NAXSOSANDWICH

Rated current	I_n [A]	500	800	1000	1250	1600	2000	2500	3200	4000	5000	6300
Dimensions	mm	185x160	185x160	200x125	200x125	200x175	200x195	200x251	200x315	200x360	200x475	200x646
Number of conductors / section	mm^2 *	1x300	1x700	1x750	1x820	1x1300	1x1500	1x2000	1x2700	1x3000	2x2000	2x2700
Rated opeartional voltage	U_e [V]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated insulation voltage	U_i [V]	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Frequency	f [Hz]	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated short time withstand current (0,1s)	Icw [kA]	40	50	50	50	70	70	70	70	70	70	70
Peak Current	Ipk [kA]	84	105	105	105	154	154	154	154	154	154	154
Phase resistance at 20°C	R_{20} [mΩ/m]	0,077	0,047	0,041	0,041	0,028	0,026	0,018	0,014	0,012	0,011	0,007
Phase reactance (@50Hz)	X_1 [mΩ/m]	0,045	0,035	0,020	0,020	0,015	0,013	0,010	0,009	0,007	0,005	0,004
Phase impedance	Z_1 [mΩ/m]	0,117	0,075	0,067	0,067	0,064	0,060	0,041	0,032	0,028	0,025	0,016
Phase resistance at thermal condition	R_1 [mΩ/m]	0,108	0,066	0,050	0,048	0,039	0,028	0,025	0,018	0,012	0,010	0,009
Pe resistance	R_{PE} [mΩ/m]	0,051	0,051	0,051	0,051	0,018	0,013	0,013	0,013	0,013	0,013	0,012
Fault loop resistance phase - N	R_{FN} [mΩ/m]	0,162	0,099	0,086	0,086	0,059	0,055	0,038	0,029	0,025	0,023	0,015
Fault loop reactance phase - N	X_{FN} [mΩ/m]	0,169	0,154	0,140	0,128	0,117	0,108	0,075	0,058	0,051	0,046	0,030
Fault loop impedance phase - N	Z_{FN} [mΩ/m]	0,234	0,183	0,164	0,154	0,131	0,121	0,084	0,065	0,059	0,051	0,035
Fault loop resistance phase - PE	R_{FPE} [mΩ/m]	0,141	0,070	0,064	0,064	0,051	0,043	0,034	0,030	0,028	0,026	0,017
Fault loop reactance phase - PE	X_{FPE} [mΩ/m]	0,115	0,102	0,102	0,102	0,100	0,085	0,068	0,059	0,055	0,052	0,032
Fault loop impedance phase - PE	Z_{FPE} [mΩ/m]	0,182	0,124	0,120	0,120	0,112	0,095	0,076	0,066	0,063	0,059	0,035
Voltage Drop with distributed load	ΔV[V/m/A] 10^{-3} cos φ = 0,70	0,093	0,062	0,056	0,056	0,052	0,047	0,033	0,026	0,023	0,020	0,015
	ΔV[V/m/A] 10^{-3} cos φ = 0,75	0,096	0,063	0,057	0,057	0,050	0,046	0,032	0,025	0,021	0,020	0,013
	ΔV[V/m/A] 10^{-3} cos φ = 0,80	0,098	0,064	0,058	0,058	0,048	0,045	0,031	0,024	0,022	0,019	0,012
	ΔV[V/m/A] 10^{-3} cos φ = 0,85	0,100	0,064	0,058	0,058	0,046	0,042	0,030	0,010	0,015	0,018	0,006
	ΔV[V/m/A] 10^{-3} cos φ = 0,90	0,101	0,064	0,058	0,058	0,043	0,040	0,028	0,021	0,019	0,017	0,010
	ΔV[V/m/A] 10^{-3} cos φ = 0,95	0,101	0,064	0,057	0,057	0,038	0,044	0,025	0,019	0,016	0,015	0,009
	ΔV[V/m/A] 10^{-3} cos φ = 1,00	0,093	0,057	0,050	0,050	0,024	0,023	0,016	0,012	0,011	0,010	0,007
Weight	p [kg/m]	6,5	10	15	15	24	29	32	42	49	54	80
Degree of protection	IP	41/55	41/55	41/55	41/55	41/55	41/55	41/55	41/55	41/55	41/55	41/55
Losses for the joule effect at rated current	P [W/m]	81	126	150	225	300	336	470	550	576	750	1000
Temperature range		-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C	-5 +40°C
Number of Joint bolts 12 MA		1	1	1	1	2	2	3	3	3	6	6
INSULATION MATERIALS OF THE JOINT	POLIAMMIDE V0 FILLED FIBER GLASS 30 % TEMPERATURE > 200 CELSIOUS											
CONDUCTORS INSULATION	NOMEK DMAC TEMPERATURE > 230 CELSIOUS											
WINDOWS WHEN PLUG IN	POLIAMMIDE V0 FILLED FIBER GLASS 30 % TEMPERATURE > 200 CELSIOUS											
SANDWICH BUSBAR HOUSING	GALVANIZED SENDZIMIR 270 GR STEEL 2 MM THICK											

*** Bars made with super conduttivity alloy L 1050**

CHECK LIST

- Naxsosandwich is a compact assembly of pure aluminium alloy 1050 that better perform when the cooling is permitted trough air circulating in the room where the busbars are installed.
- Prevent from installing two or more lines together to let inspection of joint bolts possible and to avoid one hot line shall influence the one next so the minmum distance suggested between two of them is 200mm as well as the minimum distance from a wall shall be 300 mm if this is not possible the lines shall be derated according the suggestions shown in the catalogue.
- A fire barrier is some sleeve protecting a busbar area but preventing as well the cooling so when a fire barrier is instaled a derating shall be calculated.
- The joints have one or two or three bolts that shall be tightened according to the label on the joint and shall be controlled after a first three...to five month period after the initial installation. After the installation a ceck of the torque is recommended every 12 months expecially if in the area some vibrations due to heavy machinery are expected.
- If a vertical riser installation is required some special brakets are required so ask the technical service in naxso to suggest the best patr number.
- All the lines containing elbows vertical or not diedral terminals need to have a braket is the point no matter if the general braketing is strong enough but specifically they need a next door fixing point.
- All the tap offs in the Naxsosandwich serie need to be fixed and installed when the circuits are off even the busbar shall be out of tension before installing a tap off.
- When a line is loaded at an ampage next to the max rating high temperature of the busbar housing are nor mal but if the temperature is raising over 90 celsious a ceck of general conditions is required and if the normal use is always next to the max rating the number of joint torque maintenance shall be improved.

EN AW-AlMgSi
UNI EN 573-3 (6060)

Composizione chimica percentuale									
Mg	Si	Fe	Ti	Cu	Cr	Mn	Zn	Altri elementi max	Al
0,35-0,60	0,30-0,60	0,10-0,30	0,10	0,10	0,05	0,10	0,15	0,05-0,15	Resto

Caratteristiche principali

Estrudibilità eccellente. Lega di media durezza adatta per estrusi difficili. Alta resistenza alla corrosione. Buona formabilità allo stato TaN. Buona finitura superficiale. Saldabilità buona.

Usi tipici

Applicazioni architettoniche e decorative. Profili per serramenti. Industria chimica.

Caratteristiche fisiche e generali

Peso specifico	2,7 kg/dm^3	Calore specifico 0 -100 °C	≈ 0,92 J (g.k)
Modulo di elasticità	66000 N/mm^2	Coeff. di dilatazione	
Modulo di rigidità	26500 N/mm^2	teorico lineare 20 -100 °C	23 x 10^{-6} x K^{-1}
Punto di fusione	605 °C	Conduttività termica 20 °C	≈ 1,75 W (cm x k)
		Resistività a 20 °C (T6) Resistance	**≈ 3,25 µ Ω x cm**

Lega EN AW-6060 (Al MgSi)

BARRA ESTRUSA			CARICO DI ROTTURA A TRAZIONE		CARICO AL LIMITE DI SNERVAMENTO		ALLUNGAMENTO	
Stato metallurgico	Dimensioni mm		R_m MPa		$R_{p0,2}$ MPa		A %	A $_{50\ mm}$ %
	D[1]	S[2]	min.	max.	min.	max.	min.	min.
T4[5]	≤ 150	≤ 150	120	-	60	-	16	14
T5	≤ 150	≤ 150	160	-	120	-	8	6
T6[5]	≤ 150	≤ 150	190	-	150	-	8	6

TUBO ESTRUSO							
Stato metallurgico	Dimensioni mm	R_m MPa		$R_{p0,2}$ MPa		A %	A $_{50\ mm}$ %
	e[3]	min	max	min	max.	min	min.
T4[5]	≤ 15	120	-	60	-	16	14
T5	≤ 15	160	-	120	-	8	6
T6[5]	≤ 15	190	-	150	-	8	6

PROFILATO ESTRUSO[10]							
Stato metallurgico	Dimensioni mm	R_m MPa		$R_{p0,2}$ MPa		A %	A $_{50\ mm}$ %
	e[3]	min	max	min	max	min	min.
T4[5]	≤ 25	120	-	60	-	16	14
	≤ 5	160	-	120	-	8	6
T5	5 < e ≤ 25	140	-	100	-	8	6
	≤ 3	190	-	150	-	8	6
T6[5]	3 < e ≤ 25	170	-	140	-	8	6

EN AW-A199.5

UNI EN 573-3 (1050A)

Composizione chimica percentuale								
Si	Fe	Cu	Mn	Mg	Zn	Ti	Altre impurità ciascuna	Al
0,25	0,4	0,05	0,05	0,05	0,07	0,05	0,03	99,5 min

Caratteristiche principali

Eccellente resistenza alla corrosione. Eccellente conducibilità termica ed elettrica. Alta duttilità. Buona lucidità. Eccellente saldabilità. Eccellente anodizzazione e lavorazione plastica a freddo.

Usi tipici

Attrezzi e contenitori alimentari. Industria chimica. Tubi pieghevoli. Polveri pirotecniche.

Caratteristiche fisiche e generali

Peso specifico	2,7 kg/dm^3	Calore specifico 0 -100 °C	0,22 cal/g °C^{-1}
Modulo di elasticità	68600 N/mm^2	Coeff. di dilatazione	
Modulo di rigidità	26500 N/mm^2	teorico lineare 20 -100 °C	24 x 10^{-6} x K^{-1}
Punto di fusione	658 °C	Conduttività termica 20 °C	0,5 cal (s x cm x °C)
		Resistività a 20 °C (H18)	**2,83÷2,90 μ Ω x cm Resistance**

Lega EN AW-6060 (Al MgSi)

BARRA ESTRUSA

Stato metallurgico	Dimensioni mm		CARICO DI ROTTURA A TRAZIONE R_m MPa		CARICO AL LIMITE DI SNERVAMENTO $R_{p0,2}$ MPa		ALLUNGAMENTO A %	ALLUNGAMENTO A 50 mm %
	D[1]	S[2]	min.	max.	min.	max.	min.	min.
F[4], H112	tutte	tutte	60	-	20	-	25	23
O, H111	tutte	tutte	60	95	20	-	25	23

TUBO ESTRUSO

Stato metallurgico	Dimensioni mm e[3]		R_m MPa		$R_{p0,2}$ MPa		A %	A 50 mm %
			min	max	min	max.	min	min.
F[4], H112	tutte	tutte	60	-	20	-	25	23
O, H111	tutte	tutte	60	95	20	-	25	23

PROFILATO ESTRUSO[10]

Stato metallurgico	Dimensioni mm e[3]		R_m MPa		$R_{p0,2}$ MPa		A %	A 50 mm %
			min	max	min	max	min	min.
F[4], H112	tutte	tutte	60	-	20	-	25	23

MATERIAL	TAB A	POLIAMMIDE PA 66

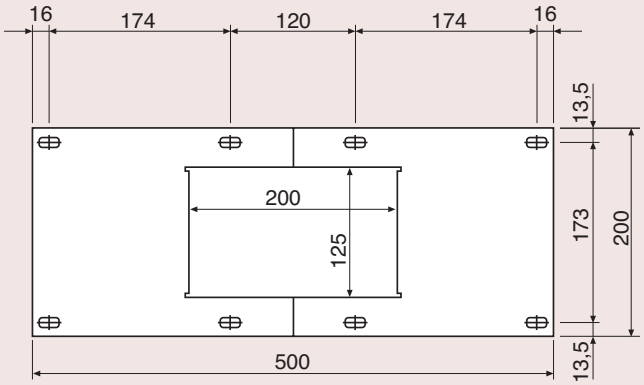
Iussed: 25/02/2003

PROPERTY	STANDARD	UNIT	VALUE	TEST CONDITIONS
Mechanical Properties				
TENSILE MODULUS	ISO 527-2/1 A	MPa	9100	DAM Test speed 1 mm/min
STRESS AT BREAK	ISO 527-2/1 A	MPa	125	DAM Test speed 1 mm/min
STRAIN AT BREAK	ISO 527-2/1 A	%	2.15	DAM Test speed 1 mm/min
FLEXURAL MODULUS	ISO 178 1 A	MPa	7800	DAM Test speed 1 mm/min
FLEXURAL STRENGTH	ISO 178 1 A	MPa	185	DAM Test speed 1 mm/min
CHARPY IMPACT STRENGTH	ISO 179 eU 23°C	KJ/m2	50	DAM
CHARPY NOTCHED IMPACT STRENGTH	ISO 179 eA	KJ/m2		DAM
TRACKING RESISTANCE	IEC 112 sol A IEC 112 sol B	V V		
Thermal Properties				
MELTING TEMPERATURE	ISO 3146/C2	°C	260	Scanning rate 10°C/min
TEMPERATURE OF DEFLECTION UNDER LOAD	ISO 75-2/Af	°C	230	Max surface stress 1.8 MPa
VICAT SOFTENING TEMPERATURE	ISO 306/B50	°C	240	Load 50N Heating rate 50°C/h
Fire Behaviour				
FLAMMABILITY	UL 94	mm/class	0.8/V-0*	
GLOW WIRE FLAMMABILITY INDEX	CEI 695-2-1/2	mm/°C	1.6/960	Conditioned 48h Standard atmosphere
Other Properties				
DENSITY	ISO 3146	Kg/m3	1470	

TECHNICAL DATA SHEET	TAB C	**RIGID PVC**		
TEST	TEST METHOD	TEST CONDITION	UNIT OF MEASURE	TYPICAL VALUE
SPECIFIC GRAVITY	ISO 1183	23°C	Kg/dm3	1.55
HARDNESS	ISO 868	23°C	Shore D	78
VICAT TEMPERATURE	ISO 306	5 KG	°C	85
ULTIMATE TENSILE STRENGTH	ISO 527	23°C	N/mm2	30
ELONGATION AT BREAK	ISO 527	23°C	%	100
IZO D	ISO 180	23°C	J/m	65
FLAME RESISTANCE	UL 94	-	Class	VO

Properties Polipropilene TAB B	Varie	Norm ASTM	DIN	ISO		Unit
Oxigen index	-	D 2863	-	-	30	%
Glow wire test	IEO 695 2-1	VDE 0471 2-1	-	-	**960**	°C
Needle flame test	IEO 695 2-2	-	-	-	YES	-
Flame resistance	CSA C 22-2	-	-	-	-	-
Electrical						
Volume resistivity	-	D 257	53482	-	-	Ohm · cm
Surface resistivity	-	D 257	53482	-	-	Ohm
Dielectric strenght	-	D 149	-	-	-	KV/mm
Tracking resistance	ICE 112 sol A ICE 112 sol B	- -	- -	- -	**> 600** > 600 M	V V
Termal						
Operating temperature limit 20000 h / short time	ICE 216 -	- -	- -	- -	100 -	°C °C
Thermal coeff. of linear expansion	-	D 696	53752	-	6 ·10 - 5	K · 1
Vicat softening point 9,8 N / 49 N	- -	D 1525 D 1525	53460 53460	R 306 R 306	**150** 107	°C °C
Heat distortion temperature 0,45 MN/m2/1,81 MN/m2	- -	D 648 D 648	53461 53461	R 75 R 75	135 80	°C °C
Ball penetration test	ICE 335 ICE 335	- -	- -	- -	YES NO	125°C 165°C
Mechanical						
Tensile strenght at yield	-	D 638	53455	R 527	29	N/mm²
Elongation at yield	-	D 638	53455	R 527	10	%
Flexural modulus	-	D 790	53457	R 178	3000	N/mm²
Flexural strnght	-	D 790	-	R 178	50	N/mm²
Notched impact strenght IZOD	-	D 256	-	R 180	3	KJ/m²
Notched impact strenght CHARPY	-	-	53453	R 179	-	KJ/m²
Physical						
Density	-	-	53479	R 1183	1,4	g/cc
Linear mould shrinkage	-	-	-	-	1,2	%
Water absorption	-	-	-	-	2/100	%

NXW1000A NXW1250A



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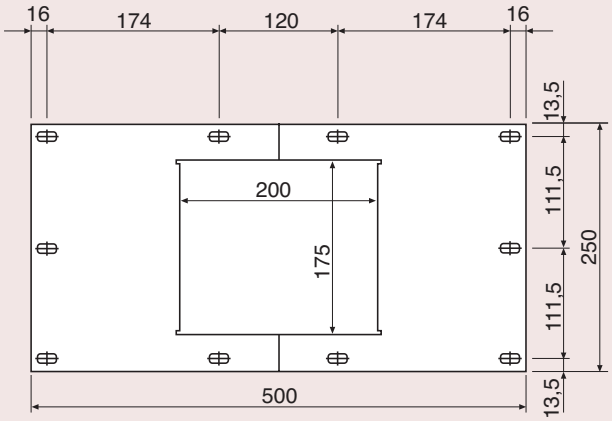

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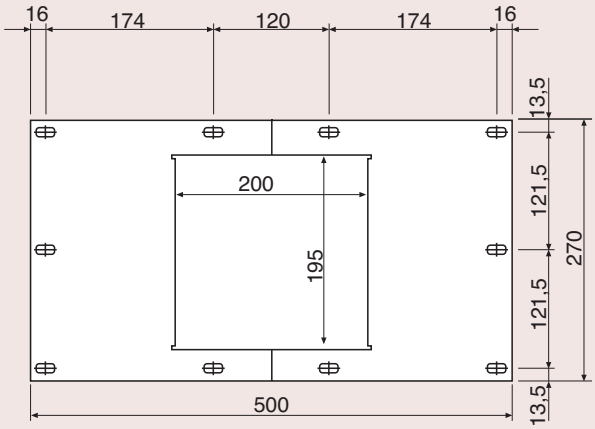

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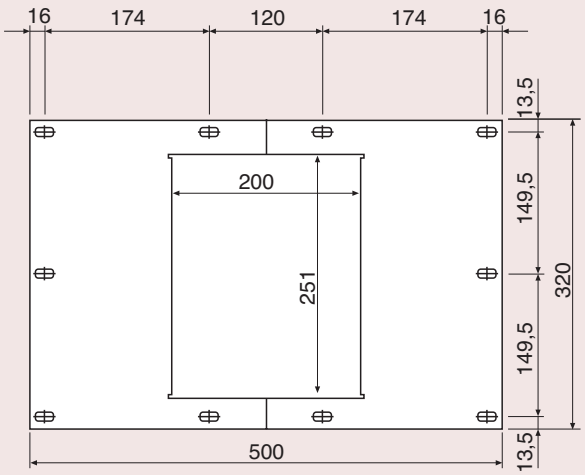

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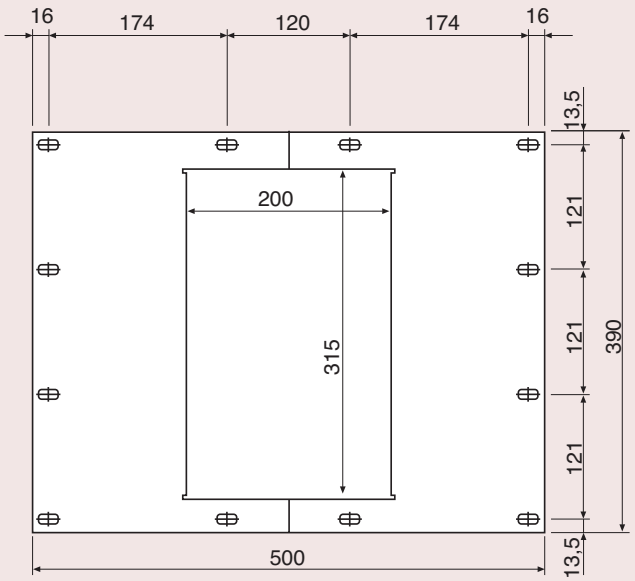

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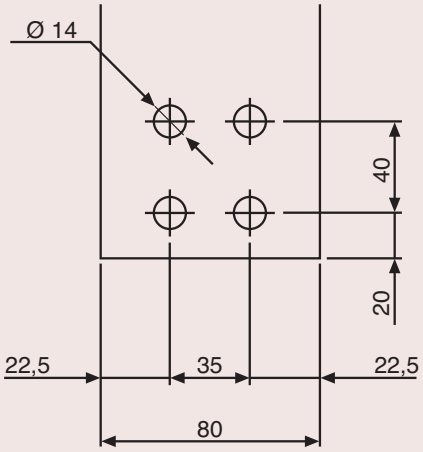

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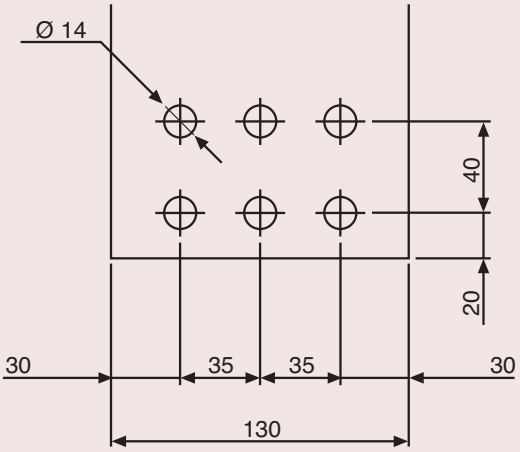

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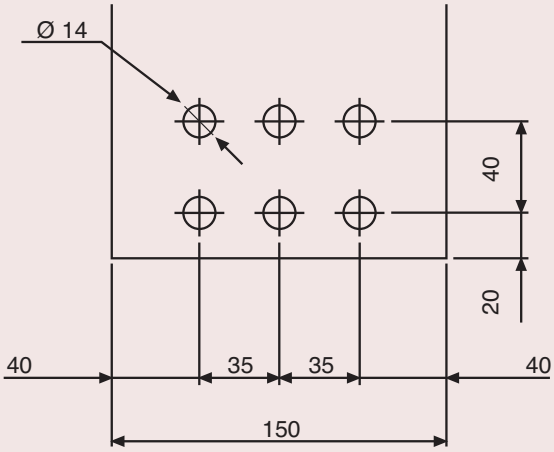

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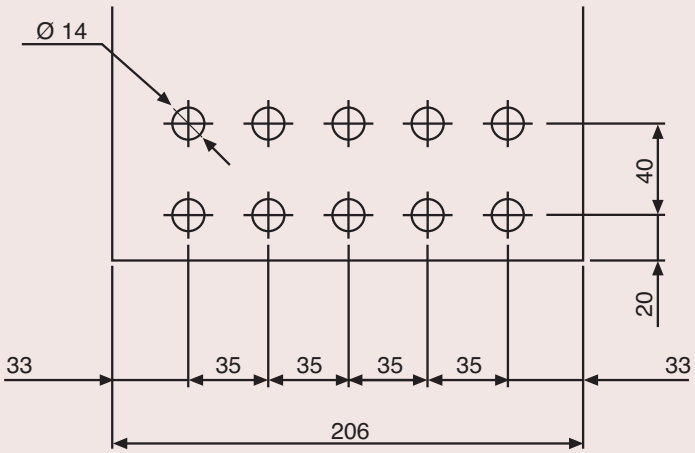

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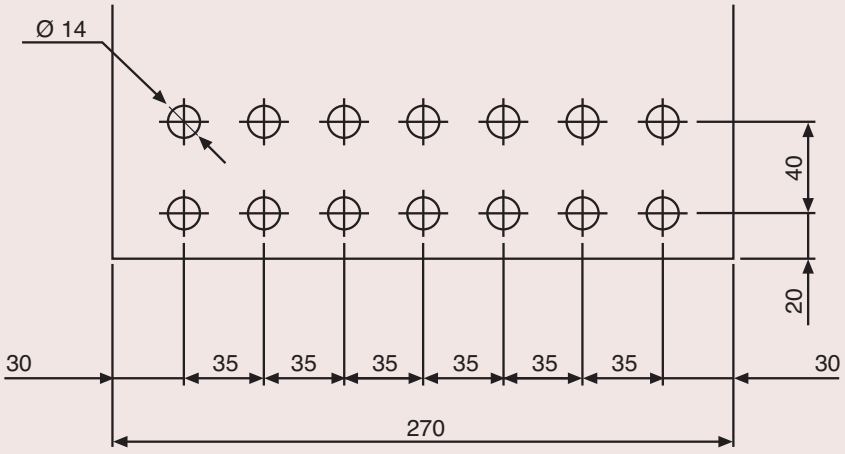

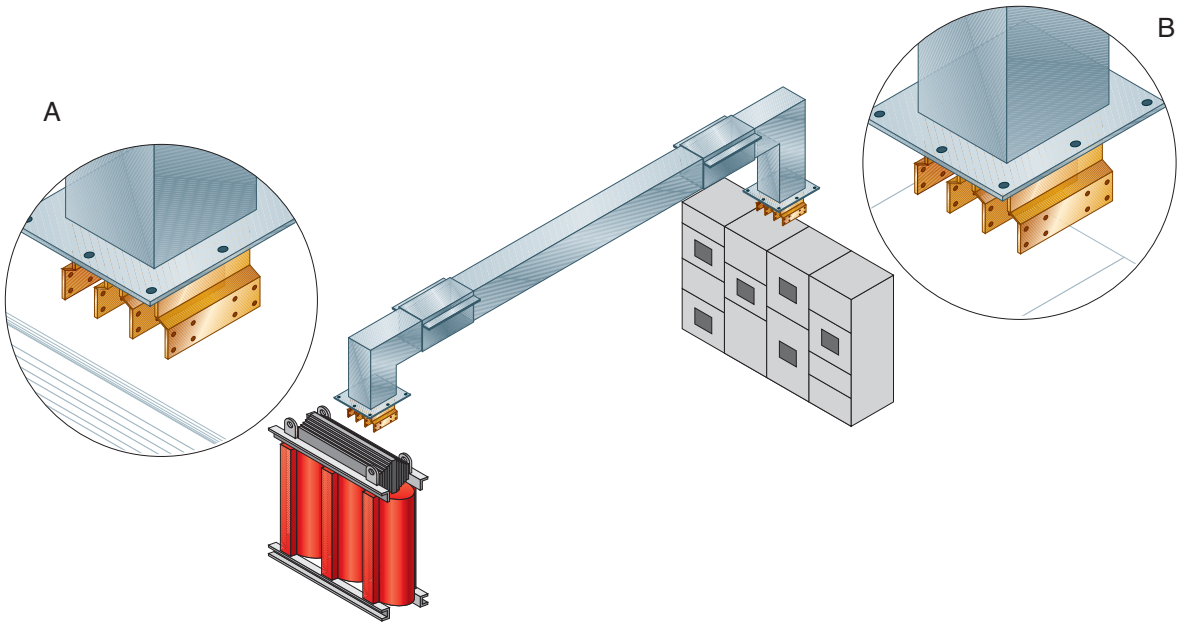
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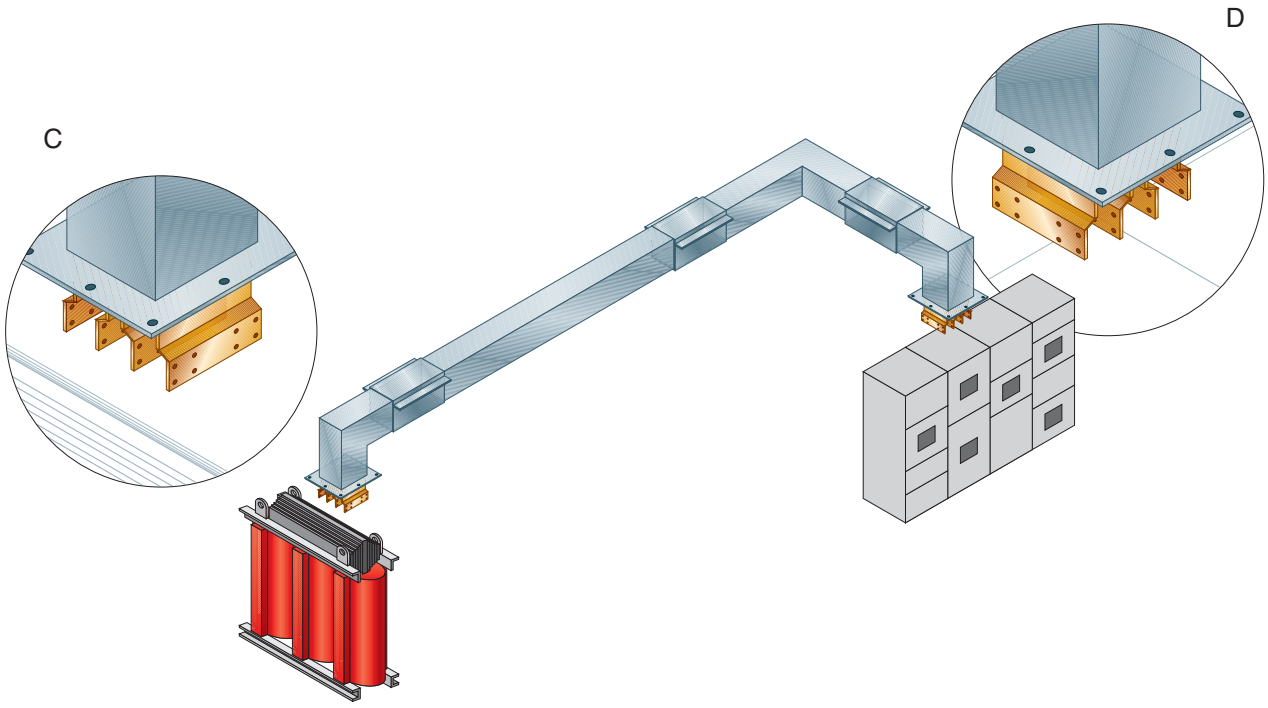
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THE CHARACTERISTICS OF ALUMINIUM

Aluminium has specific features resulting in benefits that make it superior to other metals; the industrial production process for aluminium was implemented in 1886 by Hall and Héroult.
Over 30,2 million tons of aluminium are utilisedyearly, worldwide; abaut 9 tons in Europe, with an important prospective growth.

Here are some of its major features:

- **LIGHTNESS** aluminium makes significant weight savings
- **LIFESPAN** great corrosion resistance
- **CONDUCTIVITY** crucial for electrical applications
- **WORKABILITY** it can be shaped or moulded in ordinary ways and more easily than most other metals
- **VERSATILITY** aluminium alloys can be rigid or metals
- **APPEARANCE** it's a clean metal and its surface can be treated with a wide range of coatings

- **RECYCLABILITY** easily and cheaply recyclable
- **MECHANICAL STRENGTH** aluminium alloys have a mechanical resistanceof 60 to 530 Newton/mm2
- **CORROSION RESISTANCE** aluminium has a greater corrosion strength than most metals and is considered the cheapest metal with a high anti-corrosion strength
- **REFLECTIVITY** its high reflectivity makes aluminium desirable in the manufacturing of lighting equipment
- **NON TOXICITY** its salts are totally nontoxic
- **IT DOES NOT GENERATE SPARKS** unlike ferrous metals, aluminium does not generate sparks when rubbed with other metals; for this reason it's particularly desirable when used with inflammable or explosive products

COMPARISON OF TECHNICAL FEATURES BETWEEN ALUMINIUM AND COPPER

Aluminium and copper are the two metals most widely utilised as electrical conductors

- **CONDUCTIVITY** Aluminium's specific electrical conductivity is double that of copper.
  For this reason it is indispensable for electronics and for electrical applications.
- **COMPARATIVE FEATURES**

CROSS SECTION RATIO, RESISTANCE BEING EQUAL

$$\frac{\text{Cross section Al}}{\text{Cross section Cu}} = 1{,}6 \qquad \frac{\text{Diameter of Al conductor}}{\text{Diameter of Cu conductor}} = \sqrt{1{,}6} = 1{,}3$$

RATIO OF MASSES, CURRENT BEING EQUAL

$$\frac{\text{Mass of Al conductor}}{\text{Mass of Cu conductor}} = 0{,}5$$

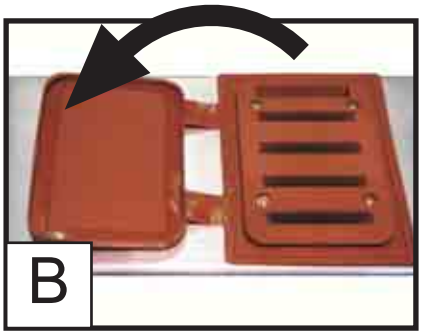
From this we can conclude, mainly:
Although electrical resistivity of aluminium is only 1,6 times that of copper, in two lines of equal resistance an aluminium conductor's diameter will only be 1,3 times that of copper.
Copper's specific mass is 3,3 times that of aluminium. Therefore, if resistance is the same, an aluminium conductor will be twice as light as a copper conductors.
1 KG OF ALUMINIUM REPLACES 2 KG OF COPPER

USE OF BUSBAR TRUNKING SYSTEMS

An electrical system, in addition to assuring safety, must be reliable and simple to install, and it must be easily operated by end users. By employing busbar trunking systems instead of traditional cable systems you can fulfill all market needs where transportation or distribution of electrical power are concerned. Affordability and ease of design have made busbar trunking systems very popular boyh in industrial plants and workshops as well as in services and hospital. Busbar trunking systems are utulised to supply power to manufacturing systems and to feed lighting equpment.

BUSBAR TRUNKING SYSTEMS CREATE A WIDE CONSENSUS: THEY APPEAL TO CUSTOMERS, ENGINEERING CONSULTANTS AND INSTALLER ALIKE


A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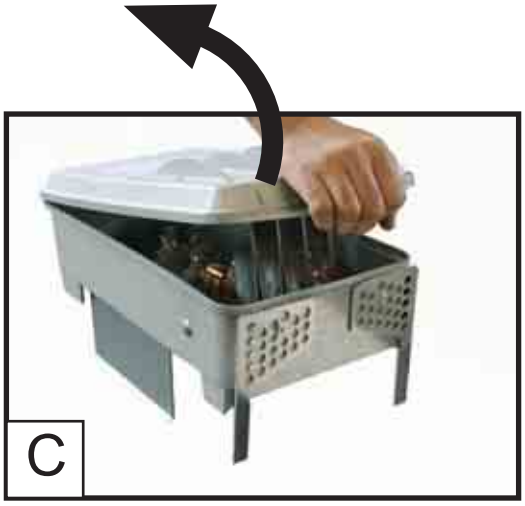
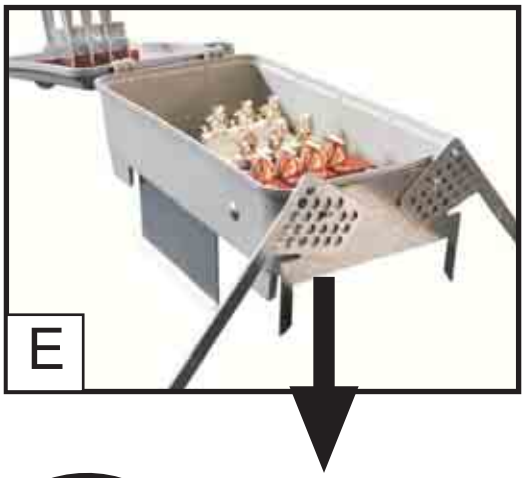

C


D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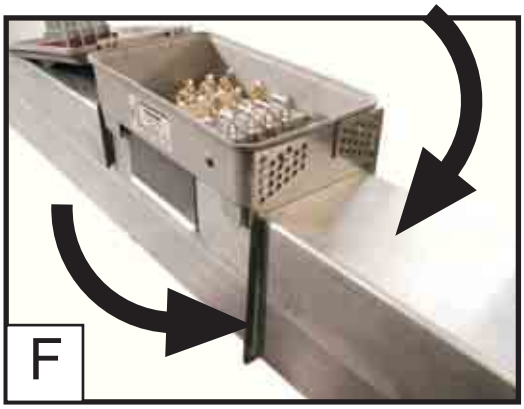
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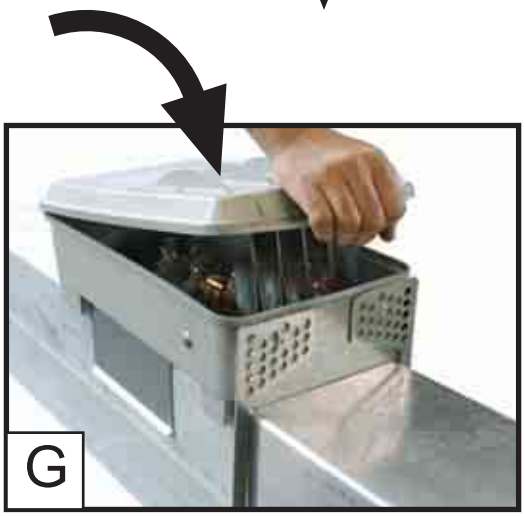
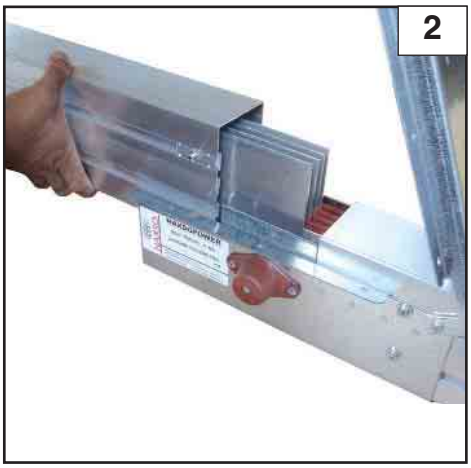

G


H

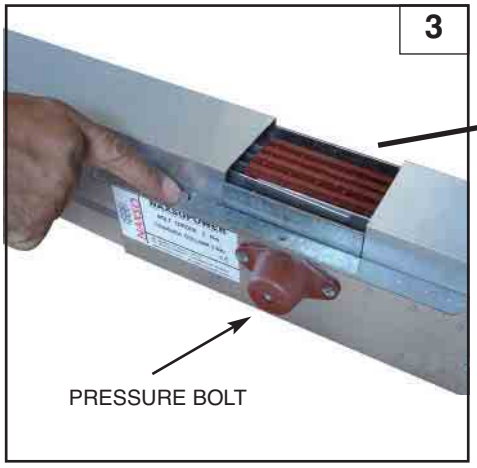
APERTURA VITI COPERCHIO

OPEN THE LID UNSCREW THE LID SCREWS



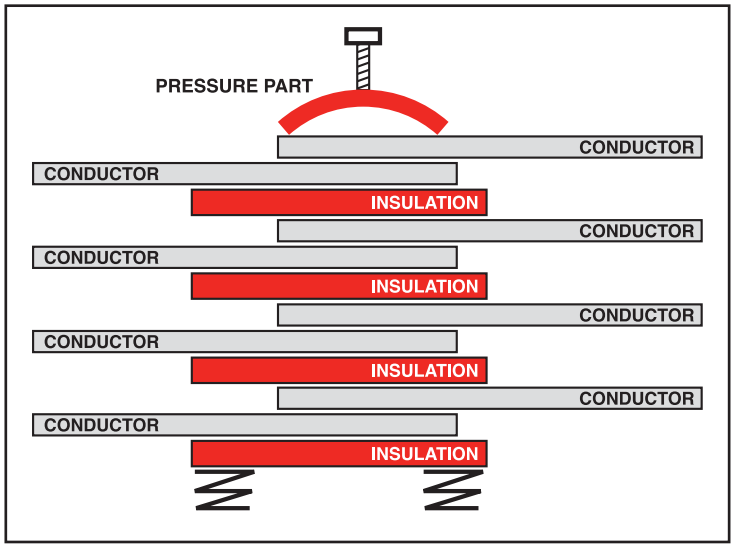
APERTURA COPERCHIO

OPEN FULLY THE LID



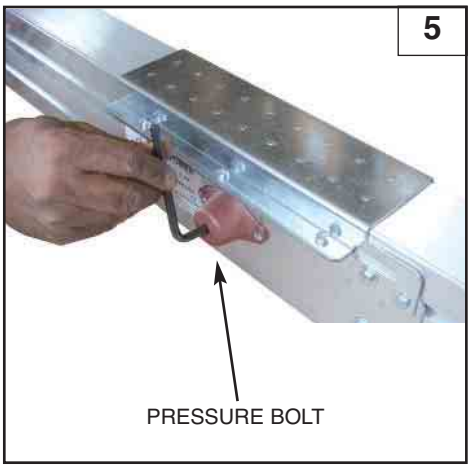
INSERIMENTO DELLE DUE BARRE

INSERT THE TWO LENGTHS THE WAY YOU SEE



CHIUSURA VITI COPERCHIO

BE SURE THE TWO LENGTHS ARE WELL CONNECTED



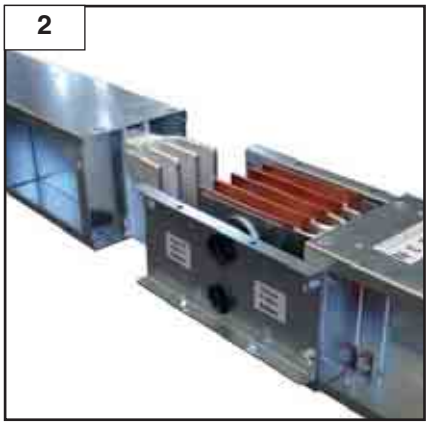
CHIUSURA VITE BRUGOLA GIUNTO

BE SURE THE TWO LENGTHS ARE WELL CONNECTED

1

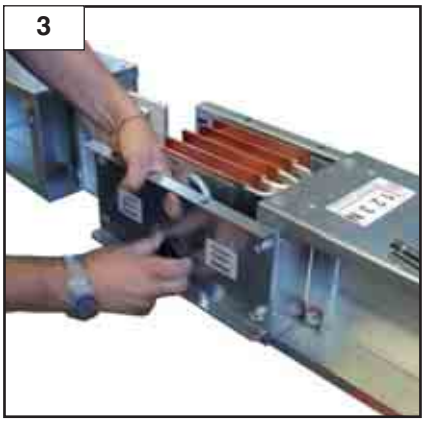
OPEN THE COVER

2



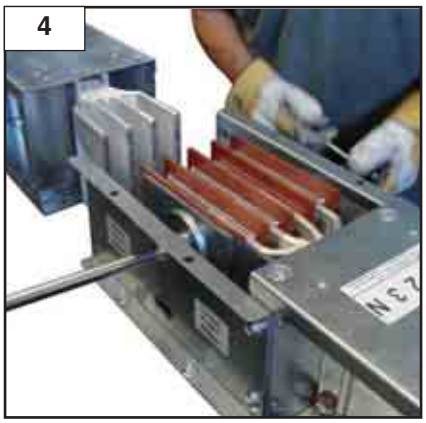
ALIGNMENT OF THE TWO BUSBARS IN A VERY STRAIGHT WAY

3



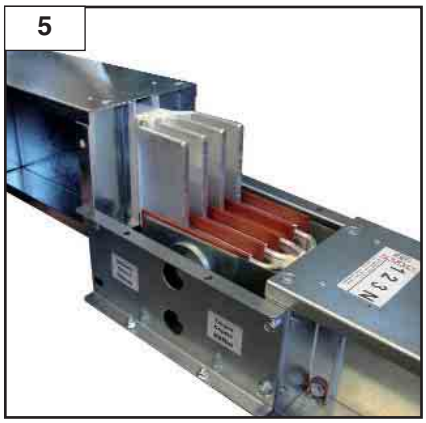
TAKE AWAY AND REMOVE THE BOLTS COVER

4



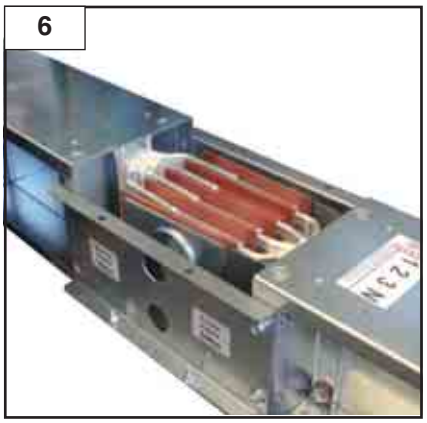
UNSCREW THE JOINT BOLTS BY TWO TURNS

5



INSERT THE TERMINAL BUSBAR N° 2 IN TO THE JOINT N° 1 (JOINT THE TWO LENGTHS)

6

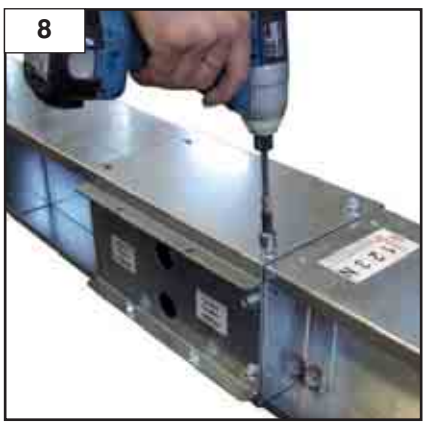


FINAL RESULT OF THE JOINING

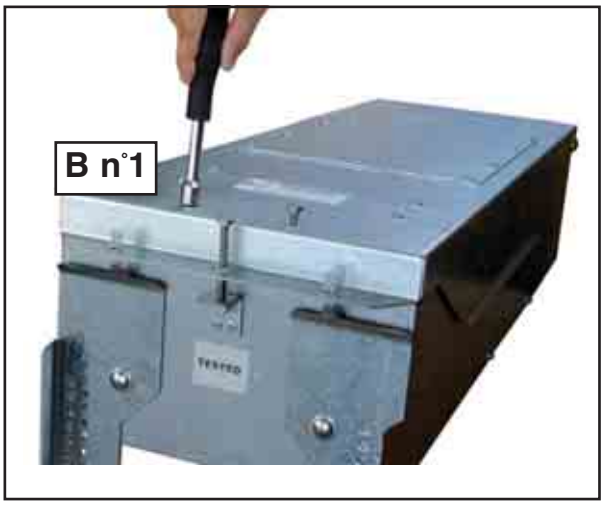
7

PERFORM THE TORQUE 60NM WITH DINAMOMETRIC TOOL

8

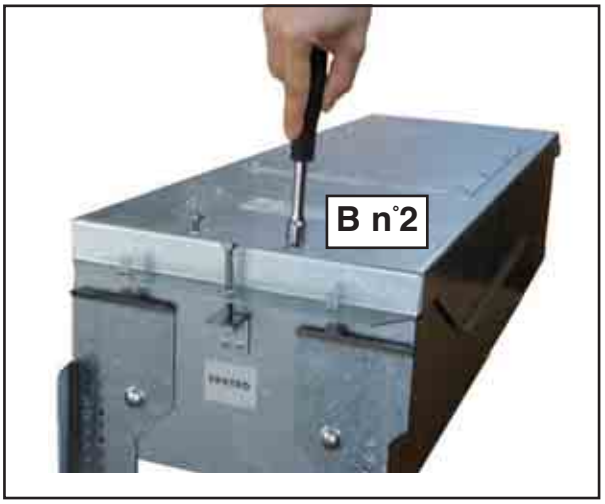


CLOSE THE JOINT AND TORQUE ALL THE BOLTS



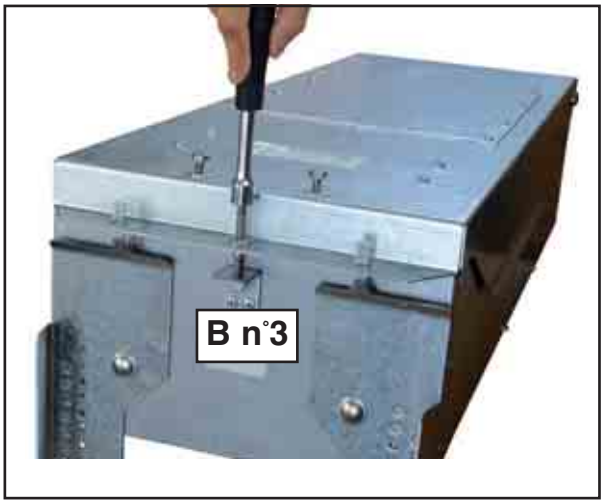
Per aprire il coperchio svitare il bullone n° 1 totalmente e rimuoverlo temporaneamente
Per chiudere il coperchio fox svitare completamente il bullone n°3 e avvitare fino a chiusura i bulloni n° 2 e n° 3

To open the lid Unscrew bolt n° 1
To close the lid unscrew bolt n 3 and than screw down bolts n 1 and n 2 to the tighten



Svitare il il bullone n° 2 totalmente e rimuoverlo temporaneamente
Per chiudere il coperchio fox svitare completamente il bullone n°3 e avvitare fino a chiusura i bulloni n° 2 e n° 3

Unscrew bolt n 2 and temporary remove them
To close the lid unscrew bolt n 3 and than screw down bolts n 1 and n 2 to the tighten



Avvitare fino a fondo corsa il bullone n° 3
Per chiudere il coperchio fox svitare completamente il bullone n°3 e avvitare fino a chiusura i bulloni n° 2 e n° 3

Than screw down bolt n 3
To close the lid unscrew bolt n 3 and than screw down bolts n 1 and n 2 to the tighten