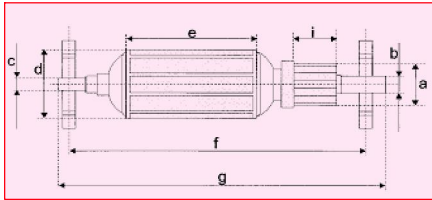


## Part dimensions



Commutator diameter	(a)	4-90 mm
Shaft diameter	(b)	3-25 mm
Stack lamination diameter	(d)	25-100 mm
Stack lamination height	(e)	20-100 mm
Journals distance	(f)	40-340 mm
Armature overall dimension	(g)	50-420mm
Commutator turned length	(i)	5-30 mm
Armature weight		50-5000 g

## Equipment technical data

Supply voltage	220-240 V 50/60 Hz
Power supply	0,3 KW
Size(LxDxH)	500x150x340
Weight	125 Kg
Cycle time	6 s (Dependent on check number)
Gauging heads number	Up to 8 (Top Gauge 200)
Measurement resolution	0,1 µm
Measuring range	7 mm
Measuring direction	Bottom up
Signal sampling	Dedicated for each channel
Sampling time	0,5 ms
Sampling resolution	24 bit
Measure processing	Electronic unit included in the bench
Dimensional and Geometric measurements	Bar to Bar ( BTB ) Delta to Bar ( DTB ) Delta max. Bar ( DMB ) Run Out ( TIR ) Nominal diameter ( DIA ) Roundness, Eccentricity, Triangularity, Quadrangularity, Residual, Diameter
Camera controls	See enclosed description. Other upon analysis
Camera Number	Up to 2
Journal positioning system	Electronic XZ
Gauging head positioning system	Electronic XZ
PC/CNC Human interface	Connected to the measuring unit via Ethernet LAN
Software tools	Statistical Process Control and Printer Data acquisition and storage on Access Data Base
Languages	Italian, English, German, French, Spanish

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**Balance Systems**



Balance Systems

# PR4

## MULTIFUNCTION SYSTEM FOR ARMATURE INSPECTION

### Characteristics

The system is available in either the following configurations:  
- autonomous station, with automatic testing cycle, loaded manually or by a robot ;  
- measurement components and software for measurement management on PC/CNC.

Checks by variables, effected with contact gauging heads:

- 1) - Commutator: bar to bar, delta to bar, delta max. bar, run out, nominal diameter;
- 2) - Stack lamination and shaft: nominal diameter, roundness, eccentricity, triangularity, quadrangularity, residual;
- 3) - Overall armature: diameters and lengths obtained with measurement formulas;

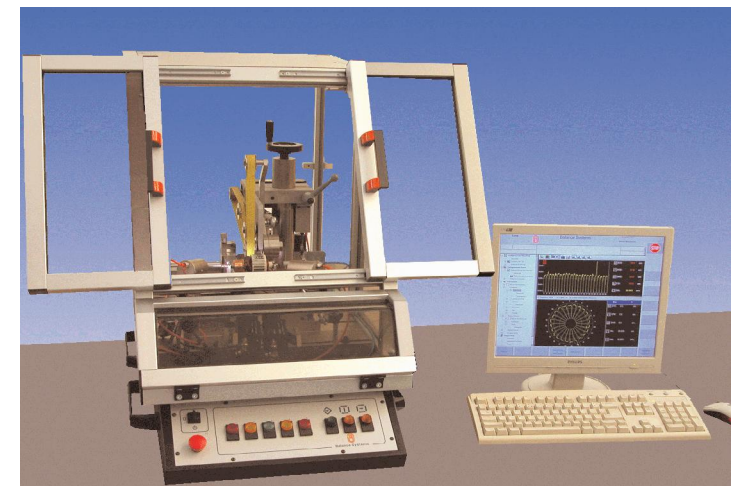
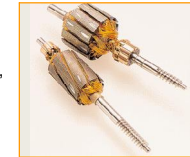
Checks by attributes, effected with cameras, such as: centering of the unbalance correction milling, correct hook positioning and bending, gap presence of chips, resin and bar rag, etc;  
Part positioning on "V" journals. Automatic part rotation by belt drive. Lexan protection.  
Displacement transducers to guide on video the bench tooling.

Measurement parameters and tooling positions of the specific armature stored in tables, recalled for operator's control and help in the successive re-toolings. Interfaces: digital I/O, CAN, Profibus, Ethernet.

Data visualization on PC/CNC VDU and printer.  
Measurement acquisition and storage for Statistical Process Control.

### Benefits

- » Easy to integrate in any productive architecture;
- » Simple to configure and use;
- » Quick to retool;
- » Precise;
- » Safe;
- » Ensures consistent production quality;
- » Eliminates operator's check subjectivity;
- » Gives evidence of product and process quality.



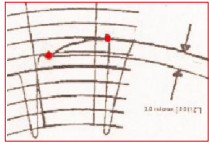
UNI EN ISO 9001 Cert. n. 9105. BALS

# DIMENSIONAL AND GEOMETRIC CHECKS

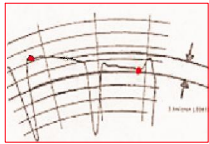
## Commutator



BTB = Bar to Bar



DTB = Delta To Bar



DMB = Delta Max Bar

TIR = Total Indicated Roundness  
(Run out)

DIA = Nominal Diameter  
(Quotas Average)

## Stack Lamination/Shaft

DIA = Diameter  
Average "V"



RND = Roundness  
Vmax - Vmin



ECC = Eccentricity  
Vmax - Vmin



TRI = Triangularity  
Vmax - Vmin

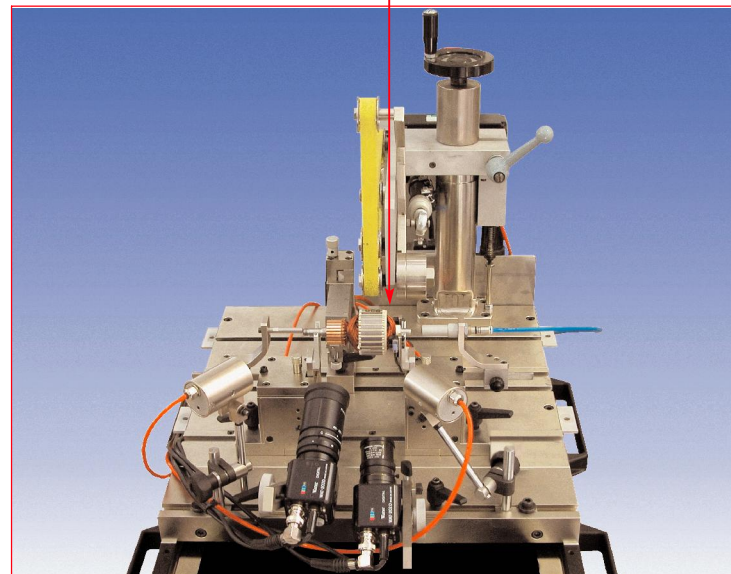
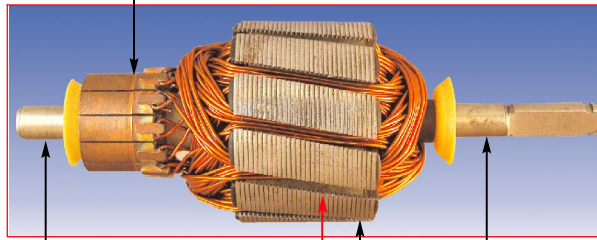


QTR = Quadrangularity

R = Residual

## Overall Armature

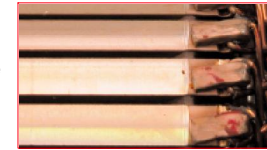
Quotes calculated with  
formulas relating gauging  
points



# CAMERA CHECKS

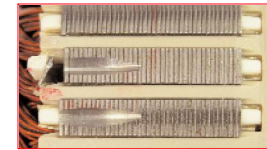
## Commutator

Hook / Gap.  
Finishing.  
Presence of chips, resin or gel in the  
bars gap.  
Bar turning rag.



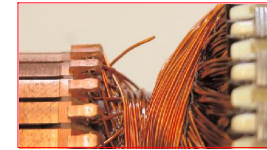
## Stack lamination

Check of unbalance correction  
millings. (laminations positioning,  
integrity and spacing).  
Slot check (integrity, edge continuity,  
wedge presence).



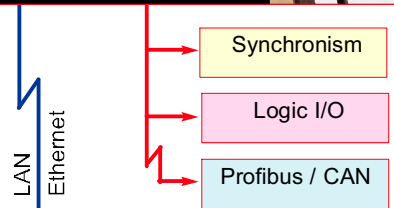
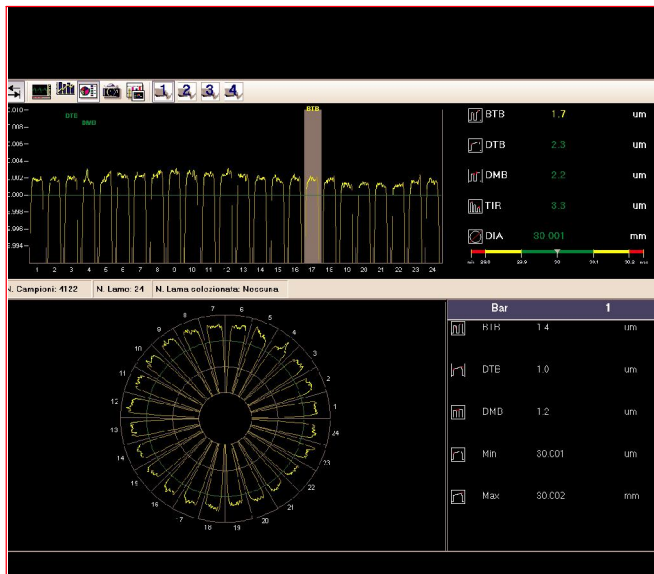
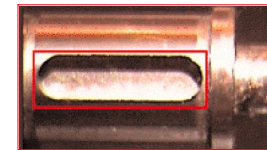
## Winding

External maximum profile.  
Copper wires out of place.  
Gel correct disposal between hook  
and down stream wiring.



## Shaft / Rotor

Spline check (type and size).  
Presence of details (bearings ecc.)  
Presence of machining (grooves,  
threads, shaft ends, ecc.)



Operator's interface  
- Configuration  
- Part Program  
- Results  
- Visualization



PC / CNC

