



# simasa

- Ⓔ MANUAL DE INSTRUCCIONES ORIGINAL
- Ⓖ ORIGINAL USER GUIDE
- Ⓕ MANUEL ORIGINAL D'UTILISATION

DEL-32

DEL-36

DEL-45

DEL-52

COMBI-25/32

COMBI-30/36

COMBI-36/52

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## 1. INFORMACIÓN GENERAL.

**ATENCIÓN:** Lea y comprenda perfectamente las presentes instrucciones antes de comenzar a manejar la máquina

SIMA S.A. agradece la confianza depositada en nuestros fabricados al adquirir una máquina SIMA.

Este manual le proporciona las instrucciones necesarias para su puesta en marcha, utilización, mantenimiento y en su caso, reparación. Se señalan también los aspectos que pueden afectar a la seguridad y salud de los usuarios durante la realización de cualquiera de dichos procesos. Si se siguen las citadas instrucciones y se opera como se indica, se obtendrá un servicio seguro y un mantenimiento sencillo.

Por ello, la lectura de este manual es obligatoria para cualquier persona que vaya a ser responsable del uso, mantenimiento o reparación de la máquina.

**Se recomienda tener siempre este manual en un lugar fácilmente accesible donde se va a utilizar la máquina.**

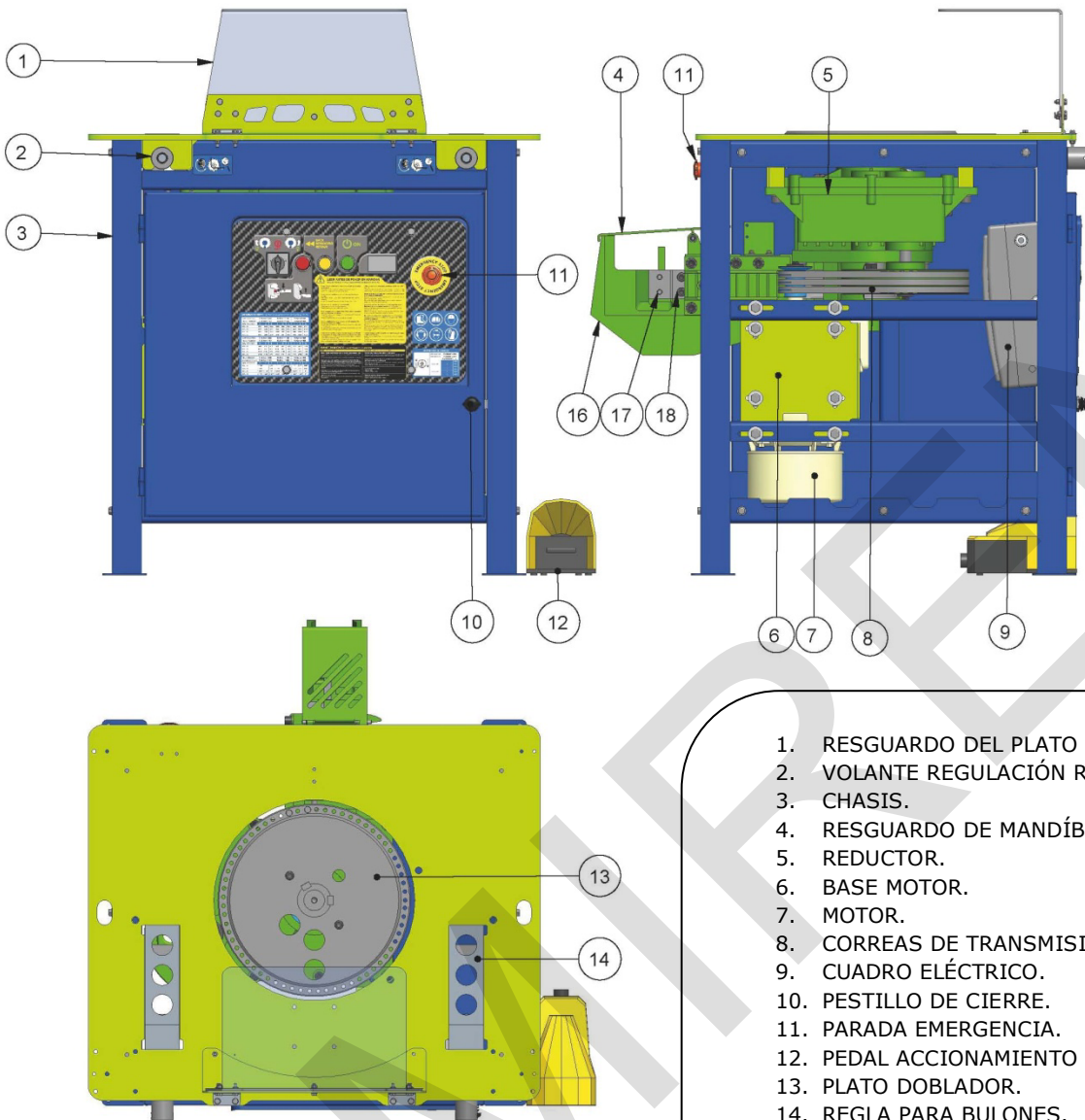
## 2. DESCRIPCIÓN GENERAL DE LA MÁQUINA

- Las máquinas de elaboración de ferralla SIMA están diseñadas y fabricadas para doblar barras de acero liso y corrugado de construcción, en armaduras pasivas de acero para hormigón estructural. El procedimiento de doblado se realiza en frío mediante mandriles que garantizan unos diámetros interiores de doblado conforme a normas Europeas.
- Las máquinas combinadas "cizalla dobladora" modelos COMBI están diseñadas para que además del doblado de barras, también realizan la función de cizalla para el corte de barras de acero. mediante cuchillas intercambiables montadas en las mandíbulas. El avance del material se realiza manualmente empujando la barra sobre el rodillo, a continuación dejar caer la barra en la garganta de corte y bajar el resguardo de protección, posteriormente presionando el pedal obtenemos el corte del material.

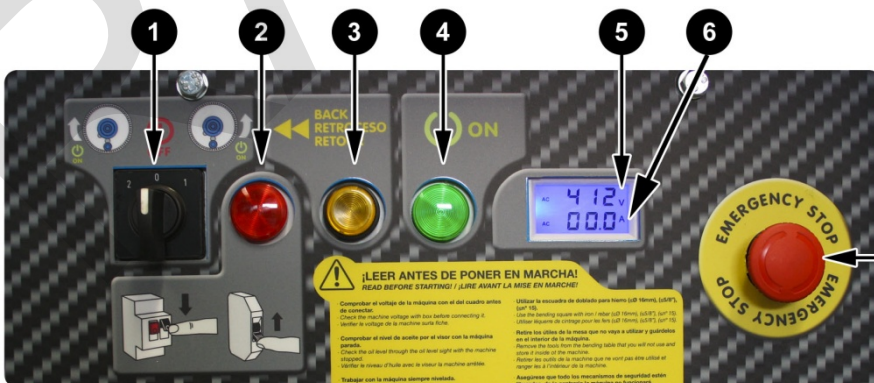
**Cualquier otro uso que se le pueda dar a esta máquina se considera inadecuado y puede resultar peligroso, por lo que queda expresamente prohibido.**

- Equipada con motor-freno eléctrico autoventilado
- El elemento principal de la máquina, es el reductor que se encarga de transmitir la energía necesaria para realizar el doblado de barras de acero
- La máquina es accionada por el motor eléctrico que transmite el movimiento, mediante transmisión al mecanismo doblador en el que se montan los diferentes mandriles para el doblado de las barras de acero.
- La maniobra de trabajo puede ser seleccionada para trabajar en dos sentidos diferentes de giro, a izquierda o a derecha, cambiando el sentido de giro con el Inversor eléctrico del panel de mandos.
- El ángulo de doblado se consigue introduciendo el pivote en el plato doblador para determinar el ángulo de doblado aproximado, y desplazando milimétricamente el final de carrera móvil mediante su mando, para ajustar el ángulo con más exactitud.
- El panel de mandos está dotado de pulsetería y mandos eléctricos de gran sencillez y fácilmente localizables, identificados mediante pictogramas.
- Equipada con mandos de parada y retroceso para facilitar la maniobra, están dotadas de setas de emergencia a ambos lados de la máquina, para casos de emergencia o maniobras incorrectas.
- Las maniobras eléctricas para la elaboración de las barras de acero se realiza en baja tensión a 24 Voltios conforme a Normas Europeas.
- La equipación de bulones, mandriles de doblado y escuadra de acero están tratados térmicamente para soportar el agresivo trabajo.
- Dispone de un pedal para confirmar y ejecutar la maniobra, esto permite al operador permanecer retirado de la mesa durante la maniobra y ejecución de las barras en el momento del corte o doblado evitando así lesiones laborales
- La zona de trabajo está protegida por un resguardo superior que limita posibles accidentes, este resguardo está dotado de un visor transparente que permite observar el material a doblar y los elementos de doblado, evitando llegar con las miembros superiores a la zona de doblado.
- La estructura de la máquina está pintada al horno con pintura epoxi - poliéster lo que le confiere una alta resistencia a la superficie y mantiene la estructura protegida de la corrosión.
- La equipación eléctrica cumple la normativa de seguridad comunitaria.
- Los modelos COMBI están equipados con una mandíbula de corte y dotada de un resguardo de seguridad que incorpora un sistema de protección eléctrica, que impide el funcionamiento de la máquina en el caso de estar levantado fuera de su posición.

### 3. PARTES DE LA MÁQUINA.



1. RESGUARDO DEL PLATO DOBLADOR
2. VOLANTE REGULACIÓN REGLA.
3. CHASIS.
4. RESGUARDO DE MANDÍBULA.
5. REDUCTOR.
6. BASE MOTOR.
7. MOTOR.
8. CORREAS DE TRANSMISIÓN
9. CUADRO ELÉCTRICO.
10. PESTILLO DE CIERRE.
11. PARADA EMERGENCIA.
12. PEDAL ACCIONAMIENTO GIRO PLATO.
13. PLATO DOBLADOR.
14. REGLA PARA BULONES.
15. CLAVIJA CONEXIÓN RED.
16. MANDÍBULA
17. CUCHILLA FIJA
18. CUCHILLA MÓVIL.



1. MANDO / INVERSOR DE GIRO PLATO.
2. PILOTO DE SOBRECARGA.
3. PULSADOR RETROCESO FORZADO.
4. PILOTO DE CONEXIÓN "ON"
5. VOLTÍMETRO.
6. AMPERÍMETRO.
7. PARADA DE EMERGENCIA STOP.



#### 4. TRANSPORTE.

Para un transporte seguro de la maquina, siga las siguientes instrucciones:

Las maquinas Dobladoras y Combinadas disponen de orificios en la mesa para su elevación con grúas mediante cadenas o cables homologados. Los medios de transporte empleados que se utilicen deben garantizar su seguridad.

**IMPORTANTE:** Durante el transporte de la maquina, esta nunca debe ponerse invertida ni tampoco apoyarla sobre ninguno de los lados, solo deberá estar apoyada sobre sus cuatro patas.



#### 5. PICTOGRAMAS.

Los pictogramas incluidos en la maquina tienen el siguiente significado:



ES OBLIGATORIO EL USO DE CALZADO DE SEGURIDAD



ES OBLIGATORIO EL USO DE CASCO Y GAFAS.










LEER MANUAL DE INSTRUCCIONES



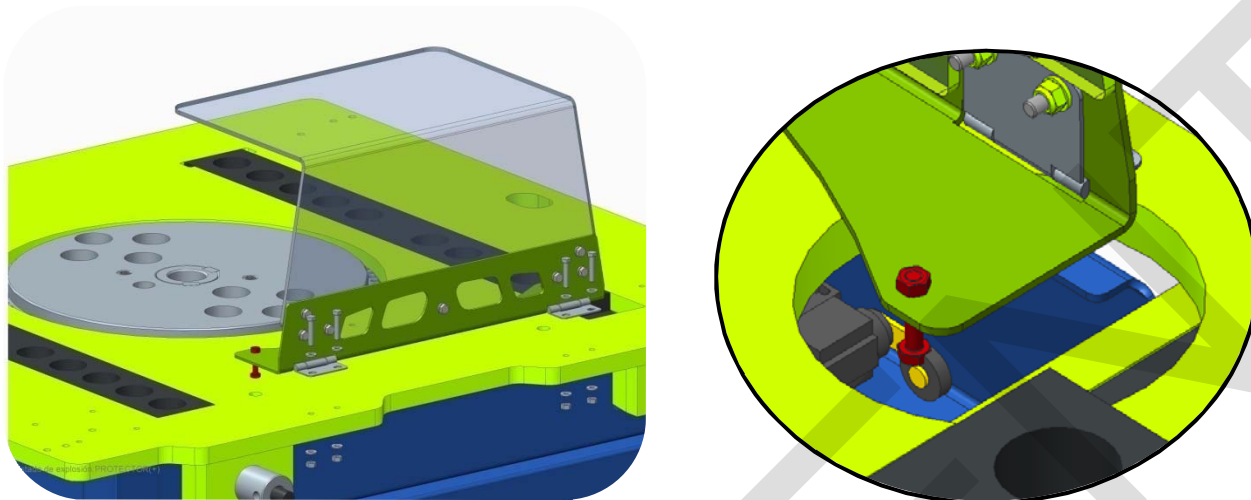
ES OBLIGATORIO EL USO DE GUANTES

#### 6. CONDICIONES DE SUMINISTRO.

											
			Ø60	Ø100	Ø140	Ø160	Ø200				
DEL-32	1	4	4	1	1			1	1	1	2
DEL-36	1	4	4	1	1	1		1	1	1	2
DEL-45	1	4	4	1	1	1		1	1	1	2
DEL-52	1	4	4	1	1	1	1	1	1	1	2
COMBI-25/32	1	4	4	1	1			1	1	1	2
COMBI-30/36	1	4	4	1	1	1		1	1	1	2
COMBI-36/52	1	4	4	1	1	1	1	1	1	1	2

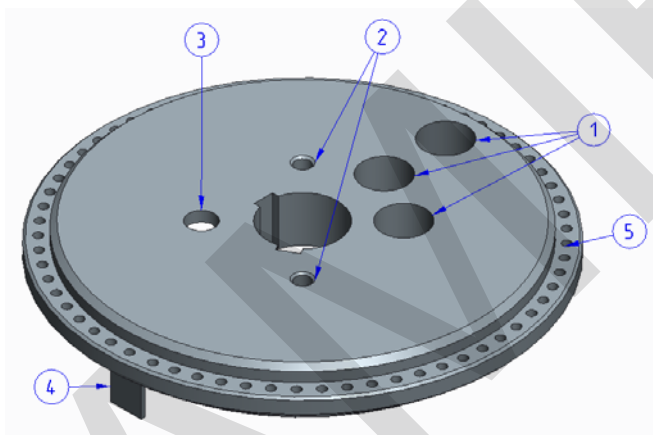
### 6.1 MONTAJE PROTECTOR PLATO.

Por cuestiones de transporte, la maquina se sirve con el resguardo del plato doblador desmontado, este resguardo debe ser montado en su posición correcta para que la maquina sea operativa, en su posición el resguardo presiona un micro interruptor de seguridad que de no estar presionado, la maquina no se podrá poner en marcha.

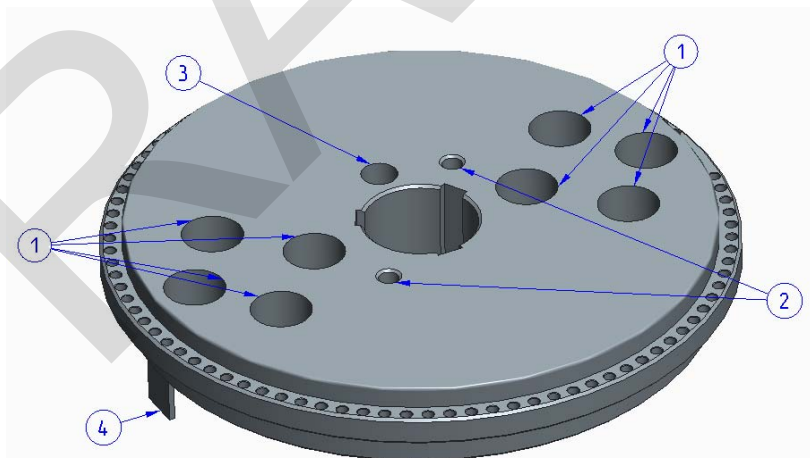


### 6.2 PARTES DEL PLATO.

Dependido del modelo de maquina adquirido, el plato de doblado dispondrá de varios tipo de agujeros con la siguiente finalidad.

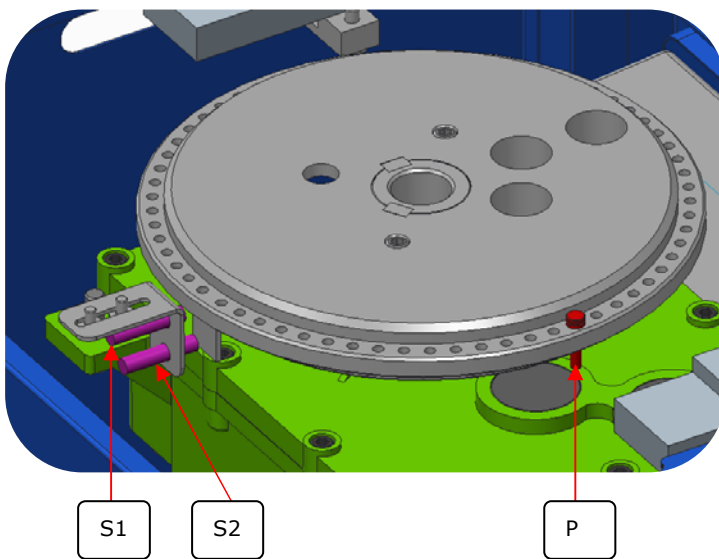


1. Taladros para bulón de empuje. Según tipo de barra y diámetro del casquillo, el bulón de empuje se colocará en distintas posiciones.
2. Taladros roscados para fijación del kit opcional de grandes diámetros.
3. Taladro para kit opcional dispositivo de espirales.
4. Pieza referencia sensor parada plato.
5. Taladros para el pivote de inversión.



### 6.3 PIVOTE DE INVERSIÓN PARA CONFIGURACIÓN DEL ÁNGULO DE DOBLADO.

El pivote inversión "P" es el elemento con el cual seleccionamos el ángulo de giro del plato. Dependiendo del sentido de giro del plato que seleccionemos (horario o anti horario), tendremos que insertar el pivote a la izquierda o a la derecha del sensor inductivo "S1" y "S2".



El sensor S1, es el encargado de detener el giro del plato cuando el pivote de inversión P pasa delante de él.

EL sensor S2, es el encargado de detener el plato en posición cero cuando retrocede a su posición inicial.

## 7. PUESTA EN MARCHA.

**ATENCIÓN:** Deben seguirse todas las recomendaciones de seguridad señaladas y cumplir con la normativa de seguridad y prevención de riesgos laborales de cada país

**RODAJE:** Las máquinas dobladoras y combinadas no necesitan ninguna operación de rodaje, están diseñados especialmente para obtener las máximas prestaciones desde el momento de su puesta en marcha.

### USO NORMAL DE LA MAQUINA:

Las máquinas dobladoras y combinadas han sido diseñadas y construidas para elaborar barras de hierro liso y corrugado. Cualquier otro uso no indicado expresamente se considera anormal. Cualquier útil o accesorio añadido o modificado sin la autorización escrita del fabricante se considera inapropiada y peligrosa, por lo que en estos casos o por mal uso si se producen daños o lesiones, SIMA S.A. exime toda responsabilidad como fabricante. Al instalar la máquina debe asegurarse que el plano donde se coloque para trabajar sea una superficie firme, horizontal y que el terreno no sea blando.



**Esta máquina, NO TIENE QUE SER UTILIZADA BAJO LA LLUVIA. Cúbrala con materiales impermeables. Si la máquina ha estado expuesta bajo la lluvia, compruebe antes de conectarla que las partes eléctricas no estén humedadas o mojadas. TRABAJAR SIEMPRE CON BUENAS CONDICIONES DE ILUMINACIÓN.**

### 7.1 INSTALACIÓN ELÉCTRICA.

El cable de extensión usado para alimentar la maquina, deberá tener una sección mínima de 4x2.5 mm<sup>2</sup> hasta 25 metros de longitud. Para una distancia mayor será de 4x4 mm<sup>2</sup>. En uno de sus extremos se deberá conectar una base aérea normalizada de 3P+T ó 3P+N+T compatible con el interruptor tomacorrientes de la maquina, y en el otro, una clavija aérea normalizada de 3P+T ó 3P+N+T compatible con la salida del cuadro de alimentación.

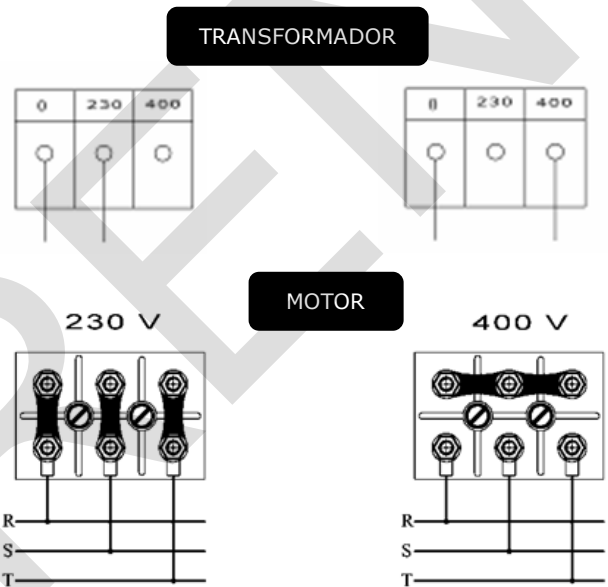


**Las maquinas con motor eléctrico deben ser conectadas siempre a un cuadro normalizado que disponga de un magnetotérmico y un diferencial de acuerdo con las características del motor:**

3Kw y 4Kw, trifásico a 400V, magnetotérmico de 15A y diferencial de 15A/300mA.  
3Kw / 4Kw, trifásico a 230V, magnetotérmico de 20A y diferencial de 20A/300mA.



**ATENCIÓN:** La tensión de funcionamiento de la máquina esta visible mediante la indicación de **VOLTAJE** junto a la Clavija de conexión y tapa cuadro eléctrico. **Si por alguna razón usted cambia la configuración eléctrica de la máquina de 400V a 230V, cambie las pegatinas de indicación de voltaje con el fin de evitar daños.**



No conecte la máquina a la red si no está seguro de la tensión de alimentación disponible. Si la tensión no fuese la correcta, la maquina sufriría daños eléctricos irreparables y quedaría inutilizada.



No manipule nunca los cables de alimentación hilos conductores o material eléctrico de la máquina, si no ha desconectado totalmente la energía eléctrica de la red.



**MUY IMPORTANTE:** La toma de tierra debe estar conectada siempre antes de la puesta en marcha.

## 7.2 CONEXIÓN A LA RED ELÉCTRICA.

La maquina posee un visor de voltaje y amperios con el fin de visualizar el voltaje de la red antes de que la tensión pase por todos los elementos eléctricos de la maquina ocasionando daños irreparables.

Para conectar la maquina a la red proceda de la siguiente forma.

1. Abra la puerta y conecte la clavija de la línea de tensión a la clavija del cuadro eléctrico. La tensión de la red solo llegará hasta el conmutador de conexión del sentido de giro, pudiéndose visualizar el voltaje en el visor.



**ATENCIÓN:** El transformador de la maquina tiene una tolerancia admisible de  $\pm 10\%$  sobre la tensión para la que está preparada. Si supera dichos limites, provocará daños irreversibles en el transformador.

**Maquina preparada para 400V = 380V min / Max 430V max**

**Maquina preparada para 230V = 210V min / Max 250V max**

2. Gire el conmutador seleccionando un sentido de giro y se iluminara el piloto verde de conexión.
3. Pise el pedal para hacer girar el plato y comprobar el sentido de giro.



**Posición 0.** Maquina desconectada

**Posición 1.** Maquina conectada con giro del plato antihorario.

**Posición 2.** Maquina conectada con giro del plato horario.

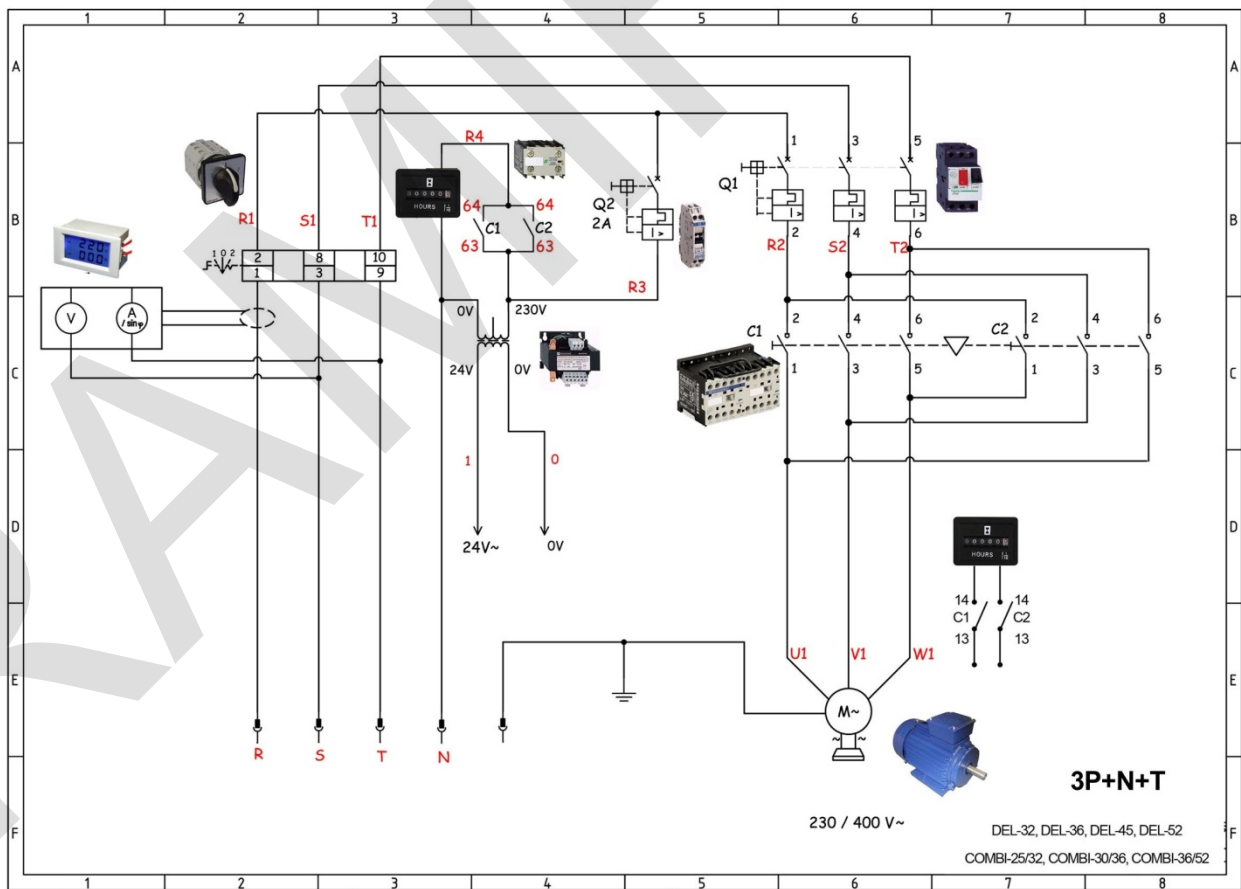
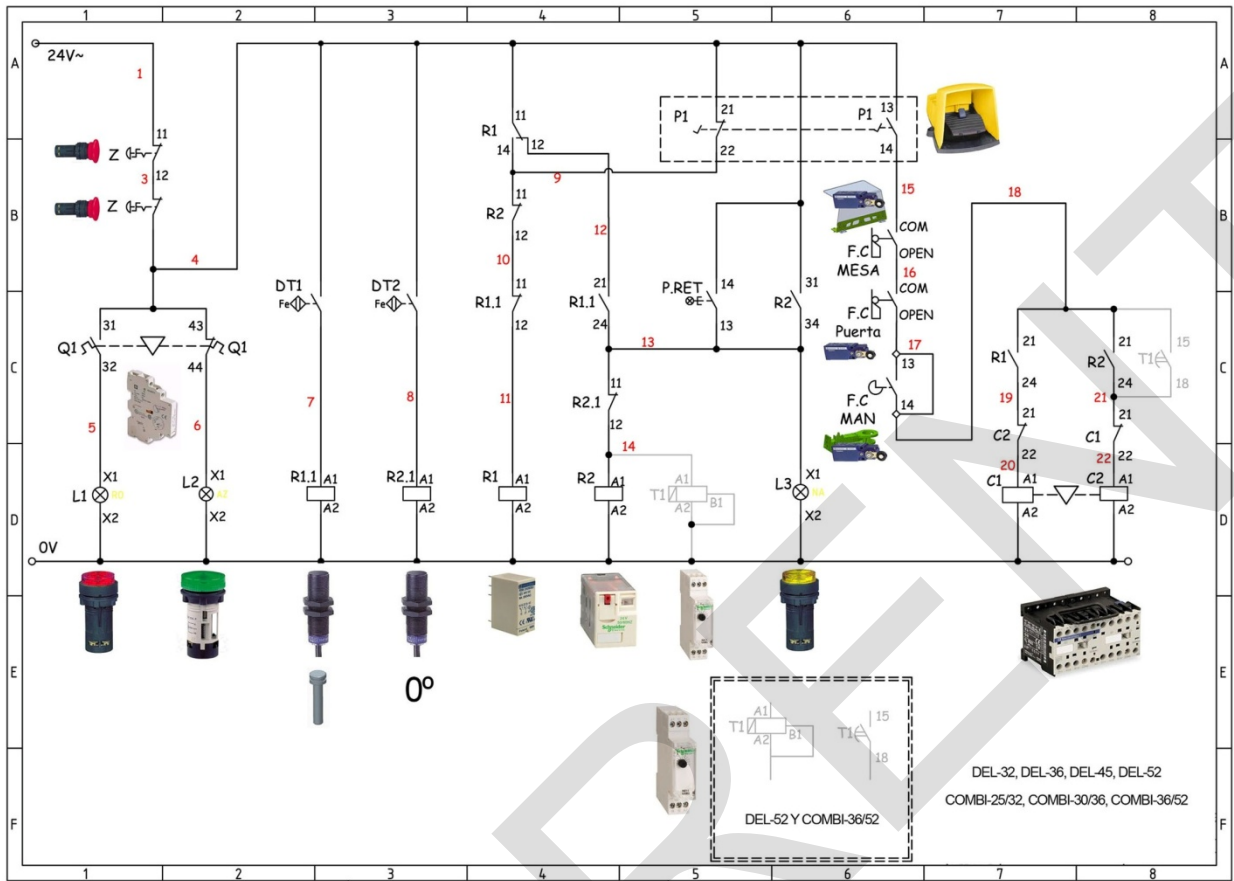


**Al conectar la maquina, asegúrese que el plato doblador gira en el sentido que indica la etiqueta del panel de control de la máquina, evitará accidentes con los distintos accesorios que se colocan en el plato doblador.**

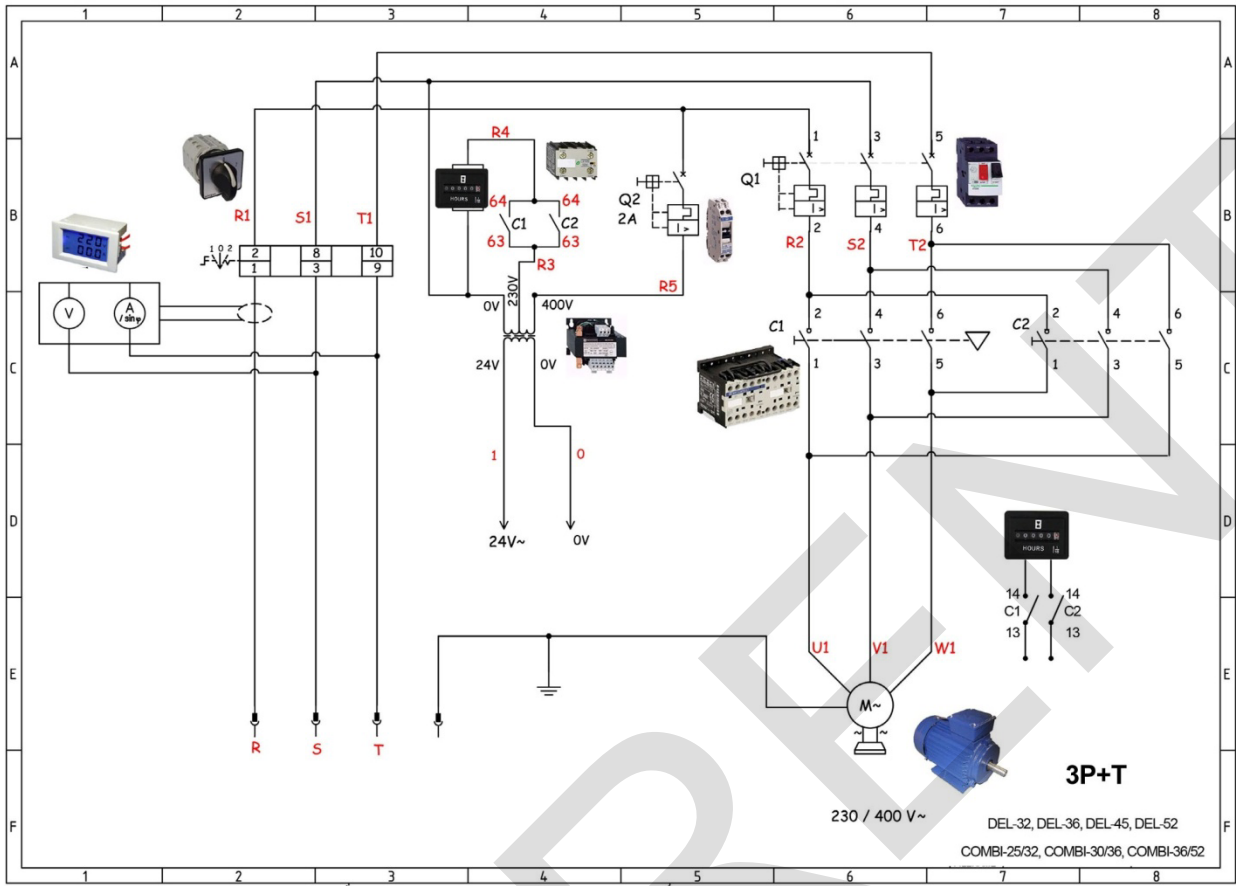
**Si no gira en el mismo sentido, tendrá que cambiar las fases de la línea de alimentación que está utilizando para alimentar la maquina.**

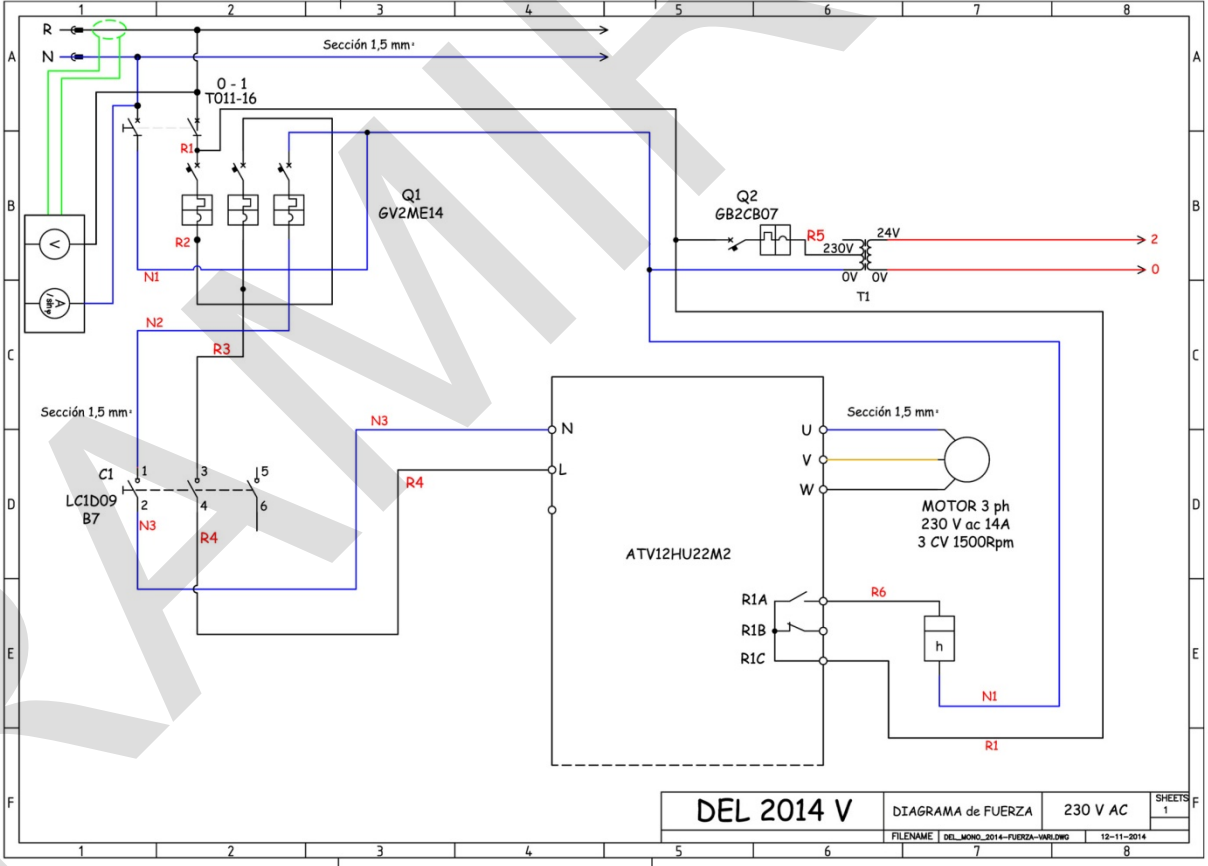
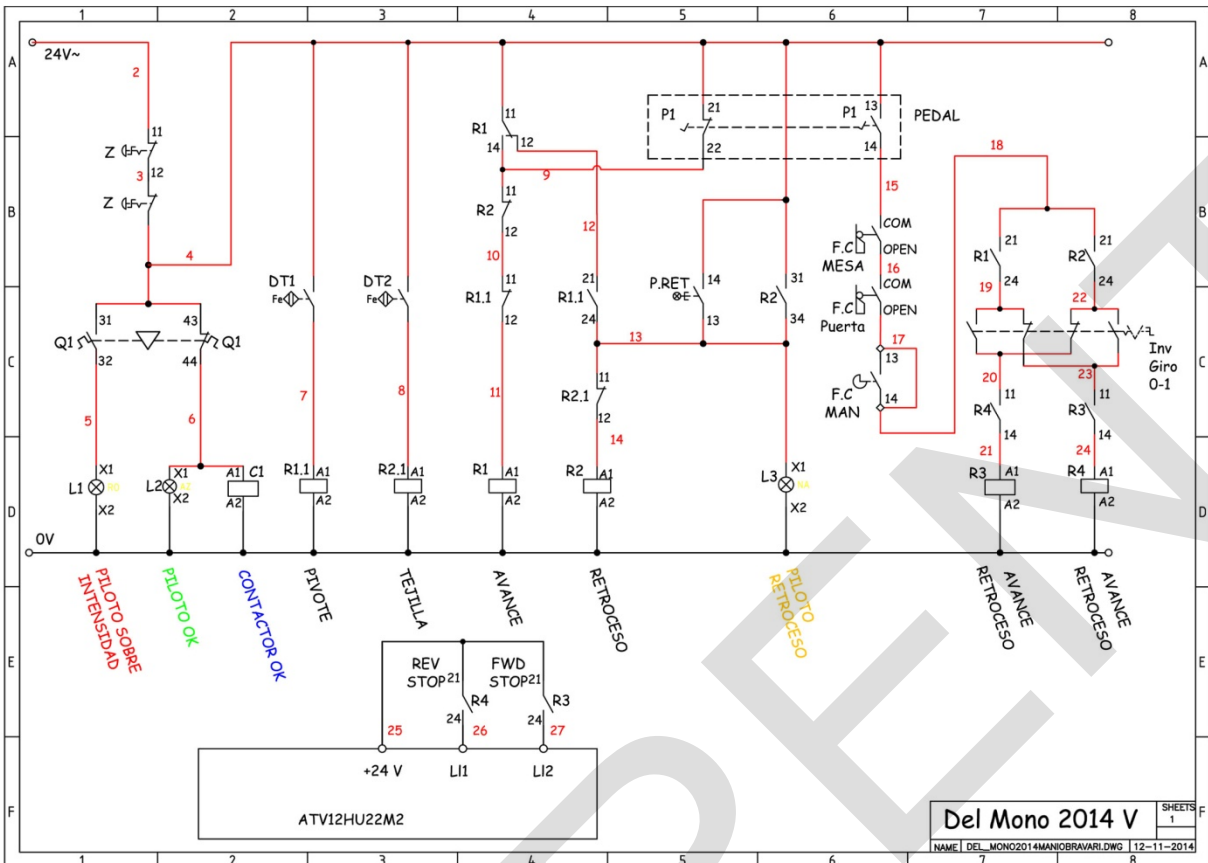


7.3 ESQUEMAS ELÉCTRICOS.









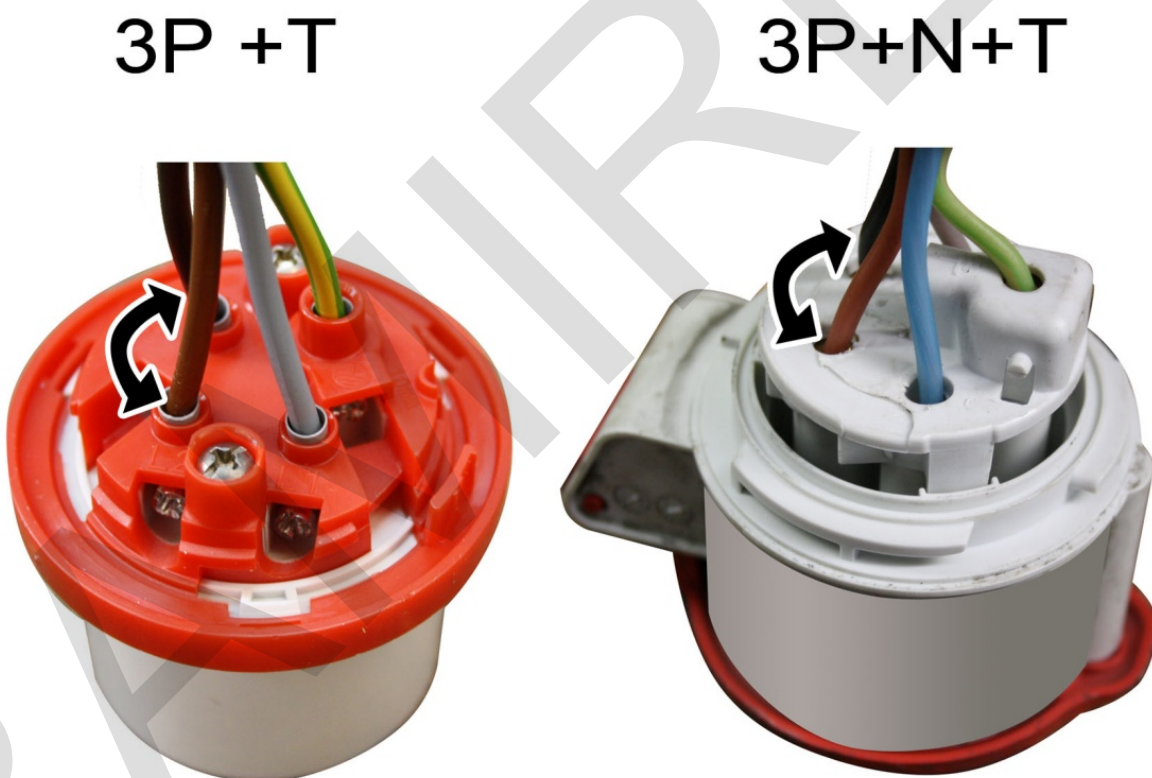
## RETROCESO MANUAL DEL PLATO DOBLADOR

Si durante la operación de doblado usted detiene la maniobra por algún motivo y necesita que el plato doblador retroceda sin tener que llegar al final del ciclo, pulse RETROCESO y accione el pedal, el plato retrocederá desde cualquiera que sea su posición hasta su posición inicial.



### 7.4 CAMBIO DE FASES PARA ESTABLECER SENTIDO DE GIRO CORRECTO.

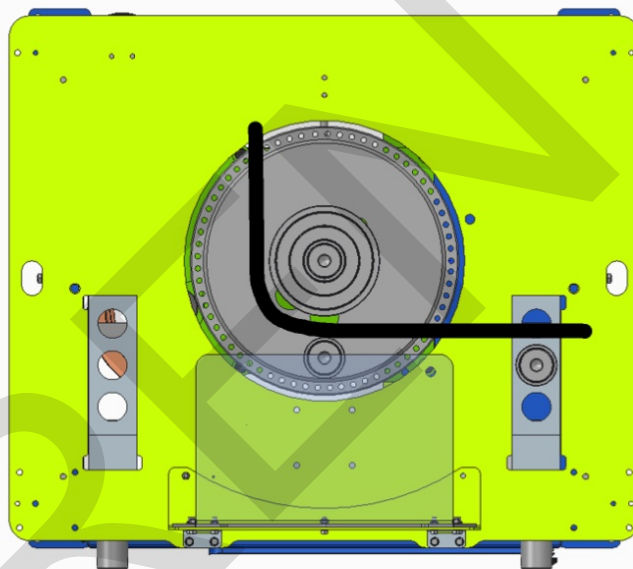
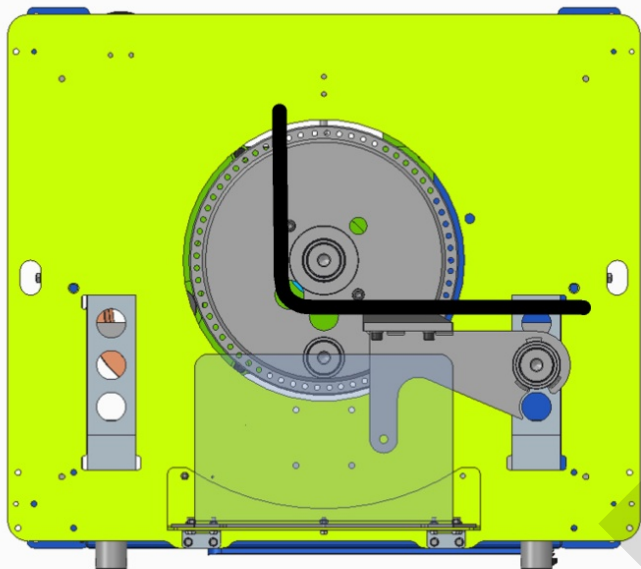
Para cambiar el sentido de giro del plato doblador, tendrá que abrir la clavija e intercambiar los hilos o fases tal como se indica en la imagen.



## 8. DOBLADO CON ESCUADRA O MANDRILES.

El apoyo con la escuadra de doblado se usa para doblar barras  $\leq$ de  $\varnothing 16\text{mm}$ , con el fin de reducir la distancia desde donde se apoya la barra hasta la zona donde será curvada, evitando así que la barra flexione ocasionando una deformación permanente

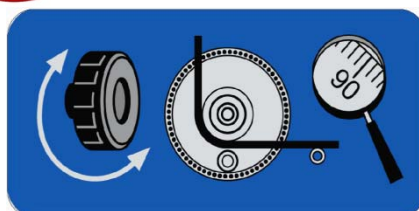
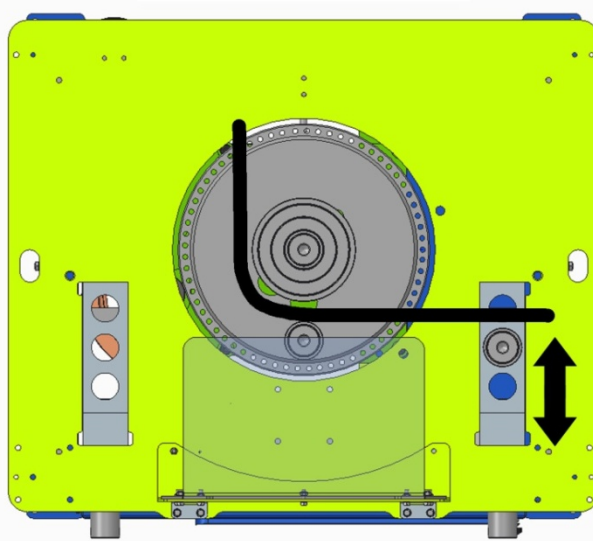
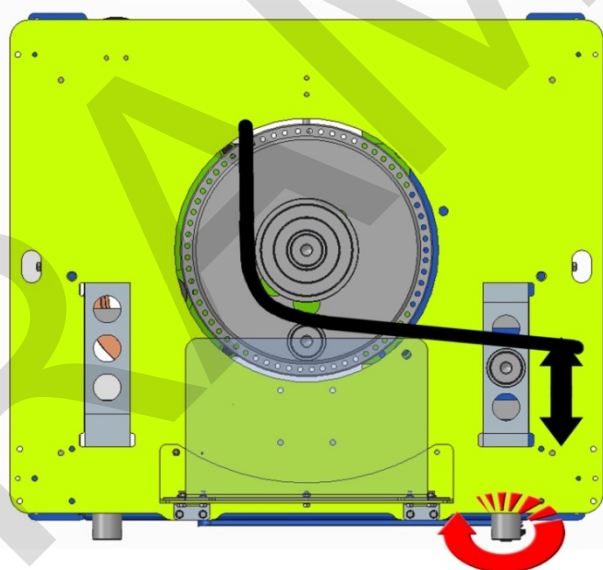
El apoyo con mandriles se usa para barras  $>\varnothing 16\text{mm}$  dado que la rigidez de barras superiores a este diámetro no flexionará en la zona de apoyo dando lugar a deformación permanente.



### 8.1 AJUSTE FINAL ÁNGULO DE DOBLADO.

Si no ha obtenido el ángulo deseado con el pivote de inversión y necesita un pequeño ajuste, será necesario desplazar el bulón de apoyo de la barra mediante los volantes regulables.

Gire el volante desplazando la regla hacia adelante para cerrar el ángulo o hacia atrás para abrir el ángulo.

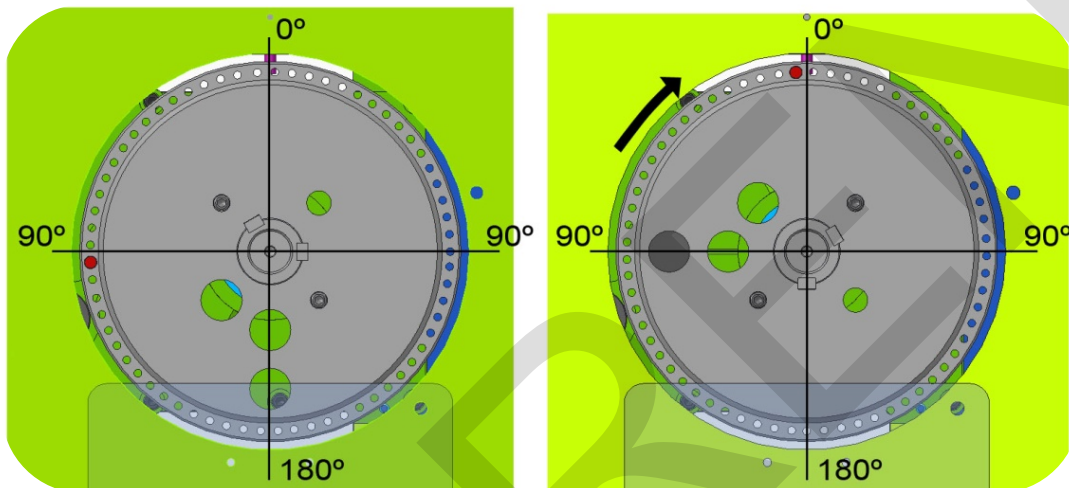


## 9. REALIZACIÓN DE UN DOBLADO



Antes de comenzar a doblar a barras en serie, realice el test de doblado sin colocar ningún accesorio sobre el plato ni la mesa hasta controlar los movimientos de la maquina y hacerse con el control.

1. Divida el plato imaginariamente en cuatro sectores de 90°.
2. Seleccione sentido de giro horario con el conmutador.
3. Inserte el pivote de inversión a mano izquierda del 0°, de tal forma que describa un ángulo de 90°.
4. Pise el pedal para hacer girar el plato y no lo suelte. El plato llegara hasta el final de recorrido y se detendrá cuando el pivote de inversión pase por delante del sensor inductivo.
5. Para hacer retroceder el plato a su sitio, levante el pie del pedal y vuélvalo a pisar.



## 10. REALIZACIÓN DEL CORTE.

Para utilizar la máquina como cizalla debe seguir el siguiente procedimiento:



**ATENCIÓN** Retire todos los bulones casquillos y pivotes que se encuentren en la mesa y en el plato doblador



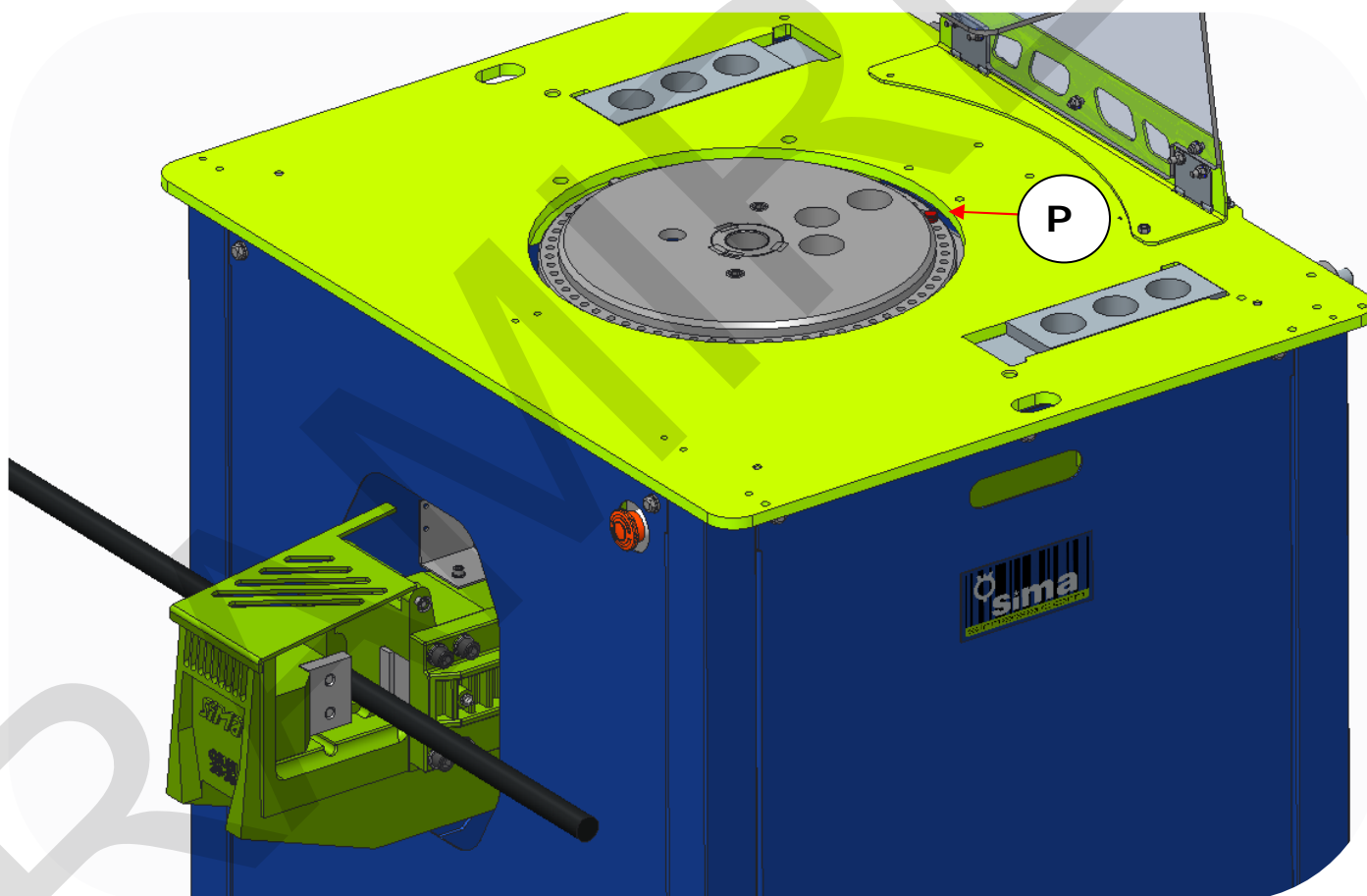
**ATENCIÓN:** Nunca utilice de forma simultánea el corte y el doblado a la vez, ello supone un gran riesgo de accidente y a la vez un sobre esfuerzo al motor y al reductor provocando serias averías.

### MODO CORTE CONTINUO.

Si usted no coloca ningún pivote de inversión sobre el plato, y pisa el pedal. El plato girara continuamente y la cuchilla móvil no dejara de entrar y salir de su alojamiento hasta que deje de pisar el pedal.

### MODO CORTE A CORTE.

Para obtener un solo corte ciclado, puede preparar la maquina colocando el pivote de inversión "P" en la posición de 180°, momento en el que se cierran las cuchillas. Tendrá que levantar el pie del pedal y volver a pisar para que el plato doblador retroceda hasta su punto de origen, y la cuchilla móvil quede escondida en su alojamiento, dejando paso libre al paso de la barra.

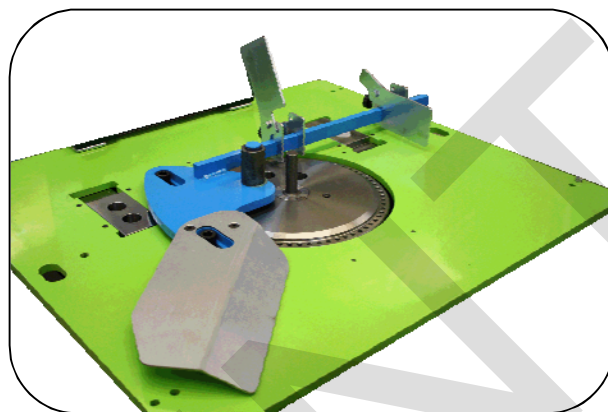




## 11. DISPOSITIVOS OPCIONALES.

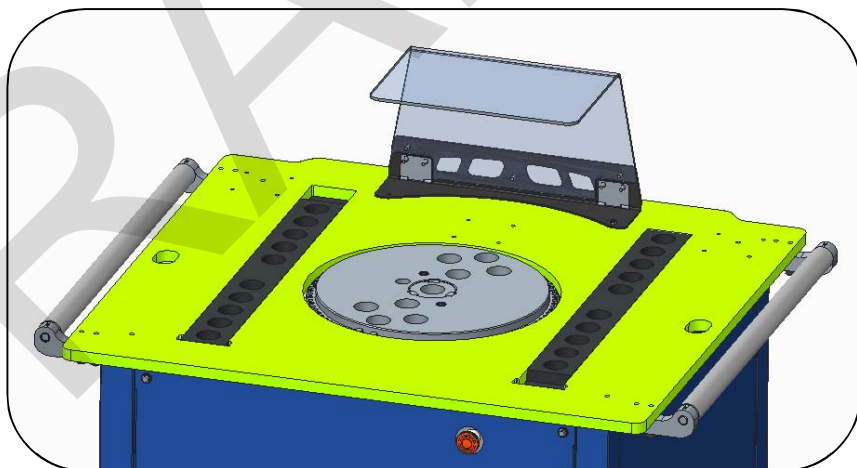
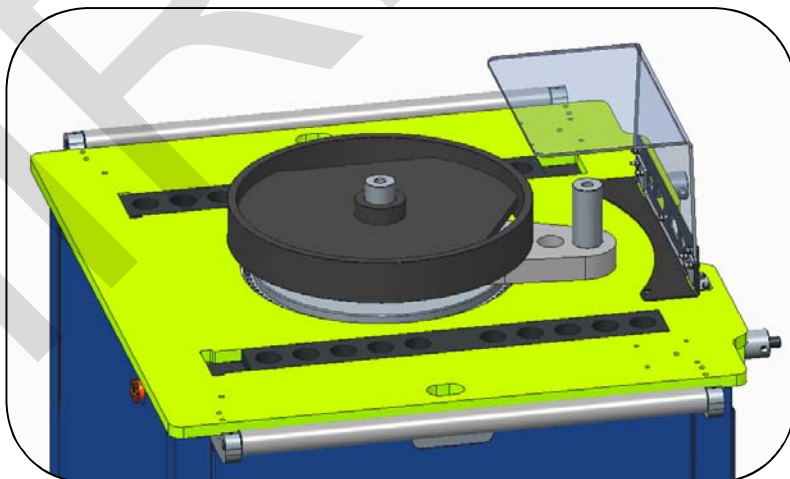
Las máquinas dobladoras y combinada disponen de accesorios adicionales que no van en dotación con la máquina, los cuales están diseñados para la realización de distintas funciones como:

- 1. DISPOSITIVO DE ESTRIBOS:** Este dispositivo está diseñado para la realización de estribos.



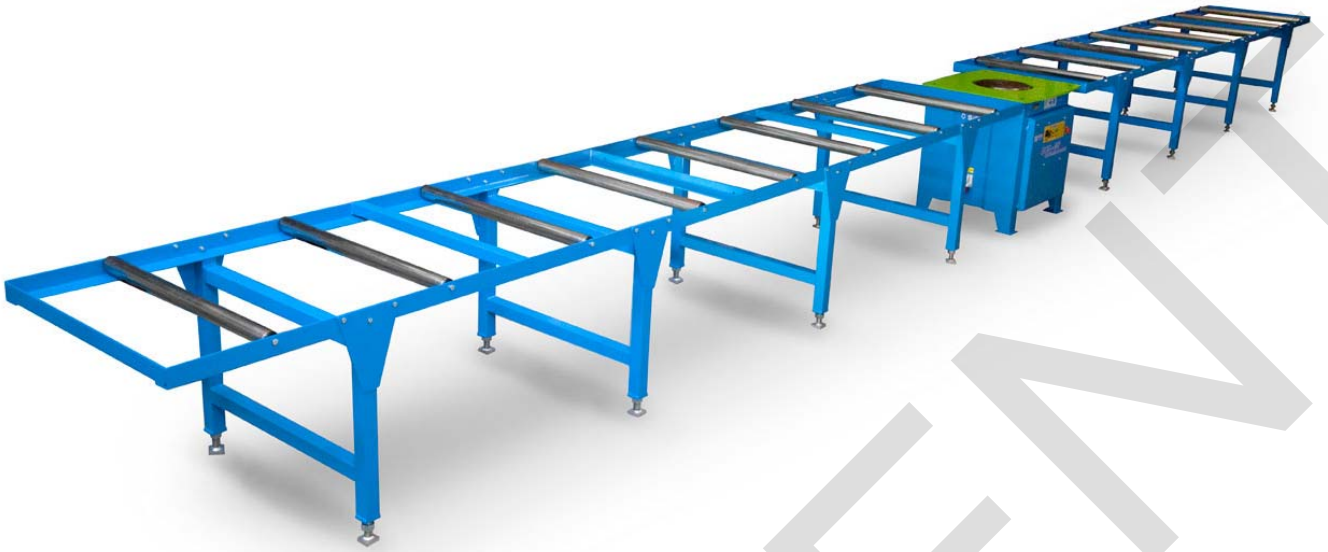
- 2. DISPOSITIVO DE ESPIRALES:** Este dispositivo está diseñado para la realización de estribos en forma de espiral. Podemos introducir barras desde 6 hasta 20mm de diámetro.

- 3. DISPOSITIVO GRANDES RADIOS:** Este dispositivo está diseñado para la realización del doblado de barras dejando un radio de doblado conforme a la normativa de doblado Europea. Está compuesto por una serie de accesorios y mandriles con un radio mínimo específico para cada diámetro de barra.

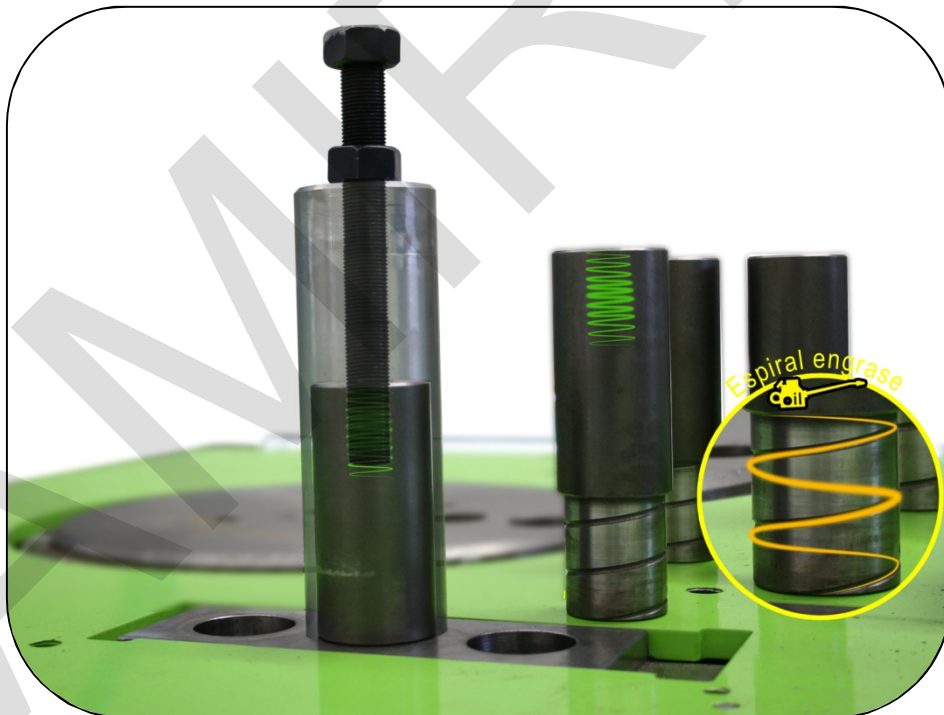


- 4. KIT RODILLOS DE ENTRADA:** Este kit está diseñado para hacer más fácil el deslizamiento de las barras y proteger la mesa del desgaste ocasionado por el roce de la barra.

5. **MESAS DE RODILLOS:** Diseñado para facilitar y agilizar la manipulación de las barras.



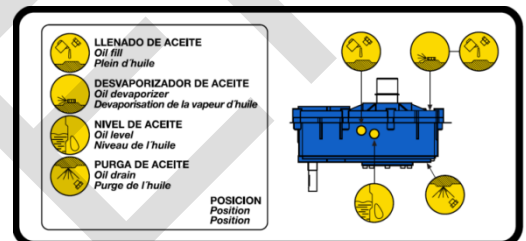
6. **EXTRACTOR DE BULONES:** Diseñado para extraer los bulones cuando quedan atascados.



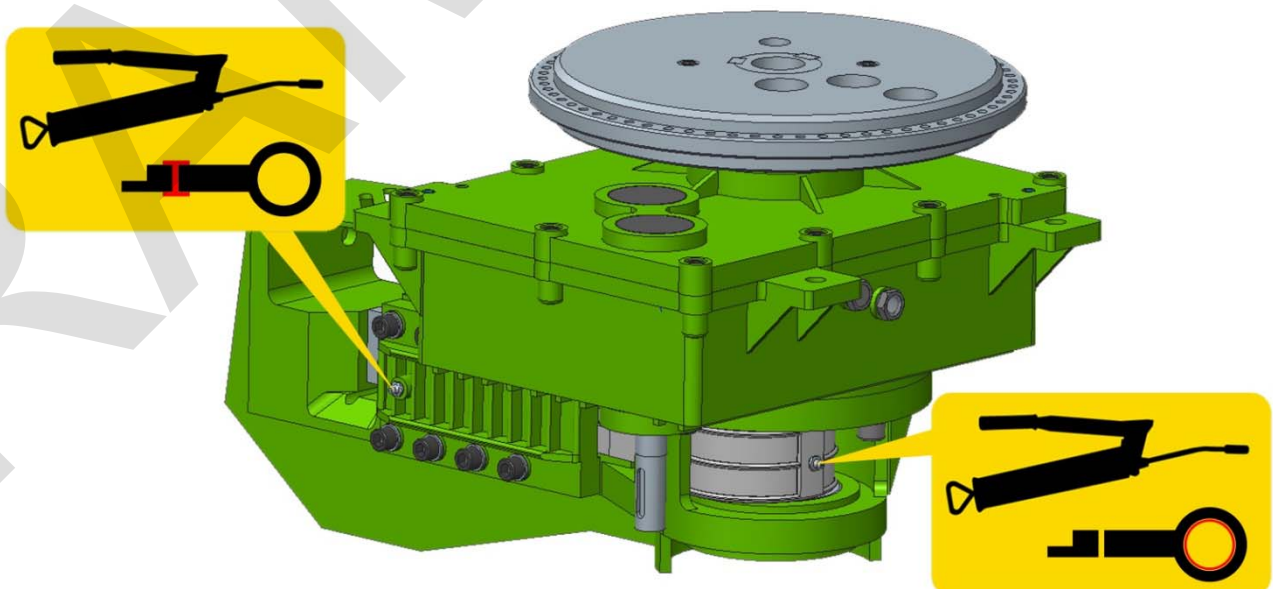


## 12. MANTENIMIENTO, INSPECCIÓN Y CONTROL.

- 1 Primer cambio de aceite a las 1000 horas de funcionamiento si es aceite mineral, posteriormente al cabo de 3000/4000 horas de trabajo o a tres años independientemente de las horas de funcionamiento de la máquina; o bien al cabo de 20.000 horas si se emplea aceite sintético.
- 2 Engrasar semanalmente con grasa cálcica los agujeros donde van alojados los bulones y la parte inferior del bulón, de esta manera evitaremos la corrosión y el gripado.
- 3 Al final de cada jornada desconecte la maquina.
- 4 Si la maquina no está cubierta, cúbrala con tela impermeable y evite salpicaduras de agua
- 5 Cuando sea necesario retire los restos de material que hayan caído en su interior.
- 6 Periódicamente realice la limpieza de las partes visibles y proceda a realizar el engrasado necesario de los orificios de la mesa, plato doblador y bulones.
- 7 Controlar periódicamente **(cada 8 días de uso)** la eficacia de las cuchillas de corte y en el caso que haya que sustituirlas proceda como se indica en este manual.
- 8 Controlar periódicamente **(control mensual)** el nivel de aceite del reductor mediante su visor, si se observa que ha descendido el nivel se debe añadir aceite hasta que sea visible en la marca del visor.



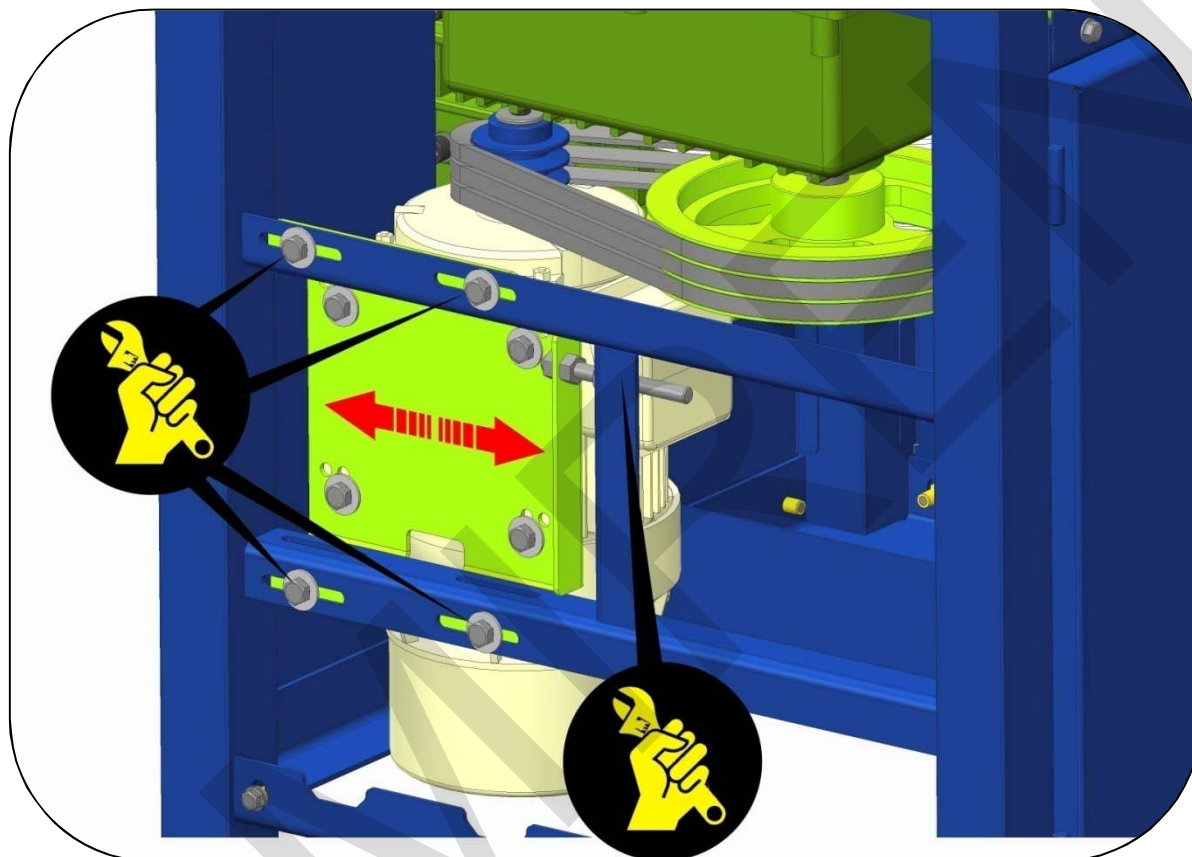
- 9 Para los modelos COMBI, existen dos puntos de engrase los cuales hay que engrasar aproximadamente **(cada 20 días)** dependiendo del uso.



### 12.1 CAMBIO O TENSADO DE LAS CORREAS.

Las máquinas salen de fábrica con las correas de transmisión perfectamente tensadas, es posible que después de ser instalada la maquina y tras varias jornadas de trabajo las correas de transmisión queden flojas. Para volver a tensarlas o reemplazarlas deberá seguir el siguiente procedimiento.

1. Asegúrese de que la maquina esta desconectada de la red eléctrica.
2. Retirar el lateral de la maquina.
3. Aflojar los cuatro tornillos que fijan la plataforma a las guías.
4. Incrementar la tensión mediante el tensor.
5. Volver a apretar los tornillos.
6. Volver a montar el lateral.

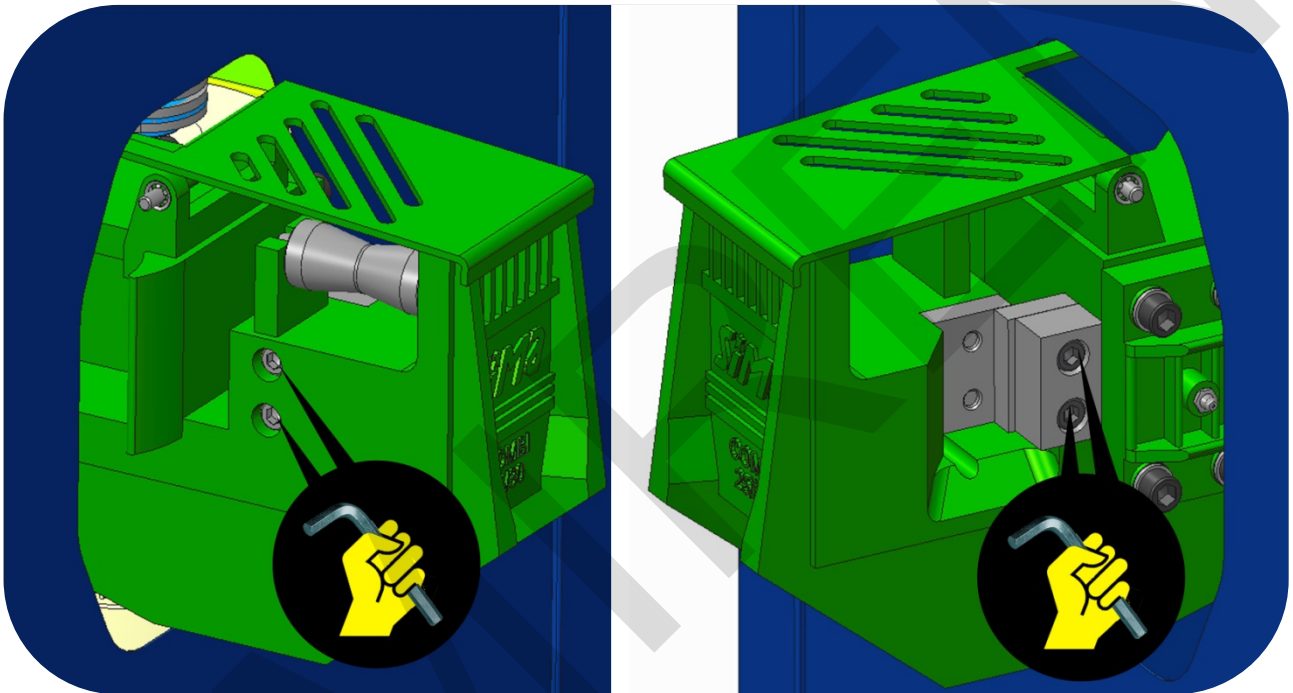




## 12.2 SUSTITUCIÓN DE LAS CUCHILLAS (MODELOS COMBI)

Si alguna de las cuchillas de corte de la maquina se ve deteriorada por el uso deberá seguir el siguiente procedimiento para reemplazar sus cuchillas en la mandíbula de corte:

- 1 **CAMBIO DE LA CUCHILLA FIJA.** Asegúrese que la maquina este desconectada de la red eléctrica. Levante el resguardo móvil de las cuchillas, a continuación retire los tornillos y gire la cuchilla para un nuevo filo de corte ó sustitúyala por otra nueva en caso necesario. Volver a operar de forma inversa.
- 2 **CAMBIO DE LA CUCHILLA MÓVIL.** Para realizar el cambio de esta cuchilla es necesario que la biela este desplazada fuera de su alojamiento, opere de la siguiente forma; con la maquina puesta en marcha y el pivote de inversión del plato doblador retirado de su posición, presione el pedal y observe el movimiento de la cuchilla. Cuando se observe que la cuchilla esta fuera del alojamiento levantaremos el pie del pedal, inmediatamente después desconectaremos la máquina de la red eléctrica para evitar accidentes; de este modo podrá acceder a los tornillos que fijan la cuchilla; retire los tornillos de la cuchilla para un nuevo filo ó sustitúyala por una nueva en caso necesario. Volver a operar en orden inverso.











### 13. SOLUCIÓN A LAS ANOMALÍAS MÁS FRECUENTES.


ANOMALÍA	POSIBLE CAUSA	SOLUCIÓN
Potencia de corte o doblado insuficiente.	Correas destensadas o dañadas.	Tensarlas o sustituirlas.
	Cuchillas dañadas.	Cambiar la cara corte o sustituirlas.
	Baja potencia en motor.	Revisar motor por servicio técnico.
El plato de doblado gira pero no vuelve y se para tras coincidir con el sensor inductivo.	Sensor inductivo defectuoso	Verifique el sensor inductivo de parada y confirme su continuidad. (1 abierto, 0 cerrado). Sustituirlo en caso de avería
Falta tensión en la maquina, la lámpara piloto de estado de energía no se enciende.	Falta de tensión en el cuadro de suministro de energía	Revisar cuadro eléctrico del lugar de trabajo comprobar que existe tensión en el lugar de la toma de energía
	Conexión defectuosa a la red	Verifique la tensión de la red eléctrica del lugar de trabajo y sus conexiones.
	Desconexión del disyuntor de maniobra	Rearmar el disyuntor
	Cable conductor eléctrico en mal estado.	Comprobar el estado y la conexión de los cables.
La lámpara piloto de estado de energía está encendida pero la maquina no funciona.	La maquina no está bien conectada.	Comprobar que la máquina este conectada a todas sus fases. Comprobar el disyuntor del cuadro eléctrico de la maquina
	Paradas de emergencia bloqueadas	Desbloquear paradas de emergencia
	Elementos eléctricos de seguridad desactivados	Comprobar que las dispositivos de seguridad de puertas, resguardos, paradas de emergencia y demás seguridades están operativas
Conexión a 230V ó 400V. La conexión es regular pero la maquina no tiene fuerza suficiente.	Tensión inestable.	Comprobar la salida de la corriente de emisión. Si el voltaje es inferior a 230V y a 400V la maquina no funciona. Se aconseja un estabilizador de tensión.
La maquina pierde aceite por la parte inferior del reductor	Retenes deteriorados o dañados.	Revisar los retenes y sustituirlos si presentan deterioro.
Durante el retroceso después del doblado, el plato doblador no para en el punto de inicio.	Sensor inductivo defectuoso	Verifique el sensor inductivo y su continuidad (1 abierto 0 cerrado). Sustituirlo en caso de avería
El plato doblador no se detiene instantáneamente al final de cada maniobra	Electo-freno desajustado por desgate	Revisar el electro-freno y justarlo tensando los muelles y dejando una luz uniforme entre disco y zapata de 0,30-0,40mm Utilizando galgas graduadas para este reglaje.
	Disco zapata del electro-freno con desgaste importante	Reemplazar el disco zapata
Ruidos extraños dentro del bloque reductor	Deterioro interno de alguno de sus elementos	Desmontar el bloque reductor y verificar rodamientos y engranes, sustituir elementos que presenten roturas o deterioro
Ruidos extraños en el motor	Avería del motor en algunos de sus componentes	Observar de donde procede el ruido, desmontar el motor y proceder a su reparación





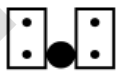

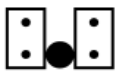



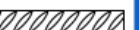
14. CARACTERÍSTICAS TÉCNICAS.

								
	Kg	C.V.	Kw	R.P.M.	LxAxH	LxAxH	R.P.M. x1'	L
<b>DEL 32</b>	302	3	2.2	1500	910x808x1141	950x850x1050	11	5,1
<b>DEL 36</b>	355	4	3	1500	910x808x1141	950x850x1050	10	10
<b>DEL 45</b>	490	4	3	1500	1040x1000x1141	1080x1040x1050	6,5	8,8
<b>DEL 52</b>	721	5,5	4	1500	1040x1000x1141	1080x1040x1050	6	15
<b>COMBI 25/32</b>	386	3	2.2	1500	910x1009x1141	950x1070x1050	11	5,1
<b>COMBI 30/36</b>	435	4	3	1500	910x1033x1141	950x1070x1050	10	10
<b>COMBI 36/52</b>	790	5	4	1500	1040x1244x1141	1080x1290x1050	6,5	15

10.1 CAPACIDADES DE DOBLADO.

<b>CAPACIDAD DE CORTE / CUTTING CHARACTERISTICS / CAPACITÉS DE COUPE</b>																											
LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250						R=N/mm <sup>2</sup> 480						R=N/mm <sup>2</sup> 650														
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450						R=N/mm <sup>2</sup> 650						R=N/mm <sup>2</sup> 850														
Nºx 	1			2			3			1			2			3			1			2			3		
<b>DEL-32</b>	Ø32	Ø24	Ø18	Ø25	Ø20	Ø16	Ø25	Ø20	Ø16	Ø25	Ø20	Ø16	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14
<b>DEL-36</b>	Ø36	Ø26	Ø22	Ø32	Ø24	Ø18	Ø32	Ø24	Ø18	Ø32	Ø24	Ø18	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16
<b>DEL-45</b>	Ø45	Ø32	Ø25	Ø40	Ø32	Ø25	Ø40	Ø32	Ø25	Ø40	Ø32	Ø25	Ø40	Ø26	Ø25	Ø40	Ø26	Ø25	Ø40	Ø26	Ø25	Ø40	Ø26	Ø25	Ø40	Ø26	Ø25
<b>DEL-52</b>	Ø52	Ø36	Ø30	Ø46	Ø34	Ø25	Ø46	Ø34	Ø25	Ø46	Ø34	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25

LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250									R=N/mm <sup>2</sup> 480									R=N/mm <sup>2</sup> 650								
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450									R=N/mm <sup>2</sup> 650									R=N/mm <sup>2</sup> 850								
																											
Nºx 	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>COMBI 25/32</b>	Ø25	Ø18	Ø12	Ø32	Ø24	Ø18	Ø20	Ø16	Ø10	Ø25	Ø20	Ø16	Ø20	Ø14	Ø8	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14	Ø25	Ø18	Ø14
<b>COMBI 30/36</b>	Ø30	Ø20	Ø16	Ø36	Ø26	Ø22	Ø25	Ø18	Ø14	Ø32	Ø24	Ø18	Ø25	Ø16	Ø12	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16	Ø32	Ø22	Ø16
<b>COMBI 36/52</b>	Ø36	Ø26	Ø22	Ø52	Ø36	Ø25	Ø32	Ø20	Ø16	Ø46	Ø34	Ø25	Ø32	Ø18	Ø16	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25	Ø42	Ø32	Ø25

## 15. RECOMENDACIONES DE SEGURIDAD

Las máquinas dobladoras y combinadas para elaboración de barras de acero, deben ser utilizadas por operarios que hayan sido instruidos y formados en el funcionamiento de la máquina.

- Antes de poner en marcha la máquina, lea atentamente las instrucciones y observe el cumplimiento de las normas de seguridad. Aprenda perfectamente a detener la máquina de una forma rápida y segura
  - Colocar la maquina en una superficie plana y bien iluminada.
  - No conectar la máquina hasta haber garantizada su estabilidad
  - No ponga en marcha la máquina si no tiene montadas todas las protecciones de seguridad y resguardos con que ha sido diseñada.
  - Se aconseja el uso de gafas de protección, botas de seguridad y guantes. Usar siempre material homologado y cumplir con las medidas de prevención y riesgos de cada lugar
  - Utilice siempre el equipo de protección individual (EPI) de acuerdo al trabajo que está realizando
  - Prohibir el acceso de personas ajenas a la zona de trabajo de la maquina.
  - La ropa de trabajo no debe incluir prendas sueltas que puedan ser atrapadas por las partes móviles de la maquina.
  - Cuando tenga que desplazar la maquina hágalo siempre con el motor parado y las partes móviles bloqueadas.
  - Mantengan siempre en su correcta posición todos los elementos de protección y resguardos de seguridad.
  - **Atención:** Antes de colocar los bulones, mandriles y escuadra de doblado, comprobar el sentido de giro del plato de doblado. Después de esta comprobación instalar los accesorios necesarios para el trabajo.
  - Los cables eléctricos que presenten cortes y roturas deben ser cambiados de inmediato.
  - Desconecte la máquina de la red eléctrica y no manipule ni opere sobre los elementos mecánicos y eléctricos de la maquina con el motor en marcha.
  - No utilizar la máquina para las funciones que no ha sido diseñada
- **MUY IMPORTANTE:** La toma de tierra debe estar conectada siempre antes de la puesta en marcha.
  - Usar cables de extensión normalizados
  - Asegúrese que el voltaje de la red de alimentación a la que va a ser conectada la maquina, coincide con el voltaje que se indica en la etiqueta adhesiva fijada a la maquina.
  - Asegúrese que el cable de extensión de alimentación de la máquina, no entre en contacto con puntos de alta temperatura, aceites, agua, aristas cortantes, evitar que sea pisado o aplastado por el paso de vehículos y personas, así como depositar objetos sobre el mismo.
  - No utilizar agua a presión para limpiar circuitos y elementos eléctricos.

**ATENCIÓN:** Deben seguirse todas las recomendaciones de seguridad señaladas en este manual y cumplir con la normativa de prevención de riesgos laborales de cada lugar.

**SIMA, S.A. no se responsabiliza de las consecuencias que se puedan derivar de un mal uso o usos inadecuados de las máquinas dobladoras y combinadas para la elaboración de barras de acero.**

## 16. GARANTÍA.

SIMA, S.A. fabricante de maquinaria para la construcción, dispone de una red de servicios técnicos Red SERVÍ-SIMA. Las reparaciones efectuadas en garantía por nuestra Red SERVÍ-SIMA, están sometidas a unas condiciones con objeto de garantizar el servicio y calidad de las mismas.

SIMA. S.A. garantiza todos sus fabricados contra cualquier defecto de fabricación, quedando amparados por las condiciones especificadas en el documento adjunto CONDICIONES DE GARANTÍA.

Las condiciones de garantía cesaran en caso de incumplimiento de las condiciones de pago establecidas.

SIMA S.A. se reserva el derecho de modificar sus productos sin previo aviso

## 17. DECLARACIÓN SOBRE RUIDOS

El nivel de presión acústica en el puesto de trabajo es inferior a 70 dB(A)

## 18. DECLARACIÓN SOBRE VIBRACIONES MECÁNICAS

La máquina no presenta fuentes de vibraciones mecánicas que conlleven riesgos para la salud y la seguridad de los trabajadores.

## 19. REPUESTOS.

Los repuestos disponibles están identificados en la web [WWW.SIMASA.COM](http://WWW.SIMASA.COM). Para solicitar cualquiera de ellos, deberá ponerse en contacto con el departamento de post-venta de SIMA S.A. y especificar claramente el **número** con el que está señalado, así como el **modelo, número de fabricación y año de fabricación** que aparece en la placa de características de la máquina a la cual va destinado.

## 20. PROTECCIÓN DEL MEDIO AMBIENTE.



Se deberán recuperar las materias primas en lugar de desechar los restos. Los aparatos, accesorios, fluidos y embalajes deberán ser enviados a sitios indicados para su reutilización ecológica. Los componentes de plástico están marcados para su reciclaje seleccionado.



**R.A.E.E. Los residuos de aparatos eléctricos y electrónicos deberán ser depositados en lugares indicados para su recogida selectiva.**



SOCIEDAD INDUSTRIAL DE MAQUINARIA ANDALUZA, S.A.

POL. IND. JUNCARIL, C/ALBUÑOL, PARC. 250

18220 ALBOLOTE (GRANADA)

Tel.: 34 - 958-49 04 10 – Fax: 34 - 958-46 66 45

FABRICACIÓN DE MAQUINARIA PARA LA CONSTRUCCIÓN

ESPAÑA



# simasa

- Ⓔ MANUAL DE INSTRUCCIONES ORIGINAL
- ⒼⒷ ORIGINAL USER GUIDE
- ⒻⓂ MANUEL ORIGINAL D'UTILISATION

DEL-45

DEL-52

COMBI-25/32

COMBI-30/36

COMBI-36/52

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# RAMIRENT



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## 1. GENERAL INFORMATION

**WARNING: Please read and understand perfectly the present instruction before using the machine.**

SIMA S.A. thanks you for your trust in our products and for purchasing the BENDING OR COMBINED ELECTRICAL CUTTING/BENDING MACHINE.

This manual provides you with the necessary instructions to start, use, maintain and in your case, repair of the present machine. All aspects as far as the safety and health of the users is concerned have been stated.

Respecting all instructions and recommendations guarantees safety and low maintenance.

As such, reading this manual carefully is compulsory for any person responsible for the use, maintenance or repair of this machine.

**It is recommended to have always this manual in an easily accessible place where the machine is being**

## 2. GENERAL DESCRIPTION OF THE MACHINE

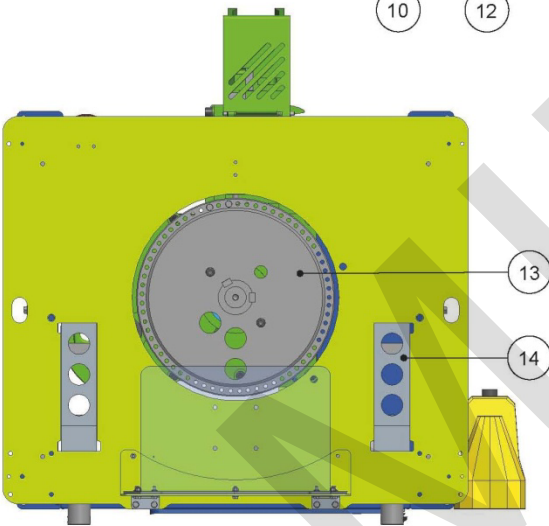
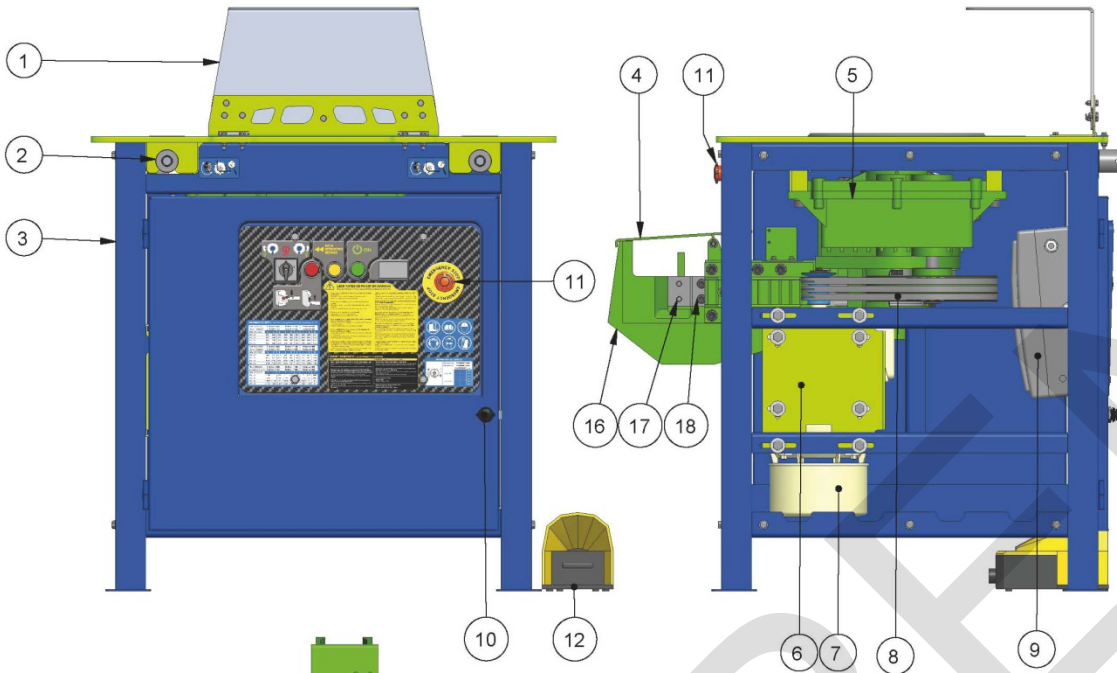
- The DEL bending machines have been manufactured to bend flat and reinforced steel bars used for construction and passive steel armatures for structural concrete. The bending operation is done in cold using mandrills to guarantee the bending interior diameter is conforming to the European norms.

- The combined machines bending/cutting models COMBI are designed to bend as well as cut steel bars. The cutting tools are two blades, one fixed and one moving. The cutting operation is done manually by pushing the bar on the roller, dropping the bar into the cutting throat, lowering the protection guard and pressing the pedal.

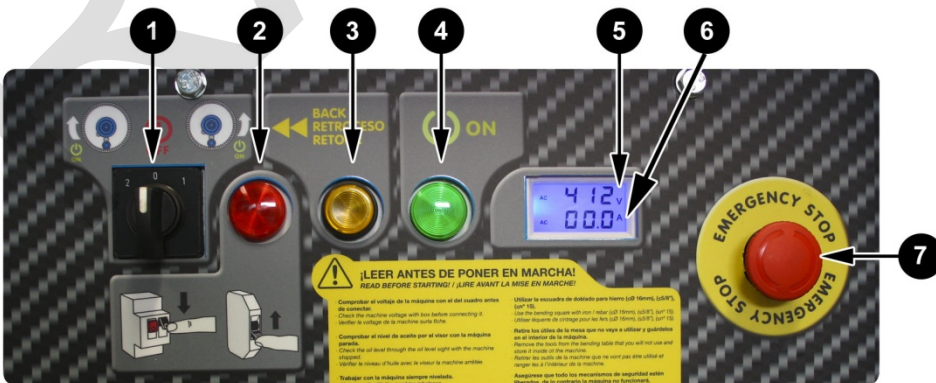
**Any other use of this machine is considered inadequate and can be dangerous. Thus, this is completely prohibited.**

- The machine is equipped with an electrical auto-ventilated motor-brake
- The reducer is the main element of the machine. It is responsible for transmitting the needed energy to carry out the steel bars bending.
- The machine is operated by an electrical motor that passes the movement, by a transmission to the bending mechanism in which the different mandrills are mounted.
- The bending plate can be selected to work in two different directions, left or right, by changing the direction of rotation in the electrical control panel.
- The bending angle can be decided by inserting the pivot in the bending plate. For a more precise bending, the ruler can be accurately adjusted by its handle.
- The commands panel is endowed with polyester, electrical knobs easily identified by pictograms.
- The machine is equipped with shutdown and backward movement buttons to facilitate its manoeuvre. The emergency knobs on both sides of the machine can be used in case of danger or incorrect manoeuvres.
- The general bars bending manoeuvre is performed in low-voltage (24V) according to the European standards.
- The original equipment (bolts, mandrels bending square) are heat-treated to withstand the tough type of work the machine performs.
- The machine is furnished with a pedal to confirm and execute the manoeuvre, thus avoiding the upper parts to be trapped while the machine is running.
- The work area is protected by a safety guard to limit possible accidents. This guard is transparent to allow observation of the material being bent, avoiding getting to the upper parts of the bending area.
- The machine is equipped with wheels to facilitate their movement.
- The machine is painted in oven with a highly resistance, anti-corrosion epoxy polyester paint.
- The original, electrical equipment is in conformity with the EC safety norms.
- The COMBI model is supplied with a cutting jaw with a safety metal guard connected to an electrical protection system. When this safety guard is lifted, the machine stops working.

### 3. MACHINE



- 1. SAFETY VISOR BENDING PLATE
- 2. MINOR ADJUSTMENT HANDLE
- 3. CHASIS
- 4. SAFETY GUARD FOR CUTTING HEAD
- 5. GEAR BOX
- 6. MOTOR PLAQUE
- 7. MOTOR
- 8. TRANSMISSION BELTS
- 9. ELECTRICAL BOX
- 10. ACCESS DOOR HANDLE
- 11. EMERGENCY STOP
- 12. BENDING PLATE FOOT PEDAL
- 13. BENDING PLATE
- 14. SIDE MANDREL ADJUSTMENT
- 15. ELECTRICAL SOCKET
- 16. MCUTTING HEAD
- 17. FIXED CUTTING BLADE
- 18. MOVING CUTTING BLADE



- 1. INVERSE SWITCH
- 2. OVERLOAD PROTECTION WARNING LIGHT
- 3. RETURN SWITCH
- 4. ON LIGHT
- 5. VOLTMETER
- 6. AMPMETER
- 7. EMERGENCY STOP

## 4. TRANSPORT

For a safe transport of the machine, please follow the following instructions:

The Bending and Combined machines are fitted with holes in the working table to be lifted with cranes through chains or cables. The means of transport used must be safe.

**IMPORTANT:** During the transport of the machine, the latter should never be reversed nor be put on either side. The machine is only to rest on its four feet.



## 5. PICTOGRAMS

Pictograms included in the machine entail the following:



USE SAFETY FOOTWEAR



USE HELMET AND EYE AND EAR DEFENDERS










READ INSTRUCTIONS MANUAL



USE SAFETY GLOVES

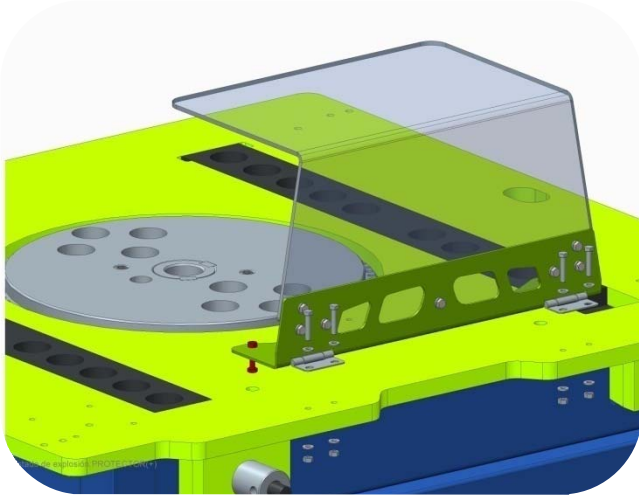
## 6. DELIVERY CONDITIONS

SIMA bending and combined machines are delivered individually packed on a reinforced pallet. The following items are sent together with the machine:

											
			Ø60	Ø100	Ø140	Ø160	Ø200				
DEL-32	1	4	4	1	1			1	1	1	2
DEL-36	1	4	4	1	1	1		1	1	1	2
DEL-45	1	4	4	1	1	1		1	1	1	2
DEL-52	1	4	4	1	1	1	1	1	1	1	2
COMBI-25/32	1	4	4	1	1			1	1	1	2
COMBI-30/36	1	4	4	1	1	1		1	1	1	2
COMBI-36/52	1	4	4	1	1	1	1	1	1	1	2

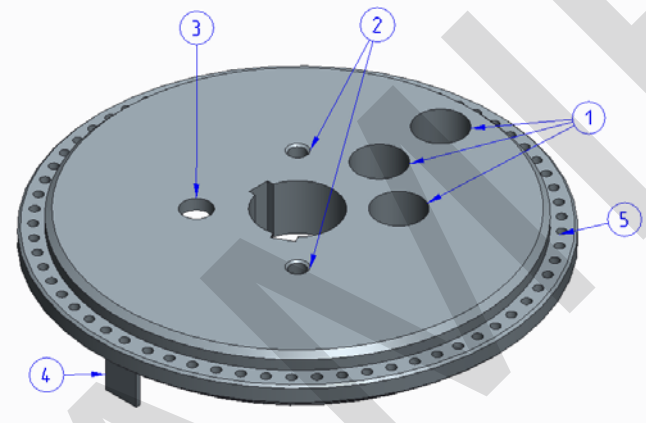
## 6.1 INSTALLING THE PROTECTIVE VISOR

For transport reasons, the plate safety guard is disassembled. Before using the machine, the plate safety guard should be mounted. The latter presses a security microswitch and if it is not installed correctly the machine will not start.

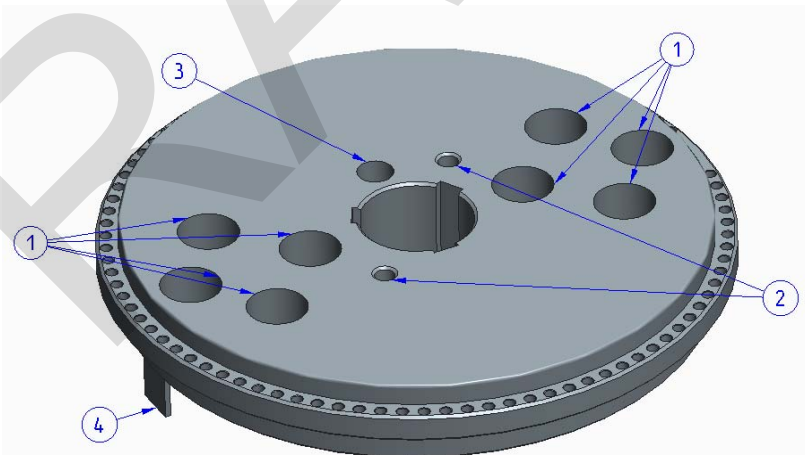


## 6.2 BENDING PLATE

Depending on the model that you have purchased the bending plate will have different holes for different purposes.

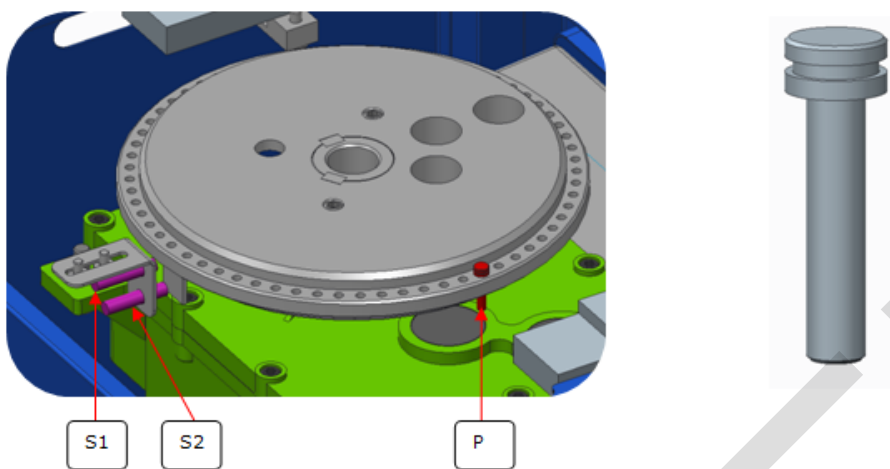


1. Holes for bending mandrels. Depending on the size of the rebar the mandrels will go into different holes.
2. Screw holes for fixing the optional large diameter kits
3. Screw hole for spiral kit.
4. End of bend reference point.
5. Holes for bending pins.



### 1.3 ANGLE INVERSION AND SELECTION PIVOT

The inversion pivot (**Fig. P**) It is used to select the plate rotation angle. Depending on the rotation direction of the plate that we choose, we have to insert the pivot in different sectors relative to the **S1 and S2 sensor**



Sensor S1, is to stop the bending plate when the pivot passes over it.

Sensor S2, is to stop the bending plate when it returns to its original position.

## 7. STARTING-UP AND USING THE MACHINE

**WARNING:** All safety recommendations must be followed, either the ones mentioned in the present user manual or those complying with all labour risks prevention norms in every location.

**WHEELWORK:** SIMA bending and combined machines do not need any wheelwork operations as they are specially designed to obtain the maximum performance from start.

#### **NORMAL USE OF THE MACHINE:**

The bending machines have been designed for bending and cutting flat and reinforced steel bars for use in the structure and other construction. Each other use that has not been expressly indicated is considered abnormal. Any tool or accessory added or amended without written authorization from the manufacturer is considered inappropriate and dangerous. If any damage or injury is caused as a result thereof or by misuse of the machine, SIMA S.A. exempts all responsibility as manufacturer. The machine must be installed on a plane, firm and horizontal surface and the ground should not be soft.



**This machine MUST NOT BE USED IN THE RAIN. Cover with waterproof materials. If the machine has been exposed in the rain check before connecting the electrical parts are not wet. Always work with good lighting conditions.**



## 7.1 PLUGGING THE MACHINE TO THE ELECTRICITY

The extension cable used to feed the machine needs to have a minimum section of  $4 \times 2.5 \text{ mm}^2$  up to 25 meters long. For a superior distance  $4 \times 4 \text{ mm}^2$  can be used. In one of its ends, it is needed to connect a base normalised aerial of 3P+T or 3P+N+T compatible with the machine switch and in the other end, one normalised aerial pin of 3P+T ó 3P+N+T compatible with switchboard exit.

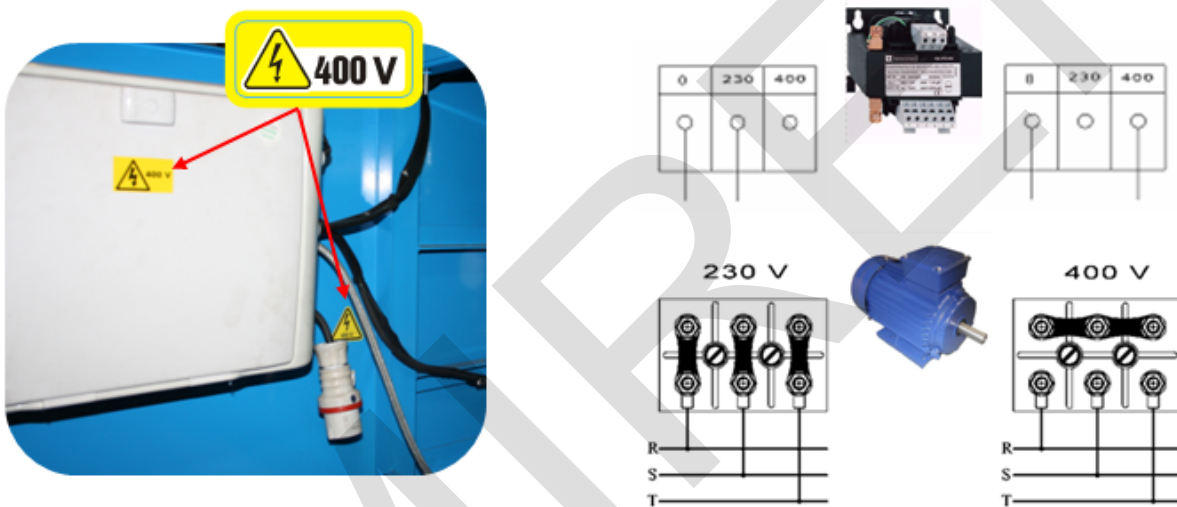


**Machines with electrical motor should always be connected to a normalised switchboard that disposes of a magneto-thermal switch and a differential in accordance with the characteristics of the motor:**

3Kw / 4 HP, three phase at 400V, 15A magneto-thermal and 15A/300mA differential.

3Kw / 4 HP, three phase at 230V, 20A magneto-thermal and 20A/300mA differential.

The machine electrical tension is visible on the voltage indication next to the top of engine terminals and on the machine characteristics plate.



**Do not plug the machine to the electricity if you are not sure of the available electrical tension. If the tension is not correct, the engine will undergo irreparable harm or out of service.**



**Do not perform any electrical work on the machine unless it is disconnected from the mains.**



**VERY IMPORTANT: Earth should always be connected before the machine is switched on.**

## 7.2 CONNECTING TO ELECTRICITY SOURCE.

The machine has a display so that the user can see the voltage supplied to the machine before the voltage reached the electrical components and causes any damage.

To connect the machine do the following

1. Open the door and connect the socket to the electrical box socket .This way the electricity will not reach the motor and you can see the voltage coming into the machine.



**IMPORTANT:** The transformer has a tolerance of  $\pm 10\%$  of the stated voltage capability of the machine. If this limit is passed then it will damage the transformer.

**400v machine = 380V min / Max 430V max**

**230V machine = 210V min / Max 250V max**

2. Select a bending direction on the electrical panel and the green light will come on.
3. Depress the pedal to start to bend and see which way the plate is bending



**Position 0.** Machine disconnected

**Position 1.** Machine connected in anti clockwise.

**Position 2.** Machine connected in clockwise position.

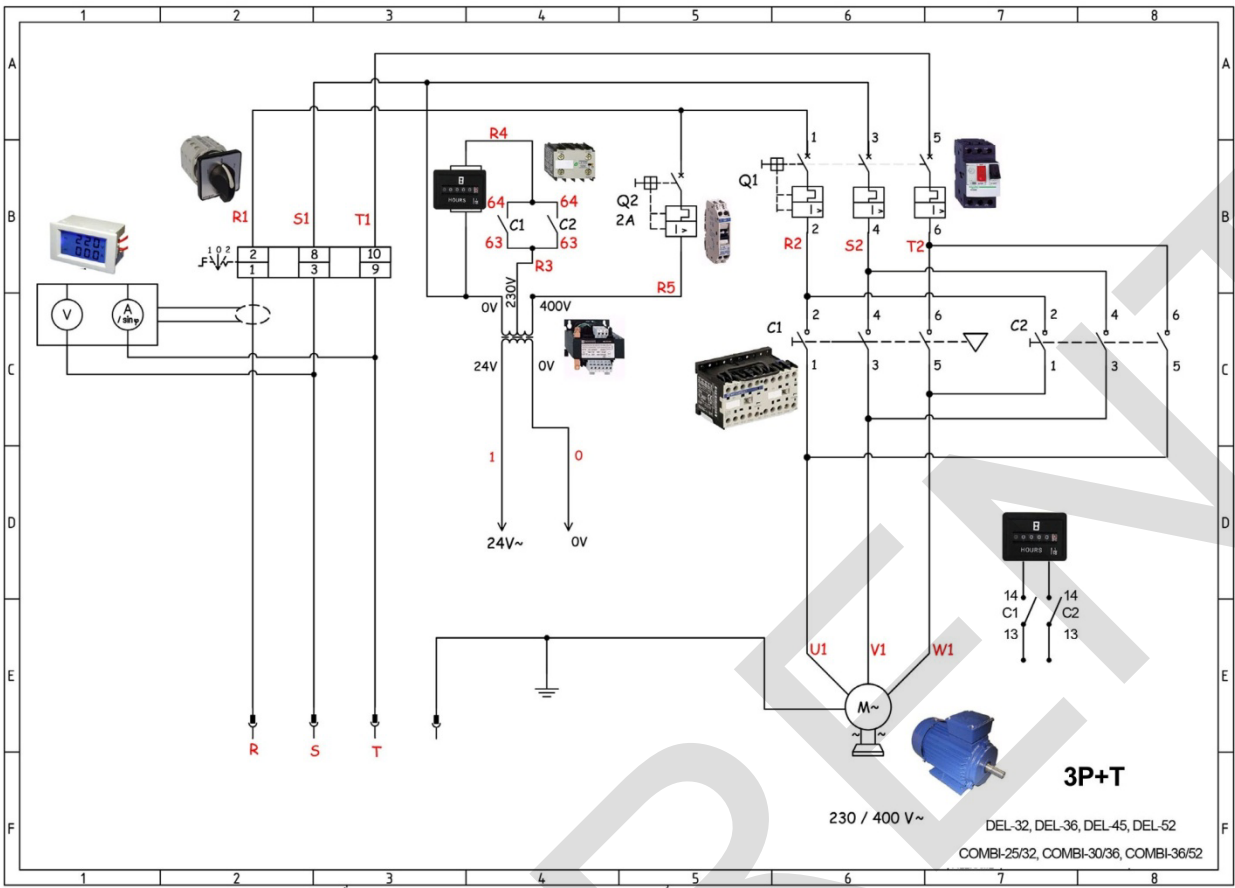


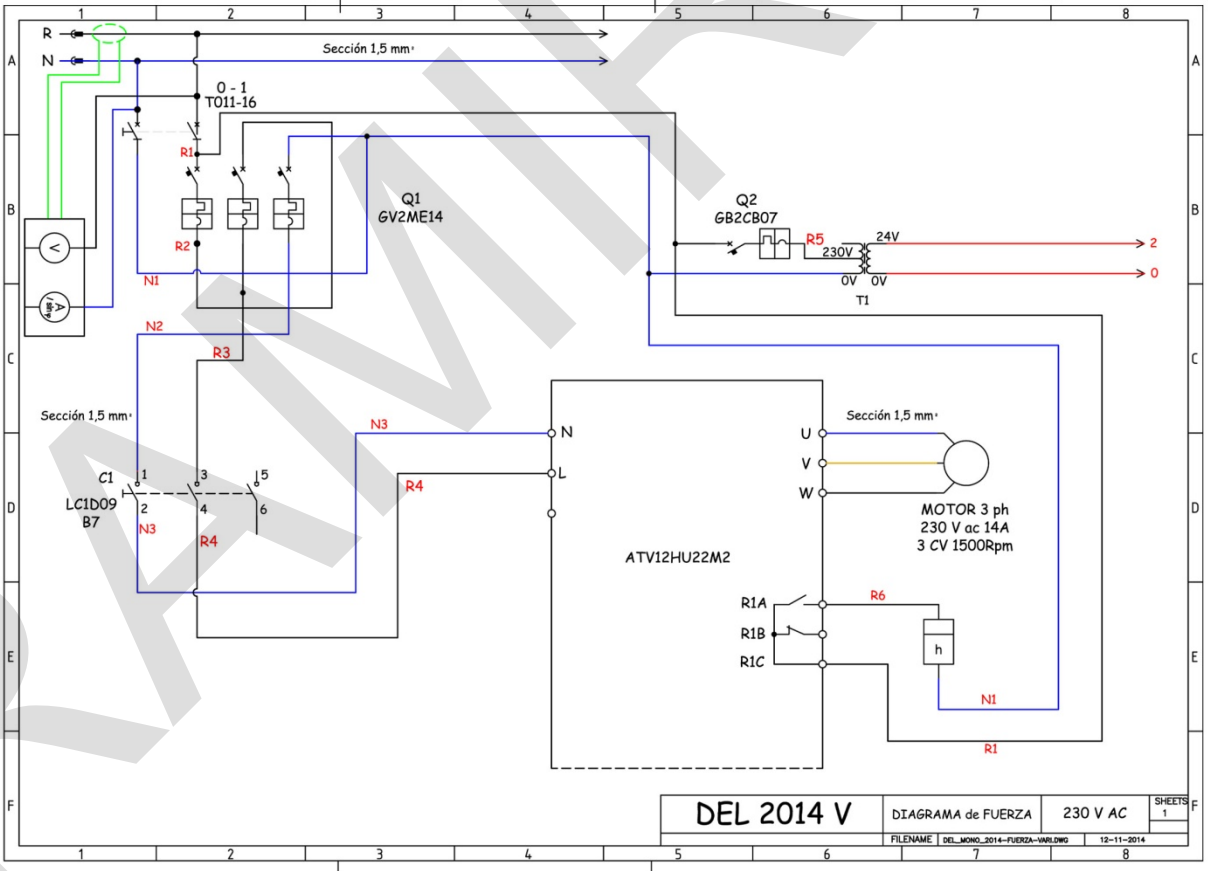
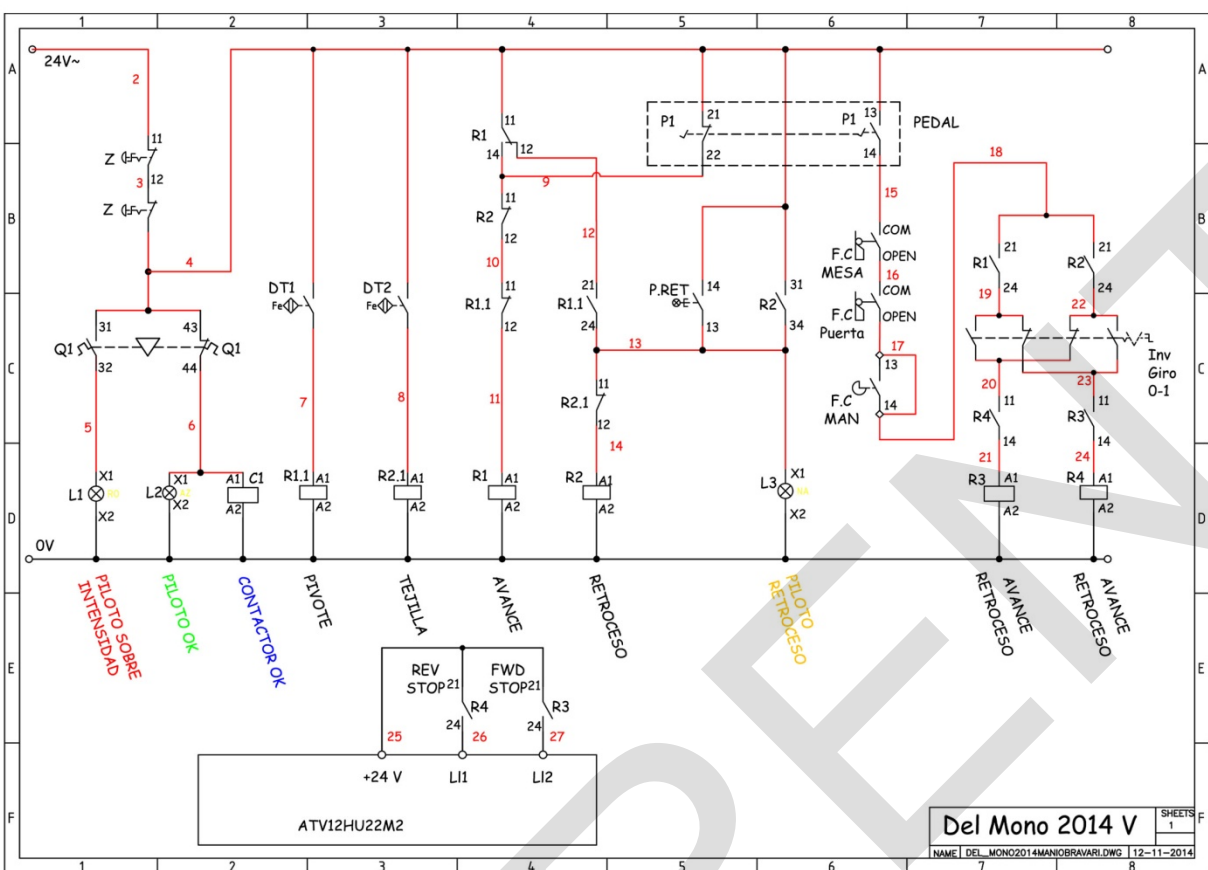
**When connecting the machine, make sure the machine is turning in the way the sticker indicates, this will avoid accidents with the accessories on the bending plate.**

**If it doesn't turn the right way please change the phases.**









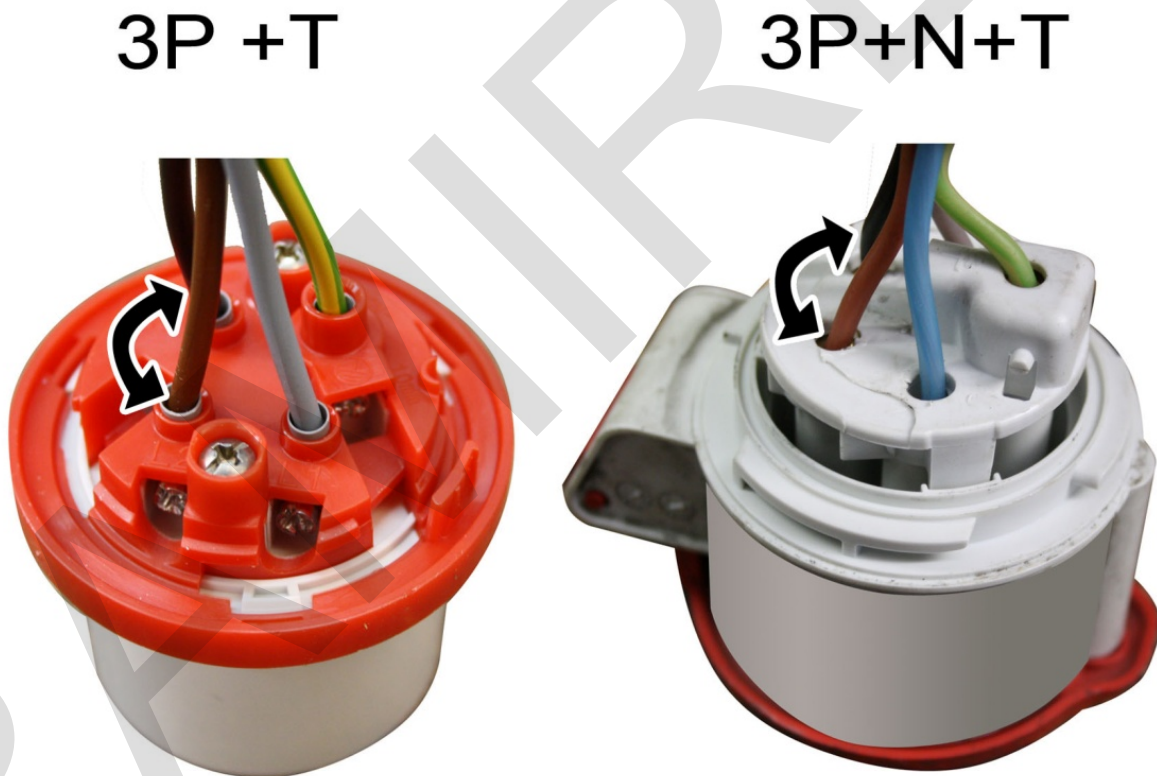
## MANUAL EMERGENCY RETURN OF BENDING PLATE

If during the bend you want to stop the process press the RETURN button and use the pedal to return to a previous position or to the start.



### 7.4 SWITCHING PHASES TO ACHIEVE THE CORRECT BENDING DIRECTION FOR THE PLATE.

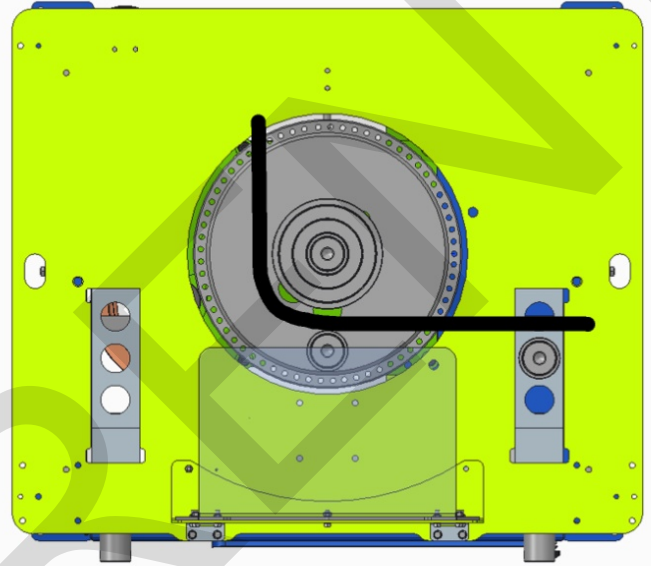
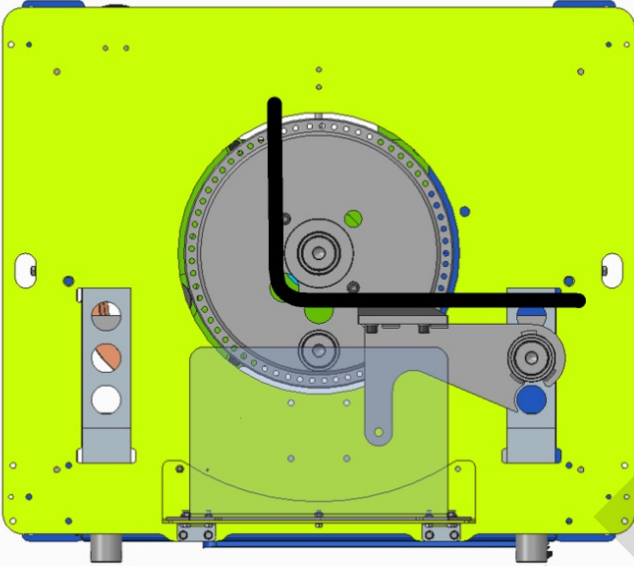
To change the direction of the bend you will have to open the connecting socket and interchange the wires as show in the image.



## 8. BENDING WITH SUPPORT DEVICE OR MANDRELS.

The bending support accessory is used to bend bars up to 16mm to support the bar all the way to the bending area. This will help stop the bar from flexing and deforming.

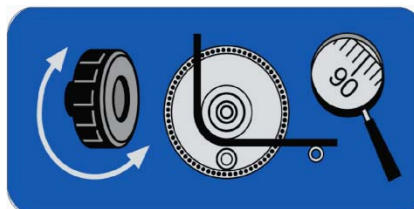
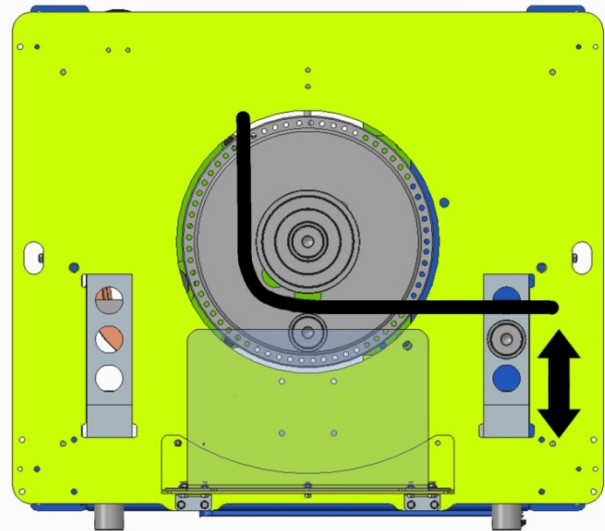
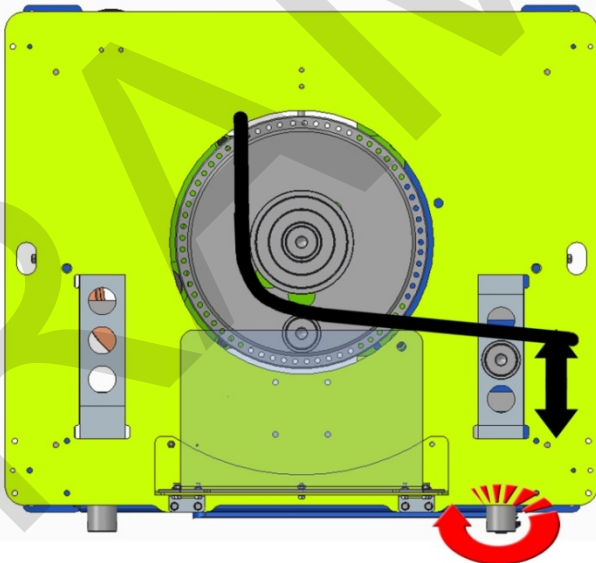
Mandrels are used for bars thicker than 16mm as the rigidity is sufficient that there will be no deformation.



### 8.1 ADJUSTING THE BENDING ANGLE.

If you haven't achieved the bending angle you require with the pin and you need to make a small adjustment you can use the silver metal handles on the side of the machine to move the support mandrels.

Turn the handle to push the mandrel further away to make a tighter angle and bring it towards to make a more open angle.

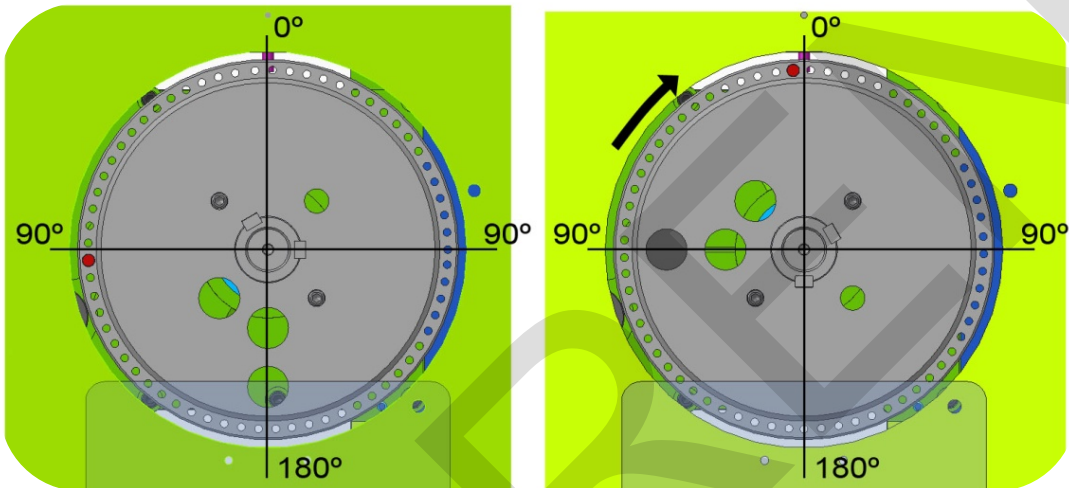


## 9. MAKING A BEND



**Before starting to bend a rebar make some bends without any accessories on the machine until you are comfortable with the movement.**

1. Divide the bending plate into 4 imaginary 90degree sections.
2. Select bending direction with the control panel button.
3. Insert the plate pin to the left of 0 degrees so achieve an angle of 90.
4. Step on the pedal and don't lift off. The bending plate will move until the pin reaches the inversion switch.
5. To make the plate return lift your foot off the pedal and press again and the plate will return.





## 10. MAKING A CUT.



Remove all the bolts, shells and pivots that are on the bending plate.



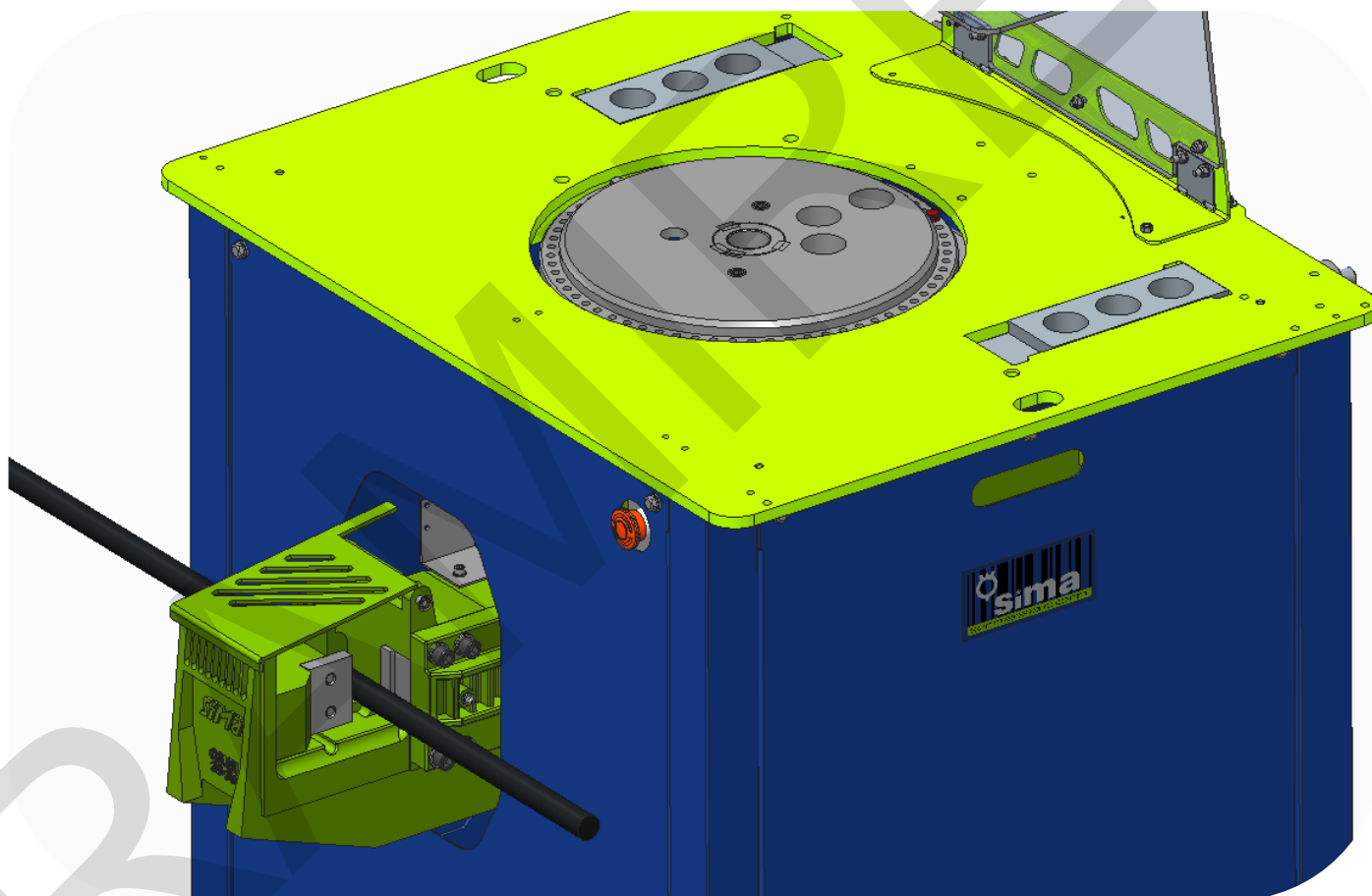
Never use the machine for cutting and bending at the same time as this presents a great risk to accidents and an over effort for the motor and the reducer causing serious damages.

### CONTINUOUS CUTTING

Remove all the bolts, shells and pivots that are on the bending plate and press the pedal.

### DISCONTINUOUS CUTTING

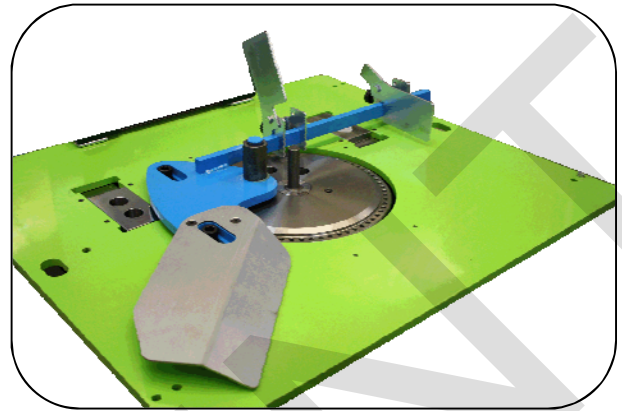
To obtain a cutting in cycles, you can prepare the machine, placing an inversion pivot **P** right in the interior, small hole in the end of course of the plate exactly when the blades close.



## 11. SPECIAL ATTACHMENTS.

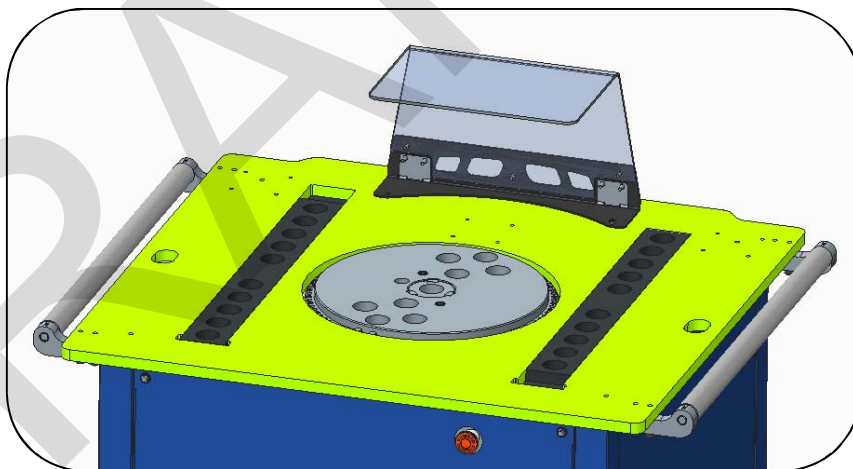
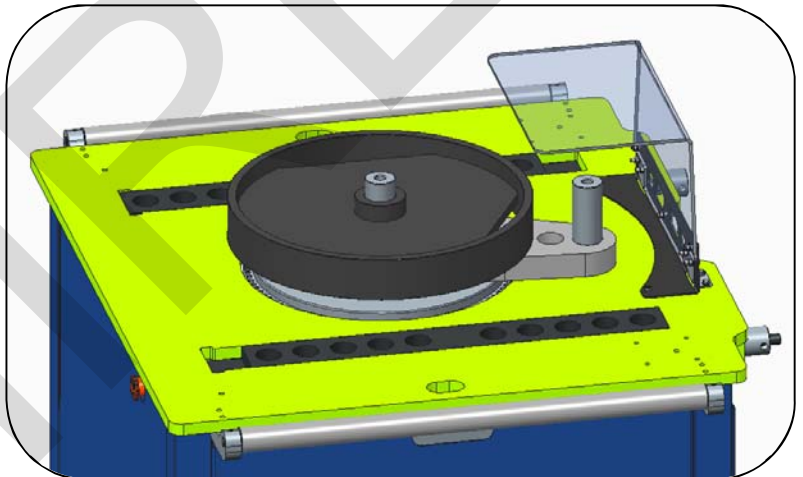
The bending and combined machines can use certain accessories that do not come included with the machine. These attachments perform different functions.

**1. STIRRUP DEVICE :** This device is for making stirrups.



**2. SPIRAL DEVICE:** This device is used to make spiral formations with rebar.. Bars of diameter 6mm to 20mm can be used.

**3. BIG DIAMETER DEVICE :** This device aids in complying with EU safety regulations for large bends. It is composed of a series of accessories and mandrels with a minimum radius for each bar diameter.



**4. ROLLER SUPPLY BENCH:** This is designed to help the bars slide towards the machine and protect the deterioration of the table through constant contact with the rebar.

5. **ROLLER FEED TABLES:** Designed to support bars before they are fed into the machines.



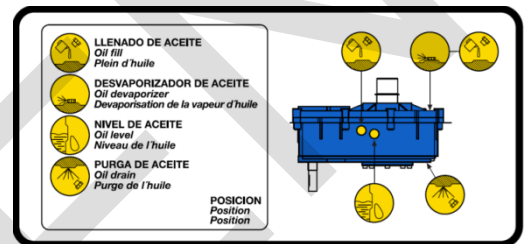
6. **MANDREL EXTRACTOR:** Designed to help remove the mandrels.



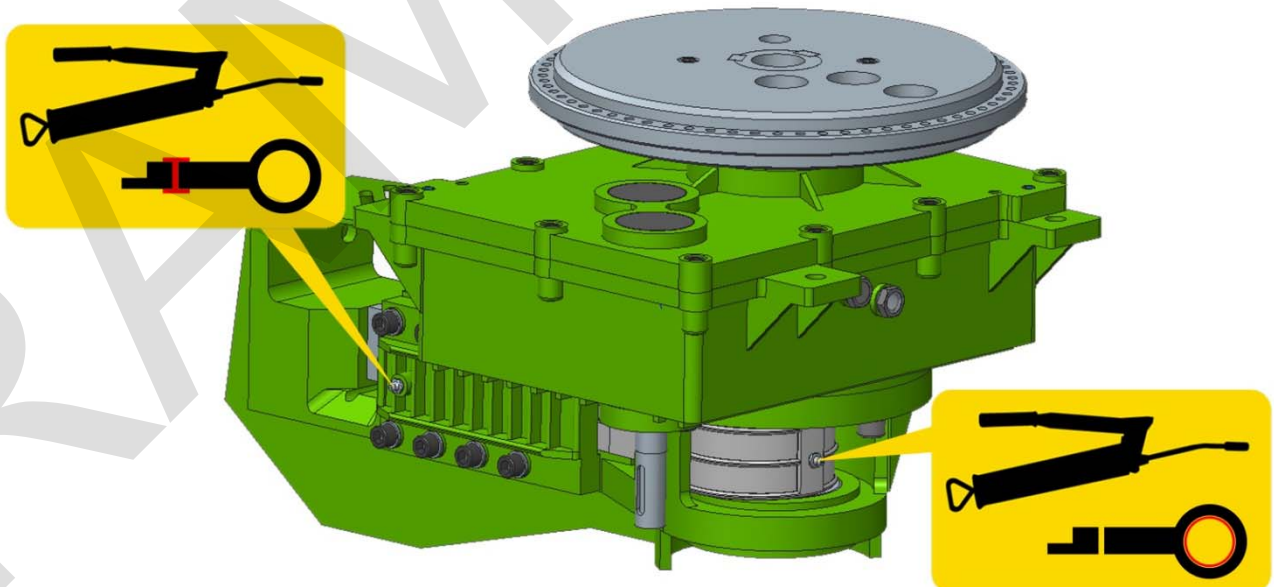


## 12. MAINTENANCE.

- 1 First oil change after 1000 hours of use if mineral oil is used and then again after 3000/4000 hours if the oil used is synthetic or after 3 years of use if these hours aren't reached. If synthetic oil is used change oil after 20,000 hours.
- 2 Grease the holes where the pins and mandrels go and also the bottom of the pins and mandrels , this will also help avoid build up of rust.
- 3 At the end of the day disconnect the machine.
- 4 Cover the machine at night to protect from rain.
- 5 When possible remove debris form the inside of the machine.
- 6 Clean the exterior and grease pins and mandrels frequently..
- 7 Check the blades on the cutter (**every 8 days of use**) to see if they need changing.
- 8 Check oil level in the gear box (**every month**) if the level has gone down be sure to fill up.



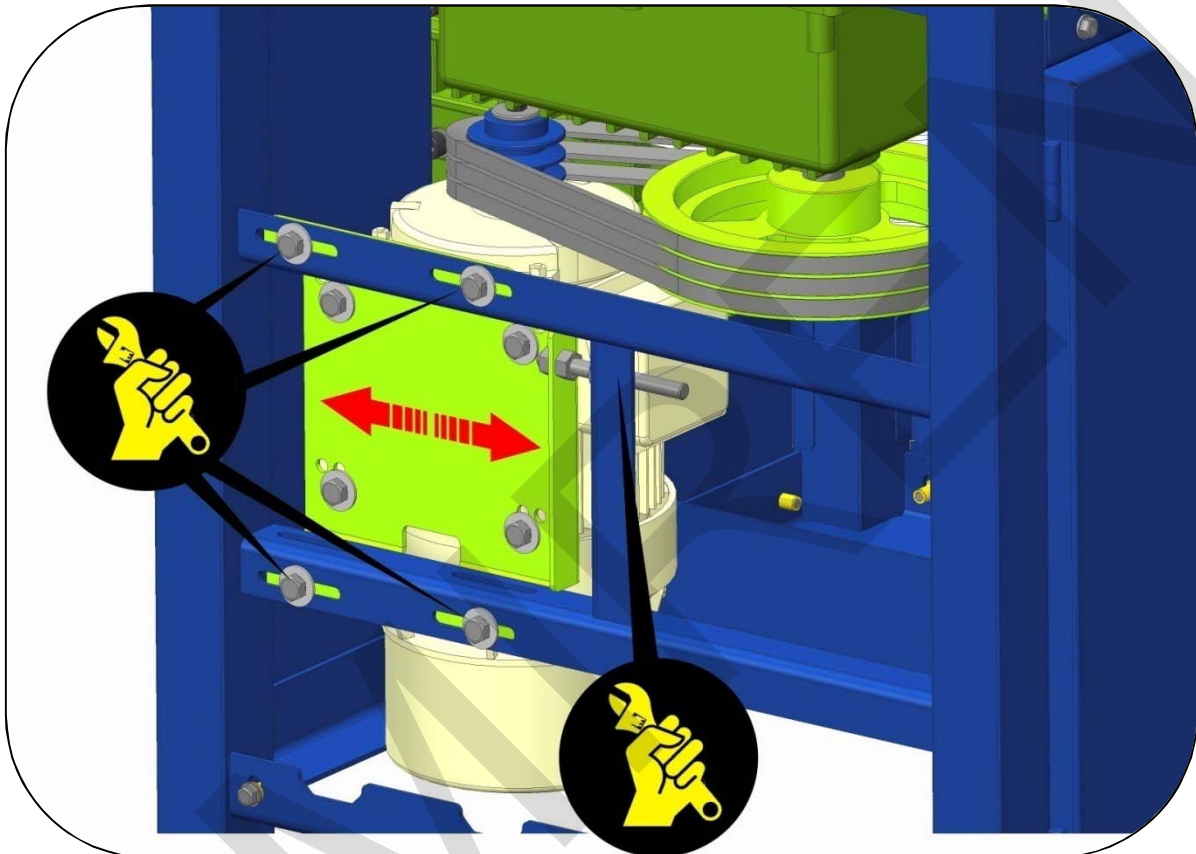
- 9 For COMBI models, there are two greasing points that should be greased every 20 days.



## 12.1 CHANGING THE BELTS .

The machines leave the factory with the belts correctly tightened, however it is possible that after a few days of work the belts become loose. To tighten the belts again the process is the same.

1. Make sure the machine is disconnected from the electricity supply.
2. Remove the side panel of the machine.
3. Loosen the 4 bolts that hold the platform to the guide.
4. Tighten the belt with the tightening mechanism.
5. Retighten the bolts.
6. Replace the side panel of the machine.



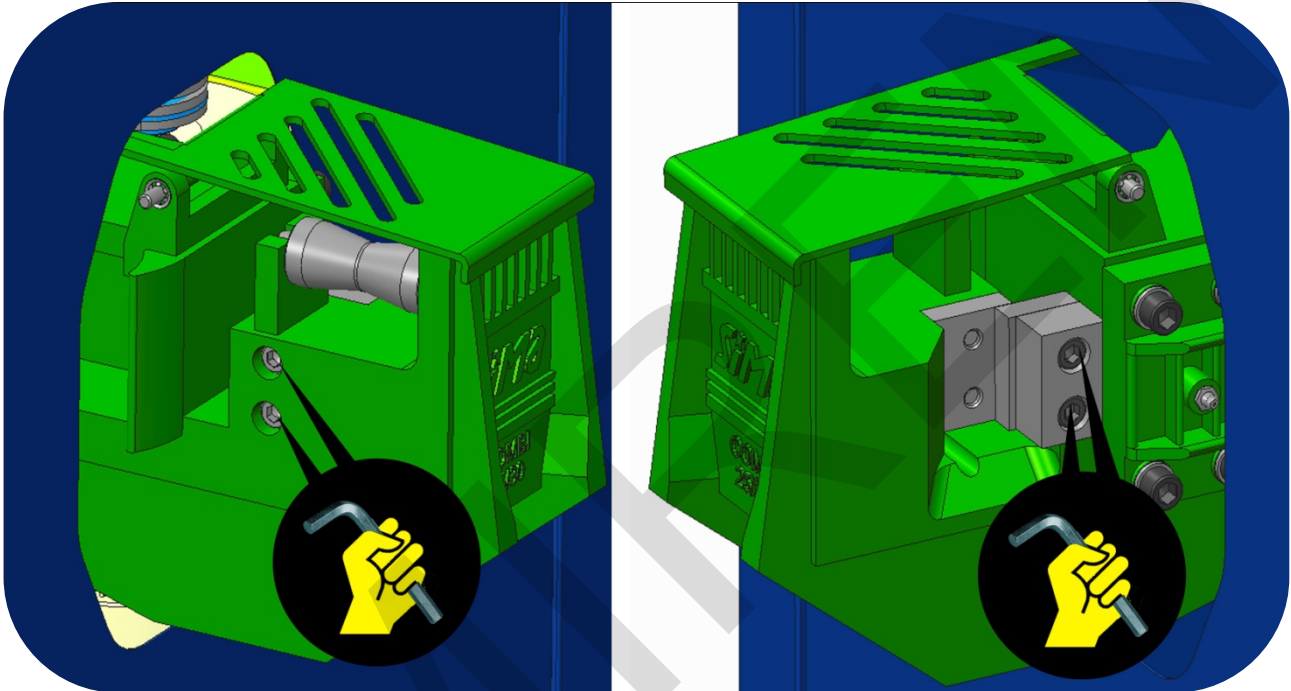


## 12.2 REPLACING THE BLADES (COMBI MODELS)

If any of the cutting blades is damaged, replace them as to the following procedure:

**1 CHANGING THE FIXED BLADE.** Make sure the machine is unplugged from electricity. Lift the safety guard off the blades. Afterwards, remove the screws and rotate the blade for a new cutting session or substitute it with a new blade if necessary.

**2 CHANGING THE MOVEABLE BLADE.** To change this blade, it is necessary that the connecting rod is displaced outside its housing. Operate in the following way: with the machine switched on and the inversion pivot of the bending plate removed from its position, press the pedal and observe the movement of the blade. When we see that the blade is outside its housing, we depress the pedal. Right after, we unplug the machine from the electricity to avoid any accident. In this way, we can reach the screws that fix the blade. Remove the screws of the blade for a new cutting or substitute it with a new blade if necessary.













## 13. TROUBLE SHOOTING.

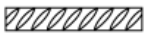
PROBLEM	POSSIBLE CAUSE	SOLUTION
NOT ENOUGH POWER TO CUT OF BEND.	LOOSE OR DAMAGED BELTS	TIGHTEN OR REPLACE BELTS
	DAMAGED BLADES	REPLACE BLADES OR CHANGE CUTTING SIDE
	MOTOR NOT RECEIVING CORRECT CURRENT	CHECK VOLTAGE
THE BENDING PLATE DOESN'T RETURN TO ITS ORIGINAL POSITION AFTER THE BEND IS COMPLETE	DEFECTIVE INDUCTIVE SENSOR	CHECK THE SENSOR (1 OPEN, 0 CLOSED). REPLACE IF DAMAGED
NOT ENOUGH OR UN CURRENT REACHING THE MACHINE, THE PILOT LIGHT DOESN'T COME ON	LACK OF CURRENT REACHING THE ELECTRICAL JUNCTION BOX	CHECK SITE JUNCTION BOX TO MAKE SURE ELECTRICITY IS BEING PRODUCED
	MAIN ELECTRICITY DOWN	CHECK THE CURRENT FROM THE MAINS
	FUSE HAS BLOWN ON THE JUNCTION BOX	REARM THE FUSE
	CABLE IN BAD STATE	REPLACE THE CABLES
THE PILOT LIGHT IS ON BUT THE MACHINE DOESN'T WORK	THE MACHINE ISN'T CORRECTLY CONNECTED	CHECK THAT ALL PHASES ARE COMPLETE. CHECK THE FUSE IN THE MACHINES ELECTRICAL BOX
	EMERGENCY STOP BUTTON IS DEPRESSED	RELEASE EMERGENCY STOP
	SECURITY FEATURES ARE ACTIVATED	MAKE SURE ALL DOORS, EMERGENCY STOP BUTTONS AND PLASTIC TABLE TOP GUARD ARE IN CORRECT POSITION
230V OR 400V CONNECTION. THE CONNECTION IS CORRECT BUT THE MACHINE DOESN'T HAVE ENOUGH POWER.	UNSTABLE ELECTRICITY SUPPLY	CHECK THE ELECTRICITY SUPPLY IF THE VOLTAGE IS INFERIOR TO 230V OR 400V THE MACHINE WON'T WORK. A TENSION STABILISER IS RECCOMENDED
THE MACHINE LOSES OIL THROUGH THE GEAR BOX	RUBBER WASHER DETERIORATED.	REPLACE RUBBER WASHER
WHEN BEND IS FINISHED THE PLATE DOESN'T STOP AT THE ORIGINAL POSITION	DEFECTIVE INDUCTIVE SENSOR	CHECK THE SENSOR (1 OPEN, 0 CLOSED). REPLACE IF DAMAGED
THE BENDING PLATE DOESNT STOP IMMEDIATELY WHEN THE PEDAL IS RELEASED	THE MOTOR BRAKE HAS WORN	CHECK THE MOTOR BRAKE AND TIGHTEN THE SPRINGS LEAVING A UNIFORM GAP BETWEEN THE DISC AND THE PLATE OF .3 TO .4MM.
	THE MOTOR BRAKE IS NOT OPERATIONAL	REPLACE THE MOTOR BRAKE
STRANGE NOISE FROM WITHIN THE GEARBOX	DETERIORATION OF SOME OF THE INTERNAL COMPONENTS	DISMANTLE THE GEARBOX AND CHECK BEARINGS AND GROOVES. REPLACED DAMAGED ELEMENTS
STRANGE NOISE FORM THE MOTOR	MISFUNCTIONION OF ONE OF ITS COMPONENTS	FIND OUT THE SOURCE OF THE NOISE AND REPAIR



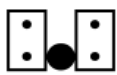

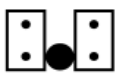


## 14. CARACTERÍSTICAS TÉCNICAS.

								
	Kg	C.V.	Kw	R.P.M.	LxAxH	LxAxH	R.P.M. x1'	L
<b>DEL 32</b>	302	3	2.2	1500	910x808x1141	950x850x1050	11	5,1
<b>DEL 36</b>	355	4	3	1500	910x808x1141	950x850x1050	10	10
<b>DEL 45</b>	490	4	3	1500	1040x1000x1141	1080x1040x1050	6,5	8,8
<b>DEL 52</b>	721	5,5	4	1500	1040x1000x1141	1080x1040x1050	6	15
<b>COMBI 25/32</b>	386	3	2.2	1500	910x1009x1141	950x1070x1050	11	5,1
<b>COMBI 30/36</b>	435	4	3	1500	910x1033x1141	950x1070x1050	10	10
<b>COMBI 36/52</b>	790	5	4	1500	1040x1244x1141	1080x1290x1050	6,5	15

## 14.1 BENDING CAPACITIES.

## CAPACIDAD DE CORTE / CUTTING CHARACTERISTICS / CAPACITÉS DE COUPE

LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250			R=N/mm <sup>2</sup> 480			R=N/mm <sup>2</sup> 650		
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450			R=N/mm <sup>2</sup> 650			R=N/mm <sup>2</sup> 850		
Nºx 	1	2	3	1	2	3	1	2	3
<b>DEL-32</b>	Ø32	Ø24	Ø18	Ø25	Ø20	Ø16	Ø25	Ø18	Ø14
<b>DEL-36</b>	Ø36	Ø26	Ø22	Ø32	Ø24	Ø18	Ø32	Ø22	Ø16
<b>DEL-45</b>	Ø45	Ø32	Ø25	Ø40	Ø32	Ø25	Ø40	Ø26	Ø25
<b>DEL-52</b>	Ø52	Ø36	Ø30	Ø46	Ø34	Ø25	Ø42	Ø32	Ø25

LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250			R=N/mm <sup>2</sup> 480			R=N/mm <sup>2</sup> 650											
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450			R=N/mm <sup>2</sup> 650			R=N/mm <sup>2</sup> 850											
																		
Nºx 	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>COMBI 25/32</b>	Ø25	Ø18	Ø12	Ø32	Ø24	Ø18	Ø20	Ø16	Ø10	Ø25	Ø20	Ø16	Ø20	Ø14	Ø8	Ø25	Ø18	Ø14
<b>COMBI 30/36</b>	Ø30	Ø20	Ø16	Ø36	Ø26	Ø22	Ø25	Ø18	Ø14	Ø32	Ø24	Ø18	Ø25	Ø16	Ø12	Ø32	Ø22	Ø16
<b>COMBI 36/52</b>	Ø36	Ø26	Ø22	Ø52	Ø36	Ø25	Ø32	Ø20	Ø16	Ø46	Ø34	Ø25	Ø32	Ø18	Ø16	Ø42	Ø32	Ø25

## 15. SAFETY RECOMMENDATIONS

Bending and combined (bending/cutting) machines should be used by trained people or people familiarized with their operation.

- Before starting up the machine please read the instructions and make sure safety norms are respected. Learn how to stop the machine in a fast and safe way.
- Place the machine on a plane surface. Connect the machine to the electricity only when you are sure of its stability.
- Start the machine only when you have mounted the safety guards that come with the machine.
- It is recommended to use safety glasses, safety boots, gloves etc. Please always use approved materials.
- Always use Individual Protection Equipment (IPE) in accordance with the type of work you are effectuating.  
Prohibit strangers to access the place of work of the machine.

Work clothes are not supposed to have loose articles that can cling into movable parts of the machine.

When you have to move the machine, unplug the electricity cables and block the moving parts of the machine.

Always keep protection elements and the safety guards in their correct positions.

**Attention:** Before placing the bolts, mandrills and the bending squares, check the direction of rotation of the bending plate. You can then install the suitable accessories for the type of work you want to make.  
The damaged electrical cables should be urgently replaced.

Unplug the machine from the electricity and never manipulate nor operate on the mechanical nor electrical elements of the machine while the engine is on.

Never use the machine for purposes other than those it has been designed for.

- **VERY IMPORTANT: Earth should always be connected** before switching on the machine.
- Use correct connection cable
- Check the electricity supply to the machine and make sure it is the same as indicated on the serial number plaque or sticker.
- Make sure the cable is secure from direct heat, oil, footfall.
- Don't use pressurised water to clean the machine as this may get into the electrical components.

**ATTENTION: You are to follow all safety recommendations mentioned in the present user manual and comply with all labour risks prevention norms in every location.**

**SIMA, S.A. is not responsible for the consequences possibly generated but the inadequate use of the bending or the combined (bending/cutting) machine.**

## 16. WARRANTY

SIMA, S.A. the manufacturer of light machinery for construction possesses a net of technical services "SERVI-SIMA".

Repairs under warranty made by SERVÍ-SIMA are subject to some strict condition to guaranty a high quality and service.

SIMA S. A. guarantees all its products against any manufacturing defect; to take into account the conditions stated in the attached document "WARRANTY CONDITIONS". The latter would cease in case of failure to comply with the established payment terms. SIMA S.A. reserves its right to bring modifications and changes to its products without prior notice.

## 17. DECLARATIONS ON NOISE

The acoustic levels emitted by the MACHINE are inferior to 70 dB (A)

## 18. DECLARATIONS ON MECHANIAL VIBRATIONS

The machine does not present any source of mechanical vibrations that cause risks to the health or safety of the operator.

## 19. SPARE PARTS

The spare parts for the bending and combined machines, manufactured by SIMA, S.A. are to be found in the spare parts plan, attached to this manual.

To order any spare part, please contact our alter-sales service clearly indicating the serial number of the machine, **model, manufacturing number and year of manufacturing that show on the serial number plaque or sticker.**

## 20. ENVIRONMENT PROTECTION



Raw materials have to be collected instead of throwing away residuals. Instruments, accessories, fluids and packages have to be sent into specific places for ecological reuse. Plastic components are marked for selective recycling.



**R.A.E.E. Residuals arising of electrical and electronic instruments have to be stored into specific places for selective collection.**



SOCIEDAD INDUSTRIAL DE MAQUINARIA ANDALUZA, S.A.

POL. IND. JUNCARIL, C/ALBUÑOL, PARC. 250

18220 ALBOLOTE (GRANADA)

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FABRICACIÓN DE MAQUINARIA PARA LA CONSTRUCCIÓN

ESPAÑA



# simasa

- Ⓔ MANUAL DE INSTRUCCIONES ORIGINAL
- Ⓖ ORIGINAL USER GUIDE
- Ⓕ MANUEL ORIGINAL D'UTILISATION

DEL-45

DEL-52

COMBI-25/32

COMBI-30/36

COMBI-36/52

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# RAMIRENT

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## 1. GENERAL INFORMATION

**WARNING: Please read and understand perfectly the present instruction before using the machine.**

SIMA S.A. thanks you for your trust in our products and for purchasing the BENDING OR COMBINED ELECTRICAL CUTTING/BENDING MACHINE.

This manual provides you with the necessary instructions to start, use, maintain and in your case, repair of the present machine. All aspects as far as the safety and health of the users is concerned have been stated.

Respecting all instructions and recommendations guarantees safety and low maintenance.

As such, reading this manual carefully is compulsory for any person responsible for the use, maintenance or repair of this machine.

**It is recommended to have always this manual in an easily accessible place where the machine is being**

## 2. GENERAL DESCRIPTION OF THE MACHINE

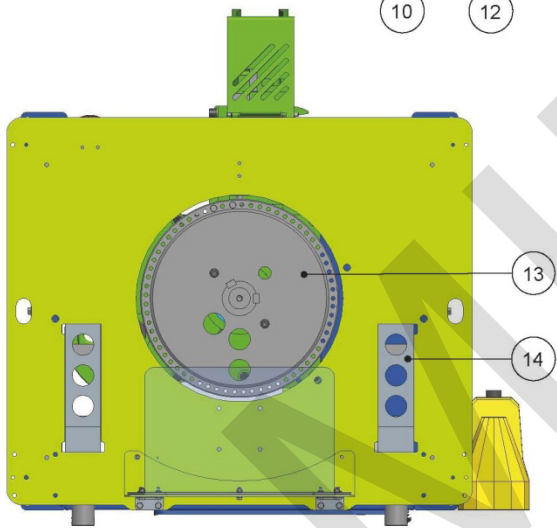
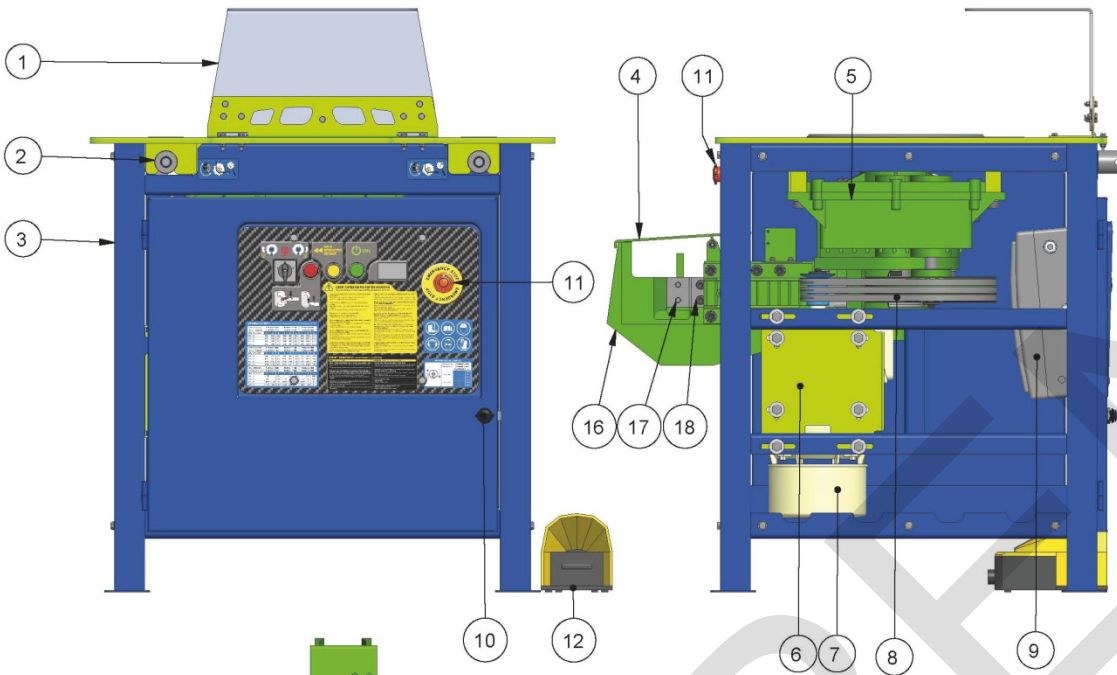
- The DEL bending machines have been manufactured to bend flat and reinforced steel bars used for construction and passive steel armatures for structural concrete. The bending operation is done in cold using mandrills to guarantee the bending interior diameter is conforming to the European norms.

- The combined machines bending/cutting models COMBI are designed to bend as well as cut steel bars. The cutting tools are two blades, one fixed and one moving. The cutting operation is done manually by pushing the bar on the roller, dropping the bar into the cutting throat, lowering the protection guard and pressing the pedal.

**Any other use of this machine is considered inadequate and can be dangerous. Thus, this is completely prohibited.**

- The machine is equipped with an electrical auto-ventilated motor-brake
- The reducer is the main element of the machine. It is responsible for transmitting the needed energy to carry out the steel bars bending.
- The machine is operated by an electrical motor that passes the movement, by a transmission to the bending mechanism in which the different mandrills are mounted.
- The bending plate can be selected to work in two different directions, left or right, by changing the direction of rotation in the electrical control panel.
- The bending angle can be decided by inserting the pivot in the bending plate. For a more precise bending, the ruler can be accurately adjusted by its handle.
- The commands panel is endowed with polyester, electrical knobs easily identified by pictograms.
- The machine is equipped with shutdown and backward movement buttons to facilitate its manoeuvre. The emergency knobs on both sides of the machine can be used in case of danger or incorrect manoeuvres.
- The general bars bending manoeuvre is performed in low-voltage (24V) according to the European standards.
- The original equipment (bolts, mandrels bending square) are heat-treated to withstand the tough type of work the machine performs.
- The machine is furnished with a pedal to confirm and execute the manoeuvre, thus avoiding the upper parts to be trapped while the machine is running.
- The work area is protected by a safety guard to limit possible accidents. This guard is transparent to allow observation of the material being bent, avoiding getting to the upper parts of the bending area.
- The machine is equipped with wheels to facilitate their movement.
- The machine is painted in oven with a highly resistance, anti-corrosion epoxy polyester paint.
- The original, electrical equipment is in conformity with the EC safety norms.
- The COMBI model is supplied with a cutting jaw with a safety metal guard connected to an electrical protection system. When this safety guard is lifted, the machine stops working.

3. MACHINE



- 1. SAFETY VISOR BENDING PLATE
- 2. MINOR ADJUSTMENT HANDLE
- 3. CHASIS
- 4. SAFETY GUARD FOR CUTTING HEAD
- 5. GEAR BOX
- 6. MOTOR PLAQUE
- 7. MOTOR
- 8. TRANSMISISON BELTS
- 9. ELECTRICAL BOX
- 10. ACCESS DOOR HANDLE
- 11. EMERGENCY STOP
- 12. BENDING PLATE FOOT PEDAL
- 13. BENDING PLATE
- 14. SIDE MANDREL ADJUSTMENT
- 15. ELECTRICAL SOCKET
- 16. MCUTTING HEAD
- 17. FIXED CUTTING BLADE
- 18. MOVING CUTTING BLADE



- 1. INVERSE SWITCH
- 2. OVERLOAD PROTECTION WARNING LIGHT
- 3. RETURN SWITCH
- 4. ON LIGHT
- 5. VOLTMETER
- 6. AMPMETER
- 7. EMERGENCY STOP

## 4. TRANSPORT

For a safe transport of the machine, please follow the following instructions:

The Bending and Combined machines are fitted with holes in the working table to be lifted with cranes through chains or cables. The means of transport used must be safe.

**IMPORTANT:** During the transport of the machine, the latter should never be reversed nor be put on either side. The machine is only to rest on its four feet.



## 5. PICTOGRAMS

Pictograms included in the machine entail the following:



USE SAFETY FOOTWEAR



USE HELMET AND EYE AND EAR DEFENDERS










READ INSTRUCTIONS MANUAL



USE SAFETY GLOVES

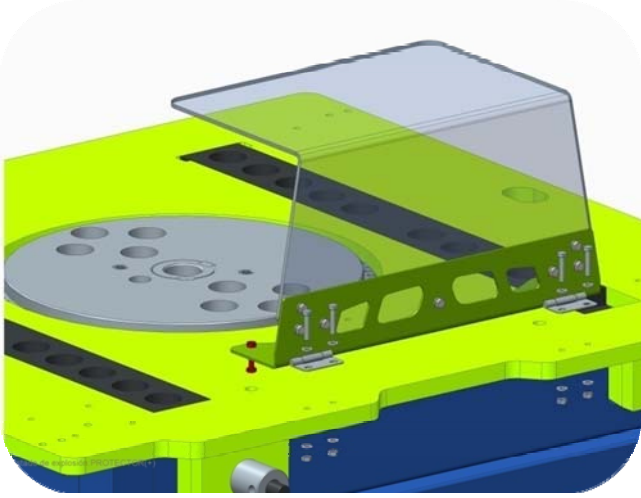
## 6. DELIVERY CONDITIONS

SIMA bending and combined machines are delivered individually packed on a reinforced pallet. The following items are sent together with the machine:

											
			Ø60	Ø100	Ø140	Ø160	Ø200				
DEL-32	1	4	4	1			1	1	1	2	
DEL-36	1	4	4	1	1	1	1	1	1	2	
DEL-45	1	4	4	1	1	1	1	1	1	2	
DEL-52	1	4	4	1	1	1	1	1	1	2	
COMBI-25/32	1	4	4	1	1	1	1	1	1	2	
COMBI-30/36	1	4	4	1	1	1	1	1	1	2	
COMBI-36/52	1	4	4	1	1	1	1	1	1	2	

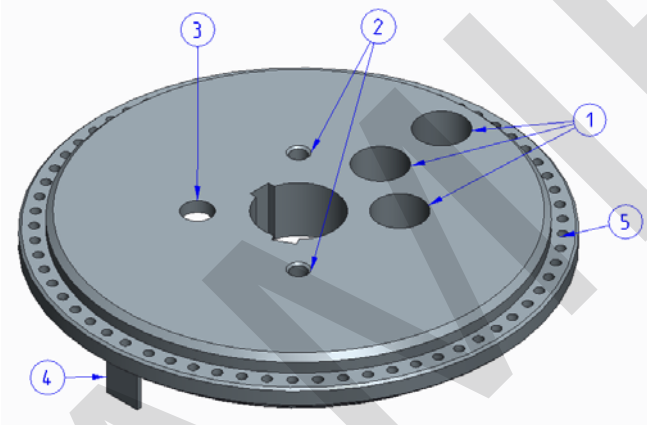
## 6.1 INSTALLING THE PROTECTIVE VISOR

For transport reasons, the plate safety guard is disassembled. Before using the machine, the plate safety guard should be mounted. The latter presses a security microswitch and if it is not installed correctly the machine will not start.

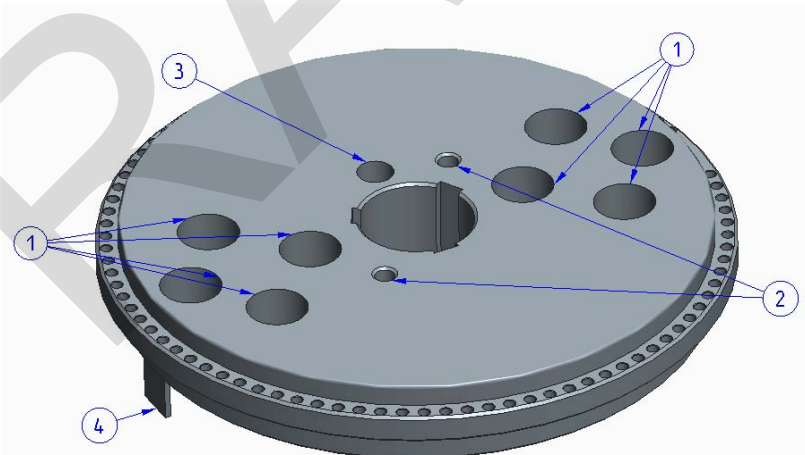


## 6.2 BENDING PLATE

Depending on the model that you have purchased the bending plate will have different holes for different purposes.

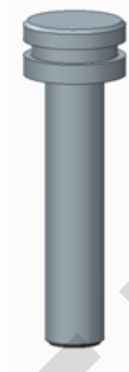
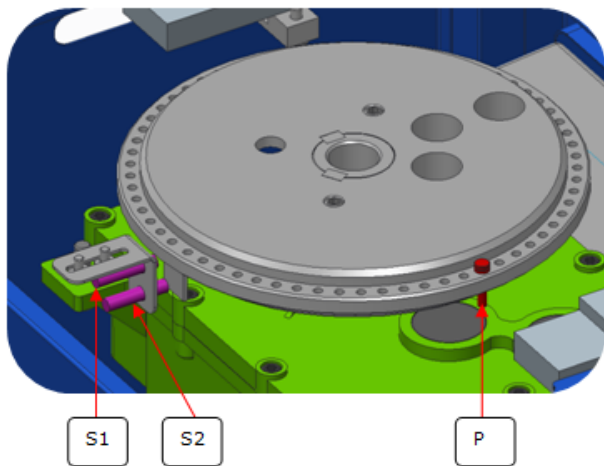


1. Holes for bending mandrels. Depending on the size of the rebar the mandrels will go into different holes.
2. Screw holes for fixing the optional large diameter kits
3. Screw hole for spiral kit.
4. End of bend reference point.
5. Holes for bending pins.



### 1.3 ANGLE INVERSION AND SELECTION PIVOT

The inversion pivot (**Fig. P**) It is used to select the plate rotation angle. Depending on the rotation direction of the plate that we choose, we have to insert the pivot in different sectors relative to the **S1 and S2 sensor**



Sensor S1, is to stop the bending plate when the pivot passes over it.

Sensor S2, is to stop the bending plate when it returns to its original position.

## 7. STARTING-UP AND USING THE MACHINE

**WARNING:** All safety recommendations must be followed, either the ones mentioned in the present user manual or those complying with all labour risks prevention norms in every location.

**WHEELWORK:** SIMA bending and combined machines do not need any wheelwork operations as they are specially designed to obtain the maximum performance from start.

#### **NORMAL USE OF THE MACHINE:**

The bending machines have been designed for bending and cutting flat and reinforced steel bars for use in the structure and other construction. Each other use that has not been expressly indicated is considered abnormal. Any tool or accessory added or amended without written authorization from the manufacturer is considered inappropriate and dangerous. If any damage or injury is caused as a result thereof or by misuse of the machine, SIMA S.A. exempts all responsibility as manufacturer. The machine must be installed on a plane, firm and horizontal surface and the ground should not be soft.



**This machine MUST NOT BE USED IN THE RAIN. Cover with waterproof materials. If the machine has been exposed in the rain check before connecting the electrical parts are not wet. Always work with good lighting conditions.**



## 7.1 PLUGGING THE MACHINE TO THE ELECTRICITY

The extension cable used to feed the machine needs to have a minimum section of  $4 \times 2.5 \text{ mm}^2$  up to 25 meters long. For a superior distance  $4 \times 4 \text{ mm}^2$  can be used. In one of its ends, it is needed to connect a base normalised aerial of 3P+T or 3P+N+T compatible with the machine switch and in the other end, one normalised aerial pin of 3P+T ó 3P+N+T compatible with switchboard exit.

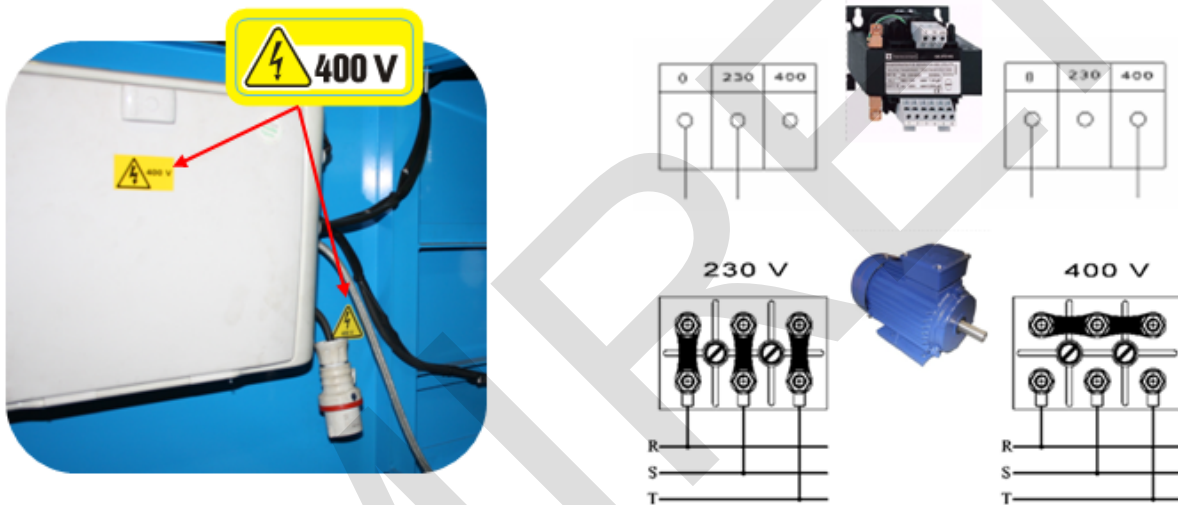


**Machines with electrical motor should always be connected to a normalised switchboard that disposes of a magneto-thermal switch and a differential in accordance with the characteristics of the motor:**

3Kw / 4 HP, three phase at 400V, 15A magneto-thermal and 15A/300mA differential.

3Kw / 4 HP, three phase at 230V, 20A magneto-thermal and 20A/300mA differential.

The machine electrical tension is visible on the voltage indication next to the top of engine terminals and on the machine characteristics plate.



**Do not plug the machine to the electricity if you are not sure of the available electrical tension. If the tension is not correct, the engine will undergo irreparable harm or out of service.**



**Do not perform any electrical work on the machine unless it is disconnected from the mains.**



**VERY IMPORTANT: Earth should always be connected before the machine is switched on.**

## 7.2 CONNECTING TO ELECTRICITY SOURCE.

The machine has a display so that the user can see the voltage supplied to the machine before the voltage reached the electrical components and causes any damage.

To connect the machine do the following

1. Open the door and connect the socket to the electrical box socket .This way the electricity will not reach the motor and you can see the voltage coming into the machine.



**IMPORTANT:** The transformer has a tolerance of  $\pm 10\%$  of the stated voltage capability of the machine. If this limit is passed then it will damage the transformer.

**400v machine = 380V min / Max 430V max**

**230V machine = 210V min / Max 250V max**

2. Select a bending direction on the electrical panel and the green light will come on.
3. Depress the pedal to start to bend and see which way the plate is bending



**Position 0.** Machine disconnected

**Position 1.** Machine connected in anti clockwise.

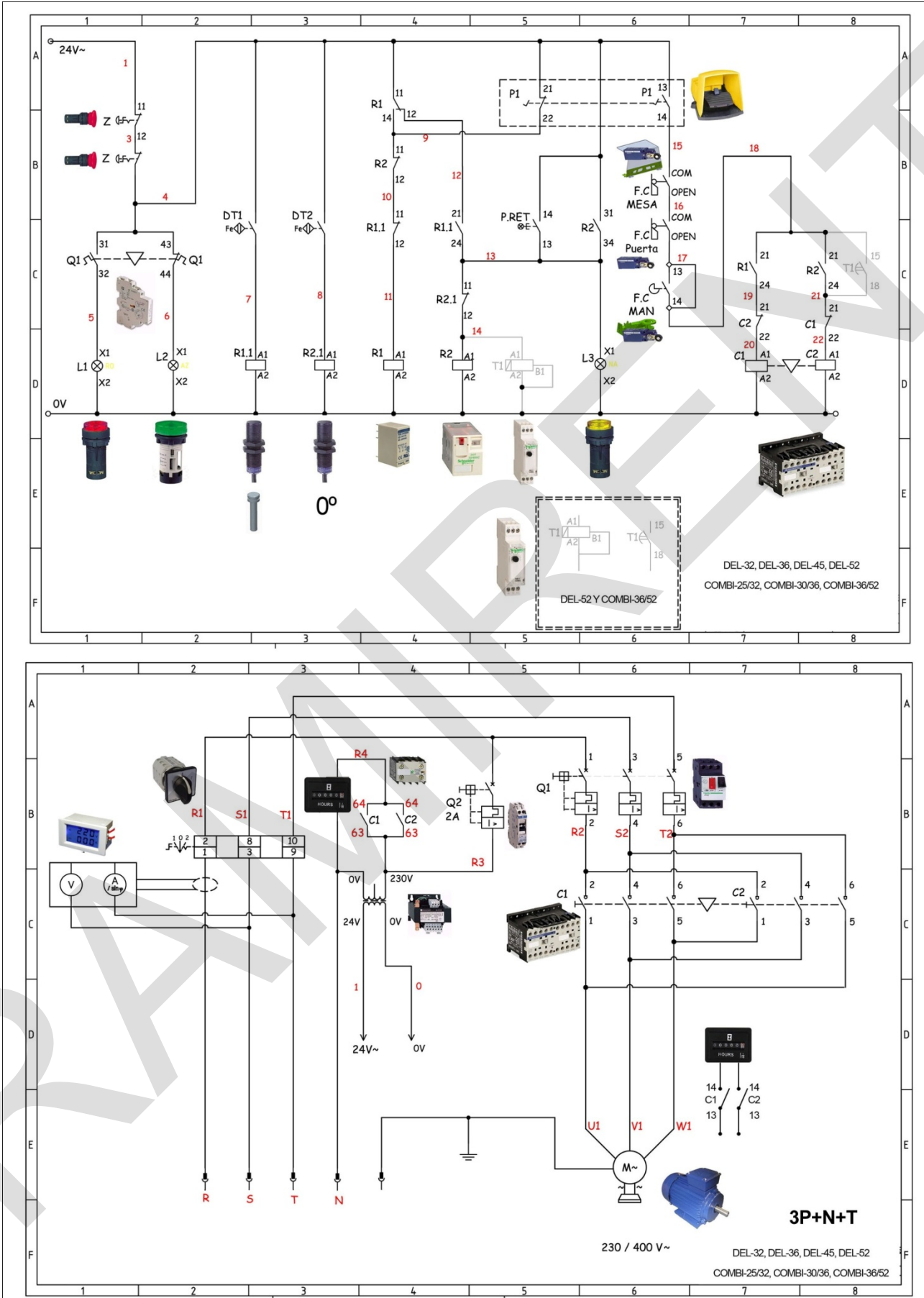
**Position 2.** Machine connected in clockwise position.

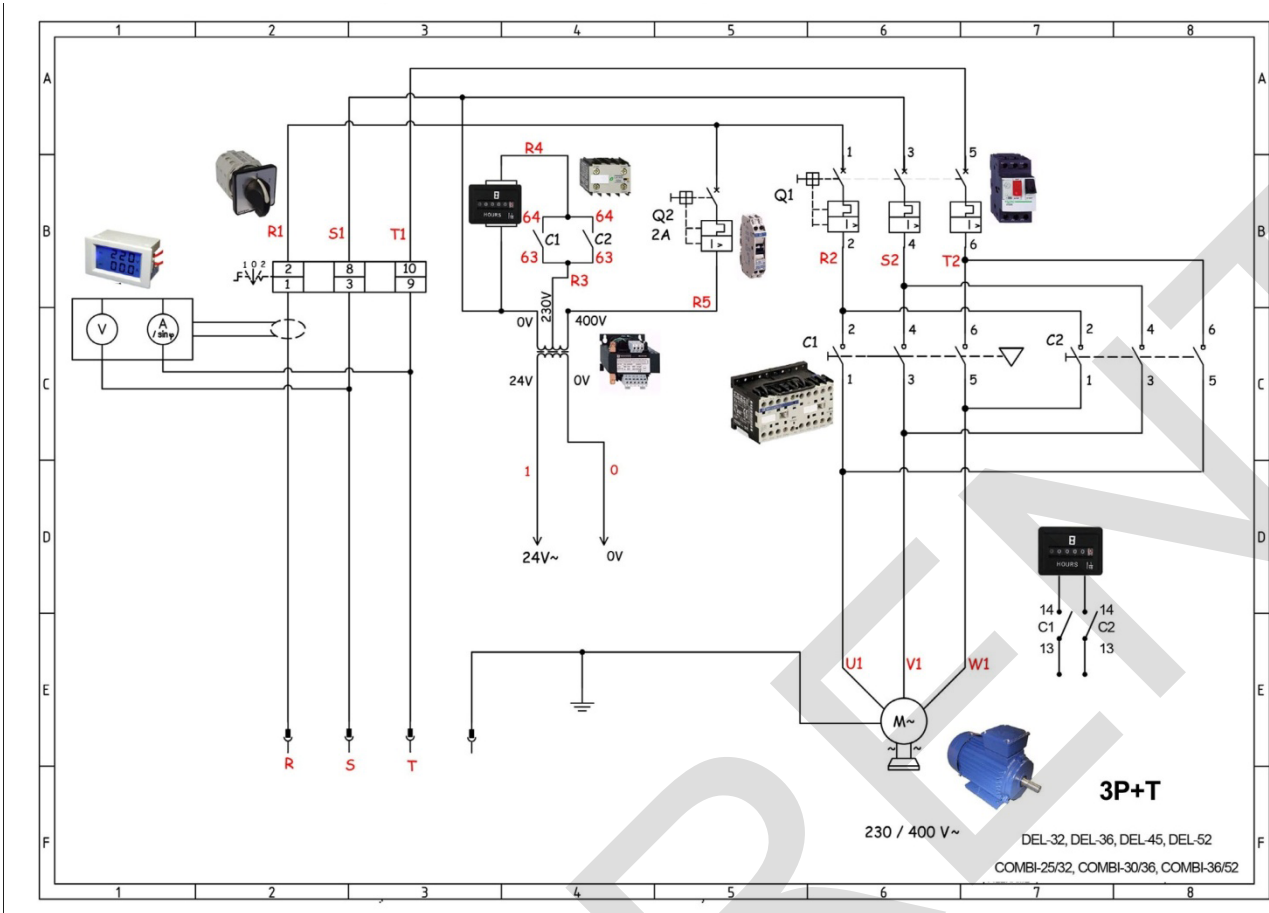


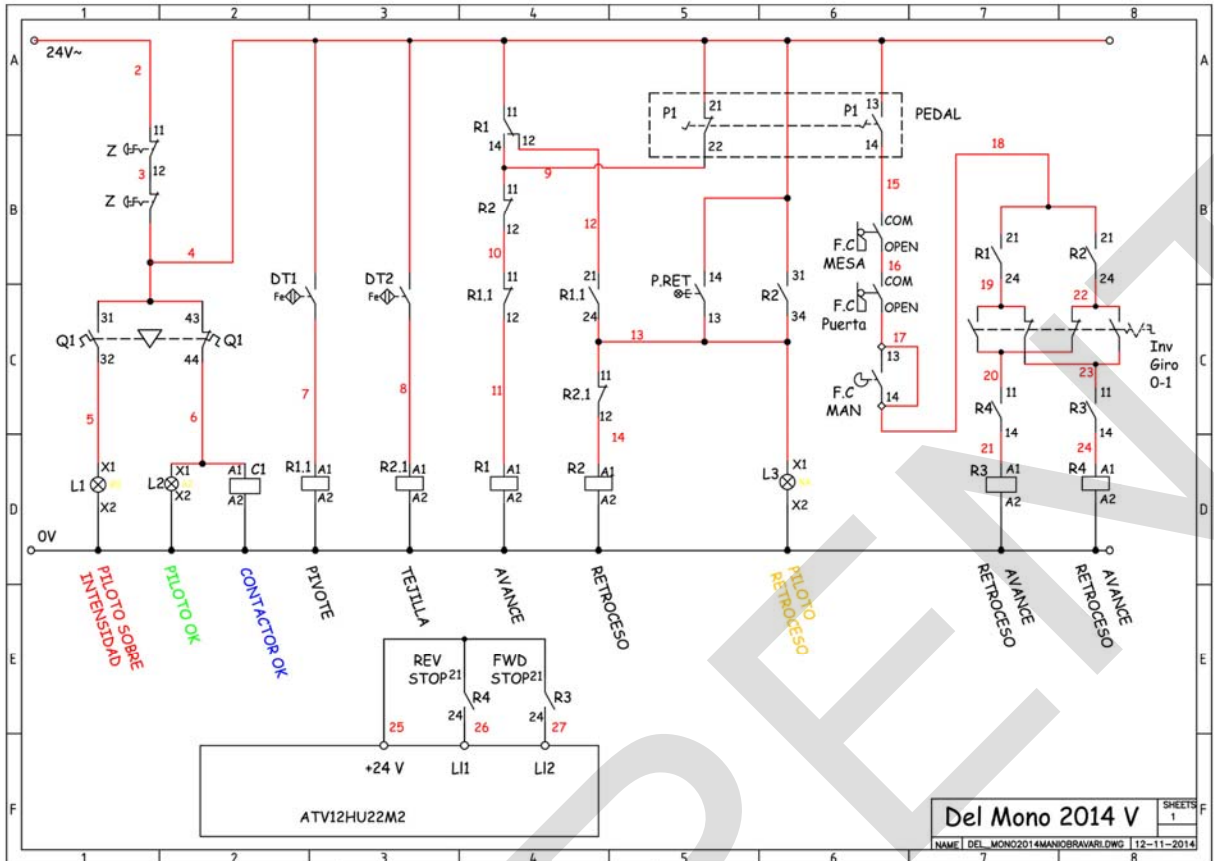
When connecting the machine, make sure the machine is turning in the way the sticker indicates, this will avoid accidents with the accessories on the bending plate.

If it doesn't turn the right way please change the phases.

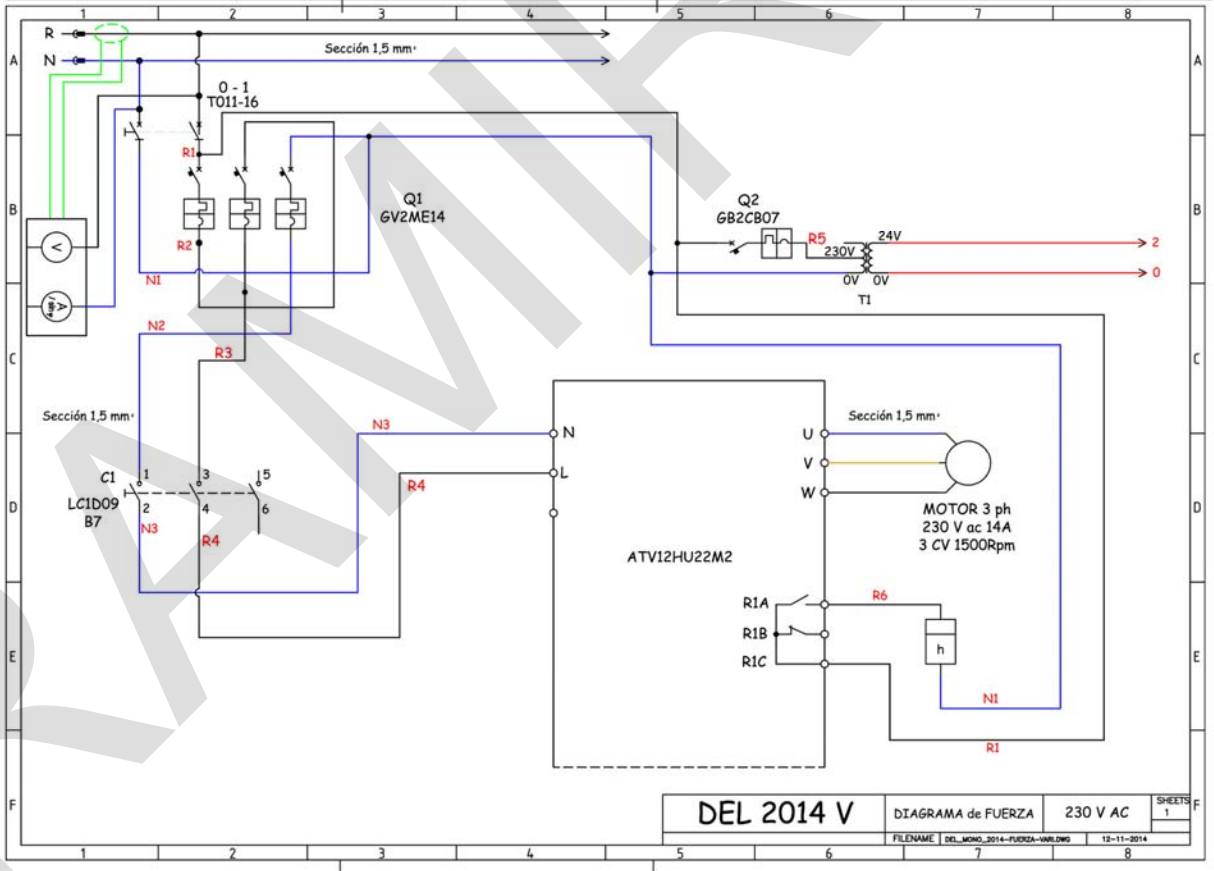
### 7.3 ELECTRICS SCHEME







Del Mono 2014 V SHEETS 1  
 NAME | DEL\_MONO2014MANIOBRARVARLDWG | 12-11-2014



DEL 2014 V DIAGRAMA de FUERZA 230 V AC SHEETS 1  
 FILENAME | DEL\_MONO\_2014-FUERZA-VARLDWG | 12-11-2014



## MANUAL EMERGENCY RETURN OF BENDING PLATE

If during the bend you want to stop the process press the RETURN button and use the pedal to return to a previous position or to the start.



### 7.4 SWITCHING PHASES TO ACHIEVE THE CORRECT BENDING DIRECTION FOR THE PLATE.

To change the direction of the bend you will have to open the connecting socket and interchange the wires as show in the image.

3P +T



3P+N+T

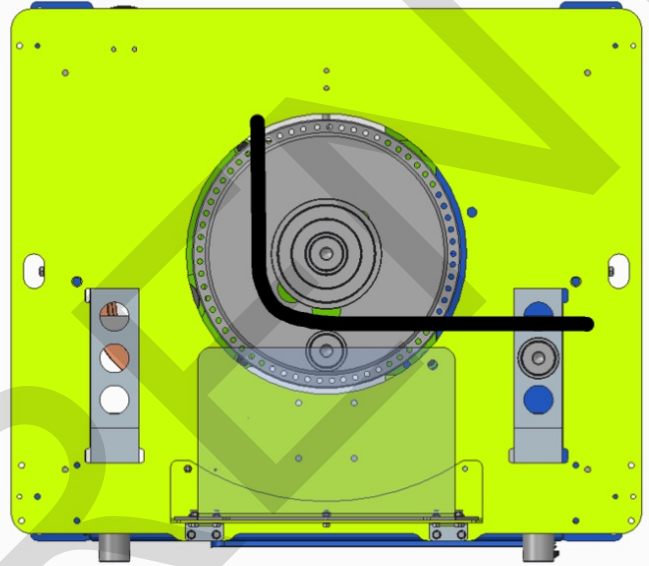
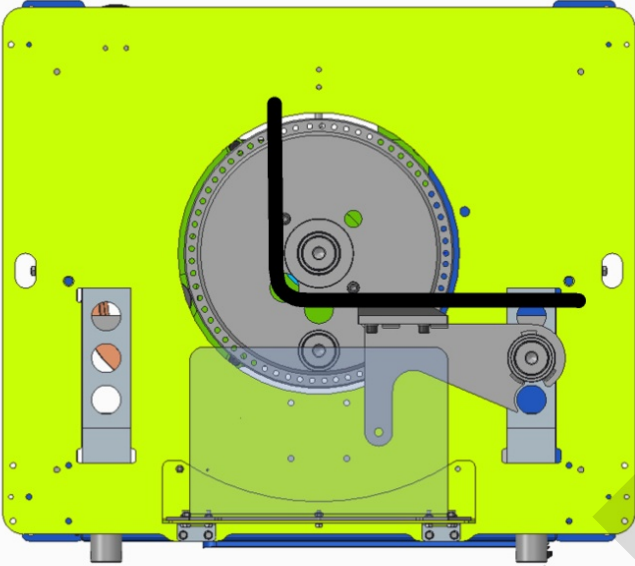




## 8. BENDING WITH SUPPORT DEVICE OR MANDRELS.

The bending support accessory is used to bend bars up to 16mm to support the bar all the way to the bending area. This will help stop the bar from flexing and deforming.

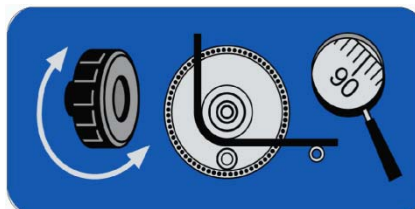
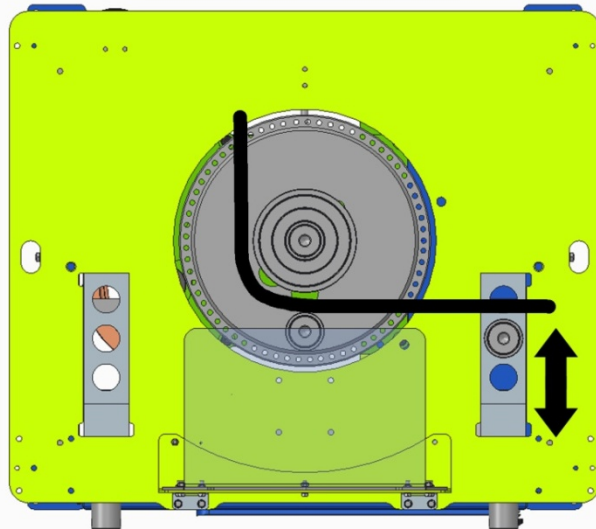
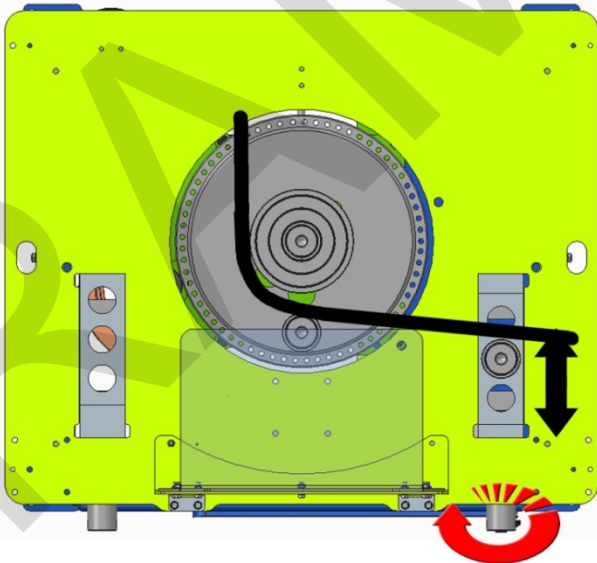
Mandrels are used for bars thicker than 16mm as the rigidity is sufficient that there will be no deformation.



### 8.1 ADJUSTING THE BENDING ANGLE.

If you haven't achieved the bending angle you require with the pin and you need to make a small adjustment you can use the silver metal handles on the side of the machine to move the support mandrels.

Turn the handle to push the mandrel further away to make a tighter angle and bring it towards to make a more open angle.

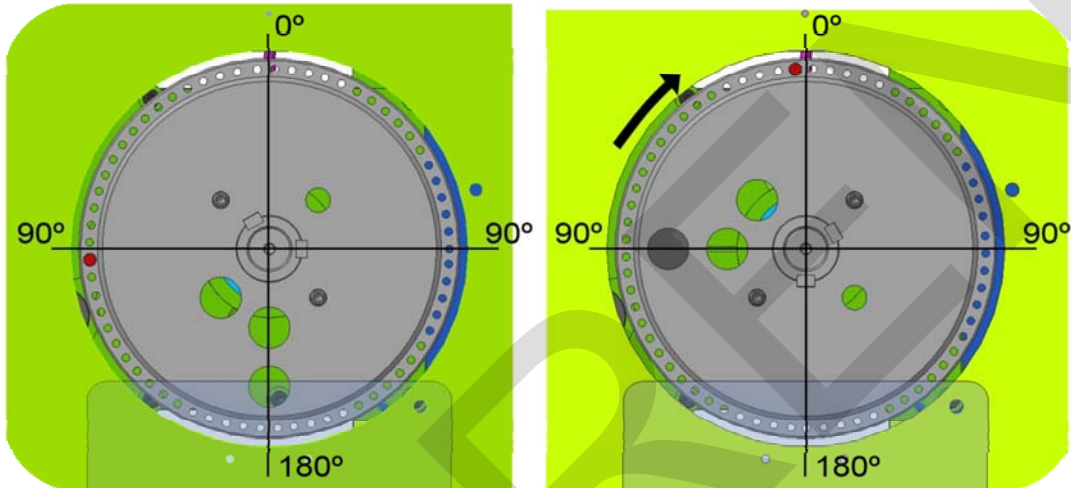


## 9. MAKING A BEND



Before starting to bend a rebar make some bends without any accessories on the machine until you are comfortable with the movement.

1. Divide the bending plate into 4 imaginary 90degree sections.
2. Select bending direction with the control panel button.
3. Insert the plate pin to the left of 0 degrees so achieve an angle of 90.
4. Step on the pedal and don't lift off. The bending plate will move until the pin reaches the inversion switch.
5. To make the plate return lift your foot off the pedal and press again and the plate will return.



## 10. MAKING A CUT.



Remove all the bolts, shells and pivots that are on the bending plate.



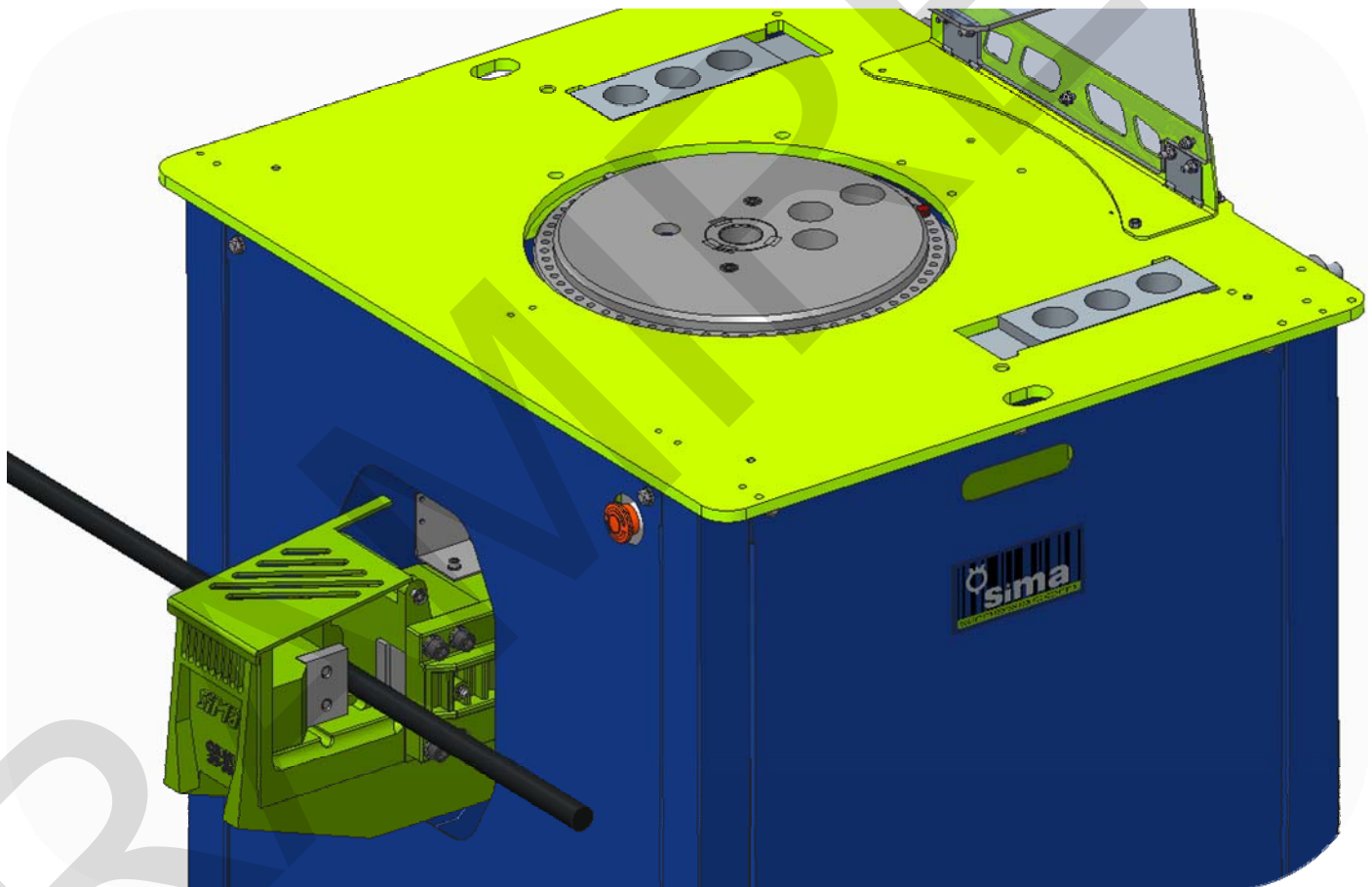
Never use the machine for cutting and bending at the same time as this presents a great risk to accidents and an over effort for the motor and the reducer causing serious damages.

### CONTINUOUS CUTTING

Remove all the bolts, shells and pivots that are on the bending plate and press the pedal.

### DISCONTINUOUS CUTTING

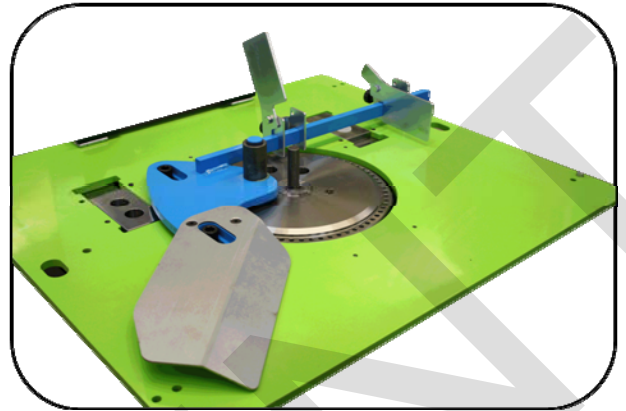
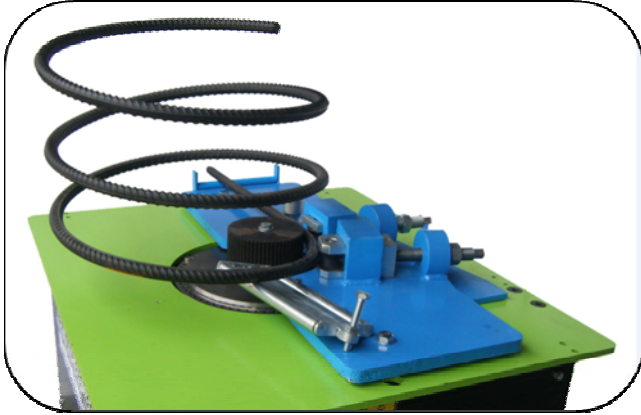
To obtain a cutting in cycles, you can prepare the machine, placing an inversion pivot **P** right in the interior, small hole in the end of course of the plate exactly when the blades close.



## 11. SPECIAL ATTACHMENTS.

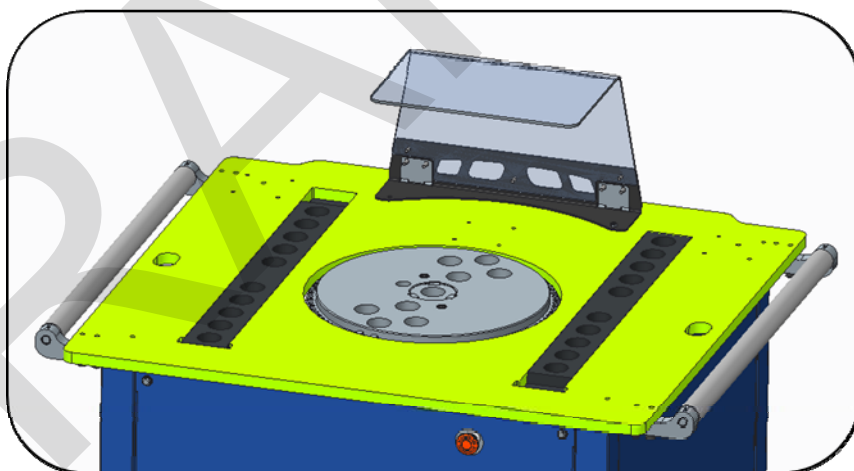
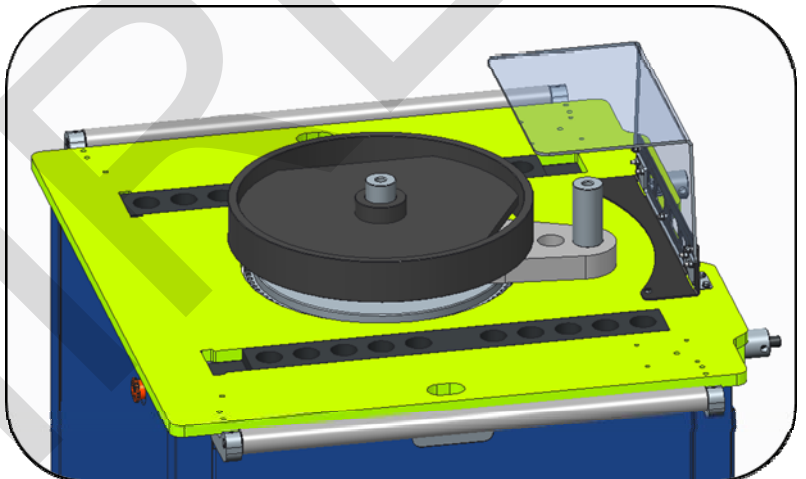
The bending and combined machines can use certain accessories that do not come included with the machine. These attachments perform different functions.

**1. STIRRUP DEVICE :** This device is for making stirrups.



**2. SPIRAL DEVICE:** This device is used to make spiral formations with rebar.. Bars of diameter 6mm to 20mm can be used.

**3. BIG DIAMETER DEVICE :** This device aids in complying with EU safety regulations for large bends. It is composed of a series of accessories and mandrels with a minimum radius for each bar diameter.



**4. ROLLER SUPPLY BENCH:** This is designed to help the bars slide towards the machine and protect the deterioration of the table through constant contact with the rebar.

5. **ROLLER FEED TABLES:** Designed to support bars before they are fed into the machines.



6. **MANDREL EXTRACTOR:** Designed to help remove the mandrels.

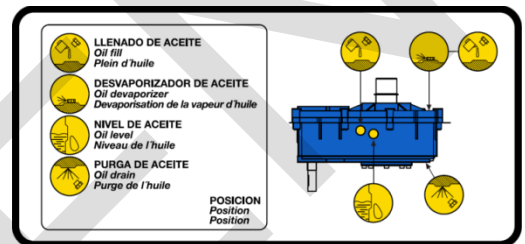




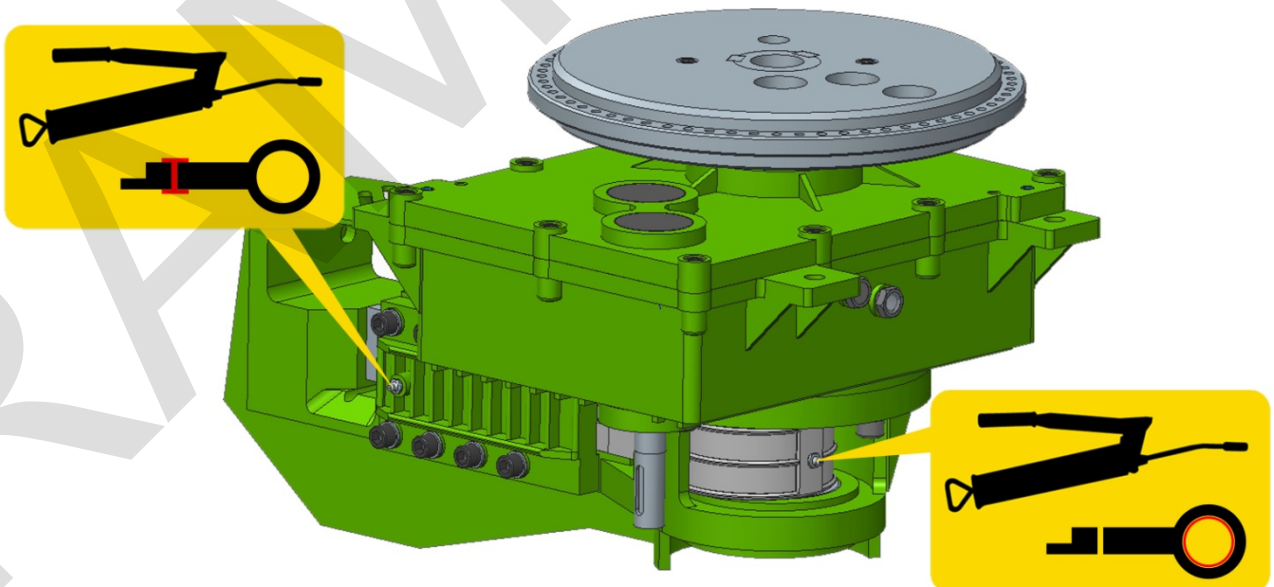


## 12. MAINTENANCE.

- 1 First oil change after 1000 hours of use if mineral oil is used and then again after 3000/4000 hours if the oil used is synthetic or after 3 years of use if these hours aren't reached. If synthetic oil is used change oil after 20,000 hours.
- 2 Grease the holes where the pins and mandrels go and also the bottom of the pins and mandrels , this will also help avoid build up of rust.
- 3 At the end of the day disconnect the machine.
- 4 Cover the machine at night to protect from rain.
- 5 When possible remove debris form the inside of the machine.
- 6 Clean the exterior and grease pins and mandrels frequently..
- 7 Check the blades on the cutter (**every 8 days of use**) to see if they need changing.
- 8 Check oil level in the gear box (**every month**) if the level has gone down be sure to fill up.



- 9 For COMBI models, there are two greasing points that should be greased every 20 days.

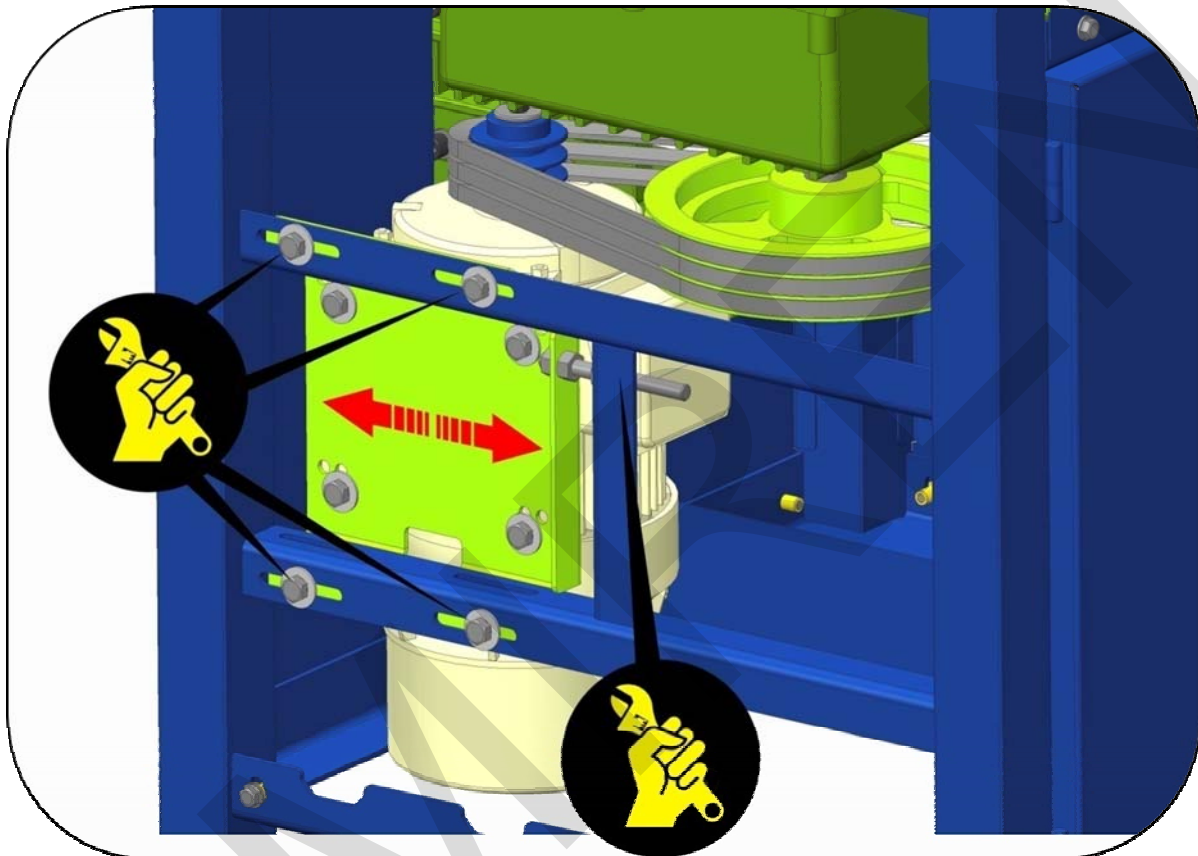




## 12.1 CHANGING THE BELTS .

The machines leave the factory with the belts correctly tightened, however it is possible that after a few days of work the belts become loose. To tighten the belts again the process is the same.

1. Make sure the machine is disconnected from the electricity supply.
2. Remove the side panel of the machine.
3. Loosen the 4 bolts that hold the platform to the guide.
4. Tighten the belt with the tightening mechanism.
5. Retighten the bolts.
6. Replace the side panel of the machine.

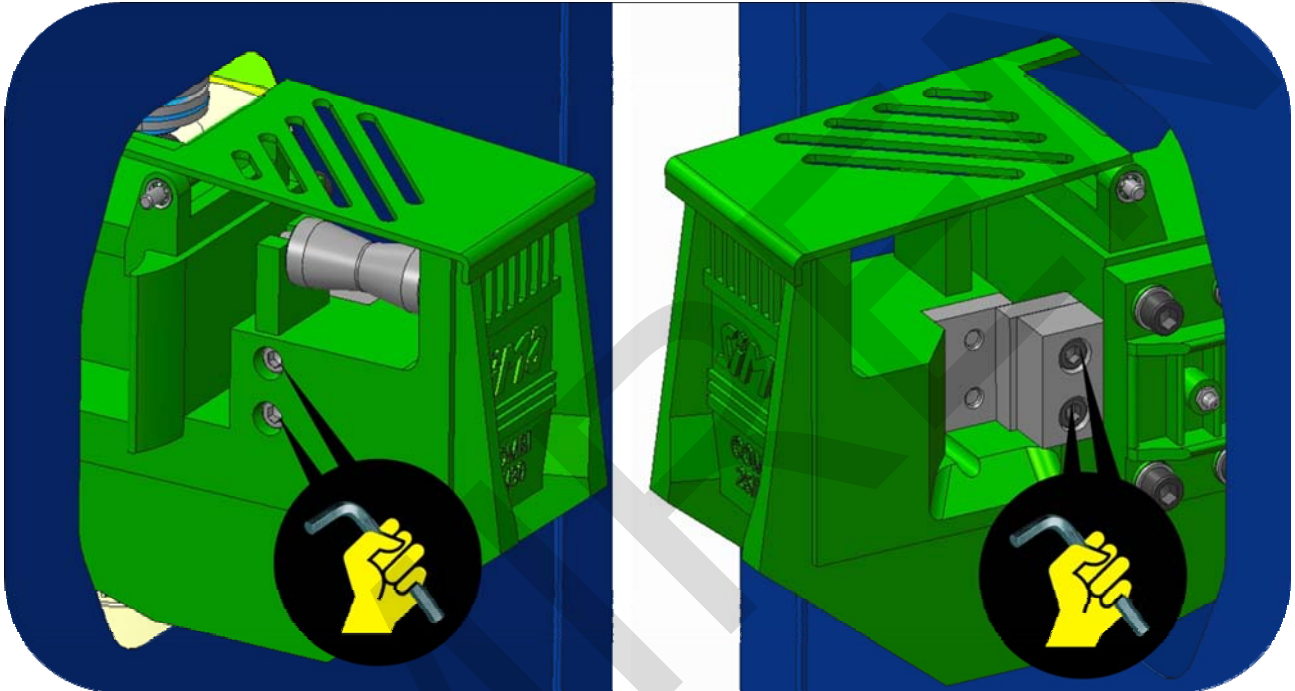


## 12.2 REPLACING THE BLADES (COMBI MODELS)

If any of the cutting blades is damaged, replace them as to the following procedure:

**1 CHANGING THE FIXED BLADE.** Make sure the machine is unplugged from electricity. Lift the safety guard off the blades. Afterwards, remove the screws and rotate the blade for a new cutting session or substitute it with a new blade if necessary.









**2 CHANGING THE MOVEABLE BLADE.** To change this blade, it is necessary that the connecting rod is displaced outside its housing. Operate in the following way: with the machine switched on and the inversion pivot of the bending plate removed from its position, press the pedal and observe the movement of the blade. When we see that the blade is outside its housing, we depress the pedal. Right after, we unplug the machine from the electricity to avoid any accident. In this way, we can reach the screws that fix the blade. Remove the screws of the blade for a new cutting or substitute it with a new blade if necessary.



### 13. TROUBLE SHOOTING.

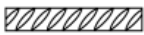
PROBLEM	POSSIBLE CAUSE	SOLUTION
NOT ENOUGH POWER TO CUT OF BEND.	LOOSE OR DAMAGED BELTS	TIGHTEN OR REPLACE BELTS
	DAMAGED BLADES	REPLACE BLADES OR CHANGE CUTTING SIDE
	MOTOR NOT RECEIVING CORRECT CURRENT	CHECK VOLTAGE
THE BENDING PLATE DOESN'T RETURN TO ITS ORIGINAL POSITION AFTER THE BEND IS COMPLETE	DEFECTIVE INDUCTIVE SENSOR	CHECK THE SENSOR (1 OPEN, 0 CLOSED). REPLACE IF DAMAGED
NOT ENOUGH OR UN CURRENT REACHING THE MACHINE, THE PILOT LIGHT DOESN'T COME ON	LACK OF CURRENT REACHING THE ELECTRICAL JUNCTION BOX	CHECK SITE JUNCTION BOX TO MAKE SURE ELECTRICITY IS BEING PRODUCED
	MAIN ELECTRICITY DOWN	CHECK THE CURRENT FROM THE MAINS
	FUSE HAS BLOWN ON THE JUNCTION BOX	REARM THE FUSE
	CABLE IN BAD STATE	REPLACE THE CABLES
THE PILOT LIGHT IS ON BUT THE MACHINE DOESN'T WORK	THE MACHINE ISN'T CORRECTLY CONNECTED	CHECK THAT ALL PHASES ARE COMPLETE. CHECK THE FUSE IN THE MACHINES ELECTRICAL BOX
	EMERGENCY STOP BUTTON IS DEPRESSED	RELEASE EMERGENCY STOP
	SECURITY FEATURES ARE ACTIVATED	MAKE SURE ALL DOORS, EMERGENCY STOP BUTTONS AND PLASTIC TABLE TOP GUARD ARE IN CORRECT POSITION
230V OR 400V CONNECTION. THE CONNECTION IS CORRECT BUT THE MACHINE DOESN'T HAVE ENOUGH POWER.	UNSTABLE ELECTRICITY SUPPLY	CHECK THE ELECTRICITY SUPPLY IF THE VOLTAGE IS INFERIOR TO 230V OR 400V THE MACHINE WON'T WORK. A TENSION STABILISER IS RECCOMENDED
THE MACHINE LOSES OIL THROUGH THE GEAR BOX	RUBBER WASHER DETERIORATED.	REPLACE RUBBER WASHER
WHEN BEND IS FINISHED THE PLATE DOESN'T STOP AT THE ORIGINAL POSITION	DEFECTIVE INDUCTIVE SENSOR	CHECK THE SENSOR (1 OPEN, 0 CLOSED). REPLACE IF DAMAGED
THE BENDING PLATE DOESNT STOP IMMEDIATELY WHEN THE PEDAL IS RELEASED	THE MOTOR BRAKE HAS WORN	CHECK THE MOTOR BRAKE AND TIGHTEN THE SPRINGS LEAVING A UNIFORM GAP BETWEEN THE DISC AND THE PLATE OF .3 TO .4MM.
	THE MOTOR BRAKE IS NOT OPERATIONAL	REPLACE THE MOTOR BRAKE
STRANGE NOISE FROM WITHIN THE GEARBOX	DETERIORATION OF SOME OF THE INTERNAL COMPONENTS	DISMANTLE THE GEARBOX AND CHECK BEARINGS AND GROOVES. REPLACED DAMAGED ELEMENTS
STRANGE NOISE FORM THE MOTOR	MISFUNCTIONION OF ONE OF ITS COMPONENTS	FIND OUT THE SOURCE OF THE NOISE AND REPAIR



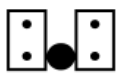

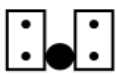


## 14. CARACTERÍSTICAS TÉCNICAS.

								
	Kg	C.V.	Kw	R.P.M.	LxAxH	LxAxH	R.P.M. x1'	L
<b>DEL 32</b>	302	3	2.2	1500	910x808x1141	950x850x1050	11	5,1
<b>DEL 36</b>	355	4	3	1500	910x808x1141	950x850x1050	10	10
<b>DEL 45</b>	490	4	3	1500	1040x1000x1141	1080x1040x1050	6,5	8,8
<b>DEL 52</b>	721	5,5	4	1500	1040x1000x1141	1080x1040x1050	6	15
<b>COMBI 25/32</b>	386	3	2.2	1500	910x1009x1141	950x1070x1050	11	5,1
<b>COMBI 30/36</b>	435	4	3	1500	910x1033x1141	950x1070x1050	10	10
<b>COMBI 36/52</b>	790	5	4	1500	1040x1244x1141	1080x1290x1050	6,5	15

## 14.1 BENDING CAPACITIES.

## CAPACIDAD DE CORTE / CUTTING CHARACTERISTICS / CAPACITÉS DE COUPE

LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250			R=N/mm <sup>2</sup> 480			R=N/mm <sup>2</sup> 650		
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450			R=N/mm <sup>2</sup> 650			R=N/mm <sup>2</sup> 850		
Nºx 	1	2	3	1	2	3	1	2	3
<b>DEL-32</b>	Ø32	Ø24	Ø18	Ø25	Ø20	Ø16	Ø25	Ø18	Ø14
<b>DEL-36</b>	Ø36	Ø26	Ø22	Ø32	Ø24	Ø18	Ø32	Ø22	Ø16
<b>DEL-45</b>	Ø45	Ø32	Ø25	Ø40	Ø32	Ø25	Ø40	Ø26	Ø25
<b>DEL-52</b>	Ø52	Ø36	Ø30	Ø46	Ø34	Ø25	Ø42	Ø32	Ø25

LIMITE ELÁSTICO	R=N/mm <sup>2</sup> 250			R=N/mm <sup>2</sup> 480			R=N/mm <sup>2</sup> 650											
RESIS. TRACCIÓN	R=N/mm <sup>2</sup> 450			R=N/mm <sup>2</sup> 650			R=N/mm <sup>2</sup> 850											
																		
Nºx 	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<b>COMBI 25/32</b>	Ø25	Ø18	Ø12	Ø32	Ø24	Ø18	Ø20	Ø16	Ø10	Ø25	Ø20	Ø16	Ø20	Ø14	Ø8	Ø25	Ø18	Ø14
<b>COMBI 30/36</b>	Ø30	Ø20	Ø16	Ø36	Ø26	Ø22	Ø25	Ø18	Ø14	Ø32	Ø24	Ø18	Ø25	Ø16	Ø12	Ø32	Ø22	Ø16
<b>COMBI 36/52</b>	Ø36	Ø26	Ø22	Ø52	Ø36	Ø25	Ø32	Ø20	Ø16	Ø46	Ø34	Ø25	Ø32	Ø18	Ø16	Ø42	Ø32	Ø25

## 15. SAFETY RECOMMENDATIONS

Bending and combined (bending/cutting) machines should be used by trained people or people familiarized with their operation.

- Before starting up the machine please read the instructions and make sure safety norms are respected. Learn how to stop the machine in a fast and safe way.
- Place the machine on a plane surface. Connect the machine to the electricity only when you are sure of its stability.
- Start the machine only when you have mounted the safety guards that come with the machine.
- It is recommended to use safety glasses, safety boots, gloves etc. Please always use approved materials.
- Always use Individual Protection Equipment (IPE) in accordance with the type of work you are effectuating.  
Prohibit strangers to access the place of work of the machine.

Work clothes are not supposed to have loose articles that can cling into movable parts of the machine.

When you have to move the machine, unplug the electricity cables and block the moving parts of the machine.

Always keep protection elements and the safety guards in their correct positions.

**Attention:** Before placing the bolts, mandrills and the bending squares, check the direction of rotation of the bending plate. You can then install the suitable accessories for the type of work you want to make.  
The damaged electrical cables should be urgently replaced.

Unplug the machine from the electricity and never manipulate nor operate on the mechanical nor electrical elements of the machine while the engine is on.

Never use the machine for purposes other than those it has been designed for.

- **VERY IMPORTANT: Earth should always be connected** before switching on the machine.
- Use correct connection cable
- Check the electricity supply to the machine and make sure it is the same as indicated on the serial number plaque or sticker.
- Make sure the cable is secure from direct heat, oil, footfall.
- Don't use pressurised water to clean the machine as this may get into the electrical components.

**ATTENTION: You are to follow all safety recommendations mentioned in the present user manual and comply with all labour risks prevention norms in every location.**

**SIMA, S.A. is not responsible for the consequences possibly generated but the inadequate use of the bending or the combined (bending/cutting) machine.**

## 16. WARRANTY

SIMA, S.A. the manufacturer of light machinery for construction possesses a net of technical services "SERVI-SIMA".

Repairs under warranty made by SERVÍ-SIMA are subject to some strict condition to guaranty a high quality and service.

SIMA S. A. guarantees all its products against any manufacturing defect; to take into account the conditions stated in the attached document "WARRANTY CONDITIONS". The latter would cease in case of failure to comply with the established payment terms. SIMA S.A. reserves its right to bring modifications and changes to its products without prior notice.

## 17. DECLARATIONS ON NOISE

The acoustic levels emitted by the MACHINE are inferior to 70 dB (A)

## 18. DECLARATIONS ON MECHANIAL VIBRATIONS

The machine does not present any source of mechanical vibrations that cause risks to the health or safety of the operator.

## 19. SPARE PARTS

The spare parts for the bending and combined machines, manufactured by SIMA, S.A. are to be found in the spare parts plan, attached to this manual.

To order any spare part, please contact our alter-sales service clearly indicating the serial number of the machine, **model, manufacturing number and year of manufacturing that show on the serial number plaque or sticker.**

## 20. ENVIRONMENT PROTECTION



Raw materials have to be collected instead of throwing away residuals. Instruments, accessories, fluids and packages have to be sent into specific places for ecological reuse. Plastic components are marked for selective recycling.



**R.A.E.E. Residuals arising of electrical and electronic instruments have to be stored into specific places for selective collection.**





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FABRICACIÓN DE MAQUINARIA PARA LA CONSTRUCCIÓN

ESPAÑA