



Automated assembly solutions

INSTRUCTION MANUAL

Radial riveting machine RR-12 and options UC, UR, CE and PB



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Version 4.5

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1. Introduction

Please read this instruction manual carefully before start operating the machine.

This manual contains the necessary information to get the knowledge of the machine you have acquired and get its best performance.

It also contains information about how to set up, start up, maintenance, information about riveting tools, safety instructions ... All will make your riveting machine an accurate and reliable one.

We hope this information will enable you the knowledge about the machine to give answer to most of your questions; nevertheless, if you require any further assistance do not hesitate to contact our technical staff.

We really thank you for choosing **AGME RADIAL RIVETING MACHINES**.

NOTES:

- All the information included is the property of **INDUSTRIAS AGME, S.A.** and can not be reproduced or passed to third parties.
- **INDUSTRIAS AGME, S.A.** reserves the right to modify this manual without prior notice.
- The measurements and dimensions shown on the drawings are just indicative.

1.1. Symbols



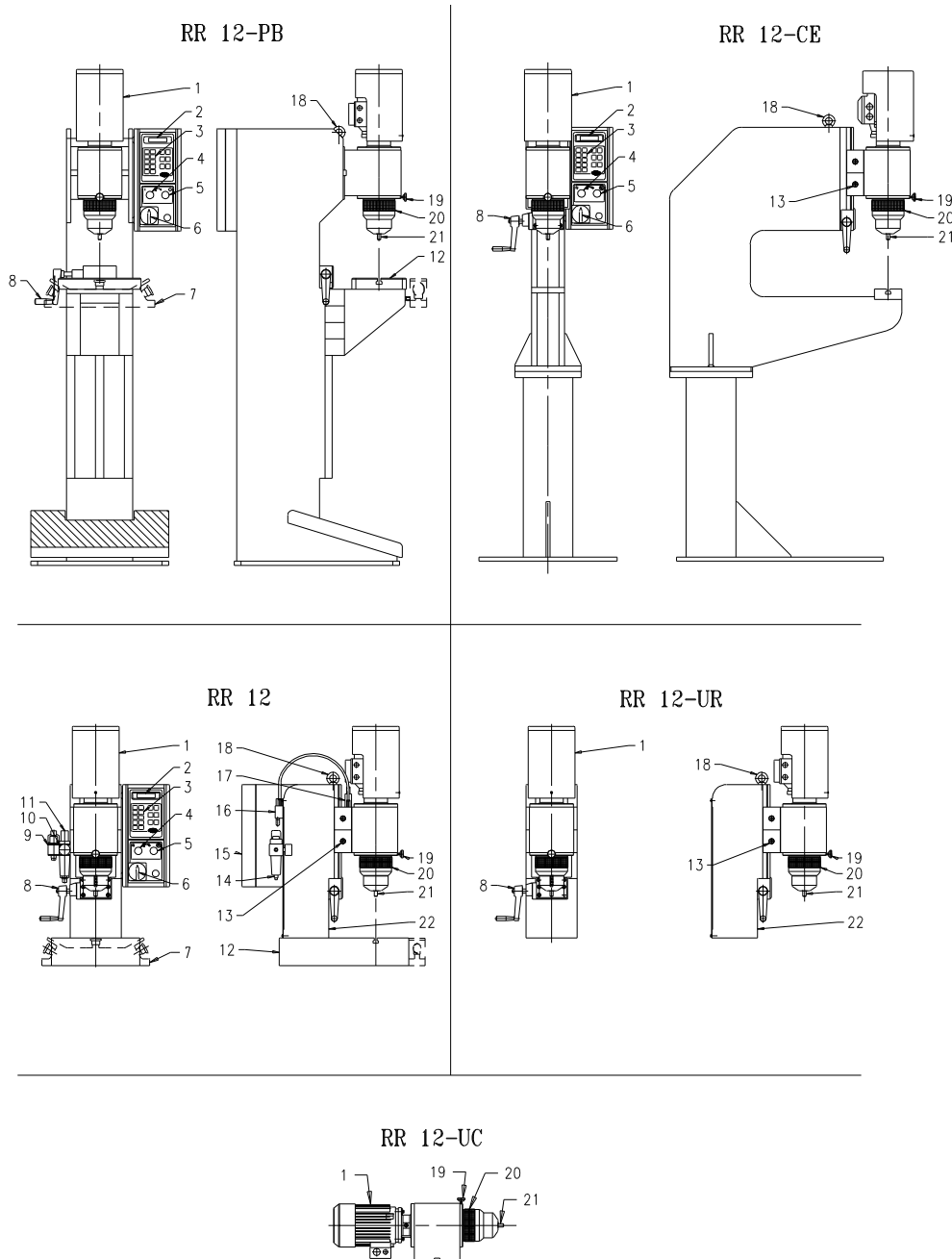
Please make a proper use of the machine to get its best performance.



Be aware of a great risk for the machine if manual operations are not made according specifications.

2. Product description

2.1. Main components



NUMBER	DESCRIPCIÓN	NUMBER	DESCRIPCIÓN
1.	RIVETING MOTOR HEAD	12.	BASE
2.	DISPLAY SCREEN	13.	HEIGHT ADJUSTER
3.	KEYBOARD	14.	WATER PURGUE
4.	START BUTTON	15.	ELECTRIC CABINET
5.	STOP BUTTON	16.	ELECTROVALVE
6.	GENERAL SWITCH	17.	SPEED REGULATION
7.	TWO HAND SAFETY CONTROL	18.	EYE BOLT FOR TRANSPORT
8.	HEIGHT ADJUSTMENT CRANK HANDLE	19.	HEIGHT ADJUSTMENT LOCKING SCREW
9.	CUT OFF VALVE	20.	HUNDREDTH ADJUSTMENT
10.	PRESSURE GAUGE	21.	RIVETING TOOL
11.	PRESSURE ADJUSTER	22.	COLUMN

2.2. Technical characteristics

		RR 12	CE	PB	UR	UC
Working capacity *	mm	2-12				
Electric system	V / Hz	220/380 /440, 50/60				
Riveting motor power	kW	0,55				
Total installed capacity	kW	0.70			0.55	
Control circuit	V DC	24				
Maximum working pressure	bar	6				
Riveting time	Sc	0.1 - 5				
Riveting stroke	Mm	5-40				
Distance between base and head	Mm	65 - 230				
Base size	Mm	320 x 290		300x200		
Distance between head and column	Mm	170	500	170	170	
Two hand safety switch		✓	✓	✓	*	*
Parts counter		✓	✓	✓	*	*
Stroke adjustment in hundredths		✓	✓	✓	✓	✓
Dimensions	cm	94.5x60.5x47	185x84x50	180x66.5x54.5	84.5x47x42	61.6x21x16
Weight	Kg	168	200	385	130	30

* Rivet head diameter in **39 kg/mm²** steel.

Optional extras

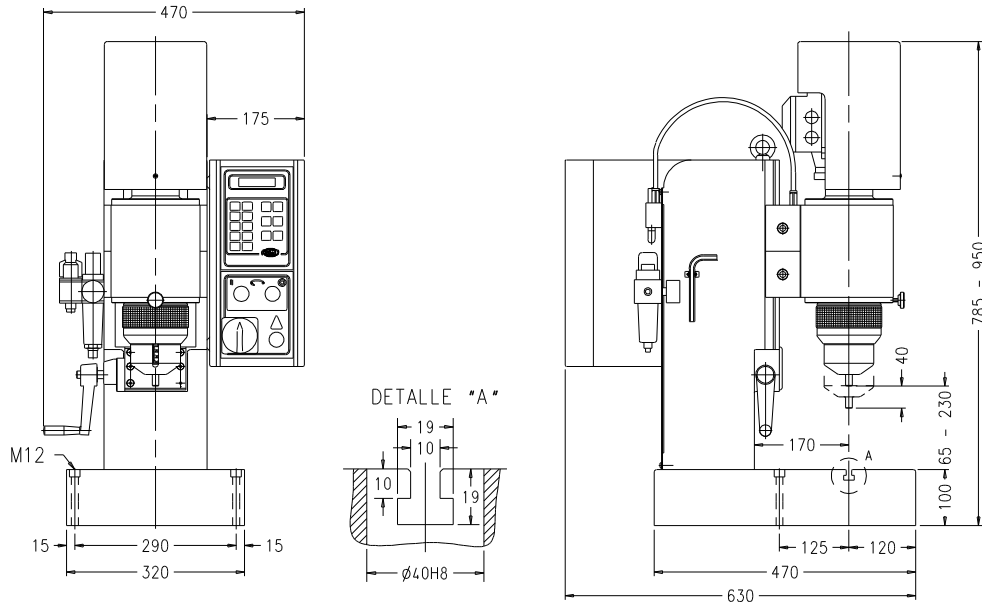
- Riveting fixtures
- Hold down device
- Multi head riveting machine
- Different riveting tools
- Work lighting
- Electronic pressure control
- Advanced position detector
- Heads for different radius and lengths of riveting tools.
- Automatic lubrication.

Accessories supplied

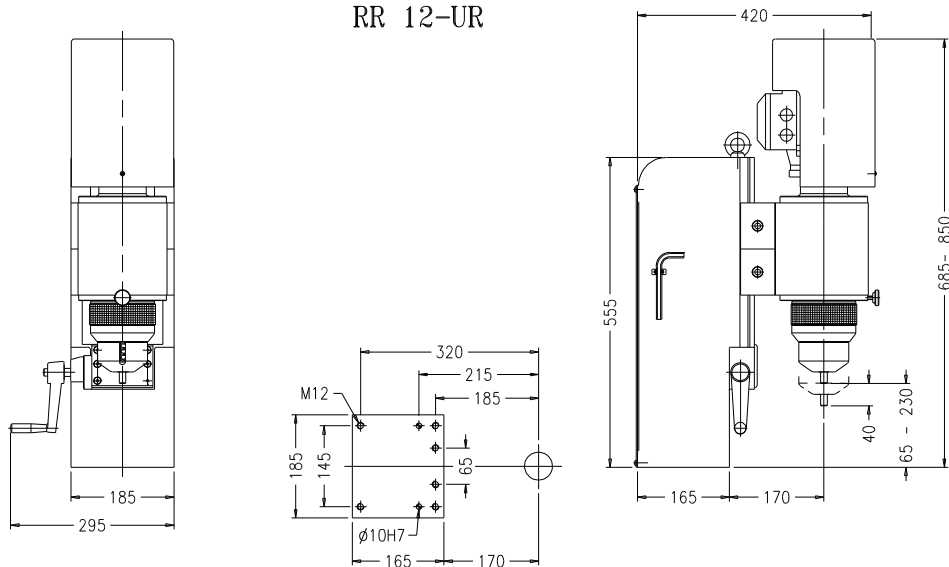
Description	Qty.
12x12 crank handle	1
M12x130 DIN912 screws	2
Allen 10mm key	1
Grease tube	1
Pressure pump	1

2.3. General dimensions

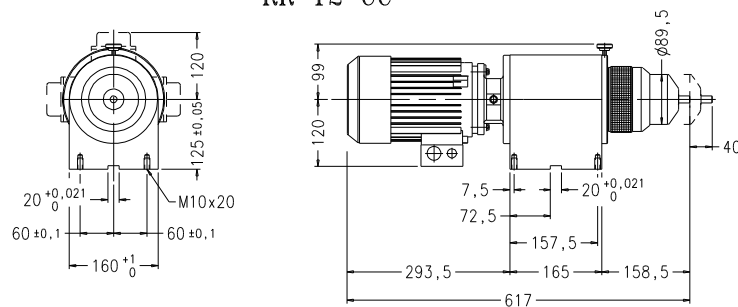
RR 12



RR 12-UR

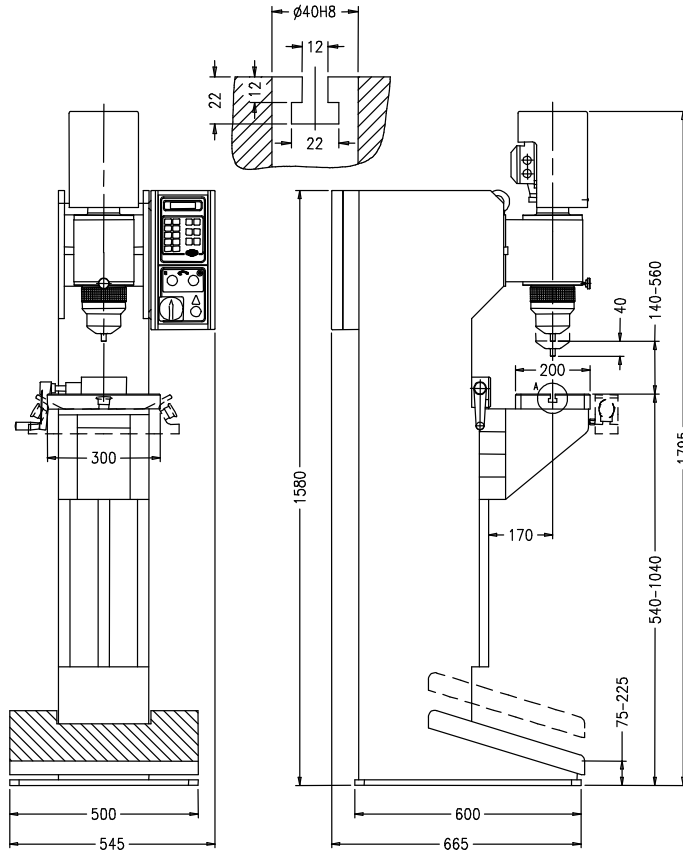


RR 12-UC

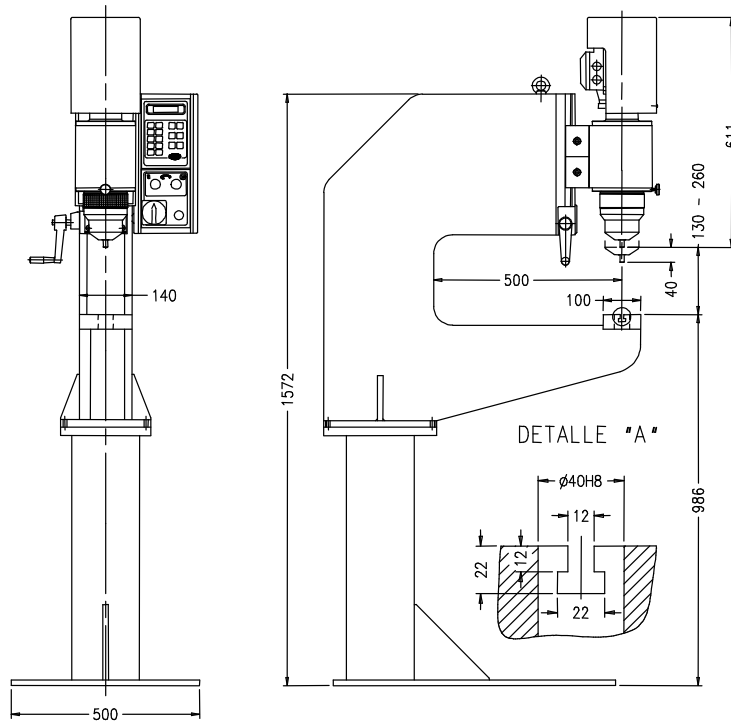


RR-12 PB

DETALLE "A"



RR-12 CE



3. Installation and operation

3.1. Requirements

Handling and operations must be carried out by qualified personnel, with enough mechanical and electrical knowledge to develop this job.

3.2. Acceptance

Prior to acceptance, customer must check riveting machine to be complete and without damage. AGME should be informed immediately of any defect found. Radial riveting machine should not be started up without repairing all the defects found.

3.3. Installation of RR-12

The machine is designed to be used on a workbench which should be strong enough to support a 175 kg weight.

We recommend, following the workplace ergonomic rules, to design the workbench with a height between 800 and 900 mm (tooling height included).

Once the machine is correctly placed, secure it to the workbench with the M12x130 screws provided with the machine located in the base plate.

It is necessary to leave at least 1 meter of empty space at both sides and back of the machine to ease the maintenance operations.

3.4. Installation of UC (Head Unit)

The machine has been designed to be installed in any position, whether horizontal, vertical or inclined.

As most recommended position, the riveting should be carried out always downwards, either in vertical, either in a inclined position. However, when the riveting position must be either vertical or inclined upwards, special care must be taken to protect the riveting head against the impurities, using i.e. accessory (hood) to be installed at the riveting tool. This hood is an optional that should be ordered apart of the machine.

The unit should be positioned on a mechanized base plate and two grooves with its corresponding cotters, to be later fixed with 4 M10 screws.

3.5. Installation of UR (Radial Unit)

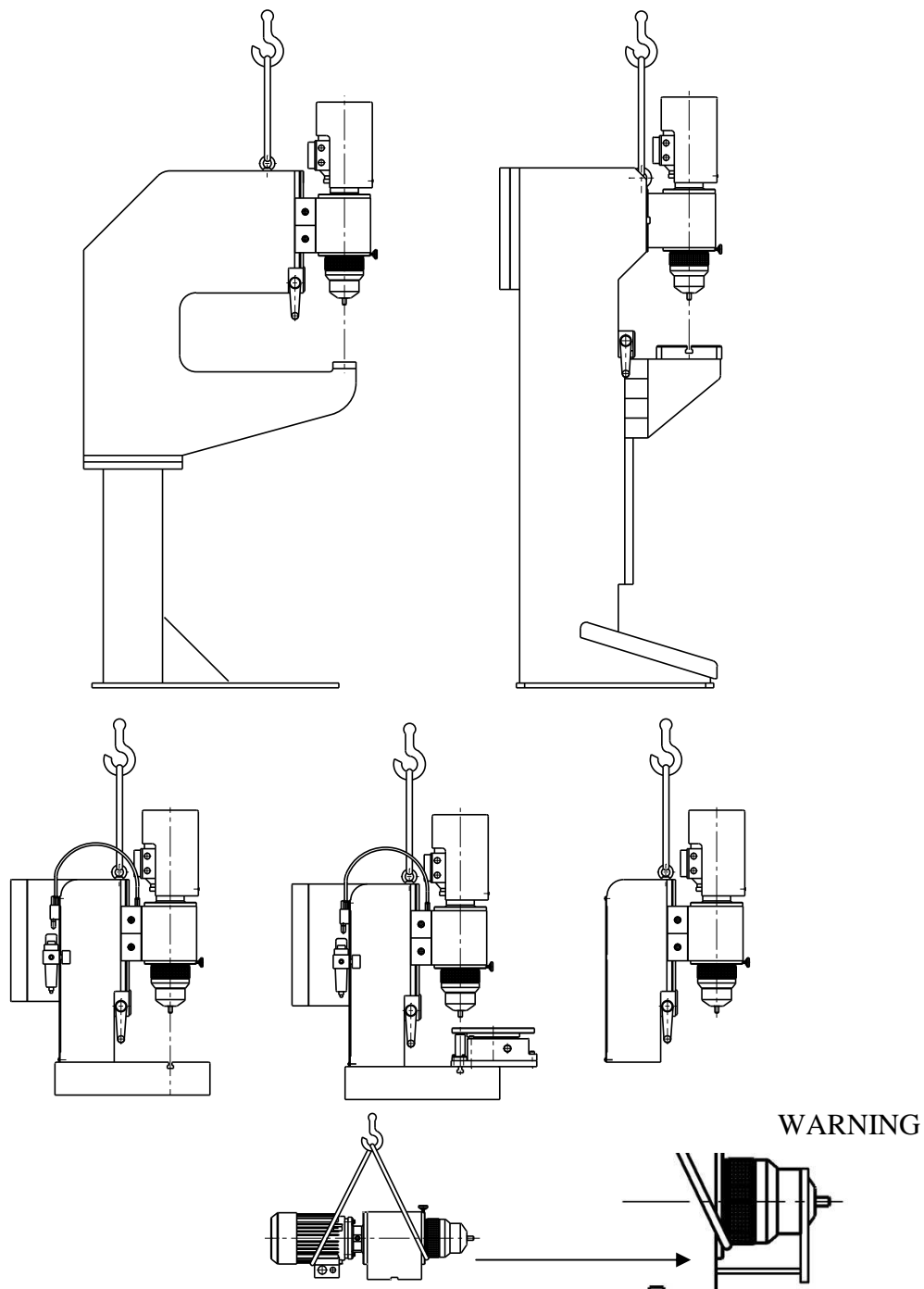
Six M12 x 45 screws and two 10 x 50 bolts will be used to fix i.e. unit according to its particular dimensions.

3.6. Installation of CE (Special Collar) and PB (Base Plate)

The machine can be placed on the floor and depending of the conditions of the area and in order to improve its stability, the machine can be placed on anti-vibration blocks or, fixed to the floor by bolts.

3.7. Transport

A removable **eye-bolt** is provided at the top of the column for lifting the machine (see section 2.1, number 18). Please ensure this eye-bolt is firmly tightened before lifting.



3.8. Pneumatic installation

The pneumatic connection must be made to the 1/4" G thread receptacle located on the left hand side of the machine, at the **cut off valve** (or pneumatic energy disconnection valve) (see section 2.1 – number 9).

The air pressure input must be no higher than 6 Kg/cm².

The pneumatic unit includes:

- Cut off or disconnection valve.
- Water separator filter with semi-automatic draining.
- Pressure regulator with pressure gauge.

The turning the key of the **cut off valve** (see section 2.1 – number 9) lets the compressed air flow. The output pressure of the air can be adjusted by the **pressure adjuster** (11) and is shown in the **pressure gauge** (10). The service pressure should be fixed between 1,5 and 6 Kg/cm²

Beneath the pressure regulator it is placed the water separator which is drained automatically when the air pressure drops below 0.2 Kg/cm²

It can also be manually drained by slightly pressing the **water purge** (see section 2.1 – number 14).

3.9. Pneumatic system

Turn the **cut off valve** key (section 2.1 – number 9) to let the compressed air flow. The maximum working pressure must not exceed 6 Kg/cm² in the pressure gauge (10).

3.10. Adjustments

3.10.1. Introduction

Before any adjustments, lift the riveting head with the help of the **crack handle** (section 2.1 – number 8). Before this operation, release the two **screws** (13) leaving the enough space for the tooling and for the placement of the parts.



IMPORTANT NOTE : fasten the two blocking screws of the vertical movement of the head. If this operation is not carried out, it could lead to the deterioration of the elevator spindle and other components.

Once the start up of the machine is made the **display screen** (section 2.1 – number 2) will indicate the working mode.

3.10.2. Height adjustment (approximate)

Release the two **vertical blocking screws** (see section 2.1 – number 13) and the whole riveting unit could be moved to the most appropriate vertical position with the help of the **crank** (number 8).



IMPORTANT NOTE: before carrying out any cycle, fasten the two blocking screws (see section 2.1 number 13). If this operation is not carried out, it could lead to the deterioration of the elevator spindle and/or other components.

Once the head is correctly positioned and blocked, we will be able to watch the distance between the table and the head, and to make a note of that value in the electric, if necessary (see 2.1.12 of the electric appendix). This value is shown at the meter placed at the **crank** (see section 2.1 number 8).

3.10.3. Working stroke adjustment

The adjustment is made turning the **adjusting ring** (section 2.1, number 20) after releasing the **locking screw** (number 19).

Each full turn is 2 mm. and each division 0,01 mm.

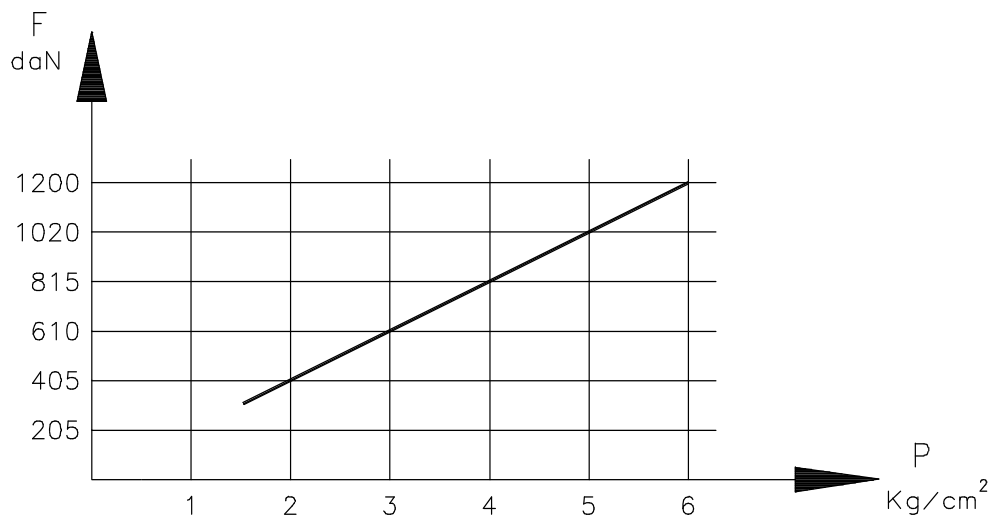
The adjustment should be made gradually during the riveting process until the desired results are obtained. The maximum adjustment is 40 mm. And the riveting stroke should be kept as short as possible. This will enable a shorter riveting time and will increase the operator safety.

The appropriate value can be saved according to the content (2.1.12) of the electric appendix.

3.10.4. Working pressure adjustment

Riveting pressure can be modified adjusting the pneumatic pressure with the **pressure adjuster** (see section 2.1 – number 11). This adjuster is fixed to avoid any unwanted manipulation.

Turning this valve, the pneumatic oil pressure can be adjusted from 1,5 to 6 Kg/cm², getting values of the force as shown at the below table. The appropriate value can be saved according to the content (2.1.12) of the electric appendix.



3.10.5. Riveting speed adjustment

The **speed regulating valve** (see section 2.1 – number 17) allows the adjustment of the speed of the riveting head.

The graduated knob is fixed to avoid any unwanted manipulation; to unfix, pull the knob.

Turning the knob clockwise, the riveting speed decreases.. This regulation is specially useful to avoid the deformation of axles with small diameters or fragile pieces to be riveted. (see as well content 5.4).

Once the most appropriate speed has been selected,, the regulation knob must be again fixed by pressing on the knob; this speed can be saved according to the content (2.1.12) of the electric appendix.

3.10.6. First cycles

To the riveting tool displacement once of the most appropriate working conditions have been selected using the function keys as well as height, pressure and speed adjustments have been done, the machine will be operative to run the first cycles, using the bimanual control or the pedal (optional).

4. Riveting tools shape

4.1. Introduction

Each riveting tool has a specific shape, depending of the type of the rivet head that must be obtained. Riveting tools can be:

- Conical (the most usual).
- Flat
- Convex.

There is a list with codes (see content 4.4.).

Riveting tool is fixed and taken out manually or making use of some pincers.

This machine is equipped with a magnet to keep the riveting tool. In case you have any riveting tool with a joint, you must take out this joint in order to fix this tool correctly.

4.2. Riveting tools length

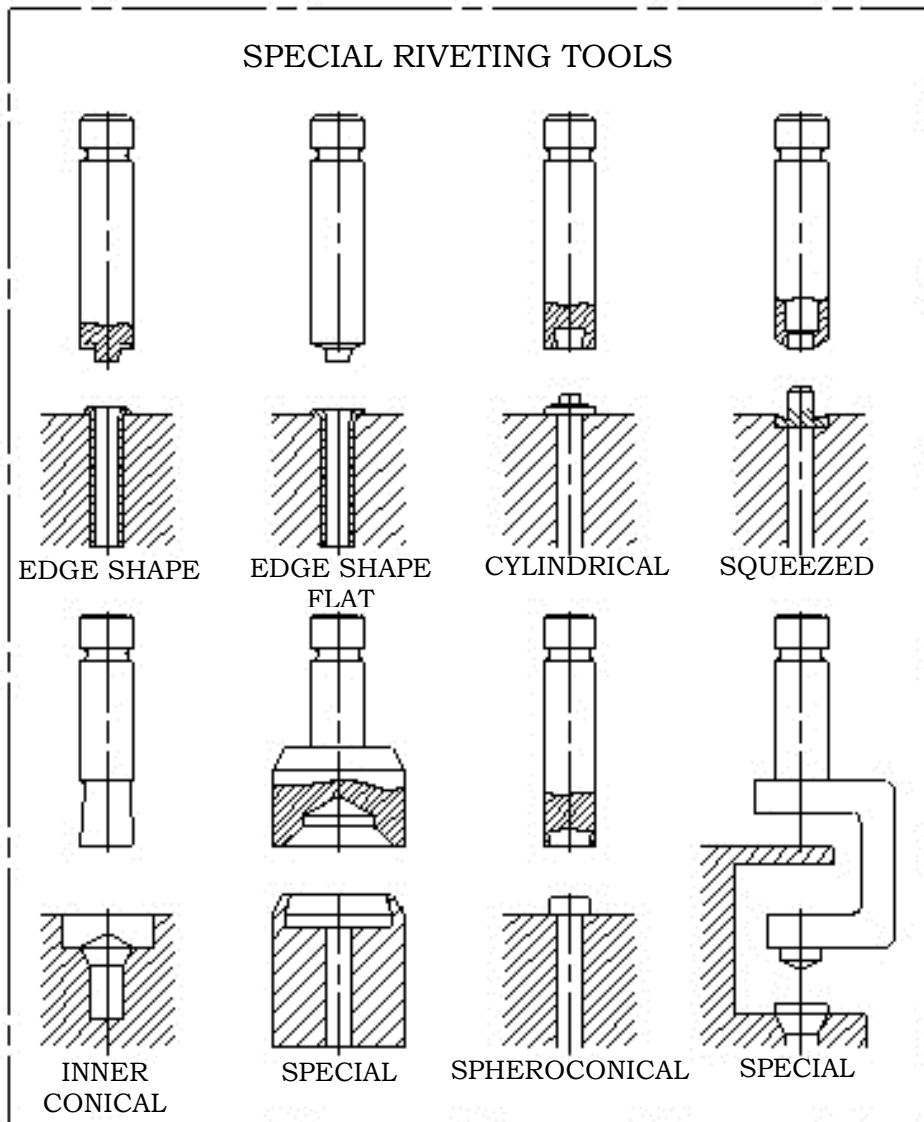
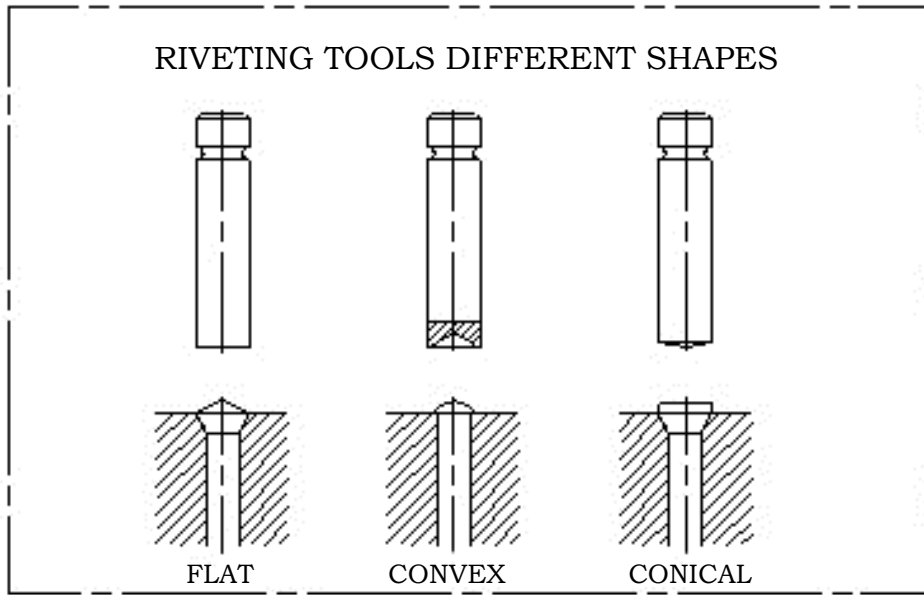
The standard riveting tool is 44 mm. long, but when less accessible parts must be riveted, there are options with riveting tools with lengths from 65 to 85 mm. For these cases, keep in mind that the cup and the toolholder must also be changed.



IMPORTANT NOTE: Riveting tools lengths must always be kept under the mentioned figures. The centre of the end of the riveting tool must exactly fit with the main axle of the riveting machine.

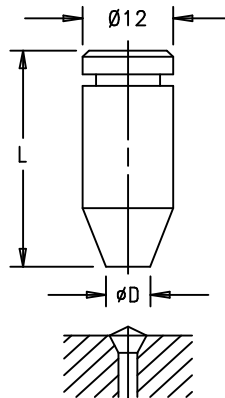
The non fulfilment of the above note will result in a poor riveting performance and can cause the deterioration of some of the components of the machine.

4.3. Riveting tools different shapes



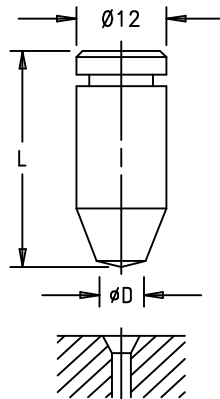
4.4. Standard riveting tools

FLAT RIVETING TOOL

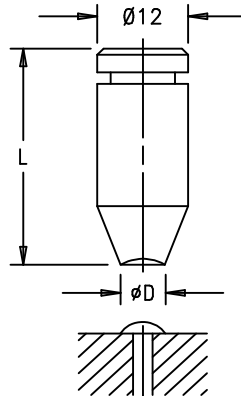


D	L=44	L=65	L=85
1	1.01.001.331	1.01.001.343	1.01.001.355
2	1.01.001.332	1.01.001.344	1.01.001.356
3	1.01.001.333	1.01.001.345	1.01.001.357
4	1.01.001.334	1.01.001.346	1.01.001.358
5	1.01.001.335	1.01.001.347	1.01.001.359
6	1.01.001.336	1.01.001.348	1.01.001.360
7	1.01.001.337	1.01.001.349	1.01.001.361
8	1.01.001.338	1.01.001.350	1.01.001.362
9	1.01.001.339	1.01.001.351	1.01.001.363
10	1.01.001.340	1.01.001.352	1.01.001.364
11	1.01.001.341	1.01.001.353	1.01.001.365
12	1.01.001.342	1.01.001.354	1.01.001.366

CONICAL RIVETING TOOL



D	L=44	L=65	L=85
1	1.01.001.367	1.01.001.379	1.01.001.391
2	1.01.001.368	1.01.001.380	1.01.001.392
3	1.01.001.369	1.01.001.381	1.01.001.393
4	1.01.001.370	1.01.001.382	1.01.001.394
5	1.01.001.371	1.01.001.383	1.01.001.395
6	1.01.001.372	1.01.001.384	1.01.001.396
7	1.01.001.373	1.01.001.385	1.01.001.397
8	1.01.001.374	1.01.001.386	1.01.001.398
9	1.01.001.375	1.01.001.387	1.01.001.399
10	1.01.001.376	1.01.001.388	1.01.001.400
11	1.01.001.377	1.01.001.389	1.01.001.401
12	1.01.001.378	1.01.001.390	1.01.001.402

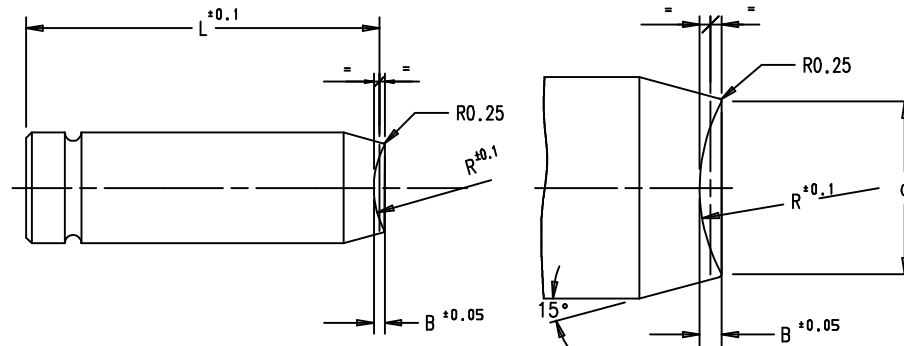
CONVEX HEAD RIVETING TOOL

D	L=44	L=65	L=85
1	1.01.001.403	1.01.001.415	1.01.001.427
2	1.01.001.404	1.01.001.416	1.01.001.428
3	1.01.001.405	1.01.001.417	1.01.001.429
4	1.01.001.406	1.01.001.418	1.01.001.430
5	1.01.001.407	1.01.001.419	1.01.001.431
6	1.01.001.408	1.01.001.420	1.01.001.432
7	1.01.001.409	1.01.001.421	1.01.001.433
8	1.01.001.410	1.01.001.422	1.01.001.434
9	1.01.001.411	1.01.001.423	1.01.001.435
10	1.01.001.412	1.01.001.424	1.01.001.436
11	1.01.001.413	1.01.001.425	1.01.001.437
12	1.01.001.414	1.01.001.426	1.01.001.438

**IMPORTANT NOTE:**

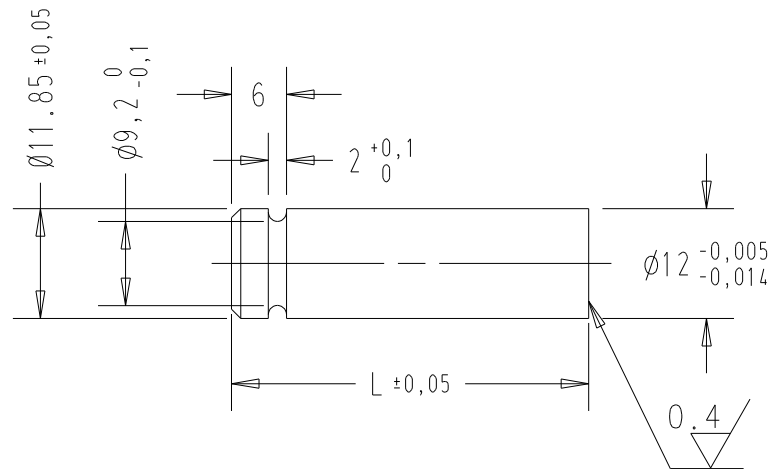
- 44 mm. long riveting tools are assembled on tool holders with code 1.01.003.386, pressure cups with code 1.01.002.385, with radius = 065 mm, nose with code 1.01.003.092 and spring with code 1.01.002.388
- 65 mm. long riveting tools are assembled on tool holders with code 1.01.002.395, pressure cups with code 1.01.002.396, with radius = 085 mm, nose with code 1.01.003.092 and spring with code 1.01.002.388
- 85 mm. long riveting tools are assembled on tool holders with code 1.01.002.397, pressure cups with code 1.01.002.398, with radius = 105mm, nose with code 1.01.003.092 and spring with code 1.01.002.388

4.5. Riveting tool shape for convex head rivets



d	R	B
2	2	0.15
2.5	3	0.17
3	3.5	0.23
3.5	4	0.29
4	5	0.32
4.5	5.5	0.38
5	6	0.44
5.5	6.5	0.50
6	7	0.57
6.5	8	0.59
7	8.5	0.65
7.5	9	0.71
8	10	0.73
8.5	10.5	0.80
9	11.5	0.82
9.5	12	0.88
10	13	0.90
10.5	13.5	0.96
11	14.5	0.99
11.5	15	1.05
12	16	1.07

4.6. Riveting tools manufacturing: dimensions



4.7. Riveting tools manufacturing materials



IMPORTANT NOTE:

L=44 only with cup 1.01.002.385 and tool holder 1.01.002.386

L=65 only with cup 1.01.002.396 and tool holder 1.01.002.395

L=85 only with cup 1.01.002.398 and tool holder 1.01.002.397.

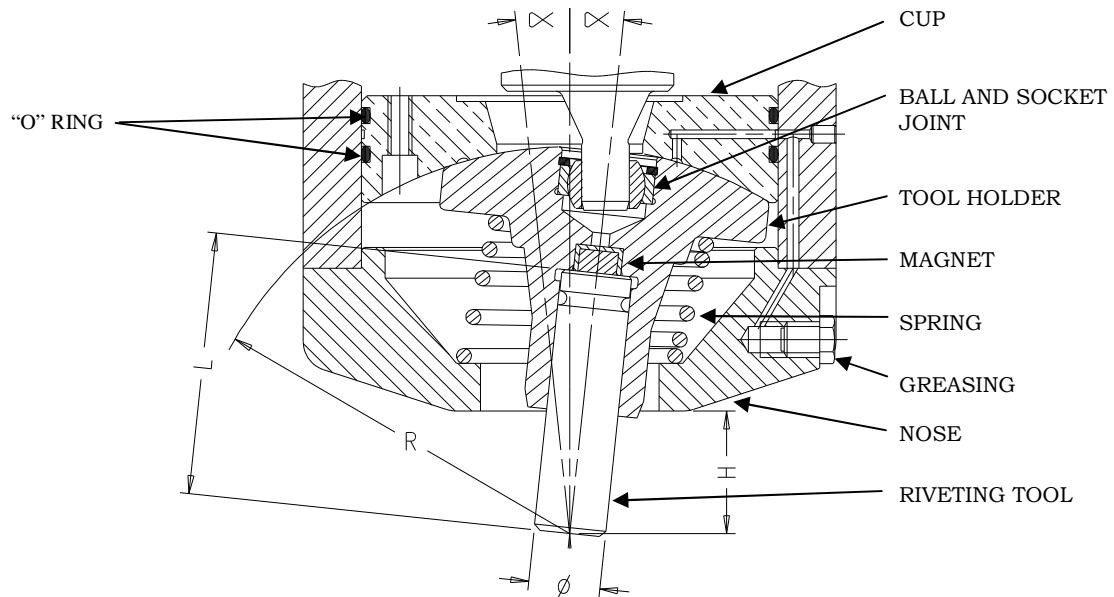
STANDARDS	DENOMINATION
DIN	S 6-5-2 N°1.3343
UNE	F-5603 6-5-2
SAE	M2
AFNOR	Z 85WDCV 06-05-04-02

COMPOSITION %								
C	Si	Mn	P	S	CR	Mo	V	W
0.86-0.94	≤ 0.45	≤ 0.40	≤ 0.030	≤ 0.030	3.8-4.5	4.7-5.2	1.7-2.0	6.0-6.7

EQUIVALENTS			
PATRICIO ECHEVERRIA	PHOENIX BOHLER	THYSSEN	UDDEHOLM
RMO	S.600	THY RAPID 3343	UHB 29

HEAT TREATMENT		
HARDENING	TEMPERING	HARDNESS
1200-1240°	540-560°	63-65 HRc

4.8. Different radius



NOTE: Unless customer different requirement, the RR-12 head will always be Standard with the following specifications:

Radius R=65mm, Riveting tool length L=44 and Riveting tool Ø=12.

	STANDARD		
MACHINE	RR-12		
Ø RIVETING TOOL	Ø12		
R	65	85	105
L	44	65	85
H	20	40	60
ANGLE α	6°	4°30'	3°30'
CUP	1.01.002.385	1.01.002.396	1.01.002.398
TOOL HOLDER	1.01.002.386	1.01.002.395	1.01.002.397
NOSE	1.01.003.092		
SPRING	1.01.002.388		
"O" RING	21.140.11.0065 (OR2006600-N70)		
BALL AND SOCKET JOINT	21.100.25.0006 (GE 8 E)		
SEGGER WASHER	21.100.30.0001 (BR-16)		
MAGNET	21.300.14.0002 (IMA 8 SCB)		
GREASING	23.130.19.0001 (AT-873 M6x1)		

5. Different riveting methods

5.1. Mechanical stop

Adjust the riveting stroke head with the **adjusting ring** (see section 2.1 – number 20).

This kind of riveting is commonly used when a constant riveting height is required.

5.2. Without mechanical stop

When the riveting height admits large tolerances, mechanical stop riveting is not necessary and it is usual to work with a programmed riveting time. For this kind of riveting it is very important select a correct pressure and riveting time.

5.3. High pressure

For absolutely rigidity riveting conditions (big mechanical needs) a high riveting pressure must be applied. This will give short cycle times and will reduce riveting tool wear.

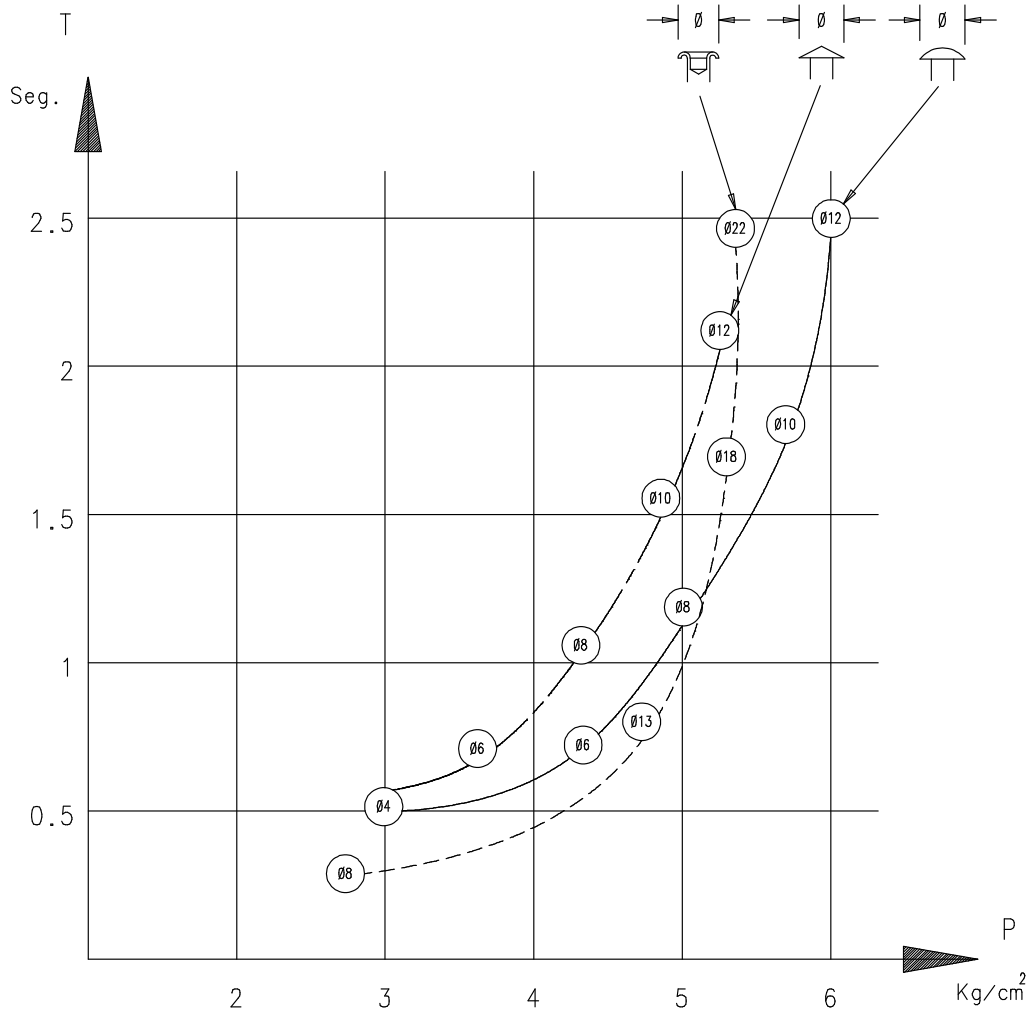
5.4. Low pressure

It is used when a non flatted riveting is needed, fragile parts must be riveted or when the mobility of the riveted parts must be guaranteed. On these cases, a low pressure must be applied and a longer riveting time will be needed.

5.5. Hold down device (optional)

When the parts must to be pressed prior to riveting, a hold down device must be fitted to the spindle of the machine.

5.6. Riveting pressure and time for rivets of 39 Kg/mm²



6. General advices

6.1. Introduction

- We strongly recommend to reduce the riveting stroke to the minimum; this will enable a saving on riveting time as well as an increase on safety conditions.
- In order to avoid a machine overheating, riveting times must be settled to the real riveting conditions, thus avoiding unnecessary times of working.
- If the riveting job requires both long riveting time and high pressure, it is necessary to program a non working time at least double as the riveting time.

6.2. Noise level

The equivalent continuous noise pressure “A” at the operator work station is less than 70 dBA.

Level for the steady instant acoustic pressure “C” at the operator work station is less than 130 dBC.

6.3. Switching off

Prior to any maintenance operation, the machine must be isolated from its energy sources (pneumatic and electrical) using the **cut off** valve (see section 2.1 – number 9) and the **general switch** (number 6).

General switch can be even locked with a padlock in “O” position (disconnected) to avoid any unnoticed connection from other people.

6.4. Advices

- Do not overcharge the maximum capacities of the machine described.
- Always ensure that components are correctly fixed prior the riveting. In case of rivet fall or movement, do not try to correct its position once the bimanual or pedal have been acted.
- Do not modify any safety device and always fulfil all the recommendations described in this manual.
- Do not rivet pieces without the correct fixed tools.
- Do not make any maintenance operation with the machine “on”. Ensure the power supply has been switched off.
- AGME spare parts are manufactured based on many years of experience with riveting machines. Only use original spare parts supplied by AGME.

7. Maintenance

7.1. Introduction

The following instructions must be carried out to guarantee a proper functional and safety operation of the machine.

7.2. Preventive maintenance

Prior to any maintenance operation, the power supply of the machine must be switched off.

7.2.1. Mechanical maintenance

	The shortest			Checking	Dismantling	Cleaning	Greasing	Replacement	Refill
	Every 40 hr. or once per week	2000 hr. or once per year	4000 hr. or every 2 years						
Manual greasing point	*						*(1)		
Cup and tool holder		*		*	*	*	*(1)		
Cinematic chain (2)		*		*	*	*	*(3)		
Radial and axial ball bearings of pinion			*	*	*	*	*(3)	*	
Compressed air unit		*		*		*			
Joints (4)			*		*	*		*	
Automatic greasing system (optional)			*	*	*	*	*		*(5)

(1) Grease type: KLUBER GE 11-680

(2) Parts: Pinion case, pinion, crown, bearings.

(3) Grease type: KlüberSpeed BFP 42-32.

(4) Parts: Joint sealing kit

(5) Refill when the advice message is shown on the machine display screen.

- We strongly recommend replacement of parts to be done every 4000 hours or every 2 years (the shortest) to be made by AGME qualified technicians in order to assure the best machine assembly and performance.
- These recommended maintenance checking periods should be lowered when working in extreme conditions, closet o machine's maximum capacity.

7.2.2. Overview

If any strange working condition is observed during operation, please contact AGME technicians.

When manual lubrication (standard) apply the grease with the pump provided with the machine when the advice message is shown on the machine display screen.

When automatic lubrication (optional) fill the tank with grease (be careful, without any air) when the advice message is shown on the machine display screen.

Unpainted surfaces should be cleaned with an oiled duster.

The manufacturer declines any liability in case of accident due to the manipulation or substitution of parts that are not original from AGME.

7.3. Lubrication

7.3.1. Manual lubrication

The head of the riveting machine is delivered from the factory with enough grease to allow the activity, without greasing, for one week (considering 5 days, 8 working hours per day).

After those 40 hours, the head must be lubricated with the pump provided with the machine, pressing once. Prior to this operation, the puma must be filled of grease with the supplied tube of 100 grams.

For stronger jobs or very high riveting frequencies, lubrication period must be shortened.



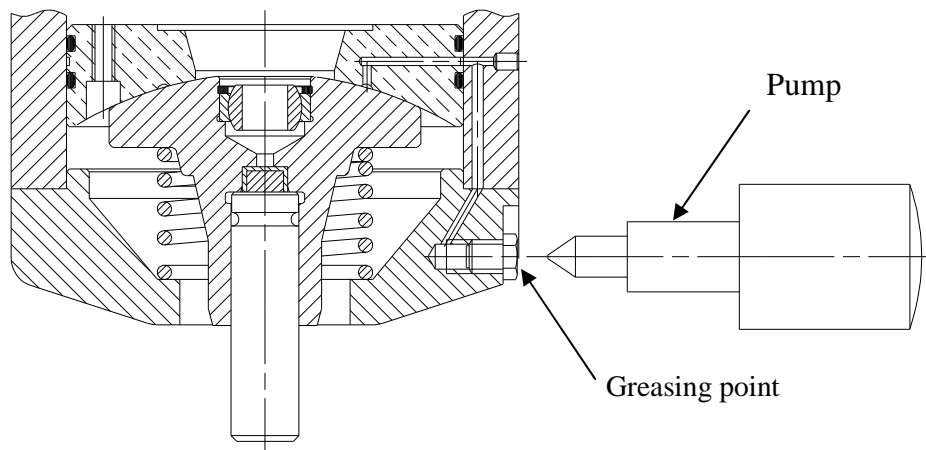
AGME internal code for the grease is 32.000.364, and the commercial reference is GE 11-680 KLUBER.



IMPORTANT: Before the first set up or after a long non working period, lubrication must be made.



IMPORTANT: After a maintenance dismantling, a double grease pumping must be made to ensure a correct refilling of the tool holder.



After 40 working hours, an advice message will appear on the screen. The riveting machine will keep operative but we strongly recommend to lubricate the machine to avoid any damage. After lubrication and to remove the message from the screen, please press “SHIFT RESET”.

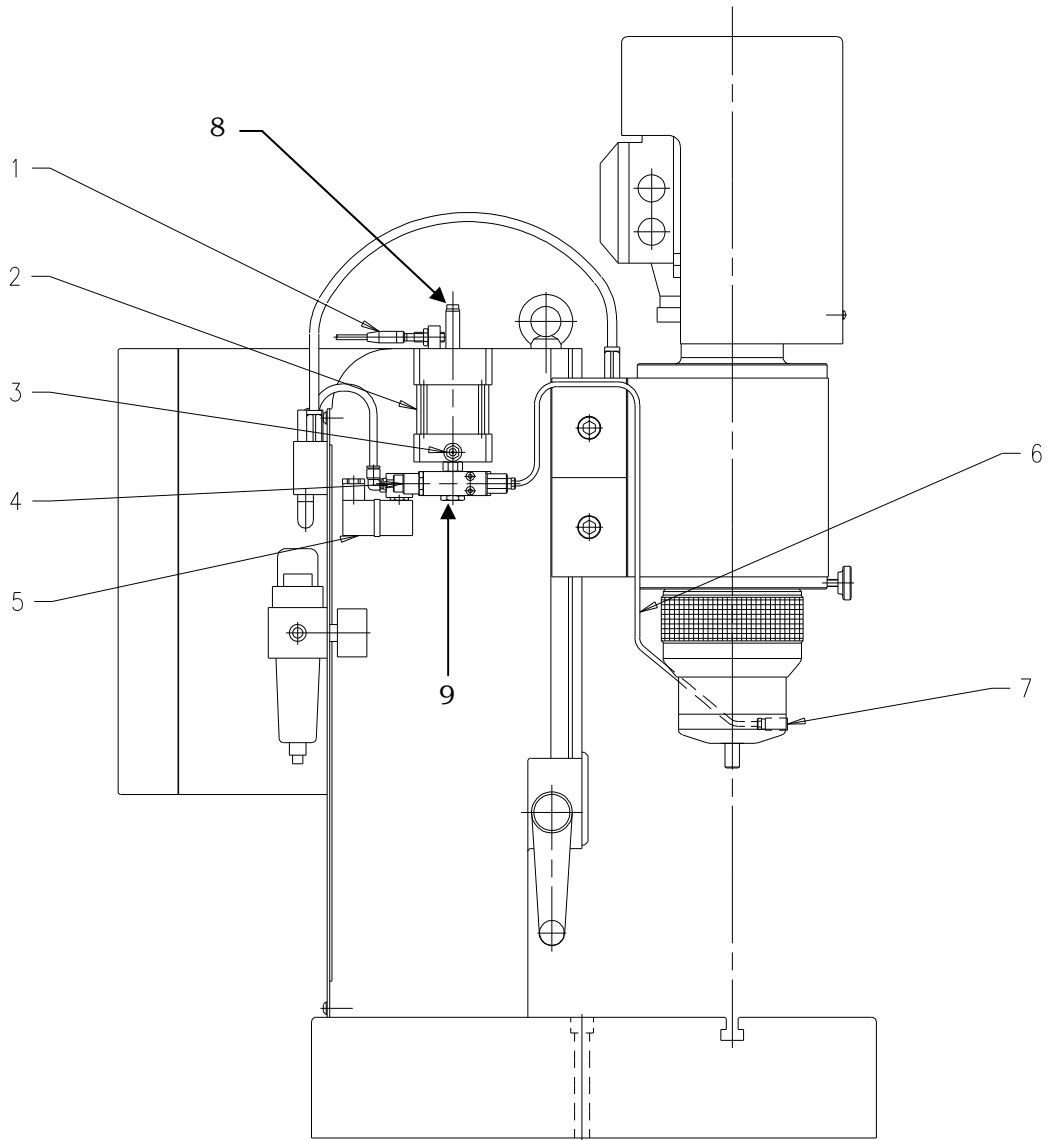
7.3.2. Head bearings lubrication.

The riveting headstock bearings are lubricated in the factory assembly process with long-life grease.

It is recommended that the whole headstock is dismantled every 4,000 operation hours and all the pieces are cleaned, checked for wear and re-assembled, and re-greased with:

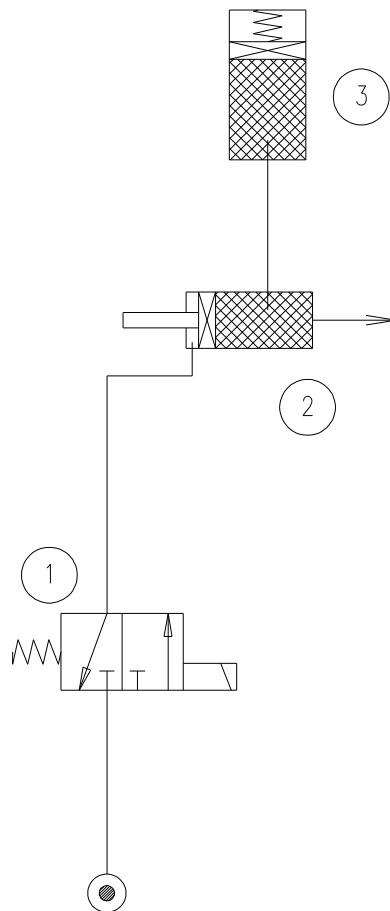
KlüberSpeed BFP 42-32

Likewise during this maintenance operation it is advisable to substitute all the watertight joints and shank guides to re-assemble.

7.3.3. Automatic lubrication (optional)

N°	DESCRIPTION
1	Grease lack detector
2	Tank
3	Point of refilling
4	Volumetric dispenser
5	Solenoid
6	Grease circuit
7	Head grease coupling
8	Upper purge cup
9	Lower purge cup

7.3.3.1. Pneumatic diagram for the automatic lubrication system



N°	DESCRIPTION
1	Solenoid
2	Volumetric dispenser
3	Tank



IMPORTANT: The automatic doser needs to be loaded with 6bar compressed air using a 6mm diameter pipe. Not observing this rule, could lead into a machine overheating and excessive friction between the pressure cup and the tool holder that could damage the unit.



IMPORTANT: The machine tool holder must be greased manually at least 5 times before being put into service or after being stopped for a long time.

The volumetric dispenser is programmed to pump 10 mm³ of grease every 16 hours.

If working conditions are strong or riveting frequencies are higher than normal, this quantity can be modified turning the knob of the volumetric dispenser. To do so, previously you should back off the stud accommodated in the knurled knob. Every red sign is 10 mm³ of grease, to a maximum of 30 mm³.

There is option as well to make a manual greasing just pressing the know that is marked with the red signs.

Once the tank is empty, the detector will take the signal to the electric cabinet and an advise message will appear in the screen. The riveting machine will keep operative but we strongly recommend to lubricate the machine as soon as possible to avoid any damage. After lubrication and to remove the message from the screen, please press "SHIFT RESET".



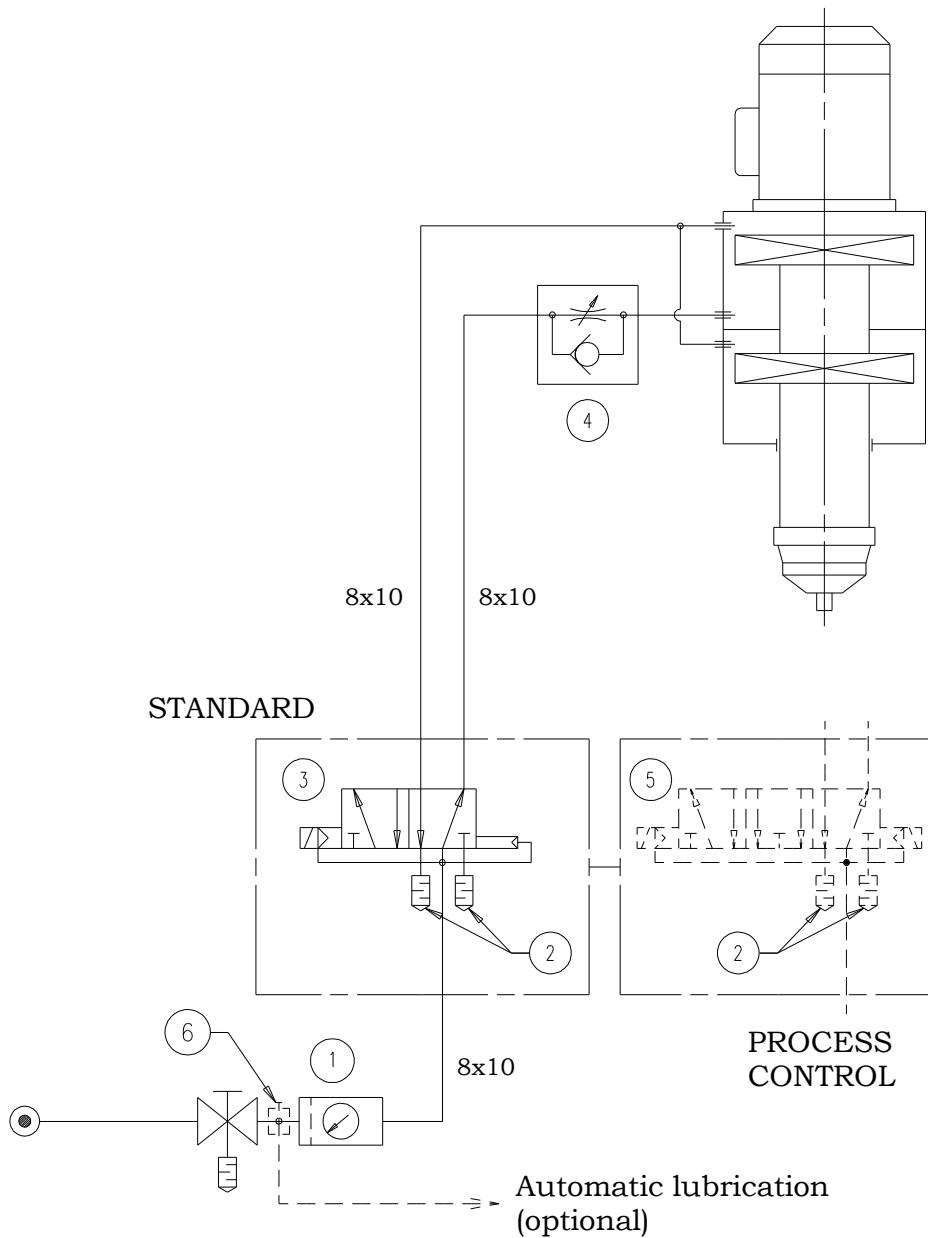
IMPORTANT: When refilling the tank, avoid the presence of air for an optimal lubrication. The presence of air would lead to lubrication failures.

When refilling the tank and to avoid the presence of air, it is necessary to follow the following recommendations:

1. The pump must be filled without air.
2. Dismantle purge taps (see section 7.3.3 – numbers 8 and 9).
3. Fill the grease with the pump until it leaks by the lower hole and place the tap.
4. Make the same operation until the grease leaks by the upper hole and place the tap.
5. Refill to a $\frac{3}{4}$ of the tank capacity.

8. Attached documents

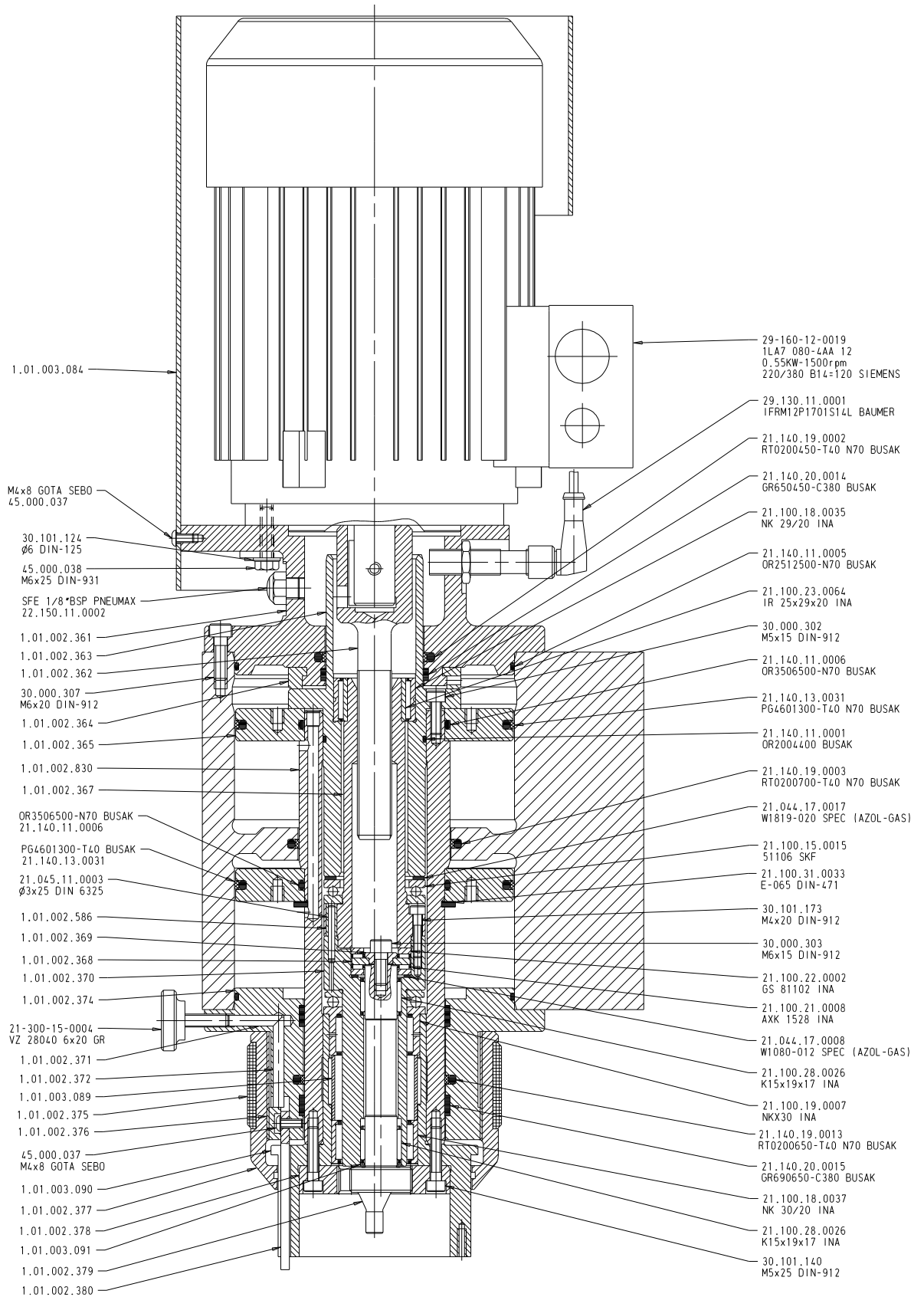
8.1. Pneumatic diagram



8.1.1. Main components list

ID	DESCRIPTION	MANUFACTURER	REFERENCE	QTY.	AGME CODE
1	FILTERING GROUP	PNEUMAX	FR1/4+VALVE 3/2+MANOMET RE	1	29.002.000
2	SILENCER	FESTO	1/4"	2	29.001.001
3	ELECTROVALVE	PNEUMAX	834.52.3.6. 24V cc	1	29.001.996
4	FLOW REGULATION	SMC	EAS 3500-02	1	29.000.930
5	ELECTROVALVE	PNEUMAX	834.53.32.3.5.M 2 24V cc	1	29.002.496
6	BRANCHING BLOCK	PNEUMAX	17140	1	29.501.131

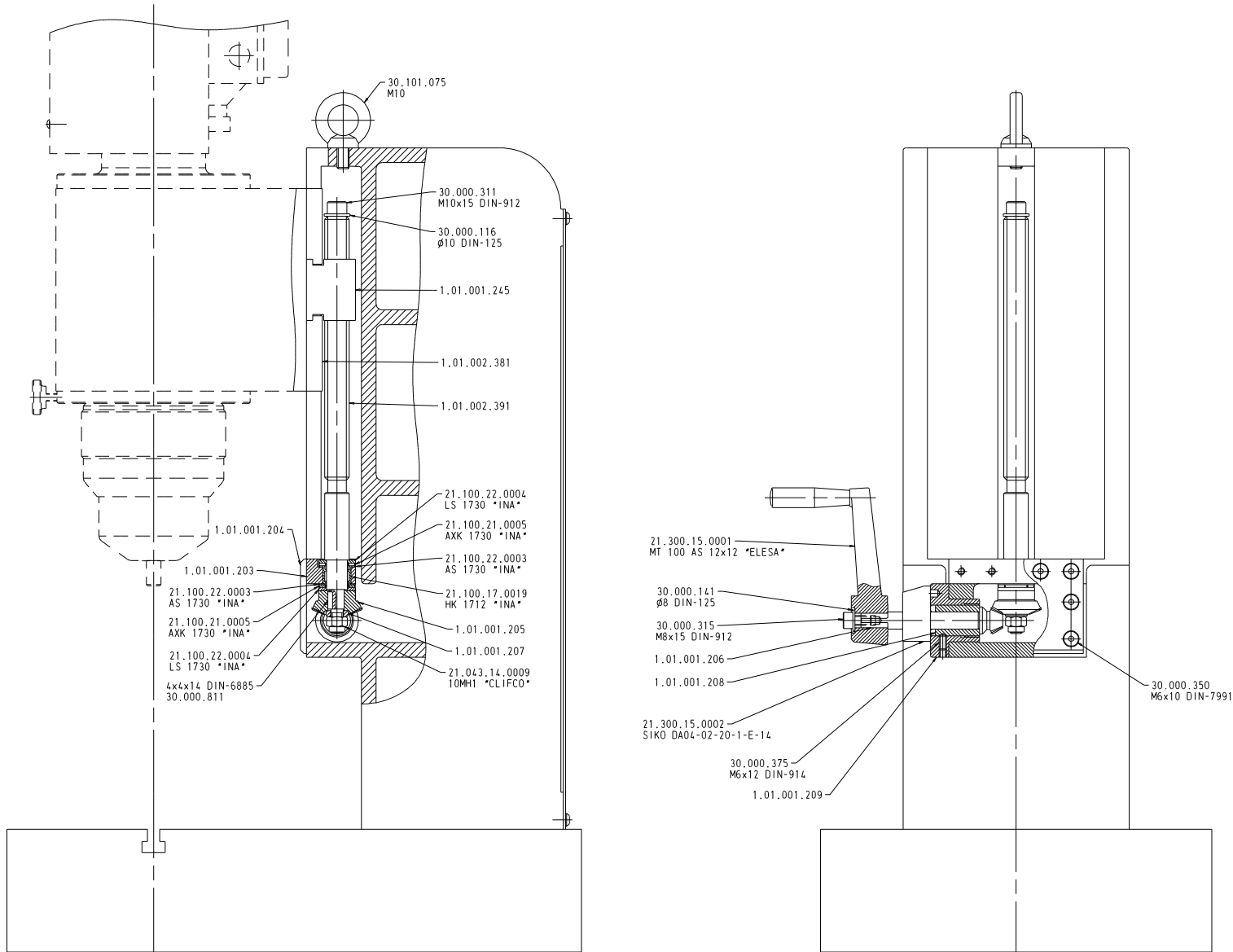
8.2. Main cylinder components diagram



8.2.1. Main cylinder components list

COMPONENTS		COMERCIAL COMPONENTS	
CODE	DESCRIPTION	CODE	DESCRIPTION
1.01.002.360	MOTOR COVER	21.140.19.0002	JOINT RT0200450-T40 N70
1.01.002.361	MOTOR SUPPORT	21.140.19.0003	JOINT RT0200700-T40 N70
1.01.002.362	TRANSMISSION AXLE	21.140.19.0013	JOINT RT0200650-T40 N70
1.01.002.363	BACK ROD	21.140.13.0031	JOINT PG4601300-T40
1.01.002.364	ELASTIC RING	21.140.20.0014	GUIDE GR650450-C380
1.01.002.365	PISTÓN	21.140.20.0015	GUIDE GR690650-C380
1.01.002.830	MAIN ROD	21.140.11.0001	JOINT OR2004400-N70
1.01.002.367	ROTOR	21.140.11.0005	JOINT OR2512500-N70
1.01.002.368	INTERMEDIATE DISK	21.140.11.0006	JOINT OR3506500-N70
1.01.002.369	PINION WASHER	21.100.15.0015	BEARING 51106
1.01.002.370	PINION CASING	21.100.18.0037	BEARING NK30/20
1.01.002.371	SHORT BLOCKING AXLE	21.100.19.0007	BEARING NKX30
1.01.002.372	LONG BLOCKING AXLE	21.100.28.0026	BEARING K15x19x17
1.01.003.090	PINION CASING SUPPORT	21.100.22.0002	BEARING GS 81102
1.01.002.374	CYLINDER SPOUT	21.100.23.0064	BEARING IR 25x29x20
1.01.002.375	NONIUS RING	21.100.18.0035	BEARING NK 29/20
1.01.002.376	BLOCKING SECTOR	21.100.21.0008	BEARING AXK 1528
1.01.002.377	NONIUS STOP NUT	29.160.12.0019	1LA7 080-4AA 12 0.55KW-1500rpm
1.01.002.378	CROWN	22.150.11.0002	SILENCER SFE 1/8" BSP
1.01.002.379	PINION	21.300.15.0004	WHEEL VZ 28040 6x20 GR
1.01.002.380	COTTER PIN	21.044.17.0008	WASHER W1080-012
1.01.003.091	WASHER	21.044.17.0017	WASHER W1819-020
1.01.002.586	POLYAMIDE TUBE		
1.01.003.089	SEPARATOR		

8.3. Main elevator spindle components diagram (drawing)

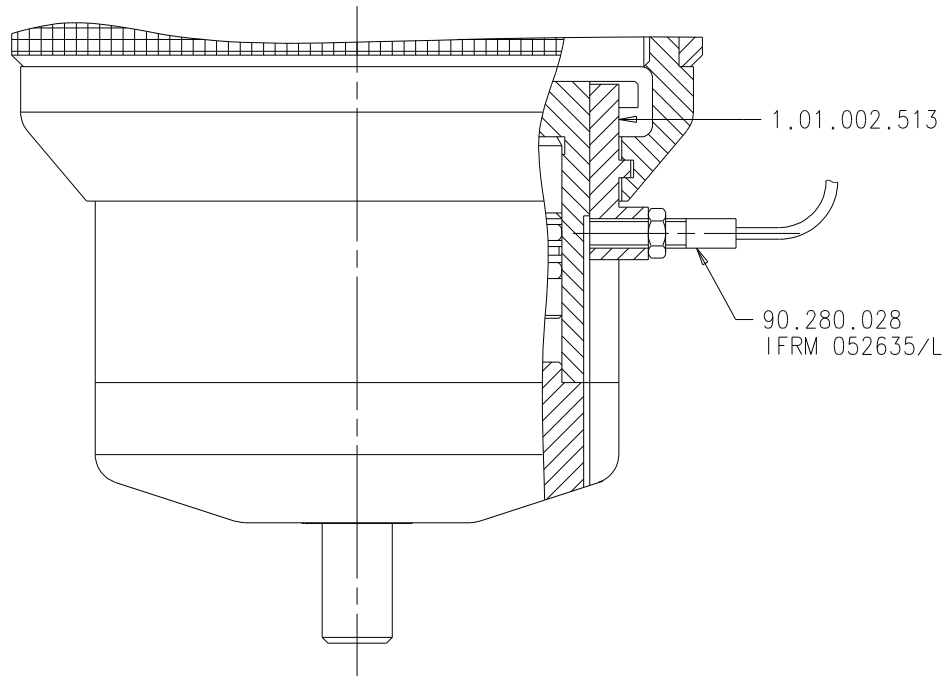


8.3.1. Main elevator spindle components (list)

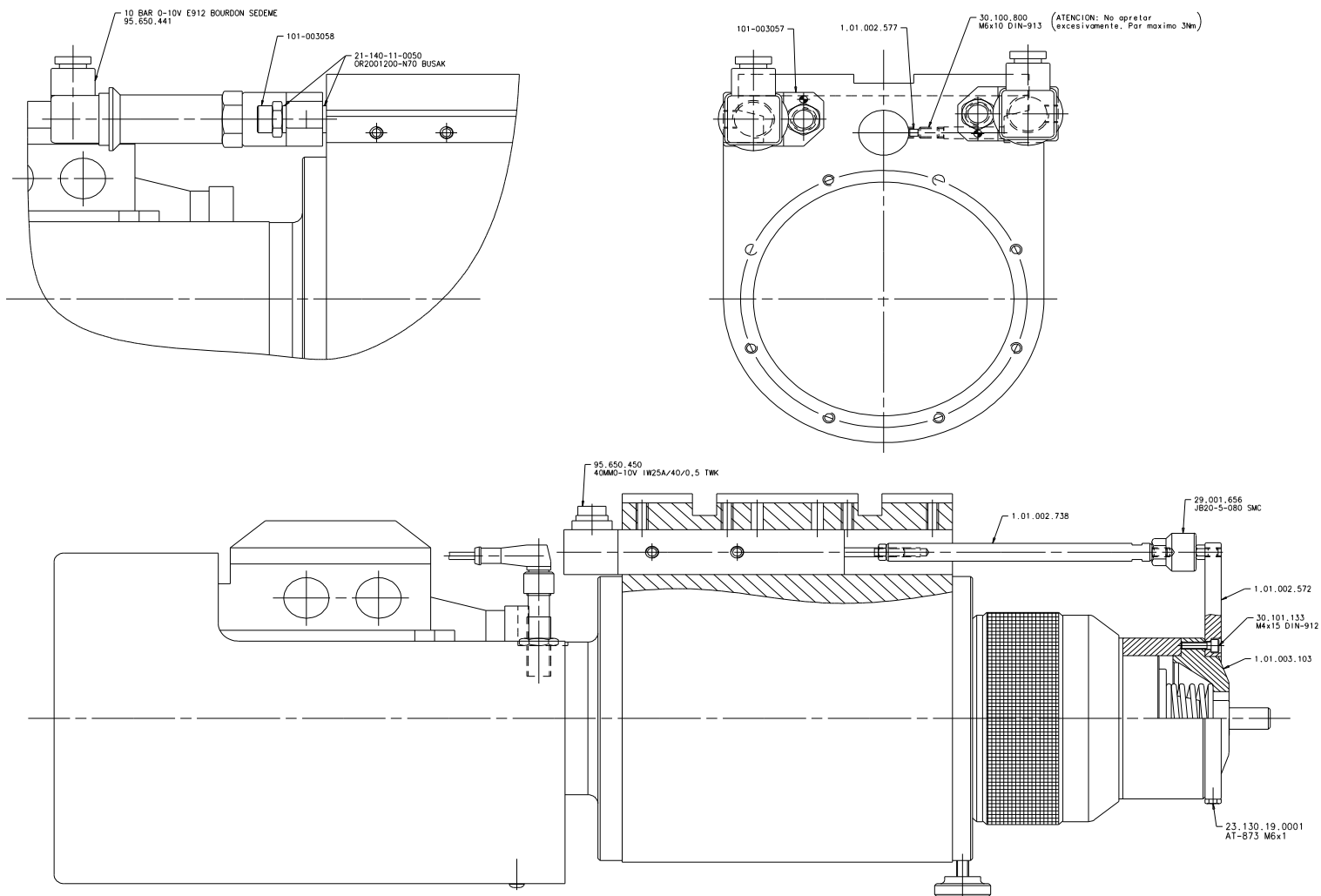
COMPONENT		COMMERCIAL COMPONENTS	
CODE	DESCRIPTION	CODE	DESCRIPTION
1.01.001.203	SPINDLE PLATE	21.100.21.0005	BEARING AXK 1730
1.01.001.204	SPINDLE COVER	21.100.22.0004	BEARING LS 1730
1.01.001.205	CONICAL BEARING	21.100.22.0003	BEARING AS 1730
1.01.001.206	CONTROL CONTACT	21.100.17.0019	BEARING HK 1712
1.01.001.207	CONTACT WASHER	21.300.15.0001	WHEEL MT 100 AS 12x12
1.01.001.208	CONTROL ADJUST CASE	21.043.14.0009	NUT 10MH1
1.01.001.209	CONTROL CONTACT COVER	21.300.15.0002	COUNTER DA04-02-20-1-E-14
1.01.001.245	SPINDLE SLEEVE	30.000.811	COTTER PIN 4x4x14 DIN-6885
1.01.002.381	NUT FLANGE		
1.01.002.391	SPINDLE		

8.4. Options

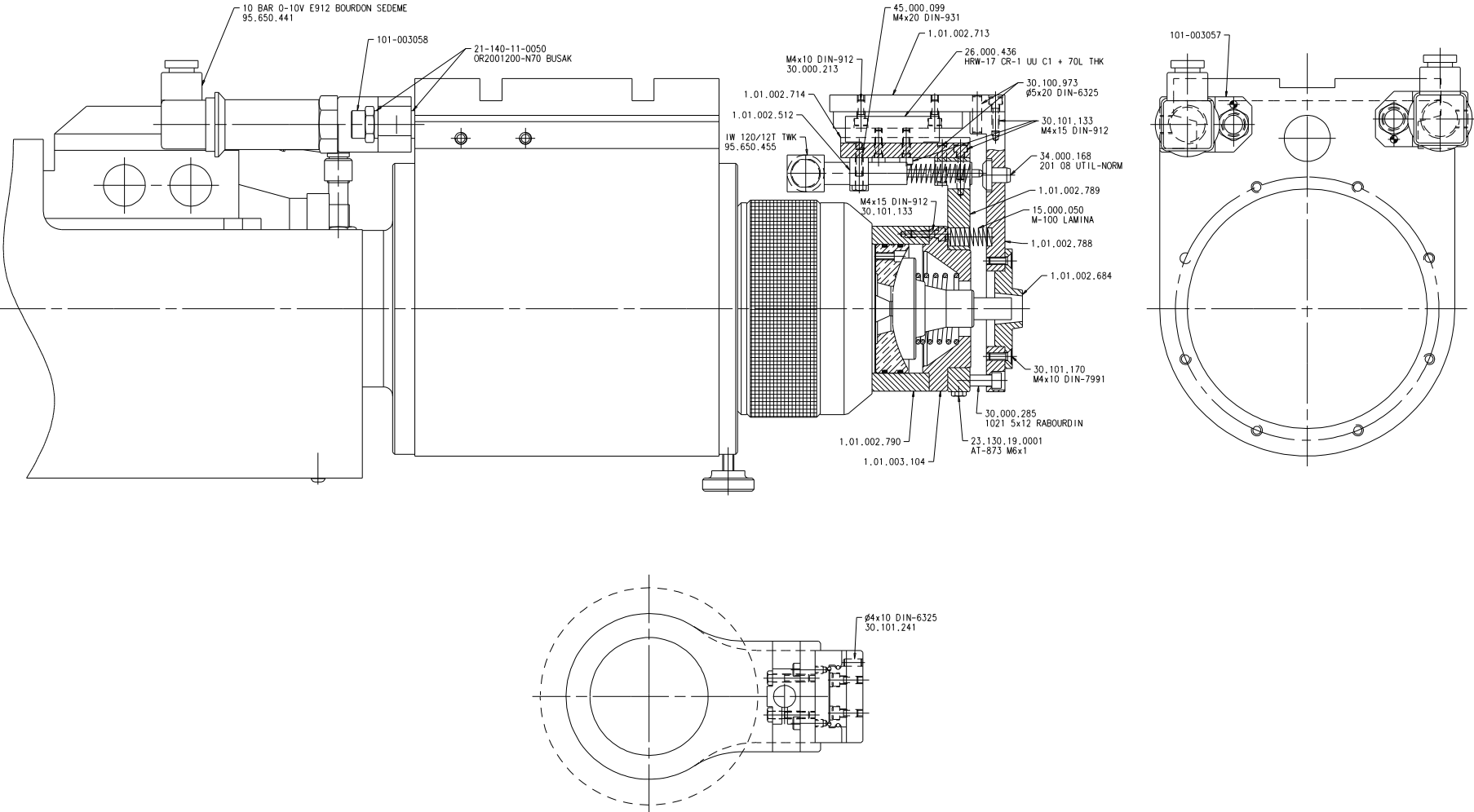
8.4.1. Advanced position detector



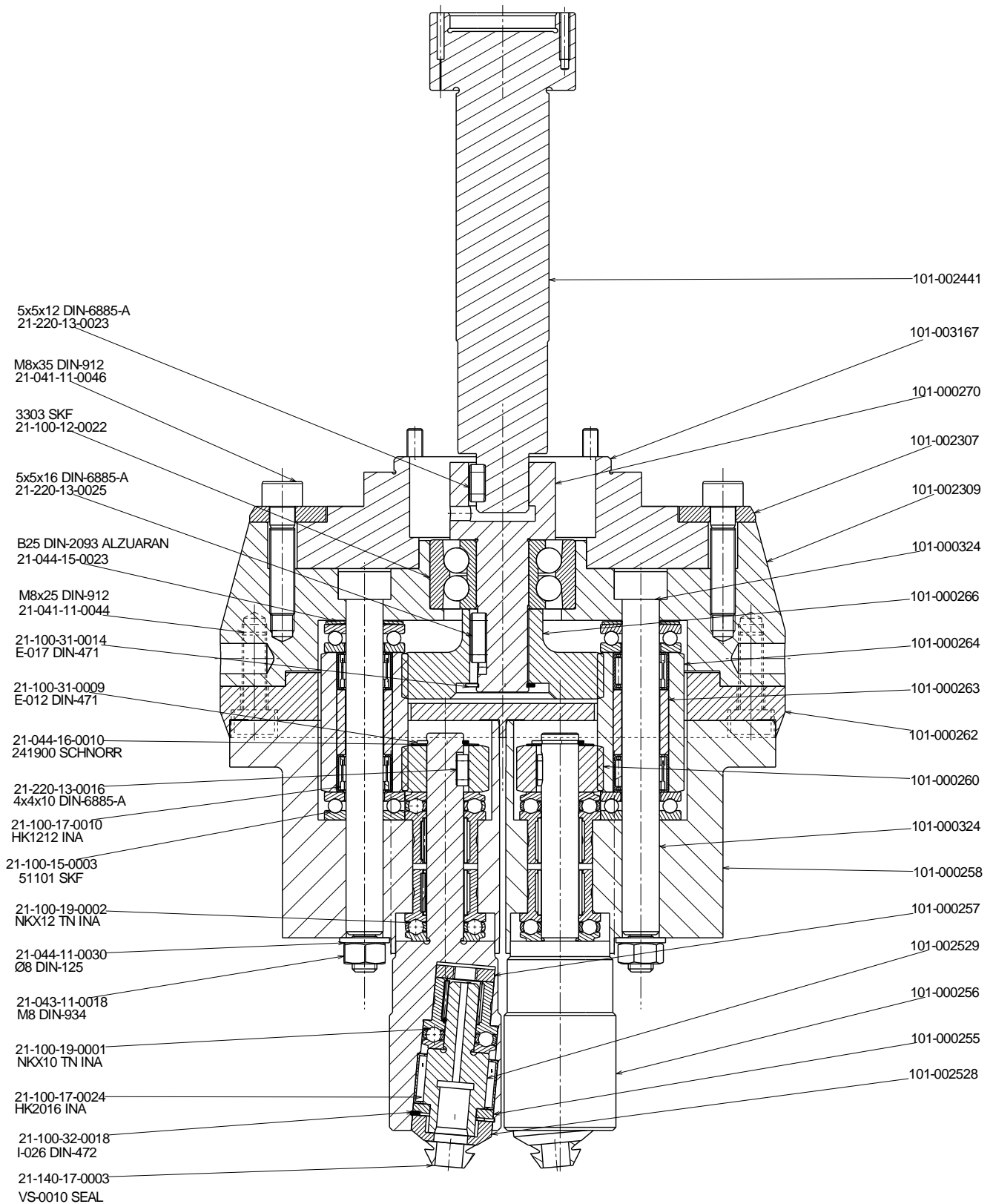
8.4.2. Quality assurance AC-1



8.4.3. Quality assurance AC-2



8.4.4. Twin - head



8.4.4.1. Head and rivet holder adjustment for different distances between centres

In order to adjust the machine and get different distances between centres, the head and rivet holder must be rotated in β and α angle respectively.

The mathematical formulas obtained for the rivet holder and head rotation angles for different “d” distances are as follows:

$$\alpha = \arccos \left(\frac{a^2 - d^2 + 4r^2}{4ar} \right)$$

$$\beta = \arcsin \left(\frac{2r}{d} \sin \alpha \right)$$

Where:

d= distance between centres

r= 26; rivet holder radius

a= 89; distance between rotation centres

α = riveting tool rotation angle

β = head rotation angle

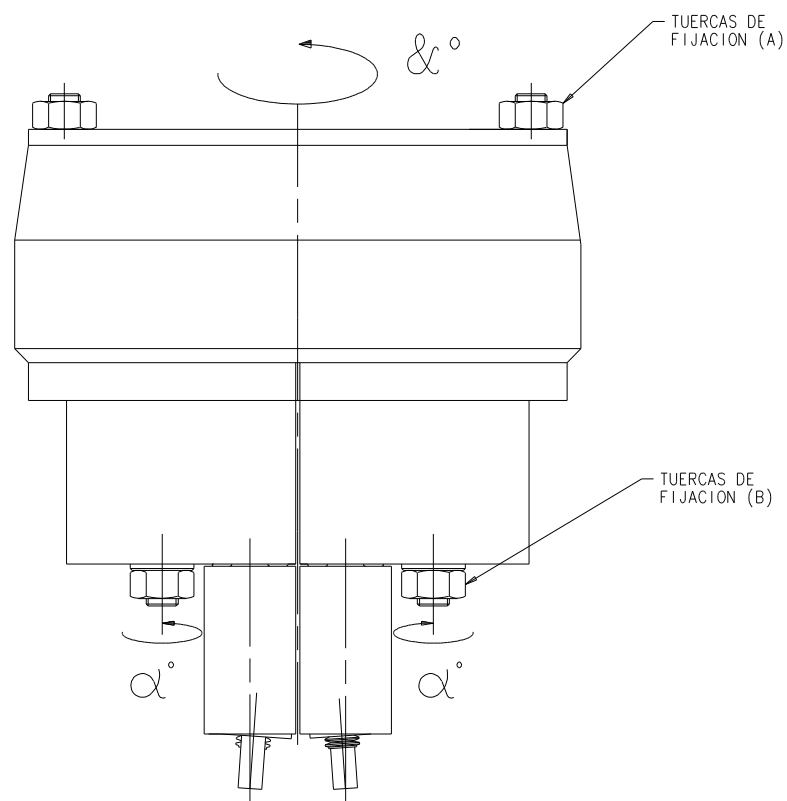
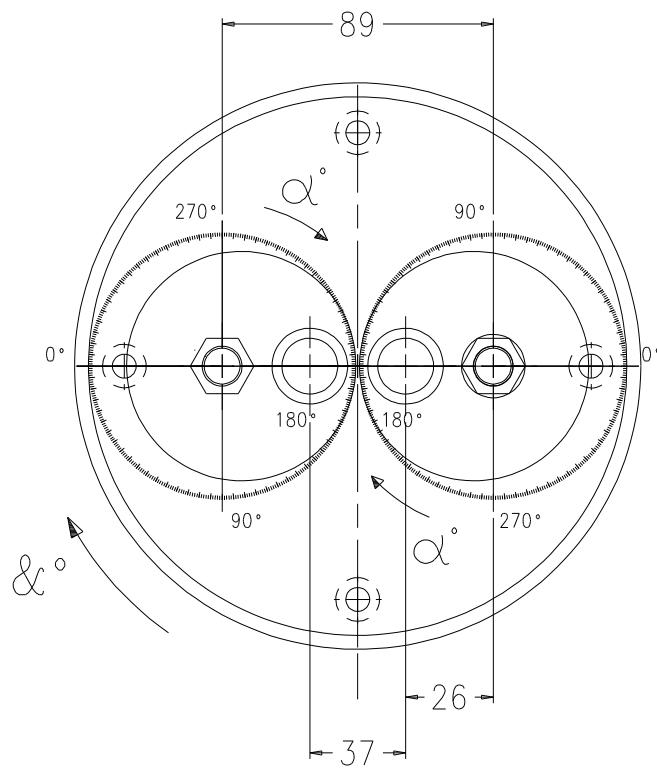
For different quantities of “d” and following the above formulas, different angles will be obtained for the riveting tools and the head.

The following table shows some indicative values:

Technical values for different distances between centres RR-12							
d	&(RAD)	&(GRAD)	B(GRADES)	d	&(RAD)	&(GRAD)	B(GRADES)
37	0,00	0,00	0,00	90	1,29	74,17	33,77
38	0,13	7,30	10,01	91	1,31	75,33	33,56
39	0,18	10,40	13,92	92	1,34	76,50	33,34
40	0,22	12,83	16,78	93	1,36	77,67	33,11
41	0,26	14,92	19,06	94	1,38	78,86	32,87
42	0,29	16,80	20,97	95	1,40	80,05	32,62
43	0,32	18,53	22,60	96	1,42	81,24	32,37
44	0,35	20,16	24,03	97	1,44	82,45	32,10
45	0,38	21,70	25,29	98	1,46	83,67	31,83
46	0,40	23,18	26,42	99	1,48	84,89	31,54
47	0,43	24,60	27,42	100	1,50	86,13	31,25
48	0,45	25,98	28,33	101	1,52	87,37	30,95
49	0,48	27,31	29,14	102	1,55	88,63	30,64
50	0,50	28,62	29,88	103	1,57	89,90	30,32
51	0,52	29,90	30,55	104	1,59	91,18	29,99
52	0,54	31,16	31,16	105	1,61	92,48	29,65
53	0,57	32,39	31,71	106	1,64	93,78	29,31
54	0,59	33,61	32,21	107	1,66	95,11	28,95
55	0,61	34,81	32,66	108	1,68	96,45	28,58
56	0,63	35,99	33,07	109	1,71	97,80	28,21
57	0,65	37,17	33,44	110	1,73	99,17	27,82
58	0,67	38,33	33,78	111	1,76	100,56	27,42
59	0,69	39,48	34,08	112	1,78	101,97	27,01
60	0,71	40,63	34,35	113	1,80	103,39	26,59
61	0,73	41,76	34,60	114	1,83	104,84	26,16
62	0,75	42,89	34,81	115	1,86	106,31	25,72
63	0,77	44,02	35,00	116	1,88	107,81	25,26
64	0,79	45,14	35,16	117	1,91	109,33	24,80
65	0,81	46,26	35,31	118	1,94	110,88	24,31
66	0,83	47,37	35,43	119	1,96	112,46	23,82
67	0,85	48,48	35,53	120	1,99	114,07	23,31
68	0,87	49,58	35,61	121	2,02	115,71	22,78
69	0,88	50,69	35,67	122	2,05	117,40	22,24
70	0,90	51,79	35,71	123	2,08	119,12	21,67
71	0,92	52,89	35,74	124	2,11	120,88	21,09
72	0,94	54,00	35,75	125	2,14	122,70	20,49
73	0,96	55,10	35,75	126	2,17	124,56	19,87
74	0,98	56,20	35,73	127	2,21	126,49	19,22
75	1,00	57,30	35,69	128	2,24	128,48	18,54
76	1,02	58,41	35,65	129	2,28	130,54	17,84
77	1,04	59,51	35,59	130	2,32	132,68	17,10
78	1,06	60,62	35,52	131	2,35	134,92	16,32
79	1,08	61,73	35,43	132	2,40	137,27	15,50
80	1,10	62,84	35,33	133	2,44	139,75	14,63
81	1,12	63,96	35,22	134	2,48	142,38	13,70
82	1,14	65,07	35,10	135	2,53	145,19	12,70
83	1,16	66,19	34,97	136	2,59	148,25	11,61
84	1,17	67,32	34,83	137	2,65	151,63	10,39
85	1,19	68,45	34,68	138	2,71	155,45	9,01
86	1,21	69,58	34,52	139	2,79	159,97	7,36
87	1,23	70,72	34,35	140	2,89	165,85	5,21
88	1,25	71,86	34,16	141	3,14	180,00	0,00
89	1,27	73,01	33,97				

If a determined distance between centres must be obtained, follow these steps:

- Release “B” locknuts (see page 42). Knowing the value of the “d” distance, go to the above table to get the values of angles (α and β).
- Rotate the two rivet holders with the required α degrees (*these values are estimate*). Check the distance by measuring with a gauge (measure the exterior and subtract the \emptyset of the rivet holder)
- Once the operation completed, tighten locknuts “B and check there are no distance variations when tightening.
- Release locknut “A” for positioning angle β (*these values are estimated*).
- Check the results of the adjustment of β angle making a cycle with the part to be riveted. If the required perpendicularity is not obtained, repeat the previous operations until the positioning is correct.



8.5. ***Frequently asked questions***

1. How is the snap die assembled?

Introduce manually in the hole of the snap-die holder, with the snap-die slot inside the snap-die holder.

2. How is the snap die fixed?

The snap-die holder has a magnet.

3. How is the snap die removed?

By pulling the snap die with your hand or tongs.

4. Which direction should the motor of the riveting-machine head run?

It can rotate in both directions interchangeably.

5. The snap die does not swing

This may be because:

- The riveting machine is not connected electrically.
- The circuit breaker protector in the electrical cabinet has gone off.
- The bearings of the powertrain are seized.
- Although the motor runs and the powertrain is in good conditions, the pinion is broken.

6. Why does not it lower or put pressure?

This may be because:

- The machine is not hydraulically connected.
- Pressure is not correctly selected in the manometer for air inlet.
- The electrovalve is broken.
- There is an internal sealing gasket damaged.
- The hydraulic pump or coupling is damaged.
- The pressure control valve is not correctly tared.
- The hydraulic motor is rotating counter-clockwise.

7. Why the same riveting head is not always produced

This may be because:

- The height of the rivets or pieces is not the same.
- Time working instead of mechanical stop.
- Fluctuation of the pressure inlet.

8. Why does the snap die swing laterally?

This may be because:

- The snap-die length is not correct.
- The cap radius and snap-die holder do not match.
- The snap-die holder is decoupled from the pinion.

9. How long do wear parts last?

NAME	No. OF CYCLES
Snap die	200,000 / 1,000,000
Cap	3,000,000
Pinion	5,000,000
Pinion bearings	5,000,000
Sealing set of the cylinder and head	5,000,000
Snap-die holder	5,000,000
Spring	6,000,000
Crown	6,000,000

These values have been obtained during tests under optimum adjustment and operation conditions. Cannot be taken as binding references.

10. Which grease should be used for lubricating the head?

GE 11-680 of Kluber Brand.

11. Which grease should be used for lubricating the internal bearings?

KlüberSpeed BFP 42-32 of Kluber Brand.

12. Which is the normal working temperature of the head?

The normal temperature of the riveting head ranges between 45°C and 65°C.

13. Which is the normal working temperature of the hydraulic unit?

The normal temperature of the hydraulic unit ranges between 50°C and 60°C.

8.6 Spare parts

DENOMINATION	CODE
Pinion	1.01.002.379
Crown	1.01.002.378
Standard cup	1.01.002.385
Standard tool holder	1.01.002.386
Spring	1.01.002.388
Intermediate disk	1.01.002.368
Elastic ring (assembled)	21.100.30.0001
Magnet (assembled)	21.300.14.0002
Ball and socket joint (assembled)	21.100.25.0006
Pinion radial bearing	21.100.28.0026
Pinion axial bearing	21.100.22.0002 + 21.100.21.0008
Grease for head (on tube)	32.000.364
Cylinder set of joints	3.01.000.486
Head set of joints	3.01.000.487