

SMALL DIAMETER TUNNELLING
AND PIPE JACKING

ABOUT PALMIERI GROUP

With over 40 years of experience in the manufacture of parts and consumables related to the Tunneling and Drilling activities Palmieri is nowadays one of the leading and most specialized companies worldwide.

Design and production of either rotating and fixed tools for any type of excavation, from horizontal boring (Tunnels for road, railways and water) to vertical boring and drilling has been Palmieri focus since the very beginning.

From the initial start with tools as core business, the Company has extended its range of interest to Engineering development, manufacturing, refurbishment and rental of underground equipment such as TBMs, Raise Boring Machines, Microtunnelling / Pipe jacking equipment, Cutterheads, Back-Up systems, Rolling Stock, as well as innovative and non-conventional solutions for all the above mentioned business sectors.

Recycling and forestry have also become an important area where to work offering a wide range of tools and tool holders, that are fully compatible with almost all machineries and equipment on the market.



Nowadays Palmieri Group consists of 2 companies whose respective business and know-how are strategically integrated in order to deliver the most accurate and efficient service on the market.

Palmieri's determination to achieve the diverse requirements of clients world-wide is parallel with its advancing technological resources. The use of CAD/CAM and CNC for design and precision machining are evidence of Palmieri's commitment of extremely high quality and efficient work practices. Palmieri uses only the finest European steel, robotic material handling systems and ultra modern CNC (computer numerical controlled) machines. Thanks to its productive independence, all the Group's products are designed and produced internally, ensuring full control over the entire supply chain. Nowadays the Group Companies are world leaders in production capabilities and can provide all products with delivery times that are amongst the shortest in the industry, followed by first class services all over the world.



RCM – REMOTE CONTROL MACHINES

Equipment for the excavation of small tunnels for utilities and pipes with circular cross section with size range of 800 to 2000 mm, for all types of grounds, even in the presence of water. The machine is pushed forward thanks to the thrust force provided by an adequately sized power unit placed on board the control container located outside the tunnel. During the advance, product pipes are installed from the outside and transmit the thrust from the pushing unit to the machine can.



PALMIERI OFFERS SOLUTIONS FOR ALL TYPES OF GROUND: FROM SOFT SOIL TO THE HARDEST ROCK.

The equipment is available in two different types depending on the preferred spoil removal system, which is selected in advance according to the geological conditions to be encountered during the drive; the commonly used "slurry" system, and the screw conveyor system.

RCM – SLURRY SYSTEM



RCM – SCREW CONVEYOR

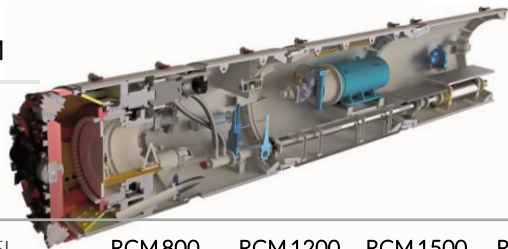


A cutterhead is attached to the machine; this is conceived and accurately designed both according to the specific geology of the ground to be excavated and to the main machine specifications in such a way to obtain the best possible advance rates with minimal cutting tools replacements.

The whole equipment is monitored by a control and guidance container placed outside the tunnel. The excavation accuracy is controlled by the driving system (a laser and laser target system) which is continuously monitored and calibrated by the machine operator seating in the container with the aid of a PLC computer and its control monitor.



PALMIERI RCM



MACHINE MODEL	RCM 800	RCM 1200	RCM 1500	RCM 1600	RCM 1800	RCM 2000
Pipe ID (mm)	800	1200	1500	1600	1800	2000
Pipe OD (mm)	960-1090	1490	1820	1940	2120	2400
Machine OD (mm)	975-1110	1510	1840	1970	2150	2435
Speed (rpm)	0-6	0-7	0-8	0-8	0-10	0-10
Torque (max) (kNm)	75	270	370	370	630	630
Face access	no	yes	yes	yes	yes	yes
Installed power (kW)	75	132	160	160	250	250
Steering cylinders nr.	3	3	4	4	4	4
Force per cylinder (kN/bar)	353,4/450	770/500	1270/500	1270/500	1270/500	1270/500
Stroke per cylinder (mm)	50	70	80	80	80	80
Slurry line diameter (mm)	100	125	150	150	150	200
Reception shaft diameter	2,5	4	4	4	4	5



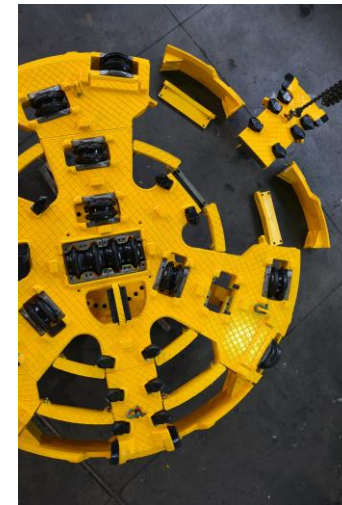
PALMIERI CONTROL CONTAINER



Machine range	RCM 800 - 1200	RCM 1200 - 2000
Container type	20'/20' HC	20'/20' HC
Dimensions (w \times l \times h)	6000x2450x2900 mm	6000x2450x2900 mm
Installed power	130/55 kW	55 kW
Standard set inverters	2x45 kW + 1x60 kW	2x90 kW + 2x132 kW
Number of intermediate jacking stations	Max 6	Max 6



EXTENSION KITS and MODULAR CUTTING HEADS



One of the biggest microtunnelling's technique's advantages is the possibility, within a certain diameter range, to easily increase the machine boring diameter by simply installing a removable "Upsizing Kit" which is easily bolted onto the original machine can.

By using the same main jacking station and the same machine body, clients can widen their machine's boring diameter range with minimal investments and a very simple technology.

It is possible to add a cutting head with a larger diameter or a modular head.

Palmieri can supply a Modular Upsize Kit and a Modular Cutting Head.

By using a modular shields to upsize the machine, is possible to use the same machine and the same upsizing kit to different excavations.

Furthermore, the modular head is the perfect engineering solution studied for blind tunnels with "disposable shield": the cutting head is completely recovered and the customer is given the opportunity to expand or modify it with customized solutions.

The assembly and disassembly operations can be carried out on site and in the tunnel without the use of oxy-cutting and without welding.



PALMIERI JACKING STATIONS



COMPACT JACKING STATION

COMPACT JACKING STATION

	RCM 800 -1500	RCM 1500 - 2000
Machine range	RCM 800 -1500	RCM 1500 - 2000
Dimensions (w×l×h)	4485x2945x2610mm	5250x4455x3127mm
Shaft dimensions	5 x 3,5 m	5,5 x 4,5 m
Dry weight	11700 kg	25000 kg
Support plate radius	2,4 m	3 m
Clear space btw. Cylinders	1820 mm	2605 mm
Max pipe diameter	DN 1500 (O.D. 1800)	DN 2000 (O.D. 2400)
Number of strokes	2	2
Total stroke	3447 (1730+1717)	3367 (1730+1637)
Thrust cylinders	2	2
Max thrust cylinder	2113/320 kN/bar	4020/320 kN/bar
Total thrust	4226/320 kN/bar	8040/320 kN/bar



TELESCOPIC JACKING STATION

TELESCOPIC JACKING STATION

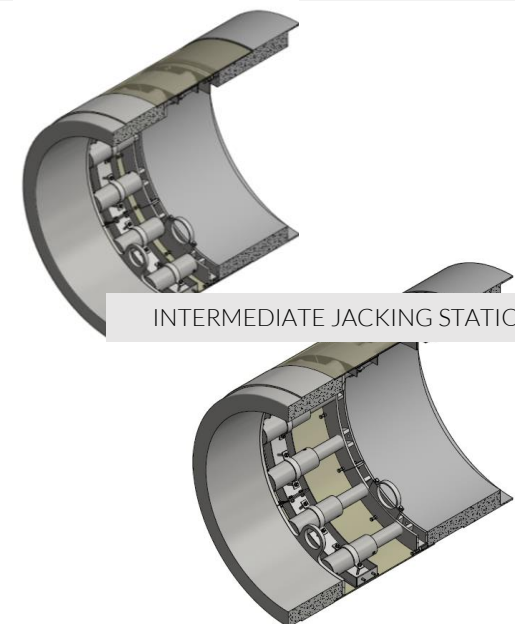
	RCM 800 -1500	RCM 1500 - 2000	RCM 2000-2400
Machine range	RCM 800 -1500	RCM 1500 - 2000	RCM 2000-2400
Dimensions (w×l×h)	2x7,4x2 mm	2,4X7,4X2,4 mm	2,9X7,7X3,2 mm
Shaft dimensions	2,5x8 m	3X8 m	3,4X8 m
Dry weight	10000 kg	11500 kg	15000 kg
Max pipe diameter	DN 1500 (O.D. 1800)	DN 2000 (O.D. 2400)	DN 2400 (O.D. 3000)
Total stroke	4000 mm	4000 mm	4000 mm
Thrust cylinders	2/4	4/6	4/6
Max thrust cylinder	2697/450 kN/bar	2697/450 kN/bar	2697/450 kN/bar
Total thrust	5394-10788/450 kN/bar	10788-16182/450 kN/bar	10788-16182/450 kN/bar

INTERMEDIATE JACKING STATIONS

When boring drives exceed 100/150 linear meters, very often the main jacking station alone is not powerful enough to provide the machine with the necessary thrust as required to advance. The maximum drive length that can be obtained by only using the external main jacking station is not constant and cannot be precisely predicted, due to the presence of several factors such as the pipes frictions, the pushing force and the pipes diameters.

In such a case, when the pipe diameter is large enough to allow the entrance of an operator, the adoption of intermediate jacking stations is recommended.

Such devices (operated by the machine operator via the on board PLC computer located inside the container's cabin) are located between the boring lining pipes at pre-determined intervals according to the job specifications and provide the additional pushing force to advance. Palmieri Group can supply a wide range of intermediate jacking stations, all tailor made and designed in accordance with the specific jobs and machinery features.



INTERMEDIATE JACKING STATION

ADDITIONAL EQUIPMENT

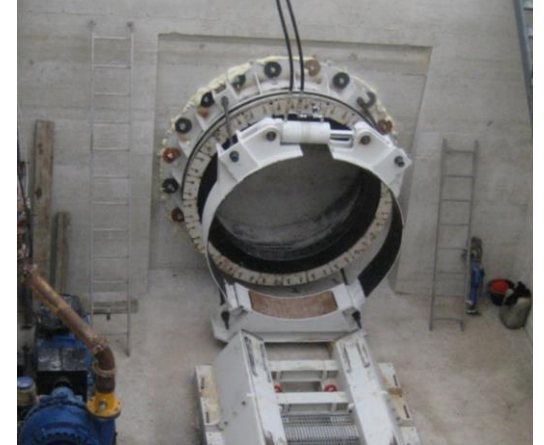
CUTTING TOOLS FOR SOFT/MIXED/ROCK SOIL



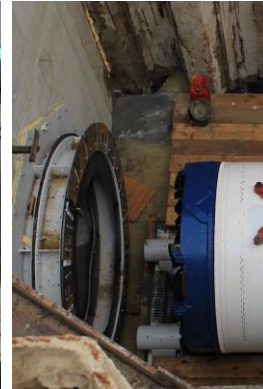
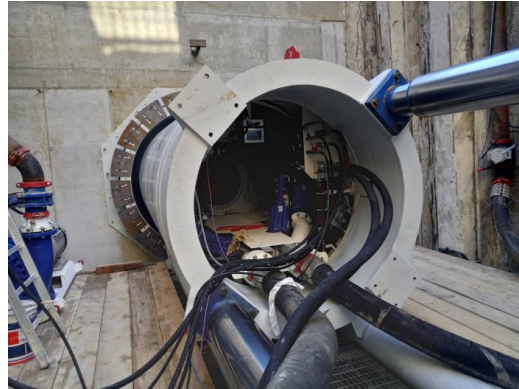
LUBRICATION SYSTEM (BENTONITE)



PIPE BRAKER



SHAFT SEAL



COMPLETE FEED/SLURRY LINE

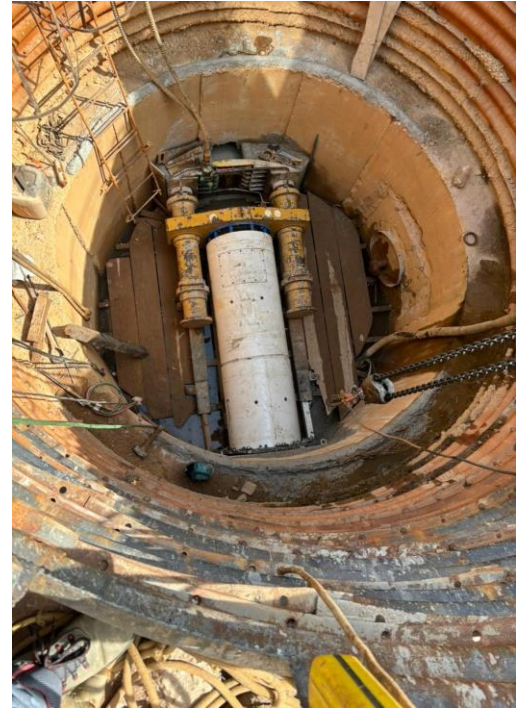
GUIDANCE SYSTEM

COMPLETE ELECTRICAL LINE

ON SITE SERVICE SUPPORT



CONSTRUCTION SITES





Enduring Quality and Performance



Headquarters:
Via dell' Industria, 58
40041 Gaggio Montano (Bo)
Tel. +39 0534 32511
info@palmierigroup.com

