



Maintenance

*Tools, equipments and machines
for*

On-shore / Off-shore

**tube bundle
heat-exchangers maintenance**

1 Tube testing and plugging

2 Tube bundle extraction and transporting

3 Tube bundle cleaning

4 Retubing

5 Other workings

Historical note



Franco Agostino
Founder



since 1961

At the end of the nineteen fifties Mr. Franco Agostino was afforded the opportunity to learn the art of making tube expanders by an old German manufacturer, Mr. Albert Otto. From that time, and thanks to the determination and perseverance of these men, Mr. Agostino was able to start up the small Italian factory that a few years later became Maus Italia.

Today Maus Italia has risen to a position of world leadership thanks to the tireless work of many collaborators and the belief of an Italian clientele which is exceptionally active in the international marketplace.

Active on the international market in the subsequent years, an irresistible desire of innovation push our company in inserting new products, more and more innovatory in the field of manufacture and maintenance of the heat exchangers.

This last one is the subject of this brochure, up-to-dated at 2010, that Maus Italia is presenting with the attempt of giving a contribution of clearness and competence, which are values that have always marked us all over the world.

www.mausitalia.it

*latest technology
machines and tools
for heat exchangers
assembly and maintenance*

MAUS ITALIA



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M.A.U.S. ITALIA di F. Agostino & C. Sas

S.S. Paulese Km 30 - 26010 Bagnolo Cremasco (CR) - Italy

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Conforms to the quality management systems standard

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(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by contacting the certified organization)

**Progettazione e produzione di mandrini allargatubi, macchine per mandrinare
e macchine per la manutenzione di scambiatori di calore**

**Design and production of tube expanders, rolling equipments
and machines for maintenance of heat exchangers**

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The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years.

Maintenance

Tools, equipments and machines
for
On-shore / Off-shore
tube bundle
heat-exchangers maintenance

In the next pages we have tried to show by sketches main maintenance operations performed on heat exchangers tube bundles.

The purpose is to summarize for our qualified customers a complete range of machines and tools for the maintenance of tube bundles of heat exchangers both on-site and in the workshop. The machines designed and manufactured by us are the result of decades of experience with hundreds of clients on five continents.

The three main plant maintenance operations are depicted here briefly:



The **testing, extraction, transporting** and **water cleaning** of the tube bundles in **off-shore** and **on-shore** petrochemical installations.

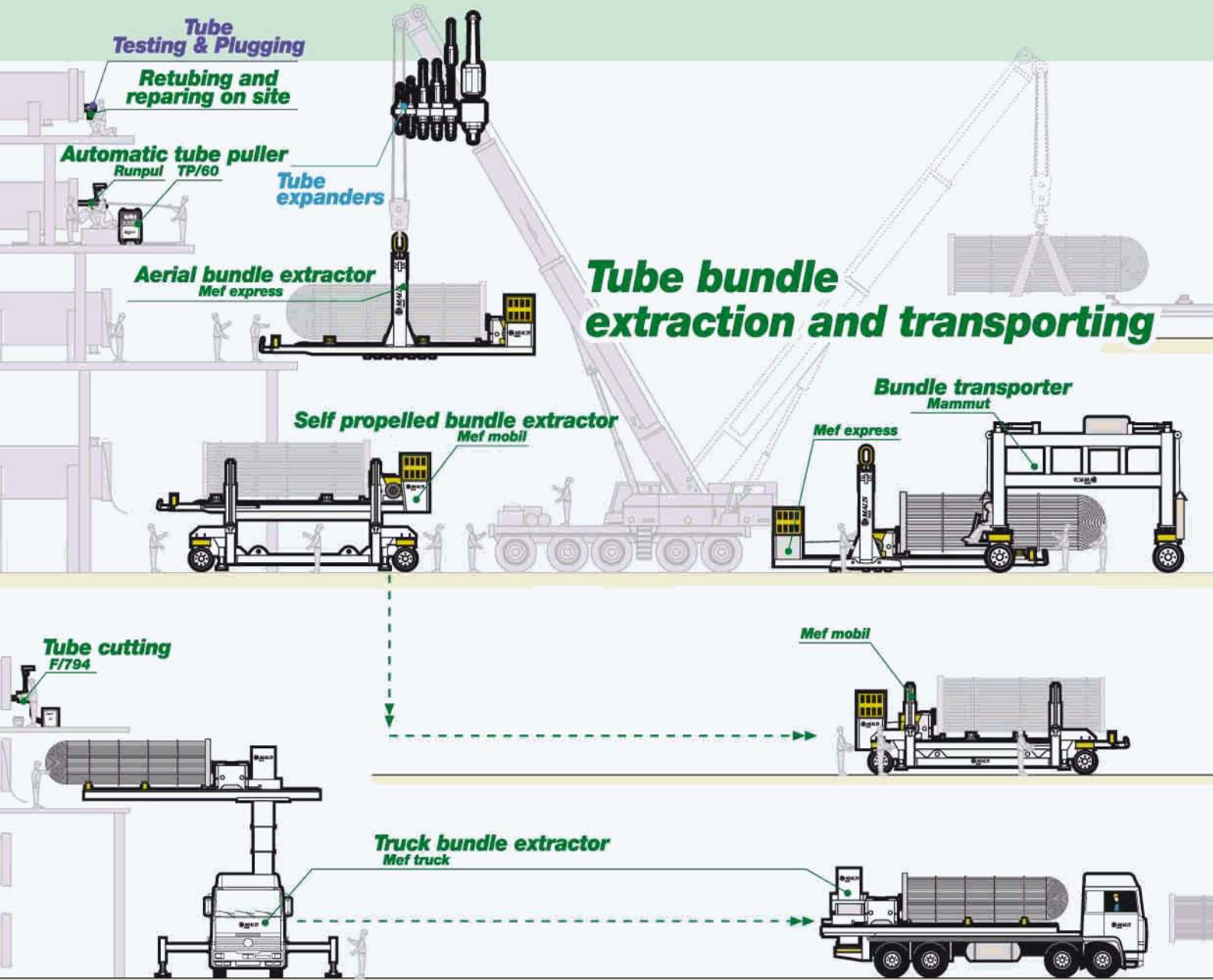


After **washing**, it could be necessary the **partial** or **total retubing** of the tube bundle.

The operations, detailed here following, briefly explain the use of our tools, equipments and machines, matched to the different phases of the retubing operation: cut, extraction, tube-sheet refurbishment, tube bundle assembling, expansion, facing, welding.

On-shore

- Tube testing & Plugging
- Retubing and repairing on site
- Tube bundle extraction and transporting
- Tube bundle cleaning



Off-shore

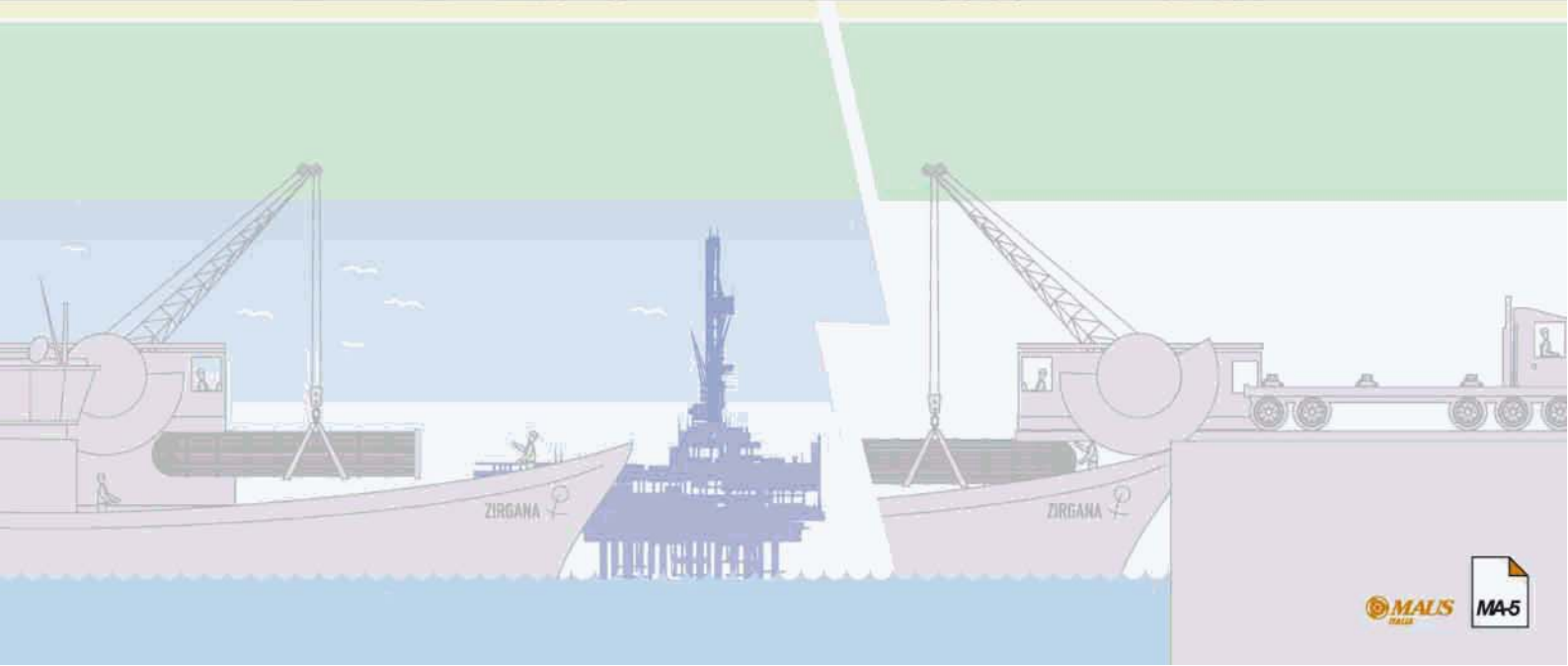
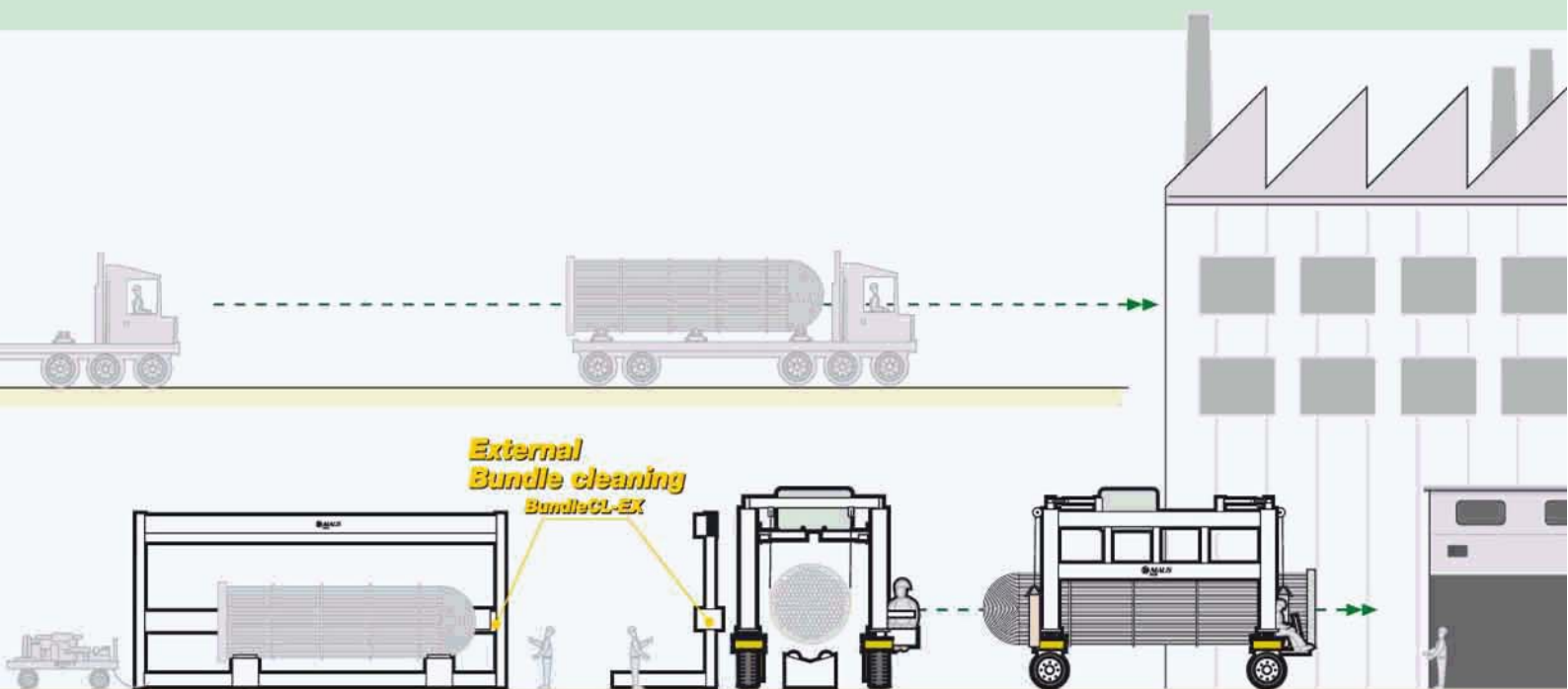
Tube bundle extraction and transporting



Tube bundle cleaning



Tube bundle heat-exchangers maintenance **on-site.**



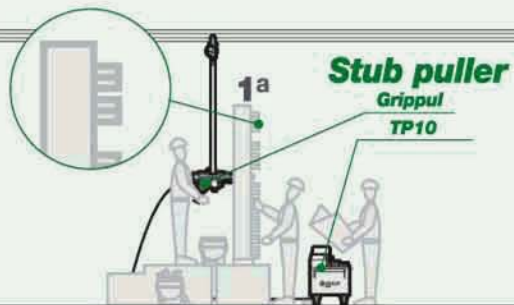
Retubing

Other workings

- Tube cutting
- Tube pulling
- Tube sheet refurbishment
- Tube bundle assembling
- Tube rolling
- Tube to tube sheet TIG orbital welding
- Tube facing
- TIG orbital welding



Tube pulling



Refurbishment of the tube-sheet

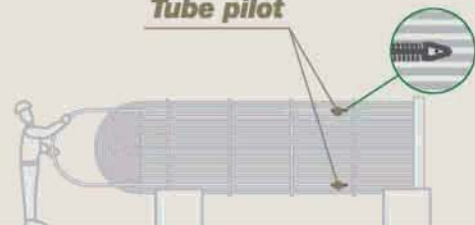
Tube bundle assembling

Holetool

Drilling - Reaming - Grooving



Tube pilot



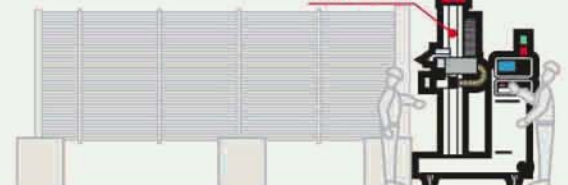
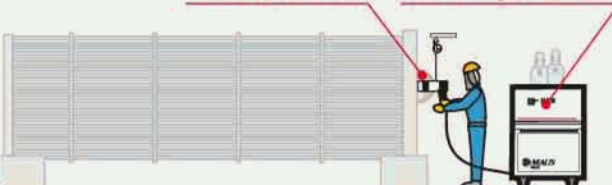
Tube to tube sheet TIG orbital welding

Tubweld semi-automatic equipment

MWH-70 MWH-80 Tubweld-Top-S / Basic-S

Automatic welding machine

MaTIG 500

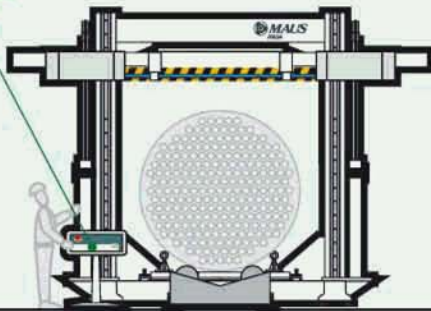


Tube bundle heat-exchangers maintenance on-workshop.

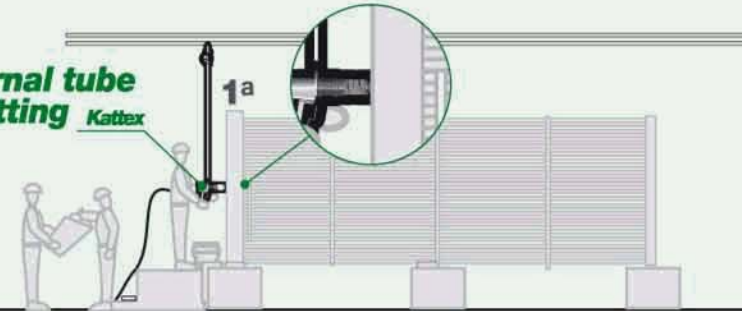


Tube cutting

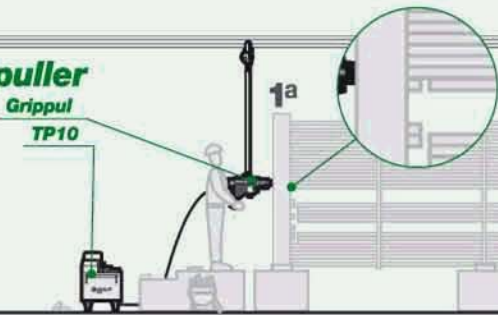
Bundle saw machine
BundleCut 2000



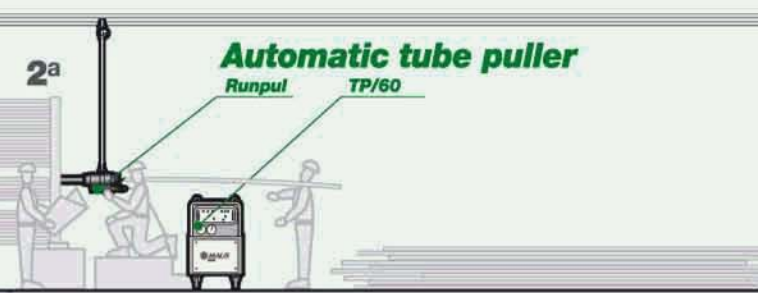
Single internal tube incising/cutting
Kattex



Stub puller
Grippul
TP10

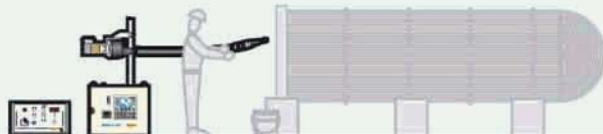


Automatic tube puller
Runpul
TP/60



Tube rolling

Semiautomatic electrical tube rolling



Portable semiautomatic pneumatic tube rolling

Minirol Macrorol Masterol

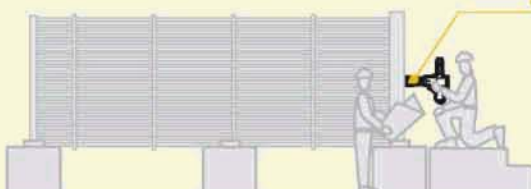


Automatic rolling machine
MA2501

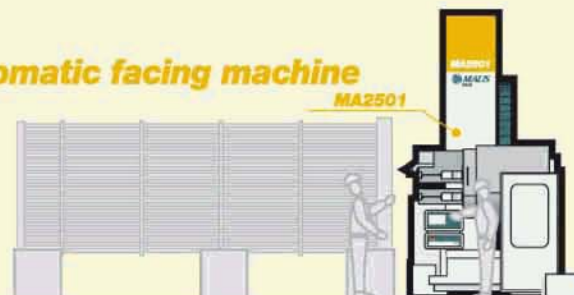


Tube facing

Semiautomatic electric or pneumatic tube facing
Tubend



Automatic facing machine
MA2501



Tube testing and tube plugging

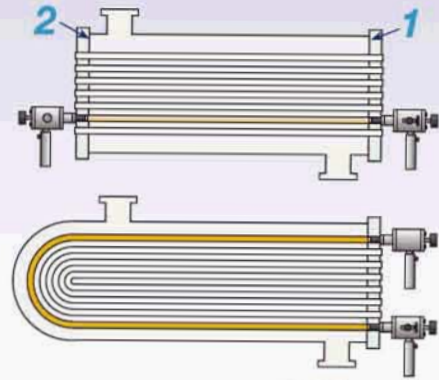
In order to solve the problem of pneumatically testing the leakage in the tube and in the junctions between tube and tube sheet in heat exchangers when assembled, operative or in use, Maus Italia proposes the guns of the **G** series and **P** series which are fast, efficient, easy to use and to handle.

After having verified the possibility of intervention on site, it is possible to plug some defective tubes with standard plugs model **F785**, made by a ring and a tapered pin, or by high-tech plugs model **Pop a plug**.



Pneumatic pressure tube testing

Provides a fast and effective method for pneumatically testing heat exchanger tubes and tube to tubesheet joints for leaks. Three different type **G-series** are proposed: **G-150**, **G-450** and **G-650**.



MA-10

Hydrostatic pressure tube testing

P-series portable type, compact and independent for hydrostatic tests in the heat exchangers: **PSR-2300** e **PSR-7800**.



MA-11

Tube plugs and high pressure tube plugs

Tube plug model **F/785** in carbon steel, brass, stainless steel or aluminium and high pressure plugs model **Pop a plug**.



MA-11



MAUS

MA-9

Pneumatic pressure tube testing

Quick (3÷10 tubes per min)

Efficient

Simple to use

Manageable



Guns

G-Series provides a fast and effective method for pneumatically testing heat exchanger tubes and tube to tubesheet joints for leaks. Three different type are proposed: **G-150**, **G-450** and **G-650**.

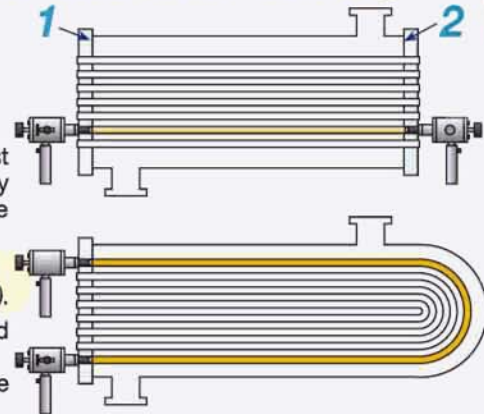


G-150 - Individual near end tube testing

It is used to test single straight, U-shaped tubes, or tubes with only one end open; the kit is composed of an air gun and a tube plugging gun (in case of tubes open at both ends). They have been conceived to pneumatically test the leakage of the smallest hole. They **weight 1 Kg (2.2 Lb)** approx. as they are made in aluminium; they make it possible to test tubes with ID from:

G-150 : 7,1 mm to 31,3 mm (0,280" to 1,230")
G-150A : 31,4 mm to 64,3 mm (0,231" to 2,531").

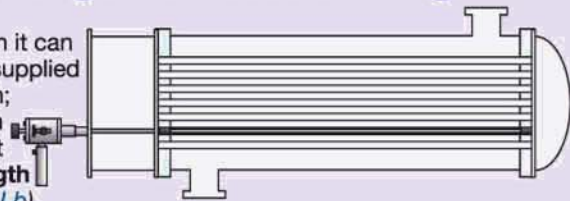
After making the gaskets of both guns expand simultaneously and after the pressure has stabilized inside the tube, every small leakage is easily detected.



G-450 - Individual through the tube testing

Conceived to test **an entire tube** when it can be accessed **only from one end**. It is supplied with a connection and fixed test length; it is **available in lengths from 610 mm to 1830 mm (from 2 to 6 feet)**. The test length can be **assembled up to a length of 7320 mm (24 Ft)** It **weight 1Kg (2.2 Lb)** approx. as it is made in aluminium; it is very easy to handle.

Tubes with ID from 12,2 mm to 31,2 mm (from 0,480 to 1,230") can be tested. After inserting the entire test length and **expanding the two gaskets at the ends and after the pressure has stabilized** inside the tube, the slightest leakage will be easily detected.



G-650 - Roll joint testing

This gun is referred to as a **vacuum gun** as it has been conceived to **test the joint between the tube and the tube-sheet creating a vacuum in the junction area** between the two parts.

This gun **weight 1 kg (2.2 Lb)** approx. as it is made in aluminium, it is very easy to handle and makes it **possible to test tubes with ID as shown in Tab.** Any leakage can be easily detected after having expanded the gasket, created and stabilized the vacuum in the junction area.

de "	mm	dim "	Gun		Manifold		Square O-ring	
			Model	Cod.	Model	mm	d _{mf} "	Cod.
1/2"	7,1 ÷ 11,4	0.28 ÷ 0.46	G-650	GSC-6508	GSC-6608	20,07	0.790	GSC-6708
5/8"	7,2 ÷ 12,6	0.29 ÷ 0.49		GSC-6509	GSC-6610	25,02	0.985	GSC-6710
	12,7 ÷ 15,0	0.50 ÷ 0.59		GSC-6510				
3/4"	10,7 ÷ 12,1	0.42 ÷ 0.47		GSC-6511	GSC-6612	28,32	1.115	GSC-6712
	12,2 ÷ 18,0	0.48 ÷ 0.71		GSC-6512				
7/8"	14,0 ÷ 21,3	0.55 ÷ 0.84		GSC-6514	GSC-6614	31,05	1.240	GSC-6714
1"	17,0 ÷ 24,4	0.67 ÷ 0.96		GSC-6516	GSC-6616	36,20	1.425	GSC-6716
1:1/8"	20,3 ÷ 27,7	0.80 ÷ 1.09		GSC-6518	GSC-6618	39,37	1.550	GSC-6718
1.1/4"	23,3 ÷ 30,7	0.92 ÷ 1.21		GSC-6520	GSC-6620	42,55	1.675	GSC-6720
1.1/2"	29,7 ÷ 37,1	1.17 ÷ 1.46		GSC-6524	GSC-6624	54,74	2.155	GSC-6724
1.5/8"	33,0 ÷ 40,4	1.30 ÷ 1.59	GSC-6526	GSC-6626	57,91	2.280	GSC-6726	
1.3/4"	36,1 ÷ 43,4	1.42 ÷ 1.71	G-650A	GSC-6528	GSC-6628	61,34	2.415	GSC-6728
2"	42,4 ÷ 49,8	1.67 ÷ 1.96		GSC-6532	GSC-6632	67,69	2.665	GSC-6732
2.1/4"	48,8 ÷ 56,1	1.92 ÷ 2.21		GSC-6536	GSC-6636	74,04	2.915	GSC-6736
2.1/2"	55,1 ÷ 62,5	2.17 ÷ 2.46		GSC-6540	GSC-6640	80,39	3.165	GSC-6740



Hydrostatic pressure tube testing

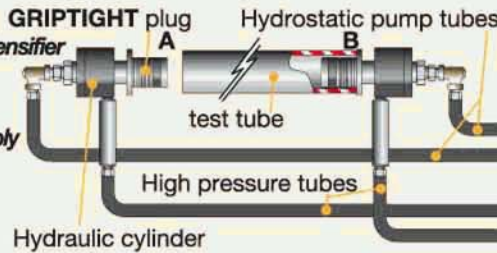


Pump

P-Series pumps

Not much larger than a small and compact suitcase, allow the hydrostatic tests in single tubes of heat exchangers. They are designed to supply high pressure water utilizing 1,72 - 8,62 Bar (25 - 125 psi) compressed air to drive the pump. The system is supplied with **AUTO SQUAT** cylinders kit for fix **TIGHT GRIP TEST PLUGS** in the tubes.

- Self lubricating air over water intensifier
- Lockable aluminum tool box
- Water supply connection
- Regulator to control inlet air supply
- High pressure bleed valve
- High pressure outlet



P-Series

PSR-2300 PSR-7800

	Bar	Psi	158 (2300)	535 (7800)
Maximum Outlet pressure				
Open flow rate	Lt/min	GPM	5,4 (1.43)	1,5 (0.39)
Flow Rate at 85% Rated Output	Lt/min	GPM	2,5 (0.65)	0,8 (0.22)
Lenght	mm	"	610 (24")	
Width	mm	"	242 (9.1/2")	
Height	mm	"	267 (10.1/2")	
Approximate Shipping Weight	Kg	Lb	19 (42)	

F/785 Tube plugs

Tube plug composed of ring and tapered pin in carbon steel (CS), brass (B), stainless steel (SS) or aluminium (AL).



Pop a plug

High pressure tube plugs

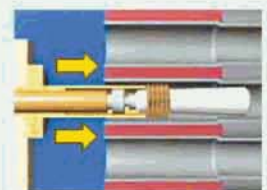
Pop a plug is undoubtedly an innovative proposal which enables the tubes in the heat exchangers to be plugged, by using a very easy, safe method with a plug which can be removed up to pressure of 300 Bar (4500 psi) without welding.

It is made up of three mechanical parts:

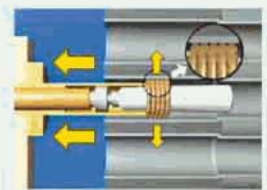
- a a threaded adapter.
- b a sealing ring
- c a tapered pin



The threaded adapter is fixed to the hydraulic pump and is then inserted in the tube at a minimum reach of 1.3/4" (about 45 mm); it must however be in the tube sheet area to guarantee safe anchoring.



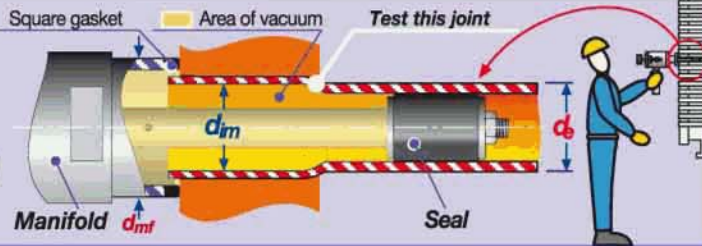
When the pump is activated, the tapered pin is pulled, by the threaded adapter, and passes through the sealing ring which expands and presses with its wings against the inside part of the tube thus guaranteeing the requested sealing.



After reaching the pulling necessary to plug the tube, the threaded adapter detaches from the pin and remains attached to the gun.



G-650



G-series replacement seal:

- Order Cod.
GS# + Cod.
 A - G-150
 B - G-450
 C - G-650

de	8-9 BWG	10-11 BWG	12-13 BWG	14-15 BWG	16-17 BWG	18-19 BWG	20-24 BWG
"	Cod.	Cod.	Cod.	Cod.	Cod.	Cod.	Cod.
1/2"	-	-	0028	0033	0037	0040	0043
5/8"	0030	0037	0040	0047	0050	0053	0056
3/4"	0043	0047	0053	0056	0062	0065	0068
7/8"	0056	0062	0065	0072	0075	0078	0081
1"	0068	0072	0078	0083	0087	0090	0093
1.1/8"	0081	0087	0090	0097	0100	0103	0106
1.1/4"	0093	0097	0103	0110	0112	0115	0118
1.3/8"	0106	0112	0115	0122	0126	0128	0131
1.1/2"	0118	0122	0128	0134	0137	0140	0143
1.5/8"	0131	0137	0140	0147	0150	0153	0156
1.3/4"	0143	0147	0153	0158	0162	0165	0168
2"	0168	0173	0178	0183	0187	0190	0193
2.1/4"	0193	0198	0203	0208	0212	0215	0218
2.1/2"	0218	0223	0228	0232	0237	0240	0243





Tube bundle extraction and transporting

After having carried out all the operations foreseen in the **testing** phase and having excluded any possibility of partial reparation on site, or it is simply necessary to wash the bundle, it is necessary to remove it from the shell.



For this purpose Maus Italia has developed a complete series of tube bundle pullers which fall into two categories, **AERIAL** and **SELF-PROPELLED**, which are available for **ON-SHORE** and **OFF-SHORE** operations ,on request, with special preparation for operation in dangerous classified areas.

The **AERIAL** type, designed for use with the help of a crane, is capable of reaching all the work positions accessible overhead and normally is the most manageable and economic tube bundle puller.

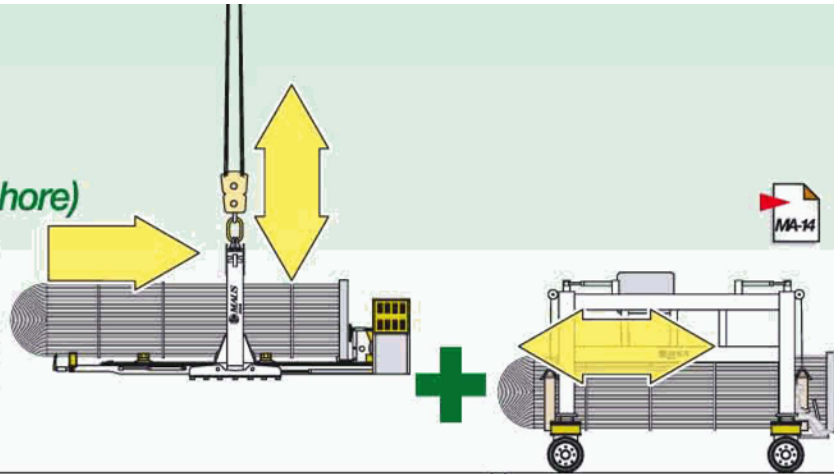
The **SELF-PROPELLED** type has the advantage of not needing a crane but clearly has a more determined and limited range of use.

Let's examine them in detail:



Mef express + Mammut (on-shore)

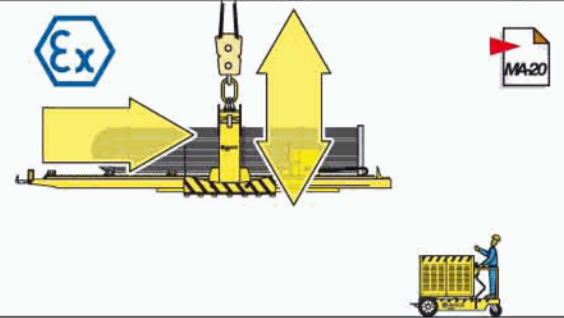
The quick hooking **aerial tube bundle puller** is produced in various sizes for tube bundles up to **95 T (143300 Lb)** and lengths up to **12,5 m (41 ft)**. This model works well in combination with the absolutely new **Mammut** tube bundle transporter, suitable for rapid transport to the work bench for washing on **workshop**.



Mef express NAVY (off-shore)

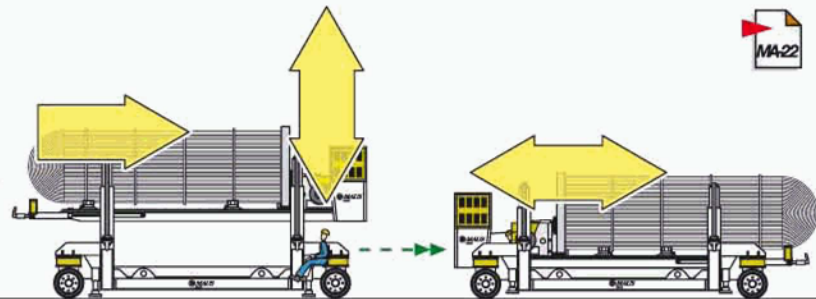
Aerial bundle extractor, suitable for ocean platforms and **FPSO** installations. This is a special version of the **Mef express**, designed and manufactured for meeting the specific needs of safety and off-shore maneuverability. Specific construction solutions are assessed case by case depending on the motor drive and limitations (of weight and size).

One of these **NAVY** solutions envisages the separated **Van Motor** drive unit including one converted **diesel engine (Explosion-proof)**, assembled on a **self-propelled trolley**.



Mef mobil (on-shore)

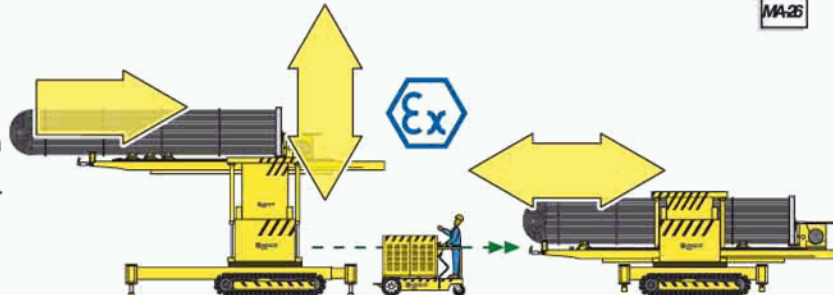
Self-positioning remote controlled bundle puller for extraction, hoisting and movement of tube bundles. This tube bundle puller has been designed for cases of difficult access. It is completely self-sufficient, as is presented as a global solution in petrochemical plants for the extraction and transportation of tube bundles.



Mef mobil NAVY (off-shore)

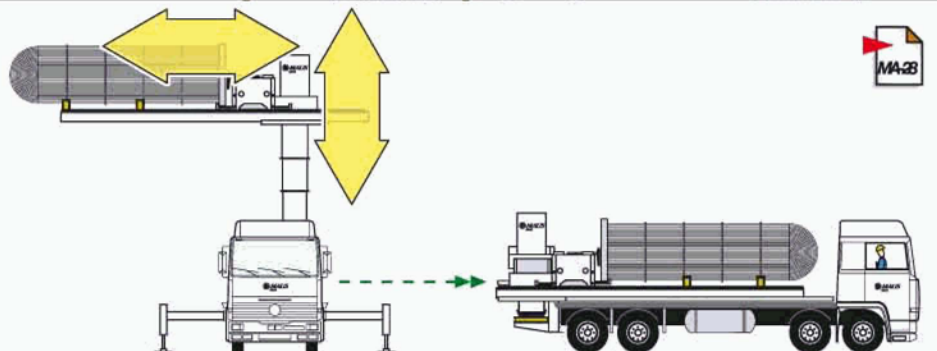
Self-positioning remote controlled bundle puller for extraction, hoisting and movement of bundles on platforms and FPSO.

This special version of the **Mef mobil** is available in different sizes and also designed taking into consideration the possibility of maneuvering on board. It has two parts (like the **Mef Aerial NAVY**), one operative and the other for control, consisting of the hydraulic unit powered by an explosion-proof version of the diesel motor, installed on a self-propelled trolley.



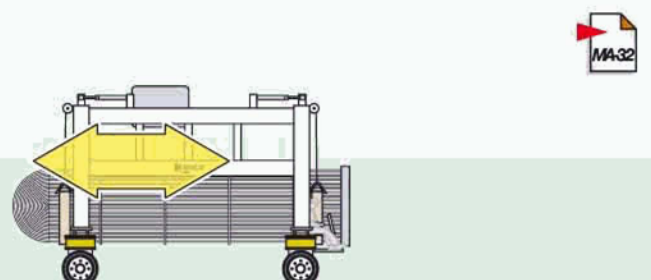
Mef Truck

Mef truck, thanks to the original project of the telescopic rotating column, allows the quick pulling/inserting of the bundle. Once the truck is positioned, it is easy and **quick to lift** the extractor and to proceed with the extraction. This system is particularly advised for the maintenance companies which operate continuously in the petrochemical plant field.



Mammut bundle transporter

This specially designed machine provides a brilliant solution to the problem of **moving tube bundles** inside installations from the point where they are extracted to the washing area or the **workshop** inside the installation, eliminating the use of trucks and mobile cranes and speeding up considerably the loading and unloading operations carried out just a few centimeters from ground level in complete safety.



Aerial bundle extractors (on-shore)

Mef express

Quick hooking tube bundle puller

Mef express tube bundle puller is the quick hooking version of the already existing **Mef** model. It has been entirely designed and manufactured by Maus Italia for the maintenance of heat exchangers tube bundles in petrochemical plants. The hydraulic hooking of the tube plate makes it possible to quickly insert and pull out the tube bundles when the refineries are at a shutdown with a consequent work time reduction.

The great solidity and sturdness of the structure as well as the innovative improvements make this machine extremely reliable.

Mef express puller is **proposed in different standard dimensions** according to the weight, the length and diameter of the tube bundles. A portable console enables the remote control of all the operations with consequent reduction in the personnel and increase in the final safety margins. In the diesel version a console with wireless remote control is available. It is supplied with **diesel or pneumatic motorization**.

The **Mef express** tube bundle puller, which already gives good performance in the **basic version**, is supplied on request with a series of very interesting **optional features** illustrated in the next page.

Diesel or pneumatic driving units are available

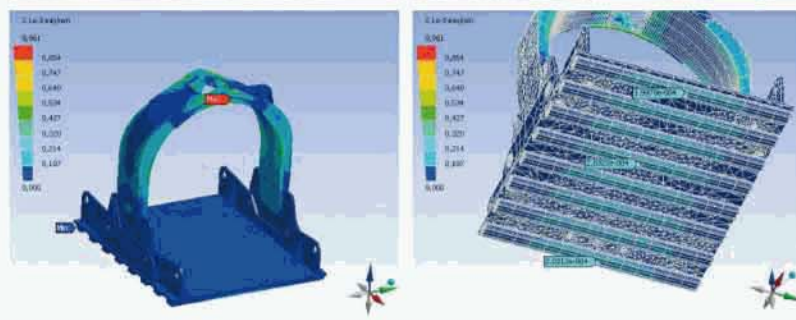
Easy to operate

Performing and reliable

Affordable prices

Tested solidity
(lifting test)

Advanced design



Motorization

Bundle extractors can be supplied with **Diesel engines** or **air motors**. Motors executions suitable for hazardous classified working area are available on request (complete with **Atex conformity** declaration).

Customized executions

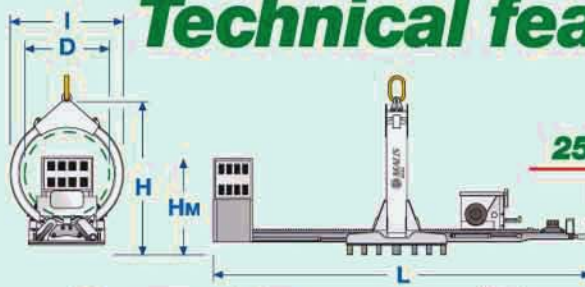
Maus (**ISO 9001 certified**) can supply also customized bundle pullers to meet special requirements from the customer (submitting all necessary docs / drawings / calculations).

On request,
SPECIAL VERSION
for low temperatures

Technical features



Shipping by container



Bundle dimensions	1300		1600		1700		2000		2000		2200*		2500*	
	65		65	75	65	75	65	75	100	75	100	100	125	
Tube sheet O.D. D mm	1300		1600		1700		2000		2000		2200		2500	
Length mm	6500		6500	7500	6500	7500	6500	7500	10000		7500	10000	10000	12500
Max lifting capacity T	10 (15)		15 (22,5)		22 (33,3)		35 (52,5)		35 (52,5)		45 (67,5)		65 (97,5)	

Mef dimensions	1300		1600		1700		2000		2000		2200*		2500*	
	65		65	75	65	75	65	75	100	75	100	100	125	
Width I mm	1600		2000		2050		2300		2300		2900		3000	
Height H mm	2000		2500		2600		2800		3000		3300		3650	
Length L mm	7800		8100	9100	8100	9100	8100	9100	11600		9100	11600	11600	14100
Height (motor) HM mm	2150		2250		2250		2250		2250		2250		2250	
Weight Kg	4850		6200	6400	6500	6700	8250	8600	10800		12000	14000	16000	18500
Pulling max speed m/min	2,5		2,5		2,5		2,0		2,0		2,0		1,5	
Pulling force T	20		30		35		50		50		65		90	



Bundle dimensions	1300		1600		1700		2000		2000		2200*		2500*	
	65		65	75	65	75	65	75	100	75	100	100	125	
Tube sheet O.D. D "	51		63		67		78		78		87		98	
Length Ft	21		21	24	21	24	21	24	32		24	32	32	41
Max lifting capacity Lb	22000 (33000)		33000 (49500)		48500 (72750)		77100 (115650)		77100 (115650)		99200 (148800)		143300 (214950)	

Mef dimensions	1300		1600		1700		2000		2000		2200*		2500*	
	65		65	75	65	75	65	75	100	75	100	100	125	
Width I Ft	5.3		6.6		6.8		7.6		7.6		9.5		9.9	
Height H Ft	6.6		8.2		8.6		9.2		9.8		10,8		12.0	
Length L Ft	25.6		27	30	27	30	27	30	38		30	38	38	46.3
Height (motor) HM Ft	7.0		7.4		7.4		7.4		7.4		7.4		7.4	
Weight Lb	10700		13700	14100	14400	14800	18200	19000	23800		26500	30900	35300	40800
Pulling max speed Ft/min	8.2		8.2		8.2		6.6		6.6		6.6		4.9	
Pulling force Lb	44000		66100		77100		110200		110200		143300		198400	

* For heavier bundles please contact us
 ** With Diesel driving unit
 *** Designed to support (under testing condition) a static load of 1.5 times the nominal load capacity
 * Available in disassemblable rocker arm version
 Nominal (Static load capacity for testing)

Aerial bundle extractors (on-shore)

Mef express

Standard supply

Diesel version

Diesel engine
(air cooled)



Pneumatic version

Air motor



Manual local command
on back side



Manual local command
on back side



Electric Portable
remote control



MA-16 MALIS

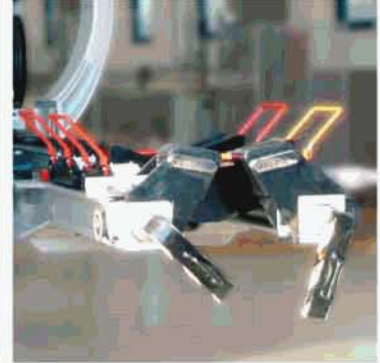
Pneumatic portable
remote control



Lifting point
alternative system



Hydraulic vices
for shell flange clamping



Main carriage
for continuous
pulling/pushing



Two hydraulic cylinder
for balancing action



Large base
of rocker arm
for balancing



* Disassemblable rocker
arm in 3 pieces for transport
also by container



* Only for 2200
and 2500 models.

MA-15

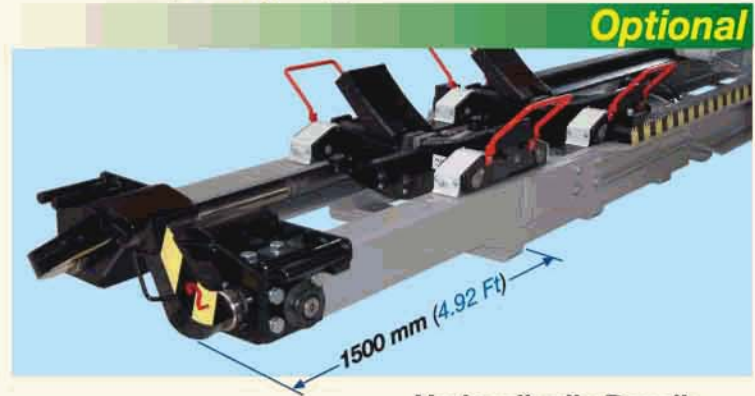
New bundle supports
with manual
adjustment



Mef express

Optionals

Removable Extension
1500 mm (4.92 Ft) long



Water cooled
diesel engine



Portable wireless
remote control



Adapters for small
diameter tube bundles



Hydraulically Bundle
supports with cust.
shape
(baffle-rod bundle)



Stainless steel guards
for sliding parts



Hydraulic telescopic
extended arm for bundle
insertion



Hydraulically controlled
bundle supports

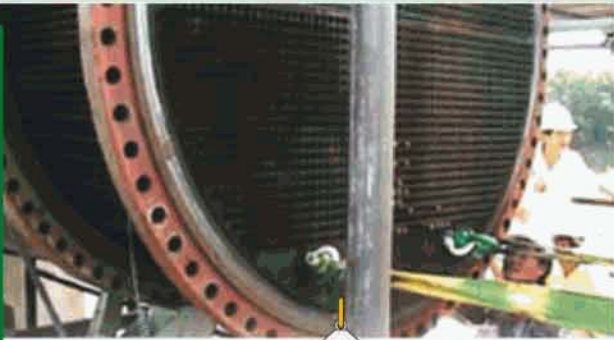


Aerial bundle extractors (on-shore)

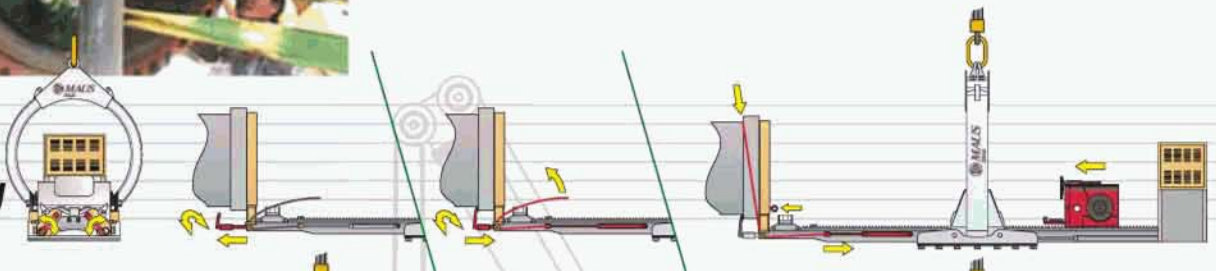
Mef express

Extraction sequence

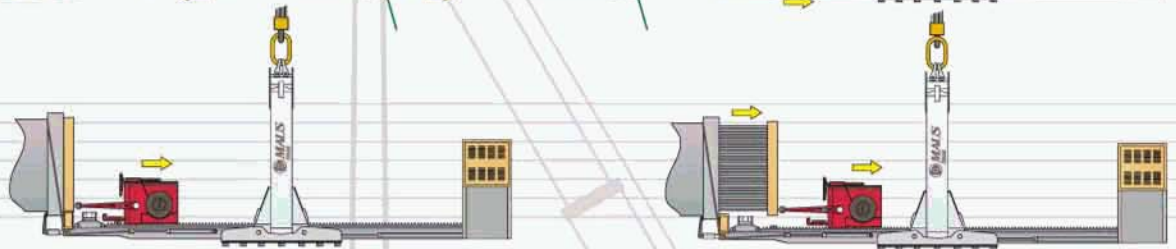
The main operations are shown below in sequence.



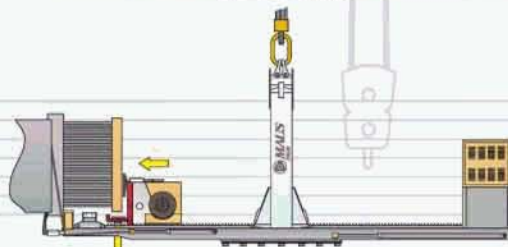
Shell blocking



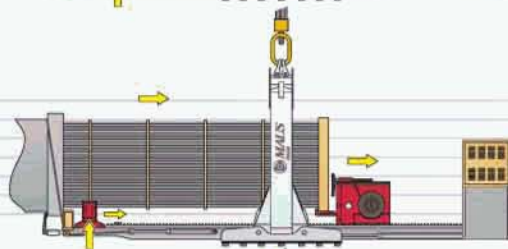
Pull with cable



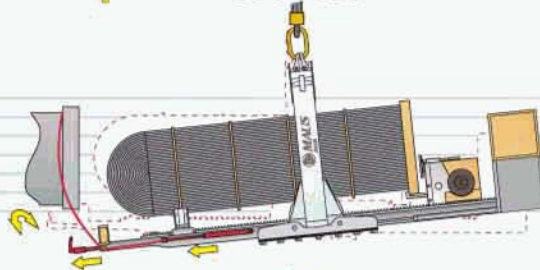
Hooking
Start of pulling



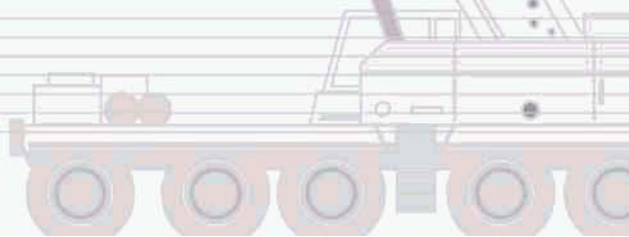
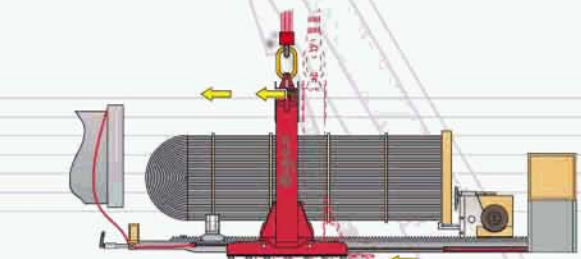
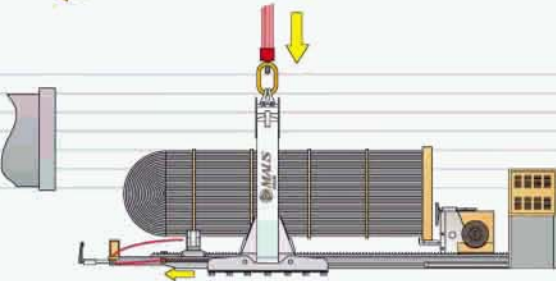
Pulling
Holding

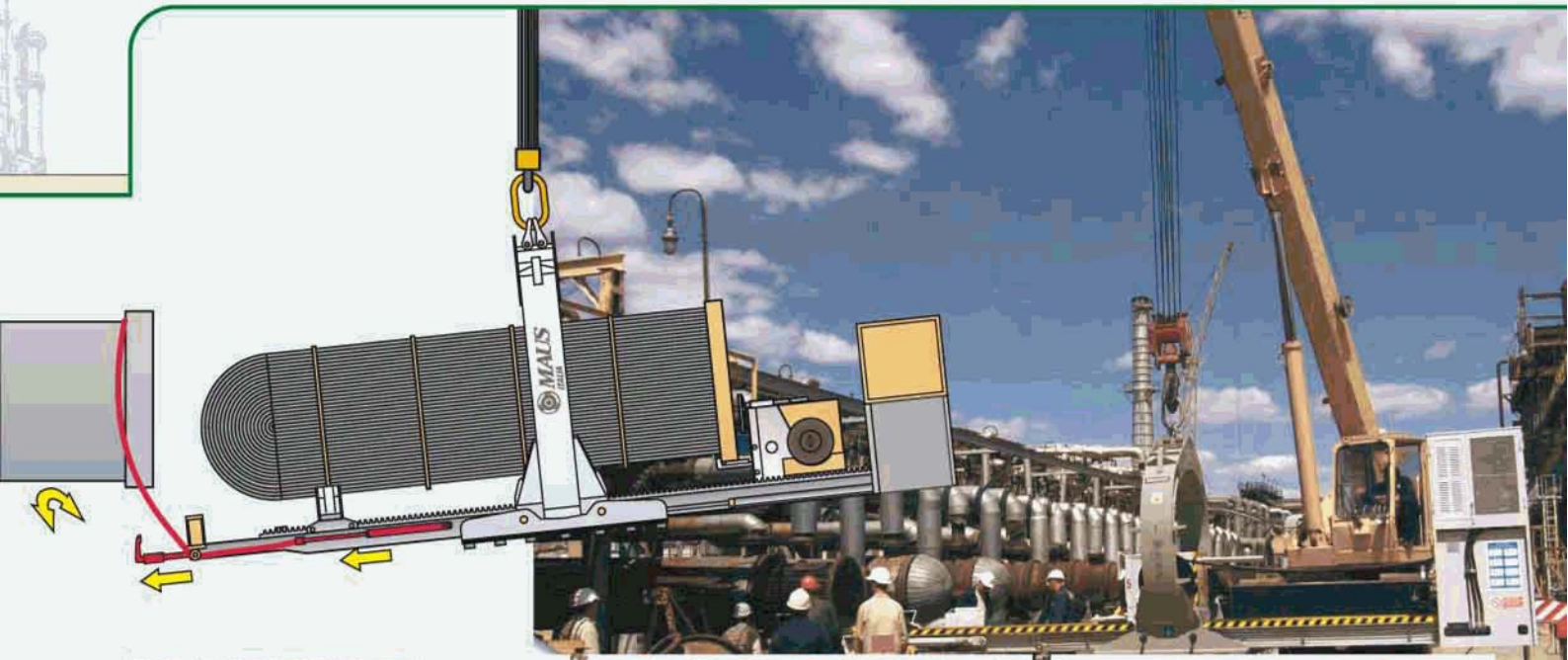


End of pulling
Balancing



Release
Shifting
Unloading





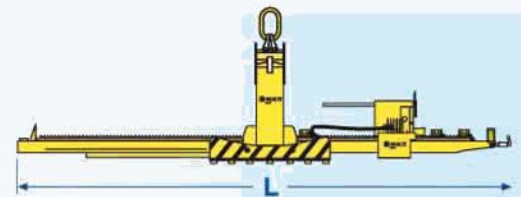
Aerial bundle extractors (off-shore)

Mef express NAVY

Quick hooking tube bundle puller



This special version of the **Mef express** unit has been produced to meet the need for extraction of tube bundles on petroleum platforms and installations at sea on large vessels known as FPSO. The machine consists of a **Mef express NAVY** operative part, produced for this purpose following the most rigid standards concerning shipbuilding. There are many similarities with the **Mef express ON SHORE** as a rapid extraction system, however it is equipped with a special device that blocks any oscillations of the bundle due to sea swell. It is very compact and light, suitable for handling in **small spaces**, powered by a mobile power unit called **Van Motor NAVY**. In view of the unusual nature of the off-shore application, the dimensional details of the **Mef express NAVY** are based on the design specifications of the installation provided by the final client or engineer in charge of the project in a spirit of the closest collaboration.



Motorization

Bundle extractors can be supplied with **Diesel engines** or **air motors**. Motors executions suitable for hazardous classified working area are available on request (*complete with Atex conformity declaration*).

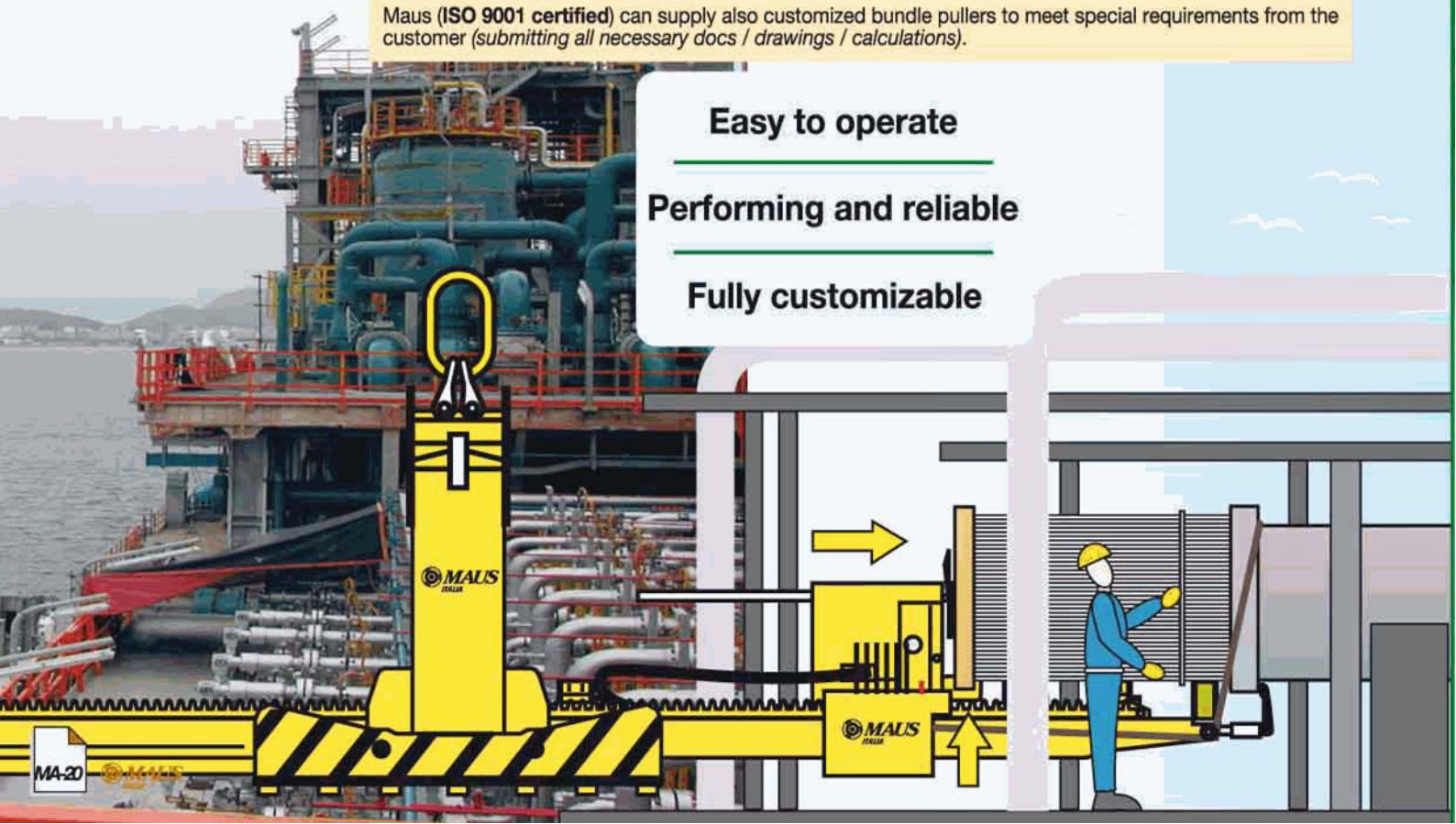
Customized executions

Maus (**ISO 9001 certified**) can supply also customized bundle pullers to meet special requirements from the customer (*submitting all necessary docs / drawings / calculations*).

Easy to operate

Performing and reliable

Fully customizable



Hydraulic commands



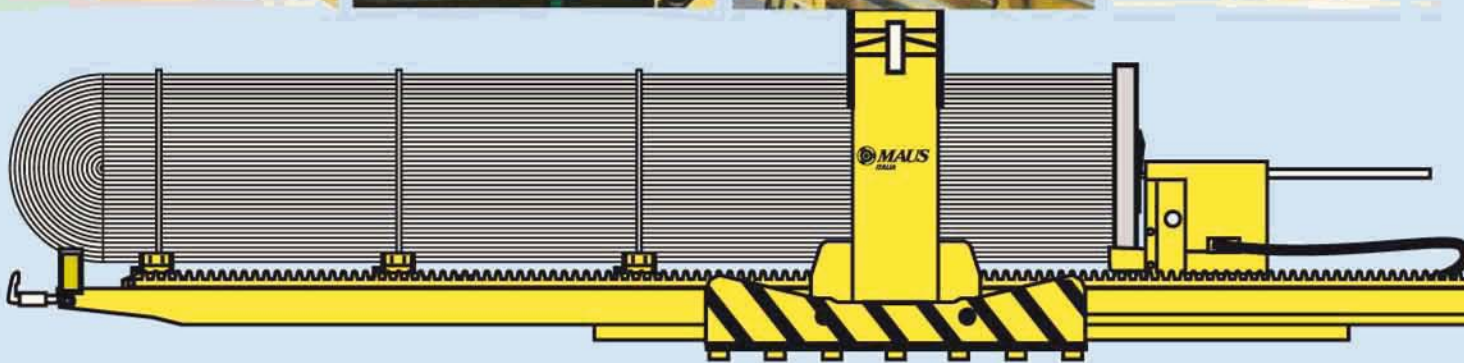
Main carriage with bundle blocking system



Circular rocker arm for lifting



Hydraulic vice



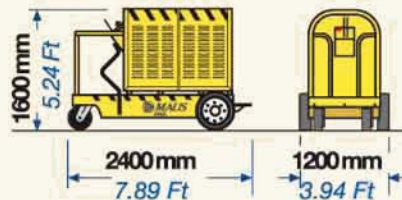
Van Motor NAVY

The separate drive unit complete with motor and hydraulic unit



Van Motor NAVY is a self-propelled trolley consisting of a hydraulic unit powered by a diesel motor converted into an **explosion proof version**. The hydraulic unit is connected to hydraulic hoses, wound on reels, which power the operative machinery.

With the **Van Motor NAVY** it is possible to operate both the **Mef espress NAVY** and the **Mef mobil NAVY**. This system reduces the weights and dimensions of the operating machines making it possible to access points in the plant that would otherwise be inaccessible. These machines are designed to be able to work in force 10 sea conditions.



Sturdy

High safety

Complete **trasformation** of the Diesel I.C.E., electrical, starter, battery and relevant control panel (close to the motor) according to:

- ATEX 94/9/CE (DPR n.126 of 28.03.1998) relative to machines and equipments used in dangerous area ZONE 2 Cat. 3G IIB T3 200°C (392°F)
- ENI1834-1 relative to the "Safety requirements" for designing and construction of I.C.E. to be used in atmosphere explosive.

Certification: **Explosion proof CE** declaration will be released according to the specification mentioned in the **ATEX 94/9/CE** for the 3G Category transformation.

Technical Specifications

- Trolley with two front driving wheels c/w self braking system and two rear self braking wheels.
- Footboard for driver
- Water cooled diesel motor model Lombardini LDW 2204, 35,5 Kw at 3000 rpm complete with spark arrestor
- Oil tank 200 Lt (53 US Gal) capacity
- Quick hydraulic connection
- Winding wheels for hydraulic hoses
- Electrical control panel for I.C.E control only for safe area operation
- Estimated weight: 750 Kg (1653 Lb)

Self propelled bundle extractors (on-shore)

Mef mobil

Self-positioning tube bundle puller, remote controlled for extraction, hoisting and movement of tube bundles



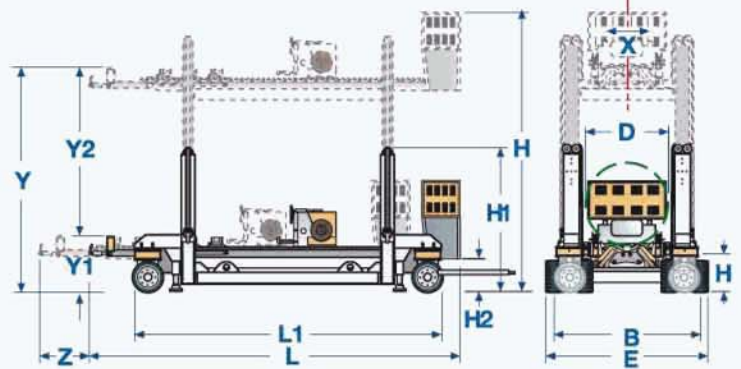
The **Mef mobil** tube bundle puller, designed for cases of difficult access, is completely **self-sufficient**, as is presented as a global solution in petrochemical plants for the extraction of tube bundles.

The tested rapid quick-hooking system **Mef express** is used for the **extraction and insertion** of the bundle.

The **Mef mobil** puller operates autonomously without the assistance of a crane for positioning and hoisting or trucks for transport to the tube bundle maintenance area after extraction.

It is solid, robust and stable and autonomously raises to a height of **4,2 m (166")** enabling a rapid and precise approach to the heat exchanger.

The use of the portable remote control (*wireless also available*), can control all the operations, leading to the inevitable reduction in personnel and increasing the final safety margins. The **Mef mobil** puller is proposed in two sizes, differentiating in weight, length and diameter of the tube bundle to pull out. The operation of inserting the tube bundle after maintenance also becomes extremely rapid and precise thus guaranteeing reduction in plant stopping times.

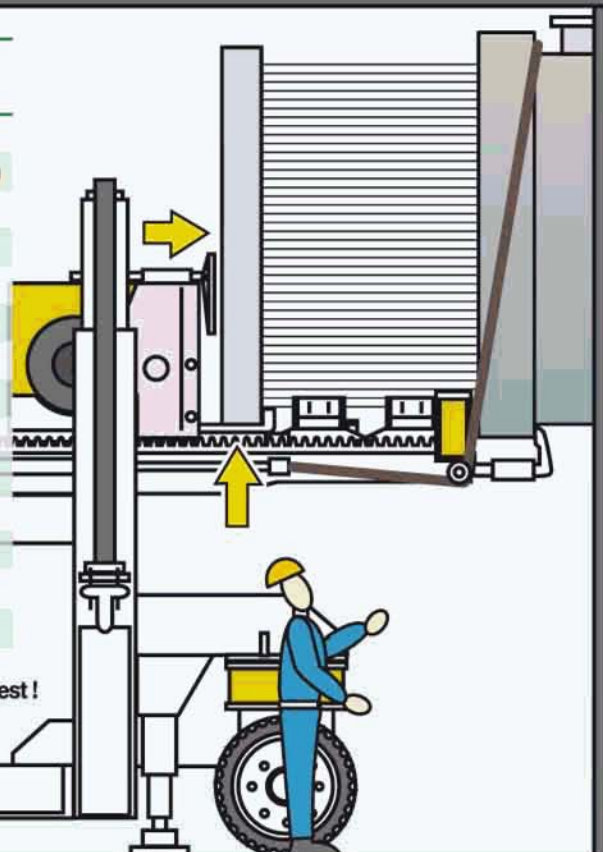


Easy to operate | Performing reliable

Performing reliable

Mef mobil		1300 65/75	2000 65/75
Min. width (transport)	B mm "	2500 (99)	3000 (119)
Max. length	L mm "	8100/9100 (319/359)	8100/9100 (319/359)
Height	H1 mm "	2540 (100)	2540 (100)
Plane height	H2 mm "	400 (16)	400 (16)
Min. heat exchanger height	Y1 mm "	650 (26)	700 (28)
Length excluding steering bar	L1 mm "	5050/6050 (199/238)	5050/6050 (199/238)
Max. width	E mm "	2900 (115)	3450 (136)
Max. height	H mm "	5850 (230)	5850 (230)
Feeding	Z mm "	1500 (60)	1500 (60)
Vertical stroke	Y2 mm "	3500 (138)	3500 (138)
Puller traverse	X mm "	±200 (± 8)	±100 (± 4)
Weight	Kg Lb	9200 (20300)	12500 (27600)
Axis rotation	DGS	120°	120°
Elevation at tube sheet bottom	Y* mm "	650/4150 (26/164)	700/4200 (28/166)

*Y = Y1 + Y2 ESpecial executions with Y2 > 3500mm (138") on request !



**Motor group
Hydraulic unit
Electric system**

**Support hydraulic
trolley and heat
exchanger
blocking system**

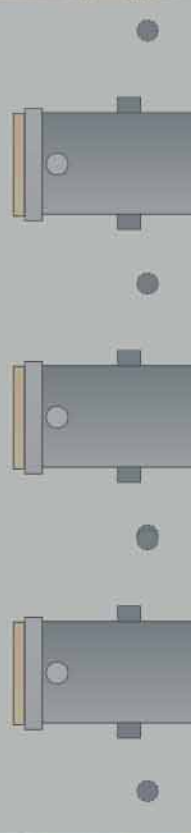
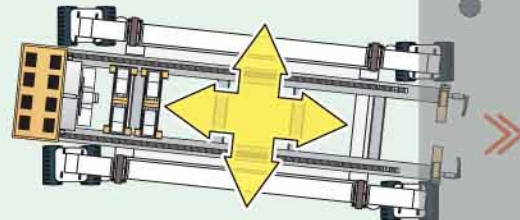
Driving seat

**Front view of
the bundle
extraction with
bundle support
trolley and
hydraulic vice**



Bundle size		1300 65/75	2000 65/75
Length	mm "	6500/7500 (255/295)	6500/7500 (255/295)
Diameter D	mm "	1300 (52)	2000 (79)
Max lifting capacity	T Lb	15 (33000)	30 (66000)

Performances		1300 65/75	2000 65/75
Main carriage pulling/pushing	KN Lb	30 (66100)	50 (110200)
Main carriage speed	m/min ft/min	2 (6.6)	2 (6.6)



Self propelled bundle extractors (on-shore)

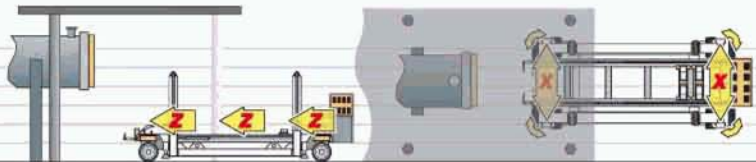
Mef mobil

Extraction sequence

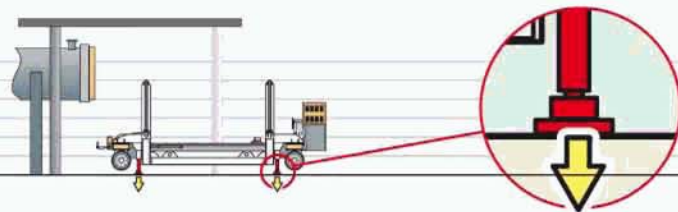
The main operations are shown below in sequence.



- 1 Approximate approach to about 0,5mt (20")



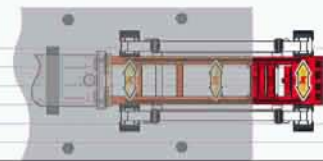
- 2 4 hydraulic feet to stabilize the puller



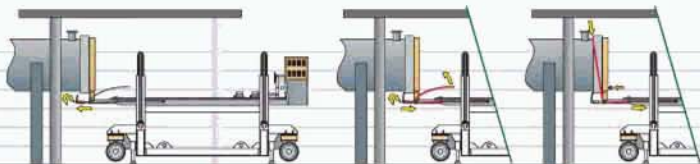
- 3 Servo-assisted positioning and hoisting upto
Y max = 4200mm (165")
Z max = 1500mm (59")



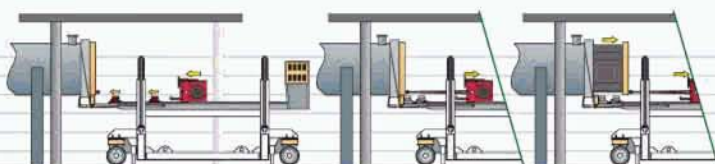
- 4 Servo-assisted positioning up to X max = 200mm (8")

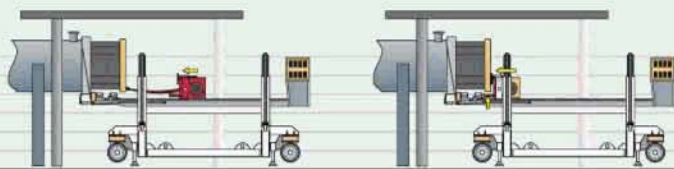
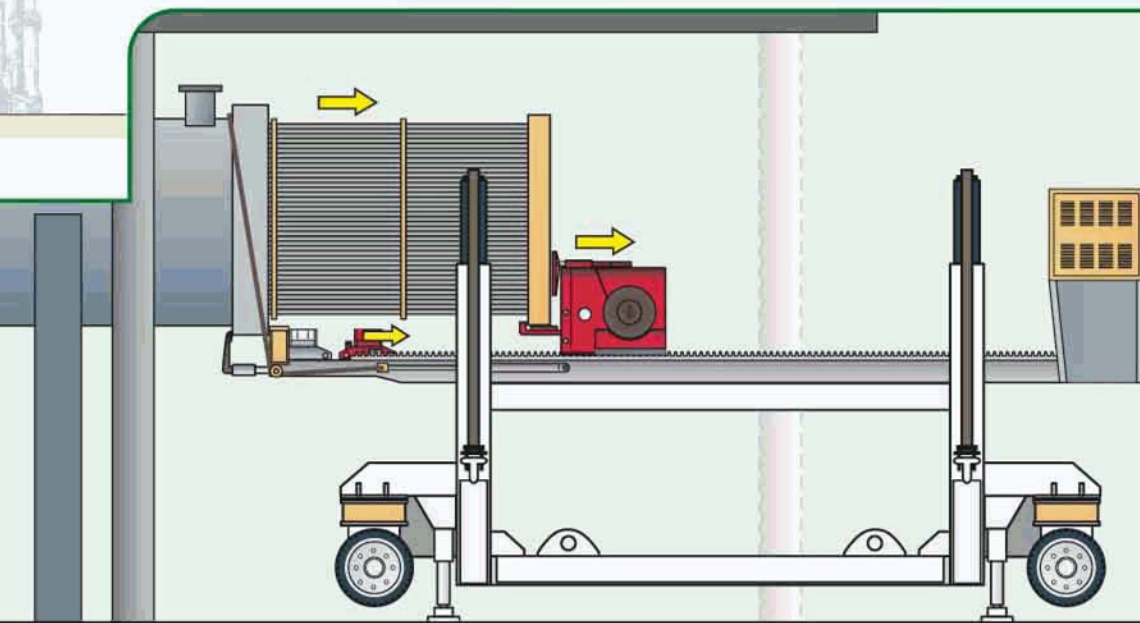


- 5 Shell blocking

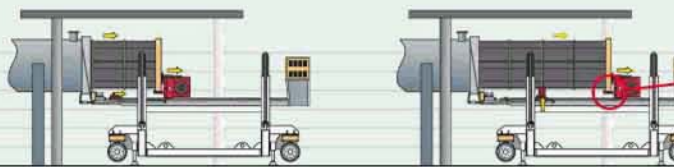


- 6 Trolley feeding
Fastening to eyebolts
Pull with cable

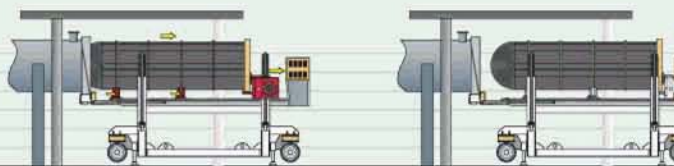




Trolley re-approach
with cable release
Hooking up for extraction
and support **7**



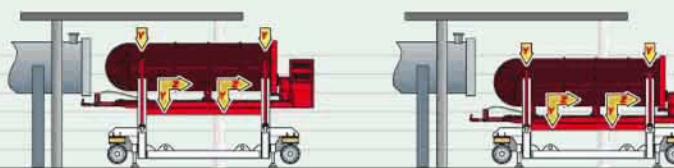
Pulling and support
with independent
hydraulically
controlled trolleys **8**



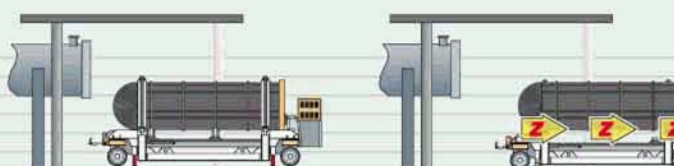
End of pulling **9**



Shell release **10**



Lowering of bundle **11**



Release of
4 hydraulic feet **12**
Towards the
maintenance area

Self propelled bundle extractors (off-shore)

Mef mobil NAVY

Self-positioning Puller, remote controlled for extraction, hoisting and movement of tube bundles

This special version of the **Mef mobil** unit has been produced to meet the need for extraction of tube bundles on petroleum platforms and installations at sea on large vessels known as FPSO. The machine consists of a **Mef mobil NAVY** operative part, produced for this purpose following the most rigid standards concerning shipbuilding. There are many similarities with the **Mef mobil ON SHORE** as a rapid extraction system, however it is equipped with a special device that blocks any oscillations of the bundle due to sea swell. It is very compact and light, suitable for handling in **small spaces**, powered by a mobile power unit called **Van Motor NAVY**.

In view of the unusual nature of the **off-shore application**, the dimensional details of the **Mef mobil NAVY** are based on the design specifications of the installation provided by the final client or engineer in charge of the project in a spirit of the closest collaboration.



Easy to operate

Performing and reliable

Customized design

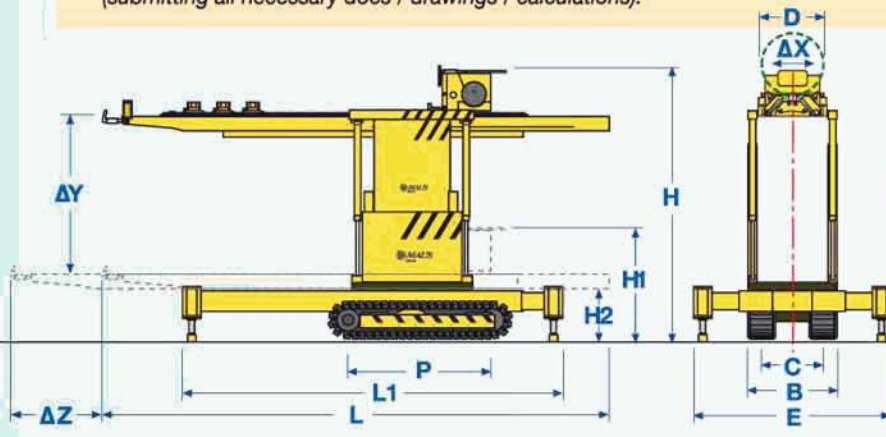
Self-positioning

Motorization

Bundle extractors can be supplied with **Diesel engines** or **air motors**. Motors executions suitable for hazzardous classified working area are available on request (*complete with ATEX conformity declaration*).

Customized executions

Maus (ISO 9001 certified) can supply also customized bundle pullers to meet special requirments from the customer (*submitting all necessary docs / drawings / calculations*).





Hydraulic control



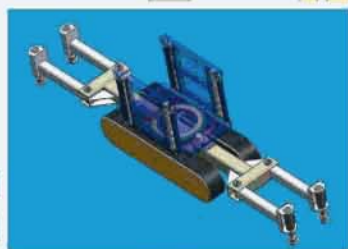
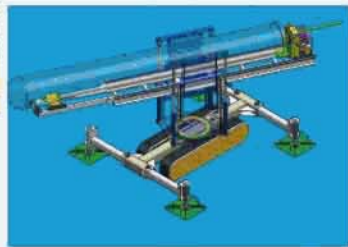
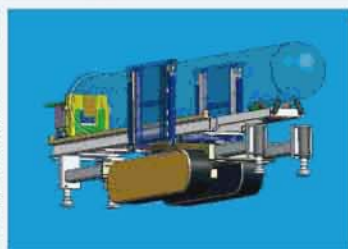
Blocking system to the heat exchangers



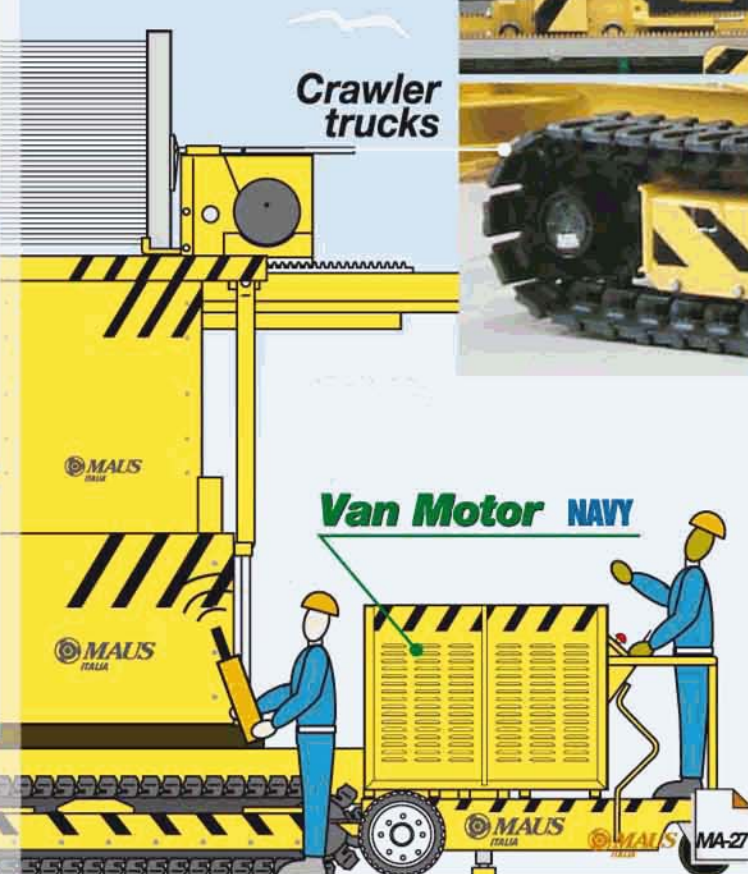
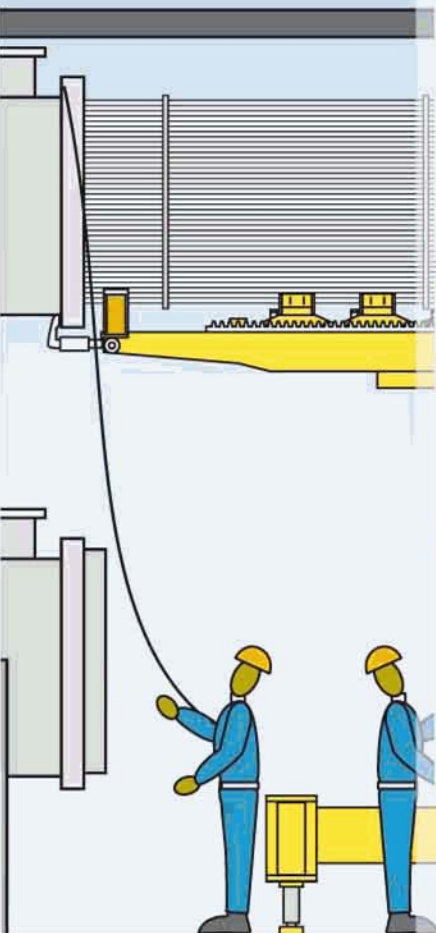
Main carriage



Advanced design



Crawler trucks



Van Motor NAVY

Truck mounted tube bundle puller

Mef truck

Completely independent tube bundle puller assembled on the truck



Mef truck, thanks to the original project of the telescopic rotating column, allows the quick pulling/inserting of the bundle.

Once the truck is positioned, it is easy and **quick to lift** the extractor and to proceed with the extraction.

This system is particularly advised for the maintenance companies which operate continuously in the petrochemical plant field



NO TOW TRUCK

- Quick pulling**
- Performing and reliable**
- Self propelled**
- completely independent**



Dual-Use trolley
Capacity of pulling
on both sides



Main features

Mef truck positioning

Hydraulic stabilizers

Oleodynamic structure with 6 telescopic independent arms

Rotating telescopic column

Complete lifting system assembled on thrust bearing and having a lifting stroke of 6400mm (21 Ft); 600 ÷ 7000 mm (2÷23 Ft). 90° column rotation is permitting the positioning of the extractor on the same axis of the bundle (*working position*)

Extractor frame

The extractor frame is assembled on the lifting fork and it is longitudinally moved by two double effect hydraulic cylinders.

Pulling/pushing

Manual trolleys

They grant a safe support during the extraction/insertion of the bundle.

Pulling/pushing trolley

Bundle extraction on both truck sides thanks to the frame design and especially thanks to the main carriage (complete with anchoring plate on both sides) design with capacity of pulling/pushing on both sides.

Control

Proportional remote control

Control on working operations by radio remote control wireless system.

Manual commands

Emergency push buttons command.



Dual-Use trolley pulling / pushing



Lifting/anchoring plate



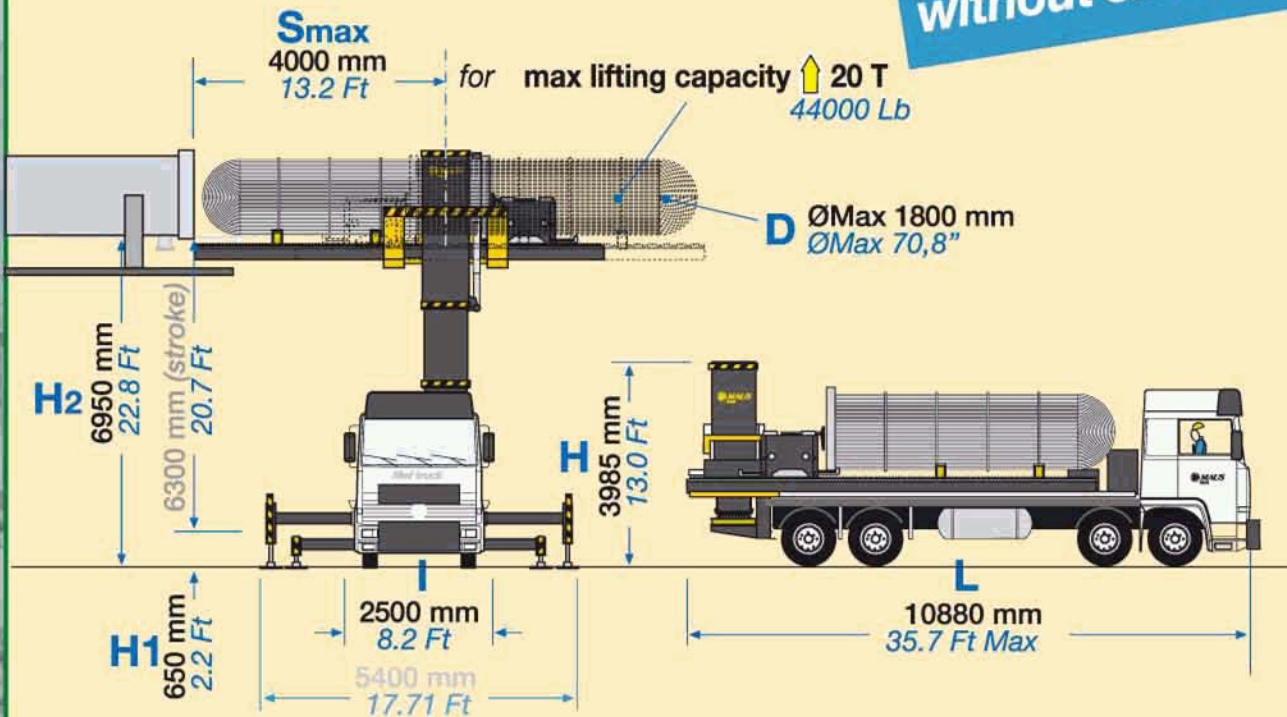
Truck mounted tube bundle puller

Mef truck



Technical features

Fast extraction
without shell hooking



Bundles dimensions and max weight

			1800 75	
Tube sheet O.D.	D	mm	1800	70.8
Length		mm Ft	7500	24.6
Max lifting capacity	↑	T Lb	20	44000

Overall dimensions and weight

			1800 75	
* Truck width	I	mm Ft	2500	8.2
* Height	H	mm Ft	3985	13.0
* Length	L	mm Ft	10880	35.7
Weight		Kg Lb	32900	72500

Performances/working capacities

			1800 75	
** Ledge	S_{max}	mm Ft	4000	13.2
** Bundle elev. (min/max)	H₁/H₂	mm Ft	650/6950	72550
Pulling max speed		m/min Ft/min	2	6.6
Pulling/pushing force	←	T Lb	40	88000

Mef truck
is supplied with:

• VOLVO FM13 360 8x4

Class

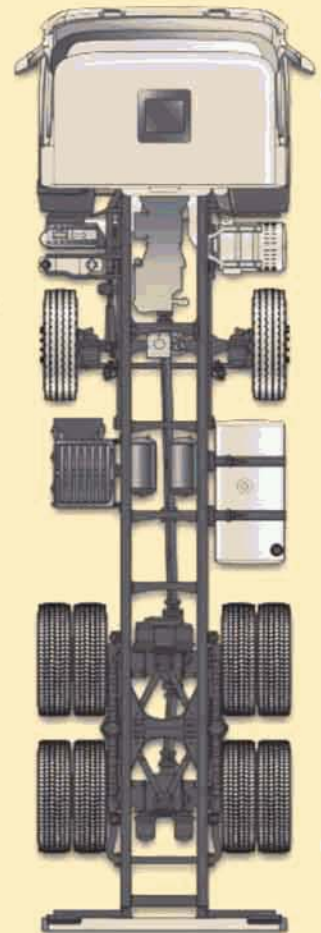
EURO 4 (standard)
EURO 5 (optional)

Engine

D13B 13 litre
inline 6 cylinder
turbo charged
intercooler diesel

Max power

360 HP (270KW)
at 1400-1800 rpm

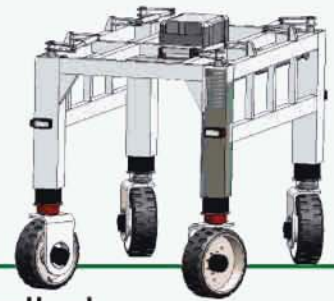


* With extractor closed on the truck

** As to truck axis (measure of working position)

** Measuring at the tube sheet bottom

Bundle transporter



Mammut

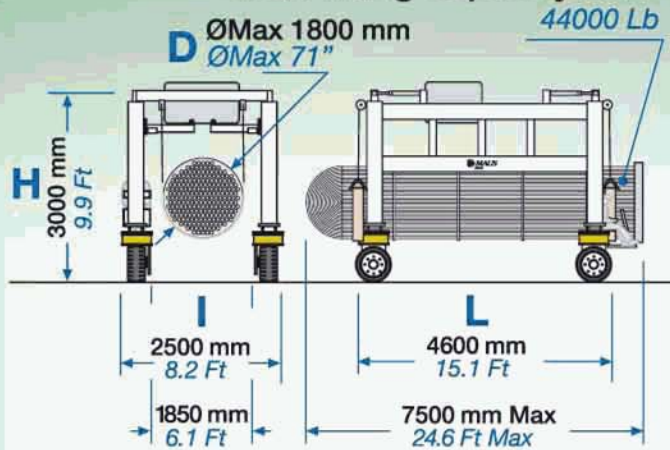
On-site self-propelled heat-exchanger transporter

This specially designed machine provides a brilliant solution to the problem of **moving tube bundles inside the plant** from the point where they are extracted to the **washing yard** or the internal workshop of the plant thus eliminating the use of trucks and mobile cranes and speeding up considerably the loading and unloading operations carried out just a few inches from ground level in **complete safety**.



- Sturdy**
- Less personnel**
- High driveability**
- High level of safety**

max lifting capacity 20 T



Bundles dimensions and max weight

1800
75

Tube sheet O.D.	D	mm	1800	71.0
Length		mm Ft	7500	24.6
★ Max lifting capacity	↑	T Lb	20	44000

Overall dimensions and weight

1800
75

Width	I	mm Ft	2500	8.2
Height	H	mm Ft	3000	9.9
Length	L	mm Ft	4600	15.1
Weight		Kg Lb	5000	11000

Performances/working capacities

1800
75

Max speed (No load)	Kmh Mph	30	19
Max speed (Full load)	Kmh Mph	16	10
Max gradient		10%	

Motorization

1800
75

Motor type: diesel		Lombardini LDW 2204 T	
Cylinders	N°	4	
Displacement	cc	2199	
Boring	mm "	88	3.46
Stroke	mm "	90	3.56
Rpm		3000	
Power	Kw	49.2	
Maximum Torque	Kg/m Lb/Ft	18,7	135
Oil capacity	Lt US Gal	4,50	1.19

★ Also available on request for 40 T (88000 Lb)

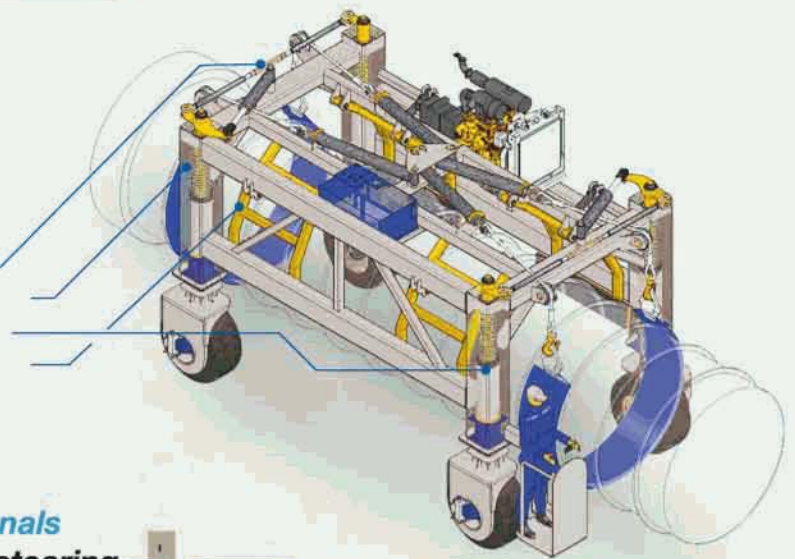
Mammut

Standard supply

- Lifting brackets
- Standing driving place
- Two steering driving wheels

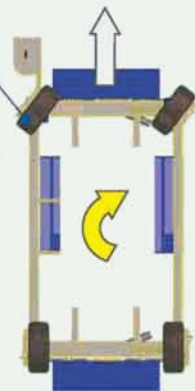
Optionals supply

- Rear steering
- Damping system of rear wheels
- Damping system of front wheels
- Bundle clamping jaws
- Driving seat
- Portable radiocommand



Two steering driving wheels

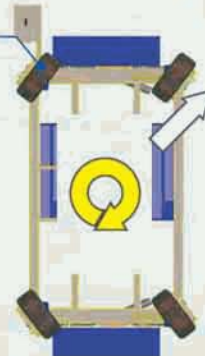
Standard supply for base execution.



Optionals

Four steering driving wheels

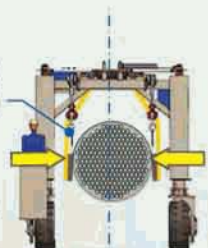
Full steering allows a lower ray with quicker movements. Moreover, it is possible to move transversally, very effective during the positioning.



Optionals

Anti-oscillation hydraulic vices

Bundle locking for eliminating the oscillation during the transport, allowing a safety and rapid movement.



Double portal frame

Designed in accordance with Class FEM A3 of the European Movement Federation and in respect of CE 98/33 rules.

Hydraulic lifting

The synchronization of hydraulic cylinders movement in combination with the ropes of transmission is controlled by manual levers at the driving seat.

Superelastic tyres

They reduce sensibly the noise, the vibrations, the deformations in full-load and the rolling friction with consequent fuel reduction. Extremely cut resistant for a nearly nul maintenance.

Optionals

Four driving wheels, obtained with hydraulic motors of self-bracking type directly flanged and integrated on them

Damping system, allowing the tyre having always grip on the ground

Particularly indicated for disconnected grounds

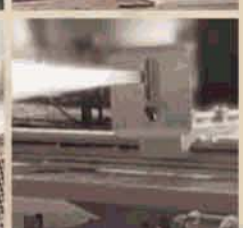




Tube bundle cleaning

After extraction the tube bundle is taken to the **area where the high pressure water washing equipment is located**. Maus Italia has a complete range of machines for **automatic internal and external cleaning of the tubes** in the tube bundles.

These machines are indispensable for cleaning exchangers on an industrial scale. The **simultaneous use of a number of high pressure water jets** ensures that the cleaning is **rapid and thorough**.

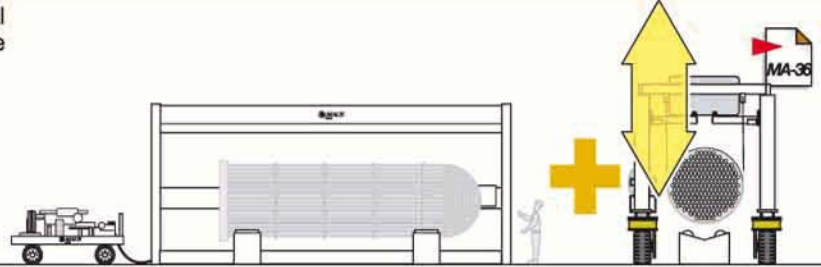


BCL-X + Idroscal + Mammut

Robot for the external automatic cleaning of tube bundles.

These machines, produced in electrowelded steel, automatically washes the outside of the tube bundle, which is placed on motorized rollers, and disintegrate encrusted scale with powerful jets of water.

Together with the powerful pump of the **Idroscal 350** or **Idroscal 400** series, this is the equipment needed to deal with bundles one after another during plant maintenance shutdowns.

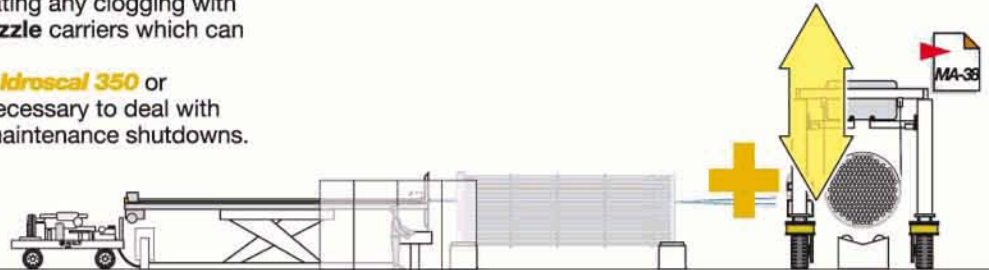


BCL-IN+ Idroscal + Mammut

Robot for the internal automatic cleaning of tube bundles.

These machines, produced in electrowelded steel, automatically washes the inside of the tube, disintegrating any clogging with powerful jets of water applied by **4-6 nozzle carriers** which can move simultaneously on **3 axes**.

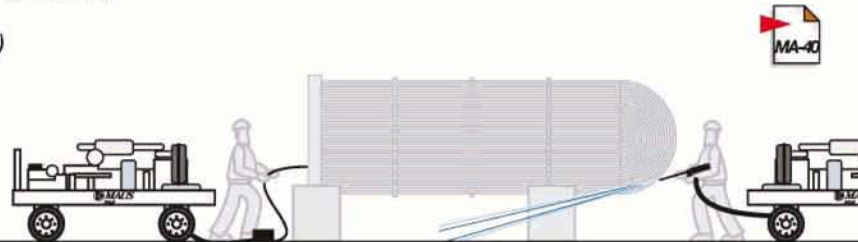
Together with the powerful pump of the **Idroscal 350** or **Idroscal 400** series, this equipment is necessary to deal with bundles one after another during plant maintenance shutdowns.



Idroscal-pump

Hydrodynamic pump for the external/internal manual cleaning with high pressure

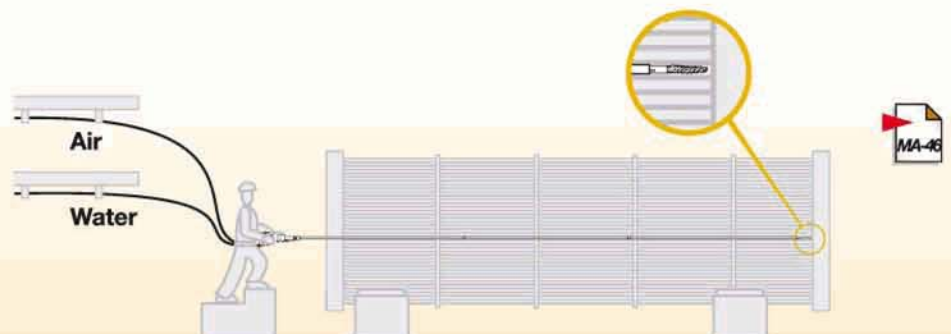
Indispensable element for the heat exchangers cleaning. Maus Italia suggests different sizes according to the use and to the requested services, necessary to grant scale removal. Indicatively, **Idroscal 110** (with installed power 110 Kw) offers a service range which is normally enough for solving more frequent problems.



Hardscal

Pneumatic shafting tube cleaners for heat-exchangers tubes

The pneumatic shafting tube cleaners with tool water cooling system are the simplest and most effective solution for cleaning the heat exchanger tubes, even when completely clogged.



STD execution for bundles up to
 1600x8000x25TonMax 63"x315"x55000LbMax
mm mm

High Pressure external cleaning robot

BCL-X

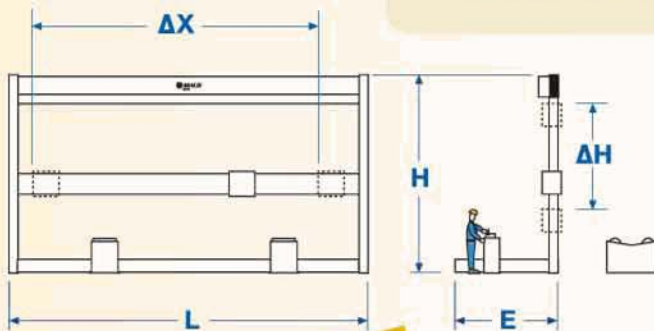
Automatic high Pressure external cleaning robot

This equipment automatically washes the tube bundle which is placed on motorized rollers, disintegrating the scale with powerful jets of water which are moved longitudinally and sideways through the tube bundle. Together with a powerful modern pump of the **Idroscaal** series with incorporated speed reducer, this is the equipment needed to deal with bundles one after another during plant maintenance shutdowns. Designed and developed for high technology cleaning of exchangers. The general features and size of the **BCL-X**, apart from the standard model presented, are based on the specific engineering situation.



Easy to use
Safe and reliable
Minimum maintenance
 Carrier box motion

Hydraulic pack distributor
controlling 3 movements.
STD supply EEX Electric motor;
Diesel driving units on request



Support rollers for heat exchangers

Set of rollers: 1 motorized roller and 1 idle.



BCL-X Heavy duty L-shape frame

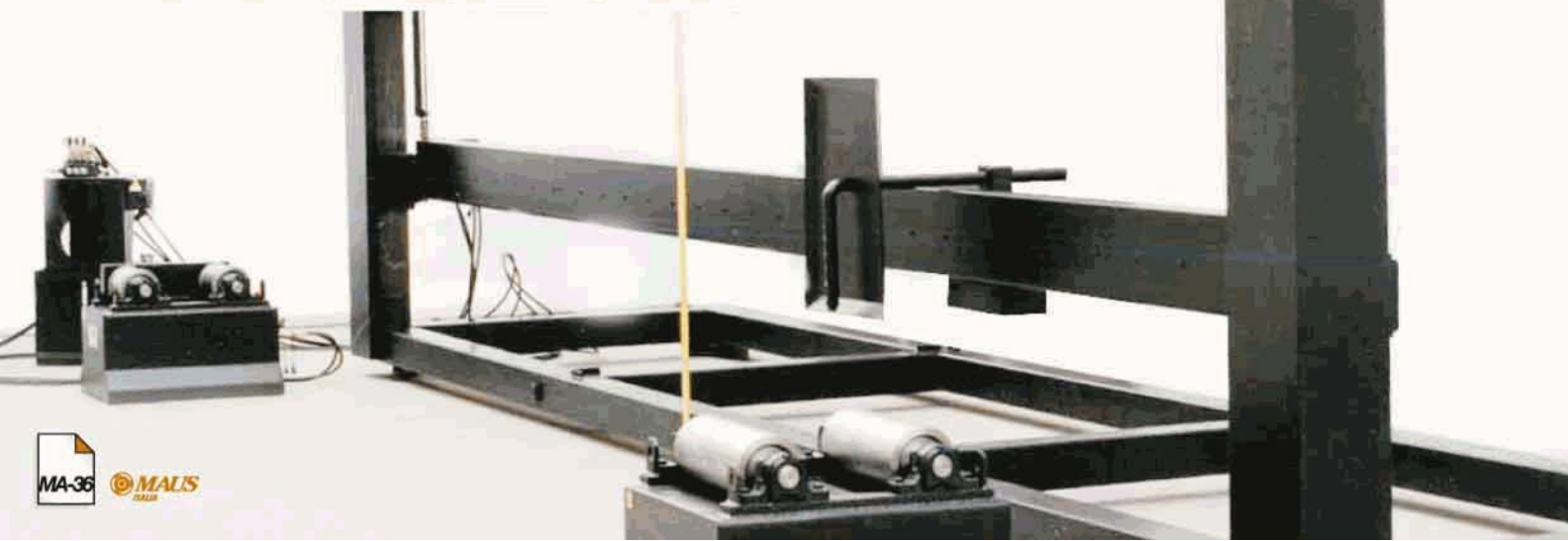
Length	L	mm Ft	8500	28.0	
Horizontal stroke	ΔX	mm Ft	8000	26.2	
Height	H	mm Ft	2310	7.6	
Vertical stroke	ΔH	mm Ft	1600	5.2	
Width	E	mm Ft	2100	6.9	
Weight		Kg Lb	2800	6200	

Rollers SET

			STD	On request
Weight	Kg Lb	800	1764	950 2094
Max lifting capacity	T Lb	30	66000	45 99000

Customized executions

Maus organization (ISO 9001 certified) can supply customized bundle cleaners to meet special requirements from the customer, submitting all necessary docs / drawings / calculations.





Operating procedure

Step 1

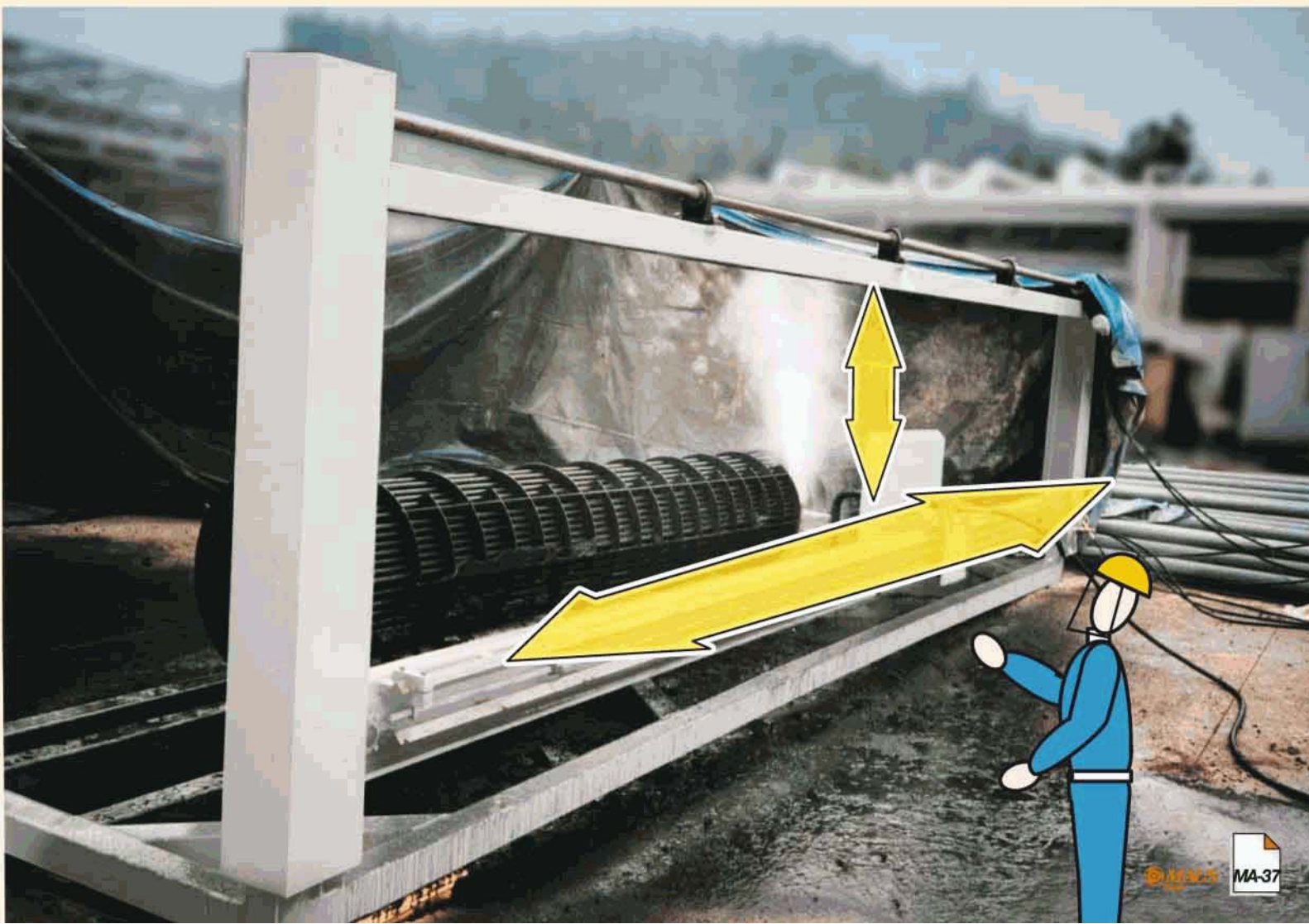
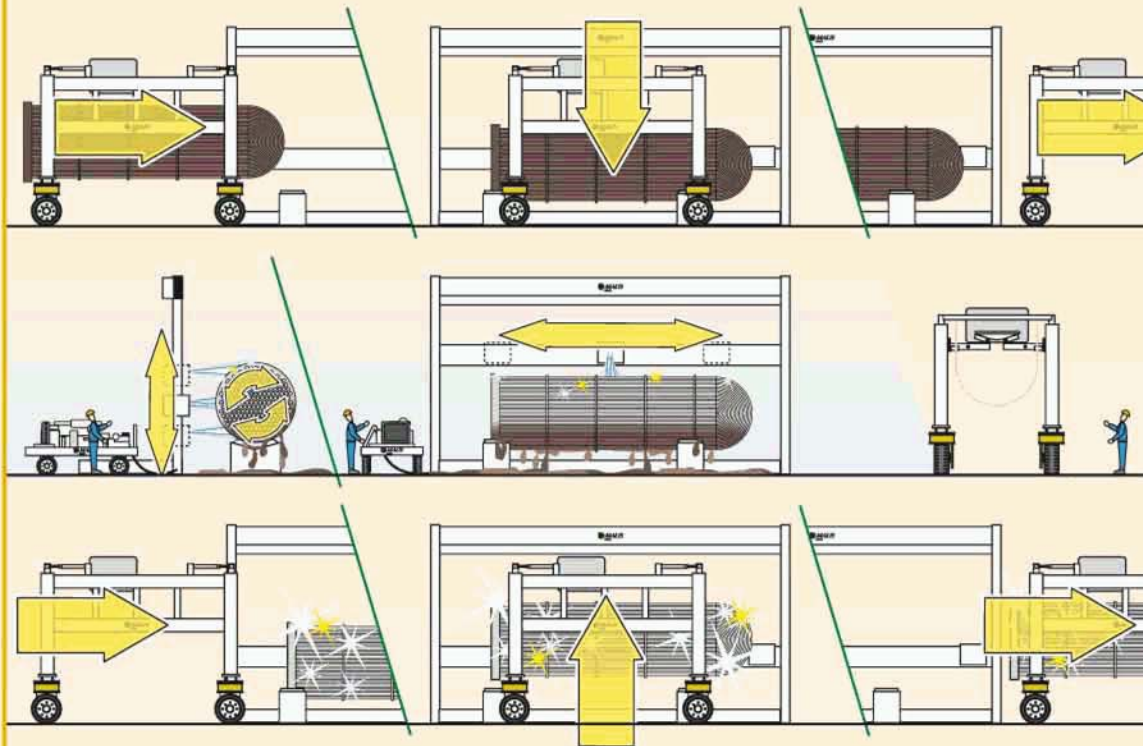
The tube bundle is positioned on the rollers in front of the **BCL-X** using the **Mammut** transporter.

Step 2

The machine moves on the horizontal and vertical axes while the tube bundle is rotated by the motorized rollers enabling the water jets to disintegrate the scale.

Step 3

When the washing is finished the tube bundle is picked up again by the **Mammut** and taken back on site for insertion.



Range of tubes
I.D. from 10 to 40mm (3/8" to 1.1/2")

High Pressure internal cleaning robot



BCL-IN

Multiple nozzle carrier robot for the **automatic** internal cleaning of tube bundles

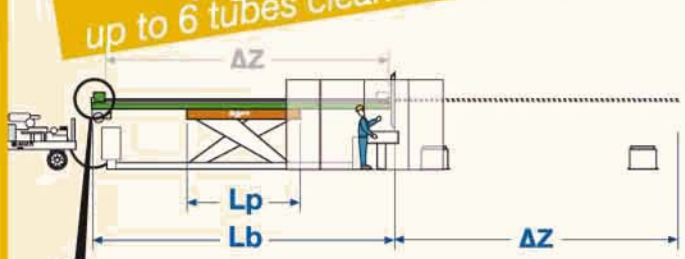
The robot **automatically washes** the tube bundle, lying on the motorized rollers, disintegrating encrusted scale with powerful jets of water brought inside the tubes by nozzle carriers.

Together with a powerful modern pump of the **Idroscal** series with incorporated speed reducer, this is the equipment needed to deal with bundles one after another during plant maintenance shutdowns. Designed and developed for high technology cleaning of exchangers. The general features and size of the **BCL-IN**, apart from the standard model presented, are based on the specifications of the engineering department.

Easy to use
Safe and reliable
Minimum maintenance
Adjustable (tube length and pitch)

Manual commands
for robot cleaning
on power pack

High performing
up to 6 tubes cleaned in 14sec.



Variable number of rigid lances: 2 - 4 - 6

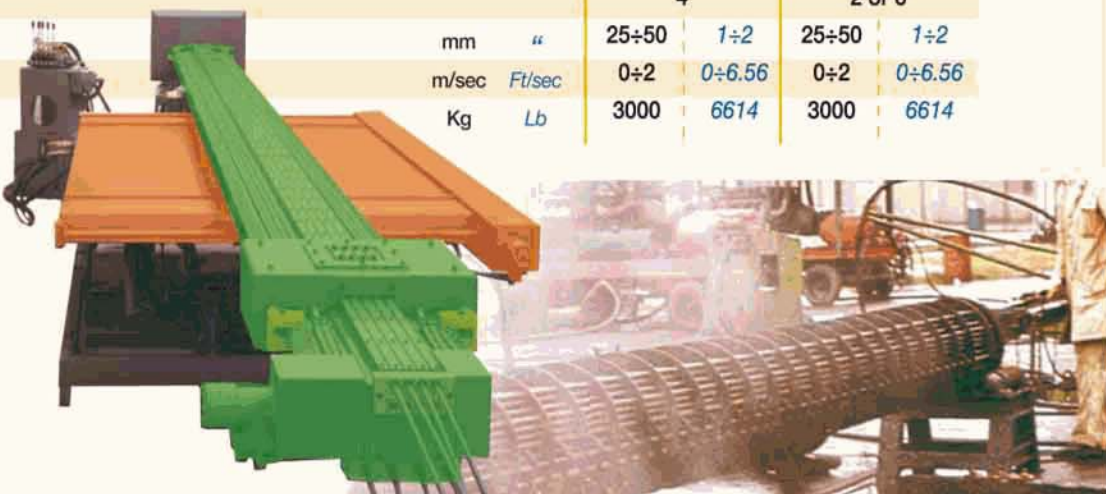
Support rollers for heat exchangers 

STD execution for bundles up to
1600x7500x25Ton_{Max} 63"x295"x55000L_{bMax}

				STD		Optional	
Lances holder bean	Lances holder bean Length	Lb	mm Ft	8000	26.2	10500	34.4
	Horizontal Lances holder bean stroke	ΔX	mm Ft	1400	4.6	1400	4.6
	Lances holder bean Stroke (inside tubes)	ΔZ	mm Ft	7500	24.6	10000	32.8
platform	Lances Length		mm Ft	7500	24.6	10000	32.8
	Lifting platform Length	Lp	mm Ft	3000	9.9	3000	9.9
	Lifting platform width	E	mm Ft	1800	6.0	1800	6.0
	Lifting platform height (retracted: level min.)	Hmin	mm Ft	600	2.0	800	2.6
	Lifting platform height (extended: level Max.)	H	mm Ft	2200	7.2	3800	12.4
	Vertical platform stroke (level Max. - level min.)	ΔH	mm Ft	1600	5.2	3000	9.8
	Number of rigid lances				4		2 or 6
Adjustable tubes pitch		mm "	25÷50	1÷2	25÷50	1÷2	
Main carriage speed		m/sec Ft/sec	0÷2	0÷6.56	0÷2	0÷6.56	
Weight (platform with beam)		Kg Lb	3000	6614	3000	6614	

Customized executions

Maus organization (ISO 9001 certified) can supply customized bundle cleaners to meet special requirements from the customer, submitting all necessary docs / drawings / calculations.





Operating procedure

Step 1

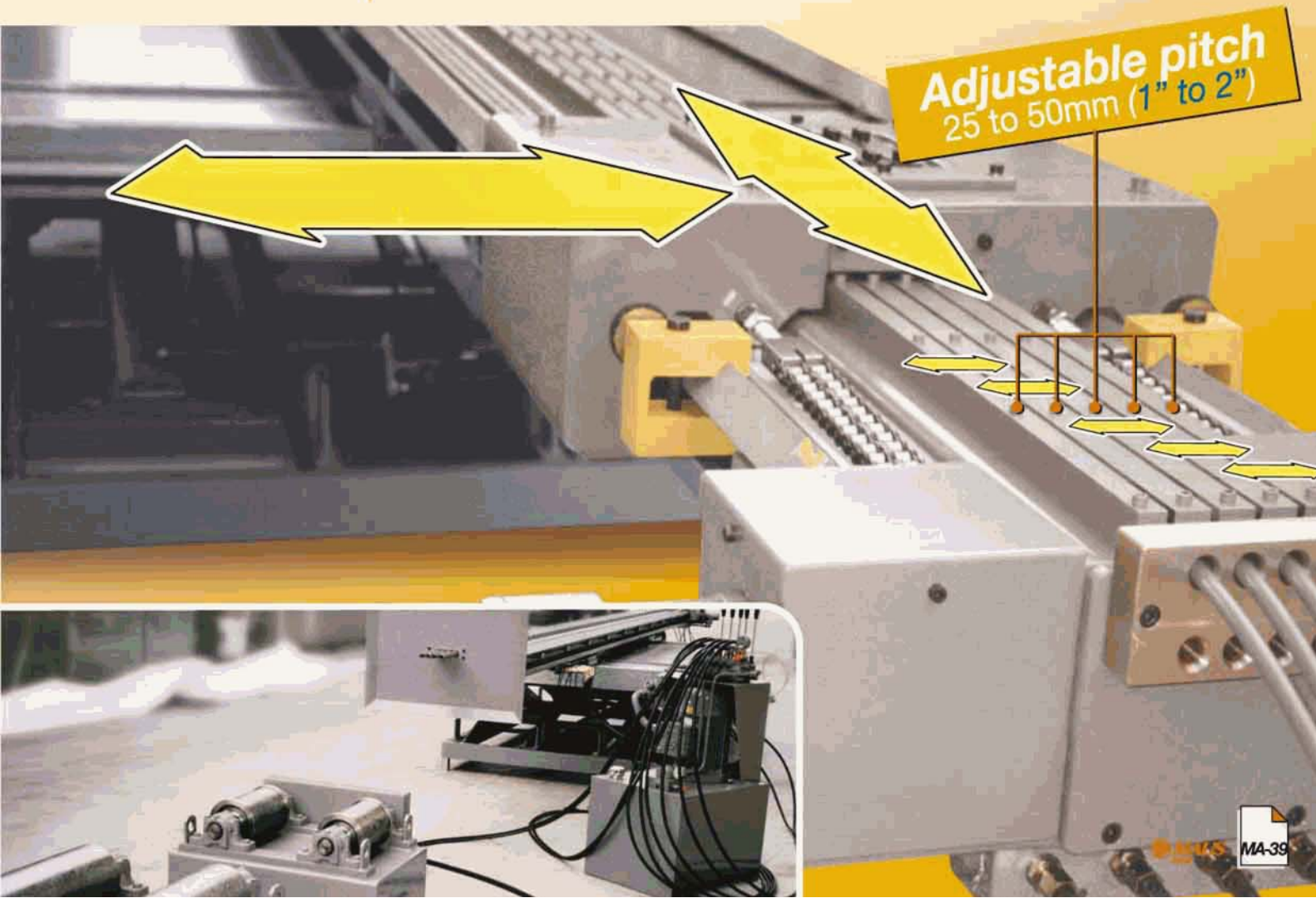
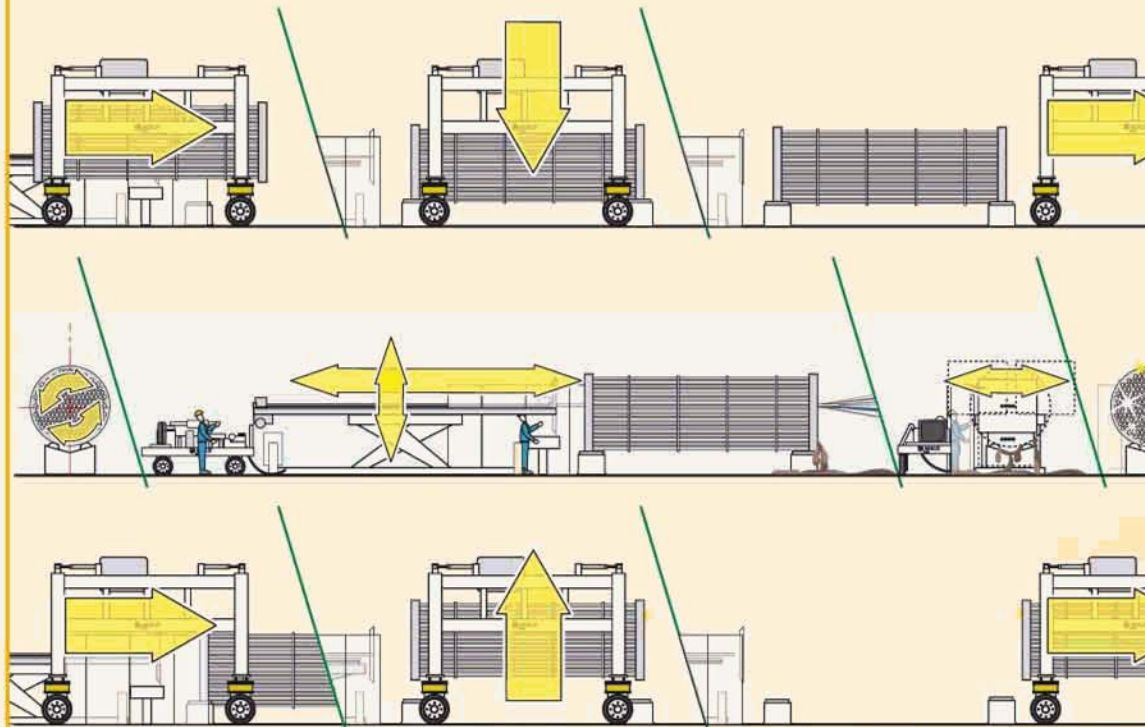
The tube bundle is positioned on the rollers in front of the **BCL-IN** using the **Mammut** transporter.

Step 2

The rows of tubes to be cleaned are aligned with the row of nozzle carriers by the motorized rollers. Once the nozzle carriers have been positioned at the inlets of the tubes by the servo system they can be moved forward for descaling the tube interiors.

Step 3

When the washing is finished the tube bundle is picked up again by the **Mammut** and taken back on site for insertion.



High Pressure internal/external manual cleaning pumps

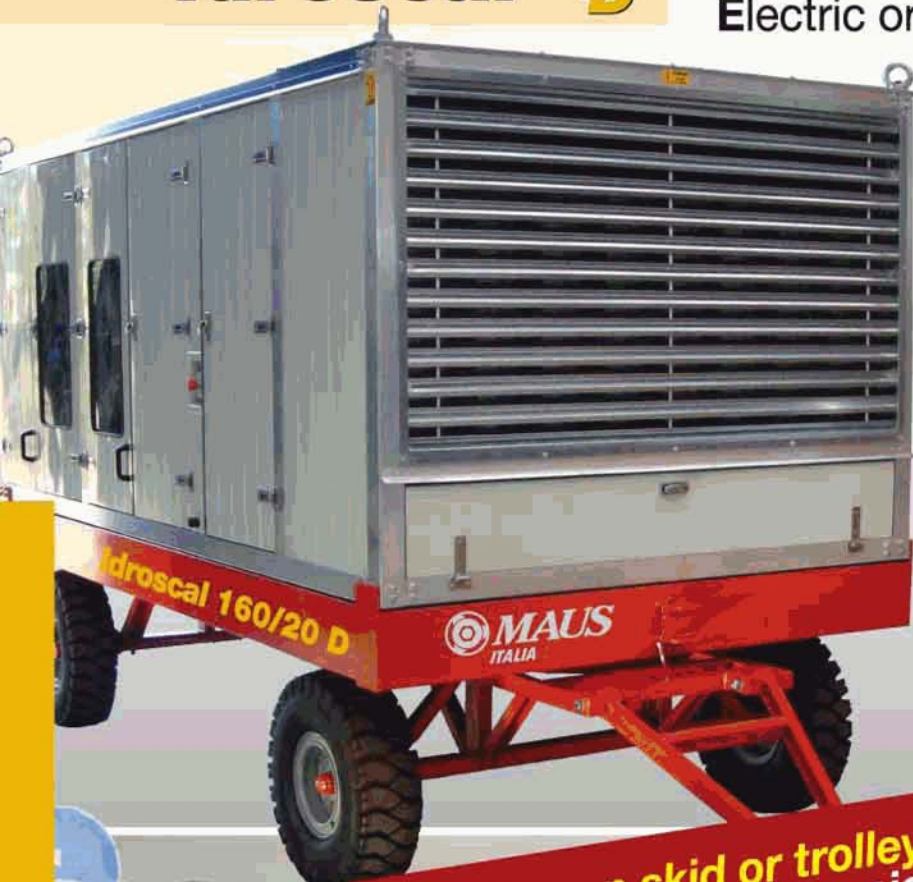
Idroscal NAVY

Idroscal pumps can be supplied on request in NAVY version with suitable motors for hazardous classified working area (complete with Atex conformity declaration)



Idroscal $\begin{matrix} E \\ D \end{matrix}$

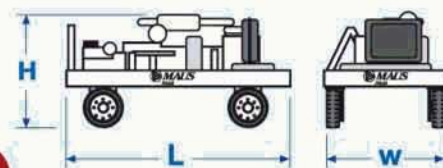
Hydrodynamic pump descalers for heat-exchangers, with Electric or Diesel motor.



Hydrodynamic descalers for heat exchangers are an indispensable supplement to our already wide range of machines for working in the chemical industry, refineries and petrochemical plants. Our units are supplied completely skid assembled (on-wheels on request) and are including the necessary safety devices and controls (on request) to guarantee the perfect running for a long working life. The hydrodynamic units are basically including a reciprocating triplex plunger pump c/w piping and fittings, manometer, mechanical pressure gauge and safety valve; the assembling pumps-driving units is made with flexible joint adequately protected.

Speed reducer incorporated

Stainless steel head



Available on skid or trolley and also soundproof version



Working accessories

External tube cleaning

Internal tube cleaning



H.P. hose



Available in pieces of 20 mt (65.6 Ft). F/F joined 9,5 mm (3/8"), 22x1.5 mm (0.87"x 0.06), 19,0mm (3/4") with 2, 4 and 6 reinforcement braids in steel wire. In accordance with SAE and DIN standards.

High pressure gun



With automatic valve and safety block in accordance with German standards. 1000 bar (14500 psi).

Nozzle for high pressure gun



Made in INOX steel and in different shapes according to the job and the kind of scaling (Flat or round).

Spare parts service



The piston pumps have a high performance and reliability, but need expert maintenance and original spare parts.

Other nozzles

Rotating nozzle



Nozzle with frontal rotating jet and protective cover. Max. pressure 500/1000 bar (7250/14500 psi)

Revolving nozzle "gir-o-jet"



Self-blocking jets also with sapphire insert and jets in semi-radial position or combi.

Nozzle with cutter



Available in various diameters for combining a mechanical effect with the hydrodynamic action.

H.P. hose



Available in pieces of 20 mt (65.6 Ft). F/F joined 9,5 mm (3/8"), 22x1.5 mm (0.87"x 0.06), 19,0mm (3/4") with 2, 4 and 6 reinforcement braids in steel wire. In accordance with SAE and DIN standards.

Foot valve



In INOX steel. It's necessary to the operator handling the lances for internal tubes cleaning.

Flexible lances for tubes



Available size from O.D. 9,5mm (0.37"), up to O.D. 18mm (0.71"). Max. working pressure over 4350 bar (63000 psi).

Nozzle for flexible lances



In INOX steel with rear jets. Position and number of jets upon request. Available sizes from O.D. 100mm (3.93").

High Pressure internal and external manual cleaning pumps



Idroscal

Pumps main features and model choice examples

The selections of the right pump size is obtained by consulting the below table, where looking for the needed combinations of performance (capacity and pressure) is obtained the pump plungers diameter and the pump power; these to data define the selected pump as per given examples.

Pump model selection

Examples

- The model of one pump given 97 Lt/min (25.6 US.Gal/min) capacity with a pressure of 810 Bar (11750 psi) will be:

Idroscal 160/28

E Electric
D Diesel

- Operating manual pistol for external washing requires 54 Lt/min (14.3 US.Gal/min) with a pressure of 785 Bar (11385 psi); the selected model will be:

Idroscal 90/24

E Electric
D Diesel

For BLC

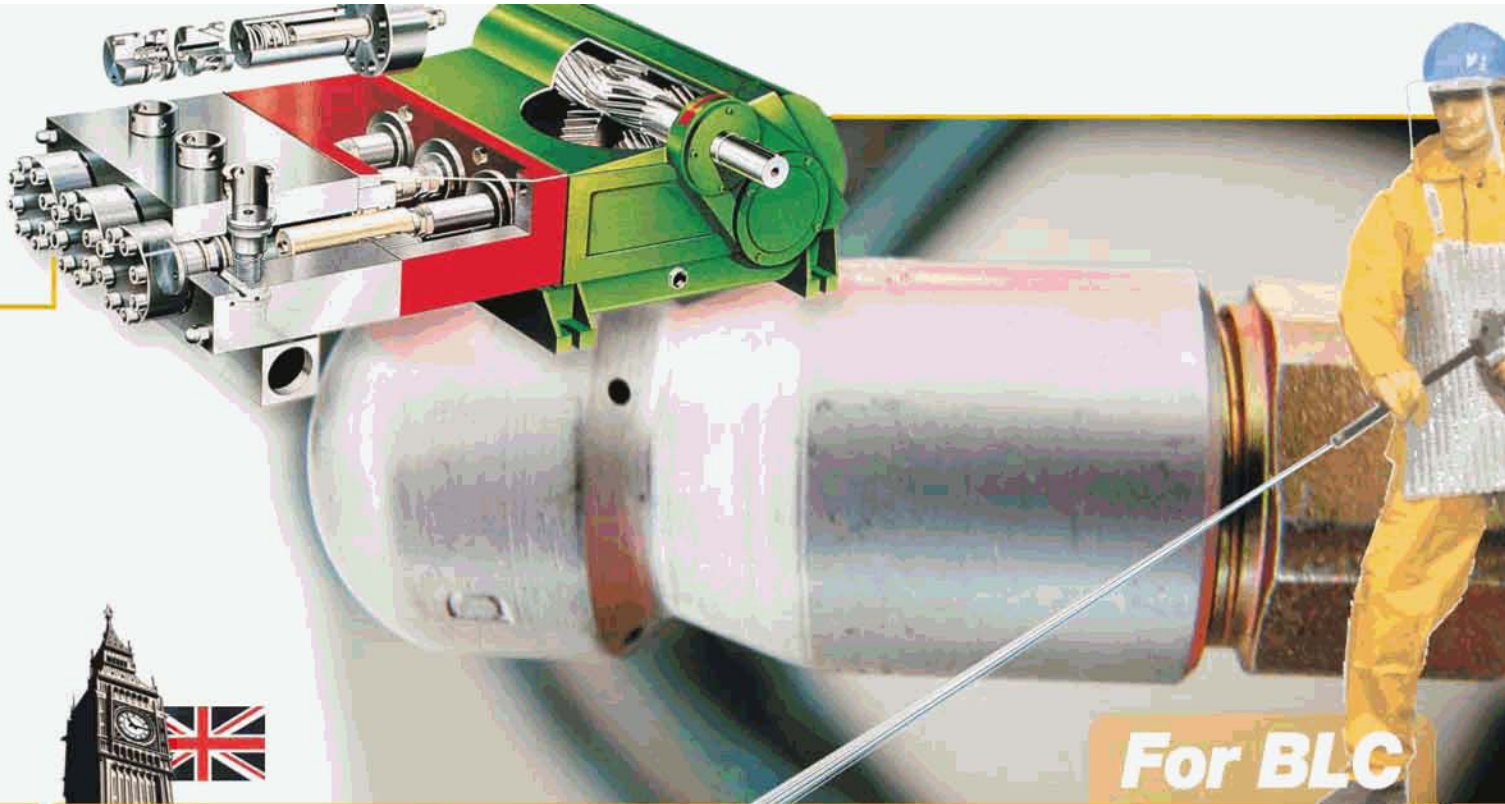
Pumps	Cod.	mm	45 Kw		90 Kw		110 Kw		130 Kw		160 Kw		350 Kw		400 Kw	
			Debit	Pressure	Debit	Pressure	Debit	Pressure	Debit	Pressure	Debit	Pressure	Debit	Pressure	Debit	Pressure
	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar	Lt/min	Bar
14	14	15	1530	18	2300	-	-	-	-	-	-	-	-	-	-	-
16	16	20	1170	24	2000	-	-	-	-	-	-	-	-	-	-	-
18	18	25	940	30	1395	35	1630	38	1750	40	2000	-	-	-	-	-
20	20	31	760	37	1130	43	1305	47	1430	49	1600	-	-	-	-	-
22	22	37	630	45	930	52	1075	57	1180	59	1300	-	-	-	-	-
24	24	44	530	54	785	62	905	68	995	71	1100	-	-	-	-	-
26	26	52	450	63	665	73	770	79	845	83	950	98	1880	98	2000	-
28	28	60	390	73	575	84	665	92	730	97	810	114	1620	114	1820	-
30	30	69	340	84	500	97	560	106	635	111	710	131	1440	131	1580	-
32	32	78	295	96	440	110	505	120	560	126	620	149	1265	149	1400	-
36	36	99	235	121	345	139	400	152	440	160	490	188	1000	188	1100	-
40	40	122	190	150	4061	172	325	188	355	197	400	232	810	232	900	-
45	45	155	150	190	280	218	255	238	280	250	315	294	640	294	705	-
50	50	191	120	234	180	269	205	294	225	309	255	363	505	363	560	-
55	55	232	100	283	150	326	170	355	185	374	210	439	420	439	465	-
60	60	-	-	-	-	387	145	423	155	445	180	523	350	523	390	-
65	65	-	-	-	-	-	-	-	-	-	-	613	300	613	330	-
70	70	-	-	-	-	-	-	-	-	-	-	711	260	711	285	-
75	75	-	-	-	-	-	-	-	-	-	-	816	225	816	250	-
85	85	-	-	-	-	-	-	-	-	-	-	1049	175	1049	195	-
95	95	-	-	-	-	-	-	-	-	-	-	1310	140	1310	155	-

Unit	Idroscal 45 Kw	90 Kw	110 Kw	130 Kw	160 Kw	350 Kw	400 Kw
	Skid mounted						
R.p.m.	650	530	435	475	500	440	440
Electric Dim (LxwxA) mm	2100x3000x1100	2000x1300x1100	2200x1300x1200	2200x1300x1200	2200x1300x1200	-	-
Peso Kg	700	1000	1400	1400	1700	-	-
Diesel Dim (LxwxA) mm	2300x1400x1100	3000x1500x1500	3000x1500x1500	3000x1500x1500	3000x1500x1500	4000x2000x2000	4000x2000x2000
Weight Kg	1100	1400	1500	1600	1500	3500	3500
Lubrication	Oil bath	Forced circulation	Oil bath	Forced circulation	Forced circulation	Forced circulation	Forced circulation

On request:

- Higher power pumps
- On trolley with sound proof version
- NAVY Version





For BLC

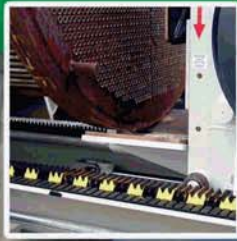
Pumps		45 Kw		90 Kw		110 Kw		130 Kw		160 Kw		350 Kw		400 Kw	
Cod.	inches	US gpm	Psi	US gpm	Psi	US gpm	Psi	US gpm	Psi	US gpm	Psi	US gpm	Psi	US gpm	Psi
14	0.55	3.96	22191	4.76	33359	-	-	-	-	-	-	-	-	-	-
16	0.63	5.28	16969	6.34	29007	-	-	-	-	-	-	-	-	-	-
18	0.71	6.60	13633	7.92	20233	9.25	23641	10.04	25381	10.57	29007	-	-	-	-
20	0.79	8.19	11023	9.77	16389	11.36	18927	12.42	20740	12.94	23206	-	-	-	-
22	0.87	9.77	9137	11.89	13488	13.74	15592	15.06	17114	15.59	18855	-	-	-	-
24	0.94	11.62	7687	14.27	11385	16.38	13126	17.96	14431	18.76	15954	-	-	-	-
26	1.02	13.74	6526	16.64	9645	19.28	11168	20.87	12256	21.93	13779	25.89	27267	25.89	29007
28	1.10	15.85	5656	19.28	8340	22.19	9645	24.30	10588	25.62	11748	30.12	24496	30.12	26397
30	1.18	18.23	4931	22.19	7252	25.62	8412	28.00	9210	29.32	10298	34.61	20885	34.61	22916
32	1.26	20.60	4279	25.36	6382	29.06	7324	31.70	8122	33.29	8992	39.37	18347	39.37	20305
36	1.42	26.15	3408	31.96	5004	36.72	5802	40.15	6382	42.27	7107	49.67	14504	49.67	15954
40	1.57	32.23	2756	39.63	4061	45.44	4714	49.66	5149	52.04	5802	61.29	11748	61.29	13053
45	1.77	40.95	2176	50.19	3191	57.59	3698	62.87	4061	66.04	4569	77.67	9282	77.67	10225
50	1.97	50.46	1740	61.82	2611	71.06	2973	77.67	3263	81.63	3698	95.89	7324	95.89	8122
55	2.17	61.29	1450	74.76	2176	86.12	2466	93.78	2683	98.80	3046	115.97	6091	115.97	6744
60	2.36	-	-	-	-	102.23	2103	111.74	2248	117.56	2611	138.16	5076	138.16	5656
65	2.56	-	-	-	-	-	-	-	-	-	-	161.94	4351	161.94	4786
70	2.76	-	-	-	-	-	-	-	-	-	-	187.83	3771	187.83	4134
75	2.95	-	-	-	-	-	-	-	-	-	-	215.56	3263	215.56	3626
85	3.35	-	-	-	-	-	-	-	-	-	-	277.12	2538	277.12	2828
95	3.74	-	-	-	-	-	-	-	-	-	-	346.06	2030	346.06	2248

Unit	Idroscal 45 Kw	90 Kw	110 Kw	130 Kw	160 Kw	350 Kw	400 Kw
	<i>Skid mounted</i>						
	R.p.m.	650	530	435	475	500	440
Electric	Dim (LxWxA) Ft	6.89 x 9.94 x 3.61	6.56 x 4.26 x 3.61	7.22 x 4.26 x 3.94	7.22 x 4.26 x 3.94	7.22 x 4.26 x 3.94	-
	Peso Lb	1540	2200	3080	3080	3740	-
Diesel	Dim (LxWxA) Ft	7.55 x 4.59 x 3.61	9.84 x 4.92 x 4.92	9.84 x 4.92 x 4.92	9.84 x 4.92 x 4.92	9.84 x 4.92 x 4.92	13.12 x 6.56 x 6.56
	Weight Lb	2420	3080	3300	3520	3300	7720
	Lubrication	Oil bath	Forced circulation	Oil bath	Forced circulation	Forced circulation	Forced circulation

On request:

- Higher power pumps
- On trolley with sound proof version
- NAVY Version



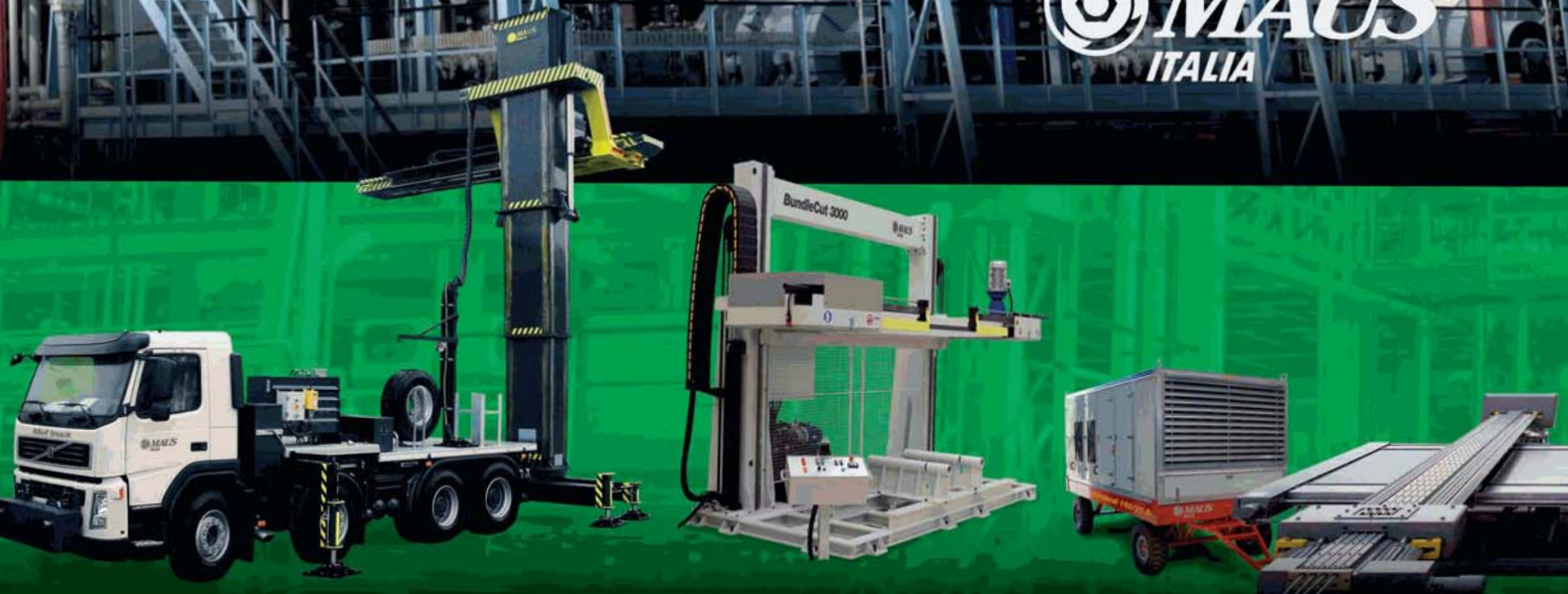


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 **MAUS**
ITALIA



Mechanical internal cleaning (straight tubes only)

Hardscal



Simple to use
Versatility

Pneumatic shafting tube cleaners for tube bundle heat-exchangers

The pneumatic shafting tube cleaners with tool water cooling system are the simplest and most effective solution to clean the heat exchanger tubes even when completely obstructed. The continuous flow of water (max pressure 20 Bar - 290 psi) through holes in the tools provides cooling during the process and helps to drain away the material removed from the tubes.

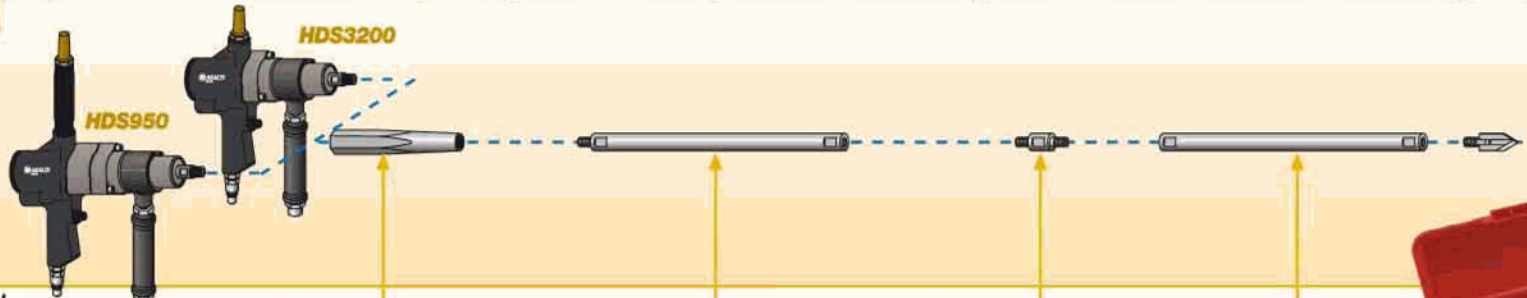


Hardscal

HDS3200

HDS950

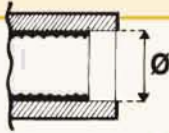
		HDS3200		HDS950	
R.p.m.		3200	3200	950	950
Tube I.D. (from-to)	mm "	9,5 ÷ 25,4	3/8" ÷ 1"	9,5 ÷ 44,4	3/8" ÷ 1.3/4"
Dimensions L x D x H/H1	mm "	242 x 66 x 300/400	9.5"x 2.6"x 11.8"/15.8"	277 x 66 x 300/400	10.9"x 2.6"x 11.8"/15.8"
Weight	Kg Lb	3,5	7,8	4,5	10
Pressure	Bar Psi	6-7	90-100	6-7	90-100
Air consumption	Lt/min Cfm	840	30	840	30



mm "		Drive coupling		Drive shaft			Shaft coupling		Driven shaft	
mm	"	Model	Thread	Model	mm Ø	Thread	Model	Thread	Model	Thread
7,39 ÷ 9,09	0.291 ÷ 0.358	MAT-337-A	5/8" NF x 1/4" NF	MCC-336	6,35	1/4" 1/4" NFM x 10-32 F	MCC-334	10-32 M	MCC-335	10-32 FX 10-32 F
9,09 ÷ 10,67	0.359 ÷ 0.420	MAT-333-A	5/8" NF x 5/16" NF	MCC-332	7,94	5/16" 5/16" NFM x 1/4" NFF	MCC-330	1/4" NFM	MCC-331	1/4" NFF x 1/4" NFF
10,67 ÷ 12,27	0.421 ÷ 0.483	MAT-321-A	5/8" NF x 3/8" NF	MCC-324	9,52	3/8" 3/8" NFM x 1/4" NFF	MCC-322	1/4" NFM	MCC-323	1/4" NFF x 1/4" NFF
12,27 ÷ 15,44	0.484 ÷ 0.608	MAT-313-A	5/8" NF x 7/16" NF	MCC-316	11,11	7/16" 7/16" NFM x 5/16" NFF	MCC-314	5/16" NFM	MCC-315	5/16" NFF x 5/16" NFF
15,44 ÷ 18,72	0.609 ÷ 0.737	MAT-309-A	5/8" NF x 1/2" NF	MCC-312	12,70	1/2" 1/2" NFM x 3/8" NFF	MCC-310	3/8" NFM	MCC-311	3/8" NFF x 3/8" NFF
18,72 ÷ 21,11	0.738 ÷ 0.831	MAT-305-A	5/8" NF x 9/16" NF	MCC-308	14,29	9/16" 9/16" NFM x 3/8" NFF	MCC-306	3/8" NFM	MCC-307	3/8" NFF x 3/8" NFF
21,11 ÷ 26,80	0.832 ÷ 1.055	MAT-301-A	5/8" NF x 5/8" NF	MCC-304	15,88	5/8" 5/8" NFM x 3/8" NFF	MCC-302	3/8" NFM	MCC-303	3/8" NFF x 3/8" NFF
26,80 ÷ 39,65	1.056 ÷ 1.561	MAT-317-A	5/8" NF x 3/4" NF	MCC-320	19,05	3/4" 3/4" NFM x 7/16" NFF	MCC-318	7/16" NFM	MCC-319	7/16" NFF x 7/16" NFF
39,65 ÷ 60,30	1.562 ÷ 2.374	MAT-325-A	5/8" NF x 1" NF	MCC-328	25,40	1" 1" NFM x 7/16" NFF	MCC-326	7/16" NFM	MCC-327	7/16" NFF x 7/16" NFF

Each single type of work requires specific equipment and tools.
Clients are invited to submit their problems to our Technical Department in order to find the right solution.

Cleaning drills and brushes



WIDIA TIPS

mm		"		mm		"		mm		"		MAT	MTW	MCB	MCT	MB
9,12 ÷ 9,88	0.359 ÷ 0.389	8,7	0.343									MAT 201	MTW 201	MCB 201	MCT 201	MB 201
9,91 ÷ 10,67	0.390 ÷ 0.420	9,5	0.375									MAT 202	MTW 202	MCB 202	MCT 202	MB 202
10,69 ÷ 11,48	0.421 ÷ 0.452	10,3	0.406	6,35	1/4							MAT 203	MTW 203	MCB 203	MCT 203	MB 203
11,48 ÷ 12,27	0.452 ÷ 0.483	11,1	0.437									MAT 204	MTW 204	MCB 204	MCT 204	MB 204
12,29 ÷ 13,06	0.484 ÷ 0.514	11,9	0.468									MAT 205	MTW 205	MCB 205	MCT 205	MB 205
13,08 ÷ 13,84	0.515 ÷ 0.545	12,7	0.500									MAT 206	MTW 206	MCB 206	MCT 206	MB 206
13,87 ÷ 14,66	0.546 ÷ 0.577	13,5	0.531	7,93	5/16							MAT 207	MTW 207	MCB 207	MCT 207	MB 207
14,68 ÷ 15,44	0.578 ÷ 0.608	14,3	0.562									MAT 208	MTW 208	MCB 208	MCT 208	MB 208
14,68 ÷ 15,44	0.578 ÷ 0.608	14,3	0.562									MAT 108	MTW 108	MCB 108	MCT 108	MB 108
15,47 ÷ 16,23	0.609 ÷ 0.639	15,1	0.593									MAT 209	MTW 209	MCB 209	MCT 209	MB 209
16,26 ÷ 17,15	0.640 ÷ 0.675	15,9	0.625									MAT 210	MTW 210	MCB 210	MCT 210	MB 210
17,17 ÷ 17,93	0.676 ÷ 0.706	16,7	0.656									MAT 211	MTW 211	MCB 211	MCT 211	MB 211
17,96 ÷ 18,72	0.707 ÷ 0.737	17,5	0.687									MAT 212	MTW 212	MCB 212	MCT 212	MB 212
18,75 ÷ 19,53	0.738 ÷ 0.769	18,2	0.718									MAT 213	MTW 213	MCB 213	MCT 213	MB 213
19,56 ÷ 20,32	0.770 ÷ 0.800	19,1	0.750									MAT 214	MTW 214	MCB 214	MCT 214	MB 214
20,35 ÷ 21,11	0.801 ÷ 0.831	19,9	0.781	9,52	3/8							MAT 215	MTW 215	MCB 215	MCT 215	MB 215
21,13 ÷ 21,89	0.832 ÷ 0.862	20,6	0.812									MAT 216	MTW 216	MCB 216	MCT 216	MB 216
21,92 ÷ 22,71	0.863 ÷ 0.894	21,4	0.843									MAT 217	MTW 217	MCB 217	MCT 217	MB 217
22,73 ÷ 23,50	0.895 ÷ 0.925	22,2	0.875									MAT 218	MTW 218	MCB 218	MCT 218	MB 218
23,52 ÷ 24,28	0.926 ÷ 0.956	23,0	0.906									MAT 219	MTW 219	MCB 219	MCT 219	MB 219
24,31 ÷ 25,07	0.957 ÷ 0.987	23,8	0.937									MAT 220	MTW 220	MCB 220	MCT 220	MB 220
25,35 ÷ 26,01	0.998 ÷ 1.024	24,6	0.968									MAT 221	MTW 221	MCB 221	MCT 221	MB 221
26,04 ÷ 26,80	1.025 ÷ 1.055	25,4	1.000									MAT 222	MTW 222	MCB 222	MCT 222	MB 222
26,82 ÷ 27,58	1.056 ÷ 1.086	26,2	1.031									MAT 223	MTW 223	MCB 223	MCT 223	MB 223
27,61 ÷ 28,37	1.087 ÷ 1.117	27,0	1.062									MAT 224	MTW 224	MCB 224	MCT 224	MB 224
28,40 ÷ 29,18	1.118 ÷ 1.149	27,8	1.093									MAT 225	MTW 225	MCB 225	MCT 225	MB 225
29,21 ÷ 29,97	1.150 ÷ 1.180	28,6	1.125									MAT 226	MTW 226	MCB 226	MCT 226	MB 226
30,00 ÷ 30,76	1.181 ÷ 1.211	29,4	1.156									MAT 227	MTW 227	MCB 227	MCT 227	MB 227
30,78 ÷ 31,55	1.212 ÷ 1.242	30,2	1.187									MAT 228	MTW 228	MCB 228	MCT 228	MB 228
31,57 ÷ 32,51	1.243 ÷ 1.280	30,9	1.218	11,11	7/16							MAT 229	MTW 229	MCB 229	MCT 229	MB 229
32,54 ÷ 33,30	1.281 ÷ 1.311	31,8	1.250									MAT 230	MTW 230	MCB 230	MCT 230	MB 230
33,32 ÷ 34,09	1.312 ÷ 1.342	32,5	1.281									MAT 231	MTW 231	MCB 231	MCT 231	MB 231
34,11 ÷ 34,90	1.343 ÷ 1.374	33,3	1.312									MAT 232	MTW 232	MCB 232	MCT 232	MB 232
34,93 ÷ 35,69	1.375 ÷ 1.405	34,1	1.343									MAT 233	MTW 233	MCB 233	MCT 233	MB 233
35,71 ÷ 36,47	1.406 ÷ 1.436	34,9	1.375									MAT 234	MTW 234	MCB 234	MCT 234	MB 234

Drills choice

Completely obstructed tubes
Partially obstructed tubes
Brushing

friable deposits

tough deposits

MAT

MCB

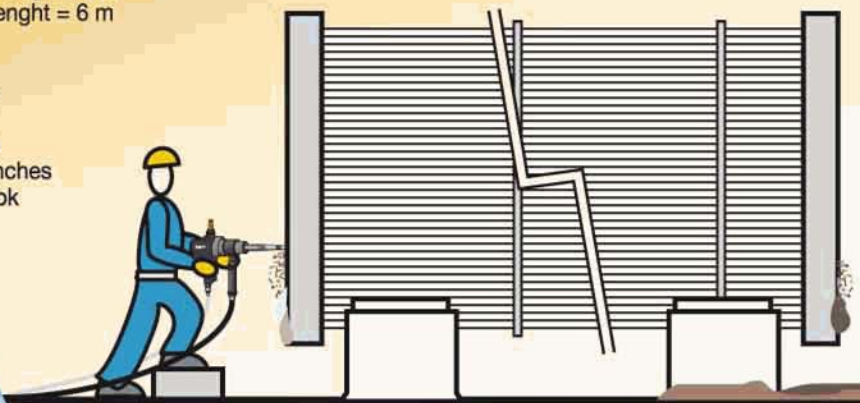
MTW

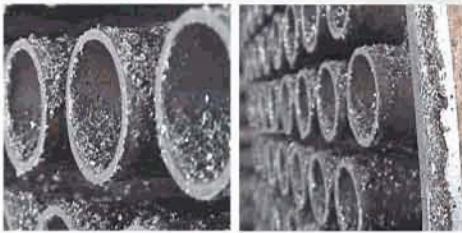
MCT

MB

The **HDS** machine is supplied inside its box complete with:

- 1 Air hose 1/2" mm Length = 6 m
- 1 Water hose 3/8" Length = 6 m
- 1 Muffler
- 1 Additional handle
- 1 Water handle valve
- 1 Air lubricator
- 1 Set of spare vanes
- 1 Set of service wrenches
- 1 Operating handbook





Retubing

After washing it may be necessary **to retube the tube bundle partially or completely.**

The operations shown below give a summary of the use of our tools, equipments and machines used together in the various steps of retubing (*remaking of the tube bundle*):

- tube cutting
- tube pulling

In this chapter the machines and tools for tube cutting and tube pulling are presented

For other subjects listed below consult the related documents:

- tube sheet refurbishment
- tube bundle assembling
- tube rolling
- tube facing
- tube to tube sheet TIG orbital welding.

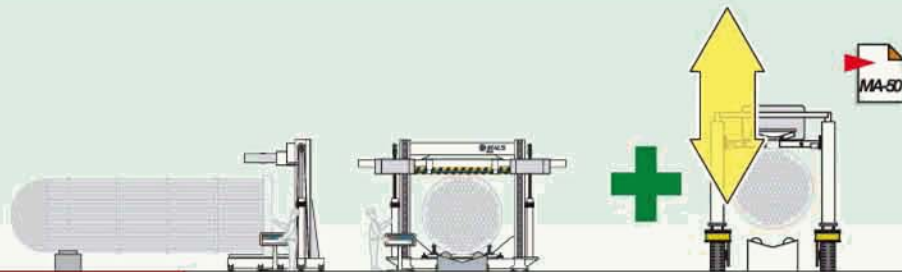
4



BundleCut

Bundle saw machine

Maus Italia offers **BundleCut**, the new band saw for the **dismantling and recovery** of heat exchanger tube sheets. Available in the standard version for tube bundles of \varnothing 2000 mm (79") and the larger version up to \varnothing 3000 mm (118").

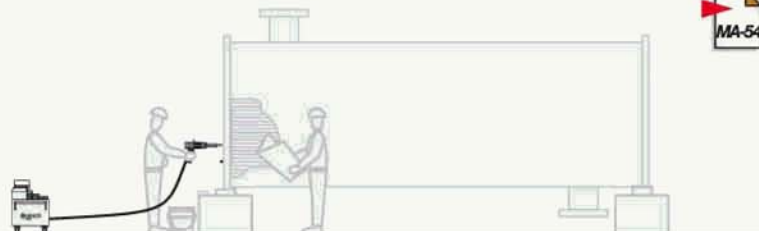


Kattex

Hydraulically operated single internal tube incising/cutting

Innovative pending patented parting tool for instantaneous internal cutting of tubes, particularly useful for fixed tube sheet-type heat exchangers.

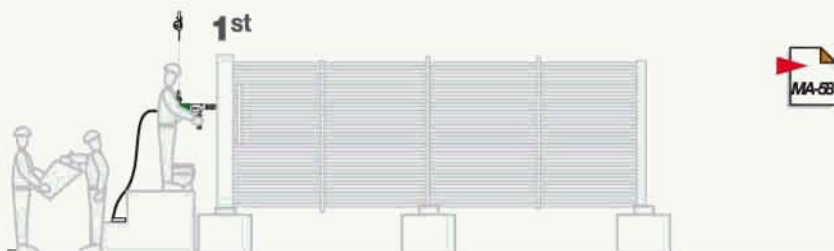
New
pending patented



F/794

Motor operated single internal tube cutting.

Tube cutter model **F/794** is the traditional solution offered for **internal tube cutting**.



Grippul

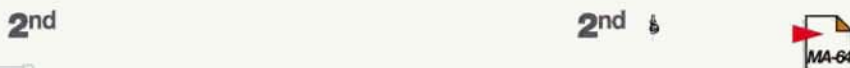
Quick attaching gripper tube pullers

Grippul series **quick attaching gripper tube pullers** is designed and built for rapid extraction of tube stubs from tube sheets. Associated with **BundleCut** or **Kattex**, facilitates and highly speeds up the recovery of the tube sheets.



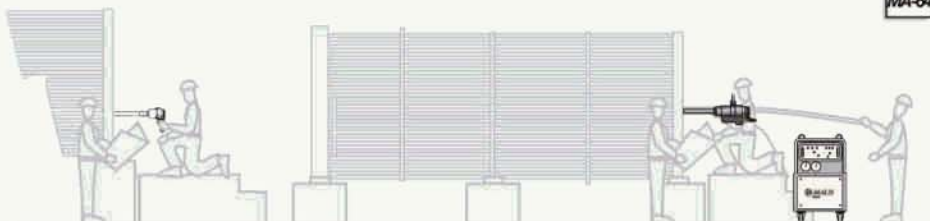
Onlypul

Semi-automatic hydraulic tube pulling for small scale maintenance



Runpul

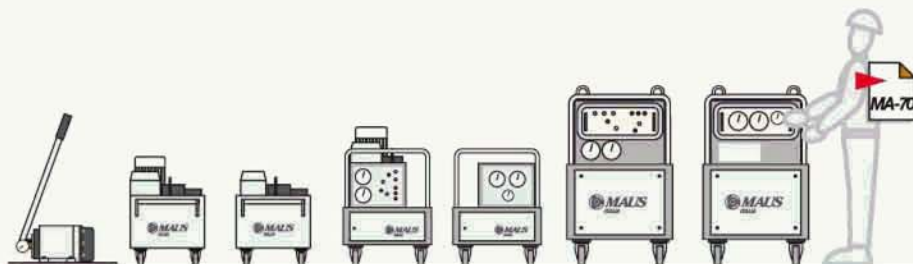
Automatic hydraulic tube pulling complete with **automatism for continuous high speed extraction** of tubes suitable for large scale maintenance work.



TP

Hydraulic units

Complete range of hydraulic units capable of satisfying various needs depending on the type of use: from the simple replacement of a tube to the more demanding applications of large scale maintenance work.



Cheaptool

Equipment for the manual maintenance of the tube in heat exchangers

Cheaptool is the complete system that Maus Italia produces for the manual, **low-cost** maintenance of tubes in heat exchangers in oil refineries, condensers in electric power stations, boilers, etc.



Cutting equipments

Pulling equipments

Hand tools

Bundle saw machine

Healthy environment

High safety

High productivity

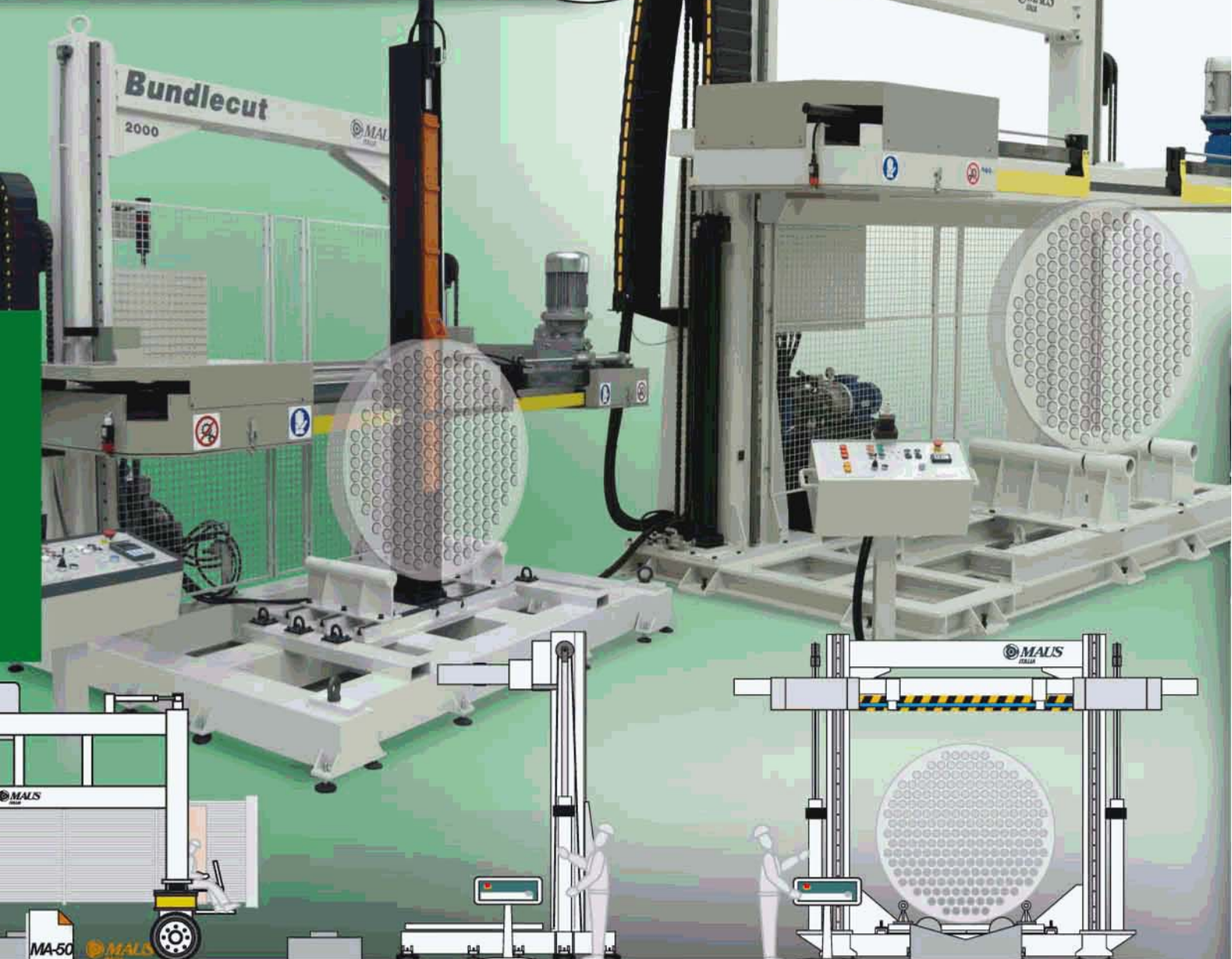
Precise cut

BundleCut

Band saw for the dismantling and refurbishment of heat exchanger tube sheets

Maus Italia proposes **BundleCut**, the new band saw. The solid construction of its electro-welded structure, the use of precision guides and pads and several fundamental devices make this machine an **absolute innovation** to be included in a **modern workshop** of heat exchanger maintenance. The **quality** of the mechanical band cutting in replacement of the oxygen cutting eliminates pollution from combustion gas and **protects the holes of the tube sheet** against scratching during extraction of the stubs.

BundleCut associated with the quick attaching gripper tube puller of the **Grippul** series, facilitates and **highly speeds up the recovery** of the tube sheets.



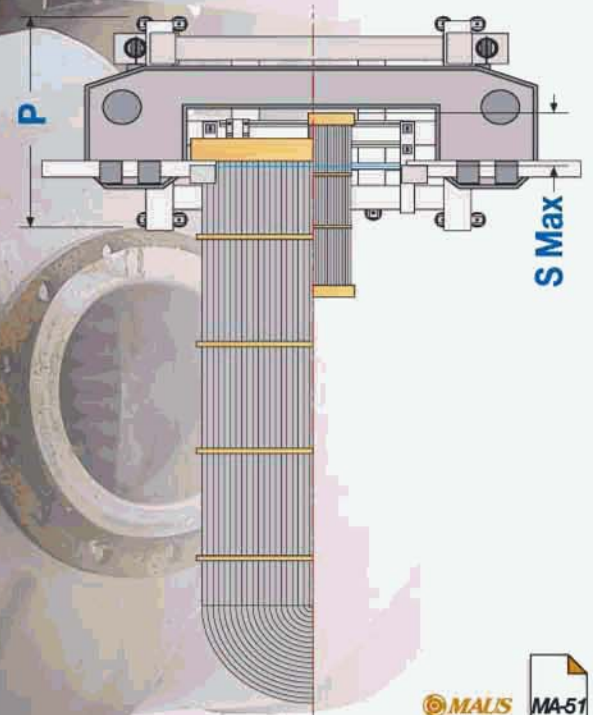
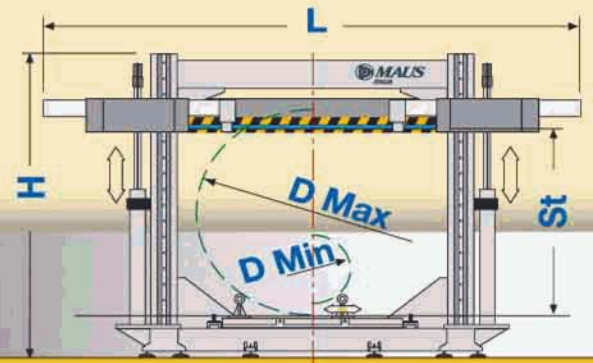
Technical features

On request available also with **QUICK HYDRAULIC** tube sheet locking device

BundleCut				2000		3000	
Length	L	mm	<i>Ft</i>	3800	12.5	5200	17.1
Width	P	mm	<i>Ft</i>	2300	7.6	2330	7.6
Height	H	mm	<i>Ft</i>	3050	10.0	3850	12.6
Floor space requirement		mm	<i>Ft</i>	5500x2500	18 x 9	6500x3000	21 x 10
Vertical stroke	St	m/min	<i>Ft</i>	2000	6.6	3100	10.1
Cutting speed		mm	<i>Ft/min</i>	20÷250	65÷820	11÷140	36÷460
Bundle diameter Max.	D Max	mm	"	2000	78.74"	3000	118.11"
Bundle diameter Min.	D Min	mm	"	200	7.87"	350	13.78"
Tube sheet thickness Max.	S Max		"	600	23.62"	800	31.50"
Average cutting time only bundle		min		30÷60		100÷200	
Average cutting time h-ex with shell		min		60÷90		120÷240	
Hydraulic unit power		Kw		1.3		4	
Saw motor power		Kw		5.5		11	
Power supply		* V-Ph-Hz		400-3-50/60		400-3-50/60	
Absorbed power		KW		7		15	
Air supply		Bar	<i>Psi</i>	4÷8	58÷116	4÷8	58÷116
Saw blade type		mm	"	7930x41x1,3	312.2"x1.6"x0.05"	10900x54x1,6	429.1"x2.1"x0.06"
Weight		Kg	<i>Lb</i>	4500	9920	7700	16980

Different characteristics from standard are studied on specific request of the customer

* On request 230-3-50/60



Bundle saw machine



BundleCut

Example of right procedure of bundle cutting

Simultaneous cutting of shell-tube bundle.
 Fixed sheet: Ø 1100mm (43,30") - Shall: INOX 304 L
 Tubes: Ø 25,4 mm (1") x 14 BWG - INOX 304L
 Time: 90 minutes



On request available also with
QUICK HYDRAULIC
 tube sheet locking device

Ø	mm	600	1000
	Ft	1.97	3.28

Positioning

The heat exchanger is positioned in front of the **BundleCut** and the support brackets are adapted for correct

10' 30'

Fastening

The heat exchanger is fastened with an anchoring belt with tightener (or quick hydraulic tube sheet locking device as optional)

5' 15'

Cutting

The solidity of the structure enables the bundle and the shell to be cut at the same time, even if the materials are highly alloyed.

30' 180'

Separation

When the cutting has been completed the heat exchanger is moved while the sheet remains fixed to the **BundleCut**.

5' 15'

Precision

The stubs that are still attached to the sheet are undeformed and easy to remove.

50' 240'





Control console



Adjustable saw guide



Lubrication plant



hydraulic unit



New
pending patented

Single internal tube incising/cutting

To use with
TP10-E



Kattex

Hydraulically operated tube incising/cutting (pre-**Grippul**)



Innovative patented tool for **instantaneous internal cutting**

of tubes, particularly useful for fixed plate-type exchangers.

Use of the **Kattex** ensures a clean result and in very little time for the purpose of dismantling or partially retubing a tube bundle during maintenance.

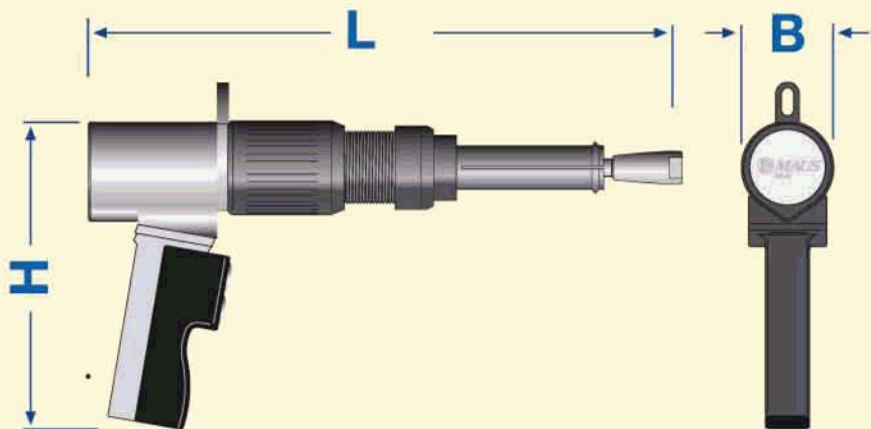
The concept is to incise into the tube before using the stub puller (**Grippul** equipment).

Precise

Simple to use

Rapid

Low cost



Kattex

6-E

Length	L	mm	"	60	2.36
Width	B	mm	"	340	13.39
Height	H	mm	"	200	7.87
Maximum operating pressure		bar	psi	350	5076
Maximum incising/cutting force		T	Lb	6	13240
Cutting speed - INSTANTANEOUS!		sec.		3 sec. Max	
Weight		Kg	Lb	3,5	7.71
Protection level		IP		55	
Controls - low voltage - A.C.		Volt		24	



Cutting off without shaving

Cutting procedure

The **Kattex** is both simple to use and innovative. The four steps for rapid cutting of a tube are given here. The timeline shows the speed with which the operation is carried out and thus ensuring very high productivity.

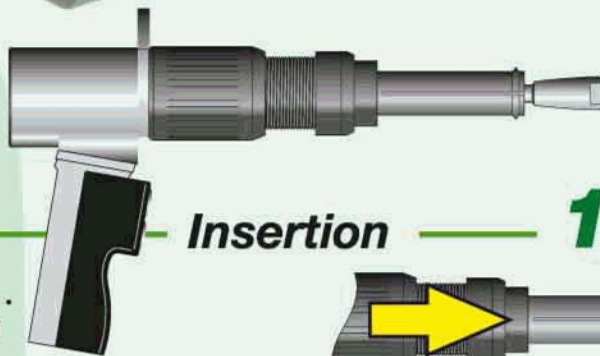
The simulation is for: Tube:
25,4 mm (1") x 13 BWG
stainless steel 304

Time: 9 seconds



Insert the **Kattex** in the tube to be cut until it comes up against the collar

2"



Insertion 1

Press the switch on the handle and wait until you hear the "clunk" on contact with the collar.

4"

Quick cut 2



Press the switch on the other side and wait for the complete release of the tube

2"

Release 3



Extract the **Kattex** from the cut tube and proceed with the next cut or extraction of the stub using a tube puller of the **Grippul** series

1"

Withdrawal 4

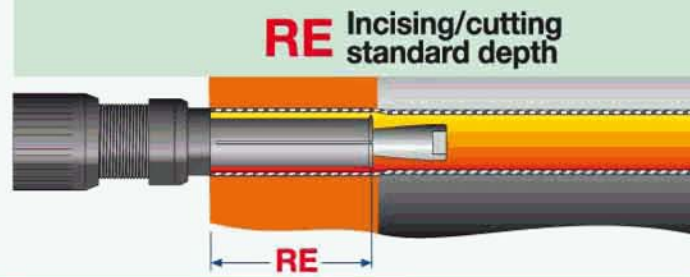


All done in just **9** sec. in a few seconds!



Precise cutting results with the **Kattex**

Single internal tube incising/cutting



Kattex

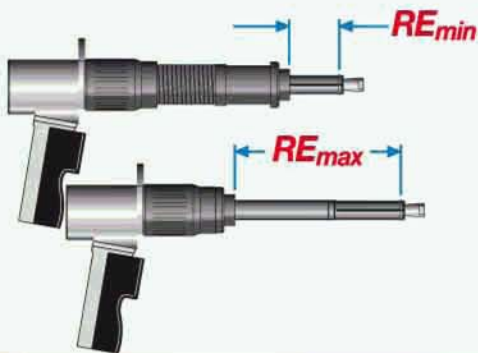
Incising/cutting depth

Assembling for reaching shown standard depth.
On request special deep are available.

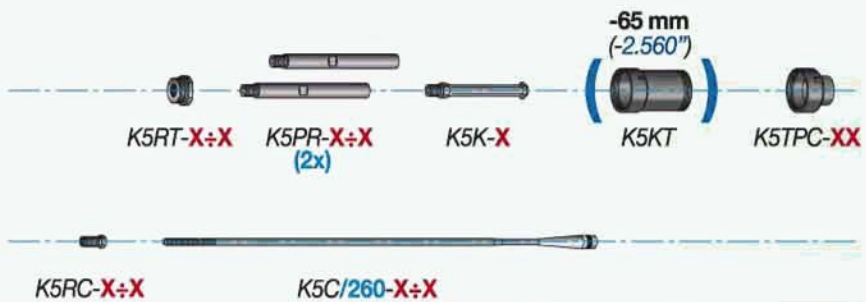
$$RE = 10 \text{ mm } (0.394") \div 75 \text{ mm } (2.953")$$



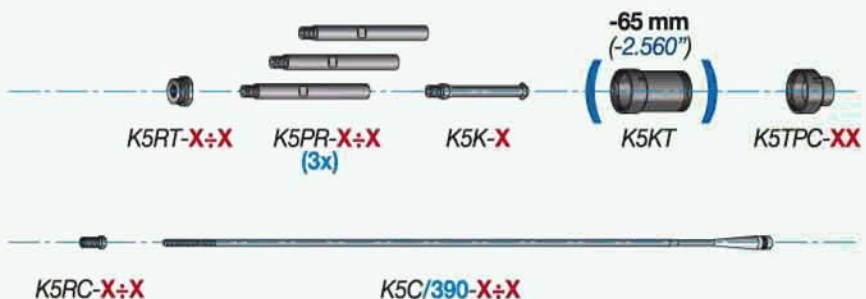
$$RE = 75 \text{ mm } (2.953") \div 205 \text{ mm } (8.071")$$

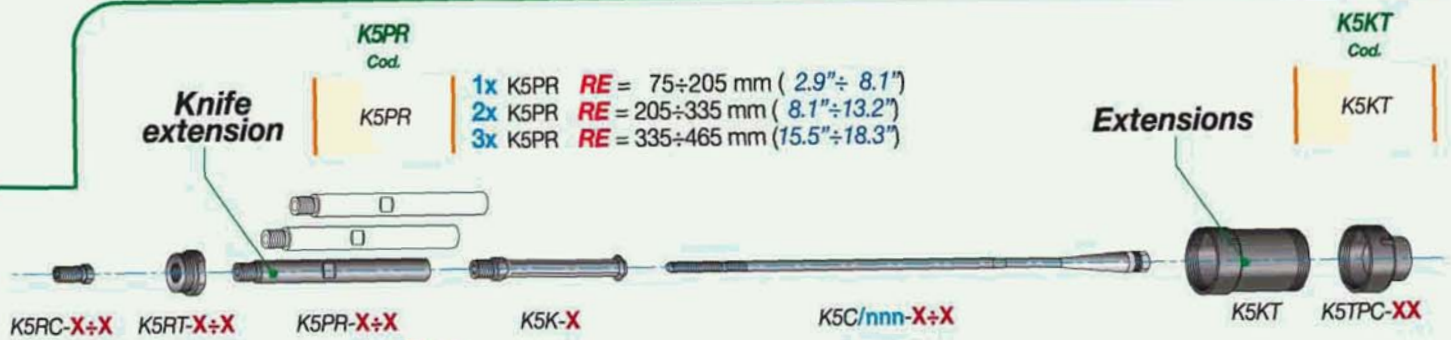


$$RE = 205 \text{ mm } (8.071") \div 335 \text{ mm } (13.189")$$



$$RE = 335 \text{ mm } (13.189") \div 465 \text{ mm } (18.387")$$





Kattex 6-E



$d_e = 12,7 \text{ mm} \div 38,1 \text{ mm}$
 $1/2" \div 1.1/2"$

d_e " mm	Tube					Cone reduction K5RC Cod.	Knife reduction K5RT Cod.	Knife extension K5PR Cod.	Knife K5K Cod.	Expansions		Cone K5C/nnn Cod.	Collar K5TPC Cod.
	B.W.G.	mm	sp	mm	mm					mm	mm		
1/2" (12,7)	16	1,65	0.065	9,4	0.370	K5RC-1÷2	K5RT-1÷2	K5PR-1÷2	K5K-1 K5K-2	9,0÷12,5	0.354÷0.492	K5C/nnn-1÷2	K5TPC-14
	18 ÷ 24	1,24 ÷ 0,56	0.049 ÷ 0.022	10,2 ÷ 11,6	0.402 ÷ 0.456					9,8 ÷ 13,3	0.386 ÷ 0.524		
5/8" (15,9)	14	2,11	0.083	11,7	0.459	K5RC-3÷4	K5RT-3÷4	K5PR-3÷4	K5K-3 K5K-4	11,1 ÷ 15,3	0.437 ÷ 0.602	K5C/nnn-3÷4	K5TPC-18
	16 ÷ 24	1,65 ÷ 0,56	0.065 ÷ 0.022	12,6 ÷ 14,8	0.495 ÷ 0.583					12,1 ÷ 16,3	0.476 ÷ 0.642		
3/4" (19,0)	12	2,77	0.109	13,4	0.532	K5RC-5÷6	K5RT-5÷6	K5PR-5÷6	K5K-5 K5K-6	12,8 ÷ 18,1	0.504 ÷ 0.713	K5C/nnn-5÷6	K5TPC-21
	14 ÷ 24	2,11 ÷ 0,56	0.083 ÷ 0.022	14,8 ÷ 17,9	0.584 ÷ 0.766					14,2 ÷ 19,5	0.559 ÷ 0.768		
7/8" (22,2)	10	3,40	0.134	15,4	0.607	K5RC-7÷8	K5RT-7÷8	K5PR-7÷8	K5K-7 K5K-8	14,6 ÷ 20,6	0.575 ÷ 0.811	K5C/nnn-7÷8	K5TPC-25
	13 ÷ 24	2,41 ÷ 0,56	0.095 ÷ 0.022	17,4 ÷ 21,1	0.685 ÷ 0.831					16,7 ÷ 22,7	0.657 ÷ 0.894		
1" (25,4)	10	3,40	0.134	18,6	0.732	K5RC-9÷10	K5RT-9÷10	K5PR-9÷10	K5K-9 K5K-10	17,8 ÷ 24,8	0.701 ÷ 0.976	K5C/nnn-9÷10	K5TPC-28
	12 ÷ 24	2,77 ÷ 0,56	0.109 ÷ 0.022	19,8 ÷ 24,2	0.782 ÷ 0.956					19,1 ÷ 26,1	0.752 ÷ 1.027		
1.1/4" (31,8)	10	3,40	0.134	25,0	0.982	-	K5RT-11÷12	K5PR-11÷12	K5K-11 K5K-12	24,0 ÷ 31,0	0.945 ÷ 1.220	K5C/nnn-11÷12	K5TPC-34
	12 ÷ 24	2,77 ÷ 0,56	0.109 ÷ 0.022	24,2 ÷ 30,7	1.032 ÷ 1.206					25,3 ÷ 32,3	0.996 ÷ 1.272		
1.1/2" (38,1)	10	3,40	0.134	31,1	1.232	-	K5RT-13÷14	K5PR-13÷14	K5K-13 K5K-14	30,3 ÷ 37,3	1.193 ÷ 1.468	K5C/nnn-13÷14	K5TPC-41
	12 ÷ 24	2,77 ÷ 0,56	0.109 ÷ 0.022	32,5 ÷ 37,0	1.282 ÷ 1.456					31,7 ÷ 38,7	1.248 ÷ 1.524		

For incising

For cutting

On request also solution for different customizing deep are available (RE)

Sample codes for ordering accessories:

d_e 3/4" (19,0) 14 B.W.G. RE 6.69" 170mm

K5RC-5÷6 (1 Cone reduction)
 K5RT-5÷6 (1 Knife reduction)
 2x K5PR-5÷6 (2 Knife extensions)
 K5K-6 (1 Knife)
 K5C/260-5÷6
 K5TPC-21

Motor operated tube cutting

F/794

Tube cutter for medium tube-sheets

This tube cutter is designed for the use in maintenance of heat exchanger and boilers.



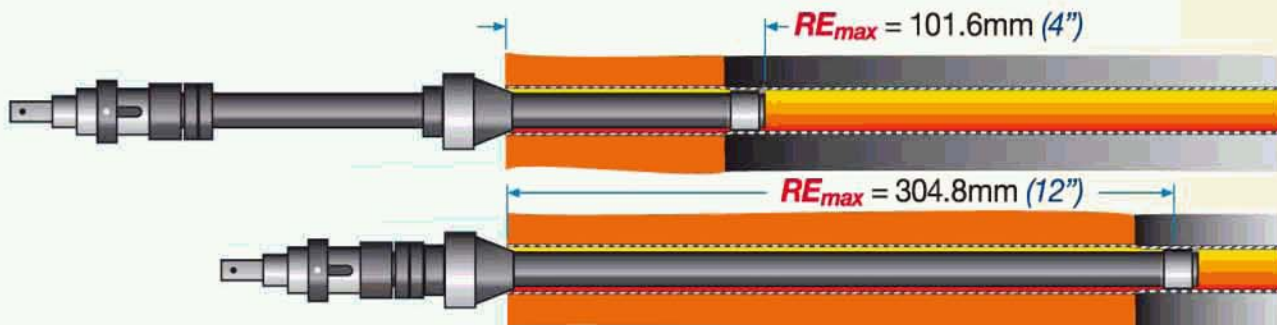
Tube de "	Tube cutter Cod.	Cutting I.D.		Bit Cod.	Tube pilots (not included - order separately) Indicated for B.W.G.	∅ "	Electrical	Suggested motors		
		mm	"					Non ferrous tubes	Pneumatic Steel tubes	Stainless Steel tubes
1/2"	F794-0	8,1 ÷ 15,0	0.32 ÷ 0.59	BIT-F794-0	14 - 16 - 18 - 20 - 22 - 24	3/8" (9,5)	MDse648	MOF 20 R	MOF 20 R	MOF 3
5/8"	F794-1	11,2 ÷ 18,0	0.44 ÷ 0.71	BIT-F794-1	14 - 16 - 18 - 20 - 22 - 24				MOF 3	MOF 3 R
3/4"	F794-2	13,5 ÷ 22,0	0.53 ÷ 0.87	BIT-F794-2÷4	14 - 16 - 18 - 20 - 22 - 24				MOF 3	MOF 3 R
7/8"	F794-3	16,0 ÷ 24,9	0.63 ÷ 0.98		14 - 16 - 18 - 20 - 22 - 24				MOF 3	MOF 3 R
1"	F794-4	18,0 ÷ 26,9	0.71 ÷ 1.06	BIT-F794-5÷6	12 - 14 - 16 - 18 - 20 - 22	1/2" (12,7)	MOF 3	MOF 3 R	MOF 3 R	
1.1/4"	F794-5	23,1 ÷ 34,0	0.91 ÷ 1.34		12 - 14 - 16 - 18 - 20 - 22			MOF 3 R	MOF 3 R	
1.1/2"	F794-6	30,0 ÷ 41,9	1.18 ÷ 1.65		12 - 14 - 16 - 18 - 20 - 22			MOF 3 R	MOF 3 R	

On request, tube cutters **F/794** for bigger diameters are available

F/794/L

Tube cutter for thick tube-sheets

This tube cutter is designed for the use in maintenance of heat exchanger and boilers. Dedicated to the maintenance of exchangers with very thick tube sheets.



F/794

Choice of the motorization

Maus Italia gives indications concerning the pneumatic and electric motorizations suitable for the use of the **F/794** as well as advise for the selection of the adaptor to be used.

Portable electric drill

- Mechanical 2 speed gear
- Electronic regulator of the rpm for optimal cutting speed
- Optimal control with ergonomic grip and supplementary grip



Electric

MDse 648

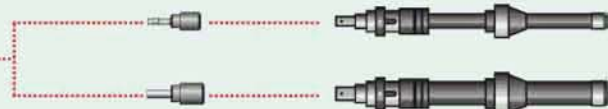
Feed voltage	Volt	220V - 50/60Hz - 1Ph	
Absorbed power	Watt	740	
Speed No-Load	Giri/min	260-600 / 640-1400	
Speed Full-Load	Giri/min	0-360 / 0-860	
Weight	Kg Lb	3,4	7.5
Dimension	mm "	488 x 82	19.2 x 3.2

MDse 648



F/311-3/8"

F/794



F/312/CIL-1/2"



Portable pneumatic drill

- With Morse Tape shank

MOF 20 R and **MOF 3R** models are reversible



Pneumatic

MOF 20 R

MOF 3

MOF 3 R

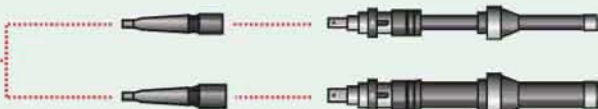
Speed	Giri/min	470	170	140
Power	Watt	745	745	745
Shank	CM	2	2	2
Air Shank	" gas	3/8"gas	3/8"gas	3/8"gas
Air consumption	Lt/sec cfm	14 0.49	14 0.49	14 0.49
Weight	Kg Lb	4,5 8.82	4,2 9.22	4,6 10,10
Dimensions	Ø x L x h - mm	66x236x360	66x272x360	66x241x360
	Ø x L x h - "	2.6"x8.3"x14.2	2.6"x10.7"x14.2	2.6"x9.5"x14.2

MOF



RCM - 2-3/8"

F/794



RCM - 2-1/2"



Hydraulically operated stubs puller

Grippul



Quick attaching gripper tube pullers

Grippul series quick attaching gripper tube pullers, incorporating know-how from Maus Italia's more than thirty years experience in tube extraction with the **TP/30** and **TP/60** automatic pullers, have now reached their **second generation** with the **Grippul 11** and **Grippul 21**. The second generation Grippul feature significant innovations that improve the operating characteristics and strength of the tool set.

The **Grippul** is designed and built for **rapid extraction of tube stubs from tube sheets**.

The **Grippul**, available in electric or pneumatic versions, has integral remote control and is now available in the **second generation Grippul 11** and **Grippul 21** models, which differ in extraction force.

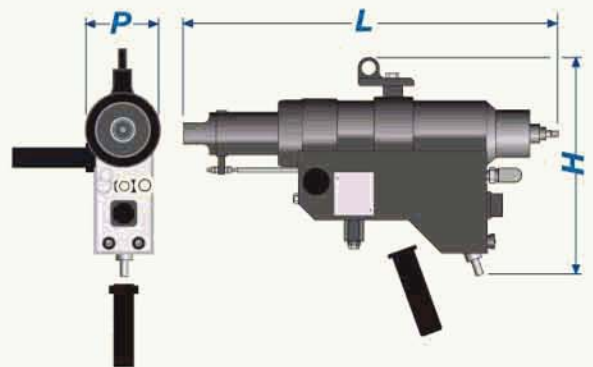
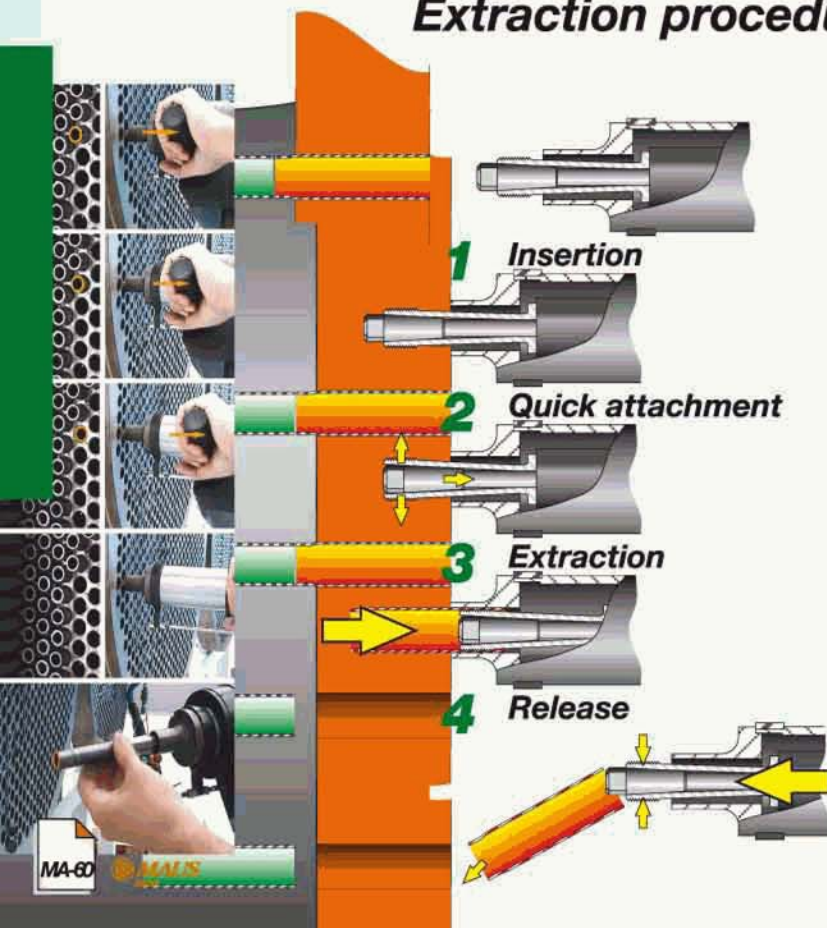
Flexible
Tolerance up to
1 mm (0.04") of iD

Quick
4÷6 extractions
per minute

Economical
Low
tool wear

High quality
No damage to hole
in the tube-sheet

Extraction procedure

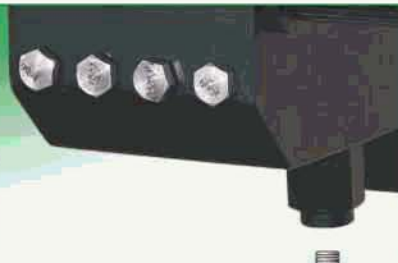


Comes complete with:

- Carrier case
- Set of spare gaskets
- Set of service spanners
- Pressure gauge
- Instruction booklet
- Set of service tools
- 2 (Two) hydraulic hoses:

Ø 9,5mm x 6m
Ø 3/8" x 19,7 ft





The **ABTS** (Anti-Breaking Tie-Rod System) allows the force with which the jaw penetrates the tube to be regulated to suit the tube's diameter and the material of which it is made. This device means the system is **unaffected by the difference in inside diameter of, as much as 1 mm (0.04")**, between tubes in the same sheet, preventing tie-rod breakage.



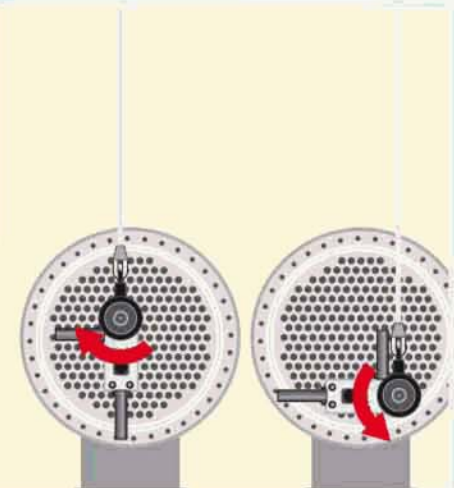
The **RC24** remote control beside the knobs **simplifies and speeds up stub extraction**. The remote control is fitted on both pneumatic and electric versions.



The electric **OPS** (Over Pressure Switch) cuts off hydraulic fluid delivery when the piston reaches the end of its stroke, **preventing unnecessary overpressure in the system**.



The **RSR** (revolving support ring) on which the Grippul is suspended during use allows **optimal positioning in the tightest spaces**.



Model	Tube		Maximum pulling force		Remote control power supply			Piston stroke		Max. pressure		Dimensions				Weight		Balancer			
	min	max	KN	Lb	Volt	Bar	Psi	mm	"	Bar	Psi	L		P		H			Kg	Lb	IP
	mm	"										mm	"	mm	"	mm	"				
Grippul 11 E	12,7 ÷ 38,1	1/2" ÷ 1.1/2"	10	22000	24	-	-	120	4.72"	350	5075	500	19.7"	113	4.45"	270	10.63"	23	51	55	TPB 10
Grippul 11 P	12,7 ÷ 38,1	1/2" ÷ 1.1/2"	10	22000	-	6,3	91.4	120	4.72"	350	5075	500	19.7"	113	4.45"	270	10.63"	23	51	-	TPB 10
Grippul 21 E	25,4 ÷ 63,5	1" ÷ 2.1/2"	20	44000	24	-	-	130	5.12"	350	5075	600	23.6"	130	5.12"	290	11.43"	34	75	55	TPB 20
Grippul 21 P	25,4 ÷ 63,5	1" ÷ 2.1/2"	20	44000	-	6,3	91.4	130	5.12"	350	5075	600	23.6"	130	5.12"	290	11.43"	34	75	-	TPB 20

TP10-E TP10-P

Semi-automatic Electrical and Pneumatical hydraulic pump unit



Model	Max. pressure *		Oil flow rate		Power supply	Remote control power supply		Dimensions			Weight				
	bar	psi	Lt/min (bar)	US gpm (psi)		Volt	mm	"	mm	"	mm	"	Kg	Lb	IP
TP10-E	350	5075	12 (0÷70) 0,9 (70÷350)	3,17 (0÷1015 psi) 0,24 (1015÷5075 psi)	1,1Kw-230/400V-50/60Hz-3Ph	24	680	26.8"	520	20.5"	720	28.3"	82	181	30

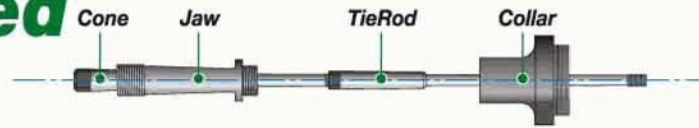
Model	Max. pressure *		Oil flow rate		Power supply	Air pressure required		Dimensions			Weight				
	bar	psi	Lt/min (bar)	US gpm (psi)		bar	psi	mm	"	mm	"	mm	"	Kg	Lb
TP10-P	350	5075	12 (0÷70) 0,9 (70÷350)	3,17 (0÷1015 psi) 0,24 (1015÷5075 psi)	1,7Kw-7 bar (67Cfm) 1900 Lt/min (67Cfm)	7	100	680	26.8"	460	18.1"	600	23.6"	82	181

* On request available also 700 Bar (10000 psi) version

The **Grippul** can also be used with **TP/60** power units, providing considerably enhanced performance.



Hydraulically operated stubs puller



Grippul Tools

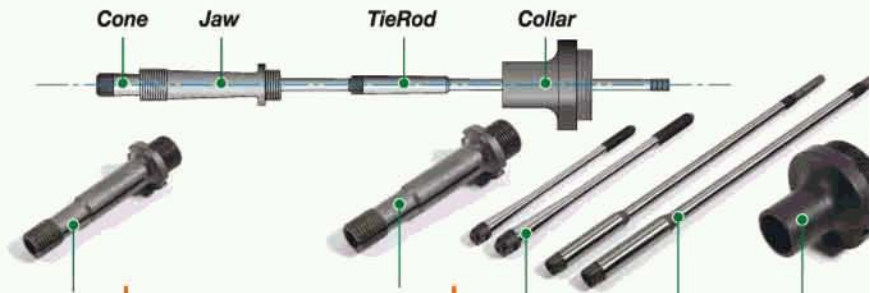
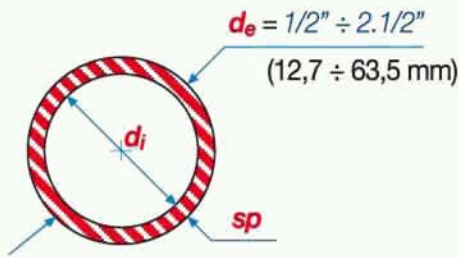


de " mm	Tube sp		di		Expansion		Jaw G11J Cod.	Expansion		Jaw G21J Cod.	Cone		TieRod		Collar TPC Cod.	
	B.W.G.	"	mm	"	mm	"	mm	"	mm	"	mm	Cod.	Cod.	Cod.	Cod.	
1/2" (12,7)	14	0.083	2,11	0.334	8,5	0.335÷0.393	8,5÷10,0	G11J-02	-	-	-	-	-	-	-	
	16	0.065	1,65	0.370	9,4	-	-	-	-	-	-	-	-	-	-	
	17	0.058	1,47	0.384	9,7	-	-	-	-	-	-	-	-	-	-	
	18	0.049	1,24	0.402	10,2	0.347÷0.433	9,5÷11,0	G11J-02/A	-	-	-	G11C 02÷03	-	G11T 02÷03	-	TPC-14
	19	0.042	1,07	0.416	10,5	-	-	-	-	-	-	-	-	-	-	
	20	0.035	0,89	0.430	10,9	0.393÷0.472	10,5÷12,0	G11J-03	-	-	-	-	-	-	-	
5/8" (15,9)	14	0.083	2,11	0.459	11,7	0.452÷0.512	11,5÷13,0	G11J-04	-	-	-	-	-	-	-	
	15	0.072	1,83	0.481	12,2	-	-	-	-	-	-	-	-	-	-	
	16	0.065	1,65	0.495	12,6	-	-	-	-	-	-	-	-	-	-	
	18	0.049	1,24	0.527	13,4	0.492÷0.551	12,5÷14,0	G11J-1	-	-	-	G11C 04÷2	-	G11T 04÷2	-	TPC-18
	19	0.042	1,07	0.541	13,7	-	-	-	-	-	-	-	-	-	-	
	20	0.035	0,89	0.555	14,1	0.551÷0.610	14,0÷15,5	G11J-2	-	-	-	-	-	-	-	
	22	0.028	0,71	0.569	14,5	-	-	-	-	-	-	-	-	-	-	
3/4" (19,0)	12	0.109	2,77	0.532	13,4	0.531÷0.610	13,5÷15,5	G11J-2/A	0.531÷0.610	13,5÷15,5	G11J-2/A	-	-	-	-	
	13	0.095	2,41	0.560	14,2	-	-	-	-	-	-	-	-	-	-	
	14	0.083	2,11	0.584	14,8	0.571÷0.650	14,5÷16,5	G11J-3	0.571÷0.650	14,5÷16,5	G11J-3	-	-	-	-	
	15	0.072	1,83	0.606	15,3	-	-	-	-	-	-	-	-	-	-	
	16	0.065	1,65	0.620	15,7	0.610÷0.689	15,5÷17,5	G11J-4	-	-	-	G11C 2/A÷8	G11C 2/A÷8	G11T 2/A÷8	G21T 2/A÷8	TPC-21
	18	0.049	1,24	0.652	16,5	-	-	-	-	-	-	-	-	-	-	
	19	0.042	1,07	0.666	16,8	-	-	-	-	-	-	-	-	-	-	
7/8" (22,2)	20	0.035	0,89	0.680	17,2	0.669÷0.748	17,0÷19,0	G11J-5	-	-	-	-	-	-	-	
	22	0.028	0,71	0.694	17,6	-	-	-	-	-	-	-	-	-	-	
	12	0.109	2,77	0.657	16,6	0.650÷0.728	16,5÷18,5	G11J-6	-	-	-	-	-	-	-	
	14	0.083	2,11	0.709	18,0	-	-	-	-	-	-	-	-	-	-	
	16	0.065	1,65	0.745	18,9	0.728÷0.807	18,5÷20,5	G11J-7	-	-	-	G11C 2/A÷8	-	G11T 2/A÷8	-	TPC-25
	18	0.049	1,24	0.777	19,7	-	-	-	-	-	-	-	-	-		
	19	0.042	1,07	0.791	20,0	-	-	-	-	-	-	-	-	-		
	20	0.035	0,89	0.805	20,4	0.787÷0.866	20,0÷22,0	G11J-8	-	-	-	-	-	-	-	
	22	0.028	0,71	0.819	20,8	-	-	-	-	-	-	-	-	-	-	
1" (25,4)	10	0.134	3,40	0.732	18,6	-	-	-	0.728÷0.846	18,5÷21,5	G21J-8/A	-	-	-	-	
	12	0.109	2,77	0.782	19,8	-	-	-	-	-	-	-	-	-	-	
	13	0.095	2,41	0.810	20,6	0.767÷0.846	19,5÷21,5	G11J-9	0.768÷0.886	19,5÷22,5	G21J-9	-	-	-	-	
	14	0.083	2,11	0.834	21,2	-	-	-	-	-	-	-	-	-	-	
	15	0.072	1,83	0.856	21,7	0.827÷0.906	21,0÷23,0	G11J-9/A	0.827÷0.945	21,0÷24,0	G21J-9/A	-	-	-	-	
	16	0.065	1,65	0.870	22,1	-	-	-	-	-	-	G11C 8/A÷11	G21C 8/A÷11	G11T 8/A÷20	G21T 8/A÷11	TPC-28
	18	0.049	1,24	0.902	22,9	0.866÷0.945	22,0÷24,0	G11J-10	0.866÷0.984	22,0÷25,0	G21J-10	-	-	-	-	
	19	0.042	1,07	0.916	23,2	-	-	-	-	-	-	-	-	-	-	
	20	0.035	0,89	0.930	23,6	0.925÷1.004	23,5÷25,5	G11J-11	0.925÷1.043	23,5÷26,5	G21J-11	-	-	-	-	
	22	0.028	0,71	0.944	24,0	-	-	-	-	-	-	-	-	-	-	

Critical extractions
Reached power limits

Depending on tube material and tube-sheet thickness
Choose bigger size





d_e " mm	Tube sp		d_i		Expansion		Jaw G11J	Expansion		Jaw G21J	Cone		TieRod		Collar TPC	
	B.W.G.	" mm	" mm	" mm	" mm	" mm	Cod.	" mm	" mm	Cod.	Cod.	Cod.	Cod.	Cod.	Cod.	
1.1/4" (31,8)	10	0.134	3,40	0.982	25,0	-	-	-	0.965 ÷ 1.083	24,5 ÷ 27,5	G21J-12	-	-	-	-	-
	11	0.120	3,05	1.010	25,7	-	-	-	-	-	-	-	-	-	-	-
	12	0.109	2,77	1.032	26,2	-	-	-	-	-	-	-	-	-	-	-
	13	0.095	2,41	1.060	27,0	1.043 ÷ 1.122	26,5 ÷ 28,5	G11J-13	1.043 ÷ 1.161	26,5 ÷ 29,5	G21J-13	-	-	-	-	-
	14	0.083	2,11	1.084	27,6	-	-	-	-	-	-	G11C 12÷15	G21C 12÷15	G11T 8/A÷20	G21T 12÷15	TPC-34
	16	0.065	1,65	1.120	28,5	1.102 ÷ 1.181	28,0 ÷ 30,0	G11J-14	1.102 ÷ 1.220	28,0 ÷ 31,0	G21J-14	-	-	-	-	-
	18	0.049	1,24	1.152	29,3	-	-	-	-	-	-	-	-	-	-	-
	19	0.042	1,07	1.166	29,6	-	-	-	-	-	-	-	-	-	-	-
	20	0.035	0,89	1.180	30,0	1.161 ÷ 1.240	29,5 ÷ 31,5	G11J-15	1.161 ÷ 1.280	29,5 ÷ 32,5	G21J-15	-	-	-	-	-
1.1/2" (38,1)	8	0.165	4,19	1.170	29,7	-	-	-	1.161 ÷ 1.280	29,5 ÷ 32,5	G21J-16	-	-	-	-	-
	10	0.134	3,40	1.232	31,3	-	-	-	-	-	-	-	-	-	-	-
	11	0.120	3,05	1.260	32,0	-	-	-	1.240 ÷ 1.358	31,5 ÷ 34,5	G21J-17	-	-	-	-	-
	12	0.109	2,77	1.282	32,5	-	-	-	-	-	-	-	-	-	-	-
	13	0.095	2,41	1.310	33,3	-	-	-	-	-	-	-	-	-	-	-
	14	0.083	2,11	1.334	33,9	-	-	-	1.299 ÷ 1.417	33,0 ÷ 36,0	G21J-18	G11C 16÷20	G21C 16÷20	G11T 8/A÷20	G21T 16÷20	TPC-41
	15	0.072	1,83	1.356	34,4	-	-	-	-	-	-	-	-	-	-	-
	16	0.065	1,65	1.370	34,8	1.358 ÷ 1.437	34,5 ÷ 36,5	G11J-19	1.358 ÷ 1.476	34,5 ÷ 37,5	G21J-19	-	-	-	-	-
	18	0.049	1,24	1.402	35,6	-	-	-	-	-	-	-	-	-	-	-
1.3/4" (44,4)	10	0.134	3,40	0.482	37,6	-	-	-	1.476 ÷ 1.594	37,5 ÷ 40,5	G21J-21	-	-	-	-	-
	11	0.120	3,05	1.510	38,3	-	-	-	-	-	-	-	-	-	-	-
	12	0.109	2,77	1.532	38,8	-	-	-	-	-	-	-	-	-	-	-
	14	0.083	2,11	1.584	40,2	-	-	-	1.555 ÷ 1.673	39,5 ÷ 42,5	G21J-22	-	G21C 21÷26	-	G21T 21÷32	G21 TPC-48
	15	0.072	1,83	1.606	40,7	-	-	-	-	-	-	-	-	-	-	-
	16	0.065	1,65	1.620	41,1	-	-	-	-	-	-	-	-	-	-	-
	18	0.049	1,24	1.652	41,9	-	-	-	-	-	-	-	-	-	-	-
	19	0.042	1,07	1.666	42,2	-	-	-	1.634 ÷ 1.752	41,5 ÷ 44,5	G21J-23	-	-	-	-	-
	20	0.035	0,89	1.680	42,6	-	-	-	-	-	-	-	-	-	-	-
2" (50,8)	10	0.134	3,40	1.732	44,0	-	-	-	1.713 ÷ 1.831	43,5 ÷ 46,5	G21J-24	-	-	-	-	-
	12	0.109	2,77	1.782	45,2	-	-	-	-	-	-	-	-	-	-	-
	13	0.095	2,41	1.810	46,0	-	-	-	1.791 ÷ 1.909	45,5 ÷ 48,5	G21J-25	-	G21C 21÷26	-	G21T 21÷32	G21 TPC-54
	14	0.083	2,11	1.834	46,6	-	-	-	-	-	-	-	-	-	-	-
	16	0.065	1,65	1.870	47,5	-	-	-	1.870 ÷ 1.988	47,5 ÷ 50,5	G21J-26	-	-	-	-	-
2.1/2" (63,5)	10	0.134	3,40	2.232	56,7	-	-	-	2.224 ÷ 2.343	56,5 ÷ 59,5	G21J-30	-	-	-	-	-
	11	0.120	3,05	2.260	57,4	-	-	-	-	-	-	-	-	-	-	-
	12	0.109	2,77	2.282	57,9	-	-	-	-	-	-	-	-	-	-	-
	14	0.083	2,11	2.334	59,3	-	-	-	2.303 ÷ 2.421	58,5 ÷ 61,5	G21J-31	-	G21C 27÷32	-	G21T 21÷32	G21 TPC-68
	15	0.072	1,83	2.356	59,8	-	-	-	-	-	-	-	-	-	-	-
	16	0.065	1,65	2.370	60,2	-	-	-	2.382 ÷ 2.500	60,5 ÷ 63,5	G21J-32	-	-	-	-	-

Critical extractions Reached power limits Depndng on tube material and tube-sheet thickness Choose bigger size

Hydraulically operated continuous tube pullers

Onlypul



Semiautomatic continuous hydraulic tube pullers

Hydraulic tube puller for sizes from 9,5 mm (3/8") to 101,6 mm (4"), for semiautomatic continuous extraction. Suggested for **small scale maintenance work**.

included



Hydraulic Gun

Version

Onlypul ##-EM
Runpul ##-EM

Electric

Onlypul ##-PM
Runpul ##-PM

Pneumatic

Hydraulic Unit

Version

TP 1-H

Manual

TP 10-E

TP 30-E

TP 60-E

Electric

TP 10-P

TP 30-P

TP 60-P

Pneumatic

Runpul



Automatic continuous hydraulic tube pullers

Hydraulic tube puller for sizes from 9,5 mm (3/8") to 101,6 mm (4"), with double jaws, for automatic continuous tube pulling at high speed. Suggested for **large scale maintenance work on condensers and exchangers**.

included



Onlypul Runpul comes complete with:

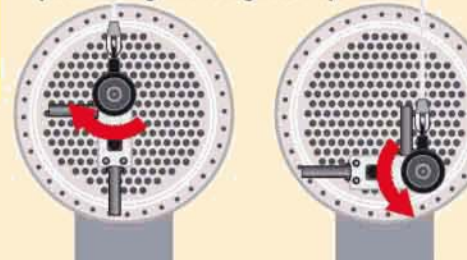
- Carrier case
- Set of spare gaskets
- Set of service spanners
- Instruction booklet



The **USD** (Unclamping System Device) is an **emergency hydraulic device for unblocking jaws jammed on the tube due to rust, etc.**



The **RSR** (revolving support ring) on which the **Onlypul** and **Runpul** is suspended during use allows **optimal positioning in the tightest spaces**.

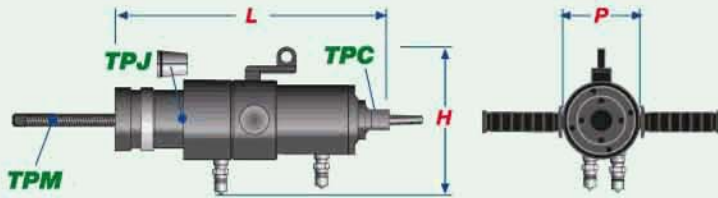


The electric **OPS** (Over Pressure Switch) cuts off hydraulic fluid delivery when the piston reaches the end of its stroke, **preventing unnecessary overpressure in the system**.

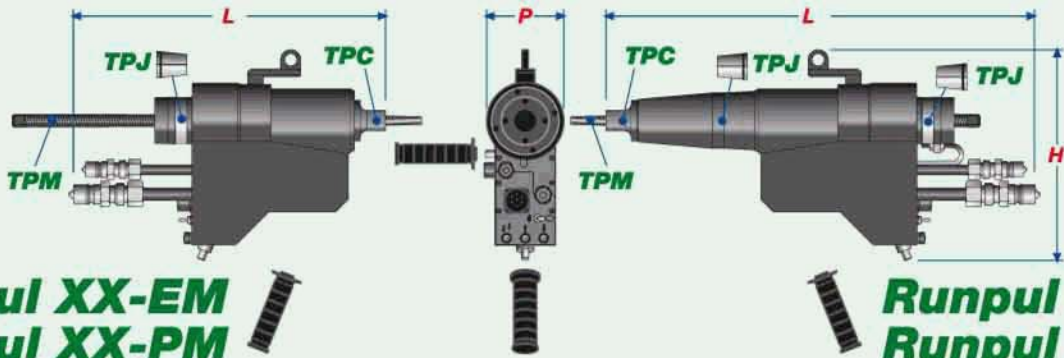


The **RC24** remote control beside the knobs **simplifies and speeds up stub extraction**. The remote control is fitted on both pneumatic and electric versions.

Onlypul XX-HM



Onlypul XX-EM Onlypul XX-PM



Runpul XX-EM Runpul XX-PM

	Hydraulic Gun	Tube	Power	Speed	Ram	L	P	H	Weight	Balancer	Suggested
	Cod.	de mm	KN Lbs	m/min inches/min	stroke mm "	mm "	mm "	mm "	Kg Lb	Cod.	Hydraulic Units
Manual	Onlypul 15-HM	3/8"÷1.1/8" (9,5÷28,6)	15 33000	-	101,6 4	420 16.6	125 4.9	230 9.1	15 33.1	TPB 15	TP 1-H
	Onlypul 30-HM	3/8"÷1.1/4" ^{Gas} (9,5÷42,4)	30 66000	-	101,6 4	420 16.6	155 6.1	270 10.7	30 66.2	TPB 30	TP 1-H
Semiautomatic	Onlypul 15-EM	3/8"÷1.1/8" (9,5÷28,6)	15 33000	-	101,6 4	500 19.7	125 4.9	340 13.4	21 46.2	TPB 15	TP 10-E TP 10-P
	Onlypul 15-PM										
	Onlypul 30-EM	3/8"÷1.1/4" ^{Gas} (9,5÷42,4)	30 66000	-	101,6 4	500 19.7	155 6.1	430 16.9	38 83.6	TPB 30	TP 10-E TP 10-P
	Onlypul 30-PM										
	Onlypul 45-EM	1"÷3" (25,4÷76,2)	45 99000	-	50,8 2	510 20.1	190 7.5	430 16.9	55 121.2	TPB 45	TP 30-E TP 30-P
	Onlypul 45-PM										
Onlypul 60-EM	2"÷4" (50,8÷101,6)	60 132000	-	50,8 2	510 20.1	220 8.7	450 17.7	71 156.5	TPB 60	TP 30-E TP 30-P	
Onlypul 60-PM											
Automatic	Runpul 15-EM	3/8"÷1.1/8" (9,5÷28,6)	15 33000	8 315	101,6 4	690 27.2	124 4.9	340 13.4	26 57.2	TPB 15	TP 30-E TP 60-E TP 30-P TP 60-P
	Runpul 15-PM										
	Runpul 30-EM	3/8"÷1.1/4" ^{Gas} (9,5÷42,4)	30 66000	4 170	101,6 4	730 28.7	155 6.1	430 16.9	46 101.2	TPB 30	TP 30-E TP 60-E TP 30-P TP 60-P
	Runpul 30-PM										
	Runpul 45-EM	1"÷3" (25,4÷76,2)	45 99000	3,4 134	50,8 2	740 29.1	190 7.5	430 16.9	70 154.0	TPB 45	TP 30-E TP 60-E TP 30-P TP 60-P
	Runpul 45-PM										
	Runpul 60-EM	2"÷4" (50,8÷101,6)	60 132000	3 110	50,8 2	750 29.5	220 8.7	450 17.7	96 211.2	TPB 60	TP 30-E TP 60-E TP 30-P TP 60-P
	Runpul 60-PM										

* On request available also 700 Bar (10000 psi) version

Hydraulically operated continuous tube pullers tools

Onlypul Runpul

Tools



TPM

de mm	sp B.W.G.	dim mm	Mandrel		
			Cod.	"	
3/8" (9,5)	17 ÷ 19	6,5 ÷ 7,5	0,256 ÷ 0,295	TPM-7	5/16"
	20 ÷ 24	7,5 ÷ 8,5	0,295 ÷ 0,335	TPM-8	
1/2" (12,7)	14 - 16	8,5 ÷ 9,5	0,335 ÷ 0,374	TPM-9	3/8"
	17 - 18	9,5 ÷ 10,5	0,374 ÷ 0,413	TPM-10	
	19 ÷ 21	10,5 ÷ 11,5	0,413 ÷ 0,453	TPM-11	
	24	11,5 ÷ 12,5	0,453 ÷ 0,492	TPM-12	
5/8" (15,9)	16 - 17	12,5 ÷ 13,5	0,492 ÷ 0,531	TPM-13A	1/2"
	19 ÷ 21	13,5 ÷ 14,5	0,531 ÷ 0,571	TPM-14A	
	23 - 24	14,5 ÷ 15,5	0,571 ÷ 0,610	TPM-15A	
3/4" (19,0)	11	12,5 ÷ 13,5	0,492 ÷ 0,531	TPM-13	5/8"
	12 - 13	13,5 ÷ 14,5	0,531 ÷ 0,571	TPM-14	
	14 - 15	14,5 ÷ 15,5	0,571 ÷ 0,610	TPM-15	
	16 - 17	15,5 ÷ 16,5	0,610 ÷ 0,650	TPM-16	
	18 ÷ 20	16,5 ÷ 17,5	0,650 ÷ 0,689	TPM-17	
7/8" (22,2)	14	17,5 ÷ 18,5	0,689 ÷ 0,728	TPM-18S	5/8"
	16 - 17	18,5 ÷ 19,5	0,728 ÷ 0,768	TPM-19S	
	18 - 19	19,5 ÷ 20,5	0,768 ÷ 0,807	TPM-20S	
1" (25,4)	10 - 11	18,5 ÷ 19,5	0,728 ÷ 0,768	TPM-19	3/4"
	12	19,5 ÷ 20,5	0,768 ÷ 0,807	TPM-20	
	13 - 14	20,5 ÷ 21,5	0,807 ÷ 0,846	TPM-21	
	15 - 16	21,5 ÷ 22,5	0,846 ÷ 0,886	TPM-22	
	18	22,5 ÷ 23,5	0,886 ÷ 0,925	TPM-23	
	19 - 20	23,5 ÷ 24,5	0,925 ÷ 0,965	TPM-24	
3/4"Gas (26,9)	13	21,5 ÷ 22,5	0,846 ÷ 0,886	TPM-22G	3/4"
	14 - 15	22,5 ÷ 23,5	0,886 ÷ 0,925	TPM-23G	
	16 - 17	23,5 ÷ 24,5	0,925 ÷ 0,965	TPM-24G	
	19 ÷ 21	24,5 ÷ 25,4	0,965 ÷ 1,004	TPM-25G	
1.1/4" (31,8)	10	24,5 ÷ 25,5	0,965 ÷ 1,004	TPM-25	1"
	11 - 12	25,4 ÷ 26,5	1,004 ÷ 1,043	TPM-26	
	13	26,5 ÷ 27,5	1,043 ÷ 1,083	TPM-27	
	14 - 15	27,5 ÷ 28,5	1,083 ÷ 1,122	TPM-28	
	16 ÷ 18	28,5 ÷ 29,5	1,122 ÷ 1,161	TPM-29	
	19 ÷ 22	29,5 ÷ 30,5	1,161 ÷ 1,201	TPM-30	
	23 - 24	30,5 ÷ 31,5	1,201 ÷ 1,240	TPM-31	
1"Gas (33,7)	9	25,5 ÷ 26,5	1,004 ÷ 1,043	TPM-26G	1"
	10	26,5 ÷ 27,5	1,043 ÷ 1,083	TPM-27G	
	11 - 12	27,5 ÷ 28,5	1,083 ÷ 1,122	TPM-28G	
	13 - 14	28,5 ÷ 29,5	1,122 ÷ 1,161	TPM-29G	

TPM

de mm	sp B.W.G.	dim mm	Mandrel		
			Cod.	"	
1.1/2" (38,1)	10 - 11	31,5 ÷ 32,5	1,240 ÷ 1,280	TPM-32	1"
	12 - 13	32,5 ÷ 33,5	1,280 ÷ 1,319	TPM-33	
	14	33,5 ÷ 34,5	1,319 ÷ 1,358	TPM-34	
	15 ÷ 17	34,5 ÷ 35,5	1,358 ÷ 1,398	TPM-35	
	18 ÷ 20	35,5 ÷ 36,5	1,398 ÷ 1,437	TPM-36	
	21 ÷ 24	36,5 ÷ 37,5	1,437 ÷ 1,476	TPM-37	
	1.1/4"Gas (42,4)	12	36,5 ÷ 37,5	1,437 ÷ 1,476	
13 - 14		37,5 ÷ 38,5	1,476 ÷ 1,516	TPM-38G	
15 - 16		38,5 ÷ 39,5	1,516 ÷ 1,555	TPM-39G	
17 ÷ 19		39,5 ÷ 40,5	1,555 ÷ 1,594	TPM-40G	
20 ÷ 24		40,5 ÷ 41,5	1,594 ÷ 1,634	TPM-41G	
1.3/4" (44,4)	10 - 11	37,5 ÷ 38,5	1,476 ÷ 1,516	TPM-38/44	1"
	12	38,5 ÷ 39,5	1,516 ÷ 1,555	TPM-39/44	
	13 - 14	39,5 ÷ 40,5	1,555 ÷ 1,594	TPM-40/44	
	15 - 16	40,5 ÷ 41,5	1,594 ÷ 1,634	TPM-41/44	
	18 - 19	41,5 ÷ 42,5	1,634 ÷ 1,673	TPM-42/44	
	20 ÷ 24	42,5 ÷ 43,5	1,673 ÷ 1,713	TPM-43/44	
1.1/2"Gas (48,3)	11 - 12	42,5 ÷ 43,5	1,673 ÷ 1,713	TPM-43G	1"
	13 - 14	43,5 ÷ 44,5	1,713 ÷ 1,752	TPM-44G	
	15 ÷ 17	44,5 ÷ 45,5	1,752 ÷ 1,791	TPM-45G	
	18 - 19	45,5 ÷ 46,5	1,791 ÷ 1,831	TPM-46G	
2" (50,8)	10	43,5 ÷ 44,5	1,713 ÷ 1,752	TPM-44/51	1"
	11 - 12	44,5 ÷ 45,5	1,752 ÷ 1,791	TPM-45/51	
	13	45,5 ÷ 46,5	1,791 ÷ 1,831	TPM-46/51	
	14 - 15	46,5 ÷ 47,5	1,831 ÷ 1,870	TPM-47/51	
	16 ÷ 18	47,5 ÷ 48,5	1,870 ÷ 1,909	TPM-48/51	
2.1/4" (57,1)	9 - 10	49,5 ÷ 50,5	1,949 ÷ 1,988	TPM-50/57	1.1/2"
	11	50,5 ÷ 51,5	1,988 ÷ 2,028	TPM-51/57	
	12 - 13	51,5 ÷ 52,5	2,028 ÷ 2,067	TPM-52/57	
	7	50,5 ÷ 51,5	1,988 ÷ 2,028	TPM-51G	
8	51,5 ÷ 52,5	2,028 ÷ 2,067	TPM-52G		
9	52,5 ÷ 53,5	2,067 ÷ 2,106	TPM-53G		
2.1/2" (63,5)	7	53,5 ÷ 54,5	2,106 ÷ 2,146	TPM-54/63	1.1/2"
	8	54,5 ÷ 55,5	2,146 ÷ 2,185	TPM-55/63	
	9	55,5 ÷ 56,5	2,185 ÷ 2,224	TPM-56/63	
	10	56,5 ÷ 57,5	2,224 ÷ 2,264	TPM-57/63	

Onlypul 15
Runpul 15

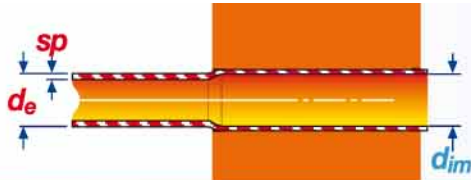
Onlypul 30
Runpul 30

Onlypul 45
Runpul 45

Onlypul 60
Runpul 60

Critical extractions
Reached
power limits

Depending on tube material
and tube-sheet thickness
Choose bigger size



TPJ for Onlypul Jaw



Set-TPJ for Runpul Set of jaws



TPC for Onlypul / Runpul Collar

d_e "	Onlypul 15 Runpul 15 Cod.	Onlypul 30 Runpul 30 Cod.	Onlypul 45 Runpul 45 Cod.
3/8"	TPJ/15-1	TPJ/30-1	-
1/2"	TPJ/15-2	TPJ/30-2	-
5/8"	TPJ/15-3	TPJ/30-3	-
3/4"	TPJ/15-4	TPJ/30-4	-
7/8"	TPJ/15-4/A	TPJ/30-4/A	-
1"	TPJ/15-5	TPJ/30-5	TPJ/45-5
3/4"Gas	-	TPJ/30-6	TPJ/45-6
1.1/4"	-	TPJ/30-7	TPJ/45-7
1"Gas	-	TPJ/30-8	TPJ/45-8
1.1/2"	-	TPJ/30-9	TPJ/45-9

d_e "	Onlypul 15 Runpul 15 Cod.	Onlypul 30 Runpul 30 Cod.	Onlypul 45 Runpul 45 Cod.
3/8"	TPC-11	TPC-11	-
1/2"	TPC-14	TPC-14	-
5/8"	TPC-18	TPC-18	-
3/4"	TPC-21	TPC-21	-
7/8"	TPC-25	TPC-25	-
1"	TPC-28	TPC-28	TPC-28
3/4"Gas	-	TPC-31	TPC-31
1.1/4"	-	TPC-34	TPC-34
1"Gas	-	TPC-37	TPC-37
1.1/2"	-	TPC-41	TPC-41

d_e "	Onlypul 30 Runpul 30 Cod.	Onlypul 45 Runpul 45 Cod.	Onlypul 60 Runpul 60 Cod.
1.1/4"Gas	TPJ/30-10	TPJ/45-10	-
1.3/4"	-	TPJ/45-11	-
1.1/2"Gas	-	TPJ/45-12	-
2"	-	TPJ/45-13	TPJ/60-13
2.1/4"	-	TPJ/45-14	TPJ/60-14
2"Gas	-	TPJ/45-15	TPJ/60-15
2.1/2"	-	TPJ/45-16	TPJ/60-16
3"	-	TPJ/45-17	TPJ/60-17
3.1/2"	-	-	TPJ/60-18
4"	-	-	TPJ/60-19

d_e "	Onlypul 30 Runpul 30 Cod.	Onlypul 45 Runpul 45 Cod.	Onlypul 60 Runpul 60 Cod.
1.1/4"Gas	TPC-44	TPC-44	-
1.3/4"	-	TPC/45-48	-
1.1/2"Gas	-	TPC/45-53	-
2"	-	TPC/45-56	TPC/60-56
2.1/4"	-	TPC/45-60	TPC/60-60
2"Gas	-	TPC/45-63	TPC/60-63
2.1/2"	-	TPC/45-66	TPC/60-66
3"	-	TPC/45-80	TPC/60-80
3.1/2"	-	-	TPC/60-93
4"	-	-	TPC/60-105



Hydraulically operated tube pullers tools

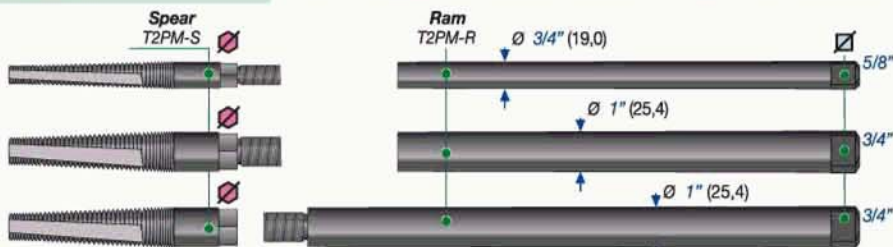
Onlypul

T2PM two pieces mandrel for size from 1/2" (12,7mm) to 1.1/2" (38,1mm)

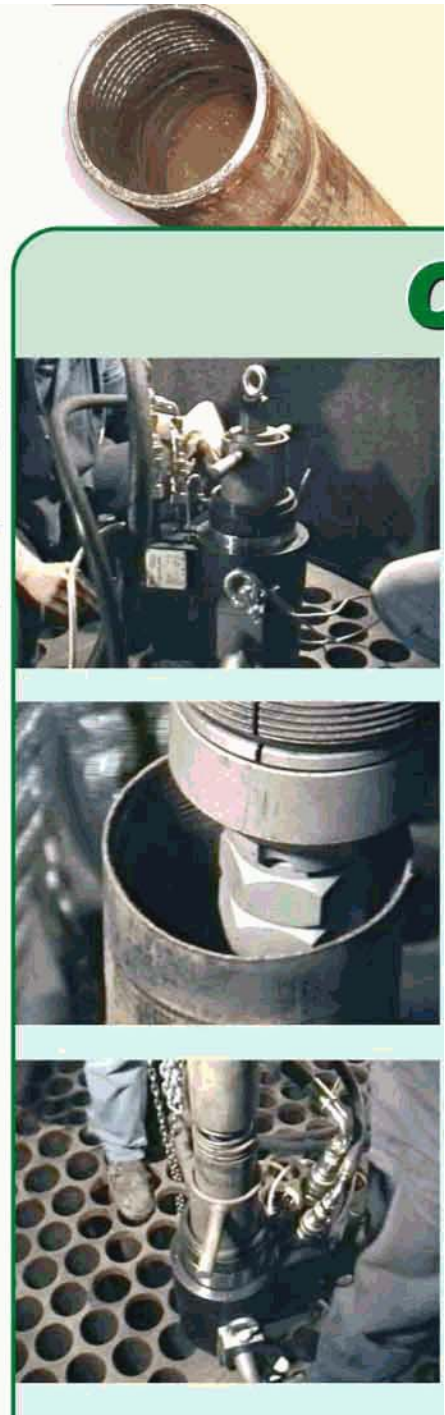
$d_e = 1/2"$
(12,7)

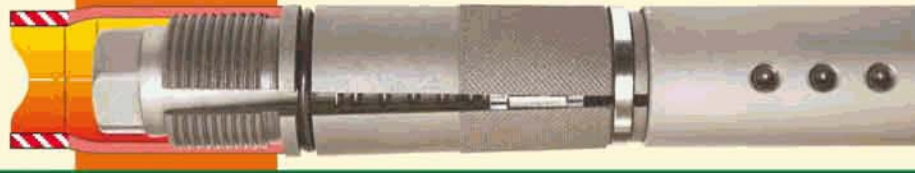
$d_e = 5/8" \div 1"$
(15,9 ÷ 25,4 mm)

$d_e = 1.1/4" \div 1.1/2"$
(31,8 ÷ 38,1 mm)



d_e mm	sp B.W.G.	dim		T2PM		TPJ	TPC
		mm	"	Spear Cod.	Ram Cod.	Jaw Cod.	Collar Cod.
1/2" (12,7)	14 - 16	8,5 ÷ 9,5	0,335 ÷ 0,374	T2PM-S9			
	17 - 18	9,5 ÷ 10,5	0,374 ÷ 0,413	T2PM-S10			
	19 ÷ 21	10,5 ÷ 11,5	0,413 ÷ 0,453	T2PM-S11	T2PM-R9÷12	TPJ/15-4 TPJ/30-4	TPC/21
	24	11,5 ÷ 12,5	0,453 ÷ 0,492	T2PM-S12			
5/8" (15,9)	16 - 17	12,5 ÷ 13,5	0,492 ÷ 0,531	T2PM-S13			
	19 ÷ 21	13,5 ÷ 14,5	0,531 ÷ 0,571	T2PM-S14	T2PM-R13÷24	TPJ/15-5 TPJ/30-5	TPC/28
	23 - 24	14,5 ÷ 15,5	0,571 ÷ 0,610	T2PM-S15			
3/4" (19,0)	11	12,5 ÷ 13,5	0,492 ÷ 0,531	T2PM-S13			
	12 - 13	13,5 ÷ 14,5	0,531 ÷ 0,571	T2PM-S14			
	14 - 15	14,5 ÷ 15,5	0,571 ÷ 0,610	T2PM-S15			
	16 - 17	15,5 ÷ 16,5	0,610 ÷ 0,650	T2PM-S16	T2PM-R13÷24	TPJ/15-5 TPJ/30-5	TPC/28
	18 ÷ 20	16,5 ÷ 17,5	0,650 ÷ 0,689	T2PM-S17			
	21 ÷ 24	17,5 ÷ 18,5	0,689 ÷ 0,728	T2PM-S18			
7/8" (22,2)	14	17,5 ÷ 18,5	0,689 ÷ 0,728	T2PM-S18			
	16 - 17	18,5 ÷ 19,5	0,728 ÷ 0,768	T2PM-S19	T2PM-R13÷24	TPJ/15-5 TPJ/30-5	TPC/28
	18 - 19	19,5 ÷ 20,5	0,768 ÷ 0,807	T2PM-S20			
1" (25,4)	10 - 11	18,5 ÷ 19,5	0,728 ÷ 0,768	T2PM-S19			
	12	19,5 ÷ 20,5	0,768 ÷ 0,807	T2PM-S20			
	13 - 14	20,5 ÷ 21,5	0,807 ÷ 0,846	T2PM-S21			
	15 - 16	21,5 ÷ 22,5	0,846 ÷ 0,886	T2PM-S22	T2PM-R13÷24	TPJ/15-5 TPJ/30-5	TPC/28
	18	22,5 ÷ 23,5	0,886 ÷ 0,925	T2PM-S23			
	19 - 20	23,5 ÷ 24,5	0,925 ÷ 0,965	T2PM-S24			
1.1/4" (31,8)	10	24,5 ÷ 25,5	0,965 ÷ 1,004	T2PM-S25			
	11 - 12	25,4 ÷ 26,5	1,004 ÷ 1,043	T2PM-S26			
	13	26,5 ÷ 27,5	1,043 ÷ 1,083	T2PM-S27			
	14 - 15	27,5 ÷ 28,5	1,083 ÷ 1,122	T2PM-S28			
	16 ÷ 18	28,5 ÷ 29,5	1,122 ÷ 1,161	T2PM-S29	T2PM-R25÷48	TPJ/30-5	TPC/35
	19 ÷ 22	29,5 ÷ 30,5	1,161 ÷ 1,201	T2PM-S30			
	23 - 24	30,5 ÷ 31,5	1,201 ÷ 1,240	T2PM-S31			
1.1/2" (38,1)	10 - 11	31,5 ÷ 32,5	1,240 ÷ 1,280	T2PM-S32			
	12 - 13	32,5 ÷ 33,5	1,280 ÷ 1,319	T2PM-S33			
	14	33,5 ÷ 34,5	1,319 ÷ 1,358	T2PM-S34			
	15 ÷ 17	34,5 ÷ 35,5	1,358 ÷ 1,398	T2PM-S35	T2PM-R25÷48	TPJ/30-5	TPC/41
	18 ÷ 20	35,5 ÷ 36,5	1,398 ÷ 1,437	T2PM-S36			
	21 ÷ 24	36,5 ÷ 37,5	1,437 ÷ 1,476	T2PM-S37			





Onlypul Runpul

TPM-K Quick gripping extraction mandrel for size from 1.1/2" (38,1mm) to 4" (101,6mm)

Maus Italia **exclusive design** mandrel, to be used in combination with the semi-automatic pulling gun **Onlypul** or **Runpul**, allows a rapid anchoring to the tube (**No need of impact tool or keys**)



Extension of the quick gripping attachment typical of the **Grippul** even in continuous tube pulling ≥ 38.1 mm (1.1/2") with **Runpul 30**, **Runpul 45** and **Runpul 60**



Quick tool attaching: the operator no longer has to screw and unscrew the end in the tube

Quick tube gripping operation

Low wear limited to replacement of the jaws

d_e mm	sp B.W.G.	d_{im} mm	d_{im} "	Mandrel Cod.	Cone Cod.	Jaw Cod.	Ram Cod.	\varnothing "
1.1/2" (38,1)	10 - 11	31,5 ÷ 32,5	1.240 ÷ 1.280	TPM-K-32		JK-32		
	12 - 13	32,5 ÷ 33,5	1.280 ÷ 1.319	TPM-K-33		JK-33		
	14	33,5 ÷ 34,5	1.319 ÷ 1.358	TPM-K-34		JK-34		
	15 ÷ 17	34,5 ÷ 35,5	1.358 ÷ 1.498	TPM-K-35	CK-32÷37	JK-35	RK-32÷37	1.1/4"
	18 ÷ 20	35,5 ÷ 36,5	1.498 ÷ 1.437	TPM-K-36		JK-36		
	21 ÷ 24	36,5 ÷ 37,5	1.437 ÷ 1.476	TPM-K-37		JK-37		
1.3/4" (44,4)	10 - 11	37,5 ÷ 38,5	1.476 ÷ 1.516	TPM-K-38		JK-38		
	12	38,5 ÷ 39,5	1.516 ÷ 1.555	TPM-K-39		JK-39		
	13 - 14	39,5 ÷ 40,5	1.555 ÷ 1.594	TPM-K-40		JK-40		
	15 - 16	40,5 ÷ 41,5	1.594 ÷ 1.634	TPM-K-41	CK-38÷43	JK-41	RK-38÷43	1.1/4"
	18 - 19	41,5 ÷ 42,5	1.634 ÷ 1.673	TPM-K-42		JK-42		
	20 ÷ 24	42,5 ÷ 43,5	1.673 ÷ 1.713	TPM-K-43		JK-43		
2" (50,8)	10	43,5 ÷ 44,5	1.713 ÷ 1.752	TPM-K-44		JK-44		
	11 - 12	44,5 ÷ 45,5	1.752 ÷ 1.791	TPM-K-45		JK-45		
	13	45,5 ÷ 46,5	1.791 ÷ 1.831	TPM-K-46		JK-46		
	14 - 15	46,5 ÷ 47,5	1.831 ÷ 1.870	TPM-K-47	CK-44÷49	JK-47	RK-44÷49	1.1/4"
	16 ÷ 18	47,5 ÷ 48,5	1.870 ÷ 1.909	TPM-K-48		JK-48		
	19 ÷ 22	48,5 ÷ 49,5	1.909 ÷ 1.949	TPM-K-49		JK-49		
2.1/4" (57,1)	9 - 10	49,5 ÷ 50,5	1.949 ÷ 1.988	TPM-K-50		JK-50		
	11	50,5 ÷ 51,5	1.988 ÷ 2.028	TPM-K-51	CK-50÷52	JK-51	RK-50÷52	1.1/2"
	12 - 13	51,5 ÷ 52,5	2.028 ÷ 2.067	TPM-K-52		JK-52		
2.1/2" (63,5)	7	53,5 ÷ 54,5	2.106 ÷ 2.146	TPM-K-54		JK-54		
	8	54,5 ÷ 55,5	2.146 ÷ 2.185	TPM-K-55		JK-55		
	9	55,5 ÷ 56,5	2.185 ÷ 2.224	TPM-K-56	CK-54÷57	JK-56	RK-54÷57	1.1/2"
	10	56,5 ÷ 57,5	2.224 ÷ 2.264	TPM-K-57		JK-57		
3" (76,2)	7	66,5 ÷ 67,5	2.618 ÷ 2.657	TPM-K-67		JK-67		
	8	67,5 ÷ 68,5	2.657 ÷ 2.697	TPM-K-68		JK-68		
	9 - 10	68,5 ÷ 69,5	2.697 ÷ 2.736	TPM-K-69	CK-67÷70	JK-69	RK-67÷70	1.3/4"
	11	69,5 ÷ 70,5	2.736 ÷ 2.776	TPM-K-70		JK-70		
3.1/2" (88,9)	6	78,5 ÷ 79,5	3.091 ÷ 3.130	TPM-K-79		JK-79		
	7	79,5 ÷ 80,5	3.130 ÷ 3.169	TPM-K-80		JK-80		
	8 - 9	80,5 ÷ 81,5	3.169 ÷ 3.209	TPM-K-81	CK-79÷82	JK-81	RK-79÷82	1.3/4"
	10	81,5 ÷ 82,5	3.209 ÷ 3.248	TPM-K-82		JK-82		
4" (101,6)	6	91,5 ÷ 92,5	3.602 ÷ 3.642	TPM-K-92		JK-92		
	7 - 8	92,5 ÷ 93,5	3.642 ÷ 3.681	TPM-K-93		JK-93		
	9	93,5 ÷ 94,5	3.681 ÷ 3.720	TPM-K-94	CK-92÷95	JK-94	RK-92÷95	1.3/4"
	10	94,5 ÷ 95,5	3.720 ÷ 3.760	TPM-K-95		JK-95		

Onlypul 30
Runpul 30

Onlypul 45
Runpul 45

Onlypul 60
Runpul 60



Power unit

Flexibility and economy of use

High quality of the maintenance

Tubes sizes extractable (up to) 101,6 mm (4")

Speed of extraction 8mt/min (26 Ft/min)

TP

Unit for the continuous pulling of tubes from 12,7÷101,6 mm (1/2" to 4")

The tube pulling equipment is designed and produced by Maus Italia for daily use in the workshops of petroleum refineries and aluminum refineries, in power stations and sugar factories for the partial or complete retubing of tube bundles in heat exchangers, condensers and boilers.

The **TP** systems come in **7 different versions** depending on **driving unit** (manual, air motor or electric motor), **working system** (semi-automatically, automatically in a continuous process) and **performance**.

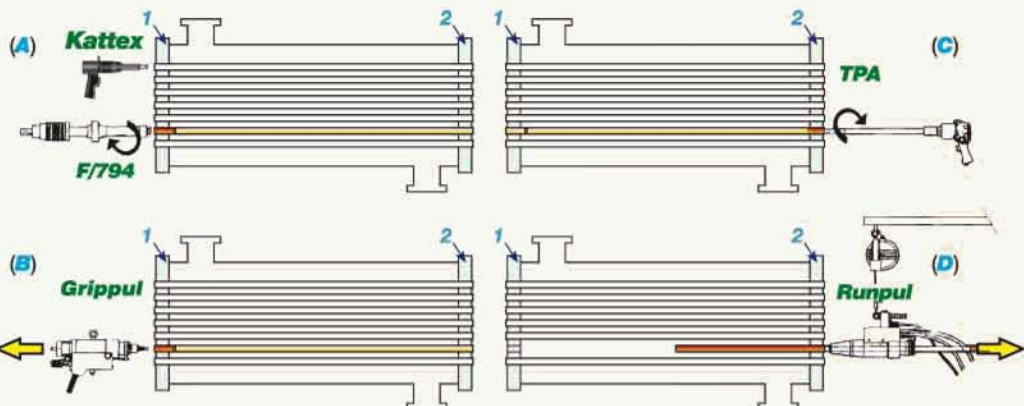
The size of the machines is calculated on the basis of the **number of tubes to be extracted**.



Suggested operation

As illustrated in the figure at the bottom of the page, Maus Italia offers solutions for dealing with the problem of dismantling tube bundles in increasingly rapid and convenient ways thanks to a series of accessories capable of meeting all needs. The **Kattex** or **F/794** motor powered tube cutters are used to cut the tube to be extracted (A).

Meanwhile it is possible to work on the opposite tube sheet using the **Onlypul** continuous semiautomatic tube puller or the **Runpul** (C and D) automatic version. After the tube has been cut, the **Grippul** is used to proceed with rapid extraction (6 per minute) of the stubs (B). The hydraulic units are connected rapidly to all the tube pullers by a unified connection system.



MTP

Possible combinations between hydraulic gun and power unit

Manual equipment

Hydraulic Gun
Cod.

Power unit
Cod.

Set
Cod.

Onlypul - HM



TP1-H



MTP1H-OM

Grippul - E

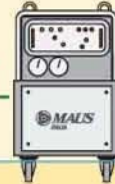


TP10-E



MTP10-GE

TP60-E



MTP60-GE

Onlypul - EM



TP10-E



MTP10-OE

TP30-E



MTP30-OE

Runpul - EM



TP30-E



MTP30-RE

TP60-E



MTP60-RE

Grippul - P



TP10-P



MTP10-GP

TP60-P



MTP60-GP

Onlypul - PM



TP10-P



MTP10-OP

TP30-PS



MTP30-OP

Runpul - PM



TP30-PS



MTP30-RP

TP60-P



MTP60-RP

Electric equipment

Pneumatic equipment

Power unit



TP1-H

Hand pump

Model	Max. pressure		Oil flow rate		Dimensions			Weight				
	bar	psi	Lt/ciclo	US gpm	Width mm	Depth mm	Highth mm	Kg	Lb			
TP1-H	300	4350	0,025	0.007	350	13.8"	200	7.9"	230	9.1"	9,5	21



TP10-E

Semi-automatic
Electrical
hydraulic pump unit

Model	Max. * pressure		Oil flow rate		Power supply	Remote control power supply	Dimensions			Weight							
	bar	psi	Lt/min (bar)	US gpm (psi)			Width mm	Depth mm	Highth mm	with oil		without oil		IP			
TP10-E	350	5075	12 (0÷70) 0,9 (70÷350)	3.17 (0÷1015 psi) 0.24 (1015÷5075 psi)	1,1Kw-230/400V-50/60Hz-3Ph	24	680	26.8"	520	20.5"	720	28.3"	82	181	52	115	55



TP10-P

Semi-automatic
Pneumatical
hydraulic pump unit

Model	Max. * pressure		Oil flow rate		Power supply	Air pressure required	Dimensions			Weight							
	bar	psi	Lt/min (bar)	US gpm (psi)			Width mm	Depth mm	Highth mm	with oil		without oil					
TP10-P	350	5075	12 (0÷70) 0,9 (70÷350)	3.17 (0÷1015 psi) 0.24 (1015÷5075 psi)	1,7Kw-7 bar (67Cfm) 1900 Lt/min (67Cfm)	7	100	680	26.8"	460	18.1"	600	23.6"	82	181	52	115

* On request available also 700 Bar (10000 psi) version

TP30-E

Automatic Electrical hydraulic pump unit

Oil filter cartridge

25µ Filter capacity
Replaceable cartridge



Electric motor TEFC

5.5Kw - 230/400V
3Ph - 50/60Hz
4 poles (1500 rpm)
B5 - IP 55

Hydraulic pump

variable capacity:
8÷40 Lt/min
2÷11 US gpm



Pilot lights of the state of the hydraulic gun, manual, automatic and Jaws release pilot light

Extraction pilot lamp indicator

Pressure gauges 350 bar (5075 psi)
oil discharge and return line

Return pilot lamp indicator

Work selector / jaws release

Hand bar

Oil level indicator

The TP30-E is controlled directly by the operator with substantial increase in productivity

Model	Max. pressure		Oil flow rate		Power supply	Remote control power supply		Dimensions			Weight				IP		
	bar	psi	Lt/min	US gpm		Vdc	mm	Width	Depth	Highth	with oil	without oil	Kg	Lb		Kg	Lb
TP30-E	350	5075	8÷40	2÷11	5,5Kw-230/400V-50/60Hz-3Ph	24	700	27.6"	950	37.4"	1080	42.5"	360	794	270	596	30

TP30-PS

Automatic Pneumactical hydraulic pump unit

Oil filter cartridge

25µ Filter capacity
Replaceable cartridge



Pneumatic motor

4Kw
7 bar (100 psi)
4800 Lt/min (170 Cfm)

Hydraulic pump

variable capacity:
8÷40 Lt/min
2÷11 US gpm



Internal tool box for hydraulic gun

Pressure gauges 350 bar (5075 psi)
oil discharge and return line

Air supply pressure gauge

Internal tool box for working accessories, hydraulic hoses, electric cables c/w lockable door

Hand bar

Oil level indicator

The TP30-PS is controlled directly by the operator with substantial increase in productivity

Model	Max. pressure		Oil flow rate		Power supply	Air pressure required		Dimensions			Weight						
	bar	psi	Lt/min	US gpm		bar	psi	Width	Depth	Highth	with oil	without oil	Kg	Lb	Kg	Lb	
TP30-PS	350	5075	8÷40	2÷11	4Kw - 7 bar (100psi)-4800 Lt/min (170Cfm)	7	100	770	30.3"	920	36.2"	1000	39.4"	220	485	130	287

Power unit

TP60-E

Automatic Electrical hydraulic pump unit PLC managed

High performance, accuracy in assembly and the best components from selected international sub-suppliers are the ingredients that make this unit the leader in the market.

PLC managed
Removable control rack for easy maintenance

Dirty oil filter alarm

Oil temperature alarm

Pilot lights of the state of the hydraulic gun, manual, automatic and Jaws release pilot light

Work selector / jaws release

Return pilot lamp indicator

Extraction pilot lamp indicator

Pressure gauges
350 bar (5075 psi)
oil discharge and return line

Hand bar

Internal tool box
for hydraulic gun
c/w lockable door

Hydraulic pump

variable capacity:
8÷60Lt/min
2÷16US gpm



60 Lt/min - 16 US gpm

Electric motor
TEFC

5.5Kw - 230/400V
3Ph - 50/60Hz
4 poles (1500 rpm)
B5 - IP 55



Oil filter cartridge

25µ Filter capacity
Replaceable cartridge



Manual regulator

Oil flow
Oil pressure



Emergency push button

External fan cooled radiator

Oil level indicator

Internal tool box
for working accessories,
hydraulic hoses,
electric cables
c/w lockable
door

2 speeds extraction

The PLC present on the TP60-E makes it possible for the operator to have two extraction speeds.

The TP60-E is controlled directly by the operator with substantial increase in productivity

Model	Max. pressure		Oil flow rate		Power supply	Remote control power supply	Dimensions			Weight		Weight		IP					
	bar	psi	Lt/min	US gpm			Width	Depth	High	Kg	Lb	with oil	without oil						
TP60-E	350	5075	8÷60	2÷16	5,5 Kw-230/400V-50/60Hz-3Ph	24	700	27.6"	1070	42.1"	1270	50.0"	440	970	440	970	320	706	55

TP60-P

Automatic Pneumatically hydraulic pump unit

Hydraulic pump

variable capacity:

8÷60 Lt/min
2÷16 US gpm



60 Lt/min - 16 US gpm

Pneumatic motor

6,7 Kw
7 bar (100psi)
8000 Lt/min
(283 Cfm)



Oil filter cartridge

25µ Filter capacity
Replaceable cartridge



Hand bar

Pressure gauges
350 bar (5075 psi)
oil discharge and return line

Return pilot pneumatic indicator

Extraction pilot pneumatic indicator

Air supply pressure gauge

Internal tool box
for hydraulic gun
c/w lockable door



Manual regulator

Oil flow
Oil pressure



Oil level indicator



Internal tool box
for working accessories,
hydraulic hoses,
electric cables
c/w lockable door

The **TP60-P** is controlled directly by the operator with substantial increase in productivity



Model	Max. pressure		Oil flow rate		Power supply	Air pressure required		Dimensions			Weight						
	bar	psi	Lt/min	US gpm		bar	psi	Width mm	Depth mm	Height mm	with oil Kg	without oil Kg					
TP60-P	350	5075	8÷60	2÷16	6,7Kw - 7 bar (100psi) - 8000 Lt/min (283Cfm)	7	100	700	27.6"	1070	42.1"	1270	50.0"	410	904	290	640

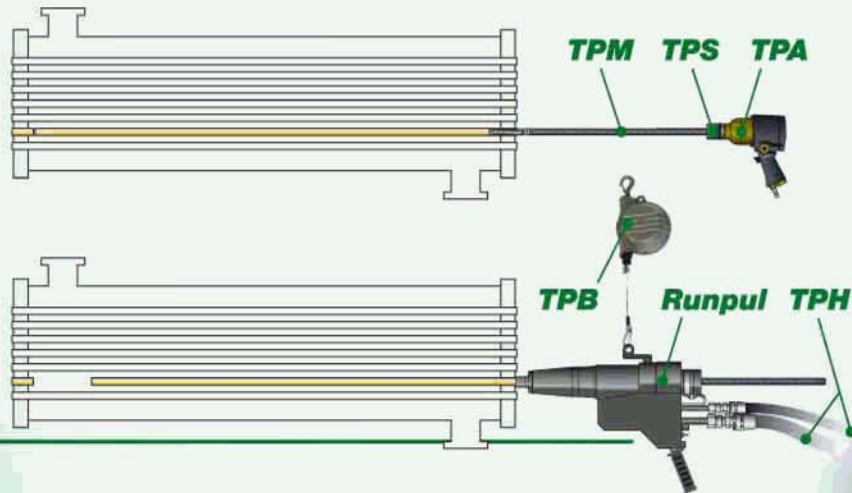
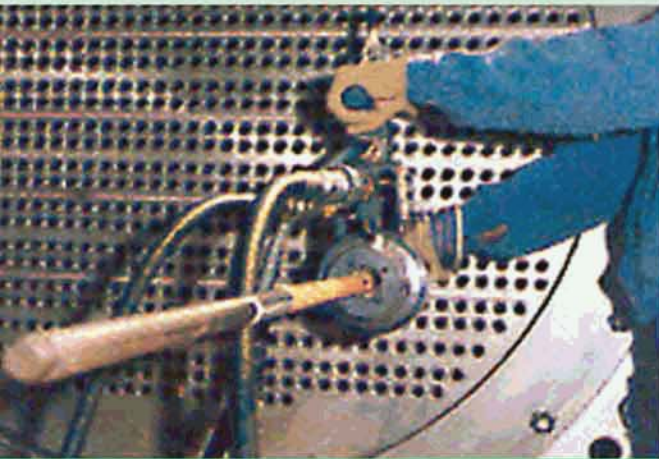


Accessories



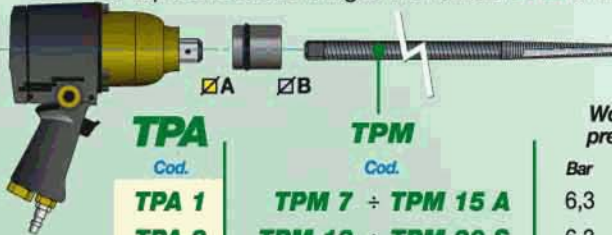
TP

Accessories for **Grippul**, **Onlypul** and **Runpul** pulling equipment



TPA - Impact tool

For rapid and secure fixing of the mandrel **TPM** in the tube before extraction.



TPA

Cod.

TPM

Cod.

Working pressure

Air shank

∅A

Weight

Bar

Psi

"

"

Kg

Lb

TPA 1

TPM 7 ÷ TPM 15 A

6,3

91.4

3/8" Gas

3/4"

5,0

10.8

TPA 2

TPM 13 ÷ TPM 20 S

6,3

91.4

1/2" Gas

1"

6,3

13.8

TPA 3A

TPM 19 ÷ TPM 37

6,3

91.4

1/2" Gas

1"

9,3

20.6

TPA 4

TPM 37 G ÷ TPM 49/51

6,3

91.4

1/2" Gas

1"

15,0

32.9

TPA 5

TP 50/57 ÷ TP 95/102

6,3

91.4

3/4" Gas

1.1/2"

32,0

70.55



TPB - Spring balancer with rapid return

Spring balancer with rapid return for support and balancing of the **Grippul**, **Onlypul** and **Runpul**.

Available in 6 different lifting range capacity.



TPB

Cod.

Lifting range

Kg

Lb

TPB 10

20 ÷ 25

44 ÷ 55

TPB 15

25 ÷ 30

55 ÷ 66

TPB 20

30 ÷ 35

66 ÷ 77

TPB 30

40 ÷ 55

88 ÷ 121

TPB 45

55 ÷ 65

121 ÷ 143

TPB 60

65 ÷ 105

143 ÷ 231



Hydraulic guns

Grippul 11

Onlypul 15 - Runpul 15

Grippul 21

Onlypul 30 - Runpul 30

Onlypul 45 - Runpul 45

Onlypul 60 - Runpul 60

TPS - Socket

Sturdy socket to be mounted between the impact tool **TPA** and the mandrel **TPM**.



TPS

Cod.

TPA

∅A

TPM

∅B

TPS 1B

3/4"

5/16"

TPS 2B

3/4"

3/8"

TPS 3B

3/4"

1/2"

TPS 3A

1"

1/2"

TPS 4

1"

5/8"

TPS 5

1"

3/4"

TPS 6

1"

1"

TPS 6A

1"

1.1/2"

TPS 7

1.1/2"

1"

TPS 8

1.1/2"

1.1/2"

Balanced support arms

Designed by Maus Italia for the vertical heat exchangers (Sugar Plants or Aluminium Refineris), they are suitable for the positioning and moving of the stub/tube pullers of the series **Grippul**, **Onlypul** and **Runpul**. It's guarantee a trouble-free use in total safety for the operator thanks to a system of slides and balances.

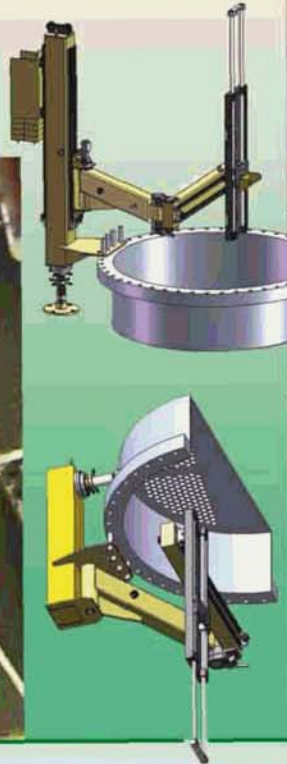
TSA-2000

Suitable for the upper tube-sheet, it is used with the **Runpul** and **Onlypul** equipment for the continuous extraction, and not for single tubes

BSA-2000

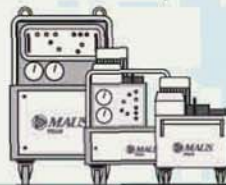
Suitable for the lower tube-sheet, it is used with **Kattex** and **Grippul** equipment for the cutting and extraction of the stub.

They are considered a good investment because they can also used for managing the rolling motors



TPH - High pressure flexible hydraulic hoses with quick adapter

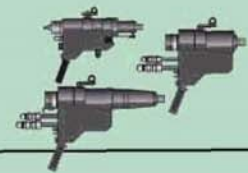
High pressure flexible hydraulic hoses with quick adapter to ensure the proper and safe connection between tube pullers hydraulic guns **Grippul**, **Onlypul** and **Runpul** series and power units chosen.



A



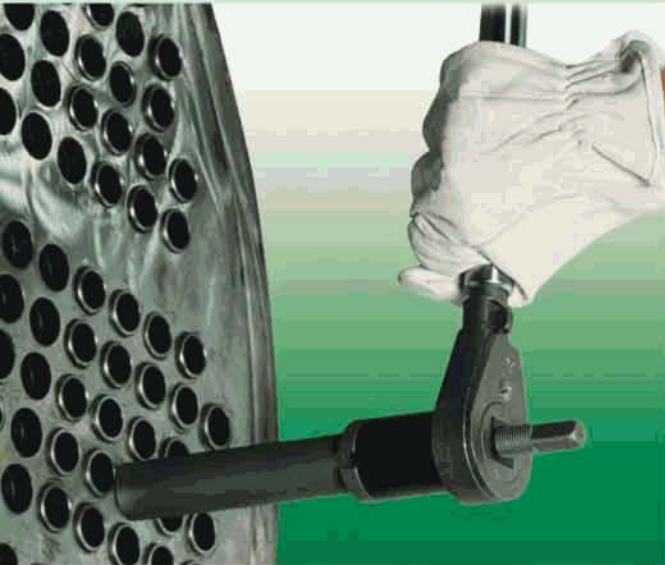
B



TPH Cod.	Power unit	A		O.D. Tubo		B		Hydraulic guns
		mm	“	mm	“	mm	“	
TPH 960	TP10 - TP30	19,0	3/4”	9,5	3/8”	19,0	3/4”	Onlypul
TPH 970	TP10 - TP30	12,7	1/2”	9,5	3/8”	12,7	1/2”	Onlypul
TPH 940	TP10 - TP60	12,7	1/2”	9,5	3/8”	9,5	3/8”	Grippul
TPH 950	TP10 - TP60	19,0	3/4”	9,5	3/8”	12,7	1/2”	Grippul
TPH 1270	TP30 - TP60	12,7	1/2”	12,7	1/2”	12,7	1/2”	Runpul
TPH 1900	TP30 - TP60	19,0	3/4”	19,0	3/4”	19,0	3/4”	Runpul

Manual tool for tube extraction

Cheaptool



Equipment for the manual maintenance of the tube in heat exchangers

Cheaptool is the complete system of Maus Italia products for the manual, low-cost maintenance of tubes in heat exchangers in oil refineries, condensers in electric power stations, boilers, etc..

Cheaptool consists of various products that work in synergy to increase the effectiveness of the work on the tube being replaced. The tube reamer **F/791** starts first by reducing the thickness of the tube to enable the **F/793** to enter the part that has been reamed (therefore offering less resistance) and to expel the tube. The tube collapsing tool **F/792** is used when the thickness of the tube is not high and offers less resistance.

Cheaptool also includes a manual tube cutter **F/790**, a manual extractor **F/800** and a pneumatic hammer **F/789** suggested for use with the above tools.

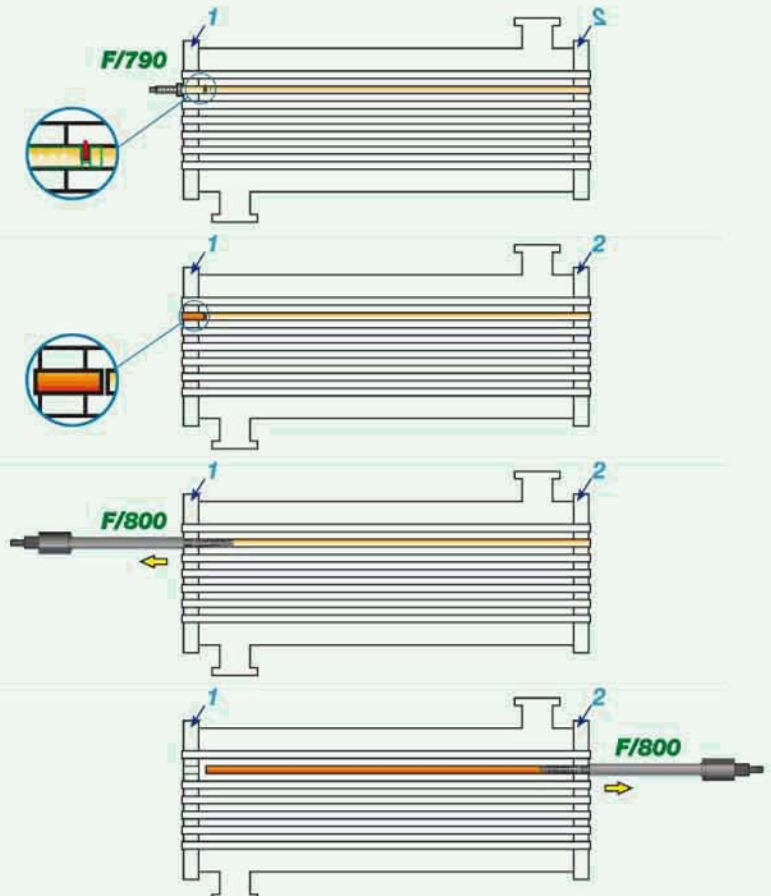
Flexibility and economy of use

High quality of maintenance

Examples of right procedures of tube extraction by **Cheaptool**

1st example of use Cutting and pulling of tube stub and tube

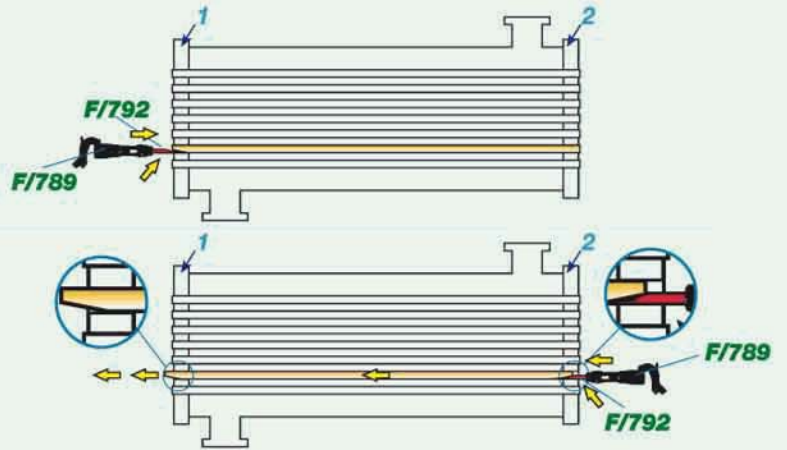
- Work on the first tubesheet with the one-revolution tube cutter **F/790** to cut the tube to be replaced.
- After cutting the tube stub is connected to the first tubesheet and the remaining part of the tube is connected to the second tubesheet.
- Using the **F/800** manual tube puller it is easy to pull out the stub from the first tubesheet quickly and efficiently.
- By repeatedly using the **F/800** manual tube puller on the second tubesheet all the tube can be pulled out easily thus freeing the exchanger.



2nd example of use

Initial extraction and removal for thin-walled tubes

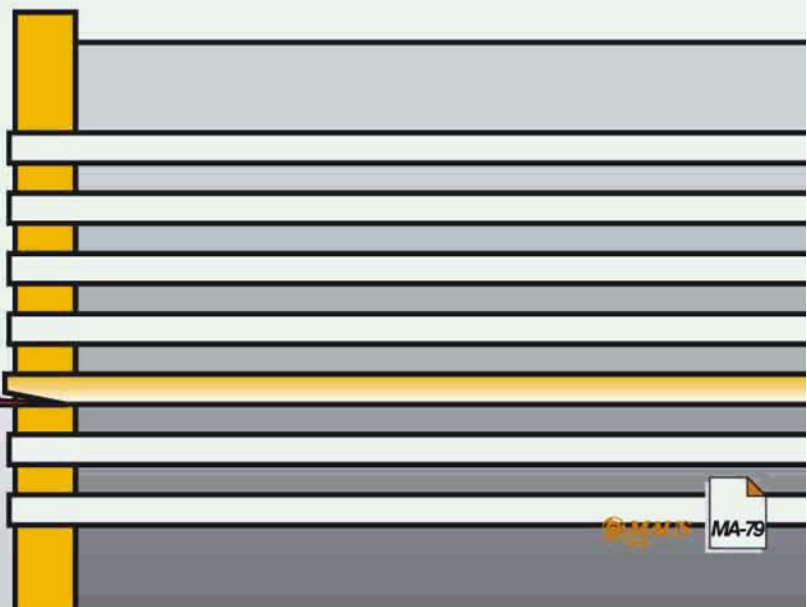
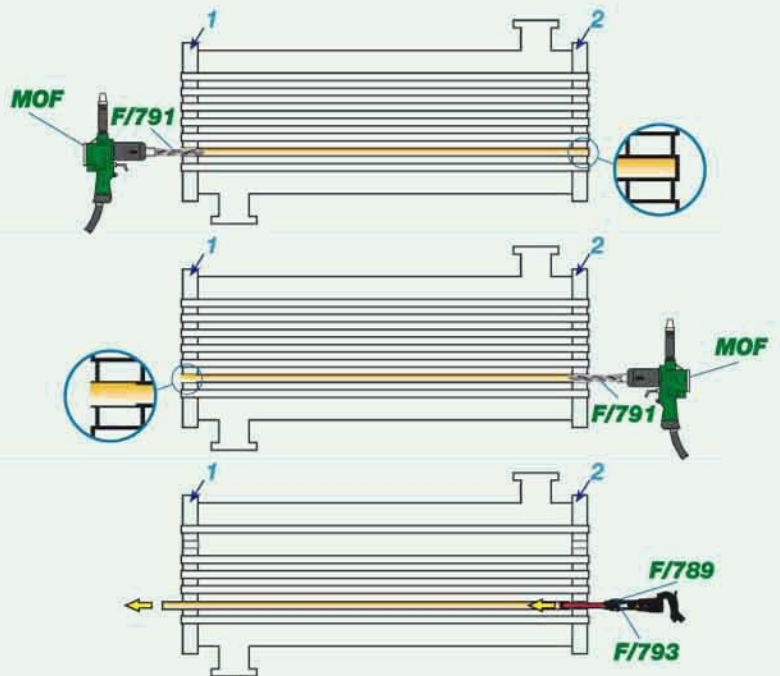
- Work on the first tubesheet with the **F/792** tube collapsing tool using the **F/789** pneumatic hammer to extract the tube.
- Initial extraction on the second tubesheet with the same **F/792** using the **F/789** moves the tube out for the first few millimeters giving sufficient length for a good grip in manual pulling.



3rd example of use

Initial extraction and removal

- Work on the first tubesheet with the **F/791** tube reamer with the **MOF**, reducing the tube thickness to make it easier to strip.
- Work in the same way also for the second tubesheet still using the **F/791** together with the **MOF** thus preparing the tube on both sides for removal.
- Operate the **F/793** tube expeller to move the tube out a few inches giving sufficient length for a good grip in manual pulling.



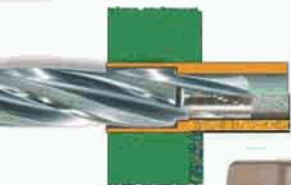
Manual tool for tube extraction

F/791

Tube reamer



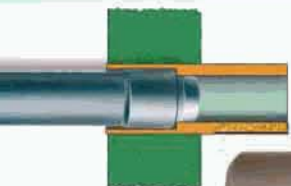
These are high-speed steel reamers, with Morse taper connection and rear tang with diameter ground in accordance with the BWG of the tubes. To use to reduce the thickness of tubes to be replaced, for a depth of about 80% of the thickness of the sheet.



F/793

Tube expeller

Use preferably with a pneumatic hammer.
Standard tang: $\varnothing 17,2$ mm (0.677") x 60,3 mm (2.3/8")



F/792

Tube collapsing tool

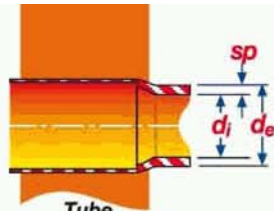
Used for crumpling tubes of non-ferrous alloys or ferrous alloys made lighter with the use of the reamer **F/791** and expelling them from the tube plate. To be used preferably with a pneumatic hammer.
Standard tang: $\varnothing 17,2$ mm (0.677") x 60,3 mm (2.3/8")



F/789

Pneumatic hammer specific for "Cheaptool"





Tube						F/791	L1		F/793	L3	F/792	L2			
de	B.W.G.	sp	di	F/791	L1		F/793	L3	F/792	L2					
mm		mm	mm	Cod.	mm		Cod.	mm	Cod.	mm					
1/2"	-	-	-	-	-	-	-	-	F/792-0	196,0					
(12,7)	-	-	-	-	-	-	-	-	-	7.717					
5/8" (15,9)	10	3,4	0.134	9,5	0.357	F/791-1			F/793-1						
	11	3,0	0.120	9,8	0.385	F/791-2			F/793-2						
	12	2,8	0.109	10,3	0.407	F/791-3			F/793-3						
	13	2,4	0.095	11,0	0.435	F/791-4	100,0	3.937	2	F/793-4	182,0	7.165	F/792-1	192,0	7.559
	14	2,1	0.083	11,7	0.459	F/791-5			F/793-5						
	15	1,8	0.072	12,2	0.481	F/791-6			F/793-6						
	16	1,6	0.065	12,6	0.495	F/791-7			F/793-7						
	18	1,2	0.049	13,4	0.527	F/791-8			F/793-8						
3/4" (19,0)	10	3,4	0.134	12,2	0.482	F/791-9			F/793-9						
	11	3,0	0.120	12,9	0.510	F/791-10			F/793-10						
	12	2,8	0.109	13,5	0.532	F/791-11			F/793-11						
	13	2,4	0.095	14,2	0.560	F/791-12	120,0	4.724	2	F/793-12	182,0	7.165	F/792-2	194,0	7.638
	14	2,1	0.083	14,8	0.584	F/791-13			F/793-13						
	15	1,8	0.072	15,4	0.606	F/791-14			F/793-14						
	16	1,6	0.065	15,7	0.620	F/791-15			F/793-15						
	18	1,2	0.049	16,6	0.652	F/791-16			F/793-16						
7/8" (22,2)	10	3,4	0.134	15,4	0.607	F/791-17			F/793-17						
	11	3,0	0.120	16,1	0.635	F/791-18			F/793-18						
	12	2,8	0.109	16,7	0.657	F/791-19			F/793-19						
	13	2,4	0.095	17,4	0.685	F/791-20	130,0	5.118	2	F/793-20	182,0	7.165	F/792-3	190,0	7.480
	14	2,1	0.083	18,0	0.709	F/791-21			F/793-21						
	15	1,8	0.072	18,6	0.731	F/791-22			F/793-22						
	16	1,6	0.065	18,9	0.745	F/791-23			F/793-23						
	18	1,2	0.049	19,7	0.777	F/791-24			F/793-24						
1" (25,4)	8	4,2	0.165	17,0	0.670	F/791-25			F/793-25						
	10	3,4	0.134	18,6	0.732	F/791-26			F/793-26						
	11	3,0	0.120	19,3	0.760	F/791-27			F/793-27						
	12	2,8	0.109	19,9	0.782	F/791-28			F/793-28						
	13	2,4	0.095	20,6	0.810	F/791-29	155,0	6.102	3	F/793-29	182,0	7.165	F/792-4	177,0	6.969
	14	2,1	0.083	21,2	0.834	F/791-30			F/793-30						
	15	1,8	0.072	21,7	0.856	F/791-31			F/793-31						
	16	1,6	0.065	22,1	0.870	F/791-32			F/793-32						
1.1/4" (31,8)	8	4,2	0.165	23,4	0.920	F/791-34			F/793-34						
	10	3,4	0.134	24,9	0.982	F/791-35			F/793-35						
	11	3,0	0.120	25,6	1.010	F/791-36			F/793-36						
	12	2,8	0.109	26,2	1.032	F/791-37	165,0	6.496	3	F/793-37	182,0	7.165	F/792-5	164,0	6.457
	13	2,4	0.095	26,9	1.060	F/791-38			F/793-38						
	14	2,1	0.083	27,5	1.084	F/791-39			F/793-39						
	16	1,6	0.065	28,4	1.120	F/791-40			F/793-40						
	1.1/2" (38,1)	8	4,2	0.165	29,7	1.170	F/791-41			F/793-41					
10		3,4	0.134	31,3	1.232	F/791-42			F/793-42						
11		3,0	0.120	32,0	1.260	F/791-43			F/793-43						
12		2,8	0.109	32,6	1.282	F/791-44	180,0	7.087	4	F/793-44	182,0	7.165	F/792-6	165,0	6.496
13		2,4	0.095	33,3	1.310	F/791-45			F/793-45						
14		2,1	0.083	33,9	1.334	F/791-46			F/793-46						
16		1,6	0.065	34,8	1.370	F/791-47			F/793-47						

Manual tool for tube extraction

F/790

One revolution tube cutter

Cheaper tube cutter, adjustable reach from 50,8 mm to 152,4 mm (2" to 6"). The **F/790** was designed for hand use with a tap wrench and its functioning is based on the eccentricity of the blade.



When the **F/790** is inserted, the blade is completely in.



At the beginning of the rotation it perforates the tube.



In **one revolution** the tube is completely cut.



Rotating the **F/790** anti-clockwise the blade goes back in so that the cutter can be removed.

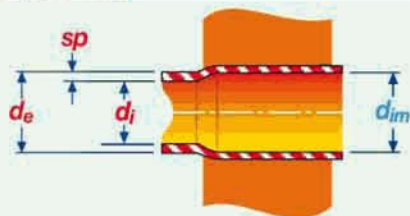
de mm	Tube		F/790 Cod.	Spare bit Cod.	∅			
	B.W.G.	sp				di		
1/2" (12,7)	18	1,2	0.049	10,2	0.402	F/790-1	BIT-F790-1-2	1/4"
	20	0,9	0.035	10,9	0.430	F/790-2		
5/8" (15,9)	14	2,1	0.083	11,7	0.459	F/790-3	BIT-F790-3	3/8"
	16	1,6	0.065	12,6	0.495	F/790-4		
	18	1,2	0.049	13,4	0.527	F/790-5		
	20	0,9	0.035	14,1	0.555	F/790-6		
3/4" (19,0)	14	2,1	0.083	14,8	0.584	F/790-7	BIT-F790-7	3/8"
	16	1,6	0.065	15,7	0.620	F/790-8		
	18	1,2	0.049	16,6	0.652	F/790-9		
	20	0,9	0.035	17,3	0.680	F/790-10		
	22	0,7	0.028	17,6	0.694	F/790-11		
7/8" (22,2)	14	2,1	0.083	18,0	0.709	F/790-12	BIT-F790-8÷16	1/2"
	16	1,6	0.065	18,9	0.745	F/790-13		
	18	1,2	0.049	19,7	0.777	F/790-14		
	20	0,9	0.035	20,4	0.805	F/790-15		
	22	0,7	0.028	20,8	0.819	F/790-16		
1" (25,4)	12	2,8	0.109	19,9	0.782	F/790-17	BIT-F790-17÷22	5/8"
	14	2,1	0.083	21,2	0.834	F/790-18		
	16	1,6	0.065	22,0	0.870	F/790-19		
	18	1,2	0.049	22,9	0.902	F/790-20		
	20	0,9	0.035	23,6	0.930	F/790-21		
	22	0,7	0.028	24,0	0.944	F/790-22		
1.1/4" (31,8)	12	2,8	0.109	26,2	1.032	F/790-23	BIT-F790-23÷32	3/4"
	14	2,1	0.083	27,5	1.084	F/790-24		
	16	1,6	0.065	28,4	1.120	F/790-25		
	18	1,2	0.049	29,3	1.152	F/790-26		
	20	0,9	0.035	30,0	1.180	F/790-27		
1.1/2" (38,1)	12	2,8	0.109	32,6	1.282	F/790-28	BIT-F790-23÷32	1"
	14	2,1	0.083	33,9	1.334	F/790-29		
	16	1,6	0.065	34,8	1.370	F/790-30		
	18	1,2	0.049	35,6	1.402	F/790-31		
	20	0,9	0.035	36,3	1.430	F/790-32		



F/800

Manual extractor

Recommended for small maintenance jobs, the **F/800** hand extractor allows easy removal of stubs and tubes.



d_e mm	sp B.W.G.	d_i mm	d_{im} "	TPMM Mandrel Cod.	TPCM Collar Cod.	F/800 Manual extractor Cod.	"	
3/8" (9,5)	17 ÷ 19	6,5 ÷ 7,5	0.256 ÷ 0.295	TPMM-7	1/2"	TPCM-11	F/800-1	7/8"
	20 ÷ 24	7,5 ÷ 8,5	0.295 ÷ 0.335	TPMM-8				
1/2" (12,7)	14 - 16	8,5 ÷ 9,5	0.335 ÷ 0.374	TPMM-9	1/2"	TPCM-14	F/800-1	7/8"
	17 - 18	9,5 ÷ 10,5	0.374 ÷ 0.413	TPMM-10				
	19 ÷ 21	10,5 ÷ 11,5	0.413 ÷ 0.453	TPMM-11				
	24	11,5 ÷ 12,5	0.453 ÷ 0.492	TPMM-12				
5/8" (15,9)	16 - 17	12,5 ÷ 13,5	0.492 ÷ 0.531	TPMM-13	1/2"	TPCM-18	F/800-1	7/8"
	19 ÷ 21	13,5 ÷ 14,5	0.531 ÷ 0.571	TPMM-14				
	23 - 24	14,5 ÷ 15,5	0.571 ÷ 0.610	TPMM-15				
3/4" (19,0)	11	12,5 ÷ 13,5	0.492 ÷ 0.531	TPMM-13	1/2"	TPCM-21	F/800-1	7/8"
	12 - 13	13,5 ÷ 14,5	0.531 ÷ 0.571	TPMM-14				
	14 - 15	14,5 ÷ 15,5	0.571 ÷ 0.610	TPMM-15				
	16 - 17	15,5 ÷ 16,5	0.610 ÷ 0.650	TPMM-16				
	18 ÷ 20	16,5 ÷ 17,5	0.650 ÷ 0.689	TPMM-17				
	21 ÷ 24	17,5 ÷ 18,5	0.689 ÷ 0.728	TPMM-18				
7/8" (22,2)	14	17,5 ÷ 18,5	0.689 ÷ 0.728	TPMM-18	3/4"	TPCM-25	F/800-2	1.1/4"
	16 - 17	18,5 ÷ 19,5	0.728 ÷ 0.768	TPMM-19				
	18 - 19	19,5 ÷ 20,5	0.768 ÷ 0.807	TPMM-20				
1" (25,4)	10 - 11	18,5 ÷ 19,5	0.728 ÷ 0.768	TPMM-19	3/4"	TPCM-28	F/800-2	1.1/4"
	12	19,5 ÷ 20,5	0.768 ÷ 0.807	TPMM-20				
	13 - 14	20,5 ÷ 21,5	0.807 ÷ 0.846	TPMM-21				
	15 - 16	21,5 ÷ 22,5	0.846 ÷ 0.886	TPMM-22				
	18	22,5 ÷ 23,5	0.886 ÷ 0.925	TPMM-23				
	19 - 20	23,5 ÷ 24,5	0.925 ÷ 0.965	TPMM-24				
1.1/4" (31,8)	10	25,3 ÷ 25,5	0.995 ÷ 1.004	TPMM-25	1"	TPCM-34	F/800-3	1.3/4"
	11 - 12	25,5 ÷ 26,5	1.004 ÷ 1.043	TPMM-26				
	13	26,5 ÷ 27,5	1.043 ÷ 1.083	TPMM-27				
	14 - 15	27,5 ÷ 28,5	1.083 ÷ 1.122	TPMM-28				
	16 ÷ 18	28,5 ÷ 29,5	1.122 ÷ 1.161	TPMM-29				
	19 ÷ 22	29,5 ÷ 30,5	1.161 ÷ 1.201	TPMM-30				
	23 - 24	30,5 ÷ 31,5	1.201 ÷ 1.240	TPMM-31				
1.1/2" (38,1)	10 - 11	31,5 ÷ 32,5	1.240 ÷ 1.280	TPMM-32	1"	TPCM-41	F/800-3	1.3/4"
	12 - 13	32,5 ÷ 33,5	1.280 ÷ 1.319	TPMM-33				
	14	33,5 ÷ 34,5	1.319 ÷ 1.358	TPMM-34				
	15 ÷ 17	34,5 ÷ 35,5	1.358 ÷ 1.398	TPMM-35				
	18 ÷ 20	35,5 ÷ 36,5	1.398 ÷ 1.437	TPMM-36				
	21 ÷ 24	36,5 ÷ 37,5	1.437 ÷ 1.476	TPMM-37				
2" (50,8)	10	43,5 ÷ 44,5	1.713 ÷ 1.752	TPMM-44	1.1/4"	TPCM-56	F/800-4	2.1/4"
	11 - 12	44,5 ÷ 45,5	1.752 ÷ 1.791	TPMM-45				
	13	45,5 ÷ 46,5	1.791 ÷ 1.831	TPMM-46				
	14 - 15	46,5 ÷ 47,5	1.831 ÷ 1.870	TPMM-47				
	16 ÷ 18	47,5 ÷ 48,5	1.870 ÷ 1.909	TPM-48				
	19 ÷ 22	48,5 ÷ 49,5	1.909 ÷ 1.949	TPM-49				

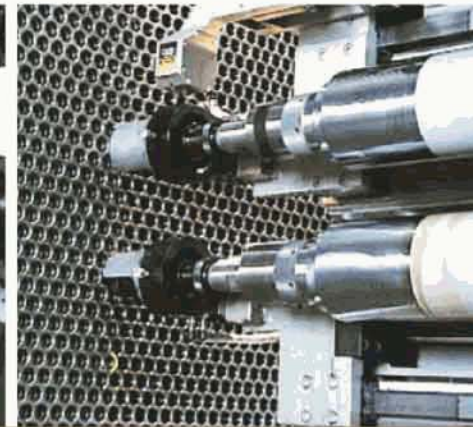
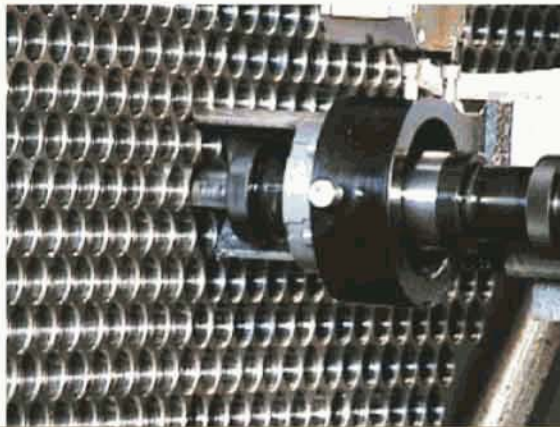
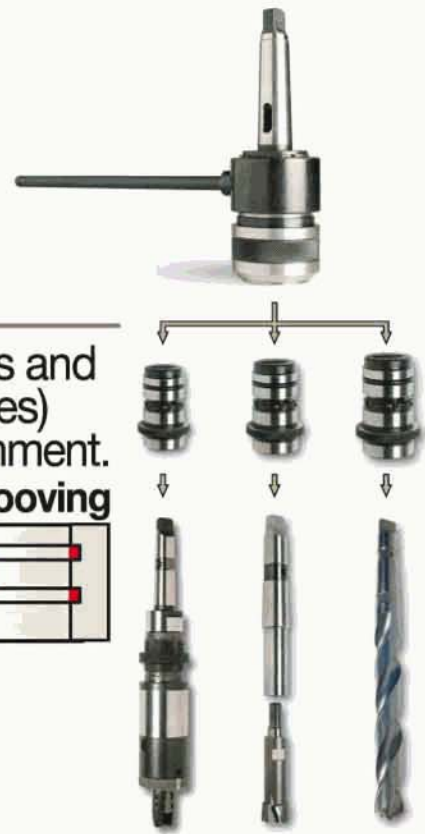
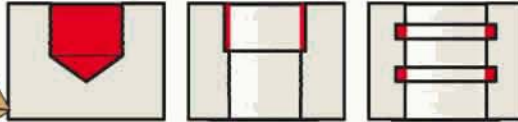
Other workings

(see relative catalogues)

Holetool

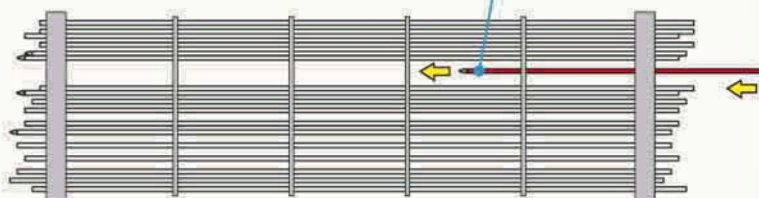
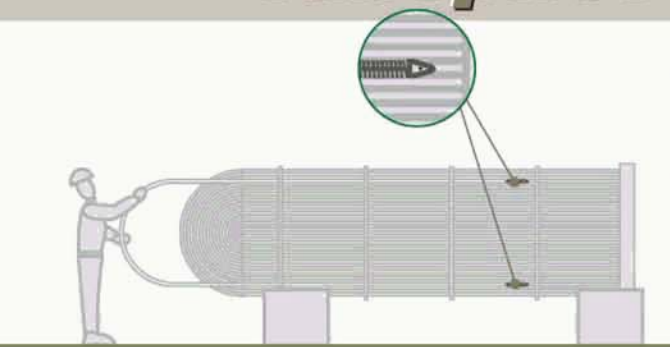
Automatic equipments and tools (with cooling holes) for tube sheet refurbishment.

Drilling **Reaming** **Grooving**



Tubepilot

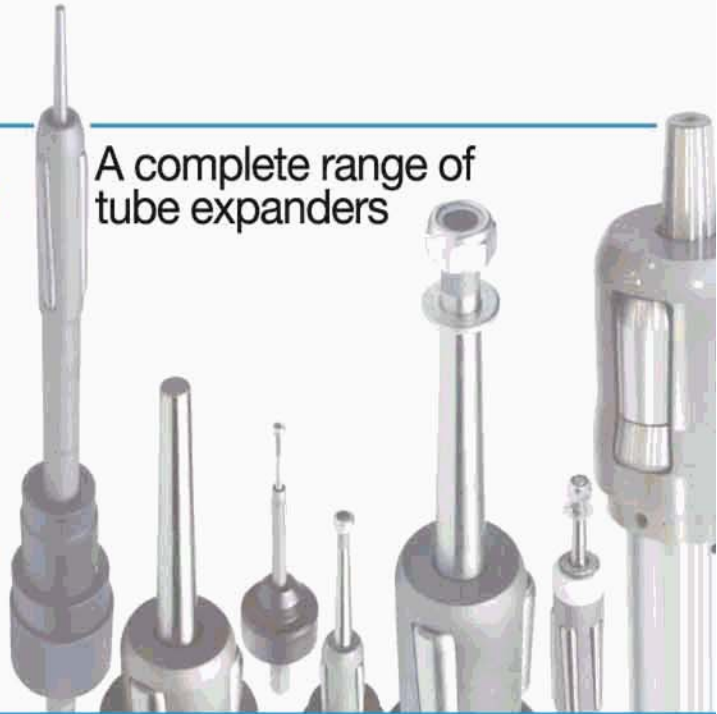
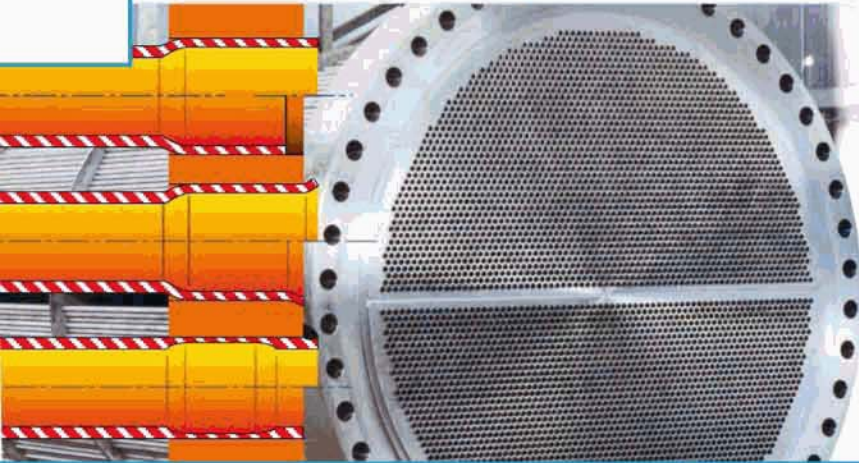
Tube pilot for tube bundle assembling



5

Tube expanders

A complete range of tube expanders



Tuberoll

Semiautomatic and automatic electric or pneumatic tube rolling



<p>VISUALIZZAZIONI</p> <p>Giri 480 Giri/1'</p> <p>Saltataggio Arrestato</p> <p>Parziale 1480 Passo 12</p> <p>Corrente 38.00</p> <p>Coppia 38.00</p> <p>0.689 Amp 38.00Nm</p>	<p>PARAMETRI SPECIALI</p> <p>Livello Parametri MAUS ITALIA</p> <p>CORRENTE</p> <p>Corrente reale 18.445 Amp</p> <p>Corrente offset A 1.496 Amp</p> <p>Corrente offset B 0.845 Amp</p> <p>MOTORE</p> <p>Tipo motore</p> <p>Velocità massima 800 Giri/1'</p> <p>Corrente massima 38 Amp</p> <p>Rapporto di riduzione 3.71 N</p> <p>Costante di coppia 0.222 Nm/Amp</p>																											
<p>GRAFICO</p> <p>Coppia (Nm) vs Tempo</p>	<p>VELOCITA'</p> <p>Velocità massima 800 Giri/1'</p> <p>Coppia massima 31 Nm</p> <p>Velocità A 800 Giri/1'</p> <p>Velocità B 200 Giri/1'</p> <p>Marcia</p> <p>Plato v4</p> <p>Velocità 200 300 540 800 Giri/1'</p> <p>Eseguire procedura di azzeramento abbinamento motore ogni volta si cambia velocità</p>																											
<p>PARAMETRI SPECIALI</p> <p>Icons for various machine settings and safety features.</p>	<p>COPPIE</p> <table border="1"> <tr> <td>Fase A</td> <td>Nm</td> <td>Amp</td> </tr> <tr> <td></td> <td>8,000</td> <td>6,590</td> </tr> <tr> <td>Fase B</td> <td></td> <td></td> </tr> <tr> <td>Passo 1</td> <td>25,000</td> <td>20,600</td> </tr> <tr> <td>Passo 2</td> <td>0000,000</td> <td>0000,000</td> </tr> <tr> <td>Passo 3</td> <td>0000,000</td> <td>0000,000</td> </tr> <tr> <td>Passo 4</td> <td>0000,000</td> <td>0000,000</td> </tr> <tr> <td>Passo 5</td> <td>0000,000</td> <td>0000,000</td> </tr> <tr> <td>Massima</td> <td>31,000</td> <td>38,000</td> </tr> </table>	Fase A	Nm	Amp		8,000	6,590	Fase B			Passo 1	25,000	20,600	Passo 2	0000,000	0000,000	Passo 3	0000,000	0000,000	Passo 4	0000,000	0000,000	Passo 5	0000,000	0000,000	Massima	31,000	38,000
Fase A	Nm	Amp																										
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Passo 3	0000,000	0000,000																										
Passo 4	0000,000	0000,000																										
Passo 5	0000,000	0000,000																										
Massima	31,000	38,000																										

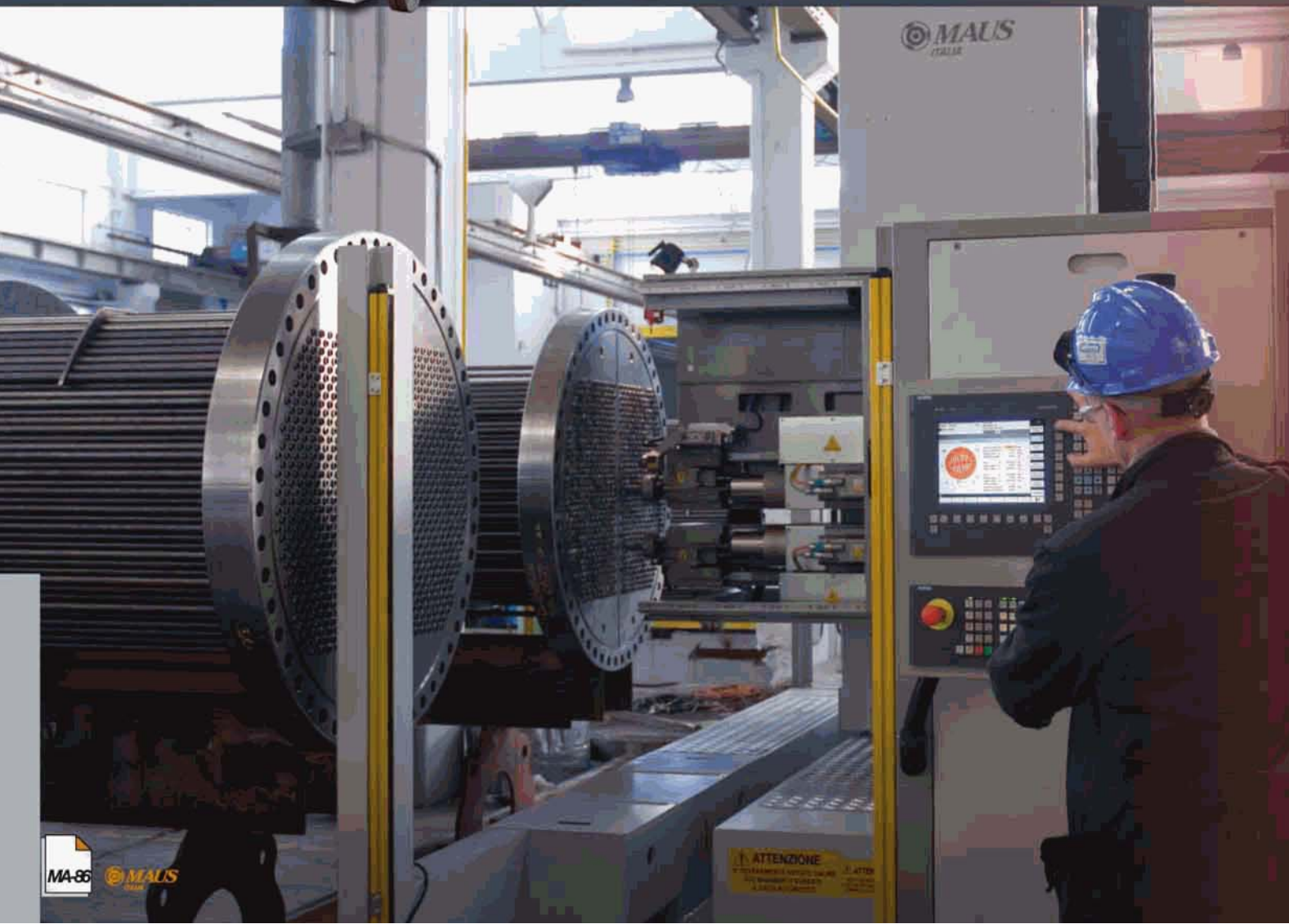
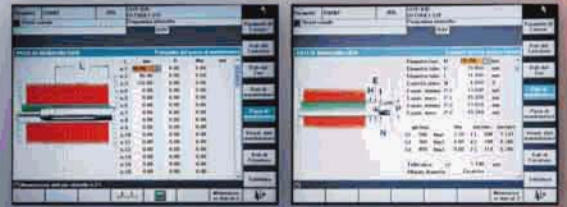
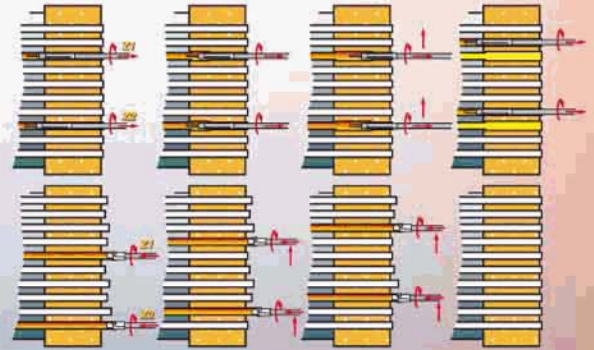
Other workings

(see relative catalogues)



MA-2501

Automatic rolling, facing and welding
double-axis centre



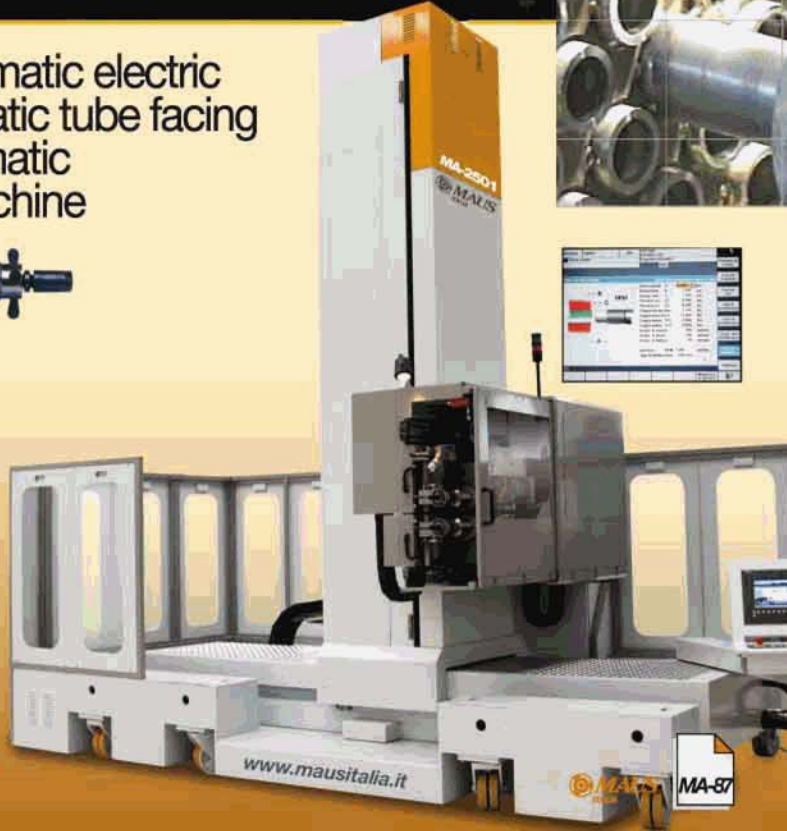
Tubweld

Semi-automatic and automatic systems for tube to tube sheet TIG orbital welding



Tubend

Semiautomatic electric or pneumatic tube facing and automatic facing machine

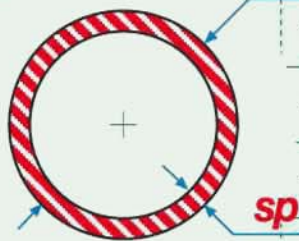


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MAUSITALIA MA-87

BWG

de mm	00 BWG		0 BWG		1 BWG		2 BWG		3 BWG		4 BWG		5 BWG		6 BWG		7 BWG		8 BWG		9 BWG		10 BWG		11 BWG			
	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm	“	mm		
sp →	0,380	9,65	0,340	8,64	0,300	7,62	0,284	7,21	0,259	6,58	0,238	6,05	0,220	5,59	0,203	5,16	0,180	4,57	0,165	4,19	0,148	3,76	0,134	3,40	0,120	3,05		
1/4" (6,3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/8" (9,5)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2" (12,7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/8" (15,9)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/4" (19,0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,482	12,2	0,510	12,9	-	-
7/8" (22,2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,607	15,4	0,635	16,1	-	-
1" (25,4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,670	17,0	0,704	17,9	0,732	18,6	0,760	19,3	-	-
1.1/4" (31,8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,890	22,6	0,920	23,4	0,954	24,3	0,982	25,0	1,010	25,7	-	-
1.1/2" (38,1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,140	28,9	1,170	29,7	1,204	30,6	1,232	31,3	1,260	32,0	-	-
1.3/4" (44,4)	-	-	-	-	-	-	-	-	-	-	1,310	33,2	1,344	34,1	1,390	35,2	1,420	36,0	1,454	36,9	1,482	37,6	1,510	38,3	-	-	-	-
2" (50,8)	-	-	-	-	-	-	-	-	-	-	1,524	38,7	1,560	39,6	1,594	40,5	1,640	41,6	1,670	42,4	1,704	43,3	1,732	44,0	1,760	44,7	-	-
2.1/4" (57,1)	1,490	37,8	1,570	39,8	1,650	41,8	1,682	42,7	1,732	43,9	1,774	45,0	1,810	45,9	1,844	46,8	1,890	47,9	1,920	48,7	1,954	49,6	1,982	50,3	2,010	51,0	-	-
2.1/2" (63,5)	1,740	44,2	1,820	46,2	1,900	48,2	1,932	49,1	1,982	50,3	2,024	51,4	2,060	52,3	2,094	53,2	2,140	54,3	2,170	55,1	2,204	56,0	2,232	56,7	2,260	57,4	-	-
2.3/4" (69,8)	1,990	50,5	2,070	52,5	2,150	54,5	2,182	55,3	2,232	56,6	2,274	57,7	2,310	58,6	2,344	59,5	2,390	60,6	2,420	61,4	2,454	62,3	2,482	63,0	2,510	63,7	-	-
3" (76,2)	2,240	56,9	2,320	58,9	2,400	60,9	2,432	61,8	2,482	63,0	2,524	64,1	2,560	65,0	2,594	65,9	2,640	67,0	2,670	67,8	2,704	68,7	2,732	69,4	2,760	70,1	-	-
3.1/4" (82,6)	2,490	63,3	2,570	65,3	2,650	67,3	2,682	68,2	2,732	69,4	2,774	70,5	2,810	71,4	2,844	72,3	2,890	73,4	2,920	74,2	2,954	75,1	2,982	75,8	3,010	76,5	-	-
3.1/2" (88,9)	2,740	69,6	2,820	71,6	2,900	73,6	2,932	74,5	2,982	75,7	3,024	76,8	3,060	77,7	3,094	78,6	3,140	79,7	3,170	80,5	3,204	81,4	3,232	82,1	3,260	82,8	-	-
3.3/4" (95,2)	2,990	75,9	3,070	77,9	3,150	79,9	3,182	80,8	3,232	82,0	3,274	83,1	3,310	84,0	3,344	84,9	3,390	86,0	3,420	86,8	3,454	87,7	3,482	88,4	3,510	89,1	-	-
4" (101,6)	3,240	82,3	3,320	84,3	3,400	86,3	3,432	87,2	3,482	88,4	3,524	89,5	3,560	90,4	3,594	91,3	3,640	92,4	3,670	93,2	3,704	94,1	3,732	94,8	3,760	95,5	-	-
4.1/4" (108,0)	3,490	88,7	3,570	90,7	3,650	92,7	3,682	93,6	3,732	94,8	3,774	95,9	3,810	96,8	3,844	97,7	3,890	98,8	3,920	99,6	3,954	100,5	3,982	101,2	4,010	101,9	-	-
4.1/2" (114,3)	3,740	95,0	3,820	97,0	3,900	99,0	3,932	99,9	3,982	101,1	4,024	102,2	4,060	103,1	4,094	104,0	4,140	105,1	4,170	105,9	4,204	106,8	4,232	107,5	4,260	108,2	-	-





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