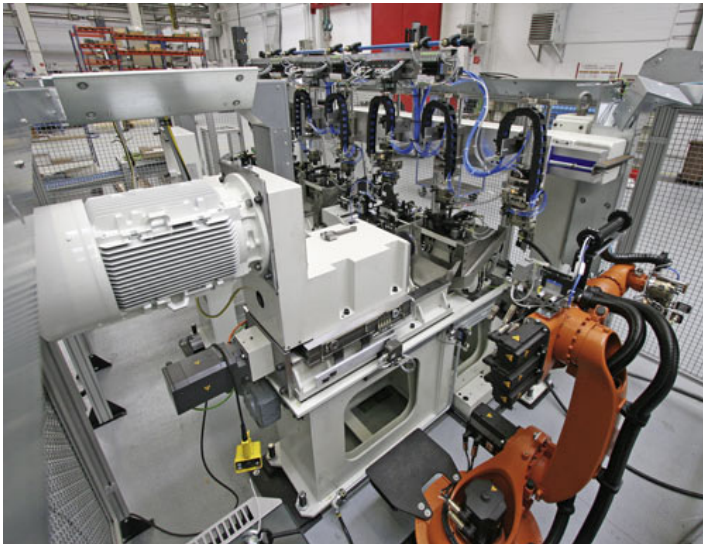


## 112 TBMP, 212 TBMP Transfer Weight-Correction Machine for Connecting-Rods



- Modular design for all connecting-rod designs
- Fully automatic operating sequence
- Integrated, fast in-line transport
- Linking with a production line
- High accuracy through digital measured value processing and numerically-controlled correction procedure

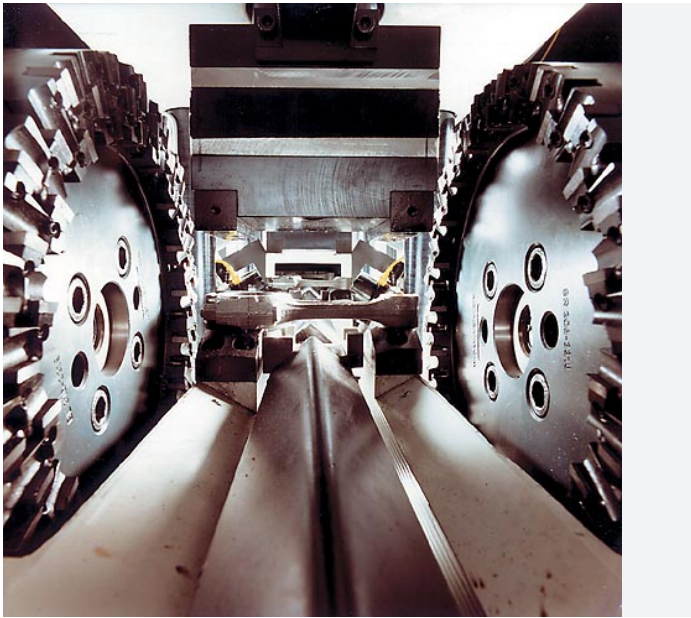
### Range of application

Measurement of the weight of rotating and oscillating parts or the absolute weight of machined connecting-rods for internal combustion engines. Controlled weight correction at the prepared correction pads on the small-end and big-end. Weight correction is usually followed by fineboring. Application of the machine in largevolume production, interfaced with the production line.

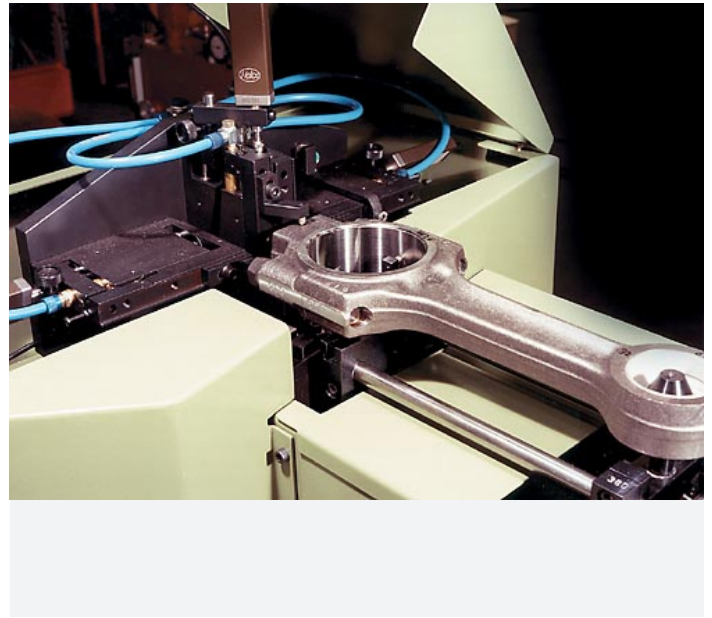
### Design

Transfer machine with automatic operating sequence. Modular machine construction, thus optimally adaptable to the task. Arrangement of the stations in an in-line direction with all stations covered by an electro-mechanical lift and carry transfer for transport of the connecting rods. Welded machine base with lateral bases supporting the milling units, prepared for removal of the chips by a chip-conveyor or underfloor extractor. Electromechanical, numerically controlled milling unit and digital operating tandem weighers. Microprocessor-controlled measuring equipment for acquisition of the measured values and processing; machine PLC control with fault diagnosis.

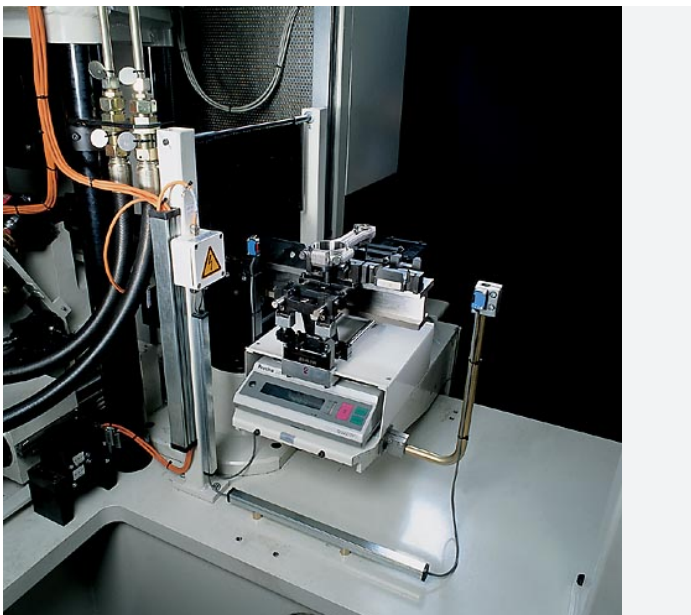
## 112 TBMP, 212 TBMP Transfer Weight-Correction Machine for Connecting-Rods



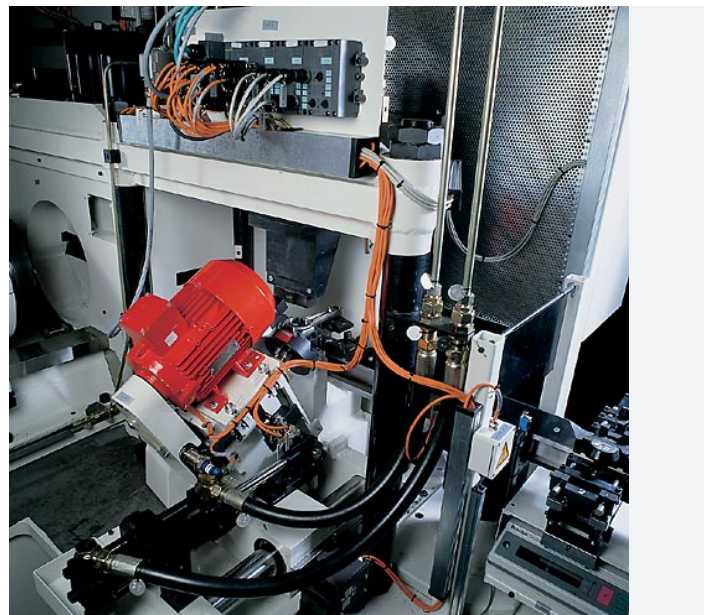
Electro-mechanical carriage units with digital positioning control. Milling of the correction pads with amply dimensioned milling cutters with hard-metal carbide inserts (divided arrangement for overlapping cut.) The horizontal layout of the units allows easy chip removal directly through the machine bed into a collection bin, on a chip-conveyor or underfloor extractor.



Sampling of the connecting-rod geometry for increasing the correction accuracy is an option. This method allows an offset to cater for weight deviations through final machining of the journal holes and/or acquisition of the actual pad geometry.

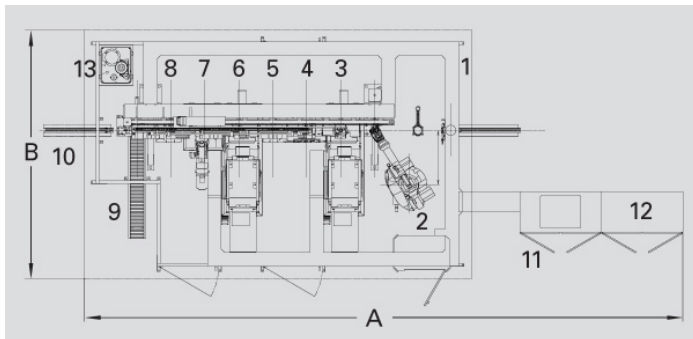


Measurement and control weighers with two electronic load-cells for the big-end and small-end. Digital determination of the absolute weight or deviations from the pre-defined target weight. Zero setting according to a master connecting-rod. Weighers are adaptable to other connecting-rod types by adjustment or exchange of adapters.



De-burring equipment with rotating tool, matched to the actual parameters of the workpiece. Largely constant control of the de-burring cross-section without affecting the weightcorrection results.

## 112 TBMP, 212 TBMP Transfer Weight-Correction Machine for Connecting-Rods



- 1 Transfer station/separator
- 2 Loading robot (option)
- 3 Pre-milling station (option)
- 4 Geometry scanning
- 5 Measuring station
- 6 Milling station
- 7 Deburring station
- 8 Control station
- 9 Out of tolerance belt
- 10 Transfer station, IO parts
- 11 Operating cabinet

# 112 TBMP, 212 TBMP

## Transfer Weight-Correction Machine for Connecting-Rods

Technical data at a glance		112 TBMP	212 TBMP
Measuring unit			PC 850
Con-rod with 1 boss		•	
Con-rod with 2 bosses			•
Loading station		•	•
Measuring station		•	•
Checking station		•	•
1 milling unit		•	
2 milling units			•
De-burring station		•	•
Sorting station		•	•
Integrated transporter		•	•
<b>Connecting-rod</b>			
Total weight	[g]	400 - 7000	400 - 7000
Weight, small-end	[g]	110 - 1900	110 - 1900
Weight, big-end	[g]	290 - 5100	290 - 5100
Gauge	[mm]	110 - 300	110 - 300
Hole dia. at small-end	[mm]	16 - 56	16 - 56
Hole dia. at big-end	[mm]	40 - 105	40 - 105
Rod thickness	[mm]	20 - 50	20 - 50
Rod width, max.	[mm]	160	160
Correction pad width, small-end	[mm]	10 - 50	10 - 50
Correction pad width, big-end	[mm]	20 - 70	20 - 70
<b>Machine</b>			
Width A	[mm]	8500	8500
Depth B	[mm]	2600	2600
Height C	[mm]	2000	2000
Achievable tolerance	[g]	±1 - 10	±1 - 10
Measurement uncertainty	[g]	0,1	0,1
Milling cutter wheel dia. max.	[mm]	360	360
Cut width	[mm]	20 - 75	20 - 75
Cycle time	[s]	5 - 13	5 - 13
Air pressure	[kPa]	600	600
Power consumption	[kVA]	20	40

# 112 TBMP, 212 TBMP

## Transfer Weight-Correction Machine for Connecting-Rods

	Order No.	R0670100.01	R0670200.01
	Order No.	R0670101.01	R0670201.01
Boss detection	Order No.	R0670102.01	R0670202.01
Chip conveyor	Order No.	R0670103.01	R0670203.01
Linking equipment	Order No.		o.r.

2) Acc. To DIN 1319, 95% probability, dependent on form accuracy of correction pads and weight division

3) Dependent on the weight to be corrected, con-rod material and permissible milling data

o.r. On request