

ZANUSCHI

AUTOMATIC SCREWDRIVING SYSTEMS

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AUTOMATIC SCREWDRIVING SYSTEMS
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The Zucchelli company was established in 1974, thanks to the owner's experience. Our core business is the design and manufacture of automatic screwdriving systems, customized to suit the customers needs.

Our production is based upon a constant development of new solutions to fulfill specific customers needs.



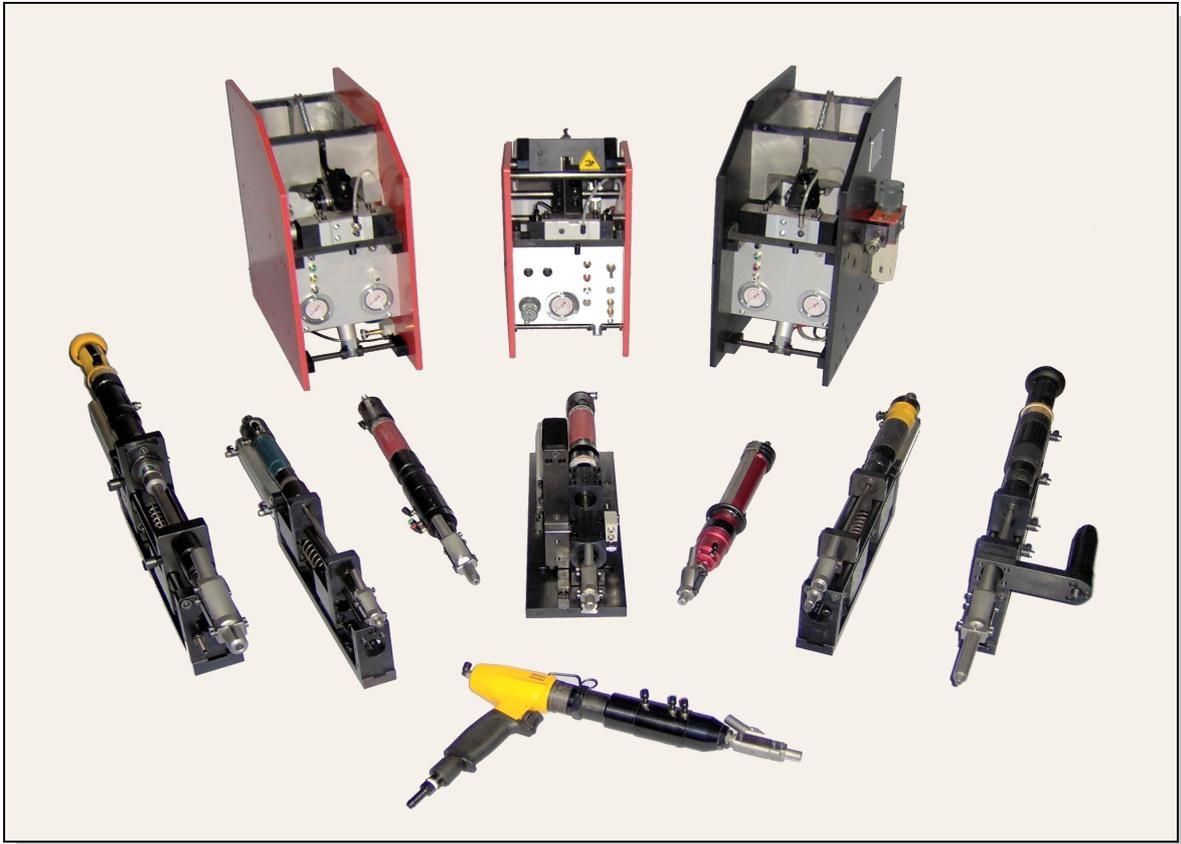
All the production is carried out in our plant: engineering, mechanical part production, assembly and final testing.



Our spare parts warehouse covers all the machine models we built.



The production of mechanical parts is carried out with leading machine tools

OUR PRODUCTION LINE

Our production consists of three main machine lines:

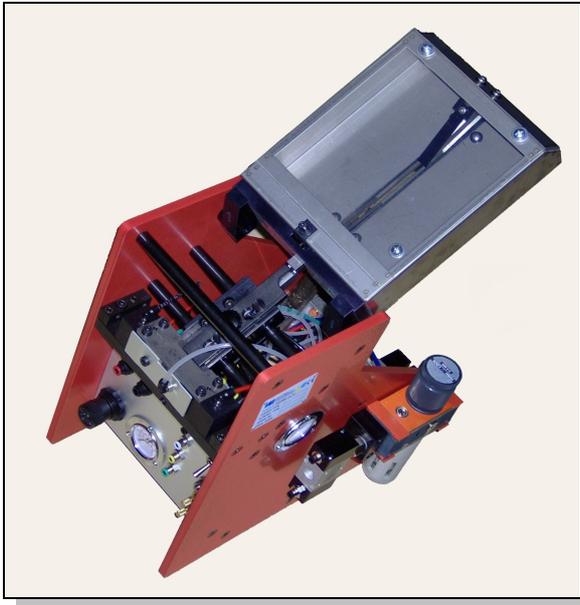
Screwfeeders, blade feeders type and box feeders type.

Screwdriving slides (fixtured spindles), mainly for automatic assembly lines, but also for semi-automatic assembly workbench.

Hand-Held screwdrivers, autoadvance with screw held in view screwdrivers (IAV patented system), autoadvance screwdrivers, telescopic screwdrivers.

On all screwdriving systems (hand-held and fixtured) is applied the screw receiving nozzle head. There are three different types of nozzle heads: jaws type nozzle head, pipe type nozzle heads, anti screw tilting nozzle heads; actually we are able to supply twelve different types/sizes of nozzle heads.

All screwdriving systems should be supplied with electronic or pneumatic screwdrivers of the main brands.

SCREWFEEDERS

We manufacture two different types of screwfeeders: box feeders and blade feeders. The main difference is in the screw loading system. In the box feeder we have a pivoted box that moves up and down and feeds the screws to the fixed rail. In the blade feeder there is a fixed bowl, inside which there is a sliding blade that feeds the screws to the fixed rail.

The screwfeeders line is the following:

- 8/30 Single box feeder for screws with maximum length of 25mm***
- 8/30/2 Double box feeder for screws with maximum length of 25mm***
- 12/48 Single box feeder for screws with maximum length of 45mm***
- 20/80 Single box feeder for screws with maximum length of 78mm***
- 10/35 Single blade feeder for screws with maximum length of 30mm***
- 10/35S2 Single blade feeder, with double selector for screws with maximum length of 30mm***
- 10/35/2 Double blade feeder for screws with maximum length of 30mm***

All the feeders should be equipped with pneumatic logic (mainly for hand-held screwdrivers), or with an electrovalve module to be controlled by an external PLC.

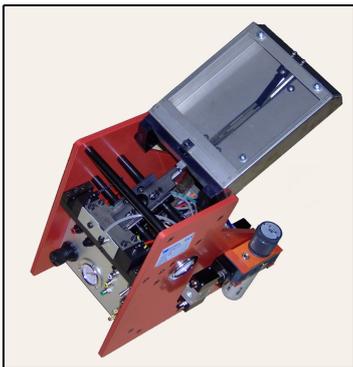
BOX SCREWFEEDERS

Working principle

This type of screwfeeder has three main parts:

- *The pivoted box, is a stainless steel sheet box that has a central rail to let the screws move. When the box goes up, it let the screws slide down to the fixed rail.*
- *The fixed rail is a sloped rail that receive the screws from the box's rail, and let them slide down to the screw selector. Another function of the fixed rail is to supply a reservoir of screws to the selector.*
- *The screw selector is the part of the machine that takes the screws, one by one, from the fixed rail, put them inside the output pipe, and send them to the screwdriver nozzle head via an air blast.*

Box screwfeeders line



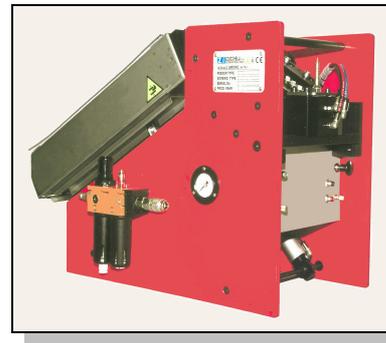
**Feeder
8/30**



**Feeder
8/30/2**



**Feeder
12/48**



**Feeder
20/80**

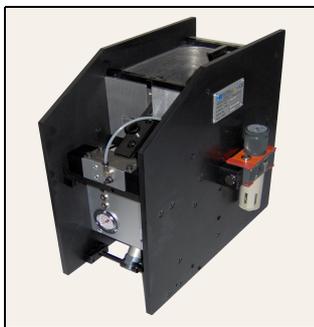
BLADE SCREWFEEDERS

Working principle

As the box feeder, this type of screwfeeder has three main parts:

- The bowl is the main screw tank. inside the two halves of the bowl slides the pivoted blade that loads the screws; when the blade goes up, the screws slide down to the fixed rail (note that the bowl is divided in two parts on the single feeder, and in three in the double one).*
- The fixed rail is a sloped rail that receive the screws from the box's rail, and let them slide down to the screw selector. Another function of the fixed rail is to supply a reservoir of screws to the selector.*
- The screw selector is the part of the machine that takes the screws, one by one, from the fixed rail, put them inside the output pipe, and send them to the screwdriver nozzle head via an air blast.*

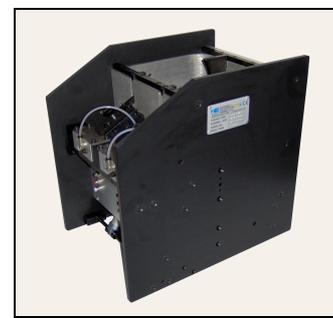
Blade screwfeeders line



Feeder 10/35



Feeder 10/35S2



Feeder 10/35/2

AUTOMATIC SCREWDRIVING SLIDES

Fixtured spindles for automatic systems



Slide 4900 double stroke with integrated screw jam eject cylinder, with electronic nutrunner

Screwdriving slide types

We made three different sizes of screwdriving slides:

Model 4500 with 15mm linear guideway rail, blocks with four rows of balls, frame width 40mm

Model 4700 with 20mm linear guideway rail, blocks with four rows of balls, frame width 45mm

Model 4900 with 25mm linear guideway rail, blocks with four rows of balls, frame width 60mm

Every slide size should be of different type:

Single stroke slide, double stroke slide, double stroke slide with screw jam ejection cylinder, double stroke slide with integrated screw jam ejection cylinder, double stroke slide with screw held in view (IAV system). The slides have three standard strokes size, but should be easily customized up to 300/400mm stroke, or more to fulfill customer needs.

All slides should be equipped with offset gearbox (for narrow interaxes between two or more screws), all type of nozzle head, screw jam ejection cylinder (external or integrated), depth stop control.

Working principle of the automatic screwdriving slides

SINGLE STROKE SLIDE, is composed by a main frame that supports the nozzle head, the screwdriving cylinder, the linear rail, and the block that carry the screwdriver.

The screw is sent from the feeder to the nozzle head, then driving the cylinder and the screwdriver rotation, the screw is ejected from the nozzle, and tightened in the same time. this type of slide must be used only when the nozzle should always remain in the correct position (respect to the component) to tighten the screw, this because of the missing approach stroke (nozzle head stroke).

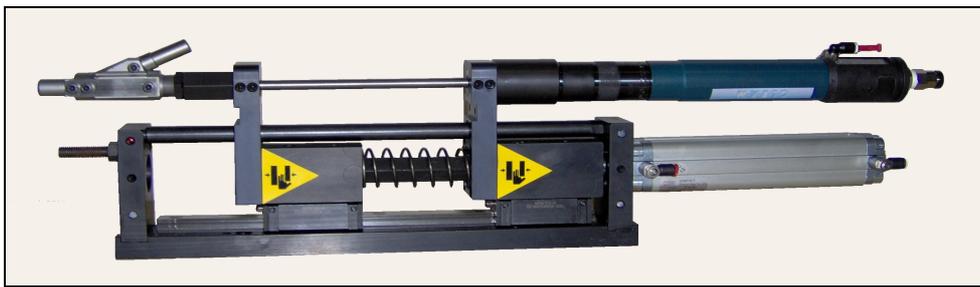
DOUBLE STROKE SLIDE, is composed by a main frame that supports the main cylinder, the linear rail, the block that carry the screwdriver, and the block that carry the nozzle head. This type of slide has two different strokes: the first is the approach stroke, that moves the nozzle head to the component and reaches the screw location; the second is the screwdriving stroke that eject the screw from the nozzle head while tightening it. The double stroke system is made with only one cylinder.

DOUBLE STROKE SLIDE, with SCREW JAM EJECTION CYLINDER, this slide is like the previous one, but with an extra function. The screw jam ejection cylinder is an optional part that is useful to eject the screw from the nozzle head when is not possible to remove the component under the slide: this system can eject the screw moving the nozzle head against the screwdriver avoiding any contact with the component. This option should be an external cylinder fixed on the side of the frame slide, or integrated in the block that moves the nozzle head (this is very useful with small installation area).

DOUBLE STROKE SLIDE with SCREW HELD IN VIEW (IAV system), this slide is like the standard double stroke slide, but with an added function: the screw body is held in view protruding from the nozzle head jaws. With this function is possible to insert screws from the bottom.

SCREWDRIVING SLIDE MODEL 4500

The screwdriving slide model 4500, has a minimum width of 40mm (fitting and sensors excluded). The linear guideway rail has a width of 15mm, and the blocks have four rows of balls. Note that the fittings and the sensors should be installed on each side of the slide.



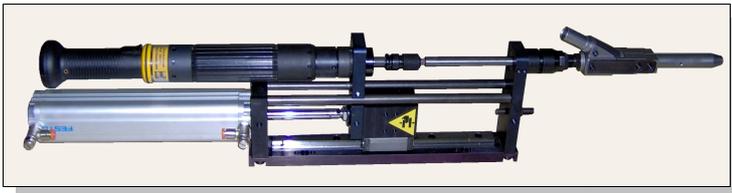
**Slide 4500
double stroke
150mm with
pneumatic
screwdriver**

**Slide 4500
double stroke
150mm with
electric screwdriver**

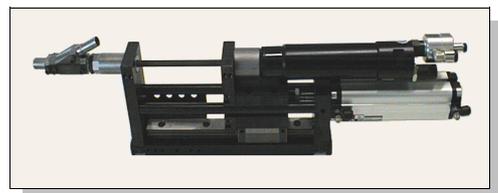


SCREWDRIVING SLIDE MODEL 4700

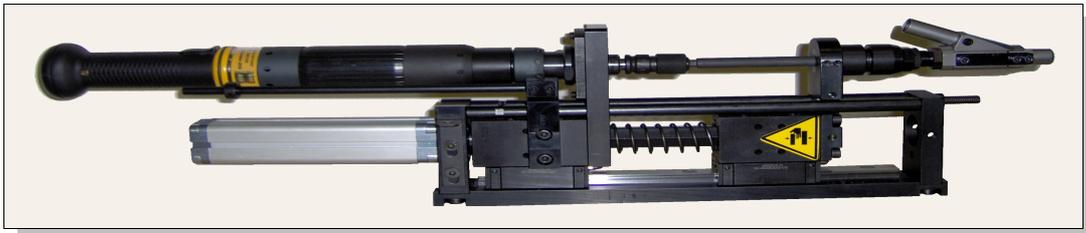
The screwdriving slide model 4700, has a minimum width of 45mm (fitting and sensors excluded). The linear guideway rail has a width of 20mm, and the blocks have four rows of balls. Note that the fittings and the sensors should be installed on each side of the slide.



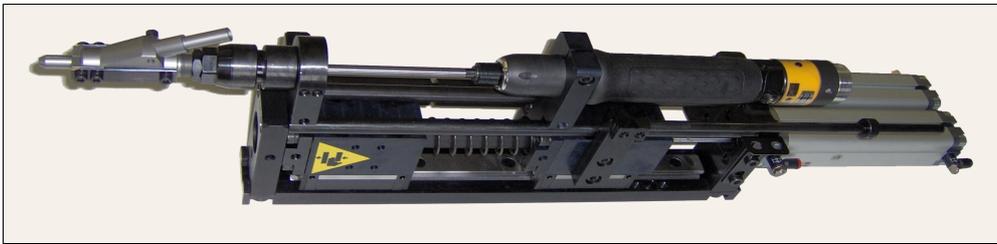
Slide 4700 single stroke 200mm with electronic nutrunner



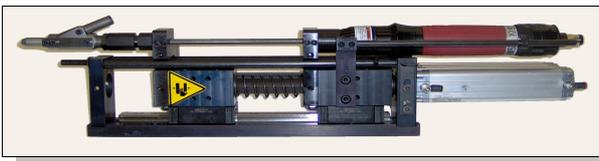
Slide 4700 single stroke 125mm with pneumatic screwdriver



Slide 4700 double stroke 200mm with electronic nutrunner



Slide 4700 double stroke 125mm with screw jam eject cylinder and electronic screwdriver



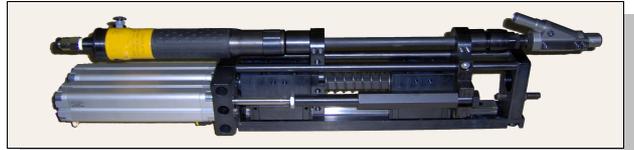
Slide 4700 double stroke 125mm with screw jam eject cylinder and pneumatic screwdriver



Slide 4700 double stroke 125mm with screw jam eject cylinder, anti screw tilting nozzle head, and pneumatic screwdriver



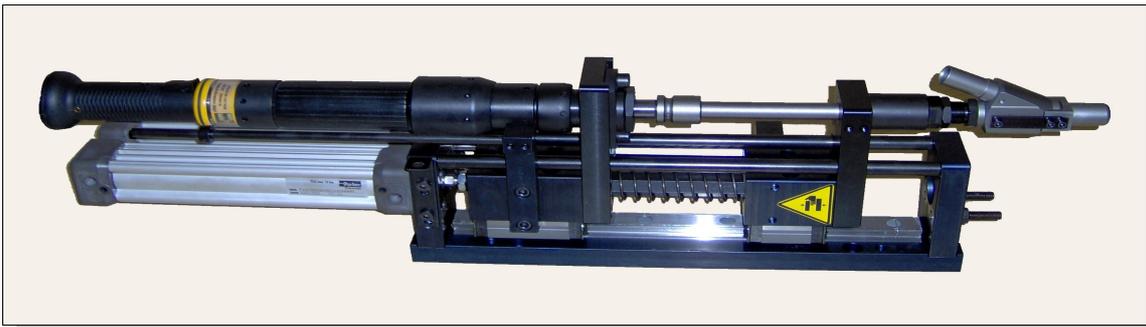
Slide 4700 double stroke 200mm with depth stop and pneumatic screwdriver



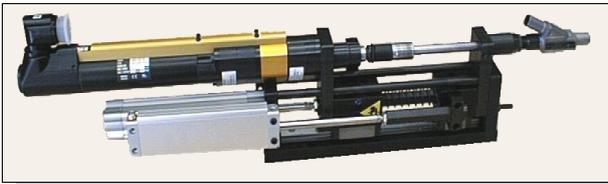
Slide 4700 double stroke 125mm with screw jam eject cylinder and pneumatic screwdriver

SCREWDRIVING SLIDE MODEL 4900

The screwdriving slide model 4900, has a minimum width of 60mm (fitting and sensors excluded). The linear guideway rail has a width of 25mm, and the blocks have four rows of balls. Note that the fittings and the sensors should be installed on each side of the slide.



Slide 4900 double stroke 160mm with screw jam eject cylinder and electronic screwdriver



Slide 4900 double stroke 125mm with screw jam eject cylinder and electronic nutrunner



Slide 4900 double stroke 160mm with screw jam eject cylinder and electronic screwdriver

**All the slides should be supplied with all necessary sensors for PLC logic:
Hall and proximity sensors for cylinders
Ring type sensors for screw presence in the nozzle head
Depth sensor to check the final tightening depth**

**All system is supplied with all technical documentation for installation:
electric circuit and layout, pneumatic circuit and layout, mechanical drawing necessary for
the installation, commercial components documentation.**

SCREWDRIVING SLIDES FOR TORQUE ARM



The manual screwdriving slides we make are of two sizes:

Model 3700, with 20mm linear guideway rail, blocks with four rows of balls, frame width 45mm.

Model 3900, with 25mm linear guideway rail, blocks with four rows of balls, frame width 60mm.

There are three different types: Autoadvance slide, Autoadvance slide with screw held in view, Double stroke slide.

This slides are similar to the automatic ones, but are made for manual use (providing a push start handle), and are usually fixed on torque arm.

Working principle

AUTOADVANCE SLIDE, is a single stroke slide with a push start handle, and is mainly used with nozzle head pipe type, to tighten screws in very deep or small recess.

AUTOADVANCE SLIDE with SCREW HELD IN VIEW, is similar to the single stroke slide with nozzle head fixed on the frame, but it has two strokes: the first is to position and held the screw in view, using the bit to force the screw head against the jaws, and the second stroke eject the screw while tightening it. This type of slide allows the visibility of the screw body, and avoid the contact of the jaws with the part to be assembled.

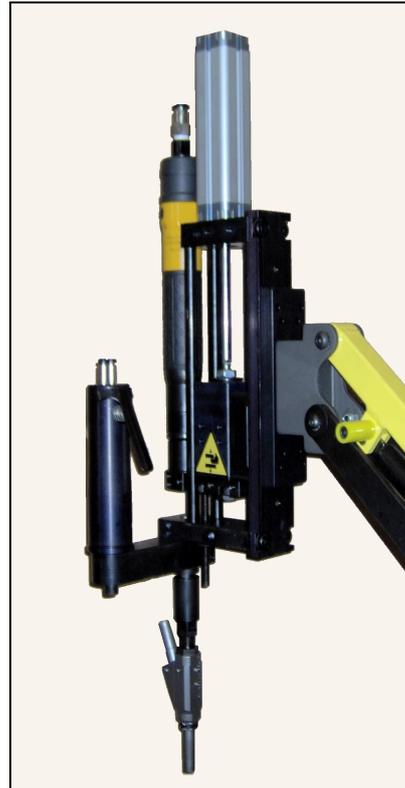
DOUBLE STROKE SLIDE, is the same as the automatic one, but the block that moves the nozzle head has the push start handle to make the nozzle head approach stroke manually. There are two different kind of this type: the 4700 that is like the automatic one with the push start handle, and the 5100 double stroke that was engineered for window assembly workbenches.

MODELS and OPTIONS

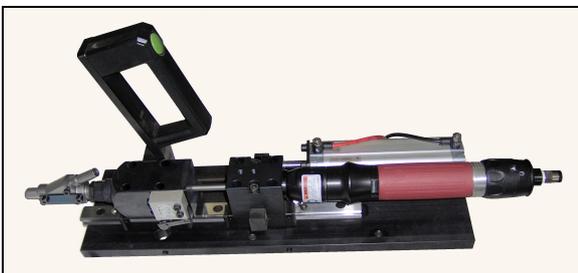
All the manual screwdriving slides, should be supplied with pneumatic logic, or with electrovalves module. All the strokes of these slides are customized to fulfill customer needs.



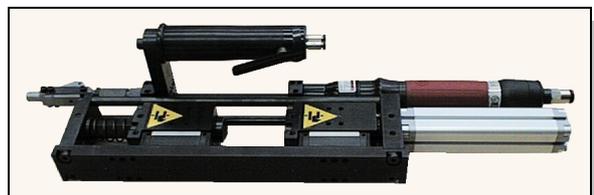
Slide 3900 IAV with electronic nutrunner and electric push start handle



Slide 3700 autoadvance with nozzle head pipe type, pneumatic screwdriver and handle



Slide 5100 double stroke with pneumatic screwdriver and handle



Slide 4700 stroke with pneumatic screwdriver and handle

HAND-HELD SCREWDRIVERS



Hand-Held screwdrivers are of three types: telescopic screwdriver, autoadvance screwdriver, autoadvance screwdriver with screw held in view (IAV patented system).

The telescopic screwdriver, has a sliding sleeve to make the screwdriving stroke, but it has the disadvantage of changing its length during tightening. This is the simplest and cheaper one, but the less ergonomic one.

The autoadvance screwdriver makes the screwdriving stroke with a cylinder inside the transmission; it's main use is with nozzle head pipe type to tighten screws inside small or deep recess.

The autoadvance screwdriver with the screw held in view (IAV patented system), is like the previous model, but with an extra stroke to hold the screw in view, allowing the visibility of the screw body, and avoiding the contact between the jaws and the component. There are two types of held in view screwdrivers: the first has different strokes for different length of screws, the second is limited to a single stroke size, and is suitable only for short screws, but is a very compact one and is suitable for very small working area.

MODELS and OPTIONS

All the hand held screwdrivers should be equipped with electronic or pneumatic screwdrivers of the main brands. The standard strokes cover most of the applications, but is possible to design new special strokes for particular customer request.

The modular concept we engineered let us change type of screwdriver easily replacing the clutch sleeve with the right one for the new screwdriver. On all screwdrivers is possible to apply any of the nozzle head we make.



Screwdriver IAV 25600L



Screwdriver IAV 50600L



Autoadvance screwdriver 39800L



Screwdriver IAV 39600L



Screwdriver IAV 96800L



Screwdriver IAV 35600P

SCREW RECEIVING NOZZLE HEAD



The screw receiving nozzle head is the most customized part of the screwdriving system (this to allow the tightening of the screw without interference with the component).

The main types are three: jaws nozzle head type, pipe nozzle head type, anti screw tilting nozzle head type.

JAWS NOZZLE HEAD, which has a pair of jaws to held and guide the screw during tightening; this type is the best to guide the screw and keep it always on the bit axes (this because the screw is guided by the jaws on the head and on the body).

PIPE NOZZLE HEAD, has a terminal pipe that is the only solution to put screws inside a deep and small recess. In this type the screw is held by three or six radial balls, and is guided only on the body.

ANTI SCREW TILTING NOZZLE HEAD, is used only for squarish screws, and is mainly a jaws type nozzle head. This type has a swivel tube that avoid the screw tilting when it arrives from the screwfeeder.

To solve our customers need, we also made special nozzle head with jaws and a frontal pipe together, special pipes and special pipes. Actually we are able to supply twelve different types and sizes of nozzle heads, plus more than three hundred types of jaws and about one hundred types of pipes.

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