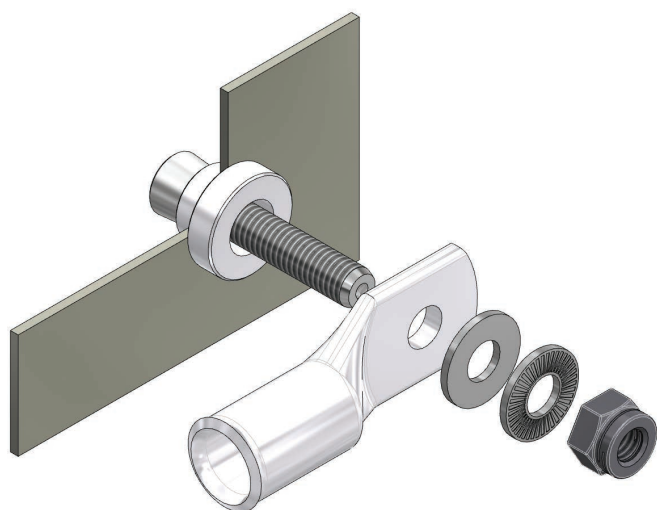
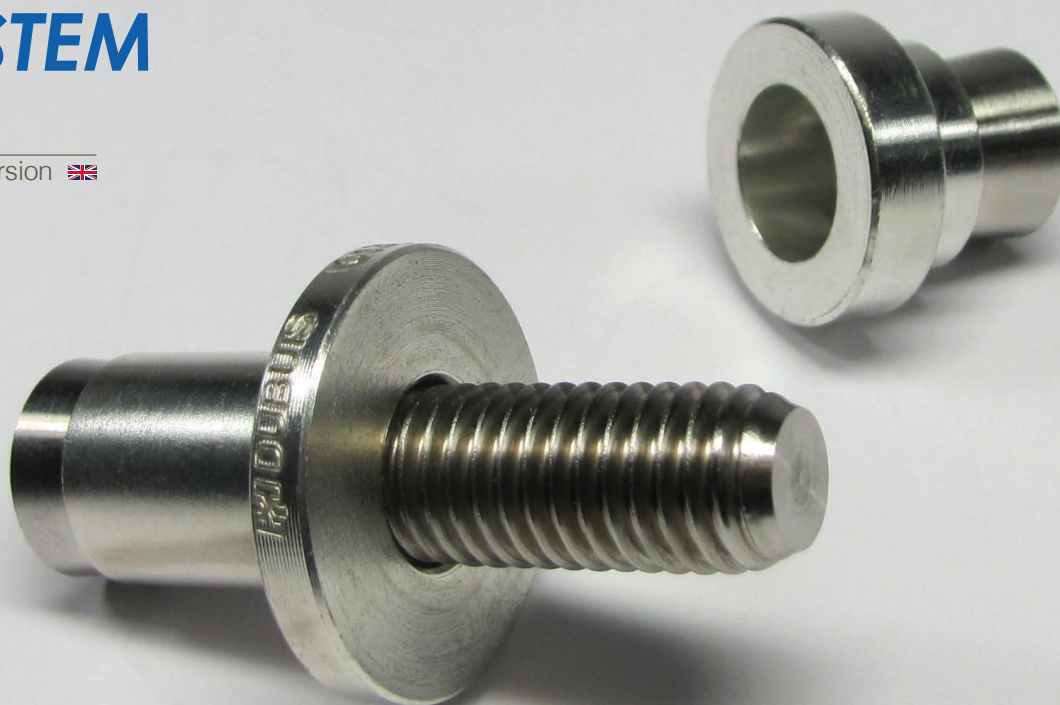


EARTH BONDING SYSTEM

English version 



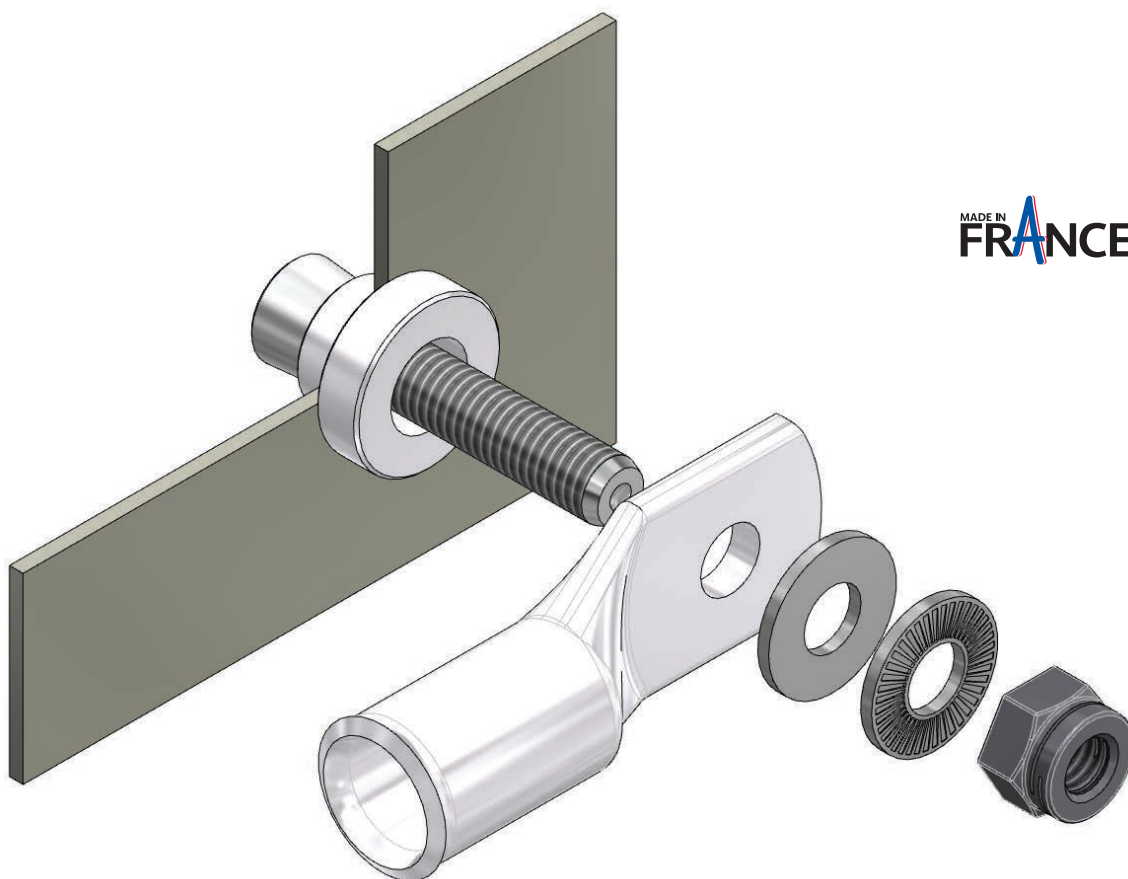
**COST REDUCTION
EASY TO USE
RELIABILITY
PERFORMANCE**

THE EARTH BOND

► SUMMARY



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MADE IN
FRANCE

COST REDUCTION

EASY TO USE

RELIABILITY

PERFORMANCE

The Dubuis Earth Bonding system is an innovative method for setting a secure fixing with a reliable electrical connection. The earth bond offers an equipotential link between a structure and equipment, and allows the passage of high intensity current in case of short-circuit.

► APPLICATIONS

ROLLING STOCK

ELECTRICAL CONNECTION TO THE RAIL

AUTOMOTIVE

OFF SHORE (CATHODIC PROTECTION)

MILITARY VEHICLES

SHIPBUILDING



► BENEFITS

COST REDUCTION

Quick and easy to use, time saving & limited tooling investment.

FAST

Drill, Expend & Connect, 3 minutes only to connect.

UNIVERSAL APPLICATIONS

Irregular, curves surfaces, install into a blind hole, or restricted areas, partitions, electrical cupboard, air-conditioning, brakes system, various components of the chassis and frame.

EASY TO USE

Quick & easy process for repeatable and automatable connections.

TOOLS

Manual, light, only one person operation.

SECURITY

Safe connection, no heat, no sparks or fire.

NO PLATE PREPARATION OR CLEANING

Requires no welding, impacting, cleaning or surface preparation.

RELIABILITY & PERFORMANCE

Constant & long-lasting connection providing low electrical resistance.

TRACEABILITY

Each earth bond is marked with a batch number.

INTENSIVE TESTS

Mechanical, vibration, electrical, short circuit, destruction, corrosion, rotation tests.

APPROVED & CUSTOMERS REFERENCES

Main rolling stock players, car manufacturers and other end users in wind power markets.

ENGINEERING

Development for specific applications in partnership.

► PRINCIPLE

Dubuis earth bond consists in two pre-assembled components :

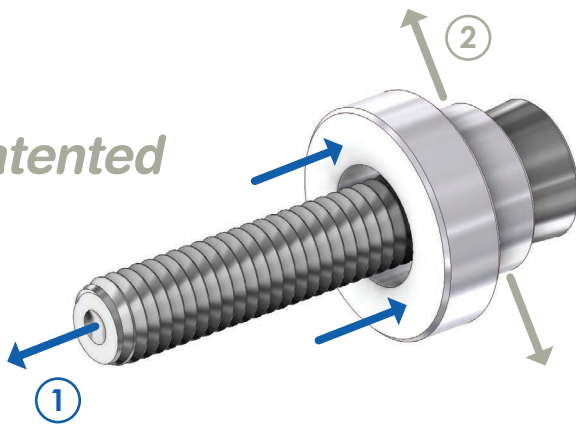
A conical dowel having a thread



A flanged bush with an outside cylindrical diameter



Patented



A tensile load applied by calibrated PMT pulling tool allows the dowel to be pulled through the shouldered bushing, while remaining fixed in the pre-drilled hole of the structure.

As the conical dowel passes through the bushing, the bushing expands within the cavity making electrical contact within the metal structure and establishing a permanent electrical connection. Once the bond is set up, it offers a conductive platform to make contact with the lug and threaded stud to secure its connection.

Recommendation of the locking nut assembly stainless steel 316L, used by the Railway industry for all applications composed of :

Stanal self locking nut
Ridged contact washer
Flat washer

► PROCESS : 3 STEPS

① DRILLING



② SETTING



③ CONNECTION



10 REASONS TO GIVE UP WELDING FOR EARTH BOND



DUBUIS EARTH BOND



WELDING

SECURITY

✓ No danger

Dangerous, gas handling, fire, spark

TIME FOR PROCESS

✓ Fast, simple, Earth bond installed on 3 minutes only (drilling included)

Average of 15 minutes per welding

SURFACE PREPARATION

✓ No preparation required

Important preparation, average of 8 minutes. Tooling setting, sanding, cleaning and welding.

COST REDUCTION & TIME SAVING

✓ Quick and easy to use, intensive setting, very low investment on tooling

Long process, hazardous depending on the operator

RELIABILITY & LIFE EXPECTANCY

✓ Life connection offering very low electrical resistance

Limited reliability depending on the operator

TOOLING

✓ Light handling tool

Heavy, large and dangerous

OPERATOR SKILL

✓ No training

Welder training : M1 - M2 - M3 - M4 - M5 - M6 - M7

TRACEABILITY AND QUALITY

✓ Each earth bond has a batch number marked on conical bush

-

TESTING

✓ Mechanical, vibration, electrical, short circuit destruction, shock sealing, corrosion...

-

APPROVALS

✓ Main rolling stock players, car manufacturers and other end users in wind power markets.

-

THE EARTH BOND

INSTALLATION STEPS



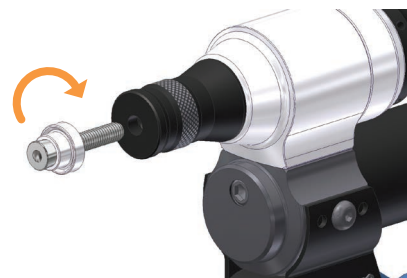
1

Drill a hole in the structure to the determined diameter of the earth bond



2

Push the trigger to fully discharge hydraulic pressure & retract the piston.



3

Screw the bond into the nose of the hydraulic setting tool.



4

Insert the bond into the hole so that the flange is flush to the plate.
MAKE SURE THE TOOL IS PERPENDICULAR TO THE STRUCTURE.



5

Pump the handle of the tool until an audible click is heard (calibrated pressure force).



6

After the click, push the trigger to discharge hydraulic pressure.



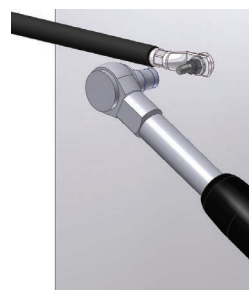
7

Release the tool from the stud, turn off the button at the back of the tool.



8

Attach the connection and the fastening and screw the nut.



9

Tighten to the required torque value

TOOLING FOR SETTING EARTH BOND



PMT C6

THREAD	M6
PULLING FORCE	10 kN
STROKE	8 mm
WEIGHT	1,280 kg
DIMENSIONS (L x l x H in mm)	185 x 205 x 45
ENERGY	Hydraulic manual
PART NUMBER	MTPM060A1000



PMT 8

THREAD	M8
PULLING FORCE	18 kN
STROKE	8 mm
WEIGHT	1,280 kg
DIMENSIONS (L x l x H in mm)	185 x 205 x 45
ENERGY	Hydraulic manual
PART NUMBER	MTPM080A1000



PMT 10

THREAD	M10
PULLING FORCE	25 kN
STROKE	8 mm
WEIGHT	1,280 kg
DIMENSIONS (L x l x H in mm)	185 x 205 x 45
ENERGY	Hydraulic manual
PART NUMBER	MTPM100A1000



PMTXX - UNIVERSAL TOOL

THREAD	M6 - M8 - M10 *
PULLING FORCE	Adjustable 10 to 25 kN
STROKE	12 mm
WEIGHT	1,440 kg
DIMENSIONS (L x l x H in mm)	192 x 52 x 207
ENERGY	Hydraulic manual
PART NUMBER	MTPMXX0A1000
CARTRIDGE AND NOSES	Interchangeable

* M5 - 10/32UNF - 1/4" - 5/16" - 3/8" Consult us



BTEMXX - UNIVERSAL TOOL

THREAD	M6 - M8 - M10 *
PULLING FORCE	Adjustable 10 to 25 kN
STROKE	11 mm
WEIGHT	3,440 kg
DIMENSIONS (L x l x H in mm)	373 x 60 x 260
ENERGY	Hydraulic on battery
PART NUMBER	BTEMXX0A1120
CARTRIDGE AND NOSES	Interchangeable

* M5 - 10/32UNF - 1/4" - 5/16" - 3/8" Consult us



PMA 10

THREAD	M6 - M8 - M10
PULLING FORCE	Adjustable 10 to 25 kN
STROKE	8 mm
WEIGHT	3,700 kg
DIMENSIONS (L x l x H in mm)	270 x 140 x 320
ENERGY	pneumatic
PART NUMBER	65909



CONTROL GAUGE

PART NUMBER	80928 (in its case)
WEIGHT	4,700 kg
DIMENSIONS (L x l x H in mm)	380 x 300 x 80
TOOL CONTROL	PMT C6 - PMT 8 - PMT 10 PMA 10 - PMTXX

► Delivered in its plastic case.

www.dubuis.com

► SPECIAL REAMER DRILLS HSS 5 % COBALT







The quality of boring is very important to ensure the electrical connection. The drilling tolerances have to be respected (-0/+0,2). DUBUIS offers a range of reamer drills, adapted to the diameter of each earth bond, to use with handle drilling machines.

Two methods of drilling :







1. Boring in the middle of the material just before the setting of earth bond with the **long step drill**
2. Drilling of a core removing hole with a diameter 1 mm under the nominal diameter, boring of the hole by the operator at the nominal diameter just before the setting of earth bond with the **short step drill**



SHORT DRILLS

	PART NUMBER	DRILLING Ø	DRILLING LENGHT
	OFE0850016	8,5 mm	16 mm
	OFE1050020	10,5 mm	20 mm
	OFE1150018	11,5 mm	18 mm
	OFE1350019	13,5 mm	19 mm
	OFE1500018	15 mm	18 mm
	OFE1900022	19 mm	22 mm

LONG DRILLS

	PART NUMBER	DRILLING Ø	DRILLING LENGHT
	OFE0850032	8,5 mm	32 mm
	OFE1050041	10,5 mm	41 mm
	OFE1150044	11,5 mm	44 mm
	OFE1350037	13,5 mm	37 mm
	OFE1500042	15 mm	42 mm
	OFE1900051	19 mm	51 mm

► DRILLING LUBRICATION :

We recommend the use of a drilling lubrication for electrical neutrality. The use of these oils does not disturb the connection, also in case of oil residue around the hole.



Drilling in steel or stainless steel
use **Ferrofluid** lubrication

P.N. : 80300



Drilling in aluminum use **Alufluid**
lubrication

P.N. : 80298

- Reduces the wear of the drill
- Increases the lifetime of the drill
- Avoids the sticking of cuttings on the drill
- Electrical neutrality

THE EARTH BOND TORQUE WRENCHES

P.9

Having installed the earth bond, it is essential to ensure that the locking nut securing the connection is tightened to the correct torque value and the required fastening.

- Adjustable torque value
- Equipped with a vernier to improve accuracy of setting : readable and precise to eliminate risk of error
- The vernier remains locked in the set position, to prevent accidental misadjustment
- A touch sensitive and audible release
- Reset automatically as soon as the force is released and immediately ready for next operation
- Fitted with a reversible ratchet to unscrew the nut
- Torque wrench are numbered and delivered with a test certificate
- Delivered in a plastic protection storage tube



TECHNICAL SPECIFICATION

STANDARD	ISO 6789
ACCURACY	+/- 4% of the displayed value
OPERATION RANGE	From 20% to 100% of the maximum capacity of the tool

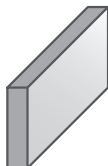
TORQUE WRENCHES

		
PART NUMBER	80997	80967
CAPACITIES (Nm)	5 - 25	20 - 100
□	1/4"	1/2"
EARTH BOND THREAD	M6 - M8	M10
SOCKETS PN.	(M6) OFACR10 	OFACS16H 
	(M8) OFACR13 	

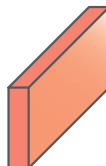


① **DEFINE THE PLATE RAW MATERIAL WHERE WILL BE SET THE EARTH BOND**

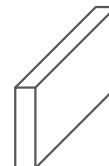
Steel & Stainless steel



Aluminium

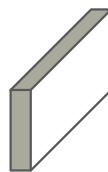


Others



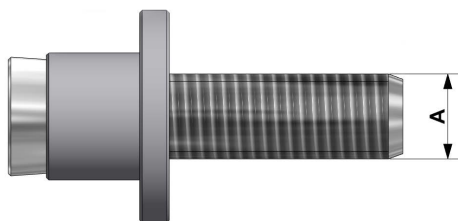
② **IDENTIFY PLATE THICKNESS :**

- 1,5 – 4 mm
- 2 – 4 mm
- > 4 mm
- OTHERS



③ **DETERMINE THE CABLE SECTION TO CONNECT**

④ **IDENTIFY THE THREAD TYPE :
M6 – M8 – M10 OR OTHERS**



HOW TO DEFINE YOUR EARTH BOND & TOOLING ?

- 5 CHOOSE BETWEEN MALE THREADED EARTH BOND RANGE & FEMALE EARTH GROUNDING BOSS RANGE, RESPECTING PLATE RAW MATERIAL :

EARTH BOND ►

Universal application
Choose the lenght of threaded conical dowel.



GROUNDING BOSS ►

Universal application
Dedicated to narrow spaces.



- 6 RESPECT DRILLING TOLERANCES USING SPECIAL DRILLS AND DRILLING LUBRICATION

- 7 CHOOSE A SETTING TOOL CALIBRATED AND ADAPTED FOR EACH EARTH BOND THREAD

M6

► PMTC6 TOOL



M8

► PMT8 TOOL



M10

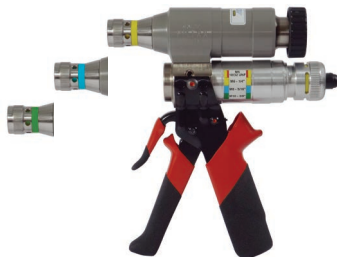
► PMT10 TOOL



MANUAL TOOL Small series

M6 - M8 - M10

► PMTXX TOOL



M6 - M8 - M10

► BTEMXX TOOL



MANUAL TOOL Small and medium series








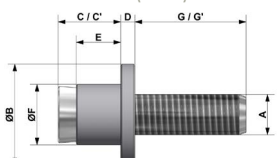
M6 - M8 - M10

► PMA10 TOOL



INTENSIVE USE For medium and high volume series









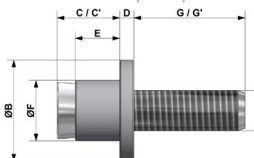
► USE WITH STEEL & STAINLESS STEEL PLATE

THREAD	M6	M6	M6	M6	M6	M6
PLATE THICKNESS	1,5 - 4 mm	1,5 - 4 mm	1,5 - 4 mm	1,5 - 4 mm	> 4	> 4
DRILLING DIAMETER (mm)	11,5 / 11,7	11,5 / 11,7	11,5 / 11,7	11,5 / 11,7	8,5 / 8,7	8,5 / 8,7
PACKAGING (20 PCS/BOX)						
DUBUIS P.N.	80974	80923	77907	77905	80975	80925
ALSTOM P.N.	DTR0000133407	DTR0000001260	DTR0000133407	DTR0000001260	DTR0000133656	DTR0000001261
FORMER BOMBARDIER P.N.	NA	3EER100005-781	NA	NA	3EER400005-6424	NA
LONG DRILL SHORT DRILL	OFE1150044 OFE1150018	OFE1150044 OFE1150018	OFE1150044 OFE1150018	OFE1150044 OFE1150018	OFE0850032 OFE0850016	OFE0850032 OFE0850016
SETTING TOOL	PMT6 / PMA10					
A4-80 SS FASTENING	81920 					
MAXIMUM TORQUE VALUE	10 N.m					
DIMENSIONS (mm)		M6 16 10,5 (6,5±2)* 4,5 4,5 11,5 13 (17±2)*	M6 16 10,5 (6,5±2)* 4,5 4,5 11,5 21 (25±2)*	M6 16 10,5 (6,5±2)* 4,5 4,5 11,5 13 (17±2)*	M6 16 10,5 (6,5±2)* 4,5 4,5 11,5 21 (25±2)*	M6 16 14 (12±1)* 3,5 11 8,5 17 (19±1)*
WEIGHT	14,5 gr	16,5 g	14,5 g	16,5 g	15 g	16 g
BUSH RAW MATERIAL	Tined copper					
ELECTRICAL PERFORMANCE :						
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	Steel SS	25 µΩ 120 µΩ	25 µΩ 120 µΩ	25 µΩ 120 µΩ	25 µΩ 120 µΩ	25 µΩ 75 µΩ
SHORT CIRCUIT RESISTANCE	Steel SS	3 × 15 kA 3 × 10 kA	3 × 15 kA 3 × 10 kA	3 × 15 kA 3 × 10 kA	3 × 15 kA 3 × 10 kA	3 × 10 kA 3 × 10 kA
ELECTRICAL CONTACT SURFACE EARTH BOND / NF F00-363		160 sqmm	160 sqmm	160 sqmm	160 sqmm	290 sqmm
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	Steel SS	30 µΩ 150 µΩ	30 µΩ 150 µΩ	30 µΩ 150 µΩ	30 µΩ 150 µΩ	- -
MECHANICAL PERFORMANCE :						
TENSILE LOAD TEST NF F00-363	2 mm 4 mm	400 daN -	400 daN -	400 daN -	400 daN -	- 500 daN
SHEARING	Steel SS	1,5 mm 4 mm 1,5 mm 4 mm	100 daN 180 daN 130 daN 180 daN	100 daN 180 daN 130 daN 180 daN	100 daN 180 daN 130 daN 180 daN	200 daN 200 daN
VIBRATION BS EN 61373		1g - 5 à 150 Hz 5H/axis	1g - 5 à 150 Hz 5H/axis	1g - 5 à 150 Hz 5H/axis	1g - 5 à 150 Hz 5H/axis	4g - 10 à 500 Hz 90 min/axis
SHOCKS BS EN 61373		5g - 30 ms 3 shocks/axis	5g - 30 ms 3 shocks/axis	5g - 30 ms 3 shocks/axis	5g - 30 ms 3 shocks/axis	300g - 3 ms 3 shocks/axis
SEALING	6 Bar pressure resistance with no air leak					
SCALE TEMPERATURE USAGE	-50°C / +80°C					

* Dimension after crimping








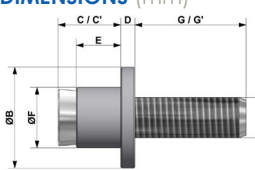
TESTS, PERFORMANCES, STANDARDS & DIMENSIONS

► USE WITH STEEL & STAINLESS STEEL PLATE

THREAD	M8	M8	M10	M10	M10	M10	
PLATE THICKNESS	1,5 - 4 mm	> 4	2 - 4 mm	> 4	> 4	> 4	
DRILLING DIAMETER (mm)	15 / 15,2	11,5 / 11,7	19 / 19,2	13,5 / 13,7	13,5 / 13,7	13,5 / 13,7	
PACKAGING (20 PCS/BOX)							
DUBUIS P.N.	81929	81928	80924	80926	81952	80945	
ALSTOM P.N.	DTR0000247260	DTR0000038412	DTR0000000083	DTR0000000084	DTR0000061617	DTR00211632A	
FORMER BOMBARDIER P.N.	NA	NA	3EER100005-783	3EER100005-784	NA	NA	
LONG DRILL	OFE1500042	OFE1150044	OFE1900051	OFE1350037	OFE1350037	OFE1350037	
SHORT DRILL	OFE1500018	OFE1150018	OFE1900022	OFE1350019	OFE1350019	OFE1350019	
SETTING TOOL	PMT8 / PMA10		PMT10 / PMA10				
A4-80 SS FASTENING	81922		81921 				
MAXIMUM TORQUE VALUE	25 N.m		50 N.m				
DIMENSIONS (mm)		<div>A B C C' D E F G G'</div>	M8 20 12,5 (7±2)* 5,5 4,5 15 16 (21,5±2)*	M8 20 15 (12±1)* 3,5 11 11,5 19 (22±1)*	M10 25 12 (6,5±2)* 5,5 4,5 19 25 (30,5±2)*	M10 25 14 (12±1)* 3,5 11 13,5 28 (30±1)*	M10 25 16 (14±1)* 3,5 13 13,5 28 (30±1)* 21 (23,5±1)*
WEIGHT	29 g	26 g	51 g	42 g	45 g	46 g	
BUSH RAW MATERIAL	Tined copper					Stainless steel	
ELECTRICAL PERFORMANCE :							
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	Steel SS	20 µΩ 70 µΩ	20 µΩ 70 µΩ	20 µΩ 70 µΩ	20 µΩ 60 µΩ	20 µΩ 60 µΩ	90 µΩ -
SHORT CIRCUIT RESISTANCE	Steel SS	3 × 15 kA 3 × 10 kA	3 × 20 kA 3 × 15 kA	- 3 × 15 kA	- 3 × 20 kA	- 3 × 20 kA	- -
ELECTRICAL CONTACT SURFACE EARTH BOND / NF F00-363		210 sqmm	400 sqmm	270 sqmm	465 sqmm	550 sqmm	720 sqmm
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	Steel SS	- -	- -	25 µΩ 90 µΩ	- -	- -	- -
MECHANICAL PERFORMANCE :							
TENSILE LOAD TEST NF F00-363	2 mm 4 mm	300 daN -	- 600 daN	500 daN -	- 800 daN	- -	- -
SHEARING	Steel SS	2 mm 4 mm 2 mm 4 mm	- - - -	- - - -	190 daN 340 daN 250 daN 340 daN	- 600 daN - 600 daN	- - - -
VIBRATION BS EN 61373		-	-	4g - 10 à 500 Hz 90 min/axis	4g - 10 à 500 Hz 90 min/axis	-	-
SHOCKS BS EN 61373		-	-	300g - 3 ms 3 shocks/axis	300g - 3 ms 3 shocks/axis	-	-
SEALING	6 Bar pressure resistance with no air leak						
SCALE TEMPERATURE USAGE	-50°C / +80°C						

* Dimension after crimping

► USE WITH ALUMINIUM PLATE







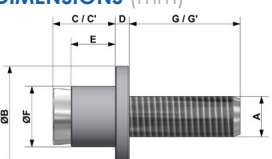
THREAD	M6	M6	M6	M6	M6	M6
PLATE THICKNESS	1,5 - 4 mm	1,5 - 4 mm	1,5 - 4 mm	1,5 - 4 mm	> 4	> 4
DRILLING DIAMETER (mm)	11,5 / 11,7	11,5 / 11,7	11,5 / 11,7	11,5 / 11,7	10,5 / 10,7	10,5 / 10,7
PACKAGING (20 PCS/BOX)						
DUBUIS P.N.	80976	80958	77906	77904	80977	80960
ALSTOM P.N.	DTR0000127255	DTR0000000074	DTR0000127255	DTR0000000074	DTR0000133695	DTR0000001263
FORMER BOMBARDIER P.N.	3EER4000057272	3EER300001-0318	NA	NA	3EER400005-4645	3EGK202252
LONG DRILL	OFE1150044	OFE1150044	OFE1150044	OFE1150044	OFE1050041	OFE1050041
SHORT DRILL	OFE1150018	OFE1150018	OFE1150018	OFE1150018	OFE1050020	OFE1050020
SETTING TOOL	PMT6 / PMA10					
A4-80 SS FASTENING	81920 					
MAXIMUM TORQUE VALUE	10 N.m					
DIMENSIONS (mm)		A	B	C	C'	D
	M6	M6	M6	M6	M6	M6
	16	16	16	16	16	16
	10,5 (6,5±2)*	10,5 (6,5±2)*	10,5 (6,5±2)*	10,5 (6,5±2)*	14,5 (12±1)*	14,5 (12±1)*
	4,5	4,5	4,5	4,5	3,5	3,5
	4,5	4,5	4,5	4,5	11	11
	11,5	11,5	11,5	11,5	10,5	10,5
	13 (17±2)*	21 (25±2)*	13 (17±2)*	21 (25±2)*	16 (18,5±1)*	24 (26,5±1)*
WEIGHT	10 g	12 g	10 g	12 g	13 g	15 g
BUSH RAW MATERIAL	Nickel plated aluminium					
ELECTRICAL PERFORMANCE :						
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	60 µΩ	60 µΩ	60 µΩ	60 µΩ	60 µΩ	60 µΩ
SHORT CIRCUIT RESISTANCE	3 × 10 kA	3 × 10 kA	3 × 10 kA	3 × 10 kA	3 × 10 kA	3 × 10 kA
ELECTRICAL CONTACT SURFACE EARTH BOND / SURFACE NF F00-363	160 sqmm	160 sqmm	160 sqmm	160 sqmm	360 sqmm	360 sqmm
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	90 µΩ	90 µΩ	90 µΩ	90 µΩ	-	-
MECHANICAL PERFORMANCE :						
TENSILE LOAD TEST NF F00-363	2 mm 4 mm	250 daN -	250 daN -	250 daN -	250 daN -	- 300 daN 300 daN
SHEARING	1,5 mm 2 mm 4 mm	35 daN - 200 daN	35 daN - 200 daN	35 daN - 200 daN	35 daN - 200 daN	- - 210 daN 210 daN
VIBRATION BS EN 61373	1 g - 5 à 150 Hz 5 H/axis	1 g - 5 à 150 Hz 5 H/axis	1 g - 5 à 150 Hz 5 H/axis	1 g - 5 à 150 Hz 5 H/axis	-	4 g - 10 à 500 Hz 90 min/axis
SHOCKS BS EN 61373	5 g - 30 ms 3 shocks/axis	5 g - 30 ms 3 shocks/axis	5 g - 30 ms 3 shocks/axis	5 g - 30 ms 3 shocks/axis	-	300 g - 3 ms 3 shocks/axis
SEALING	6 Bar pressure resistance with no air leak					
SCALE TEMPERATURE USAGE	-50°C / +80°C					

actual document

* Dimension after crimping






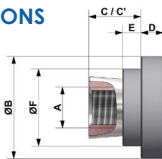
TESTS, PERFORMANCES, STANDARDS & DIMENSIONS

► USE WITH ALUMINIUM PLATE

THREAD	M8	M8	M10	M10		
PLATE THICKNESS	1,5 - 4 mm	> 4	2 - 4	> 4		
DRILLING DIAMETER (mm)	15 / 15,2	13,5 / 13,7	19 / 19,2	15 / 15,2		
PACKAGING (20 PCS/BOX)						
DUBUIS P.N.	81931	81930	80959	80961		
ALSTOM P.N.	DTR0000190302	DTR0000314231	DTR0000001262	DTR0000000079		
FORMER BOMBARDIER P.N.	33GH000025-3623	NA	3EGH000038-6908 3EER400005-4647	3EER300001-0322		
LONG DRILL	OFE1500042	OFE1350037	OFE1900051	OFE1500042		
SHORT DRILL	OFE1500018	OFE1350019	OFE1900022	OFE1500018		
SETTING TOOL	PMT8 / PMA10		PMT10 / PMA10			
A4-80 SS FASTENING	81922 		81921 			
MAXIMUM TORQUE VALUE	25 N.m		50 N.m			
DIMENSIONS (mm)		A B C C' D E F G G'	M8 20 12,5 (7±2)* 4,5 4,5 15 16 (21,5±2)*	M8 20 15 (12±1)* 3,5 11 13,5 19 (22±1)*	M10 25 12 (6,5±2)* 5,5 4,5 19 24,5 (30±2)*	M10 25 15,5 (12±1)* 3,5 11 15 27,5 (31±1)*
WEIGHT	19 g	22 g	34 g	36 g		
BUSH RAW MATERIAL	Nickel plated aluminium					
ELECTRICAL PERFORMANCE :						
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	20 µΩ	20 µΩ	20 µΩ	20 µΩ		
SHORT CIRCUIT RESISTANCE	3 × 15 kA	3 × 20 kA	3 × 20 kA	3 × 20 kA		
ELECTRICAL CONTACT SURFACE EARTH BOND / SURFACE NF F00-363	210 sqmm	465 sqmm	270 sqmm	520 sqmm		
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	-	-	50 µΩ	-		
MECHANICAL PERFORMANCE :						
TENSILE LOAD TEST NF F00-363	2 mm 4 mm	100 daN -	- 400 daN	200 daN -	- 500 daN	
SHEARING	1,5 mm 2 mm 4 mm	- - -	- - -	- 105 daN 310 daN	- - 490 daN	
VIBRATION BS EN 61373	-	-	4 g - 10 à 500 Hz 90 min/axis	4 g - 10 à 500 Hz 90 min/axis		
SHOCKS BS EN 61373	-	-	300 g - 30 ms 3 shocks/axis	300 g - 3 ms 3 shocks/axis		
SEALING	6 Bar pressure resistance with no air leak					
SCALE TEMPERATURE USAGE	-50°C / +80°C					





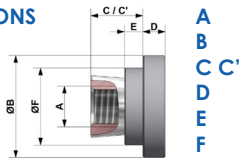
* Dimension after crimping

► USE WITH STEEL & STAINLESS STEEL PLATE

THREAD	M6	M6	M8	M8	M10		
PLATE THICKNESS	> 4	1,5 - 4 mm	> 4	1,5 - 4 mm	2 - 4		
DRILLING DIAMETER (mm)	11,5 / 11,7	11,5 / 11,7	13,5 / 13,7	15 / 15,2	19 / 19,2		
PICTURE (20 PCS/BOX)							
DUBUIS P.N.	77902	81963	77945	81965	81967		
ALSTOM P.N.	NA	DTR0000209903	NA	NA	DTR0000361647		
LONG DRILL SHORT DRILL	OFE1150044 OFE1150018	OFE1150044 OFE1150018	OFE1350037 OFE1350019	OFE1500042 OFE1500018	OFE1900051 OFE1900022		
SETTING TOOL	PMT C6 / PMA10		PMT8 / PMA10		PMT10 / PMA10		
A4-80 SS FASTENING	78913		78914		78915		
MAXIMUM TORQUE VALUE	8 N.m		16 N.m		25 N.m		
DIMENSIONS (mm)		A B C C' D E F	M6 16 16 (12,5±1)* 4,5 11 11,5	M6 16 10,5 (6,5±2)* 4,5 4,5 11,5	M8 25 14,5 (10,5±1)* 3,5 7 13,5	M8 20 12,5 (6,5±2)* 5,5 4,5 15	M10 25 13 (6,5±2)* 5,5 4,5 19
WEIGHT	15 g		10 g		20 g	17 g	28 g
BUSH RAW MATERIAL					Tined copper		
ELECTRICAL PERFORMANCE :							
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	Steel SS	25 µΩ 120 µΩ	25 µΩ 120 µΩ	20 µΩ 70 µΩ	20 µΩ 70 µΩ	20 µΩ 70 µΩ	
SHORT CIRCUIT RESISTANCE	Steel SS	- -	3 × 15 kA 3 × 10 kA	- -	3 × 15 kA 3 × 10 kA	3 × 15 kA	
ELECTRICAL CONTACT SURFACE EARTH BOND / SURFACE NF F00-363		400 sqmm	160 sqmm	300 sqmm	210 sqmm	270 sqmm	
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	Steel SS	- -	30 µΩ 150 µΩ	- -	- -	25 µΩ 900 µΩ	
MECHANICAL PERFORMANCE :							
TENSILE LOAD TEST NF F00-363	2 mm 4 mm	- -	400 daN 600 daN	- -	300 daN 700 daN	500 daN 800 daN	
SCALE TEMPERATURE USAGE				-50°C / +80°C			

* Dimension after crimping

► USE WITH ALUMINIUM PLATE

THREAD	M6	M8	M8	M10	
PLATE THICKNESS	1,5 - 4 mm	1,5 - 4 mm	> 4	2 - 4	
DRILLING DIAMETER (mm)	11,5 / 11,7	15 / 15,2	13,5 / 13,7	19 / 19,2	
PICTURE (20 PCS/BOX)					
DUBUIS P.N.	81964	81966	77946	81968	
ALSTOM P.N.	DTR0000125537	DTR0000275700	NA	DTR0000125310	
BOMBARDIER P.N.	NA	NA	NA	3EER4000010-4201	
LONG DRILL SHORT DRILL	OFE1150044 OFE1150018	OFE1500042 OFE1500018	OFE1350037 OFE1350019	OFE1900051 OFE1900022	
SETTING TOOL	PMT C6 / PMA10	PMT8 / PMA10		PMT10 / PMA10	
A4-80 SS FASTENING	78913	78914		78915	
MAXIMUM TORQUE VALUE	10 N.m	20 N.m	25 N.m	30 N.m	
DIMENSIONS (mm)	<div><p>A B C C' D E F</p></div>	M6 16 10,5 (6,5±2)* 4,5 4,5 11,5	M8 20 12,5 (6,5±2)* 5,5 4,5 15	M8 20 11 (8±1)* 3,5 7 13,5	M10 25 13 (6,5±2)* 5,5 4,5 19
WEIGHT	6 g	9 g	8 g	14 g	
BUSH RAW MATERIAL	Nickel plated aluminium				
ELECTRICAL PERFORMANCE :					
ELECTRICAL RESISTANCE LUG / PLATE - NF F00-363	60 μΩ	20 μΩ	40 μΩ	20 μΩ	
SHORT CIRCUIT RESISTANCE	3 × 10 kA	3 × 15 kA	-	3 × 20 kA	
ELECTRICAL CONTACT SURFACE EARTH BOND / SURFACE NF F00-363	160 sqmm	210 sqmm	300 sqmm	270 sqmm	
CORROSION RESISTANCE 500 H IN SALT MIST NF EN 3373	90 μΩ	-	-	-	
MECHANICAL PERFORMANCE :					
TENSILE LOAD TEST NF F00-363	250 daN 450 daN	200 daN 550 daN	- -	300 daN 650 daN	
SCALE TEMPERATURE USAGE	-50°C / +80°C				

* Dimension after crimping



TRANSMISSION
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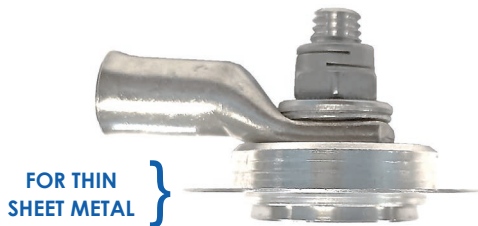


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EARTH BOND THIN METAL SHEET

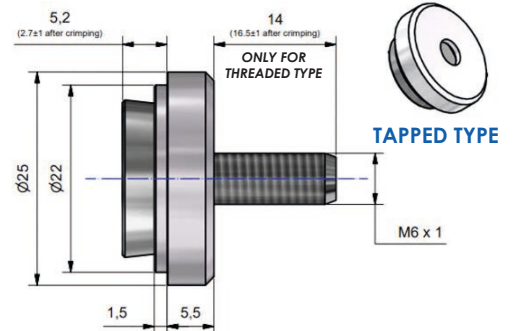
M6 - Ø22mm

SIMPLE ELECTRICAL CONNECTION



THREADED # 95855 - STEEL & ST. STEEL
(MALE) # 95875 - ALUMINIUM

TAPPED # 96815 - STEEL & ST. STEEL
(FEMALE) # 95897 - ALUMINIUM



DUBUIS EARTH BOND - Ø22 M6 is composed of an expansible tin-plated copper bush (#95855/96815) or an aluminium bush (#95875/95897) and a stainless-steel dowel except #95897 which is in anodized aluminium. Not including self-locking nut, washer and lug.

CONNECTION PERFORMANCE

Max. Electrical resistance Lug/ St Plate - **60µΩ**
Max. Electrical resistance Lug/ Al. Plate - **80µΩ**
Max. Electrical resistance Lug/ St.St. Plate - **180µΩ**
Max tensile load @ THK 0.5mm - **65daN**
Max shearing load@ THK 0.5mm - **40daN**

APPLICATION

Simple connection on the useful side

Plate thickness **0.5 to 1mm**

Drilling @ **Ø22^{+0.2}** mm

M6 Stainless steel dowel

Advise torque value @ **6Nm**

#95855 **32g** - #95875 **20g**

#96815 **27g** - #95897 **9g**

Additional products

OFE2222062
Reamer drill Ø22

78995
Stamp Ø22 for setting tool



COMPATIBLE TOOLS



PMTC6



PMTXX



BTEMXX



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& DISTRIBUTION

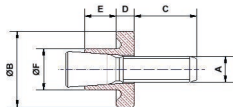


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IMPERIAL EARTH BOND



For use with steel plate

Part Number	A	ØB	C (C')	D	E	ØF	Hole size		Plate thickness		Torque value	Setting tools		Long stepped drill
							min	max	min	max		Designation	Part Number	
81983	1/4 UNC	0,63 in	0.51 (0.70) in	0,177 in	0,177 in	7/16	0,437 in	0,445 in	0,059 in	0,157 in	6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE07/16043
81987	1/4 UNC	0,63 in	0.63 (0.748) in	0,138 in	0,433 in	3/8	0,375 in	0,383 in	> 0.157 in		6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE03/08037
81989	3/8 UNC	0,984 in	0.944 (1.22) in	0,216 in	0,177 in	3/4	0,75 in	0,758 in	0,078 in	0,157 in	25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE03/04051
81993	3/8 UNC	0,984 in	1.102 (1.22) in	0,137 in	0,433 in	17/32	0,531 in	0,539 in	> 0.157 in		25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE17/32037
81911	3/8 UNC	0,984 in	1.102 (1.22) in	0,137 in	0,433 in	17/32	0,531 in	0,539 in	> 0.157 in		25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE17/32037
81910	3/8 UNC	0,984 in	0.944 (1.22) in	0,216 in	0,177 in	3/4	0,75 in	0,758 in	0,078 in	0,157 in	25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE03/04051

For use with aluminium plate

Part Number	A	ØB	C (C')	D	E	ØF	Hole size		Plate thickness		Torque value	Setting tools		Long stepped drill
							min	max	min	max		Designation	Part Number	
81984	1/4 UNC	0,63 in	0.51 (0.70) in	0,177 in	0,177 in	7/16	0,437 in	0,445 in	0,059 in	0,157 in	6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE07/16043
81988	1/4 UNC	0,63 in	0.63 (0.748) in	0,138 in	0,433 in	7/16	0,437 in	0,445 in	> 0.157 in		6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE07/16043
81990	3/8 UNC	0,984 in	0.944 (1.22) in	0,216 in	0,177 in	3/4	0,75 in	0,758 in	0,078 in	0,157 in	25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE03/04051
81994	3/8 UNC	0,984 in	1.102 (1.22) in	0,137 in	0,433 in	19/32	0,594 in	0,602 in	> 0.157 in		25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE19/32042

* C' is when bond is crimped

IMPERIAL EARTH BOSS



For use with steel plate

Part Number	A	ØB	C	D	E	ØF	Hole size		Plate thickness		Torque value	Setting tools		Long stepped drill
							min	max	min	max		Designation	Part Number	
81985	1/4UNC	0,63	0,252	0,177	0,177	7/16	0,437	0,445	0,059	0,157	6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE07/16043
81991	3/8UNC	0,984	0,362	0,216	0,177	3/4	0,75	0,758	0,078	0,157	25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE03/04051

For use with aluminium plate

Part Number	A	ØB	C	D	E	ØF	Hole size		Plate thickness		Torque value	Setting tools		Long stepped drill
							min	max	min	max		Designation	Part Number	
81986	1/4UNC	0,63	0,252	0,177	0,177	7/16	0,437	0,445	0,059	0,157	6 ft.lbs	PMT3/4UNC	MTPC140A1000	OFE07/16043
81992	3/8UNC	0,984	0,362	0,216	0,177	3/4	0,75	0,758	0,078	0,157	25 ft.lbs	PMT3/8UNC	MTPC380A1000	OFE03/04051



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MTPX06 - MTPX08 - MTPX10

THREAD	M6 - M8 - M10
PULLING FORCE	10 kN - 18 kN - 25 kN
STROKE	8 mm
TOOL WEIGHT (with battery)	1,200 kg
HEAD WEIGHT	0,400 kg
DIMENSIONS TOOL (L x l x H in mm)	169 x 125 x 47
DIMENSIONS HEAD (L x l x H in mm)	48 x 44 x 40
PART NUMBER	MTPX060A1000 MTPX080A1000 MTPX100A1000

* 10/32UNF - 1/4" - 5/16" - 3/8" Consult us



BTPX06 - BTPX08 - BTPX10

THREAD	M6 - M8 - M10
PULLING FORCE	10 kN - 18 kN - 25 kN
STROKE	8 mm
TOOL WEIGHT (with battery)	2,700 kg
HEAD WEIGHT	0,400 kg
DIMENSIONS TOOL (L x l x H in mm)	200 x 265 x 60
DIMENSIONS HEAD (L x l x H in mm)	48 x 44 x 40
PART NUMBER	BTPX060A1120 BTPX080A1120 BTPX100A1120

* 10/32UNF - 1/4" - 5/16" - 3/8" Consult us



RAIL BONDS



XPH3INE - XPH4INE - XPH6INE

THREAD	M10 - M12 - M16
PULLING FORCE	27 kN - 37 kN - 60 kN
STROKE	8 mm
TOOL WEIGHT (with battery)	2,800 kg
HEAD WEIGHT	1,300 kg
DIMENSIONS TOOL (L x l x H in mm)	200 x 265 x 60
DIMENSIONS HEAD (L x l x H in mm)	48 x 44 x 40
PART NUMBER	XPH3INEA1120 XPH4INEA1120 XPH6INEA1120

DUBUIS, IT'S ALSO :



BATTERY OPERATED HYDRAULIC MULTITOOLS

The BPP063 is a battery powered 62kN tool with interchangeable heads.

The BPP063 accepts crimping, cutting, and punching heads of the MULTITOOLS range.

Exists in BPE063 and BPL063 version.

CATENARY MAINTENANCE TOOLS

Dubuis offers a full range of tooling for catenary wire maintenance, during various operations.



SIGNALLING, RETURN OF TRACTION CURRENT

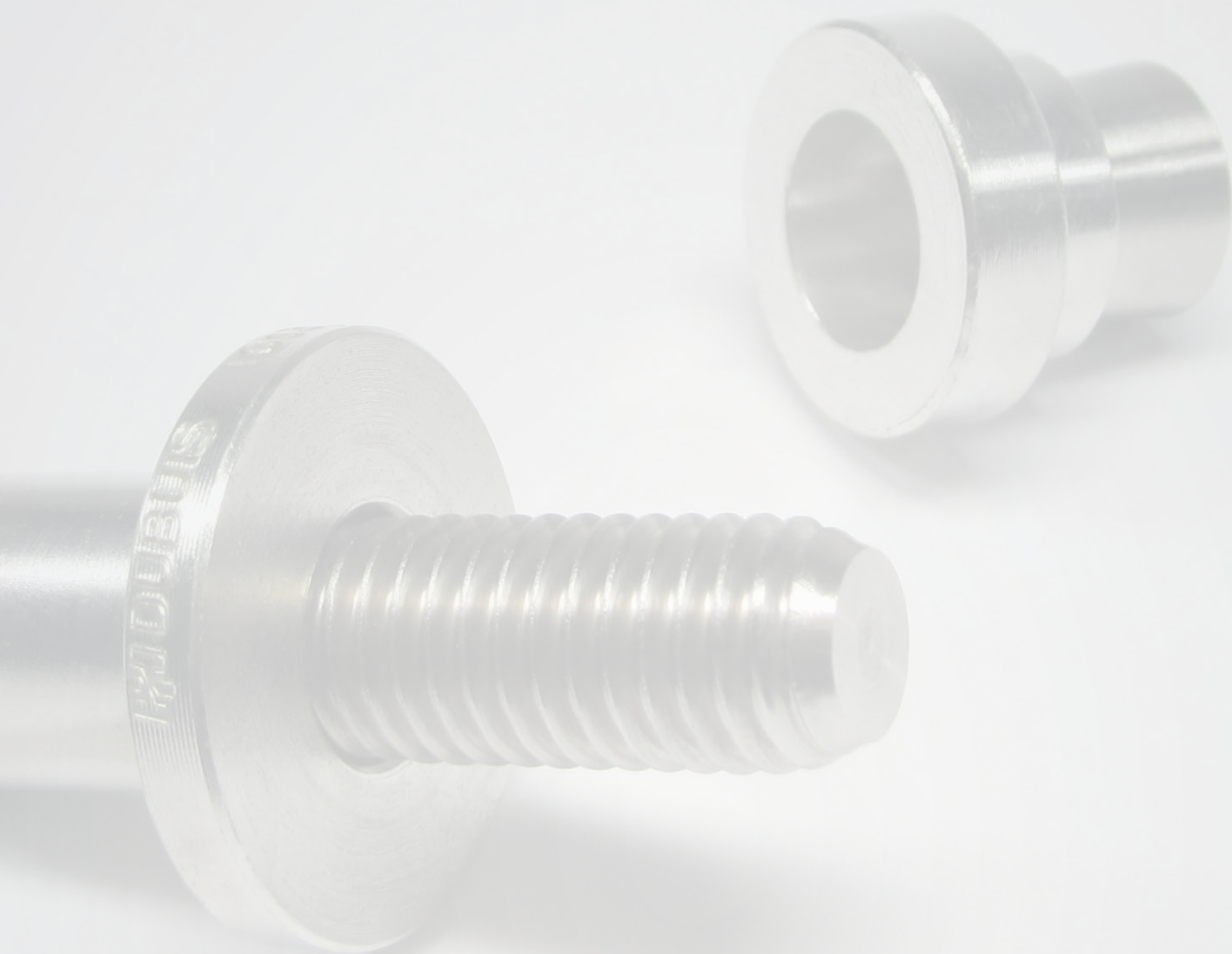
Thanks to the rail bond advantages, Dubuis has provided solutions for the reliability of connections. The regularity of traffic on all rail networks equipped with this concept is considerably improved.

Keys products :

- Electrical connection to the rail with bond:
Ø 8 mm M6 to Ø 22 mm M16 & setting tools PHxIN
- Rail drilling Machines & accessories



Find our full range of products on the rail catalog available on www.dubuis.com.



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LONG. : E 01°18'15"

