

Industrial tightening

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Automatic screw feeding and tightening

ELECTRONIC CONTROLLED NUTRUNNERS | OIL PULSE NUTRUNNERS | INDUSTRIAL PNEUMATIC
NUTRUNNERS | PNEUMATIC SCREWDRIVERS | ELECTRIC SCREWDRIVERS | TORQUE MULTIPLIERS



sira
S.p.A.

SPECIALISTI IN AVVITATURA

Automatic screw feeding systems

The Nitto Seiko automatic screw feeding FM systems, based on the blade hopper mechanism, are accurate, low-noise and reliable.

They can be used in manual, semi-automatic and full-automatic applications. The blade hopper selects the screws from the basket and brings them by gravity on the vibrating tracks; hence they are guided towards the escapement and air feeder units. A specific mechanical device drives the defective or incorrectly positioned screws out of the linear tracks. The standard Nitto Seiko FM can feed up to 2 screws simultaneously. In order to meet customers' requirements SIRA has designed and produced new escapement units for up to 6 screws per cycle.

FM-503H: autoalimentato della Nitto Seiko



GENERAL DIAGRAM OF COMPOSITION OF AN AUTOMATIC TIGHTENING SYSTEM



DRIVERS AND MOTORS

Pneumatic



Electric



Electronic



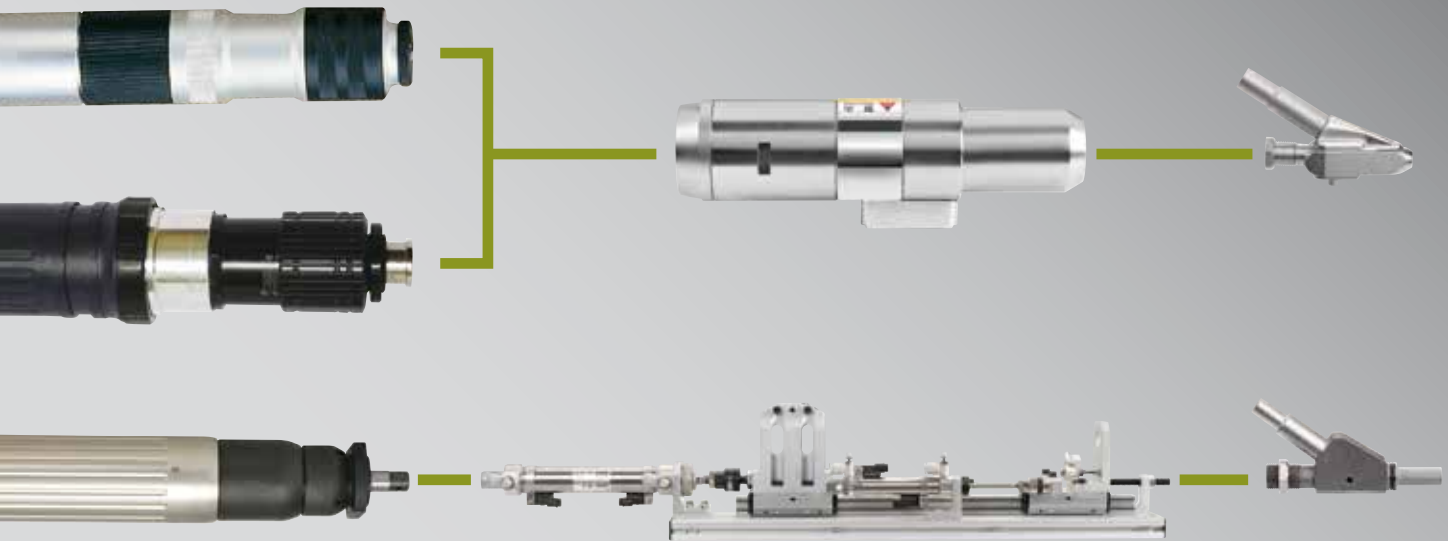
ACCESSORIES

Driver units (Easy Jet)
Positioners
Additional basket
Escapment units
Sliding spindles
Sensors and Bits
Feeding hose



SPECIAL APPLICATIONS

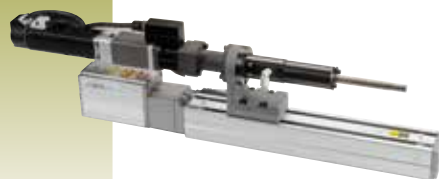
ERGONOMIC REACTION ARMS



Pneumatic



Electronic



AUTOMATIC TIGHTENING UNITS

SCREW CHUCK HEADS



Automatic screw feeding systems

AUTOMATIC SCREW FEEDING SYSTEMS

The Nitto Seiko automatic screw feeding FM systems, based on the blade hopper mechanism, are accurate, low-noise and reliable. They can be used in manual, semi-automatic and full-automatic applications.

The main features are:

- > cycle enable signal
- > functional keypad to setup all the feeder parameters
- > setup of start/stop and speed of the hopper
- > setup of screw feeding time
- > Lack of screw on the vibrating track signal
- > Setup up of frequency, power and vibration time after the screw feeding

> Setup of signal delay after lack of screw on the vibrating tracks

The blade hopper selects the screws from the basket and brings them by gravity on the vibrating tracks; hence they are guided towards the escapement and air feeder units. A specific mechanical device drives the defective or incorrectly positioned screws out of the linear vibrating tracks. Inside the escapement unit, the air pressure feeds the screw through a flexible hose to the driver chucks mounted on the screwdriver. The hopper blade movement is regulated by the presence or lack of screws on the linear vibrating tracks. It is activated only when the number of



screws is below a configurable limit and stops when the maximum quantity is reached.

The standard Nitto Seiko FM can feed up to 2 screws simultaneously. In order to meet customers' requirements SIRA has designed and produced new escapement units for up to 6 screws per cycle.

SCREW FEEDER WITH INTERCHANGEABLE RAIL - QUICHER SERIES

The **Quicher series** of screw feeders with interchangeable rail, compatible with several screw diameters, are compact and reliable. The Slim Quicher Series (SS) features an ESD housing, while the Quicher Robot Series (QRJ) are suitable for full-automatic stations. All the Quicher Series feature a device for correct screw selection and an optical sensor for screw presence detection.



Model	Screw Ø mm	Screw length mm	Screw no./min-sec	Weight Kg	Size mm	Power Supply	Air pressure Mpa	No. of screw feeded standard version
FM-503H	2-6	MAX 30	50/min	19	215x412x338	230 VAC	0,6	1-2
FM-801H	3-8	MAX 50	50/min	50	288x595x546	230 VAC	0,6	1-2
QUICHER NJ	1,4-5	MAX 18	2/sec	3,2	130x275x136	12 VDC	-	1
QUICHER NJR ROBOT	1,4-5	MAX 18	2/sec	4,2	130x275x136	12 VDC	-	1
QUICHER SS	1-3	MAX 16	2/sec	2,4	55x180x98,8	12 VDC	-	1

CONTROL PANELS

The FMC-D control panels are based on a PLC and can manage multi-spindle tightening units (more than 2 spindles) and/or integration with other sections of assembly lines.

The basic version features an alphanumeric display with function keys, but touch screen graphical displays can be easily integrated.



TIGHTENING UNITS

SIRATEC tightening units perform the screwdriver tightening movement using the state of the art actuators and drivers to obtain the best quality, precision and long-lasting reliable application. Both UA-L and UA-LZ units are based on watertight linear guides without lubrication.



UA-L Series is suitable in applications where the approaching movement to the tightening point is performed by a Cartesian axis or by an anthropomorphic robot. In UA-LZ the approaching movement is performed by a pneumatic cylinder included in the unit.

Model	Max no. of spindles	Approaching/ Tightening Cylinder stroke mm	Max torque Nm	Support material	Support width mm
UA-L1	1	100	12	Aluminum profile	60
UA-H1	1-2	100	18	Aluminum plate	110
UA-LC1	1	60	12	Aluminum profile	60
UA-LR1	1	150	18	Brushless Axis	58
UA-L1 Vacuum	1	100	12	Aluminum profile	60
UA-LR1 Vacuum	1	150	18	Brushless Axis	58
UA-L2	1-4	160	25	Aluminum profile	120
UA-H2	1-4	160	40	Aluminum plate	120
UA-L3	1-6	160	40	Aluminum profile	120
UA-LZ1	1	100/50	12	Aluminum profile	80
UA-HZ1	1-2	100/50	18	Aluminum profile	110
UA-LMZ1	1	100/40	12	Aluminum profile	80
UA-LZ2	1-4	160/80	25	Aluminum profile	120
UA-HZ2	1-4	160/80	40	Aluminum plate	120
UA-LZ3	1-6	160/80	40	Aluminum profile	200
MAGNUM	1-6	160	40	Aluminum plate	128
MAGNUM-G	1-8	250	40	Aluminum plate	200

SCREWDRIVERS

SIRA can offer a wide range of pneumatic, electric and electronic nutrunners and screwdrivers both in semi-automatic screw feeding applications (with operator) and in full-automatic systems.

The URYU pneumatic auto-shutoff screwdrivers are ideal in manual and automatic applications with high production

Brand* Model	Torque control	Type	Torque range (Nm)	Manual/ Automatic
URYU PNEUMATIC				
US-LT SERIES	Clutch	Straight	0.15-10.5	M/A
US-LT SERIES	Clutch	Pistol	0.4-20	M
USM SERIES	Clutch	Motor	5-40	M/A
KILEWS ELECTRIC				
SKD SERIES	Clutch	Straight	0.02-18	M/A
SKD SERIES	Clutch	Pistol	1.96-18	M
DELVO ELECTRIC				
DLV SERIES	Clutch	Straight	0.05-7	M/A
DLV SERIES	Current control	Straight	0.05-1	M/A
ESTIC ELECTRONIC				
EH2 SERIES	Torque transducer	Straight	1-420	M/A
EH2 SERIES	Torque transducer	Pistol	1-120	M
EH2 SERIES	Torque transducer	Angle	4-600	M
ENRZ SERIES	Torque transducer	Motor	1-1500	A

G.N. please refer to the specific product catalog for more information.

volumes where the high precision of mechanical clutch and the best reliability of the tool is required. The electric high-efficiency brushless version of mechanical auto-shutoff clutch is suitable in applications where the high quality of tightening is combined to clean, low-noise environment.

KILEWS and DELVO can offer a wide range of products with I/O interfaceability to the production line. When traceability, cycle control and data communication are required by the application, the ESTIC range of torque/angle controlled nutrunners are the best fit. A wide range of manual nutrunners and motors can deliver the best tightening quality and communications features for production line integrated systems.



DRIVER HEADS

SIRA Driver Chucks are designed and manufactured not only for the standard but even for special and complex applications such as in case of very short screws, where special anti-overturning devices are included in the chuck, or in applications with narrow recesses.



Model	Screw size	Ø Screw head size mm
CHUCK MODEL WITH SCREW-STOPPER TOOTH		
3KZ	M2-M2,6	4,0-4,7
3KC-100	M2-M3	4,0-6,0
3KC-300	M3-M5	5,6-8,5
3KF-300	M4-M6	8,0-10,0
3KL-300	M5-M8	10,0-12,5
CHUCK MODEL WITH ANTI-OVERTURNING DEVICE		
9KC-100	M2-M3	4,0-6,0
9KC-300	M3-M5	5,6-8,5
9KF-300	M4-M6	8,0-10,0
9KL-300	M5-M8	10,0-12,5
TUBE MODEL WITH RETAINING BALLS		
CAR-100	M2-M4	4,0-7,7
CAR-300	M3-M5	7,5-10,6
CAR-300L	M4-M6	10,5-12,5
CAR-350	M6-M8	12,0-13,2
TUBE MODEL WITH ANTI-OVERTURNING DEVICE		
CAR-400AR	M6-M8	11,0-13,6
CHUCK MODEL ON CAR BODY (ONLY FOR AUTOMATION)		
CAR-CHUCK	M2-M4	4,0-8,0
CHUCK MODEL ON 3K BODY (ONLY FOR AUTOMATION)		
SIRA-CHUCK	M2-M4	4,0-8,0
¼" HEX SHAFT FOR MANUAL OR ROBOTIC APPLICATIONS		
AC24	M2,6-M4	4,7-8,0
AC35	M3-M5	5,6-10,0
¼" HEX SHAFT FOR MANUAL OR ROBOTIC VACUUM APPLICATIONS		
QN-Vacuum	M1.4-M12	Hex 2.3-18,0
QH-Vacuum	M2-M12	Hex 4-18,0
QRS-Vacuum	M1-M5	1.5-8,0

Accessories

ESCAPMENT UNITS

The function of the escapement unit is to pick the screws from the feeder track and to send them to the driver chuck through the flexible hose. SIRA has designed special escapement units to feed from 2 to 8 screws per cycle.

Model	Automatic feeder no.	Escapement units no.	Feedable driver no.
SEL-2	1	Single	2
SEL-3	1	Single	3
SEL-4	1	Double	4
SEL-6	1	Double	6
SEL-8	2	Double	8



Accessories

OTHER ACCESSORIES

The following accessories give a wider range of options to meet the greater part of fastening application requirements:

> **Vacuum Kit.** For fastening units where vacuum technology is used to pick and keep the screw in the chuck

> **Anti-overturning Kit for FM-503H feeder** with double thread self-tapping screws

> **Additional basket SH-300** for FM-503H Feeder

> **Telescopic driver unit** for manual applications

> **Easy Jet driver unit** with pneumatic fastening movement

> Poliuretano or rilsan **feeding hose** ~~with wide~~ choice of length and diameter

> **Toroidal sensor** to detect screw passage and **Vacuum** switch to detect torque shut-off in pneumatic tools

> **MAG-O-NET series bit Magnetizer** and wide range of Vessel bits

REACTION ARMS

SIRATEC HANDY Series reaction arms are designed and manufactured to grant the best ergonomic performance for the operator in the range from 25 to 100 Nm. The primary function is to absorb the reaction force during

tightening process, which otherwise would be in charge of the operator. Project quality, material choice and care in the manufacturing process yield comfort, safety and best technical performance.

Model	Max torque Nm	Suspension	Option / Notes
HANDY-4	40	Spring	Encoder option ready
HANDY-4/100	100	Pneumatic	Encoder option ready
HANDY-6	16	Spring	Pantograph
HANDY-7/25	25	Balancer	Cartesian
HANDY-7/60	60	Balancer	Cartesian
HANDY-7PP	25	Balancer + pneumatic vertical shift	Cartesian
JOY-JET/L	40	Balancer + pneumatic vertical shift	Encoder option ready Lever start
JOY-JET/P	40	Balancer + pneumatic vertical shift	Encoder option ready Push start



REACTION ARM MODEL HANDY-4/100

SLIDING SPINDLES

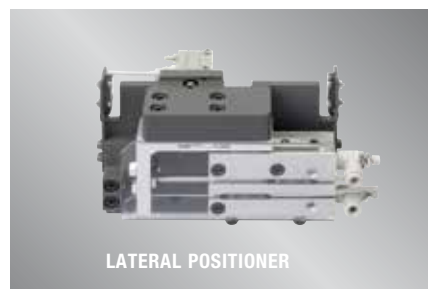
With strokes ranging from 7 to 40 mm and torque from 11 to 20 Nm, coaxial or cardanic offset type, the sliding spindle grant a fluid transmission of rotation movement, compensating the difference between tightening and screwdrivers area.



SLIDING SPINDLE

POSITIONERS

These devices substitute the escapement units. They are applied after the vibrating linear tracks and their task is to position a single screw in a specific point available for robot or vacuum picking. The Vacuum version can also position screws or plugs for upside-down picking.



LATERAL POSITIONER

SPECIAL APPLICATIONS

SIRA technical staff can support the Customer in every step of design and manufacture of semi-automatic or full-automatic tightening stations, both stand alone and integrated with other systems, with the best standard of quality and safety always in mind.



SPECIALISTI IN AVVITATURA

SIRA Sp.A.

via della Resistenza, 53

20090 Buccinasco (MI) Italia

tel. 02.488527.1 - fax 02.48852760

Uff. Vendite Rivenditori tel. 02.488527.38

Uff. Vendite Riparazioni tel. 02.488527.37

Uff. Vendite Ricambi tel. 02.488527.46

www.sira-spa.com

e-mail: info@sira-spa.com