



INSTRUCTIONS BOOK

HYDRAULIC PRESS BRAKE

MP3160CNC

NS: 2026-107



PRADA NARGESA, S.L

Ctra. de Garrigàs a Sant Miquel s/n · 17476 Palau de Santa Eulàlia (Girona) SPAIN

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NARGESA CLIENTS

Prada Nargesa has more than 12.200 customers around the world. Some of our clients, those who offer service to third parties with the Nargesa machinery in their workshops, have been pleased to be part of this network that aims to connect them with possible future clients. In this way, all those people or companies that have a need for any part or tool that can be manufactured by using the Nargesa range of machinery, will be able to find a solution in their area to be able to satisfy their production requirements by hiring their services.



We have more than 12.200 customers in 150 different countries around the world

Discover its location on the interactive map on our website!

DO YOU WANT TO PARTICIPATE?

Send an email to nargesa@nargesa.com, include the following information and we will add you to this list.

We want to encourage all those who haven't participated yet in this great comercial network!

1. Company name
2. CIF/Tax Code
3. City
4. Country
5. Machine or machines

PRADA NARGESA

Prada Nargesa S.L. is a family business founded in 1970 located near Barcelona, Spain, with more than 50 years of experience in the sector of manufacturing of industrial machinery, and more than 10.000m² of facilities. Nargesa is a symbol of quality, reliability, warranty and innovation.

Our whole range of machines and accessories is manufactured entirely in Nargesa. We have a constant stock of 400 machines, and we have more than 21.300 machines sold all over the world.



OUR RANGE OF MACHINERY

Ironworker Machines
Ring Roller Bender and Pipe Bender
Non-mandrel Tube and Pipe Bender
Twisting / Scroll Bending Machines
Horizontal Press Brakes
End Wrought Iron Machines
Gas Forges

Iron Embossing Machines
Hydraulic Shear Machines
Hydraulic Press Brakes
Presses for Locks
Broaching Machines
Power Hammers

CERTIFICATES

Prada Nargesa has several certifications that backup both, the design and manufacturing processes, as well as the journey through exporting our products around the world and the quality of the manufacturing components we use for our machines. These facts turn into real advantages for our customers:



AUTHORIZED EXPORTER

- Faster customs procedures
- Reduction of tariff documentation
- Tariff preferences according to geographical location



INNOVATIVE SME

- Development in innovation, design and manufacturing technologies
- Certification and audit of efficiency in product and service
- Ability to foresee customer needs



R+D+I MANAGEMENT

- Manufacturing based on the R+D+I process
- Technological surveillance system

SUCCESS STORIES

At Prada Nargesa we believe that the testimony of our clients is our best guarantee, and that is why we like to expose some of the success stories that we have witnessed around the world:



Discover its location on the interactive map on our website!

DO YOU WANT TO PARTICIPATE?

Send an email to nargesa@nargesa.com including the following information and we will add you to our website:

- Company name
- Testimonial name
- Post in the Company
- Country
- Descriptive text
- Photography with the machine

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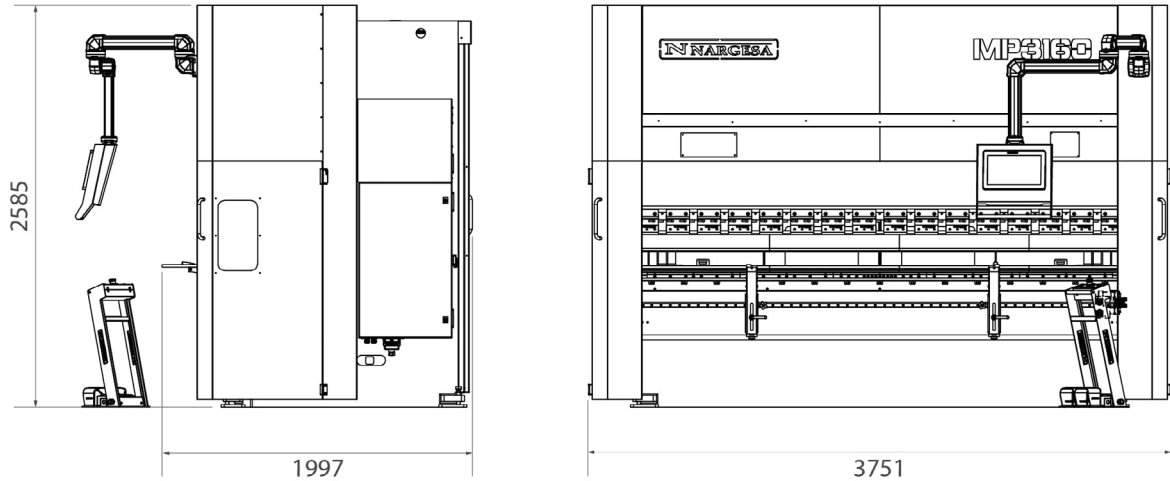
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ANNEX 1. ESA S840 SOFTWARE

ANNEX 2. TECHNICAL ANNEX

1. MACHINE DETAILS

1.1. Dimensions

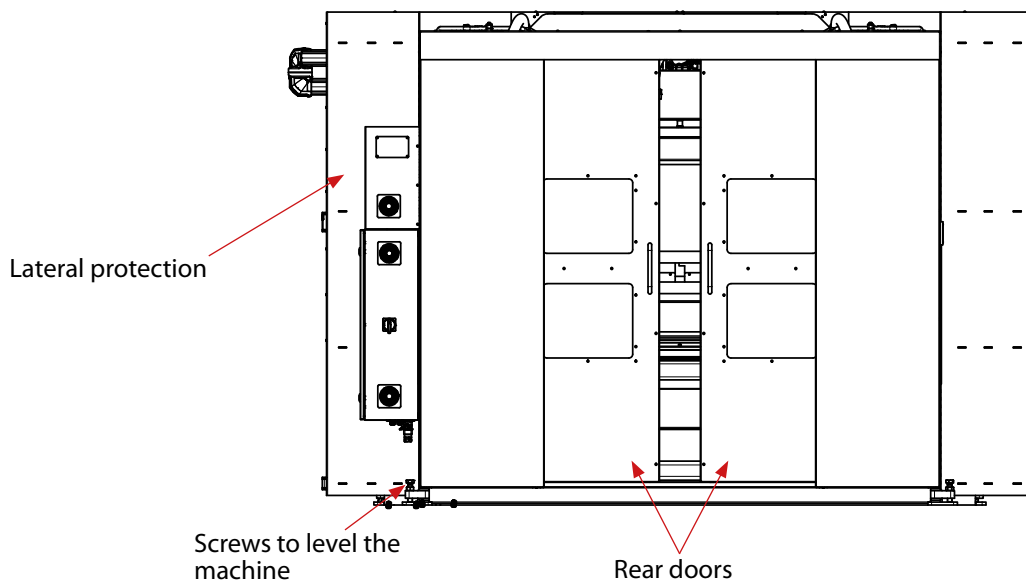
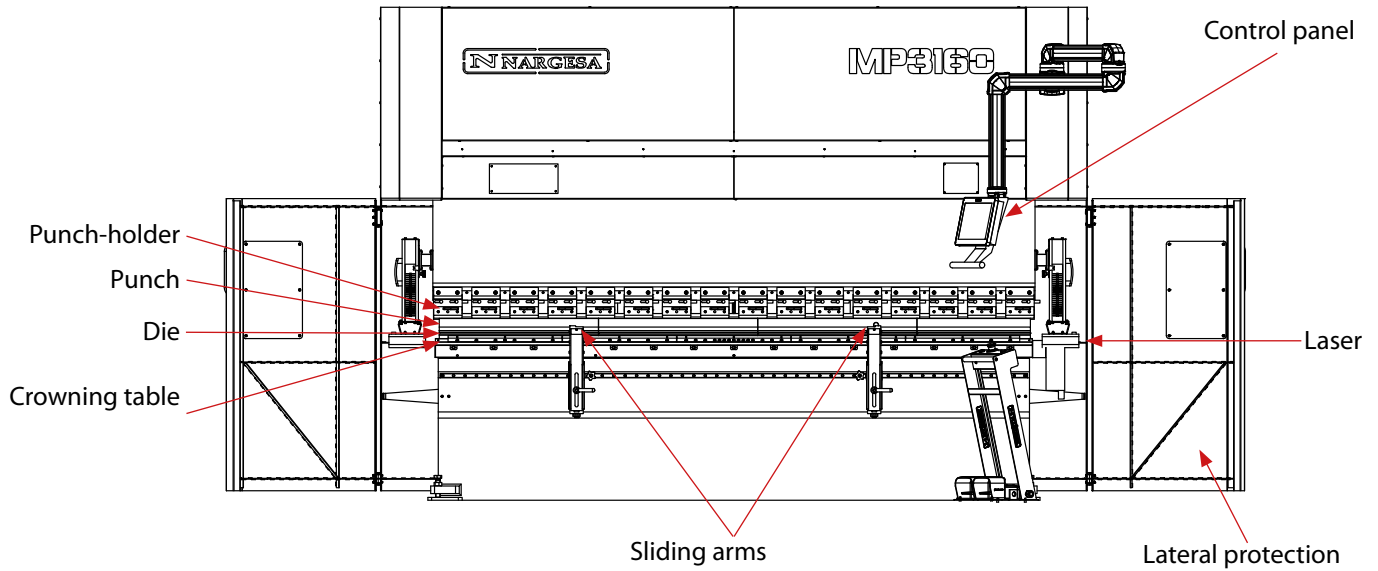


1.2. Description of the machine

The MP3160CNC press brake is specifically designed to bend sheet metal in different grades, any other application than those specified above, the manufacturer is not responsible for any damage caused to the machine or persons using it.

The MP3160CNC is adapted to the European standards and directives for machinery manufacturing.

1.3. Machine part identification



		www.nargesa.com			
PRADA NARGESA, S.L. - CTRA. DE GARRIGAS A SANT MIQUEL S/N 17476 PALAU DE STA. EULALIA (GIRONA) SPAIN - TEL.(+34) 972568085					
TRADEMARK NARGESA		MODEL MP1500CNC			
YEAR OF MANUFACTURE		SERIAL N°			
DIMENSIONS 2110x1880x2210		mm.	WEIGHT 4900	Kg.	
POWER 5,5	Kw.	INTENSITY 22/11	A.	VOLTAGE	V. Hz 50/60

1.4. Características generales

Motor	15 Kw a 1460 r.p.m.
Intensity	12,8 A a 400 V 22,1 A a 230 V
Pressure of the hydraulic pump	280 kg/cm ² (22 MPa)
Pump	36 l/m
Deposit	134 L
Double acting piston	160 Tm
Neck	400mm 15,75"
Inner folding lenght	2630mm 103,5"
Total folding lenght	3100mm 122"
Total displacement of top	600+100mm 23,62"+4"
Maximum punch displacement	220mm 8,66"
Free distance table/slice	445mm 17,52"
Weight	11.900Kg 26.235lb.

1.5. Accessories

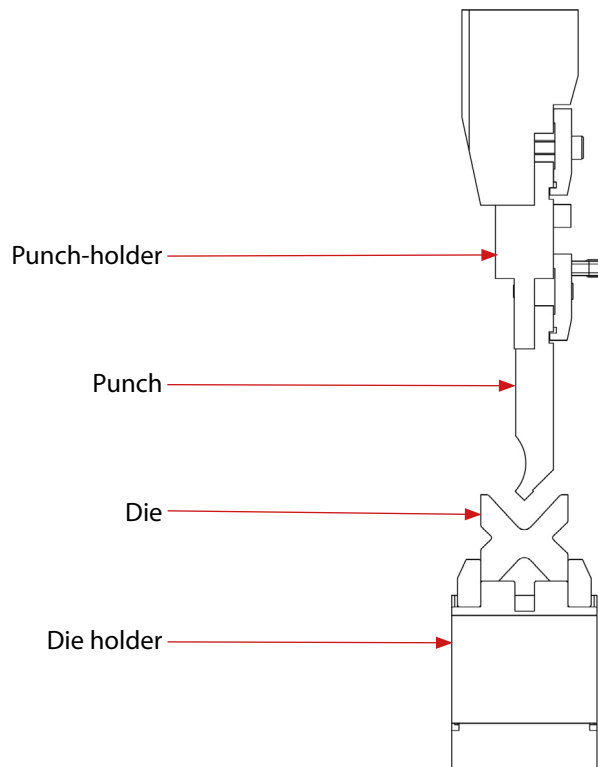
1.5.1. Description of accessories

The punch and die are treated, ensuring reliability and endurance under normal use. Arrays have different openings for different thicknesses of sheet metal and bending radi.

1.5.2. Tooling

The press brake MP3003CNC, has been designed for the use with "V" dies, punch and die holder.

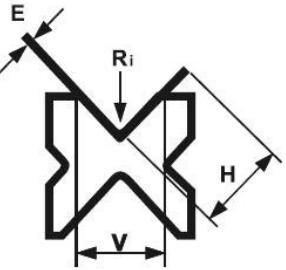
Other dies with upper V's sectioned punches and press brake anvils can be also used. Please ask the manufacturer.



Ton/m										E = mm 42 • 48 kg/mm ²															
V	H	Ri	0,5	0,6	1	1,2	1,5	1,8	2	2,5	3	4	5	6	8	10	12	15	20	25					
4	2,6	0,7	4	10,5																					
6	3,9	0,9	2,5	6,5	10																				
8	5,2	1,5	2	5,5	8	11,5	18																		
10	6,5	1,7		4,1	6,5	9,5	14,5	21	26																
12	7,8	2			5,5	8	12	17,5	21,5	33,5															
16	10,4	2,7				6	9	13	16	25	36														
20	13	3,4					7,5	10,5	13	20	29	52													
26	18	4,2						8,5	10,5	16	23	41	64												
30	20	5							14	19	34	54	77												
35	23	6								17	30	46	66												
42	27	6,7									15	26	40	58	103										
45	29	7,5										23	36	52	91										
50	32	8,5											21	32	46	82	128								
60	39	10												27	39	69	107								
70	45	11,7													33	59	92	132							
80	52	13,5														29	52	80	116	180					
90	58	15															46	71	103	160					
100	65	17																41	64	93	144	256			
110	71	18,5																	59	84	131	233			
120	78	20																		54	77	120	213		
140	91	24																			66	103	183		
170	110	29																				55	85	151	
200	130	35																					72	128	200



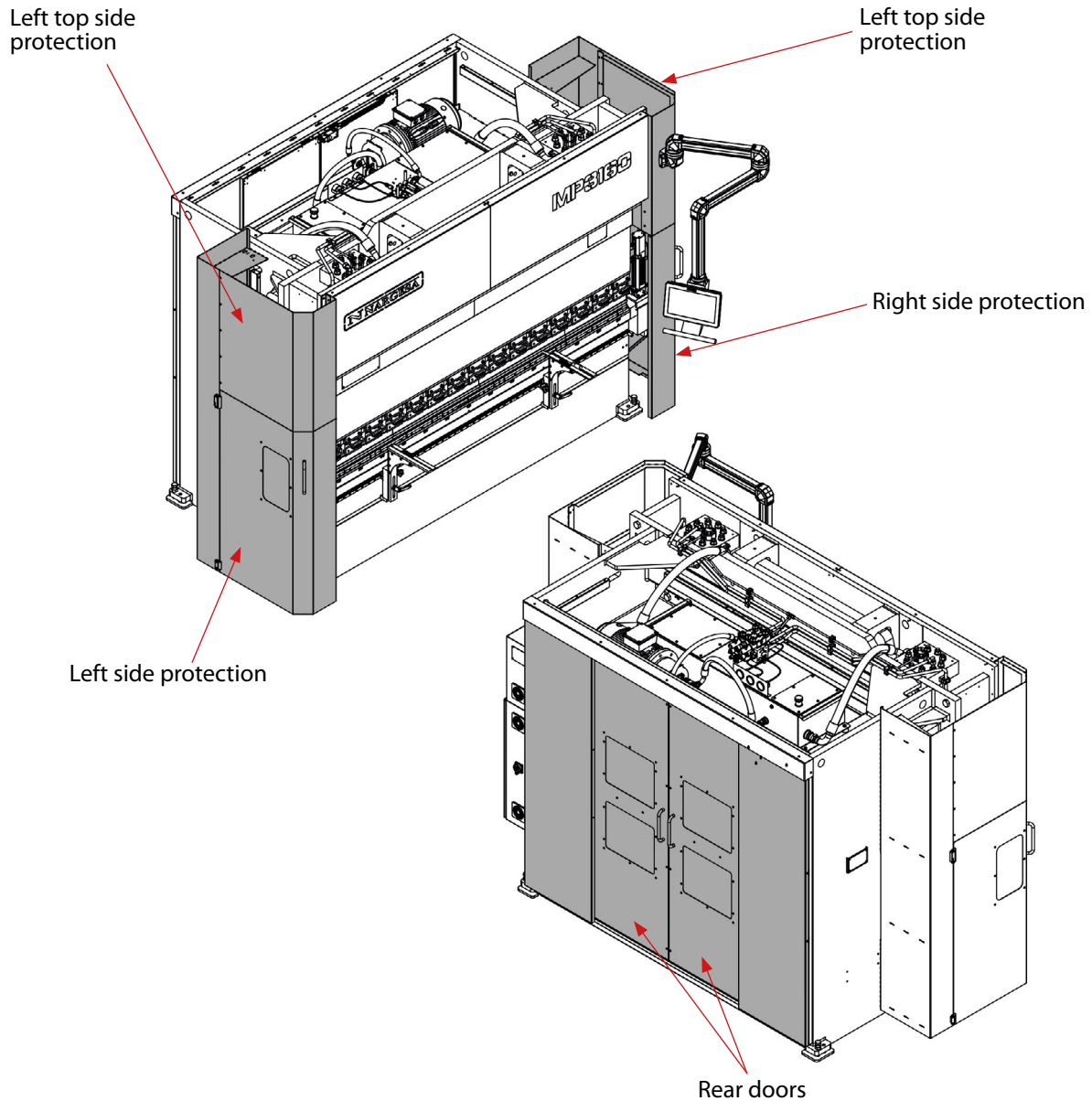
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1.6. Description of safety devices

Fixed safety devices consisting of CNC press brake MP3003CNC are the side shields to prevent manipulation of tooling on the sides and guards at the rear of the machine covering the belts and pulleys of the rear gauge.

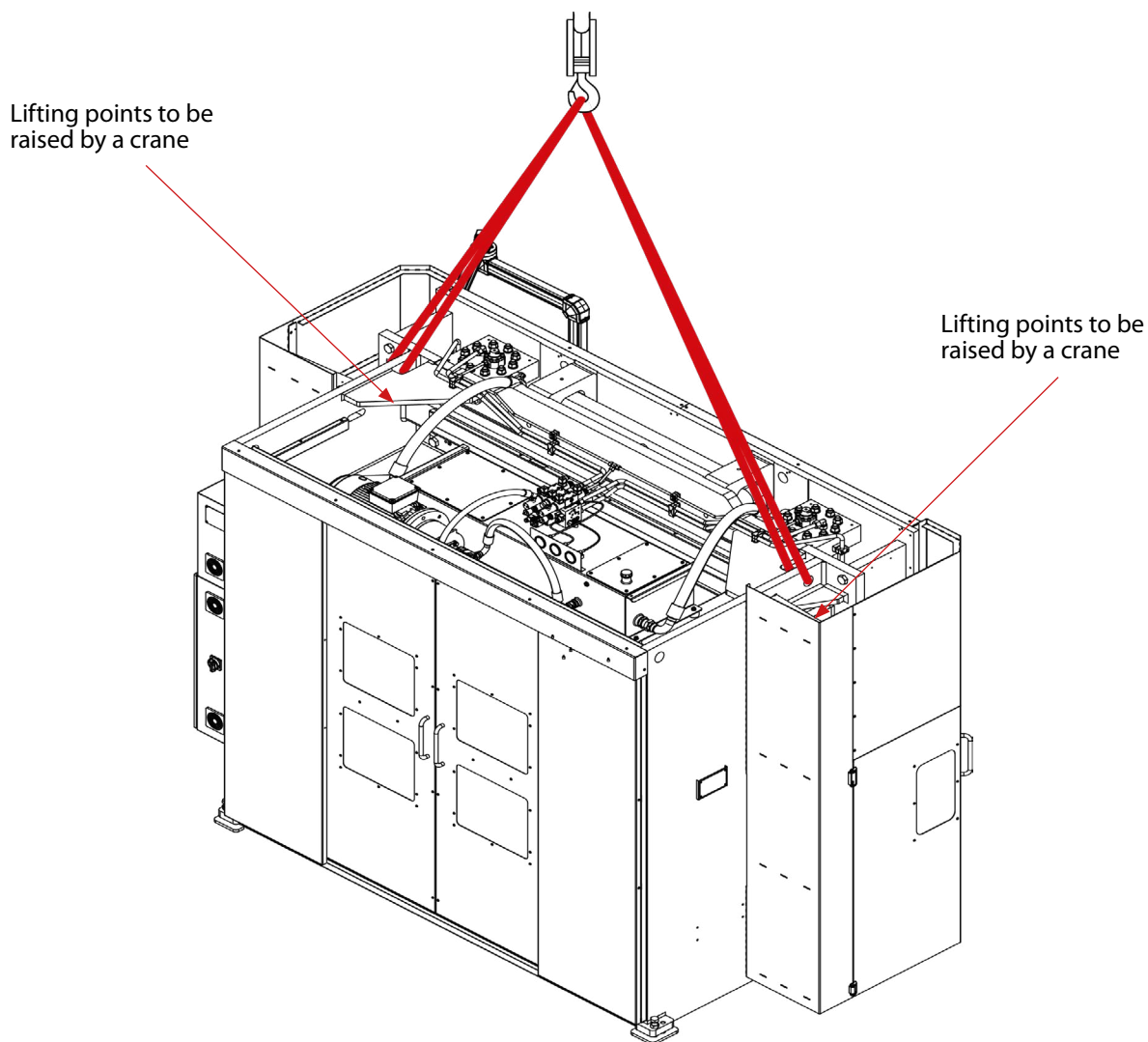


You can not remove the protective caps unless it is for maintenance and it should be carried out by technically trained personnel. PRADA NARGESA will not responsible for damage caused by not adhering to the afore mention instructions.

2. TRANSPORTATION AND STORAGE

2.1. Transportation

Lifting should be performed by a crane, on the marking point to that end anchorage. The machine will never rise by anywhere else other than the specified and provided the two points of the front of the machine will be used because the weight is found mostly in the front so we will make the machine remain in a horizontal line when raised.



2.2. Storage conditions

Press brake will not be never stored in a place where the following conditions are not settled:

- * Humidity between 30% and 95% non-condensing.
- * Temperature -25 to 55 ° C or 75 ° C for periods not exceeding 24 hours (remember that these temperatures are in storage)
- * It is advisable not to stack heavy objects on the machines.
- * Do not disassemble for storage.

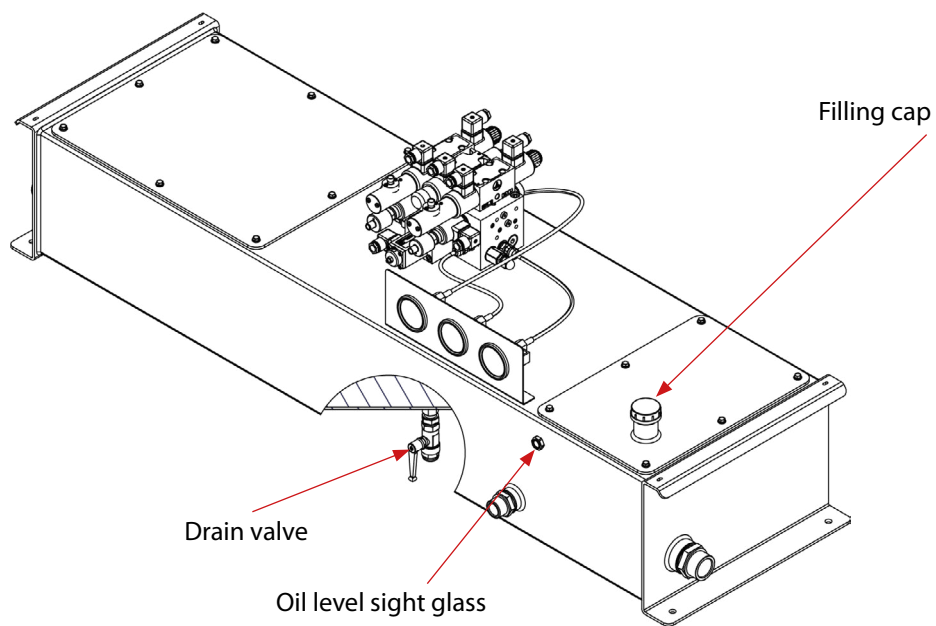
3. MAINTENANCE

3.1. General maintenance

At the top of the tank there is the level sightglass. In the absence of oil, fill up to the mark of the peephole.

- Every 1000 hours of use, check the oil level in the tank.
- Replace oil every 4,000 hours of work.

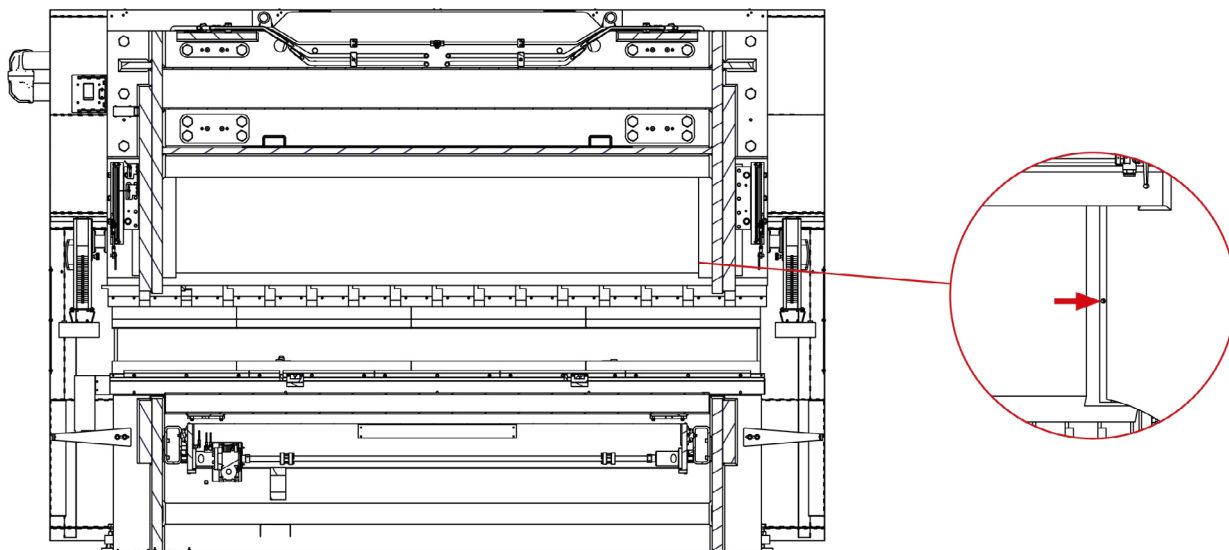
Oil Type: SIL POWER HV-46



WARNING: Stop the machine in order to carry out the maintenance of the machine. In case of replacement of the oil, start the engine and depress the flashing time increasing the pressure gradually until the circuit is complete.

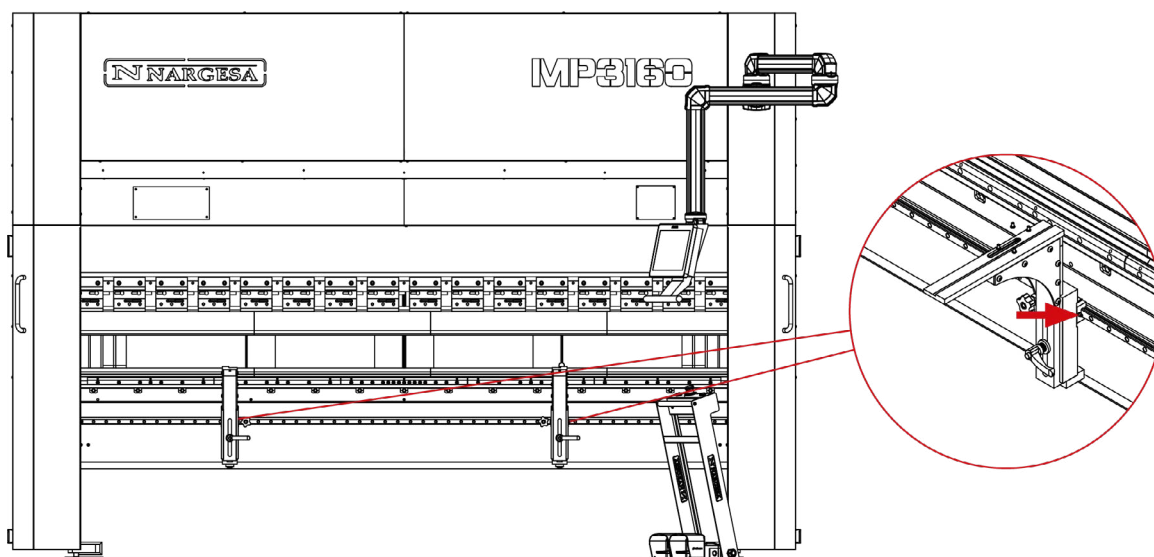
➡ Grease all guide accessories every 6 months. As a whole 2

Sectioned view of the machine



➡ Lubricate all sheet holders greasers.. As a whole 2

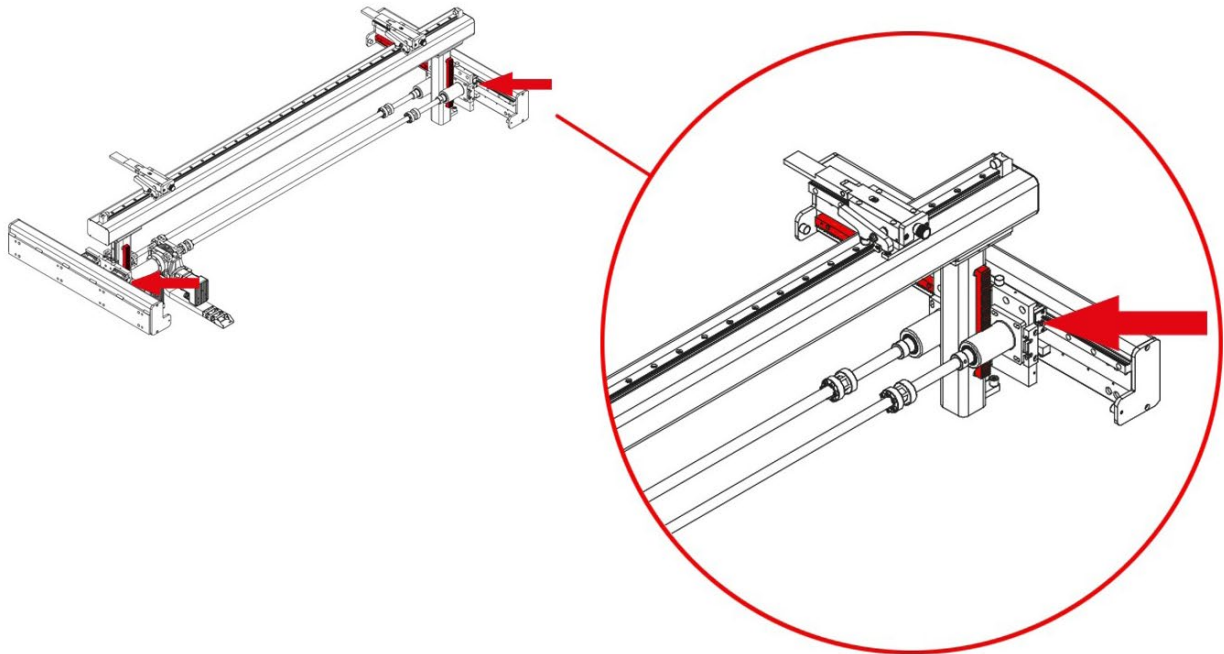
Front view of the machine



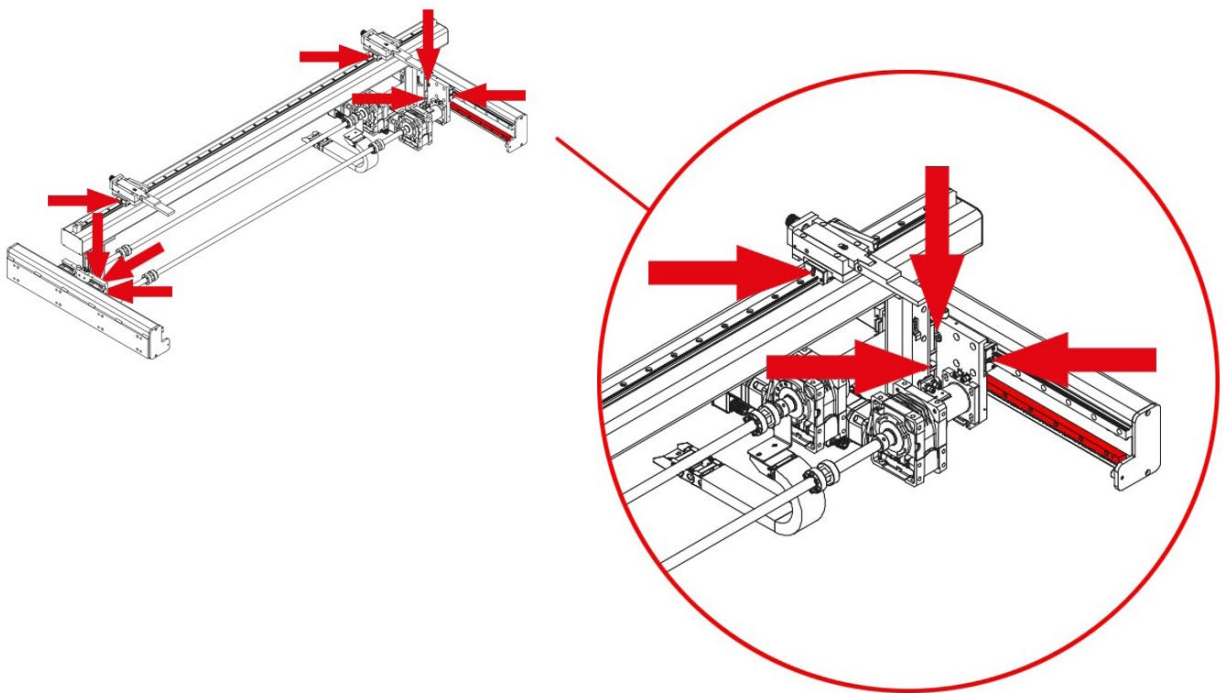
➡ Lubricate all gauge greasers. As a whole 10

Lubricate all racks on axis X and Axis R. As a whole 4

Back view of gauge



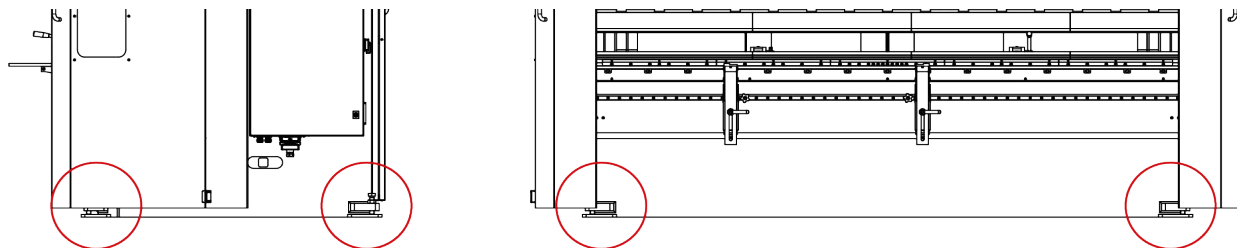
Front view of Gauge



4. INSTALLMENT AND START UP

4.1 Location of the machine

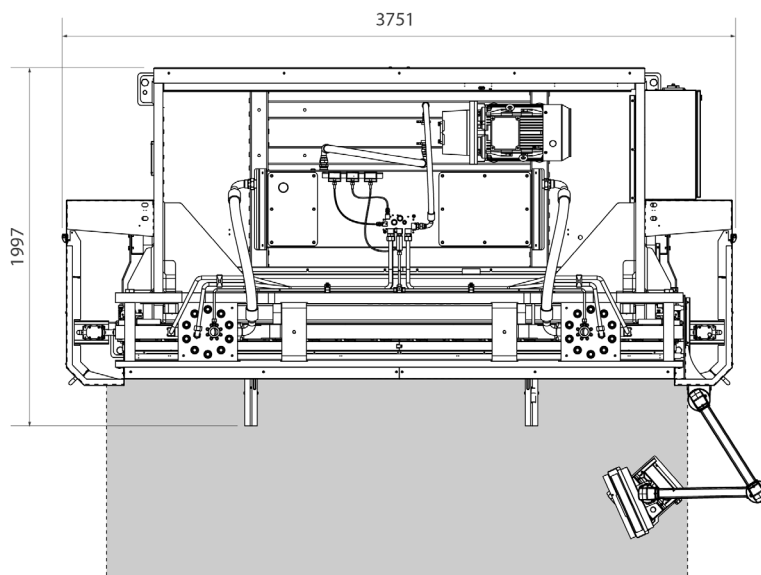
It is advisable to locate the machine properly to avoid having to move it; otherwise it would be required to follow the guidelines outlined in the transport section (# 2). It should be placed on a flat, level surface to prevent vibration and movement during folding operations. It is possible to level the machine by screws at the base of the machine one at each corner.



4.2. Dimensions and working site

When the machine is placed it must be taken into account its size, the workspace of the operator and the possible lengths of the workpiece.

The machine can be used by a single operator, which must be placed frontally to the machine, never in a side area since he should control the whole machine and also the main protections are designed for the front use of it.



4.3. Admissible outer conditions

Ambient temperature between $+5^{\circ}\text{C}$ and $+50^{\circ}\text{C}$ without exceeding an average temperature of $+45^{\circ}\text{C}$ 24h

Humidity between 30% and 90% non-condensing.

4.4. Connection to power supply

IMPORTANT: This machine must be connected to a 400V outlet with a neutral earthing contact as well.

The MP3160CNC, is equipped with a three-phase motor 230V / 400V star connected 9,5 Kw for connection to a 400V power supply. It must be connected to a single power supply with the power source indicated.

If the line voltage is not the one indicated: it will be necessary to proceed to change the connection of the bobins of the motor of the hydraulic unit as follows:

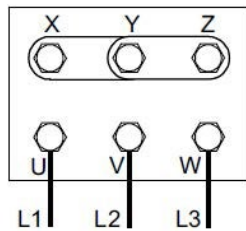


Figura estrella
(predeterminada)
Para tensión 400V

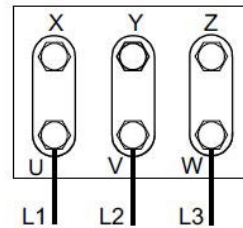
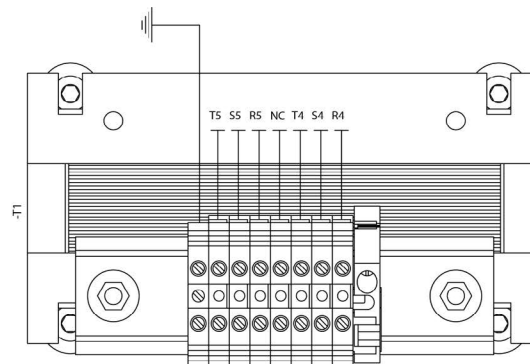


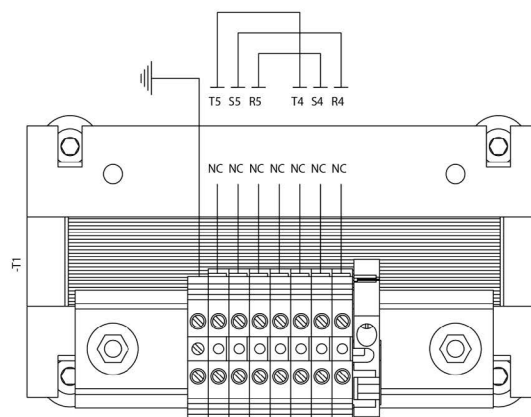
Figura triangulo
Para tensión 230V

The gauge activation is done by a servomotor which does not require any action when making a tensión change from 400v to 230v or the other way around.

The inverter configuration will have to be modified as well, as indicated in the following pictures:



400V Configuration



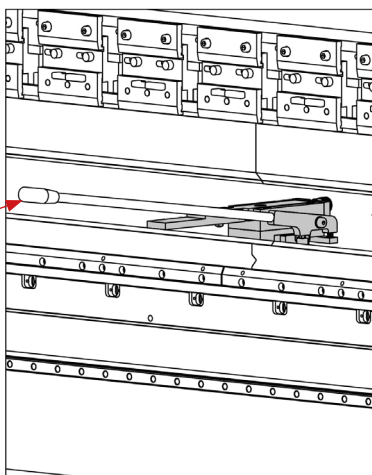
230V Configuration

5. ADJUSTMENT OF THE BACK GAUGE HANDLES

When it becomes necessary to change the press brake gauge needles position, it will be done by an activation bar provided for such operation and from the machine front side.

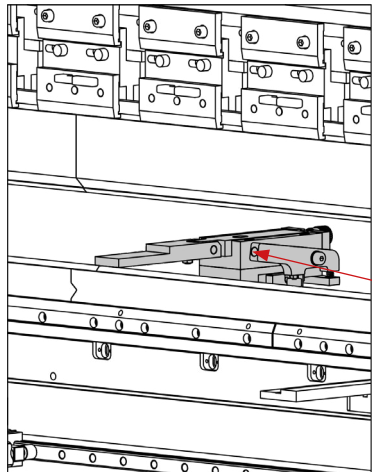
It is completely forbidden to carry out this operation without the activation bar.

Activation bar

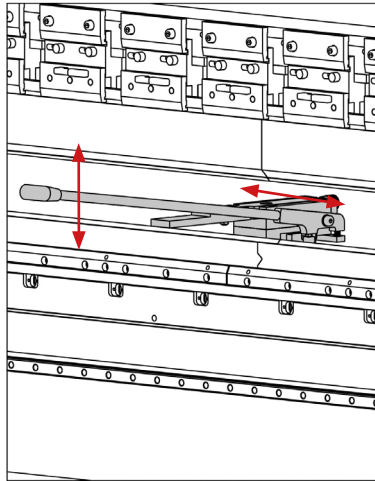


In order to proceed with the movement of the needles, we insert the activation bar in the existing slot there in the needles support.

Activation bar slot



We raise the lever, releasing the needle support and we can move the needle to a new desired position. We lower the lever and the needle will remain fixed in the new position.



We take the lever off and we have the gauge ready to be used again.

WARNING:

Make sure we have removed the lever before starting up the press brake again.

6. WARNINGS

Do not manipulate components of the machine while it's running.

Do not use the machine for any other purposes but the ones described in this manual

Use gloves for handling machine components during the folding process .

Wear safety goggles and protective boots approved by the EC.

Hold the material at the ends, never by the part of the fold .

Do not work without the protections fitted to the machine.

Maintain a safe distance between the machine and the operator during the time the machine is running.

Do not use any other tooling but the ones supplied by NARGESA.

The dies that may be coupled to the machine must always be set and fixed.

In case of accident by negligence of the operator, for not following the safety and operating standards set out in the manual, NARGESA SL will not accept any responsibility.

Bear in mind the obligation for all operators working with the machine to wear goggles, gloves and safety shoes.

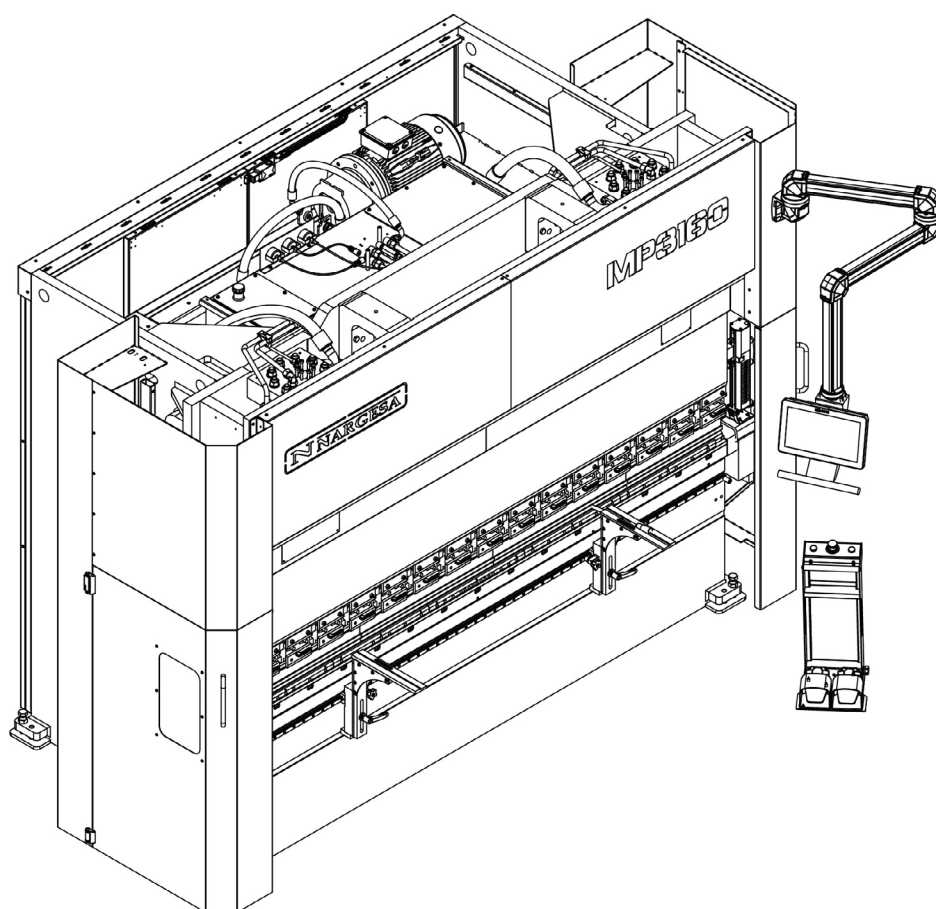
Description of the marks on the machine. It's marked on the front with the following hazard symbols.





TECHNICAL ANNEX | SPARE PARTS

MP3160CNC Hydraulic Press Brake



PRADA NARGESA, S.L

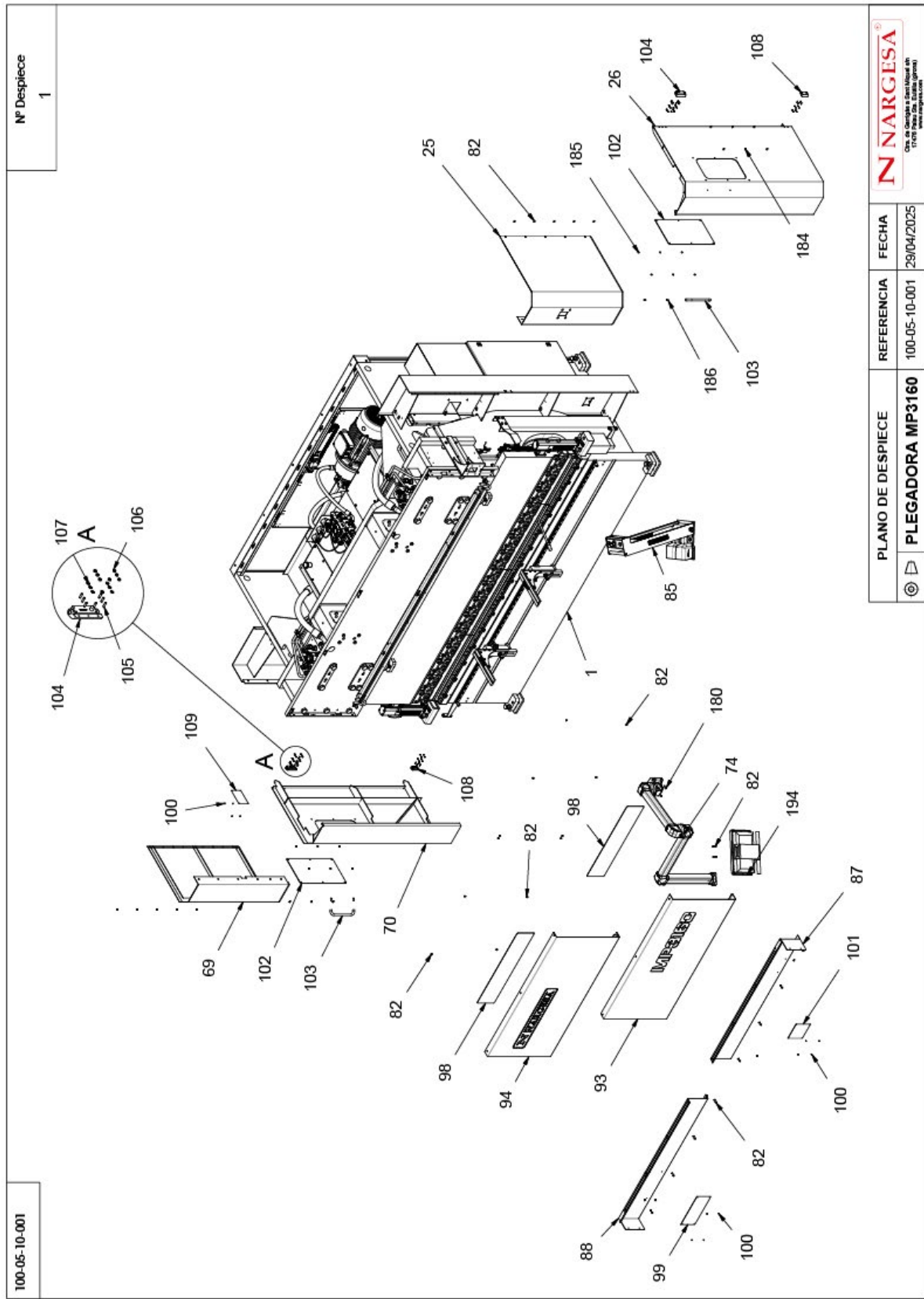
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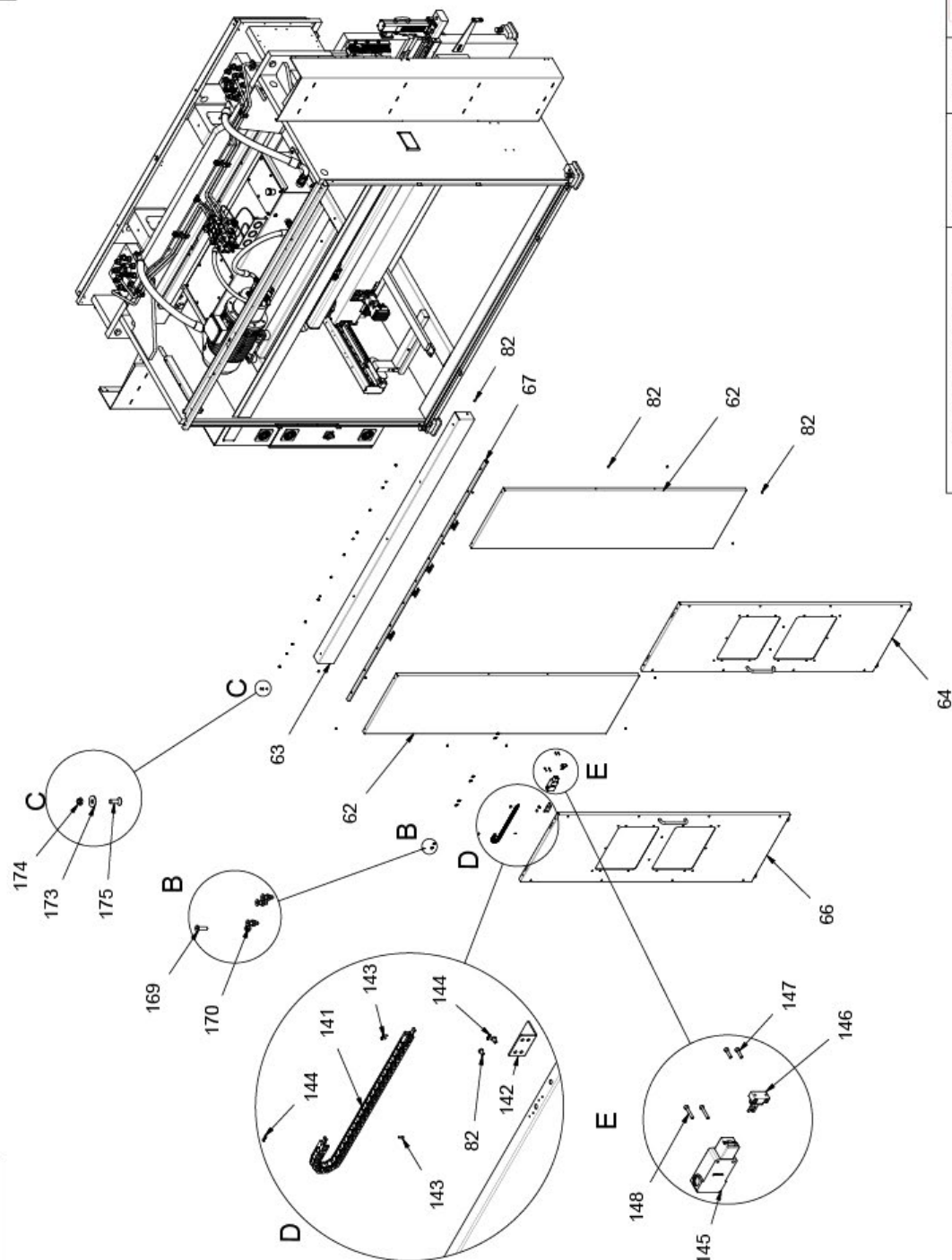
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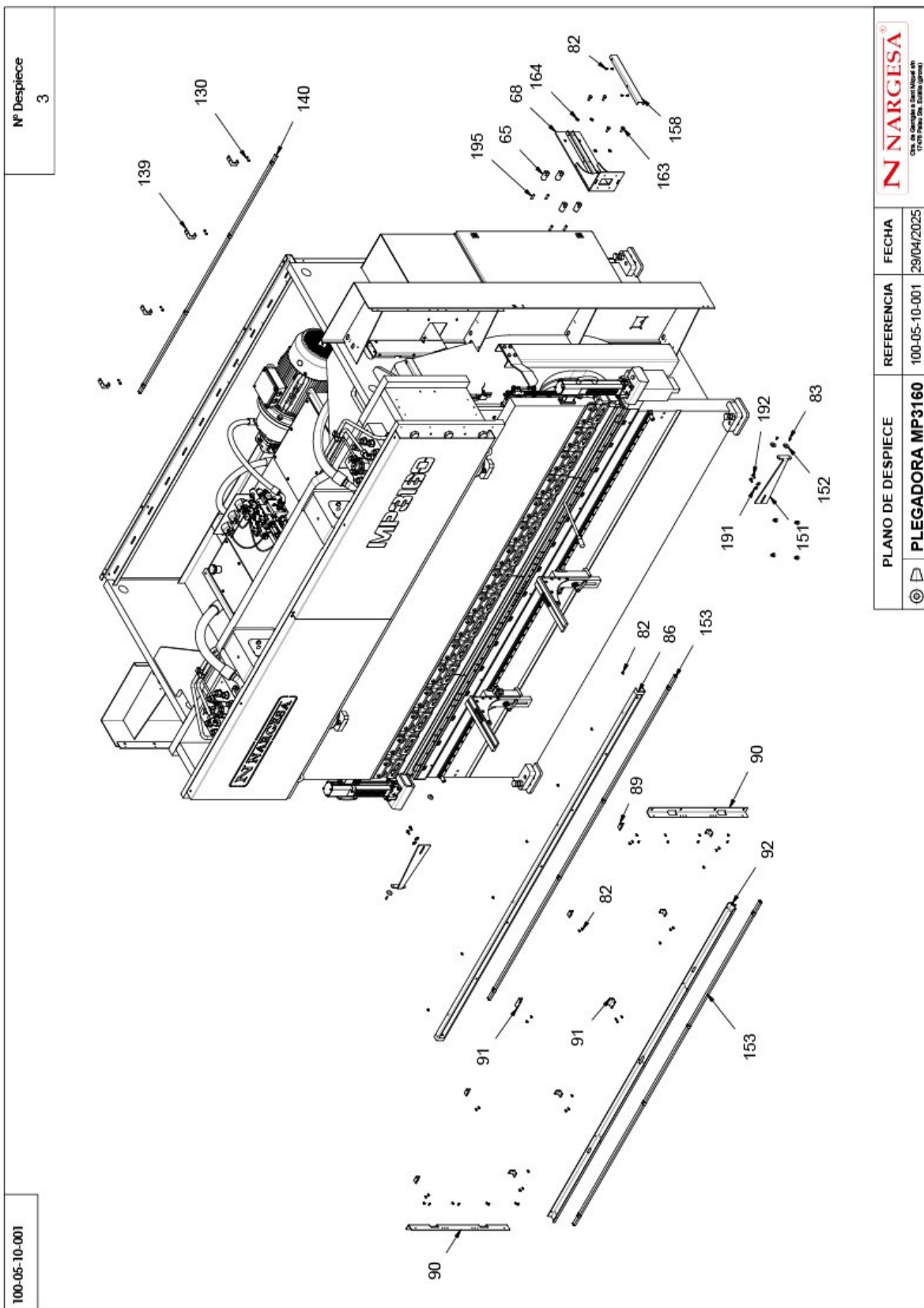
1. List of parts

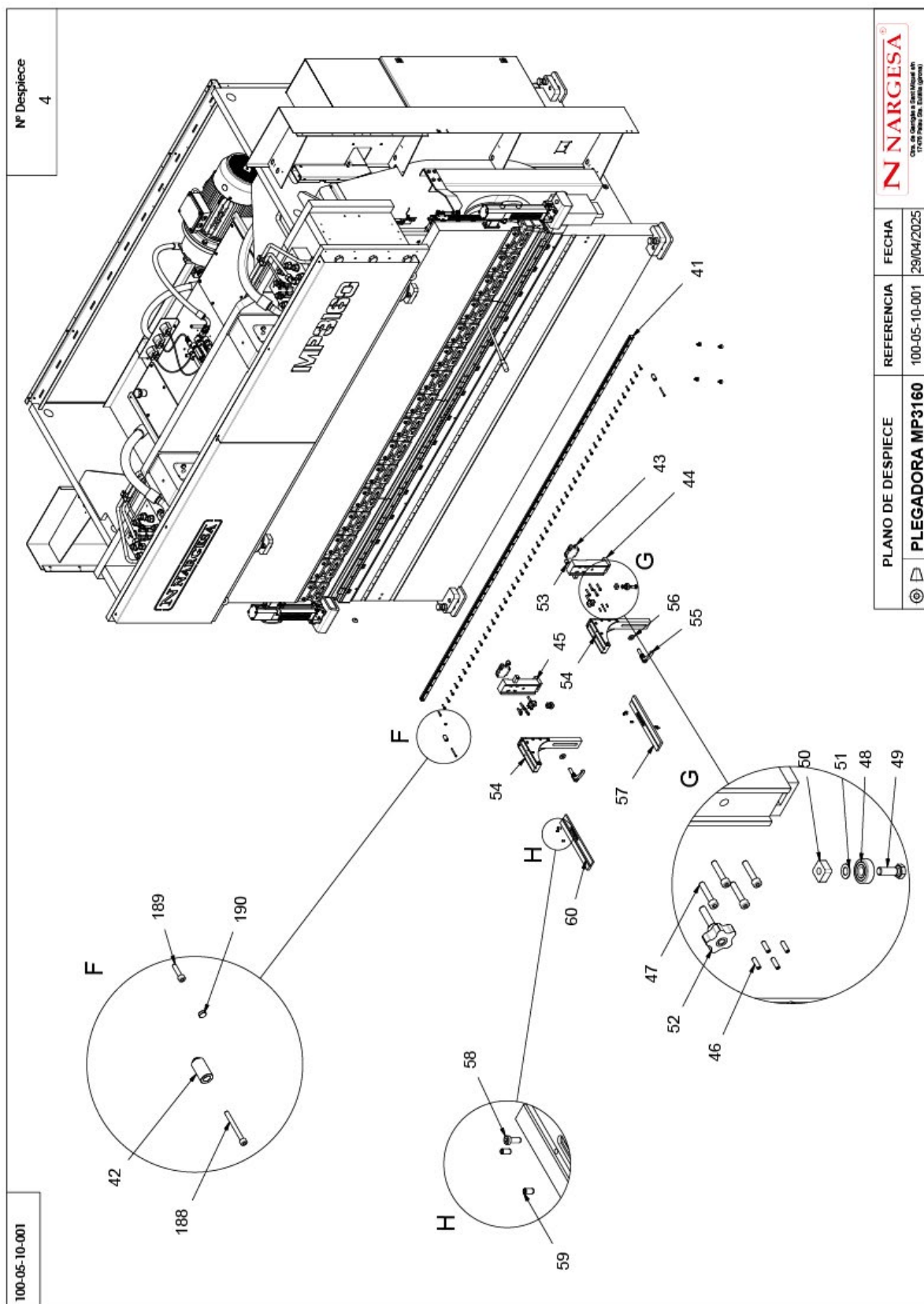


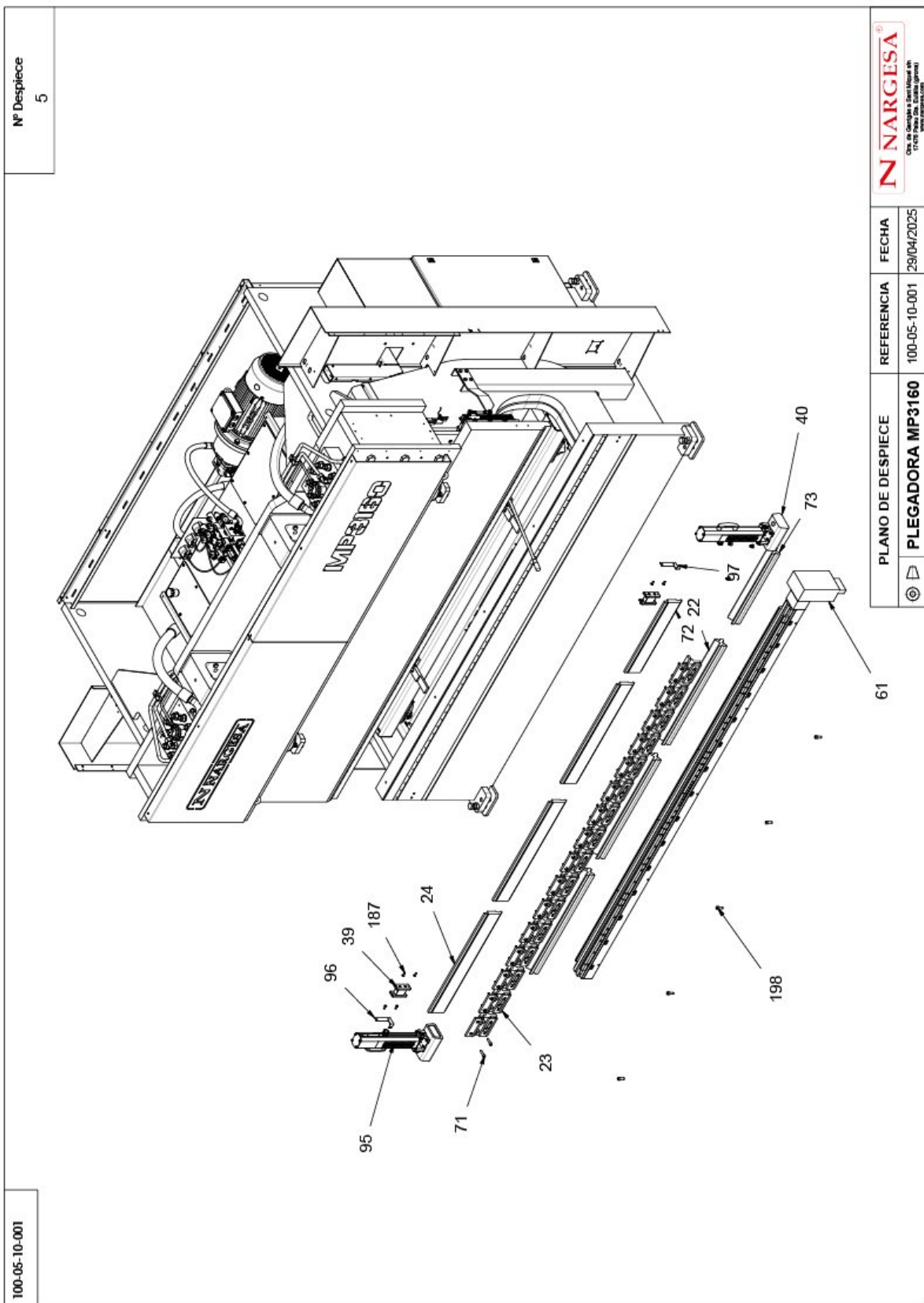


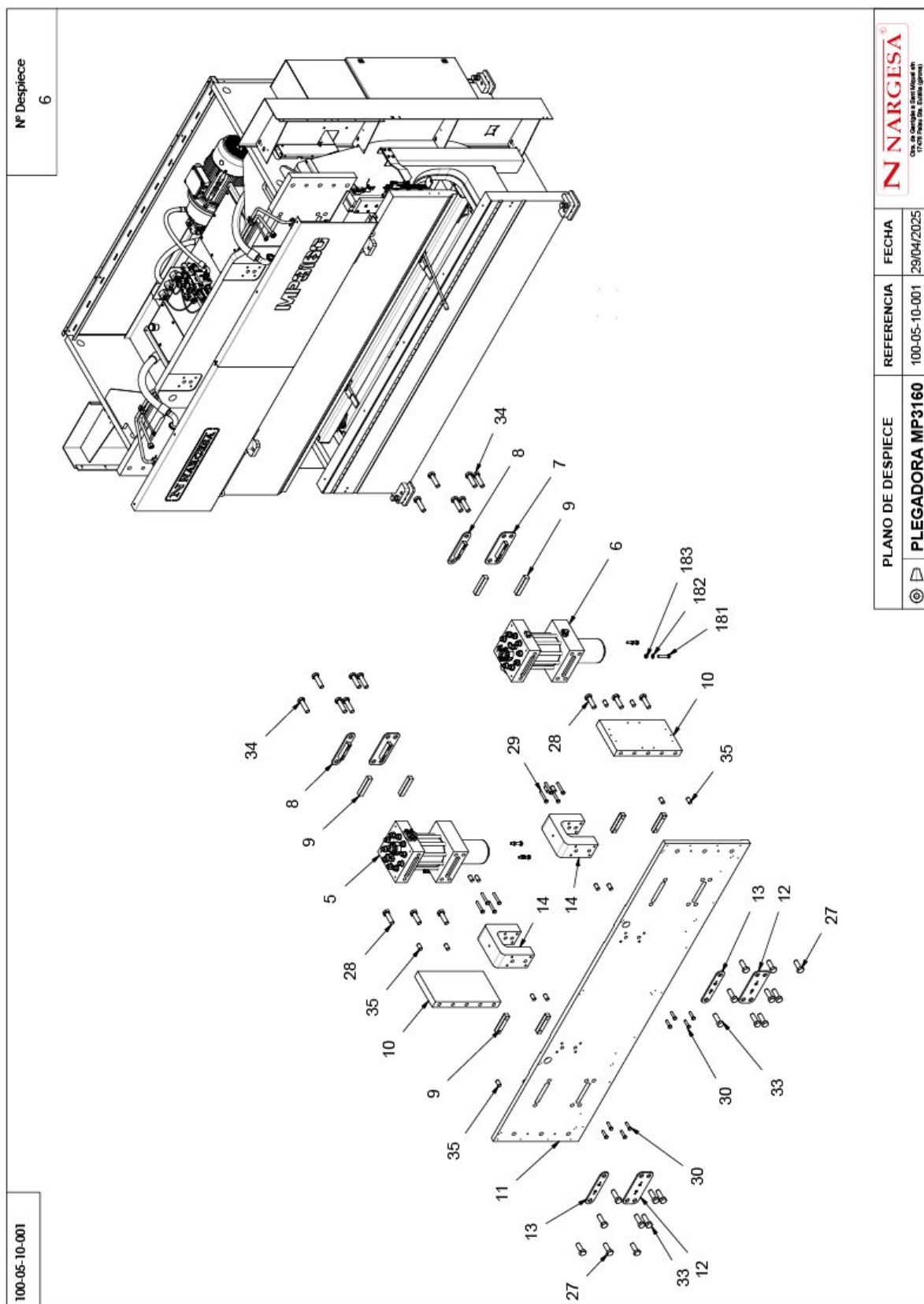
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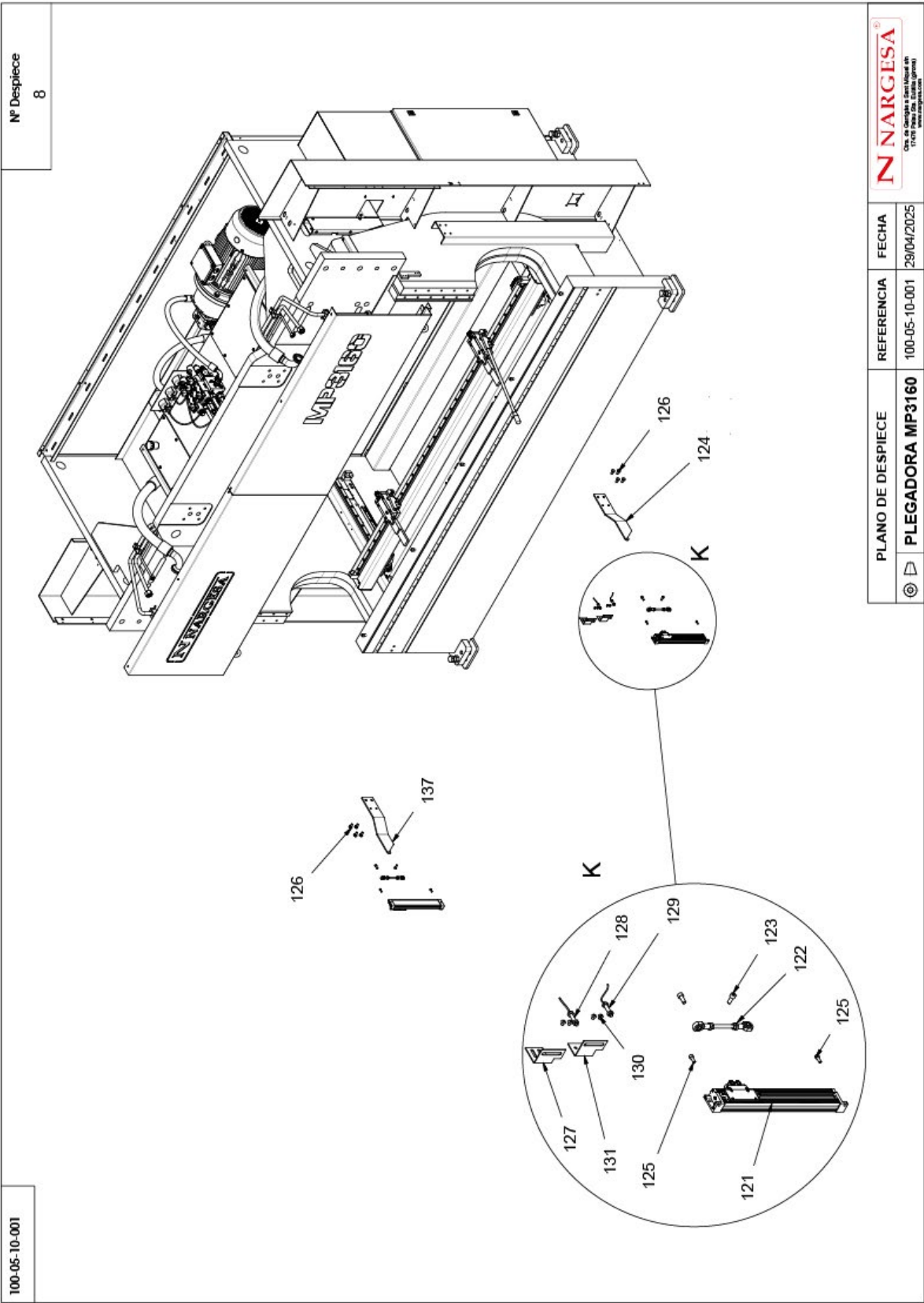
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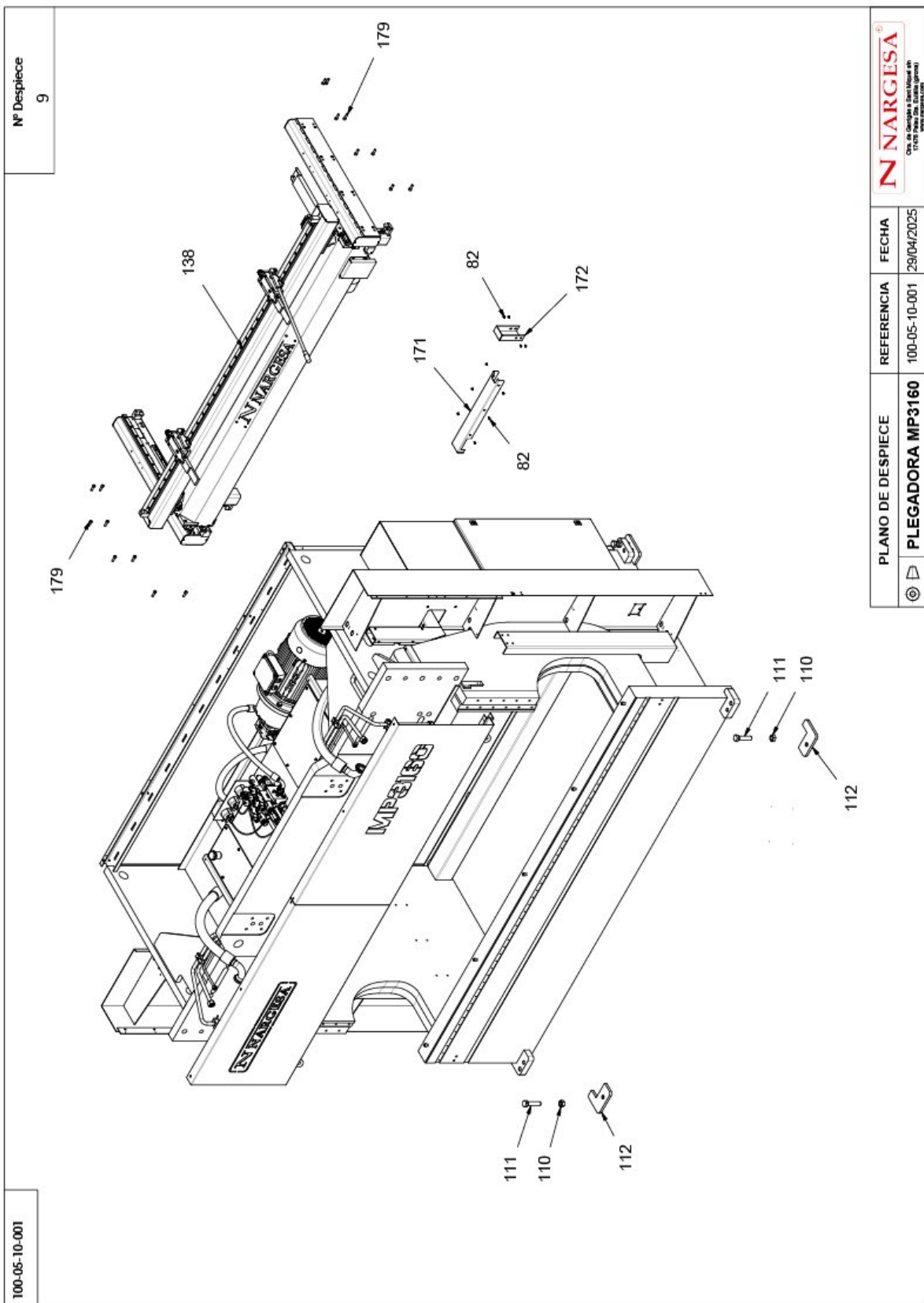


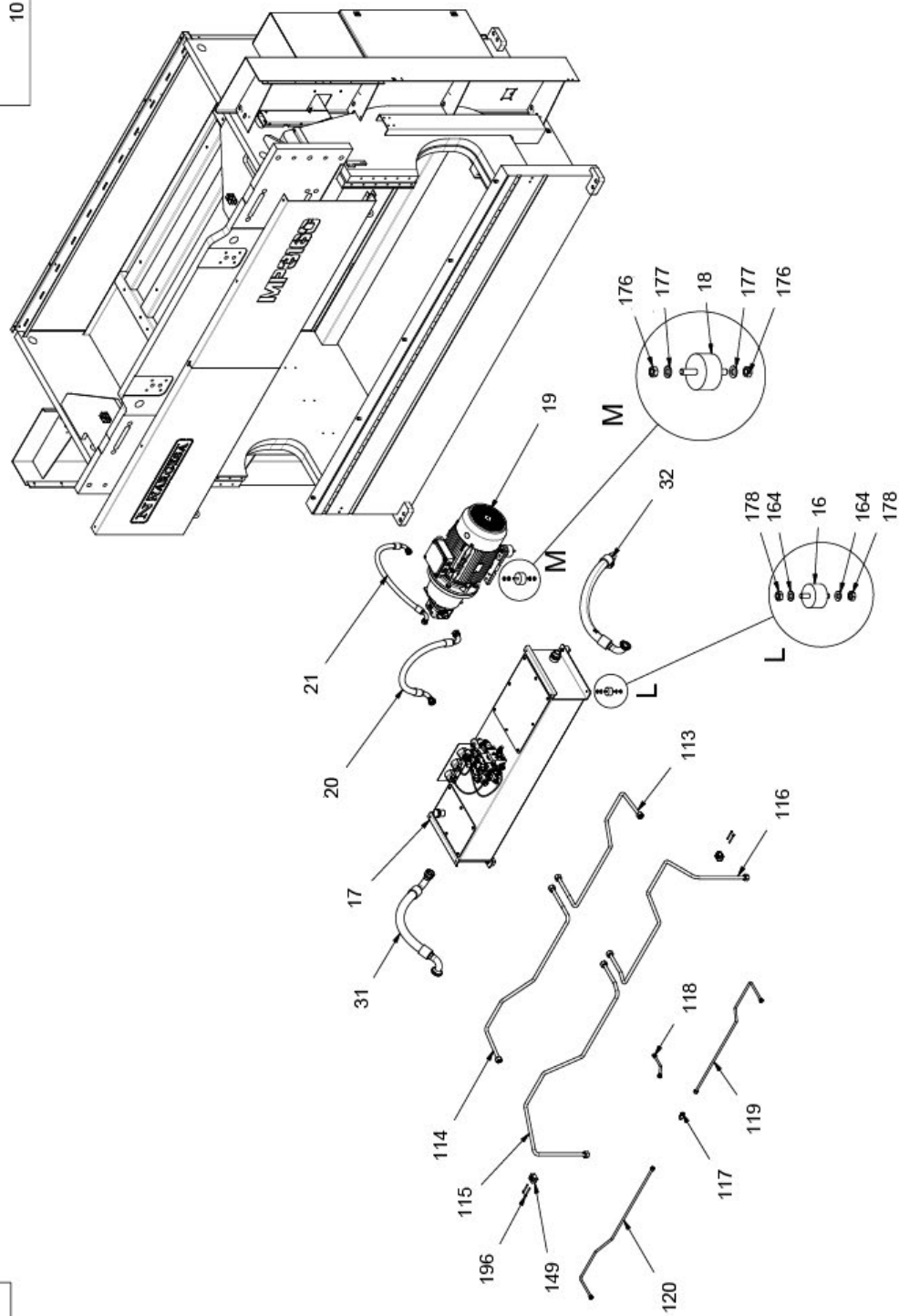




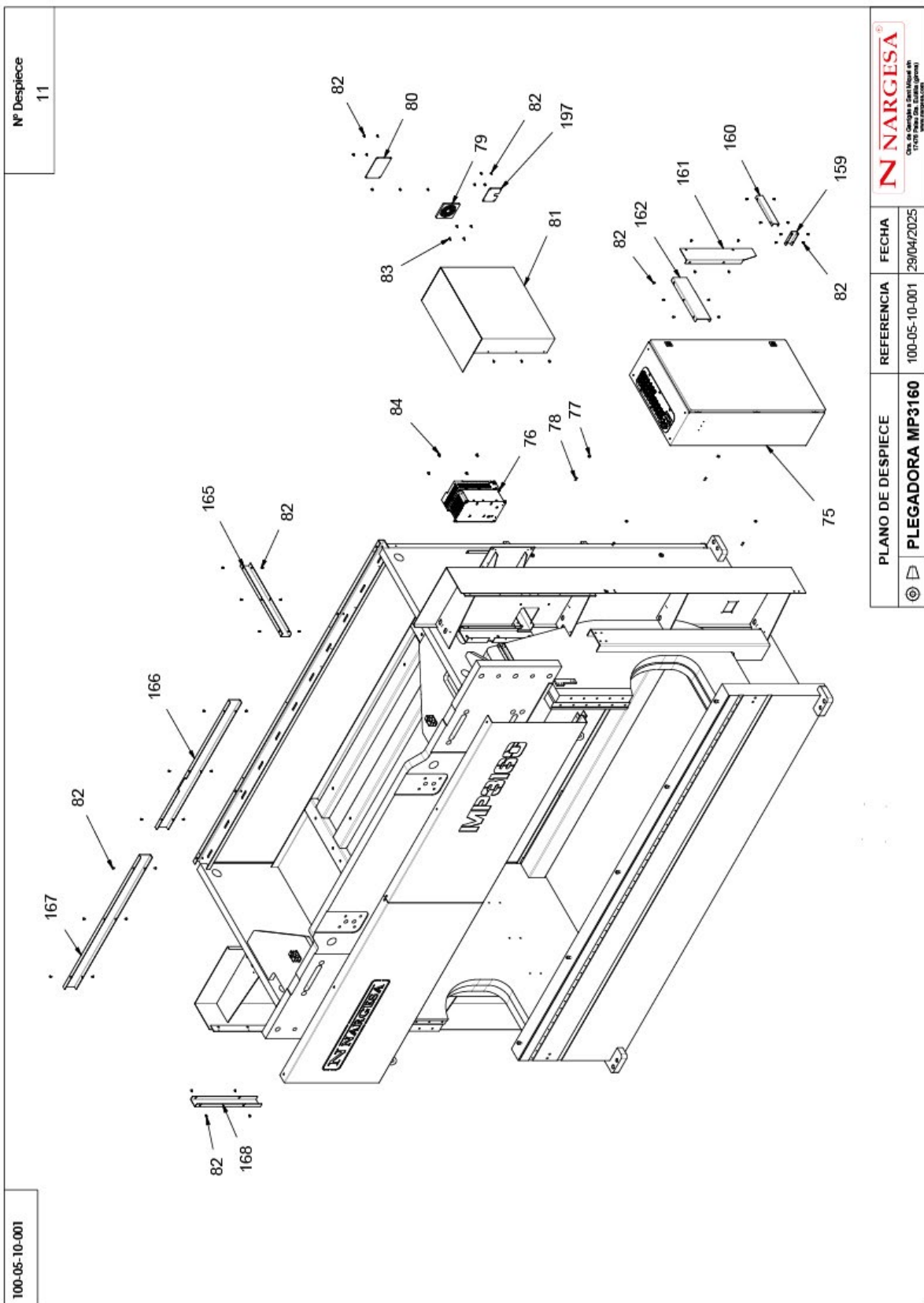


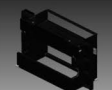


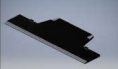
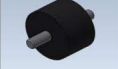
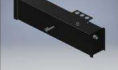


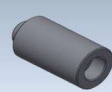


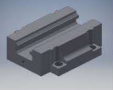
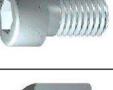
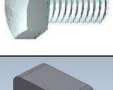
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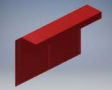


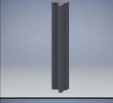
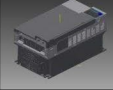
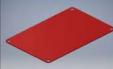
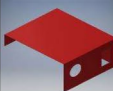
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
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2		120-05-10-00028	GUIA DERECHA TRANCHA PLEGADORA MP3160	1
3		120-05-10-00029	GUIA IZQUIERDA TRANCHA PLEGADORA MP3160	1
4		020-D912-M12X40	TORNILLO ALLEN DIN 912 M12x40	22
5		130-05-10-00010	CONJUNTO CILINDRO IZQUIERDO PLEGADORA MP3160	1
6		130-05-10-00012	CONJUNTO CILINDRO DERECHO D190_180 MODIFICADO	1
7		130-05-10-00013	CONJUNTO TOPE CHAVETA INFERIOR INTERNA PLEGADORA MP3160	2
8		130-05-10-00014	CONJUNTO TOPE CHAVETA SUPERIOR INTERNA PLEGADORA MP3160	2
9		120-05-10-00023	CHAVETA 35X33X180 PLEGADORA MP3160	8
10		120-05-10-00022	REFUERZO LATERAL SUPERIOR PLEGADORA MP3160	2
11		120-05-10-00021	CHAPA FRONTAL SUPERIOR PLEGADORA MP3160	1
12		130-05-10-00015	CONJUNTO TOPE CHAVETA INFERIOR EXTERNA PLEGADORA MP3160	2
13		130-05-10-00016	CONJUNTO TOPE CHAVETA SUPERIOR EXTERNA PLEGADORA MP3160	2
14		120-05-10-00026	REFUERZO CENTRAL ESTRUCTURA PLEGADORA MP3160	2

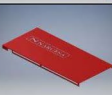
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
15		130-05-10-00007	CONJUNTO TRANCHA PLEGADORA MP3160	1
16		031-SIB-00003	SILENT BLOCK DOBLE Ø50X30 M10	4
17		130-05-10-00019	CONJUNTO GRUPO HIDRAULICO PLEGADORA MP3160	1
18		031-SIB-00015	SILENT BLOCK DOBLE Ø75X40 M12	4
19		130-05-10-00020	GRUPO MOTOR BOMBA HIDRAULICA PLEGADORA MP3160	1
20		120-05-10-00112	Manguera Aspiración Bomba 1 " Codo 90º Tg 1"- Codo 90º Tg 1" L=600 (40 bars) Posición 180º	1
21		120-05-10-00113	Manguera Presión Bomba 3/4" Codo 90º Tg 3/4"- Codo 90º Tg 3/4" L=940 (280 bars) Posición 90º	1
22		140-05-01-00117	Matriz M460R 835mm	3
23		140-05-10-00002	Brida Anclaje Rapido con Cuña de Ajuste H100+30 L150	16
24		140-05-01-00116	Punzon PS135.85.R08 835mm	3
25		130-05-10-00029	CONJUNTO TAPA SUPERIOR LATERAL DERECHO PLEGADORA MP3160	1
26		130-05-10-00031	CONJUNTO PUERTA DERECHA PLEGADORA MP3160	1
27		020-D931-M30X80	Tornillo DIN 931 M30x80	6
28		020-D931-M30X100	Tornillo DIN 931 M30x100	6

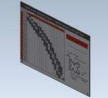
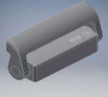
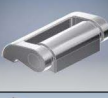
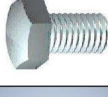
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29		020-D931-M16X100	TORNILLO HEXAGONAL DIN 931 M16X100	8
30		020-D931-M16X60	TORNILLO HEXAGONAL DIN 931 M16X60 8.8 PAVONADO	8
31		120-05-10-00114	Manguera Aspiración Cilindro Derecho 1" 1/2 CODO 90º Tg 1" 1/2- CODO 90º BRIDA SAE 2" 3000 PSI L=1060 (90 Bars) Posicion 180º	1
32		120-05-10-00115	Manguera Aspiración Cilindro Izquierdo 1" 1/2 CODO 90º Tg 1" 1/2- CODO 90º BRIDA SAE 2" 3000 PSI L=1060 (90 Bars) Posicion 180º	1
33		020-D931-M30X90	Tornillo DIN 931 M30x90	12
34		020-D931-M30X110	Tornillo DIN 931 M30x110	12
35		030-D6325-00011	Pasador Cilindrico DIN 6325 D25x50	16
36		120-05-10-00051	PLACA BASE ENCODER IZQUIERDO PLEGADORA MP3160	1
37		130-05-10-00021	CONJUNTO GUIA TRANCHA PLEGADORA MP3160	2
38		130-05-10-00022	CONJUNTO PASAMANO GUIA TRASERA PLEGADORA MP3160	2
39		130-05-06-00265	Soporte Laser	2
40		130-05-06-00276	Conjunto Láser MP3003	1
41		120-05-06-00416	GUIA PATIN	1
42		120-05-06-00426	Tope Final Guia Soporte Chapas	2

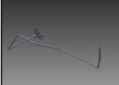
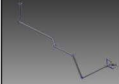
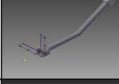
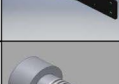
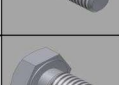
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43		030-PL-00001	PATIN LINEAL	2
44		130-05-06-00239	Conjunto Guia Izquierda Soporte Chapas MP3003CNC	1
45		130-05-06-00240	Conjunto Guia Derecha Soporte Chapas MP3003CNC	1
46		020-D913-M6X20	ESPARRAGO ALLEN DIN 913 M6X20	8
47		020-D912-M8X40	TORNILLO ALLEN DIN 912 M8X40	8
48		030-CJ-00038	Rodamiento De Bolas Tapado 6301-2RS D12XD37X12	2
49		020-D933-M12X35	Tornillo Hexagonal DIN 933 M12X35	2
50		120-05-06-00421	Tuerca Fijacion Cojinete	2
51		120-05-06-00424	Arandela Cojinete	2
52		031-POMM-00010	Pomo Macho Lobulos Ø50 - M10x40	2
53		120-05-06-00452	Tope Posicion Brazos Porta Chapa	2
54		130-05-06-00264	Conjunto Deslizante Soporte Chapas MP3003CNC	2
55		031-MAG-00006	EMPUÑADURA GRADUABLE M16X50	2
56		120-05-06-00423	Arandela Vertical	2

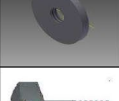
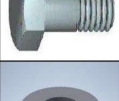
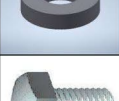
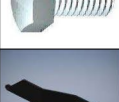
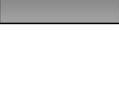
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57		120-05-08-00171	Guia Superior Derecha Soporte Chapa	1
58		020-D6912-M8X20	Tornillo Allen Cabeza Reducida Din6912 M8X20 8.8 Pavonado	2
59		030-D7979D-00001	PASADOR CILINDRICO DIN 7979D D8X16	4
60		120-05-08-00168	Guia Superior Izquierda Soporte Chapa	1
61		140-05-10-00001	Mesa Compensacion ATB-3130-90-95-CNC	1
62		120-05-10-00080	TAPA TRASERA FIJA PLEGADORA MP3160	2
63		120-05-10-00081	CHAPA TRASERA SUPERIOR PLEGADORA MP3160	1
64		130-05-10-00026	CONJUNTO PUERTA CORREDERA DERECHA PLEGADORA MP3160	1
65		120-05-10-00076	SEPARADOR SOPORTE BRAZO CONTROL PLEGADORA MP3160	4
66		130-05-10-00027	CONJUNTO PUERTA CORREDERA IZQUIERDA PLEGADORA MP3160	1
67		030-GKL-00001	CONJUNTO GUIA KLEIN K75 l=2670 mm	1
68		130-05-10-00028	CONJUNTO SOPORTE BRAZO CONTROL PLEGADORA MP3160CONJUNTO SOPORTE BRAZO CONTROL PLEGADORA MP3160	1
69		130-05-10-00030	CONJUNTO TAPA SUPERIOR LATERAL IZQUIERDO PLEGADORA MP3160	1
70		130-05-10-00032	CONJUNTO PUERTA IZQUIERDA PLEGADORA MP3160	1

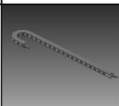
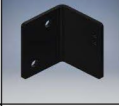
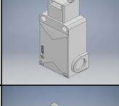
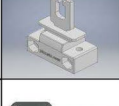
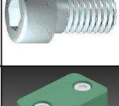
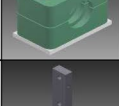
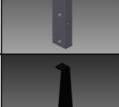
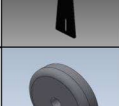
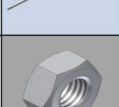
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
71		020-D912-M10X40	TORNILLO ALLEN DIN 912 M10X40	32
72		140-05-01-00161	PUNZON PS135.85 R08 L=595 mm	1
73		140-05-01-00160	MATRIZ M460R L=595 mm	1
74		050-BRA-00001	CONJUNTO BRAZO PANTALLA PLEGADORA MP3160	1
75		ARMARIO ELECTRICO PLEGADORA 140 NG	CONJUNTO ARMARIO ELECTRICO MP3160	1
76		VARIADOR VFD65AMS23ANSAA	VARIADOR VFD65AMS23ANSAA	1
77		020-D934-M8	Tuerca Hexagonal DIN 934 M8	16
78		020-D913-M8X20	ESPARRAGO ALLEN DIN 913 M8X20	4
79		050-TAPVENT-00001	Tapa Ventilador	1
80		120-05-10-00129	TAPA TRASERA VARIADOR DE FRECUENCIA PLEGADORA MP3160	1
81		130-05-10-00033	CONJUNTO TAPA VARIADOR DE FRECUENCIA PLEGADORA MP3160	1
82		020-I7380-M6X10	Tornillo Allen Abombado ISO 7380 M6X10	183
83		020-D7991-M5X16	Tornillo Allen Avellandado DIN7991 M5X16	8
84		020-I7380-M8X12	Tornillo Allen Abombado ISO7380 M8X12	4

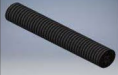
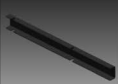
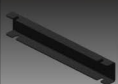
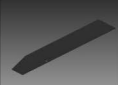
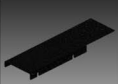
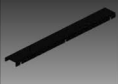
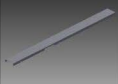
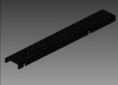
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
85		130-05-10-00035	CONJUNTO PEDAL PLEGADORA NG	1
86		130-05-10-00041	CONJUNTO SOPORTE CHAPAS DELANTERAS	1
87		120-05-10-00170	TAPA FRONTAL TRANCHA DERECHA PLEGADORA MP3160	1
88		130-05-10-00040	CONJUNTO TAPA FRONTAL TRANCHA IZQUIERDA PLEGADORA MP3160	1
89		120-05-10-00096	SOPORTE EXTERNO CHAPAS FRONTALES PLEGADORA MP3160	8
90		120-05-10-00097	CHAPA SOPORTE TAPAS LATERALES PLEGADORA MP3160	2
91		120-05-10-00099	SOPORTE CENTRAL CHAPAS FRONTALES PLEGADORA MP3160	2
92		120-05-10-00098	CHAPA SOPORTE LED EXTERIOR PLEGADORA MP3160	1
93		130-05-10-00042	CONJUNTO TAPA FRONTAL SUPERIOR DERECHO PLEGADORA MP3160	1
94		130-05-10-00043	CONJUNTO TAPA FRONTAL SUPERIOR IZQUIERDA PLEGADORA MP3160	1
95		050-LAS-00001	CONJUNTO LASER PLEGADORA	1
96		120-05-06-00533	CHAPA INDICADORA POSICION LASER IZQUIERDA	1
97		120-05-06-00534	CHAPA INDICADORA POSICION LASER DERECHA	1
98		120-05-06-00543	METACRILATO NARGESA	2

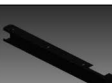
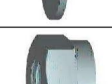
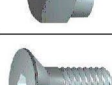
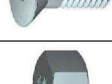
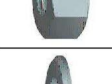
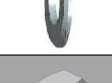
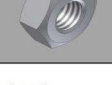
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99		122-CAL-0506-004	PLACA ALUMINIO ADVERTENCIAS PLEGADORA	1
100		020-D7337-3X8	Remache De Clavo DIN7337 De Al D3X8	12
101		122-CAL-0505-002	TABLA ESPECIFICACIONES	1
102		120-05-08-00034	TAPA POLICARBONATO	2
103		031-APM-00001	ASA INOXIDABLE 250X45 M6	2
104		050-BIS-00001	BISAGRA DE SEGURIDAD	2
105		020-D913-M5X16	Esparrago Allen DIN913 M5X16	22
106		020-D934-M5	Tuerca Hexagonal DIN934 M5	22
107		020-D125B-M5	Arandela DIN 125 B M5	22
108		050-BIS-00002	BISAGRA	2
109		122-PLC-0000-001	Placa Características General	1
110		020-D934-M24	TUERCA DIN 934 M24	4
111		020-D933-M24X100	TORNILLO HEXAGONAL DIN 933 M24X100	4
112		120-05-01-00536	Placa Pie Plegadora	4

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
113		120-05-10-00117	Tubo Conformado STAUFFFORM Conexion B1 Cilindro Derecho MP3160	1
114		120-05-10-00119	Tubo Conformado STAUFFFORM Conexion B2 Cilindro Izquierdo MP3160	1
115		120-05-10-00118	Tubo Conformado STAUFFFORM Conexion A2 Cilindro Izquierdo MP3160	1
116		120-05-10-00116	Tubo Conformado STAUFFFORM Conexion A1 Cilindro Derecho MP3160	1
117		040-TMMM-00001	Figura "T" Macho-Macho-Macho Tubo 12L	1
118		120-05-10-00120	Tubo Conformado STAUFFFORM Central Salida F	1
119		120-05-10-00121	Tubo Conformado STAUFFFORM Conexion F cilindro Derecho Plegadora MP3160	1
120		120-05-10-00122	Tubo Conformado STAUFFFORM Conexion F Cilindro Izquierdo Plegadora MP3160	1
121		050-ENC-00006	Encoder Lineal GVS200TE0022005M-05-SSC	2
122		130-05-06-00246	ACCIONAMIENTO ENCODER LINEAL	2
123		020-D912-M8X20	Tornillo Allen DIN912 M8X20	4
124		120-05-10-00124	ACCIONAMIENTO ENCODER DERECHO PLEGADOR MP3160	1
125		020-D912-M6X16	Tornillo Allen DIN912 M6X16	4
126		020-D933-M10X20	Tornillo Hexagonal DIN 933 M10X20	8

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
127		120-05-09-00152	SOPORTE INDUCTIVO TRANCHA	1
128		050-IND-00003	Detector Inductivo Diell M8 NO PNP-10-30 M12	1
129		050-IND-00004	Detector Inductivo Diell M8 NC PNP-10-30 M12	1
130		020-I7380-M6X8	Tornillo Allen Abombado ISO7380 M6X8	12
131		120-05-09-00153	SOPORTE INDUCTIVO TRANCHA	1
132		020-D913-M8X40	ESPARRAGO ALLEN DIN 913 M8X40	1
133		120-05-09-00154	Arandela inductivo	1
134		020-D931-M14X100	TORNILLO HEXAGONAL DIN 931 M14 X100	4
135		120-05-05-00087	ARANDELA DE GRUESO Ø30XØ14.5X8	4
136		020-D933-M8X35	TORNILLO HEXAGONAL DIN 933 M8x35	10
137		120-05-10-00125	ACCIONAMIENTO ENCODER IZQUIERDO PLEGADOR MP3160	1
138		130-05-10-00038	CONJUNTO TOPE PLEGADORA MP3160	1
139		120-05-10-00126	SOPORTE LED INTERIOR PLEGADORA MP3160	4
140		TIRA LED INTERIOR	Tira Led Interior L=2000 mm 4 Soportes	1

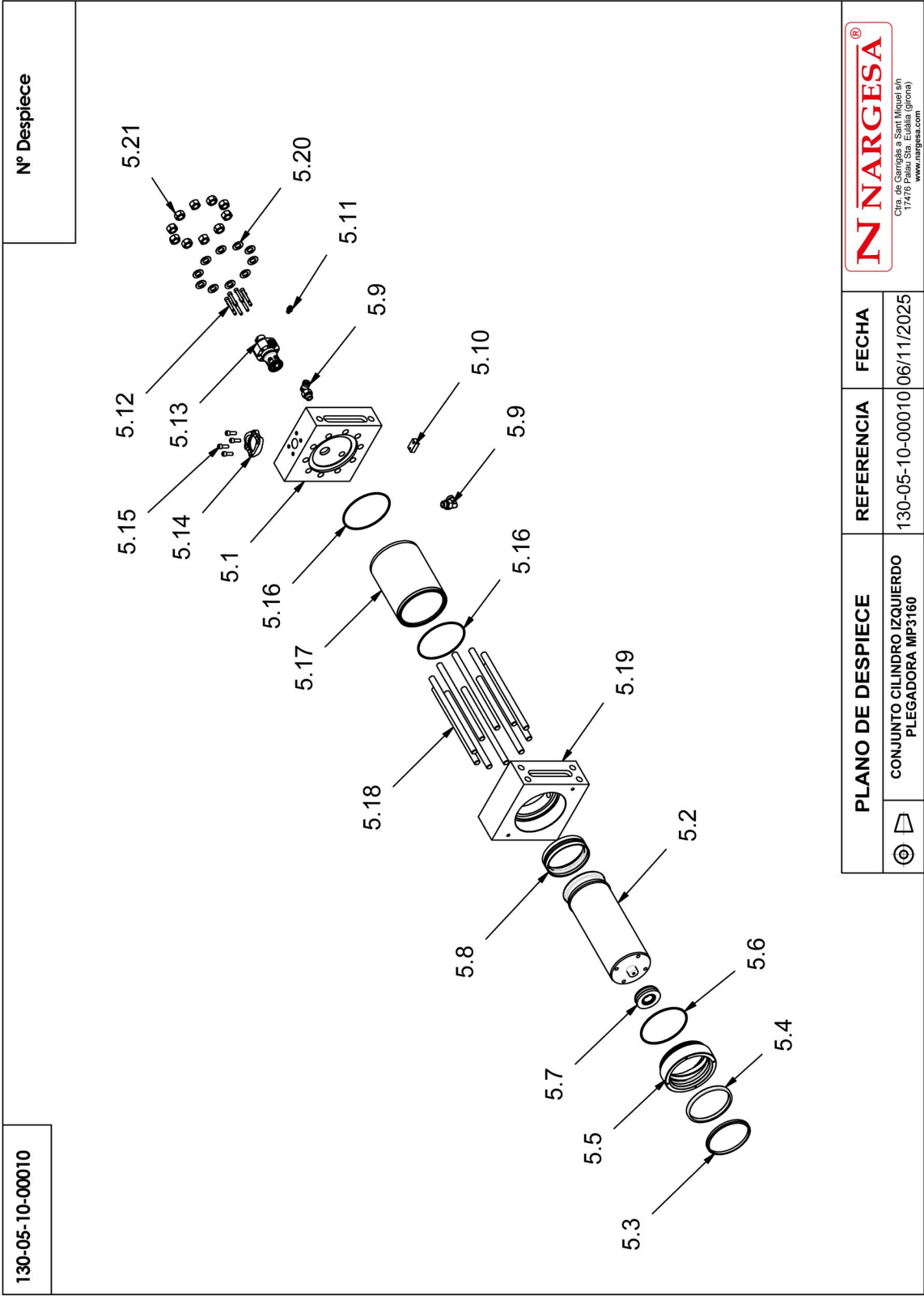
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
141		120-05-10-00128	CADENA PORTA CABLE PLEGADORA MP3160 E2i.10.10.028.0 E2.100.10.56PZ.A1	1
142		120-05-10-00127	SOPORTE CADENA PORTACABLE PUERTA TRASERA PLEGADORA MP3160	1
143		020-D7991-M3X10	Tornillo Allen Avellanado DIN7991 M3X10	4
144		020-D934-M3	Tuerca DIN 934 M3	4
145		050-ECLV-00001	Enclavamiento Puerta Pizzato	1
146		050-ECLVM-00001	Enclavamiento Movil Pizzato	1
147		020-D912-M5X20	TORNILLO ALLEN DIN912 M5X20	2
148		020-D912-M5X30	TORNILLO ALLEN DIN 912 M5X30	2
149		040-ABR-00010	Abrazadera Simple Tubo D20	2
150		120-05-10-00144	PLACA BASE ENCODER DERECHO PLEGADORA MP3160	1
151		120-05-10-00149	CHAPA SOPORTE IMAN PUERTAS LATERALES PLEGADORA MP3160	2
152		031-BM-00004	BASE MAGNETICA D32X7 AGUJERO AVELLANADO 5.5-11	4
153		050-LED-00009	Tira Led 2730mm MP-3003	2
154		020-D934-M14	Tuerca DIN 934 M14	6

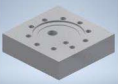
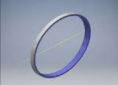
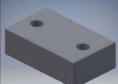
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
155		020-D913-M14X80	ESPARRAGO ALLEN DIN 913 M14X80	6
156		030-D6325-00014	Pasador Cilindrico DIN 6325 D10X25	6
157		020-D912-M12X35	TORNILLO ALLEN DIN 912 M12X35	8
158		120-05-10-00152	TAPA CANAL SOPORTE BRAZO PLEGADORA MP3160	1
159		120-05-10-00151	TAPA CANAL PEQUEÑA SUPERIOR PLEGADORA MP3160	1
160		120-05-10-00150	TAPA CANAL PEQUEÑA HORIZONTAL PLEGADORA MP3160	1
161		120-05-10-00153	TAPA CANAL VERTICAL LADO CONTROL PLEGADORA MP3160	1
162		120-05-10-00154	TAPA CANAL HORIZONTAL PLEGADORA MP3160	1
163		020-D933-M10X25	Tornillo Hexagonal DIN 933 M10X25	4
164		020-D125B-M10	Arandela Biselada DIN 125B M10	12
165		120-05-10-00157	TAPA CANAL SUPERIOR LATERAL PLEGADORA MP3160	1
166		120-05-10-00155	TAPA CORTA CANAL SUPERIOR PLEGADORA MP3160	1
167		120-05-10-00156	TAPA LARGA CANAL SUPERIOR PLEGADORA MP3160	1
168		120-05-10-00158	TAPA CANAL VERTICAL LATERAL PLEGADORA MP3160	1

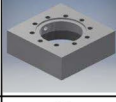
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169		020-D7991-M4X16	Tornillos de cabeza avellanada con hueco hexagonal	16
170		020-D985-M4	Tuerca Autoblocante DIN 984 M4	16
171		120-05-10-00160	TAPA CANAL TOPE HORIZONTAL PLEGADORA MP3160	1
172		120-05-10-00159	TAPA CANAL TOPE VERTICAL PLEGADORA MP3160	1
173		020-D9021-M5	Arandela Ancha DIN9021 Para M5	11
174		020-D985-M5	Tuerca Autoblocante DIN 985 M5	11
175		020-D7991-M5X15	Tornillo Allen Avellandado DIN7991 M5X16	11
176		020-D934-M12	Tuerca DIN 934 M12	8
177		020-D125B-M12	Arandela DIN 125 B M12	8
178		020-D934-M10	Tuerca Hexagonal DIN934 M10	8
179		020-D912-M10X30	Tornillo Allen DIN 912 M10X30	16
180		020-D912-M8X25	Tornillo Allen DIN 912 M8X25	4
181		020-D933-M16X90	TORNILLO HEXAGONAL DIN 933 M16X90	4
182		020-D125B-M16	Arandela Biselada DIN125B Para M16	4

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
183		020-D934-M16	Tuerca Hexagonal DIN 934 M16	8
184		020-I7380-M6X12	Tornillo Allen Abombado ISO 7380 M6X12	12
185		020-D934-M6	Tuerca Hexagonal DIN 934 M6	12
186		020-I7380-M6X20	Tornillo Allen Abombado ISO7380 M6X20	4
187		020-I7380-M8X20	TORNILLO ALLEN ABOMBADO ISO7380 M8X20	8
188		020-D912-M6X60	TORNILLO ALLEN DIN 912 M6X60	2
189		020-D912-M6X25	Tornillo Allen DIN912 M6X25	50
190		031-TG-00001	TAPON GUIA LINEAL AGUJERO M6	50
191		020-D9021-M8	Arandela Ancha DIN9021 Para M8	4
192		020-D933-M8X20	TORNILLO HEXAGONAL DIN 933 M8X20	4
193		020-D71412-00002	Engrasador DIN 71412 M8X1.25 Recto	2
194		050-CNC-S840W	CONJUNTO CONTROL ESA S840W	1
195		020-D913-M10X35	Espiga Allen DIN 913 M10X35	4
196		020-D933-M6X65	Tornillo Hexagonal DIN 933 M6X65	4
197		120-05-10-00161	Tapa Conector Mesa Compensacion	1
198		020-D912-M12X30	Tornillo Allen DIN 912 M12x30	5

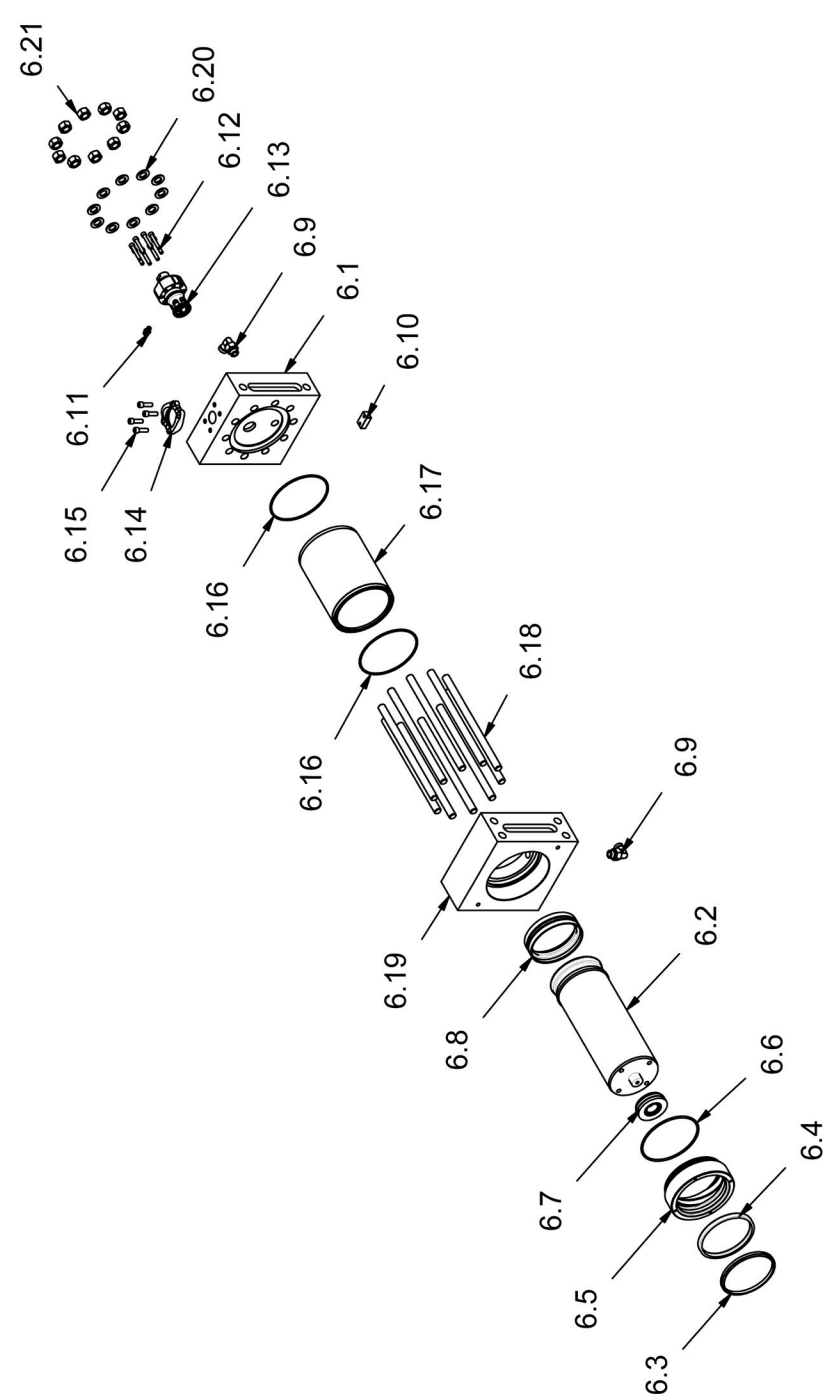
2. Left piston group

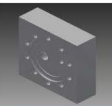
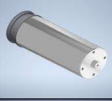
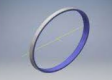
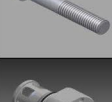
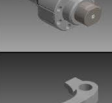


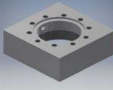
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
5.1		120-05-10-00035	TAPA SUPERIOR CILINDRO IZQUIERDO PLEGADORA MP3160	1
5.2		130-05-10-00008	CONJUNTO SOLDADO VASTAGO PLEGADORA MP 3160	1
5.3		040-RAS-00014	Rascador - D180XD195X14/10	1
5.4		040-BA-00021	COLLARIN D180XD200X15	1
5.5		120-05-10-00036	DOLLA DELANTERA CILINDRO PLEGADORA MP3160	1
5.6		040-JT-00107	JUNTA TORICA D199,2X5,7 Nbr 90 Shore	1
5.7		030-ROT-00008	ROTULA GX 40 S	1
5.8		040-DPS-00011	Junta DPS D190XD165X25_4X12_7	1
5.9		040-CGMH-00004	RACORD CODO GIRATORIO 20S-3/4" BSPT MACHO	2
5.10		120-05-10-00037	SEPARADOR ABRAZADERAS CILINDRO PLEGADORA MP3160	1
5.11		040-RMM-00013	Adaptador Recto 12L-1/4 BSPP c/junta	1
5.12		020-D912-M10X60-12_9	Tornillo Allen DIN 912 M10 X60 Calidad 12.9	8
5.13		040-VLL-00002	Valvula de Llenado NSV060BE05L NG50	1
5.14		040-SAE-00002	Semibrida 3000 PSI SAE 2"	2

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
5.15		020-D912-M12X35	TORNILLO ALLEN DIN 912 M12X35	4
5.16		040-JT-00108	JUNTA TORICA D202X5,33 Nbr 90 Shore	2
5.17		120-05-10-00033	CAMISA CILINDRO PLEGADORA MP3160	1
5.18		120-05-10-00034	TIRANTE CILINDRO PLEGADORA MP3160	10
5.19		120-05-10-00032	TAPA INFERIOR CILINDRO PLEGADORA MP3160	1
5.20		020-D125B-M24	Arandela DIN 125 B M24	10
5.21		020-D934-M24X2	Tuerca DIN 934 M24X200	10

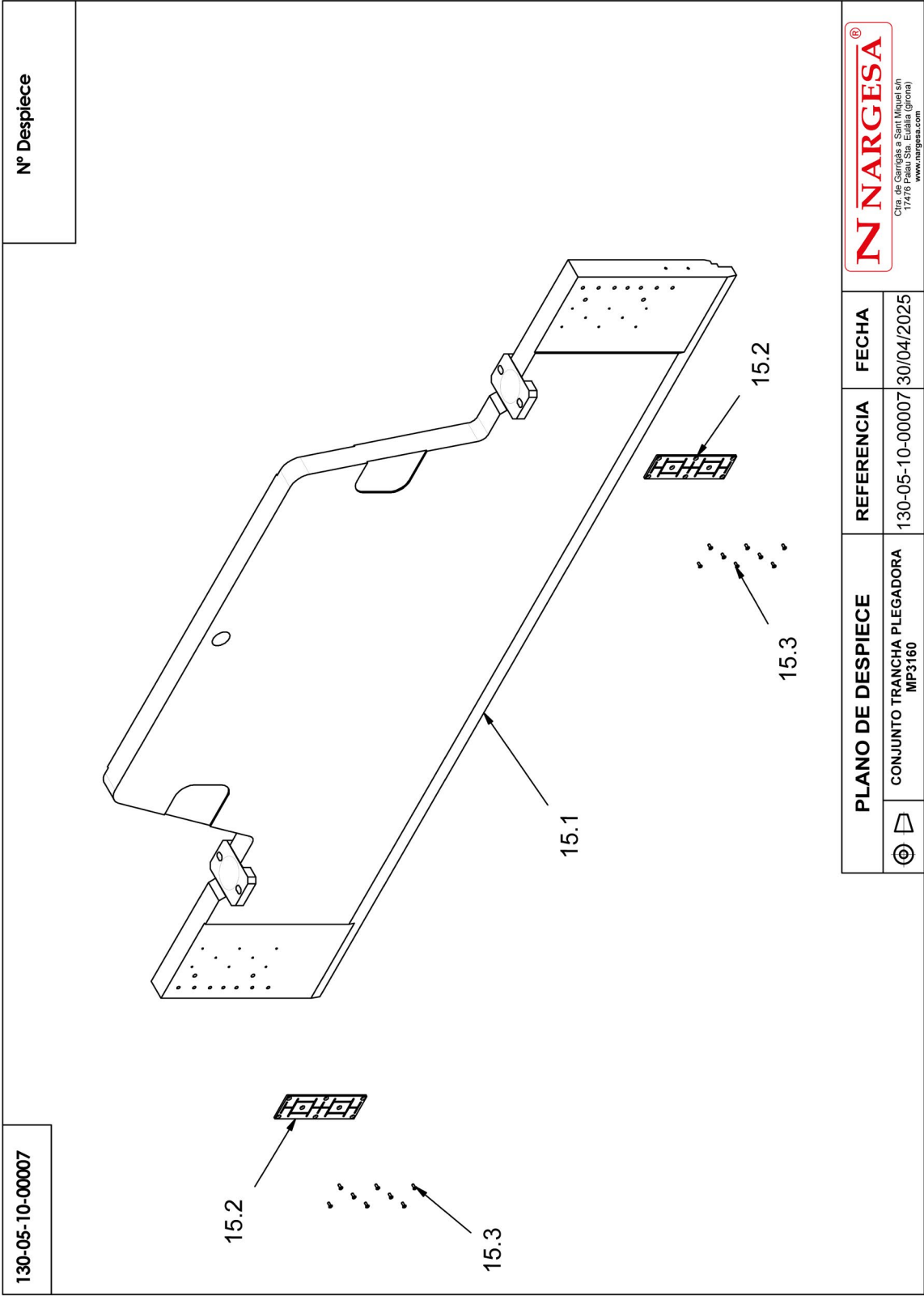
3. Right piston group

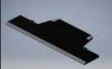
130-05-10-00012		<table border="1"> <thead> <tr> <th data-bbox="1284 369 1340 728">PLANO DE DESPIECE</th><th data-bbox="1284 728 1340 1019">REFERENCIA</th><th data-bbox="1284 1019 1340 1310">FECHA</th></tr> </thead> <tbody> <tr> <td data-bbox="1340 369 1388 728">  </td><td data-bbox="1340 728 1388 1019">CONJUNTO CILINDRO DERECHO PLEGADORA MP3160</td><td data-bbox="1340 1019 1388 1310">130-05-10-00012 06/11/2025</td></tr> </tbody> </table> N NARGESA® C/da de Garbíes a Sant Miquel d'En 17476 Palau Sta. Eulàlia (Girona) www.nargesa.com Este plano es propiedad de Prada Nargesa SL. No podrá ser reproducido, comunicado a terceros o utilizado para otro fin que no sea el acordado sin su permiso escrito.	PLANO DE DESPIECE	REFERENCIA	FECHA		CONJUNTO CILINDRO DERECHO PLEGADORA MP3160	130-05-10-00012 06/11/2025
PLANO DE DESPIECE	REFERENCIA	FECHA						
	CONJUNTO CILINDRO DERECHO PLEGADORA MP3160	130-05-10-00012 06/11/2025						

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
6.1		120-05-10-00038	TAPA SUPERIOR CILINDRO DERECHO PLEGADORA MP3160	1
6.2		130-05-10-00008	CONJUNTO SOLDADO VASTAGO PLEGADORA MP 3160	1
6.3		040-RAS-00014	Rascador - D180XD195X14/10	1
6.4		040-BA-00021	COLLARIN D180XD200X15	1
6.5		120-05-10-00036	DOLLA DELANTERA CILINDRO PLEGADORA MP3160	1
6.6		040-JT-00107	JUNTA TORICA D199,2X5,7 Nbr 90 Shore	1
6.7		030-ROT-00008	ROTULA GX 40 S	1
6.8		040-DPS-00011	Junta DPS D190XD165X25_4X12_7	1
6.9		040-CGMH-00004	RACORD CODO GIRATORIO 20S-3/4" BSPT MACHO	2
6.10		120-05-10-00037	SEPARADOR ABRAZADERAS CILINDRO PLEGADORA MP3160	1
6.11		040-RMM-00013	Adaptador Recto 12L-1/4 BSPP c/junta	1
6.12		020-D912-M10X60-12_9	Tornillo Allen DIN 912 M10 X60 Calidad 12.9	8
6.13		040-VLL-00002	Valvula de Llenado NSV060BE05L NG50	1
6.14		040-SAE-00002	Semibrida 3000 PSI SAE 2"	2

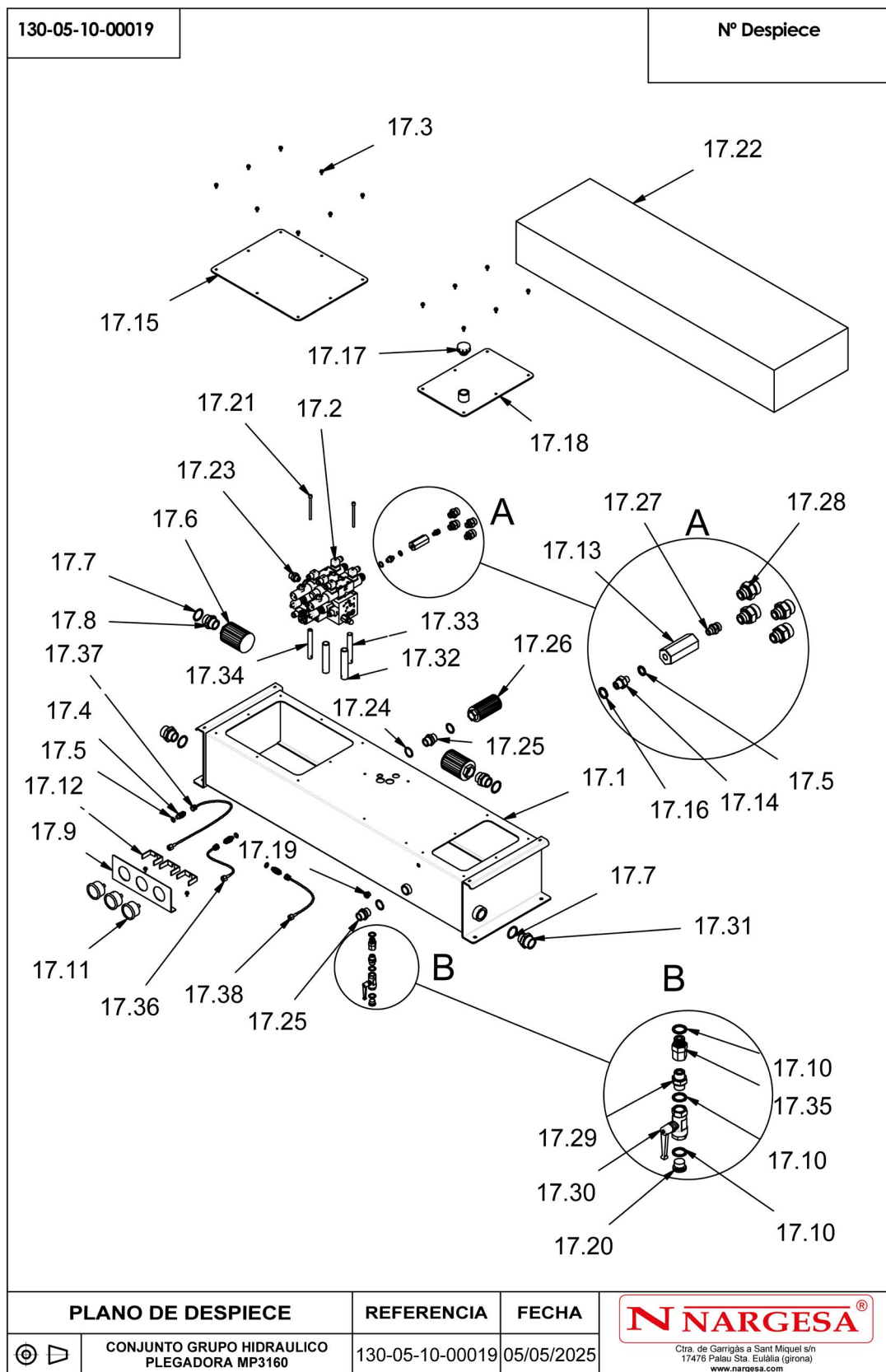
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
6.15		020-D912-M12X40	TORNILLO ALLEN DIN 912 M12x40	4
6.16		040-JT-00108	JUNTA TORICA D202X5,33 Nbr 90 Shore	2
6.17		120-05-10-00033	CAMISA CILINDRO PLEGADORA MP3160	1
6.18		120-05-10-00034	TIRANTE CILINDRO PLEGADORA MP3160	10
6.19		120-05-10-00032	TAPA INFERIOR CILINDRO PLEGADORA MP3160	1
6.20		020-D125B-M24	Arandela DIN 125 B M24	10
6.21		020-D934-M24X2	Tuerca DIN 934 M24X200	10

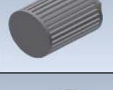
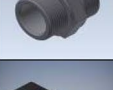
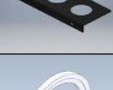
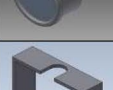
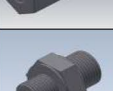
4. Exploded view of the folding group assembly

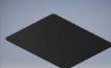
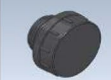
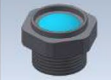
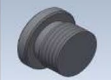
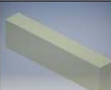
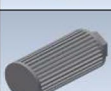
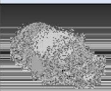


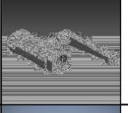
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
15.1		130-05-10-00006	CONJUNTO SOLDADO TRANCHA PLEGADORA MP3160	1
15.2		120-05-10-00027	REGLA BIPLAST PLEGADORA MP3160	2
15.3		020-D7991-M6X16	Tornillo Allen DIN 7991 M6X16	16

5. Hydraulic group

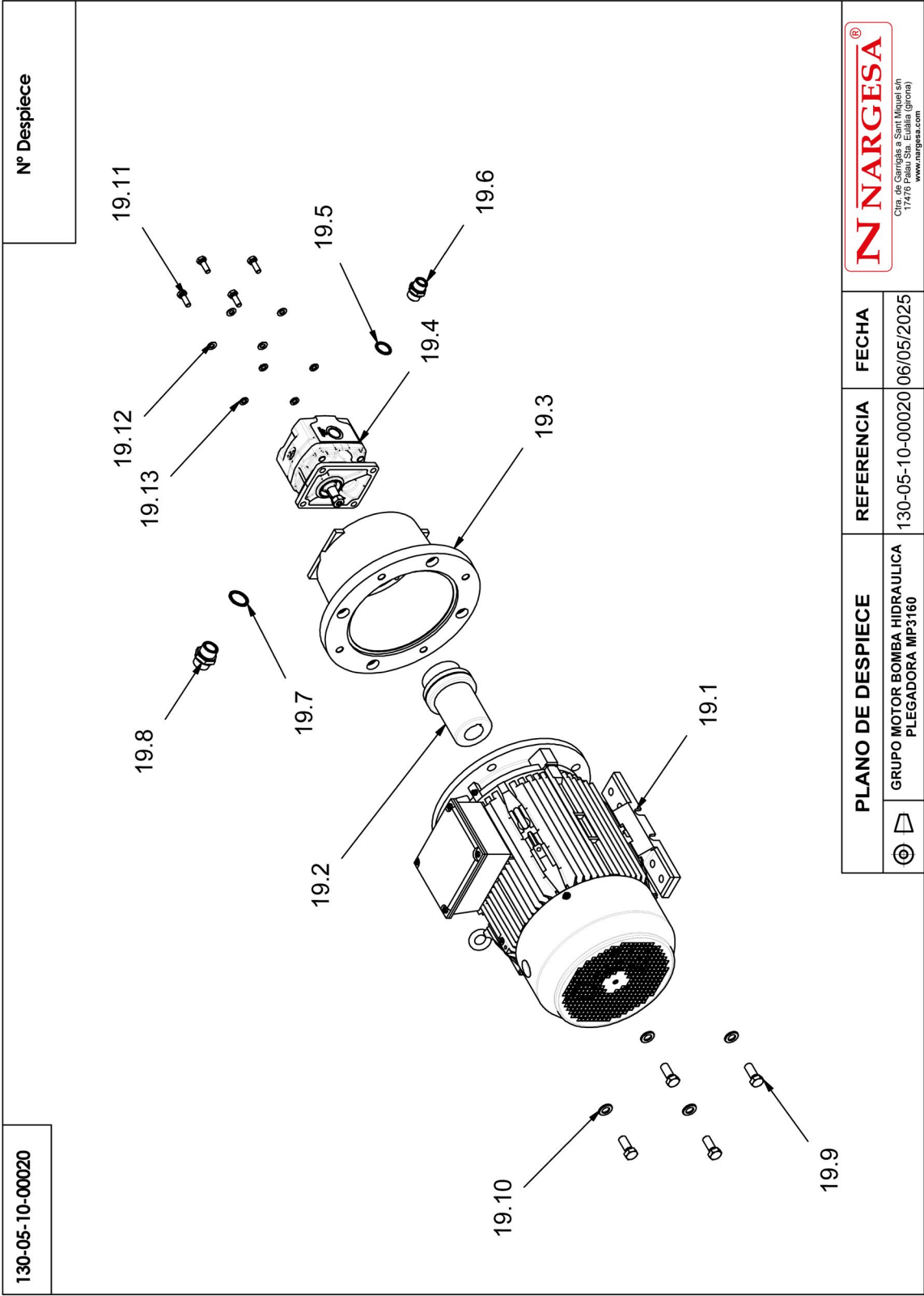


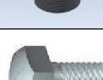
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
17.1		130-05-10-00017	DEPOSITO HIDRAULICO PLEGADORA MP3160	1
17.2		040-BL-00019	Bloque central SAKB53529H06B048XS1129	1
17.3		020-D6921-M6X12	Tornillo Hexagonal Embridado M6X12	16
17.4		040-TM-00001	Toma Minimex 1/4"	3
17.5		040-JMG-00002	Junta Metal Goma 1/4' Gas	4
17.6		040-FL-00001	Filtro De Aspiracion 1" 1/4"	2
17.7		040-JMG-00005	Junta Metal Goma 1 1/4' Gas	4
17.8		040-RMM-00008	Racor 1 1/4" Macho Macho	2
17.9		120-05-10-00050	CHAPA MANOMETROS PLEGADORA MP3160	1
17.10		040-JMG-00001	Junta Metal Goma 1/2' Gas	4
17.11		040-MAN-00002	Manometro 0-300 Bars D63 Empotrable Toma 1/4' Trasera	3
17.12		040-FIM-00001	Fijacion Trasera Manometro Empotrar D63	3
17.13		120-05-09-00150	ALARGO REDUCTOR 3/8-1/4	1
17.14		040-RMM-00003	Racor 3/8' Macho Macho	1

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
17.15		120-05-10-00049	TAPA CIEGA DEPOSITO HIDRAULICO PLEGADORA MP3160	1
17.16		040-JMG-00004	Junta Metal Goma 3/8" Gas	1
17.17		040-TLL-00001	Tapón De Llenado 1" Con Filtro	1
17.18		130-05-10-00018	CONJUNTO TAPA DEPOSITO HIDRAULICO PLEGADORA MP3160	1
17.19		040-NA-00001	Visor Nivel Aceite De 3/8" Gas	1
17.20		040-TVA-00001	Tapon Allen 1/2 "	1
17.21		020-D912-M8X110-12_9	Tornillo Allen DIN912 M8X110 Calidad 12.9	2
17.22		120-05-10-00108	ACEITE HIDRAULICO HV-46 PLEGADORA MP3160 134 Litros	1
17.23		040-RRMM-00007	Racor Reducido 3/4'-1/2' Macho Macho	1
17.24		040-JMG-00006	Junta Metal Goma 1" Gas	3
17.25		040-RMM-00007	Racor 1" Macho Macho	2
17.26		040-FL-00003	Filtro De Aspiracion 1"	1
17.27		040-RMM-00013	Adaptador Recto 12L-1/4 BSPP c/junta	1
17.28		040-RMM-00012	Adaptador Recto 20S-1/2 BSPP c/junta	4

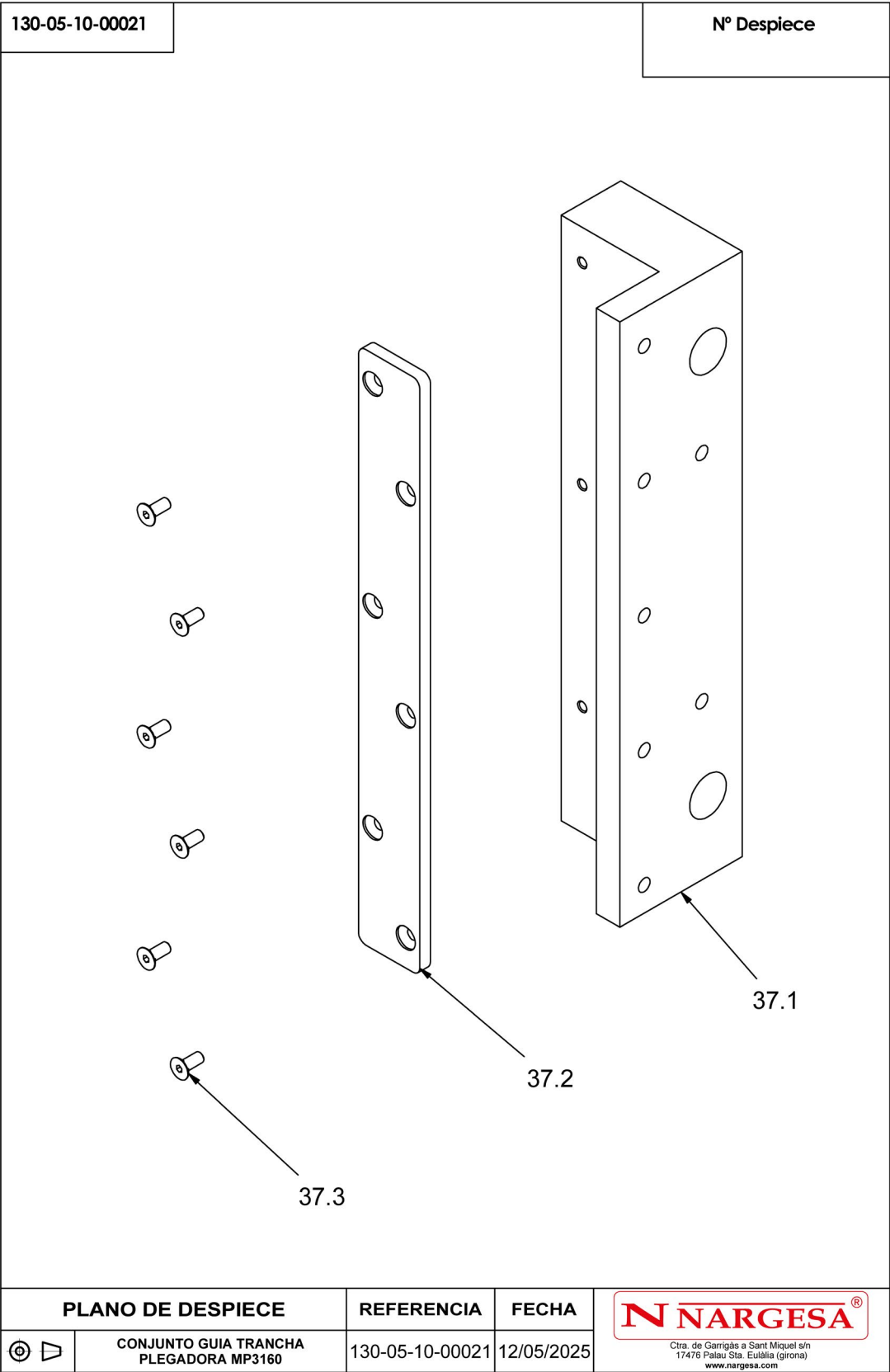
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
17.29		040-RMM-00004	Racor 1/2" Macho Macho	1
17.30		040-VDP-00004	Grifo de Bola Hembra Hembra 1/2" PN40	1
17.31		040-RRMM-00016	Racor Reducido 1 1/2'-1 1/4' Macho Macho	2
17.32		120-05-04-00150	Tubo De Retorno 3/4"	2
17.33		120-05-04-00130	Tubo Retorno 1/2"	1
17.34		120-05-09-00151	Tubo Retorno 3/8"	1
17.35		040-RG-00001	Racor Giratorio M-H 1/2"	1
17.36		120-05-10-00109	Manguera Minimex Tuerca 1/4" para Manometro- Tuerca Conexion Minimex M16x200 L= 320 mm	1
17.37		120-05-10-00110	Manguera Minimex Tuerca 1/4" para Manometro- Tuerca Conexion Minimex M16x200 L= 610 mm	1
17.38		120-05-10-00111	Manguera Minimex Tuerca 1/4" para Manometro- Tuerca Conexion Minimex M16x200 L= 420 mm	1

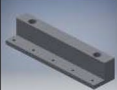
6. Engine exploded view



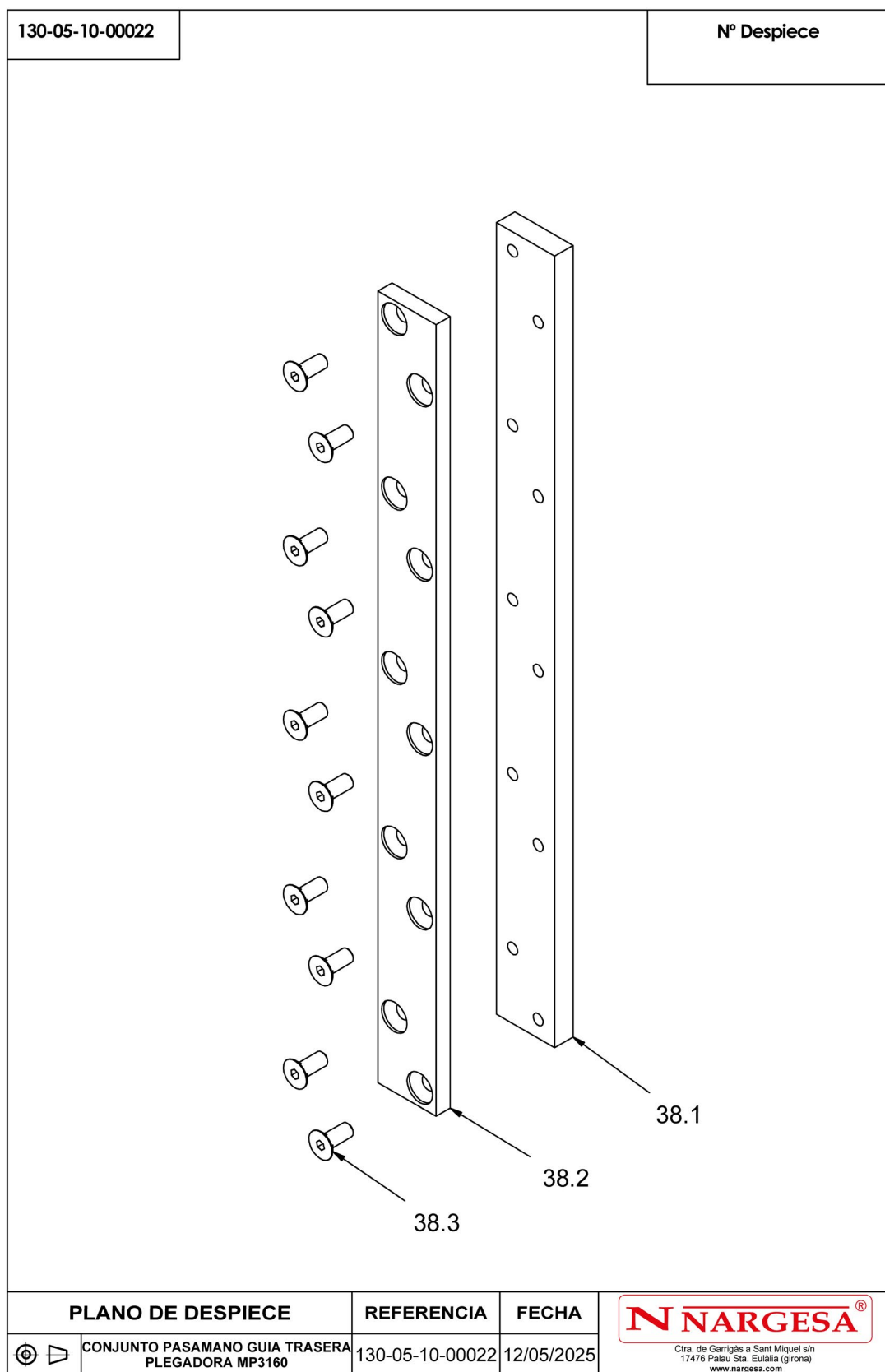
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
19.1		050-ME-00028	Motor Electrico TECHTOP IEC IE3 T3CR160L-4 20 CV (15 KW) 1500 RPM 230/400 V 50 HZ B3 B5 sondas PTC	1
19.2		040-AE-00021	Acoplamiento Elastico ND43C	1
19.3		040-CA-00005	CAMPANA ACOPLAMIENTO LS352 MOTOR 15 KW	1
19.4		040-BH-00010	Bomba Hidraulica 3TPW-G0-230-D-EUR-B-N-10-0-G1G34 36 l/min	1
19.5		040-JMG-00007	Junta Metal Goma 3/4' Gas	1
19.6		040-RMM-00006	Racor 3/4" Macho Macho	1
19.7		040-JMG-00006	Junta Metal Goma 1' Gas	1
19.8		040-RMM-00007	Racor 1" Macho Macho	1
19.9		020-D933-M16X40	Tornillo DIN 933 M16X40	4
19.10		020-D125B-M16	Arandela Biselada DIN125B Para M16	4
19.11		020-D933-M10X30	Tornillo Hexagonal DIN 933 M10X30	4
19.12		020-D125B-M10	Arandela Biselada DIN 125B M10	4
19.13		020-D127-M10	ARANDELA GLOWER DIN127 PARA M10	4

7. Exploded view of the sprocket guide assembly



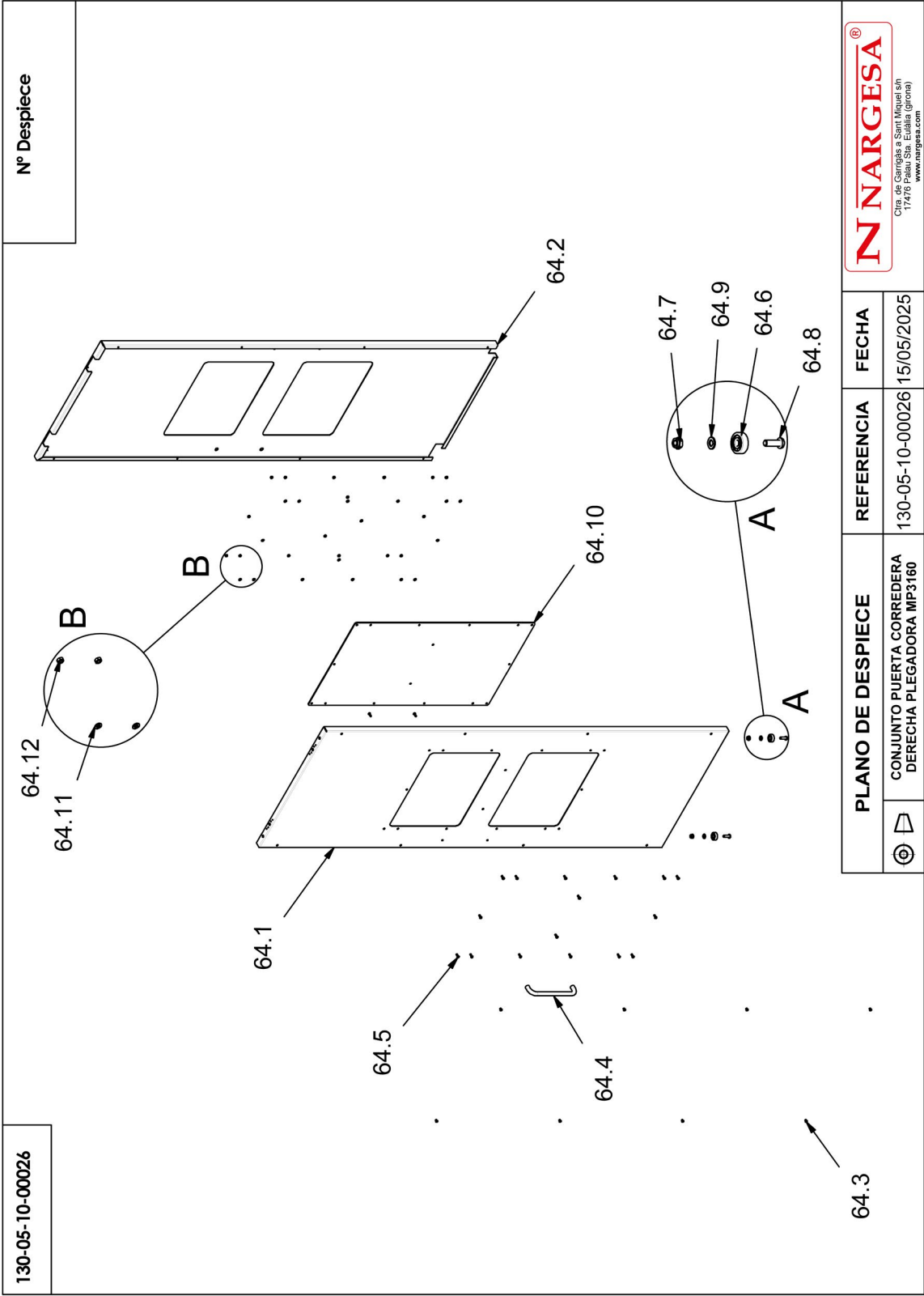
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
37.1		120-05-10-00052	GUIA LATERAL PLEGADORA MP3160	1
37.2		120-05-10-00053	GUIA BIPLAST LATERAL PLEGADORA MP3160	1
37.3		020-D7991-M5X12	Tornillo Allen Avellandado DIN7991 M5X12	6

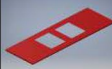
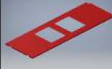
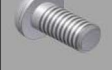
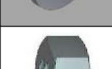
8. Rear guide handrail assembly exploded view



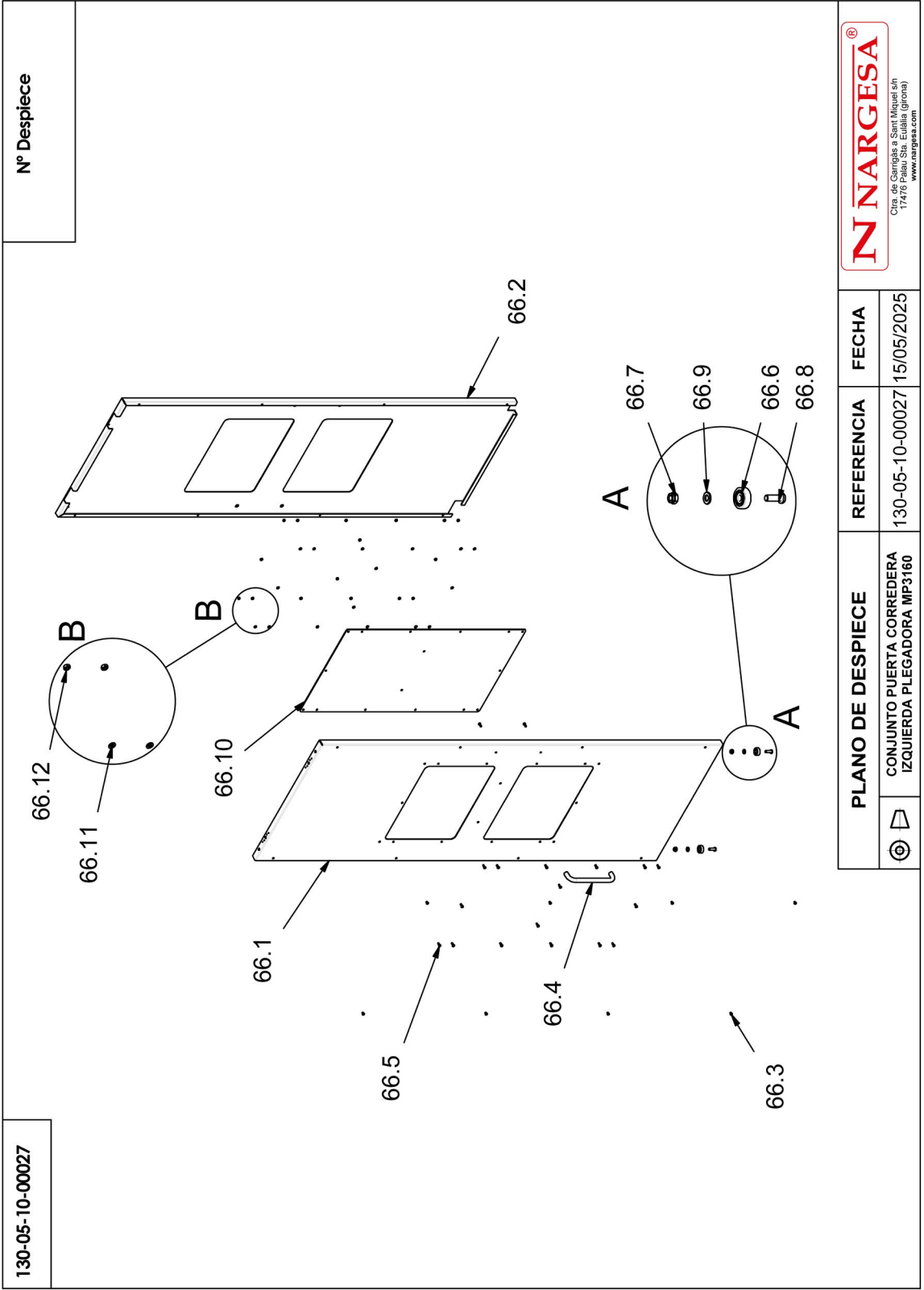
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
38.1		120-05-10-00054	GRUESO GUIA TRASERA PLEGADORA MP3160	1
38.2		120-05-10-00055	GUIA BIPLAST TRASERA PLEGADORA MP3160	1
38.3		020-D7991-M5X12	Tornillo Allen Avellandado DIN7991 M5X12	10

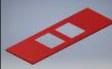
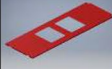
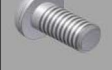
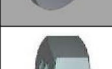
9. Exploded view of the right sliding door assembly

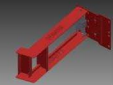
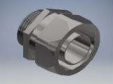
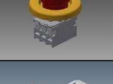
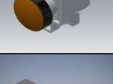
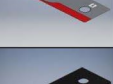
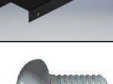
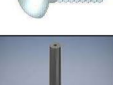
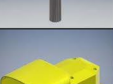


Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
64.1		120-05-10-00077	PUERTA TRASERA PLEGADORA MP3160	1
64.2		120-05-10-00078	CONTRA PUERTA TRASERA PLEGADORA MP3160	1
64.3		020-I7380-M6X8	Tornillo Allen Abombado ISO7380 M6X8	8
64.4		031-APM-00001	ASA INOXIDABLE 250X45 M6	1
64.5		020-I7380-M6X16	Tornillo Allen Abombado ISO7380 M6X16	18
64.6		030-CJ-00048	Rodamiento de Bolas 6300 2RS D10XD35X11	2
64.7		020-D985-M10	Tuerca Autoblocante DIN 985 M10	2
64.8		020-I7380-M10X30	Tornillo Allen Abombado ISO 7380 M10x30	2
64.9		020-D125B-M10	Arandela Biselada DIN 125B M10	2
64.10		120-05-10-00079	POLICARBONATO TRASERO PLEGADORA MP3160	1
64.11		020-D125B-M6	Arandela Biselada DIN 125B M6	16
64.12		020-D934-M6	Tuerca Hexagonal DIN 934 M6	16

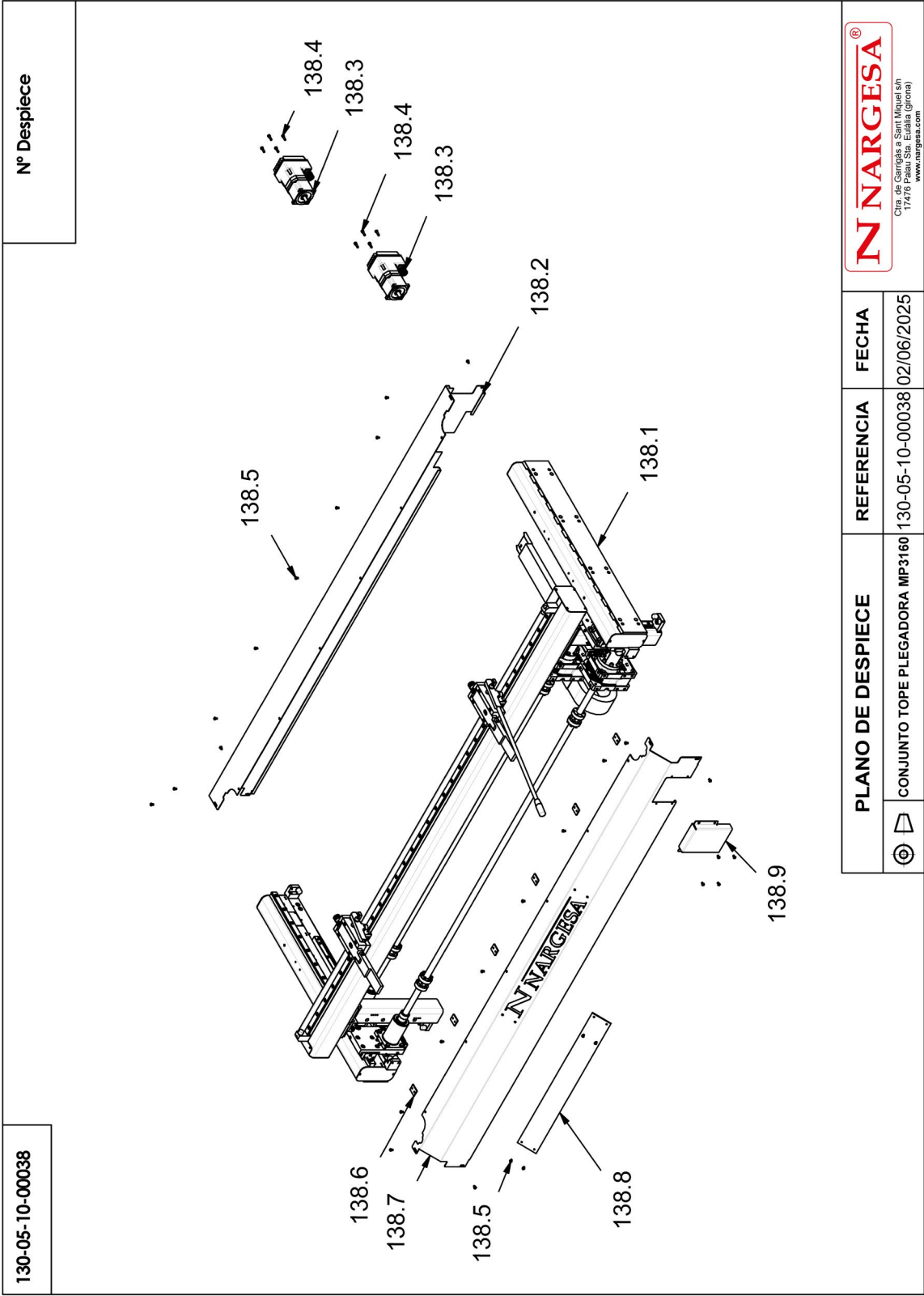
10. Left sliding door assembly exploded view

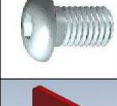
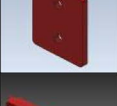
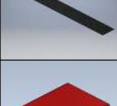


Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
66.1		120-05-10-00077	PUERTA TRASERA PLEGADORA MP3160	1
66.2		120-05-10-00078	CONTRA PUERTA TRASERA PLEGADORA MP3160	1
66.3		020-I7380-M6X8	Tornillo Allen Abombado ISO7380 M6X8	8
66.4		031-APM-00001	ASA INOXIDABLE 250X45 M6	1
66.5		020-I7380-M6X16	Tornillo Allen Abombado ISO7380 M6X16	18
66.6		030-CJ-00048	Rodamiento de Bolas 6300 2RS D10XD35X11	2
66.7		020-D985-M10	Tuerca Autoblocante DIN 985 M10	2
66.8		020-I7380-M10X30	Tornillo Allen Abombado ISO 7380 M10x30	2
66.9		020-D125B-M10	Arandela Biselada DIN 125B M10	2
66.10		120-05-10-00079	POLICARBONATO TRASERO PLEGADORA MP3160	1
66.11		020-D125B-M6	Arandela Biselada DIN 125B M6	16
66.12		020-D934-M6	Tuerca Hexagonal DIN 934 M6	16

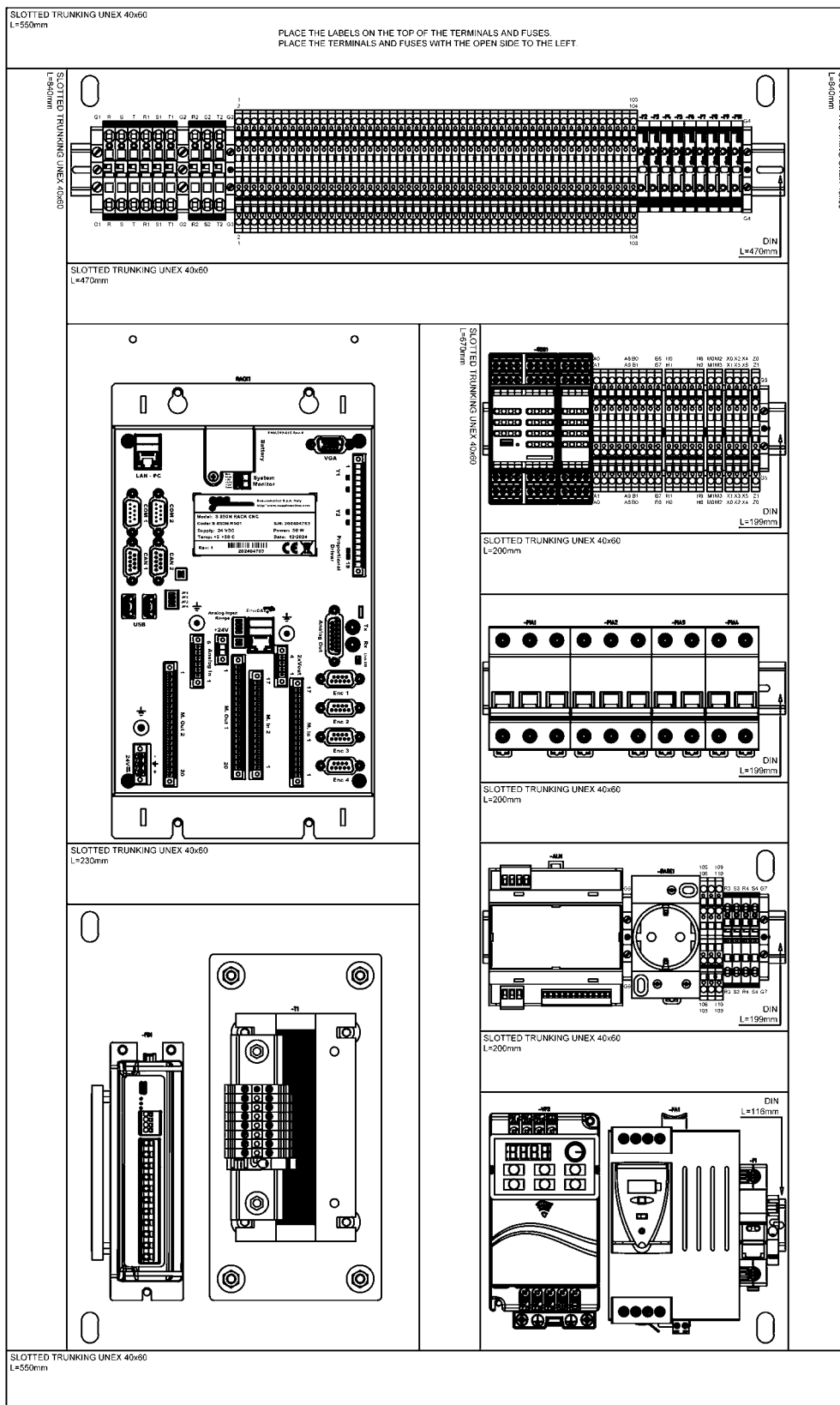
Elemento	Miniatura	Nº de pieza	Descripcion	CTDAD
85.1		130-05-10-00034	CONJUNTO SOLDADO PEDAL PLEGADORA MP3160	1
85.2		PRENSAESTOPAS 50045.ipt	RACORD METALICO M25 REF:50045	1
85.3		120-05-10-00132	TAPA INFERIOR PEDAL PLEGADORA MP3160	1
85.4		020-I7380-M6X8	Tornillo Allen Abombado ISO7380 M6X8	11
85.5		120-05-10-00134	PLACA UNION TAPAS SUPERIORES PIE PLEGADORA MP3160	2
85.6		050-PL-00006	PILOTO BLANCO SCHNEIDER	1
85.7		NT0 PARO EMERGENCIA PIZ	PARO EMERGENCIA PIZZATO CON LUZ	1
85.8		050-PUL-00008	PULSADOR NARANJA SCHNEIDER D22	1
85.9		122-CAL-0510-001	CALCA PEDAL PLEGADORA MP3160	1
85.10		120-05-10-00135	TAPA SUPERIOR PEDAL PLEGADORA MP3160	1
85.11		020-I7380-M8X16	Tornillo Allen ISO 7380 M8X16	2
85.12		120-05-10-00133	BARRA PEDAL PLEGADORA MP3160	1
85.13		050-PED-00019	Pedal Pizzato PX 10111-M2	2
85.14		020-I7050-4C8X19	020-I7050-4C8X19	4
85.15		031-SIB-00018	Silentblock D20X10 Macho M6 41001102010	4
85.16		020-D934-M6	Tuerca Hexagonal DIN 934 M6	4

12. Exploded view back gauge



Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
138.1		TOPE PLEGADORA MP3160	Tope CNC XR MP3160CNC	1
138.2		120-05-10-00107	TAPA TRASERA TOPE PLEGADOR MP3160	1
138.3		050-SME-00002	Servo Motor ED4-080-50-014-011-60 (MTR.616.151)	2
138.4		020-D912-M6X20	Tornillo Allen DIN912 M6X20	8
138.5		020-I7380-M6X10	Tornillo Allen Abombado ISO 7380 M6X10	28
138.6		120-05-06-00457	Chapa Union Protecciones	6
138.7		120-05-10-00106	TAPA DELANTERA TOPE PLEGADORA MP3160	1
138.8		120-05-08-00254	Tapa Letras Tope	1
138.9		120-05-06-00456	Tapa Reductor	1

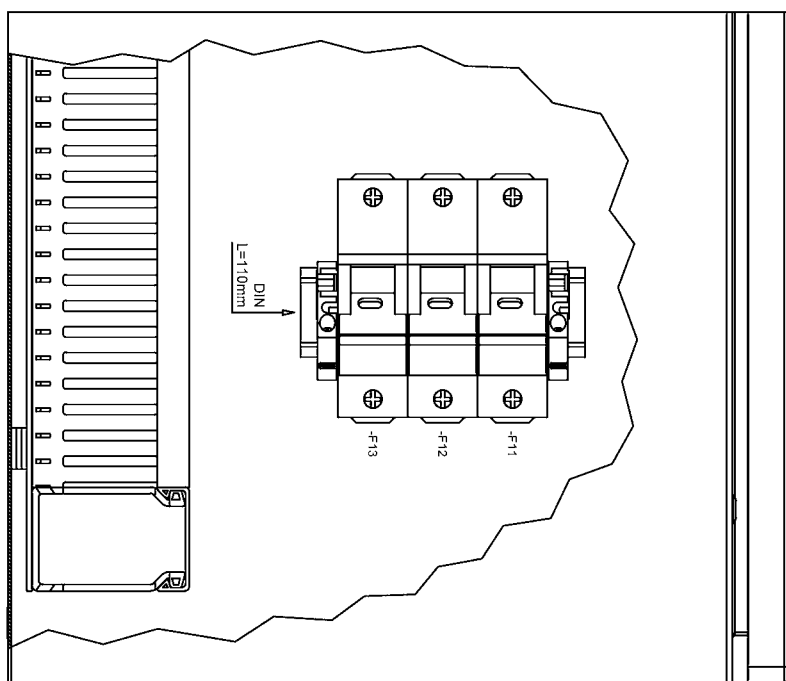
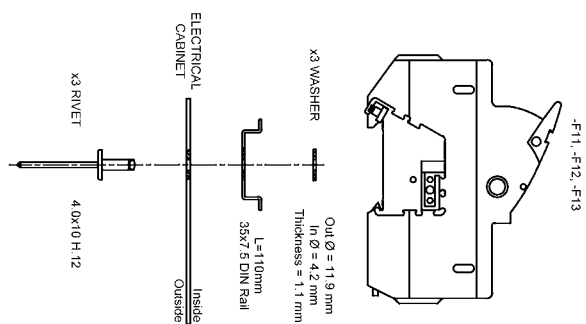
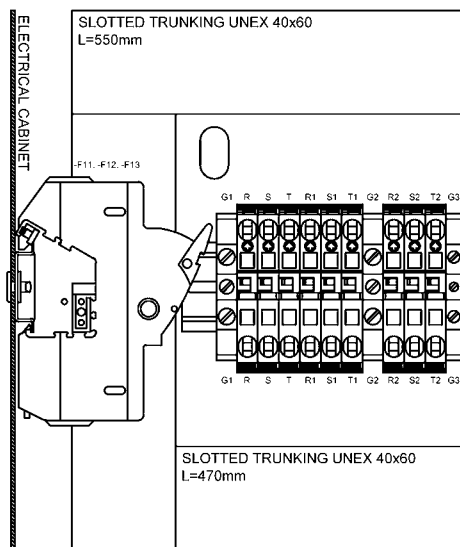
13. Electrical Cabinets

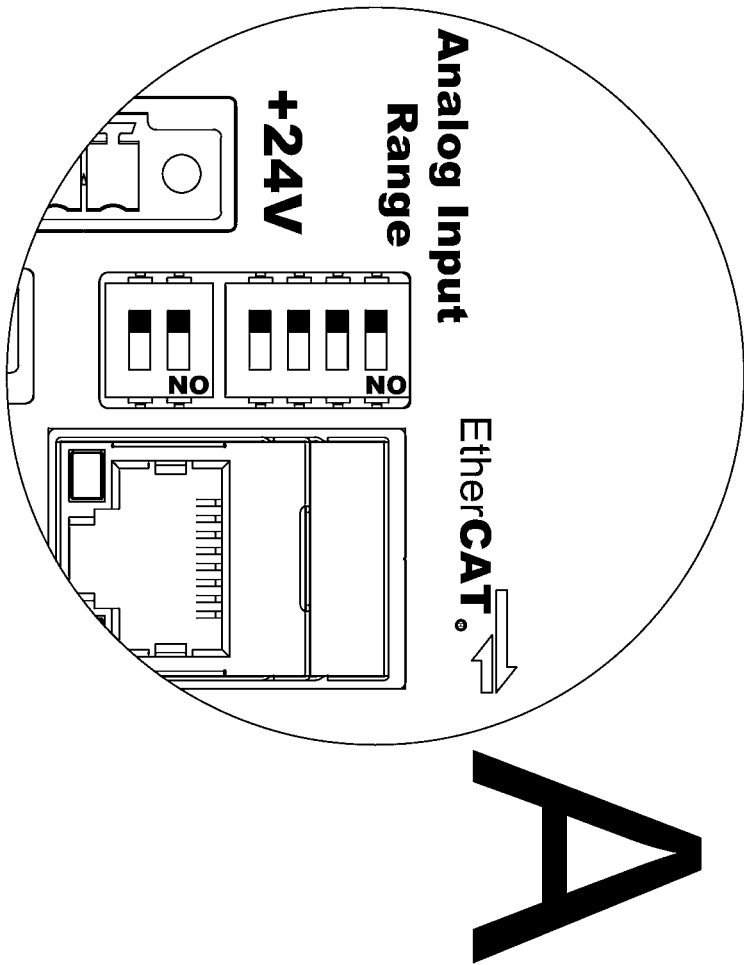
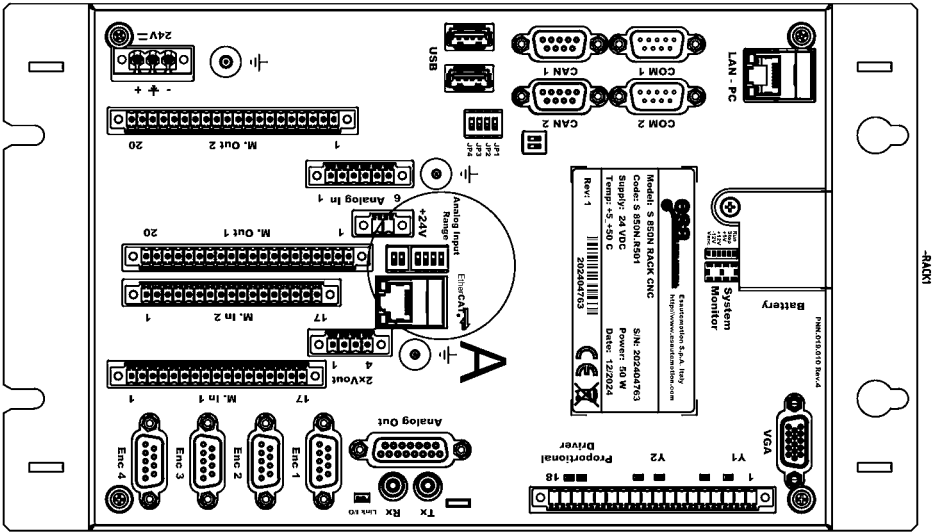


ATTENTION!

Always mount the DIN rail.

Mount the fuse holders and the EW35 stops on the USA model only.

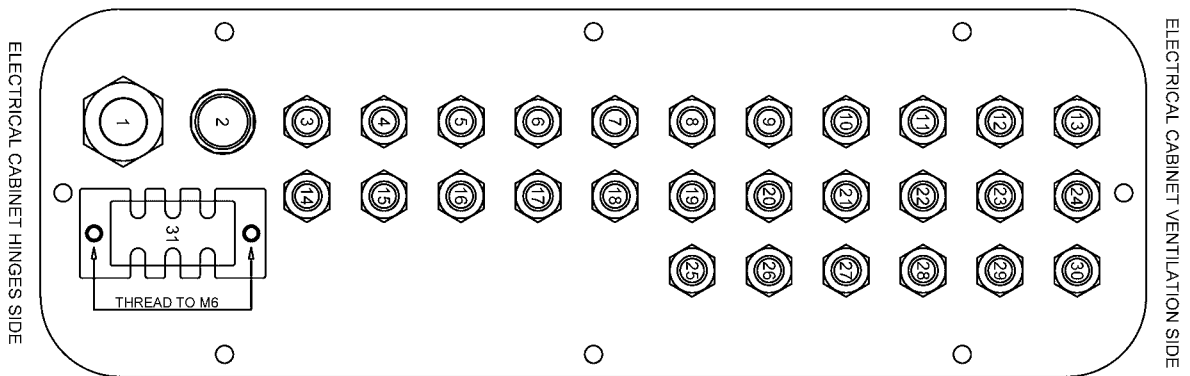




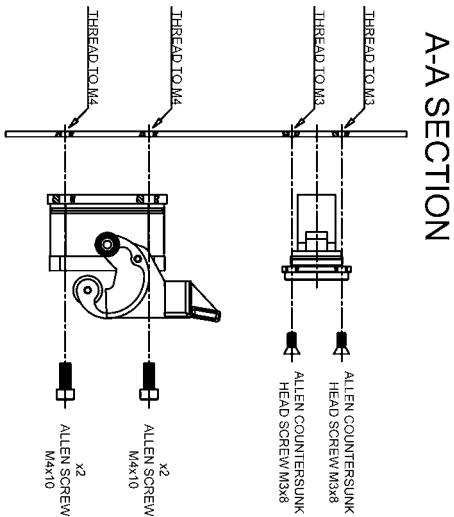
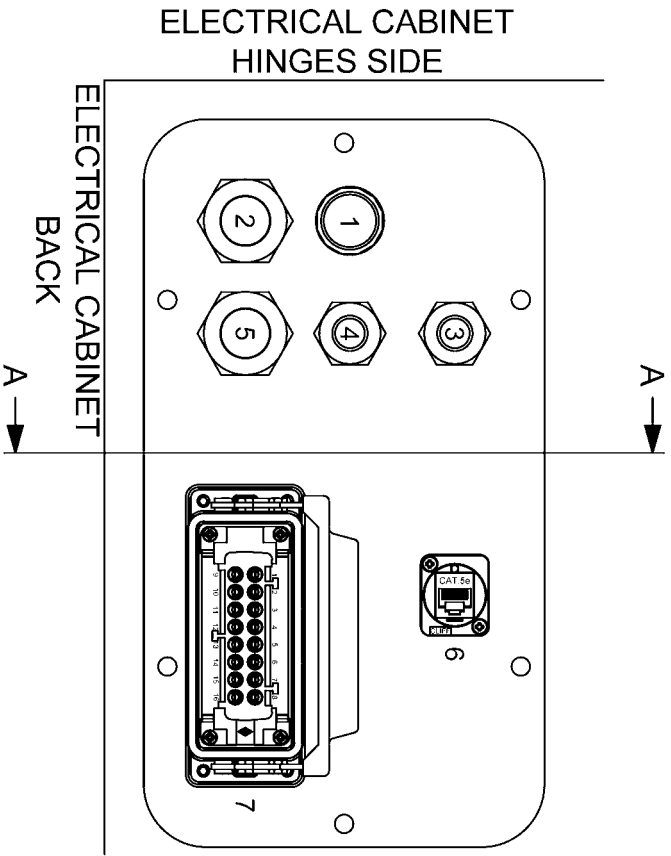
ATTENTION: THE SHADED RECTANGLE REPRESENTS THE DIP SWITCH POSITION

PLATE HOLE NUMBER	PLASTIC CABLE GLAND	ELECTRIC WIRE	DESCRIPTION
1	M25	-MG2	VF1 PUMP FREQUENCY INVERTER POWER INPUT
2	PMA DN12 M20	-MG4	CORRUGATED HOSE WITH RX (DSP LASER RECEIVER)
3	PG9	-MG4	SF4 (LEFT SIDE HINGE)
4	PG9	-MG43	PCLITE1 ESA S840 POWER INPUT
5	PG9	-MG22	L5 (BACK GAUGE AREA LAMP)
6	PG9	-MG9	IS1 (Y1 SECURITY VALVE INDUCTIVE)
7	PG9	-MG10	IS2 (Y2 SECURITY VALVE INDUCTIVE)
8	PG9	-MG23	Y1 SPOOLER SENSOR
9	PG9	-MG24	Y2 SPOOLER SENSOR
10	PG9	-MG17	EVS1 (Y1 SECURITY ELECTROVALVE)
11	PG9	-MG18	EVS2 (Y2 SECURITY ELECTROVALVE)
12	PG9	-MG28	EVD1 (Y1 DOWN ELECTROVALVE)
13	PG9	-MG30	EVD2 (Y2 DOWN ELECTROVALVE)
14	PG9	-MG5	SF5 (RIGHT SIDE HINGE)
15	PG9	-MG7	IE1 (ENCODER INDUCTIVE 1)
16	PG9	-MG13	VSA (DSP LASER TEST INDUCTIVE)
17	PG9	-MG6	VF1 PUMP FREQUENCY INVERTER SIGNALS
18	PG9	-MG20	L3 (WORK AREA LAMP)
19	PG9	-MG21	L4 (BEND AREA LAMP)
20	PG9	-MG38	TX (DSP LASER TRANSMITTER)
21	PG9	-MG8	IF (FALL VALVE INDUCTIVE)
22	PG9	-MG25	SF6 (REAR SAFETY)
23	PG9	-MG16	EVF (FALL ELECTROVALVE)
24	PG9	-MG31	EVP (PROPORTIONAL PRESSURE VALVE)
25	PG9	---	---
26	PG9	---	---
27	PG9	---	---
28	PG9	-MG26	VF1 PUMP FREQUENCY INVERTER ANALOG CONTROL
29	PG9	-MG27	EVU1 (Y1 UP ELECTROVALVE)
30	PG9	-MG29	EVU2 (Y2 UP ELECTROVALVE)
31	---	-MG32 + -MG33 + -MG41 + -MG42 + -MG46 + -MG47	EXTENSION CABLES: ETHERNET 1 + ETHERNET 2 + ENCODER 1 + ENCODER 2 + USB 1 + USB 2

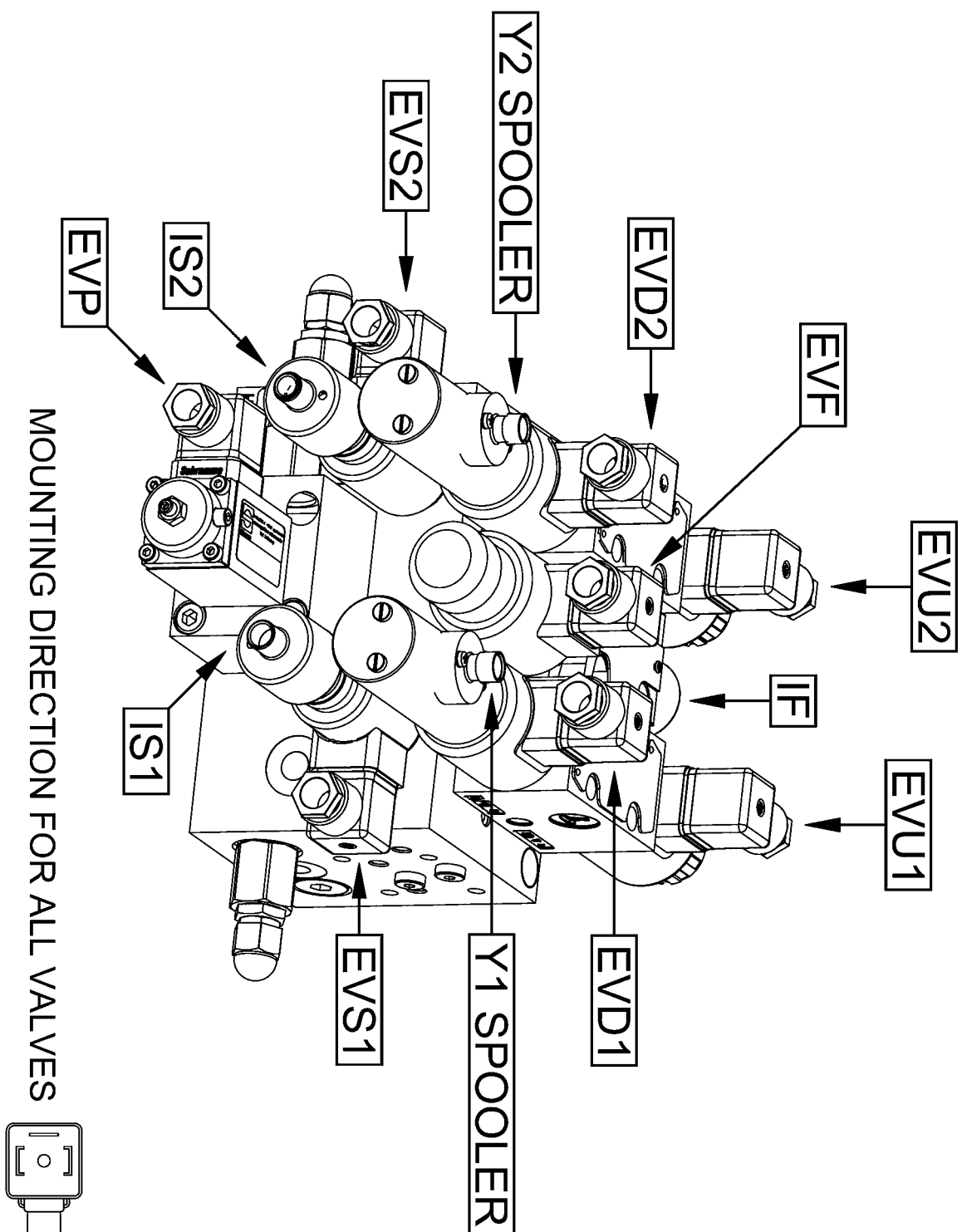
ELECTRICAL CABINET REAR SIDE

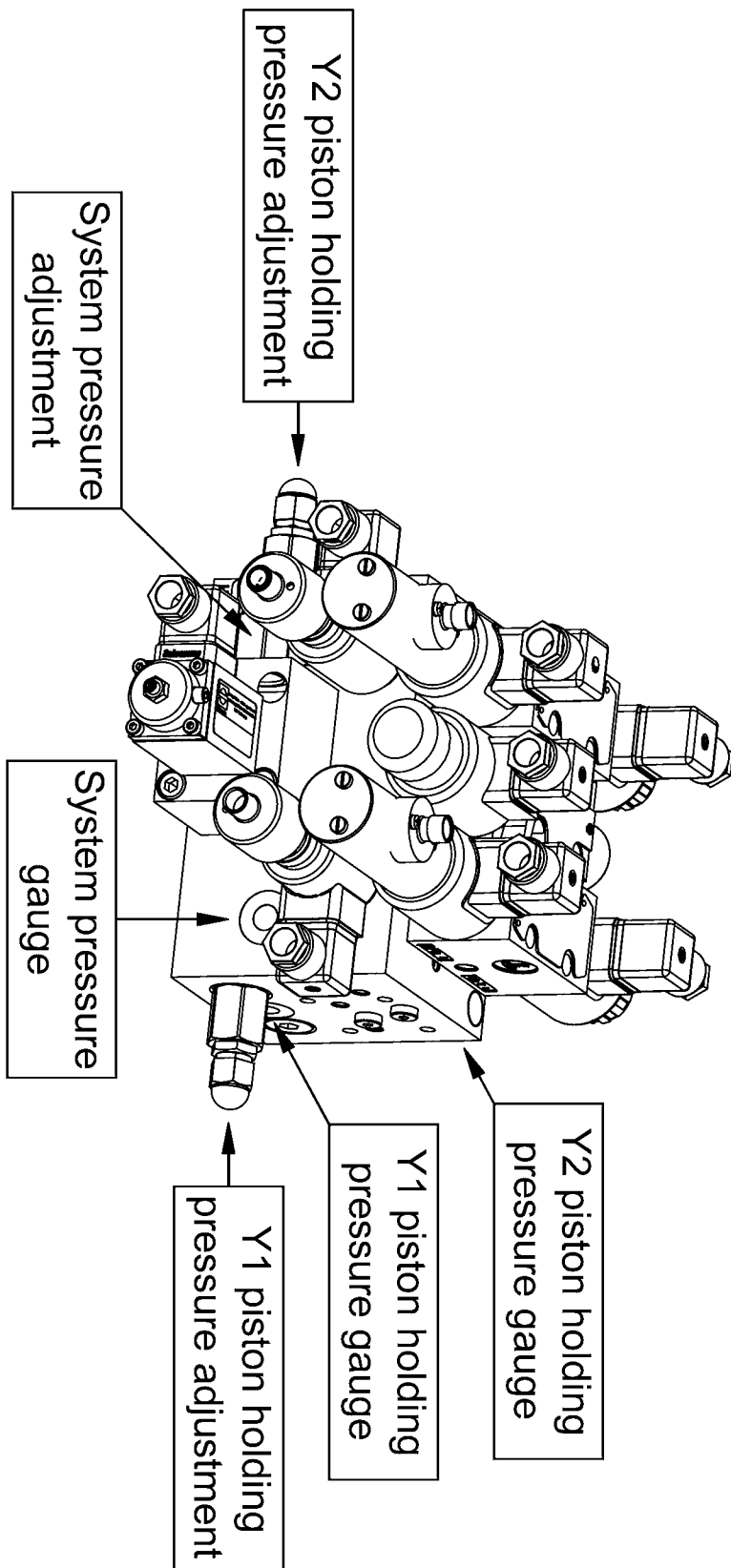


ELECTRICAL CABINET FRONT SIDE

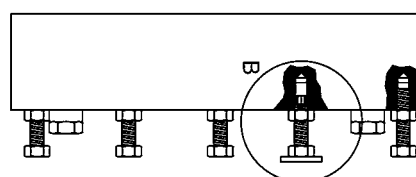
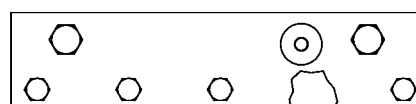
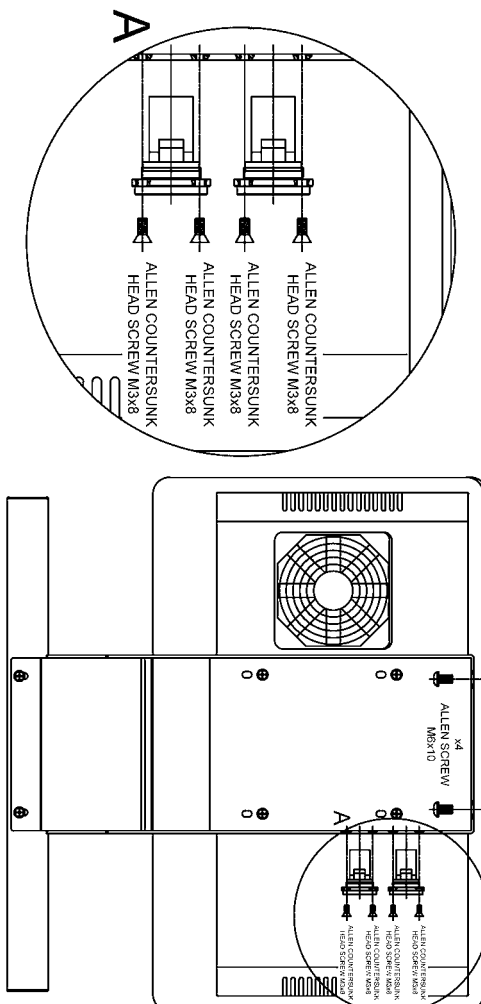
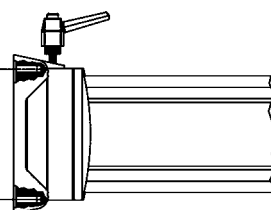
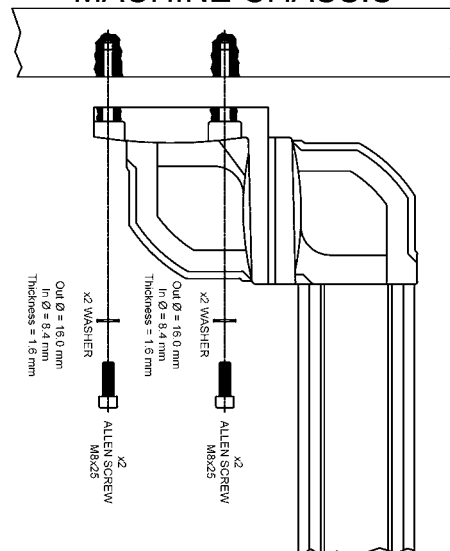


NUMBER	PLASTIC CABLE GLAND	ELECTRIC WIRE	DESCRIPTION
1	PMA DN12 M20	-MG49	CORRUGATED HOSE WITH CROWNING TABLE CONNECTOR
2	M25	-MG1	POWER SUPPLY
3	PG13.5	-MG14 + -MG15	IZ1 (Z1 AXIS, BACK GAUGE INDUCTIVE) + IZ2 (Z2 AXIS, BACK GAUGE INDUCTIVE)
4	PG13.5	-MG11 + -MG12	ITX (X AXIS, BACK GAUGE INDUCTIVE) + ITR (R AXIS, BACK GAUGE INDUCTIVE)
5	M25	-MG34	BACK GAUGE MOTOR / DRIVER HOSE
6	ETHERNET CONNECTOR	-MG48	LAN PC / LAN ELECTRICAL BOX
7	16 PIN FEMALE CONNECTOR	-MG45	PEDAL HOSE

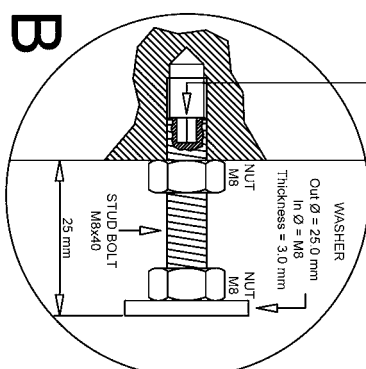


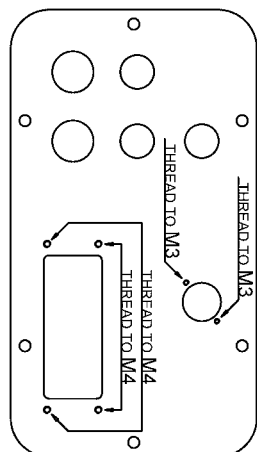


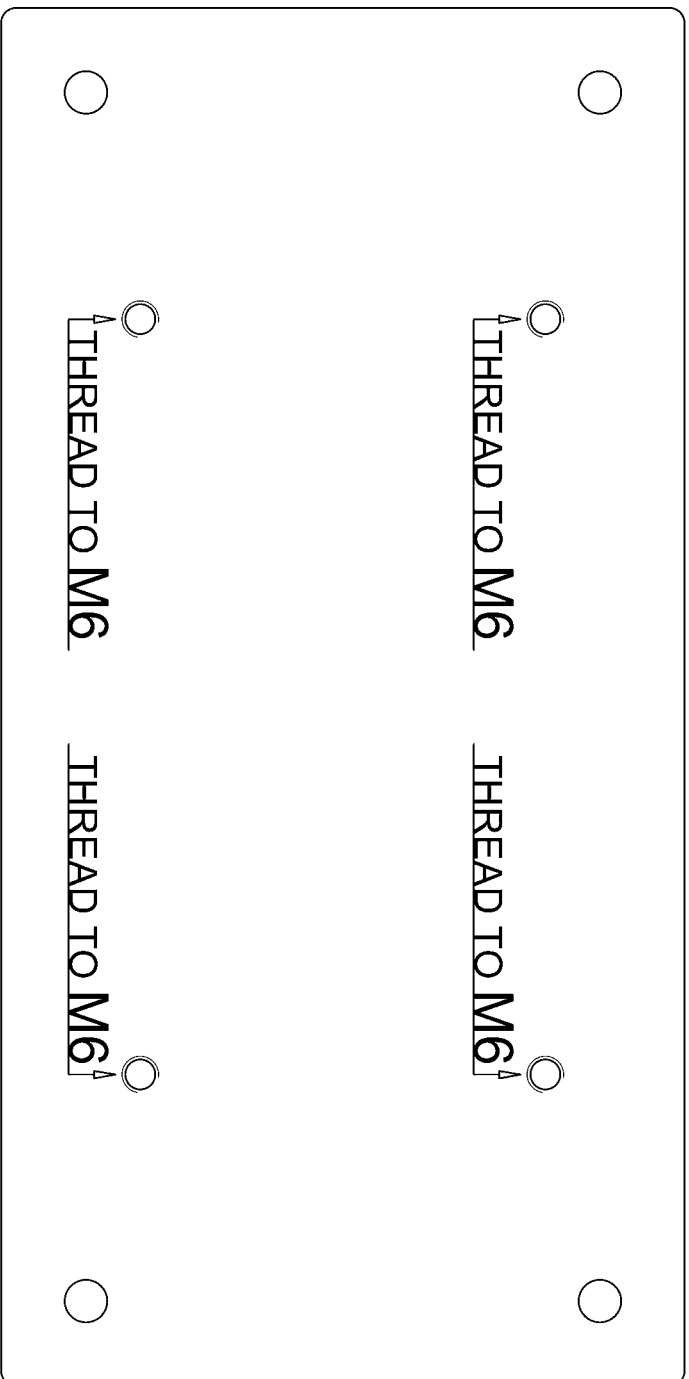
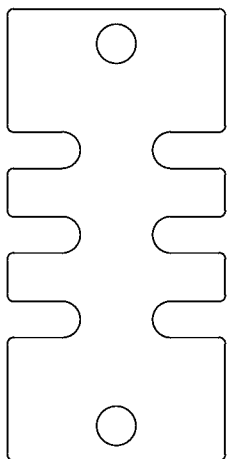
MACHINE CHASSIS

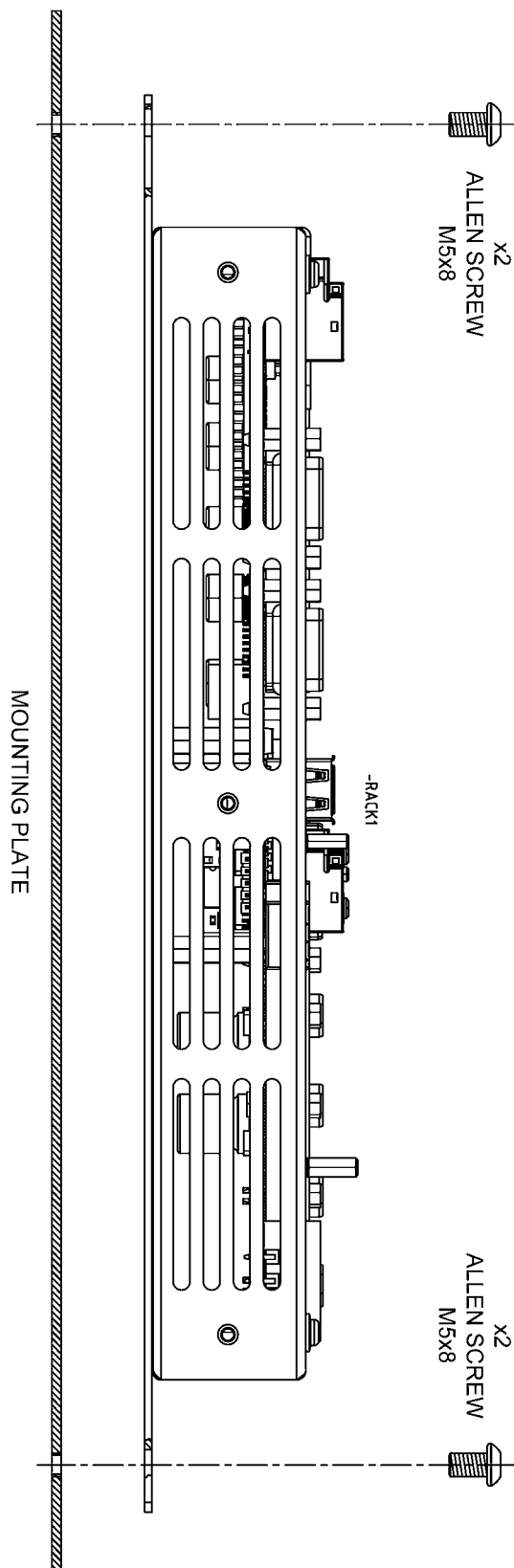


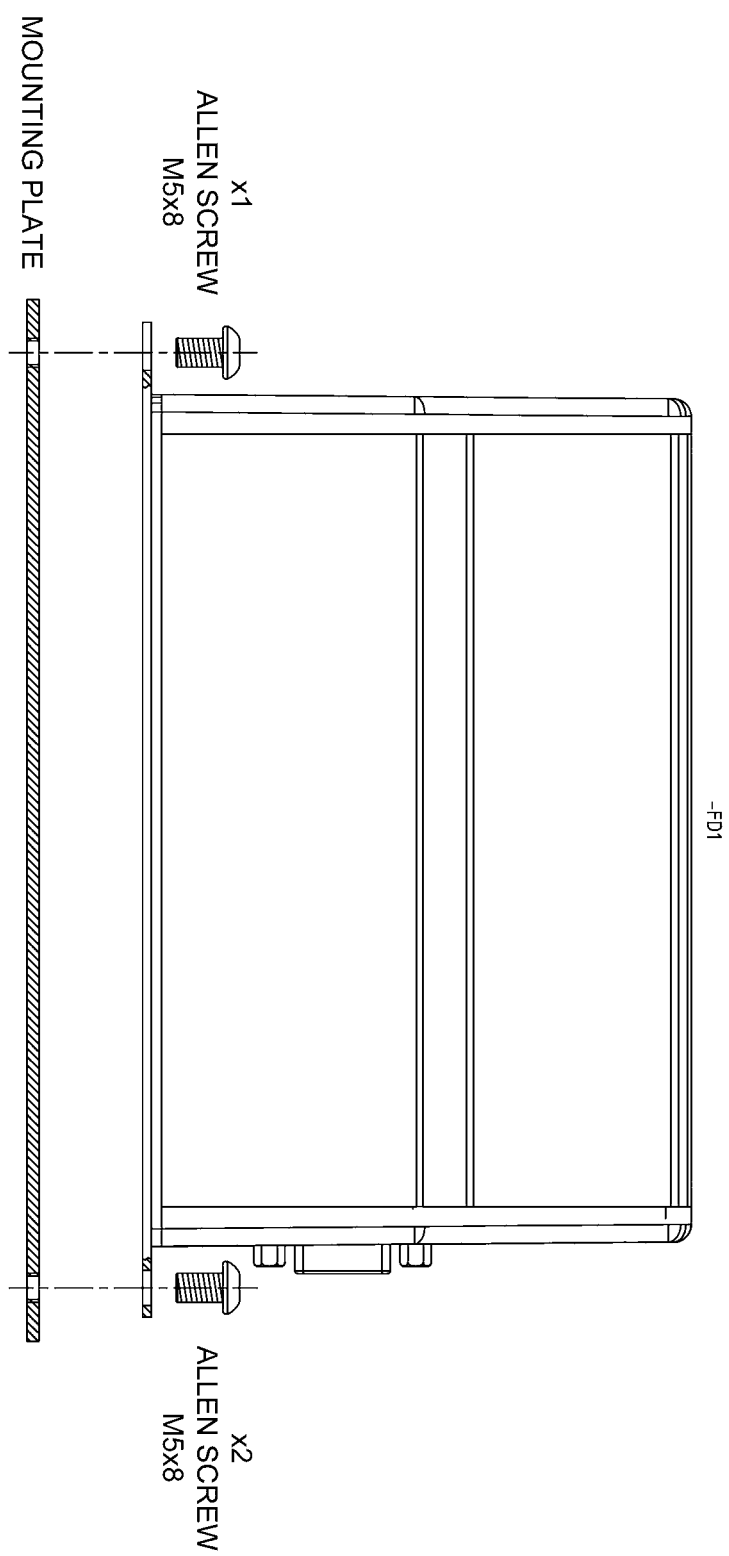
ATTENTION:
MOUNT THE STUD BOLT M8x40 WITH
THE ALLEN HEAD TOWARDS THE
THREADED HOLE

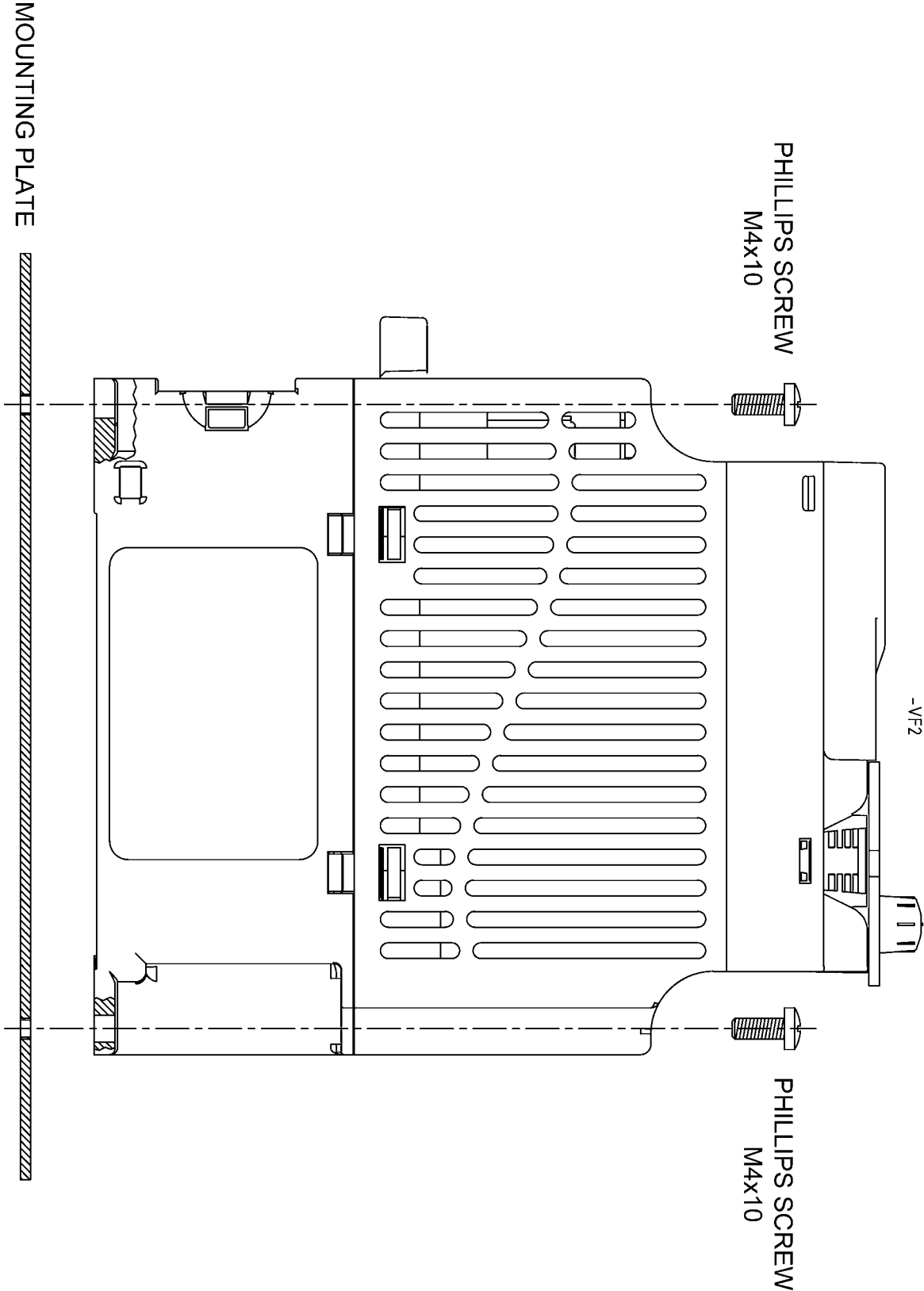


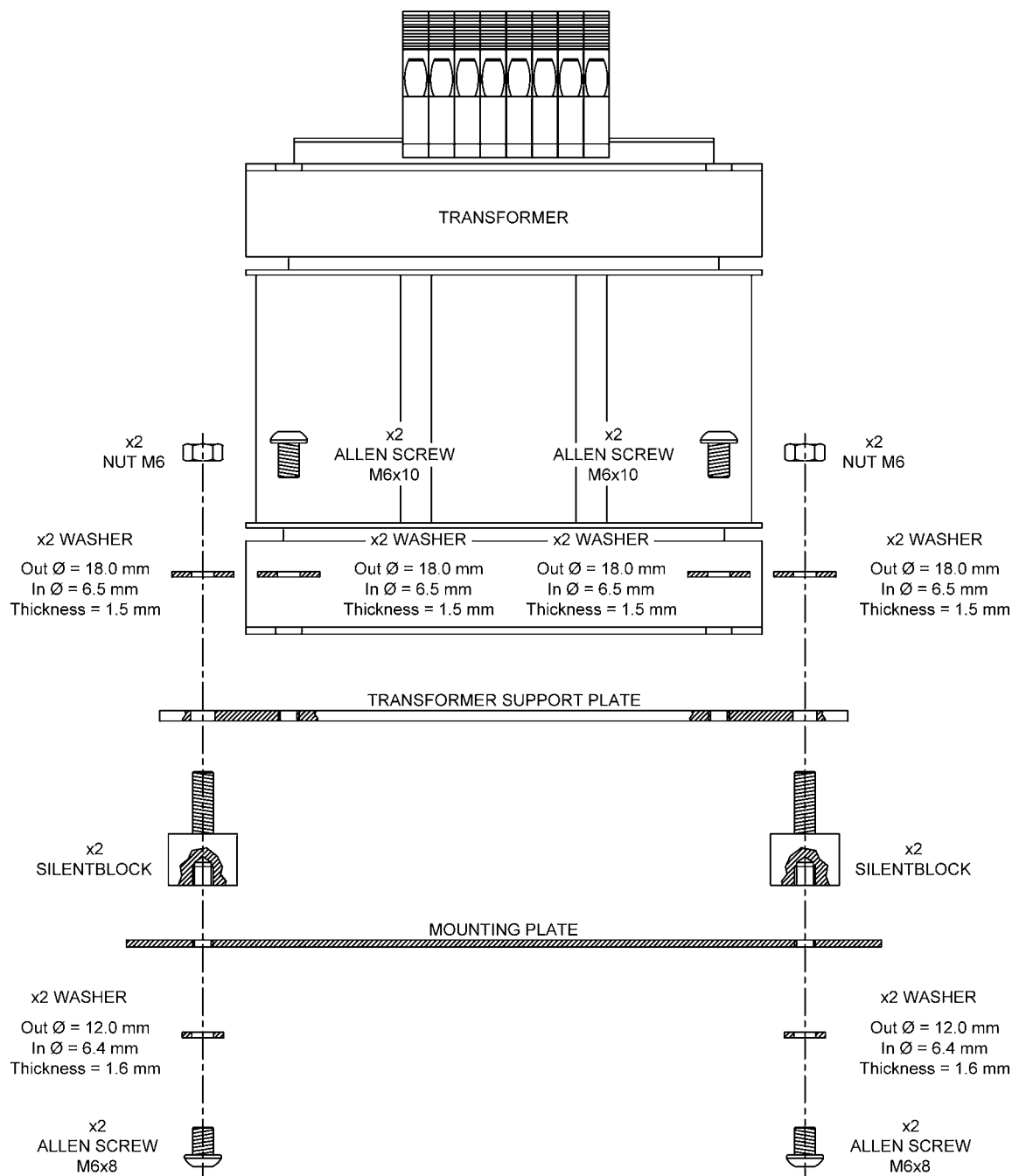


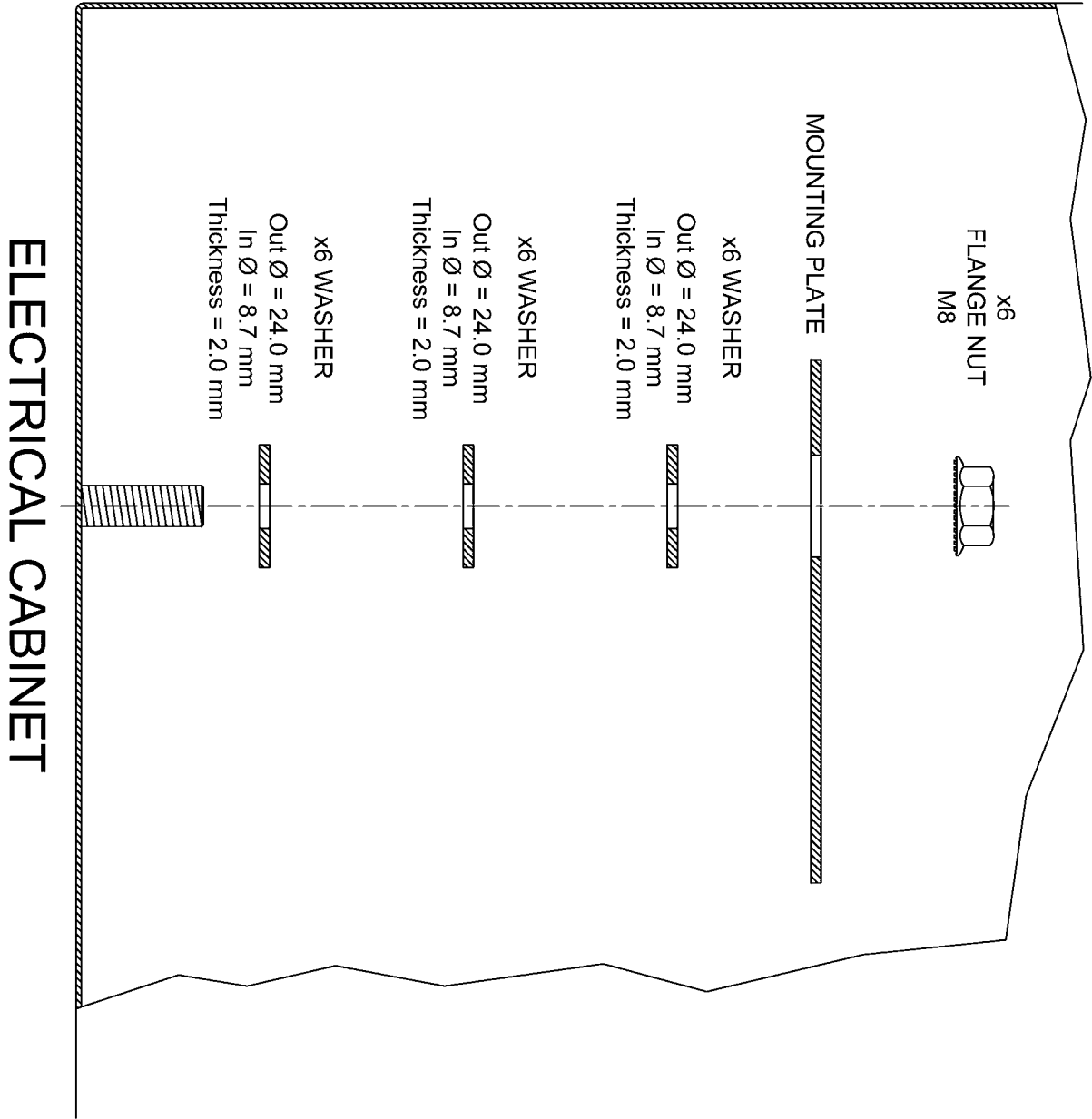


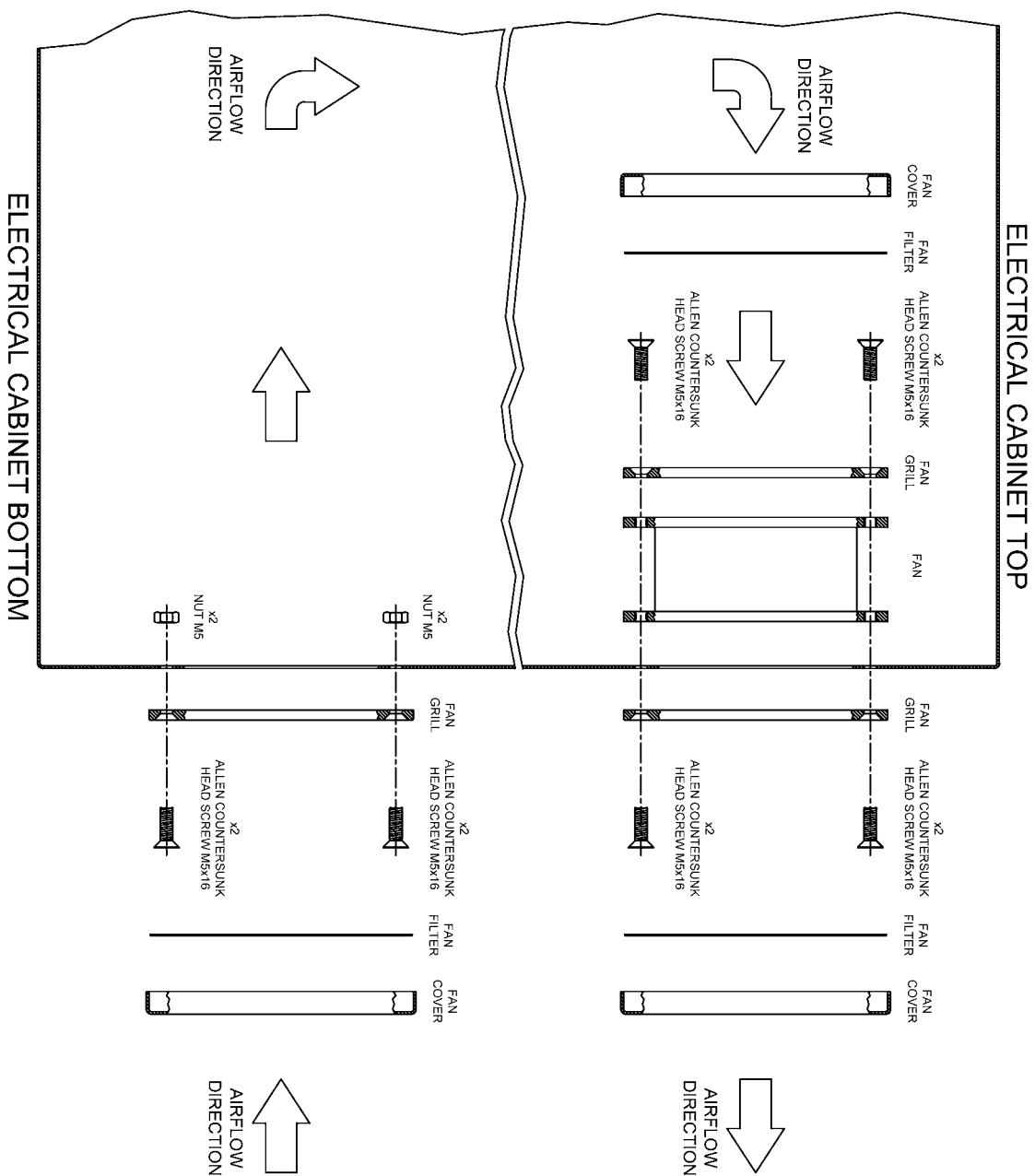


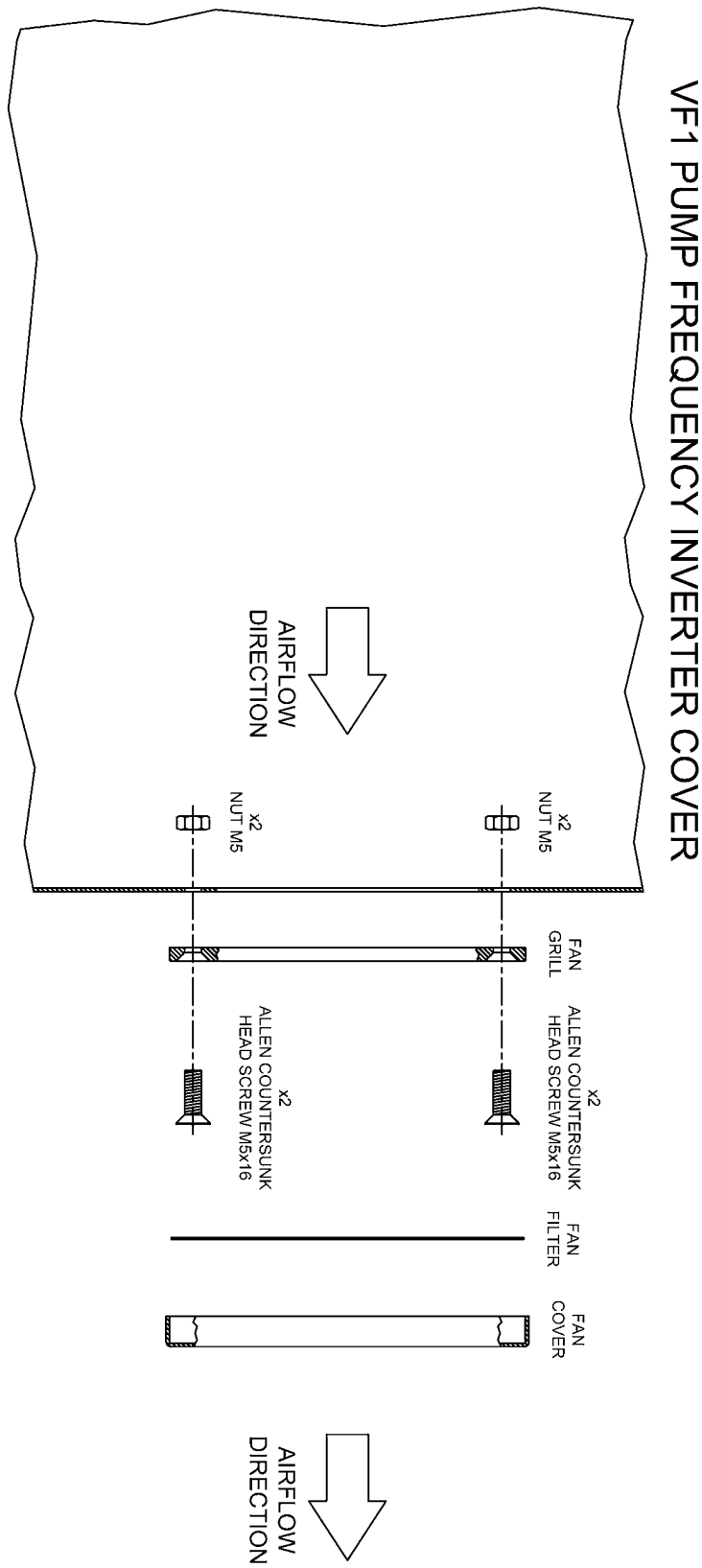






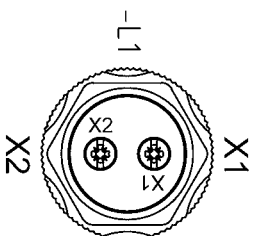




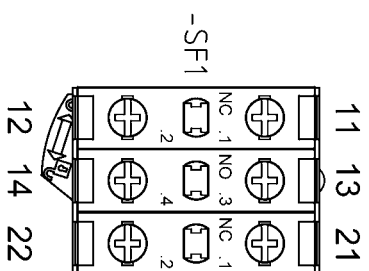


INSIDE VIEW OF THE PEDAL TOP PLATE

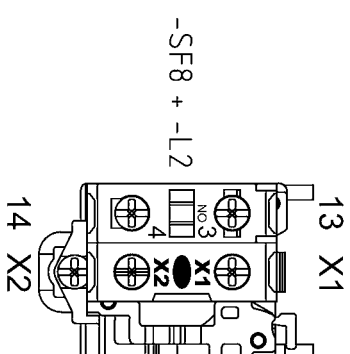
SUPPLY LAMP
(WHITE)

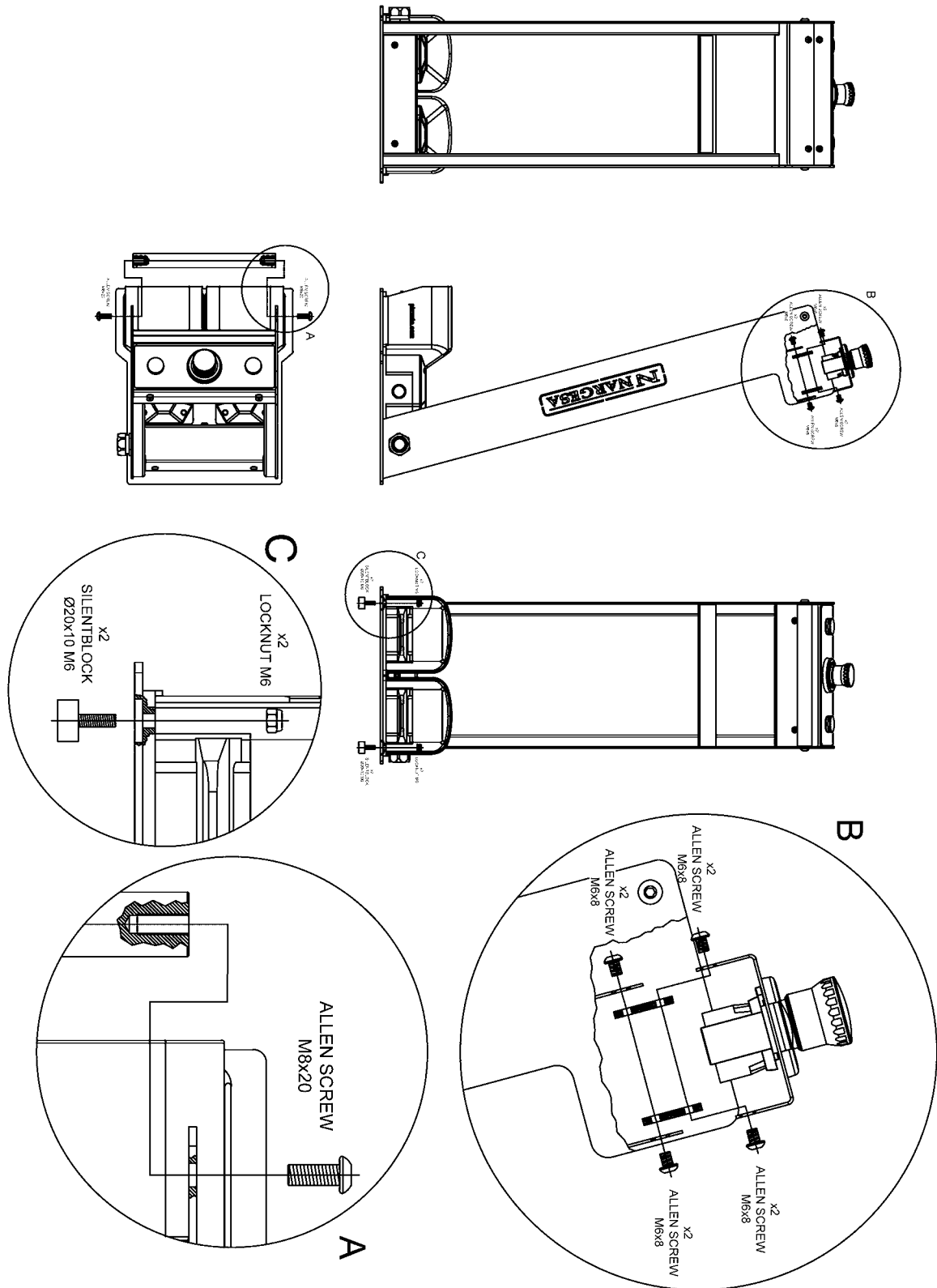


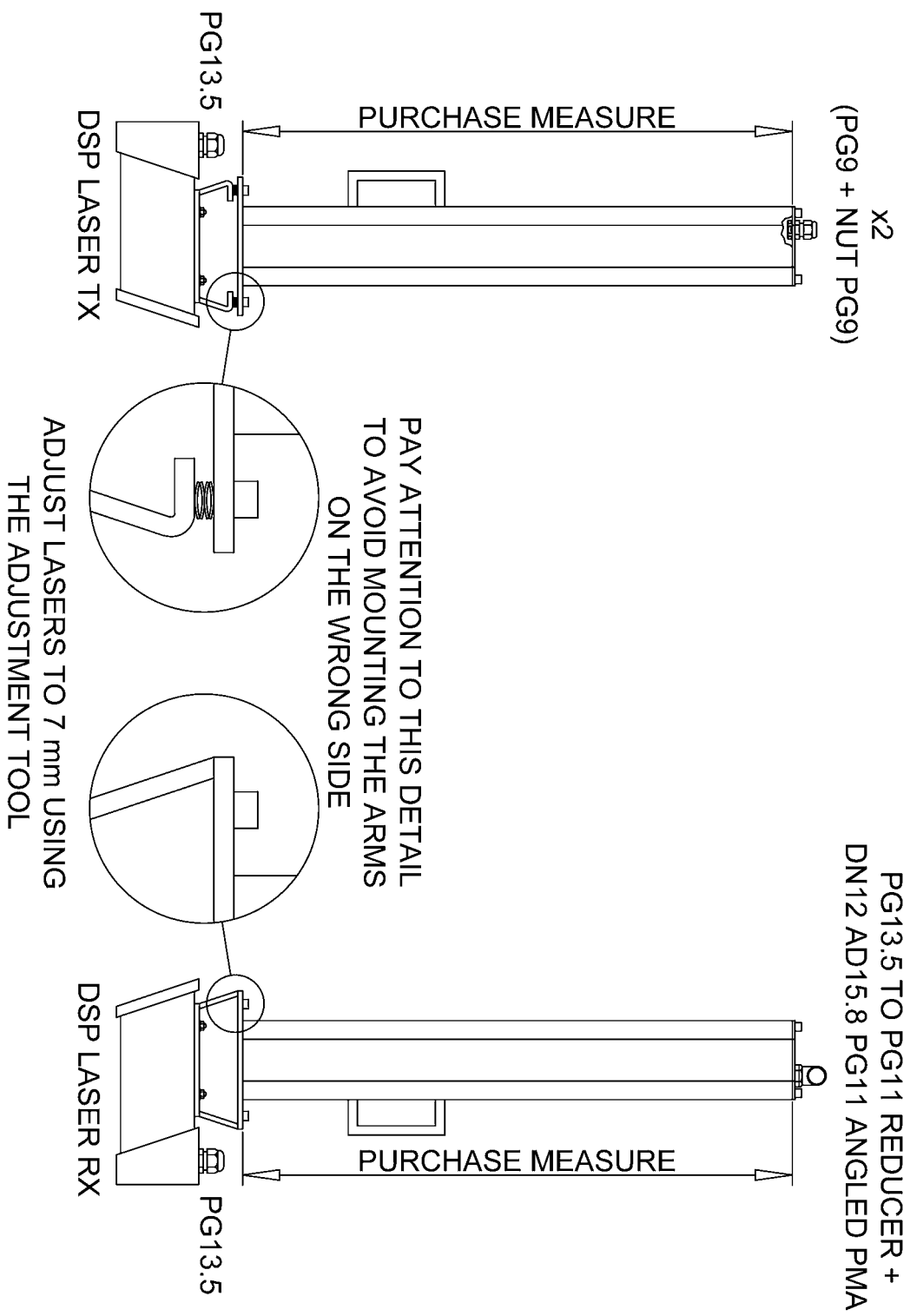
EMERGENCY
STOP

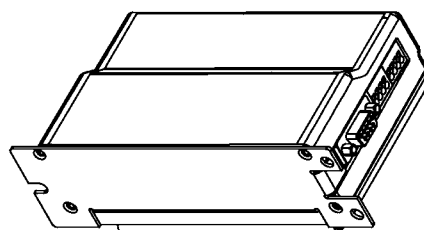
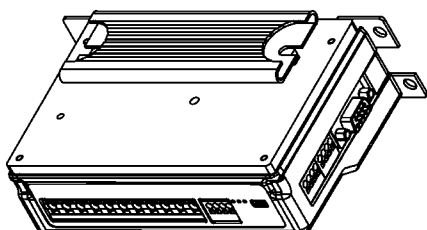
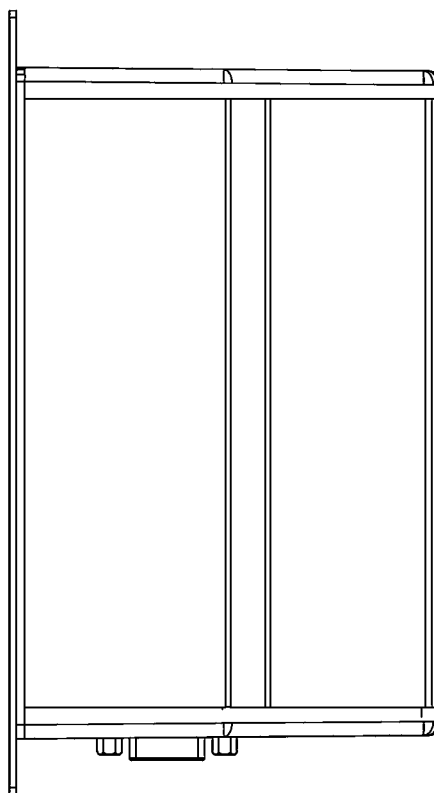
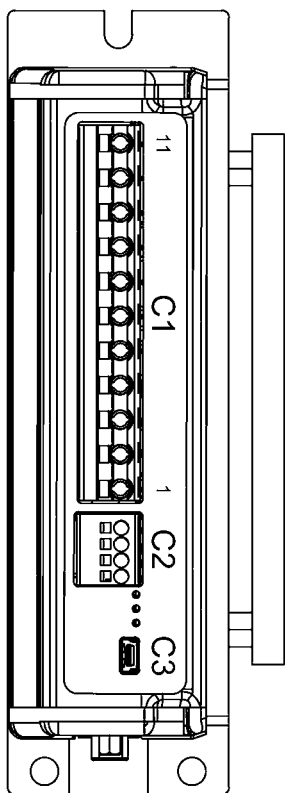
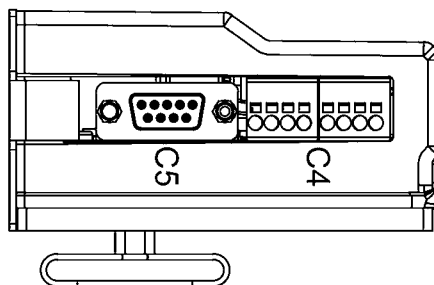


SPEED BUTTON +
SPEED LAMP (ORANGE)

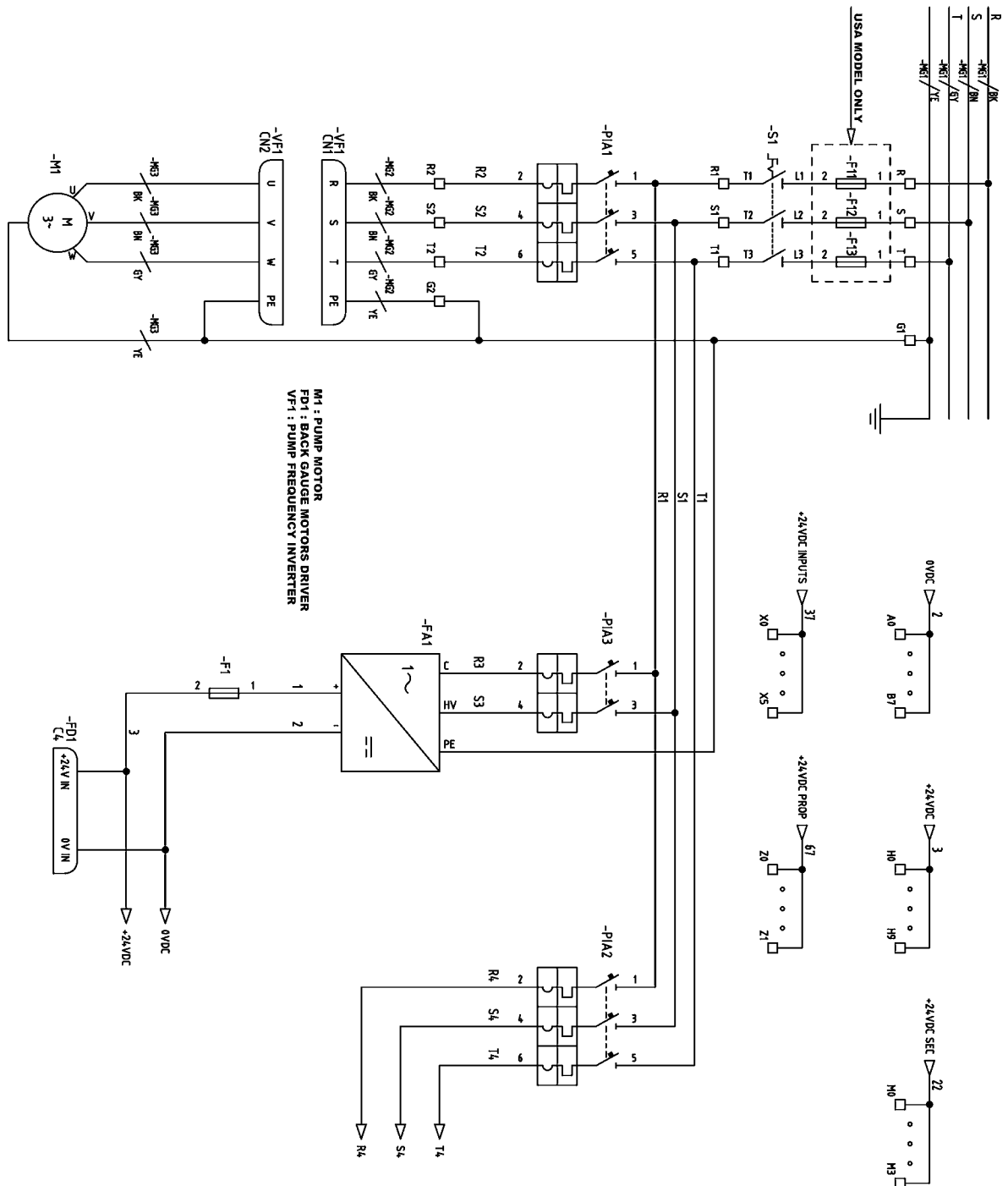




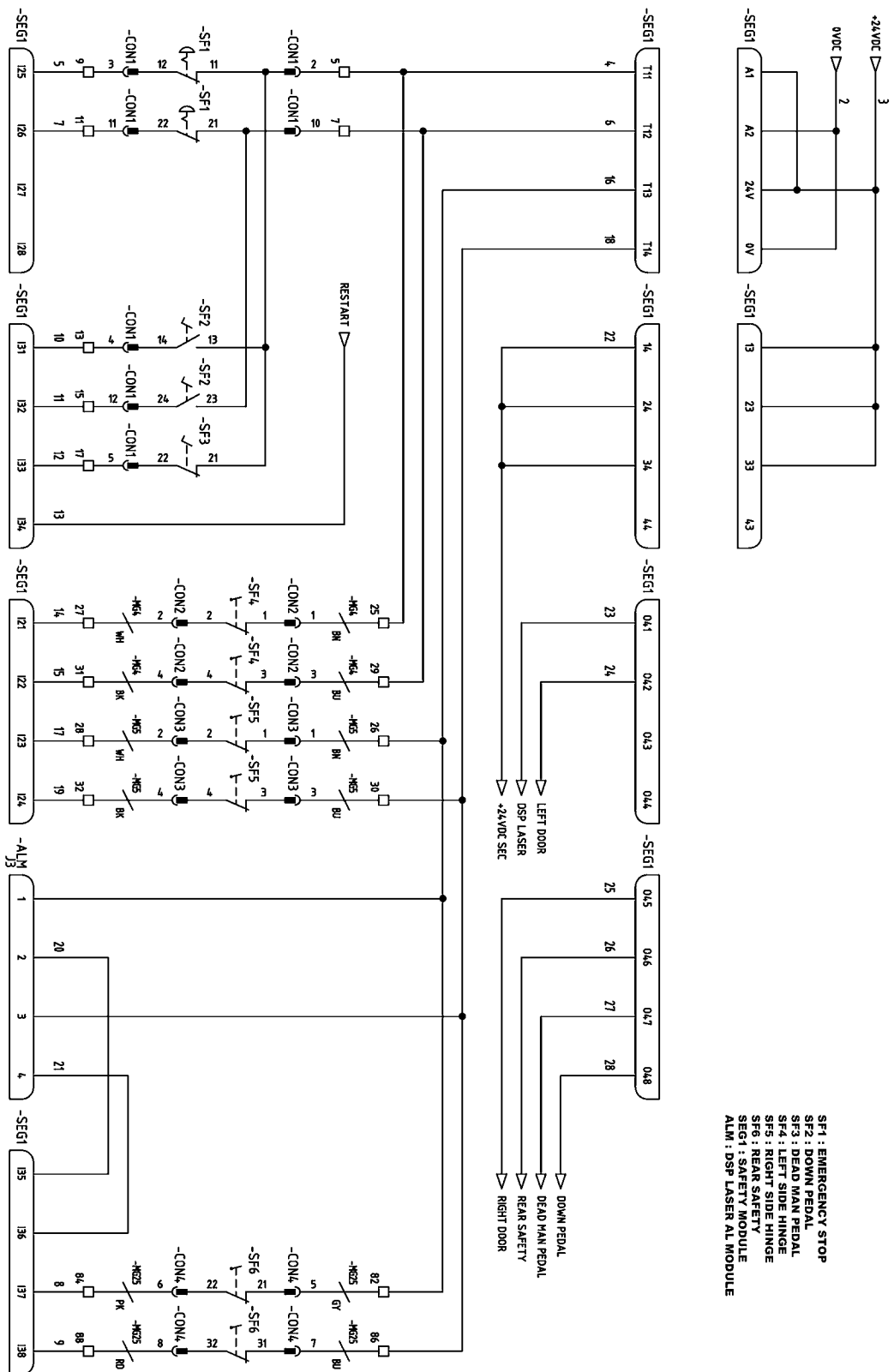


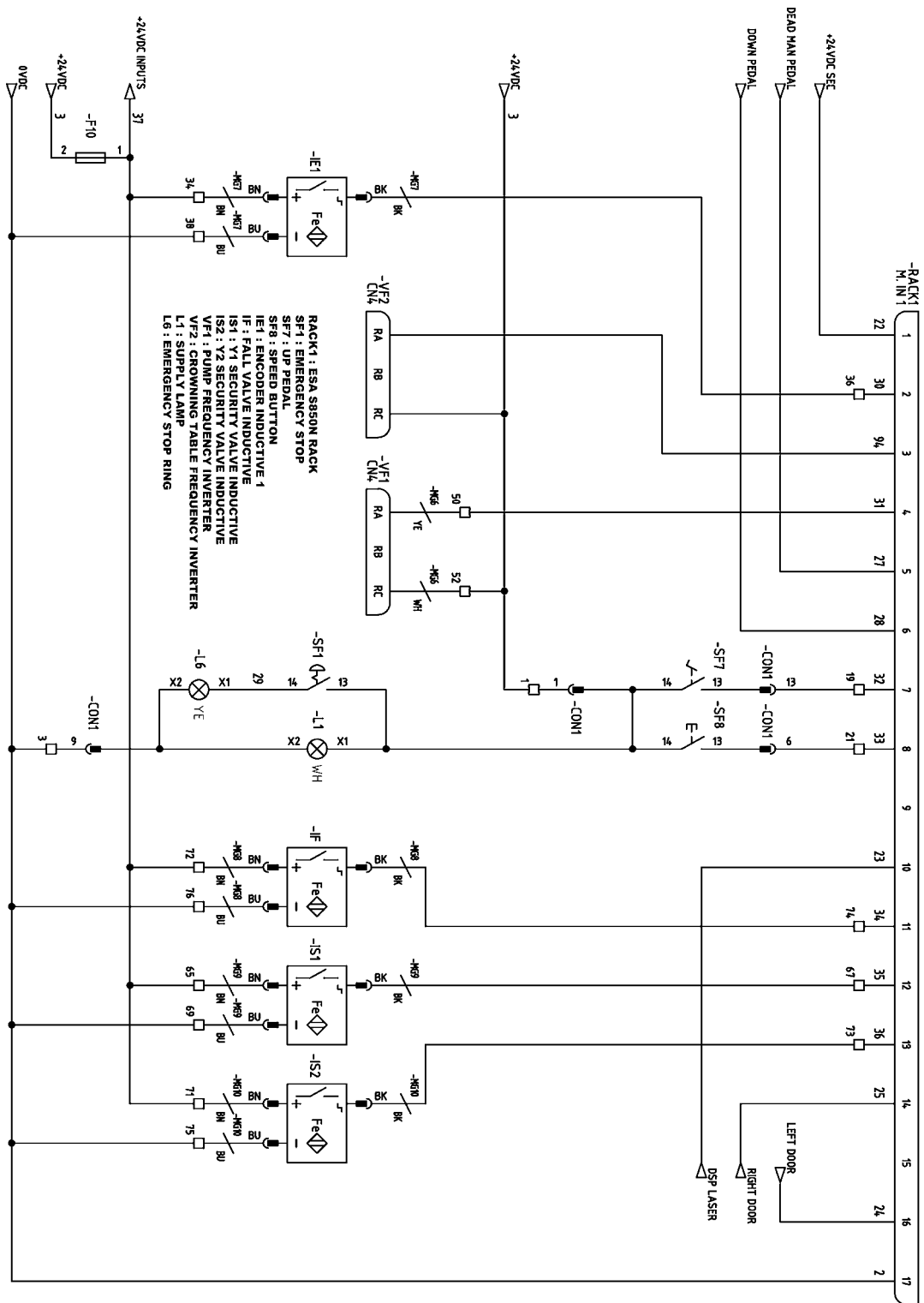


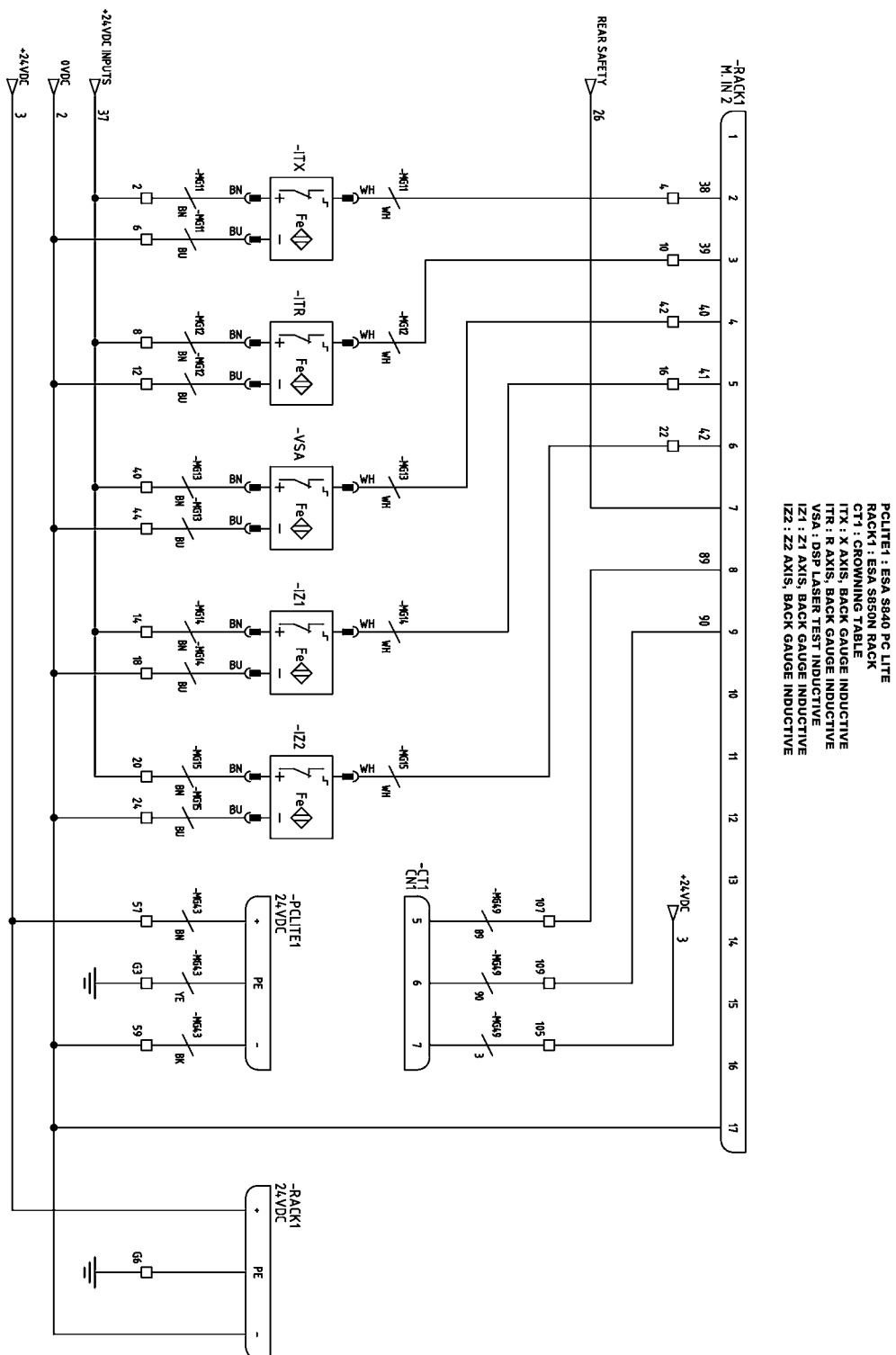
13. Electrical diagrams

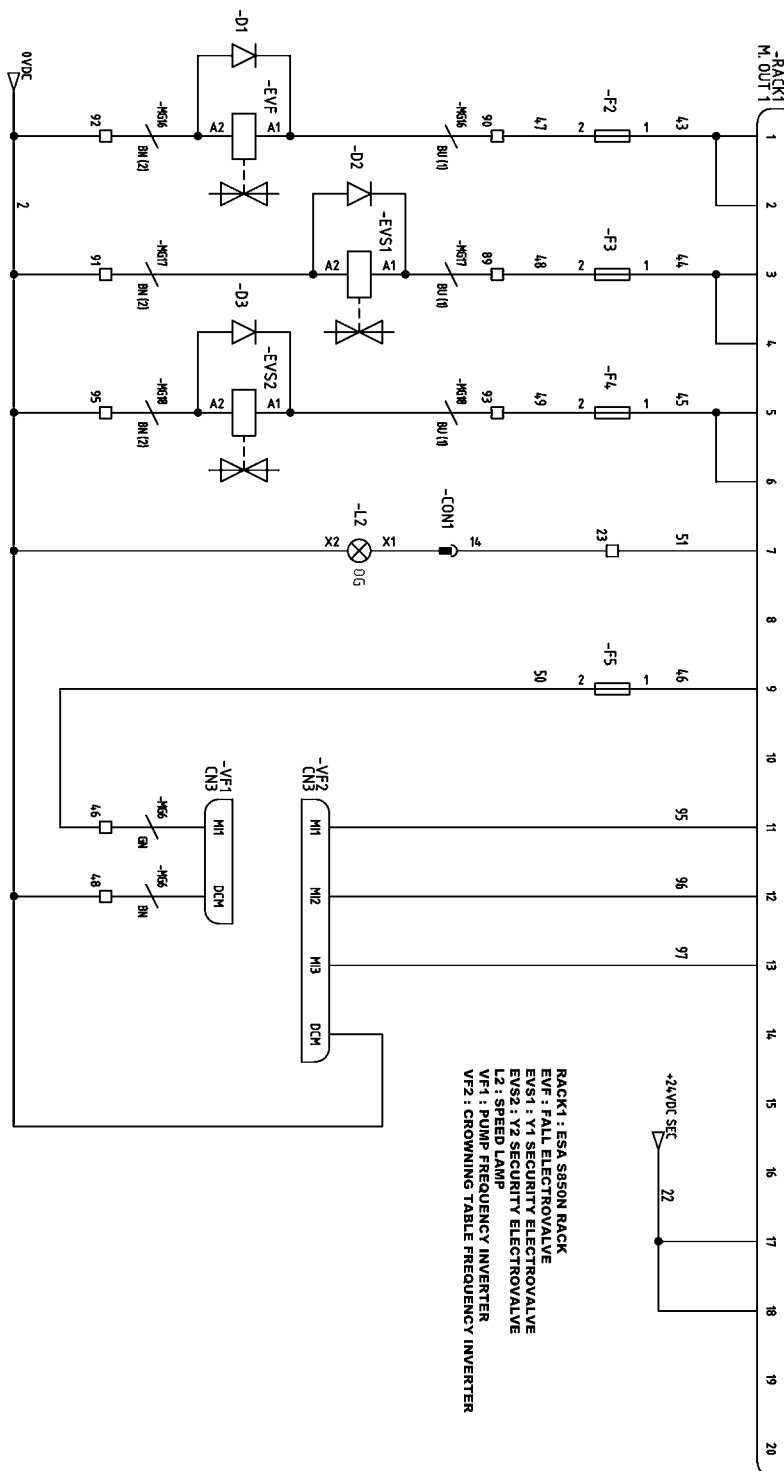


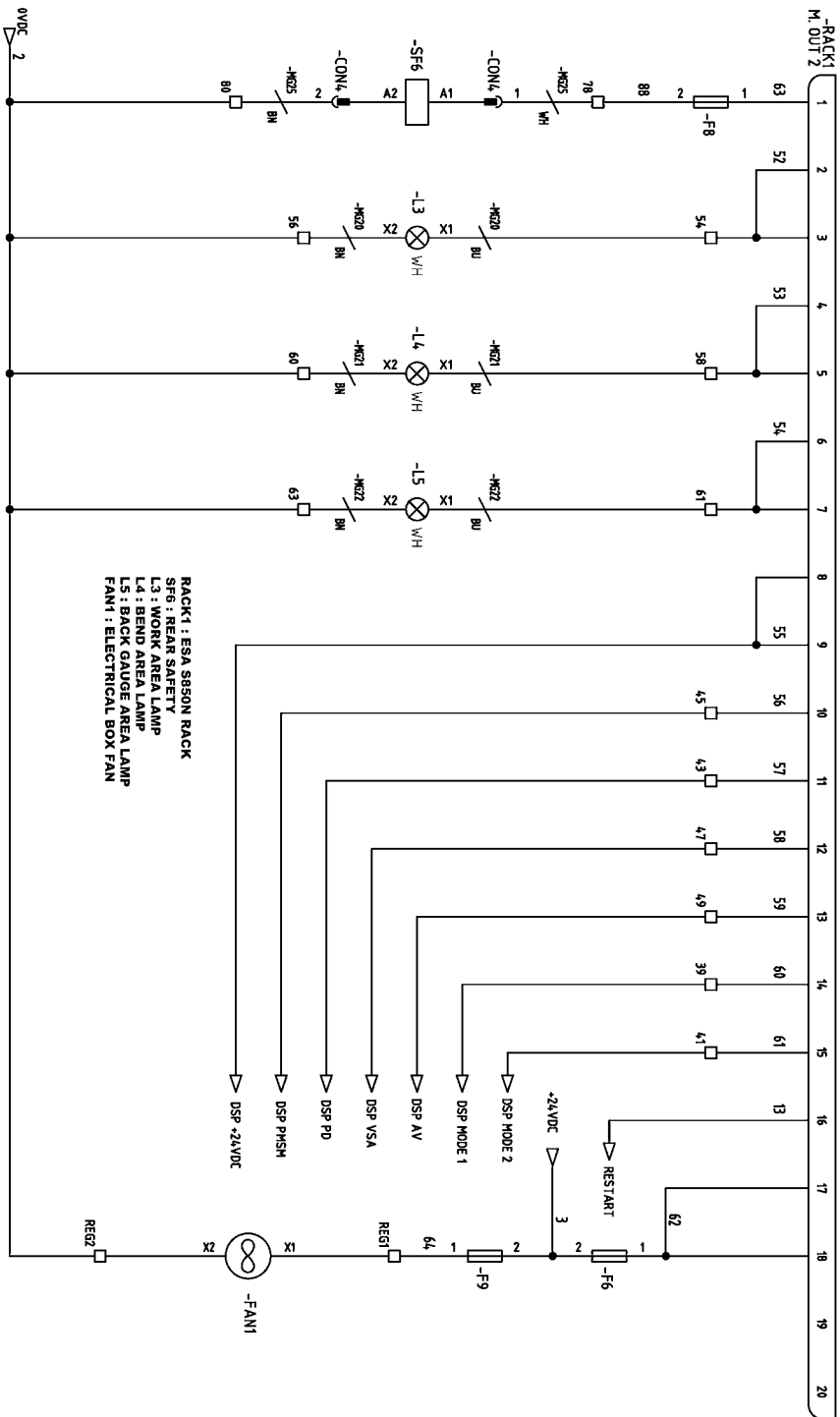


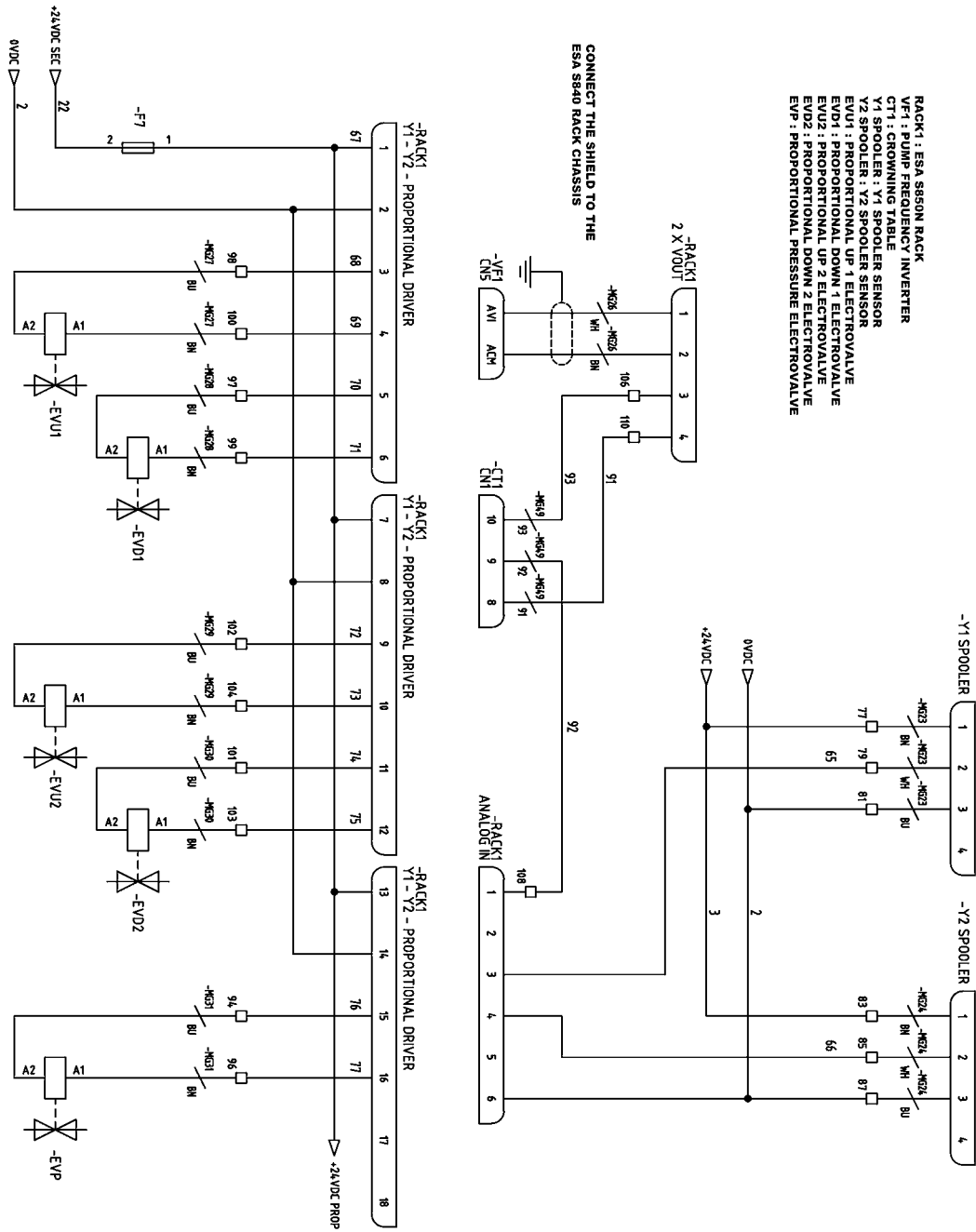


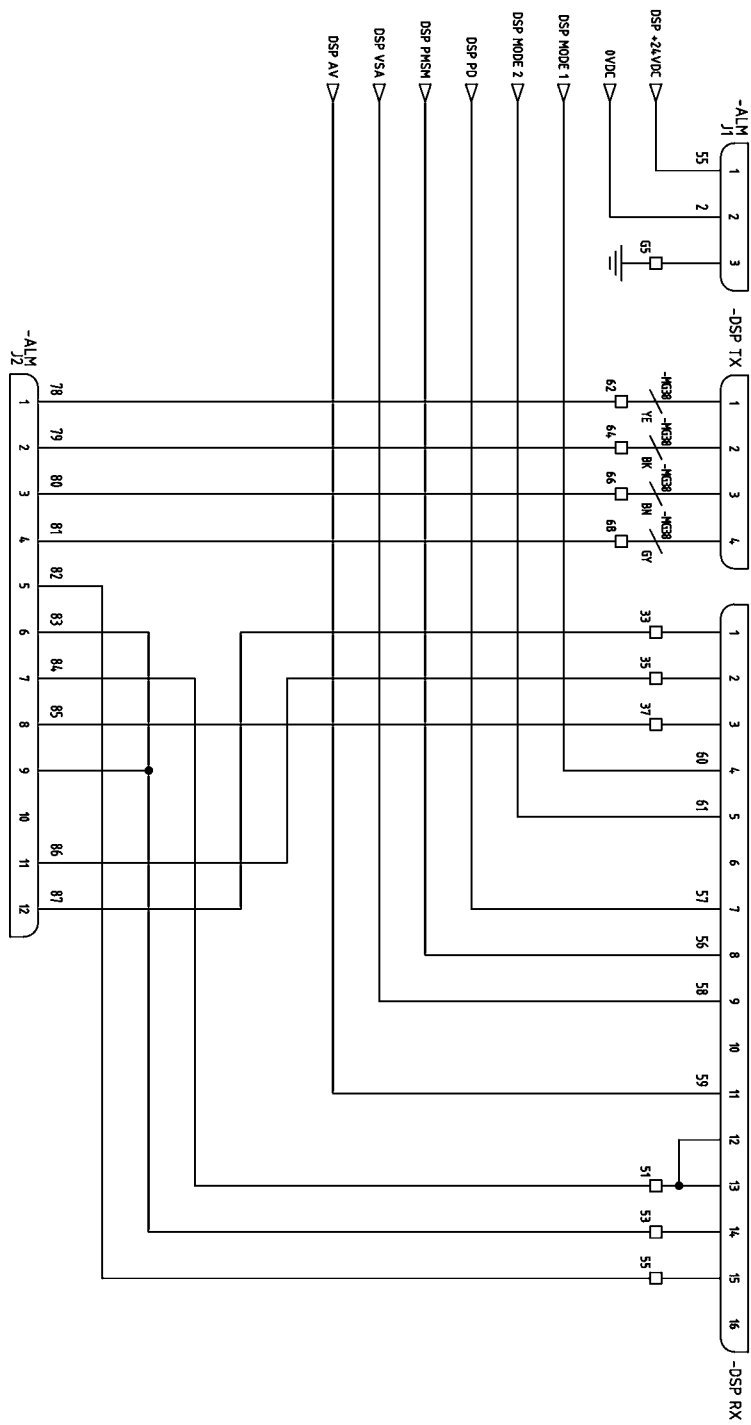






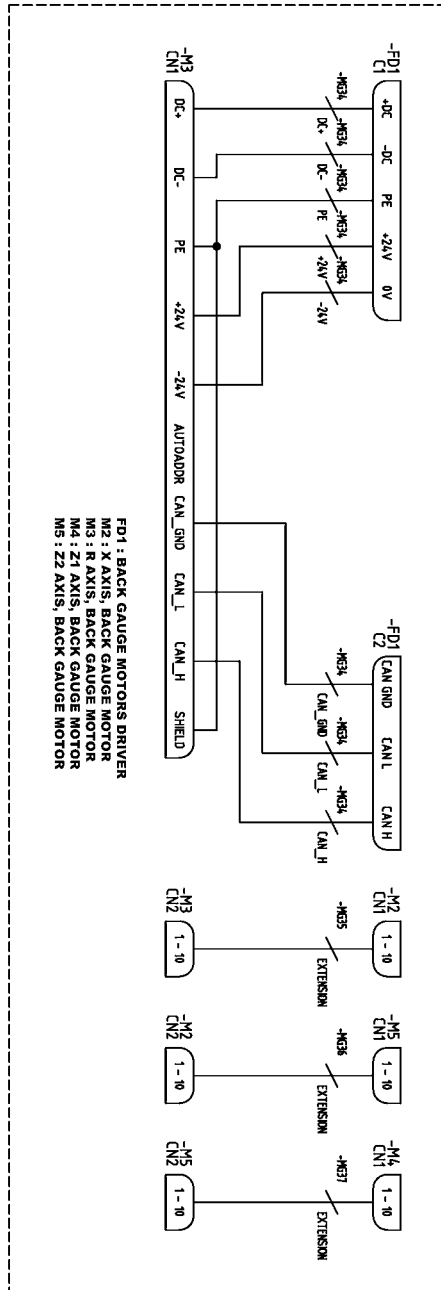




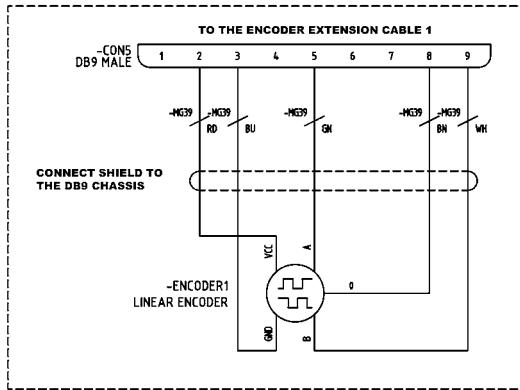


ALM : DSP LASER AL MODULE
 DSP TX : DSP LASER TRANSMITTER
 DSP RX : DSP LASER RECEIVER

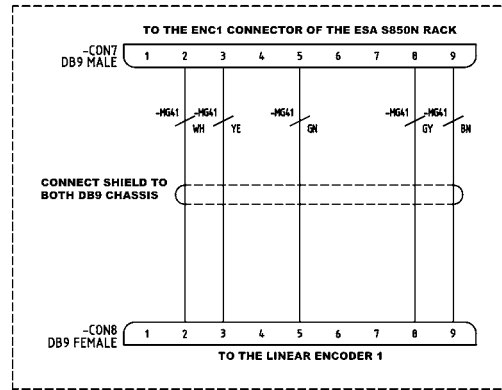
BACK GAUGE CONNECTIONS



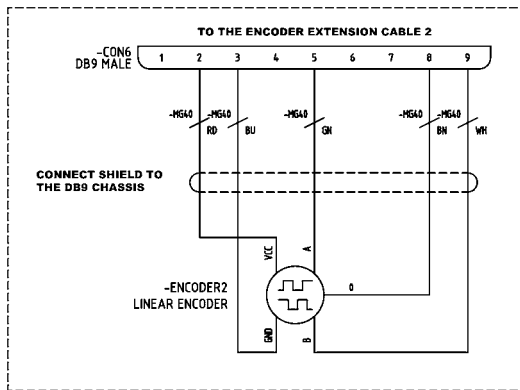
LINEAR ENCODER 1



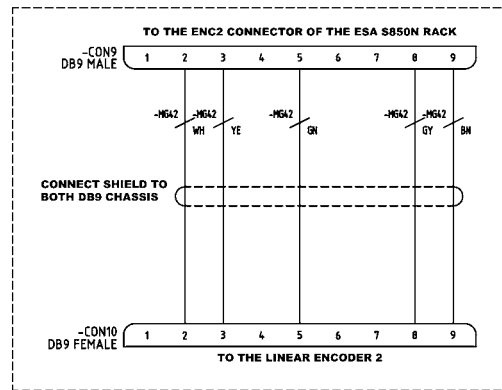
ENCODER EXTENSION CABLE 1



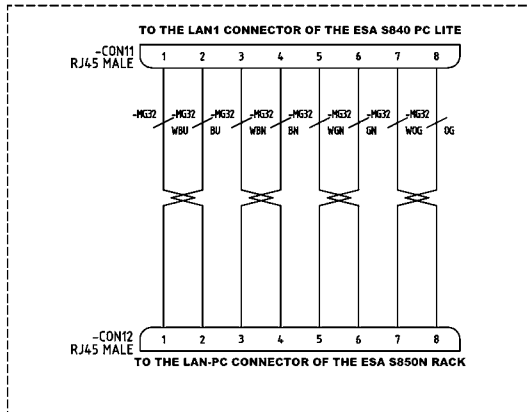
LINEAR ENCODER 2



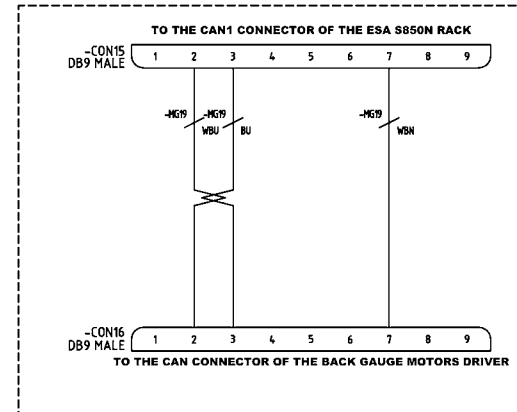
ENCODER EXTENSION CABLE 2



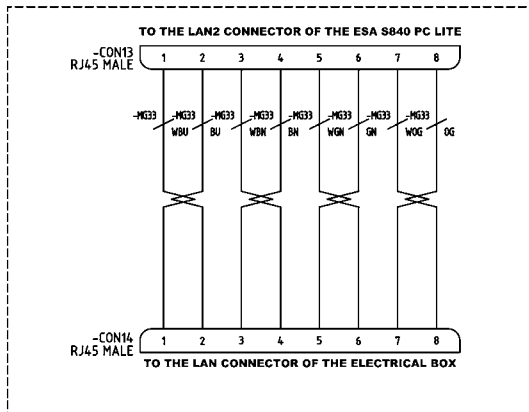
ETHERNET EXTENSION CABLE 1



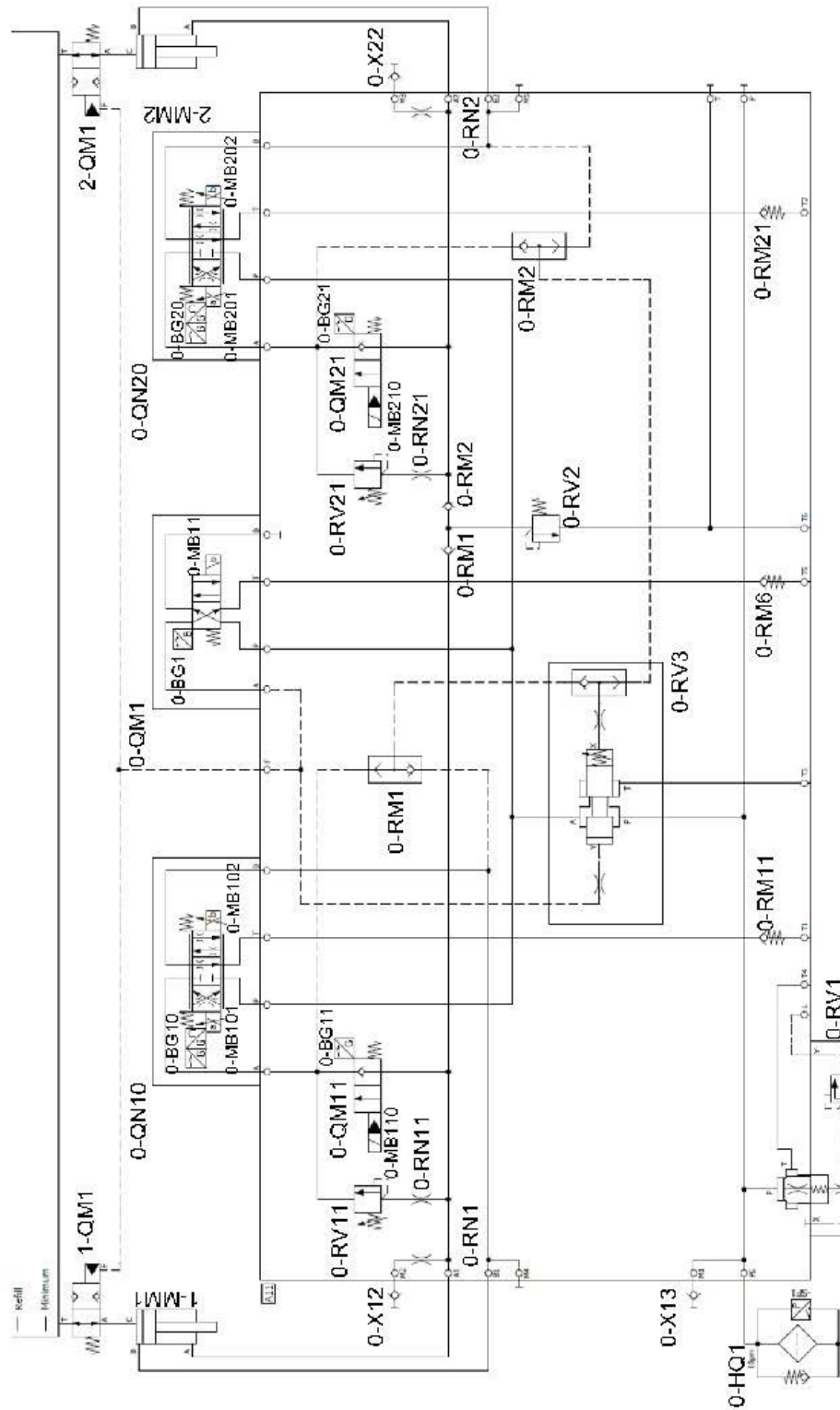
CAN BUS CABLE



ETHERNET EXTENSION CABLE 2



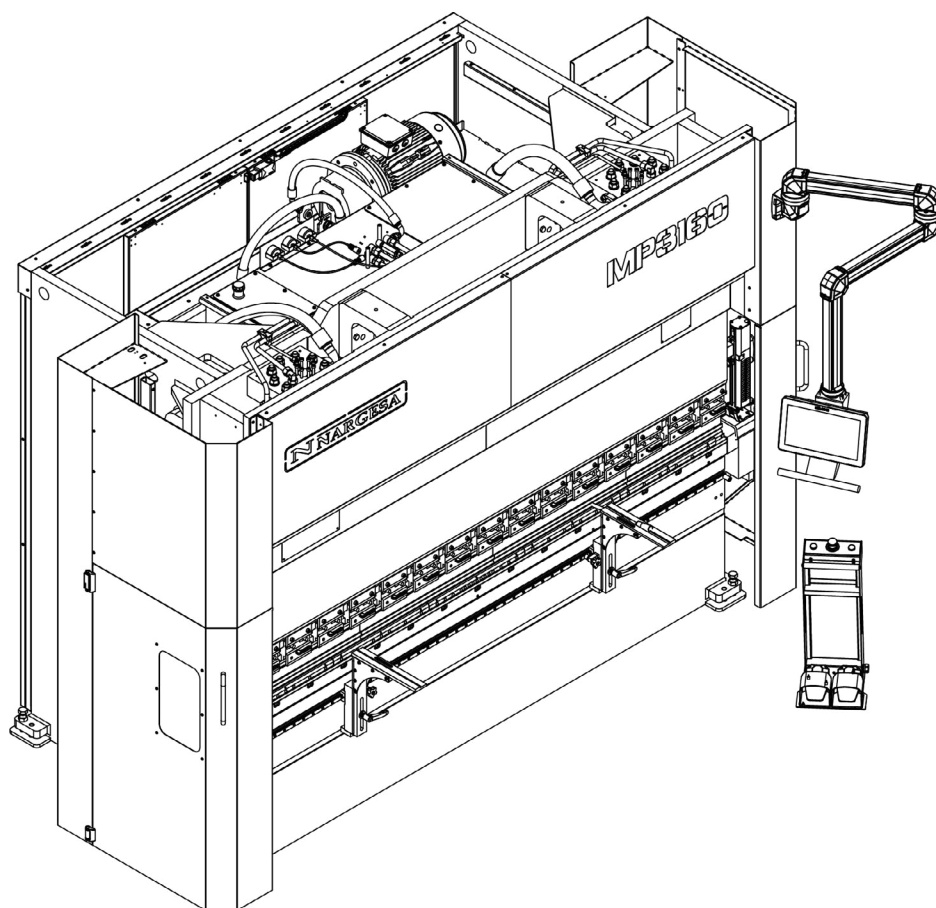
15. Hydraulic map





ANNEX 2- MP3160CNC

Software ESA S840



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Notes

General Information

The information contained in this document is only applicable to the software versions indicated on the cover page.

It may happen that not all the functions that can be performed by the product are described in this document; in this case Esautomotion is not obliged to guarantee these functions or conserve them in future versions.

Scope

The scope of this document is to help the operator if the product described on the cover page and in the installation / use of the office software.

Users

This document contains information for the:

- Machine operator with no basic computer knowledge
- Operator/technical installer with knowledge of Windows ®

Use

The document is divided into chapters that describe the most common control functions and procedures for installing the Office Software.

Reporting problems

Should any problems arise during consultation of this document please contact Esautomotion.

Explanation of the symbols

There may be graphic symbols alongside the text. These are used to highlight particularly relevant information.



Attention: This symbol is used when failure to observe the appropriate precautions could cause slight damage to property or injury to persons.



Danger: This symbol is used when failure to observe the appropriate precautions or the performing of incorrect manoeuvres could cause serious damage to property or injury to persons.



Important: This symbol is used in the document to indicate the presence of particularly important information. It means that it is essential to read and fully understand this section of the document.



Optional: This symbol is used to indicate sections of the document that describe functions or components that are only optional. The use of optional functions must be agreed upon with the machine manufacturer



Manufacturer: This symbol is used to indicate sections of the document reserved for the machine manufacturer.



Passwords: This symbol is used to indicate sections of the document that describe functions with access controlled by software access passwords.



CN: This symbol is used to indicate sections of the document that describe functions that are only available with NC and not on the PC.



PC: This symbol is used to indicate sections of the document that describe functions that are only available on the PC and not with NC.

Printing conventions

To facilitate the identification of the information in this document, use is made of special printing conventions as illustrated below.

Keypad and video

The following are used:

- The names of the screen-printed keys are highlighted in **bold print** and enclosed in square brackets. If the name of the key is preceded by "Pushbutton" it refers to a pushbutton on the pushbutton panel.
- **[ENTER]**. Identifies the pushbutton bearing the word **ENTER**.
- **[+]** indicates a key + of the keypad whereas pushbutton **[+]** indicates a pushbutton + of the pushbutton panel.
- The names of the function keys are highlighted in **bold print italics** and enclosed in square brackets.
- **[Menu Plc]**. Identifies the function key with the word Menu Plc.
- References to the fields and/or messages on the video are displayed in **bold print italics**.
- The specific text that has to be entered by the user is underscored.
- If the manual indicates "enter ok" the word "ok" must be entered.
- DIRECTION or DIRECTIONAL keys is the collective name of the UP, DOWN, LEFT and RIGHT arrows.
- The pressing in sequence of sets of keys is indicated by separating the identifiers of the key to press with the character ">".
- **[Manual]** > **[START]**. Describes the pressing in sequence of the keys **[Manual]** and **[START]**.
- The simultaneous pressing of several keys together is indicated by separating the identifiers of the keys themselves with the character "+".
- **[SHIFT]** + **[à]** Describes the simultaneous pressing of the keys **[SHIFT]** and **[à]**.

Text

The following agreements are used:

- **Italics** are used to highlight specialist terms.
- **Bold print** is used to highlight particularly important words.

Glossary

CNC: The abbreviation of Computerised Numerical Control which indicates the apparatus governing the machine, that is, the electronic device via which the work cycles are programmed, the axes are moved, etc...

It corresponds to one of the devices, the operation of which is described in this manual.

SSD: Solid State Disk, also known as Flash Hard Disk, is a data saving device without any components in movement, therefore particularly suited to industrial environments.

Menu selection: To select the menu that interest you must press the button and then select the desired menu using the number:

Setting Menu programs and tools (0)

Parameter Menu Axes

Menu Configure the Machine

Diagnostics Menu

Menu User Parameter

Menu Turn Off

Menu Esc

Version Menu

Logo Menu

Monitor Menu Memory



Home



Main Menu



Black arrow Main Menu



Sub Menu



Settings



List



Program List



Punches and dies List



Save / Usb programs or tools list



Previous



Next



Hamming or Flattening or Dutch Folding bend



New bending program



Parameters selection



Manual



Automatic



Semiautomatic



Corrections



Save / Load from disk



Delete



Minimize



Exit



Off



Start



Stop



Restart



Light



Rear Door Open



Laser



Laser Mode 1



Laser Mode 2



Laser Reset



Keys for manual handling operations; on some



versions replaced by a wheel on the front panel

Touch enviroment

The new interface of the NC Kvara S 560 and S 660W born with a new interactive graphics on which every function is achieved at the touch of your finger, not only because Esautomotion Ltd. aligns well to the features most current PC environment but also want to speed up and facilitate the work of its end user.

Soft Keyboard:

Whenever you have to set programs to move data in the input fields, enter and correct data or units or to access to the drawing musk just type on the screen to edit the data directly with your finger and immediately you will see the Soft Keyboard as shown in the Figure.

The Soft Keyboard is a virtual keyboard and interactive that has all the functionality of a PC keyboard but with the advantage that being in touch environment, allows the user to have the keyboard directly on the screen so without losing the visual changes and / or entries made to their work, thus speeding up all the useful operations.

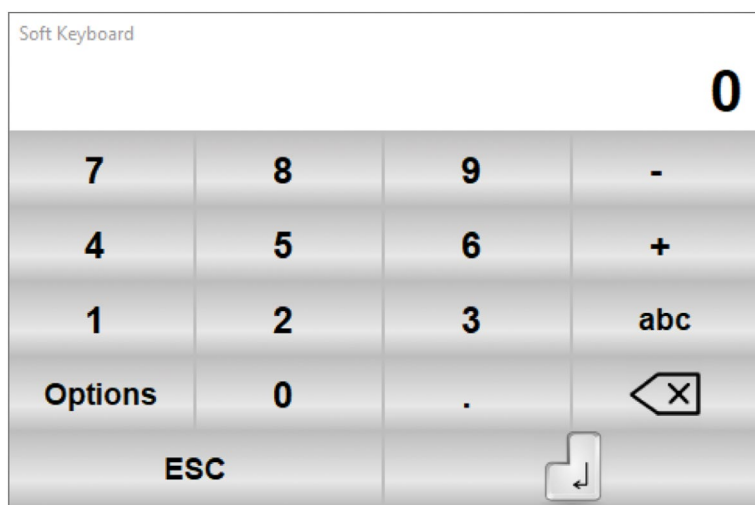


Figure a - Soft Keyboard Numbers

The  key means Delete

The  key means Confirm - ENTER

When you confirm a given inserted, the Soft Keyboard normally closes.

- By pressing "Option" you can select the "pincushion" to keep the keyboard always on in the foreground, even after confirming the entered data:

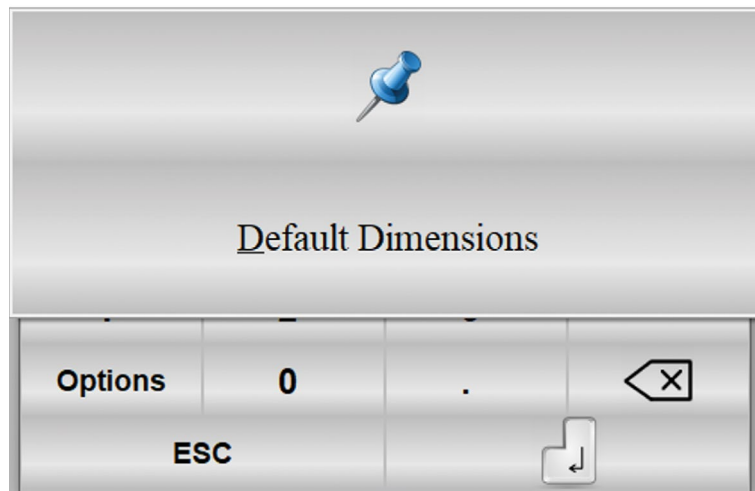


Figure b - Soft Keyboard the "pincushion"

- pressing "Default Dimensions" the keyboard is resized to a standard size.

- pressing "abc" will appear in the literary characters to nominate programs and tools chosen:

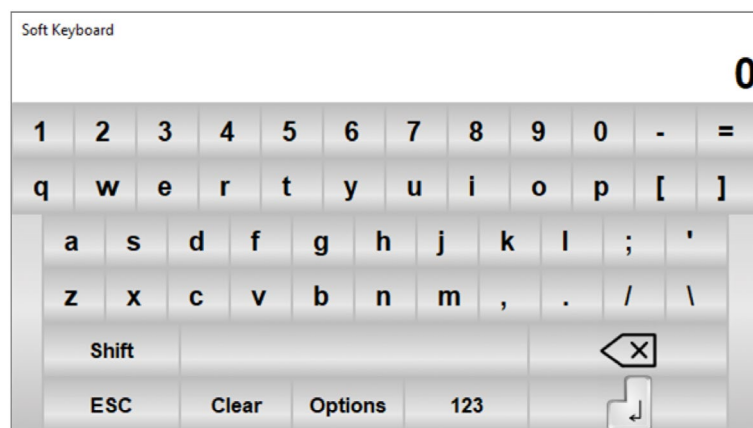


Figure c - Soft Keyboard the literary characters

Characteristics of Document

Limitations

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Any changes to this document (in either electronic or printed form), even if authorised, shall invalidate the warranties specified hereunder.

Warranties

It is possible for the product to offer types of performance not described in this document. Esautomotion does not undertake to conserve these functions in the new versions of the product or to guarantee assistance for the same. It has been verified that the contents of this document comply with the product described. Nevertheless, there may be some discrepancies. As a result, Esautomotion cannot guarantee full compliance and completeness of the contents.

The information contained in this document is revised from time to time and when necessary, a new version is issued.

This document has been drafted in partial compliance with the ANSI/IEEE standard 1063-1987 "IEEE Standard for software User Documentation".

Editions

This document is subject to changes without notice. The changes may entail a re-edition or a revision of the document.

The re-edition implies complete replacement of the document.

The revision entails the replacement/addition/elimination of pages of the document.

The bottom of every page is identified by the document code.

Notes

MS-Windows® brand registered by Microsoft Corporation.

1. NC Powering

1.1. Home Page

After turning on the Numerical Control, the first available page is the Home page.



Figure 1 - Home Page

From any other page, pressing the  icon, you can enter on the Home page.
From this page it's possible to:

- Enter in Settings pressing 
- Enter enter in Manual, pressing 
- to enter in Semiautomatic, pressing 
- to enter in Automatic pressing 
- to minimize the application, pressing 
- to exit from the application, pressing 
- to realize a new program of bend, pressing 
- to select one of the lists (Program, Punches, Dies), pressing 
- to select one of the parameters pages, pressing 
- to turn off the Numerical Control, pressing 

2. MACHINE SETUP

Operations to carry out after powering



It's **obligatory** to size the Ram to access the automatic phase and execute a work program.

Sizing of the stop axes is **optional**. It is advisable to size them if there are doubts about the correctness of the current stop axes targets. The current targets may not be correct if an axis is moved manually when the numeric control is off.

2.1. Ram Sizing

Comply with the following procedure to size the ram:

- Press 

- If the ram is up, press the **down pedal** to move it down below the zero marks

- Press the **up pedal**; this operation will activate manual re-ascent if the machine has been reset.

The ram will move upwards until it meets both the zero marks of the optic lines of the two cylinders where sizing takes place. It will now be possible to execute a program in automatic mode.

To repeat the resetting procedure without turning off the NC:

- Press **[Repeat Sizing]**;

- Press the re-ascent pedal.

2.2. Sizing the stop axes

To calibrate the axes of the stop it is necessary to follow the steps below:

- Press 

- Press 

The stop axes move towards the sizing limit switch. Once the limit switch has been touched, they will reverse their direction and, after having released the limit switch, they will size to the first zero mark of the encoder.

3. PUNCHES AND DIES SETUP

3.1. Punches and Dies List

Comply with the following procedure to access the tools list:

- Press  to display the list of punches or list of dies

- If the list of dies appears, press again  to display the punches, or vice versa.

The following window will appear in the case of punches:

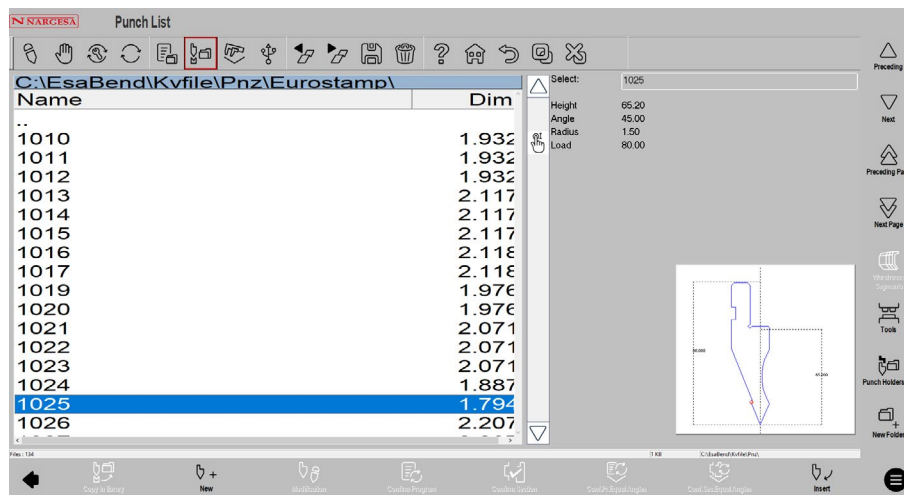


Figure 2. Punches List

The window on the left is the list window.

In the center there are the data of the punch to which the cursor has set (in the list).

The window on the right gives a preview of the punch to which the cursor has set.

The following window will appear in the case of dies:

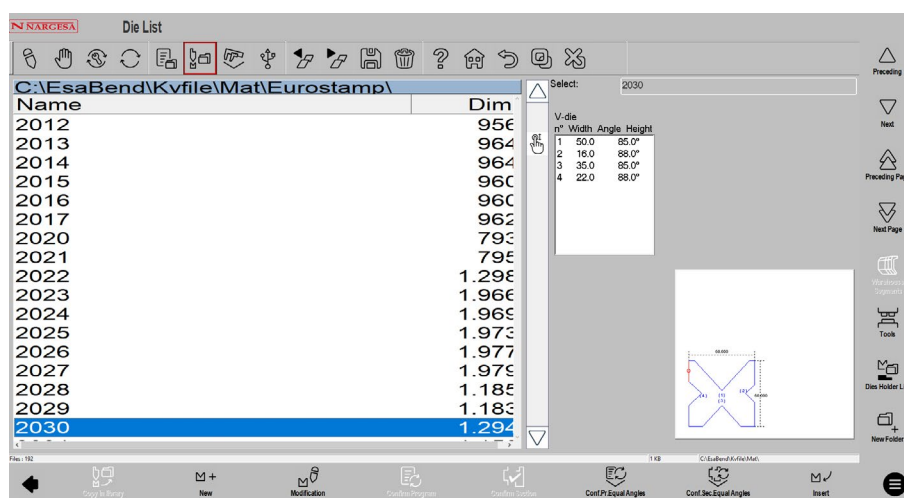


Figure 3. Dies List

The window on the left is the list window.

The central boxes give the data of the die to which the cursor has set (in the list).

The window on the right gives a preview of the die to which the cursor has set.

When the available tools are many, for fast choice, is enough to flow the wheel visualized on the panel, with own touch.

The function keys have the following meanings:

-  + to completely draw the punch or  + to completely draw the die
-  + to use a type 1 preset punch or  + to draw a preset die
-  + to use a type 2 preset punch
-  + to use a type 3 preset punch
-  + to use a type 4 preset punch (round punch).
-  ↶ to insert the punch or  ↶ to insert the die in the work program or in the selected bend

How to display the preview

Allows you to display the tool preview (to make it easier to identify). The preview function is normally enabled, but can be disabled if not required. Comply with the procedure below:

- Press the  to display the list of punches or list of dies
- Select the **Preview**  item
- Select the preview item is disabled

Repeat the operation to re-enable the item again.

How to copy a punch or die

This allows you to create a copy of a tool with another name so that it can then be modified. Move to the tool you wish to copy and then comply with the procedure below:

- Press the  key to access the menu
- Select the **Copy**  item
- This accesses a window where the tool name must be entered.

After the name has been entered, move to the **[Confirm]** button and press **[OK]**

How to rename a punch or die

Allows you to change the name of a tool. Move to the tool you wish to rename and comply with the procedure below:

- Press the  key to access the menu
- Select the **Rename**  item
- This accesses a window where the new tool name must be entered.

After the name has been entered, move to the **[Confirm]** button and press **[OK]**

How to erase a punch or die

Allows you to eliminate a tool. Move to the tool you wish to eliminate and comply with the procedure below:

- Press the  key
- Press **[Yes]**
- the selected tool will be erased.

Save all tools on USB

Allows you to save all the tools on USB so that they can then be transferred to another numeric control (useful when backup copies must be created). Comply with the procedure below:

- Insert into the USB port a USB device formatted with enough space to hold the tools.
- Press the  key to access the menu
- Select the **Save Tools**  item
- All the tools (dies and punches) will be saved on USB.

Erase all tools

Used to erase all the tools. Comply with the procedure below:

- Press the  key to access the menu
- Select the **Delete Tools**  item

All the tools will be Deleted (confirmation is requested for each tool).

Tools list on USB device

Used to display the list of tools USB device. The possible operations are the same as the tool list, then you can copy, rename, delete all tools present on the USB device. Select the list punches and dies and perform the following steps:

- Insert into the USB port a device containing tools (created by VIS 600 or VIS 800 cnc's series)

- Press the  key

- The list of punches or dies on USB will be displayed

- Proceed with the required operation.

How to save all tools from USB to NC

Allows you to save the tools from floppy disk to NC, so that they can be downloaded from another numeric control. Comply with the following procedure:

- insert into the USB port a device containing tools (created by VIS 600 or VIS 800 cnc's series)

- Press the  key

- Press the  key to access the menu

- Select the **Save Tools**  menu

- All the tools (dies and punches) will be saved from USB to NC.

3.1.1. How to enter a new punch

Comply with the following procedure to enter a new punch:

- Press the   key ; the list of punches or list of dies will appear
- If you see the list dies press again the   key;

Select the desired type of punch. The punch can either be completely drawn or three types of preset punches with fixed measurements can be used. These measurements are varied in order to rescale and re-design the punch.

The following types of preset punch are available:

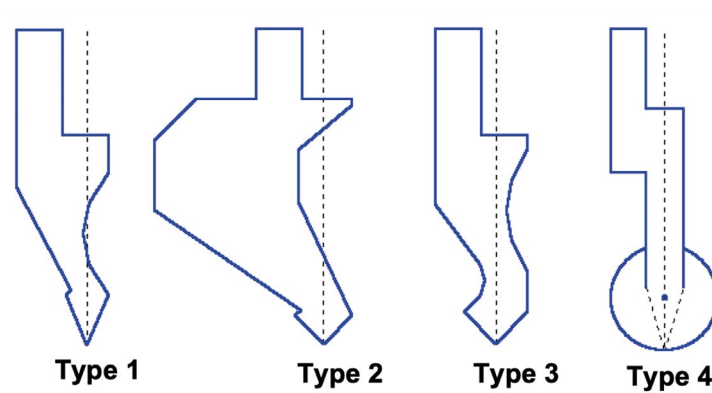


Figure 4. Types of preset punch

It is advisable to use preset punches if the punch to be entered is similar to one of the proposed types (taken from the catalogues), since the drawing will be less difficult.

The punch must be completely drawn if it is not within the preset punch categories.

Note

Remember that the punch drawing is used to make anti-collision checks for the graphically designed work pieces, while the bending depth calculation is developed according to the punch dimension data. If there are difficulties in completely drawing a punch, the problem can be obviated by using a type of preset punch and attempting to adapt it to the real shape as much as possible by means of the pre-defined data.

Press:

-  + to completely design the punch
-  + to use a preset punch type 1;
-  + to use a preset punch type 2;
-  + to use a preset punch type 3.
-  + to use a type 4 preset punch (round punch).

A window will be opened requesting entry of the punch dimensions:

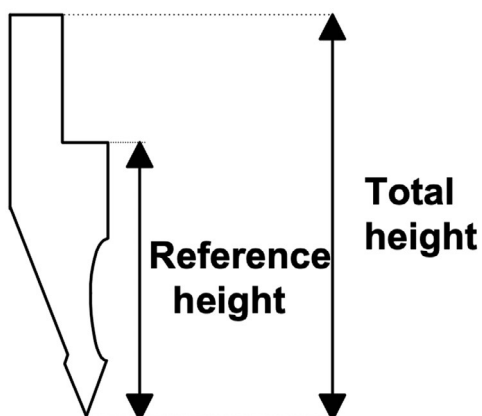


Figure 5. Punch dimensions

Enter the Total Height and the Reference Height as indicated in the figure and select **OK**.

Access to the drawing page

Access the drawing page once the punch dimensions have been entered and the type of punch selected. The drawing page changes, depending on the type of punch selected.

3.1.2. Punches to draw

The punches to draw page is obtained by means of the drawing function (see relative chapter in the operator manual)

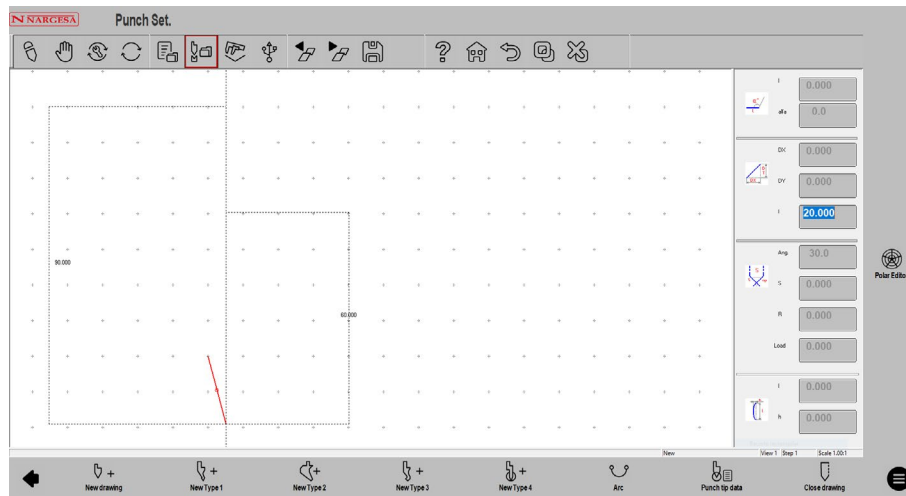


Figure 6. Punch drawing page

The left-hand window is the drawing window.

The four right-hand windows are drawing data entry windows and respectively represent:

- The polar drawing data
- The Cartesian drawing data
- The vertex drawing data
- The arc drawing data

Drawing conventions

The punch must be drawn in an anticlockwise direction, remembering that the stop is on the right-hand side of the punch itself.

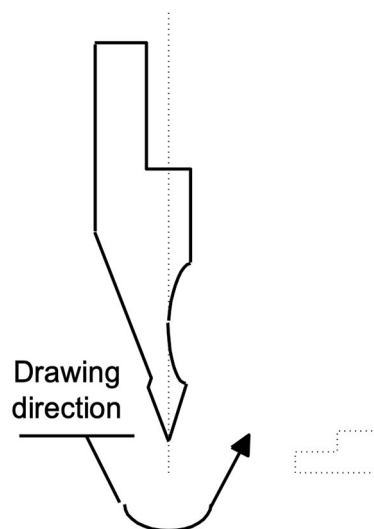


Figure 7. Punch drawing direction

Vertex entry

The tip must be defined in order to use the punch drawing. When the drawing is commenced, the marked line represents one of the two sides of the tip. Proceed in the following way to define the tip:

- Enter the length l (section l);
- Press **[ENTER]**;
- Enter the tip angle (ang. angle);
- Press **[ENTER]**;
- Enter the chamfer, if present (S data item)
- Press **[ENTER]**;
- Enter the tip radius (R data item);
- Press **[ENTER]**;
- Enter the punch load (maximum tons for meter);
- Press **[ENTER]**.

The tip will be drawn and the next section will be automatically drawn with the same length as entered in section "l".

How to do the drawing

Supposing that the following punch must be drawn:

The cursor is in section l of the data entry window of the drawn tip data:

- Enter the tip data as previously described
- Enter the length of the second side of the tip (section l1)
- Press **[ENTER]**; the cursor will set to the **alfa** Field where the angle is entered in relation to the next section
- Press on the display to move to the design, using own touch (touch environment)
- Press **[ENTER]**; the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field 1 where the length of the section is entered
- Press **[Arc]**;
- Enter the length corresponding to section l2 in Field 1
- Enter the depth corresponding to section p1 in Field h
- Press **[ENTER]**.
- Enter the length corresponding to section l3 in Field 1
- Press **[ENTER]**. The cursor will move to the **alfa** Field where the angle is entered in relation to the next section
- Enter value 90.0 in the **alfa** field
- Press **[ENTER]**; the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field 1 where the section length can be entered. The punch drawing will form by continuing to alternatively enter the lengths and angles. The more the entered measurements and angles correspond to reality, the more the drawing will be correct. Figure 8 Example of a punch to be drawn.

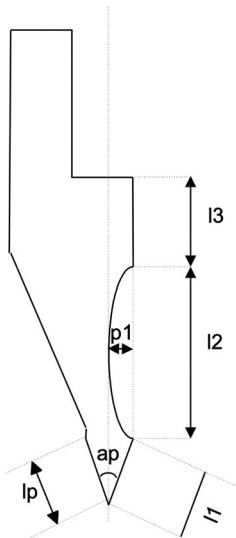


Figure 8. Punch drawing example

Graphic helps

In relation to sections whose measurements may cause difficulties, the operator can use graphic helps allowing the angle value to be varied by $\pm 1^\circ$ and the length to be varied by $\pm 1\text{mm}$ each time. This achieves a visual correspondence between the drawing and the real punch. To enable this feature, only valid for settings punches:

- Press the key to access the menu

- Select the **Dynamic** item

The angle value is increased by 1° by pressing the down arrow of an external keyboard and is diminished by one degree at a time by pressing the up arrow. The length value is increased by pressing the right arrow and decreased by pressing the left arrow.

Drawing curved sections

As shown in the example, the drawing function can be used to draw curved sections. Press the item and the cursor will move to the arc data entry window.

Enter length l and depth h of the arc and the curve corresponding to the entered data will be automatically plotted.

Entered data correction

Incorrect entries may be made during drawing entry. Correct these entries and move amongst the various drawn

- Sections by means of the and keys and by modifying the values of the fields.
- Use the key to switch to the immediately previous entry Field and then alternatively pass to a section entry Field and an angle entry Field (alfa)
- The key immediately passes to the next section and, thus, always to the section entry Field (l)
- Press **[ENTER]** to pass to the immediately following entry Field and to then alternatively pass to a section entry Field (l) and an angle entry Field (alfa), or tap on the desired field.

Error correction

A very frequent error (particularly if the arrows are used to enter the angles) is that of forgetting to press [ENTER] after having entered an angle. At this point, the length of the section will be entered in the angle entry field, thus creating an error in the drawing.

- Use the  key to move back to the angle entry field and re-enter the correct value.

Saving the drawing

At the end of the drawing, press the  key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.1.3. Preset punches

The preset punch page is presented in the form of a pre-drawn punch along with a series of data that characterize the shape of that punch

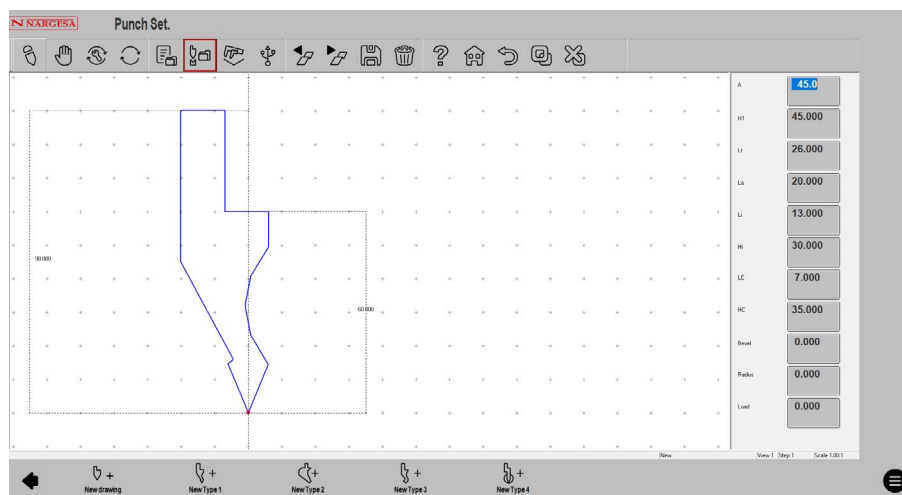


Figure 9. Preset Punch

When the data are scrolled with the **[ENTER]** key or selected with a touch, an indication will appear on the drawing as to which measurement corresponds to the selected data item.

By modifying any one of the values and pressing **[ENTER]**, the drawing will be re-plotted by taking the modified value into account.

Saving the drawing

At the end of the drawing, press the  key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.2. How to enter a new die

Comply with the following procedure to enter a new die:

- Press  to display the list of punches or list of dies
- If the list of punches appears, press the  key again.
- Select the required type of die. The die can be completely drawn or the default die with fixed dimensions can be used. These measurements can be varied in order to rescale and de-design the die:

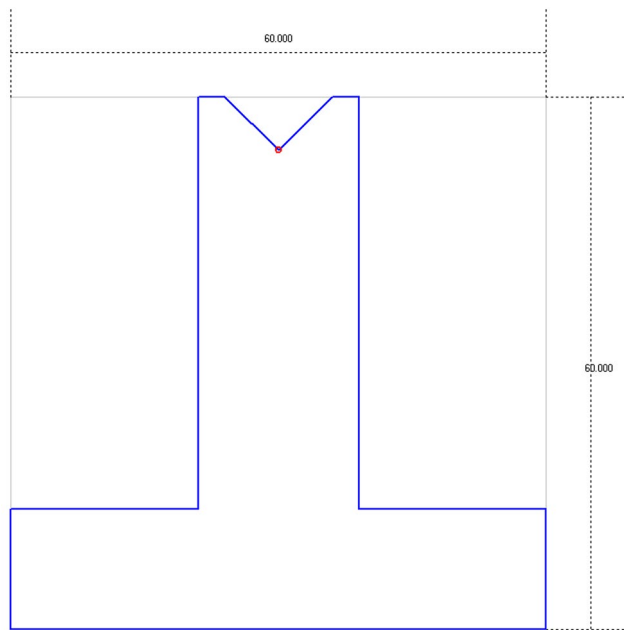


Figure 10. Available types of preset die

It is advisable to use preset dies if the die to be entered is similar to one of the proposed types (both square and overturned T dies can be drawn), since the drawing will be less difficult.

The die must be completely drawn if it is not within the preset die categories, if a die with several V-dies must be drawn or if square or pressing V-die must be used.

Note:

Remember that the die drawing is used to make anti-collision checks for the graphically designed work pieces, while the bending depth calculation is developed according to the die dimension data. If there are difficulties in completely drawing a die, the problem can be obviated by using a type of preset die and attempting to adapt it to the real shape as much as possible by means of the pre-defined data:

Press:

-  to completely design the die;
-  to use the data of the preset die.

A window will be opened requesting entry of the die dimensions:

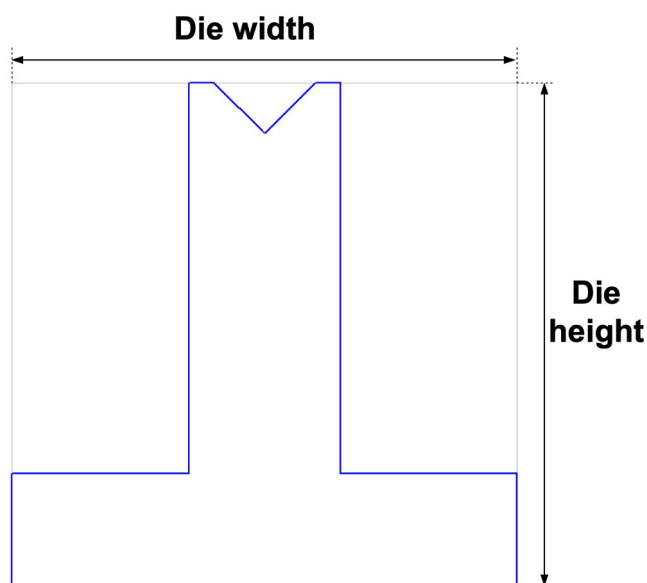


Figure 11. Die dimensions

Enter the die height and width as indicated in Figure 11

Access to the drawing page

Access the drawing page once the die dimensions have been entered and the type of die selected. The drawing page changes, depending on the type of die selected:

Tap on the **[OK]** button.

3.2.1. Dies to draw

The dies to draw page is obtained by means of the drawing function (see relative chapter in the operator manual).

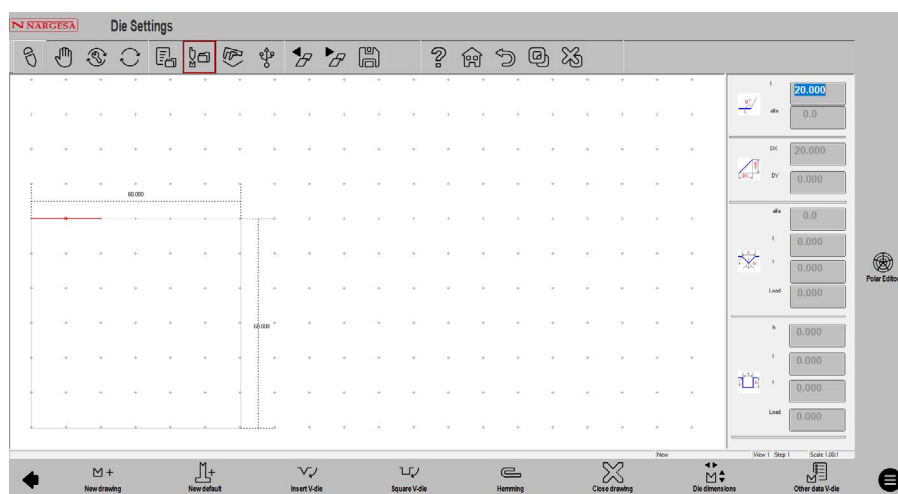


Figure 12. Die drawing page

°The left-hand window is the drawing window. The four right-hand windows are drawing data entry windows and respectively represent: 1/The polar drawing data; 2/The Cartesian drawing data; 3/The v die drawing data; 4/The square V-die drawing data.

Drawing conventions

The die must be drawn in a clockwise direction, remembering that the stop is on the right-hand side of the die itself.

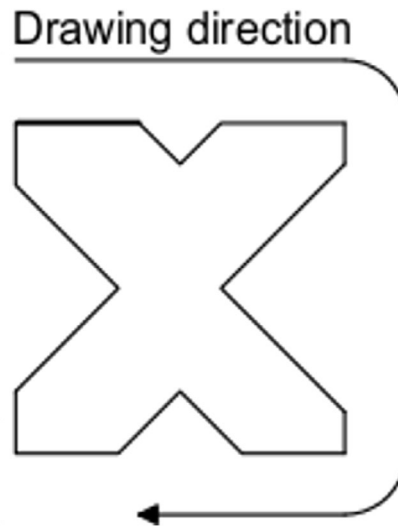


Figure 13. Die drawing direction

The marked line represents the line initially proposed in the drawing page.

How to do the drawing

Supposing that the following die must be drawn:

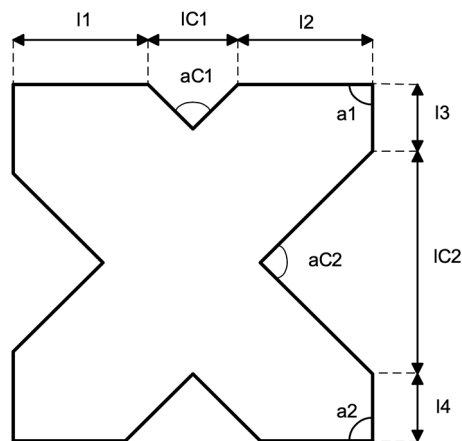


Figure 14. Example of a die to be drawn

The cursor is in Field 1 of the polar drawing data entry window:

- enter the length corresponding to section l1 in Field 1;
- press **[ENTER]**: the cursor will set to the α Field where the angle is entered in relation to the next section. Now define the first V-die of the die.

V-die entry

Comply with the following procedure:

- Press  ; the data entry window will automatically switch to the V-die data where it is necessary to:
- Enter the V-die angle (angle aC1);
- Press **[ENTER]**;
- Enter width I of the V-die (section IC1);
- Press **[ENTER]**;
- Enter radius R of the V-die.
- Press **[ENTER]**;
- Enter the V-die load (maximum tons for meter);
- Press **[ENTER]**; the V-die will be drawn and the next section automatically entered. The cursor will return to the polar data entry window;
- Enter the length corresponding to section I2 in Field I;
- Press **[ENTER]**;
- Enter the value of angle a1;
- Press **[ENTER]**; the next section will be drawn in automatic mode. The section to which the data refer will be marked, the cursor will move to Field I where the length of the section is entered;
- Enter the length corresponding to section I3 in Field I;
- Press **[ENTER]**; the cursor will move to the α Field where the angle is entered in relation to the next section.

The second V-die must now be defined:

- Press  ; the data entry window will automatically switch to the V-die data where it is necessary to:
- Enter the V-die angle (angle aC2);
- Press **[ENTER]**;
- Enter length I of the V-die (section IC2);
- Press **[ENTER]**;
- Enter V-die radius R;
- Press **[ENTER]**;
- Enter the V-die load (maximum tons for meter);
- Press **[ENTER]**; the V-die will be drawn and the next section automatically entered. The cursor will return to the polar data entry window;
- Enter the length corresponding to section I4 in Field I;
- Press **[ENTER]**;
- Enter the value of angle a2;
- Press **[ENTER]**.

The die drawing will form by continuing to alternatively enter the lengths and angles. The more the entered measurements and angles correspond to reality, the more the drawing will be correct.

Entered data correction

Incorrect entries may be made during drawing entry. Correct these entries and move amongst the various drawn

- Sections by means of the  and  keys and by modifying the values of the fields.
- Use the  key to switch to the immediately previous entry Field and then alternatively pass to a section entry Field and an angle entry Field (alfa)
- The  key immediately passes to the next section and, thus, always to the section entry Field (l)
- Press **[ENTER]** to pass to the immediately following entry Field and to then alternatively pass to a section entry Field (l) and an angle entry Field (alfa), or tap on the desired field.

Error correction

A very frequent error (particularly if the arrows are used to enter the angles) is that of forgetting to press **[ENTER]** after having entered an angle. At this point, the length of the section will be entered in the angle entry field, thus creating an error in the drawing.

- Use the  key to move back to the angle entry Field and re-enter the correct value.

Square V-die entry

The die drawing page can be used to enter square V-die. To enter one of these, carry out the following operations when on angle entry Field α of the section prior to the square V-die itself:

- Press .

This accesses the square V-die data entry window.

- Enter the depth of the square V-die;
- Press **[ENTER]**;
- Enter width l of the square V-die;
- Press **[ENTER]**;
- Enter radius R of the square V-die;
- Press **[ENTER]**;
- Enter the square V-die load (maximum tons for meter);
- Press **[ENTER]**; the square V-die will be drawn with the newly entered data. The cursor will return to the polar data description window in order to describe the next die section.

Square V-die conventions

If a square V-die has been entered, the minimum bend angle that can be made is the angle corresponding to a square V-die of the entered width and depth.

Hemming V-die entry

The die drawing page can be used to enter an Hemming V-die. To define one of these, it is necessary to indicate which are the sections that determine die closing by their movement and then draw a section squashed on both sides.

- Draw the profile of the open die with the nook of the part to be squashed;
- Draw the profile of the open die with the recess of the flattening part;
- Set the cursor to the section to be defined (vertical section);
- Press .

- The section defined as the flattening part will appear hatched on the drawing.
- The following figure shows an example of an hemming die.

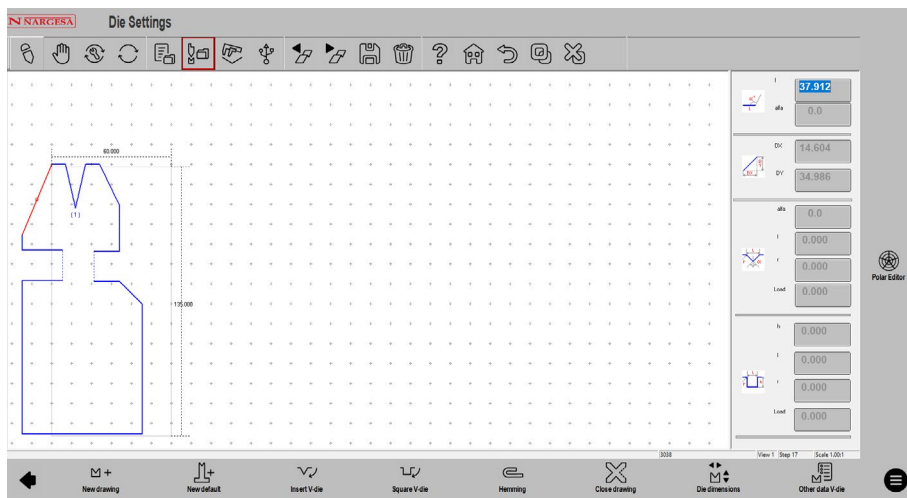


Figure 15. Drawing of the flattening die

How to enter hemming pneumatic V-die

The die drawing page can be used to enter hemming pneumatic V-dies.

To define one, two squash 0.001 mm length sections must be indicated on both sides of the die.

- Draw the profile of the open die with the recess of the flattening part, but enter 0.001 mm for this section (as though the die were closed);
- Move the cursor to the section to be defined for hemming;
- Press
- The section defined as the flattening part will appear hatched in the drawing (even though it will be difficult to see);
- Once the die has been drawn, press and digitize 1 in the **Pneumatic** field;
- Tap on the **[OK]** button;
- From this moment onwards, function 2 will be automatically enabled on the hamming bends.

When the bend is hamming with the pneumatic die, this latter will open and will then drop in the fast mode with the ram. The tools could touch each other in the fast mode (something to be avoided). The flattening opening target must be set in the general parameters if, during bend flattening, the ram must change speed (switch to the slow mode) first (at a higher target) (consult the machine parameters manual).

Entry of the pneumatic flattening die support

A new method for handling the pneumatic die support is available from version 13.2 onwards. If the press has a pneumatic flattening die support in his basement, the relative data can be entered in the General Parameters Configuration page (refer to the machine parameters manual). Once the data have been entered, flattened bends can also be obtained in the graphic mode using standard dies without having to draw particular dies with bending-flattening functions.

Saving the drawing

At the end of the drawing, press the key to memorize it. Enter the name of the punch in the window that appears. After the name has been entered, move to the **[Confirm]** button and press **[OK]**.

Tolerated name characters

The entered name can be formed by a combination of numbers and letters (e.g. the code of the punch in the catalogue can be used).

3.2.2. Default dies

The default die page is presented in the form of a pre-drawn die along with a series of data that characterize the shape of that die.

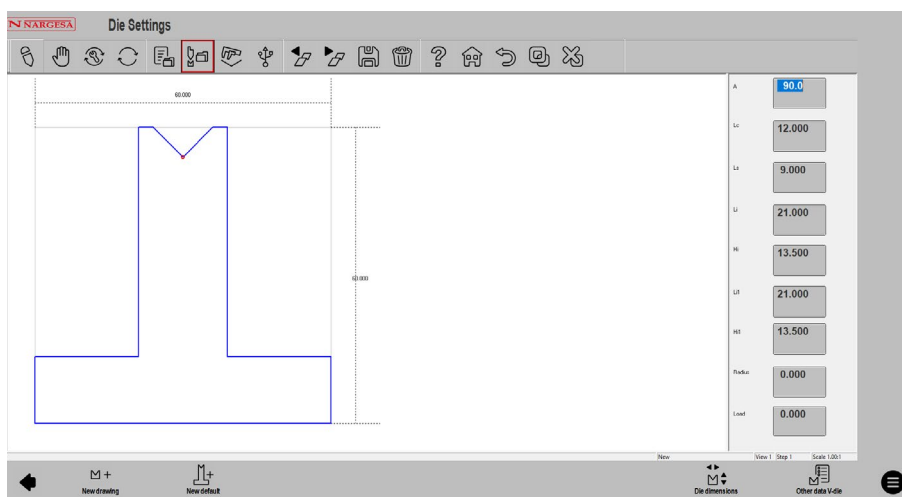


Figure 16. Preset die

When the data are scrolled with the [ENTER] key or selected with a tap, an indication will appear on the drawing as to which measurement corresponds to the selected data item.

By modifying any one of the values and pressing [ENTER], the drawing will be re-plotted by taking the modified value into account.

Saving the drawing

At the end of the drawing, press the  key to memorize it.

Enter the name of the die in the window that appears.

After the name has been entered, move or tap to [OK].

4. PROGRAMMING

4.1. List of programs

To enter the list of programs it is necessary to follow the steps below:

- Press 

- The following window will appear:

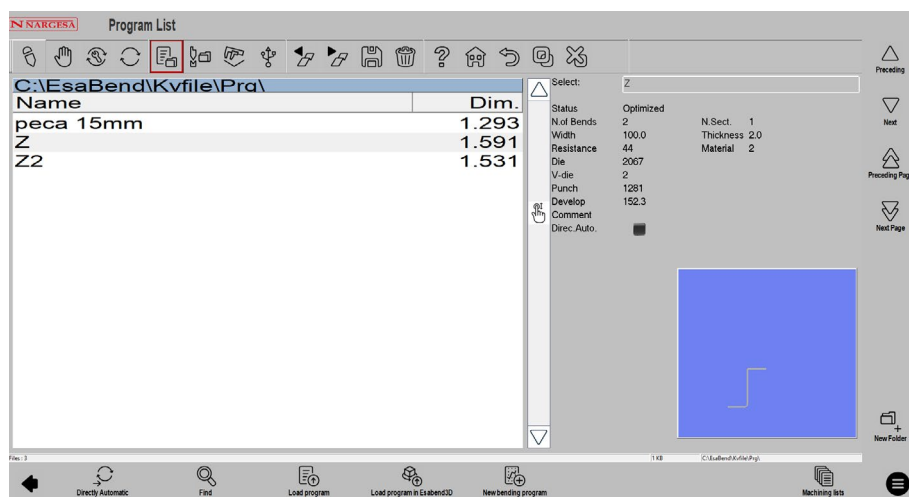


Figure 17. List of programs

The window on the left is the list window.

The top center part of the window contains the program data on which the cursor is positioned (on the list).

The window on the right down shows a preview of the drawing if the program selected is graphic.

To scroll down the programs available on the list just use your finger on the scrollbar. Are also available the following functions to move in the list:

-  to select the preceding program
-  to select the next program
-  to select the preceding page
-  to select the next page

The others function keys displayed have the following meanings:

 by pressing and enabling this function, a symbol (small red square) will appear on the right of the words **DirectAuto** to remind the use of the type of selection and method if entering in automatic.

In fact, with this selection, when choosing a program on the list instead of going to the  [Editor] page, it is possible to carry out the program by going directly into Automatic mode.

-  to find a program in the list window
-  to load the program in Automatic mode
-  to load the program in Esabend3D.
-  to set a new numeric or graphic program
-  to select a machining list
-  to select a machining list

How to view the Preview

This allows you to see the preview of the program (if the program is graphic). The preview is normally enabled but if desired you can also disable it by following the steps below:

- press the  key to open the menu.
- select the item **Preview** 
- the window preview window will be disabled.
- to re-enable it just repeat the steps above.

How to copy a program

This allows you to create a copy of a program with another name so that you can change it. Move onto the program you wish to copy and follow the steps below:

- press the  key to open the menu.
- select the item **Copy** 
- a window will open in which it will be necessary to enter the name of the program.
- after entering the name press [OK].

Renaming a program

This allows you to change the name of program. Move onto the program you wish to rename and follow the steps below:

- press the  key to open the menu.
- select the item **Rename** 
- a window will open in which it will be necessary to enter the new name of the program.
- after entering the name press [OK].

Saving a program

This allows you to save a program on the USB device in order to then transfer it to another control (also useful for creating backup copies). Move onto the program you wish to save and follow the steps below:

- press the  key.
- the program selected will be saved on the USB device.

Deleting a program

This allows you to delete a program. Move onto the device you wish to delete and follow the steps below:

- Press the  key .
- after press the [YES] key.
- the selected program will be deleted.

Saving all the programs on the USB device

This allows you to save the programs on the USB device in order to then transfer them to another control (this also allows you to create backup copies). Follow the steps below:

Insert the formatted USB device with sufficient space for containing the programs into the USB port:

- press the  key to open the menu.
- select the item **Save Programs** 
- All the programs will be saved on the USB device

Deleting all the programs

This allows you to delete all the programs. Follow the steps below:

- press the  key to open the menu.
- select the item **Delete Programs** 
- All the programs will be deleted (you will be asked to confirm).

Program list on the USB device

This allows you to view the program list on the USB device. The possible operations are the same as for the tool list therefore it is possible to copy, rename and delete all the tools present on the USB device. Select the program list and follow the steps below:

Insert the USB device containing the programs (generated for example by kvara S 560 Touch or S 660W) into the USB port.

- press the  key
- the program list on the USB device will be displayed.
- carry out the desired operation.

Saving a program from a USB device to NC

This allows you to save a program on NC from a USB device in order to be able to download it from another control. Move onto the program you wish to save and follow the steps below:

- press the  key.
- the program selected will be saved from the USB device to NC.

Saving a program from a USB device to NC

This allows you to save the programs on NC from a USB device in order to be able to download them from another control. Follow the steps below:

- insert a USB device containing the programs (generated for example by kvara S 560 Touch or S 660W) into the USB port.
- press the  key
- the program list on the USB device will be displayed.
- press the  key to open the menu.
- select the item **Save Programs** 
- all the programs will be saved from the USB device to NC.

Changing the work unit

This operation can be performed in the following sequence:

- press  to open the Program List
- press the  key to open the menu.
- press Backup unit  and [OK] after have select it:

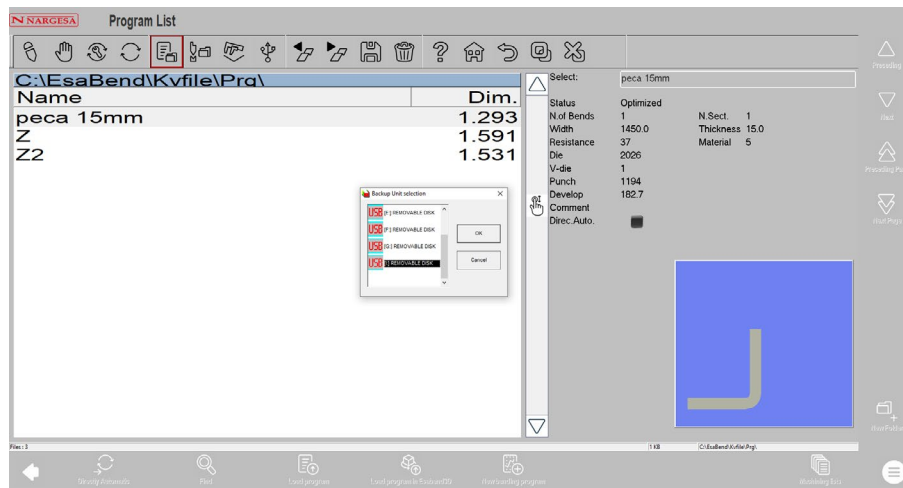


Figure 18. View of the operation for changing the work unit.

4.2. Entering a numeric program

To enter a new numeric program it's necessary to:

- press  and the Home page will open:



Figure 19. Home page

On this page it's chosen **New bending program** pressing .

Setting the piece data

A window will open for entering the program data. Please note that the touch mode provides the scroll :

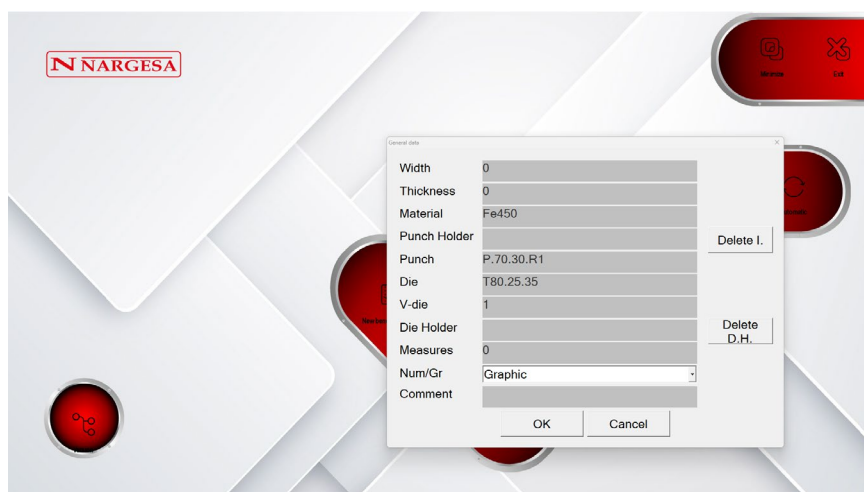


Figure 20. Page for setting the program data

- enter the punch that will be used for the bend (the punch must already have been drawn) in mind that, thanks to the new product functions this is a rapid operation. In fact, by clicking or touching the parameter to be entered, the Punch List will immediately open, afterwards , select the desired row with a double touch.
- enter the die that will be used for the bend (the die must already have been drawn).

After selecting in the editor program, the punch and die selected from the lists will appear.

- enter the **V-die** of the die that will be used for the bend (a die may have several V-dies; in the case in which it only has one, enter 1).
- enter the **width** of the metal sheet to be bent.
- enter the **thickness** of the metal sheet to be bent.
- enter the **material** (resistance) to be bent bearing in mind that, thanks to the new product functions this is a rapid operation. In fact, by clicking or touching the parameter to be entered, the Materials Table will immediately open containing all the values entered; afterwards, select the desired row with a double touch:

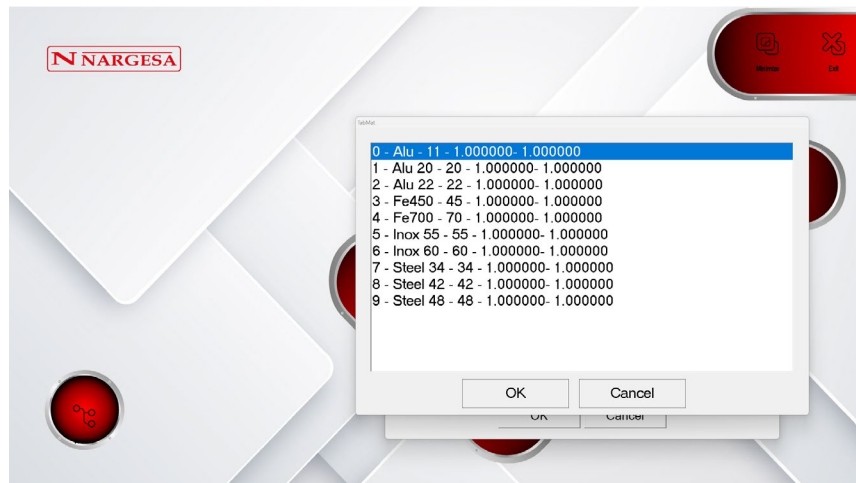


Figure 21. Page for setting the material

After selecting material appears in what is described in the NAME field of the table material.

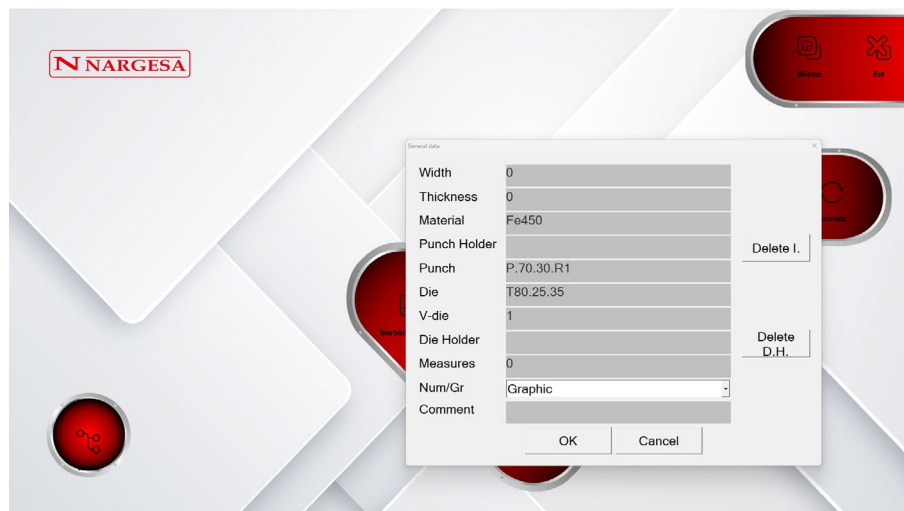


Figure 22. Page with added material

- Set specifying that the program is numeric in the field Num/Gr

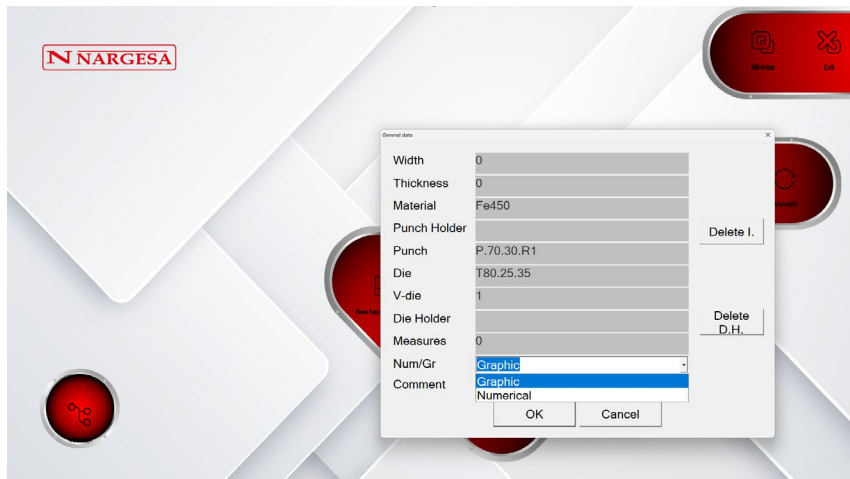


Figure 23. Numeric program setting

To accept the data, to press [OK], allowing the direct access the Settings page.

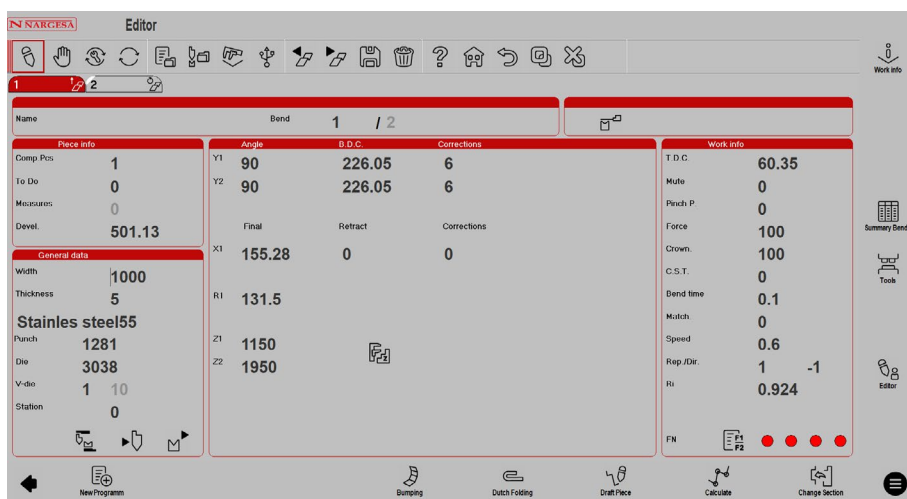


Figure 24. Numeric program Settings page

Setting the bends

The cursor now moves into the fields for setting the bend.

Set for each bend:

- The desired bend angle in the **Y1 angle** field.
- The desired bend length in the **Field Final X1** field.

All the other data relating to the bend will be calculated automatically but they can still be changed by the user.

Work info

This allows you to view the data relating to the absolute **T.D.C**, **Mute** and **Pinch point** of that bend, move onto the desired bend and follow the steps below:

- press  **Work info**
- a window will appear which contains the work info datas.
- for exit just press [OK].

Copying a bend

To copy a bend, move onto the bend you wish to copy and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Copy step**; the bend will be copied in the cnc memory waiting to be pasted.

Cutting a bend

To cut a bend, move onto the bend you wish to cut and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Cut step**; the bend will be cutted and copied in the cnc memory waiting to be pasted.

Entering a bend

To enter a new bend in a section, move onto the bend after the one you wish to enter and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **insert step**; the bend will be inserted before the one you moved onto.

Entering a copied or cutted bend

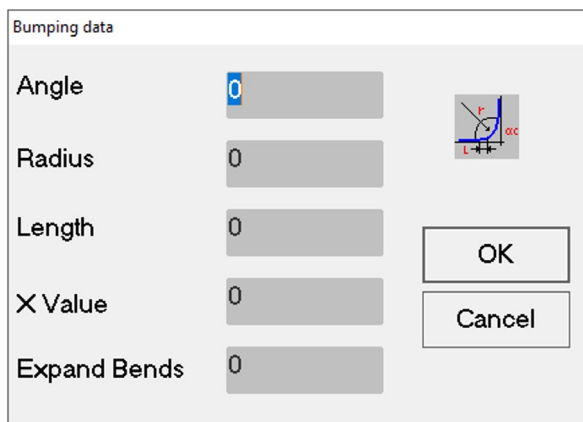
To enter a bend instead of one already present in the section or of one just entered using the  **insert step** function, move onto the bend and follow the steps below:

- press the  key to open the menu.
- press  **Edit**
- select the item  **Paste step**; the bend before copied with the item  **Copy step** or  **Cut step** will be entered instead you were positioned on.

Defining a bumping a radius

For entering the datas to define a bumping a radius bend follow this steps:

- from the  [Editor] page select the item  [Bumping]; a window will open to enter the bumping data:



The 'Bumping data' dialog box contains the following fields and controls:

- Angle:** Input field with '0' entered.
- Radius:** Input field with '0' entered.
- Length:** Input field with '0' entered.
- X Value:** Input field with '0' entered.
- Expand Bends:** Input field with '0' entered.
- OK** and **Cancel** buttons.
- Diagram:** A small schematic showing a bend with radius 'R', angle 'α', and length 'L'.

- enter the desired bumping angle in the **Angle** field.
- enter the bumping radius in the **Radius** field.
- enter the length of the bumping pitch in the **Length** field.
- enter the initial position of the X back gauges in the **X Value** field.
- enter 1 in the **Expand Bends** field in order to create all the program with singles bends, it means without repeat the same bend more than one time.
- press [OK], the bumping pitch calculated will be automatically entered on the Bend program.
- the bends created will assume the following tab : 

Correcting a bumping a radius

Whenever a bumping is carried out it is unlikely that you will obtain a correct bend at first try: this imprecision depends on the fact that the angles that have to be bent to create the bumping a radius are opened (e.g.: 170°) and it is difficult to obtain bends with these angles. In order to obtain a correct bumping it is necessary to measure the difference between the angle of the bumping obtained and the desired angle: the difference calculated must be divided equally on all the bends.

Example

Let's suppose we have to create a bumping a radius with an angle of 90° in which is it necessary to make 15 bends equal to 170°; if the angle obtained is 112.5° we must carry out the following:

$$112.5 - 90 = 22.5^\circ \text{ (difference between the real and the theoretical angles)}$$

$$22.5 / 15 = 1.5^\circ \text{ (correction to be applied for each bend)}$$

We must apply a correction of 1.5° in the bumping pitch which will be repeated 15 times.

Defining a Dutch folding bend

In the  [Editor] page of a numerical program select the item  [Dutch Folding]:

- the Dutch folding will be created setting 0 in the program angles fields.
- the bend created will assume the following tab:  

Correcting a Dutch Folding

To correct a dutch folding it is not possible to change the value of the angle, but it is necessary to change the numeric value present in the Field **B.D.C.** of the Y axis. Normally this sort of bend results opened, than will be necessary to decrease this value.

If it is needed a definitively solution will be necessary to:

- Select the  item [Corrections]
- press the item  [Coefficient corrections]
- the height entered in the field **Hemming** will be directly added to, or subtracted from the B.D.C. of the Y axis. This value will be linked to the machine and not to the program. To cancel the correction press the item  [Undo correct.].

Defining a coining bend

For entering the datas to define a coining bend follow this steps:

- From the  [Editor] page press the sub menu button  and select the item 
- the bend created will assume the following tab:  

Correcting a coining

To correct a coining it is necessary to change the lower dead point of the Y axis.

If the coining is too shallow it will be necessary to reduce the B.D.C.

If the coining is too deep it will be necessary to increase the B:D.C.

If it is needed a definitively solution will be necessary to:

- Select the  item [Corrections]
- press the item  [Coefficient corrections]
- the height entered in the field **Coining** will be directly added to, or subtracted from the B.D.C. of the Y axis. This value will be linked to the machine and not to the program. To cancel the correction press the item  [Undo correct.].

Defining a conical bend

This function allows for carrying out the "Conical" work after mounting special stops and configuring the X2 axis as conical. The most used solution for bending in conical is the use of an X2 axis mounted on the bar of the X1 axis (**incremental** mode). Another solution is to use two completely independent axes X1 and X2 (**absolute** mode). In addition to this special X2 axis, the stops also have a special profile to allow the clamping of the sheet (see figure 25).

The entering of the data for carrying out a bend in conical is only possible from the  [Editor] page and for entering the conical bend the X2 axis must allow for conical operation (or incremental or absolute). In this case, after entering the typical data of a normal bend, the final position of the X2 axis is calculated in "incremental" or "absolute" compared to the final position of the X1 axis. For entering the datas to define a conical bend follow this steps:

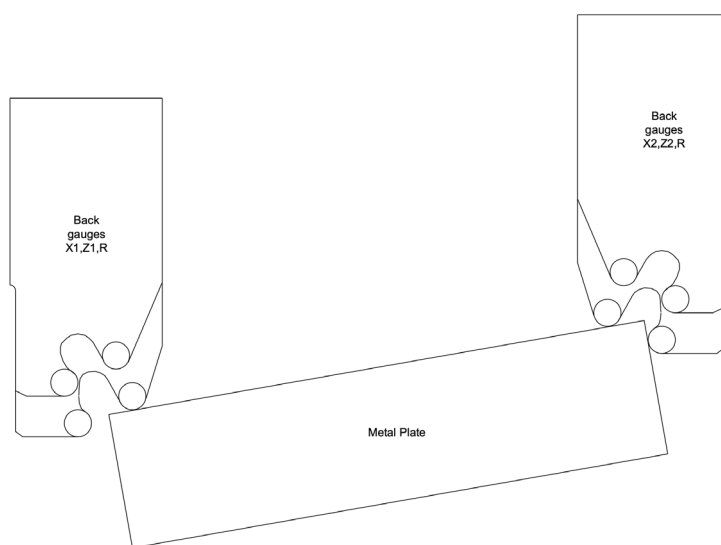
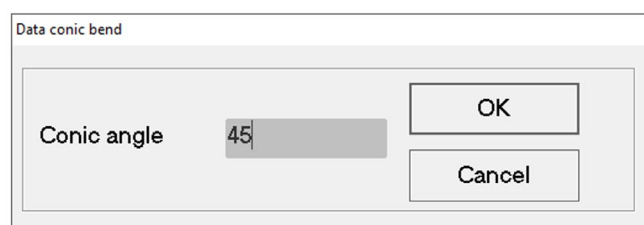


Figure 25. Example of a conical bend

- Enter the initial position of the X1 axes in the X1 Field.
- From the  [Editor] page press the sub menu button  and select the item  [Conical]
- A window will open to enter the desired conical angle: enter the desired conical angle in the Angle Field (included between -45 and 45):



- press [OK], on the  [Editor] page the heights X1, X2, Z1 and Z2 will be automatically updated.
- in the case of positive phase displacement angles, the final heights that are calculated are the X2, Z1 and Z2, for negative phase displacement angles they are the X1, Z1 and Z2.



Once a bend in conical has been generated, if you want to change the phase displacement angle or the width of the metal sheet, before re-entering in the window for entering the angle with the function  key, you must delete the bend and enter a new one; if this operation is not carried out, the heights generated by the angle set in the window will be ineffective. In the case of changes to the data of a bend (e.g. metal sheet width or thickness, etc.), the heights will not be calculated: X2, X2 Corrections and X2 Recoil. In a bend set as conical the backup function will not recalculate the correction of the heights of X2 Corrections and X2 Recoil, and therefore it is necessary to first enter the resting against/supported mode and then set the conical.

Defining a conical bumping a radius

To set a conical bumping a radius, it is necessary to move onto the first bumping bend and carry out the conical; on the first bend the heights will vary as described above, while for the bends with negative X1 will have the Z equal to the Zs of the first bumping bend. If the bumping is applied to a bend with the negative X1 nothing will be calculated.

How to make out-of-Vdie bends

In the out-of-V die bends the point of end of the bend is higher than the upper level of the die; the B.D.C. quota of the bend will be numerically higher compared to the theoretical height of clamping of the metal sheet found in the general data program.

The numeric control checks the validity of the quota of the bend and asks whether the following quotas are in a decreasing numeric order:

- Top Dead Center.
- Mute point quota (from the version 13.2 onwards it is possible to entered lower TDC than the MUTE).
- 180 quota (Pinch point).
- B.D.C. quota (Bottom Dead Center).

If the order is not complied with, it will not possible to carry out the program in automatic.

For out-of-V die bending it is necessary to:

- directly enter the value of the end of the bend in the fields **B.D.C Y1** and **B.D.C Y2** of the numeric program (the Y1 and Y2 Angle fields will be reset to zero).
- In the **Pinch point** field of the program work data, enter a value which when added to a **theoretical 180 quota** gives a higher value than the set B.D.C.s.
- In the **Mute point** field of the program work data, enter a value which when added to the **theoretical Mute variation** gives a higher value than the theoretical **180 quota + Pinch point**.
- Check that the **Top Dead Center** (T.D.C) in the steps of the program is higher than the **theoretical Mute point + Mute point**.

Example

Let's suppose we have set a program in which the:

Mute point = 132.00

180 quota = 127.00

B.D.C. calculated (at = 135 degree) = 124.72

After having checked that the desired value of the end of the bend is 142.35 we enter this value in the B.D.C Y1 and B.D.C Y2 fields.

In order to carry out this program it is necessary to:

enter 20.00 in the Pinch point Field : $127.00 + 20.00 = 147.00 > 142.35$

enter 20.00 in the Mute point field: $132.00 + 20.00 = 152.00 > 147.00$.

Check that the T.D.C point is higher than 152.00.



It is not possible to set an out of V-die bend from a graphic program.

Saving the program

At the end of the setting, press ; a window will open in which it is necessary to enter the name of the program.

After having entered the name press **[OK]**.

Save with name

It is possible save a program with a different name to the one you started off with. This may be useful if the changes made to a program must not be lost, but you wish to change the program uploaded (possibility of having various program with different corrections). Follow the steps below:

- press the  key to open the menu.
- select the item  **[Save as]**
- a window will open in which it is necessary to enter the name of the new program.
- After having entered the new name press **[OK]**.

Updating a program

If you change a tool already used in a program, it will be necessary to update the program because the heights calculated will no longer match.

To update the program, load the program from the list and follow the steps below:

- From the  [Editor] page press the  key to open the menu.
- Select the item  [Program update]; the following window will appear on the display.

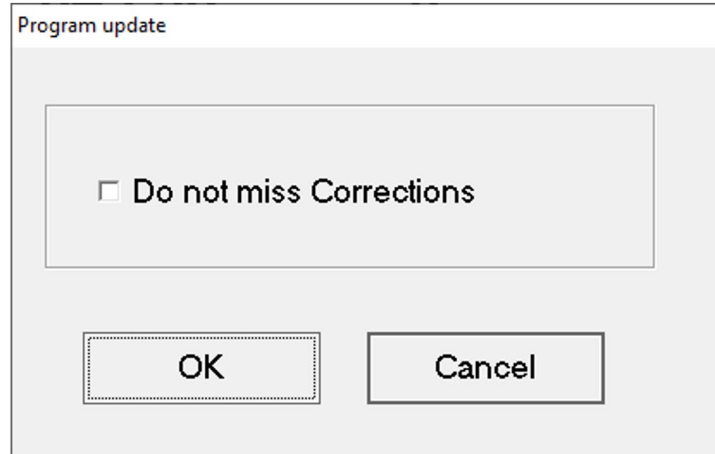


Figure 26. Updating a program

- Select OK (without check the boxes **Do not miss Corrections**).
- All the program data will be calculated.
- Save the program if necessary.

4.3. Entering a graphic program

To set a new graphic program it is necessary to follow the same procedure of setting up a numeric program of bend, but at the page for setting the program data, select "Graph" in the field Num\Gr :

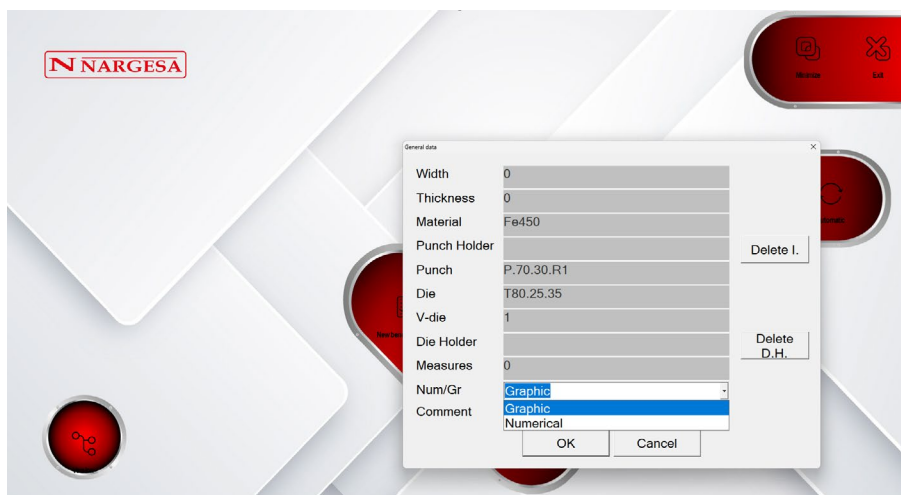


Figure 27. Graphic program setting

Setting of the general data

A window will open of entering the general data of the program.

If these data are not entered, access will not be permitted to the drawing function:

- enter the **width** of the metal sheet to be bent.
- enter the **thickness** of the metal sheet to be bent.
- enter the **Measures**: it indicates whether the user describes the piece by means of external, neutral fibre or internal measurements.
- enter the **material** (resistance) to be bent bearing in mind that, this is a rapid operation. In fact, by moving onto the parameter to be entered, the Material Table will immediately open containing all the values already entered: you can then select the desired row with a double touch.

After selecting in the editor program, besides the number, what will be described in the NAME Field of the materials table will also be displayed. See Figures 20-21 p.44/45.

- the material is calculated automatically depending on its resistance.
- enter the **punch holder** that will be used for the bend (if present)
- enter the **punch** that will be used for the bend (the punch must already have been drawn).
- enter the **die** that will be used for the bend (the die must already have been drawn).
- enter the **V-die** of the die that will be used for the bend (a die may have several V-dies; in the case in which it only has one, enter 1).
- enter the **die Holder** that will be used for the bend (if present)
- enter a **Comment** if desired.
- select [OK].

Drawing window

The drawing window will be opened:

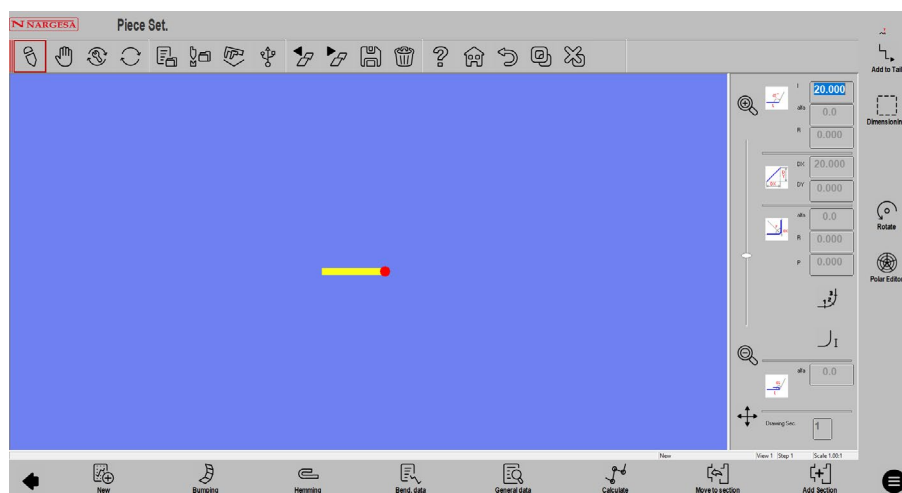


Figure 28. Drawing windows of the piece

The window on the left is the drawing window.

The four windows on the right are for entering the drawing data and they respectively represent:

- 1) the polar drawing data.
- 2) the Cartesian drawing data.
- 3) the drawing data of a bumping.
- 4) the drawing data of a dutch folding bend.

After having entered the general data and accessed the SET PIECE page, the first segment will appear in red with a length of 20.0 mm. Touch the centre of the segment with your finger and the "Soft Keyboard" will open, as in Figure 29.

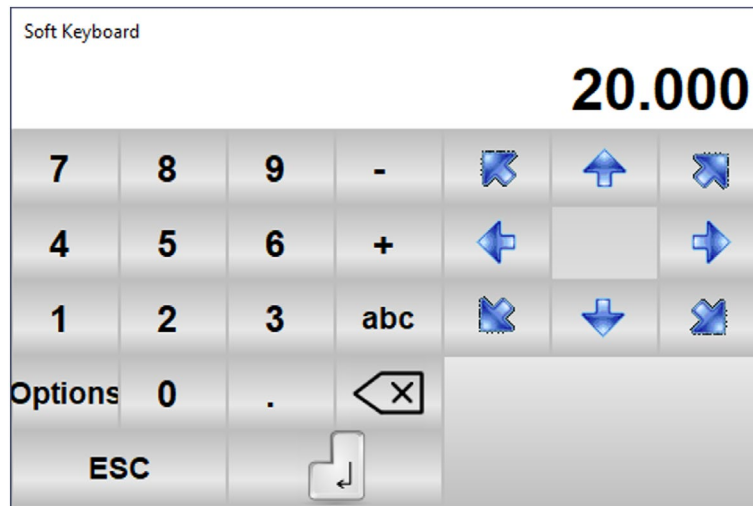


Figure 29. Soft Keyboard for setting the piece

with which you can:

- change the length of the first segment by entering a height differing from 20, and after having pressed "Confirm" (with the option enabled for always having the keyboard active in the foreground) and selecting one of the BLUE arrows on the virtual keyboard, the angles to be entered in the next bend will automatically be displayed.
- by touching one of the seven arrows starting from the right  in a clockwise direction, the next segment will be taken to 45, 90, 135, 180, -135, -90, -45.
- If the "pincushion" option of the keyboard has not been enabled, by touching the ALFA angle Field (as illustrated in Figure 32) the Soft Keyboard will reappear and allow you to enter the angle:

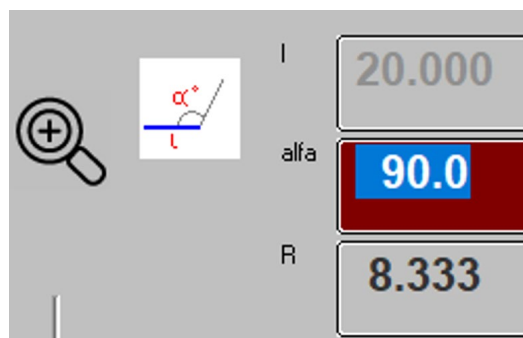


Figure 30. Portion of the part described above, viewed on the "ALFA angle field" display

- The next segment can only be entered by simply tapping the screen with your finger in the desired direction.
- Once the segment has been entered, by tapping the screen with your finger in the center of the line drawn it will be possible to enter the measurement of the desired length on the virtual keyboard.
- Also to change the angle, with your finger just press the intersection between the previous segment with the following one to make the virtual keyboard appear with the 8 blue direction arrows of the angles (obviously you can also directly write in the editing field of the virtual keyboard if preferred, or if the angle differs from one of the 8 specific angles)

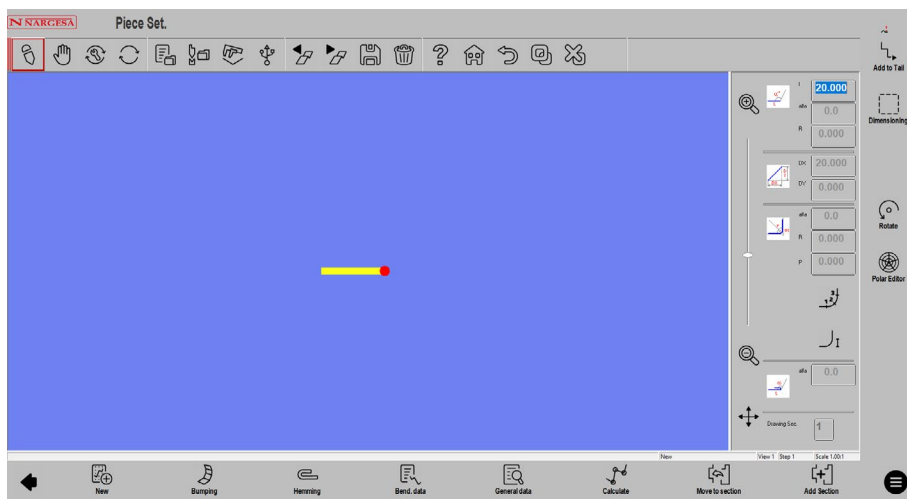


Figure 31. Intersection of the segment

The intersection between the previous segment and the next one, indicated in red, is the point to touch to change its direction and consequently also the value of the angle.

Also on the PIECE SET page:

- by touching the ZOOM bar and sliding it up and down you can intervene on the display either enlarging or reducing the view of the piece. In addition, you can hook onto it with your finger to move it to the right or left and up or down.

By pressing  [Calculate] and touching the machine drawing with your finger, you can move it to the right or left and up or down.

These two functions can also be used in the graphic viewing of the piece on the SEMIAUTOMATIC and AUTOMATIC page.

Changing the colour

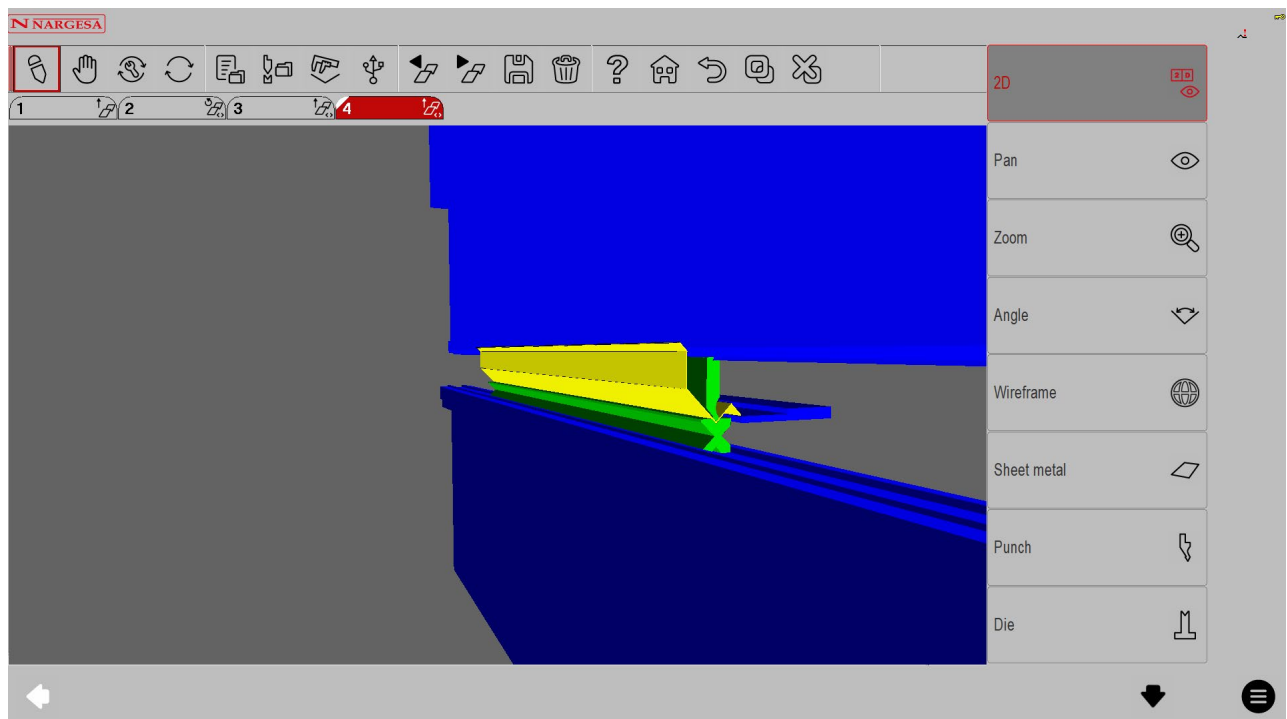
This allows you to change the colour of the background and of the piece to be bent. Follow the steps below:

- press the  key to open the menu.
- select the item  [Change color].

3D vision

This allows you to view the drawing in 3D. Follow the steps below:

- press the  key to open the menu.
- select the item  [Extrusion viewer]
- pressing the  key you can select from the following 3D views options:



- to return to the 2D view press the  key to open the menu and select [2D].

How to carry out the drawing of a piece

Let's suppose we have to draw the piece illustrated in the figure below:

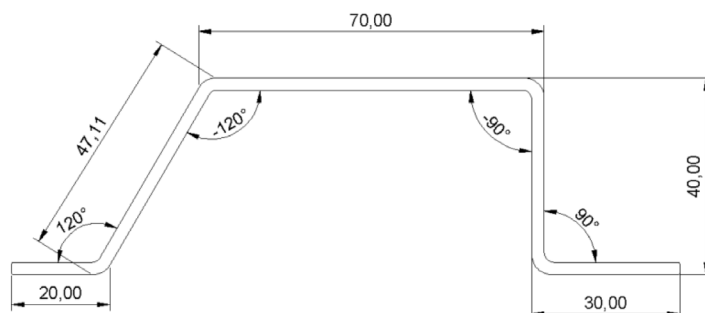


Figure 32. Example of piece to be drawn

The cursor is located in Field I of the window for the polar setting of the drawing data:

- Enter in Field I, the length corresponding to the first section of the piece to be drawn (20.0) in Field I.
- Press **[ENTER]** in the virtual keyboard.
- Enter the value of the first angle (120.0°) in Field α (value of the angle compared to the following section).
- Press **[ENTER]** the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the second section of the piece to be drawn (45.0) in Field I (length of the section).
- Press **[ENTER]**.
- Enter the value of the second angle (-120.0°) in Field α (value of the angle compared to the following section).
- Press **[ENTER]**, the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the third section of the piece to be drawn (70.0) in Field I (length of the section).
- Press **[ENTER]**.
- Enter the value of the third angle (-90.0°) in the Field α (value of the angle compared to the following section).
- Press **[ENTER]**, the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the fourth section of the piece to be drawn (20.0) in Field I.
- Press **[ENTER]**.
- Enter the value of the fourth angle (90.0°) in Field α (value of the angle compared to the following section).
- Press **[ENTER]**, the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the fifth section of the piece to be drawn (30.0) in Field I (length of the section).
- Press **[ENTER]**, the drawing has now been completed.

You could even draw the piece by touching the screen 4 times following the directions of the 3 vertices and of the last tract of the drawing:

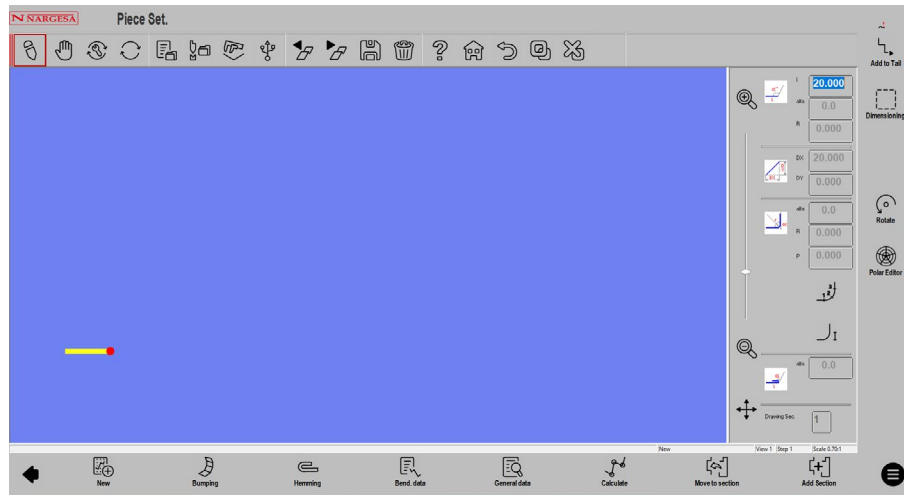


Figure 33. Drawing of the first segment

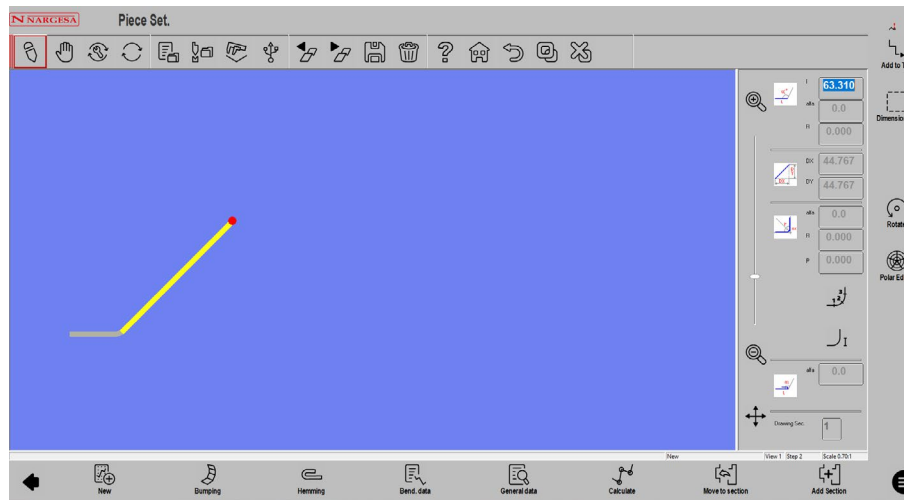


Figure 34. Drawing of the second segment

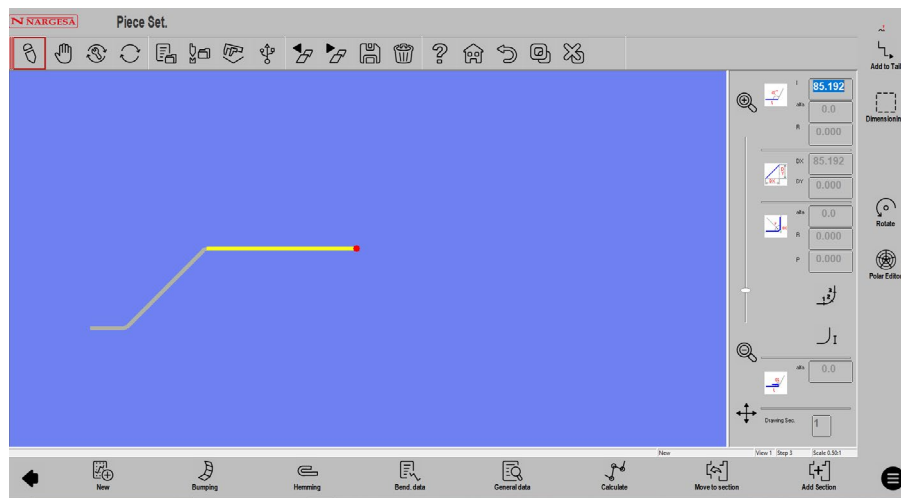


Figure 35. Drawing of the third segment

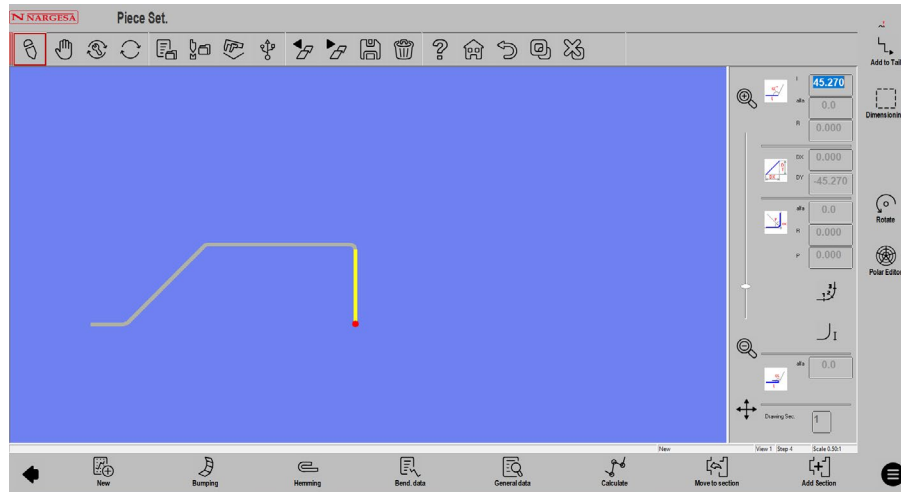


Figure 36. Drawing of the fourth segment

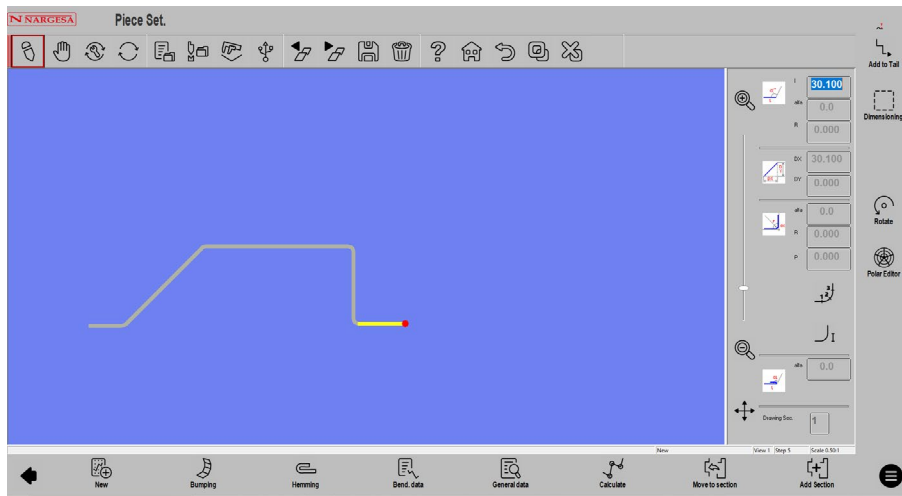


Figure 37. Drawing of the fifth segment

After have done the drawing, like explained before, you can insert the corrects measures and angles by touching the screen with your finger in the center of the lines drawn and of the vertices.

How to carry out bumping

In order to carry out a bumping it is necessary to bear in mind that as per the convention, there must be a section of metal sheet before and after the bumping.

Let's suppose we have to draw the piece illustrated in the figure below:

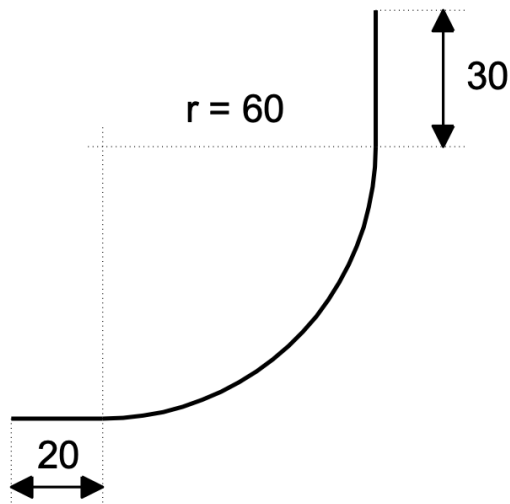


Figure 38. Example of bumping to be drawn

The cursor is located in Field I of the window for the polar setting of the drawing data:

- Enter the length corresponding to the first section of the piece to be drawn (20.0) in Field I.
- Press **[ENTER]** in the virtual keyboard.
- Press  **[Bumping]**; the window of the bumping data will open.
- Enter the desired bumping angle (90.0°) in Field "alfa".
- Press **[ENTER]**.
- Enter the radius of the bumping (60.0) in Field "R".
- Press **[ENTER]**.
- Enter the length of the bumping pitch you want to obtain in Field "P".
- Press **[ENTER]**, the next section will be drawn in automatic mode; the section that the data refer to will be highlighted.
- Enter the length corresponding to the last section to be drawn (30.0) in Field I (length of the section).
- Press **[ENTER]**, the drawing has now been completed.

How to carry out a hemming

Let's suppose we have to draw the piece illustrated in the figure:

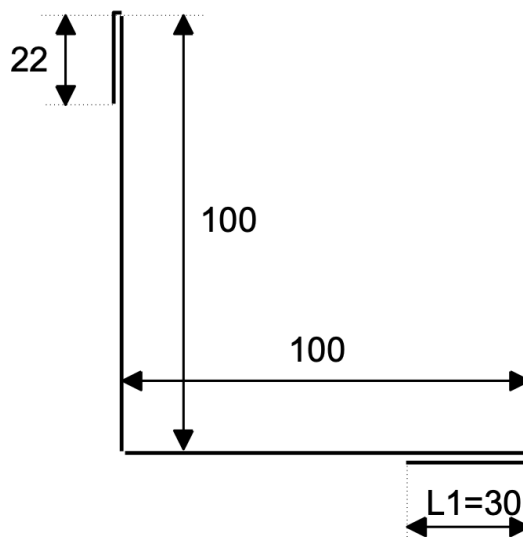


Figure 39. Example of hemming bend to be drawn

The cursor is located in Field I of the window of polar setting of the drawing data.

- Enter the length of side L1 to be hemmed (30.0) in Field I.
- Press **[ENTER]** on the virtual keyboard
- Press  **[Hemming]**.
- Enter the intermediate hamming angle (e.g.: 45.0°) in the "alfa" field.
- Press **[ENTER]**, the next section will be drawn in automatic mode; the section the data refer to will be highlighted.
- Enter the length of the current section (100.0) in Field I.
- Press **[ENTER]**, the cursor will move onto Field α for setting the angle compared to the following section.
- Enter the value of the angle (-90.0°).
- Press **[ENTER]**, the cursor will move onto Field α for setting the length of the section.
- Enter the length of the side (100.0) in Field I.
- Press **[ENTER]**.

- Press  [Hemming].
- Enter the intermediate hamming angle (e.g.: 45.0°) in the “alfa” field.
- Press [ENTER], the next section will be drawn in automatic mode; the section the data refer to will be highlighted.
- Enter the length of the last section (22.0) in Field I. The drawing has now been completed.

Saving the drawing

At the end of the setting, press the  key; a window will open in which it is necessary to enter the name of the program.

After having entered the name press [OK].

4.4. Automatic calculation of the bending sequence

It is possible to access the automatic calculation procedure from the drawing page of the piece by following the steps below:

- Press  [Calculate]

Calculation window

A window will open that shows the simulation of the piece to be bent, including the lower and upper part of the bender press, the punch, the die, the stop and the piece prior to being bent.

On the right hand side of the Automatic Sequence page there are some boxes that respectively indicate the development of the piece, the retract calculated for the bend selected, the upsettings and the rotations of the piece relating to the bending sequence found, and the enabling of the search for the bending sequence with all the solutions. The numeric control searches for the solution by always trying to leave the greatest part of the metal sheet in the operator's hands; if you change the calculation criteria pressing  it is possible to search for the sequence among all the possible solutions.

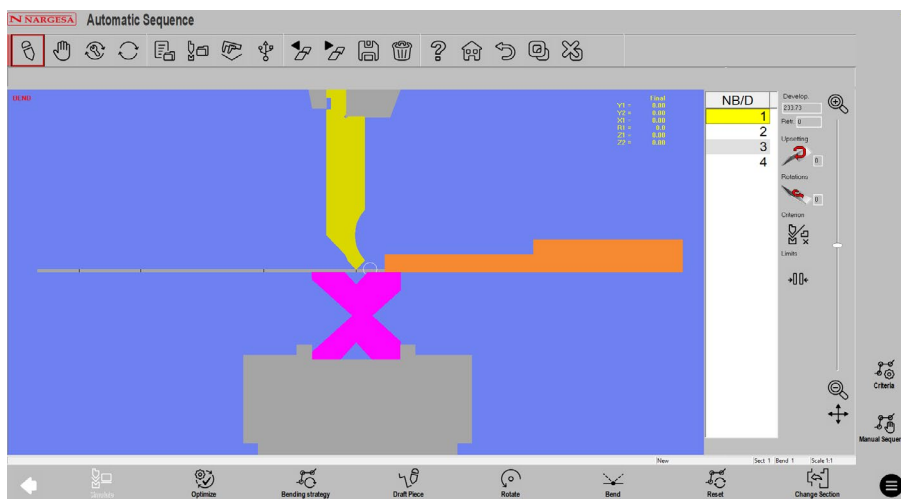


Figure 40. Calculation page of the bending sequence

It is possible to make the calculation of the bending sequence in two modes: automatic or manual.

Automatic search for the bend sequence

In the automatic search, the optimal bending sequence is established by the numeric control; by pressing  [Optimize].

Manual search for the bend sequence

In the manual search, the bending sequence is established by the operator who forces the bends.

The bending sequence can be completely or partially forced by the operator: in the case of the sequence only being partially entered, the remaining bends will be calculated automatically by the numeric control.

The operator has the possibility of shifting between the various bends by pressing the  and  keys. To force the bends it is necessary to press the  [Bend] key next to the selected bend; if you press the key next to a bend that has already been forced, that bend will be straightened.

The operator has the possibility of rotating the piece by pressing the  [Rotate] key; Press  [Optimize] when you want to force the desired bends. The numeric control finds the solution while keeping in mind the sequence forced by the operator.

Results of the optimisation

If the piece is not feasible, the control will warn the operator with a **No Solution !!** message.

In this case the operator can try to make the calculation using the criterion that carries out the search for all the solutions pressing this button  that will change in . In this way the solution found will be also the solutions which have the most part of the piece inside the machine (the solutions most dangerous for the operator fingers).

In the event that there is no possible solution, the operator can try to identify which bend makes it impossible to bend the piece from the manual search of the bend sequence; any collision of the piece with the various parts of the machine is notified by a colour change on the side of the piece that enters into collision.

In order to bend a piece even if it enters into collision (for example in the case in which the collision does not damage the sheet metal) the operator must force the entire bend sequence.

If the piece is feasible the control advises the operator with a **Solution Found** message; the operator can select the following functions in this window:

- [0 STOP]: the optimisation is stopped in order to make changes.
- [1 Continue]: a different solution to the one just found is used; if you continue to refuse to accept the solutions proposed, the numeric control will search until it comes to the end of the different solutions, and then it will display the message: **No Solution !!**.
- [2 Simulate]: the simulation of the bending of the piece is displayed; the user can continue with the bending sequence by pressing [1 Continue] or stop the simulations by pressing [0 STOP].
- [3 Confirm]: the values calculated in the solution found will be entered in the program.

Limits button

Pressing the button  [Limits] it will change in  : it means that during the optimisation of the program the minimum and maximum limits of the X and R axes are not taken into account.

Bending sequence search criteria button

Pressing the button  [Criteria] a collision tolerance edit will open : will be possible insert how many mm of piece can penetrate the tools or the machine without generating a message of **No Solution !!**. during the optimisation of the program.

Simulation

Once the solution has been accepted, it will be possible so simulate the bending sequence obtained In the optimisation window of the graphic program:

- Press the function key  [Simulate], the piece without bends, set up and ready for the first bend will be displayed.
- Press the function key  [Rest/ Support], as many times as necessary, to select the first support or the second support (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  [Continue], the piece will be displayed with the first bend already made.
- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key  [Simulate] will reappear)

Rest/ Suppor mode

Once the solution has been accepted, it will be possible so select whether to carry out a resting-against bend In the optimisation window of the graphic program:

- Press the function key  [Simulate], the piece without bends, set up and ready for the first bend will be displayed.
- Press the function key  [Rest/ Support], as many times as necessary, to select the first or second resting-against position (if available) or the supporting of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  [Continue], the piece will be displayed with the first bend already made.

- Press the function key  [Continue], the piece will be displayed with the first bend already made and in position for the second bend.
- Press the function key  [Rest/Support], as many times as necessary, to select the first supported or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- To stop the simulation press the function key  [Stop], to return to the previous step in the simulation press the function key  [Previous].
- Press the function key  [Continue], until the end of the simulation (the function key  [Simulate] will reappear)
- The function is displayed in the numeric program at the top, on the right hand side of the type of bend (see the meaning of the icon). The control automatically calculates the corrections necessary on the X and the R. The function key  [Rest/Support], in numeric mode will not work if the program is graphic. To change the resting against/supported it is necessary to enter the simulation page.

4.5. Manual calculation of the bending sequence

It is possible access the manual calculation procedure from the drawing page of the piece by following the steps below:

- Press  [Calculate]

Calculation window

A window will open that displays the simulation of the piece to be bent, including the lower and upper parts of the bender press, the punch, the die, the stop and the piece before being bent.

On the right hand side of the Automatic Sequence page there are some boxes that respectively indicate the development of the piece, the retract calculated for the bend selected, the upsettings and the rotations of the piece relating to the bending sequence found (refer to the figure in the paragraph on the Automatic calculation of the bend sequence).

Manual searching for the bend sequence

In the manual search the bending sequence is established by the 'operator by forcing the bends.

The operator has the possibility of shifting between the various bends by pressing the  and  keys.

To force the bends it is necessary to press the  [Bend] key next to the selected bend; if you press the key next to a bend that has already been forced, that bend will be straightened.

The operator has the possibility of rotating the piece by pressing the  [Rotate] key;

Press  [Optimize] when all the desired bends have been forced. The control will warn the operator with a Forced Solution message: the operator can select the following functions in this window:

- **[0 STOP]:** the optimisation is stopped in order to make changes.
- **[1 Continue]:** the bend sequence forced is rejected.
- **[2 Simulate]:** the simulation of the bending sequence is displayed; the user can continue with the bending sequence by pressing **[1 Continue]** or stop the simulations by pressing **[0 STOP]**.
- **[3 Confirm]:** the values calculated in the forced solution will be entered in the program.

Simulation

In the optimisation window of the graphic program, once the solution has been accepted, it will be possible so simulate the bending sequence obtained:

- Press the function key  **[Simulate]**, the piece without bends will be displayed, set up and ready for carrying out the first bend.
- Press the function key  **[Rest/ Support]**, as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  **[Continue]**, the piece will be displayed with the first bend already made.
- Press the function key  **[Continue]**, the piece will be displayed with the first bend already made and in position for the second bend.
- To stop the simulation press the function key  **[Stop]**, to return to the previous step in the simulation press the function key  **[Previous]**.
- Press the function key  **[Continue]**, until the end of the simulation (the function key  **[Simulate]** will reappear)

Resting against/supported

In the optimisation window of the graphic program, once the solution has been accepted, it will be possible so select the whether to carry out a supported bend:

- Press the function key  **[Simulate]**, the piece without bends will be displayed, set up and ready for carrying out the first bend.
- Press the function key  **[Rest/ Support]**, as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  **[Continue]**, the piece will be displayed with the first bend already made.
- Press the function key  **[Continue]**, the piece will be displayed with the first bend already made and in position for the second bend.

- Press the function key  **[Rest/Support]**, as many times as necessary, to select the first or second supported position (if available) or the resting-against position of the piece, obviously the stop will only move into the supported position if there are collisions and if the limit heights of the axes permit.
- Press the function key  **[Continue]**, until the end of the simulation (the function key  **[Simulate]** will reappear)
- To stop the simulation press the function key  **[Stop]**, to return to the previous step in the simulation press the function key  **[Previous]**.
- Press the function key  **[Continue]**, until the end of the simulation (the function key  **[Simulate]** will reappear)
- The function is displayed in the numeric program at the top, on the right hand side of the type of bend (see the meaning of the icon). The control automatically calculates the corrections necessary on the X and the R. The function key  **[Rest/Support]** in numeric mode will not work if the program is graphic. To change the resting against/supported mode it is necessary to enter the simulation page.

Changing the bend sequence

Once the bend sequence has been optimised, it will still be possible to change the bending sequence obtained:

The operator has the possibility of moving among the various bends by pressing the  and  keys.

To remove the bends it is necessary to press the  **[Bend]** key next to the bend selected, remove the other bend you wish to exchange, and press  **[Bend]** to select the new sequence desired on each bend removed.

4.6. How to bend a box

The numeric control does not allow to directly set the development on the flat of a box to be bent.

To be able to bend a box it is necessary to set a program with two bend sections (it doesn't matter if the program is graphic or numeric) in which to set the bends relating to the horizontal section and the bends relating to the vertical section respectively.

The two programs will be carried out one after the other, thus making it possible to create the box.



The execution of a program with several sections always starts from the section with the smallest width of the sheet metal.

How to add or delete a section

To add a section in numeric, it is necessary:

- to press the function key  **[Change Section]**
- the bend created will assume the following tab: 

Whereas to delete a section, move onto the desired section and follow the steps below:

- press the  key to open the menu.
- select the item  **[Delete Section]**; the section will be deleted and the program will move onto bend 1 of section 1.

4.7. Work data

It is possible to check the absolute TDC, Mute and Pinch point of a bend, in the following manner:

- select the item  **Work** info; a window will appear containing the absolute TDC, Mute and Pinch point.
- to exit select [OK].

4.8. Execution of a program in automatic mode

After setting a numeric program or calculating a graphic program it is possible to carry this out in automatic.

Automatic mode can be enabled by pressing the  key.

Automatic graphic page

If the program currently selected is a calculated graphic program the automatic graphic page can be viewed by pressing

 [Graphic]; this page consists of three windows:

The main window contains the drawing of the upper and lower parts of the machine, the drawing of the punch and the die entered in the program, the drawing of the piece before and after the bend, and the drawing of the stop.

The second window shows how to orient the piece for each bend (tilting or rotation of the metal sheet compared to the previous bend).

The third window contains the data of the bend in progress and the piece counter.

The final and actual axes positions are shown in yellow.

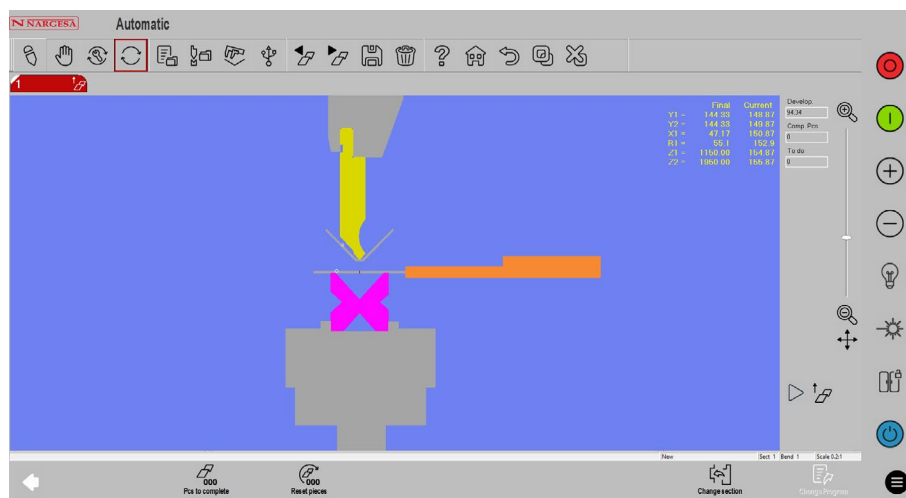


Figure 41. Automatic graphic page

Automatic graphic page

If the program currently selected is numeric, added to the numeric setting data there will also be the actual positions of the axes; it is not possible to change the program data in automatic mode.

The page also shows how to orient the piece for each bend (tilting or rotation of the metal sheet compared to the previous bend).

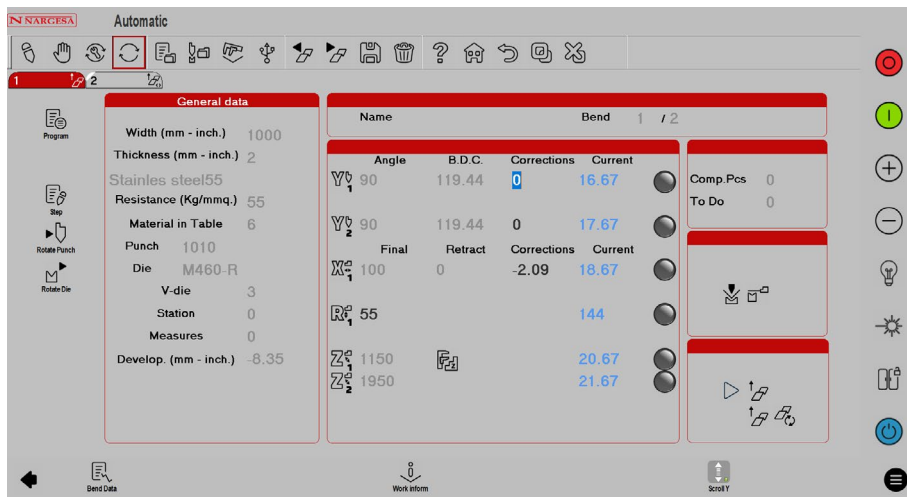


Figure 42. Automatic numeric page

- To see this visualization press  for more than 3 seconds.
- To return to the standard page press another time  for more than 3 seconds.

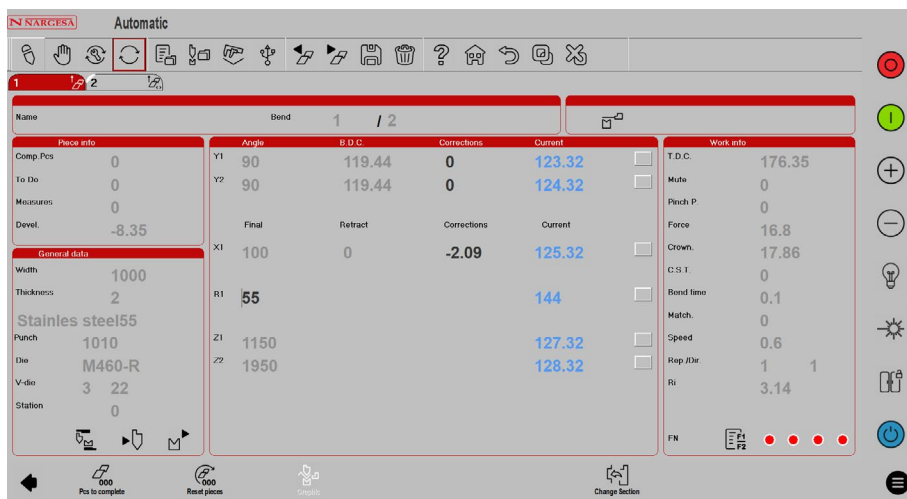


Figure 43. Automatic standard numeric page

Carrying out the automatic cycle

To start an automatic cycle just select  and press the  **START** button; this operation enables the positioning of the back gauges axes. At the end of the positioning of the stop axes press the **Down pedal** to lower the ram and make the bend.

Once the bend has been made, the ram will automatically return and the positioning of the back gauges axes relating to the next bend will take place.

Once the last bend of the program has been made, the automatic cycle will start from the first bend.

First bend

To select the first bend select the tab 

Carrying out the sample piece

The calculations made by the numeric control are purely theoretical and due to the imperfection of the sheet metal, it may be necessary to make corrections to the values calculated.

To simplify the correcting of the bend data of a piece there is a procedure for carrying out a sample piece in the SEMI-AUTOMATIC page pressing .

If this function is enabled, at the end of a bend there is no step change, instead the cycle remains on the current bend to allow the operator to correct the bend data and then repeat the bend that has been corrected.

It is possible to make step-by-step corrections to the angle or the length of the bend in a uniform manner for all the bends.

The corrections entered are automatically showed in the program.

- Press .

- Press the  button to position the back gauges axes.

- Press the **down pedal** to carry out the bend.

- Measure the bend made in terms of bend length and angle.

If the bend is not correct:

- Press  to access the correction data.

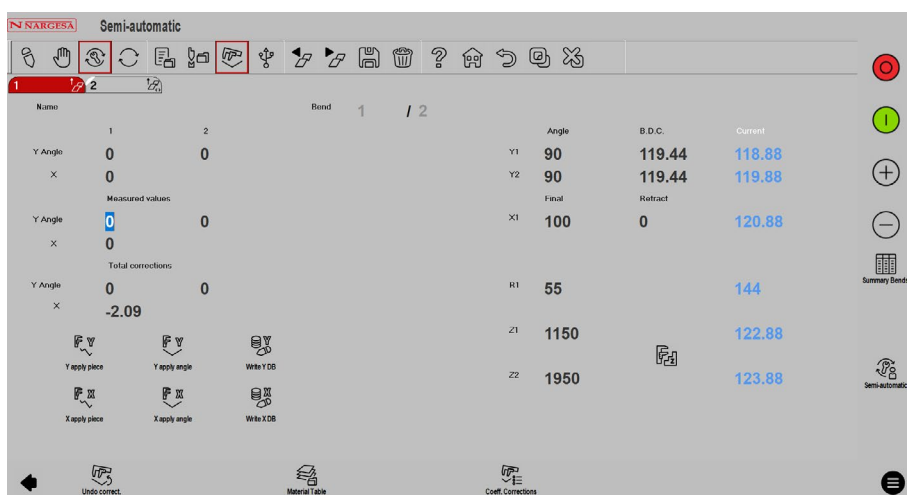


Figure 44. Correction page

- Enter the correction data's.
- Repeat the bend
check that the bend is correct:
- if correct: repeat the procedure for all the bends of the program; to move between the various bends selecting the bend tabs present in the superior part of the screen
- if incorrect: make new variations to the data of the current bend.

Once the data have been corrected for all the bends:

- Press ; the automatic cycle will start from the bend currently selected.

Setting of the correction data

The correction data to be entered are in mm for the position of the back gauges axes, and in degrees for the bend angle; the data entered will be added to the value contained in the program. In the **"Total corrections"** fields you will see the total of the different corrections.

Example: if the bend is closed by 2° it is necessary to enter a positive correction value in the two Y angle fields on the top (+2.0°); if the bend is open by 2° it is necessary to enter a negative correction value in the two Y angle fields on the top (-2.0°).

Example: if the bend is closed by 2° it is necessary to enter a positive correction value in the two Y angle fields on the top (+2.0°); if the bend is open by 2° it is necessary to enter a negative correction value in the two Y angle fields on the top (-2.0°).

Name		test		Bend		1 / 4	
		1	2	Angle	B.D.C.	Current	
Y Angle		2	2	Y1	120	147.87	0
X		0		Y2	120	147.87	0
Measured values				Final	Retract		
Y Angle		0	0	X1	19.05	0	19.05
X		0		R1	60.2		60.3
Total corrections							
Y Angle		2	2				
X		0					

Y apply piece Y apply angle Write Y DB
 X apply angle Write X DB

Undo correct Material Table Coeff. Corrections

Figure 45. example of a Y angle 2 degree of correction

If the length of the bend is less than the desired length you must enter a positive value in the X Field corresponding to the difference detected; if the length of the bend is greater than the desired length you must enter a negative value in the X Field corresponding to the difference detected.

Like said before If several corrections are made to the data of the same bend, the last value entered will be added to the previous ones in the **"Total corrections"** fields.

Example: if a bend is initially closed by 3° and after the correction (+3.0°) it is open by 1°, it will be necessary to enter -1.0° in the field for correcting the angle.

During the correction of the bend, the correction data of the angles are separated per cylinder; it is therefore possible to correct the angle of Y1 in a different manner to the angle of Y2. Writing a correction in the first field, that correspond of the Y1 axis, the same correction will be done automatically for the Y2 axe. If you want do a correction only for the Y2 axe write the correction in the Y2 field, if you want do a correction only for the Y1 axe write the correction in the Y1 field and rewrite the previous correction for the Y2 axe.

Will be possible also correct the Y1 and Y2 angles writing the measured angle in the fields **"Measured values"**, so that you do not have to calculate the difference between the measured angle and the desired angle.

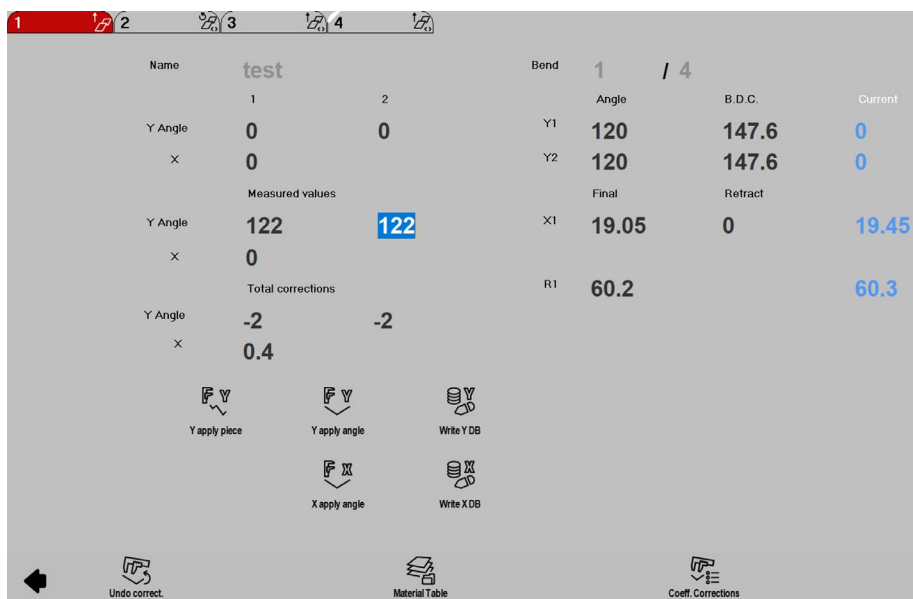


Figure 46. example of a Y angle -2 degree of correction using the "Measured values" function

If you want apply the angles corrections for all the bends of the piece select the item  [Y apply piece].

If you want apply the angles corrections for all the bends of the piece with the same angle select the item  [Y apply angle].

If you want apply the X axe corrections for all the bends of the piece with the same angle select the item  [X apply angle].

To delete the changes made to the corrections press the button  [Undo correc.].

The values present on opening the page will be restored.

4.9. Materials Table

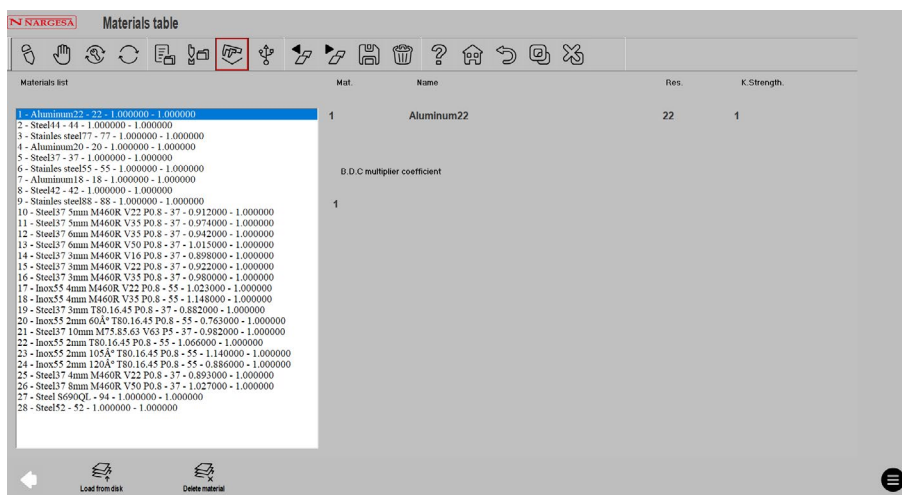
How to enter the Materials Table

To access the Materials Table page follow the steps below:

- enter the Corrections page by pressing the  button.

- press the  **[Materials Table]** button.

The table appears as illustrated in the figure:



Materials list	Mat.	Name	Res.	K.Strength.
1 - Aluminum22 - 22 - 1.000000 - 1.000000	1	Aluminum22	22	1
2 - Steel41 - 41 - 1.000000 - 1.000000				
3 - Stainless steel77 - 77 - 1.000000 - 1.000000				
4 - Aluminum20 - 20 - 1.000000 - 1.000000				
5 - Steel37 - 37 - 1.000000 - 1.000000				
6 - Stainless steel55 - 55 - 1.000000 - 1.000000				
7 - Aluminum18 - 18 - 1.000000 - 1.000000				
8 - Steel42 - 42 - 1.000000 - 1.000000				
9 - Stainless steel88 - 88 - 1.000000 - 1.000000				
10 - Steel37 5mm M460R V22 P0.8 - 37 - 0.912000 - 1.000000				
11 - Steel37 5mm M460R V35 P0.8 - 37 - 0.974000 - 1.000000				
12 - Steel37 6mm M460R V35 P0.8 - 37 - 0.942000 - 1.000000				
13 - Steel37 6mm M460R V50 P0.8 - 37 - 1.015000 - 1.000000				
14 - Steel37 3mm M460R V16 P0.8 - 37 - 0.898000 - 1.000000				
15 - Steel37 3mm M460R V22 P0.8 - 37 - 0.922000 - 1.000000				
16 - Steel37 3mm M460R V35 P0.8 - 37 - 0.980000 - 1.000000				
17 - Inco55 4mm M460R V22 P0.8 - 55 - 1.023000 - 1.000000				
18 - Inco55 4mm M460R V35 P0.8 - 55 - 1.148000 - 1.000000				
19 - Steel37 3mm T80.16.45 P0.8 - 37 - 0.882000 - 1.000000				
20 - Inco55 2mm 60A T80.16.45 P0.8 - 55 - 0.765000 - 1.000000				
21 - Steel37 10mm M75.85.63 V63 P5 - 37 - 0.982000 - 1.000000				
22 - Inco55 2mm T80.16.45 P0.8 - 55 - 1.066000 - 1.000000				
23 - Inco55 2mm 105A T80.16.45 P0.8 - 55 - 1.140000 - 1.000000				
24 - Inco55 2mm 120A T80.16.45 P0.8 - 55 - 0.886000 - 1.000000				
25 - Steel37 4mm M460R V22 P0.8 - 37 - 0.893000 - 1.000000				
26 - Steel37 8mm M460R V50 P0.8 - 37 - 1.027000 - 1.000000				
27 - Steel 5690QI - 94 - 1.000000 - 1.000000				
28 - Steel52 - 52 - 1.000000 - 1.000000				

Figure 47. Material list table

How to enter a new material

After have Opened the Materials Table add a material writing a new number in the field **Mat.** After insert the other parameters in the fields **Name** (it is the name of the material) and **Res** (it is the resistance of the material).

How to use the K Strength. coefficient

This parameter will be used in the calculation of the stretch for all the bends entered after the change in the coefficients and for all the new programmes. To apply the corrections to the existing programmes it will be necessary to re-enter the angle in each bend.

The default value of the coefficients is 1, with this value the standard stretch is calculated by re-processing the DIN6935 standard formula (or of the DIN6935, it depend of the USER PARAMETER selected, see the chapter 5.2). The value entered in the coefficients will be multiplied by the stretch calculated, therefore by setting the value 2, a double stretch is calculated, while by setting the value at 0.5, half a stretch is calculated.

The tolerated values must be found between 0 and 100.

How to disable the calculation of the stretching

To disable the calculation of the stretch of the material, it is sufficient to set the K. strength. coefficients to 0. With the calculation disabled, the corrections of the X in the numeric programmes will no longer be calculated and the development of the piece in the graphic programmes will be the exact sum of all the segments.

How to use the B.D.C multiplier coefficient

This parameter will be used in the calculation of the BDC for all the bends entered after the change in the coefficients and for all the new programmes. To apply the corrections to the existing programmes it will be necessary to re-enter the angle in each bend.

The default value of the coefficients is 1: with this value the standard BDC calculation is done. If the bend will be opened instead to do an angle correction in the program you can decrease this value, writing for example 0.99. If the bend will be closed you can increase the coefficient writing for example 1.01. If the new BDC calculated is still not correct, change another time the coefficient. The order of magnitude of the variations shall be on the order of one cent, it means 0.01.

Deleting the material

To delete a material after have selected it from the list press the function button  [Delete material].

Saving the materials

To save the materials coefficients entered in the backup USB memory just press the  button.

Uploading the materials

To upload the materials entered from a USB device just press the function button  [Load from disk].

4.10. Hemming/Coining coefficient

How to enter the Corrections Coefficient page

The Coefficients Corrections page contains the Hemming and Coining coefficients.

In order to access to the Coefficients Corrections page it is necessary to follow the steps below:

- enter the Corrections page by pressing the  button.
- press the button  [Coeff. corrections].

The following page will appear:

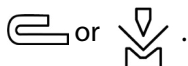
Coefficients	
Hemming	0
Coining	0

Figure 48. Correction coefficients

How to use the Hamming/Coining coefficient

Open the Coefficients correction page and enter the parameters. These parameters will be used to calculate the B.D.C.s for all the bends of the hamming/Coining type. This means that they will be algebraically added to the B.D.C.s that are calculated normally. This Coefficients become useful when we calculate the B.D.C.s too high.

In order for them to be assimilated after the setting it is necessary press another time the functions button



Saving the coefficient

The coefficients are automatically saved every time you exit from the Coefficients Correction page. They are not saved in the current work program, however they always remain linked to the machine.

To delete the changes made to the corrections press the button [Undo correc.].

The values present on opening the page will be restored

4.11. Corrections in semiautomatic mode

It is possible to directly enter the corrections of the angles and of the back gauges in the semiautomatic page with the possibility of applying the correction entered to all the angles that are the same as that specific piece of that section, or just that specific bend.

Semi-automatic page

When the machine is in the **STOP** status, the following semi-automatic page will appear:

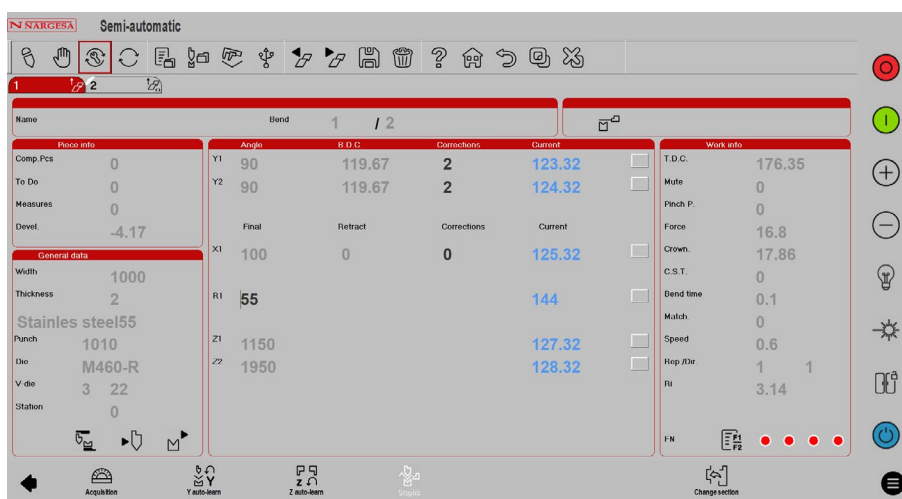


Figure 49. Semi-automatic page in STOP status

It is possible to edit the corrections of Y1, Y2, and of the X axes, in the Corrections fields, as well as the heights of the R axes in his final field, therefore the operator can enter the corrections directly from this page without having to return to the [Editor] page or pressing .

How to make the corrections

If the corrections are made on the semiautomatic page, said corrections will be made directly to the current bend. When a correction is changed, the corresponding edit is displayed with the colours reversed; in this way the operator is advised about the changes made.

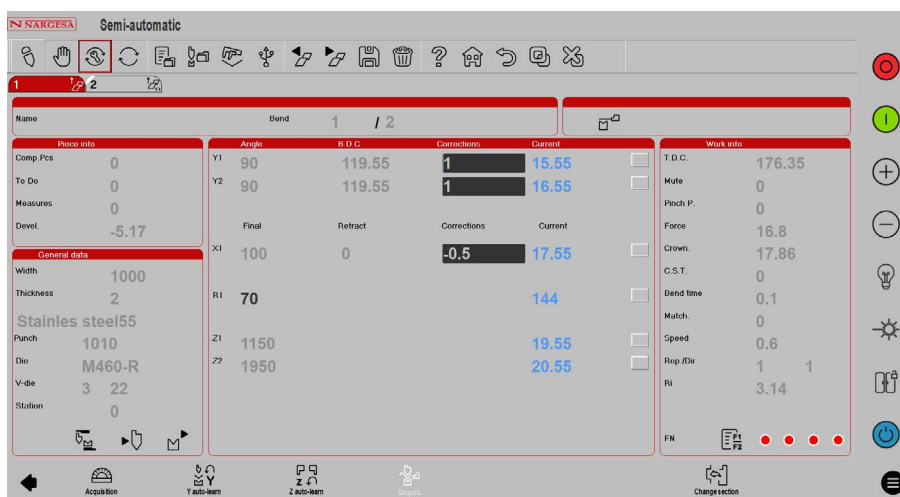


Figure 50. Corrections in Semiautomatic with the colours reversed

In order to extend the corrections to all the bends of the current section with the same angle as that of the current bend, you must follow the steps below:

Make the corrections:

- press the  button to view the secondary menu;

- press the function button  [Same Ang. Sec.Conf].

In order to extend the corrections to all the bends of the piece having the same angle as that of the current bend, you must follow the steps below:

Make the corrections:

- press the  button to view the secondary menu;

- press the function button  [Same Ang. Pr.Conf].

Corrections internal radius

It is possible to display the internal radius of the bend on the settings page. The internal radius is always calculated, either in graphic or numeric, the calculation method can be selected from the generic parameters. The change of the internal radius will influence the stretch calculations, but only if the programme is numeric. If the programme has been generated in graphic, the change to the internal radius will not recalculate the stretching.

Consult the machine parameters manual for the various application modes for the internal radius.

4.12. Selection of the DIN formula to calculate the stretch

It is possible select the standard DIN formula if you need to use it (for calculating the stretch). In order to select the standard formula, set the generic Stretch formula parameter to 1. This Field can also be changed by the operator from the  *[User Parameters]* page.

Consult the manual of the machine parameters, for the various application methods of the internal radius.

5. Bend programming and management

5.1. Summary bend page

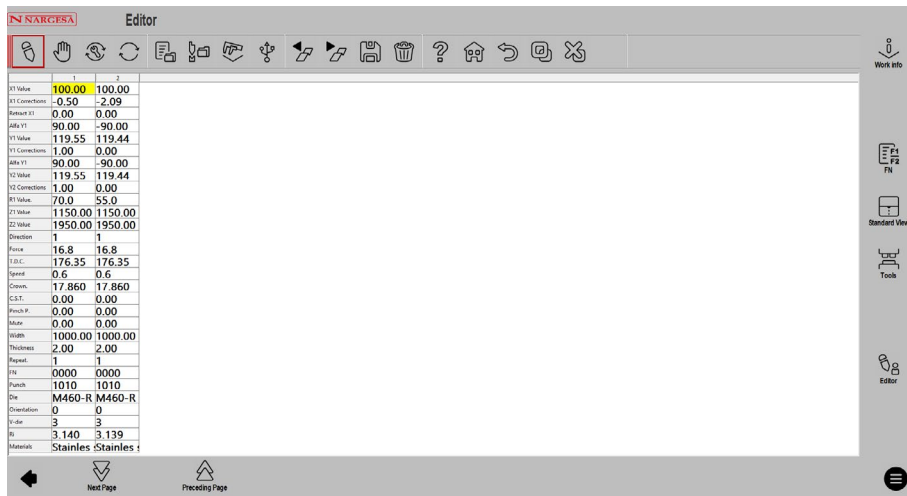
This page allows you to simultaneously view the data of all the bends of the current programme. This page is in table form similar to the graphic interface of TRIA.

From this page it is also possible to change the programme data, using the main functions contained in the settings page. The table is organised so that a bend corresponds to each column, and the date of the bends correspond to each row.

5.1.1. How to enter the summary bend page

In order to access the Summary Bend page follow the steps below:

- from the  *[Editor]* page press the  *[Summary Bends]*.
- this page contains the following information (figure 54):
- the heading of each column contains the progressive number of the bend in the program
- the first column on the left contains the description of the value associated with the row
- the value currently selected will be highlighted against a yellow background
- indications of the name of the programme selected
- indications of the bend selected from the total number of bends in the current section
- indications of the current section from the total number of sections in the program



	1	2
B1 Value	100.00	100.00
B1 Corrections	-0.50	-2.09
Bendout X1	0.00	0.00
Adj. V1	90.00	-90.00
B1 Value	119.55	119.44
B1 Corrections	1.00	0.00
Adj. V1	90.00	-90.00
B2 Value	119.55	119.44
B2 Corrections	1.00	0.00
B3 Value	70.0	55.0
B3 Value	1150.00	1150.00
B3 Value	1950.00	1950.00
Direction	1	1
Force	16.8	16.8
LDL	176.35	176.35
Speed	0.6	0.6
Down	17.860	17.860
CST	0.00	0.00
Push-P	0.00	0.00
Value	0.00	0.00
Width	1000.00	1000.00
Thickness	2.00	2.00
Repeat	1	1
Re	0000	0000
Punch	1010	1010
Die	M460-R	M460-R
Orientation	0	0
V-de	3	3
W	3.140	3.139
Materials	Stainless	Stainless

Figure 51. Bend summary Page

5.1.2. How to use the Summary Bends page

How to shift the selection

To shift the selection from one bend to another in the program:

- Press the  and  buttons. If you press the second button when the selection is on the last bend in the program, a new bend can be added to the end of the queue.

To shift the selection onto the first or last bend and from one side to the other of the selected bend, use the specific touch function of this product, as indicated above in this document.

N.B.

When there are several bends the ones in excess will not be immediately visible.

These can be viewed by pressing the  function button: to go back from the columns press .

How to change a value

In order to change a value, move onto the corresponding cell, enter the desired value and press the ENTER  key.

5.1.3. Insert step, Cut, Copy, Past Summary Bends page functions

Pressing the  function button the secondary menu view will open:

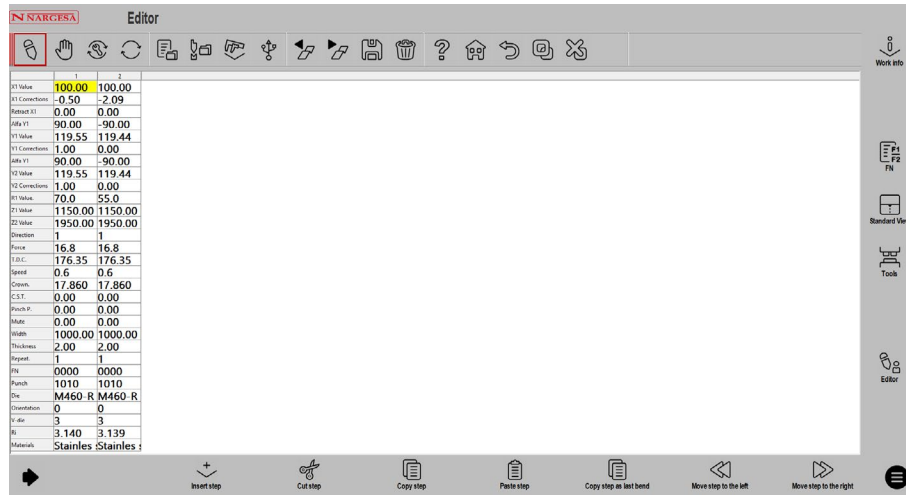


Figure 52. Insert step, Cut, Copy, Past functions

To insert a bend in a position of the program select the position desired in the program and press the  **insert step** button, an empty bend will be inserted:

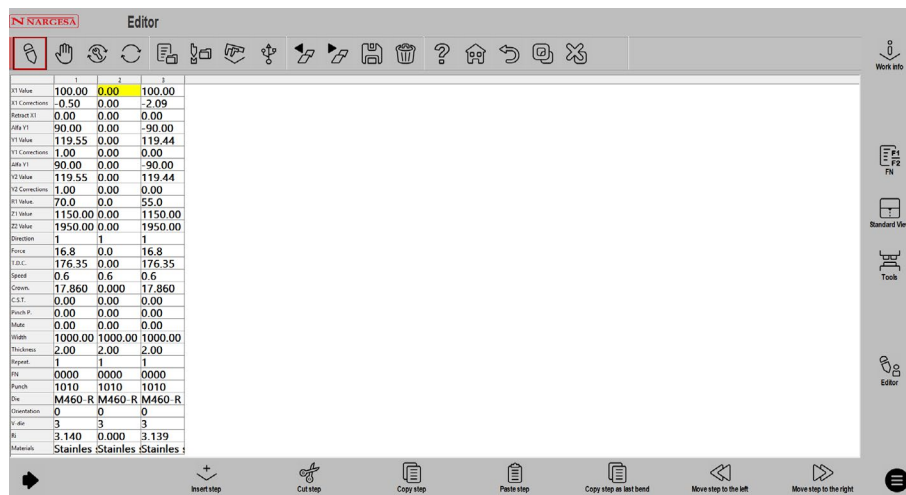


Figure 53. Insert step

If you want copy a bend in this inserted step tap on the bend to copy and select the item  **[Copy step]**. After select the bend inserted and select the item  **[Paste step]**.

If you want copy a step as last bend move to the bend to be copied and select the item  **[copy step as last bend]**.

The functions buttons  **Cut step** have the same means described before.

Saving the program

At the end of the setting press the  key; a window will open in which it is necessary to enter the name of the programme.

After having entered the name press the Enter  key and select [OK].

Standard view

If you want come back to the standard view press the function button  [Standard view].

5.2. “User Parameters” page

This page, which does not require a password, only makes the changeable data available to the end user, in this way preventing access to the main machine parameters.

- from the settings page press the  key two times to open the menu.

- select the item  [User Parameters]; the following window will open:

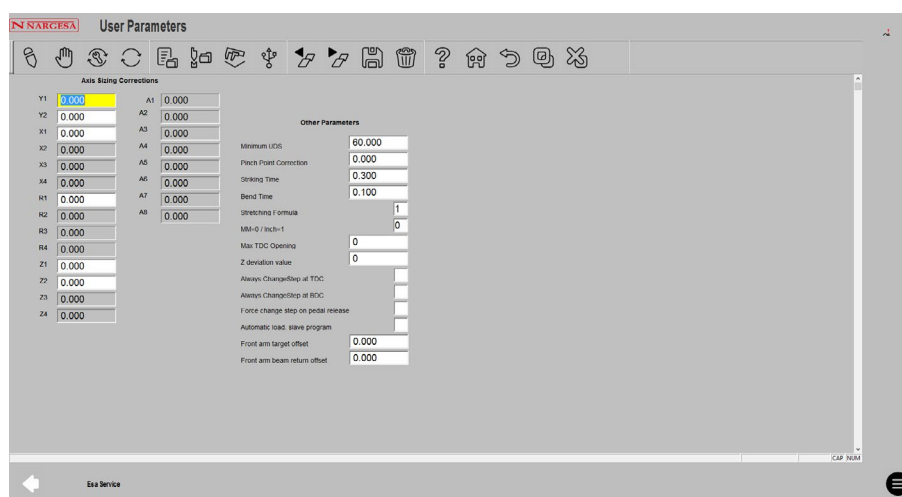


Figure 54. User Parameters page

5.2.1. Corrections to axis sizing (axis reference) parameters

In the fields of the axes configured, it is possible to make a correction to the resetting height compared to the factory data of the machine: this change may become necessary with any deterioration of the mechanics of the press-brake.

For example, the factory data of the machine regarding the resetting heights of the ram axes are **230.93 mm** for Y1 and **230.09 mm** for Y2 (as illustrated in the following figure, parameters Y1-Y2 Reference position).

GENERAL Parameters			PRESSURE Parameters		CROWNING Parameters	
Minimum position	60		Ramp	0.1	Ramp	0.2
Maximum position	245		0% Voltage	3.7	0% Voltage	3
Y1 Reference position	230.93		25% Voltage	5.4	25% Voltage	4.6
Y2 Reference position	230.09		50% Voltage	6.8	50% Voltage	6
Position tolerance	0.01		75% Voltage	8.6	75% Voltage	8
Unbalance correction	3		F.S. (A)	0.58	Crowning rate	21
Maximum unbalance	20				F.S. (A)	0
Conversion factor	50					
Coining time	0.3					
Bend time	0.1					

Figure 55. Axis Correction Parameters Page

It will consequently be necessary to carry out a correction of **-0.09 mm** for **Y1** and **0.1 mm** for **Y2**, and you must enter the corrections values in the **Y1** and **Y2** fields in the **USER PARAMETERS** page.

Axis Sizing Corrections		Other Parameters	
Y1	-0.090	A1	0.000
Y2	0.100	A2	0.000
X1	0.000	A3	0.000
X2	0.000	A4	0.000
X3	0.000	A5	0.000
X4	0.000	A6	0.000
R1	0.000	A7	0.000
R2	0.000	A8	0.000
R3	0.000		
R4	0.000		
Z1	0.000	Minimum UDS	60.000
Z2	0.000	Pinch Point Correction	0.000
Z3	0.000	Striking Time	0.300
Z4	0.000	Bend Time	0.100
		Stretching Formula	1
		MM=0 / Inch=1	0
		Max TDC Opening	0
		Z deviation value	0
		Always ChangeStep at TDC	
		Always ChangeStep at BDC	
		Force change step on pedal release	
		Automatic load, slave program	
		Front arm target offset	0.000
		Front arm beam return offset	0.000

Figure 56. Viewing the axis reference corrections table on the display

The factory data of the axis parameters of the ram are not changed, however from now on, after having made the reference of the ram axis, **Y1** will automatically calibrate to a height of **230.84 mm** and **Y2** to a height of **230.19 mm**.

Saving the user parameters

To save the new user parameters (in the file **UserTara.par**) press the  key button.

Resetting of corrections

If the manufacturer of the press decides to change the reference factory parameters, for example of the Y1, the following message will appear on the display:

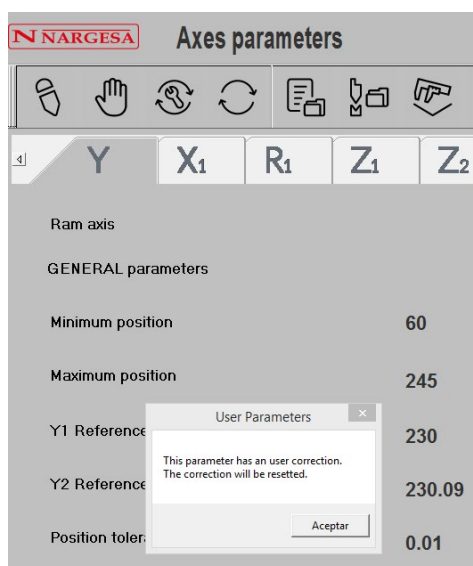


Figure 57. Resetting of corrections message

The relative correction will be automatically reset:

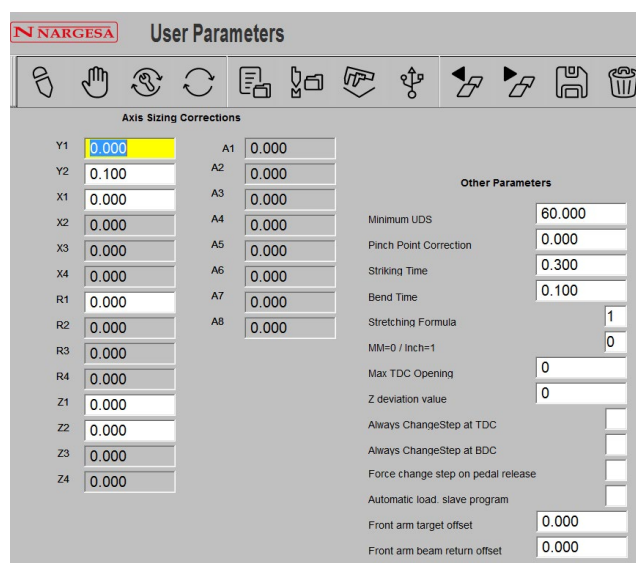


Figure 58. Viewing the axis reference corrections table on the display after the reference reset

5.2.2 Other parameters

The other parameters contained on the User Parameters page are the same as the AXIS PARAMETERS, GENERAL CONFIGURATION PARAMETERS and GENERAL PARAMETERS, except that they are made available to the user without an access password, and have the following meanings:

Minimum UDS			
Minimum value:	0.00	Maximum value:	9999.99
Default value:	0.00	Measuring unit:	mm
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	From data setting
Description:	This indicates the minimum opening of the ram compared to the metal sheet contact point to allow for extracting the sheet metal.		
Application:	Automatic calculation of the upper dead point.		
Special cases, errors, ..	In the case in which this parameter is set to 0.00 the automatic calculation procedure will calculate an opening in the ram which is just sufficient for extracting the plate of sheet metal.		
Pinch Point Correction			
Minimum value:	0	Maximum value:	9999.99
Default value:	0	Measuring unit:	mm
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	from data setting
Description:	Parameter used to compensate the value of the pinch point of the machine. The parameter is added to all the metal sheet pinch point calculated in the machine programmes.		
Application:	Automatic calculation of the metal sheet contact point		
Striking Time			
Minimum value:	0.00	Maximum value:	99.99
Default value:	0.10	Measuring unit:	seconds
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	from data setting
Description:	Time during which the ram remains stopped on the bend in order to carry out a coining or striking operation.		
Application:	The control carried out the coining operation automatically if the bend has been defined as dutch folding/coining.		

Bend time			
Minimum value:	0.00	Maximum value:	99.99
Default value:	0.00	Measuring unit:	seconds
Value type	double	Protection level:	none
Present in SW version	4.0	Change activated	From data setting
Description:	Default bending time: this is applied automatically with each new bend created		
Stretching formula			
Minimum value:	0	Maximum value:	1
Default value:		Measuring unit:	1
Value type	double	Protection level:	none
Present in SW version	14.2	Change activated	from data setting
Description:	This parameter allows for selecting the method of calculating the stretch of the material (Bend Allowance), according to the following scheme: 0: ESA Formula 1: DIN 6935 Formula.		
Application:	Automatic calculation of the metal sheet contact point		
MM=0, INCH=1			
Minimum value:	0	Maximum value:	1
Default value:	0	Measuring unit:	
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	from data setting
Description:	The following values can be assumed: 0 : values expressed in millimetres 1 : values expressed in inches.		

Maximum TDC opening				
Minimum value:		0.00	Maximum value:	9999.99
Default value:		0	Measuring unit:	mm
Value type		double	Protection level:	none
Present in SW version		1.0	Change activated	From data setting
Description:		This indicates the opening of the ram calculated automatically in the numeric programmes. It must be considered an absolute value compared to the 0 machine - 5 mm.		
Application:		Automatic calculation of the upper dead point.		
Special cases, errors, ..		In cases in which this parameter is set to 0 the automatic calculation procedure will calculate a opening height equal to the maximum height - 5 mm.		
Z Deviation value				
Minimum value:		-1000000	Maximum value:	100000
Default value:		0	Measuring unit:	mm
Value type		dword	Protection level:	none
Present in SW version		6.4	Change activated	Setting parameter
Description:		Indicates the deviation height to be used whenever the deviation of the Z axis is enabled in the bend in progress. Only one value exists, this is used for both the Z axes and in particular: Z1 will carry out an incremental positioning of the value set towards negative heights Z2 will carry out an incremental positioning of the value set towards positive heights Example : Deviation value of Z = 50 Height Z1 = 1000 Height Z2 = 2000 When the retract is carried out Z1 will move to 950, and Z2 will move to 2050 From the 8.7 version, if the deviation value is negative, the deviation of the Z will be carried out first, followed by the deviation of the X, if the value entered is positive, the deviation of the X will be carried out first, followed by the deviation of the Z.		

Always Change Step at TDC			
Minimum value:	0	Maximum value:	1
Default value:	0	Measuring unit:	
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	From data setting
Description:	The following values may be assumed: 0: the bend change is carried out when the ram reaches the Pinch point during the raising. 1: the bend change is carried out once the ram has reached the TDC .		
Application:	Automatic calculation of the upper dead point.		
Always Change Step at BDC			
Minimum value:	0	Maximum value:	1
Default value:	0	Measuring unit:	mm
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	from data setting
Description:	The following values may be assumed: 0: the bend change is carried out when the ram reaches the Pinch point during the raising. 1: the bend change is carried out once the ram has reached the BDC .		
Application:	Automatic calculation of the metal sheet contact point		
Force change step on pedal release			
Minimum value:	0	Maximum value:	1
Default value:	0	Measuring unit:	
Value type	double	Protection level:	none
Present in SW version	1.0	Change activated	from data setting
Description:	The following values may be assumed: 0: the bend change is carried out when the ram reaches the Pinch point during the raising. 1: the bend change is carried out once the operator release the down pedal at the end of the bend phase.		
Application:	Execution of a programme in automatic or semiautomatic.		

5.3. "General data"

In this page it is possible to make changes to a bend in the programme and then later on, apply said changes to

- all the bends in the program
- all the bends in the section
- all the bends in the programme with the Y1 angle equal to that of the changed bend
- all the bends in the section with the Y1 angle equal to that of the changed bend.

5.3.1. How to enter the new "General data" page

In order to access to the new general data page it is necessary to follow the steps below:

- from the  [Editor] page press the  [General Data] function button; now you enter the general data page.

This page has the same set up as that of the  [Editor] page and contains the following information (indicated in the figure):

- the fields in which the user has changed the value are illustrated with their colours reversed **120**
- the fields in which the value has been changed due to the effect of a recalculation made by the program, will have a pink background **147.73**
- the  [Lose Ccrrct.] button for cancelling the changes made temporarily.
- the  [Confirm Program] button for applying the changes made to all the bends in the programme.
- the  [Confirm Section] button for applying the changes made to all the bends in the current section.
- the  [Sme. Crns. Pr. Conf.] button for applying the changes made to all the bends in the programme that have the same Y1-Y2 angle as the one displayed on the page.
- the  [Sm. Crns. Sec. Conf.] button for applying the changes made to all the bends in the current section that have the same Y1-Y2 angle as the one displayed on the page.

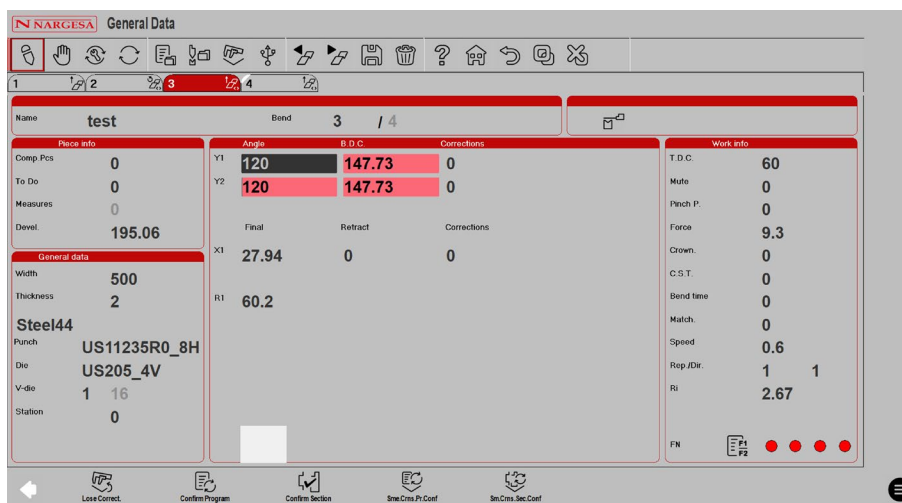


Figure 59. General data page

5.3.2. How to make corrections to the bend program

From the  [Editor] page open the general data page, which contains the same data as the currently activated bend.

Change the data of the bend displayed.

The changed or recalculated fields will turn a different colour to the one of the normal fields in order to remind the user which changes have been made.

N.B.

The bend displayed on this page is NOT actually the bend of the active programme but instead, a copy to be changed as desired.

For this reason the changes made on this page are NOT applied to any bends in the programme until such time as one of the four confirm keys are pressed.

How to apply the changes made only to the current section

To apply the changes made to all the bends of the current section press the  [Confirm Section] button.

The values highlighted with reverse colours will be copied to all the bends of the current section in the active program, and for each one, the corresponding recalculations will be carried out.

If you only wish to apply the changes to the bends in the current section, which have the same bend angle as that of the bend displayed, press the  [Sm. Crns. Sec. Conf.] button.

Upon concluding the operation all the fields of the page will return to their normal colours.

How to cancel the changes made

To cancel the changes made on the general data page press the  [Lose Ccorrect.] button.

N.B.

It is possible to shift between the bends of the programme with the  and  buttons or selecting directly the  program tabs.

It is not possible to add or delete bends from this page, to carry out these operations you must return to the

 [Editor] page.

5.4 “Metal-working machine” function

5.4.1. How to enable the “Metal-working machine” function

- from the  [Editor] page press the button  two times to open the menu
- select the item  [Configuration]
- select the item **6) MACHINE PARAMETERS**
- enter the password and press [OK]
- press the function button **Parameters 2**
- check the Auxiliary functions parameter **Metal-working machine** field.
- from this moment on the “New Bend” this functions will be enabled.

5.4.2. “New Bend” Function

This function, active on the  [Editor] and  [Summary Bends] pages, allows you to create new bends containing the same data as the previous bend. Normally instead, the new bends only have the General data the same as those of the previous bend.

This function is active in the following cases:

-  [Next] function: by pressing the  button when you are positioned on the last bend in the section, a new bend will be added to the bottom of the section. This new bend contains the same data as the preceding bend.
-  [Insert step] function: by selecting the  item from the  [Edit] menu you add a new bend to the current position.

This new bend contains the same data as the preceding bend.

5.5. "Machine Functions" Page

This news bends contains the same data as the preceding bend.

- from the  [Editor] page press the  F1 F2 [Machine functions] button; the following window will be displayed:

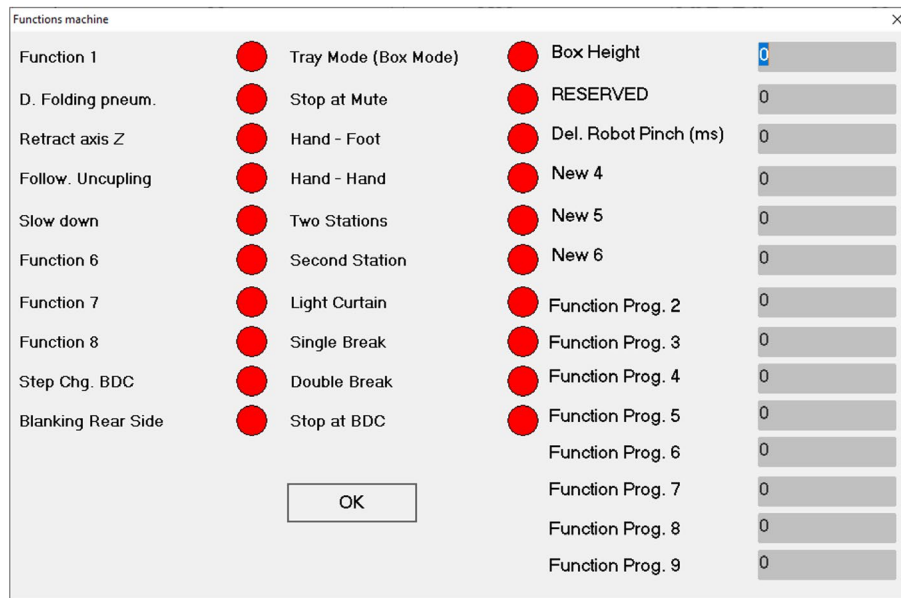


Figure 60. Machine functions

- To enable or activate a function tap on the red check box that will become green:

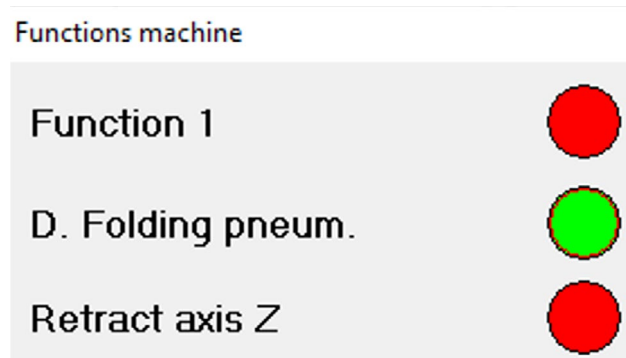


Figure 61. D. Folding pneum. Function enabled

The Machine functions are as follows:

D folding pneum.

If this function is active in a bend with a dutch folding bend, the pneumatic dutch folding die will be raised.

Z axes recoil Function

If this function is active, the Z1 and Z2 axes will carry out a recoil set in the  [User Parameters] page “Z deviation value” during the movement cycle.

Follow. Uncupling

If this function is active, during its movement cycle, the followers will also carry out the unhooking cycle. To learn about the functioning of the followers axes, consult the relative user manual.

Slow down

If this function is active, during the Semiautomatic and Automatic cycle, the ram will always be descend at slow speed.

Step chg. BDC

If this function is active, the bend step change will be made once the ram reaches the Bottom Dead Center (that is, the end of the bend).

Blanking Rear Side

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. If this function is active, the rear beam of the photocells is turned OFF to prevent the stop of the machine in case the back gauges are near the die.

Tray mode (box mode)

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. If you are bending a box the *MCS* system exclude the front and the back photocell beam, going down in high speed to the mute point calculated. If the parameter “Box height” is set to 0 The *laser safe* system stop the RAM when encounter the flange: by pressing again the down pedal the RAM proceed in high speed till the mute point calculated in the program. If the parameter “Box height” is set according to the height of the flange encountered, the RAM going down in high speed to the mute point calculated.

BOX Height

This function is used only when the *laser safe* safety system is present on the machine and the function “Tray mode” is enabled. It indicates the height of the box flange to be entered, in mm.

Stop at Mute

By enabling this function the ram stop at the mute point. It is possible to continue the bend of the piece by releasing and pressing again the down pedal.

Hand - Foot

This function is used only when the *laser safe* safety system is present on the machine. By enabling this function you are able to stop at the mute point with the hand control (if installed), and then continue again by pressing the down pedal.

Hand – Hand

This function is used only when the *laser safe* safety system is present on the machine. By enabling this function you are able to stop at the mute point with the hand control (if installed), and then continue with the same.

Two stations

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. By enabling this function you must use both pedals to bend (if installed).

Second station

This function is used only when the *laser safe* or the *MCS* safety system are present on the machine. By enabling this function you are able to use only the second pedal (if installed).

Light Curtain

This function is used only when the *laser safe* safety system is present on the machine. If installed, the function enable the working of the front light curtain.

Single Break

This function is used only when the *laser safe* safety system is present on the machine. When the function “**Light curtain**” is enabled, after have inserted the piece to bend in the machine and have removed the hands and the arms from the light curtain intervention zone, the RAM goes down to bend, without press the down pedal.

Double Break

This function is used only when the *laser safe* safety system is present on the machine. When the function “**Light curtain**” is enabled, after have inserted the piece to bend in the machine and have removed the hands and the arms from the light curtain intervention zone, the RAM goes down to bend, without press the down pedal, but only if with one hand you enter and exit from the light curtain intervention zone another time.

Stop at BDC

With this function activated, during the Semiautomatic and Automatic cycle the ram will always go down till the BDC and will remain stopped: to finish the cycle must be pressed the up pedal.

Del. Robot Pinch (ms)

Reserved

5.6. "Tools" Page

This page manages the work stations and therefore allows for automatic calculation of the Z axes (if present). You can access this page in the following manner:

- from the  [Editor] page press the  [Tools] button to access the Tooling page.

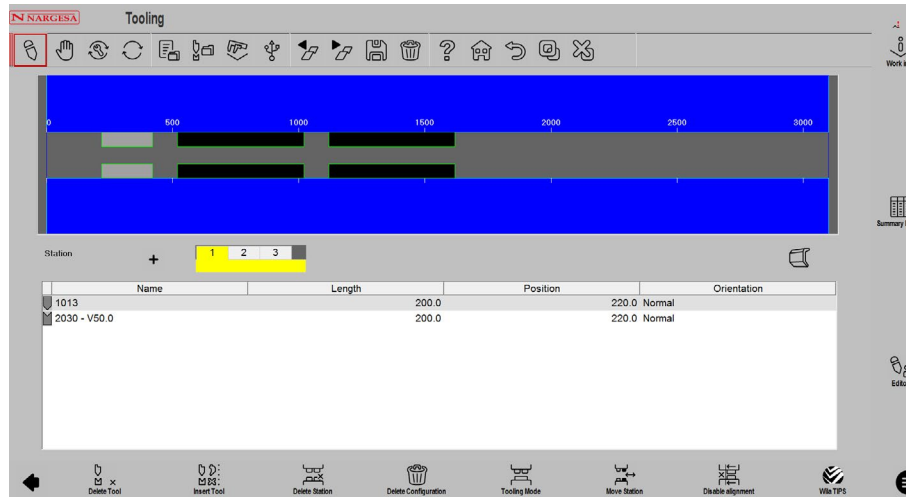


Figure 62. Tooling Page

The window at the top gives a front view of the machine.

The "Teeth" inside the machine, represent the tools.

The two windows at the bottom contain the data of the tools for each Station (a maximum of 8) and represent respectively:

- the number of the work stations selected or to be entered pressing  (from 1 to 8)
- the icon that warn you if you are composing a station  [Without tools segmentation] or  [Without tools Segmentation].
- the name of the punches and of the dies used in the selected station, their Lengths, positions and orientations.

The functions buttons at the bottom have the following means:

- the  **[Delete Tool]** button to delete the tool selected tapping on the top drawing
- the  **[Insert Tool]** button to insert the tools in the station selected: after have choose the die or the punch and have selected the tool from the list, a windows asking the tool length appears at screen.
- the  **[Delete Station]** button to delete the station selected.
- the  **[Delete Configuration]** button to delete the tools of all the stations of the machines.
- the  **[Tooling Mode]** button: pressing it a choice appears between **Without segmentation** and **With Segmentation**. In the second case the tools must have been defined in the **tooling warehouse segments** list.
- the  **[Move Station]** button to move all the station selected tapping with a finger on it.
- the  **[Disable Alignment]** button to disable the help which signals the user with a red line when the tools are aligned.

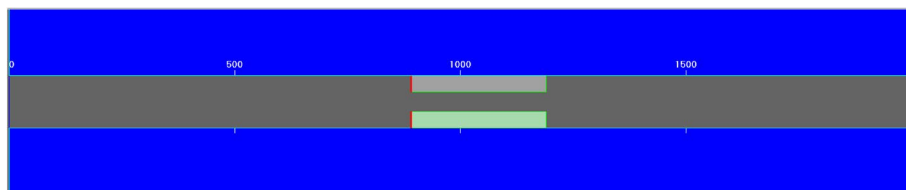


Figure 63. Tooling Alignment

5.7. Other Menu Pages

Turning off the NC

This allows you to turn off the NC machine. Follow the steps below:

- press the  **[Home]** button to open the **Home** menu.
- select the item  **[Shut down]**.

Viewing the software version

This allows you to view the information relating to the software version currently in use, the number of axes enabled, and the software options installed. Follow the steps below:

- press the  **[Home]** button to open the **Home** menu.
- select the item  **[Version]**.

6. Integrated CAD

Introduction

The Esautomotion numeric controls for the bender are also equipped with a function that allows for drawing all the necessary graphic elements for checking the feasibility of the sequences of a bend; these graphic elements are as follows:

- lower part of the machine.
- upper part of the machine.
- punch.
- die.
- piece to be bent.

Access to the drawing of the elements listed above is described in the brief handbook.

6.1. Drawing function

The drawing function works by tracing the straight line segments in accordance with the data entered by the operator. The data can be entered in either polar format or Cartesian format, however use of the polar format is recommended to make the settings more user-friendly.

6.2. Polar setting of the drawing data

This function allows for defining the sections that will make up the drawing by mean of setting a pair of data:

- length of the section.
- angle compared to the following section.



the angles entered must be found within $\pm 180.0^\circ$.

The conventions via which these angles must be entered is as follows:

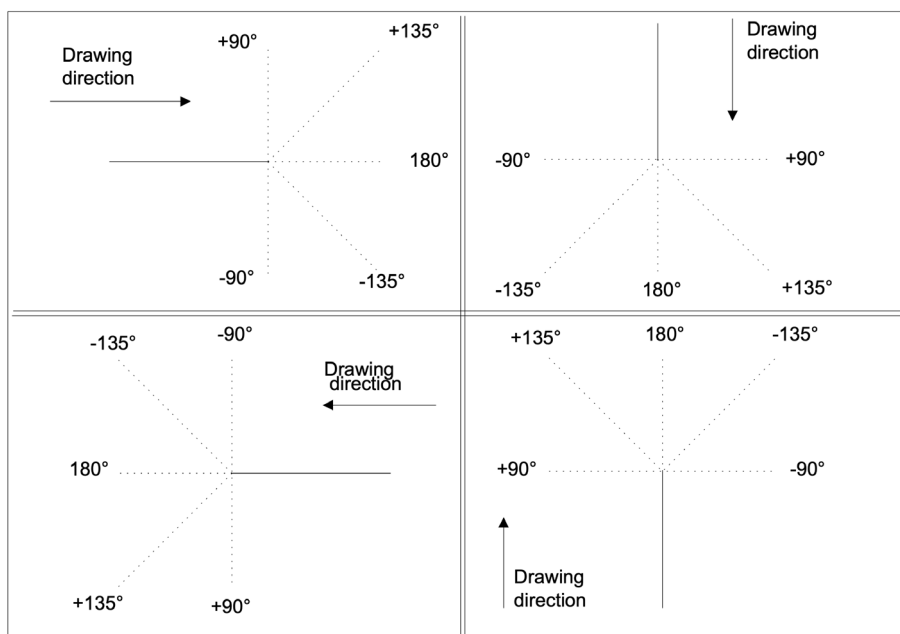


Figure 64. Conventions for setting the VSD angles

6.2.1. Cartesian setting of the drawing data

This function allows for defining the sections that will make up the drawing by means of a pair of coordinates that identify the difference between the beginning and end of the segment.

The Cartesian coordinates are not absolute but instead relate to the beginning of the segment and they must be entered as described in Figure 68.

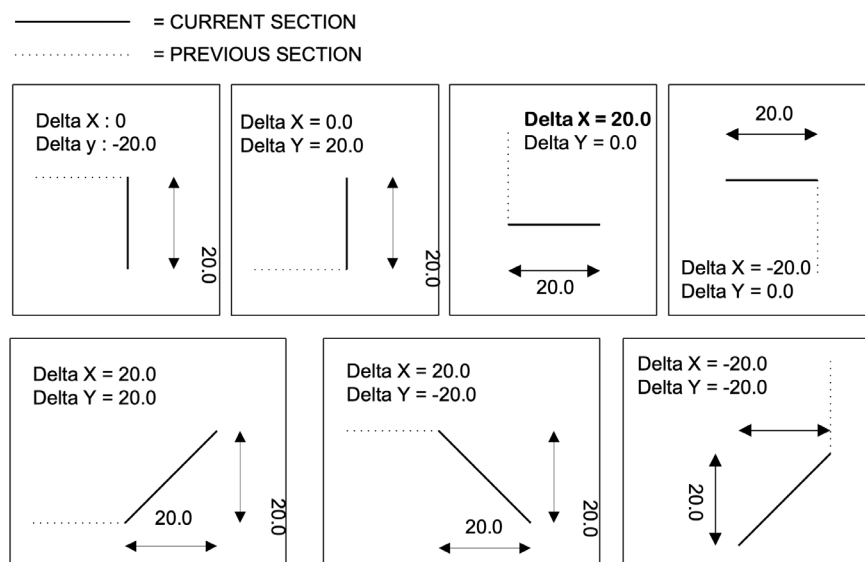


Figure 65. Conventions for setting the VSD angles

6.2.2 General data

Before starting the drawing of a graphic element it is necessary to enter some general data that will vary according to the object you wish to draw.

The data to be introduced in this phase are described in the specific chapters for each object.

6.3. Piece Setting page

- **Area 1** window of the drawing information or the status bar contains:

the name of the file that you are drawing.

the number of the step of the current drawing.

the scale factor of the drawing.

- **Area 2** window of the graphic tracing of the drawing in which:

the drawing corresponding to the data entered will be displayed.

- **Area 3** window of the polar setting of the drawing in which:

it is possible to enter the data relating to the length of the section to be drawn "I" and the angle compared to the following section "Alfa". Is it visible also the "Ri" data, it means the radius of the bend

- **Area 4** window of the Cartesian setting of the drawing in which:

it is possible to enter the Cartesian coordinates "DX" and "DY" which represent the difference between the initial coordinates and the final ones of the section to be drawn.

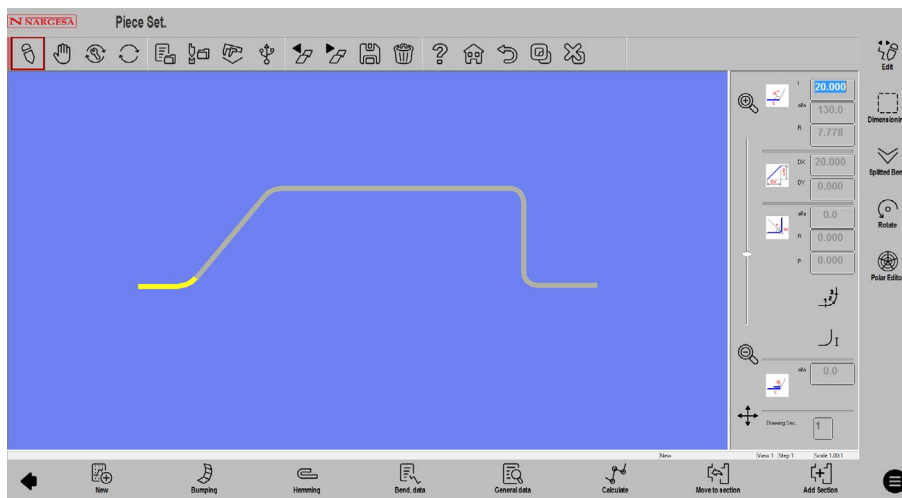


Figure 66. Drawing window

6.4. Entering of the data of the drawing

When you access the drawing of a new program, in Area 2 the first section standard length is automatically drawn.



Figure 67. first section standard length

The initial direction of the drawing, indicated by a red circle, can be changed by pressing the  [Rotate] button. The cursor is located in Field "I" in Area 3; there is a standard value in this Field, 20 mm.

N.B.

Each value entered using the virtual keyboard must be confirmed by pressing the ENTER  key.

6.4.1. How to enter a drawing in polar mode

If the cursor is not located in Field "l" of Area 3 it will be necessary to press the button  [Cartesian Editor] to activate the polar type setting. As described in the Polar Setting chapter of the in drawing data, the values to be entered are as follows:

- 1) the length of the section; the section will be rescaled depending on the length entered and the cursor will move onto the "alfa" Field for setting of the angle.
- 2) the "alfa" angle compared to the following section.

The section described above will turn grey; the following section will be drawn that then becomes the current section, and it will be shown in yellow.

After completing the entering of the data the cursor moves into Field "l" for setting of the length of the **new section**.

The entering of this data pair must be repeated until the drawing has been completed.

6.4.2. How to enter a drawing by tapping on the screen

When you access the drawing of a new program the next segment can be entered by simply tapping the screen with your finger in the desired direction like described in the chapter 4.3 of this guide. Once the segment has been entered, by tapping the screen with your finger in the center of the line drawn it will be possible to enter the measurement of the desired length on the virtual keyboard.

How to finish the drawing

In order to indicate that the drawing is finished you must set the angle of the last section to zero.

How to select the drawing data

To select the drawing data it is necessary to scroll through them with the  [Next] and  keys or tapping on the center of the section.

The  key scrolls backwards through the data forming the drawing in a sequential manner, passing step-by-step between the "alfa" Field and the "l" Field. The  scrolls backwards through the data in a sequential manner, passing step-by-step in the "l" Field. Whenever you scroll through the data of a drawing the section relating to the data displayed will be highlighted and the number of the section of current drawing will be displayed in Area 1.

How to change the drawing data

To change the drawing data it is necessary to:

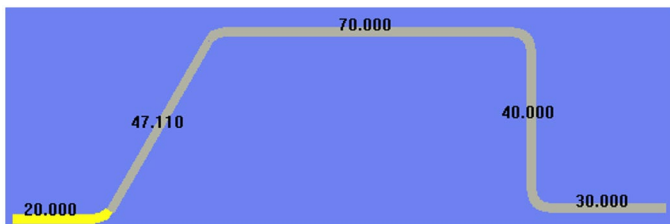
- select the value.
- enter the new value.
- press [ENTER] to accept the new value.
- the drawing will be traced depending on the new value entered.

How to visualize the drawing dimensions

Selecting the function button  [Dimensioning] will be possible to visualize some drawing dimensioning:

-  [Show None] no dimensioning are visualized

-  [Show Height] it show the lengths of the sections in the drawing:



-  [Show Angle] it show the angles of the drawing:



-  [Show Height Angle] it show the angles of the drawing:



Use the directional arrows

To automatically enter the angle of a section with respect to the following one, you can use the directional arrows. When you press one of these directional keys, a new segment will be traced in the direction indicated on the key you have pressed.

Using the directional arrows

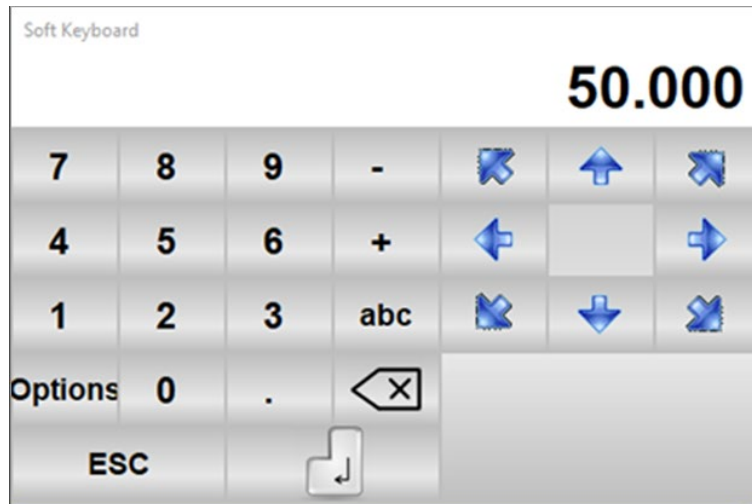


Figure 68. Position of the direction arrows keys

The directional vertical and horizontal arrows move both horizontally or vertically through the segments.

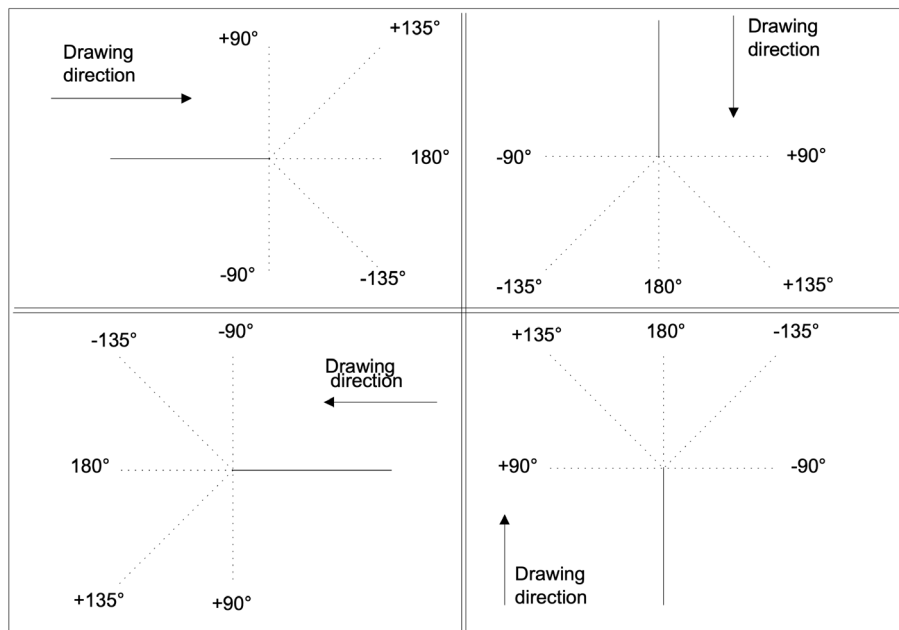


Figure 69. Using the arrows

The directional diagonals arrows move diagonally through the segments.

Use of the directional arrows

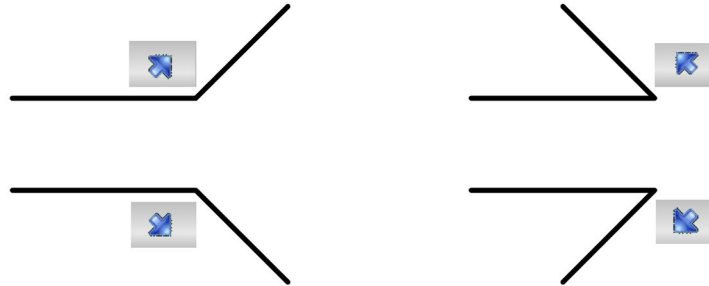


Figure 70. Using the directional diagonals arrows

The existing angle is automatically entered in the “**alfa**” Field between the current section and the segment traced depending on the directional key that has been pressed.

This angle must be confirmed with the **[ENTER]** key if you want to move on and enter the length of the new section.

How to delete a section of the drawing

To delete a section of the drawing it is necessary to select the data of the section that you want to delete and press the  button.

The current section will be deleted; the following sections will be orientated depending on the angle entered in the previous section previous to the one deleted.

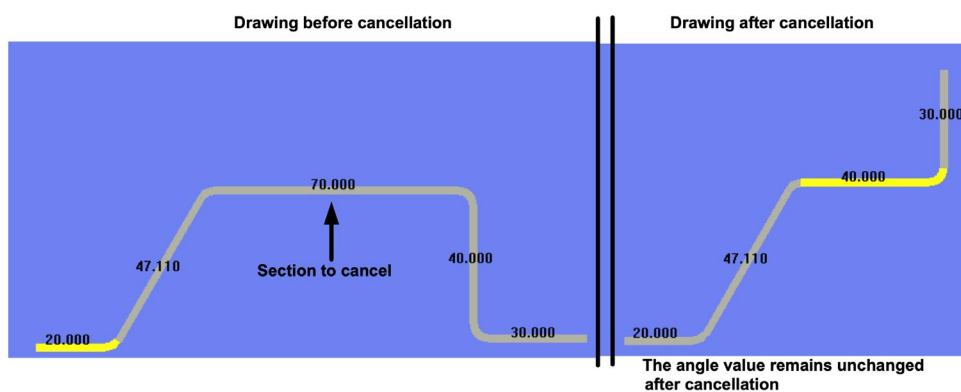


Figure 71. Deletion of a section

How to enter a section in the drawing

- Press the button  and select  **[Insert]** - in this way a section will be inserted before the one selected.

The data of the section that is inserted will be standard and they cause the extending of the currently selected side by 20 mm.

At this point it is necessary to enter the values of the new section to obtain the desired the drawing.

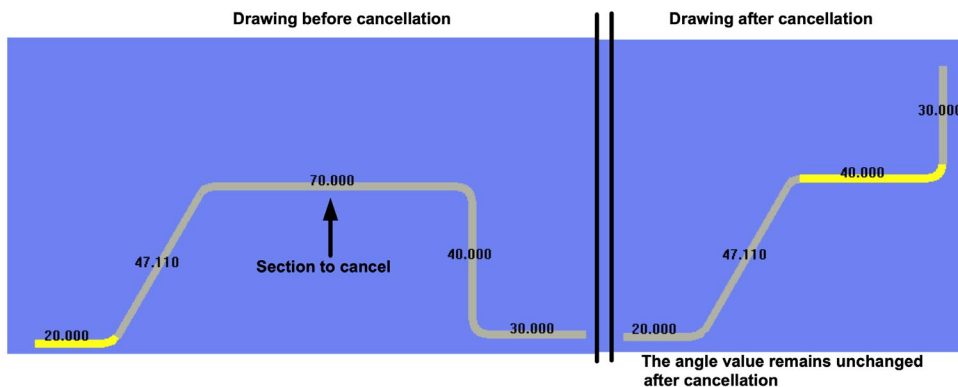


Figure 72. Inserting a section

There are some other method to enter a section in the drawing selecting the function button  **[Add to Tail]**:

-  **[Add]** selecting this function tapping near the end or of the beginning of the drawing you can add a new section.
-  **[Add to Tail]** selecting this function tapping near the end of the drawing (right side) you can add a new section.
-  **[Add to Head]** selecting this function tapping near the beginning of the drawing (left side) you can add a new section.
-  **[Edit]** selecting this function you can add a new section only using the Polar or the Cartesian Editor moving between the bends only using the function buttons  and .

6.4.3. How to use the Cartesian Editor

If it is not possible to define a segment in polar Editor, the function of drawing allows you to define it in Cartesian Editor.

Activation

From the Piece Setting page press the function button  [*Polar Editor*] in order to enable the Cartesian Editor function.

The cursor will move onto Area 4.

1) you must enter the difference between the beginning and the end of the segment along the horizontal axis in the **DX Field**.

2) you must enter the difference between the beginning and the end of the segment along the vertical axis in the **DY Field**.

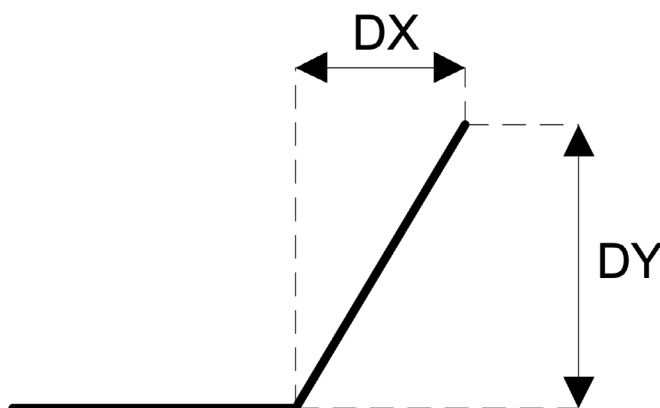


Figure 73. Cartesian data setting

By confirming the data with the key [*ENTER*] the new segment will be traced.

To return to the polar editor it is necessary to press the  [*Cartesian Editor*] button.

7. Managing the backup of the data's

7.1. Memory devices

7.1.1. USB device

This is a normal USB 1.1 or USB 2.0 or USB 3.0 device (pen drive). It must be fat 32 formatted.

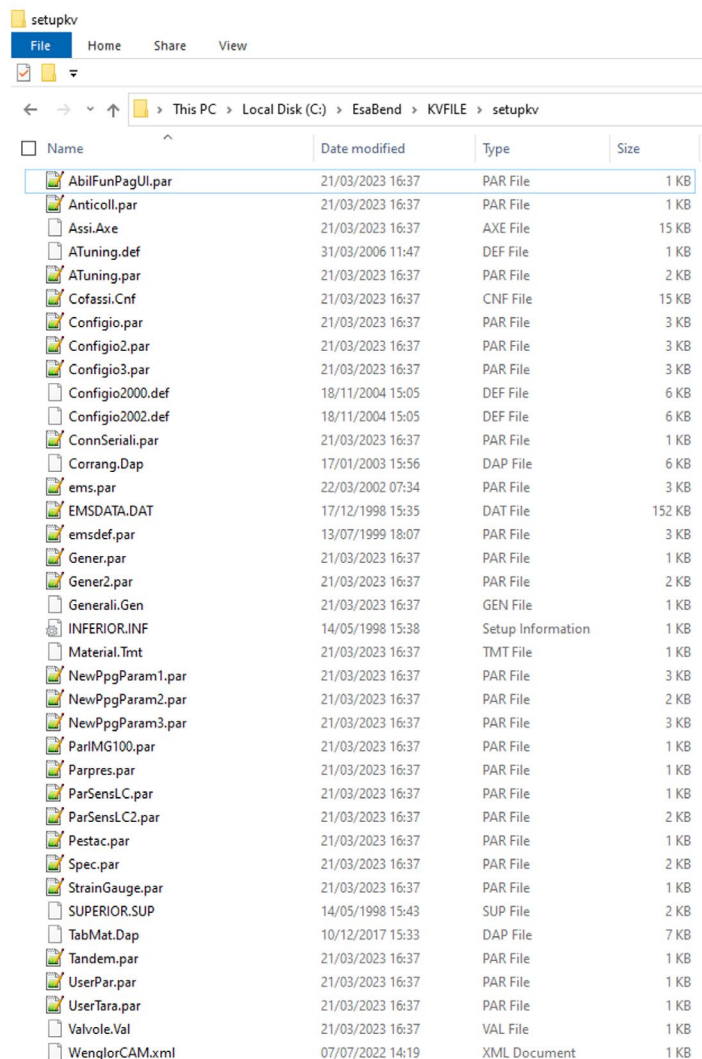
It is used to save the configuration parameters of the machine and the parameters of the axes; it is also used for the saving the security copy of the programmes, punches and dies. It is possible to view the contents of the device from any compatible IBM Personal Computer.

7.2. Exchanging the data between the memory devices

Data exchanging is understood as the transferral of the data from the internal CNC memory devices to the USB device (SAVE ALL-COMplete BACKUP) or from the USB device to the internal CNC memory devices (LOAD ALL- RESTORE BACKUP).

7.2.1 Save / Load the machine Parameters

The machine parameters are present in the VIS PC folder C:\EsaBend\KVFILE\setupkv:

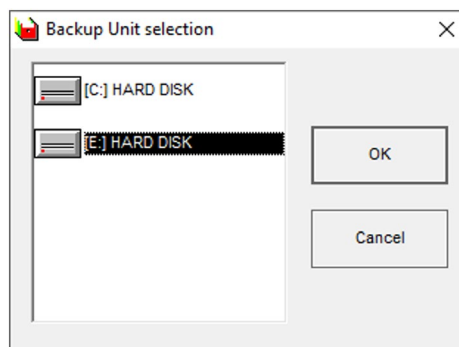


Name	Date modified	Type	Size
AbilFunPagUI.par	21/03/2023 16:37	PAR File	1 KB
Anticoll.par	21/03/2023 16:37	PAR File	1 KB
Assi.Axe	21/03/2023 16:37	AXE File	15 KB
ATuning.def	31/03/2006 11:47	DEF File	1 KB
ATuning.par	21/03/2023 16:37	PAR File	2 KB
Cofassi.Cnf	21/03/2023 16:37	CNF File	15 KB
Configio.par	21/03/2023 16:37	PAR File	3 KB
Configio2.par	21/03/2023 16:37	PAR File	3 KB
Configio3.par	21/03/2023 16:37	PAR File	3 KB
Configio2000.def	18/11/2004 15:05	DEF File	6 KB
Configio2002.def	18/11/2004 15:05	DEF File	6 KB
ConnSeriali.par	21/03/2023 16:37	PAR File	1 KB
Corrang.Dap	17/01/2003 15:56	DAP File	6 KB
ems.par	22/03/2002 07:34	PAR File	3 KB
EMSDATA.DAT	17/12/1998 15:35	DAT File	152 KB
emsdef.par	13/07/1999 18:07	PAR File	3 KB
Gener.par	21/03/2023 16:37	PAR File	1 KB
Gener2.par	21/03/2023 16:37	PAR File	2 KB
Generali.Gen	21/03/2023 16:37	GEN File	1 KB
INFERIOR.INF	14/05/1998 15:38	Setup Information	1 KB
Material.Tmt	21/03/2023 16:37	TMT File	1 KB
NewPpgParam1.par	21/03/2023 16:37	PAR File	3 KB
NewPpgParam2.par	21/03/2023 16:37	PAR File	2 KB
NewPpgParam3.par	21/03/2023 16:37	PAR File	3 KB
ParIMG100.par	21/03/2023 16:37	PAR File	1 KB
Parpres.par	21/03/2023 16:37	PAR File	1 KB
ParSensLC.par	21/03/2023 16:37	PAR File	1 KB
ParSensLC2.par	21/03/2023 16:37	PAR File	2 KB
Pestac.par	21/03/2023 16:37	PAR File	1 KB
Spec.par	21/03/2023 16:37	PAR File	2 KB
StrainGauge.par	21/03/2023 16:37	PAR File	1 KB
SUPERIOR.SUP	14/05/1998 15:43	SUP File	2 KB
TabMat.Dap	10/12/2017 15:33	DAP File	7 KB
Tandem.par	21/03/2023 16:37	PAR File	1 KB
UserPar.par	21/03/2023 16:37	PAR File	1 KB
UserTara.par	21/03/2023 16:37	PAR File	1 KB
Valvole.Val	21/03/2023 16:37	VAL File	1 KB
WenglorCAM.xml	07/07/2022 14:19	XML Document	1 KB

Parameters saving

To save all the machine parameters including the ioredir on the USB device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  [**Configuration**].
- 4) Press the button .
- 5) Select [**Backup Unit**]:



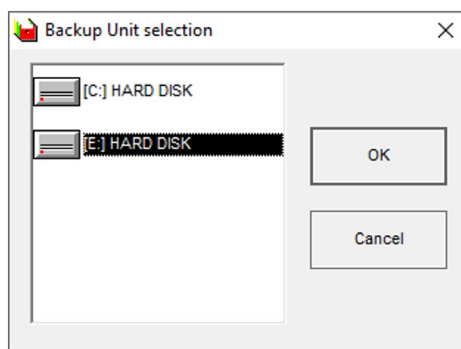
Select the backup unit from the list and select [**OK**]

- 6) Press the function button [**Save ALL**] and select [**Yes**]: after some seconds all the machine parameters will be saved on the USB device.

Parameters loading

To load all the machine parameters on the CNC device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  [**Configuration**].
- 4) Press the button .
- 5) Select [**Backup Unit**]:



Select the backup unit from the list and select **[OK]**

6) press the function button **[Load ALL]** and select **[Yes]**: after some seconds all the machine parameters will be loaded on the CNC device.

At this point if you want load also the ioredir file press the function button **[Load I/O]**

Complete backup

To save all the machine parameters, the ioredir file, the punches, the dies and all the user data's files (plc, iso cycles, defcn.usr etc...) of the machine on the USB device it is necessary to:

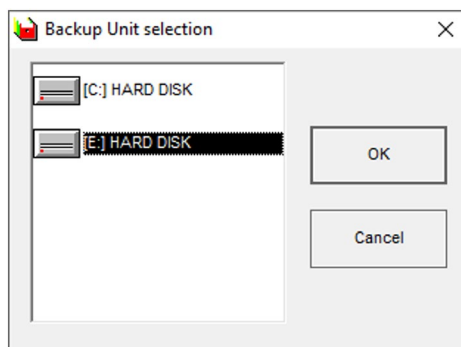
1) Insert the **USB** device in the VIS PC.

2) Press the button  two times to open the menu.

3) Select the item  **[Configuration]**.

4) Press the button .

5) Select **[Backup Unit]**:



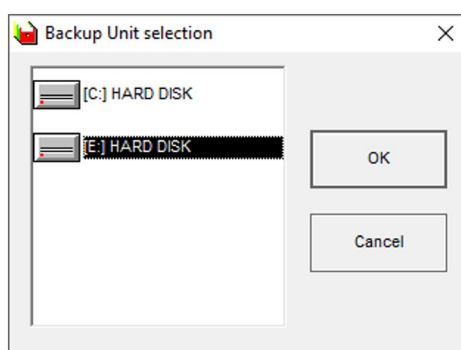
6) Select the backup unit from the list and select **[OK]**

press the function button **[Complete backup]** and select **[Yes]**: after some seconds all the machine parameters, the ioredir file, the punches, the dies and all the user data's files will be saved on the USB device.

Restore backup

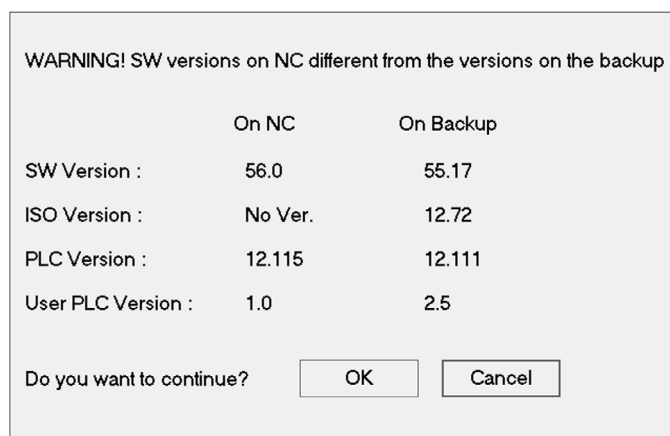
To load all the machine parameters, the punches, the dies and all the user data's files (plc, iso cycles, defcn.usr etc...) on the CNC device it is necessary to:

- 1) Insert the **USB** device in the VIS PC.
- 2) Press the button  two times to open the menu.
- 3) Select the item  **[Configuration]**.
- 4) Press the button  .
- 5) Select **[Backup Unit]**:



Select the backup unit from the list and select **[OK]**

- 6) press the function button **[Restore Backup]** and select **[Yes]**: after some seconds all the machine parameters, the punches, the dies and all the user data's files will be loaded on the CNC device.
 - 7) At this point if you want load also the ioredir file press the function button **[Load I/O]**
- If during this operation this screen will appears:



It means that the software version on the CNC is different from the version on the backup: in this case is not recommended to do the restore backup, select **[Cancel]** in order to cancel the operation.

Single parameters group loading

If you want load a single parameters group enter in the parameters page and select *[Load from Disk]*.

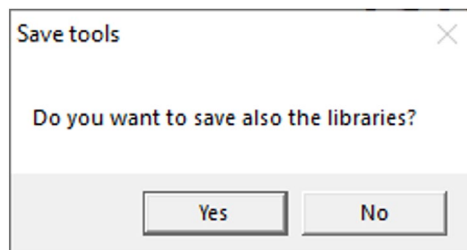
7.2.2. Saving/Loading the Tools

1) Press the top bar menu button .

2) Press the button .

3) Select the *[Save tools]*  item.

If the windows:



Select *[Yes]* or *[No]*, it is up to you.

All the tools (dies and punches) will be saved on USB.

If you want save only one tool on the USB device, from the die or punch list select the tool you need to save and press .

Loading the tools from the USB device

To load all the tools from the usb device it is necessary to:

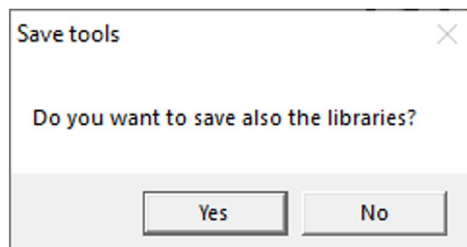
1) Press the top bar menu button .

2) Press the top bar menu button  to view the list of the dies or of the punches of the USB device.

3) Press the button .

4) Select the *[Save tools]*  item.

If the windows:



Select *[Yes]* or *[No]*, it is up to you.

All the tools (dies and punches) will be saved on the CNC device.

If you want save only one tool on the device, select the tool on the die/punch list and press .

7.2.3. Saving/Loading the programs

Saving the programs on the USB device

To save all the programs on the usb device it is necessary to:

- 1) Press the top bar menu button 
- 3) Press the button  .
- 3) Select the **[Save programs]**  items .
- 4) If you want save only one program on the USB device, from the program list select the program you need to save and press  .

Loading the programs from the USB device

To load all the tools from the usb device it is necessary to:

- 1) Press the top bar menu button 
- 2) Press the top bar menu button  to view the list of the programs of the USB device.
- 3) Press the button  .
- 3) Select the **[Save programs]**  items .
- 5) If you want load only one program from the USB device, from the program list select the program you need to save and press  .

7.2.4. Recommendations for the manufacturer and for the end user of the press brake

It is recommended to keep:

- USB device containing the machine parameters for each bender press sold (in double copy or a backup copy on the hard disk of a personal computer);
- A copy of the environment of the press brake that from the software version 73.55.0 is in the folder **C:\Esabend**. In the previous versions take a copy of the folders **DATI-DATIPPG-KVARA-KVFILE** that are present in the **C:\ CNC** disk.

8. Description of the program data

8.1. Header section

This section contains a description of the header information contained in the upper part of the EDITOR page:

Name	
Minimum value:	Maximum value:
Default value:	Measuring unit: Alphanumeric characters
Present in SW version 1.0	Change activated
Description:	This is the name of the programme currently in progress; if nothing is entered in the field the programme will be the temporary type which has still not been saved. As many as 16 characters are managed in the header.
Bend: 	
Minimum value: 1	Maximum value: 80
Default value:	Measuring unit: pure number
Present in SW version 1.0	Change activated
Description:	This is the bend currently in progress.
Section: 	
Minimum value: 1	Maximum value: 8
Default value:	Measuring unit: pure number
Present in SW version 1.0	Change activated
Description:	This is the section currently in the bending phase; the term section is understood as the side of the metal sheet on which you are carrying out the bends.

8.2. Supplementary information that cannot be changed

In the pages "Settings", "Automatic" also contain some information that cannot be changed:

- type of bend; the following values may be assumed:



normal bend in the air



calendered bend



Dutch folding bend



coining bend



conical bend

- bearing support; the following values may be assumed:



resting-against bend, the metal sheet must be pushed against the stop



supported bend, the metal sheet must be resting on top the first step of the stop



double supported bend; the metal sheet must be resting on top the second step of the stop

- Default Page:  the default page is enabled.

8.3. Section Piece info

This section contains the data regarding the entire piece.

Comp. Pcs	
Minimum value: 0	Maximum value: 9999
Default value: 0	Measuring unit: Pure Number
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates how many pieces of the programme in progress have been made; the value is automatically updated during the execution, however the user can change this as desired.
Pieces to do	
Minimum value: 0	Maximum value: 9999
Default value: 0	Measuring unit: pure number
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates how many pieces the user wishes to carry out; the number is automatically decreased at the end of each piece; at the end of the last piece the automatic execution will stop and it will be necessary to press the START button to continue working.
Measures	
Minimum value: 0	Maximum value: 1
Default value: 0	Measuring unit: pure number
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates whether the user describes the piece by means of external, neutral fibre or internal measurements; the following values may be assumed: 0 = external measurements (default). Description of the piece by means of external measurements (the stretch operations of the metal sheet are taken into account in the programme calculations). 1 = Description of the piece by means of neutral fibre measurements (no account is taken of the stretch operations of the metal sheet in the programme calculations). 2= internal measurements. Description of the piece by means of internal measurements (the stretch operations of the metal sheet are taken into account in the programme calculations).

Devel.	
Minimum value: 0	Maximum value:
Default value:	Measuring unit: mm
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates the development calculated for the piece. Can have two meaning: 1) Numerical program: it indicates the dimension to be subtracted from the total length of the piece. 2) Graphic program: length at which to cut the piece.

8.4 Section General data

This section contains a description of the general data concerning the piece; the user can however change them bend by bend.

Width	
Minimum value: 0	Maximum value: 99999.9
Default value:	Measuring unit: mm
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates the width of the metal sheet in the point of bend.
Thickness	
Minimum value: 0.01	Maximum value: 99.99
Default value:	Measuring unit: mm
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates the thickness of the metal sheet in the point of bend.
Material	
Minimum value:	Maximum value:
Default value:	Measuring unit: kg/mm²
Aluminum 22 Steel44 Stainless steel77 Aluminum20 Steel37 Stainles steel55 Aluminum18 Steel42 Stainless steel88	
Present in SW version 1.0	Change activated Setting of value
Description:	This indicates the type of material with his resistance. His K strength and B.D.C multiplier coefficient are visible in the MATERIAL TABLE. If the resistance of the material is set between 0 and 30 it means the material is aluminum, if it is set between 30 and 50 it is Steel, if more than 50 it is Stainless steel till the hardox. It is recommended to use the default values specified if you do not know the real resistance values, nevertheless, in case of errors in the final angle or in the calculation of the development, it will be necessary to check that any incorrect entering of this value will not influence the results.

Punch	
Minimum value:	Maximum value:
Default value:	Measuring unit: Alphanumeric characters
Present in SW version 1.0	Change activated Setting of value
Description:	This is the name of the punch used to make the bend.
Die	
Minimum value:	Maximum value:
Default value:	Measuring unit: Alphanumeric characters
Value type char [9]	Protection level:
Present in SW version 1.0	Change activated setting of value
Description:	This is the name of the die used to make the bend.
V-die	
Minimum value: 1	Maximum value: 10
Default value: 1	Measuring unit: pure number
Value type unsigned character	Protection level:
Present in SW version 1.0	Change activated setting of value
Description:	This is the number of the V-die used to make the bend; it must be borne in mind that it is possible to draw dies with multi-Vdie that are exactly the same as the real ones; the V-dies are automatically numbered in a progressive manner during the drawing phase.
Station	
Minimum value: 0	Maximum value: 8
Default value 0	Measuring unit: pure number
Present in SW version 5.0	Change activated setting of value
Description:	This is the number of the work station that is used for this bend, it allows you to make an automatic calculation of the Z. 0 = no account is taken of the work stations and the machine positions the Z for bending in the centre of the machine. 1 - 8 = number of the station to be used in the bend displayed, defined in the Tools page.

8.5. Axis and angle data section

This section identifies the data contained in the central part of the video in which it is possible to enter the angles of the bend, the positions of the axes, and any corrections.

Y1 Angle				
Minimum value:		-179.9	Maximum value:	180.0
Default value:			Measuring unit:	degrees
Present in SW version		1.0	Change activated	Setting of value
Description:		This is the angle of the bend required on the Y1 axis.		
B.D.C. Y1				
Minimum value:		0.00	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the position that the Y1 axis must reach in order to achieve the required angle.		
Corrections to Y1				
Minimum value:		-90.0	Maximum value:	90.0
Default value:			Measuring unit:	degrees
Present in SW version		1.0	Change activated	setting of value
Description:		This is the correction to be made to the angle of the bend resulting after the bending in order to achieve the correct angle; this can also be entered in the CORRECTIONS page.		
Y2 Angle				
Minimum value:		-179.9	Maximum value:	180.0
Default value			Measuring unit:	degrees
Present in SW version		1.0	Change activated	setting of value
Description:		This is the angle of the bend required on the Y2 axis.		

B.D.C. Y2				
Minimum value:		0.00	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	Setting of value
Description:		This is the position that the Y2 axis must reach in order to achieve the required angle.		
Corrections to Y2				
Minimum value:		-90.0	Maximum value:	90.0
Default value:			Measuring unit:	degrees
Present in SW version		1.0	Change activated	setting of value
Description:		This is the correction to be made to the angle of the bend resulting after the bending in order to achieve the correct angle; this can also be entered in the CORRECTIONS page.		
X1				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the position that the X1 axis must reach in order to achieve the required bending lenght .		
X1 Retract				
Minimum value:		0	Maximum value:	999.99
Default value			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the measurement of how far the X1 axis must move backwards when the ram reaches the pinch point in order to prevent the metal sheet from colliding against the back gauges.		

Corrections to X1				
Minimum value:		-999.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	Setting of value
Description:		This is the correction to be made to the position of the X1 axis in order to obtain the required length of the bend.		
X2				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the position that the X2 axis must reach in order to achieve the required bending lenght .		
X2 Retract				
Minimum value:		0	Maximum value:	999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the measurement of how far the X2 axis must move backwards when the ram reaches the pinch point in order to prevent the metal sheet from colliding against the back gauges.		
Corrections to X2				
Minimum value:		-999.99	Maximum value:	9999.99
Default value			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the correction to be made to the position of the X2 axis in order to obtain the required length of the bend.		

R1				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	Setting of value
Description:		This is the position that the R1 axis must reach in height in order to allow it to support the sheet metal.		
R2				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the position that the R2 axis reach in height in order to allow it to support the sheet metal.		
Z1				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the opening position of the Z1 axis towards the left to allow for correctly positioning any large pieces of sheet metal.		
Z2				
Minimum value:		-99.99	Maximum value:	9999.99
Default value			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This is the opening position of the Z2 axis towards the right to allow for correctly positioning any large pieces of sheet metal.		

A1 (Mechanical crowning)				
Minimum value:		0	Maximum value:	100
Default value:			Measuring unit:	%
Present in SW version		3.2	Change activated	Setting of value
Description:		This is the position of the mechanical crowning (WILA type), expressed in % of the maximum recovery of the bending of the bench. This function is present if the system is capable of managing this type of crowning.		
A1 (M Axis Hammerle press)				
Minimum value:		-99.99	Maximum value:	9999.99
Default value:			Measuring unit:	mm
Present in SW version		14.0	Change activated	setting of value
Description:		This is the position of the M axis M used to change the depth of the die and therefore also the angle, in the 3-point bend of the Hammerle type. This function is present if the press is of the Hammerle and consists of a die with a variable V-die bottom. If this type of Axis is enabled, the icon  will be displayed in the top right-hand corner to indicate that the press is of the Hammerle type.		
A1 (Follower 1)				
Minimum value:		0	Maximum value:	90
Default value:			Measuring unit:	Degrees
Present in SW version		6.0	Change activated	setting of value
Description:		This is the position of the follower 1, expressed in degrees, compared to the angle formed with the with the supporting plane of the sheet metal. This function is present if the press is equipped with followers.		
A2 (Follower 2)				
Minimum value:		0	Maximum value:	90
Default value			Measuring unit:	Degrees
Present in SW version		6.0	Change activated	setting of value
Description:		This is the position of the follower 2, expressed in degrees, compared to the angle formed with the with the supporting plane of the sheet metal. This function is present if the press is equipped with followers.		

8.6. Work data section

This section contains a description of the work data used bend by bend.

T.D.C. (Upper dead point)				
Minimum value:		0.01	Maximum value:	999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	Setting of value
Description:		This indicates by how many millimetres the bender press must be opened at the end of the bend (the space between the edge of the die and the punch).		
Mute				
Minimum value:		-99.99	Maximum value:	999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This indicates by how many millimetres the theoretical mute point needs to be changed to ensure the correct speed change.		
Pinch Point				
Minimum value:		-99.99	Maximum value:	999.99
Default value:			Measuring unit:	mm
Present in SW version		1.0	Change activated	setting of value
Description:		This indicates by how many millimetres the theoretical pinch point must be changed to allow for correct clamping		
Force				
Minimum value:		0.1	Maximum value:	9999.99
Default value			Measuring unit:	tons
Present in SW version		1.0	Change activated	setting of value
Description:		This is the force necessary to bend the sheet metal.		
Crowning				
Minimum value:		0	Maximum value:	100
Default value:			Measuring unit:	%
Present in SW version		1.0	Change activated	setting of value
Description:		This is the compensation necessary for straightening the bender press; this is relative to the strength used for the bend and is a percentage of the maximum force of the machine.		

C.S.T				
Minimum value:		0	Maximum value:	99.99
Default value:		0	Measuring unit:	seconds
Present in SW version		1.0	Change activated	Setting of value
Description:		Delay Time between the step change and the departure of the back gauges to allow the user to remove the metal plate. 99 wait for change step by pressing Down command.		
Bend time				
Minimum value:		0	Maximum value:	99.99
Default value:		0	Measuring unit:	seconds
Present in SW version		1.0	Change activated	setting of value
Description:		This is the time that the ram remains stopped at the B.D.C. to allow to enervating the sheet metal.		
Matching				
Minimum value:		0	Maximum value:	10
Default value:		0	Measuring unit:	m/min
Present in SW version		1.0	Change activated	setting of value
Description:		Speed used by the ram to accompany the metal plate to rise from BDC to the pinch point to prevent overturning heavy plate on to the operator. If the value has been left at zero this accompanying action will not be carried out.		
Speed				
Minimum value:		0	Maximum value:	10
Default value:		0	Measuring unit:	m/min
Present in SW version		1.0	Change activated	setting of value
Description:		This is the bending speed; if the user has to carry out delicate bends (for example with very fine thicknesses) it is recommended to use speeds that are lower than the maximum acceptable speed.		

Rep			
Minimum value: 1		Maximum value: 99	
Default value: 1		Measuring unit: Pure number	
Present in SW version 1.0		Change activated Setting of value	
Description:		This indicates the number of times the bend must be repeated before passing over to the next one.	
Dir			
Minimum value: -1		Maximum value: 1	
Default value: 1		Measuring unit: pure number	
Value type unsigned character		Protection level: setting of value	
Present in SW version 1.0		Change activated Setting of value	
Description:		NOT USED	
Ri			
Minimum value: 0		Maximum value: 9999.99	
Default value:		Measuring unit: mm	
Present in SW version 14.0		Change activated Setting of value	
Description:		This indicates the internal radius of the bend, calculated by the NC. If the programme is numeric, any changes to this value will have a direct influence on the calculation of the development. If the programme is graphic, it will only serve for indicating to the operator which internal radius will be obtained.	

FN	
Minimum value:	Maximum value:
Default value: 	Measuring unit:
Present in SW version 1.0	Change activated Setting 
Description:	Functions from 1 to 20 These are the data used to manage the special functions like the pneumatic Dutch folding die, pneumatic R axes; they can assume the following values: 0 = function not enabled 1 = function enabled In order to access to all of the functions tap the icon 

OUR PRODUCT RANGE



IRON WORKERS



NON-MANDREL PIPE BENDER



HORIZONTAL PRESS BRAKES



SECTION BENDING
MACHINES



CNC SECTION BENDING
MACHINES



LASER WELDING EQUIPMENT



TWISTING/SCROLL
BENDING MACHINES



HYDRAULIC PRESS BRAKES



HYDRAULIC SHEAR
MACHINES



GAS FORGES



IRON EMBOSSING
MACHINES



END WROUGHT IRON
MACHINES



BROACHING MACHINES



POWER HAMMERS



BLACKSMITH FORGING PRESS