



Cembre

11 V 113 E



Certified Quality
Management System

PRODUCTS FOR RAILWAY APPLICATIONS



PRESENTATION

This catalogue illustrates the range of our products for Railway Applications.

For each product family we indicate the principal features, and sometimes the most frequent applications and the necessary guidelines for a correct application.

Our sales personnel are at your disposal to supply more detailed information and our design and development engineers are available to study new solutions to particular applications.

RoHS
compliant
2002/95/EC

All Cembre products comply with Directive 2002/95/CE of the European Parliament and Council dated 27 January 2003 (and subsequent amendment).

On 14th December 1990 **Cembre SpA Quality Management System** was certified by **Lloyd's Register of Quality Assurance (LRQA)** according to **ISO 9002-1987 EN 29002 - 1987 BS 5750: Part 2: 1987** for the manufacture of insulated and uninsulated copper crimping connectors.

Then on 22nd December 1992 **Cembre SpA** was certified **ISO 9001** for the design and manufacture of cable accessories, electrical connectors and associated tools.

The activities of the main premises in Brescia, the Italian regional offices and the subsidiary companies in Great Britain, France, Spain, Germany and USA are governed by a single Quality System, assessed by **Lloyd's Register of Quality** as conforming to the **ISO 9001:2008** norm, for the design, manufacture and sales of electrical connectors and associated tools, cable accessories, marking systems, tooling and products for railway applications. In house repair, refurbishment and calibration of tooling.

This guarantees a homogeneous and high quality level of the products and services that Cembre offers to its customers.

Cembre S.p.A. has recently recognised the need to align its **Environmental Management System** with the spirit and content of **UNI EN ISO 14001: 2004** as fundamental to future development.

To this end the company undertook a wide-ranging review of all functions including development and design stages, material selection, usage and manufacturing processes. The resulting definition of operational procedures in line with these aims and provisions has enabled Cembre S.p.A. to achieve Environmental Certification, further highlighting the company's sensitive and careful approach to environmental protection.



Production units

Cembre S.p.A.,
factory in Brescia (ITALY)
covers an area of approximately
115.000 sqm

Cembre Ltd.
factory in Curdworth
Birmingham (GREAT BRITAIN)

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RAIL WEB ELECTRICAL CONNECTION SYSTEM FOR RETURN TRACTION AND EARTHING APPLICATIONS

AR 60D



Steel M12 screw with hollow hex head

Copper bush

Flat steel washer

Self-locking nut

Cable lug

Rail web Permanent Electrical Contact type AR 60D, for hole diameter 19-20 mm

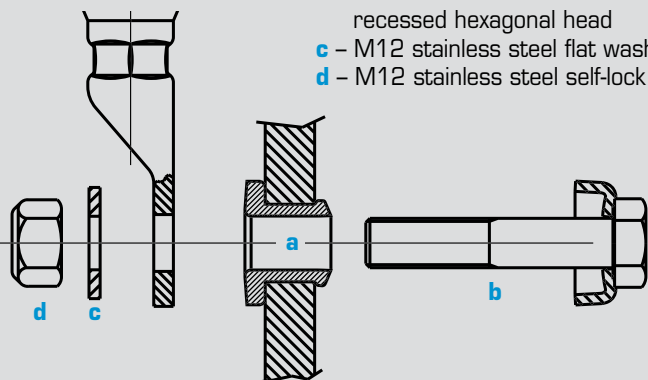
Railweb thickness: 14 to 16,5 mm

This unique system was designed and developed by Cembre in 1988 following a review of existing electrical connection systems. The aim of the Cembre system is to provide a low resistance interface between the rail web and the terminal lug. Following in-depth testing in the laboratory and extensive field trials, the system has been recognised and approved for total reliability.

- low electrical resistance (microhm)
- simple to install, not dependent on operator skill level
- quick and easy to install (less than one minute)
- easy to connect/disconnect cables, for fault finding

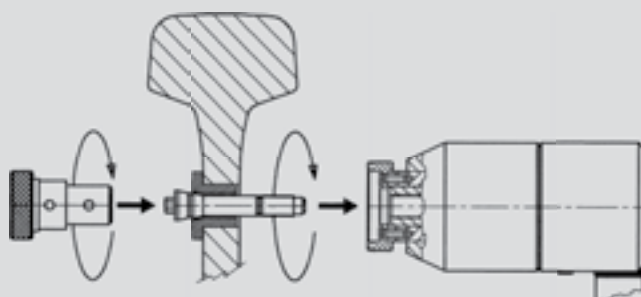
System components:

- a** - AR 60-1: Electrolytically tin plated copper bush
- b** - M12 steel bolt with recessed hexagonal head
- c** - M12 stainless steel flat washer
- d** - M12 stainless steel self-lock nut

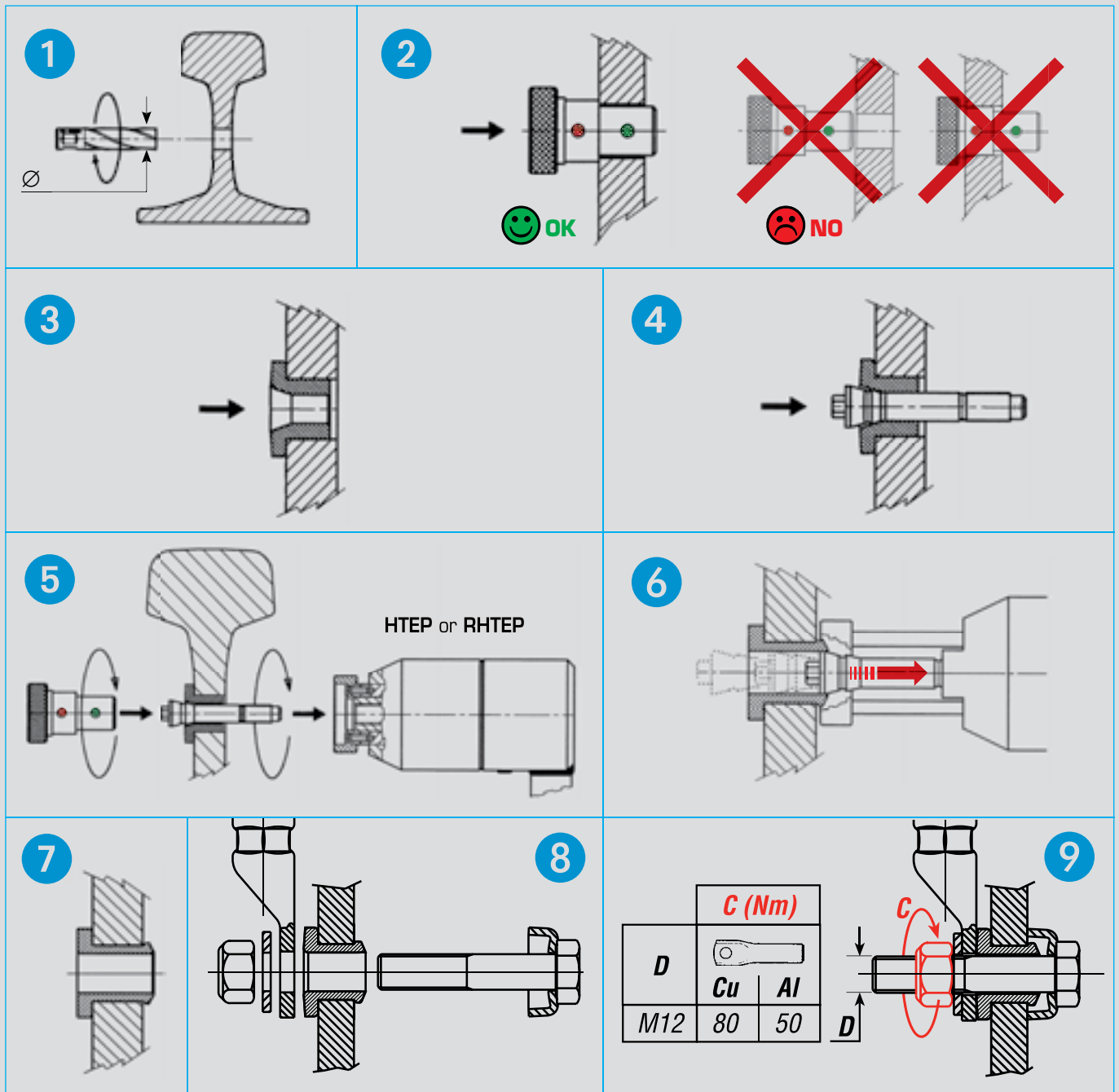


To be installed by:

HTEP hydraulic tool or tool type RHTEP head for connection to a hydraulic pump



AR 60D ASSEMBLY



RAIL WEB CABLE CONNECTION SYSTEM DOUBLE CONTACT BUSH TYPE

AR 260D



Railweb thickness: 14 to 16,5 mm

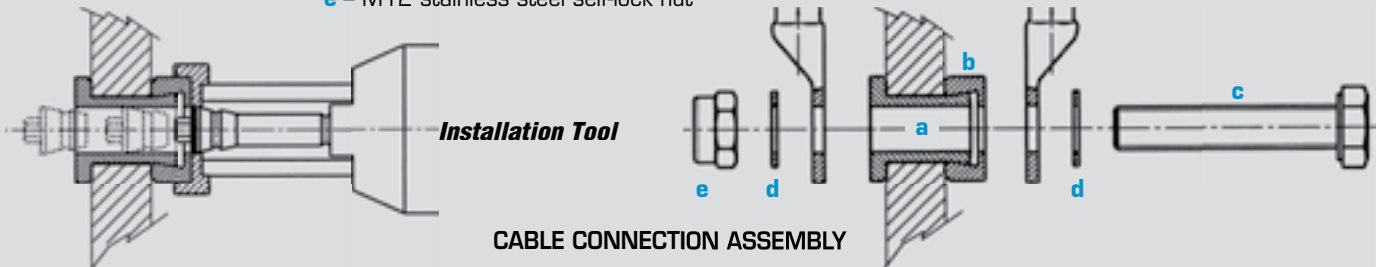
System components:

AR 260D

- a** – Electrolytically tin-plated copper bush type **AR 260-1**
- b** – Electrolytically tin-plated copper washer type **AR 260-2**
- c** – M12x70 stainless steel set pin
- d** – M12 stainless steel flat washer
- e** – M12 stainless steel self-lock nut

To be installed by:

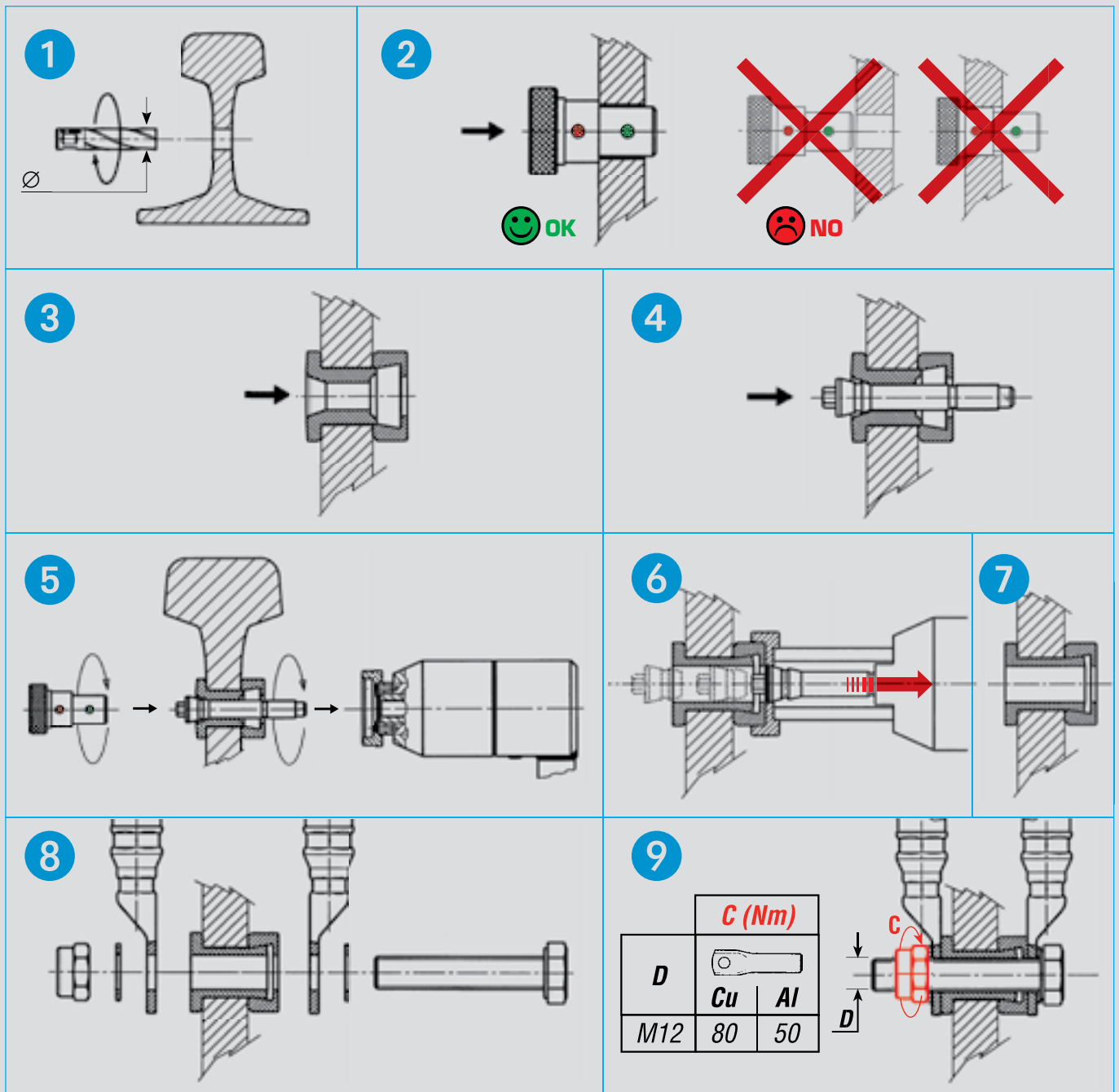
HTEP hydraulic tool or tool type
RHTEP head for connection to a hydraulic pump



RAIL WEB CABLE CONNECTION APPLICATIONS

- Traction return bonding • Continuity bonding
- Signal track circuit connection • Ground bonding

AR 260D ASSEMBLY



RAIL WEB ELECTRICAL CONNECTION SYSTEM FOR SIGNALLING DEVICES



AR 67

Steel M6
screw with
hollow hex head



Flat steel
washer



Cable lug

Copper bush



M6 Self-
locking nut

Rail web Permanent Electrical Contact type AR 67, for hole diameter 8 - 8,5 mm

Railweb thickness: 14 to 16,5 mm

System components:

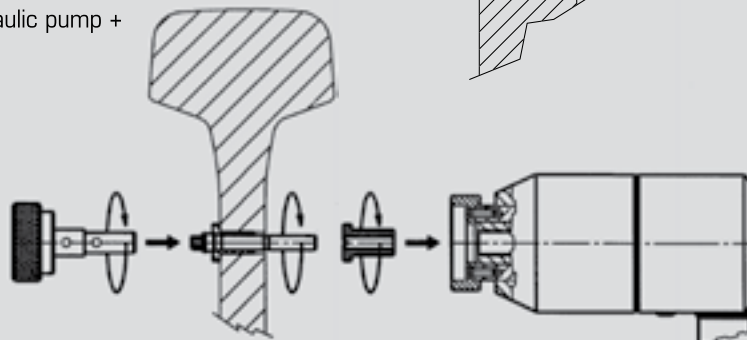
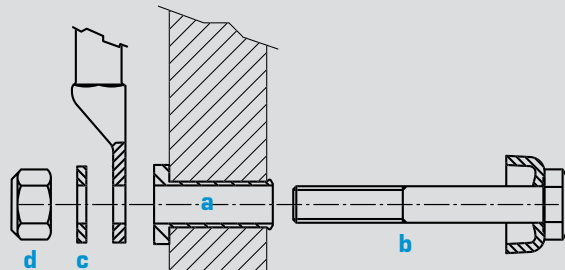
- a** – Copper bush type AR 67-1 protected on surface by suitable metal plating
- b** – Steel M6 screw with hollow hex head
- c** – Flat steel washer
- d** – M6 self-locking nut

To be installed by:

HTEP hydraulic tool + KIT AR67 INST installation Kit

RHTEP head for connection to a hydraulic pump + KIT AR67 INST installation Kit

MTE1 hand held ratchet tool



AR 67 ASSEMBLY

1

2

OK NO

3

4

5

HTEP, RHTEP
or MTE1

6

7

8

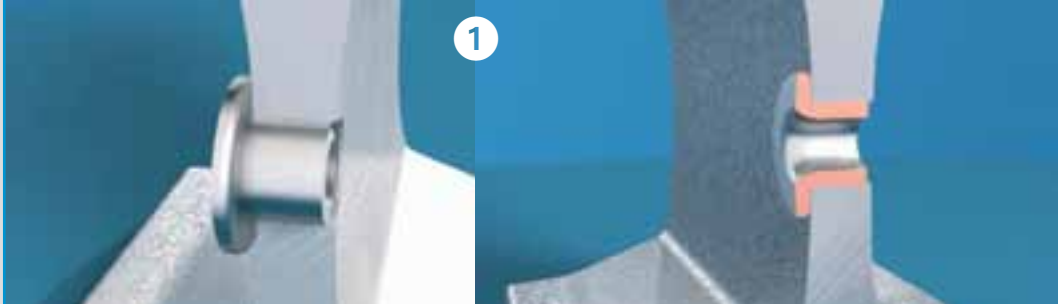
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C (Nm)		
D	C	
	Cu	Al
M6	10	6,5

RAIL WEB ELECTRICAL CONNECTION SYSTEM TYP AR

The advantages of using the rail web contact, **AR60D** are that the bush can be installed in all weather and environmental conditions, with a simple easy to operate, portable tool, producing a consistent, quality installation, independent of the skill of the operator. The reduced installation time of this systems results in overall cost savings.

During installation the bush is 'extruded' and the copper material flows into the wall of the hole, compensating for variation in hole size and filling any voids and uneven surfaces.



Schematic view of the extrusion process (section)



Extensive testing, performed in the test laboratory and in the field, has demonstrated a low and constant resistance, mechanical stability and protection from atmospheric corrosion.

Examples of the electrical tests



Heat Cycling Tests



Short Circuit Testing



On site Testing

Examples of tests in salt water environments



Salt Mist Exposure Testing

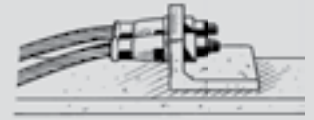
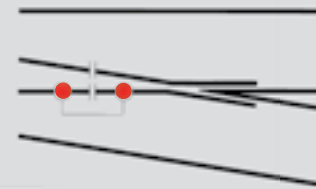


TYPICAL APPLICATIONS

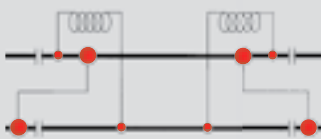
- AR 60 installation
- AR 67 installation



Transmission of coded and return current on lines fitted with automatic block



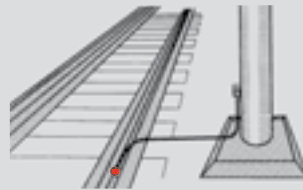
Signalling and traction current connection to manganese steel cast exchange units



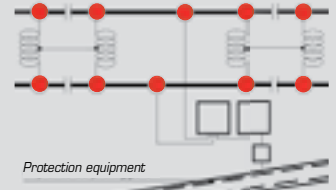
Various connections involved in the train location system



Return current connections to substations



Connection of metal structures to rails for earthing purpose



Protection equipment

Electrical connection of underground metal structures to rails



Examples of lines equipped with automatic block.



Examples of AR60D system in electrical joint applications.



Features and benefits of the AR 60D system have appeared in various Railway Industry journals

Used by all major European Railway Companies,
the AR60D system is proving to be reliable in all conditions.

ELECTRICAL CONNECTION SYSTEMS TO RAILS AND TO TRACK EQUIPMENT



1) Example of electrical connections using a low stranded conductor to provide electrical continuity on cast manganese steel crossovers.

1a) **AR60D** rail web connection, rail side

2) Example of electrical connections using a flexible cable to provide electrical continuity on cast manganese steel crossovers.

2a) **AR60D** rail web connection, rail side

3) **AR260D** double contact rail web connection



ELECTRICAL CONNECTION SYSTEMS TO RAILS AND TO TRACK EQUIPMENT



4

4) Example of electrical connection where cable layout is perpendicular to the rail.

5-6) AR 60D rail web connection, rail side.

7) AR 67 rail web connection, rail side.

8-9) Example of electrical connection, on cast manganese steel crossovers.



5



6



7



8



9

DRILLING MACHINES

conforming to
EN13977
conforming to

Cembre Rail Drilling Machines, **LD-1P-ECO** and **LD-2E**, have been specifically designed for use in Railway applications, to provide a consistent and accurate hole, in all types of weather conditions. Due to their compact size, our drill can save considerable time by allowing direct operation in cases which would normally require removal of obstructions. Special twist drill bits can be used for hole diameters 7 to 27,5 mm on rail up to 45 mm thick. Whilst broach cutters can be used for hole diameters 13 to 40 mm on rails up to 50 mm thick. The drills are provided with a coolant system consisting of a reservoir and pump for use with suitable cooling lubricants. Connection to the rail drill is by a quick coupler. The units are lightweight and ideally suited for one man operation.

LD-1P-ECO

GENERAL FEATURES:

- **Drilling range:** Ø 7÷40 mm
- **with broach cutters:** Ø 13-40 mm, on rails up to 50 mm thick.
- **with special spiral bits:** Ø 7-27,5 mm, on rails up to 45 mm thick.
- **Engine:** 2 stroke • **Displacement:** 45,4 cc
- **Fuel:** 2% oil/petrol mixture • **Start:** by rope pull
- **Clutch:** centrifugal with automatic intervention
- **Power:** 1,4 kW @ 7500 RPM
- **Weight:** with DBG-F2 clamping device 18,9 kg



According to phase 2
European Directives and
EPA regulations



LD-2E

GENERAL FEATURES:

- **Drilling range:** Ø 7÷33 mm
- **with broach cutters:** Ø 13-33 mm, on rails up to 50 mm thick.
- **with special spiral bits:** Ø 7-22 mm, on rails up to 45 mm thick.
- **Electric single phase motor:**
 - supply voltage: 220/230 V - 50 Hz
 - power rating: 1800 W
- **Weight:** with DBG-F2 clamping device 17 kg

Also available in:

110 V - 50/60 Hz version (**LD-2E-110**)

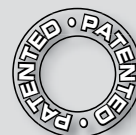


Approved SNCF
DPI 11002

LD-41P

GENERAL FEATURES:

- **Drilling range:** Ø 7÷38 mm
- **with broach cutters:** Ø 13-38 mm, on rails up to 50 mm thick.
- **with special spiral bits:** Ø 7-27,5 mm, on rails up to 45 mm thick.
- **Engine:** 4 stroke
- **Displacement:** 35,8 cc
- **Fuel:** unleaded regular grade gasoline
- **Start:** by rope pull
- **Clutch:** centrifugal with automatic intervention
- **Power:** 1 kW @ 7000 RPM
- **Weight:** with DBG-F2 clamping device 19,5 kg



Approved SNCF
DPI 11002

LD-4EF

GENERAL FEATURES:

- **Drilling range:** Ø 7÷40 mm
- **with broach cutters:** Ø 13-40 mm, on rails up to 50 mm thick
- **with special spiral bits:** Ø 7-27,5 mm, on rails up to 45 mm thick.
- **Switchable motor speed adjustment** relative to hole diameter.
Normal speed 280 RPM recommended for holes below dia 28 mm.
Low speed 250 RPM recommended for holes dia 28 - 40 mm.
- **Single phase electric motor:**
supply voltage: 220/230 V - 50 Hz
power rating: 1800 W
- **Weight:** with DBG-F2 clamping device 17 kg



DRILLING MACHINES

LD-12B - Battery

GENERAL FEATURES:

- Direct current electric motor
- Supply voltage: 24 V DC
- Power rating: 345 W
- Weight: with DBG-F2 clamping device 17,3 kg

Drilling range: \varnothing 7÷19 mm

BATTERY PACK:

- BP 24-16 (24V-16Ah): 17 kg
- BP 24-10 (24V-10Ah): 11 kg
- Battery condition display
- Protection fuse
- Battery charger 24V 2A max.



**BATTERY PACK
BP 24-16**



**BATTERY PACK
BP 24-10**

LD-8H - Hydraulic

GENERAL FEATURES:

- Engine: hydraulic
- Oil input flow: 5 gpm
- Oil input pressure: 2,000 psi
- Power: 2 kW
- Weight: with DBG-Y clamping device 20 kg

Drilling range: \varnothing 7÷38 mm

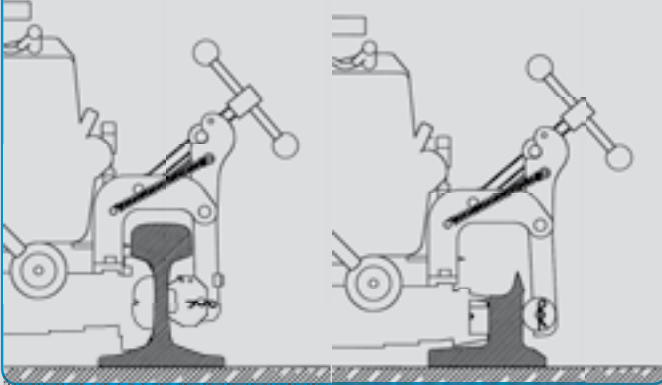


TYPICAL MOUNTING OF DRILLING MACHINES

Typical fixing situations:

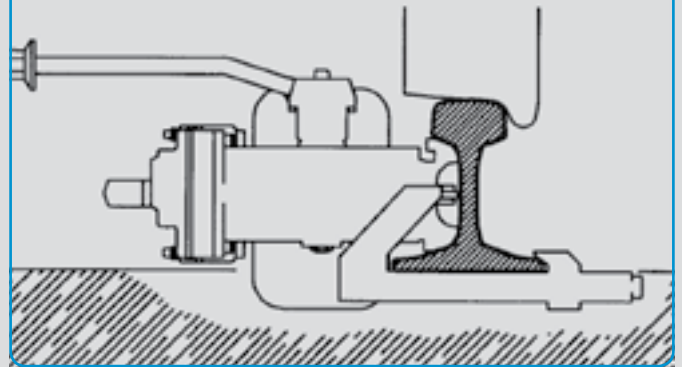
On the Rail Web

This system is ideally suited to working when the track is under possession or if not under possession when adequate train sighting provision is in place, however removal from the rail can be quickly achieved if so required. Using this arrangement, a hole can be drilled in close proximity to a sleeper.



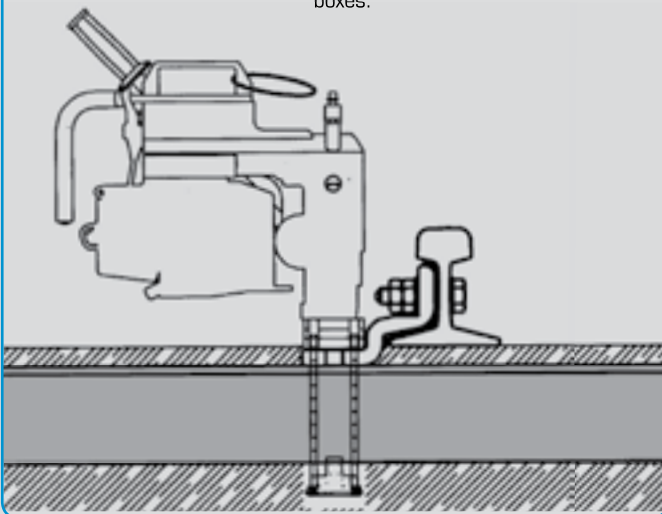
To the Rail Flange

In this situation the drill slides under the rail and can therefore be left in position during the passage of a train. Work can be carried out either side of the four foot zone. (except model LD-41P)



For Vertical drilling

This method of fixing enables vertical drilling for the assembly of attachments to spring tongues and branch plates to switchgear boxes.



STANDARD ACCESSORIES SUPPLIED WITH RAIL DRILLING MACHINES



DBG-F2 Over Rail Clamp (For use with rail possession)

For clamping drilling machine to rail web and track fittings
Complete with three terminations

- **TDB 1** for switch blades and confined spaces
- **TDB 6** for standard applications (bull head, flat bottom, check rails etc.)
- **TDB 3** for redrilling existing holes in rails for subsequent application of electrical connections and for additional special applications



SR 5000 Coolant unit

Coolant unit consisting of pressure vessel and hose, fitted with a manual pump and maximum pressure valve. Connection to the drilling machine is by quick coupler.



Calibrated measure (LD-1P-ECO)*

For accurate preparation of Petrol/Oil mixture.



Gear box oil



Range of tools

- 1 x spark plug key*
- 1 x 5 mm Allen key
- 1 x 6 mm Allen key
- 1 x 4 mm Allen key, with handle
- 1 x swarf brush

* Accessory only supplied with petrol engine rail drills



Socket head cap screws

4 pcs for clamping cutter or adaptor into spindle shaft
4 pcs for securing drilling template to the front plate
4 pcs for securing heavy duty drilling template to the front plate



ARE Adaptor

For the external application of the coolant. Fits directly to the SR 5000 coolant unit coupler

FOR USE WITH BROACH CUTTERS

Guide Bits

Allow the automatic control (opening and closing) of the flow of the cooling mixture during the drilling operation. Must be inserted in the rear of the cutter, before the cutter is located into the spindle.

- **PP1** (length 80 mm - Ø 7 mm)
For use with short broach cutters **A** Ø18 mm
- **PP2** (length 80 mm - Ø 8 mm)
For use with short broach cutters **A** Ø19 - 32 mm
- **PPL1** (length 100 mm - Ø 7 mm)
For use with long broach cutters **A.L** Ø17 mm
- **PPL2** (length 100 mm - Ø 8 mm)
For use with long broach cutters **A.L** Ø18 - 32 mm

FOR USE WITH SPIRAL BITS

DPE Spacer

For use with APE adaptor to activate the coolant when using spiral drill bits, diameter 9-12 mm



OPTIONAL ACCESSORIES & POSITIONING COMPONENTS FOR RAIL DRILLING MACHINES



VAL LD

- Steel carrying case for **rail drills**
- Accommodates the complete drill together with the **clamping device**, **DBSN** clamp and the **VAL-MPA** tool case
- 595 (L) x 345 (W) x 467 (H)

VAL LD-SR

- Steel carrying case for **rail drills** and **SR5000**
- Accommodates the complete drill together with the **clamping device**, **DBSN** clamp, the **VAL-MPA** tool case and **SR5000** unit
- 740 (L) x 367 (W) x 467 (H)

VAL MPA

- Suitable for storage of drilling templates cutters and accessories
- 390 (L) x 355 (W) x 52 (H)



MPAF for girder rails

MPAF...

MPAU

MPDU

TEMPLATES FOR POSITIONING RAIL DRILLS

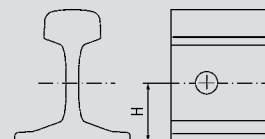
Enable the automatic positioning of the machine on the drilling axis of each specific rail.

MPAF 50 UNI for rail **UNI 50** and **S 49** type (H= 62,5 mm)

MPAF UIC 54 for rail **UIC 54** and **UIC 54E** type (H= 70 mm)

MPAF UIC 60 for rail **UIC 60** type (H= 76,3 mm)

MPAF U69 for guard rail **U 69** (UIC 33)



MPAF 35 G for girder rail **35 G / 35 GP** type (H= 59 mm)

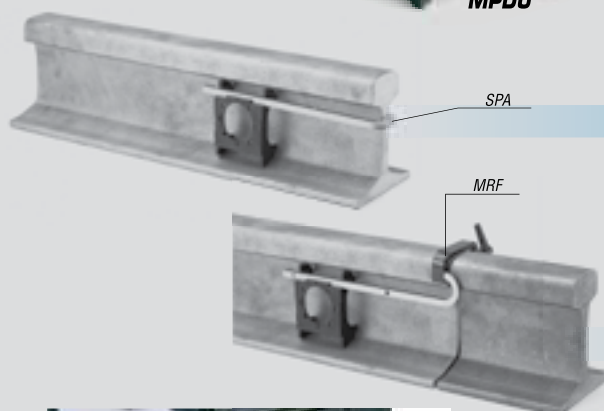
MPAF RI 60 N for girder rail **Ri 59, Ri 60** and **Ri 60N** type (H= 73 mm)

MPAF NP 4 AM for girder rail **NP 4** and **NP4aM** type (H= 73 mm)

NOTE: This is a list for reference only. Please contact Cembre for other types of rail.

MPAU for other kinds of rails or for special applications (positioning not automatic).

MPDU for other kinds of rails (adjustable positioning).



SPA

MRF

POSITIONING CONNECTING PLATES

To be located in conjunction with the MPAF positioning templates for a centre-to-centre distance, established in the Railway board standards.



MRF CLAMP

Applied as a reference to the head of rails, in conjunction with the positioning connecting plates.



SPA/2-HSB

Suitable to adjust the drilling height to be used in combination with **MPAU** template.



OPTIONAL POSITIONING COMPONENTS FOR RAIL DRILLING MACHINES

DBSN* UNDER RAIL CLAMP (FOR USE WITH NON RAIL POSSESSION)

- For clamping of drilling machine to flange
- Can remain in position while trains pass over

* No for LD-41P



DBC GUARD RAIL CLAMP

- For clamping of drilling machine to guard rail type U69 (UIC33)
- To be used in combination with MPAF U69 template

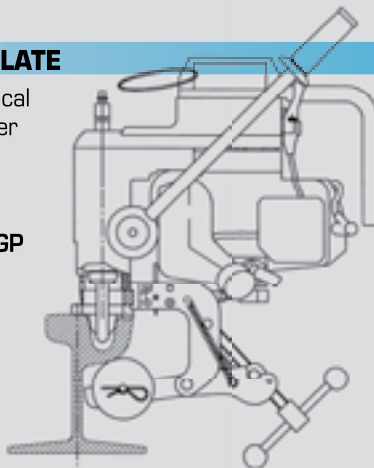
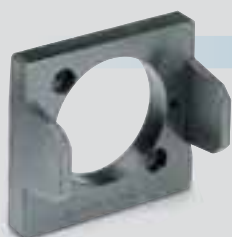


VERTICAL POSITIONING TEMPLATE

This template allows the correct vertical positioning to drill girder rails for water discharge

MPAS Ri60N for rail **Ri60N**

MPAS 35G-GP for rail **35G** and **35GP**



CONDUCTOR RAIL TEMPLATES

MPAF 106LB for 106lb conductor rail (H= 52,2 mm), use over rail clamp **DBG-LF2**

MPAF 150LB for 150lb conductor rail (H= 64 mm), use over rail clamp **DBG-LF2**



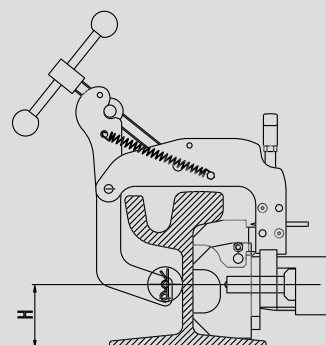
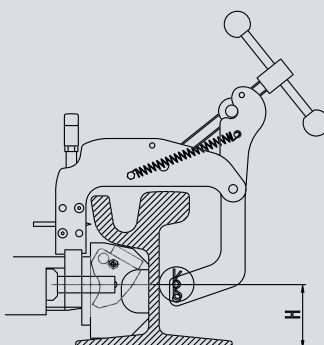
CHECK RAIL TEMPLATES

MPAF UIC33 for rail **UIC33** type (H= 35 mm), use over rail clamp **DBG-UIC33**
Drill template for holes at 35 mm from top of rail.

NOTE: to be used with **SPACER UIC33**

DBG-LF2 DEVICE FOR CLAMPING THE DRILL TO GIRDER RAILS

Use the DBG-LF2 device in place of the DBG-F2 supplied with the drilling machine, for positioning the machine on girder rails.

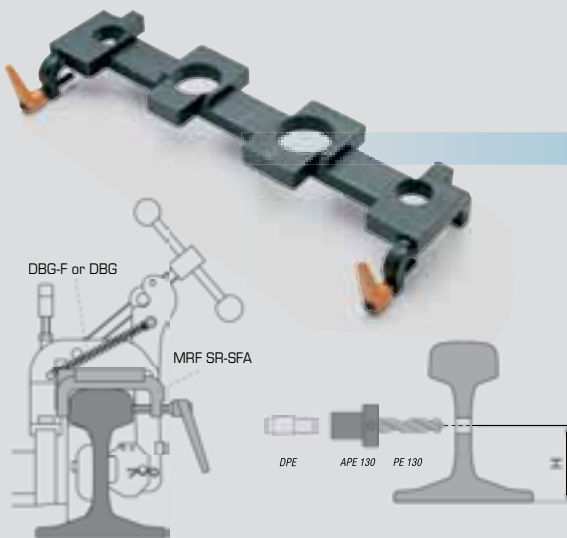


OPTIONAL POSITIONING COMPONENTS FOR RAIL DRILLING MACHINES



POSITIONING TEMPLATES FOR AXLE COUNTER GAUGE LOCATION HOLES

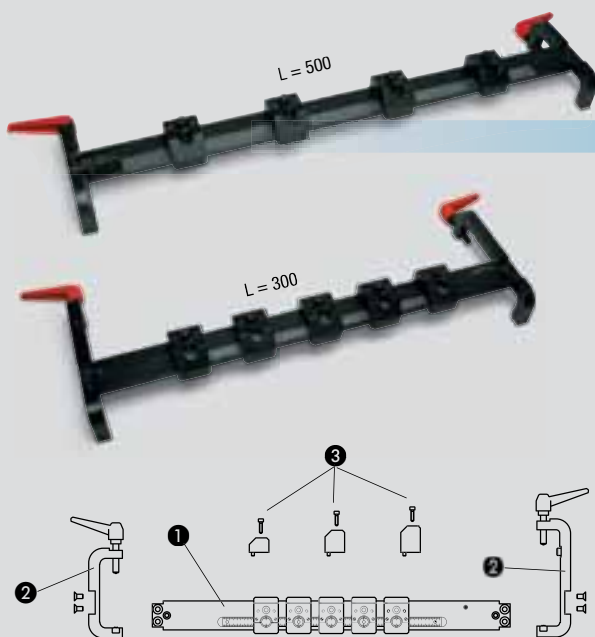
MSPAF ACG UIC60	for rail UIC60 type (H=68mm) Ø 13mm @ 148mm centres, use over rail clamp DBG-F2
MSPAF ACG BS113A	for rail BS113A type (H=65mm) Ø 13mm @ 148mm centres, use over rail clamp DBG-F2
MSPAF ACG BS95R BH	for rail BS95R bh type (H=65mm) Ø 13mm @ 148mm centres, use over rail clamp DBG-F2
MSPAF ACG BS80A	for rail BS80A type (H=56mm) Ø13mm @ 148mm centres, use over rail clamp DBG-F2
MSPAF ACG 109LB	for 109lb FG rail (H=56mm) Ø13mm @ 148mm centres
MSPAF ACG 98LB	for 98lb FG rail (H=60mm) Ø13mm @ 148mm centres



POSITIONING JIG MRF-SR SFA

The **MRF-SR SFA** positioning jig is suitable for drilling different hole centres in axles counter application type SIEMENS, ALCATEL, FRAUSCHER.

Rail Type	Product code	Drilling Height (mm)
UIC60	SR-UIC60-74	74
UIC60	SR-UIC60-81	81
UIC60	SR-UIC60-85	85
UIC60	SR-UIC60-85,5	85,5
UIC54	SR-UIC54-71,5	71,5
UIC54	SR-UIC54-72,5	72,5
UIC54	SR-UIC54-74,5	74,5
BS95RBH	SR-BS95RBH-58,5	58,5
BS113A	SR-BS113A-72,25	72,25



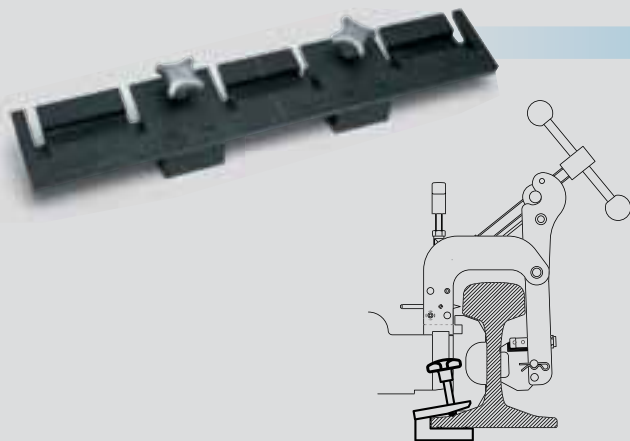
POSITIONING JIG MRF-U300S and MRF-U500S

Rail positioning gauges for different distances.

The assembly of the various components of the system allows solving a large number of needs for drilling at different interaxe distances.

Type	Description
MRF-U300-S ①	Positioner with graduated scale 300 mm
MRF-U500-S ①	Positioner with graduated scale 500 mm
CAV MRFU ②	Couple of rail traditional clamps
CAVY MRFU ②	Couple of clamps for girder or "Y" rails
BH 200-MRFU ③	Extension blocks h = 20 mm
BH 305-MRFU ③	Extension blocks h = 30,5 mm
BH 365-MRFU ③	Extension blocks h = 36,5 mm

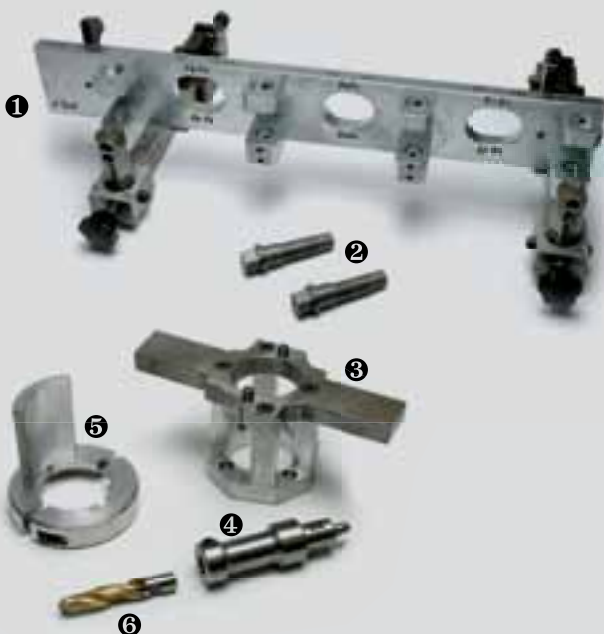
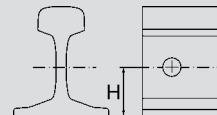
OPTIONAL POSITIONING COMPONENTS FOR RAIL DRILLING MACHINES



Positioning Jig MRFT-SR-A

Positioning jig for ALCATEL axle counter gauge fixing holes, with hole centre distances of 148-148mm. Rail foot clamping allows the jig to remain in place during train passage.

Rail	Product code	Drilling Height (mm)
UIC60	MPSR UIC60-74	74
UIC60	MPSR UIC60-68	68
UIC60	MPSR UIC60-85	85
UIC54	MPSR UIC54-68	68
UIC54	MPSR UIC54-72	72
S54	MPSR S54-63	63
S54	MPSR S54-68	68
46UNI	MPSR 46UNI-64	64
50T	MPSR 50T-64	64
S49	MPSR S49-64	64
37JP	MPSR 37JP-53	53
50JP	MPSR 50JP-63	63
100LB	MPSR 100LB-RE-64	64
R65	MPSR R65-94	94



- ① - Positioning Jig MRFT-DBS-SRA *
- ② - Blocking bolts *
- ③ - Drilling Machine Adapter *
- ④ - Spiral bit Adapter APED 130 L *
- ⑤ - Safety device for drill Lever *
- ⑥ - Spiral Bit

* accessories supplied with MRFT-DBS-SRA

Positioning Jig MRFT-DBS-SRA

The new MRFT-DBS-SRA positioning jig is suitable for drilling different hole centres in axle counter application type SIEMENS, ALCATEL, FRAUSCHER.

MRFT-DBS-SRA device may be used during train passage.

For Various rail types. Positioning jig for axle counter gauge fixing holes are the same as jig MRF-SR-SFA.

To be ordered separately:

Rail	Product code	Drilling Height (mm)
S 49	KIT SR S49-62,5/3 Rail Template 3 pieces	62,5
	KIT SR S49-64/3 Rail Template 3 pieces	64
S 54	KIT SR S54-63/3 Rail Template 3 pieces	63
	KIT SR S54-67,5/3 Rail Template 3 pieces	67,5
	KIT SR UIC60-68/3 Rail Template 3 pieces	68
UIC 60	KIT SR UIC60-74/3 Rail Template 3 pieces	74
	KIT SR UIC60-85/3 Rail Template 3 pieces	85


Information: To drill with jig type MRFT-DBS-SRA, 3 piece Rail Templates are required. Other types of Rail Templates are available to be ordered separately.



BROACH CUTTERS FOR RAIL DRILLING MACHINES

BROACH CUTTERS

These cutters rapidly produce high quality, accurate holes in a single pass. The automatic lubrocooling system, reduces friction and eliminates heat build, up during the drilling operation. Under normal conditions a broach cutter can drill 40-50 holes, depending on the hardness of the rail, before re-sharpening. Between 3 and 6 re-sharpening operations are possible.



Short range		Ø mm	Long range	
Ref.	Guide bits		Ref.	Guide bits
A 130	Ref. PP1	13		
A 135		13,5		
A 160		16	A 160L	Ref. PPL1
A 170		17	A 170L	
A 180	Ref. PP2	18	A 180L	
A 190		19	A 190L	
A 200		20	A 200L	
A 210		21	A 210L	
A 220		22	A 220L	
A 230		23	A 230L	
A 240		24	A 240L	
A 250		25	A 250L	
A 260		26	A 260L	
A 270		27	A 270L *	
A 280		28	A 280L	
A 290		29	A 290L *	
A 300		30	A 300L	
A 320		32	A 320L	
A 330		33		
Max drilling thickness 25 mm			Max drilling thickness 50 mm	

*contact Cembre for availability

To drill larger diameters, please contact Cembre.





Long range broach cutters type **A...L** are required when **MPAF RI 60 N**, **MPAF I UNI** & **MPAF NP4AM** templates are used. Alternatively, it is possible to use short range type **A...** broach cutters and type **PE...** spiral bits with the following extensions:






SPIRAL BITS FOR RAIL DRILLING MACHINES

SPECIAL SPIRAL BITS

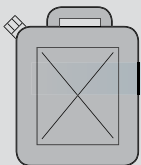
Using these bits guarantees optimum performance during the drilling operation. The semi-automatic lubrocooling system, reduces friction and eliminates heat build up during the drilling operation. As a guide, under standard conditions, a spiral bit can drill 70-100 holes, depending on the hardness of the rail, before re-sharpening. Between 5 and 10 re-sharpening operations are possible.

Ø mm	Ref.	Adapter	Spacer	Model
7	PE 70	APED 70	without DPE	
8	PE 80	APED 80		
9	PE 90	APE 90		
9,5	PE 95	APE 95	DPE 	
10	PE 100	APE 100		
12	PE 120	APE 120		
13	PE 130	APED 130	without DPE	
13,5	PE 135	APED 135/165		
14	PE 140			
16	PE 160			
17	PE 170	without adapter	DPE 	
18	PE 180			
19	PE 190			
21	PE 210			
22	PE 220			

HIGH QUALITY SPIRAL BITS

Ø mm	Ref.	Adapter	Spacer	Model
13	PE 130 AR	APED 130	without DPE	
13,5	PE 135 AR	APED 135/165		
17	PE 170 AR	without adapter	DPE 	
19	PE 190 AR			
21	PE 210 AR			
24	PE 240 AR*			
27,5	PE 275 AR*			

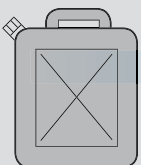
*Only for LD-3PF; LD-41P; LD-4EF drilling machines



LUBROCOOLER

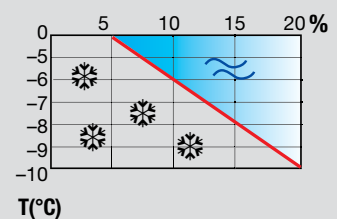
LR2 concentrate 3 litres.

This biodegradable product of vegetable origin, to be watered down in the percentage 95% water, 5% oil, will provide a white colour mixture very effective for drilling operations with no heating of the rail or the drilling machine.



ANTIFREEZE

Concentrate of 3 litres LR3 added to the lubro cooling mixture with the right percentage will maintain the lubrocooling mixture fluid (see table) in negative temperature conditions.

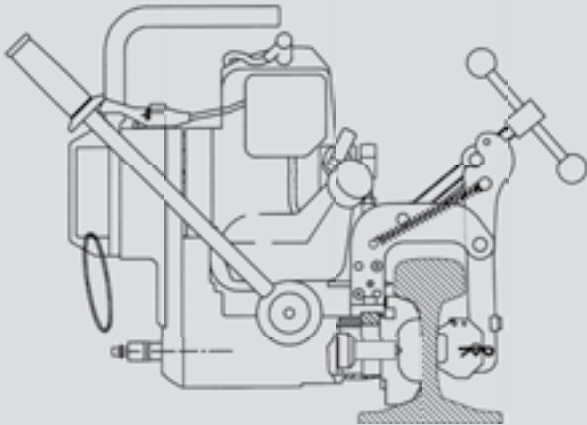


MSC SWARF COLLECTOR

For collecting metallic swarf following drilling operations.

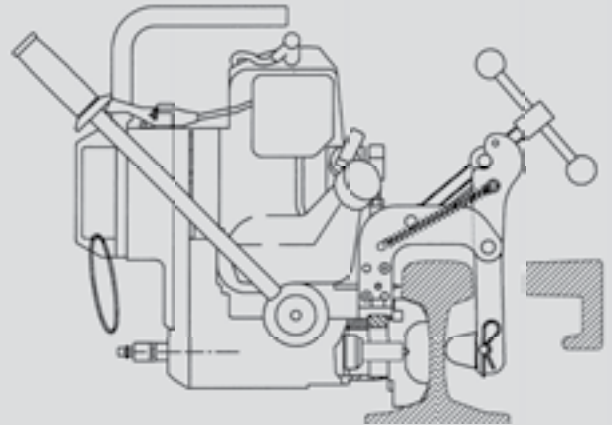
TYPICAL APPLICATIONS OF RAIL DRILLING MACHINES

ON RUNNING RAILS



STANDARD USE

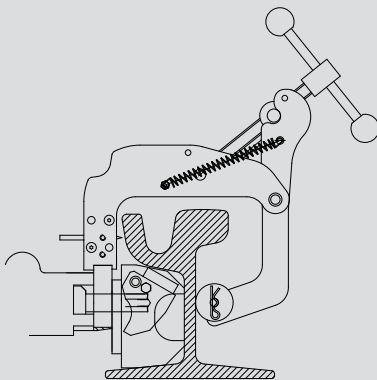
DBG-F2 over rail clamp equipped with TDB- 6 termination



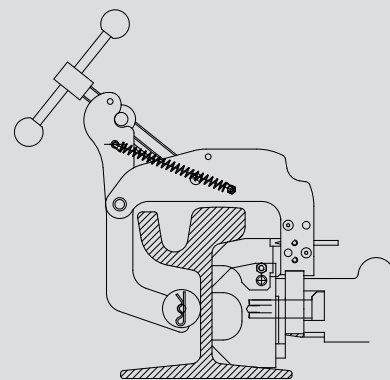
DRILLING BY THE GUARD RAIL

DBG-F2 over rail clamp equipped with TDB-3 termination

ON GIRDER RAIL (e.g. Ri 60 Np4)

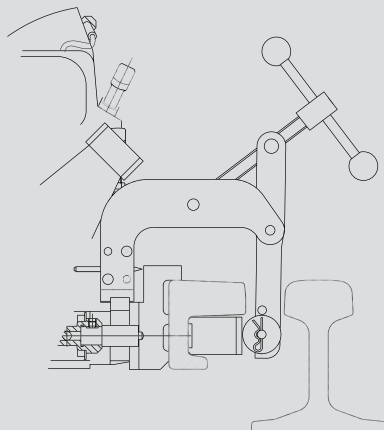


- DBG-LF2 over rail clamp
- Specific positioning template MPAF
- Use of long broach cutters A...L range



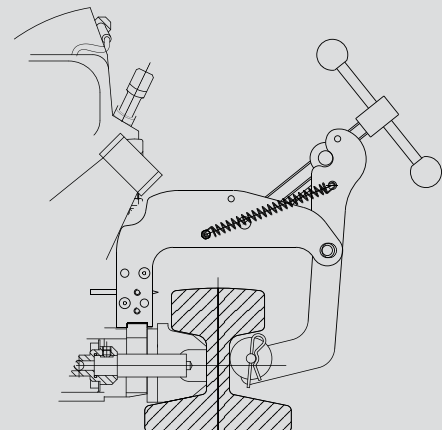
The design of the template (combination) allows positioning on both sides of the rails

ON CHECK RAIL



- DBG-UIC33 over rail clamp
- Specific positioning template MPAF-UIC33
- SPACER UIC33 spacer block
- Use of long broach cutters A...L range

ON CONDUCTOR RAIL



- DBG-LF2 over rail clamp equipped with TDB-1 termination for 150LB conductor rail drilling
- Specific positioning template MPAF-106LB or MPAF-150LB

ROBOKATTA RDS-14P-AA

Comprising the **RDS-14P** railsaw and the “active” arm **AA-RDS**, Robokatta is a new concept in Rail Disc Saws, robust, powerful and designed for precise cutting.

With a perfectly perpendicular cutting action, Robokatta is particularly suited to making the isolated joints integral to automatic signalling systems, where consistently accurate right-angle cuts in the horizontal and vertical axes are essential.

In manual mode, Robokatta offers a two-joint support arm for simple and precise operation in the cutting plane, minimising the working weight of the machine for the operator.

While the innovative automatic mode allows the operator to be in

control, but away from the machine during the cutting phase and thereby subject to:

- **Vibration:** **Zero**
- **Physical Effort:** **Zero**
- **Harmful Dust:** **Zero**
- **Sparks:** **Zero**
- **Exhaust Fumes:** **Zero**
- **Acoustic Noise:** **Minimum**



Design features:

In both manual and automatic modes, Robokatta offers tremendous advantages over other rail saws including:

- “Expert operator” cutting times and accuracy obtained due to:
 - Rigorously engineered support arms
 - Patented self-adjusting belt tension system
- Speed control device to optimise disc performance, minimising consumption and consequently delivering the greatest number of cuts
- Elastic system for vibration damping
- One-piece disc support arm and hub coupled to the fixing arm provides maximum rigidity and cutting precision
- Metallic disc protection casing with angular regulation device is not affected by vibration, so assures operator security and optimum visibility
- Transportation handle designed to assist motor protection

AUTOMATIC RAIL DISC SAW

New



Technical characteristics:

- **Husqvarna 2-stroke engine** with electronic start and 5 stage air filter; 7.9 HP (5.8 kW) at 9750 rpm
- **Pulley transmission** with centrifugal clutch and trapezoidal tooth belt
- **Tank capacity:** 1,25 l
- **Cutting disc diameter:** 350/400 mm (14 - 16 in.)
- **Disc support shaft diameter:** 25,4 mm (1 in.)
- **Dimensions** (without disc)
 - **Length:** 798 mm
 - **Width:** 285 mm
 - **Height:** 440 mm
- **Weight:**
 - **Without support arm:** 18 kg
 - **Weight of manual support arm:** 8,8 kg
 - **Weight of automatic support arm:** 18,8 kg



RDS-14P rail disc saw

AA-RDS automatic support arm

- Powered by the rail saw engine to simulate the movement of a skilled operator during the cutting phase
- Original clamp configuration for better and safer coupling to the rail being cut
- Exact cutting position indicator integrated into the clamp
- Ability to invert the rail saw easily and quickly to continue cutting on the other side of the rail, without relocating the clamp and support arm
- Arm joint supported by shielded bearings & assembled with no end float to ensure precision when cutting from both sides of the rail



- May be blocked in "Hold" position to simplify rail saw location and start-up operations



Optional Accessories:

VAL RDS

case for storage of the RDS-14P rail saw and AA-RDS active support arm.



SSR1

stabiliser support for short rail lengths.

High quality discs

The RDS-14P is optimised to use the following discs with appropriate "RAIL" marking:

HDS 350

355 x 25.4 mm
(14" x 1")

HDS 400

406 x 25.4 mm
(16" x 1")



It is also possible to use discs type 350x22.23 mm by replacing the railsaw centering bush (14" x 7/8")

Above disc dimensions: external diameter x centering hole diameter

SA-RDS

Support arm for using the RDS-14P rail disc saw in manual mode.



"Expert operator" cutting times and accuracy in automatic and manual modes

SUPPORT TROLLEY

CS-SD CS-SD-TA

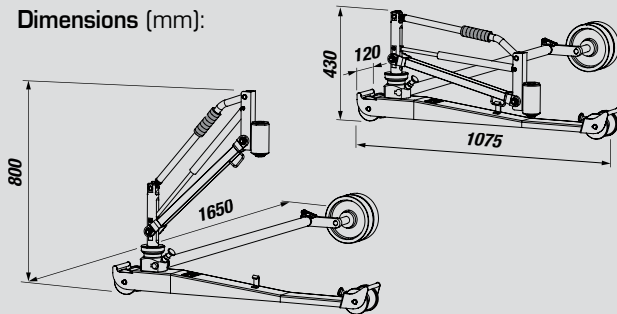
CS-SD-E (with braked wheels)*

The support mechanism, which secures the portable drilling machines SD-9P-ECO, SD-10E and the portable impact wrench NR-11P, incorporates a gas pressure spring to give a constant, balanced control to the machine during operation. Fitted with insulated wheels, the trolley does not interfere with the track electrical circuits. The trolley is easily closed and can comfortably be carried by a single operator. The **CS-SD** standard version is suitable to work on standard gauge rails (1.435 mm), while the **CS-SD-TA** is the adjustable version suitable to cover gauges from 1.000 to 1.700 mm.

**All configurations meet the stability requirements of sect. 5.15 EN 13977:2005 + A1:2007.*

General features:

- **Weight:** drill support unit 17,5 kg
- **Bar with 3rd wheel:** 12 kg
- **Dimensions (mm):**



conforming to
EN13977
conforming to

The trolley is easily assembled and can comfortably be carried by a single operator.



Portable drilling machines for wooden sleepers SD-9P-ECO + support trolley CS-SD

(See Page 33)



Portable petrol engine impact wrench NR-11P + support trolley CS-SD

(See Page 29)



HIGH TORQUE
2500 Nm



PETROL ENGINE NR-11P

Ideal for Railways, Construction sites, Oil and Mining Industries, Shipyards.

General features:

1 - Fuel Tank

This large tank has a 1.2l capacity for longer working time between refills. The gripping surfaces on the cap make it easy to remove/replace and the facility to add fuel in both vertical and horizontal positions avoids accidental spillage.

2 - Handlebar

Careful ergonomic design of the machine spreads the weight equally between left and right handles. The structure formed by the combination of the shaped handle bar and the protective shield minimise the risk of accidental mechanical shock to the fuel tank and engine.

3 - Control handle

Control buttons are specifically located to reduce the effects of working in awkward positions, eg wrist and shoulder discomfort, thereby optimising performance in both vertical and horizontal modes, while a Dead man device prevents accidental acceleration, for operator safety. The control handle assembly is clamped to the handlebar via a steel rod for enhanced robustness.

4 - Trolley [see page 29]

Optional interface kits enable the machine to be used in vertical and horizontal modes with the rail mounted CS-SD support trolley. Fitted with a braking device in accordance with EN19277, the trolley eliminates much of the effect of the weight of the machine and allows rapid movement between work areas.

5 - Gearbox

Brightened steel gears are immersed in a synthetic oil bath to prolong life and extend the range of permitted working temperatures. The gear change lever is adjacent to the accelerator control in order to avoid damage caused by changing gear while the engine is running. Smooth acceleration is provided by the centrifugal clutch.

6 - Impact mechanism

The innovative patented impact unit develops a high torque and has a larger impact surface than any other nut runner, so to extend the life of this essential component. Specialist, high spec grease minimises wear in this area and the special seal on the drive prevents the leakage of grease commonly seen on other impact wrenches.

7 - Engine

With a greater impact surface, the NR11P does not need higher rpm to develop 2500 Nm thus the engine is not continuously straining at maximum rpm, allowing maintenance intervals to be extended.

8 - Vibration

The handlebar is mounted on 4 vibration absorbing dampers so to reduce hand-arm vibration felt by operators.

9 - Easy-start

With its decompression button, primer and digital ignition coil, minimum time and effort are required to start NR11P.

Protective shield
To protect tank and engine from accidental shocks



Torque selector
With 5 positions



Forward/Reverse selector
Smooth change



IMPACT WRENCHES

Petrol engine NR-11P

General features:

ENGINE	Type:	Two stroke, forced-air cooled, single cylinder
	Displacement:	55 cc
	Fuel tank capacity:	1,2 l
	Fuel mixture ratio:	Synthetic oil 1:50 2 stroke mineral oil 1:25
	Revolution (idle):	2800 rpm \pm 200
IGNITION	Revolution (loaded, impact):	7000 rpm
	Revolution (non loaded, max):	11500 rpm
IGNITION	Type:	Digital
	Spark plug type:	RAX 80 or equivalent
CARBURETTOR	Type:	Diaphragm
IMPACT UNIT	Square driver size:	25,4 mm (1")
	Fastening torque range:	Full Throttle: 2500 Nm (1844 ft. lbs)
CAPACITY	Free mandrel speed :	1300 rpm
	Bolt diameter:	up to 33 mm (1 1/4")
WEIGHT	Dry:	18,5 kg (40,7 lbs)

Dimensions mm:



OPTIONAL ACCESSORIES:

Standard and long impact sockets, extensions, swiveling shaft, adapters.

CLIP-NR

Retaining circlip for fastening sockets to the mandrel having an external diameter range: 47 ÷ 57 mm. 3 pieces supplied as standard.

CLIP-NR 57

Retaining circlip for fastening sockets to the mandrel having an external diameter range: 57 ÷ 67 mm. 1 piece supplied as standard.

Ref.	Description
XT 100	1" x 100 mm extension
SJ 1"	1" swivel joint
CLIP NR	Retaining circlip for fastening sockets to the mandrel.
KCS-NR	interface kit for vertical use with support trolley CS-SD
KHOR-NR	interface kit for horizontal use with support trolley CS-SD
CS-SD	Support trolley common to NR11-P and sleeper drilling machines SD-9P-ECO and SD-10E.
VAL P20	Plastic box for storage of sockets and accessories.
VAL NR	Steel case for storage of NR11-P and VALP20 accessories box.
TARPCOVER 027-NR	Protection cover manufactured in Polyethylene HDPE and UV resistant. Temperature range: -40°C to +70°C.

TARPCOVER 027-NR

VAL P20

VAL NR

New

ELECTRIC IMPACT WRENCH NR-13E

NR-13E

General features:

- **Motor:** single phase electric motor
- **Supply voltage:** 220÷230V - 50 Hz
- **Power rating:** 3 kW
- **Weight:** 21 Kg

Impact Unit:

- **Square Driver size:** 25,4 mm (1")
- **Fastening torque range:** Full throttle: 2500 Nm (1844 ft. lbs)
- **Bolt diameter:** up to 33 mm (1 1/4")

HIGH TORQUE
2500 Nm



Fitted with **PRCD** device
(Portable Residual Current Device)

The NR-13E is suitable for use with the CS-SD support trolley

APPLICATIONS OF IMPACT WRENCHES

Assembly of steel structures such as bridges, building frames, rail tracks, ship building, heavy equipment maintenance, pipelines and industrial applications.

Anti-vibration couplings reduce transmission of vibration to the operator.



The protective handlebar structure facilitates a comfortable dorso-lumbar operating position without wrist injury.

A reduced mandrel axis to machine base dimension facilitates a more convenient horizontal position for working with track bolts, even when operating across sleepers.



IMPACT WRENCH MOUNTED ON SUPPORT TROLLEY CS-SD

IN VERTICAL



KCS-NR interface kit for **vertical use** with support trolley **CS-SD**. Available upon request.



KHOR-NR interface kit for **horizontal use** with support trolley **CS-SD**. Available upon request.



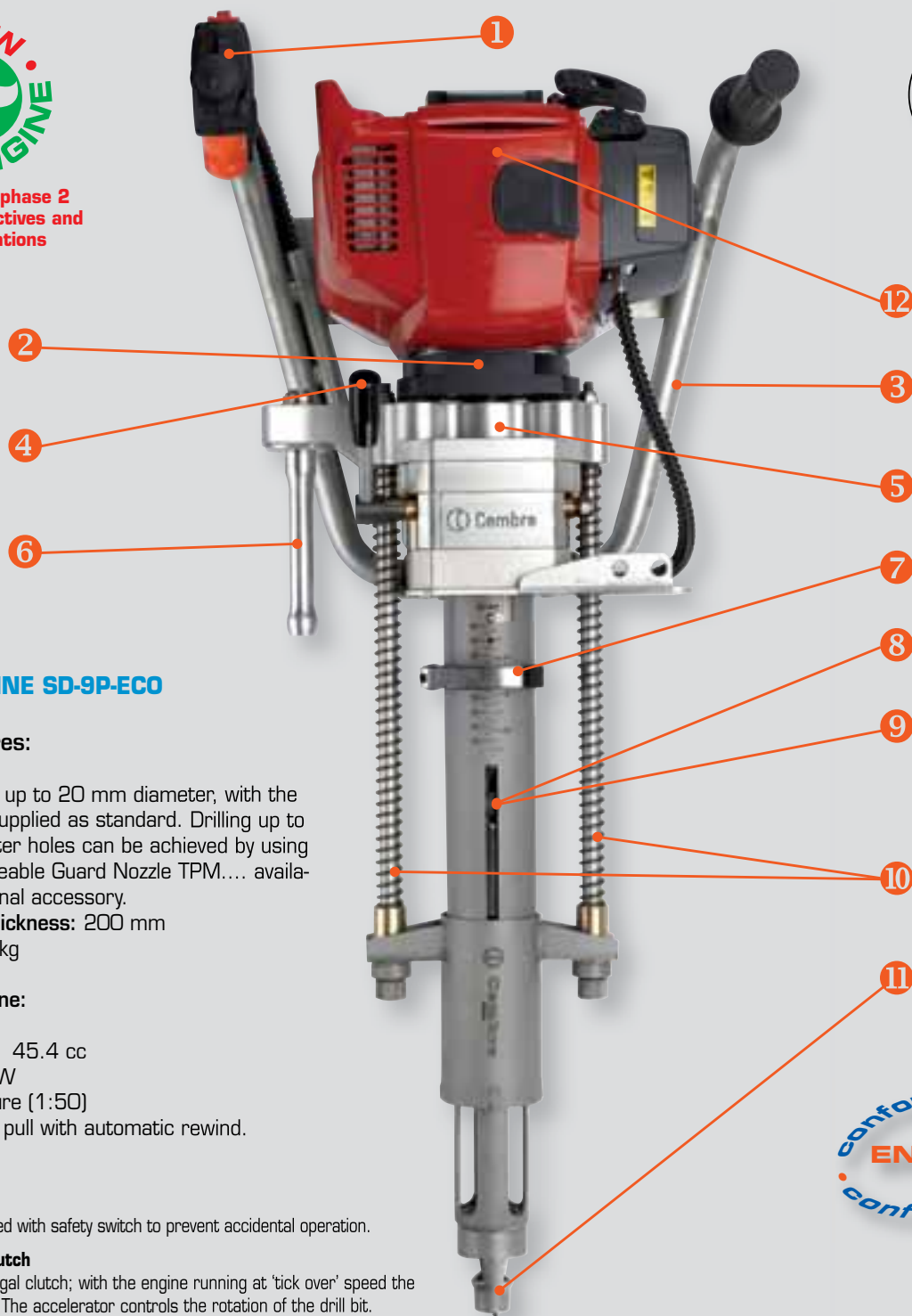
Impact wrenches can be used with the same **CS-SD** support trolley used with Cembre sleeper drilling machines.



WOODEN SLEEPER DRILLING MACHINES



According to phase 2
European Directives and
EPA regulations



PETROL ENGINE SD-9P-ECO

General features:

- **Drilling range:** up to 20 mm diameter; with the Guard nozzle supplied as standard. Drilling up to 25 mm diameter holes can be achieved by using the interchangeable Guard Nozzle TPM.... available as an optional accessory.
- **Max drilling thickness:** 200 mm
- **Weight:** 19,1 kg

Two stroke engine:

- **Displacement:** 45.4 cc
- **Power:** 1,4 kW
- **Fuel:** 2% mixture (1:50)
- **Starting:** rope pull with automatic rewind.

1 - Accelerator

Accelerator lever fitted with safety switch to prevent accidental operation.

2 - Centrifugal clutch

Fitted with a centrifugal clutch; with the engine running at 'tick over' speed the drill bit is stationary. The accelerator controls the rotation of the drill bit.

3 - Operating handle

Handle will rotate through 90° for operator comfort.

4 - Emergency lever

Emergency lever for the immediate release of the drill bit.

5 - Shock absorbers

Shock absorbers fitted between the drive shaft and spindle, reduce the transmission of machine vibrations to the operator.

6 - Carrying handle (see page 33)

Carrying handle; also used for locating the drilling machine into the CS-SD trolley.

7 - Depth gauge

Depth Gauge; easy to operate using the graduated scale, for adjusting the depth of drilled hole.

8 - MND spindle

MND spindle, for automatically securing drill bits, with a 14 mm diameter shank.

9 - MND1 interchangeable spindle

MND1 interchangeable spindle: Available as an optional accessory. For automatically securing drill bits, with a 16 mm diameter shank.

10 - Safety guard

Safety guard: providing effective, total protection of the drill bit (325 mm). Spring loaded to guarantee the retraction of the drill bit from the sleeper on completion of the drilling operation, thereby minimising operator effort.

11 - Guard nozzle

Interchangeable, Guard Nozzle TPM200-26, for locating into chairs and base plates, as commonly used on existing tracks.

12 - Engine

New engine conforming to "phase 2" of 97/68/CE, 2001/63/CE and 2002/88/CE directives.



WOODEN SLEEPER DRILLING MACHINES

ELECTRIC SD-10E

General features:

- **Engine:** single phase electric motor
- **Supply voltage:** 220/230 V / 50 Hz
- **Power rating:** 1800 W
- **Bit diameter range:** up to Ø 20 mm*
- Drilling up to 25 mm diameter holes can be achieved by using the interchangeable Guard Nozzle TPM.... available as an optional accessory.
- **Max. drilling thickness:** 200 mm
- **Weight:** 18 kg

**Depending on the type of wood it is also possible to drill larger holes*

The SD-10E drilling machine is suitable for use with the CS-SD support trolley.

Also available in 110 V - 50/60 Hz (SD-10E2-110)



PROTECTION AND SAFETY AT WORK OF DRILLING MACHINES

NOISE

Protection of workers against risks of exposure to noise during work.

The Cembre drills, models **SD-9P-ECO** and **SD-10E**, have been designed and constructed according to **EEC directives 80/1107 and 86/188** relating to the protection of workers against risks arising from exposure to chemical, physical and biological agents during work, with particular regard to the risk of exposure to noise.

This has enabled the drilling machines to be manufactured for drilling wooden sleepers at reduced noise levels.

The exposure of workers to noise produced from this equipment depends on the duration of the loading times and the intervals between exposures, and on the number of holes made within one working day.

It is also indicated, by way of example, that for a worker who uses the **SD-9P-ECO** drill properly for making holes of Ø 18 mm with a drill bit on a 16 cm thick wooden sleeper producing up to **80 holes/day**, the daily personal exposure to noise, due solely to the use of the drill is less than **79.6 dB (A)**.

Under these conditions, producing **300 holes/day** the daily exposure to noise is **84.9 dB (A)**.

Similarly, using the **SD-10E** drill, for a worker producing **450 holes/days** on a 15 cm thick wooden sleeper, the daily personal exposure to noise, due solely to the use of the drill, is less than **77.1 dB (A)**. Under these conditions, producing **900 holes/day** the daily exposure to noise is **79.7 dB (A)**.

RISK DUE TO VIBRATION (Directive 2006/42/EC, annexe 1, point 2.2.1.1).

Tests carried out in compliance with **UNI ENV 25349** and **UNI EN 28662 Part 1 Standards** and under operating conditions much more severe than those normally found, certify that **the weighted root mean square in frequency of the acceleration to which the upper limbs are exposed for each biodynamic reference axis is respectively:**

SD-9P-ECO

3,36 m/sec² on the X axis

2,84 m/sec² on the Y axis

3,75 m/sec² on the Z axis

SD-10E

3,72 m/sec² on the X axis

2,35 m/sec² on the Y axis

1,84 m/sec² on the Z axis

WOODEN SLEEPER DRILLING MACHINES

OPTIONAL ACCESSORIES FOR WOODEN SLEEPER DRILLING MACHINES

MND1

Interchangeable spindle: Available as an optional accessory. For automatically securing drill bits, with a 16 mm diameter shank.



MND1

TPM...

Guard Nozzle for the moveable guard, interchangeable with the standard nozzle.

TPM 100-18: for centering on base plates with 18 mm diam. holes, (using a 10 mm diameter max drill bit)

TPM 170-24: for centering on base plates with 24 mm diam. holes, (using a 17 mm diameter max drill bit)

TPM 190-24: for centering on base plates with 24 mm diam. holes, (using a 19 mm diameter max drill bit)

TPM 190-26: for centering on base plates with 26 mm diam. holes, (using a 19 mm diameter max drill bit)

TPM 200-26: for centering on base plates with 26 mm diam. holes, (using a 20 mm diameter max drill bit)

TPM 220-26: for centering on base plates with 26 mm diam. holes, (using a 22 mm diameter max drill bit)

TPM 250-31: for centering on base plates with 31 mm diam. holes, (using a 25 mm diameter max drill bit)



TPM...

VAL P 6

Plastic case for storing the drill bits and standard accessories supplied with the machine. This case can be stored inside the drilling machine case.



VAL P6

VAL SD

Robust steel case for storing the drilling machine and VAL P6 accessory case.



VAL SD

TARPCOVER 026-SD

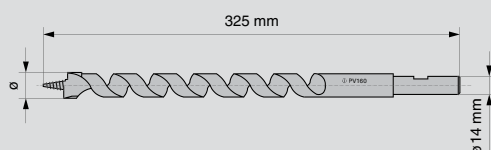
Protection cover manufactured in Polyethylene HDPE and UV resistant. Temperature range: -40°C to +70°C.



TARPCOVER 026-SD

Drill bits having a 14 mm diameter shank suitable for MND standard spindle:

Ref:	Ø mm
PV 140	14
PV 160	16
PV 170	17
PV 180	18
PV 190 (3/4")	19,05
PV 200	20
PV 210	21
PV 220	22
PV 250	25



APPLICATIONS OF WOODEN SLEEPER DRILLING MACHINES

Two stroke petrol engine machine, purpose built for use with the support trolley CS-SD



Easily combined with Support Trolley CS-SD



Example of use on **double crossovers**.

This new, patented unit has been designed and developed by Cembre, to provide **optimum safety**, both when using the drilling machine independently and with the machine fitted onto the trolley.

Compact and lightweight, the unit can be positioned and operated by a single person.



The **SD-9P-ECO** unit enables vertical holes to be drilled quickly and efficiently. If required, the angle of the Spindle Axis can be adjusted up to 5°. The unit can **quickly and easily** be removed from the track.



The unit is easily assembled and can **comfortably be carried** by a single operator.

PANDROL "E CLIP" MACHINE

conforming to
EN13977
conforming to

POWERED by
HONDA

PCM-2P for Pandrol E clips

Particularly suited to rail adjustment work, for instance on in-progress rail sections or track renewal, the PCM-2P machine is also generally applicable in maintenance operations.



Performance

Simple to use with simultaneous insertion or extraction of both clips by two independent clamps, promoting operator confidence and rapid progress.



Braking system

PCM-2P meets the requirements of EN13977.



Lighting

Equipped with spot lights oriented to the working areas.



Operation

PCM-2P is designed for single-man working.



Rail under construction

Undesirable movement of sleepers, where ballast is not yet in situ, is avoided due to the reciprocal independence of the clamps, enabling work to be carried out during rail setting.

Insertion

At the end of each insertion operation, an easily adjustable limit switch ensures clips are not over stressed.



Extraction

Removed clips are kept close by the machine, not dangerously ejected, ensuring a high level of operator safety.

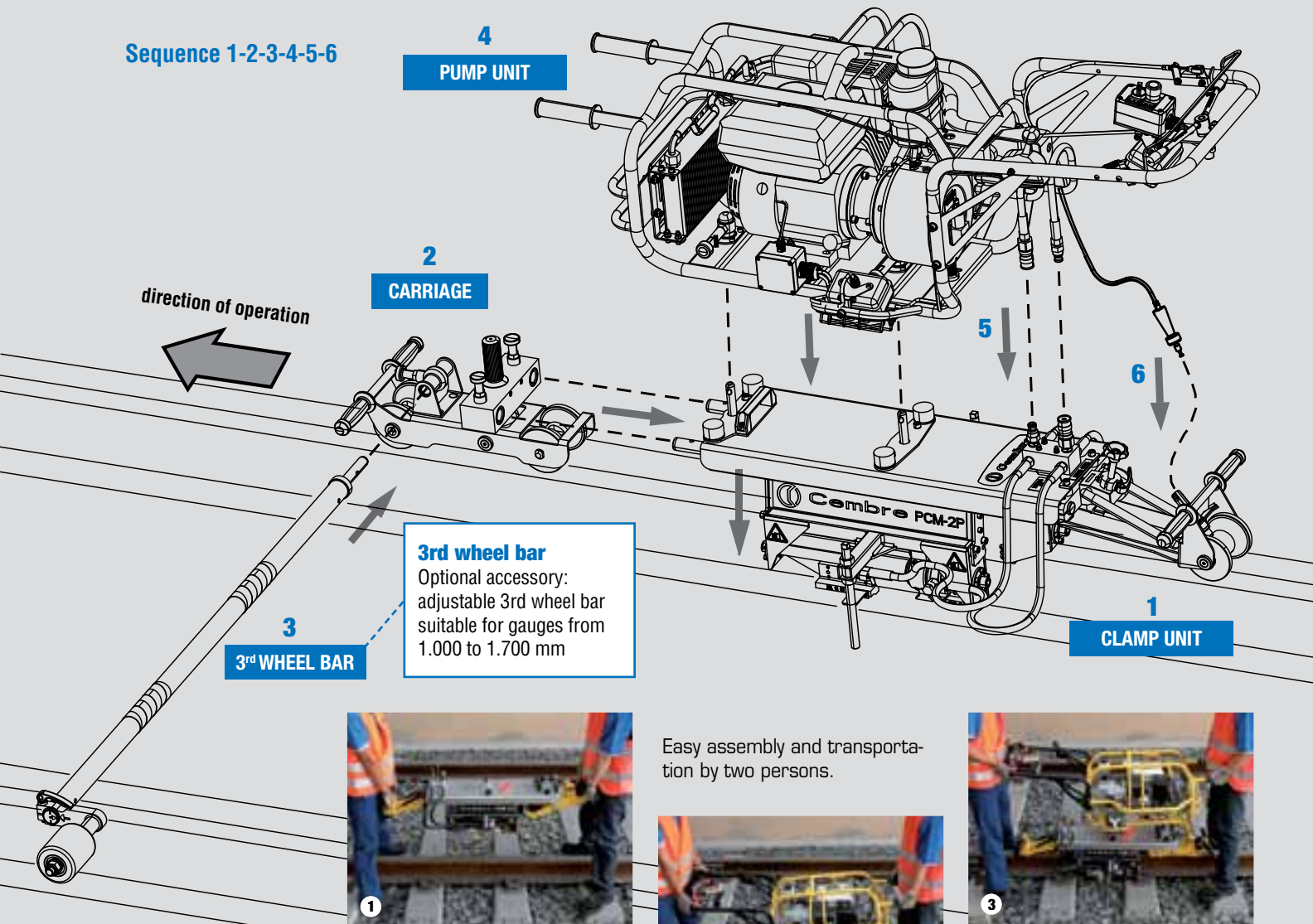


GENERAL FEATURES

- The PCM-2P machine from Cembre is suitable for the insertion and extraction Pandrol E clips used with 75mm bases on standard European gauge sleepers (1435 mm).
 - The unit is immediately ready to use requiring no assembly or disassembly of accessories.
 - Particularly suited to rail adjustment work, for instance on in-progress rail sections or track renewal, the PCM-2P machine is also generally applicable in maintenance operations.
 - Ballast on sleepers does not unduly affect the machine, as the clamps do not rest on them.
 - The pump unit is the same as that used on Pandrol Fast clip machine, incorporating a sturdy and powerful 4-stroke engine,
- Honda or equivalent, with noise levels according to CARB-EPA standards.
- Does not interfere with rail circuits due to the three insulated wheels and is also equipped with an appropriate mechanical joint to allow running without interference on the rail to reach the working area.
 - Weight: Pump unit 49 kg, Clamp unit 48 kg, Carriage 9 kg, 3rd wheel bar 5 kg.
 - The self-braking system is quick & easy to connect and intervenes automatically when the operator releases the handle of the machine.

ASSEMBLY SEQUENCE PCM-2P

Sequence 1-2-3-4-5-6



Easy assembly and transportation by two persons.

PANDROL "FAST CLIP" MACHINE

conforming to
EN13977
conforming to

for Pandrol Fast clips

The Pandrol Fast clips machine from Cembre is suitable for the insertion and extraction of Pandrol Fast clips used with all 1435 mm gauge standard rails mounted on monoblock or biblock concrete sleepers.



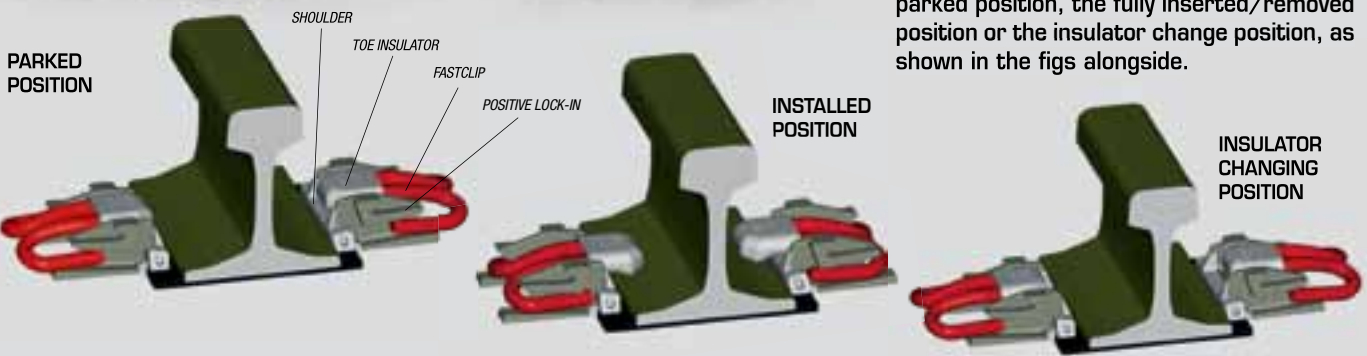
POWERED by
HONDA

Braking system

Pandrol Fast clips meets the requirements of EN13977.

Approved SNCF
DPI 11004

This Pandrol Fast clips version is also equipped with a rapid and easy to use fine adjustment system allowing the Fast clip to be positioned in either the pre-assembled parked position, the fully inserted/removed position or the insulator change position, as shown in the figs alongside.



GENERAL FEATURES

- The pump unit is the same as that used on the Pandrol E clip machine PCM-2P (see page 34), consequently owners need purchase only the CU-PCM2PFC/E braked clamp unit.
- Easy disassembly allowing operators to work safely on uneven ground.
- The unit is immediately ready to use requiring no assembly or disassembly of accessories.
- Rapid performance with a high degree of simplicity of use requiring only one operator.
- Simultaneous insertion or extraction of two clips by two independent clamps.
- Fast clips located on one side of the rail may be inserted or extracted when there are no clip on the opposite side.
- The pump unit is the same as that used on the E clip machine, incorporating a sturdy and powerful 4-stroke engine, Honda or equivalent, with noise levels according to CARB-EPA standards.
- Does not interfere with rail circuits due to the three insulated wheels and is also equipped with an appropriate mechanical joint to allow running without interference on the rail to reach the working area.
- Equipped with spot lights oriented to the working areas.
- Weight: Pump unit 48 kg, Clamp unit 66 kg, Carriage 9 kg, 3rd wheel bar 5 kg.
- The self-braking system is quick & easy to connect and intervenes automatically when the operator releases the handle of the machine.

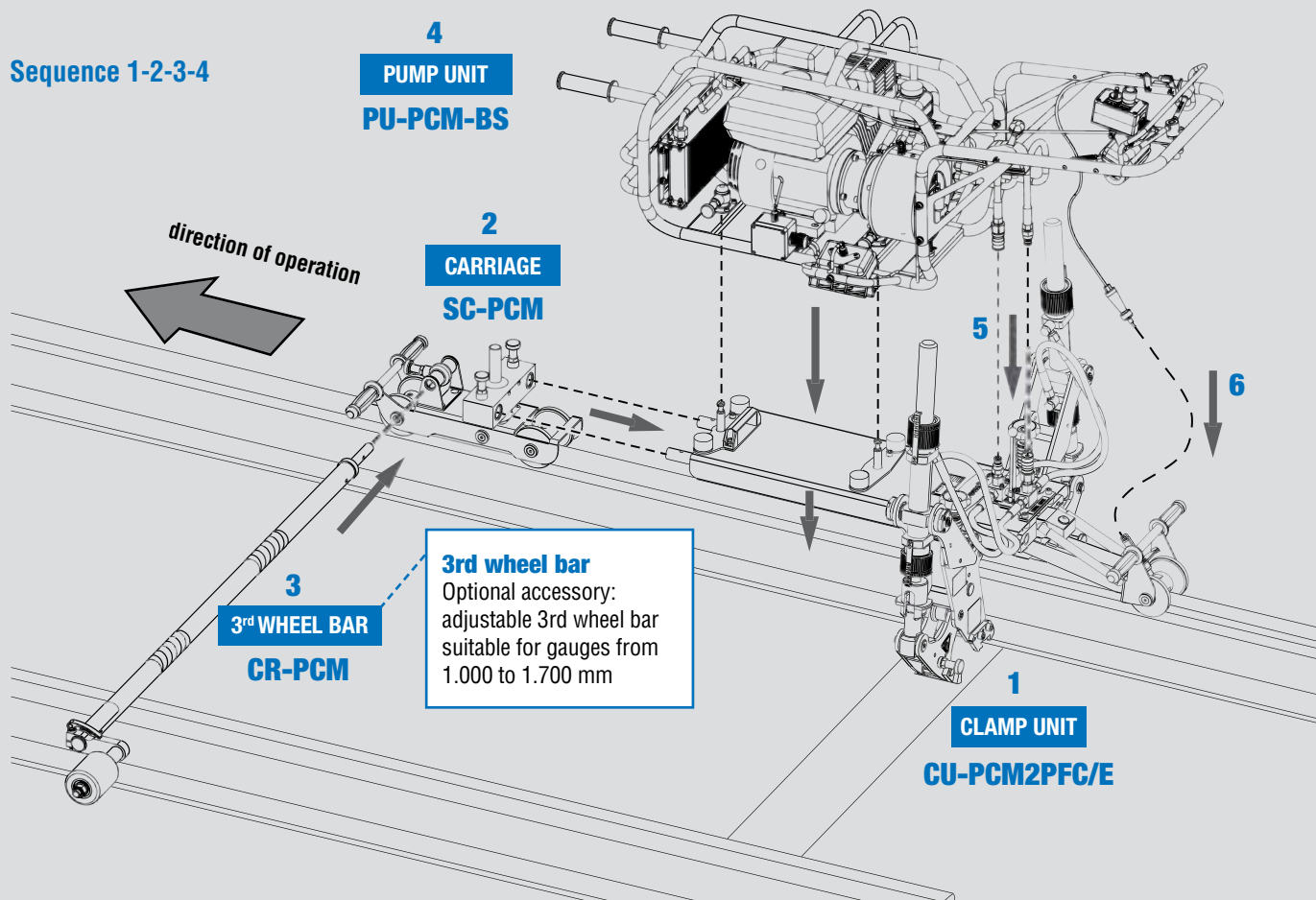


Extraction and insertion of Pandrol "Fast clips".

PANDROL "FAST CLIP" MACHINE

ASSEMBLY SEQUENCE

Sequence 1-2-3-4



OPTIONAL ACCESSORIES FOR PANDROL CLIP MACHINES

Tarpcover 019-PCM

Robust UV resistant cover for PCM machines.
Temperature range: -40°C to +70°C.



MPC 6

Manometer for checking the operation of the maximum
pressure value in the hydraulic circuit.



CONNECTING JOINTS FOR PROFILED CONTACT WIRES

The joint allows connection between new or new and worn contact wires without any tapering operation, assuring a uniform and continuous sliding area of the pantograph; the use of these joints also reduces intervention times to a minimum. In addition to the laboratory tests, on line tests have shown that the joint operates satisfactorily on 180km/h lines and on lower speed lines but with strong current absorption (gradients).



CONNECTING JOINT TYPE	TORQUE RATIO Nm	GROOVED CONTACT WIRE		
		Section (mm²)	Ø (mm)	REFERENCE STANDARD
FTGW 100	65	100	12,0	EN 50149 (Type AC-120 or Cu and CuAg 0,1)
FTGW 120		120	12,9	
FTGW 150		150	14,5	

The jointing process can be improved and made quicker by the perpendicular cutting of the contact wire ends to be joined using the appropriate tool:

HYDRAULIC CUTTING HEAD RH-TFC

Contact wire cut with a traditional cutter

Contact wire cut with the RH-TFC hydraulic head

Hydraulic RH-TFC head with interchangeable dies to perform a perfectly perpendicular cut without deformation of the wire shape (see page 39 for the selection of the available tools).



DIE SETS

A wide range of dies is available to cut most profiled contact wires or stranded conductors.



Hydraulic cutting head for cutting profiled contact wires and copper and aluminium ropes. Interchangeable dies cut perpendicularly and without deformation to optimise joint installation.

The use of this head simplifies the cutting operation and reduces the time needed to prepare the joint.

For use with any of the following 700 bar hydraulic pumps:

HTP, manually operated

PO-7000, foot operated

B70M-P24A portable electro-hydraulic 24V DC motor driven, powered by internal battery or external supply.

Contact us for further information



MFC cutting die sets available		
Contact Wire Type	Fig.	Cutting Dies
AC80-EN50149	A	MFC-AC80
AC100-EN50149	A	MFC-AC100
AC107-EN50149	A	MFC-AC107
AC120-EN50149	A	MFC-AC120
BC107-EN50149	A	MFC-BC107
BC120-EN50149	A	MFC-BC120
BC150-EN50149	A	MFC-BC150
BF100-EN50149	A	MFC-BF100
BF107-EN50149	A	MFC-BF107
BF120-EN50149	A	MFC-BF120
BF150-EN50149	A	MFC-BF150
137-BS23	A	MFC-137BS
161-BS23	A	MFC-161BS
193-BS23	A	MFC-193BS
FD100-0BB	A	MFC-FD100
FD120-0BB	A	MFC-FD120
Cu/Steel conductor	B	MFC-D7.5-S
Cu or Al Round rod Ø 10.8	B	MFC-D10.8
Cu or Al Round rod Ø 14.5	B	MFC-D14.5
Cu or Al Round rod Ø 16.1	B	MFC-D16.1

HYDRAULIC CUTTING TOOLS TYPE RH-TFC, HT-TFC, B-TFC2 FOR PROFILED CONTACT WIRES



RH-TFC

Hydraulic presshead complete with quick automatic coupler for connection to a hydraulic pump with a max working pressure of 700 bar. Suitable for cutting profiled contact wires on electrified traction systems.

Max operating pressure:	600-700 bar
Dimensions:	
length	196 mm
width (locking handle closed)	159 mm
width (locking handle open)	257 mm
Weight	3,1 kg

VAL P15

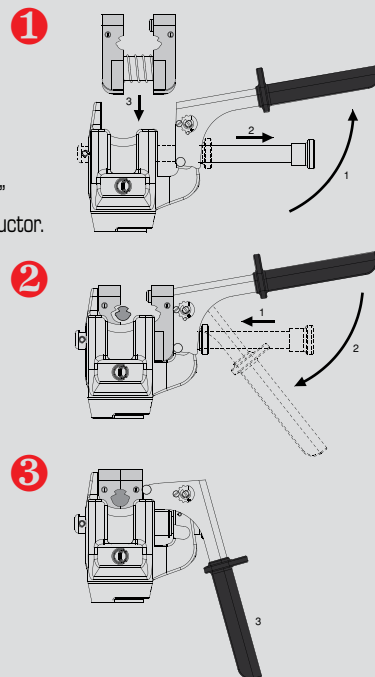
Supplied in a sturdy plastic case VAL P15 suitable for storage of the head and 4 sets of dies.

- Dimensions 315 x 300 x 95 mm - weight 0,93 kg



Simple 3 stage operation

- 1 Insert the die set into the head.
- 2 Position the conductor inside the die set so that the blade lines up with the desired cutting point; close the die set by moving the locking handle towards the tool body, until automatically "locked" in position and securely clamping the wire/conductor.
- 3 Operate the pump to advance the blade to the conductor; the blade progressively advances until the conductor is completely cut in a clean and precise manner without deforming the conductor itself.



HT-TFC

This two speed lightweight and compact, hydraulic tool is ideal for cutting profiled contact wires on electrified traction systems. Having the benefit of spring loaded handles, the dies can be advanced using only one hand. For ease of operation and comfort of the operator, the tool head can be rotated through 180 degrees. The built-in safety valve will by-pass the oil supply when the maximum pressure is reached, while the pressure release system can easily be operated at any stage of the compression.

Dimensions:	
length	373 mm
width (locking handle closed)	159 mm
width (locking handle open)	257 mm
Weight	3,6 kg



B-TFC2

The **B-TFC2** is a cordless tool that can be operated with one hand. Suitable for cutting profiled contact wires, on electrified traction systems.

- Double speed action tool
- Li-Ion Battery; 14.4V - 3.0Ah
- Balanced tool for greater control
- Head rotates for ease of operation in confined spaces
- Automatic indication of residual battery power after every operation.
- The tool is fitted with a maximum pressure valve to indicate the full extent of the blade travel
- Extremely quiet in operation with very little vibration
- Durable moulded body offering high resistance to wear and damage in all operating conditions
- The plastic carrying case can accommodate the tool and accessories



14.4V
3.0Ah
Li-Ion

Dimensions:	
length	293 mm
width (locking handle included)	99 mm
width (locking handle included)	352 mm
Weight (including battery)	5 kg

VAL P12

Supplied in a sturdy plastic case VAL P12 suitable for storage of the tool and 3 sets of dies.

- Dimensions 496 x 370 x 137 mm - weight 2,7 kg



Optional accessories:

BPS 230.14, network power supply (230V~50-60Hz).

CFC 12-24ICN, 12V car battery charger



BPS 230.14

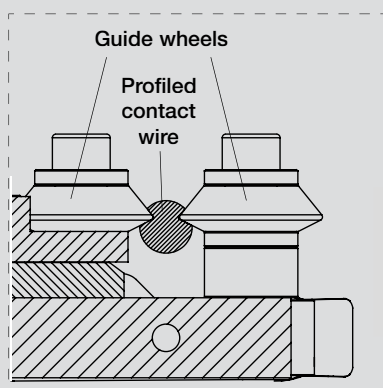
CFC 12-24ICN

PROFIED CONTACT WIRE ALIGNMENT DEVICE FOR USE DURING THE INSTALLATION OF CONNECTING JOINTS

AD-GW

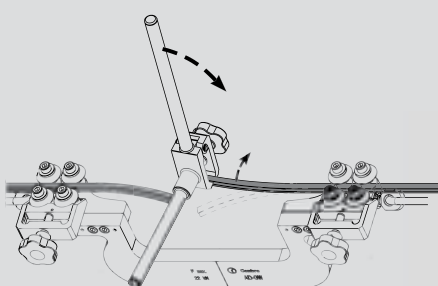
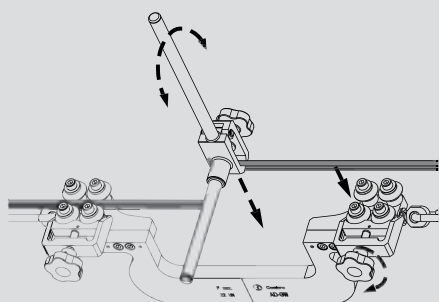
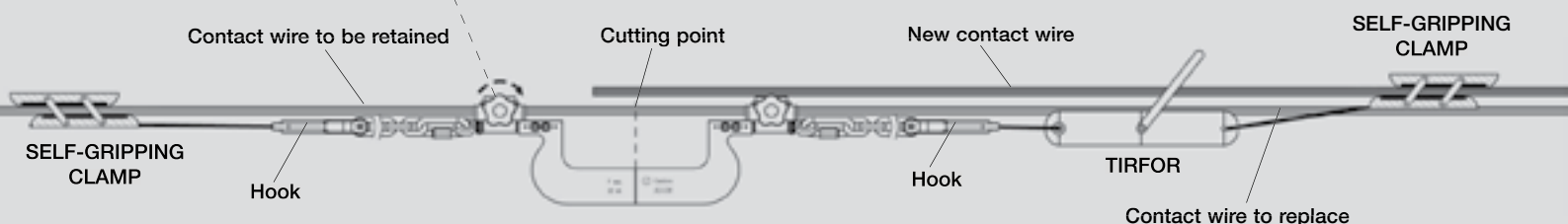
This device is designed to facilitate accurate, repeatable and secure operations when aligning two profiled contact wires during the installation of connecting joints. Included with **AD-GW** is the **HC-GW** device designed to simplify radial and lateral adjustment of the contact wire to ensure rapid processing.

AD-GW is equipped with hooks for easy attachment to self-gripping clamps and a Tirfor type mechanical ratchet block commonly used for tensioning contact wire in jointing operations.



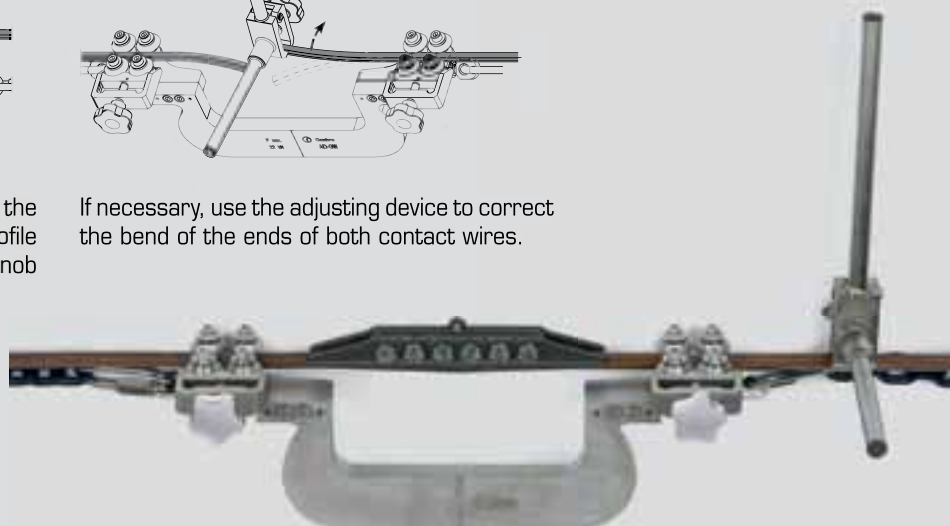
AD-GWL

suitable to install long type contact wire joints having a maximum length of 375 mm. The maximum tension weight admitted is 22 kN.



Using the **HC-GW** adjusting device, align the grooves of the new contact wire into the profile of the guide wheels then tighten the **AD-GW** knob (on the Tirfor side).

If necessary, use the adjusting device to correct the bend of the ends of both contact wires.



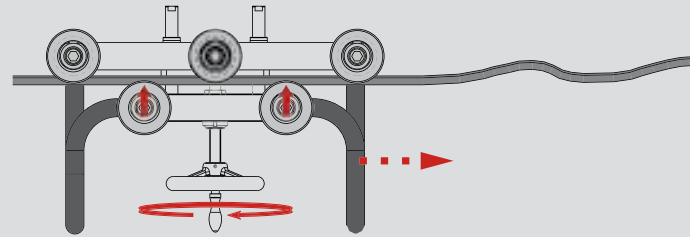
MECHANICAL STRAIGHTENING DEVICE FOR PROFILED CONTACT WIRES

MSGW

The mechanical straightening device for profiled contact wires allows the easy and continuous straightening of the most common sizes of wires for example: 100 - 120 - 150 mm².

MSGW-E1

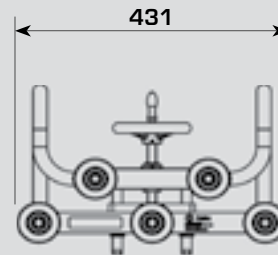
For trolley wire 185 mm² and larger



General features:

- Dimensions mm:

- Weight: 6,8 kg



STRAIGHTENING DIE SETS FOR PROFILED CONTACT WIRES



Straightening die sets to be used with ECW-H3D hydraulic head

By a combination of the calibrated profile of these dies and the high compression force of the press head, good results in correcting localised mis-shaping of the wire may be obtained, with only one operation.

The head can be connected to a hydraulic pump with a working pressure of 700 bar max (see page 54).



MSGW straightening die sets available

CONDUCTOR SIZE	Contact Wire Type	Straightening Dies
100 mm ²	AC100-EN50149	MSGW 100-3D
120 mm ²	AC120-EN50149	MSGW 120-3D
150 mm ²	BC150-EN50149	MSGW BC150-3D
150 mm ²	BF150-EN50149	MSGW BF150-3D
110 - 4/O AWG	110CN - 4/O	MSGW 110CN-4/O-3D
120 mm ²	120CN	MSGW 120CN-3D
2/O AWG	2/O AWG ASTM B47-95A	MSGW 2/OAWG-3D
335 MCM	335MCM ASTM B9-90	MSGW 335MCM-3D
350 MCM	350MCM ASTM B9-90	MSGW 350MCM-3D

HYDRAULIC SYSTEMS FOR RAIL WEB ELECTRICAL CONNECTIONS AR...., TYPE

HTEP

System consisting of:

- Hydraulic tool type **HTEP-S**, manually operated.
Head connected to the pumping body through a flexible pipe 900 mm long
- 2 units of plungers **OG 13.2** type in special steel
- type **CAL 19.20** gauge for both check of the rail hole and for screwing of the plunger into the **HTEP-S** tool
- metal case type **VAL HTEP**.

Dimensions:

Pump body:	length	275 mm
	width	130 mm
Head:	length	106 mm
Total weight:		3 kg



RHTEP

System consisting of:

- Hydraulic head type **RHTEP-S** to be connected to a pump developing a nominal pressure of 700 bar
- 2 units of plungers **OG 13.2** type in special steel
- type **CAL 19.20** gauge for both check of the rail hole and for screwing of the plungers itself into the head
- metal case type **VAL RHTEP**

Dimensions:

length:	106 mm
weight:	3 kg



Available upon request:

OG 13.2 T

Plungers OG13.2T composed of 2 separate items: insert and stem. To rapidly execute subsequent extrusion operations, it is sufficient to unscrew the insert, leaving the stem firmly screwed onto the head.



BTEPD2

System composed by:

- Hydraulic portable battery tool with the head directly connected to the body through a 900 mm flexible hose.
- N° 2 calibrated plungers type **OG 13.2** made of special steel
- **CAL 19.20** gauge to use both for checking rail drills and screwing the calibrated plunger to the head.
- Spare battery
- Battery charger
- Wrist strap and shoulder strap
- Canvas bag.



14.4V
3.0Ah
Li-Ion



KIT AR 67 INST

Including:

- **CAL 8.85** Gauge
- **M9 M5** Adapter
- **OG 6.5** Plunger

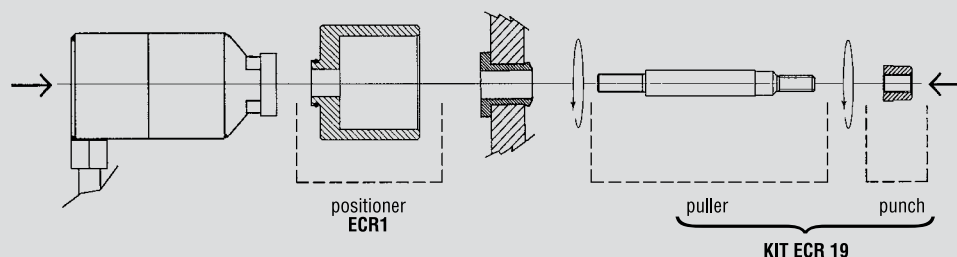
For the installation of the electrical contact AR 67 type



EXTRACTOR TO REMOVE BUSHES AR 60-1 FROM THE RAILS

ECR 19 + ECR 1 Kits

In order to remove **AR60D** bushes from the rail, available as an optional accessory the **ECR 19** kit (punch + puller) with positioner **ECR-1**. For use please refer to the following picture



HYDRAULIC NUT SPLITTING HEADS

SINGLE BLADE HEADS

- Requires connection to a pump developing 700 bar pressure
- Lightweight and compact, designed for ease of operation, for a variety of applications.
- The blade can easily be replaced

RHTD 3241

Application field:	
suitable for splitting nuts from	32 mm (M 22)
to	41 mm (M 27) hexagon
Working pressure:	700 bar
Weight:	4,6 kg



VAL P4

Supplied in a sturdy plastic case suitable for storing the tool and accessories

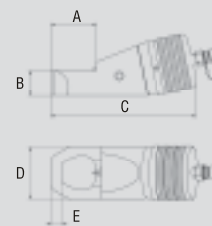


RHTD 1724

Application field:	
suitable for splitting nuts from	17 mm (M 12)
to	24 mm (M 16) hexagon
Working pressure:	700 bar
Weight:	1,76 kg



DIMENSIONS mm :



	RHTD 3241	RHTD 1724
A	66	40.5
B	36	25
C	208	150.5
D	75.5	54
E	16	7.5

DOUBLE BLADE HEAD & BATTERY OPERATED UNIT

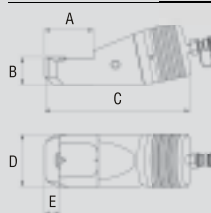
- Requires connection to a pump developing 700 bar pressure.
- Lightweight and handy; its shape and dimensions have been designed for the best comfort of operation in a variety of applications.
- The blades can be easily replaced in case of damage.
- Supplied in a sturdy plastic case suitable for storing the tool and accessories.



14.4V
3.0Ah
Li-Ion



DIMENSIONS mm :



	RHTD 3241T
A	77
B	41
C	222
D	75.5
E	21.5

RHTD 3241T

Application field:
Suitable for splitting square and hexagonal nuts or fastening bushes as indicated in the table below

Working pressure:	700 bar
Weight:	4,9 kg

B-TD3241T

14.4 V battery operated hydraulic tool suitable for splitting fastening bushes, hexagonal and square nuts as per RHTD 3241T.

TOOL SETTING

DOUBLE BLADE (MOVING BLADE AND FIXED BLADE MARKED "B")						SINGLE BLADE (MOVING BLADE MARKED "B" - BLIND PLATE MARKED "C")			
HEXAGONAL NUTS		SQUARE NUTS		FASTENING BUSHES		HEXAGONAL NUTS		SQUARE NUTS	
27	M 18	27	M 18	1/2"	0.807"	32	M 22	32	M 22
30	M 20	30	M 20	5/8"	1.010"	34	M 22	36	M 24
32	M 22	32	M 22	3/4"	1.200"	36	M 24	41	M 27
34	M 22	36	M 24	7/8"	1.375"	41	M 27		
36	M 24	41	M 27	1"	1.575"				
41	M 27			1 1/8"	1.770"				

* Blades for cutting FASTENING BUSHES are specially shaped

HYDRAULIC CRIMPING TOOLS

HT 51

This two speed lightweight and compact, hydraulic tool is ideal for working in confined spaces. Having the benefit of spring loaded handles, the dies can be advanced using only one hand, leaving the other hand free to position the connector.

For ease of operation and comfort of the operator, the tool head can be rotated through 180 degrees.

The **HT51** will accept dies common to Cembre 50 kN tools.

The built-in safety valve will by-pass the oil supply when the maximum pressure is reached, while the pressure release system can easily be operated at any stage of the compression.

Crimping force:	50 kN
Dimensions:	
length	373 mm
width	130 mm
Weight:	2,6 kg
Application range:	6-240 mm ²

VAL P1

The tool is supplied in a sturdy plastic case type **VAL P1**. Also suitable for storing 20 die sets.

Dies not included, sold separately

HT 51-KV

version also available for Power Supply Companies

B 51

14.4 V cordless hydraulic crimping tool, lightweight and balanced for single hand operation

- **Double speed action tool**
- **Li-Ion Battery; 14.4V - 3.0Ah**
- The crimping head can rotate through 180° for ease of operation
- The **B 51** will accept die sets common to the Cembre 50 kN tooling range
- Fitted with a maximum hydraulic pressure valve
- Automatic indication of residual battery power after every operation
- Extremely quiet in operation, with very little vibration
- Ergonomically designed with a sculptured body for operator comfort

Crimping force:	50 kN
Dimensions:	
length	297 mm
height	302 mm
width	94 mm
Weight with battery:	3,7 kg
Application range:	6-240 mm ²

Dies not included, sold separately

VAL P5

The tool is supplied in a sturdy plastic case type **VAL P5**. Also suitable for storing 21 die sets.

Spare battery, battery charger and shoulder strap are also included.

Optional accessories:

BPS 230.14, network power supply (230V~50-60Hz).

CFC 12-24ICN, 12V car battery charger



BPS 230.14

CFC 12-24ICN



**14.4V
3.0Ah
Li-Ion**



B 51-KV

version also available for Power Supply Companies



HYDRAULIC CRIMPING TOOLS

HT 61

The **HT 61** is a two speed hydraulic hand compression tool developing a crimping force of 60 kN, suitable for installing crimp type electrical connectors on copper cables up to 240 mm². The built in safety valve will by-pass the oil supply when the maximum pressure of 600 bar is reached and a pressure releasing system can be easily operated at any stage of the compression. For ease of operation and comfort of the operator the tool head can be fully rotated through 180° degrees. Three different dies are available depending upon the desired style of crimping; it is also possible to use dies from other manufacturers type Gr.1. For the full range of dies available please refer to **Cembre**.

Crimping force:	60 kN
Dimensions:	
length	489 mm
width	141 mm
Weight:	4,0 kg
Application range:	6-240 mm ²



VAL P7

The tool is supplied in a sturdy plastic case type **VALP7** complete with die spaces for holding up to 3 plastic boxes with dies.

B 62

The **B 62** is a two speed hydraulic cordless tooling that can be operated with one hand. Main features are the following:

- **Double speed action tool.**
- **Li-Ion Battery; 14.4V - 3.0Ah.**
- balanced tool for greater control
- head rotates for ease of operation in confined spaces
- battery condition displayed after every crimping operation to show the residual battery power
- the tool is fitted with a maximum pressure valve to ensure correct crimping operation on the **B 62**
- extremely quiet in operation with very little vibration
- durable moulded body offering high resistance to wear and damage in all operating conditions
- the plastic carrying case can accommodate the tool and the accessories
- the **B 62** will accept die sets common to the Cembre 60 kN tooling range
- it is also possible to use dies from other manufacturers type Gr. 1.

Crimping force:	60 kN
Dimensions:	
length	333 mm
height	302 mm
width	94 mm
Weight with battery:	4,2 kg
Application range:	6-240 mm ²



14.4V
3.0Ah
Li-Ion



NEW
Li-Ion
BATTERY



VAL P9

The tool is supplied in a sturdy plastic case type **VALP9**. Also suitable for storing die sets. Spare battery, battery charger and shoulder strap are also included.



BPS 230.14

CFC 12-241CN

Available upon request:
BPS 230.14, network power supply (230V~50-60Hz).
CFC 12-241CN, 12V car battery charger

HYDRAULIC CRIMPING TOOLS

HT 120

This lightweight and self contained tool will accept the semi-circular slotted dies common to most 130 kN tools.

It is particularly suitable for installing crimp type electrical connectors for overhead line applications.

The tool features a double speed action: a fast advancing speed for rapid approach of the dies to the connector and a slower more powerful speed for crimping.

For ease of operation and comfort of the operator, the tool head can be fully rotated through 180 degrees.

The built-in safety valve will by-pass the oil supply when the maximum pressure is reached, while the pressure release system can easily be operated at any stage of the compression.

Crimping force:	120 kN
Dimensions:	
length	488 mm
width	138 mm
Weight:	5,7 kg
Application range:	10-400 mm ²

VAL P3

The tool is supplied in a sturdy plastic case, VAL P3. Also suitable for storing 14 die sets.

Dies not included, sold separately



HT 131-C

This new model, self contained, robust and sturdy, will accept all semi-circular slotted dies common to most 130 kN tools.

The tool features a double speed action: a fast advancing speed for rapid approach of the dies to the connector and a slower more powerful speed for crimping.

For ease of operation and comfort of the operator, the tool head can be fully rotated through 180 degrees.

The built-in safety valve will by-pass the oil supply when the maximum pressure is reached, while the pressure release system can easily be operated at any stage of the compression.

Crimping force:	130 kN
Dimensions:	
length	473 mm
width	144 mm
Weight:	5,5 kg
Application range:	10-400 mm ²

VAL P3

The tool is supplied in a sturdy plastic case, VAL P3. Also suitable for storing 14 die sets.

Dies not included, sold separately



HT 120-KV

version also available for Power Supply Companies



HYDRAULIC CRIMPING TOOLS

B 135-C

14.4 V cordless hydraulic crimping tool, lightweight and balanced for single hand operation.

- Double speed action tool
- Li-Ion Battery; 14.4V - 3.0Ah
- The crimping head can rotate through 180° for ease of operation.
- The B 135-C will accept all semicircular slotted dies common to most 130 kN tools
- Fitted with a maximum hydraulic pressure valve
- Automatic indication of residual battery power after every operation
- Extremely quiet in operation, with very little vibration
- Ergonomically designed with a sculptured body for operator comfort

Crimping force:	130 kN
Dimensions:	
length	361 mm
width	94 mm
height	302 mm
Weight with battery:	6,35 kg
Application range:	10-400 mm ²

Dies not included, sold separately



14.4V
3.0Ah
Li-Ion



NEW
Li-Ion
BATTERY



VAL P9-C

The tool is supplied in a sturdy plastic case, VAL P9-C. Also suitable for storing 8 sets of semi-circular slotted dies.

Available upon request:
BPS 230.14, network power supply (230V~50-60Hz).
CFC 12-24ICN, 12V car battery charger



B 135-C-KV

version also available for Power Supply Companies

B 131-C

14.4 V cordless hydraulic crimping tool,

- Double speed action tool
- Li-Ion Battery; 14.4V - 3.0Ah
- The B 131-C will accept all semicircular slotted dies common to most 130 kN tools
- A balanced tool for optimum control
- Quiet in operation with very little vibration
- Lightweight construction enables the operator to hold the tool in one hand and to position the connector with the other hand
- The operating buttons, crimp/release, are mechanically interlocked, to prevent accidental operation of the tool
- A microprocessor controls the tool operation and automatically cuts out the motor on completion of the crimping operation, saving energy and extending battery life.
- Automatic indication of residual battery power after every operation
- Fitted with an integral socket, for connection to a 12 V DC external power supply/vehicle battery

Crimping force:	130 kN
Dimensions:	
length	420 mm
width	100 mm
height	250 mm
Weight with battery:	7,1 kg
Application range:	10-400 mm ²



Dies not included, sold separately



14.4V
3.0Ah
Li-Ion



NEW
Li-Ion
BATTERY



B 131-C-KV

version also available for Power Supply Companies

VAL P19

The tool is supplied in a sturdy plastic case type VAL P19 suitable for storing:

- Basic tool complete with battery and shoulder strap
- Spare battery
- Battery charger
- 14 sets of semi-circular slotted dies

CFC 12-24ICN



BPS 230.14

ESC600

Optional accessories:

BPS 230.14, network power supply (230V~50-60Hz).

CFC 12-24ICN, 12V car battery charger
ESC600, cable for connection to a 12V DC external power supply/vehicle battery length 6 m.

HYDRAULIC PRESSHEADS

RH 50

Hydraulic presshead complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar.

RH 50 will accept die sets common to Cembre 50 kN tools.

RH 50 is suitable for installing the same range of connectors as HT 51 and B 51.

Crimping force:	50 kN
Max operating pressure:	700 bar
Dimensions:	
length	196 mm
width	75 mm
Weight:	1,6 kg
Application range:	6-240 mm ²



Dies not included,
sold separately



VAL P1

The tool is supplied in a sturdy plastic case type **VALP1**.
Also suitable for storing 20 die sets.

RH 61

A hydraulic presshead complete with a quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar.

The **RH 61** head develops a crimping force of 60kN and is suitable for installing crimp type electrical connectors on copper cables up to 240 mm².

The **RH 61** head uses the same dies as HT 61.

For the full range of dies available please contact Cembre.

It is also possible to use dies from other manufacturers type Gr. 1.

Crimping force:	60 kN
Max operating pressure:	700 bar
Dimensions:	
length	245 mm
width	90,5 mm
Weight:	2,75 kg
Application range:	6-240 mm ²



Dies not included,
sold separately



VAL RH60

The tool is supplied in a metal case type **VAL RH60**.
Also suitable for storing 14 die sets.

RHC 131

Hydraulic presshead complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar.

This new design with improved mechanical features, is suitable for installing the same range of connectors as HT131-C, B135-C and B131-C.

This model accept all semicircular slotted dies, common to Cembre 130 kN tools.

Crimping force:	130 kN
Max operating pressure:	700 bar
Dimensions:	
length	232 mm
width	124 mm
Weight:	3,8
Application range:	10-400 mm ²



Dies not included,
sold separately



VAL P26

The tool is supplied in a sturdy plastic case type **VAL P26**.
Also suitable for storing 14 die sets.

HYDRAULIC PRESSHEADS

ECW-H3D

Hydraulic presshead complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar. Adaptor type **AU230-130D** is available as an optional extra, enabling the head to utilise the semi-circular slotted dies which are common to most 130 kN tools.

Also available is a series of dies for the compression of DIN electrical connectors, and a die for cutting copper, aluminum, aldreyl, aluminum-steel and steel conductors.

Crimping force:	230 kN
Max operating pressure:	700 bar
Dimensions:	
length	290 mm
width	120 mm
Weight:	5,5 kg
Application range:	10-630 mm ²



Dies not included,
sold separately



VAL ECW-H3D

The tool is supplied in a metal transportation case type **VAL ECW-H3D**. Also suitable for storing 10 die sets.

RHU 240-3D-850

Hydraulic Presshead complete with quick coupler for connection to hydraulic pump with a max operating pressure of 850 bar.

Application range from 10 up to 630 mm²

The adapter **AU 240-130D** is available as an optional extra enabling the head to utilise the semi-circular slotted dies common to most 130 kN tools.

Also available is a series of dies for the compression of DIN electrical connectors.

It's possible to use dies from the Grösse III.

Crimping force:	240 kN
Max operating pressure:	850 bar
Dimensions:	
length	283 mm
width	129 mm
Weight	5,5 kg
Application range:	10-630 mm ²



Dies not included,
sold separately



VAL 240-3D

The tool is supplied in a metal transportation case type **VAL 240-3D**. Also suitable for storing 10 die sets.

**To be used on 850 bar pump only
(P08500 or B85M-P24)**

HYDRAULIC CABLE CUTTERS

HT-TC026

Two speed hand operated hydraulic tool specifically designed to cut copper, aldrej, aluminum, aluminium-steel cables and steel ropes, aluminium and steel rods having a max overall diameter of 25 mm. The blades are manufactured from high strength special steel, heat treated to ensure a long service life. The head can rotate by 180 degrees to enable the operator to work in the most comfortable position, and can easily be opened to allow the cutting of running cables. **HT-TC026** features an automatic safety valve to bypass oil when reaching maximum pressure; a pressure release device can also be operated at any stage of operation.

Max cutting diameter: 25 mm

Dimensions:

length 382

width 129

Weight: 3,2 kg



TC 025

Hydraulic cutting head complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar. **TC 025** has the same cutting capability as HT-TC026 and B-TC026.

Max cutting diameter: 25 mm

Max operating pressure: 700 bar

Dimensions:

length 213 mm

width 82 mm

Weight: 2,0 kg



B-TC026

The **B-TC026** is a cordless tool that can be operated with one hand, specifically designed to cut copper, aldrej, aluminum, aluminium-steel cables and steel ropes, aluminium and steel rods having a max overall diameter of 25 mm.

- **Double speed action tool**
- **Li-Ion Battery; 14.4V - 3.0Ah**
- Balanced tool for greater control
- Head rotates for ease of operation in confined spaces.
- Automatic indication of residual battery power after every operation
- The tool is fitted with a maximum pressure valve to indicate the full extent of the blade travel
- Extremely quiet in operation with very little vibration
- Durable moulded body offering high resistance to wear and damage in all operating conditions
- The plastic carrying case can accommodate the tool and accessories

Max cutting diameter: 25 mm

Dimensions:

length 295 mm

width 94 mm

height 302 mm

Weight with battery: 4 kg



VAL P9

The tool is supplied in a plastic case type **VAL P9**. Spare battery, battery charger and shoulder strap are also included.



CUTTING CAPACITY			
	MATERIAL	TENSILE STRENGTH (daN/mm²)	MAX CUTTING DIAMETER (mm)
			HT-TC 026 TC 025 B-TC026
ROPE & CONDUCTORS	COPPER	≤ 41	25
	ALUMINIUM	≤ 20	25
	ALMELEC	≤ 34	25
	STEEL	≤ 180	INDICATIVE EXAMPLES: 7 x 3,0 : Ø est. = 9,0 mm 19 x 2,1 : Ø est. = 10,5 mm 19 x 2,3 : Ø est. = 11,5 mm
	MULTI STRANDS STEEL (STRANDS Qty ≥ 200)	≤ 180	18
	ACSR	≤ 180	25
RODS	STEEL	≤ 60	13
		≤ 42	16
	COPPER	≤ 30	20
		≤ 25	23
	ALUMINIUM	≤ 16	25



**14.4V
3.0Ah
Li-Ion**



Optional accessories:
BPS 230.14, network power supply (230V~50-60Hz).
CFC 12-24ICN, 12V car battery charger



BPS 230.14

CFC 12-24ICN

HYDRAULIC CABLE CUTTERS

HT-TC041

Two speed hand operated hydraulic tool specifically designed to cut copper, aldreyl, aluminium, aluminium-steel cables and steel ropes, aluminium and steel rods having a max overall diameter of 40 mm. New model, self contained, robust and sturdy. The blades are manufactured from high strength special steel, heat treated to ensure a long service life. The head can rotate by 180 degrees to enable the operator to work in the most comfortable position and can easily be opened to allow cutting of running cables.

HT-TC041 features an automatic safety valve to bypass oil when reaching maximum pressure; a pressure release device can also be operated at any stage of operation.

Max cutting diameter:	40 mm
Dimensions:	
length	550 mm
width	144 mm
Weight:	5,8 kg

TC 04

Hydraulic cutting head complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar.

TC04 has the same cutting capability as HT-TC041 and B-TC0405.

Max cutting diameter:	40 mm
Max operating pressure:	700 bar
Dimensions:	
length	311 mm
width	100 mm
Weight:	4,0 kg

B-TC0405

14.4 V cordless hydraulic cutting tool, lightweight and balanced for single hand operation. specifically designed cut copper, aldreyl, aluminum, aluminum-steel cables and steel ropes, aluminum and steel rods having a max overall diameter of 40 mm.

- **Double speed action tool**
- **Li-Ion Battery; 14.4V - 3.0Ah**
- Balanced tool for greater control
- Head rotates for ease of operation in confined spaces
- Automatic indication of residual battery power after every operation
- The tool is fitted with a maximum pressure valve to indicate the full extent of the blade travel
- Extremely quiet in operation with very little vibration
- Durable moulded body offering high resistance to wear and damage in all operating conditions
- The metal carrying case can accommodate the tool and accessories

Max cutting diameter:	40 mm
Dimensions:	
length	438 mm
width	94 mm
height	298 mm
Weight with battery:	6,7 kg

VAL B-TC095

The tool is supplied in a metal carrying case type **VAL B-TC095**. Spare battery, Battery charger and shoulder strap are also included.



CUTTING CAPACITY		
MATERIAL	TENSILE STRENGTH (daN/mm²)	MAX CUTTING DIAMETER (mm)
		HT-TC 041 TC 04 B-TC0405
ROPE & CONDUCTORS	COPPER	≤ 41
	ALUMINIUM	≤ 20
	ALMELEC	≤ 34
	STEEL	≤ 180
	MULTI STRANDS STEEL (STRANDS Qty ≥ 200)	≤ 180
	ACSR	≤ 180
RODS	STEEL	≤ 60
	COPPER	≤ 30
	ALUMINIUM	≤ 16
		≤ 25



**14.4V
3.0Ah
Li-Ion**



Optional accessories:
BPS 230.14, network power supply (230V~50-60Hz).
CFC 12-24ICN, 12V car battery charger



HYDRAULIC CABLE CUTTERS

HT-TC051

Two speed hand operated hydraulic tool specifically designed to cut copper, aluminium and telecommunications cables having a max overall diameter of 50 mm.

The blades are manufactured from high strength special steel, heat treated to ensure a long service life. The head can be easily opened to allow the cutting of running cables. The head can rotate by 90 degrees to enable the operator to work in the most comfortable position.

HT-TC051 features an automatic safety valve to bypass oil when reaching maximum pressure; a pressure release device can also be operated at any stage of operation.

Max cutting diameter: 50 mm

Dimensions:

length 497 mm

width 129 mm

Weight: 4,38 kg



TC 050

Hydraulic cutting head complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar.

TC050 features the same cutting capability as HT-TC051 and B-TC051.

Max cutting diameter: 50 mm

Max operating pressure: 700 bar

Dimensions:

length 325 mm

width 112 mm

Weight: 3,2 kg



B-TC051

14.4 V cordless hydraulic cutting tool, lightweight and balanced for single hand operation.

Specifically designed to cut copper, aluminium and telecommunications cables having a max overall diameter of 50 mm.

- **Double speed action tool**
- **Li-Ion Battery; 14.4V - 3.0Ah**
- Balanced tool for greater control
- Head rotates for ease of operation in confined spaces
- Automatic indication of residual battery power after every operation
- The tool is fitted with a maximum pressure valve to indicate the full extent of the blade travel
- Extremely quiet in operation with very little vibration
- Durable moulded body offering high resistance to wear and damage in all operating conditions
- The plastic carrying case can accommodate the tool and accessories
- The tool has the same cutting capacity of the HT-TC051 and TC 050

Max cutting diameter: 50 mm

Dimensions:

length 414 mm

width 94 mm

height 302 mm

Weight with battery: 5,1 kg



VAL P9

The tool is supplied in a sturdy plastic case type **VAL P9**.

Spare battery, battery charger and shoulder strap are also included.

Optional accessories:

BPS 230.14, network power supply (230V~50-60Hz).

CFC 12-24ICN, 12V car battery charger



BPS 230.14

CFC 12-24ICN

HYDRAULIC CABLE CUTTERS

HT-TC055

Hand operated hydraulic tool specifically designed to cut copper, aldreyl, aluminium, aluminium-steel cables and steel ropes, aluminium and steel rods having a max overall diameter of 55 mm.

The tool features a double speed action. The blades are manufactured from high strength special steel, heat treated to ensure a long service life. The head can be easily opened to allow the cutting of running cables. The head can rotate by 327 degrees to enable the operator to work in the most comfortable position. **HT-TC055** features an automatic safety valve to bypass oil when reaching maximum pressure; a pressure release device can also be operated at any stage of operation.

Max cutting diameter:	55 mm
Dimensions:	
length	595 mm
width	144 mm
Weight:	8,3 kg



TC 055

Hydraulic cutting head complete with quick automatic coupler for connection to a hydraulic pump with a max operating pressure of 700 bar. **TC055** features the same cutting capability as HT-TC055.

Max cutting diameter:	55 mm
Max operating pressure:	700 bar
Dimensions:	
length	357 mm
width	134 mm
Weight:	6,6 kg



CUTTING CAPACITY		
MATERIAL	TENSILE STRENGTH (daN/mm²)	MAX CUTTING DIAMETER (mm)
		HT-TC055 B-TC055
COPPER	≤ 41	55
ALUMINIUM	≤ 20	55
ALMELEC	≤ 34	55
STEEL	≤ 180	INDICATIVE EXAMPLES: 7 x 3,0 : Ø est. = 9,0 mm 19 x 2,1 : Ø est. = 10,5 mm 19 x 2,3 : Ø est. = 11,5 mm
MULTI STRANDS STEEL (STRANDS Q.TY ≥ 200)	≤ 180	22
ACSR	≤ 180	50 INDICATIVE EXAMPLES: 26 x 2,50 + 7 x 1,95 : Ø est. = 15,85 26 x 3,06 + 7 x 2,38 : Ø est. = 19,38 26 x 3,60 + 7 x 2,80 : Ø est. = 22,80 26 x 4,44 + 7 x 3,45 : Ø est. = 28,14 54 x 3,50 + 19 x 2,10 : Ø est. = 31,50 54 x 4,36 + 19 x 2,62 : Ø est. = 39,20 83 x 4,60 + 16 x 2,80 : Ø est. = 50,00
GUY WIRE (GW15-9/16-188)	Extra high strength grade	7 x 4,77 : Ø est. = 14,30 mm
RODS	STEEL ≤ 60	20
	STEEL ≤ 42	22
	COPPER ≤ 30	34
	COPPER ≤ 25	38,5
ALUMINIUM	≤ 16	50

B-TC055

14.4 V cordless hydraulic cutting tool, lightweight and balanced for single hand operation. Specifically designed cut copper, aldreyl, aluminium, aluminium-steel cables and steel ropes, aluminium and steel rods having a max overall diameter of 55 mm.



**14.4V
3.0Ah
Li-Ion**

- Double speed action tool
- Li-Ion Battery; 14.4V - 3.0Ah
- Balanced tool for greater control
- Head rotates for ease of operation in confined spaces
- Automatic indication of residual battery power after every operation
- The tool is fitted with a maximum pressure valve to indicate the full extent of the blade travel
- Extremely quiet in operation with very little vibration
- Durable moulded body offering high resistance to wear and damage in all operating conditions
- The metal carrying case can accommodate the tool and accessories



Max cutting diameter:	55 mm
Dimensions:	
length	483 mm
width	94 mm
height	298 mm
Weight with battery:	9,1 kg



**NEW
Li-Ion
BATTERY**

VAL B-TC095

The tool is supplied in a metal carrying case, **VAL B-TC095**. Spare battery, battery charger and shoulder strap are also included.

Optional accessories:
BPS 230.14, network power supply (230V~50-60Hz).
CFC 12-24ICN, 12V car battery charger



BPS 230.14

CFC 12-24ICN

HYDRAULIC PUMPS

PO 7000 and PO 8500

Foot operated double speed pumps, developing a maximum pressure of 700 or 850 bar. The pump is supplied with 3 m long high pressure flexible hose complete with female self-lock quick coupler. Pressure can be withdrawn at any time during operation by depressing the release lever.

A solid shaped stand gives the pump stability during operation.

PO 7000

Max operating pressure: 700 bar

Dimensions:

length	680 mm
width	200 mm
height	163 mm
Weight:	9,8 kg

PO 8500

Max operating pressure: 850 bar

Dimensions:

length	689 mm
width	200 mm
height	210 mm
Weight:	9,9 kg

Only for 850 bar heads



Storage:

PO 7000 Plastic case type VAL P21

PO 8500 Metal case type VAL 22



PO 7000



PO 8500

The **PO 8500** can be mounted on a ladder and depending of the work the position of the pumping pedal can be rotated very easily.



CPE-1

Electrically driven hydraulic pump, powered by a 230V / 50-60Hz single-phase electrical motor. The remote hand controller allows advancement and pressure release on completion of the crimping operation. The mechanically actuated emergency button located on the pump body, allows the pressure release at any time also in case of power shortage. Also available **CPE-1-110** version for 110-115V / 50-60Hz. Both models are IP 55 rated.

Max operating pressure: 700 bar

Dimensions:

length	372 mm
width	223 mm
height	482 mm
Weight:	21 kg



It is equipped with:

- high pressure flexible hose with female automatic quick coupler
- remote hand controller
- external supply connection cable



Available as optional accessories:

- RCP-B70 remote foot controller
- CS-CPE-1 transportation trolley

B70M-P24 and B85M-P24

Portable electro-hydraulic pumps, operating at 24V by battery for independent use, developing 700 or 850 bar pressure. Other versions feature an integral socket for connection to an external 24 V dc supply or are insulated and operated by remote pneumatic pedal.

B70M-P24 or B85M-P24 are supplied with following accessoires:

- **BH2433** Powerful 24V 3.3Ah Ni-MH battery
- **DC24** External battery charger
- **ERCH** Remote control
- 3 m flexible hose complete with male + female 3/8" NPT self-lock quick couplers
- Shoulder strap
- Canvas holdall for carrying accessories

Additional accessories available upon request:

- Spare 24V dc battery
- 24 V dc External supply connection cables:
 - **ESC 300 CEE** (CEE type plug, 3 m length)
 - **ESC 600** (with crocodile clips, 6 m length)
- **RCP-B70** remote foot pedal controller
- **ERCH-WH** control handle for flex hose
- **TRS-B70** rucksack
- **SH-B70** ladder support hook
- **EPS 115-230.24** network power supply 115-230V
- **BPS 230.24** network power supply 230V ~ 50-60Hz



B70M-P24

Max operating pressure: 700 bar

Dimensions:

length	390 mm
width	163 mm
height	323 mm
Weight:	9,2 kg

**24V
3.3Ah
Ni-MH**



B85M-P24

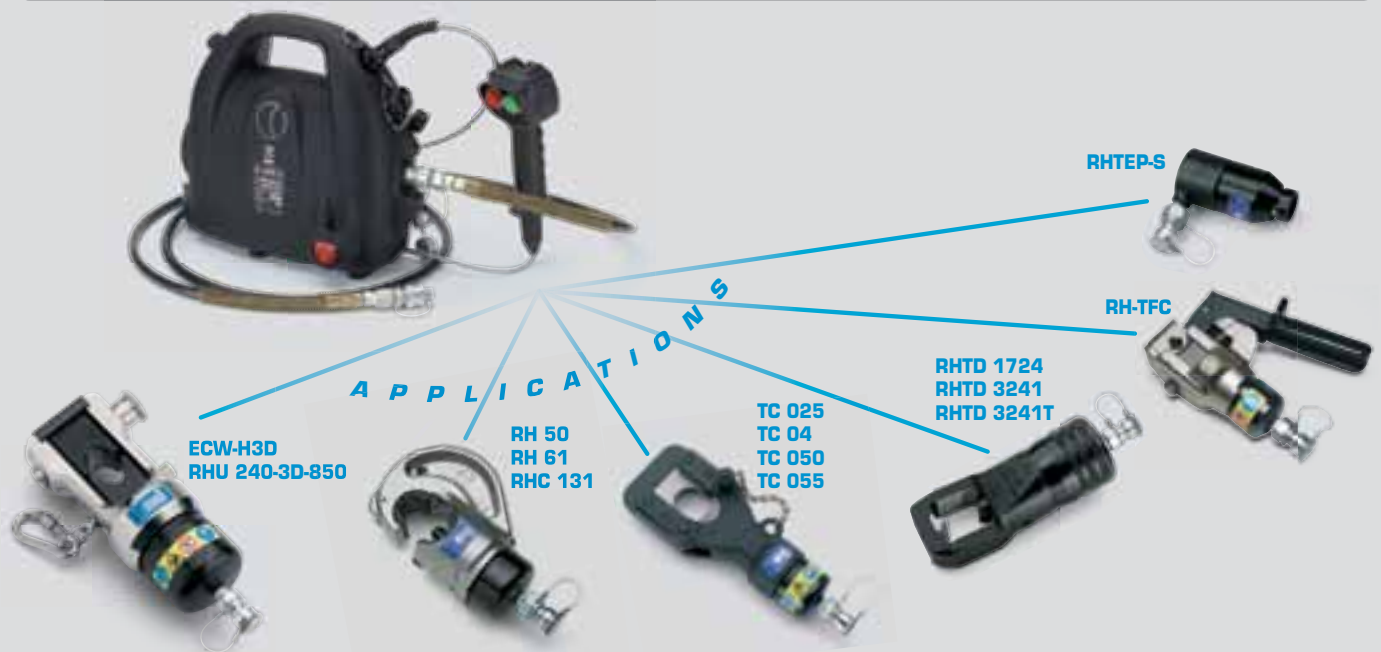
Max operating pressure: 850 bar

Dimensions:

length	390 mm
width	163 mm
height	323 mm
Weight:	9,2 kg

Only for 850 bar heads

HYDRAULIC PUMP B70M-P24



OPTIONAL ACCESSORIES FOR B70M-P24 OR B85M-P24

ESC 300CEE
CONNECTING CABLE WITH 24V
dc CEE TYPE PLUG
(for power from an external
source, length 3 meters)



ESC 600
CONNECTING CABLE WITH
CROCODILE CLIPS
(for power from an external
source, length 6 meters)



EPS 115-230.24
mains power supply 115-230V



BPS 230.24, network power supply.
Main features:
INPUT 230V~ 50-60Hz; OUTPUT 24V~
thermal and short circuit protection.
Current supply: up to 4A extended use;
18A for 50 s; 25A for 8 s.



TRS-B70
RUCKSACK
(for carrying the pump)



ERCH-WH
CONTROL HANDLE
FOR FLEX HOSES



Operating
push-button

Pressure release button

SH-B70
HOOK
(for hanging the pump
from a ladder)



RCP-B70
PORTABLE REMOTE
FOOT CONTROL



VAL-P18
Durable case
for pump and
accessories.



MECHANICAL TOOLS - Crimpstar® RANGE

The ratchet controlled tools in the Crimpstar® range, are compact, lightweight and easy to use.

Features include:

- High precision investment casting jaws made of special treated steel
- Ratchet control to ensure precise crimping.
- Emergency device to allow for jaws opening at any stage of operation.
- Toggle action leverage to reduce operator effort.
- Automatic handles opening after crimping operation
- Ergonomically designed moulded plastic grips.
- To open jaws in case of emergency push the release lever as indicated
- Several combinations of kits including tool and relative connectors are available



HP

Insulated terminals and connectors

HP 1 for conductor sizes 0,2 to 2,5 mm²

HP 3 for conductor sizes 0,25 to 6 mm²



HNN

Nylon insulated terminals and connectors

HNN 3 for conductor sizes 1,5 to 10 mm²

HNN 4 for conductor sizes 10 and 16 mm²



HPH

End to end connectors

PE HD insulated, heat shrinkable.

HPH 1 for conductor sizes 0,5 to 6 mm²



HNKE

End sleeves

HNKE 4 for conductor sizes 0,5 to 4 mm²

HNKE 16 for conductor sizes 4 to 16 mm²

HNKE 50 for conductor sizes 25 - 35 - 50 mm²



HN

Uninsulated terminals and connectors

HN 1 for conductor sizes 0,25 to 10 mm²

HN 5 for conductor sizes 10 and 16 mm²



HF

Open barrel brass terminals:

HF 1 for conductors sizes 0,5 to 4 mm² (not BN-FAB/FAR type)

HF 2 for conductors sizes 0,08 to 1,3 mm² (28 to 16 AWG)



HX

Coaxial connectors

HX 1 for types RG58, RG59, RG62 and RG 71



MECHANICAL TOOLS

SCISSORS

SC 1

Electricians scissors with high carbon steel blades and satin finished Nylon handles.



SC 3X

Multi-purpose scissors with high hardness blades (56 HRC) and anti slide serrations. The moulded plastic handles combine a rigid structure with a softer material.



WIRE STRIPPERS

HB 2

Wire strippers, for circular cables Ø 4,5 to 28,5 mm



HB 5

HB 5 Wire stripper, for PVC insulated wires 0,25 to 6 mm²



HB 6

HB 6 Wire stripper, supply configuration including stripping die for PVC insulated cables from 0,02 to 10 mm²



HB 8

HB 8 Wire stripper, for PVC insulated cables 0,2 to 6 mm²



Interchangeable stripping dies available upon request:



Grey, flat blade
Stripping features:
PVC from 0,02 to 10 mm²



Red, rounded blades
Stripping features:
PVC from 4 to 16 mm²



Blue, "V" blades
Stripping features:
PTFE from 0,1 to 4 mm²

HB 9

Insulated knife for cables, with bent blade and protective cover. Suitable for insulation and screen removal, equipped with blade guiding to avoid the damage of the strands. Handle is made of a bi-component plastic material.



HB 10

Insulated knife for cables with interchangeable straight blade. Blade protection made of plastic material, to be folded insight the handle. Ergonomic handle made of anti shock plastic material



CABLE CUTTERS



KT 1

Hand operated tool for cutting cables up to a maximum Ø 15 mm



KT 2

Hand operated tool for cutting cables up to a maximum Ø 25 mm



KT 5

Hand operated tool for cutting cables up to max section 25 mm²

Hand operated ratchet cable cutter for stranded and flexible copper and aluminum cables



KT 3

For cutting cables Ø max 32 mm
Weight: 0,59 kg
Length: 255 mm



KT 4

For cutting cables Ø max 52 mm
Weight: 0,89 kg
Length: 310 mm



5116660250

For cutting cables 6 to 250 mm²
Weight: 1,5 kg
Length: 600 mm



5116660500

For cutting cables 6 to 500 mm²
Weight: 3 kg
Length: 800 mm

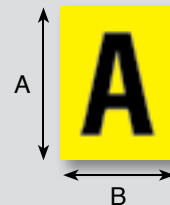
ALPHANUMERIC SIGNS ANL

ALPHANUMERIC SIGNS Vinyl, adhesive



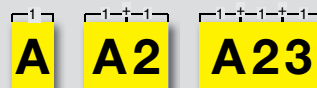
To order add the required Character or symbol to the Reference

Ref.	Dimensions mm A x B	Labels per each card	Cards per each packing	Labels per each packing
ANL 374103-...	15 x 10	56	5	280
ANL 374107-...	38 x 22	16	5	80
ANL 374108-...	60 x 34	5	5	25
ANL 374110-...	124 x 70	1	10	10



NOTE: sign with letter "I" is narrower.

Also available with numeric and alphanumeric combinations and progression. Example:



Some example of use:



Down signals



Switch shunting box



Inductive connections



Up signals (lights)



Rail circuit box

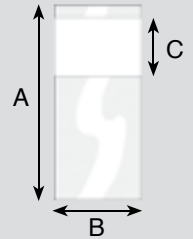
CABLE MARKERS

WRAPAROUND CABLE MARKERS KM



WRAPAROUND CABLE MARKERS KM

Ref.	Colour	Max Wrapping diameter mm	Overall Length A mm	Print Area C x B mm	Quantity
KM 05025 189109	white	10	50	15 x 25	90
KM 05025 184109	yellow	10	50	15 x 25	90
KM 07525 189115	white	14	75	25 x 25	60
KM 07525 184115	yellow	14	75	25 x 25	60
KM 15025 189123	white	38	150	25 x 25	30
KM 15025 184123	yellow	38	150	25 x 25	30



JOB TAGS WIT

JOB TAGS WIT

polypropylene,
for multi conductor
identification

Ref.	Dimensions mm	Quantity
WIT-W 56008	49 x 99	50/500

Available in different languages on request



PERMANENT PENS

PERMANENT PENS

Indelible ink pens, for various surfaces,
UV and water-resistant.

Ref.	Colour	Description	Quantity
990409	black	indelible, superfine point	2
990417	black	indelible, fine point	2
990425	black	indelible, medium point	2

PUSH-ON FLAT RING CABLE MARKERS FMS

PUSH-ON FLAT RING CABLE MARKERS FMS

with tie-on carries

Material: Soft PVC, self extinguishing according to class VO (UL 94).

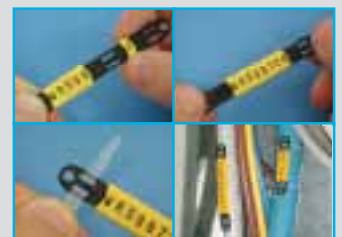
Ref	Length	Quantity
FMS-04 32274-... add the character	4 mm	500 pcs



Markers with electrical symbols are identified by the following suffixes:

GNDP Example: FMS-04 32274-GNDP	DELTA Example: FMS-04 32274-DELTA
AC Example: FMS-04 32274-AC	STAR Example: FMS-04 32274-STAR
OHM Example: FMS-04 32274-OHM	DIA Example: FMS-04 32274-DIA
AST Example: FMS-04 32274-AST	GND Example: FMS-04 32274-GND

FMS-40 20314	unprinted	40 mm	100 pcs
FMH-7 990088	carrier for 7 x FMS-04		100 pcs
FMH-12 990089	carrier for 12 x FMS-04		100 pcs
FMH-18 990090	carrier for 18 x FMS-04		100 pcs

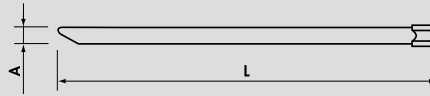


CABLE TIES AND ALUMINIUM PLATES



Material: Stainless Steel AISI 304
 Unique ball locking mechanism that allows simple and rapid installation and secure locking.
 Operating temperature:
 From -80°C to +500°C
 High tensile strength.
 Non-flammability.
 High resistance to acetic acid, alkalies, sulphuric acid, corrosion, etc.
 In general very resistant to most hostile environments.

CABLE TIES IN STAINLESS STEEL AISI 304



Type	L (mm)	A (mm)	Max. Bundle Ø (mm)	Min. Loop Tensile Strength (kg)	Quantity
GX200X4.5	200	4,5	50	46	100
GX300X4.5	300		76		
GX370X4.5	370		102		
GX520X4.5	520		156		
GX370X7.9	370	7,9	102	114	
GX680X7.9	680		207		
GX1020X7.9	1020		312		

STAINLESS STEEL CABLE TIE TOOL



Type 5527030079

width up to 7,9 mm
 With cutting device
 Weight: 0,56 kg
 Length: 180 mm



GMC-2751S
GMC-2907S



GMC-2678S



GMC-2732S

ALUMINIUM PLATES

Type	Description	Quantity Box/Bag
GMC-2751S	Aluminium plate, white background, dimensions 225x120mm, rounded corners, thickness 0.5mm, with fixing slots, to be used as support for labels series TTL8400061... or GMC-2700S + TTL8400097.	10 / 10
GMC-2907S	Aluminium plate, white background, dimensions 430x120mm, rounded corners, thickness 0.5mm, with fixing slots, for several uses as works of art or others.	10 / 10
GMC-2678S	Aluminium plate, white background, dimensions 115x200mm, rounded corners, thickness 0.5mm, with 2 holes and fixing slots, to be used eventually as support for labels series TTL8400061...	300 / 10
GMC-2732S	Aluminium plate, white background, dimensions 70x140mm, rounded corners, thickness 0.5mm, with 2 fixing holes, to be used eventually as support for labels series TTL8400057...	50 / 50

LABEL self adhesive warning vinyl labels for outdoor applications (temperature range -40°C up to +80°C)

Type	Description	Quantity Box/Bag
GMC-2700S	Self-adhesive warning outdoor vinyl label, high voltage symbol, 120mm side, yellow background, black symbol.	10 / 10



Also available in the Cembre product range

"Industrial Marking Systems"

GENERAL
MARKING

GENERAL
MARKING

Group Company Cembre

mg
MARKING GENIUS 2

PC-DRIVEN THERMAL
TRANSFER MARKER
PRINTING SYSTEM

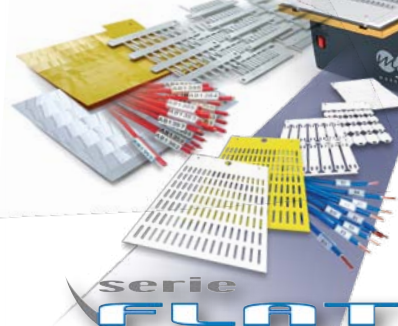


PLOT SYSTEM

PC-DRIVEN INK PLOTTER
MARKER PRINTING SYSTEM



ROLLY
THERMAL TRANSFER SYSTEM
FOR REEL MEDIA PRINTING



NEW MARKERS FOR THE IDENTIFICATION OF
TERMINAL BLOCKS AND CABLES

SIGN
stick-onsys

WARNING, PROHIBITION
AND MANDATORY SIGNS



RING
cablesys
MANUAL CABLE
MARKING SYSTEMS



"Cable glands and accessories"

MAXIblock



POLYAMIDE CABLE GLANDS WITH PROTECTION IP 68

spiralblock



MAXIbrass



NICKEL PLATED BRASS CABLE GLANDS
WITH PROTECTION IP 68

MAXIinox



STAINLESS STEEL CABLE GLANDS
WITH PROTECTION IP 68

ASK FOR THE CATALOGUES



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Cembre S.p.A.
Via Serenissima, 9
25135 Brescia (Italia)
Telefono: +39 030 36921
Telefax: +39 030 3365766
E-mail: info@cembre.com



Cembre Ltd.
Dunton Park
Kingsbury Road, Curdworth - Sutton Coldfield
West Midlands B76 9EB (Great Britain)
Tel.: 01675 470440 - Fax: 01675 470220
E-mail: sales@cembre.co.uk



Cembre S.a.r.l.
22 Avenue Ferdinand de Lesseps
91420 Morangis (France)
Tél.: 01 60 49 11 90 - Fax: 01 60 49 29 10
B.P. 37 - 91421 Morangis Cédex
E-mail: info@cembre.fr



Cembre España S.L.
Calle Verano 6 y 8
Polígono Industrial "Las Monjas"
28850 Torrejón de Ardoz - Madrid (España)
Teléfono: 91 4852580 - Telefax: 91 4852581
E-mail: info@cembre.es



Cembre AS
Fossnes Senter
N-3160 Stokke (Norway)
Phone: 33361765
Telefax: 33361766
E-mail: cembre@cembre.no



Cembre GmbH
Heidemannstraße 166
80939 München (Deutschland)
Telefon: 089/3580676
Telefax: 089/35806777
E-mail: info@cembre.de



Cembre Inc.
Raritan Center Business Park
181 Fieldcrest Avenue
Edison, New Jersey 08837 (USA)
Tel.: (732) 225-7415 - Fax: (732) 225-7414
E-mail: Sales.US@cembreinc.com

Any other country, please contact Cembre S.p.A. - Italy

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