T H I N K

C R E A T E

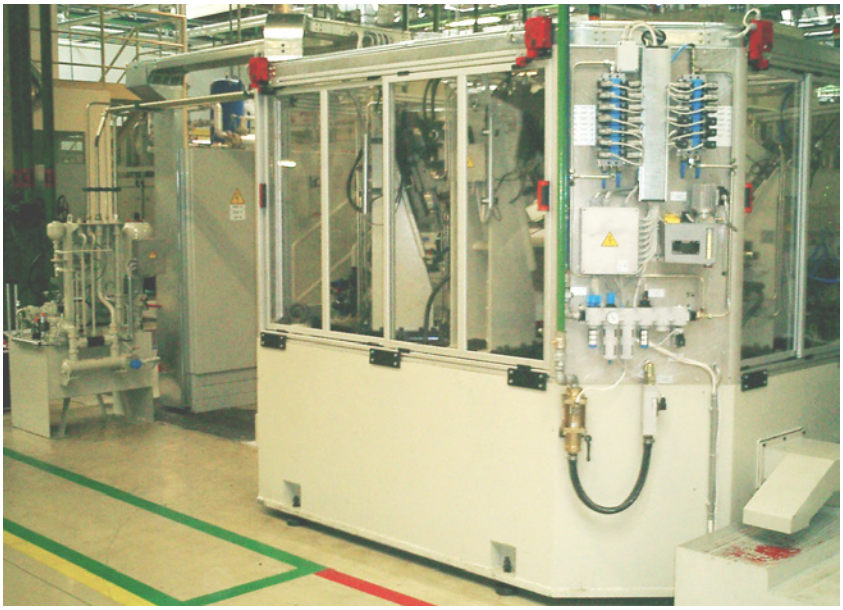
A U T O M A T E

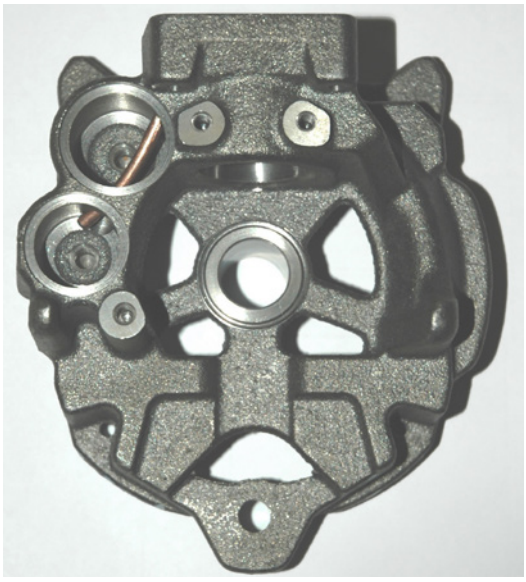
CATALOGUE

PLATE DRILLING AND TUBE INSERTION MACHINE

MAIN FUNCTION

Machine purpose is as follows:
• Drilling of 10, 5, 4.1 mm diameter holes on NBY support by means of inclined drilling units fixed to machine base.
• Brushing carried out before and after holes previously drilled through horizontal double-spindle units fixed to machine base.
• By means of hydraulic fitting, tube insertion in 4.1 mm diameter hole of NBY support. Tubes to be assembled is performed through circular vibrator. Before reaching drive-in position, tube is deformed by hydraulic cylinders.





NBY support

DESCRIPTION

Plate drilling and tube insertion machine is a single-block system mainly consisting of an arc-welded steel base carrying an indexing table with component clamping fixtures, 5 machining units, drive-in unit, load / unload station.

Components load and unload phases are automatically carried out by a 2-opposed arms rotary manipulator, which picks up NBY supports from conveyor for deposit on indexing table surface.

Manipulator also performs NBY support unload from machine for deposit on conveyor.

SPECIFICATIONS

ASSEMBLED PARTS
Tube

POWER SUPPLY
Voltage: 380 V (three-phase + ground)
Frequency: 50 Hz

PNEUMATIC POWER SUPPLY
Operating pressure: 6 bar

HYDRAULIC SYSTEM
Hydraulic power unit capacity: 160 l

LUBRICATION SYSTEM
Lubrication power unit capacity: 2,7 l

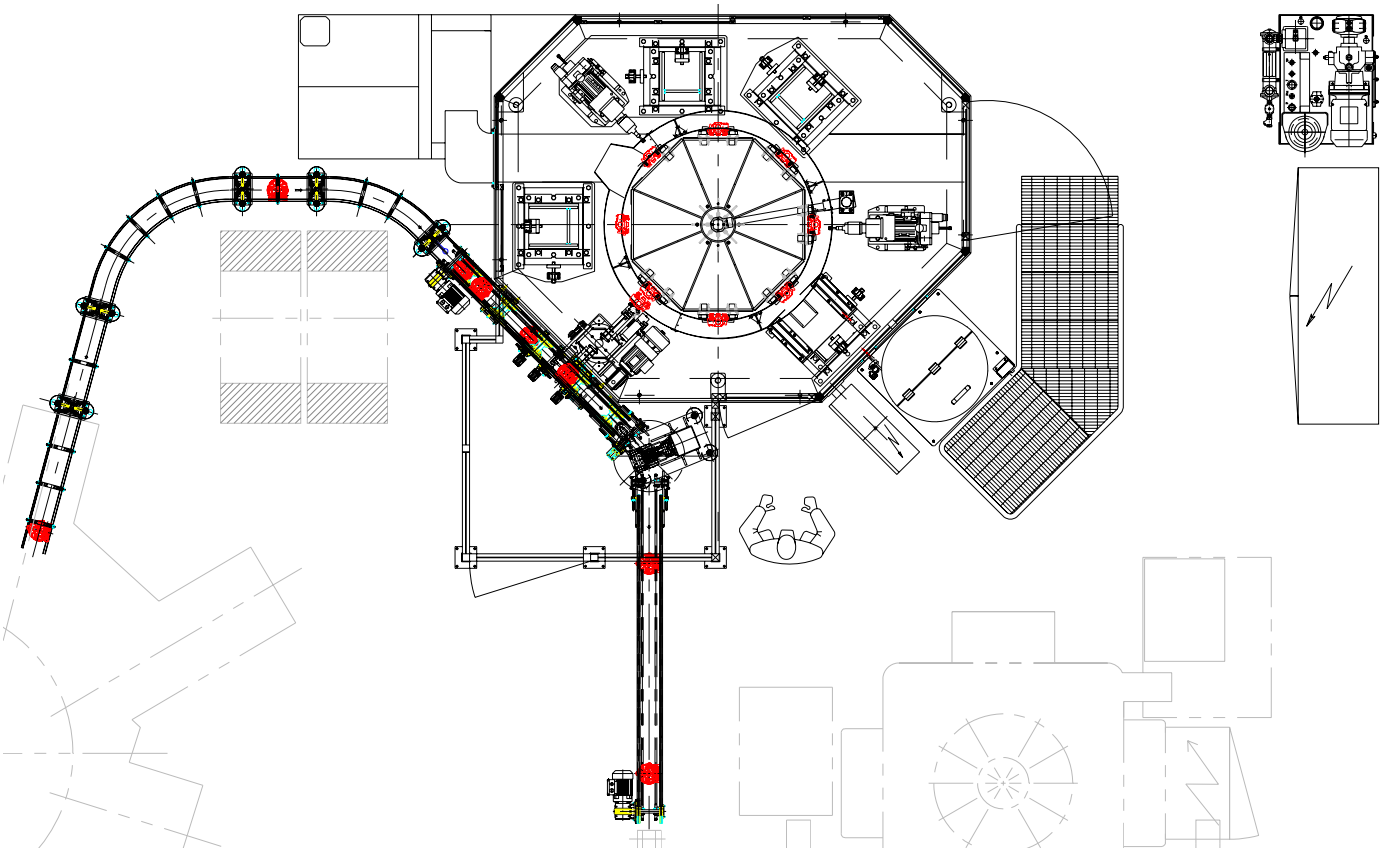
COOLING AND WASHING SYSTEM AND PART TRANSFER SYSTEM
Indexing table, conveyors

SAFETY GUARDS
- Fixed type protections
- Moving type protections provided with a interlock device
- Moving units covering guards
- Emergency push-buttons.

LIST OF STATIONS

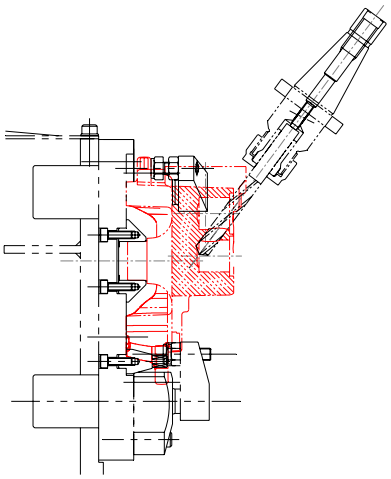
STATION	DESCRIPTION	TIPOLOGIA
1	Load / unload	Automatic
2	Drilling of 10 mm diameter hole	Automatic
3	Brushing of 10 mm diameter hole	Automatic
4	Drilling of 5 mm diameter hole	Automatic
5	Drilling of 4.1 mm diameter hole	Automatic
6	Brushing of 5-4.1 mm diameter holes	Automatic
7	Tube drive-in	Automatic

DIAGRAM

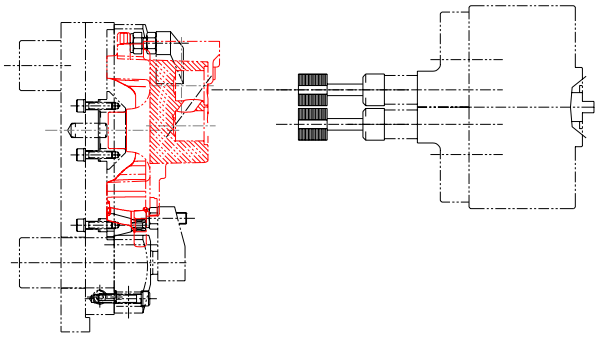


STAZIONI

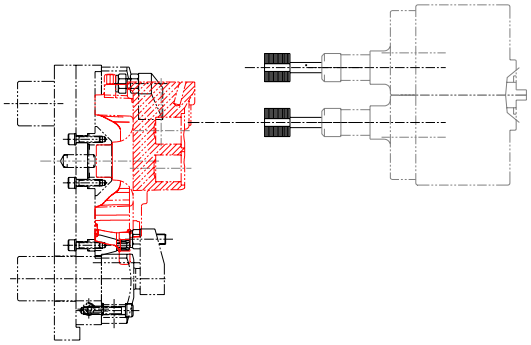
STATION 2 – DRILLING OF 10 MM DIAMETER HOLE



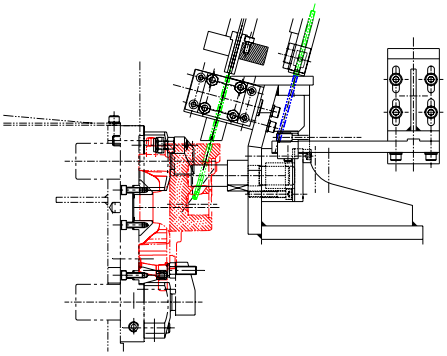
STATION 3 - BRUSHING OF 10 MM DIAMETER HOLE



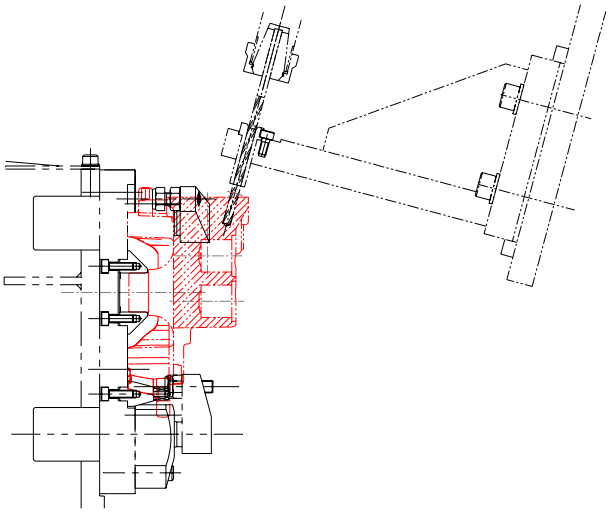
STATION 4 – DRILLING OF 5 MM DIAMETER HOLE



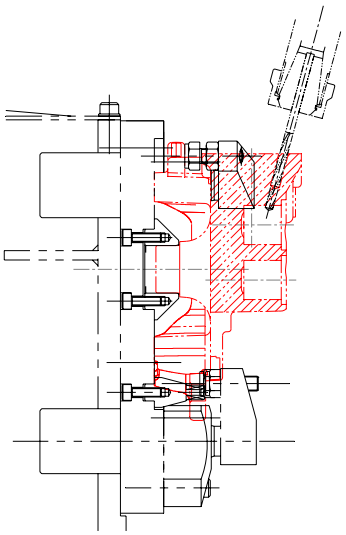
STATION 5 – DRILLING OF 4.1 MM DIAMETER HOLE



STATION 6 – BRUSHING OF 5-4.1 MM DIAMETER HOLES



STATION 7 – TUBE DRIVE IN



GRINDING MACHINE FOR VALVE PLATES EMT - EMX

MAIN FUNCTION

Carry out the automatic grinding of intake and exhaust valve seats in two types of valve plates, namely valve plate EMT type and EMX type. The machine processes two plates simultaneously, performing the same operation on each plate.

DESCRIPTION

The Valve Plate Grinding Machine is an enbloc assembly, essentially consisting of an electrowelded steel base, where the following equipment is mounted and secured:

- Loading store, on the framework of which is installed a double loader for vertical staking up;
- Two rotary tables for transfer of workpieces;
- Cross table, consisting of a structure where two slides are installed. Slides are superimposed and run on a horizontal surface, acting on 90° axes (X, Y);
- Two plate lifters equipped with double mechanism for vertical lifting;
- Grinding assembly for grinding of exhaust valve seats, including two units running on a couple of vertical guides, where a slide carries a pendulum-type grinding tool;
- Transfer unit, consisting of a pair of pick-up fingers, air-powered;
- Grinding assembly for grinding of intake valve seats, including two units housed in a framework;
- A pair of vertical guides, for running of the grinding spindle slide;
- Unloading store consisting of an removable double loader for vertical stacking;
- Every loader is provided with a quick-release level to be manually replaced.

SPECIFICATIONS

MACHINED PARTS
EMT – EMX type plates

ELECTRIC POWER SUPPLY
Voltage: 380 V (3-phase + GND)
Frequency: 50 Hz

PNEUMATIC SUPPLY
Operating pressure: 6 bars

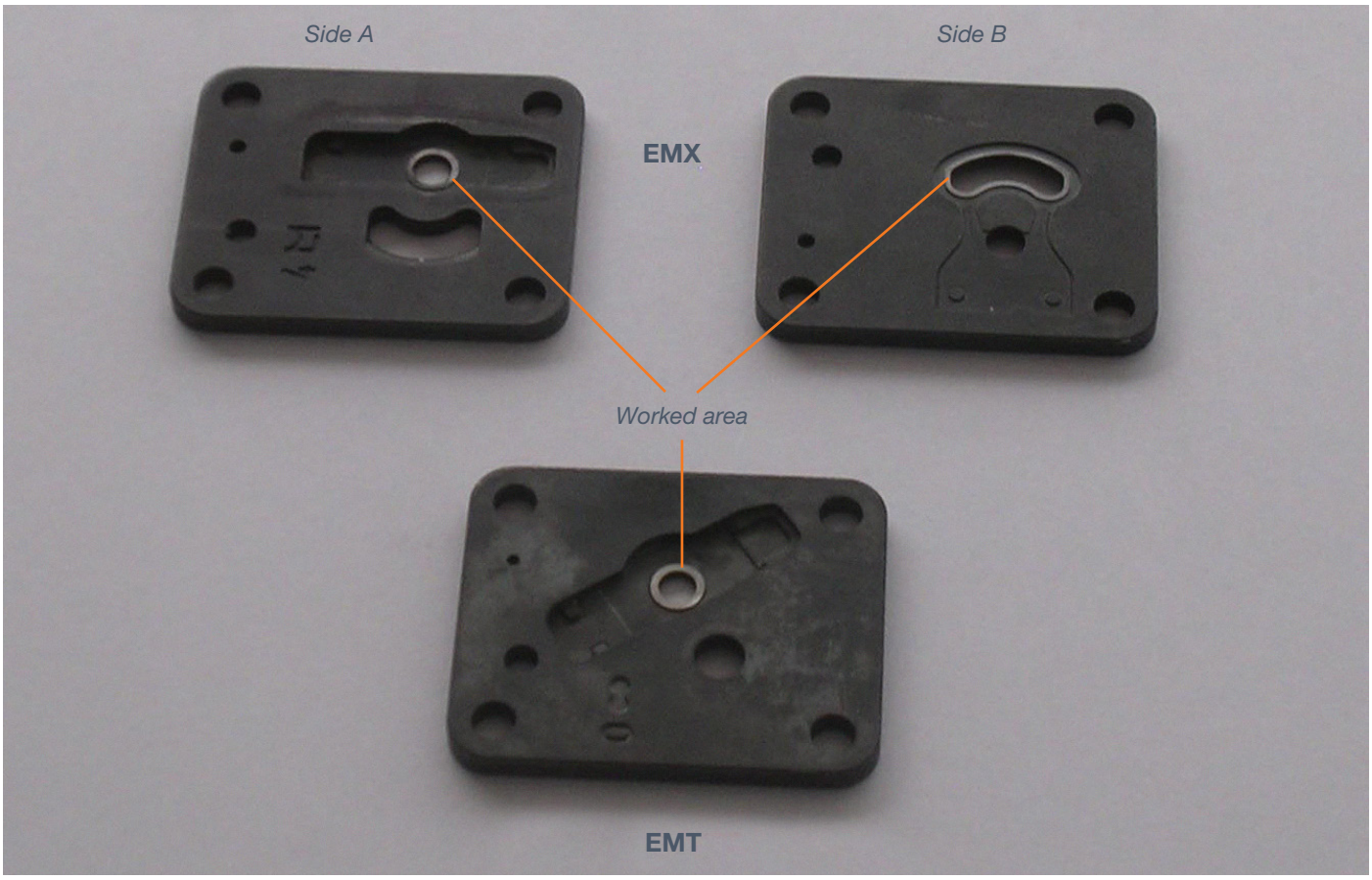
SPINDLE LUBRICATION SYSTEM
Power Unit capacity: 1.8 liters

SPINDLE COOLING SYSTEM
Power Unit capacity: 4 l

WASHING AND COOLING SYSTEM
Installed

PART TRANSFER SYSTEM
Rotary Tables

EMX - EMT

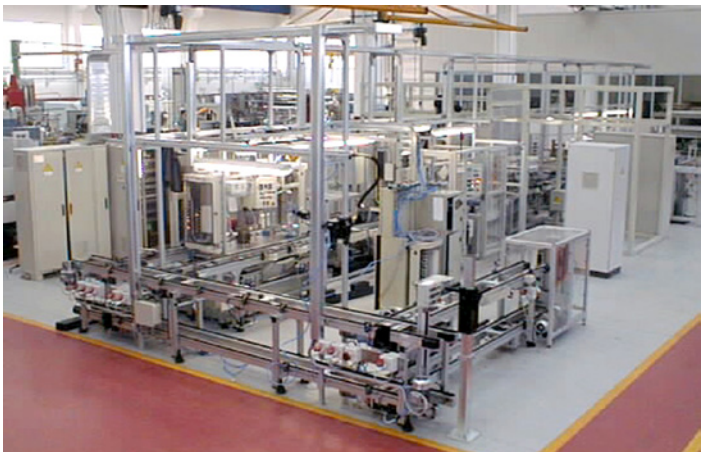


Machined part. EMX type (both sides A= exhaust valve seat, B= intake valve seat) and EMT type (one side only)

SEMI-AUTOMATIC OIL FILLING AND TESTING LINE

MAIN FUNCTION

Fill with oil and carry out various manual and automatic tests on the NBU – NE compressors



Tested part

DESCRIPTION

The line consists of a transport system, where the parts being tested feed on overlaying two-level conveyor belts.

The parts are carried in the line by means of pallets that, feeding on the upper-level conveyor belts, transfer the compressors to the different stations, whereas the lower level of the conveyor belts is used to re-enter the pallets that have reached the end of cycle.

To speed up the operations, there are two tracks arranged alongside each other, a right-hand one and a left-hand one, making it possible to operate simultaneously on two parts, thus increasing the number of products tested in the preset time.

The line consists of 23 working stations, identified by their assigned Operations, indicated with the “Op” code, followed by an incrementing number including two or three digits, which identifies the proper testing stations and the automatic or manual working stations.

SPECIFICATIONS

WORKING CYCLE
SEMIAUTOMATIC

IN: manual loading to transport system.

OUT: manual unloading from transport system..

TYPES OF TESTED COMPRESSORS
Compressors type NBU and NE.

CYCLE TIME
~ 9 sec.

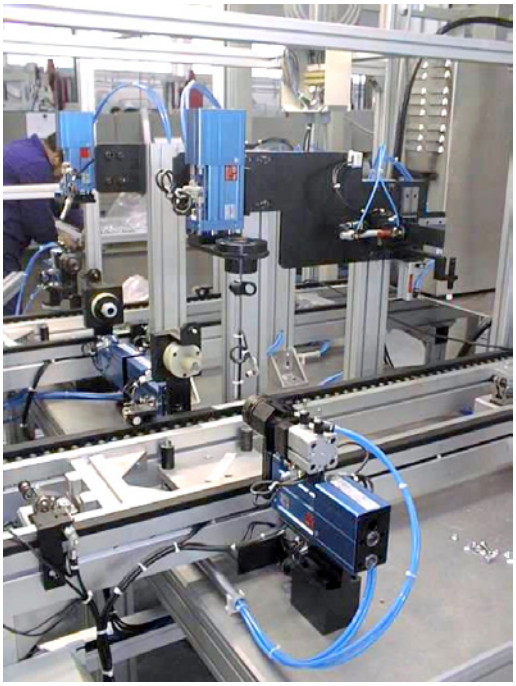
LIST OF WORKING STATIONS

- Station_1: OP_10 Manual part loading operation.
- Station_2: OP_20 Protective cap removal operation.
- Station_3: OP_30 Part labelling operation.
- Station_4: OP_40 Tube straightening operation.
- Station_5: Station 1 - Automatic parts distribution.
- Station_6: Station 2 - Rotation 1.
- Station_7: OP_50 Weighing 1.
- Station_8: OP_60 Oil filling operation.
- Station_9: OP_70 Weighing 2.
- Station_10: OP_80 Plugging in service tube.
- Station_11: OP_90 Running in and stiffness check operation.
- Station_12: OP_100 NBU testing operation.
- Station_13: OP_110 In–Jet Operation.
- Station_14: OP_120 NE manual testing operation.
- Station_15: Station 3 Rotation 2.
- Station_16: OP_130 Manual reject repairing operation.
- Station_17: Station 4 Part recovery.
- Station_18: OP_140 Plugging-in operation.
- Station_19: OP_150 Exhausting operation.
- Station_20: OP_160 Weighing and visual checking operation.
- Station_21: OP_170 Manual final repair operation.
- Station_22: OP_180 Manual part unloading operation.
- Station_23: Station 5 Empty pallet final rotation.

FUNCTIONING SYSTEM
Overall dimensions on the ground: 20760 x 7575 x h 4000 mm.

SAFETY GUARDS
The structure is provided with protections only in the following zones, facing the individual Working Stations, namely:

- conveyor belts in the zones of pallet elevators/ lowerators: aluminium and lexan guards, complete with access doors,
- OP_30: aluminium and lexan guards, complete with access doors,
- OP_90: aluminium and lexan guards, complete with access doors,
- OP_100: aluminium and lexan guards, complete with access doors,
- OP_110: aluminium and lexan guards, complete with access doors,
- OP_120: soundproof cabins surrounding the entire tracks on the left and right hands, not communicating with each other and each one
provided with one opening to allow the operator to enter the cabin.

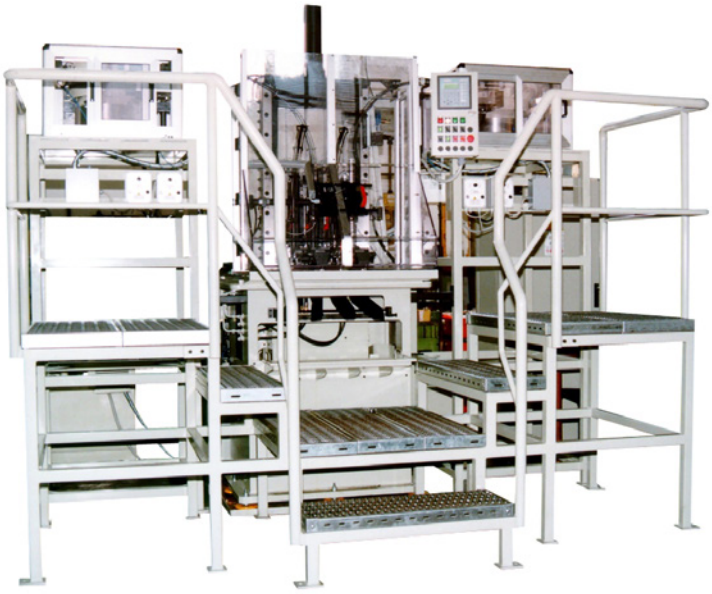


NBU - NE Compressors Testing Stations

VERTICAL BROACHING, HYDRAULIC-POWERED

MAIN FUNCTION

Broach the connecting rod-bearing cap mating surfaces.



Finished part

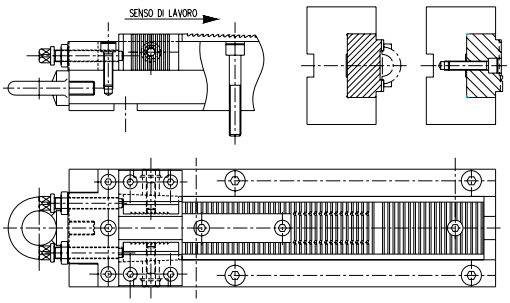
Finished part

DESCRIPTION

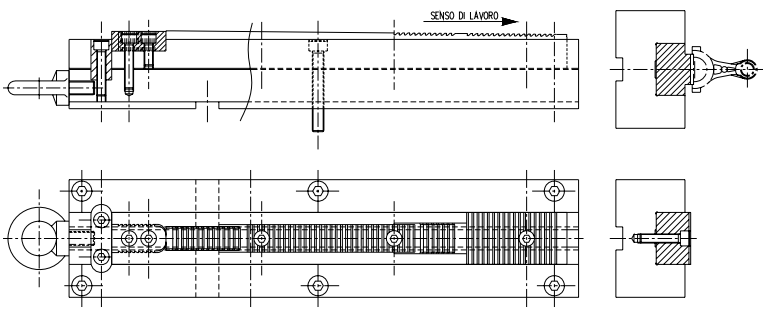
This machine can work two (2) types of connecting rods with relevant bearing cap. The work pieces (No. 2 connecting rods + No. 2 bearing caps) are simultaneously hand-loaded by the operator to special cartridge belts; afterwards they are pushed, located and clamped in position by the operator, and then machined by broaching tools working with vertical reciprocating movement.

Finally, once the machining is complete, the machine unloads the finished parts separately into suitable collection boxes, to be then taken out by the operator.

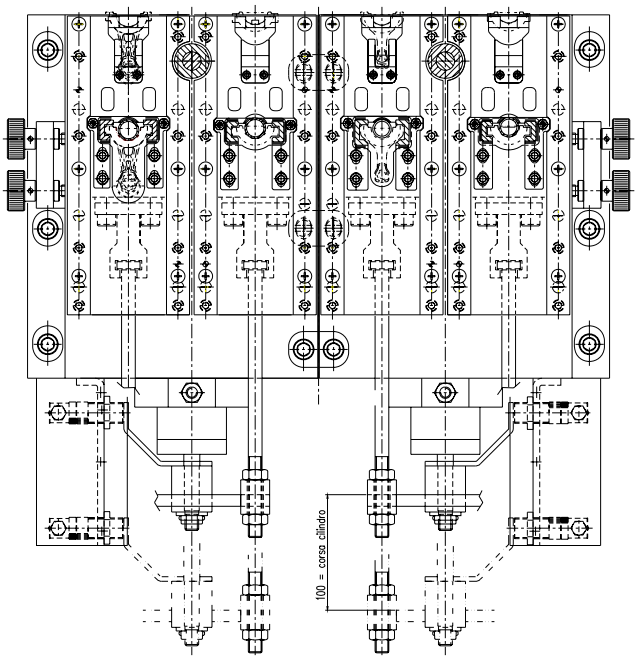
DIAGRAM



BEARING CAP BROACH HOLDER



CONNECTING ROD BROACH HOLDER



LOADING AND CLAMPING FIXTURE

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC

IN: connecting rod and bearing cap loading to cartridge belt, manual.

OUT: connecting rod and bearing cap unloading to chute, automatic.

WORKPIECE TYPES
a) Bearing caps.
b) Connecting rod shanks.

CYCLE TIME
18 sec.

HOURLY OUTPUT AT 100% EFFICIENCY
400 conn. rods + 400 bear. caps. (Note: the machine is capable to work simultaneously No. 2 connecting rods and No. 2 bearing caps per cycle.).

FUNCTIONING SYSTEM
Overall dimensions on the ground: 3500 x 2750 x h 3010 mm, weight: ~ 2500 Kg.

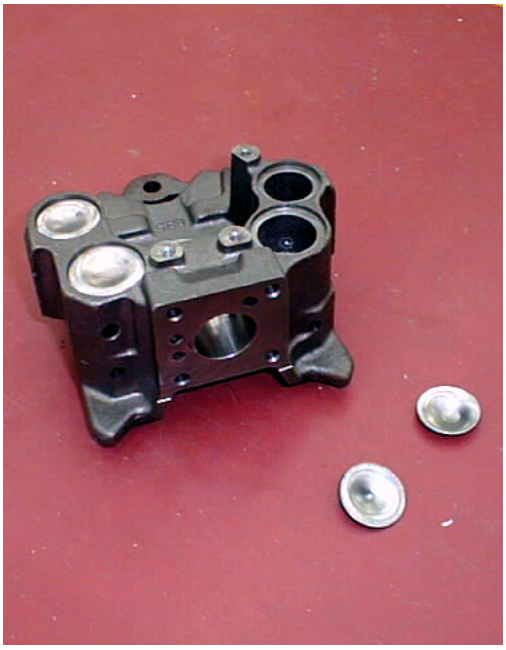
INSTALLED POWER
~ 10 kW.

SAFETY GUARDS
The whole front perimeter of the machine is guarded to avoid any accidental human intrusion to the working area.
The guarding system includes one guard and one roller protection running with the slide between the internal and external slideways (R.H./L.H.).
The guard consists of aluminium extruded square sections and lexan panels.

SPECIAL CAP DRIVING MACHINE

MAIN FUNCTION

Drive the caps into the intake muffler of the compressor motor mounts.



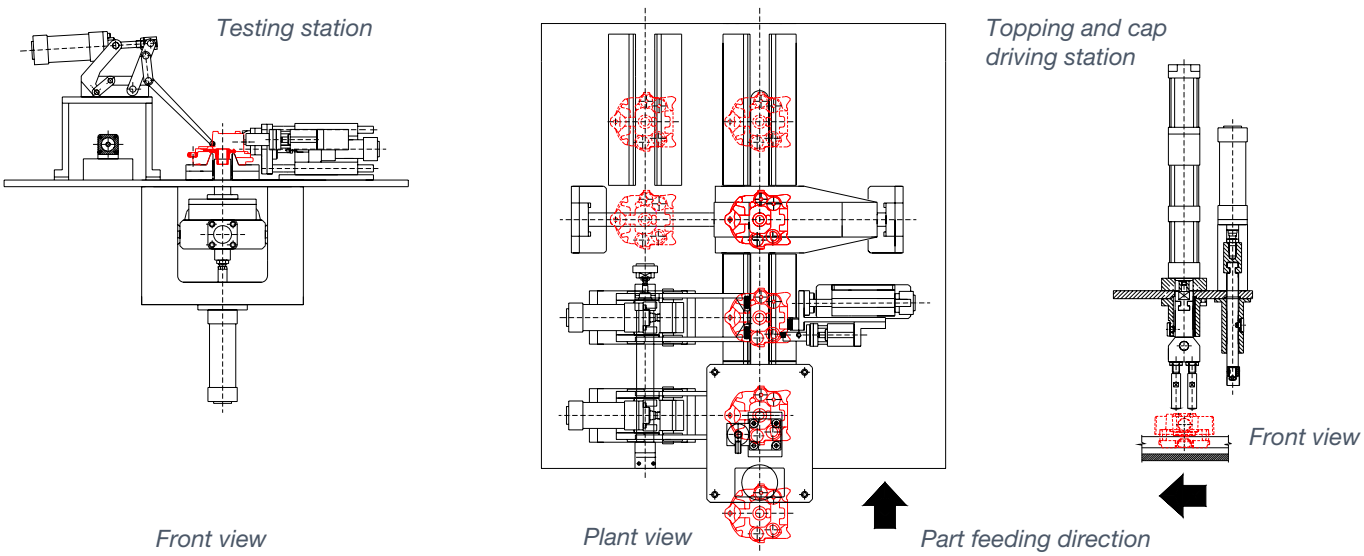
Machined part

DESCRIPTION

The motor mounts are transferred by an entry conveyor belt to the working zone, where a part detecting device signals their arrival and stops them; a system consisting of a slide mounted in the lower part of the machine, then transfers them to a position where they can be clamped by special stops, machined, checked, and finally sent to the right-hand or left-hand track on a trolley.

The parts are properly distributed between the right-hand track and the left-hand track, depending on whether they have passed the checks and can continue in the production cycle, or they are to be rejected because they do not meet the specified requirements.

DIAGRAM



SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: manual loading to entry conveyor belt.

OUT: automatic unloading onto next line.

CYCLE TIME
9 sec.

FUNCTIONING SYSTEM
Overall dimensions on the ground: 3200 x 1250 x h 2200 mm, weight: ~ 450 Kg.

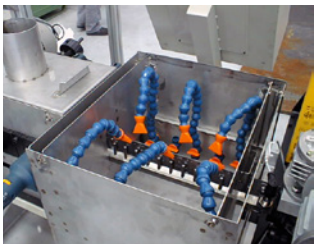
INSTALLED POWER (ABSORBED BY MOTORS)
~ 500 VA.

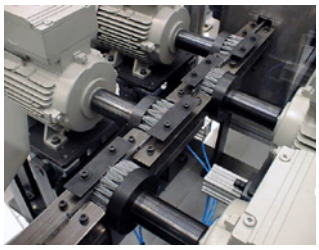
SAFETY GUARDS
Structure consisting of aluminium square sections and lexan panels, with n°2 safety openings, one on the front wall and one on the back, both equipped with safety microswitches fitted with positive lock.

SPECIAL PLATE SUPER-FINISHING MACHINE

MAIN FUNCTION

Carry out the surface super-finishing of the compressor valve plate to remove grinding swarfs.





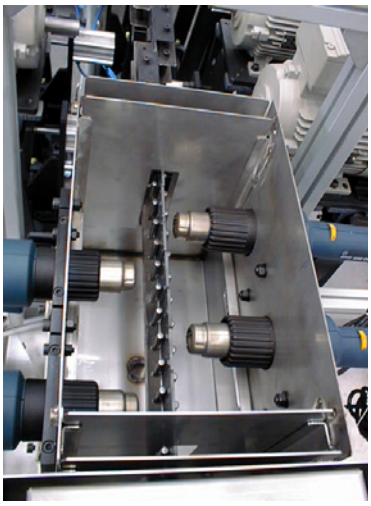


Plate Washing, Drying and Super-finishing Units

DESCRIPTION

The machine has been equipped to process three different types of plates, loaded manually by an operator onto a specific loading magazine, which slides crosswise as to the feeding direction of the plates inside the machine.

When the plates reach a pushing device, they move forward on guides that convey the parts to the various super-finishing stations inside the machine, where the surfaces are washed and dried, before the brushing.

Finally, a special unloading unit channels the finished plates onto the unloading magazine, where an operator unloads them manually from the machine.

SPECIFICATIONS

WORKING CYCLE
AUTOMATIC.

IN: manual feeding to the loading magazine, on entry.

OUT: manual unloading from the unloading magazine, on exit.

TYPES OF MACHINED VALVE PLATES
Valve plate for NBU compressors,
Valve plate for NB compressors,
Valve plate for NE compressors.

CYCLE TIME
~ 4 sec.

Finished part

HOURLY OUTPUT
~ 900 pcs/hour.

OPERATIONS CARRIED OUT ON THE VALVE PLATES

- UNIT 1: plate washing,
- UNIT 2: plate drying,
- UNIT 3: plate super-finishing.

FUNCTIONING SYSTEM
Overall dimensions on the ground: 4100 x 1450 x h 2000 mm, weight: ~ 1200 Kgs.

INSTALLED POWER (WHOLE SYSTEM)
~ 10 kW.

SAFETY GUARDS
The safety fence consists of a structure of aluminium square section bars and lexan panels; it has n°6 sliding doors, of which two are on the front side of the machine, two on the back and to on the machine sides. Every opening is fitted with safety microswitch with positive lock.
In the machine loading area, in particular close to the warehouse, a photoelectric barrier is installed to protect the personnel and avoid any accident or injury. In fact, it was not possible to protect this area with a fence or safety guards, which would have hampered the normal carrying out of manual loading operations.operazioni manuali di carico, si è provveduto a installare un'opportuna barriera fotoelettrica di sicurezza per impedire danni accidentali agli operatori addetti.

ASEO S.r.l.
Via Bologna 2
12084 Mondovì CN, Italia
T. +39 0174 551555
info@aseo.srl
www.aseo.srl