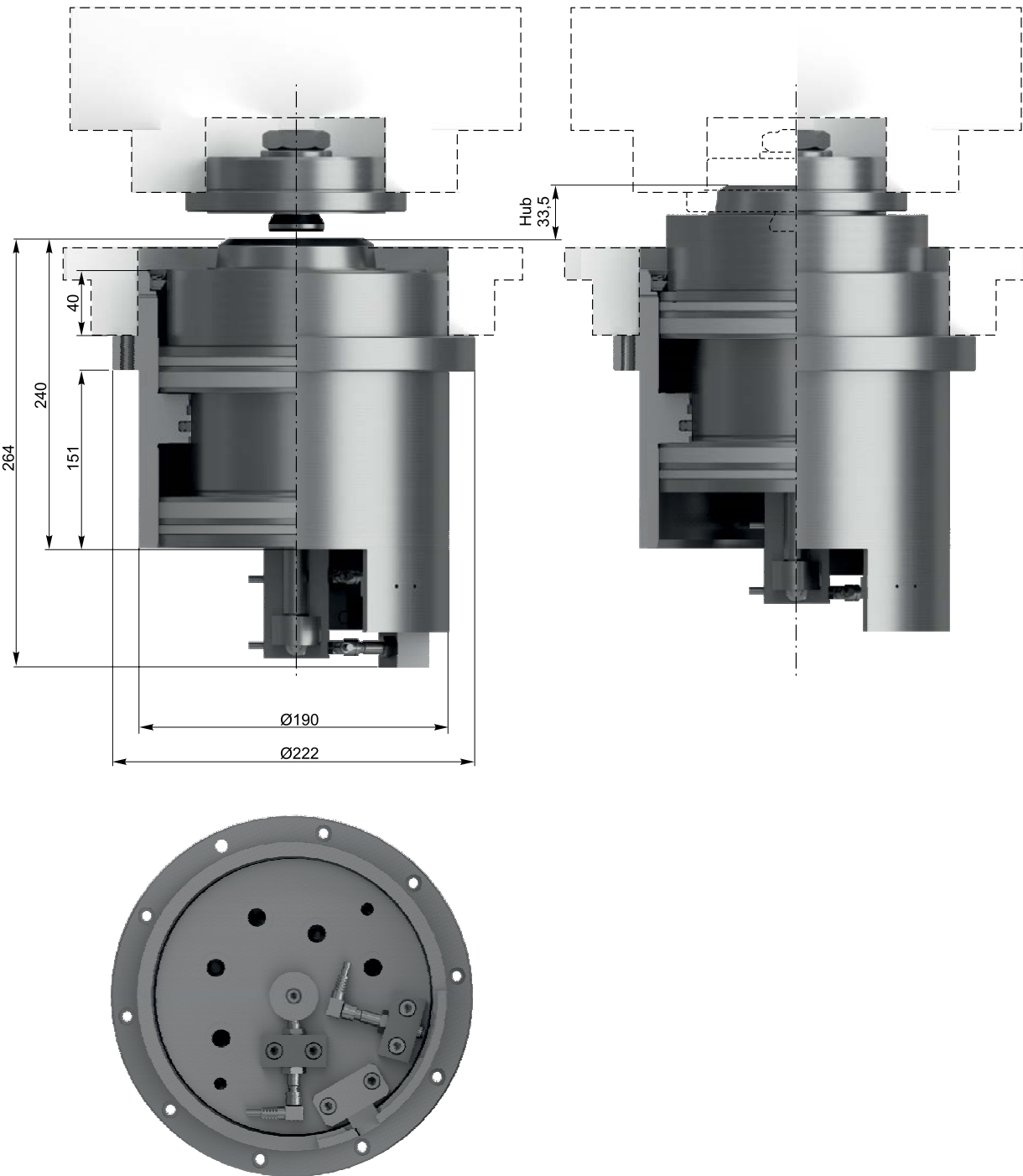
| Series STP - | 035 | 050 | 090 |
|--|--|-----------------------------------|--------------------------------------|
| Centering: | Short cone with planar surface shouldering | | |
| Sensor query: 1: released; 2: clamped; 3: error | electrically | | |
| Monitoring face contact: | optionally (with back pressure sensor) | | |
| Cleaning function: | optionally (compressed air for cleaning the face surfaces) | | |
| Retraction force, 6bar [kN]: | 0,6 up to 2,1 | 1,2 up to 4,5 | 3,8 up to 12,0 |
| Clamping force [kN]: | 2,1 | 4,5 | 12,0 |
| Holding force [kN]: | 10 | 15 | 25 |
| Max. admissible lateral force [kN]: | 10 | 15 | 25 |
| Max. Grasping distance [mm]: | 2,0 | 2,5 | 5,0 |
| Grasp. distance with max. retraction force [mm]: | 0,5 | 1,0 | 1,5 |
| Max. radial offset [mm]: | ±2 | | |
| Max. angular offset [mm]: | ±2° | | |
| Repeat accuracy [mm]: | axial: 0,04; radial: 0,05 | | |
| Maintenance interval [cycles]: | 1.000.000 | | |
| Required release pressure [bar]: | 5 | | |
| Max. operational pressure [bar]: | 12 | | |
| Air volume per cycle (clamp/release) [cm³]: | 25 | 80 | 400 |
| Operational temperature [°C]: | +10 up to +50 | | |
| Max. admissible humidity [%]: | up to 90 | | |
| Opening cycle [s]: | 0,3 | | |
| Closing cycle [s]: | 0,3 | | |
| Weight clamping unit [kg]: | 0,9 | 1,8 | 10,0 |
| Weight counter flange [kg]: | 0,35 | 0,55 | 2,5 |
| Adjustment unit: | opt. available | | |
| Media connections: | Ø 6mm, hose connector / M5-thread | Ø 6mm, hose connector / M7-thread | Ø 10mm, hose connector / G1/4-thread |
| Sensor connection: | M12-sensor plug 5 poles | | |
| Voltage supply [V]: | 24 | | |



| Series STP - | 070 |
|--|--------------------------------------|
| Centering: | cone with planar surface shouldering |
| Sensor query: | clamped/released |
| Retraction force, 6bar [kN]: | 2,0 up to 9,0 |
| Clamping force [kN]: | 9,0 |
| Holding force [kN]: | 25 |
| Max. admissible lateral force [kN]: | 50 |
| Max. grasping distance [mm]: | 3,0 |
| Grasp. distance with max. retraction force [mm]: | 1,3 |
| Max. radial offset [mm]: | ±1,5 |
| Max. angular offset [mm]: | ±2 |
| Repeat accuracy [mm]: | axial: 0,02 |
| Maintenance interval [cycles]: | 1.000.000 |
| Required release pressure [bar]: | 5 |
| Max. operational pressure [bar]: | 12 |
| Air volume per cycle (clamp/release) [cm³]: | 200 |
| Operational temperature [°C]: | +10 up to +50 |
| Max. admissible humidity [%]: | up to 90 |
| Opening cycle [s]: | 0,5 |
| Closing cycle [s]: | 0,5 |
| Weight clamping unit [kg]: | 12,0 |
| Weight counter flange [kg]: | 7,0 |
| Media connections: | G1/4 thread |
| Sensor connection: | M8-sensor plug 3-polig |
| Voltage supply [V]: | 24 |



| Series NPS - | P-090 |
|--|--|
| Centering: | cone with planar surface shouldering |
| Monitoring face contact: | optionally (with back pressure sensor) |
| Cleaning function: | optionally (compr. air) |
| Retraction force, 6bar [kN]: | 10 |
| Clamping force [kN]: | 10 |
| Holding force [kN]: | 40 |
| Max. admissible lateral force [kN]: | 40 |
| Max. grasping distance [mm]: | 1,0 |
| Grasp. distance with max. retraction force [mm]: | 0,4 |
| Max. radial offset [mm]: | ±1,5 |
| Max. angular offset [mm]: | ±2 |
| Repeat accuracy [mm]: | axial: 0,005 |
| Maintenance interval [cycles]: | 1.000.000 |
| Required release pressure [bar]: | 5 |
| Max. operational pressure [bar]: | 10 |
| Air volume per cycle (clamp/release) [cm³]: | 50 |
| Operational temperature [°C]: | +10 up to +50 |
| Max. admissible humidity [%]: | up to 90 |
| Opening cycle [s]: | 0,2 |
| Closing cycle [s]: | 0,2 |
| Weight clamping unit [kg]: | 3,5 |
| Weight counter flange [kg]: | 0,15 |
| Media connections: | G1/8 thread oder O ring sealing |



| Series STP - | 090 SC |
|--|--|
| Centering: | Short cone with planar surface shouldering |
| Sensor query: | released / clamped / error |
| Monitoring face contact: | optionally (with back pressure sensor) |
| Cleaning function: | optionally (compressed air for cleaning the face surfaces) |
| Retraction force, 6bar [kN]: | 3,8 up to 12,0 |
| Clamping force [kN]: | 12,0 |
| Holding force [kN]: | 25 |
| Max. admissible lateral force [kN]: | 25 |
| Max. grasping distance [mm]: | 5,0 |
| Grasp. distance with max. retraction force [mm]: | 1,5 |
| Max. radial offset [mm]: | ±2 |
| Max. angular offset [mm]: | ±2 |
| Repeat accuracy [mm]: | axial: 0,04; radial: 0,05 |
| Maintenance interval [cycles]: | 1.000.000 |
| Required release pressure [bar]: | 5 |
| Max. operational pressure [bar]: | 12 |
| Air volume per cycle (clamp/release) [cm³]: | 400 (clamp/release); 600 (moving in/out) |
| Operational temperature [°C]: | +10 up to +50 |
| Max. admissible humidity [%]: | up to 90 |
| Opening cycle [s]: | 1,0 |
| Closing cycle [s]: | 1,0 |
| Weight clamping unit [kg]: | 17,0 |
| Weight counter flange [kg]: | 2,5 |
| Adjustment unit: | opt. available |
| Media connections: | 4x G1/4-thread |
| Sensor connection: | 4x M12-sensor plug 5 poles |
| Voltage supply [V]: | 24 |



Industry 4.0 - the future

The integrated electronic device monitors the unit permanently.

With the display on the backside of the unit the switching condition can easily be controlled visually.

In addition, the clamping unit is primed for the future. With exchanging a multitude of data with the control system it is possible to monitor the condition of the unit over its complete service life and to detect possible failure in time.

By using just one connector plug, the connection effort and the error potential is significantly reduced.

Complete sensor system:

- distinct detection of the clamping condition
- direct back side signalling with LEDs
- digital outputs for easy processing in the higher level control system
- highest robustness and durability in welding surroundings



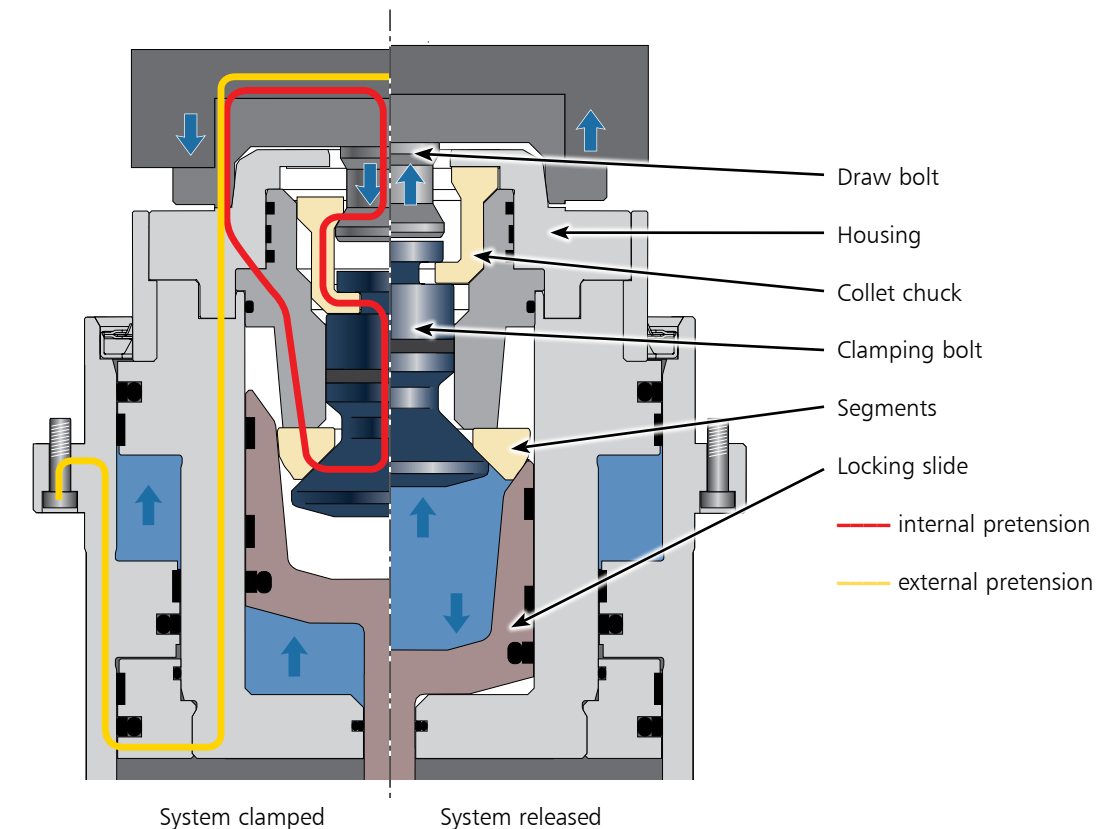
STP090



STP050



STP035



Functional process (example STP-090-SC)

Feeding: The clamping unit is in retracted position. Now the external feed-in and pre-positioning of the mounting frame can take place. When the clamping unit and the counter flange are in axial alignment, the integrated feed movement of the clamping unit is activated. The clamping unit moves out and dives into the counter flange attached to the mounting frame.

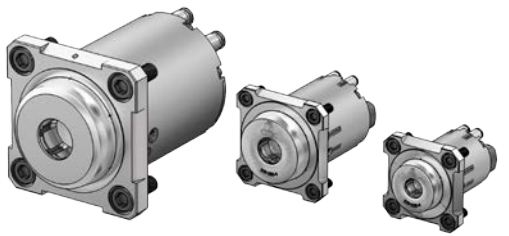

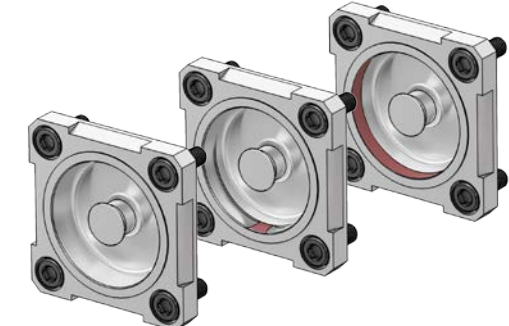
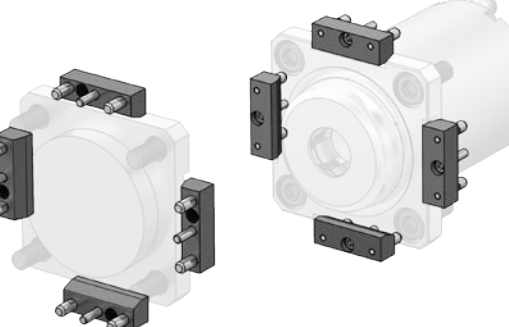


Clamping: The clamping unit is pressurised and its collet chuck grasps the flange-bolt. If the stroke of the clamping unit should not be sufficient (no total face contact between clamping unit and flange), it is possible that the clamping unit can draw the frame over the full grasping distance. Depending on the adjustment of the system, two different pretension forces are generated:

- Internal pretension (red line)
- External pretension (yellow line)

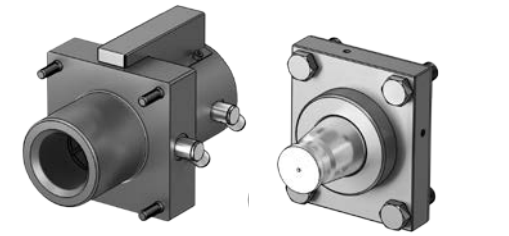



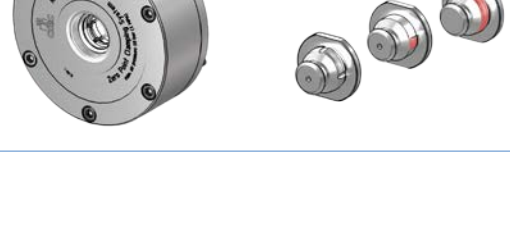

The total sequence „**grasping • centering • locking**“ takes place automatically in a single reproducible process. Through the positive locking, the interface has a high mechanical load capacity. By means of the mechanical self-locking the clamping pressure can be switched off. A continuous pressurising is not necessary.

Release: The release process takes place in reversed order. The clamping unit is supplied with release pressure so that the collet chuck clears the flange bolt. Then the unit is retracted into its housing. Now the mounting frame can be moved again.

Order numbers
Geometry- and framing clamping units

| Series | |
|---|--|
|  | 300 - 0100 Clamping unit STP-035-4.1 |
| | 300 - 0200 Clamping unit STP-050-4.1 |
| | 300 - 0300 Clamping unit STP-090-4.1 |
| Accessories | |
|  | 300 - 0111 Conus flange round STP-035-4.1 |
| | 300 - 0211 Conus flange round STP-050-4.1 |
| | 300 - 0311 Conus flange round STP-090-4.1 |
|  | 300 - 0112 Segment flange round STP-035-4.1 |
| | 300 - 0212 Segment flange round STP-050-4.1 |
| | 300 - 0312 Segment flange round STP-090-4.1 |
|  | 300 - 0113 Cylinder flange round STP-035-4.1 |
| | 300 - 0213 Cylinder flange round STP-050-4.1 |
| | 300 - 0313 Cylinder flange round STP-090-4.1 |
|  | 300 - 0121 Conus flange square STP-035-4.1 |
| | 300 - 0221 Conus flange square STP-050-4.1 |
| | 300 - 0321 Conus flange square STP-090-4.1 |
|  | 300 - 0122 Segment flange square STP-035-4.1 |
| | 300 - 0222 Segment flange square STP-050-4.1 |
| | 300 - 0322 Segment flange square STP-090-4.1 |
| | 300 - 0123 Cylinder flange square STP-035-4.1 |
| | 300 - 0223 Cylinder flange square STP-050-4.1 |
| | 300 - 0323 Cylinder flange square STP-090-4.1 |
| | 300 - 0131 Adjustment element unit STP-035-4.1 |
| | 300 - 0231 Adjustment element unit STP-050-4.1 |
| | 300 - 0331 Adjustment element unit STP-090-4.1 |
| | 300 - 0141 Adjustment element flange STP-035-4.1 |
| | 300 - 0241 Adjustment element flange STP-050-4.1 |
| | 300 - 0341 Adjustment element flange STP-090-4.1 |
| | 300 - 0151 Adjustable shim STP-035-4.1 |
| | 300 - 0251 Adjustable shim STP-050-4.1 |
| | 300 - 0351 Adjustable shim STP-090-4.1 |

Order numbers
Transfer- and zero point clamping units

| Transfer clamping unit without Z stroke | |
|---|---|
|  | 300 - 0400 Clamping unit STP-70-4.1 |
| | |
| | |
| Accessories | |
|  | 300 - 0411 Flange STP-070-4.1 |
| | |
| | |
| Transfer clamping unit with Z stroke | |
|  | 300 - 0501 Clamping unit STP-090-4-SC |
| | |
| | |
| Accessories | |
|  | 300 - 0511 Conus flange round STP-090-4-SC |
| | 300 - 0512 Segment flange round STP-090-4-SC |
| | 300 - 0513 Cylinder flange round STP-090-4-SC |
| Framing unit (previous version) | |
|  | 300 - 0500 Clamping unit STP-090-4 |
| | |
| | |
| Accessories: compatible flanges | |
|  | 300 - 0511 |
| | 300 - 0512 |
| | 300 - 0513 |
| Zero point clamping unit | |
| | 300 - 0600 Zero point clamping unit NPS-P-090 |
| | |
| | |
| Accessories | |
| | 300 - 0611 Conus bolt round NPS-P-090 |
| | 300 - 0612 Segment bolt round NPS-P-090 |
| | 300 - 0613 Cylinder bolt round NPS-P-090 |



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CYTEC Zylindertechnik GmbH

Steffensrott 1 • D-52428 Jülich

Tel.: (+49) 2461 / 6808-0 • Fax: (+49) 2461 / 6808-758

E-mail: info@cytec.de • [http:// www.cytec.de](http://www.cytec.de) • www.cytec.blog



CyTab_02 | 07/2021 | english

We reserve the right to make technical modifications. The components/ machines shown here may include options, accessories and control variants.