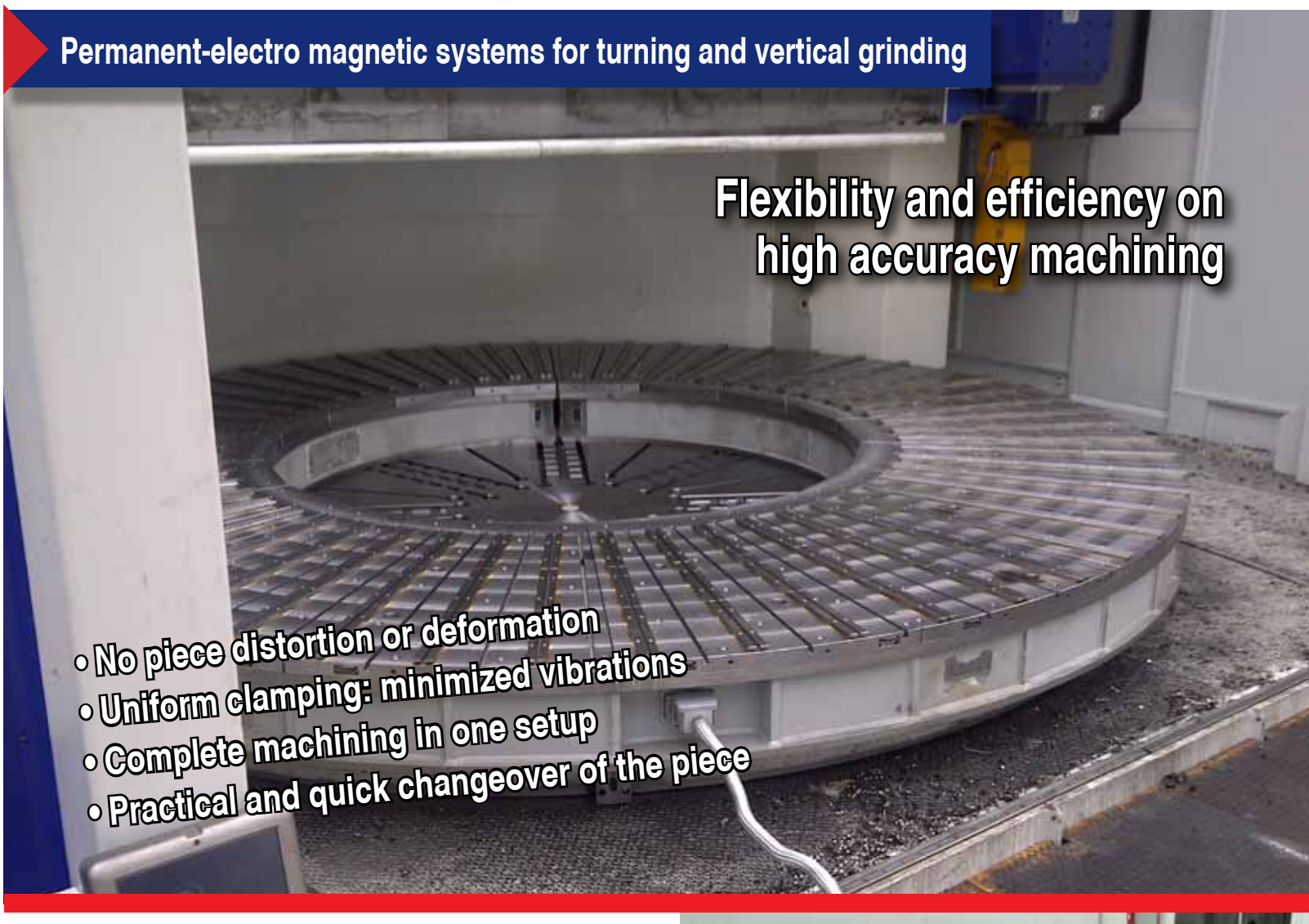
RADIALPOLE

Permanent-electro magnetic systems for turning and vertical grinding



Flexibility and efficiency on high accuracy machining

- No piece distortion or deformation
- Uniform clamping: minimized vibrations
- Complete machining in one setup
- Practical and quick changeover of the piece

The perfect solution formachining slewing, bearing rings and round flanges

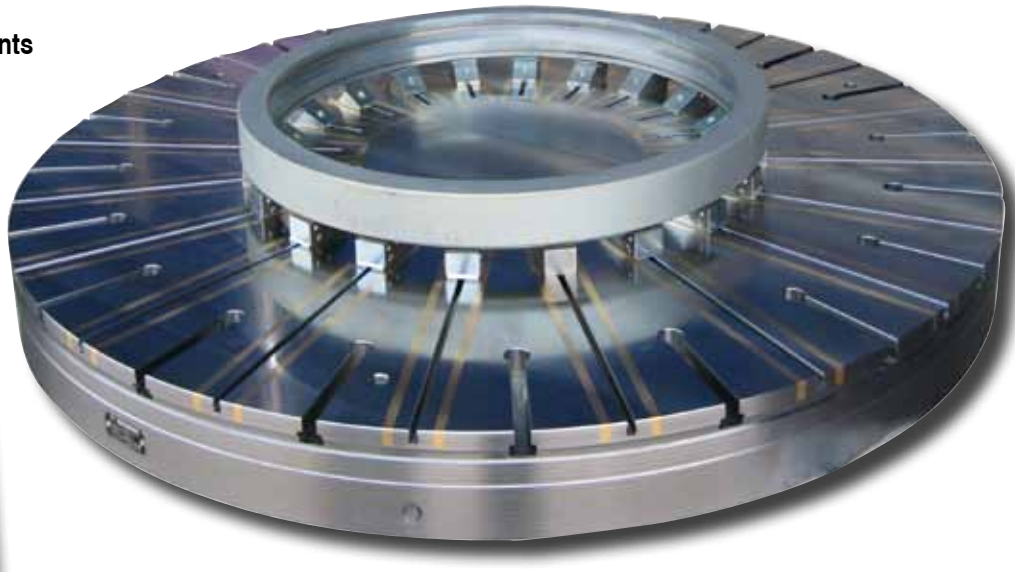
- Monolithic technology
- Full metallic surface
- High power
- Total safety

NEW INTERNATIONAL PATENT

TECNOMAGNETE®
Safety through power

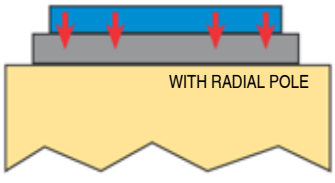
THE PERFECT SOLUTION
for machining slewing and bearing rings and round flanges for:

- **Power stations and wind generators**
- **Earth moving machines**
- **Radar and communication equipments**
- **Off shore cranes, power cranes**
- **Machine tools and gearboxes**
- **Marine engines and transmissions**



UNIQUE CLAMPING
Steady without distortions
As well as limiting access to the workpiece, conventional mechanical clamping always cause some distortions.
Internal / external workholding generates radial warping, while face plate clamping causes axial distortions.

The RADIAL-POLE system completely avoids mechanical deformations and automatically compensates any peculiarity of the workpiece shape.



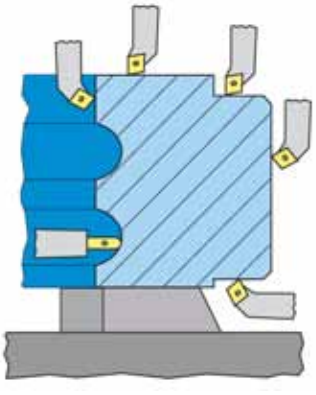
The uniform clamping along the contact surface eliminates all problems related to machining vibrations with tremendous advantages in terms of machining tolerances, tool life, stock removal and machine productivity.

Quick and easy with always predictable power
Clamping operations are quick and easy to carry out; the result in terms of clamping power is always predictable and independent from the operator.

No special tool is needed, no special experience or skill is required to clamp the part.
Time consuming manual shimming operations are no more necessary.

FULL USE OF THE MACHINE TABLE AREA
Any machine can be fitted with RADIAL-POLE system having the same or slightly larger diameter of the machine table, thus allowing to fully use the machine capacity without losing any portion of surface to accommodate clamps and fixturing units.

FREE ACCESS TO THE WORKPIECE
The magnetic clamping surface is given by the reference contact area of the part. Nothing will hinder the full access of the tools for the full machining in a single set up. With the use of pole extensions the workpiece can be raised from the magnetic system surface. The external and internal machining cycle can be exploited due to the absence of any obstacle.

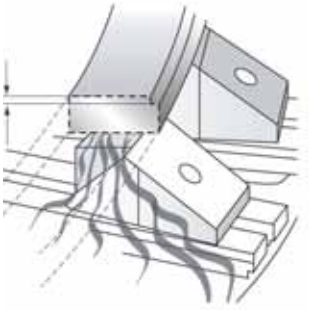


POLE EXTENSIONS

Dedicated pole extensions are used to raise the workpiece from the chuck surface; both internal and external diameters are accessible for all machining operations in a single set-up.

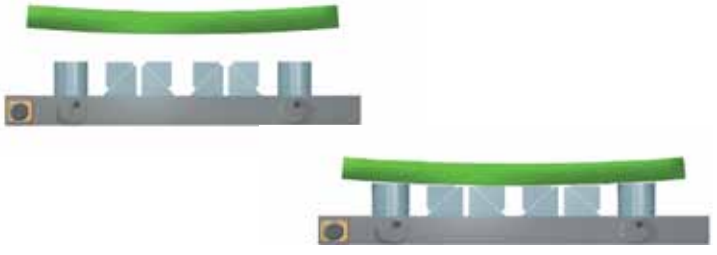
FLUX CONCENTRATION

Pole extensions allow to concentrate the magnetic flux, increasing the clamping force on the polar surface in contact with the workpiece.



AUTOMATIC SHIMMING AND STRESS RELEASE

Movable pole extensions combined with fixed ones to create a reference for the part surface, adapt the magnetic surface to the workpiece without any need of manual shimming operation and without deforming the part. Stress release operations can be carried out quickly and automatically, even without accessing the working area.

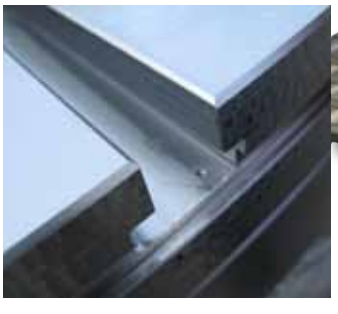


AVAILABLE CONFIGURATIONS

PR /F
"FLAT" monoblock modules, equipped with embedded "T" slots to fix the polar extensions

PR /M
Big diameters chucks can be realized combining multiple magnetic "FLAT" sectors.
They are available with or without backplate, in "FLAT" or with polar-shoes.

On request is also available the PR /S version,
in monoblock configuration but with raised polar-shoes with "T" slots to fix the polar extensions.



The PR/F modules are equipped with embedded "T" slots sono to fix the polar extensions and additional bigger "T" slots for mechanical fixtures or additional tools.

STOCK REMOVAL DATA

Different materials, different surface treatments and conditions change the clamping force due to different absorption of magnetic flux by the workpiece.
Mild steel is the most conductive material, fully absorbing the magnetic flux; 20-30% for alloy steel and 50% for cast iron are the clamping power reduction factors to be considered.

MAX STOCK REMOVAL SECTION (h)	
Common steel	Alloyed steel
3 - 4 mm^2	1 -1,2 mm^2

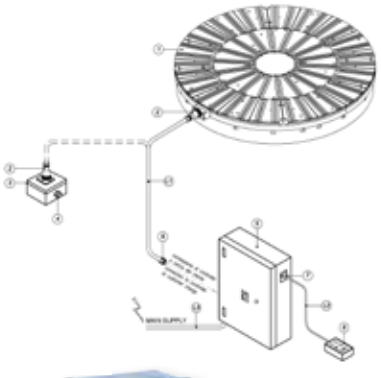
Data valid for rings with min section 40 x 40 mm.

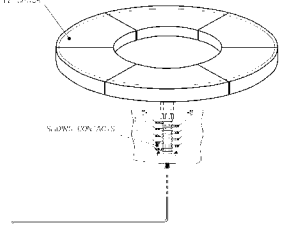
Annealed materials absorb better the flux than tempered parts. Finished surfaces have lower friction factor than rough ones; at the same time they have lower air gap that increases the overall clamping force.

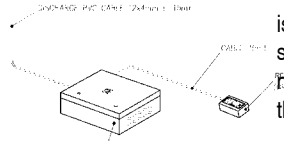
INSTALLATION LAYOUTS

"CR" version

equipped with water proof fast connector on chuck's side and integrated anti-rotation contact, it's the ideal solution to retrofit existing machines or for new ones without any need to modify the machine table.







"SC" version

is equipped with central cable outlet and sliding contacts, it's the ideal solution for new machines with prearrangements on the machine table.

TECHNICAL SPECIFICATIONS					
Model	Dimensions (mm)		Poles	Thick. ≠	Weight
	Ext. Ø	Int. Ø	no.	mm	~ kg
PRF 060030	600	300	12	110	235
PRF 080030	800	300	12	110	400
PRF 100030	1000	300	20+10	110	640
PRF 100050	1000	500	20	110	690
PRF 125030	1250	300	20+10	110	1000
PRF 125050	1250	500	20	110	1000
PRF 150050	1500	500	20	110	1450
PRF 175050	1750	500	32+16	110	1975
PRF 175070	1750	700	28	110	1975
PRF 150100	1500	1000	32	110	1450
PRF 200100	2000	1000	32	110	2340

CONTROLLER DIMENSIONS AND WEIGHT				
Model	W	L	H	Weight
	mm	mm	mm	~ kg
ST200	331	275	85	5
Pendant	135	47	85	0,2
ST500	600	250	800	35
Pendant	152	86	152	1

Standard Voltages available at 50/60 Hz
V1: 200 V - V2: 230 V
V3: 400 / 415 / 440 V - V4: 460 / 480 V

RADIAL POLE

NEW PRF FULL METALLIC SERIES

The full metallic surface, with no resin and screws, grants high robustness of the working area and a physical separation as well a perfect insulation to the internal area where electrical connections and coils are located.
All the Radial Pole chucks are now manufactured with this technology.

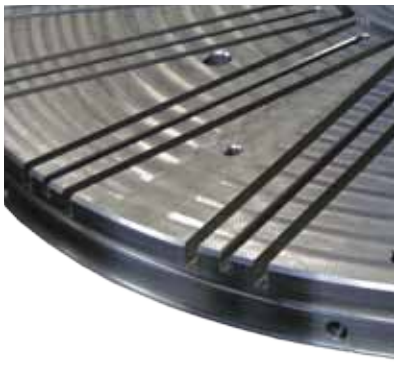
PERMANENT-ELECTRO TECHNOLOGY

TECNOMAGNETE patented permanent electro magnetic circuit needs electrical power only for the quick activation and deactivation phases. During the clamping phase the power is generated only by the high energy permanent magnets built inside.

AN IMPENETRABLE SURFACE

The uniform all-steel metallic surface has no inserts, sealing resin or any filling compound.

It therefore acts as an impenetrable mechanical shield offering permanent protection for the electric circuit and the magnets fitted inside from the back side of the module.



NO MAGNETIC STRAY FLUX

The NUFLUX system is automatically activated every DEMAG phase, ensuring a complete removal of any possible residual mangetism on the piece.

SIMPLICITY AND RELIABILITY

A RADIAL-POLE system has no internal moving parts that can get worn or damaged with the use.
No energy consumption, no heat generation, no maintenances required. Performances will be always predictable and granted in the long run.

RECTANGULAR SHAPE POLES

The rectangular shape guarantees constant and predictable clamping power, independently from the position along the pole.

SAFETY FIRST

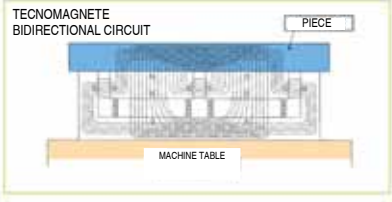
No power failure will affect the magnetic performance.
The system is intrinsically safe by definition!

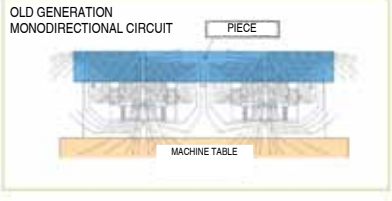
COLD CONTACT SURFACE

No heat is generated by the magnetic chuck, due to the fact that the current is flowing for extremely limited time during the MAG/DEMAG cycles only.
The contact surface between the workpiece and the chuck remains cold, granting high accuracy in machining due to the absence of thermal distortions.

BIDIRECTIONAL MAGNETIC CIRCUIT

The clamping force is given by DIRECT POLES (N/S) only, to concentrate the magnetic flux where it is needed.
The frame of the chuck remains always neutral, and no interference is given to the tool or the machine due to the total absence of stray flux.



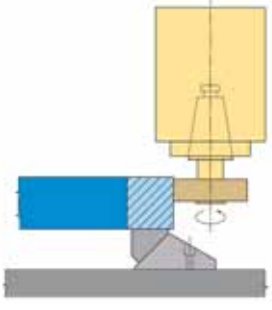


NEUTRAL CROWN

The neutral crown configuration enables the magnetic flux to be fully directed through the active surface, ensuring optimum efficiency and total insulation of the module

EASY WORKPIECE CENTERING

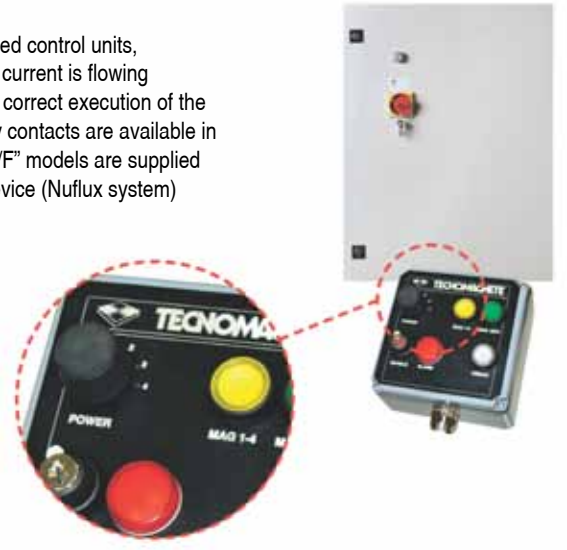
When the chuck is magnetised at low levels, it is possible to position the workpiece using the machine spindle itself to move the part in the correct location; few revolutions of machine table at low speed are enough to center the part.

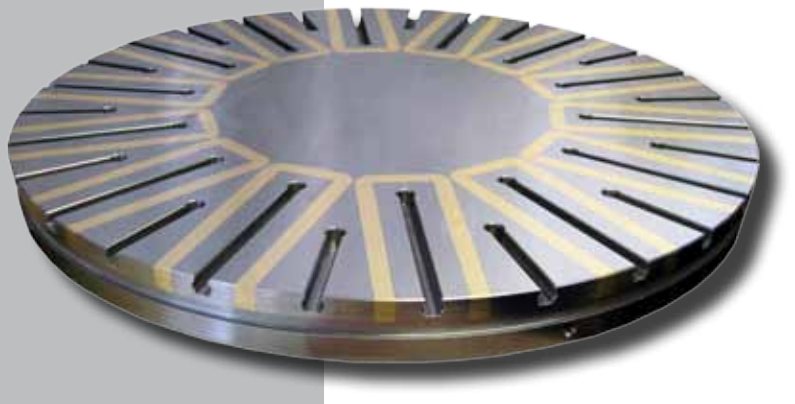


ELECTRONIC CONTROL UNITS

The state of the art of the technology

RADIAL-POLE chucks are equipped with dedicated control units, incorporating the UCS function to detect how the current is flowing during the MAG/DEMAG cycles to guarantee the correct execution of the operations. Controller enable and machine safety contacts are available in the standard configuration of the controllers. “PR/F” models are supplied with control units with built-in demagnetisation device (Nuflux system) to fully remove the magnetic field from the workpiece during the DEMAG cycle. Double action activation procedures (i.e. 2 buttons or key + button) are always requested to avoid accidentally activated cycles.





Clamping power control

The clamping power can be calibrated at different levels, to avoid deformations of thin pieces or to make easy the positioning and centering of the workpieces on the chuck at lower power levels, before clamping them with full power.

Full integration with machine tool

All RADIAL-POLE control units can be driven by the machine tool PLC, through the full interface option available.

ST200RB control unit is the standard controller supplied with small-medium chucks, with 8 level power adjustment and digital remote pendant.

ST500 control unit with IP54 cabinet is the standard controller supplied with larger chucks (external diameter> 1250mm) with 5 levels power control.
Intermediate power levels can be operated through separate button, for faster and more intuitive magnetisation procedures. This unit is available as an option also for small modules.

STANDARD SUPPLY SPECIFICATION

- Permanent-electro magnetic chuck (PR /F) and central “T” slot for fixing the pole extensions
- Electronic control unit ST200RB / ST500 with UCS current detecting system, Nuflux system, machine safety and controller enable and integrated anti-rotation contact (“CR” version)
- Remote push-button for MAG/DEMAG cycles with power adjustment
- Wiring chuck-controller (5m PVC cable)
- Instruction book

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