



Mef express HT

*Aerial extractor
for heat exchanger tube bundles*



MADE IN ITALY

Mef express HT

*To ensure minimum downtime and protection
of the tube bundle during extraction*

MAUS ITALIA presents, for **the extraction and insertion of tube bundles in the plant**, a complete new range of **Mefexpress HT** aerial tube bundle extractors with dedicated solutions for handling by crane for maintenance at great heights.

Years of evolution of the **Mefexpress** product series have allowed the design to be revisited, making the **Mefexpress HT** (High Technology) aerial tube bundle extractors of today even more lightweight, more flexible and easier to handle.

Starting from the numerous standard products that cover common market requests, MAUS ITALIA is also able to provide custom solutions to solve extreme cases with ATEX / OFF-SHORE versions.



For tube bundles up
to 125 T in weight

Focus features

STANDARD



NO damage

Protective

The **MefexpressHT** aerial extractor carefully supports the tube bundle during extraction and insertion and ensures perfect balance along its longitudinal axis, eliminating the risk of damaging the baffles or crushing the tubes.



User-friendly.

Operational simplicity

The controls on the supplied remote control make the **MefexpressHT** extremely simple and intuitive to use, guaranteeing the operator full control of the extraction or insertion sequence.



Planetary gearbox

Longlasting epicyclic power

The use of powerful planetary gearboxes guarantees greater reliability and robustness than chain systems, thus minimising the need for maintenance.

OPTIONAL



NO overturning

Electronic overturning control

The **MefexpressHT** can be supplied, upon request, with the innovative **EOC** system which allows the handling of loads in complete safety by inhibiting any incorrect commands which would compromise stability.



ATEX

ATEX certification

The **MefexpressHT** aerial extractor can, upon request, be manufactured in accordance with the ATEX directive in an explosion proof configuration for use in environments with a potentially explosive atmosphere.



Off shore

DNV certification for FPSO and offshore platforms

MAUS ITALIA can, upon request, design and produce **DNV approval type Mefexpress NAVY** aerial tube bundle extractors for OFFSHORE applications, **Mef fixed NAVY** stationary versions and **Mef mobile NAVY** self-propelled caterpillar versions.



Low Temp

Not afraid of the cold

The **MefexpressHT** aerial extractor can be supplied, upon request, in the special version, suitable for operating at the very lowest temperatures.



Customized

Adapts according to need

MAUS ITALIA can design the **MefexpressHT** aerial extractor, upon request and subject to technical verification, for bundle sizes and weights different from our standard product. Special paints for colour, composition and thickness are possible.



**Electrowelded steel ring
for lifting the extractor**

MAUS ITALIA applies targeted solutions to solve customer problems.

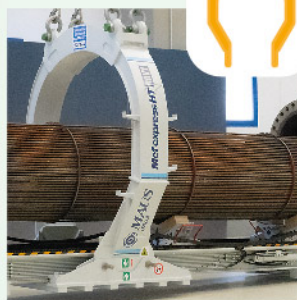
The ring can be:

- Circular
- Oval
- Divisible in three parts



Circular

Solution for all sizes of models up to the **Mefexpress HT 2045/75**



Oval

Solution to facilitate the handling of the extractor in small spaces



Divisible in 3 parts

Solution for sizes of models from the **Mefexpress HT 2545/75** upwards to facilitate transport on the plant, as well as shipping

Adjustable hydraulic vices

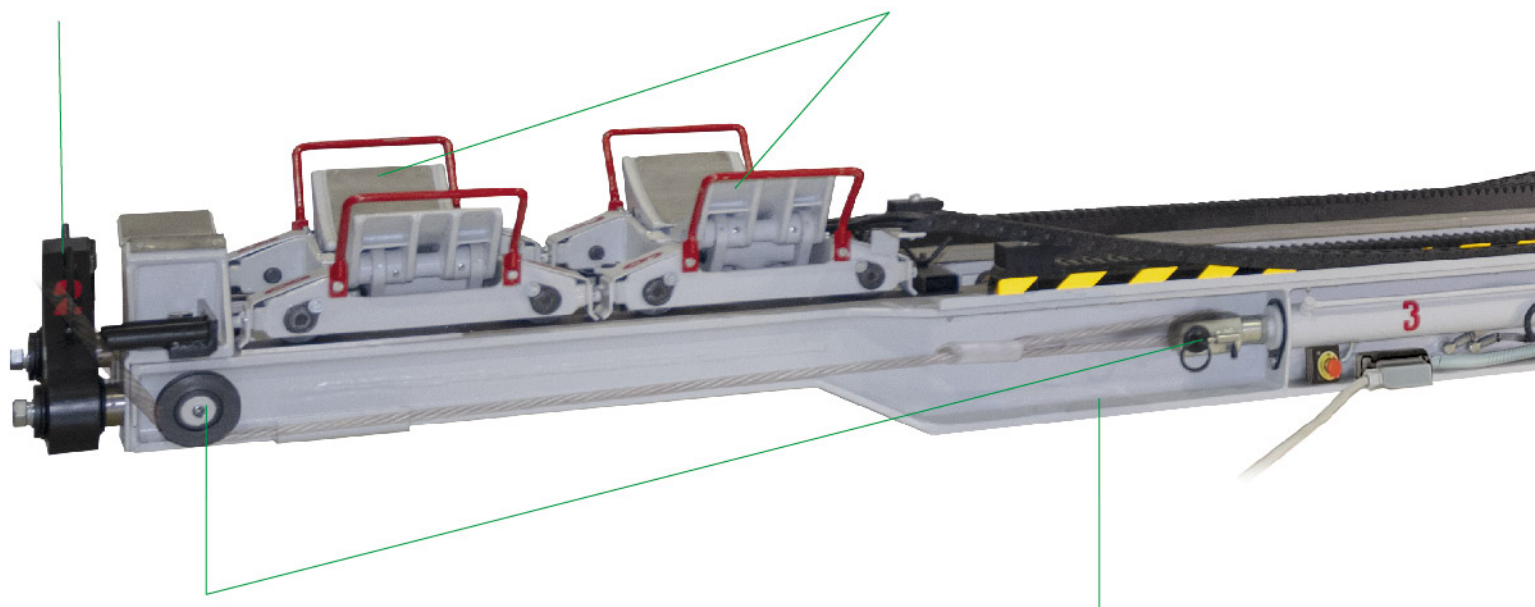
for anchoring the machine to the exchanger flange

- left and right side synchronous movement (standard)
- left and right independent movement (optional)

Support trolleys

to support the tube bundle

- with manual controls (standard)
- hydraulically operated (optional)



Hydraulic rope tensioning system

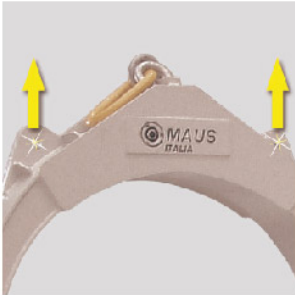
for safe anchoring of the extractor to the exchanger.

- left and right side synchronous movement (standard)
- left and right side independent movement (optional)

Electrowelded steel structure

to support the weight of the tube bundle

Mef express HT



Lifting points

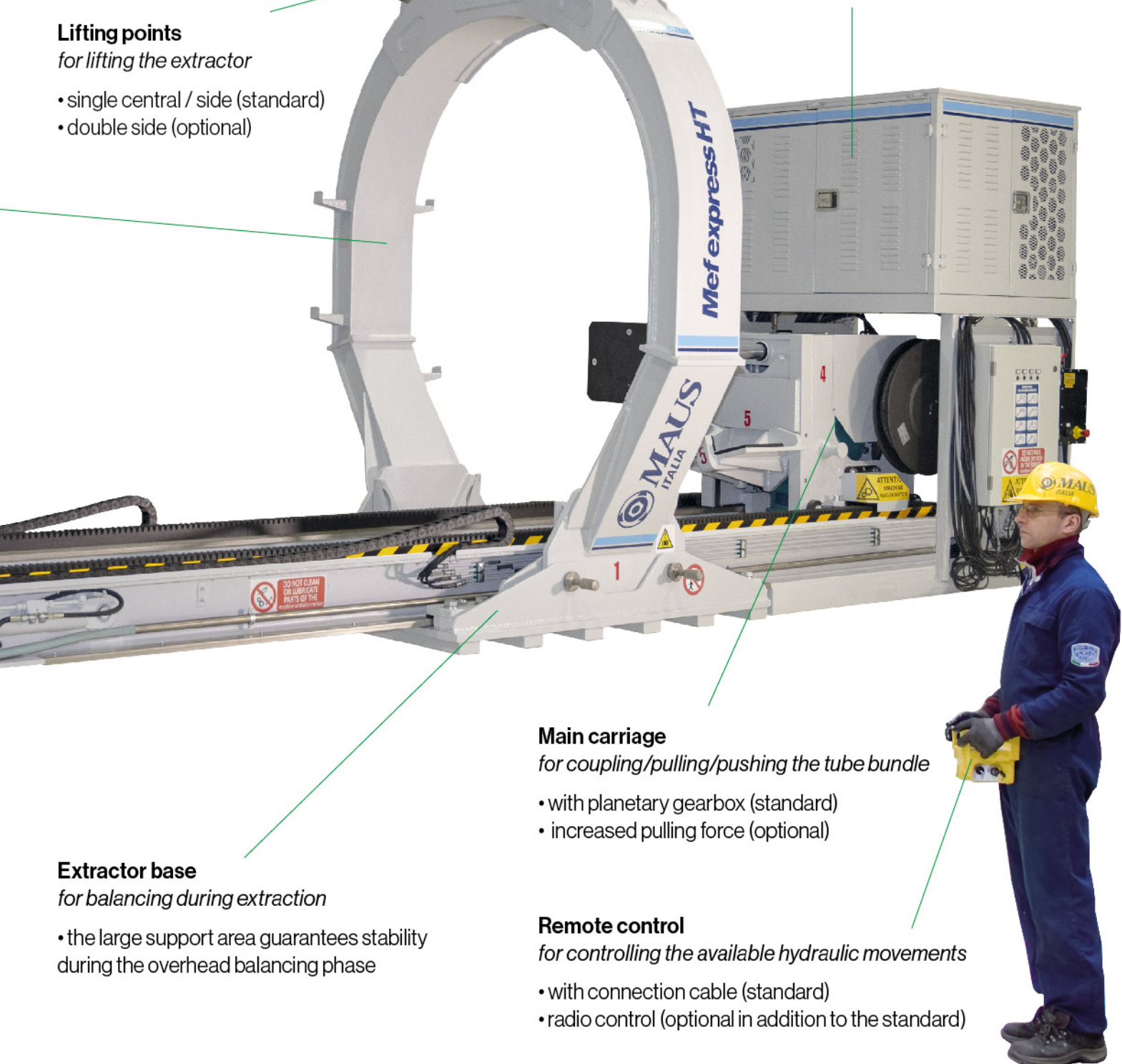
for lifting the extractor

- single central / side (standard)
- double side (optional)

Engine unit

sized for the selected model

- with air cooling (standard)
- with liquid cooling (optional)



Main carriage

for coupling/pulling/pushing the tube bundle

- with planetary gearbox (standard)
- increased pulling force (optional)

Remote control

for controlling the available hydraulic movements

- with connection cable (standard)
- radio control (optional in addition to the standard)

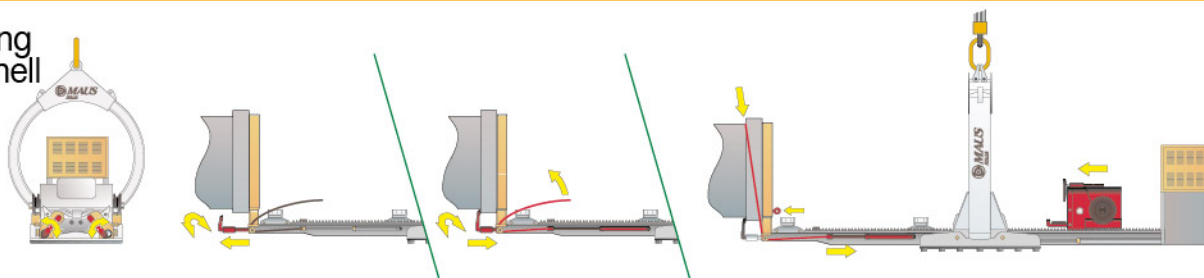
Extractor base

for balancing during extraction

- the large support area guarantees stability during the overhead balancing phase



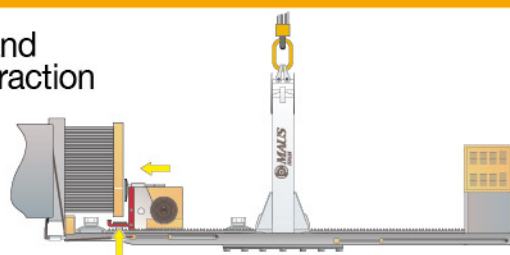
1 Anchoring
to the shell



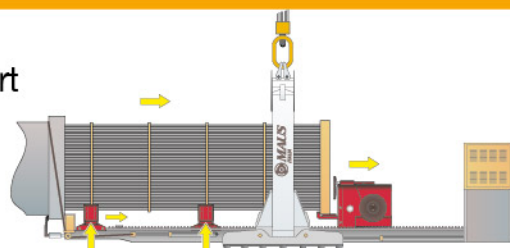
2 Pull the tubesheet
with rope



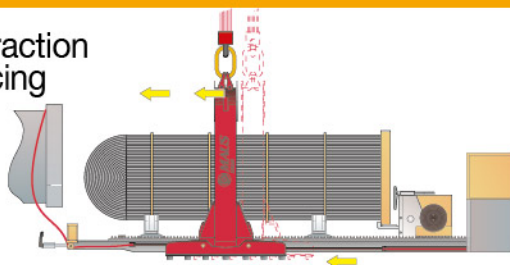
3 Coupling and
start of extraction



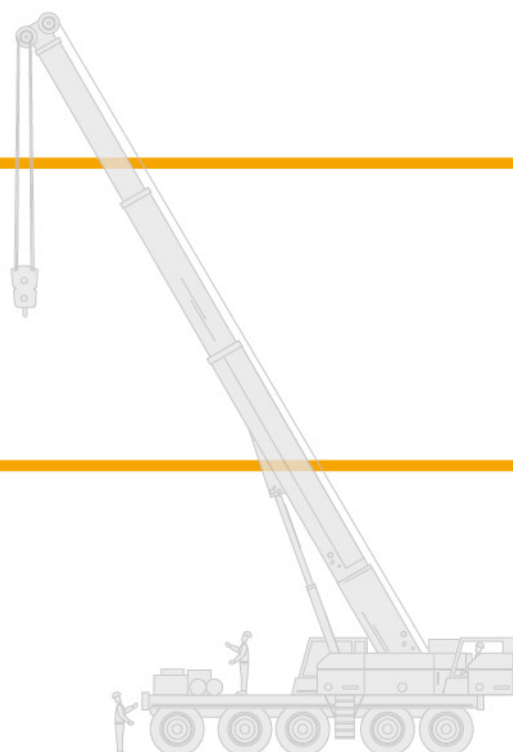
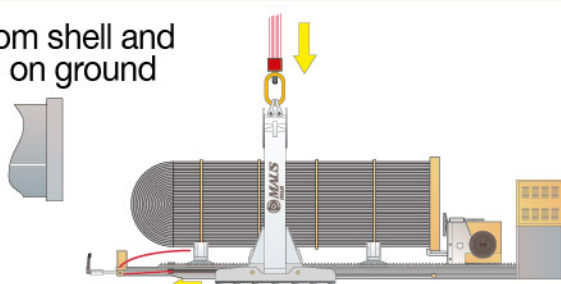
4 Extraction
and support



5 End of extraction
and balancing



6 Release from shell and
depositing on ground
using a crane



Mef express HT

Extraction sequence of a tube bundle



Anchoring to
the shell

1



Pull the tubesheet
with rope

2



Coupling and
start of extraction

3



Extraction
and support

4



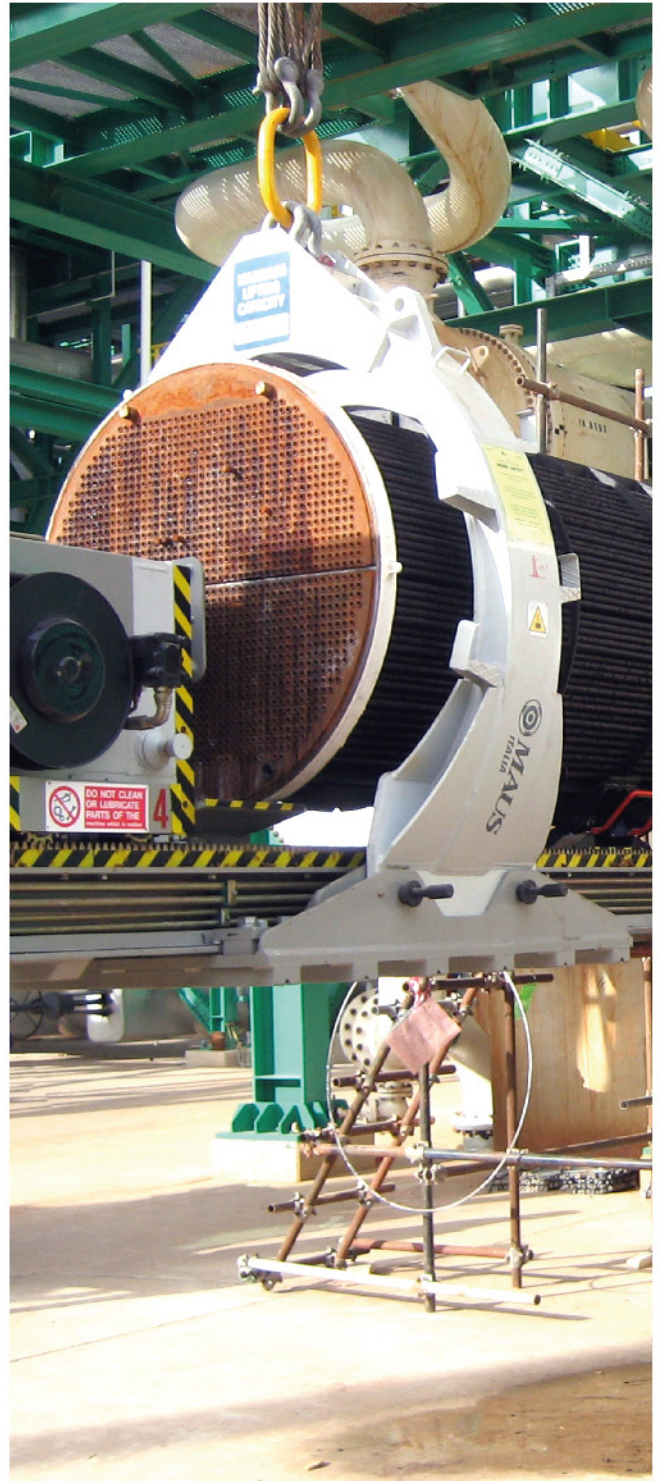
End of extraction
and balancing

5



Release from shell
and depositing on
ground using a
crane

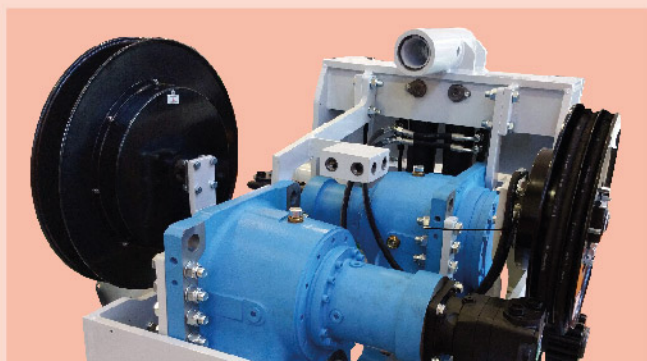
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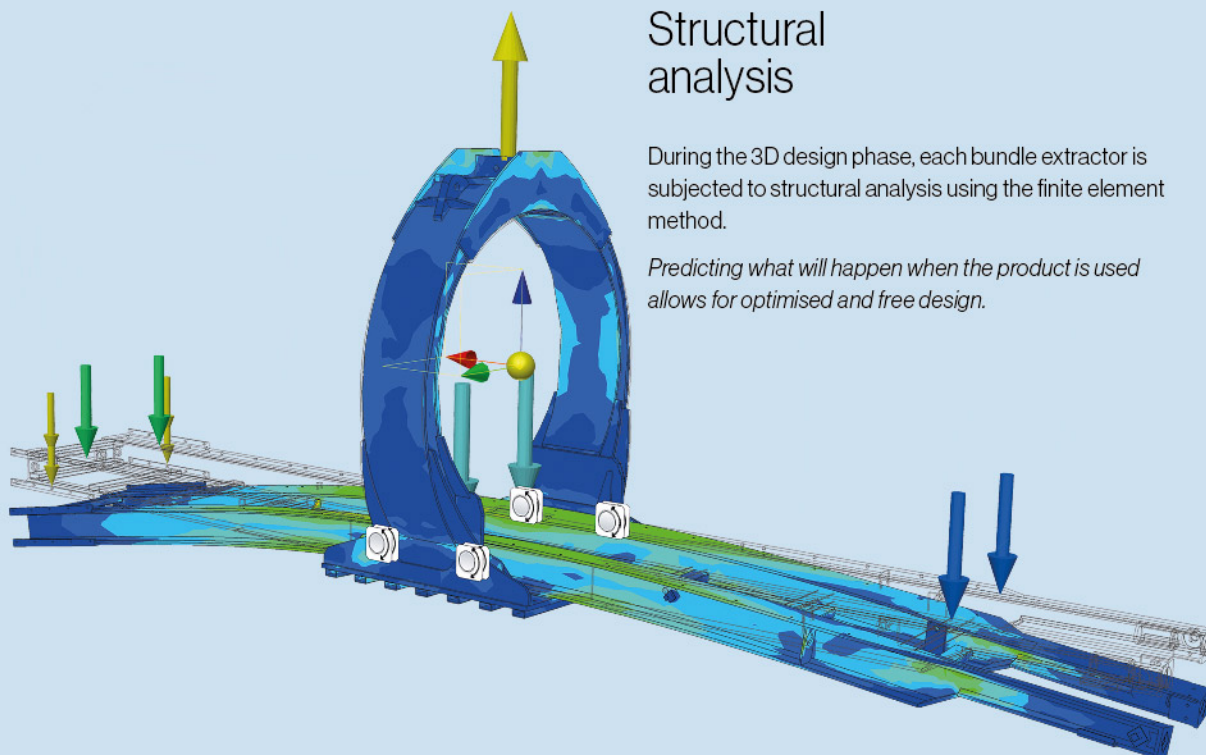


Longlasting epicyclic power

The use of powerful planetary gearboxes (between 1 and 3 according to pulling force) improves reliability and makes possible the increase of pulling force compared to chain systems, thus minimising maintenance of the transmission components.



Components such as these make the **Mefexpress HT** extractor a high-performance machine, capable of standing out in the world of heat exchanger maintenance.



Structural analysis

During the 3D design phase, each bundle extractor is subjected to structural analysis using the finite element method.

Predicting what will happen when the product is used allows for optimised and free design.

Dynanometric test of the carriage

All of our extractors are subjected to dynanometric testing to verify the actual pulling force of the carriage which will be included in the test report



Standard features of aerial tube bundle extractors

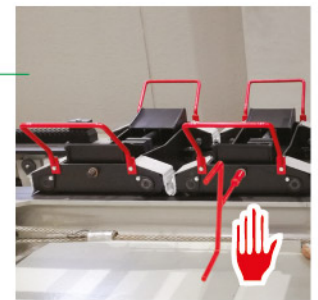
Air-cooled diesel engine

Standard motorisation consists of an air-cooled diesel engine sized appropriately for the selected **MefexpressHT** model



Manual adjustment of the bundle supports

Correct support of the tube bundle is guaranteed by the support trolleys which, resting on the diaphragms, support it safely without compromising its integrity



Spark arrestor with vibration damping

Fire and explosion protection device to limit combustion by extinguishing flames.



Remote control with connection cable

A practical remote control with cable allows the operator to control all of the commands, whilst staying at a safe distance from the extraction area



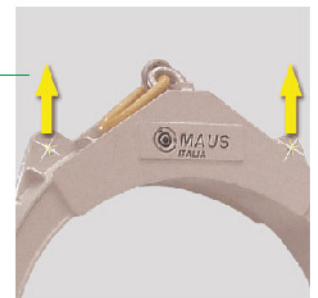
Hydraulic balancing system

Two powerful hydraulic pistons allow balancing of the extractor by modifying, if necessary, the position of the frame with respect to the ring attached to the crane



Alternative lifting points

To bypass obstacles, such as nozzles, pipes or valves, which are often present on the longitudinal axis of the **MefexpressHT** or for use with the anchor hook of the lifting crane



Easy container transport

For sizes from the **MefexpressHT 2545/75** up, the lifting ring can be disassembled into 3 parts to allow the extractor to be shipped in Open Top containers and help truck transportation.



Onboard controls

All the main controls can be activated directly on the machine with hydraulic levers on the rear of the **MefexpressHT**

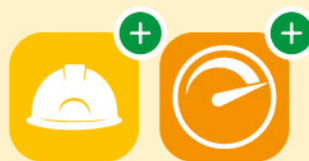
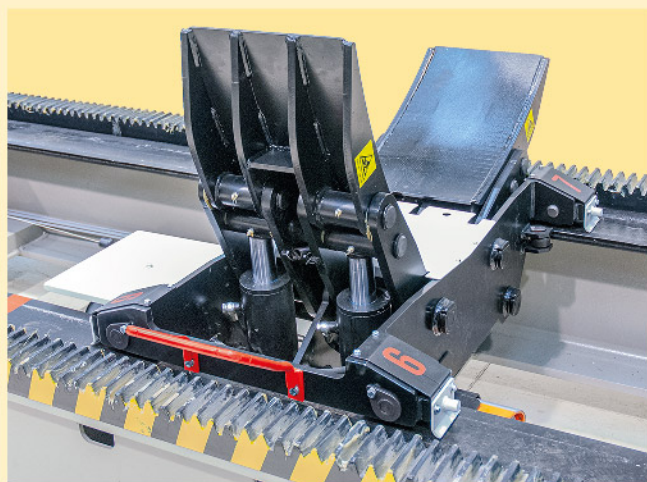
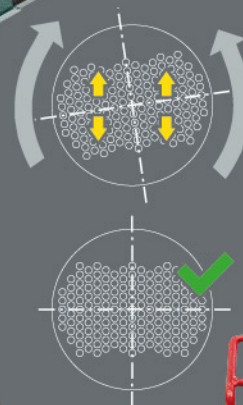


**NEW
PATENTED**



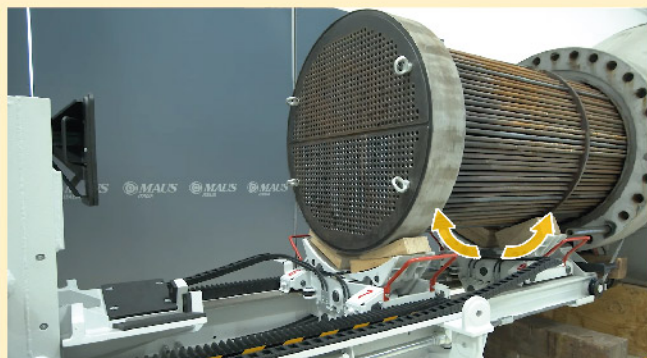
Telescopic arms for rotation of the bundle

Innovative remotely-controlled system for rotating the tube bundle which allows safe alignment the bundle with the shell, avoiding the need for the operator to climb on the Mef express HT during the final insertion phase



Power-assisted hydraulic supports

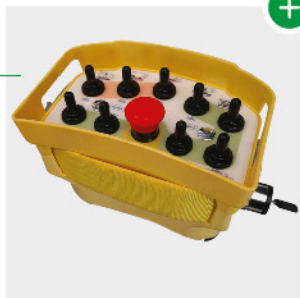
Controlled quickly and intuitively by the operator from a safe distance via remote control, these speed up the extraction and insertion of the bundle with power-assisted adjustment, reducing system downtime and increasing manoeuvring capacity of the bundle during insertion





Radio control

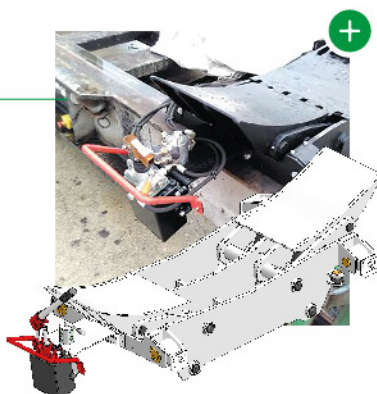
Evolution of the standard remote control allows the operator greater freedom of action without cluttering the work area with a connection cable



Hydraulic trolley with manual pump

Interchangeable product on all models which use the manual version.

The manual pump simply and economically speeds up the insertion process



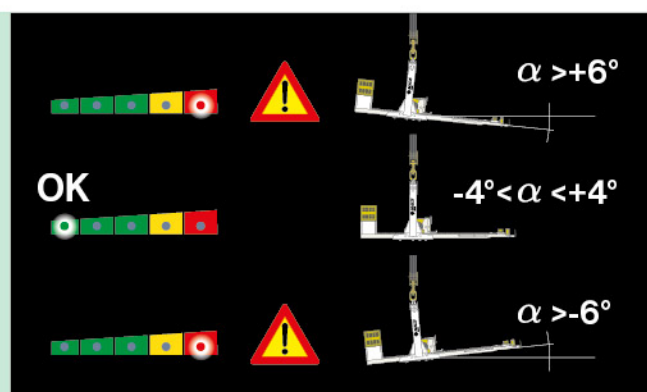
Mef express HT

Optional features of overhead tube bundle extractors (1 of 2)



Liquid cooled diesel engine

When air cooling is insufficient or unsuitable for current regulations, MAUS ITALIA can offer engines with low environmental impact and water cooling



Main functions of the **EOC** system

- display on the remote control screen of the real-time position of the extractor carriage corresponding to the length of the extracted (or to be inserted) bundle;
- display on the remote control screen of the real-time inclination of the **Mefexpress HT**;
- limitation of the maximum inclination with blocking of dangerous movements when the permitted inclination has been exceeded;
- automatic self-balancing that can be activated by the operator via remote control which brings the **Mefexpress HT** back to a balanced condition;
- electric throttle integrated into the remote control that allows variation of the engine's rpm, reducing fuel consumption, improving the extractor's autonomy and making the extraction area healthier.



EOC electronic overturning control

Innovative control system which allows overhead handling of loads in complete safety by inhibiting any incorrect commands that could compromise the stability of the **Mefexpress HT**.

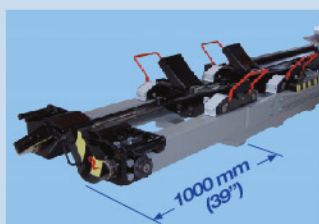


High
savings



Healthy
environment

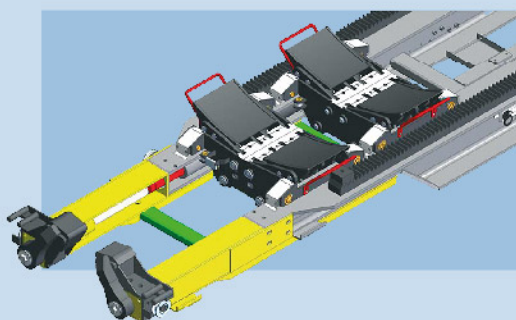
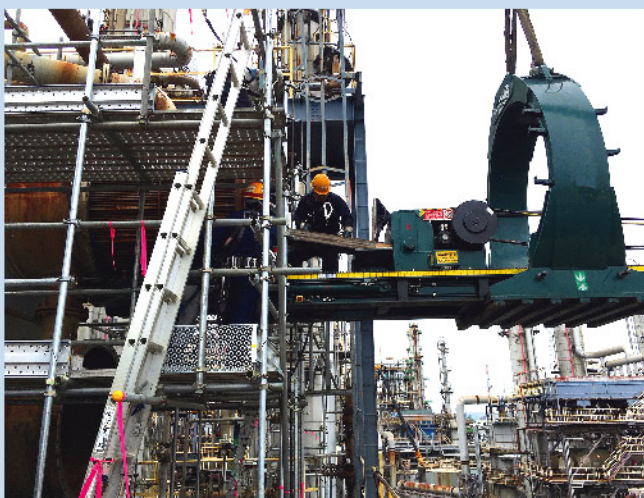




Removable extension for maximum flexibility of use

We offer an extension of 1000 mm (39") which allows the **Mef express HT** to increase the maximum length of the extractable bundle or to reach very recessed bundles under roofs.

The extension can be customised, upon request and after technical verification, in both shape and length.



Increased pulling force

The extraordinary pulling force offered by MAUS ITALIA for its standard models can, if necessary, be increased for extremely heavy tube bundles.

An additional planetary gearbox increases the pulling force by over 400 kN (90000 lb).

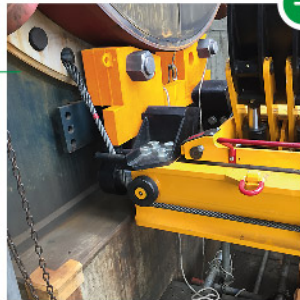


Mef express HT

Optional features of overhead tube bundle extractors (2 of 2)

Anchoring beam to the exchanger

When access to the back of the exchanger flange is impossible, a beam can be designed and built which, when properly fixed, recreates the anchor point



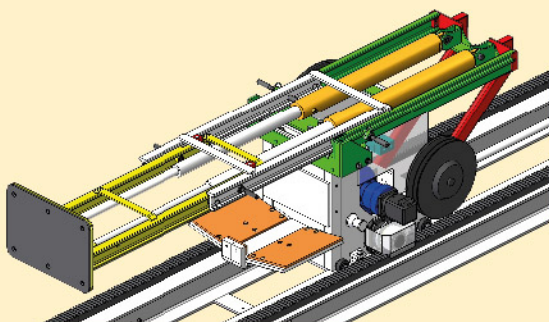
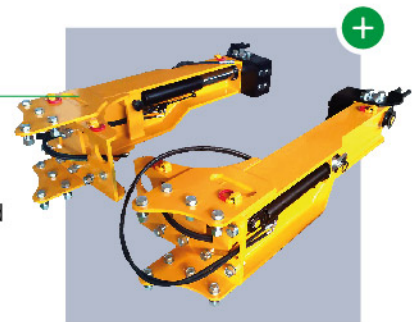
Adapter for the carriage shelf

If the tube sheet has a protrusion on its lower part, an adapter with a recess can be designed and built to allow it to be housed



Extensions for bypassing obstacles

Where there are obstacles in front of the exchanger which interfere with the extractor, extensions can be designed and built with an increased centre distance to allow them to be bypassed



Power-assisted hydraulic pusher

The main carriage pusher is offered with hydraulic movement to avoid potentially dangerous situations for the operator and to speed up the final insertion phase





Mef express HT ATEX Ex

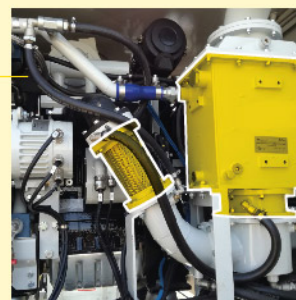
Armoured power circuits

Power circuits are insulated in explosion proof containers to prevent potential sparks from entering the work environment



Combustion gas cooling

The insertion of a heat exchanger and vibration damper allows the rapid cooling of exhaust gases up to the values allowed by the reference thermal class T



Mef express HT CSA

For the North American market (Canada and USA), MAUS ITALIA designs, manufactures and certifies its tube bundle extractors according to CSA reference standards.

Armoured engine components

Components such as the alternator, the starter motor and the battery are insulated in explosion proof containers to prevent potential sparks from entering the work environment



Mef express HT NAVY



DNV
ST-0378 | ST-E273
MARITIME



Off shore

Lifting certification

Supplied chains, shackles and lifting hooks are **DNV** certified for use in the open sea and in cases of extreme stress.



Movement certification

Movement components, such as hydraulic cylinders and planetary gearboxes, are **DNV** certified for use in the open sea and in cases of extreme stress.





Mef express HT

Certified manufacture of aerial tube bundle extractors

MAUS ITALIA can, on customer request, manufacture **Mef express HT** extractors in an explosion proof version, certified to operate in environments with potentially explosive atmospheres (**ATEX**) and on offshore/FPSO platforms (**DNV - MARITIME**).

Overdrive control

A vacuum shutoff valve installed on the engine intake prevents the engine from overheating due to overdrive



Non-sparking stainless steel protections

Each sliding part is coated with stainless steel which also protects it from accumulations of grease, thus avoiding related maintenance



The manufacture of an **ATEX** certified extractor is achieved by increasing its **thermal and electric safety** with components that have been designed to avoid, under any circumstances, the ignition of gas which may be present in the working atmosphere.



The surface temperature of the each component and of the exhaust gases must remain below the threshold defined by the reference class **T**.



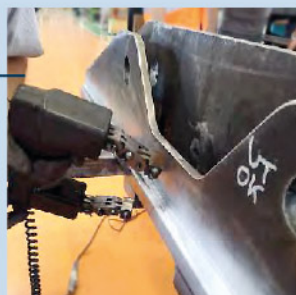
Any possible cause of a spark must be eliminated: from electrostatic charges to insulation in armoured containers of each power circuit.

A number of the solutions adopted for manufacture of an **ATEX** extractor are shown on the page.



Welding certification

Welds are subjected to magnetscopic (or radiographic) examination to obtain **DNV** certification.



MAUS ITALIA can, on customer request, manufacture **Mef express HT** extractors in an offshore version.

The **DNV MARITIME** certified transformation includes everything already done to obtain the **ATEX** certification with additional specifications for lifting accessories, movement and sizing guided by the certification specifications with a more accurate process control.





Optimised
transport costs

Shipping in
container



40 ft OT
(Open Top)

Shipping in a crate
for optional long storage



Special ring divisible
into 3 pieces



Easier truck transport



Mef express HT			904 70		1310 65		1722 65		1722 75		2030 75	
Ø tube sheet (max.)	D	mm inches	900	35	1300	51	1700	67	1700	67	2000	78
Bundle length (max.)	L	mm ft	7000	23	6500	21	6500	21	7500	24	7500	24
Tube bundle weight (max.)	T	lb	4	8800	10	22000	22	48500	22	48500	30	66000
Lifting capacity												
Mef express HT			904 70		1310 65		1722 65		1722 75		2030 75	
Length	L	mm ft	8000	26.2	7710	25.3	8125	26.7	9125	30.0	9125	30.0
Width	W	mm ft	1250	4.1	1590	5.2	2050	6.7	2050	6.7	2300	7.5
Height	H	mm ft	1480	4.9	2125	7.0	2600	8.5	2600	8.5	2930	9.6
Width to the engine	WM	mm ft	1300	4.3	1800	5.9	1800	5.9	1800	5.9	1800	5.9
Height to the engine	HM	mm ft	2200	7.2	2125	7.0	2250	7.4	2250	7.4	2250	7.4
Ring approach (min.)	A	mm ft	4105	13.5	3050	10.0	3310	10.9	3480	11.4	3480	11.4
Balancing ring stroke	S	mm ft	1450	4.8	1700	5.6	1700	5.6	2114	6.9	2114	6.9
Weight		Kg lb	2300	5071	4600	10141	6000	13228	6300	13889	7000	15432
Extraction speed (max.)		m/min ft/min	2,5	10.3	2,2	9.0	2,3	9.4	2,3	9.4	2,3	9.4
Extraction force (max.)		kN lb	100	22400	200	44900	360	80900	360	80900	360	80900
N° of standard CS manual support trolleys			2		2		2		2		2	
Lifting capacity of single carriage			4,0		7,5		7,5		7,5		10,0	



Extension

1000 mmm (39") extensions are available for all models which allow the **Mefexpress HT** to increase the maximum length of the loadable bundle.

The extension can, upon request, be customised in both shape and length.

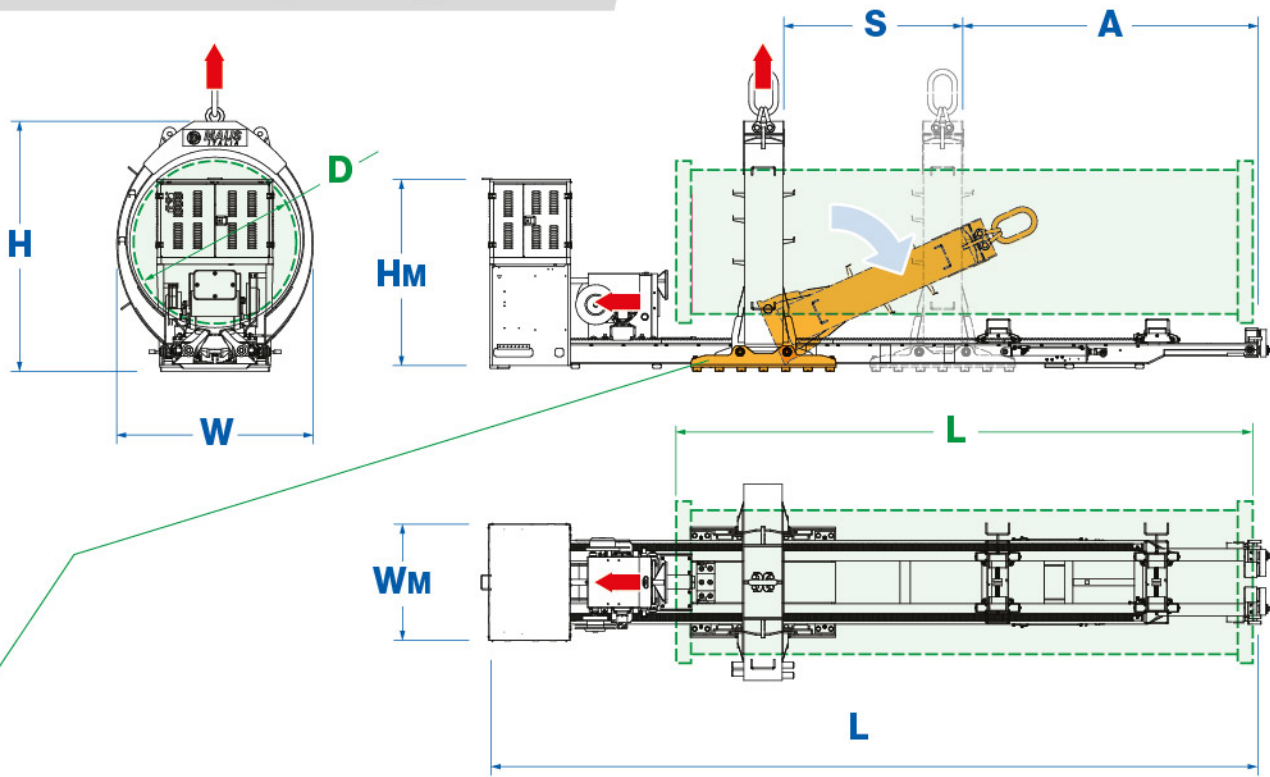


Customized

MAUS ITALIA can, upon request and after technical verification, design and manufacture the **Mefexpress HT** overhead extractor for bundles and weights which are different to the standard product.

Maximum flexibility of use

Diameter - Length - Weight



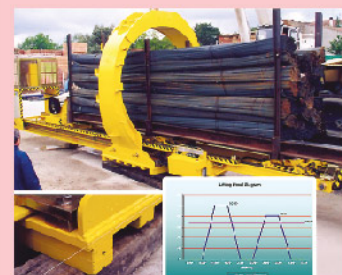
2045 75	2545 75	2545 100	3070 100	35125 113	Mef express HT
2000 78	2500 98	2500 98	3000 118	3500 138	D mm inches Ø tube sheet (max.)
7500 24	7500 24	10000 33	10000 33	11300 37	L mm ft Bundle length (max.)
45 99200	45 99200	45 99200	70 154300	125 275500	T lb Tube bundle weight (max.) Lifting capacity



2045 75	2545 75	2545 100	3070 100	35125 113	Mef express HT
9125 30.0	9125 30.0	12060 39.0	12060 39.0	13420 44.0	L mm ft Length
2300 7.5	3200 10.5	3200 10.5	3860 12.7	4300 14.1	W mm ft Width
2930 9.6	3700 12.1	3700 12.1	4370 14.3	4780 15.7	H mm ft Height
1800 5.9	1800 5.9	1800 5.9	2140 7.0	2300 7.5	Wm mm ft Width to the engine
2250 7.4	2250 7.4	2250 7.4	2250 7.4	2250 7.4	Hm mm ft Height to the engine
3510 11.5	3510 11.5	4250 13.9	4250 13.9	5695 18.7	A mm ft Ring approach (min.)
2114 6.9	2114 6.9	2750 9.0	2750 9.0	2850 9.4	S mm ft Balancing ring stroke
8600 18959	9700 21384	10900 24030	16000 35273	21000 46297	Kg lb Weight
1,3 5.3	1,3 5.3	1,0 4.1	1,0 4.1	1,0 4.1	m/min ft/min Extraction speed (max.)
490 110100	490 110100	900 202300	900 202300	1380 310200	kN lb Extraction force (max.)
2	2	3	3	4	N° of standard CS manual support trolleys
10,0 22000	15,0 33000	15,0 33000	30,0 66000	30,0 66000	T lb Lifting capacity of single carriage
900 202300	900 202300	1380 310200	1380 310200	/ /	kN lb Extraction force (max.)



All **Mef express HT** models offered by MAUS ITALIA are tested with a static load factor equal to 150% of the nominal capacity (**WLL** Working Load Limit)



ME-18



The length measurements "L" suggested above can be changed on request



The increased pulling force request transforms some parameters of the **Mef express HT**:

- Length **L** + 400 mm (+ 1.31 ft)
- Weight + 500 kg (+ 1100 lb)

CS support trolleys for supporting the tube bundle during extraction/insertion with the **MefexpressHT** series extractors

MAUS ITALIA offers 3 different versions for these fundamental components of the **MefexpressHT** series of tube bundle extractors.

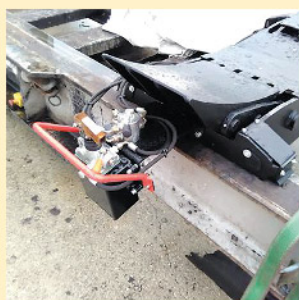


CSM

This is the entry level model, **manually controlled** by the operator using removable keys.

Complete in their functionality, they guarantee reliability and robustness.

*In the event of need or of obstruction, the manual pump of the **CSP** support trolley can be disconnected by means of quick couplings.*



CSP

This is the intermediate model, **hydraulically controlled** by the operator via a manual hydraulic pump installed directly on the trolley.

*Speeds up all lifting operations and is interchangeable with any manual models already purchased (also for the previous **Mefexpress** series)*

*MAUS ITALIA technical staff suggest the insertion of at least one **CSI** trolley on each model of the **MefexpressHT** tube bundle extractor.*

*The hydraulic system can manage up to two **CSI** trolleys.*



CSI

This is the highest performing model, **hydraulically controlled** by the operator via remote control (or levers on the machine).

It significantly speeds up all lifting operations by keeping the operator at a distance from the extraction/insertion area



Safer and faster

MefexpressHT	CSM	CSP	CSI	Lifting capacity ↑	
Models on which the trolley works	Cod.	Cod.	Cod.	T	lb
904/70	CSM-40	CSP-40	CSI-40	4,0	66000
1310/65 1722/65 1722/75 2030/75	CSM-75	CSP-75	CSI-75	7,5	16500
2045/75	CSM-100	CSP-100	CSI-100	10,0	22000
2545/75 2545/100	CSM-150	CSP-150	CSI-150	15,0	33000
3070/100 35125/113	CSM-300	CSP-300	CSI-300	30,0	66000

1 hydraulic cylinder
for each saddle

2 hydraulic cylinder
for each saddle

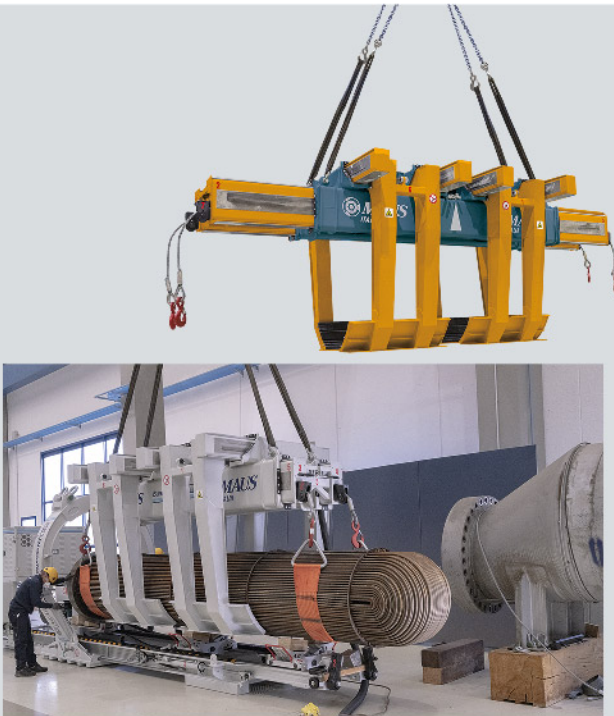
Ideal combinations
in plant maintenance



Handshake

Mef express HT

Combined use with
BundleTutor series of tube
bundle transporters



BundleTutor lifter **Super**

Aerial transporter for
the handling of tube
bundles

The **Mef express HT** aerial tube bundle extractor is used in
combination with the Bundle Tutor lifter Super aerial
transporter for handling tube bundles inside the plant.

*This allows you to quickly release the extractor for a new
operation.*

The **Bundle Tutor lifter E** electric plug-in model is particularly
suggested for use in heat exchanger manufacturing workshops.



BundleTutor mobil

Self-propelled transporter
for the handling of tube
bundles

The **Mef express HT** overhead tube bundle extractor is used in
combination with the Bundle Tutor mobil self-propelled
transporter inside the plant for safe and protected handling of
the tube bundle, as well as for speeding up loading and unloading
without the need for a crane.





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