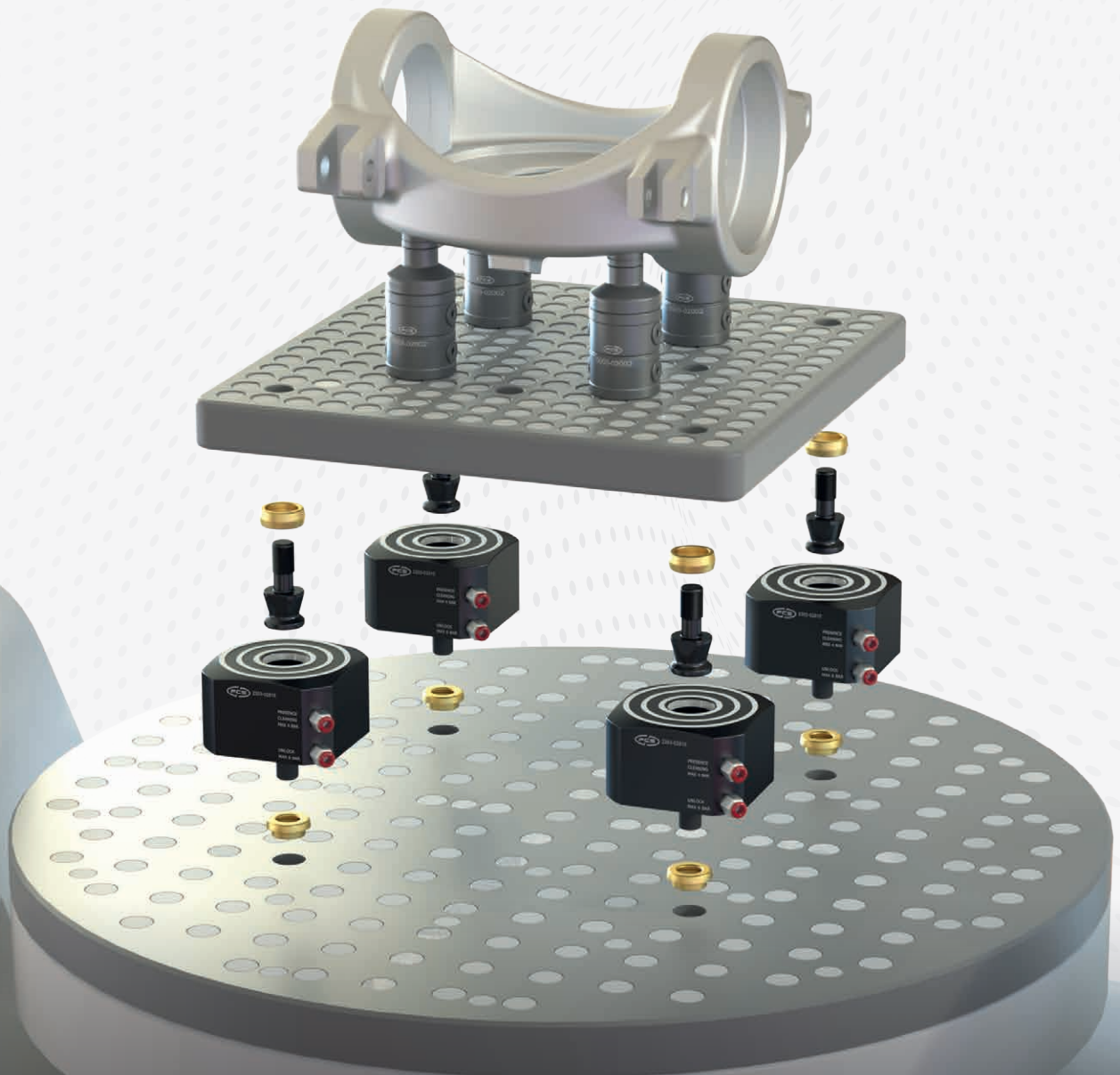




Integrated systems for production



MODULAR

Automatic Clamp

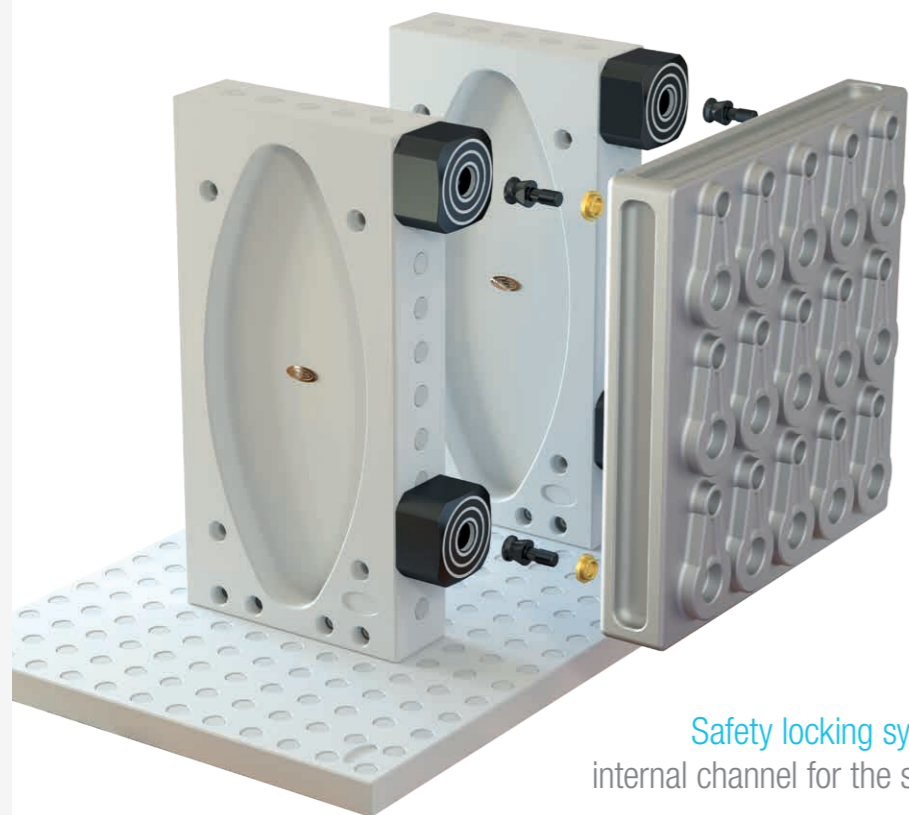


Integrated systems for production

MODULAR - FEATURES AND STRENGTHS

MODULAR - FEATURES AND STRENGTHS

Automatic clamping devices for products and production equipments based on a mechanical locking-unlocking system pneumatically activated.



MAIN FEATURES & STRENGTHS

Easy to be fixed on a machine table

Safety locking system (normally closed) with a dedicated internal channel for the swarf evacuation and the locking control

Capable of adapting to the workpiece/pallet deformation

MOUNTING PROCEDURE

Modular clamp device can be fixed directly on the machine table or on a FCS grid support (Base gauges, Cubes, etc.)

MODULAR
Product range: M12, M16, M24



FIXING SCREW



RING
Self-centering

CLAMPING SEAT
In case of mounting on FCS components, this seat is already present



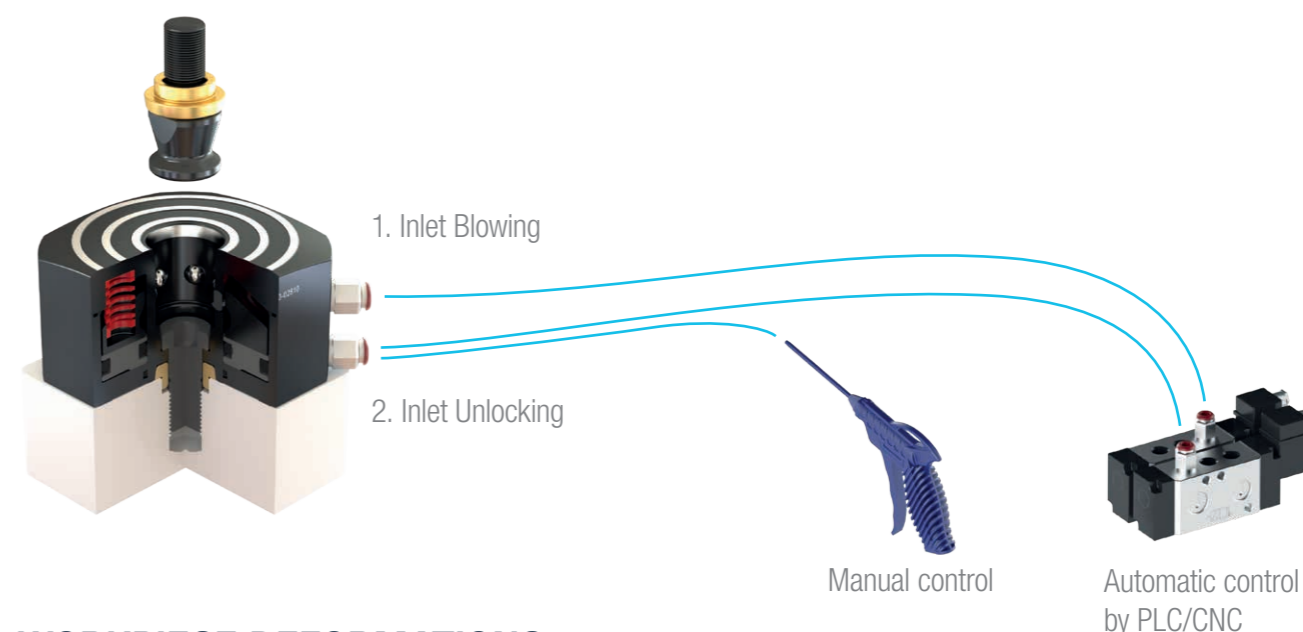
For further technical details, see the corresponding data sheet

PNEUMATIC SYSTEM

Two pneumatic lines to control the unlocking and the blowing systems:

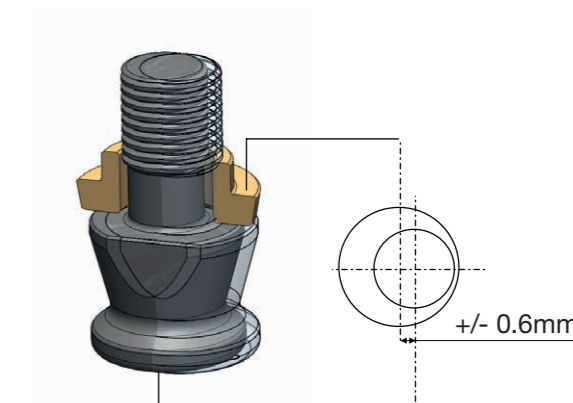
1. Blowing: supplying air at 4bar the blowing central outflow could be used:
 - for the swarf evacuation;
 - to verify if the Rod is correctly locked/unlocked (using the pressure variation caused by the closing chamber coming from the contact between the Modular with a pallet/workpiece).
2. Unlocking: without providing air, the Rod is locked by the action of the spheres (normally closed). Supplying air at 6bar, the spheres go back enabling the Rod to be unlocked.

The air supply can be controlled manually by the operator or automatically by PLC or CNC.



WORKPIECE DEFORMATIONS

Before and after workpiece deformations e.g. the positions of the clamping seats could change caused by a heat treatment.



If the clamping seat deviation is not bigger than 0,6mm (per each clamping seat), the Modular clamp is able to accept a Rod movement inside this range. It is required to increase the diameter of the spot facing of the clamping seat accordingly and to use the corresponding Ring.

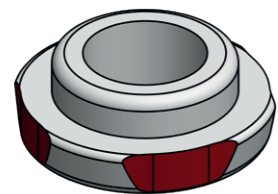
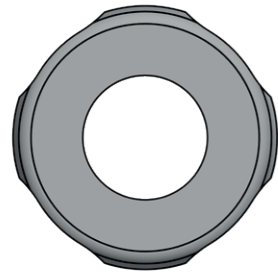
MODULAR - FEATURES AND STRENGTHS

MODULAR - FEATURES AND STRENGTHS

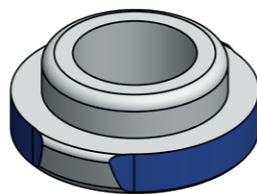
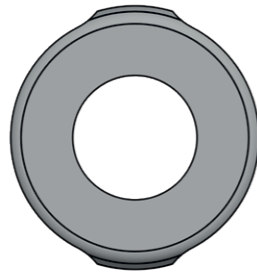
MICRO DEFORMATIONS AND DIRECTION CONTROL

The heat generated by the machining can expand the workpiece/pallet. In the case it is required to remove the workpiece/pallet from the clamping without leaving it for the cooling down, it is recommended to use dedicated type of Rings, which differ on the conical surface extension. This allows management of the thermal expansion of the workpiece/pallet as shown below.

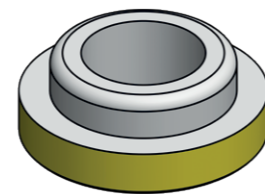
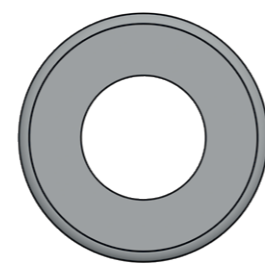
Type of fit:



CENTERING
4 contact surfaces
at 90° or full contact

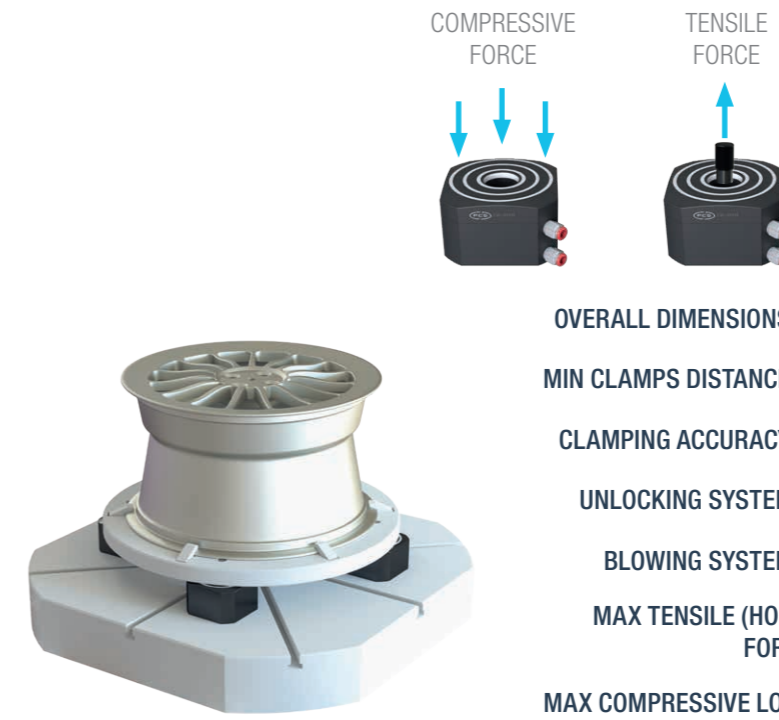


POSITIONING
2 contact surfaces
at 180°



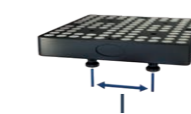
CLOSING
No contact surfaces

PRODUCT RANGE AND TECHNICAL DATA



	MODULAR M12	MODULAR M16	MODULAR M24
OVERALL DIMENSIONS (mm)	□ 74,5 H55	□ 99 H60	□ 145 H80
MIN CLAMPS DISTANCE (mm)	100	100	150
CLAMPING ACCURACY (mm)	0,005	0,005	0,005
UNLOCKING SYSTEM (bar)	6	6	6
BLOWING SYSTEM (bar)	4	4	4
MAX TENSILE (HOLDING) FORCE (N)	6000	12500	24000
MAX COMPRESSIVE LOAD (N)	8000	20000	25000
WEIGHT (kg)	1,8	3,5	9,3

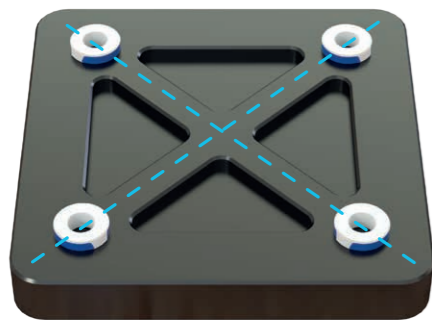
PALLET MATCHING



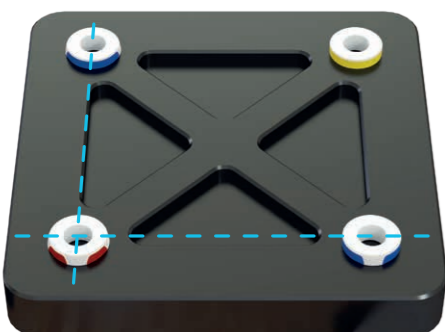
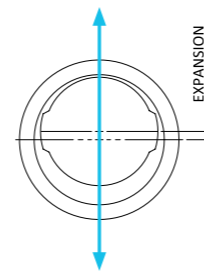
	PALLET SIZE	□	I	MODULAR M12	MODULAR M16	MODULAR M24
M6	176x176x26	15	100	✓	✓	
M8	230x230x30	20	100	✓	✓	
M10	296x296x40	25	200	✓	✓	
M12	285x285x54	25	100	✓	✓	
M16	400x400x55	50	250		✓	
M16	500x500x55	50	250		✓	
M16	600x600x80	50	350		✓	✓
M16	800x800x100	50	450			✓
M16	1000x1000x110	50	600			✓
M16	1200x1000x150	50	600-800			✓

Note: The pallet - Modular size matching can vary depending on the specific application

APPLICATION EXAMPLES



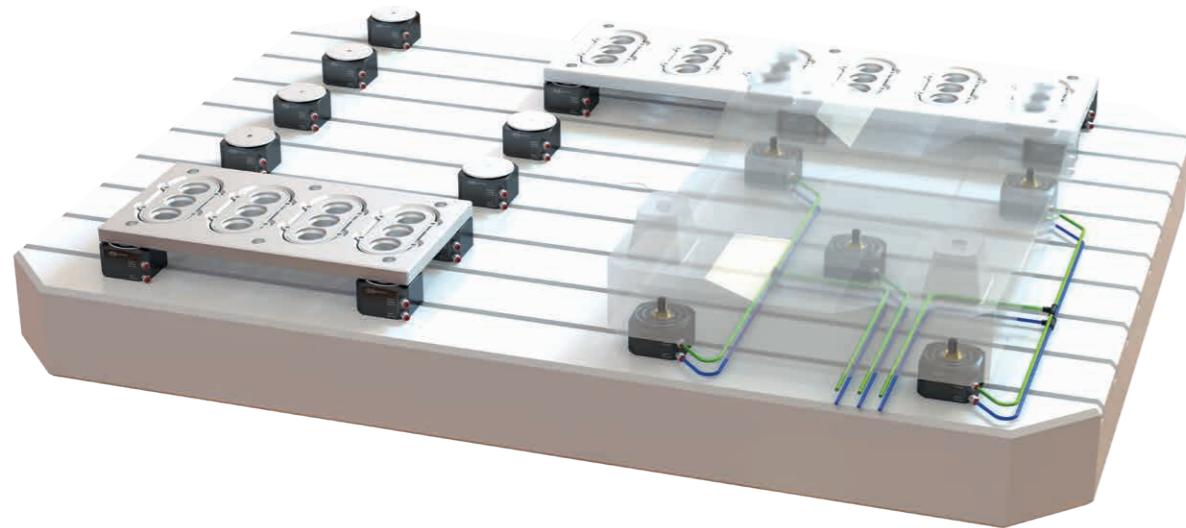
SYSTEM TO GET A UNIFORM EXPANSION FROM THE CENTER



SYSTEM TO GET A LINEAR EXPANSION FROM A CORNER

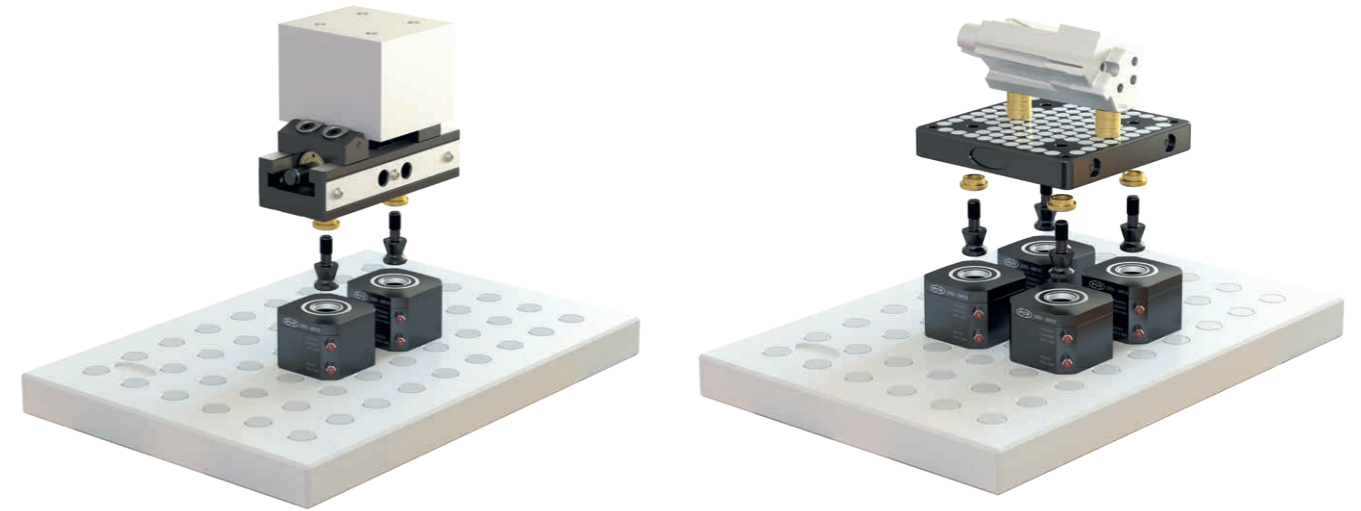
APPLICATION IN RESTRICTED ACCESSIBILITY AREA

Modular clamp is designed to be applied in areas not easily accessible, because it doesn't need manual locking.



INTERAXLE CHANGEABLE

It can be easily repositioned according to the clamping requirements.

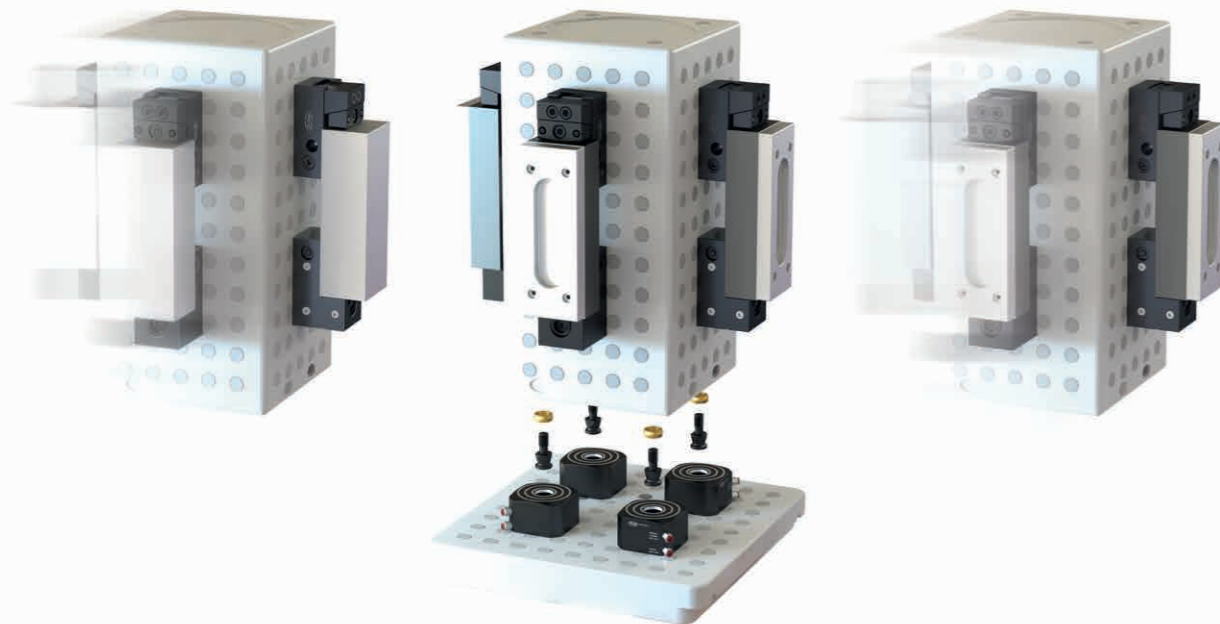


ACCURACY AND REPEATABILITY

The high accuracy of the clamping components mating surfaces allows for a highly accurate level of repeatability in workpiece positioning.

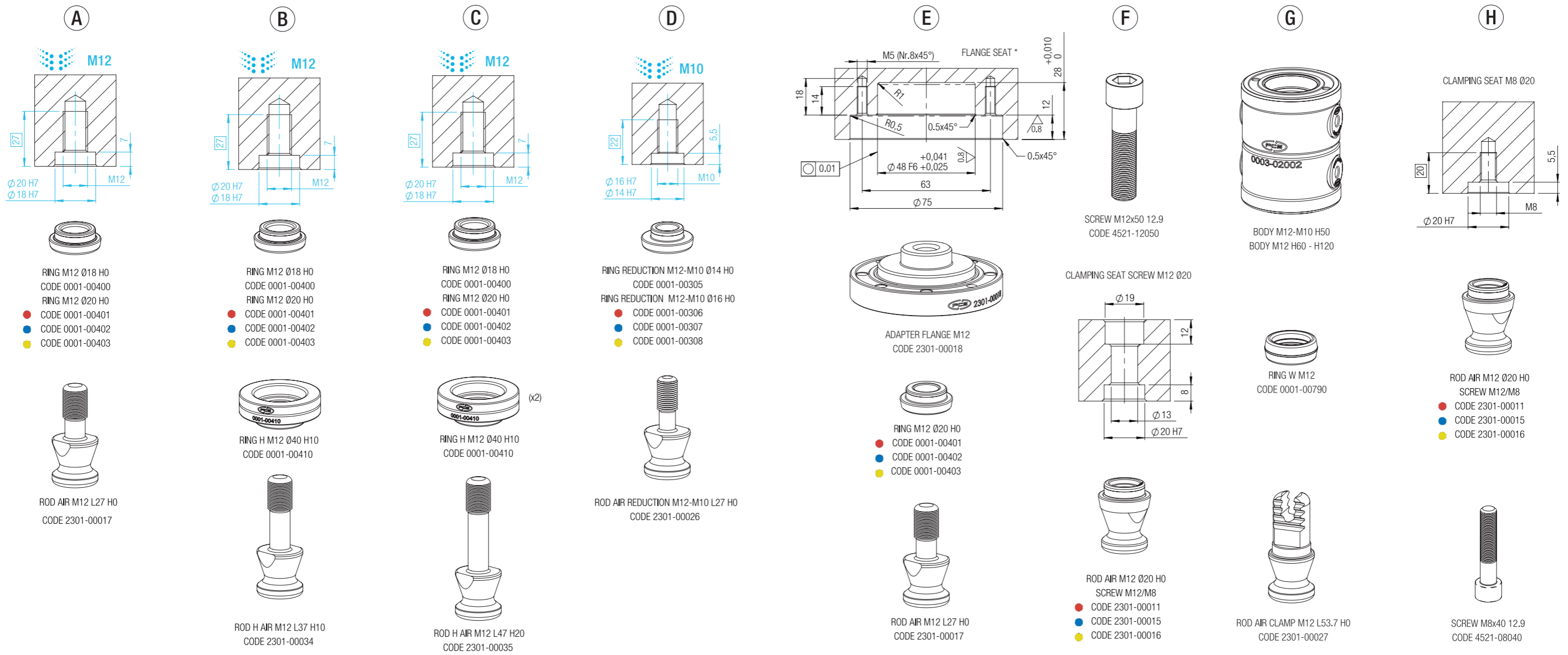
AUTOMATIC - MANUAL INTERCONNECTIONS

The automatic Modular clamps can be connected to the manual clamping components using specific Rods and Rings.



MODULAR M12 - DATA SHEET

MODULAR M12 - DATA SHEET



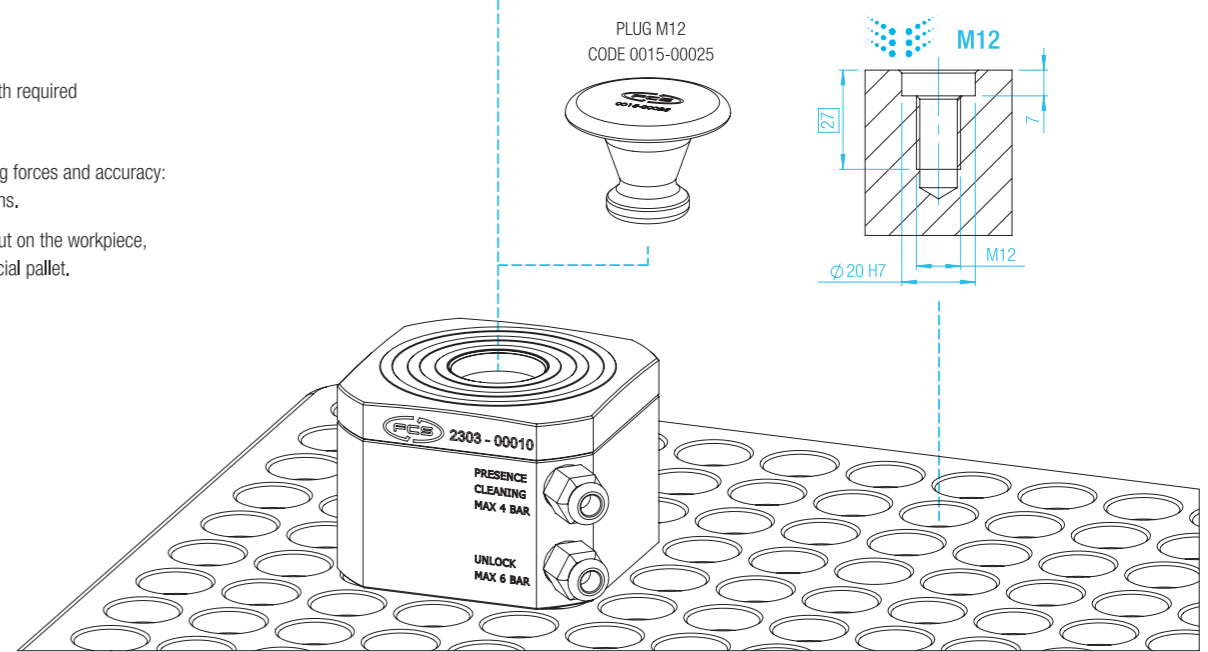
SET CODE: 2303-02650		TECHNICAL DATA																			
		<p>MIN. CLAMPING DISTANCE</p> <p>Min 75 (M12 grid step) Min 100 (M16 grid step)</p>																			
<p>THE SET INCLUDES</p> <table border="1"> <tr> <td>Nr.</td> <td>1</td> <td>MODULAR M12 H55</td> <td>CODE 2303-00010</td> </tr> <tr> <td>Nr.</td> <td>1</td> <td>RING M12 Ø20 H0</td> <td>CODE 0001-00401</td> </tr> <tr> <td>Nr.</td> <td>1</td> <td>SCREW M12x35 12.9</td> <td>CODE 4521-12035</td> </tr> </table>		Nr.	1	MODULAR M12 H55	CODE 2303-00010	Nr.	1	RING M12 Ø20 H0	CODE 0001-00401	Nr.	1	SCREW M12x35 12.9	CODE 4521-12035	<table border="1"> <tr> <td>UNLOCKING</td> <td>mechanical with pneumatic activation (6÷8 Bar)</td> </tr> <tr> <td>BLOWING</td> <td>6÷8 Bar (air), central outflow</td> </tr> <tr> <td>WEIGHT</td> <td>1.8 kg</td> </tr> </table>		UNLOCKING	mechanical with pneumatic activation (6÷8 Bar)	BLOWING	6÷8 Bar (air), central outflow	WEIGHT	1.8 kg
Nr.	1	MODULAR M12 H55	CODE 2303-00010																		
Nr.	1	RING M12 Ø20 H0	CODE 0001-00401																		
Nr.	1	SCREW M12x35 12.9	CODE 4521-12035																		
UNLOCKING	mechanical with pneumatic activation (6÷8 Bar)																				
BLOWING	6÷8 Bar (air), central outflow																				
WEIGHT	1.8 kg																				

Minimum seat length required

Tightening torques, clamping forces and accuracy: see the corresponding sections.

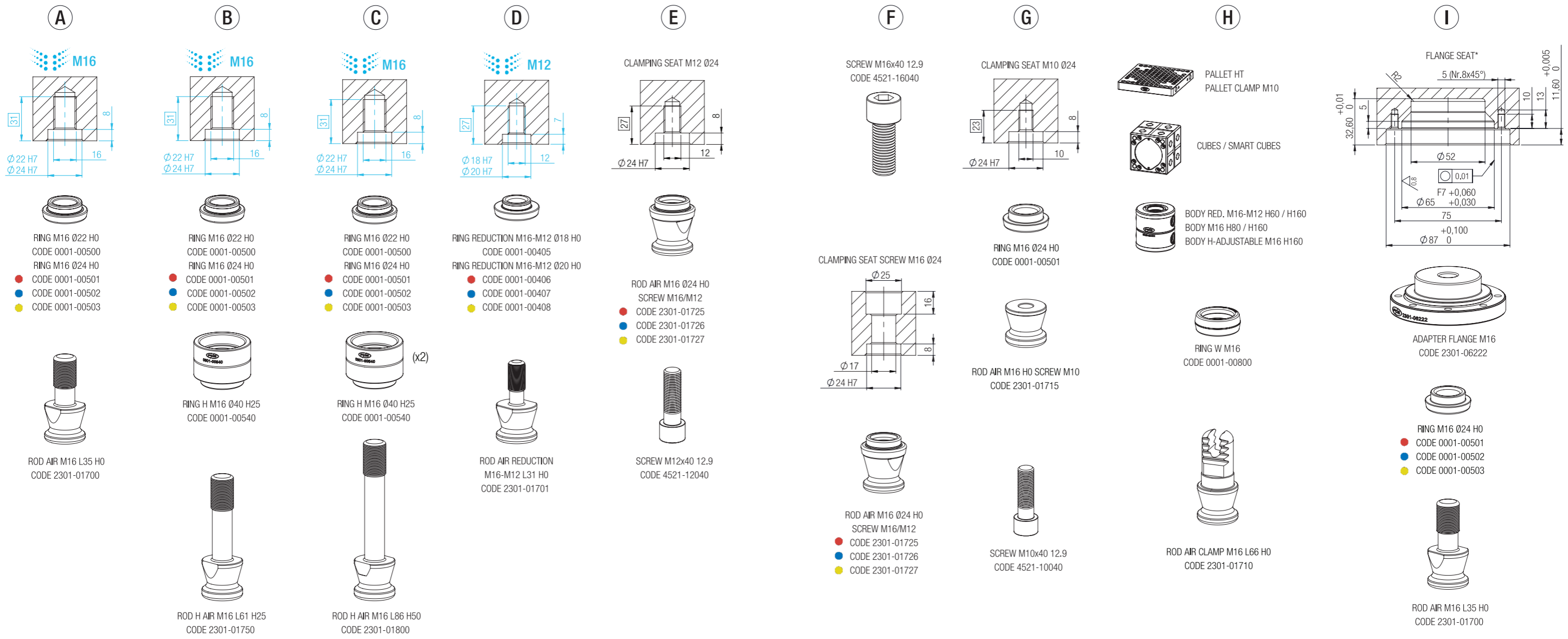
*Flange seat to be carried out on the workpiece, support equipment and special pallet.

- Centering
- Positioning
- Closing

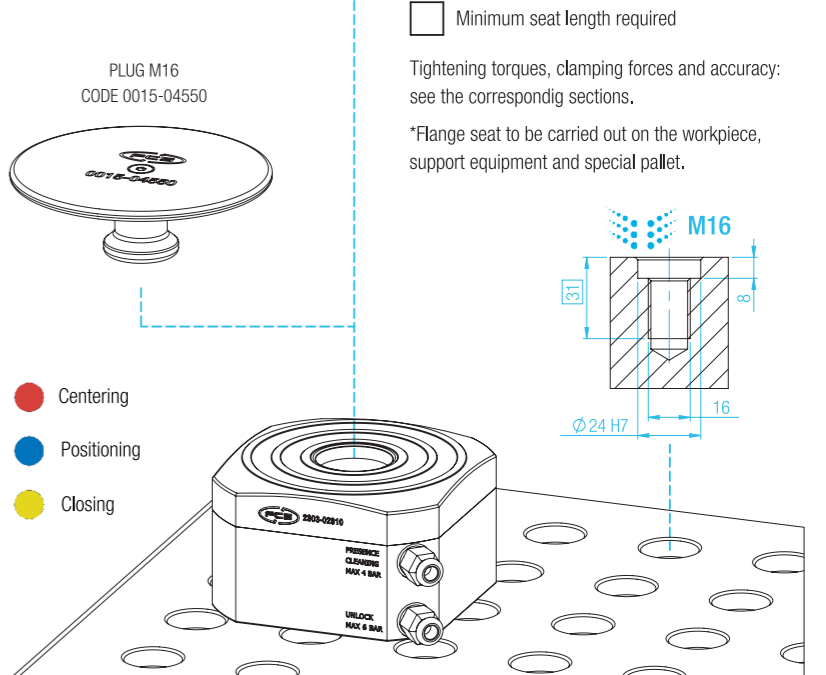
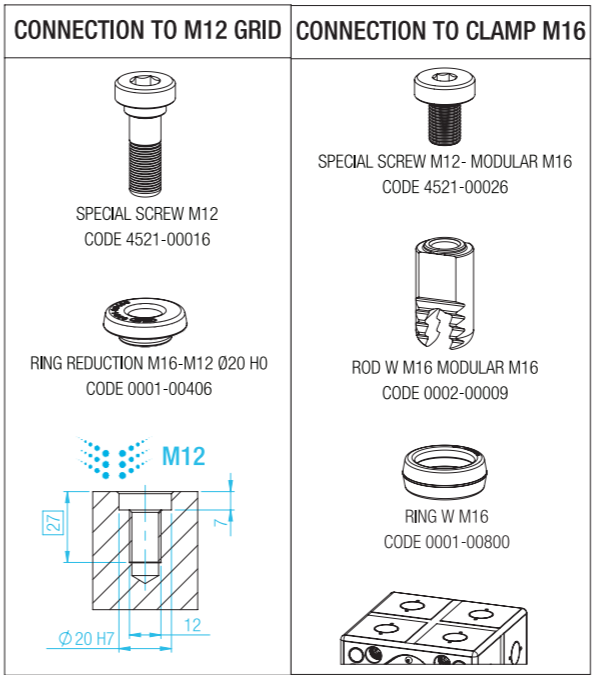


MODULAR M16 - DATA SHEET

MODULAR M16 - DATA SHEET

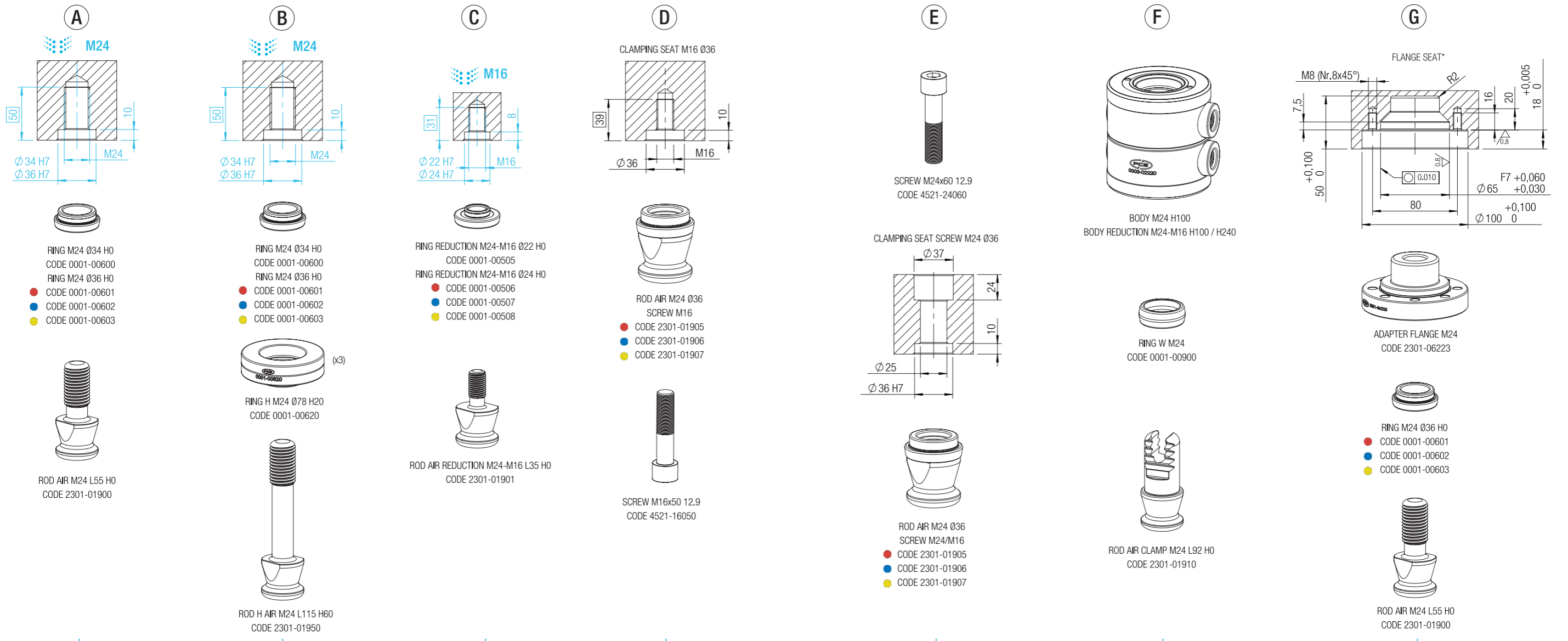


SET CODE: 2303-00006		TECHNICAL DATA	
THE SET INCLUDES			
Nr.	1	MODULAR M16 H60	CODE 2303-02810
Nr.	1	RING M16 Ø24 H0	CODE 0001-00501
Nr.	1	SCREW M16 SPECIAL	CODE 4521-00001
		UNLOCKING	mechanical with pneumatic activation (6÷8 Bar)
		BLOWING	6÷8 Bar (air), central outflow
		WEIGHT	3.5 kg

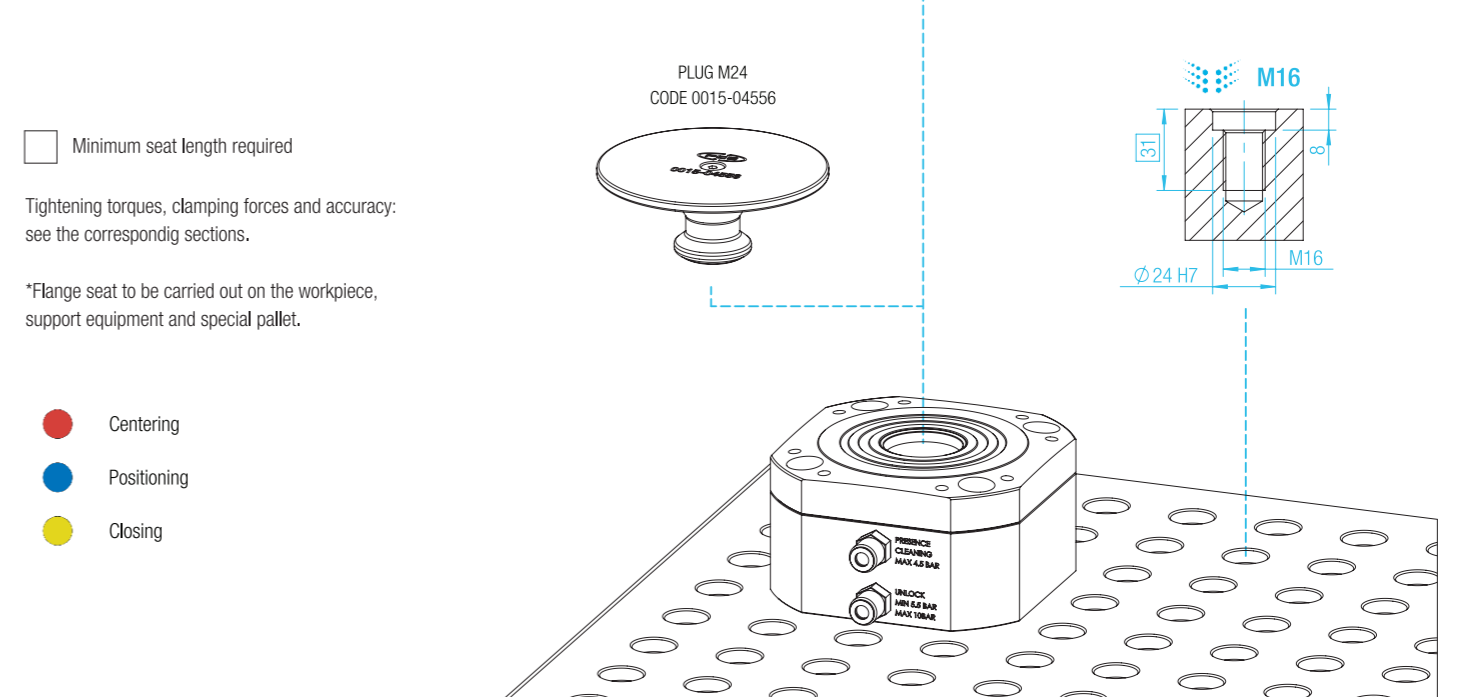


MODULAR M24 - DATA SHEET

MODULAR M24 - DATA SHEET



SET CODE: 2303-02830		TECHNICAL DATA	
THE SET INCLUDES		MIN. CLAMPING DISTANCE	
Nr.	1	MODULAR M24 H80	CODE 2303-02820
Nr.	1	RING M16 Ø24 H0	CODE 0001-00501
Nr.	4	SCREW M12x90 12.9	CODE 4521-12090
Nr.	4	REDUCTION M16-M12	CODE 4521-01612
		UNLOCKING	mechanical with pneumatic activation (6÷8 bar)
		BLOWING	6÷8 Bar (air), central outflow
		WEIGHT	9.3 kg



RODS	TORQUE (Nm)*
M10-M12	40
M12	40
M12-M16	40
M16	60
M16-M24	60
M24	60






SCREWS	TORQUE (Nm)*
M8 12.9	30
M12 12.9	60
M16 SPECIAL	60
M16 12.9	60
M24 12.9	80



*Reccomended value

CLAMP

Items	Description	Dimension	Code	SET Code
	MODULAR M12 H55	74,5x74,5 H55	2303-00010	2303-02650
	MODULAR M16 H60	99x99 H60	2303-02810	2303-00006
	MODULAR M24 H80	145x145 H80	2303-02820	2303-02830


RING

Items	Description	Dimension	Code	SET Code
	RING M12 Ø18 H0	-	0001-00400	
	RING M12 Ø20 H0	-	0001-00401 ●	
	RING M12 Ø20 H0 POSITIONING	-	0001-00402 ●	
	RING M12 Ø20 H0 CLOSING	-	0001-00403 ●	
	RING M16 Ø22 H0	-	0001-00500	
	RING M16 Ø24 H0	-	0001-00501 ●	
	RING M16 Ø24 H0 POSITIONING	-	0001-00502 ●	
	RING M16 Ø24 H0 CLOSING	-	0001-00503 ●	
	RING M24 Ø34 H0	-	0001-00600	
	RING M24 Ø36 H0	-	0001-00601 ●	
	RING M24 Ø36 H0 POSITIONING	-	0001-00602 ●	
	RING M24 Ø36 H0 CLOSING	-	0001-00603 ●	


MODULAR - INDEX

MODULAR - INDEX


RING H

Items	Description	Dimension	Code	SET Code
	RING H M12 Ø40 H10	Ø40 H10	0001-00410	
	RING H M16 Ø40 H25	Ø40 H25	0001-00540	
	RING H M12 Ø78 H10	Ø78 H60	0001-00610	


RING W

Items	Description	Dimension	Code	SET Code
	RING W M12		0001-00790	
	RING W M16		0001-00800	
	RING W M24		2301-00900	


RING REDUCTION

Items	Description	Dimension	Code	SET Code
	RING REDUCTION M12-M10 Ø14 H0	-	0001-00305	
	RING REDUCTION M12-M10 Ø16 H0	-	0001-00306 ●	
	RING REDUCTION M12-M10 Ø16 H0 POSITIONING	-	0001-00307 ●	
	RING REDUCTION M12-M10 Ø16 H0 CLOSING	-	0001-00308 ●	
	RING REDUCTION M16-M12 Ø18 H0	-	0001-00405	
	RING REDUCTION M16-M12 Ø20 H0	-	0001-00406 ●	
	RING REDUCTION M16-M12 Ø20 H0	-	0001-00407 ●	
	RING REDUCTION M16-M12 Ø20 H0	-	0001-00408 ●	
	RING REDUCTION M24-M16 Ø22 H0	-	0001-00505	
	RING REDUCTION M24-M16 Ø24 H0	-	0001-00506 ●	
	RING REDUCTION M24-M16 Ø24 H0 POSITIONING	-	0001-00507 ●	
	RING REDUCTION M24-M16 Ø24 H0 CLOSING	-	0001-00508 ●	


ROD H0

Items	Description	Dimension	Code	SET Code
	ROD AIR M12 L27 H0	H0 L27	2301-00017	
	ROD AIR M16 L35 H0	H0 L35	2301-01700	
	ROD AIR M24 L55 H0	H0 L55	2301-01900	

ROD H

Items	Description	Dimension	Code	SET Code
	ROD H AIR M12 L37 H10	H10 L37	2301-00034	
	ROD H AIR M12 L47 H20	H20 L47	2301-00035	
	ROD H AIR M16 L61 H25	H25 L61	2301-01750	
	ROD H AIR M16 L86 H50	H50 L86	2301-01800	
	ROD H AIR M24 L115 H60	H60 L115	2301-01950	


ROD REDUCTION

Items	Description	Dimension	Code	SET Code
	ROD AIR REDUCTION M12-M10 L27 H0	H0 L27	2301-00026	
	ROD AIR REDUCTION M16-M12 L32 H0	H0 L32	2301-01701	
	ROD AIR REDUCTION M24-M16 L35 H0	H0 L35	2301-01901	


MODULAR - INDEX

MODULAR - INDEX


ROD

Items	Description	Dimension	Code	SET Code
	ROD AIR M12 Ø20 H0	Ø20	2301-00011 ●	
	ROD AIR M12 Ø20 H0 POSITIONING	Ø20	2301-00015 ●	
	ROD AIR M12 Ø20 H0 CLOSING	Ø20	2301-00016 ●	
	ROD AIR M16 Ø24 H0	Ø24	2301-01725 ●	
	ROD AIR M16 Ø24 H0 POSITIONING	Ø24	2301-01726 ●	
	ROD AIR M16 Ø24 H0 CLOSING	Ø24	2301-01727 ●	
	ROD AIR M24 Ø36 H0	Ø36	2301-01905 ●	
	ROD AIR M24 Ø36 H0 POSITIONING	Ø36	2301-01906 ●	
	ROD AIR M24 Ø36 H0 CLOSING	Ø36	2301-01907 ●	


ROD MANUAL

Items	Description	Dimension	Code	SET Code
	ROD AIR CLAMP M12 L53,7	L53,7	2301-00027	
	ROD AIR CLAMP M16 L66	L66	2301-01710	
	ROD AIR CLAMP M24 L92	L92	2301-01910	

ROD

Items	Description	Dimension	Code	SET Code
	M16 W (FOR MODULAR M16)	-	0002-00009	

ADAPTER FLANGE

Items	Description	Dimension	Code	SET Code
	ADAPTER FLANGE M12		2301-00018	
	ADAPTER FLANGE M16		2301-06222	
	ADAPTER FLANGE M24		2301-06223	

ACCESSORIES

Items	Description	Dimension	Code	SET Code
	SCREW M8x40 12.9		4521-08040	
	SCREW M12x35 12.9		4521-12035	
	SCREW M12x40 12.9		4521-12040	
	SCREW M12x50 12.9		4521-12050	
	SCREW M12x90 12.9		4521-12090	
	SCREW M16x40 12.9		4521-16040	
	SCREW M16x50 12.9		4521-16050	
	SCREW M24x60 12.9		4521-24060	
		SPECIAL SCREW M16		4521-00001
	REDUCTION M16-M12		4521-01612	
	SPECIAL SCREW M12 (FOR MODULAR M16)		4521-00026	
	PLUG M12		0015-00025	
	PLUG M16		0015-04550	
	PLUG M24		0015-04556	
	PLUG BASE	Ø20	0015-04501	
		Ø24	0015-04500	
	PULLER PLUG		0015-04800	
	PULLER RING		0014-04600	
	ADAPTERS	SYSTEM M12	0014-04640	
	ADAPTERS	SYSTEM M24	0014-04650	



Integrated systems for production

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