

Tightening automation.
Putting the innovation into
productivity, increasing reliability.



MCA.
Tightening module
with automatic screw feeding to be integrated
into automatic production systems

Fiam[®]
PEOPLE AND SOLUTIONS

Effective, fast and safe production cycles.

Concentrated innovation for a faster, more reliable production process: these are the MCA tightening module.

Suitable for **large batches of the same screws**. They **can be integrated** into existing production systems such as **assembly lines, manipulators, electric Cartesian axes and collaborative robots**, in order to obtain complete and independent tightening cycles using a simple external start (from PLC, dual command, start button, pedal, etc.).



MCA on Cartesian X-Y axes

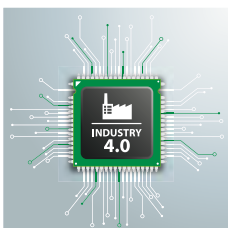
They offer concrete productivity benefits because:

- ▶ **screws are sent continuously and quickly** from the bowl feeder to the screw-retaining head (nose piece)
- ▶ the **approach** and subsequent **tightening** of the screw on the component is automatic and accurate
- ▶ the whole tightening cycle is **controlled and monitored by an integrated PLC** that interfaces with the automated production systems (Industry 4.0)
- ▶ **uninterrupted working continuity**: the several feeders innovations are designed to eliminate any possible machine downtime.

MCA is suitable for all torque requirements, even when used in heavy duty conditions. A solution designed and manufactured entirely by Fiam for industrial assembly. The ultimate in innovation and reliability packed into a single solution.



MCA for collaborative robot



INDUSTRY 4.0 SOLUTIONS

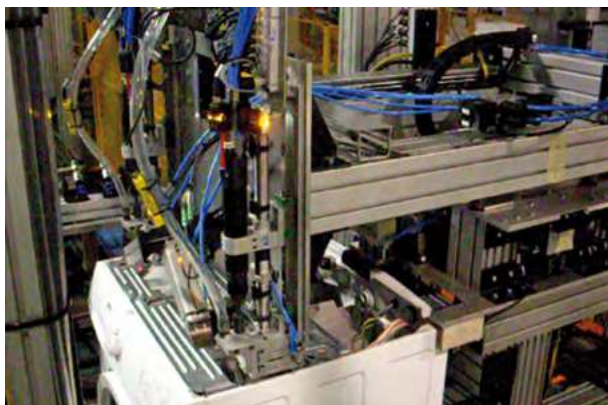
MCA tightening solutions are entirely designed and manufactured by Fiam to **integrate with plant management systems (INDUSTRY 4.0)** and may be eligible for the tax incentives available under current regulations.



MCA on anthropomorphic arm



MCA for automatic lines with pallet transfer



Multiple MCA application on washing machines



MCA su tavola rotante

For all type of screws

metric, self-threading, self-tapping, self-drilling, three-lobe, etc.

Perfect integration

on any production line: single workstations, turntables, automatic pallet lines

Installation on X,Y and Z axes

in order to tighten at different working heights

Can be installed on

anthropomorphic scararobots

and Cobots

to obtain versatile solutions, that can always be reconverted and that work safely side by side of operators

Multiple levels of accuracy

offered by: air shut-off or DC-driven nutrunner motors, which can be networked with factory's control systems (Industry 4.0)

Assures multiple tightening

and accelerate the productivity of cycles assembly

MCA for window frames field: simultaneous top-down and bottom-up assembly





Screw feeders *EasyDriver*

They manage the entire working cycle with great flexibility: they manage tightening sequences quickly and easily, customizing them to the different applications.

The **INTEGRATED PLC** (and also portable for ED S model), governs all machine parameters according to the assembly needs.

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VIBRATING BOWL



EasyDriver ED B



EasyDriver ED B 1/1



EasyDriver ED S



Fastening slides

They ensure a **precise approach stroke of the nutrunner motor/ screw-retaining head to the component**, guaranteeing **high reliability of the assembled product**. Can be **used on manipulators, electric axes or robots** and they withstand important axial thrust

Devices for Cobots

Designed to be used with collaborative robots with automatic forward bit stroke device (**patented**) that performs tightening strokes in full security.

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**SINGLE STROKE
FASTENING SLIDE**

SM15 model

- Min centre-to-centre distance 41 mm

SM20 model

- Min centre-to-centre distance 51 mm

Available also with "screw at sight" function (SW models)



**DUAL STROKE
FASTENING SLIDE**

DM15 model

- Min centre-to-centre distance 51 mm

Available also with "screw at sight" function (DW models)



Electric or air nutrunner motors

Specifically designed and manufactured for **industrial automation**, they **meet every need in terms of tightening accuracy**.

Extremely sturdy, Fiam nutrunner motors guarantee constant performance for all torque requirements, even when used in heavy duty conditions.

Different torque and torque/angle/ time control systems are available for different applications and types of joint and screw.

0,4 ÷ 10 Nm



AIR NUTRUNNER MOTORS

WITH MECHANICAL CLUTCH AND AUTOMATIC SHUT OFF

- they ensure high performance even at low air feed pressure

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VIBRATING BOWL

SEGMENT CONVEYOR



EasyDriver ED B M 1/1



EasyDriver ED B 2/1



EasyDriver ED B 1/2



EasyDriver ED B M 1/2



EasyDriver ED S - Silent Feeder

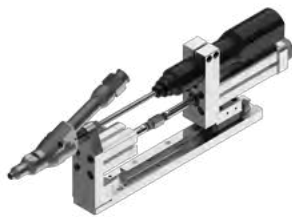


Fastening slides with OFF-SET device

DM20 model

• Min centre-to-centre distance 51 mm

Available also with "screw at sight" function (SW models)



COMPACT FASTENING SLIDE FOR SMALL SPACES OR TO TIGHTEN FROM THE BOTTOM TO THE TOP

Available also with "screw at sight" function (SW models)



TIGHTENING DEVICES FOR COBOT

0,1 ÷ 7 Nm

- The device is designed to be fixed to the Cobot's wrist with a bracket and can communicate with network PLC

0,3 ÷ 4,5 Nm



ELECTRIC NUTRUNNER MOTORS
WITH MECHANICAL CLUTCH AND AUTOMATIC SHUT OFF

+



TPU 2
POWER SUPPLY UNIT



TPU-M1
MONITORING UNIT

0,3 ÷ 10 Nm



ELECTRIC NUTRUNNER MOTORS
WITH TORQUE/ANGLE CURRENT CONTROL

+



TPU-C1
CONTROL UNIT



TPU-C3
CONTROL UNIT

0,1 ÷ 150 Nm



E-MCB



MCB



X-paq

ELECTRIC NUTRUNNER MOTORS
WITH TORQUE/ANGLE CONTROL BY:
- CURRENT CONTROL
- BUILT-IN TRANSDUCER AND ENCODER

+



E-TCS
CONTROL UNIT

+



TCS-B
CONTROL UNIT

+



CT 2500 A
CONTROL UNIT



EasyDriver screw feeders

Screw feeding technology: vibrating bowl

High working autonomy

The vibrating bowl of models available, ensure different working autonomies and the vibrator timed system, managed by the PLC, automatically stops screw feeding when not needed thereby reducing the consumption of electricity



Selector

The high selection speed allows to reach high screw feeding frequencies; the screw shooting in a closed chamber ensures a low noise level and there are no compressed air dissipations and any screw jam is eliminated



Screw passage sensors

There are two screw passage sensors which, respectively positioned under the selector and on the tightening head, detect the screw passage (one after selection and one after screw shooting)

No jamming

The 'overload' photocell makes sure no screws get jammed in the selection duct by emitting a jet of air to eliminate excess screws



INTEGRATED
Siemens
LOGO! PLC
to manage
all machine
parameters

MODBUS TCP/IP
integrated

EDMI
EasyDriver
Machine
Interface
to connect
remotely



"Poka yoke" connections

For quick and error-free installations

All clearly visible

Large transparent cover for a good internal view without having to open the machine



External keypad for immediate adjustments

Conveniently positioned: the operator does not have to open the machine to adjust parameters



Pressure under control

The air treatment unit eliminates condensation and dust present in the compressed air supply. It also regulates max supply pressure. Lubricator is also present in case of use of air nutrunner motors

Analogic line pressure switch

Controls the incoming air pressure to ensure the proper functioning of all system functions

For any type of screws

For metric, self-tapping, self-drilling, trilobate screws, with double thread etc ...



Pressure under control

The air treatment unit eliminates condensation and dust present in the compressed air supply. It also regulates max supply pressure. Lubricator is also present in case of use of air nutrunner motors

EasyDriver ED S screw feeders - Silent Feeder

Screw feeding technology: via segment conveyor



High working autonomy

The tank capacity of about 2 liters guarantees high working autonomy. Inside the tank there is an integrated sensor that activates a visual signal on the portable PLC screen of the feeder, which will start flashing when the screws are to be loaded.



No jamming

When activated, the "too full" photocell blocks the tilting bit, interrupting the loading of the screws.

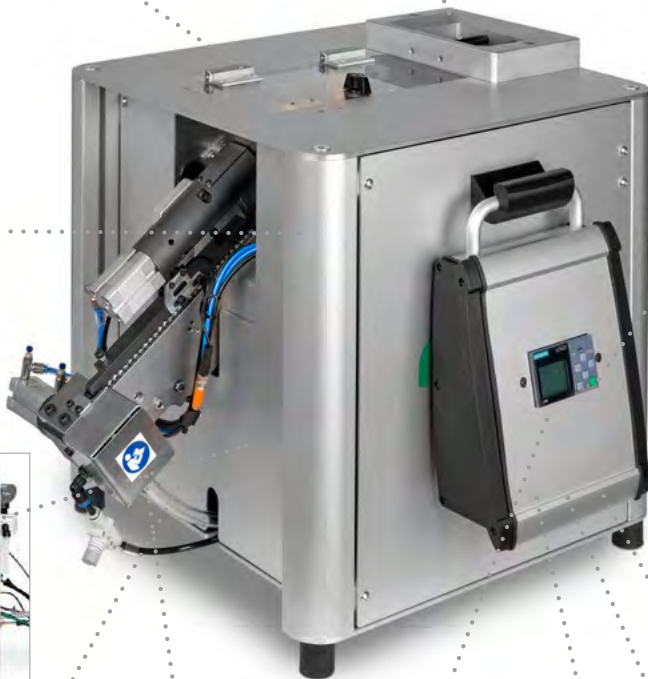


Maximum silence

The screw is fed by the movement of a segment conveyor inside the tank that aligns the screws and sends them towards an inclined rail that acts as an accumulator, exploiting the principle of gravity. The absence of screws vibration therefore guarantees maximum silence.

Guaranteed safety

- Upper door with direct access to the tank for maintenance. Access is only permitted with a key to open it.
- The door is also equipped with a safety sensor that detects its opening, deactivating the tilting bit when it is opened



External keypad for immediate adjustments

Conveniently positioned: the operator does not have to open the machine to adjust parameters



Accessible structure

Thanks to the two removable side walls, easy access to the systems for maintenance and adjustment of the machine.

Pressure under control

The air treatment unit eliminates condensation and dust present in the compressed air supply. It also regulates max supply pressure. Lubricator is also present in case of use of air screwdrivers



Analogic line pressure switch

Controls the incoming air pressure to ensure the proper functioning of all system functions

Selector

The high selection speed allows to reach high screw feeding frequencies; the screw shooting in a closed chamber ensures a low noise level and there are no compressed air dissipations and any screw jam is eliminated



EDMI
EasyDriver Machine Interface to connect remotely

MODBUS TCP/IP
integrated

INTEGRATED Siemens LOGO! PLC

- **PORTABLE:** positioned externally to be managed remotely via cable. It can be positioned and used in the most suitable location for the needs of the operator or the workstation.
- allows you to **SET ALL THE MACHINE PARAMETERS** even remotely and up to 10 meters: an advantageous condition compared to models where the PLC is integrated into the screw feeder, often positioned in difficult to access areas.



EasyDriver ED B screw feeder

Feeds screws optimally without jams.

Vibrating bowl:	Circular, 240 mm in Ø
Screws:	For screws between 10 and 35 mm in length
Key:	1 x 240 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with hopper module:** 5 or 10 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 42



EasyDriver ED B 1|1 screw feeder

It is used when it is necessary to use screwdrivers with air motors that require larger FRL units and when better sound proofing is required in the work environment.

Vibrating bowl:	Circular, 240 mm in Ø
Screws:	For screws between 10 and 35 mm in length
Key:	1 1 = 1 x 240 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with hopper module:** 5 or 10 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 42



ALL FEEDERS ARE EQUIPPED WITH LOW LEVEL SENSOR

An important device for the bowl feeder **that automatically signals the operator when the screws need to be refilled** to ensure operational continuity without machine downtime. The signal can be managed by the PLC of the tightening system and/or by external PLC. A led indicator can also be combined upon request.



EasyDriver ED B M 1|1 screw feeder

Used when the job involves large screws and also in the event of high production rates to allow the system to run unaided for longer.

Vibrating bowl:	Circular, 420 mm in Ø
Screws:	For screws between 35 and 60 mm in lenght
Key:	MAXI 1 1 = 1 x 420 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **MAXI structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **MAXI structure complete with hopper module:** 10 or 50 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 42



EasyDriver ED B 2|1 screw feeder

With its dual circular bowls, it can process **2 geometrically similar screws**, for example differing in length or made from different materials (e.g. stainless steel / browned steel) to feed a screwdriver (one way). Screw selection is managed by an input provided specifically for that purpose.

Vibrating bowl:	2 circular bowls with 240 mm in Ø
Screws:	For screws between 10 and 35 mm in lenght
Key:	2 1 = 2 x 240 mm Ø bowls feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **Structure to support the feeder** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.

For details see pp. 37 - 42



ALL FEEDERS ARE EQUIPPED WITH LOW LEVEL SENSOR

An important device for the bowl feeder **that automatically signals the operator when the screws need to be refilled** to ensure operational continuity without machine downtime. The signal can be managed by the PLC of the tightening system and/or by external PLC. A led indicator can also be combined upon request.



EasyDriver ED B 1/2 screw feeder

Capable to feed 2 single or dual stroke fastenind slides. The work cycle involves selecting and firing two screws simultaneously.

Vibrating bowl:	Circular, 240 mm in Ø
Screws:	For screws between 10 and 35 mm in lenght
Key:	1/2 = 1 x 240 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with hopper module:** 5 or 10 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 42



EasyDriver ED B M 1/2 screw feeder

Necessary when using large screws to feed 2 single or dual stroke fastenind slides. The work cycle involves selecting and firing two screws simultaneously.

Vibrating bowl:	Circular, 420 mm in Ø
Screws:	For screws between 35 and 60 mm in lenght
Key:	MAXI 1/2 = 1 x 420 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading.

Upon request:

- **MAXI structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **MAXI structure complete with hopper module:** 10 or 50 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 42



ALL FEEDERS ARE EQUIPPED WITH LOW LEVEL SENSOR

An important device for the bowl feeder **that automatically signals the operator when the screws need to be refilled** to ensure operational continuity without machine downtime. The signal can be managed by the PLC of the tightening system and/or by external PLC. A led indicator can also be combined upon request.



EasyDriver ED S screw feeder - Silent Feeder

Used as a much quieter alternative to vibrating bowls, is **equipped with a segment conveyor** that loads, aligns and sends the screws to an inclined rail optimally and without jamming.

Tank:	2 Lt capacity (Approx. 2000 screws M4x16 DIN912 type)
Screws:	• Screw shank L = max 25 mm • Screw head Ø = max 11 mm • Screw shank Ø = min 3 mm - max 5 mm (6 mm to be evaluate depending on application) No wood screws with deep thread and sharp point. No screws with loose or captive washers.
Key:	the tank feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by the PLC of the tightening system.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with module with hopper equipped with conveyor belt driven by electric motor:** 12 Lt capacity.

For details see pp. 37 - 42



Upon request:

- **DUST CLEANER:**
Device for the ED S - Silent Feeder screw feeder when used with the MCA tightening module. It is to be inserted between the feeder and the fastening slide and allows the almost **total removal of dust and powder particles** that could be created during the screw feeding process and that could compromise the quality of the assembly. The device, When properly positioned within the production layout, it can reduce tightening time by up to 0.3 seconds.



ALL FEEDERS ARE EQUIPPED WITH LOW LEVEL SENSOR

An important device for the bowl feeder **that automatically signals the operator when the screws need to be refilled** to ensure operational continuity without machine downtime. The signal can be managed by the PLC of the tightening system and/or by external PLC. A led indicator can also be combined upon request.

TECHNICAL FEATURES		EASY DRIVER SCREW FEEDERS						
		ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED B 1 2	ED B M 1 2	ED S
								
Aluminium bowl (qty.)	Ø 240mm (Capacity 1 litre)	1	1	✗	2	1	✗	✗
	Ø 420mm (Capacity 3 litres)	✗	✗	1	✗	✗	1	✗
Aluminum tank	Capacity 2 litres	✗	✗	✗	✗	✗	✗	✓
Air - Electric system	FESTO components	✓	✓	✓	✓	✓	✓	✓
Enclosure	Stainless steel with plastic top cover	✓	✗	✗	✗	✗	✗	✗
	Painted steel / aluminum and plastic upper cover	✗	✓	✓	✓	✓	✓	✓
	Sound absorbing	✗	✓	✓	✓	✓	✓	✓
Dimensions	Length [mm]	510	600	800	900	600	800	623
	Width [mm]	370	530	700	600	530	700	512
	Height [mm]	340	430	530	430	430	530	470
	Weight [Kg]	36	75	110	105	75	110	35
Tube carrying hoses and cables	Length 5 [m]	✓	✓	✓	✓	✓	✓	✓
Filter-Regulator-Lubricator unit complete with built-in pressure gauge	G3/8 (flow rate 20 l/s)	✓	✗	✗	✗	✗	✗	✓
	G1/2 (flow rate 40 l/s)	✗	✓	✓	✓	✓	✓	✓
Air consumption [l/s]	Min.	2	2	2	2	4	4	2
	Max.	16	16	16	16	32	32	16
Electricity consumption, apparent power [VA] 230V/50Hz 230V/60Hz 110V/60Hz	With air nutrunner motor	180	180	320	360	180	320	50
	With eTensil electric nutrunner motor	380	380	520	560	580	720	250
	With E-MCB electric nutrunner motor	830	830	970	1010	1480	1620	700
	With 25 MCB electric nutrunner motor	2180	2180	2320	2360	4180	4320	2050
	With X-Paq electric nutrunner motor	780	780	920	960	1380	1520	650
PLC Siemens LOGO! For the flexible and detailed management of the individual features of screw feeder	INTEGRATED PORTABLE	The machine is supplied with the parameters already set according to the cycle of customized tightening and the integrated PLC allows						
		• Setting of the different functions of the combined nutrunner motor • Protection of the various "key" functions with 4 passwords • System configuration • Absolute counts of OK and NOK tightenings • Setting of the minimum threshold of the operating pressure through line pressure switch (minimum)						
Micro SD	Present in the Siemens LOGO! PLC allows to record the main tightening data which are stored at each tightening cycle or at each fault status	✓	✓	✓	✗	✗	✗	✓
LOG DATI By means of a PC-readable SD card	Examples of stored data values : • I/O status • Internal memories • Screw shot time • Fastening time • Machine cycle time • Line pressure • Insufficient line pressure (machine stopped), • Insufficient line pressure (machine in work: tightening)	✓	✓	✓	✓	✓	✓	✗
Test method	To carry out empty tightening cycles that can be set without the need for an external PLC. Useful for machine installation, setting and troubleshooting	✓	✓	✓	✓	✓	✓	✓
It features a Modbus TCP/IP connection to communicate with the Factory management System (Industry 4.0)	Parameter control of: • Screw shooting time • Cycle time • Tightening time • Line pressure Using Network I/O: • Reception, in output, of all the foreseen signals (eg details of anomalies and types of NOK verified) Remote modification of machine operating parameters instead of intervening on-board PLC display	✓	✓	✓	✓	✓	✓	✓
Analogic line pressure switch	For feedback on the inlet air pressure and the definition of the minimum operating pressure Useful for the correct functioning of the following features: • Blows from screw overturning and overflow on vibrating bowl • Power supply of the connected air tool • Forward bit stroke device • Screw shooting • Preventing the start machine if air feeding conditions are not aligned with those set	✓	✓	✓	✓	✓	✓	✓
EDMI: Web Server Interface (EasyDriver Machine Interface)	• Login password • Remote connections with the main functions of machine PLC with access from PC / Mobile / Tablet • Real-time functionality: - Values Display: Screw shooting time Cycle time - Tightening time The maximum, minimum and average time values can be displayed for them. - Monitoring of exchange I / O signals - Access to diagnostics - Line pressure display - Access to system statistics / counters regarding anomalies and cycles performed - Flowchart showing current activities and main features • Interface language: English	✓	✓	✓	✓	✓	✓	✓

Interconnectivity: a key element for Industry 4.0

Not just tightening reliability, in-process checks and planning for any possible operating situation, but above all **interaction with the plant management systems**.

MCA tightening modules can be managed remotely just using freely programmable I/O signals or via the Modbus TCP/IP protocol; they can also **interface with line PLCs and various devices**, interacting for example with:

- Bar Code reader
- Conveyor belt
- Workpiece clamping jig activation/deactivation systems
- Signalling and monitoring mechanisms such as LEDs, part counters, light towers.

Analysis and monitoring KPIs

In addition to checking the production cycle in real time, **data storage** can **provide statistics** to monitor the machine operating cycle, and therefore productivity, and convert this data into analysis KPIs (key performance indicators) to **optimise the tightening process cycle time**.

Built-in PLC

Included in all EasyDriver screw feeders, it manages the numerous available machine parameters and drives the coupled nutrunner motor.

The **integrated Modbus TCP/IP protocol** provides interconnectivity with the factory system to monitor, for example:

- ▶ the tightening results
- ▶ the screw count/work cycles for triggering maintenance or automatic screw feeder reloading
- ▶ OK sequences, i.e. the correct pre-set tightening sequence
- ▶ in-process management of process faults, e.g. stripped threads, emergencies, fault reset.

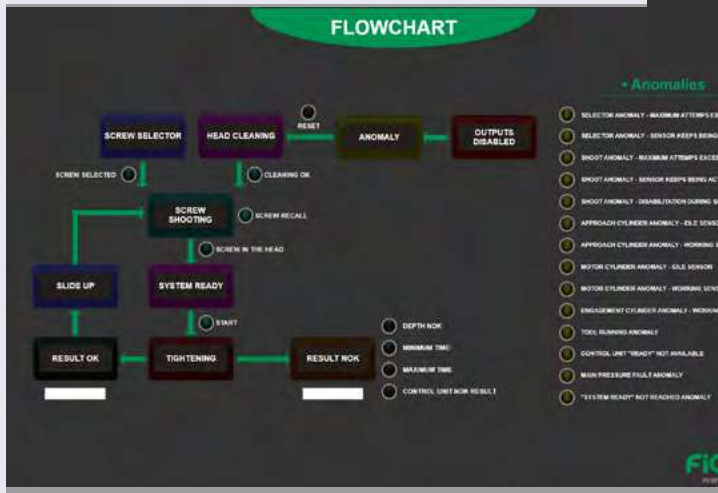
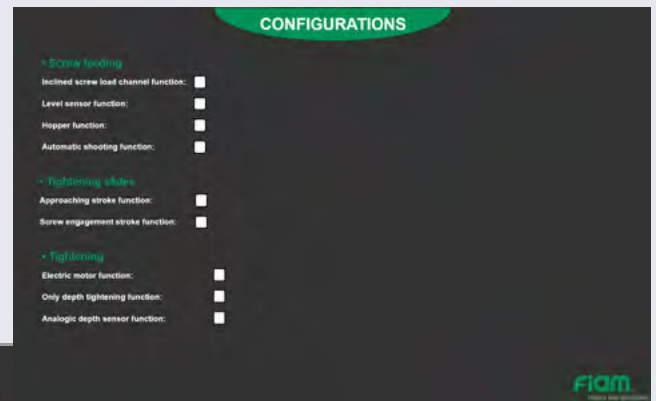
The Modbus protocol also offers a “real time” connection with the machine, and consequently remote management of the various feeder parameters.



WITH EDMi SERVICE IS IN REAL TIME

The *EDMi WebServer interface* is user-friendly and effective, allowing you to connect your MCA tightening system to a PC, mobile or tablet.

With access to the main functions of the machine PLC software, you can view the machine performance and monitor its main functions; and service is made easier because the tightening system behaviour can be checked in real time.



PARAMETER SETTING

Vibratory bowl parameters

- Bowl vibration time: \$
- Overload sensor switch-on delay time: \$
- Overload sensor switch-off delay time: \$
- Bowl vibration switch-on delay time: \$
- Overturning blow switch-off delay time: \$
- Screw advancement activation time: \$
- Time-out vibrations: \$

Screw selection parameters

- Maximum screw selection time: \$
- Time between selection attempts: \$
- Number of selection attempts: \$
- Selection start delay time: \$

Screw shooting parameters

- Maximum screw shooting time: \$
- Time between shooting attempts: \$
- Number of shooting attempts: \$
- Shooting switch-off delay time: \$

Tightening slide parameters

- Approach cylinder activation delay time: \$
- Approach cylinder deactivation delay time: \$
- Motor cylinder activation delay time: \$
- Motor cylinder deactivation delay time: \$
- Rotation activation delay time: \$
- Shooting activation time (engagement mode): \$
- Screw engagement time: \$
- Threshold ON analogic tightening sensor: \$
- Threshold OFF analogic tightening sensor: \$

Tightening result parameters

- Minimum tightening time: \$
- Maximum tightening time: \$
- Minimum time to reach depth sensor: \$

Hopper parameters

- Level sensor switch-on delay time: \$
- Level sensor switch-off delay time: \$

ANOMALIES

- SELECTOR ANOMALY - MAXIMUM ATTEMPTS EXCEEDED
- SELECTOR ANOMALY - SENSOR KEEPS BEING ACTIVE
- SHOOT ANOMALY - MAXIMUM ATTEMPTS EXCEEDED
- SHOOT ANOMALY - SENSOR KEEPS BEING ACTIVE
- SHOOT ANOMALY - DISABILTATION DURING SHOOTING
- APPROACH CYLINDER ANOMALY - IDLE SENSOR
- APPROACH CYLINDER ANOMALY - WORKING SENSOR
- MOTOR CYLINDER ANOMALY - IDLE SENSOR
- MOTOR CYLINDER ANOMALY - WORKING SENSOR
- ENGAGEMENT CYLINDER ANOMALY - WORKING SENSOR
- TOOL RUNNING ANOMALY
- CONTROL UNIT "READY" NOT AVAILABLE
- NOK TIGHTENING - MINIMUM TIME
- NOK TIGHTENING - MAXIMUM TIME
- NOK TIGHTENING - DEPTH TIGHTENING NOT ACHIEVED
- NOK TIGHTENING - NOK RESULT FROM CONTROL UNIT
- MAIN PRESSURE FAULT ANOMALY
- MAIN PRESSURE FAULT DURING TIGHTENING
- "SYSTEM READY" NOT REACHED ANOMALY
- PLC OUTPUTS DISABLED

Fiam
People and Solutions

I/O DIAGNOSTICS

PLC inputs

- I1 ANALOGIC PRESSURE SWITCH
- I2 OVERLOAD SENSOR
- I3 SELECTOR SCREW PASSAGE SENSOR
- I4 HEAD SCREW PASSAGE SENSOR
- I5 APPROACH CYLINDER - IDLE SENSOR
- I6 APPROACH CYLINDER - WORKING SENSOR
- I7 MOTOR CYLINDER - IDLE SENSOR
- I8 MOTOR CYLINDER - WORKING SENSOR
- I9 ENGAGEMENT CYLINDER - WORKING SENSOR
- I10 TOOL RUNNING
- I11 LEVEL SENSOR
- I12 OUTPUTS ENABLE

PLC outputs

- Q1 VIBRATORY BOWL
- Q2 LACK OF SCREWS / HOPPER
- Q3 SCREW OVERLOAD BLOW
- Q4 SCREW OVERTURNING BLOW
- Q5 SCREW ADVANCEMENT BLOW
- Q6 SCREW SHOOTING
- Q7 SCREW SELECTOR
- Q8 MOTOR CYLINDER
- Q9 APPROACHING CYLINDER
- Q10 ENGAGEMENT CYLINDER
- Q11 TOOL START
- Q12 SLIDE UP
- Q13 SYSTEM READY TO TN
- Q14 TIGHTENING OK
- Q15 TIGHTENING NOK
- Q16 SYSTEM ANOMALY
- Q17 ENGAGEMENT
- Q18 ENGAGEMENT
- Q19 ENGAGEMENT
- Q20 ENGAGEMENT

Fiam
People and Solutions

2

Fastening slides

COMPACT AND VERSATILE. IDEAL FOR EVERY APPLICATION.

Fastening slides are **entirely designed** and manufactured by Fiam with high quality materials, guaranteeing very high reliability and long life time, also in presence of high production rates.

Their movement ensures a **perfect approach stroke of the nutrunner motor/screw-retaining head** to the part being assembled.

Also suitable for applications with **several tightening points with very close centre-to-centre distances** (min. 41 mm for SM15 models. min. 51 mm for SM 20 models).

On request, **offset devices** are available that can reach tightening points having a centre-to-centre distance of approx. 20 mm. Due to their compact dimensions and extremely low weight, fastening slides are extremely versatile and **can be used on manipulators, electric axes and robots** with air or electric nutrunner motors.

Numerous available models allow the **installation of nutrunner motors of different sizes and are suitable for applications where high axial thrust is required (e.g. in assemblies with self-tapping screws)** or where the overall dimensions involve tightening from bottom to top or where it is necessary to favor screw engagement.

Running on ball recirculating runners:	wih dovetail size 15/20 mm
Pneumatic cylinders:	with bores of suitable diameter for the type of slide to use
Limit switch position sensors:	✓
Air flow governors:	✓
Max possible nutrunner motor diameter:	53 mm
Function "screw at sight":	upon request
Fastening slides to tighten from the bottom to the top:	upon request
Off-set device:	upon request
Analogic sensor for depth control:	✓
Weight (slide only):	1,8 ÷ 2,2 Kg



On request, fastening slides with OFFSET device for extremely short centre-to-centre distances.



Shielded screw transit sensor

Also check very small screws

Practical and rational hose

That includes the air and electric cables between slide and screw feeder

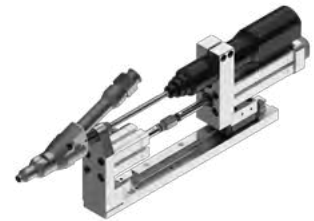
Pneumatic cylinders

Equipped with built-in pneumatic decelerators

Compact fastening slide

Compact configuration ideal to working from the bottom to the top and/or for layouts with reduced encumbrances.

The configuration also includes the "screw at sight" function which, in addition to allowing greater ease of centering on the tightening point, if used from the bottom up, prevents the screw from falling back to the end of the shot.



"Screw at sight" function

Fastening slide can be supplied with this function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further steps of approach and subsequent tightening can be completed.



Fastening slide with air nutrunner motor.



Fastening slide with electric nutrunner motor eTensil.

SINGLE STROKE FASTENING SLIDES

SM 15 model

The single stroke fastening slide stands out for the single stroke performed by its motor to reach the tightening point and then tighten. Considering compact dimensions and weight, single stroke fastening slides are particularly suitable in situations where the approach movement is made by a robot arm or a manipulator with Z axis. Rail track size: 15 mm.

Recommended for:

- tightening torque up to 10 Nm
- nutrunner motors with $\varnothing$ max 53 mm

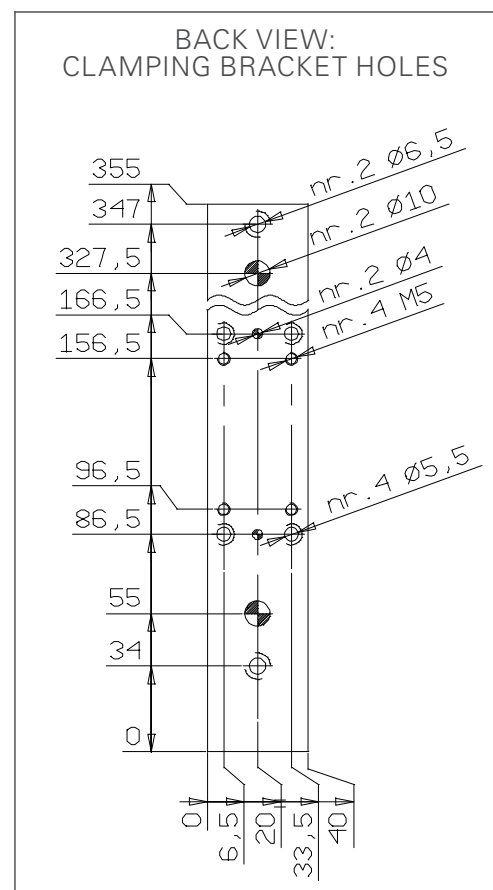
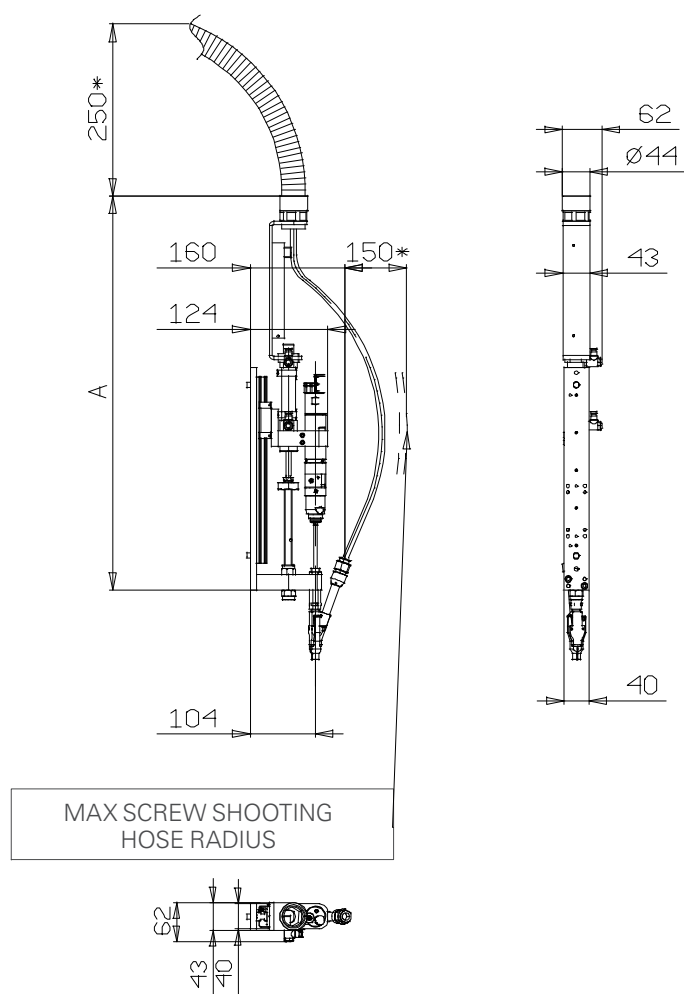
SW MODELS: WITH SCREW AT SIGHT

Single-stroke fastening slides, can be supplied with "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further steps of approach and subsequent tightening can be completed.

Single-stroke fastening slide	Size (rail track size)	Tightening stroke	Cylinder $\varnothing$ (bore)
	mm	mm	mm
SM 15D20 050-00 36	15	50	20
SM 15D20 050-00 32	15	50	20
SM 15D20 080-00 36	15	80	20
SM 15D20 080-00 32	15	80	20
SM 15D25 050-00 36	15	50	25
SM 15D25 050-00 32	15	50	25
SM 15D25 080-00 36	15	80	25
SM 15D25 080-00 32	15	80	25

How to read model names

SM	15	D20	050	00	36
Fastening slide	Rail size in mm	Cylinder $\varnothing$ (bore) in mm	Tightening stroke in mm	Approach stroke in mm	Clamping bracket $\varnothing$ in mm



The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)

SINGLE STROKE FASTENING SLIDES

SM 20 model

SM 20 single stroke fastening slides, are characterized from the different rail track size: 20 mm.

Recommended for:

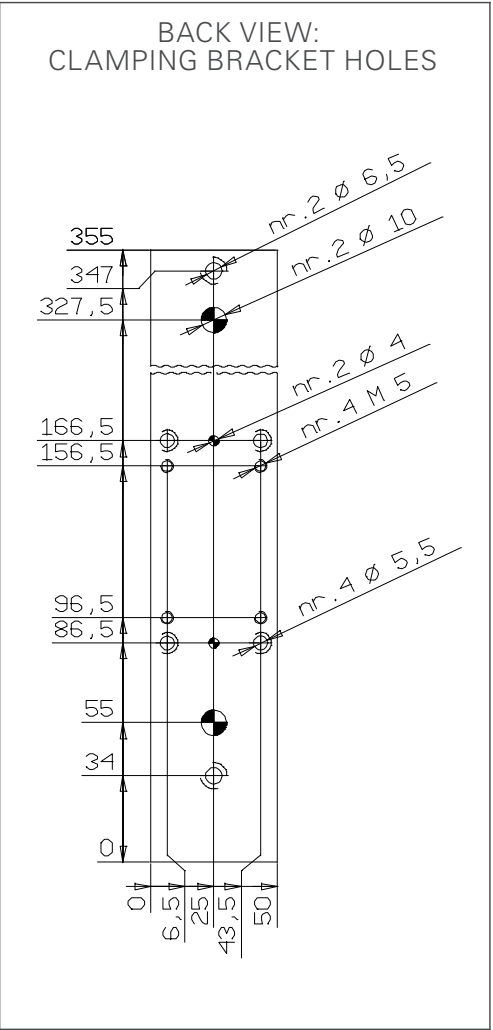
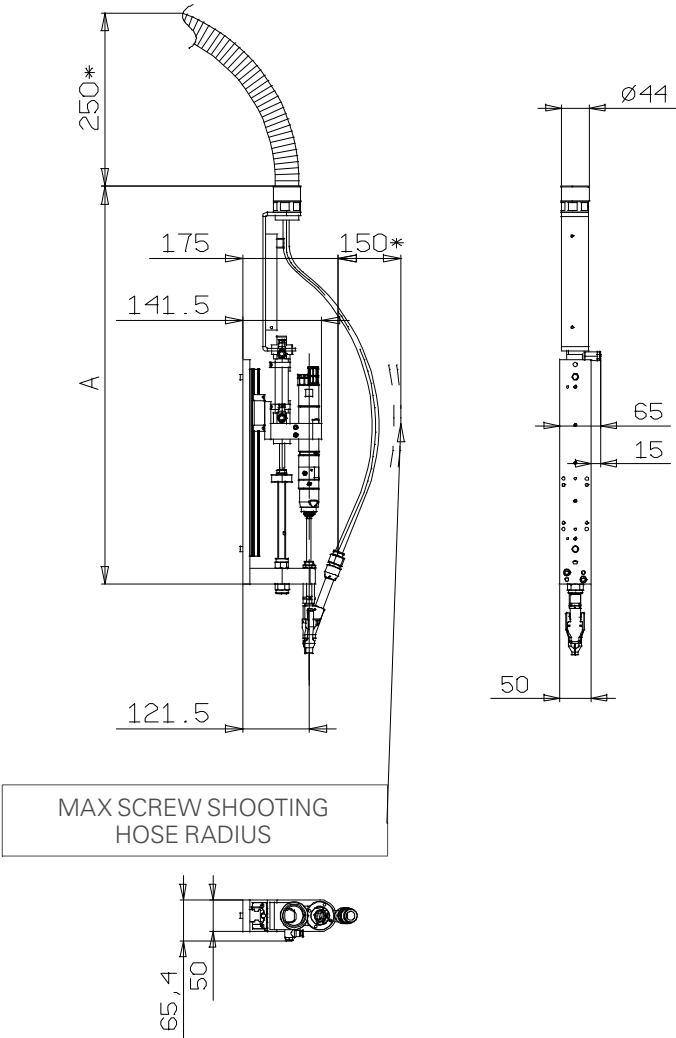
- tightening torque up to 10 Nm
- nutrunner motors with Ø max 36 or 53 mm

SW MODELS: WITH SCREW AT SIGHT

Single-stroke fastening slides, can be supplied with “visible screw” function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further steps of approach and subsequent tightening can be completed.

Single-stroke fastening slide	Size (rail track size)	Tightening stroke	Cylinder Ø (bore)
SM 20D25 050-00 42,5	mm 20	mm 50	mm 25
SM 20D25 080-00 42,5	mm 20	mm 80	mm 25

How to read model names					
SM	20	D25	050	00	42,5
Fastening slide					
Rail size in mm					
Cylinder Ø (bore) in mm					
Tightening stroke in mm					
Approach stroke in mm					
Clamping bracket Ø in mm					



The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)

DUAL STROKE FASTENING SLIDES

DM 15 model

In addition to the stroke performed by the motor for the purpose of tightening, they feature an additional approach stroke to bring the head down to the component. In the slide description the first number indicates the nutrunner motor stroke, while the second identifies the head approach stroke (in mm). Rail track size: 15 mm.

Recommended for:

- tightening torque up to 10 Nm
- nutrunner motors with $\varnothing$ max 36 or 53 mm

DW MODELS: WITH SCREW AT SIGHT

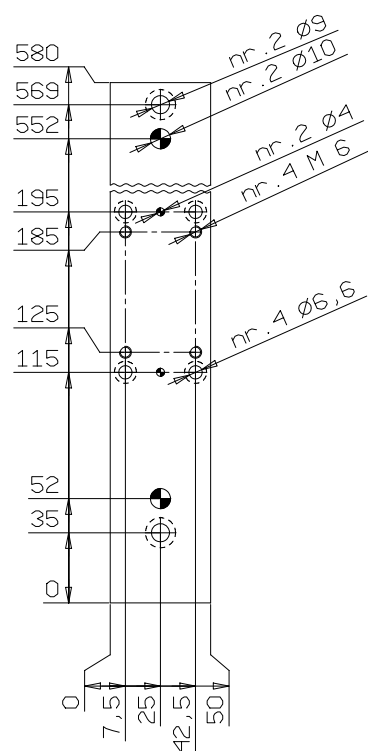
Dual-stroke fastening slides, can be supplied with "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further steps of approach and subsequent tightening can be completed.

Dual-stroke fastening slide	Size (rail track size)	Tightening and approach strokes	Cylinder $\varnothing$ (bore)	C distance	A distance
	mm	mm	mm	mm	mm
DM 15D20 050-50 36	15	50-50	20	50	710
DM 15D20 050-50 32	15	50-50	20	50	710
DM 15D20 050-80 36	15	50-80	20	80	770
DM 15D20 050-80 32	15	50-80	20	80	770
DM 15D20 080-50 36	15	80-50	20	50	770
DM 15D20 080-50 32	15	80-50	20	50	770
DM 15D20 080-80 36	15	80-80	20	80	830
DM 15D20 080-80 32	15	80-80	20	80	830
DM 15D25 050-50 36	15	50-50	25	50	710
DM 15D25 050-50 32	15	50-50	25	50	710
DM 15D25 050-80 36	15	50-80	25	80	770
DM 15D25 050-80 32	15	50-80	25	80	770
DM 15D25 080-50 36	15	80-50	25	50	770
DM 15D25 080-50 32	15	80-50	25	50	770
DM 15D25 080-80 36	15	80-80	25	80	830
DM 15D25 080-80 32	15	80-80	25	80	830

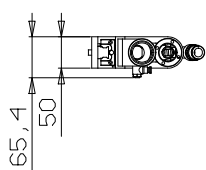
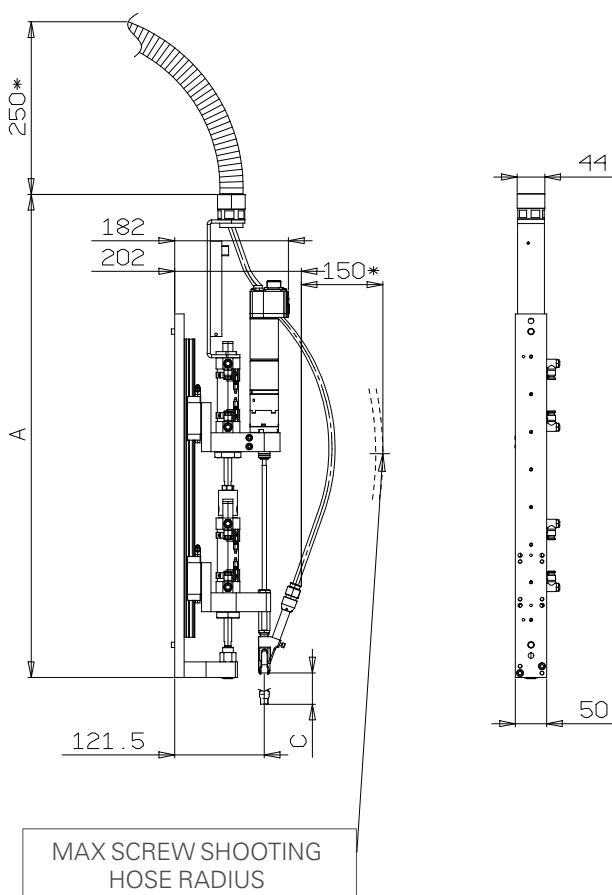
How to read model names

DM	15	D20	050	50	36
Fastening slide	Rail size in mm	Cylinder $\varnothing$ (bore) in mm	Tightening stroke in mm	Approach stroke in mm	Clamping bracket $\varnothing$ in mm

BACK VIEW: CLAMPING BRACKET HOLES



The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)



DUAL STROKE FASTENING SLIDES

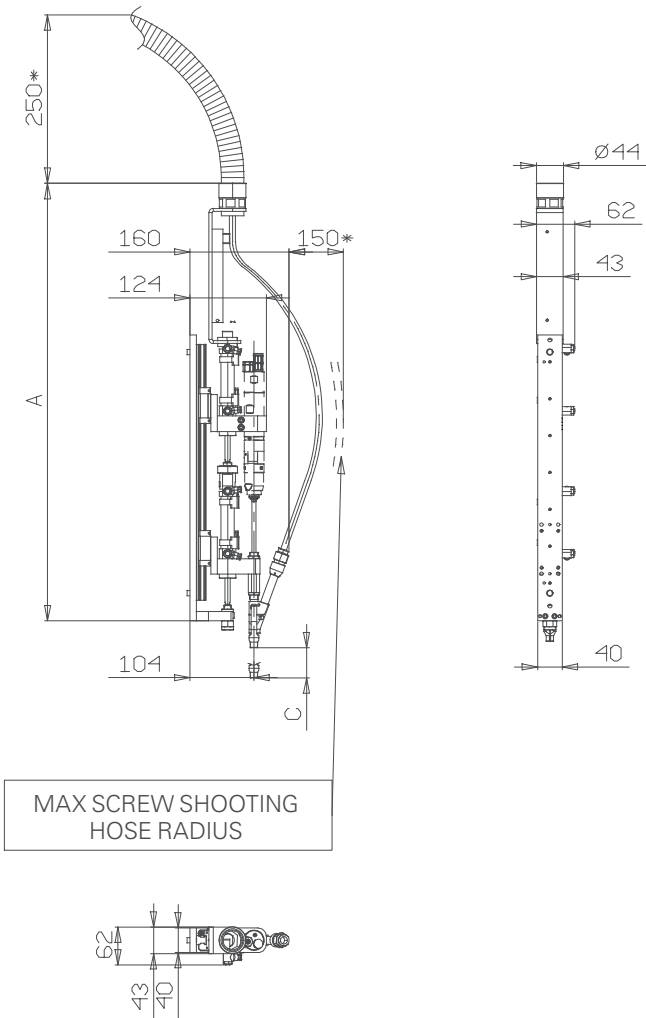
DM 20 model

DM 20 dual stroke fastening slides, are characterized from the different rail track size : 20 mm.

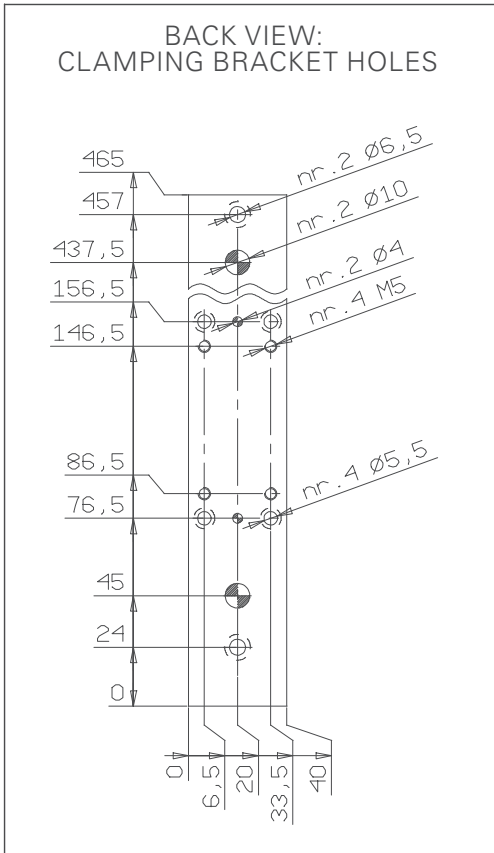
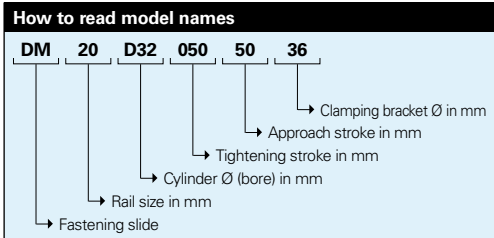
- Recommended for:**
- **tightening torque up to 10 Nm**
 - **nutrunner motors with ø max 36 or 53 mm**

DW MODELS: WITH SCREW AT SIGHT

Dual-stroke fastening slides, can be supplied with “visible screw” function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further steps of approach and subsequent tightening can be completed.



Dual stroke fastening slide	Size (rail track size)	Tightening and approach strokes	Cylinder Ø (bore)	C distance	A distance
	mm	mm	mm	mm	mm
DM 20D32 050-50 36	20	50-50	32	50	740
DM 20D32 050-50 42,5	20	50-50	32	50	740
DM 20D32 080-50 36	20	80-50	32	50	810
DM 20D32 080-50 42,5	20	80-50	32	50	810
DM 20D32 050-80 36	20	50-80	32	80	810
DM 20D32 050-80 42,5	20	50-80	32	80	810
DM 20D32 080-80 36	20	80-80	32	80	860
DM 20D32 080-80 42,5	20	80-80	32	80	860
DM 20D40 050-50 36	20	50-50	40	50	740
DM 20D40 050-50 42,5	20	50-50	40	50	740
DM 20D40 080-50 36	20	80-50	40	50	810
DM 20D40 080-50 42,5	20	80-50	40	50	810
DM 20D40 050-80 36	20	50-80	40	80	810
DM 20D40 050-80 42,5	20	50-80	40	80	810
DM 20D40 080-80 36	20	80-80	40	80	860
DM 20D40 080-80 42,5	20	80-80	40	80	860



The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)

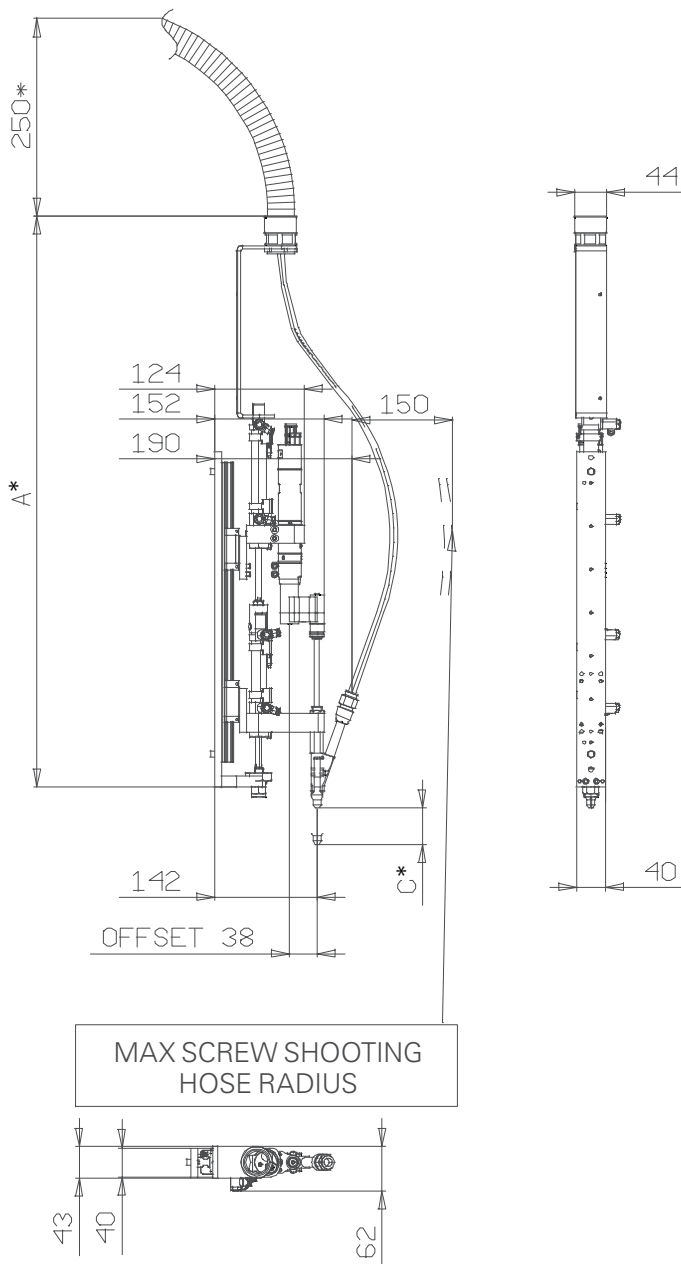
DUAL STROKE FASTENING SLIDES WITH OFFSET DEVICE

DM 15 model

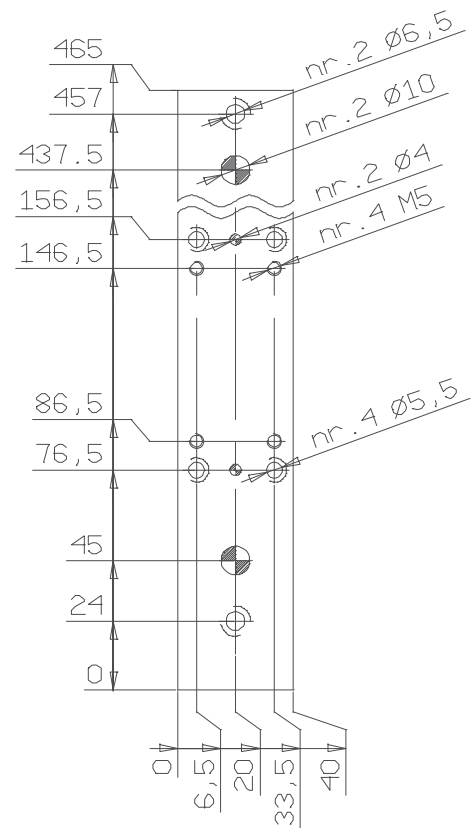
In addition to the stroke performed by the motor for the purpose of tightening, these slides feature an additional approach stroke to bring the head down to the component, as well as the offset device, which allows you to reach tightening points with center distances close to 20 mm. Rail track size: 15 mm

Recommended for:

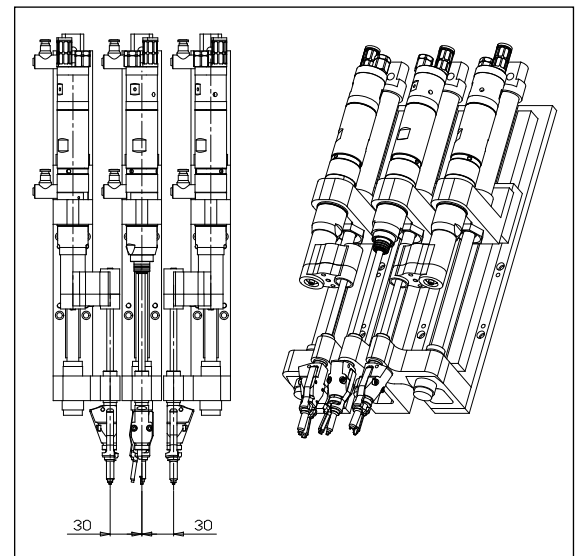
- tightening torque up to 10 Nm
- nutrunner motors with $\varnothing$ max 36 mm



BACK VIEW: CLAMPING BRACKET HOLES



The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)



Application example of 2 fastening slides with head OFFSET device, in order to fasten screws with short distance to centre.

* for measurements of dimensions A and C, refer to the table on page 17

COMPACT FASTENING SLIDES

Single or dual stroke slides can be supplied in the compact configuration: ideal for working the bottom to the top and / or for layouts with reduced spaces.

The configuration also includes the "screw at sight" function which, in addition to allowing greater ease of centering on the tightening point, if used from the bottom up, prevents the screw from falling back to the end of the shot.





Nutrunner motors available

The motorization technologies that can be used with MCA tightening modules are several and to be chosen according to the application, the type of joint and screw, the production layout and the type of production rates required and also the level of monitoring and control you need on the production cycle.

Those available are:

- | | |
|--|--|
| • Air nutrunner motors: | torque control by mechanical clutch |
| • eTensil electric nutrunner motors | torque control by mechanical clutch |
| • eTensil electric nutrunner motors | torque/angle by current control |
| • MCB / E-MCB electric nutrunner motors | torque/angle control by:
- current control
- built-in transducer and resolver/encoder |
| • X-PAQ electric nutrunner motors | torque/angle control by built-in transducer and encoder |



AIR NUTRUNNER MOTORS

They are able to tighten correctly at every level of need and their sturdiness ensures constant performance over time, for torques up to 10 Nm even in heavy duty conditions and at low supply pressures.

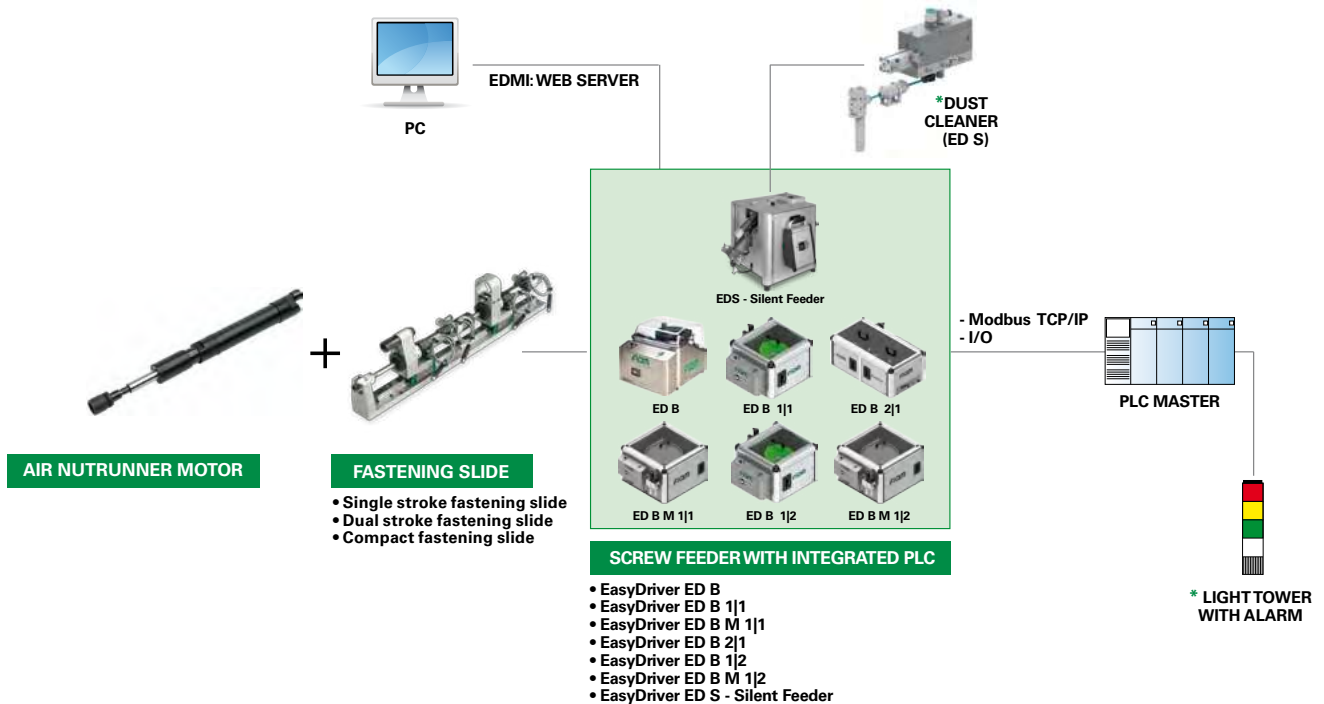
Air nutrunner motors have a **mechanical clutch for torque control** which automatically and instantly stops the supply air and guarantees **high torque repeatability** and **low Mean Shift, even when joint elasticity changes**.

This system makes it possible to keep torque values unaltered for hundreds of thousands of cycles. Ideal to assemble components manufactured with high quality materials.

To learn more about all air nutrunner motors features, consult the [online catalog here](#).



MCA TIGHTENING MODULE CONFIGURATION WITH AIR NUTRUNNER MOTORS



* Accessories available upon request. For specifications, see page 53.

eTensil ELECTRIC NUTRUNNER MOTORS WITH MECHANICAL CLUTCH

The innovative electric nutrunner motors eTensil ensure **high levels of performance and reliability with maximum safety** given their low voltage operation and perfect thermal insulation.

They stand out for:

- ▶ **Torque control with mechanical clutch and automatic shut off.** This ensures **high repeatability** – in other words a low Mean Shift value – **even when faced with a variable joint softness level**
- ▶ Brushless motors are the avant-garde in efficient and consistent performance, due to their **high-precision mechanics**
- ▶ The absence of brushes ensure **limited maintenance and absence of dust** in the workplace
- ▶ **Strong thrust bearings:** to withstand the thrust of the sort of slides found in automated production cycles that move in rapid, non-stop strokes
- ▶ **Practical machine mounting** along the full length of the aluminium outer body
- ▶ **Centring system** designed to achieve unbeatable reliability along both the vertical and horizontal axis
- ▶ High silence and safety.

As with air nutrunner motors, **clutch adjustment is quick and easy** and takes place from the outside through an access slot protected by a band spring.



eTensil nutrunner motors and control units, are covered by an extended warranty of 24 months or 1.000.000 cycles (first goal achieved).

Control unit technical features

It is possible to combine TPU-2 power supply unit or TPU-M1 monitoring unit which is able not only to supply the tools with the correct power supply but also to **monitor and manage all tool functions thanks to the large number of functions available** and programmable, such as detecting process anomalies such as threads or screws already tightened.

Power supply unit TPU-2

- Green LED: clutch shut-off, motor stop
- Red LED: error (stalled motor) / external signal stop
- Status LED: system ON/OFF
- S1 LED: emergency from an external signal
- S2 LED: tool ready
- S3 LED: tool in use (run)
- 2 rotation speeds High/Low
- 5+5 programmable I/O
- Remote management
- I/O connector features the following signals:

Input signals	Output signals
1. H/L speed	1. Ready
2. Motor Stop	2. Stalled Motor
3. Reverse	3. Run
4. Emergency	4. Reverse
5. Start	5. Clutch engaged

N.B. The I/O signals are exchanged between the feeder PLC and the TPU-2 unit.

For an in-depth study of the different features offered by the units and nutrunner motors, consult the [online catalog 111](#).

Monitoring unit TPU-M1

- 8 programs to control tightening process. Can be managed remotely in single mode or with binary combination. Also, with each program, there can set both the number of screws to tighten and the timeframe window to conclude the tightening cycle.
- 1 programmable sequence up to a max of 8 steps
- **Red LED** = Nok - **Yellow LED** = End of cycle
Green LED = Cycle progress (screws tightened) according to the set number of screws
- Automatic recognition of the tool and configuration
- Screw counter, end of cycle
- OK / NOK: tightening result displayed
- Min / Max tightening time control
- Untightening: enable/disable
- 2 levels password: to protect the set parameters or totally block the system
- Serial communication (RS232)
- Language selection (IT, EN, DE, FR, ES, TR)
- Log of the last 99 tightenings
- Integration with positioning jigs and other line devices
- 8 + 8 programmable I/O (21 + 22 signal types)
- Industry 4.0: designed to access the FIAM 4.0 cloud / OPC-UA
- Selection of programs from I / O (remotely)
- Min / Max tightening angle control

SMART PRO EVO PROGRAMMING

- Soft Start - acceleration ramp (from stopped to rated speed in approx. 1.5 seconds)
- Settable speed in tightening and untightening
- Pre-autountightening (enabled with all tightening strategies – 4 turns: 1440 degrees). To set the **untightening angle and the pause between the untightening and the subsequent tightening**
- Post-autountightening (enabled with all tightening strategies – 4 turns: 1440 degrees). **The untightening angle** is settable as well as the time pause of left rotation start after the **tightening end**

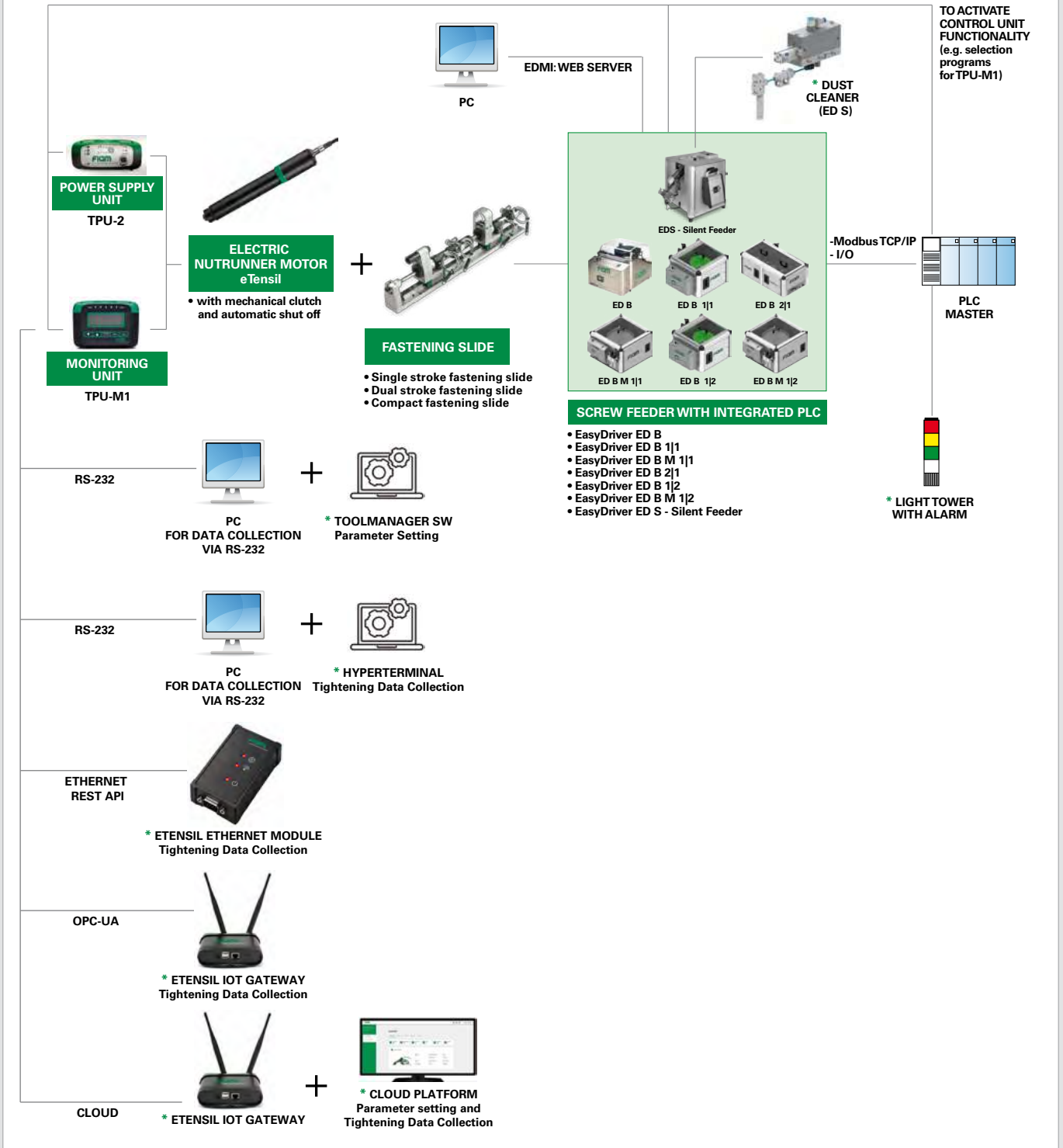
TIGHTENING STRATEGIES

- Torque control with mechanical clutch
- Torque control with mechanical clutch and tightening time monitoring
- Time control (Stop-by-time tightening). **To tighten in depth and not to defined torque**, by controlling the cycle with set tightening time
- Angle control and tightening time monitoring

Also available in the AutoPowerOn version: enable automatic power-on of the unit, allowing the workstation to be managed with a single main switch.

The multiple functions of TPU-M1 monitoring unit can be activated by an external PLC through the use of the Multiple Connector, code 692079193 (useful for splitting the I/O signals). See page 50.

MCA TIGHTENING MODULE CONFIGURATION WITH eTensil ELECTRIC NUTRUNNER MOTORS WITH MECHANICAL CLUTCH



* Accessories available upon request. For specifications, see pages 49 and following.

eTensil ELECTRIC NUTRUNNER MOTORS WITH TORQUE/ANGLE CURRENT CONTROL

The innovative control system that distinguishes these brushless electric nutrunner motors is in great demand in assembly lines where components to be assembled include several variants are processed which imply, with the different geometries and different types of screws, extreme operational flexibility.

With these motors **various assemblies are possible with different parameters of torque, speed, etc. and therefore they can be used for different applications:** the same tightening module can tighten the same screw on different joints by simply adapting the programs on the mached unit. A considerable advantage in terms of investment costs.

These are their main features:

- ▶ The torque is detected by measuring the current used by the motor while the angle is detected through integrated Hall sensors
- ▶ Brushless motors are the avant-garde in efficient and consistent performance, due to their **high-precision mechanics**
- ▶ The absence of brushes ensure **limited maintenance and absence of dust** in the workplace
- ▶ **Strong thrust bearings:** to withstand the thrust of the sort of slides found in automated production cycles that move in rapid, non-stop strokes
- ▶ **Practical machine mounting** along the full length of the aluminium outer body
- ▶ **Centring system** designed to achieve unbeatable reliability along both the vertical and horizontal axis
- ▶ Combination with control units that allow **controls, monitoring, analysis, diagnostics e real-time scheduling of production process** and **eliminate post-process controls.**



eTensil
Flam Electric Tightening Solutions



eTensil nutrunner motors and control units, are covered by an extended warranty of 24 months or 1.000.000 cycles (first goal achieved).

Control unit technical features

Control unit TPU-C1

• 1 program to control tightening process
• Automatic recognition of the tool and configuration
• Screw counter - end of cycle
DISPLAYS
• Tightening result OK/NOK
• Torque value in Nm or other unit of measurement
• Tightening time value
• Red LED = Nok - Yellow LED = End of cycle - Green LED = Cycle progress (screws tightened) according to the set number of screws
• “Smart Thread” function: for processing of selfthreading, self-tapping, self-drilling screws, or else where the final torque value is lower than thread forming torque
• “Smart Speed” function: for speeding up the production process. It is possible to create a “two-phase” tightening strategy: - The first with a high speed tool rotation until reaching the set angle - The second with a pre-defined speed that allows to maintain the accuracy of result
• Check tightening time Min/Max to detect process anomalies like overtreading and already tightened screws
• Settable untightening speed
• Clockwise or Counterclockwise tightening
• 2 levels password: to protect the set parameters or totally block the system
• Unit calibration
• Available measurement units Nm / Lb / In. / Kgf.cm
• Serial communication (RS232)
• Language selection (IT, EN, DE, FR, ES, TR)
• Log of the last 99 tightenings
• Interfacing with working stations
• 8 + 8 programmable I/O (9 + 11 signal types)
SMART PRO EVO PROGRAMMING
- Soft Start - acceleration ramp
- Settable rotation speed
- S.R.O. Speed Range Optimizer, identifies the most suitable final speed range based on the set torque
TIGHTENING STRATEGIES
■ Torque control
■ Torque control with tightening time monitoring

The features shown **are those expressed by the unit when matched with MCA tightening module**. For more information, Fiam Technical Assistance Service is at your disposal.

For an in-depth study of the different features offered by the units and nutrunner motors, consult the [online catalog 111](#).

Additional features of TPU-C3 compared to the basic unit are highlighted in red on the chart above

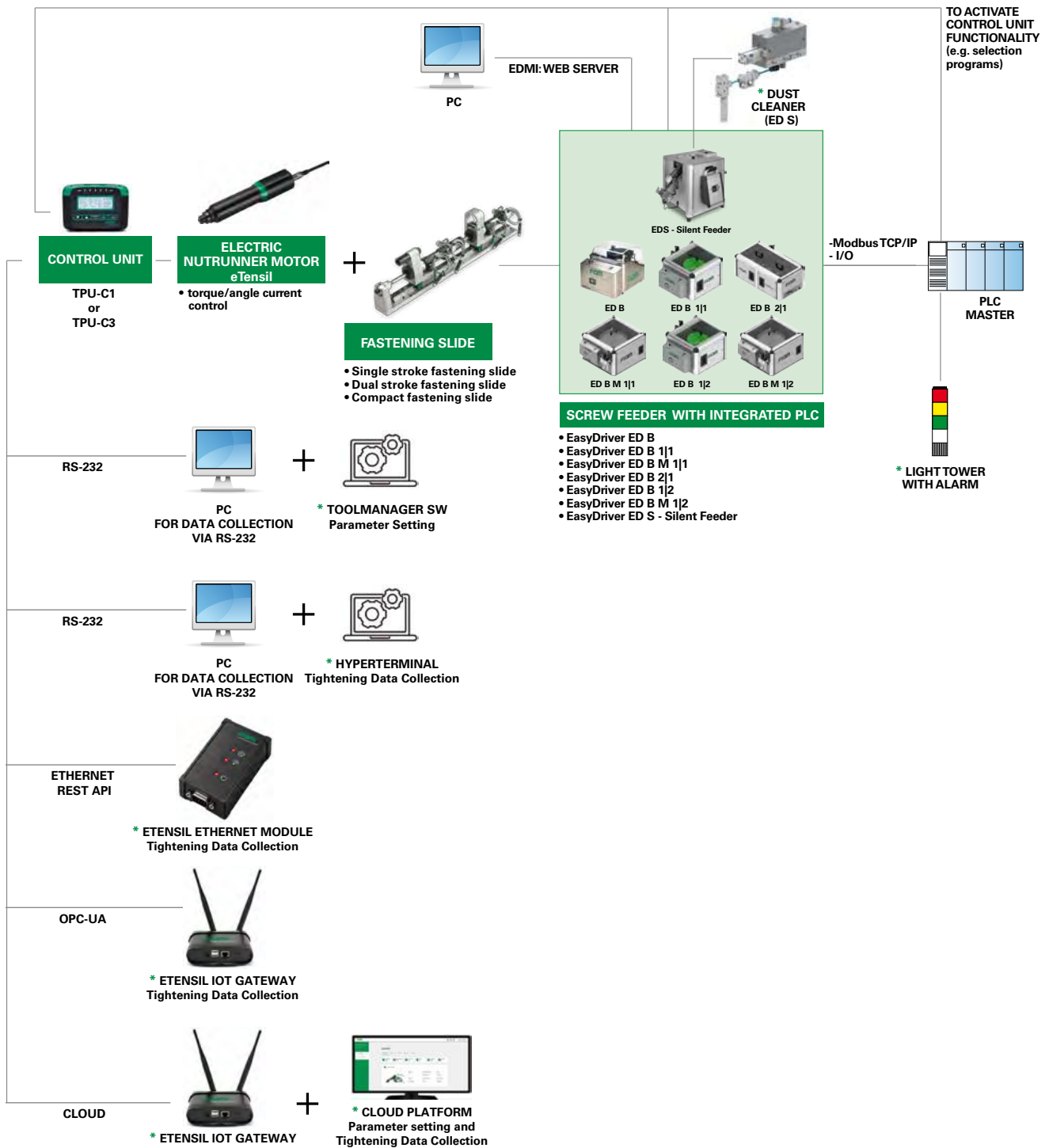
Control unit TPU-C3

• 8 programs to control the tightening process
• 1 programmable sequence up to a max of 8 steps
• Automatic recognition of the tool and configuration
• Screw counter - end of cycle
DISPLAYS
• Tightening result OK/NOK
• Torque value in Nm or other unit of measurement
• Tightening time value
• Angle value
• Red LED = Nok - Yellow LED = End of cycle - Green LED = Cycle progress (screws tightened) according to the set number of screws
• “Smart Thread” function: for processing of selfthreading, self-tapping, self-drilling screws, or else where the final torque value is lower than thread forming torque
• “Smart Speed” function: for speeding up the production process. It is possible to create a “two-phase” tightening strategy: - The first with a high speed tool rotation until reaching the set angle - The second with a pre-defined speed that allows to maintain the accuracy of result
• Check tightening time Min/Max to detect process anomalies like overtreading and already tightened screws
• Settable untightening speed
• Clockwise or Counterclockwise tightening
• 2 levels password: to protect the set parameters or totally block the system
• Unit calibration
• Available measurement units Nm / Lb / In. / Kgf.cm
• Serial communication (RS232)
• Language selection (IT, EN, DE, FR, ES, TR)
• Log of the last 99 tightenings
• Interfacing with working stations
• 8 + 8 programmable I/O (21 + 22 signal types)
• Selection of programs from 1 / 0 (remotely)
• Min / Max tightening angle control
SMART PRO EVO PROGRAMMING
- Soft Start - acceleration ramp
- Settable rotation speed
- S.R.O. Speed Range Optimizer, identifies the most suitable final speed range based on the set torque
• Pre-auto Untightening (can be activated with all tightening strategies), to set the untightening angle and the pause between the untightening and the subsequent tightening
• Post-auto Untightening (can be activated with all tightening strategies), to set the untightening angle as the pause time between untightening and subsequent tightening
TIGHTENING STRATEGIES
■ Torque control
■ Torque control with tightening time monitoring
■ Torque control with tightening angle monitoring
■ Torque control with time and tightening angle monitoring
■ Angle control and torque and time monitoring
■ Time control and torque and angle monitoring (Stop-by-time tightening) to tighten threaded fasteners to a certain height and not to a defined torque, by checking the tightening time

TPU-C1 and TPI-C3, are also available in the AutoPowerOn version: enable automatic power-on of the unit, allowing the workstation to be managed with a single main switch.

The control units’ multiple functions can be activated by an external PLC by means of the Multiple Connector, Code 692079193 (useful for splitting the I/O signals). See page 50.

MCA TIGHTENING MODULE CONFIGURATION WITH eTensil ELECTRIC NUTRUNNER MOTORS WITH TORQUE/ANGLE CURRENT CONTROL



* Accessories available upon request. For specifications, see pages 49 and following.

E-MCB ELECTRIC NUTRUNNER MOTORS WITH TORQUE/ANGLE CONTROL BY:

- CURRENT CONTROL
- BUILT-IN TRANSDUCER AND ENCODER

Innovative solutions entirely designed and manufactured by Fiam, consisting of a wide range of brushless electric nutrunner motors to be combined with the E-TCS control unit, which powers and controls all the functions of the connected tool and enables advanced management and full visualization of the entire tightening cycle directly on the color touch screen panel.

They allow real-time controls and monitoring, analysis, diagnostics and programming, and integrate perfectly with the control systems of the production facility network.

ESD certified, they ensure extremely high operational flexibility in the management of production processes, guaranteeing tightening control and reliability in every manufacturing sector, including high-quality electronics

Two types of control are available:

- **Current control and integrated encoder:**

tightening torque is detected by measuring the current absorbed by the motor, while the angle is detected through the **integrated encoder (digital angle transducer)**.

- **Torque/angle control by built-in transducer and encoder:** the torque measurement is detected by the integrated torque transducer, while angle measurement is detected by the encoder (digital angle transducer), also integrated, in order to ensure high resolution in torque/angle measurement.

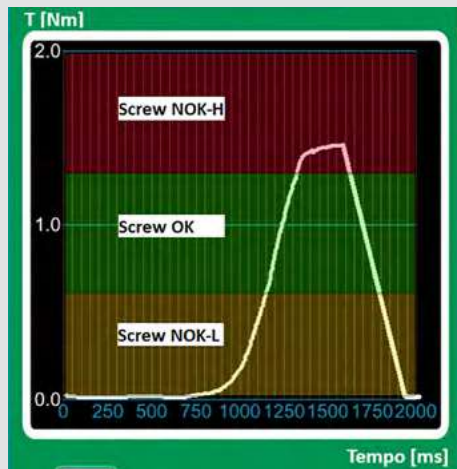
- ▶ **Brushless motors:** reduced maintenance and no dust in the workplace
- ▶ Strong **thrust bearings:** they withstand the thrust of the sort of slides found in automated production cycles that move in rapid, non-stop strokes
- ▶ Ideal external geometries: they make **machine mounting practical** along the full length of the aluminium outer body
- ▶ **Centring system:** designed to achieve unbeatable reliability along both the vertical and horizontal axis.
- ▶ Equipped with green/red/yellow **LEDs to directly** display tightening result diagnostics:
 - **Flashing = error**
 - **Steady ON LED = tightening result**



Control unit technical features

E-TCS. Evolute Tightening Control System

Entirely designed and manufactured by FIAM, it controls all the functions of the connected tool and enables advanced management – with dedicated visualization – of the entire tightening cycle directly on the color touchscreen panel.



Example of tightening results displayed in graphical form.

PROGRAMMING

- **Poka-yoke programming** directly on the color touch screen
- **100 configurable Jobs**, recallable from operator panel
- **100 configurable Tasks** for each Job
- **12 configurable Steps** for each Task

3 TIGHTENING STRATEGIES

Settable within the Steps:

- Torque Control – Angle Monitoring (TC-AM)
- Angle Control – Torque Monitoring (AC-TM)
- Torque and Angle Control (AC and TC)

- WIZARD programming of tightening strategies: guided, from Job level down to Step level
- Programming screens available in two languages (English EN, Italian IT)
- I/O test screens: it is possible to force the state of inputs and outputs directly from the unit; useful during diagnostics/commissioning when no PLC is used

VISUALIZATIONS

- Complete visualization of the tightening process
- Instant display of TORQUE/ANGLE/TIME of tightening
- Graphical visualization of tightening data
- Tightening result indication through display color changes and tool-mounted light signals
- Last 200 tightening log records
- Last 200 tightening diagrams

OTHER TYPES OF TIGHTENING CYCLE CONTROL

- Tightening with clockwise or counterclockwise rotation (for example: if counterclockwise rotation is selected, the system tightens and controls in that direction, performing loosening clockwise)
- Minimum/maximum tightening torque control
- Minimum/maximum tightening angle control
- Minimum/maximum tightening time control
- Threshold torque for angle reading and monitoring
- Screw counting
- For each screw: programming of the maximum number of re-tightening attempts in case of NOK screw
- Configurable loosening speed and direction
- Speed reduction during tightening with configurable final torque/speed values (downshift)
- Acceleration ramp duration

DATA STORAGE AND EXPORT

- Tightening logs exportable via Fieldbus (e.g. PROFINET – MODBUS TCP/IP – ETHERNET /IP)
- Import/export of tightening programs
- Data storable on SD-card, and therefore exportable
- The system can handle a capacity of over 1 million tightenings
- USB port for unit and tool firmware updates, for importing/exporting tightening program parameters, or exporting tightening logs

OTHER FEATURES

- Automatic recognition of the connected tool and all related parameters
- I/O connector: 8 inputs / 8 outputs, freely programmable (10 + 8 assignable functions)
- Fieldbus port for connection to the most widely used fieldbus systems
- SD port for SD-CARD containing programs and tightening logs; removable for backup operations
- Multiple authorization levels protected by password, up to 4 users
- Integrated date and time clock

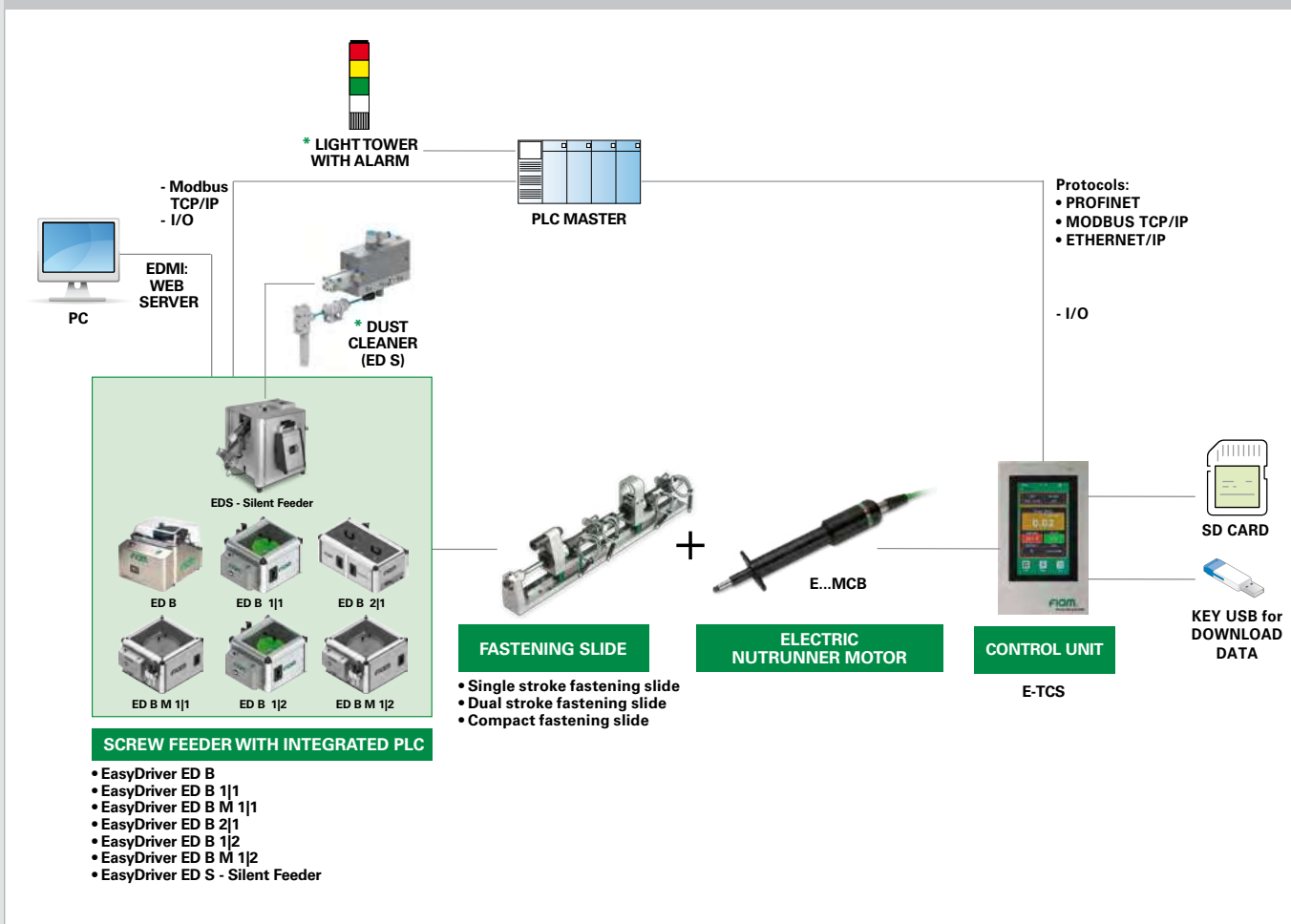
The control unit's multiple functions can be activated by an external PLC through the Multiple Connector, Code 692079193 (useful for splitting the I/O signals). See page 50.



Interconnectivity

FIELDBUS port	Connection to the Profinet fieldbus via dedicated module, to be ordered separately
USB port	For: – USB drive (useful for updating the E-TCS unit firmware)
SD card slot	SD-card type memory slot for exporting tightening data in different formats, organized into 5 convenient folders: JOB TASK STEP STRINGS DIAGRAMS. This also allows backup of contents and settings and their duplication onto other E-TCS units
I/O port	DB25 type
TOOL port	Tool connection, M16 type
Available interface modules	PROFINET interface. To be ordered separately. Self-configuring once installed. Ethernet/IP and Modbus TCP/IP modules, available upon request

MCA TIGHTENING MODULE CONFIGURATION WITH E-MCB ELECTRIC NUTRUNNER MOTORS



* Accessories available upon request. For specifications, see page 53.

MCB ELECTRIC NUTRUNNER MOTORS WITH TORQUE/ANGLE CONTROL BY:

- CURRENT CONTROL
- BUILT-IN TRANSDUCER AND RESOLVER

MCB brushless nutrunner motors can be integrate perfectly with the network control systems of the production plant.

They allow **real-time checks, monitoring, analysis, diagnostics and programming of the production process** in each industrial sector and the consequent quality of the products they assemble.

MCA tightening modules with these nutrunner motors boast extremely advanced features: they can **perform different assemblies with different parameters of torque, speed, etc. and therefore be used for different applications** thus guaranteeing a considerable advantage in terms of investment costs.

Electric nutrunner motors MCB, equipped **with brushless technology** that reduces the maintenance and ensures the absence of dust in the workplace, are paried to a control unit which integrates both power functions (voltage, current...) than those of programming and careful control of each stage of the assembly process.

Available two types of control:

- ▶ **Torque/angle current control:** the torque is detected by measuring the current used by the motor while the angle is detected through integrated Hall sensors
- ▶ **Torque/angle control by transducer and the resolver integrated:** they perform torque control and angle in direct mode; for a high resolution in the measurement of the values of torque and angle and excellent control of the tightening process.



Control unit technical features

Control unit TCS-B E

TIGHTENING STRATEGIES

- Screw engagement, torque, torque/angle, angle/torque,
- OK, NOK and RUN LEDs
- I/O: 5 inputs and 5 outputs
- RS232 connection for programming, diagnostics and data acquisition
- Torque/angle/speed adjustment through pre-set grid
- Programs storage: programs can be saved in txt format too, exported and printed
- Data printout including main information about last performed tightening strategy

PROGRAMMING

- Simple, intuitive installation on a PC with the standard equipment supplied (RS232 cable)
- System configuration through the quick guide
- System calibration: all parameters are automatically set
- OFF LINE programming: it is possible to create, modify and save the tightening programs without connection to TCS-B E system
- ON LINE programming: management of tightening programs with PC directly connected to the unit; it is possible to upload and save the tightening data directly to the PC while the tightening program works

DIAGNOSTIC CHECK

- Displays the number and type of errors detected (temperature, feeding tension, diagnostic test, check of motor sensors, resolver, transducer and system)
- Following checks may be carried out: motor rotation check, analogic measurement of the supply voltage, motor feedback signals check

TCA INTERFACE. Optional device

To interface with and control the digital I/Os, and to export all result data directly via PROFINET, MODBUS TCP/IP, and PROFIBUS communication protocols.

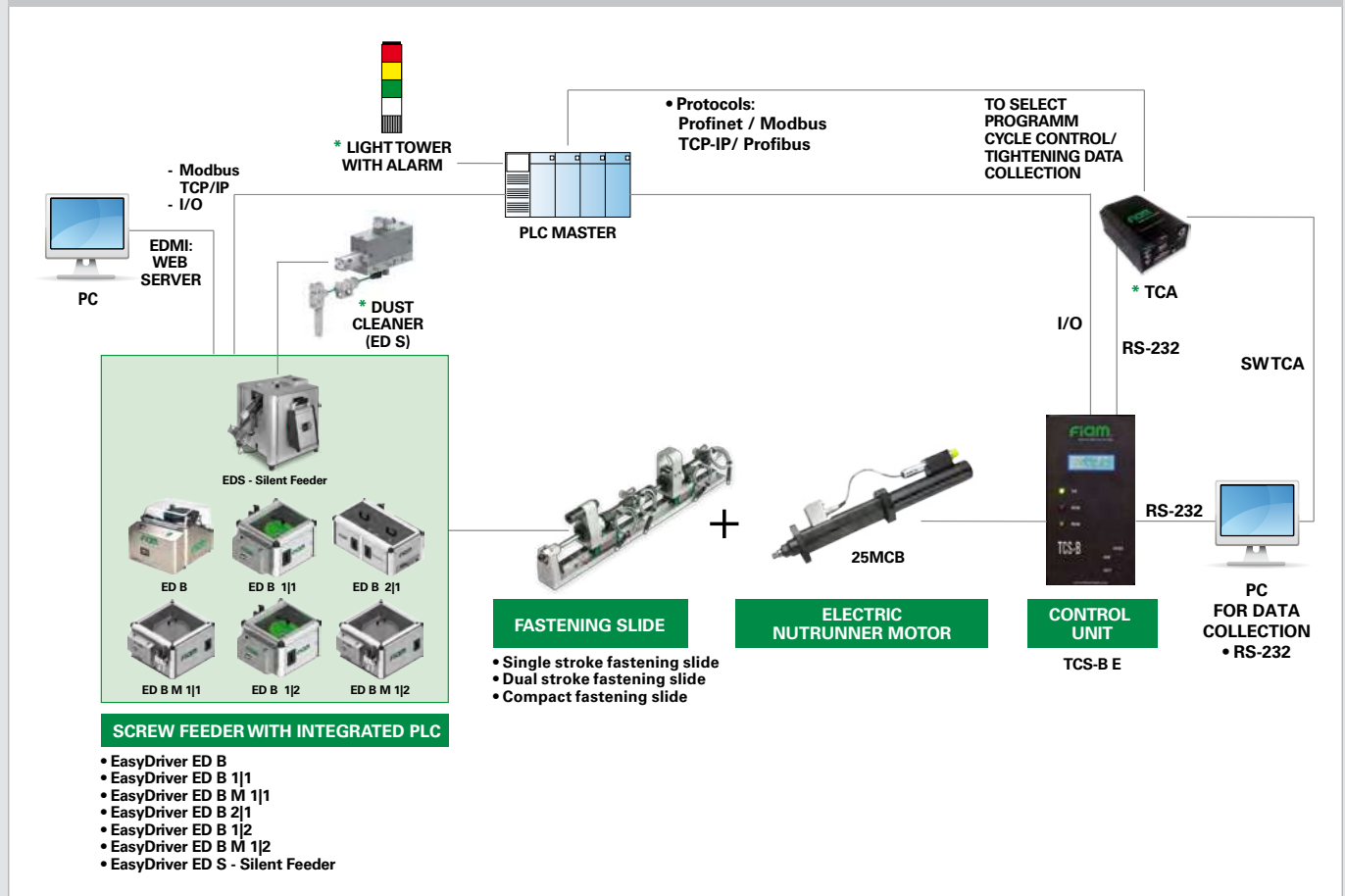
From the Master PLC, the TCA interface can:

- Export additional information (e.g., tightening torque in Nm, angle in degrees, overall tightening sequence result, selected program number, etc.)
- Receive all operating commands

For an in-depth study of the different features offered by the units, accessories and nutrunner motors, consult the [online catalog 111](#).

The features shown are those expressed by the unit when matched with MCA tightening module. For more information, Fiam Technical Assistance Service is at your disposal.

MCA TIGHTENING MODULE CONFIGURATION WITH MCB ELECTRIC NUTRUNNER MOTORS



*Accessories available upon request. For specifications, see page 53.

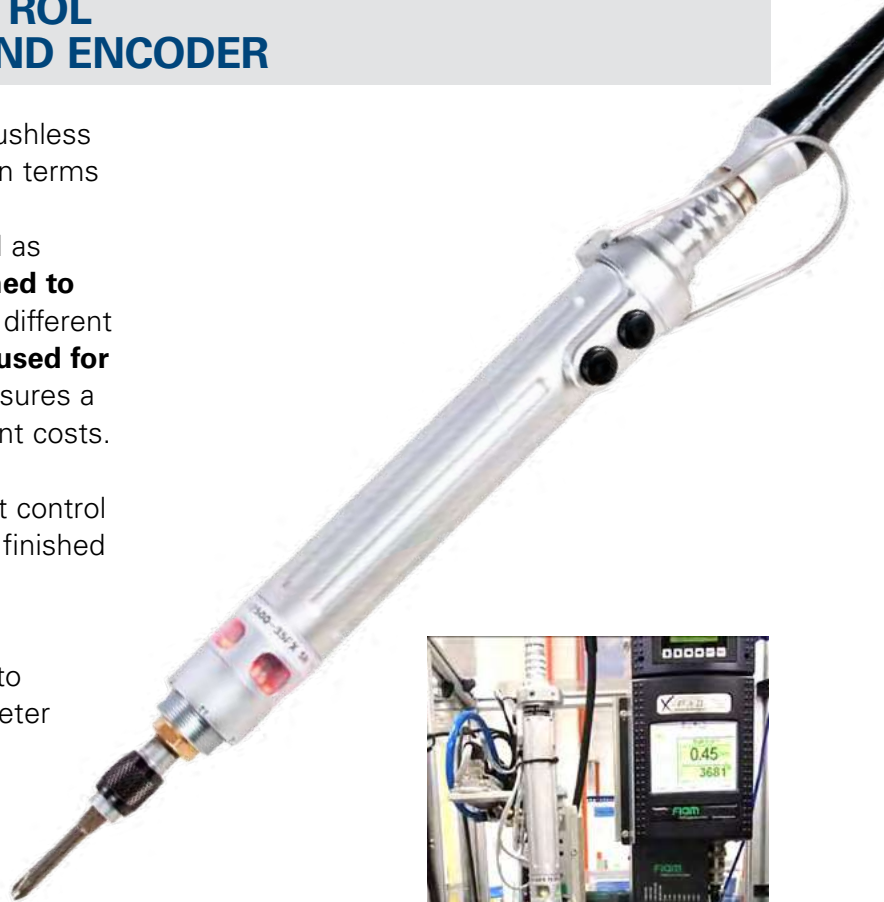
X-PAQ ELECTRIC NUTRUNNER MOTORS WITH TORQUE/ANGLE CONTROL BY BUILT-IN TRANSDUCER AND ENCODER

The high technology offered by the X-PAQ brushless electric nutrunner motors fulfills every need in terms of accuracy and precision of tightening. They represent a versatile investment as well as beneficial as each system **can be programmed to perform various assembly operations** with different torque, speed, etc. parameters **so it can be used for several applications.** A conversion which ensures a considerable advantage in terms of investment costs.

Very light and silent, they tighten with perfect control over the tightening process, resulting in high finished product quality.

They are equipped with:

- ▶ **Built-in torque transducer and encoder** to ensure high resolution torque/angle parameter measurements
- ▶ **Compact design, reduced sizes and above all weights, make them** ideal for installation on single and multiple tightening units and robots
- ▶ **Brushless technology:** do not require maintenance and do not pollute the work area as there are no carbon dust residues
- ▶ **Innovative control unit** that combines the power supply (voltage, current, etc. parameters) and **programming functions,** with **accurate control of each step of the assembly process** and **allows traceability** of all assembly job data.



Control unit technical features

Control unit CT2500A

- Quick programming on color touch screen
- **Fully displays** the tightening process
- Instantaneously controls the tightening torque and angle, and indicates the outcome by colouring the whole display
- 99 pre-settable "tasks" that can be recalled
- 24 programs available for each task

TIGHTENING STRATEGIES configurable within the tasks

- torque control
- torque control-angle monitoring
- angle control-torque monitoring

OTHER TYPE OF CONTROL

- clockwise/counterclockwise
- CW/CCW - rotation
- minimum/maximum torque
- minimum/maximum angle
- speed reduction during tightening
- time limit

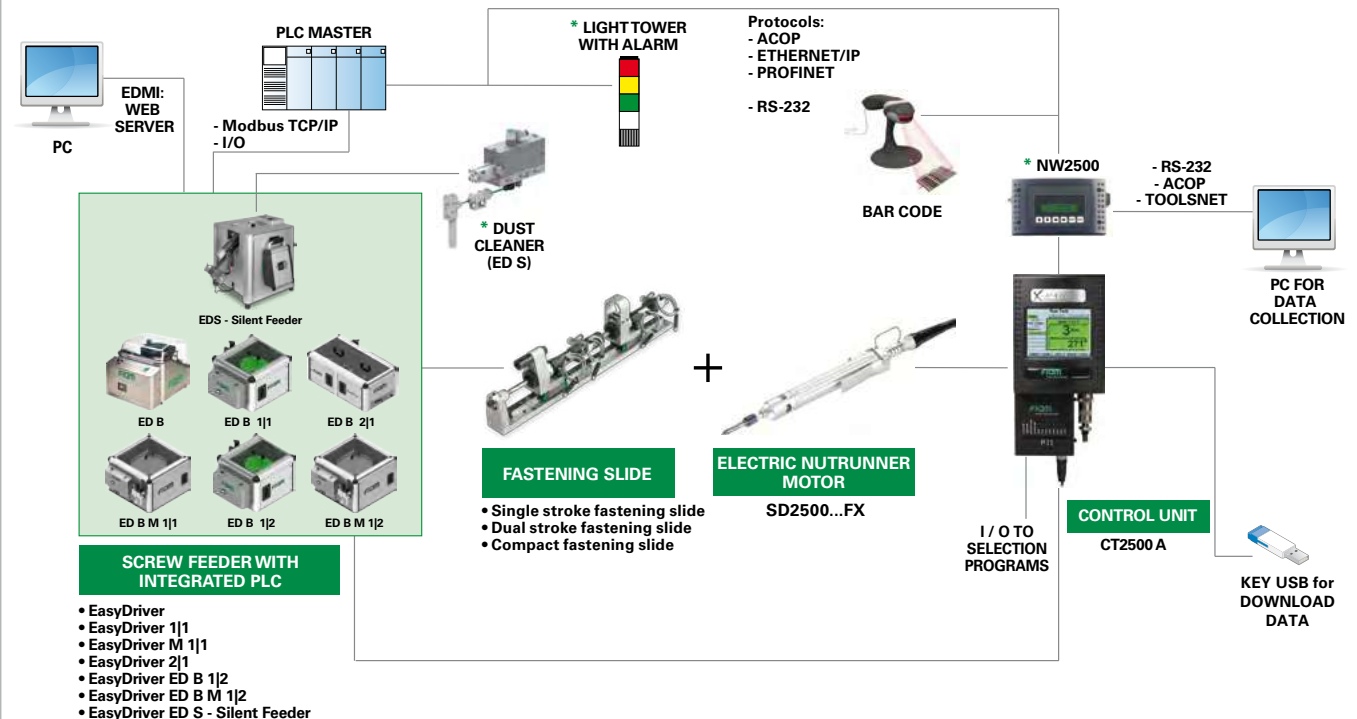
- **Screw counter:** for each screw, it is possible to program the maximum number of retries in the event of an NOK result
- **Controls tightening sequences:** the unit controls the correct pre-set tightening sequence and determines the maximum number of NOK results for each screw
- Exports the tightening result files through the USB port, which can also be use to backup and import/export tasks, and save tightening graphs
- Automatically recognises the tool and its parameters: **model, serial number, number of cycles executed, calibration value, etc. to aid any maintenance work**
- **Provides protection with passwords for three users**



* For an in-depth study of the different features offered by the unit, accessories and X-PAQ nutrunner motors, consult the [online catalogue 111](#).

The features shown are those expressed by the unit when matched with MCA tightening module. For more information, Fiam Technical Assistance Service is at your disposal

MCA TIGHTENING MODULE CONFIGURATION WITH X-PAQ ELECTRIC NUTRUNNER MOTORS



* Accessories available upon request. For specifications, see page 53.

Heads that make the difference!

The screw retaining heads (nose piece) **hold the screw coming from the feeder and guide it correctly and safely** to allow the bit to go down and tighten on the component.

They are the result of lengthy experience and, being a fundamental element for high quality tightening, are designed and manufactured entirely by Fiam.

The benefits:

- ▶ **an excellent screw hold**
- ▶ **perfect control of the screw on the tightening point**
- ▶ **any depth can be reached**
- ▶ **quick and easy assembly and disassembly**

High resistance to breaking and wearing:

they are built with highest quality materials through precise and accurate machining together with the treatments

Safe and reliable screw holding:

heads are equipped with jaws which are opening to release the screw when the bit starts tightening the screw on the component. They can be of different types, depending on the screw or dimensions of the component to be tightened



Examples of special heads with friction jaws to access to deep tightening points, behind shoulders or for entering very narrow holes.

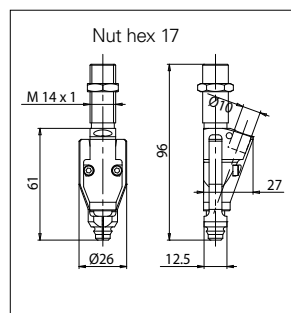
For all types of screw:

the heads have 3 different sizes to take all the various screw types on the market and additionally they can always be customised

EVERY SCREW HAS ITS SIZE

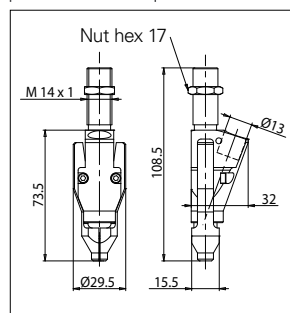
TTV - P

Ø screw head (mm)	L Total length of the screw (mm)
4,5 ÷ 7,0	max 25



TTV - G

Ø screw head (mm)	L Total length of the screw (mm)
7,1 ÷ 10,0	max 35





SOME OF THE MODELS AVAILABLE



WITH ANTI-OVERTURNING DEVICE

when you have screws with screw length / head diameter, between 1.1 (approx) and 1.5, to avoid the screw jamming



WITH FRICTION JAWS

that hold the screw on the head and not on the stem: no opening to allow the head to insert, without further encumbrances, even inside holes and deep tightening points



FOR BIG SCREWS

to tighten screws up to 45 mm length



WITH HOSE

to reach deep tightening points or inside holes



WITH SUPPORTS OR WITH SPECIAL MATERIALS

to facilitate safe and easy positioning. Special materials and geometries are designed not to damage the components during assembly

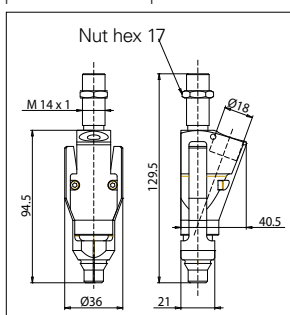


WITH ELASTIC HOSE AND MECHANICAL SCREW GRIPPING

the hose not only holds the screw perfectly on the head but it rotates together with the screw during tightening. Ideal situation not only for embedded tightening points but also as a substitute for screw suction systems that can become inefficient in the case of assemblies on materials that create dust during tightening

TTV - M

Ø screw head (mm)	L Total length of the screw (mm)
10,1 ÷ 13,5	max 35



MCA TIGHTENING MODULES WITH FASTENING SLIDES

NUTRUNNER MOTORS Technology	Model	Tightening torque range of nutrunner motor, on soft joint		Idle speed	Type of matched control unit
		Nm	in lb		
PNEUMATIC SOLUTIONS torque control by mechanical clutch	MCA 20MC S../D... ..	0,4÷5	3,5 ÷ 44,2	650÷2700	-
	MCA MCSE S../D... ..	0,9÷10	8÷88,5	500÷2500	-
	MCA MCY S../D... ..	7÷10	62÷88,5	550÷800	-
ELECTRIC SOLUTIONS "eTensil" torque control by mechanical clutch	MCA U2/M1 E8MC S../D... ..	0,3÷4,5	2,6÷39,8	2000÷285	TPU-2 /TPU-M1
ELECTRIC SOLUTIONS "eTensil" torque/angle by current control	MCA C1/C3 E8MCC S../D... ..	0,3÷10	2,6÷88,5	55÷2000	TPU-C1 /TPU-C3
ELECTRIC SOLUTIONS "X-PAQ" torque/angle control by built-in transducer and encoder	MCA CT SD2500 S../D... ..	0,1÷5,6	1÷50	500÷1700	CT2500A
ELECTRIC SOLUTIONS "MCB" torque/angle by current control	MCAT2 25MCB C S../D... ..	4÷50	61,9÷796,5	500÷1500	TCS-B 25 E
ELECTRIC SOLUTIONS "MCB" torque/angle control by built-in transducer and resolver	MCAT2 25MCB A S../D... ..	4÷50	61,9÷796,5	500÷1500	TCS-B 25 E
ELECTRIC SOLUTIONS "E-MCB" torque/angle current control	MCA E1 E8MCB C S../D...	0,1÷18	0.88÷159.31	max 2000	E-TCS
	MCA E1 E12MCB C S../D...				
	MCA E1 E18MCB C S../D...				
ELECTRIC SOLUTIONS "E-MCB" torque/angle control by built-in transducer and encoder	MCA E1 E8MCB A S../D...	0,1÷18	0.88÷159.31	max 2000	E-TCS
	MCA E1 E12MCB A S../D...				
	MCA E1 E18MCB A S../D...				

Values to be considered reduced by 20% if used screw feeder EasyDriver ED B

Key:

Tightening module	MCA
Type of nutrunner motor	20MC Pneumatic technology MCSE Pneumatic technology MCY Pneumatic technology E8MC Electric technology eTensil E8MCC Electric technology eTensil SD2500 Electric technology X-paq 25MCBC Electric technology 25MCBA Electric technology E-MCB C Electric technology E-MCB A Electric technology
Type of fastening slide	SM Single stroke SW Single stroke with screw at sight DM Dual stroke DW Single stroke with screw at sight
Type of control units	U2 = TPU 2 - Power supply unit eTensil M1 = TPU-M1 - Monitoring unit eTensil C1 = TPU-C1 - Control unit eTensil C3 = TPU-C3 - Control unit eTensil CT = CT2500A - Control unit X-paq T2 = TCS-B 25 E - Control unit E1 = E-TCS - Control unit
Type of screw feeders	B = Easy Driver ED B B11 = Easy Driver ED B 1 1 BM11 = Easy Driver ED B M 1 1 B21 = Easy Driver ED B 2 1 B12 = Easy Driver ED B 1 2 BM12 = Easy Driver ED B M 1 2 S = Easy Driver ED S (with segment conveyor)

Air inlet: 1/4" gas
 Recommended air passage: ø 8 mm
 Accessories drive:  1/4

TPU-2 power supply unit: see page 26
 TPU-M1 monitoring unit: see page 26

TPU-C1 and TPU-C3 control units: see page 29
 CT2500A control unit: see page 37
 TCS-B 25 E control units: see page 35
 E-TCS control units: see page 32F

For the following solutions, the speed range varies depending on control unit used

eTensil with mechanical clutch

- with **TPU-2** unit, LOW speed is approximately 80% of the maximum speed shown in the table and can only be selected using the LOW/HIGH button.
- with **TPU-M1** unit, the speed is adjustable and the minimum speed is equal to 50% of the maximum speed shown in the table.

eTensil with current control

- with **TPU-C1/C3** units, the speed is adjustable and the minimum speed is equal to 15% of the maximum speed shown in the table.

E-MCB

- with **E-TCS** unit, the speed is adjustable and the minimum speed is equal to 3% of the maximum speed shown in the table.

For torques and speeds other than those indicated, contact **Fiam Technical Consultancy Service**.

In order to obtain the nominal torque and speed range, it is necessary to set parameters following the instructions given in Use and Maintenance Manual.
 For any further information, contact the **Fiam Technical Service**.

Standard equipment supplied with tightening module

- **EasyDriver screw feeder**
- **For ED S screw feeder:** the portable PLC is equipped with a 3 m long cable. On request: 10 m cable
- Fastening slide complete with fittings and support bracket
- Air or electric nutrunner motor
- **With air nutrunner motor are supplied:**
 - Clutch adjustment key
 - Clutch spring
- **With eTensil electric nutrunner motor are supplied:**
 - Selected monitoring/control unit
 - Kit connection cables
 - Clutch adjustment key (for models with mechanical clutch)
- **With other electric nutrunner motors are supplied:**
 - Control Unit
 - Kit connection cables
 - Test certificate
- **Ethernet connection cable**
- **Screw-retaining head** customized for the screw, completed with bush
- **4 tightening bits** (1 fitted + 3 as spares part)
- Screw shooting hose
- Two shielded screw transit sensors
- **Operation and maintenance manual**
- **Eco-friendly packaging**

Models available upon request

AIR NUTRUNNER MOTORS

- With **left rotation only**
- **For torques greater** than those indicated in the table
- With **different speed**

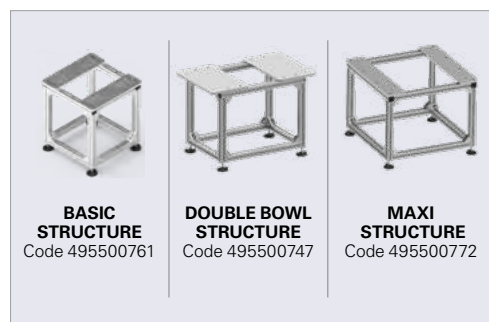
FASTENING SLIDES

- Models with **different approaching strokes**
- Fastening slides with **protection** in transparent polycarbonate for internal view and greater safety for operators
- Special **fastening slide** for tightening points with a very close **distance to centre (20 mm)**
- **Slides with cable wiring at 90°** for layout with reduced spaces



Slides with cable wiring at 90°

SUPPORTING STRUCTURES AND HOPPERS



SUPPORTING STRUCTURES

Entirely designed and manufactured by Fiam, they are useful to support EasyDriver feeders and their hoppers when used to solve needs production at high rates. They ensure greater cleanliness and functionality of the operational layout thanks to:

- **An aluminum base plate already prepared with the holes** that allow to fix the suitable feeder on it
- **Aluminum profiles with channels for cables and tube bundles inside the slots** positioned under the support surface
- **Support adjustable feet in height** and possibility of having additional brackets for floor fixing through a simple anchoring with supplied squares.

They are available in three sizes: basic structure, double bowl structure or maxi.



HOPPERS

The hoppers are available **on request** and are used to solve **high-speed** production needs, as they increase the feeding capacity of the EasyDriver feeders.

They are available with two different technologies

- **Vibration hoppers** (5, 10 and 50 Lt).
- **Belt hopper** (12 Lt), for greater silence requirements in the production line, in combination with the ED S – Silent Feeder.

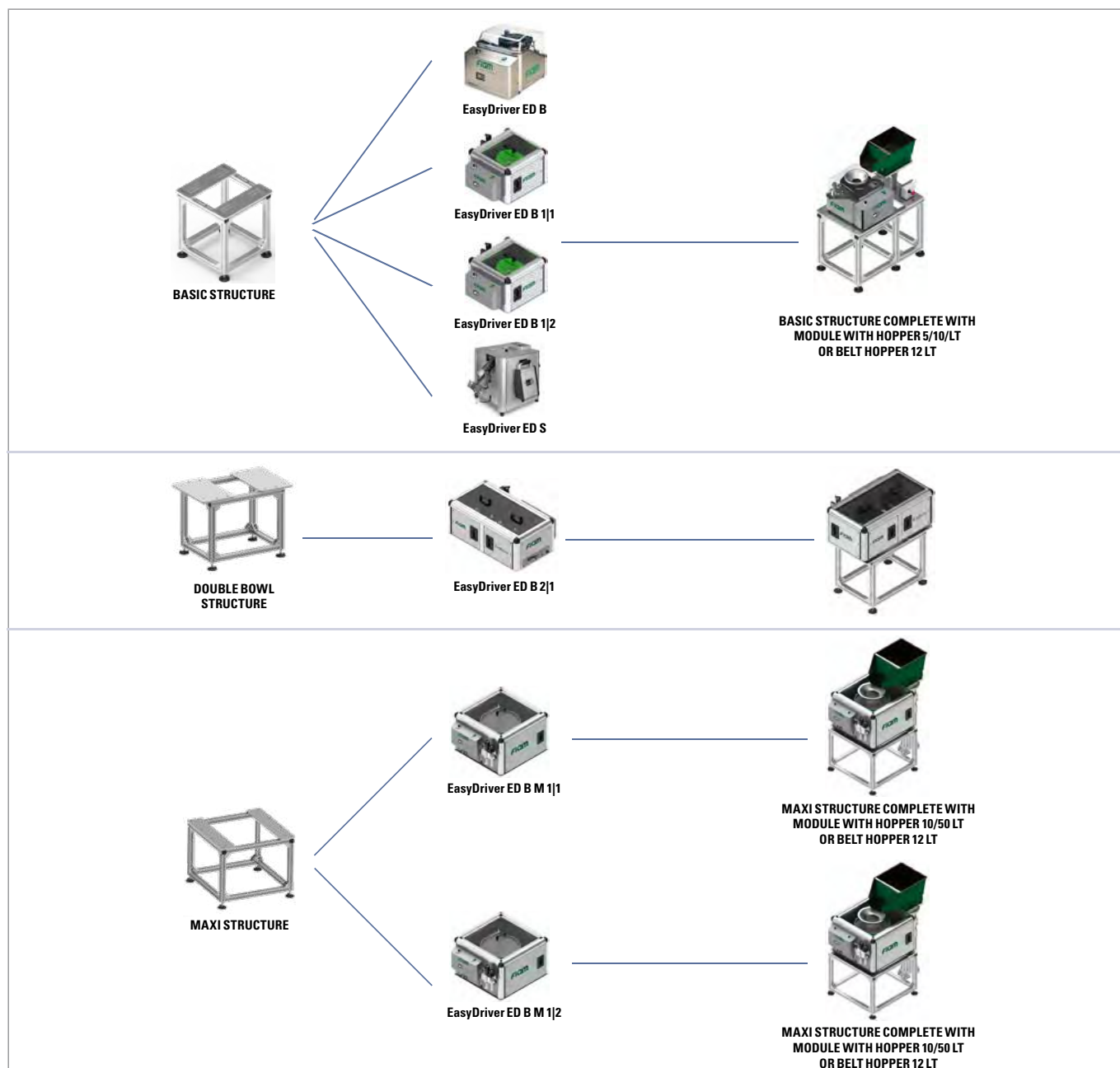
Hoppers are coordinated by the low lever sensor integrated on the EasyDriver screw feeders.



SUPPORTING STRUCTURES COMPLETE WITH HOPPERS

The complete support structure with hopper (vibration or belt) is the **optimal complete configuration** that allows the EasyDriver feeder to be correctly positioned together with the chosen hopper (with the exception of the ED B 2|1 feeder, which cannot be fed with hoppers). Available in the BASIC or MAXI configuration depending on the feeder chosen for the production layout.

SUPPORTING STRUCTURES AND HOPPERS	EASY DRIVER FEEDERS						
	ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED B 1 2	ED B M 1 2	ED S
Basic structure - code 495500761	✓	✓			✓		✓
Double bowl structure (not suitable for the combination with modules for hoppers) - code 495500761				✓			
Basic structure complete torque/angle current control	✓	✓			✓		
Basic structure complete with hopper 10 Lt	✓	✓			✓		
Basic structure complete with belt hopper 12 Lt	✓	✓			✓		✓
MAXI structure - code 495500772			✓			✓	
MAXI structure complete with hopper 10 Lt			✓			✓	
MAXI structure complete with hopper 50 Lt			✓			✓	
MAXI structure complete with belt hopper 12 Lt			✓			✓	



COVER WITH FUNNEL AND CAP

To facilitate the refilling of screws, each feeder can be equipped with:

- a customized **cover** with **funnel**
 - the relative **cap** for closing the cover with funnel.
- These accessories allow easier loading of screws: both manually by the operator, and automatically in the case of use with the hopper.

Cover with funnel



Code 395502658



Code 395502645



Code 395500778



Code 395502779

Cap for funnel



Code 395500577

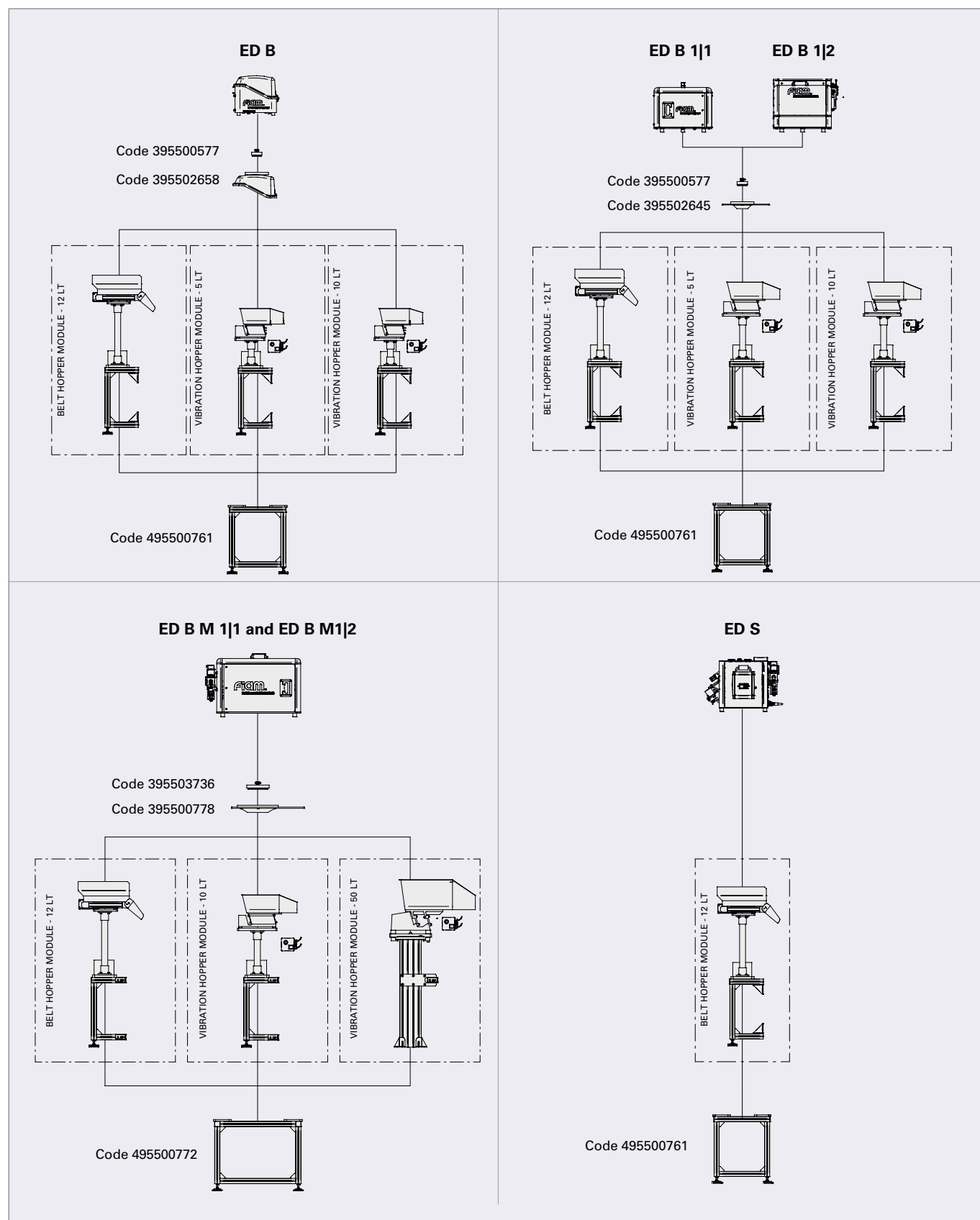


Code 395503736

EASY DRIVER FEEDERS

ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED B 1 2	ED B M 1 2	ED S
✓						
	✓			✓		
		✓			✓	
			✓			
✓	✓		✓ x 2	✓		
		✓			✓	

CONFIGURATIONS OF FEEDERS, SUPPORTING STRUCTURES AND HOPPERS



OTHER ACCESSORIES FOR WORKSTATION

See page 49.

Tighten with Cobots. Humans take a leading role.

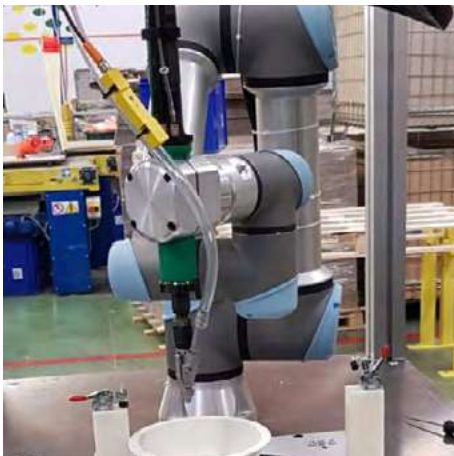
There will be a **growing use** of “smart machines”; or **collaborative robots**, in production systems. These solutions are not destined to replace humans, but to collaborate with them and **free them from the heavier and more dangerous tasks, allowing them to provide the real added value in their work.**

Operators, or humans, become the ideal means for carrying out complex operations, and their **skills are extended** through a process of “*job enlargement*,” in which they are asked to **perform the more critical tasks** so that their daily work is more motivating and their jobs are more highly qualified.



SCREW FEEDERS *EasyDriver*

Easy Driver screw feeder, in addition to relating to the line PLC and the control unit (when used), it is equipped with the **Modbus TCP / IP communication protocol**. This fieldbus enables broader and faster communication – via Ethernet connection – of all work-cycle-related information and digital Input and Output signals exchanged with and sent to the Cobot.



JAM-PROOF SCREW SHOOTING

All MCA modules feature two shielded screw transit sensors that, located under screw selector and on the tightening head **(check whether the screw has dropped into the hose properly and readies it for subsequent shooting)**.

With this dual system, only once the first sensor located on the tightening head has detected the passage of the screw can a new screw be selected: this avoids screws jamming and building up in the screw shooting hose.

This arrangement results in:

- **improved control of the screw's position** in the hose at each stage of feeding
- **faster screw feeding as screw** selection takes place at the same time as tightening
- **shorter working times** and greater reliability given the continuity of operation.

PATENTED FORWARD BIT STROKE



Device designed to allow the **bit to advance to the tightening point automatically** and not allow it to withdraw. In addition, during the tightening stage, the screwdriver's head does not touch the surfaces of the component, protecting them from any potentially damaging contact.

The forward bit stroke device is designed to be fixed to the Cobot's wrist with a bracket.

NUTRUNNER MOTOR

The nutrunner motors that can be used on Cobots - see range on page 23- for the choice - come in the following versions:

- **AIR** for torque ranges from **0,4 to 5 Nm**
- **ELECTRIC - ETENSIL RANGE** - for torque ranges from **0,3 to 10 Nm**
- **ELECTRIC - X-PAQ RANGE** for torque ranges from **0.1 to 5.6 Nm**
- **ELECTRIC - E-MCB RANGE** for torque ranges from **0.1 to 6 Nm**

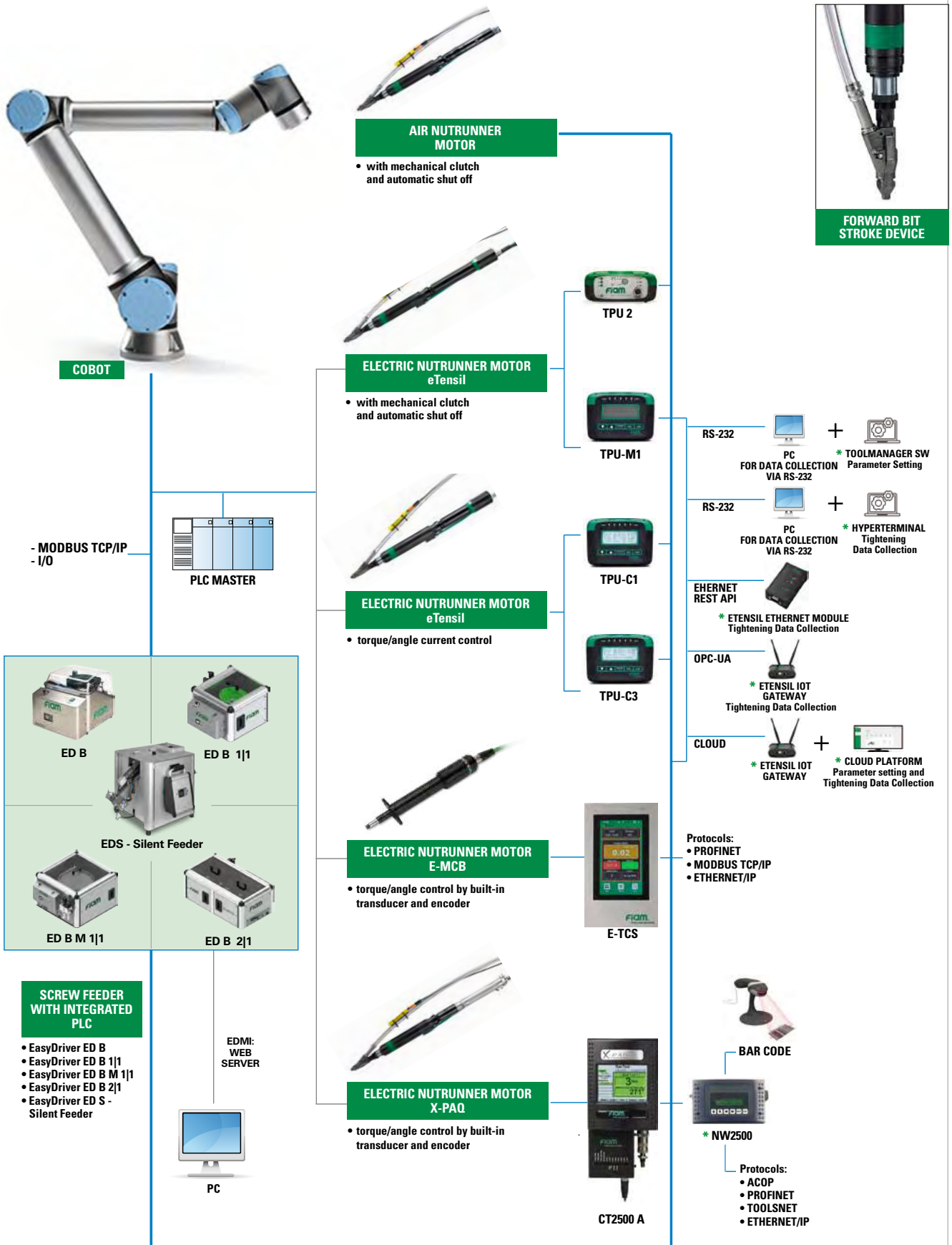
Safety front and centre

The regulations state that: *"... in the use of collaborative applications, there are two main types of risk to be analysed: **contact and access to the work space**. The objective to be reached – again according to the regulations – is a minimal transfer of energy from the robotic system to the human, and the **systems for minimizing this type of risk** consist in reducing speed and force, reducing the moving masses (i.e. the weight of the robot), adopting a rounded or smooth design, and the use of force/torque control systems."*

Given that collaborative robots already come with sensors that detect contact with objects/humans, the **solution designed and produced by Fiam** for Cobots is **fully compliant with said recommendations** since:

- the devices to be fixed to the cobots with **brackets are extremely light and very small in size**
- screws are **always held inside jaws**
- the screw is only shot out once the **screwdriver head is positioned** by the cobot **over the tightening point**: this means that the tip of the screw is never exposed during handling and hence cannot hit the operator.

MCA TIGHTENING MODULE FOR COBOT CONFIGURATION



* Accessories available upon request. For specifications, see pages 49 and following.

MCA TIGHTENING MODULE FOR COBOT

NUTRUNNER MOTORS Technology	Model	Tightening torque range of nutrunner motor, on soft joint		Idle speed	Type of matched control unit	Forward bit stroke device max stroke
		Nm	in lb	RPM		mm
PNEUMATIC SOLUTIONS torque control by mechanical clutch	MCA 20MC AC ...	0,4÷5	3,5÷44,2	650 ÷ 2700	-	100
ELECTRIC SOLUTIONS "eTensil" torque control by mechanical clutch	MCA U2/M1 E8MC AC ...	0,3÷4,5	2,6÷39,8	2000÷285	TPU2 /TPU-M1	100
ELECTRIC SOLUTIONS "eTensil" torque/angle by current control	MCA C1/C3 E8MCC AC ...	0,3÷10	2,6÷88,5	55÷2000	TPU-C1 /TPU-C3	100
ELECTRIC SOLUTIONS "X-PAQ" torque/angle control by built-in transducer and encoder	MCA CT SD2500 AC ...	0,1÷5,6	1÷50	500÷1700	CT2500A	100
ELECTRIC SOLUTIONS "E-MCB" torque/angle control by current control	MCA E1 E8MCB C AC ... MCA E1 E12MCB C AC ...	0,1÷6	0,88÷53.10	max 2000	E-TCS	100
ELECTRIC SOLUTIONS "E-MCB" torque/angle control by built-in transducer and encoder	MCA E1 E8MCB A AC ... MCA E1 E12MCB A AC ...	0,1÷6	0,88÷53.10	max 2000	E-TCS	100

Values to be considered reduced by 20% if used screw feeder EasyDriver ED B

Key:

Tightening module	MCA
Type of nutrunner motor	20MC Pneumatic technology E8MC Electric technology eTensil E8MCC Electric technology eTensil SD2500 Electric technology X-paq E-MCB C Electric technology E-MCB A Electric technology
Tightening device	AC Forward bit stroke for Cobot
Type of control units	U2 = TPU 2 - Power supply unit eTensil M1 = TPU-M1 - Monitoring unit eTensil C1 = TPU-C1 - Control unit eTensil C3 = TPU-C3 - Control unit eTensil CT = CT2500A - Control unit X-paq E1 = E-TCS - Control unit
Type of screw feeders	B = Easy Driver ED B B11 = Easy Driver ED B 1 1 BM11 = Easy Driver ED B M 1 1 B21 = Easy Driver ED B 2 1 B12 = Easy Driver ED B 1 2 BM12 = Easy Driver ED B M 1 2 S = Easy Driver ED S (with segment conveyor)

Air inlet: 1/4" gas

Recommended air passage: ø 8 mm

Accessories drive: $\square$ 1/4

TPU 2 power supply unit: see page 26

TPU-M1 monitoring unit: see page 26

TPU-C1 and TPU-C3 control units: see page 29

CT2500A control unit: see page 37

E-TCS control units: see page 32

For the following solutions, the speed range varies depending on control unit used

eTensil with mechanical clutch

- with **TPU-2** unit, LOW speed is approximately 80% of the maximum speed shown in the table and can only be selected using the LOW/HIGH button.

- with **TPU-M1** unit, the speed is adjustable and the minimum speed is equal to 50% of the maximum speed shown in the table.

eTensil with current control

- with **TPU-C1/C3** units, the speed is adjustable and the minimum speed is equal to 15% of the maximum speed shown in the table.

E-MCB

- with **E-TCS** unit, the speed is adjustable and the minimum speed is equal to 3% of the maximum speed shown in the table.

For torques and speeds other than those indicated, contact **Fiam Technical Consultancy Service**.

In order to obtain the nominal torque and speed range, it is necessary to set parameters following the instructions given in Use and Maintenance Manual.

For any further information, contact the **Fiam Technical Service**.

Standard equipment supplied with tightening module for Cobot

- **EasyDriver screw feeder**
- **For ED S screw feeder:** the portable PLC is equipped with a 3 m long cable. On request: 10 m cable
- Air or electric nutrunner motor
- **With air nutrunner motor are supplied:**
 - Clutch adjustment key / Clutch spring
- **With eTensil electric nutrunner motor are supplied:**
 - Selected monitoring/control unit
 - Kit connection cables
 - Clutch adjustment key (for models with mechanical clutch)
- **With other electric nutrunner motors are supplied:**
 - Control Unit / Kit connection cables / Test certificate

- **Ethernet connection cable**
- **Screw-retaining head** customized for the screw, completed with bush
- **4 tightening bits** (1 fitted + 3 as spares part)
- Screw shooting hose
- Two shielded screw transit sensors
- **Operation and maintenance manual**
- **Eco-friendly packaging**

NB: the supply does not include the bracket for fixing the forward bit stroke device to the Cobot.

Available Interconnection Configurations

The interconnection options available for MCA automatic tightening modules depend on the control unit used.

The table below summarizes the capabilities offered by the various devices, enabling users to quickly identify the solution that best meets their integration and production process digitalization requirements.

The functions listed are available either as standard features or through specific Fiam devices and accessories, available upon request and described in the following sections, to meet a wide range of connection and data exchange needs.

Connection Type	Control Unit						Screw Feeders
Interface / Protocol	TPU-M1	TPU-C1	TPU-C3	E-TCS	TCS-B	X-PAQ	EasyDriver
Digital I/O	●	●	●	●	●	●	●
RS-232	●	●	●	—	●	●	—
MODBUSTCP/IP	—	—	—	●	●	—	●
PROFIBUS	—	—	—	—	●	—	—
PROFINET	—	—	—	●	●	●	—
ACOP	—	—	—	—	—	●	—
ETHERNET/IP	—	—	—	●	—	●	—
TOOLNET	—	—	—	—	—	●	—
ETHERNET REST API	●	●	●	—	—	—	—
OPC UA	●	●	●	—	—	—	—
CLOUD (via ETHERNET/WI-FI)	●	●	●	—	—	—	—

LEGEND AND DEFINITIONS

Local Connection Direct communication with the Master PLC or a PC; no Internet access required.

Factory Network Interconnection with the Master PLC, SCADA, or MES through industrial networks and communication protocols.

Ethernet / IT Network Integration with software applications, databases, MES systems, or IT applications via Ethernet network (available upon request).

CLOUD Connection to Fiam Cloud services via the Internet, typically through an IoT Gateway and IoT Adapter (available upon request).

● Included as standard

Interconnectivity Accessories

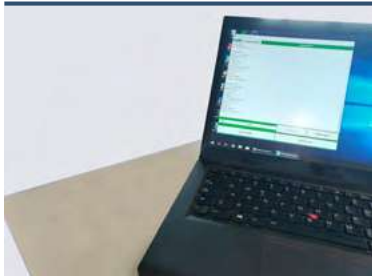


TOOLMANAGER

Software designed by Fiam to easily, quickly and reliably connect eTensil tightening systems to the needs of modern manufacturing. Installed on a PC, it enables full management of tightening parameters, programs and sequences, ensuring accurate control of tightening operations and seamless integration with the smart factory process logic.

Through serial-port communication, **TOOLMANAGER interfaces with the power and control units TPU-C1, TPU-C3 and TPU-M1** (with firmware version 1.21 or later), allowing users to read, modify, create and upload tightening configurations in an intuitive and highly efficient way. An essential tool to optimize setup times, increase traceability and standardize tightening programs across the production line.

Model	For units	Code
Toolmanager	TPU-M1 TPU-C1 TPU-C3	686200920



HYPERTERMINAL KIT

Interconnection systems for Fiam tightening solutions Fiam HyperTerminal Kit allows to connect all Personal Computers (including those of the latest generation) so the network systems, **with Fiam units equipped with an RS 232 serial port.**

The kit includes:

- USB key containing the HyperTerminal software designed by Fiam with which it is possible **display** on the PC text strings received via serial communication, **create** both text files and CSV format files for Excel with the collected data and **save** the data on the PC for the processing of statistics and analysis on production processes.
- Adapter cable: RS232 to USB converter cable
- NULL Modem adapter
- Gender Changer Serial Adapter
- Serial cable: 3 meters long with Male / Female connector

Model	For units	Code
Hyperterminal Kit	Fiam with RS-232	686200913



MULTIPLE CONNECTOR FOR I/O

code 692079193

To be connected to the 25-pole I/O ports of **Fiam TPU units**. It allows to make the I/O signals available on 3 connectors and therefore the connection with 3 devices in parallel. Equipped with connection cable between unit and multiple connector and relative power supply, it has 8 status LEDs for Outputs and 8 test buttons for Input signals.



eTensil ETHERNET MODULE

The eTensil Ethernet Module is a device designed by Fiam for the interconnectivity of eTensil tightening systems. It provides access to tightening logs via Ethernet connection, enabling seamless integration with major enterprise information systems such as ERP, MES, and platforms dedicated to monitoring and collecting production data.

Thanks to the RS-232 serial port connection, the device communicates with eTensil control units: TPU-C1, TPU-C3 and TPU-M1, making stored data available through a server service with REST API interface, a software standard designed to facilitate data exchange between IT systems.

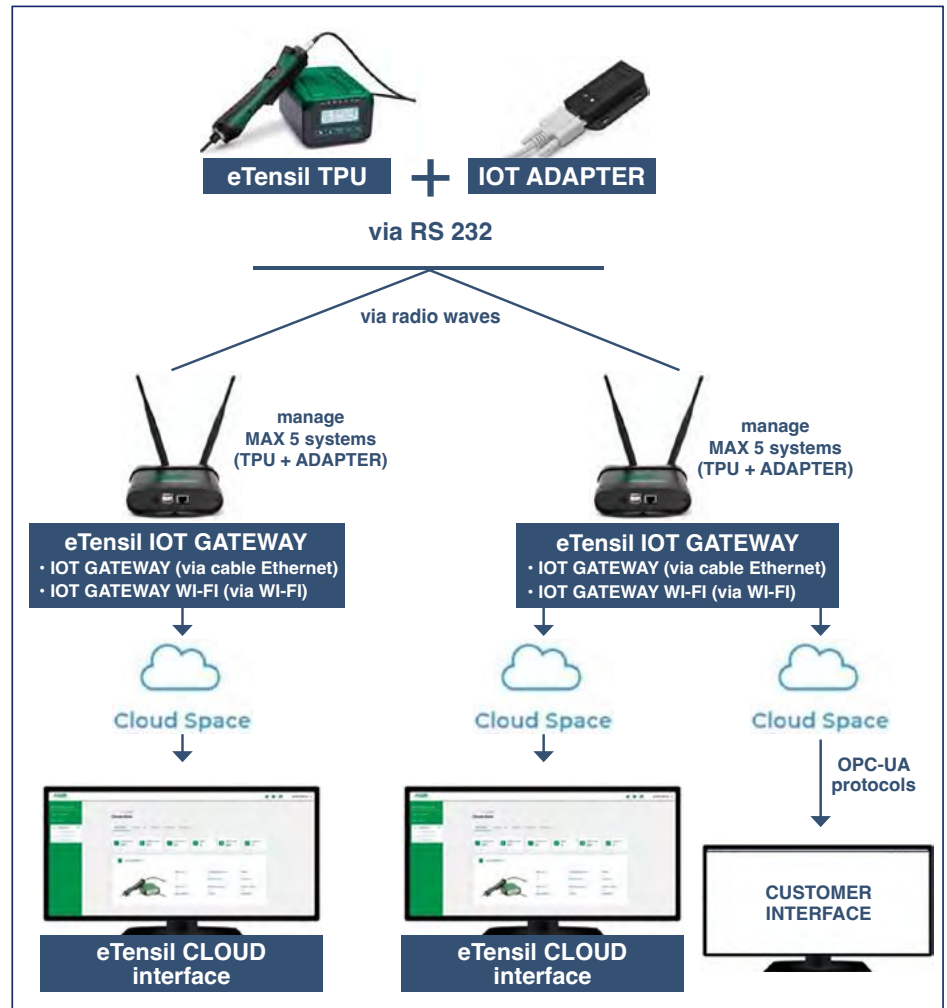
The module can be periodically queried by the customer's IT systems to retrieve stored tightening data.

Model	For units	Code
eTensil Ethernet Module	TPU-M1 TPU-C1 TPU-C3	686200501



eTensil CLOUD

The eTensil TPU (except for TPU-A3) units interface with the management systems of production plant or they are set up for data exchange, allowing the **remote visualization, control and management of tightening processes** through “open” CLOUD platforms or eTensil Platform Cloud included with wireless Fiam devices that receive and transmit data to the CLOUD server.





eTensil IOT ADAPTER

code 686200500

Device to be connected to the serial port of eTensil TPU-C1/C3/M1 control units. Necessary for the collection and transmission of tightening data to eTensil IOT GATEWAY. The device is equipped with diagnostics LED lights. Included 3mt length connection cable.



eTensil IOT GATEWAY

Dispositivo da collegare alla porta seriale delle unità di alimentazione e controllo eTensil: TPU-C1/C3/M1. Diversi i modelli disponibili:

eTensil IOT GATEWAY	Wireless device. Receives data collected by eTensil IOT ADAPTER device and transmits it to the Cloud server. The tightening data are transmitted via Ethernet cable to the included eTensil Cloud interface platform. Supplied with power supply.	code 686200550
eTensil IOT GATEWAY WIFI	Wireless device. Receives data collected by eTensil IOT ADAPTER device and transmits it to the Cloud server. The tightening data are transmitted via WIFI to the included eTensil Cloud interface platform. Supplied with power supply.	code 686200551
eTensil IOT GATEWAY OPC-UA	Wireless device. Receives data collected by eTensil IOT ADAPTER device and transmits it to the Cloud server. The tightening data are transmitted via Ethernet cable to the included eTensil Cloud interface platform or, via OPC-UA protocol, to the customer's platform. Supplied with power supply.	code 686200552
eTensil IOT GATEWAY OPC-UA WIFI	Wireless device. Receives data collected by eTensil IOT ADAPTER device and transmits it to the Cloud server. The tightening data are transmitted via WI-FI to the included eTensil Cloud interface platform or, via OPC-UA protocol, to the customer's platform. Supplied with power supply.	code 686200553



eTensil CLOUD INTERFACE PLATFORM

Included in the supply of each eTensil IOT GATEWAY, it is designed to visualize, modify the set-ups and collect all the tightening data processed by eTensil systems and to remotely manage these processes in a complete and organized way. The platform is accessible through a WEB page on the Cloud.

For each connected device: display of name and code, if active/offline, the settings, belonging to an operating zone and the parameters of individual programs and tightening sequences, I/O status

- Search filters for operating areas / devices / active or offline devices
- No. of screws tightened, sequences completed, screws OK/NOK, rejects/reset pressed, operating hours, no. total number of incorrect shutdowns
- Detailed display of tightening /untightening results with all parameters of date and time, tightening time and angle, torque, program reference
- The corresponding date/time print, no. of active program on the TPU unit
- Filterable table with the history of operations performed: time period up to 1 year
- All system data can also be filtered according to the desired details, displayed in a summary chart and exported as a CSV file.

REMOTE ASSISTANCE

Assistance to manage your tightening processes? It's simple: just add Fiam as a user in eTensil CLOUD interface platform or alternatively, use an "open" application like such as, for example, TEAMVIEWER for sharing with our Technical Assistance.

Other accessories and services are available upon request



DUST CLEANER: SCREW CLEANER DEVICE

To be used exclusively with the ED S - Silent screw feeder, it is essential for removing dust particles and screw dust in automatic tightening systems. Positioned correctly in the production layout, it can accelerate screw firing times by up to 0.3 seconds.



LED INDICATOR

Provide 3 types of bright, to be connected to control and monitoring units through 1,5 mt long cable included in supply. It allows the immediate feedback of the tightening process status. It can be fixed to the workbench.

Model	For units	Code
Led indicator	TPU-C1	686990039
	TPU-C3	686990039
	TPU 2	686990034
	TPU-M1	686990039



LIGHT TOWER WITH ALARM

3 colour tower-light equipped with a sound device. To be connected to control unit through the supplied cable 3 meters long. It allows immediate verification of the state of the tightening process. With a diameter of 55 mm, it can be fixed to the workbench.

Model	For units	Code
Light tower with alarm	TPU-C1	686990040
	TPU-C3	
	TPU 2	
	TPU-M1	



START-UP AND TESTING SERVICES

Would you like to take advantage of Fiam support for the start-up and testing of the solution directly on your production line? These services include:

- Verification of connections and correct system operating conditions (e.g., bowl rotation and alignment)
- Operator training and basic instructions for initial maintenance procedures
- System start-up and any necessary calibration
- Assistance during the first hour of production

- **Exhaust air conveying hoses:** for MCA systems with air nutrunner motor, they are used to channel and direct away the exhaust air flow
- **Packaging for critical transport:** a wooden crate is available for the transport of tightening systems under critical conditions. Dimensions: 650 x 500 x 715 mm (LxWxH); Weight: 11 kg.

For any further information, the Fiam Technical Assistance Service is at your disposal.

REQUEST A FREE QUOTATION!

When choosing an MCA tightening module with automatic screw feeding, you have to consider:

- **The kind of material to be tightened** (plastic, wood, steel, etc.)
- **Dimensions of the component** to be assembled
- **Tightening torque and speed**, but the most important factor is the screw.

By sending us the details through Data Entry Configurator 4.0, **which you can compile directly on our website**, you will quickly receive a no-obligation "turnkey" solution that will save you time and money!



<https://www.fiamgroup.com/en/request-a-quotation/>

Discover how it works!



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Fiam
PEOPLE AND SOLUTIONS

Fiam Utensili Pneumatici S.p.A.
Viale Crispi 123
36100 Vicenza, Italy
Tel. +39.0444.385000
Fax +39.0444.385002

**Fiam France
Succursale**
73, cours Albert Thomas
69003 Lyon, France
Tel. +39.0444.385000

**Fiam España
Sucursal**
Avenida del Doctor Arce, 14
28002 Madrid - España
Tel. +39.0444.385000

**Fiam Deutschland
Niederlassung**
Kupferstrasse 5
70565 Stuttgart, Deutschland
Tel. +39.0444.385000

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www.fiamgroup.com

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Meet us on:



Tightening automation.
Productivity and ergonomics
within your reach.



CA.
Handheld tightening system
with automatic screw feeding

Fiam[®]
PEOPLE AND SOLUTIONS

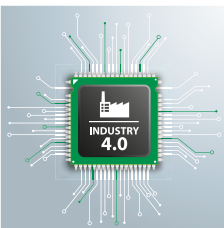
HANDHELD TIGHTENING SYSTEM WITH AUTOMATIC SCREW FEEDING

To save you time and money.

The time needed for tightening becomes more and more essential for increasing productivity: tightening solutions with automatic screw feeding are the correct answer for setting up workstations which strongly increase productivity, allowing a return on the investment in just a short time.

This is why:

- ▶ The **manual phases** involving picking up the screw and positioning it correctly on the workpiece **are eliminated**
- ▶ They are ideal to tighten **large and medium batch of equal screws**
- ▶ They guarantee a continuous supply of **screws which are «shot» automatically** from the feeder
- ▶ **They reduce the tightening cycle times (-35%)** (see example on the next page)
- ▶ They facilitate a recovery of efficiency and **increased productivity**
- ▶ **They guarantee reduced operator fatigue** because they are easy to use and perfectly ergonomic



INDUSTRY 4.0 SOLUTIONS

CA tightening solutions are entirely designed and manufactured by Fiam to **integrate with plant management systems (INDUSTRY 4.0)** and may be eligible for the tax incentives available under current regulations.

Return on investment in a very short time.

With regard to the **return on investment**, here below we describe the example of one of our customers and how the tightening system with automatic screw feeding has modified their production times with tangible benefits.

		HOW IT WAS	→	HOW IT IS NOW
PHASE		OPERATOR TIME (seconds)		OPERATOR TIME (seconds)
1	Component pick-up	1		1
2	Right insert pick-up	0,5		0,5
3	Right insert placement	0,5		0,5
4	Screw 1 pick-up	0,5		0,5
5	Screw positioning on screwdriver	0,5		0,5
6	Component/screwdriver approach	1		1
7	Tightening screw 1 on insert	0,2		0,2
8	Screw 2 pick-up	0,8		0,8
9	Screw positioning on screwdriver	0,5		0,5
10	Component/screwdriver approach	1		1
11	Tightening screw 2 on insert	0,5		0,5
12	Left insert pick-up	1,5		1,5
13	Left insert placement	0,5		0,5
14	Screw 3 pick-up	1		1
15	Screw positioning on screwdriver	0,5		0,5
16	Component/screwdriver approach	1		1
17	Tightening screw 3 on insert	0,5		0,5
18	Screw 4 pick-up	0,5		0,5
19	Screw positioning on screwdriver	0,5		0,5
20	Component/screwdriver approach	0,5		0,5
21	Tightening screw 4 on insert	0,5		0,5
22	Component placement on bench	1		1

15s
TOTAL

→

10,20s
TOTAL

-32%
(4,80 seconds/piece)

With a production of 2,000 pieces per day, the payback in this case is only 98 days: **a return on the investment in a very short time!**

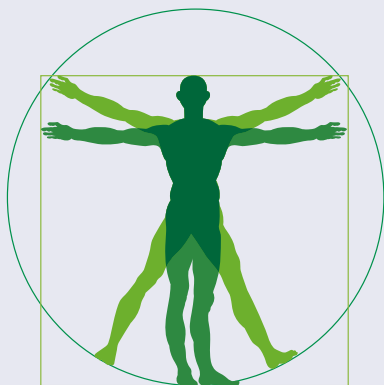
HANDHELD TIGHTENING SYSTEM WITH AUTOMATIC SCREW FEEDING

To work with precision, reliability and great ergonomics.

Together with the high productivity given by the automatic screws feeding that present directly on the tightening point, these latest generation systems allow **precise, reliable and constant assembly**, cycle after cycle in every production sector.

Designed and built entirely by Fiam, they are:

- ▶ available with **pneumatic or electric technology**
- ▶ equipped with **different levels** of tightening parameters (torque / angle / time), to be chosen according to production needs
- ▶ they monitoring assembly cycles with **Poka Yoke systems**
- ▶ characterized by **low weights** thanks to construction materials in light alloys
- ▶ equipped with **several ergonomic features** useful to make the operators' work easy and safe.



ERGONOMIC AIDS FOR THE OPERATOR'S WELL-BEING

CA handheld tightening systems are designed to be combined with effective ergonomic aids which, in addition to preserving operator from **physical fatigue** are also useful for **reducing mental and organizational fatigue** by acting on factors such as:

- Reduction of the continuous supervision of the machine
- Facilitated management of operating flows that are increasingly varied
- Facilitation to work organization
- Immediate access to various operational information

Low noise level

The systems are very quiet especially with electric automatic screwdrivers.

Easy and fast clutch adjustment

In pneumatic and electric eTensil automatic screwdrivers, to increase or decrease tightening torque you can adjust from the outside and therefore without intervening inside the screwdriver, through a protected access device.

Easy and functional starting system

Fast screw shooting
Thanks to the selector in the closed chamber, there is no dissipation of compressed air and excellent reliability of screw feeding is guaranteed.

No jamming

Blade exit synchronized with screw shooting through tightening cycle set and managed by the PLC: no jamming and continuous work cycles.

Pistol grip

For vertical tightening points, is equipped with "multi-position" suspension device to facilitate the best tool balance.

High-precision mechanics and modularity

The careful design ensures the reduction to a minimum of the torque dispersion transmitted by the motor and the modular structure, allows fast maintenance interventions and a reduction of components.
For an increasingly advantageous T.C.O.

Programmable screw recall

Functionality managed by the PLC located in the screw feeder. Through a dedicated command the customer is free to recall the screw as needed of its production process.

Efficient grips

The grip position, close to the tightening point, helps the operator in centering the component to be tightened.

Maximum ergonomics

The hanging ring that eliminates the necessary effort in supporting the tool, the silence of the system, the grip handling and the numerous accessories available for these solutions are only some elements designed to increase ergonomics for operators.



EasyDriver Screw feeders

They manage the entire working cycle with great **flexibility**: they manage tightening sequences quickly and easily, customizing them to the different applications.

The **INTEGRATED PLC** or **PORTABLE**, governs all machine parameters according to the assembly needs.



EasyDriver ED B



EasyDriver ED B 1|1

Page 8



Tightening devices

- **Forward bit stroke** (patented)

- **Telescopic**

To tighten all kinds of screws on any component geometry and with maximum speed and without effort.



TELESCOPIC
DEVICE

Page 18



Type of screwdriver

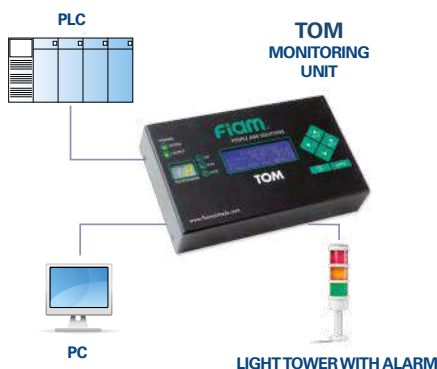
They meet every need in terms of tightening **accuracy**.

Extremely sturdy, Fiam screwdrivers guarantee constant performance for all torque requirements, even when used in heavy duty conditions.

Different torque and torque/angle control systems are available for different applications and types of joint and screw.

PNEUMATIC

$0,4 \div 10 \text{ Nm}$



ELECTRIC

WITH MECHANICAL CLUTCH AND AUTOMATIC SHUT OFF

$0,3 \div 4,5 \text{ Nm}$



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EasyDriver ED B M 1|1



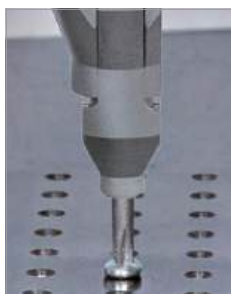
EasyDriver ED B 2|1



EasyDriver ED S - Silent Feeder



FORWARD BIT STROKE
DEVICE



EVEN WITH PISTOL GRIP:



TRIC

TORQUE/ANGLE BY CURRENT
CONTROL

$0,3 \div 10 \text{ Nm}$



+



TPU-C1
CONTROL UNIT



TPU-C3
CONTROL UNIT

ELECTRIC

TORQUE/ANGLE CONTROL
BY BUILT-IN TRANSDUCER
AND RESOLVER

$0,1 \div 5,6 \text{ Nm}$



X-paq

+



CT 2500 A
CONTROL UNIT

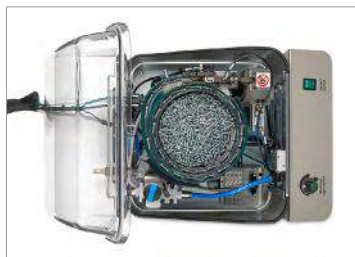


EasyDriver screw feeders

Screw feeding technology: vibrating bowl

High working autonomy

The vibrating bowl of models available, ensure different working autonomies and the vibrator timed system, managed by the PLC, automatically stops screw feeding when not needed thereby reducing the consumption of electricity



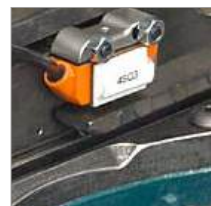
Selector

The high selection speed allows to reach high screw feeding frequencies; the screw shooting in a closed chamber ensures a low noise level and there are no compressed air dissipations and any screw jam is eliminated



No jamming

The 'overload' photocell makes sure no screws get jammed in the selection duct by emitting a jet of air to eliminate excess screws



**INTEGRATED
Siemens
LOGO! PLC
to manage
all machine
parameters**

**MODBUS TCP/IP
integrated**

**EDMI
EasyDriver
Machine
Interface
to connect
remotely**



"Poka yoke" connections

For quick and error-free installations



All clearly visible

Large transparent cover for a good internal view without having to open the machine



Pressure under control

The air treatment unit eliminates condensation and dust present in the compressed air supply. It also regulates max supply pressure. Lubricator is also present in case of use of air screwdrivers

Analogic line pressure switch

Controls the incoming air pressure to ensure the proper functioning of all system functions

For any type of screws

For metric, self-tapping, self-drilling, trilobate screws, with double thread etc ...



Removable structure

In stainless steel and long lasting, it can easily be dismantled for maintenance. Designed to ensure all maintenance operations easy, safe and reliable



External keypad for immediate adjustments

Conveniently positioned: the operator does not have to open the machine to adjust parameters

EasyDriver ED S screw feeders - Silent Feeder

Screw feeding technology: via segment conveyor



High working autonomy

The tank capacity of about 2 liters guarantees high working autonomy. Inside the tank there is an integrated sensor that activates a visual signal on the portable PLC screen of the feeder, which will start flashing when the screws are to be loaded.



No jamming

When activated, the "too full" photocell blocks the tilting blade, interrupting the loading of the screws.

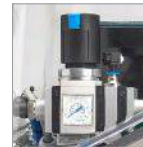
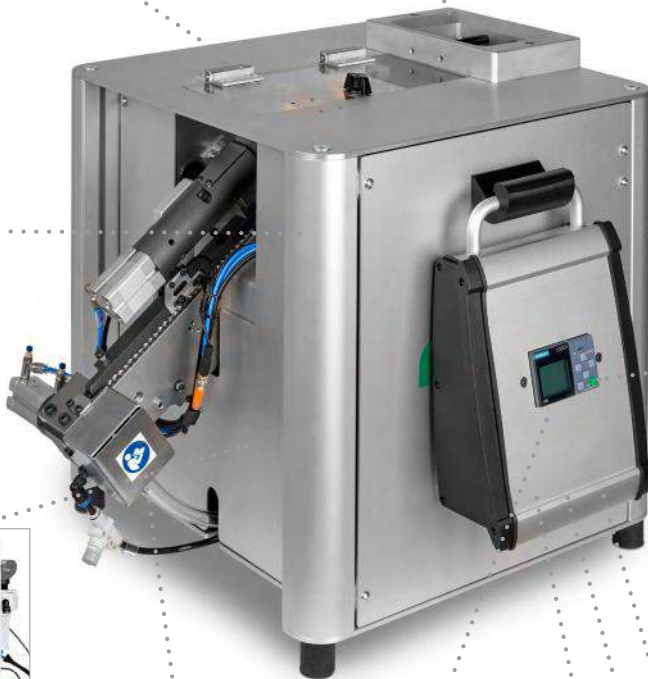


Maximum silence

The screw is fed by the movement of a segment conveyor inside the tank that aligns the screws and sends them towards an inclined rail that acts as an accumulator, exploiting the principle of gravity. The absence of screws vibration therefore guarantees maximum silence.

Guaranteed safety

- Upper door with direct access to the tank for maintenance. Access is only permitted with a key to open it.
- The door is also equipped with a safety sensor that detects its opening, deactivating the tilting blade when it is opened



Pressure under control

The air treatment unit eliminates condensation and dust present in the compressed air supply. It also regulates max supply pressure. Lubricator is also present in case of use of air screwdrivers

External keypad for immediate adjustments

Conveniently positioned: the operator does not have to open the machine to adjust parameters



Accessible structure

Thanks to the two removable side walls, easy access to the systems for maintenance and adjustment of the machine.



Analogic line pressure switch

Controls the incoming air pressure to ensure the proper functioning of all system functions

EDMI
EasyDriver Machine Interface to connect remotely

MODBUS TCP/IP
integrated

INTEGRATED Siemens LOGO! PLC to manage all machine parameters

- **PORTABLE:** positioned externally to be managed remotely via cable. It can be positioned and used in the most suitable location for the needs of the operator or the workstation.
- allows you to set all the machine parameters even remotely and up to 10 meters: an advantageous condition compared to models where the PLC is integrated into the screw feeder, often positioned in difficult to access areas.

Selector

The high selection speed allows to reach high screw feeding frequencies; the screw shooting in a closed chamber ensures a low noise level and there are no compressed air dissipations and any screw jam is eliminated





EasyDriver ED B screw feeder

Feeds screws optimally without jams.

Bowl:	Circular, 240 mm in Ø
Screws:	For screws between 10 and 35 mm in lenght
Key:	1 x 240 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by the PLC of the tightening system or by external PLC.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with hopper module:** 5 or 10 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 40



EasyDriver ED B 1|1 screw feeder

It is used when it is necessary to use screwdrivers with air motors that require larger FRL units and when better sound proofing is required in the work environment.

Bowl:	Circular, 240 mm in Ø
Screws:	For screws between 10 and 35 mm in lenght
Key:	1 1 = 1 x 240 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by the PLC of the tightening system or by external PLC.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with hopper module:** 5 or 10 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 40





EasyDriver ED B M 1|1 screw feeder

Used when the job involves large screws and also in the event of high production rates to allow the system to run unaided for longer.

Bowl:	Circular, 420 mm in Ø
Screws:	For screws between 35 and 60 mm in length
Key:	MAXI 1 1 = 1 x 420 mm Ø bowl feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by the PLC of the tightening system or by external PLC.

Upon request:

- **MAXI structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **MAXI structure complete with hopper module:** 10 or 50 Lt capacity (vibrating hopper), 12 Lt (belt hopper).

For details see pp. 37 - 40



EasyDriver ED B 2|1 screw feeder

With its dual circular bowls, it can process **2 geometrically similar screws**, for example differing in length or made from different materials (e.g. stainless steel / browned steel) to feed a screwdriver (one way).

Screw selection is managed by an input provided specifically for that purpose.

Bowl:	2 circular bowls with 240 mm in Ø
Screws:	For screws between 10 and 35 mm in length
Key:	2 1 = 2 x 240 mm Ø bowls feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by external PLC.

Upon request:

- **Structure to support the feeder** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.

For details see pp. 37 - 40





EasyDriver ED S screw feeder - Silent Feeder

Used as a much quieter alternative to vibrating bowls, is equipped with a segment conveyor that loads, aligns and sends the screws to an inclined rail optimally and without jamming.

Tank:	2 Lt capacity (Approx. 2000 screws M4x16 DIN912 type)
Screws:	• Screw shank L = max 25 mm • Screw head Ø= max 11 mm • Screw shank Ø= min 3 mm - max 5 mm (6 mm to be evaluate depending on application) No wood screws with deep thread and sharp point. No screws with loose or captive washers.
Key:	the tank feeds an air/electric screwdriver

Included:

- **Low level sensor:** device for the bowl feeder indicates when the bowl needs screw reloading. The signal can be managed by the PLC of the tightening system.

Upon request:

- **Basic structure to support the feeder,** equipped with aluminum base plate already prepared with the holes that allow to fix the suitable feeder on it. With aluminum profiles with channels for cables and tube bundles inside the slots positioned under the support surface, is available with support adjustable feet in height even for floor fixing.
- **Basic structure complete with module with hopper equipped with conveyor belt driven by electric motor:** 12 Lt capacity.

For details see pp. 37 - 40



TECHNICAL FEATURES		EASY DRIVER SCREW FEEDERS				
		ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED S
						
Aluminium bowl (qty.)	Ø 240mm (Capacity 1 litre)	1	1	✗	2	✗
	Ø 420mm (Capacity 3 litres)	✗	✗	1	✗	✗
Aluminum tank	Capacity 2 litres	✗	✗	✗	✗	✓
Air - Electric system	FESTO components	✓	✓	✓	✓	✓
Dimensions	Length [mm]	395	600	800	900	623
	Width [mm]	500	530	700	600	512
	Height [mm]	340	430	530	430	470
	Weight [Kg]	36	75	110	105	35
Tube carrying hoses and cables	Length 5 [m]	✓	✓	✓	✓	✓
Filter-Regulator-Lubricator unit complete with built-in pressure gauge	G3/8 (flow rate 20 l/s)	✓	✗	✗	✗	✓
	G1/2 (flow rate 40 l/s)	✗	✓	✓	✓	✓
Air consumption [l/s]	Min.	2	2	2	2	2
	Max.	16	16	16	16	16
Electricity consumption, apparent power [VA] 230V/50Hz 230V/60Hz 110V/60Hz	With air nutrunner motor	180	180	320	360	50
	With eTensil electric nutrunner motor	255	255	400	400	130
	With SD2500 electric nutrunner motor	780	780	920	1560	650
PLC Siemens LOGO! For the flexible and detailed management of the individual features of screw feeder	INTEGRATED	The machine is supplied with the parameters already set according to the cycle of customized tightening and the integrated PLC allows				
		• Setting of the different functions of the combined nutrunner motor • Protection of the various “key” functions with 4 passwords • System configuration • Absolute counts of OK and NOK tightenings • Setting of the minimum threshold of the operating pressure through line pressure switch (minimum)				
	INTEGRATED PORTABLE	✗	✗	✗	✗	✓
Micro SD	Present in the Siemens LOGO! PLC allows to record the main tightening data which are stored at each tightening cycle or at each fault status	✓	✓	✓	✓	✓
LOG DATI By means of a PC-readable SD card	Examples of stored data values : • I/O status • Internal memories • Screw shot time • Fastening time • Machine cycle time • Line pressure • Insufficient line pressure (machine stopped), • Insufficient line pressure (machine in work: tightening)	✓	✓	✓	✓	✓
Test method	To carry out empty tightening cycles that can be set without the need for an external PLC. Useful for machine installation, setting and troubleshooting	✓	✓	✓	✓	✓
It features a Modbus TCP/IP connection to communicate with the Factory management System (Industry 4.0)	Parameter control of: • Screw shooting time • Cycle time • Tightening time • Line pressure Using Network I/O: • Reception, in output, of all the foreseen signals (eg details of anomalies and types of NOK verified) Remote modification of machine operating parameters instead of intervening on-board PLC display	✓	✓	✓	✓	✓
Analogic line pressure switch	For feedback on the inlet air pressure and the definition of the minimum operating pressure Useful for the correct functioning of the following features: • blows from screw overturning and overflow on vibrating bowl • power supply of the connected air tool • forward bit stroke device • screw shooting • preventing the start machine if air feeding conditions are not aligned with those set	✓	✓	✓	✓	✓
EDMI: Web Server Interface (EasyDriver Machine Interface)	• Login password • Remote connections with the main functions of machine PLC with access from PC / Mobile / Tablet • Real-time functionality: - Values Display: Screw shooting time Cycle time - Tightening time The maximum, minimum and average time values can be displayed for them. - Monitoring of exchange I / O signals - Access to diagnostics - Line pressure display - Access to system statistics / counters regarding anomalies and cycles performed - Flowchart showing current activities and main features • Interface language: English	✓	✓	✓	✓	✓

Interconnectivity: a key element for Industry 4.0

Not just tightening reliability, in-process checks and planning for any possible operating situation, but above all **interaction with the plant management systems**.

CA handheld tightening systems can be managed remotely just using freely programmable I/O signals or via the Modbus TCP/IP protocol; they can also **interface with line PLCs and various devices**, interacting for example with:

- Bar Code reader
- Conveyor belt
- Workpiece clamping jig activation/deactivation systems
- Signalling and monitoring mechanisms such as LEDs, part counters, light towers.

Analysis and monitoring KPIs

In addition to checking the production cycle in real time, **data storage** can **provide statistics** to monitor the machine operating cycle, and therefore productivity, and convert this data into analysis KPIs (key performance indicators) to **optimise the tightening process cycle time**.

Built-in PLC

Included in all EasyDriver screw feeders, it manages the numerous available machine parameters and drives the coupled screwdriver.

The **integrated Modbus TCP/IP protocol** provides interconnectivity with the factory system to monitor, for example:

- ▶ the tightening results
- ▶ the screw count/work cycles for triggering maintenance or automatic screw feeder reloading
- ▶ OK sequences, i.e. the correct pre-set tightening sequence
- ▶ in-process management of process faults, e.g. stripped threads, emergencies, fault reset.

The Modbus protocol also offers a “real time” connection with the machine, and consequently remote management of the various feeder parameters.



WITH EDM SERVICE IS IN REAL TIME

The *EDMI WebServer interface* is user-friendly and effective, allowing you to connect your CA tightening system to a PC, mobile or tablet. With access to the main functions of the machine PLC software, you can view the machine performance and monitor its main functions; and service is made easier because the tightening system behaviour can be checked in real time.

Fiam®

PEOPLE AND SOLUTIONS

Name:

Password:

☐ To customized site

☐ Keep me logged on

WEB SITE

FIAM CLOUD

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CONFIGURATIONS

Screw feeding

Inclined screw load channel function: ☐

Level sensor function: ☐

Hopper function: ☐

Automatic shooting function: ☐

Tightening slides

Approaching stroke function: ☐

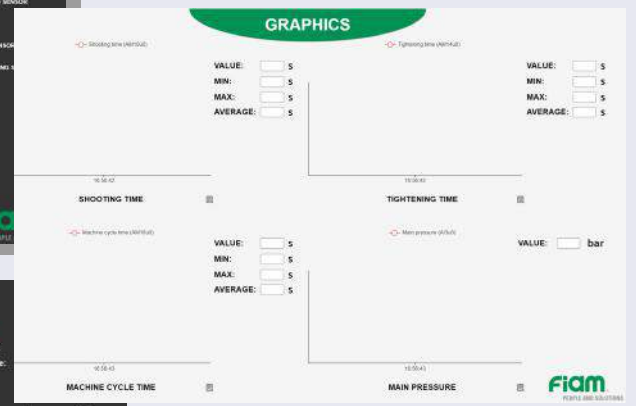
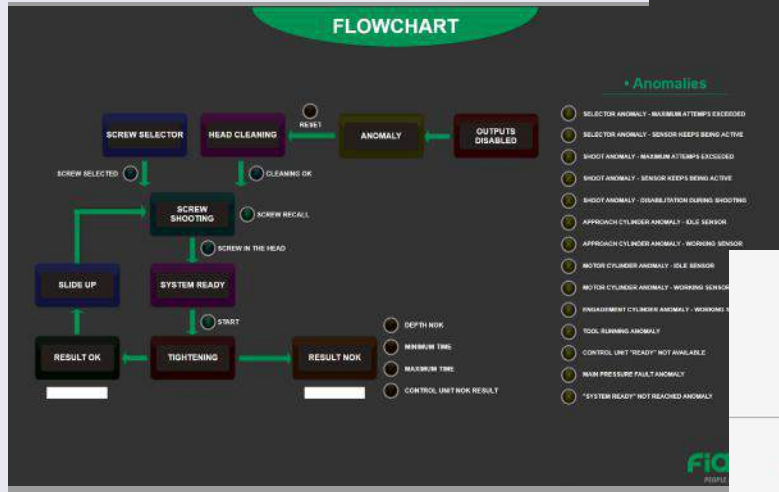
Screw engagement stroke function: ☐

Tightening

Electric motor function: ☐

Only depth tightening function: ☐

Analogic depth sensor function: ☐



PARAMETER SETTING

Vibratory bowl parameters

Bowl vibration time: s

Overload sensor switch-on delay time: s

Overload sensor switch-off delay time: s

Bowl vibration switch-on delay time: s

Overload blow switch-off delay time: s

Overturning blow switch-off delay time: s

Screw advancement activation time: s

Time-out vibrations: s

Screw selection parameters

Maximum screw selection time: s

Time between selection attempts: s

Number of selection attempts: s

Selection start delay time: s

Screw shooting parameters

Maximum screw shooting time: s

Time between shooting attempts: s

Number of shooting attempts: s

Shooting switch-off delay time: s

Tightening slide parameters

Approach cylinder activation delay time: s

Approach cylinder deactivation delay time: s

Motor cylinder activation delay time: s

Rotation activation delay time: s

Shooting activation time (engagement mode): s

Screw engagement time: s

Threshold ON analogic tightening sensor: s

Threshold OFF analogic tightening sensor: s

Tightening result parameters

Minimum tightening time: s

Maximum tightening time: s

Minimum time to reach depth sensor: s

Hopper parameters

Level sensor switch-on delay time: s

Level sensor switch-off delay time: s

I/O DIAGNOSTICS

PLC inputs

I1 ANALOGIC PRESSURE SWITCH ☐

I2 OVERLOAD SENSOR ☐

I3 HEAD SCREW PASSAGE SENSOR ☐

I4 HEAD SCREW PASSAGE SENSOR ☐

I5 APPROACH CYLINDER - IDLE SENSOR ☐

I6 APPROACH CYLINDER - WORKING SENSOR ☐

I7 MOTOR CYLINDER - IDLE SENSOR ☐

I8 MOTOR CYLINDER - WORKING SENSOR ☐

I9 ENGAGEMENT CYLINDER - WORKING SENSOR ☐

I10 TOOL RUNNING ☐

I11 LEVEL SENSOR ☐

I12 OUTPUTS ENABLE ☐

PLC outputs

Q1 TIGHTENING START ☐

Q2 RESET SYSTEM ☐

Q3 SCREW RECALL ☐

Q4 OPTIONAL RESET ☐

Q5 OK RESULT FROM ELECTRIC UNIT ☐

Q6 NOK RESULT FROM ELECTRIC UNIT ☐

Q7 ELECTRIC UNIT READY ☐

Q8 SENSITIVE INPUT ☐

Q9 SENSITIVE INPUT ☐

Q10 SENSITIVE INPUT ☐

Q11 SENSITIVE INPUT ☐

Q12 SENSITIVE INPUT ☐

Q13 SENSITIVE INPUT ☐

ANOMALIES

SELECTOR ANOMALY - MAXIMUM ATTEMPTS EXCEEDED	☐	TOOL RUNNING ANOMALY	☐
SELECTOR ANOMALY - SENSOR KEEPS BEING ACTIVE	☐	CONTROL UNIT "READY" NOT AVAILABLE	☐
SHOOT ANOMALY - MAXIMUM ATTEMPTS EXCEEDED	☐	NOK TIGHTENING - MINIMUM TIME	☐
SHOOT ANOMALY - SENSOR KEEPS BEING ACTIVE	☐	NOK TIGHTENING - MAXIMUM TIME	☐
SHOOT ANOMALY - DISABILITATION DURING SHOOTING	☐	NOK TIGHTENING - DEPTH TIGHTENING NOT ACHIEVED	☐
APPROACH CYLINDER ANOMALY - IDLE SENSOR	☐	NOK TIGHTENING - NOK RESULT FROM CONTROL UNIT	☐
APPROACH CYLINDER ANOMALY - WORKING SENSOR	☐	MAIN PRESSURE FAULT ANOMALY	☐
MOTOR CYLINDER ANOMALY - IDLE SENSOR	☐	MAIN PRESSURE FAULT DURING TIGHTENING	☐
MOTOR CYLINDER ANOMALY - WORKING SENSOR	☐	"SYSTEM READY" NOT REACHED ANOMALY	☐
ENGAGEMENT CYLINDER ANOMALY - WORKING SENSOR	☐	PLC OUTPUTS DISABLED	☐

FORWARD BIT STROKE

The patented forward bit stroke, designed and manufactured by Fiam, is available for all air and electric screwdrivers and it provides **automatic bit ejection** during tightening.

Wide range of stroke of the blade

Tightening strokes can be chosen within the wide range of 100 mm and allow you to tighteng anywhere, even in very limited spaces, close to sidewalls or inside small diameter holes or very deep holes.

Reduced fatigue

Automatic bit ejection replaces operator's physical force to tighten and operation becomes even more ergonomic if the screwdriver is combined with Cartesian arm that counteracts the axial bit thrust.

Components are not damaged

The bit, in addition to always leaving the screw tip is in sight, during the tightening phase, the head of the screwdriver does not touch the component surfaces, thereby avoiding any friction.

No screws loss

The screw is held by the doors and the bit while the screw shank always remains "visible", this allows the operator to easily center the tightening point and work quickly and safely. This mechanical system ensures the screw is held perfectly every time by jaws and prevents loss of screws during work or worse inside components.

Automatic contrast on the blade

The thrust of over 25 kg exerted by the blade ensures reliable tightening on any type of joint and allows to work without the bit moving backs, even for example in the case of self-drilling screws.

Effortless starting

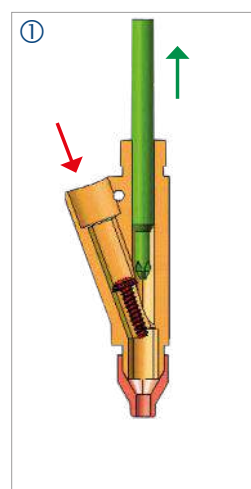
The lever start, with a new generation electronic sensor, durable and reliable over time, requires a single pressure of the lever to start the tightening and a "double click" for the possible screw recall.

Quick release

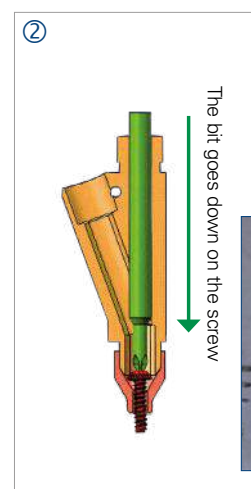
The sturdy quick relase chuck ensures stability and the easy and quick engagement of the bit takes place without having to disassemble the entire device.

Smart design

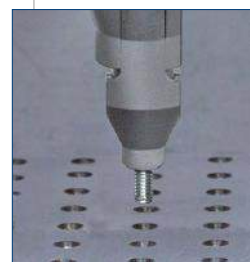
The modular construction and the reduced number of components facilitate maintenance interventions. There is also a screw passage sensor that allows better monitoring of the tightening process.



SCREW LOADING:
automatic screw feed



TOOL READY:
the tool always leaves
the screw visible



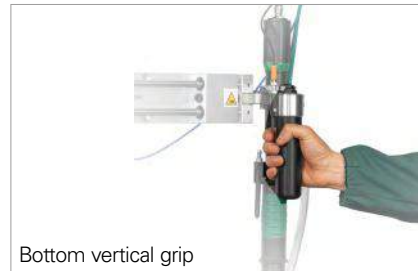
The versatility of the auxiliary grip to use with Cartesian arms: one handle, 3 different positions



Horizontal grip



Upper vertical grip



Bottom vertical grip

If you use the screwdriver with a Cartesian arm or one of the numerous ergonomic accessories available, you get:

- ▶ **No effort in supporting** the screwdriver and in making the tightening
- ▶ **Smooth movements**
- ▶ Keeping the **wrist in an ergonomic** position at all times
- ▶ **Automatic contrast to the thrust** caused by the tool blade: the force is discharged onto the mechanical arm e not on that of the operator!

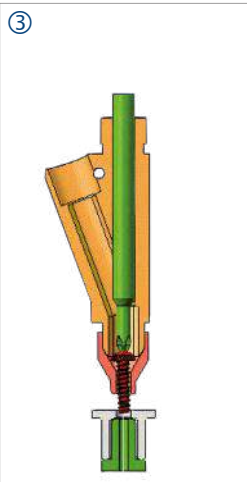
Find out how it works in the video and on p. 32 all features.



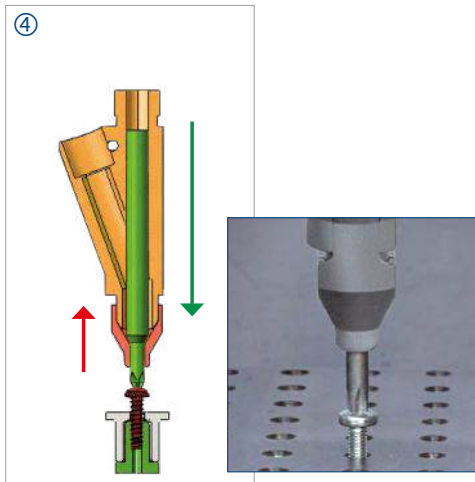
ZERO FATIGUE!



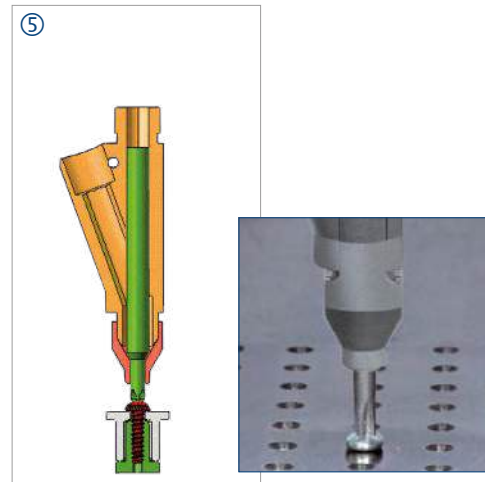
BC CARTESIAN ARM



WITH SCREW VISIBLE: tightening starts, positioning is easier because the screw is visible



TIGHTENING: press the lever, the bit tightens, the screwdriver head moves away and **never** touches the surface



END OF TIGHTENING: the screw is tightened

2

Tightening devices

TELESCOPIC

This device, which can be used on pneumatic and electric auto feed screwdrivers, allows to reach tightening points in inaccessible spaces or at great depths and therefore to **tighten also inside holes thanks to its telescopic stroke of 40, 60 and 100 mm.**

Its main features are:

Tightening without fatigue

The **straight and pistol grips** provide for push or push button starting system depending on the working needs and the great smoothness of telescopic shaft allows to tighten in any operational layout.

For perfectly ergonomic station work, you can use it with Cartesian arms, articulated Cartesian arms as well as the assisted one equipped with positioning device (discover them on pages 32 and 33).

Working with 2 tightening modes:

- **with torque control**
- **with tightening height control**

There are two built-in sensors that allow for the great operational versatility.

- **The first rest sensor:** always active, monitoring the head's stroke, it does not allow the screw to be called while tightening is still in progress. **The cycle stops when the set tightening torque is reached.**
- **The second depth control sensor:** allows the cycle to be stopped once **screw height reaches the preset height** above the surface the screw retaining head is resting on.





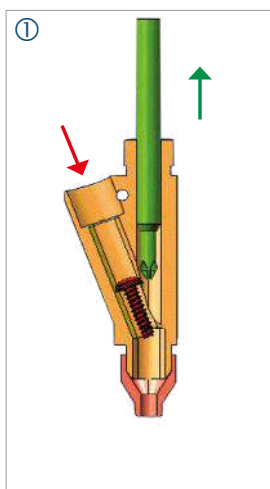
While the first sensor is always active, the second one can be activated directly from the PLC keypad of the Easy Driver screw feeder.

In this case, the motor is not stopped by the automatic and instantaneous torque control system, but by the sensor that cuts off the power to the motor when the tightening height is reached.

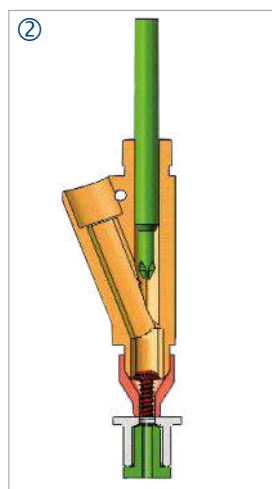
The sensor must be adjusted to the tightening height to advance or retard the motor cut out.



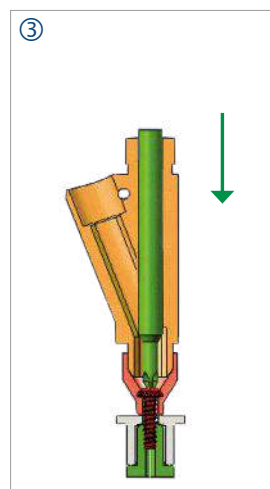
HERE'S HOW IT WORKS!



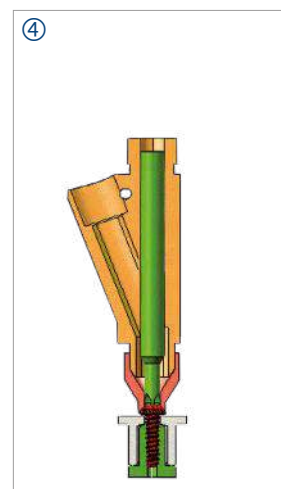
① SCREW LOADING:
automatic screw feed



② TOOL CONTACT:
the jaws of the screwdriver
head touch the surface



③ TIGHTENING:
Push start system, the bit
goes down and tightens



④ END OF TIGHTENING:
The screw is tightened,
the jaws always remain in
contact with the surface



Type of screwdriver

The motorization technologies that can be used with CA handheld tightening systems are numerous and to be chosen according to the application, the type of joint and screw, the production layout and the type of production rates required and also the level of monitoring and control that you want to have on the production cycle.

Those available are:

- | | |
|--|---|
| • Air auto feed screwdrivers | torque control by mechanical clutch |
| • eTensil electric auto feed screwdrivers | torque control by mechanical clutch |
| • eTensil electric auto feed screwdrivers | torque/angle by current control |
| • X-PAQ electric auto feed screwdrivers | torque/angle control by built-in transducer and resolver |

AIR AUTO FEED SCREWDRIVERS

They are able to tighten correctly at every level of need and their sturdiness ensures constant performance over time, for torques up to 10 Nm even in heavy duty conditions and at low supply pressures.

Air auto feed screwdrivers have a mechanical clutch for torque control which automatically and instantly stops the supply air and guarantees **high torque repeatability** and low **Mean Shift, even when joint elasticity changes**.

This system makes it possible to keep torque values unaltered for hundreds of thousands of cycles and reduces the reaction to the operator's hand. Thanks to careful study of the internal gears, the vibration levels are below 2,5 m/s².



Clutch adjustment is easy as well fast and can be done from the outside through an access slot protected by a band device.

Screwdrivers are also equipped with a device for picking up the pneumatic signal to use Poka Yoke production cycle monitoring systems, for example with the TOM unit (see Accessories available upon request on page 36).

Features of the combinable monitoring unit (upon request)

TOM - Monitoring unit

DOUBLE DISPLAY VISUALIZATIONS

- OK / END OF CYCLE / NOK
- No. Program in use
- No. of set sequence
- No. of screws to be tightened
- No. of screws tightened on the total

- 1 sequence of 8 programs
- 99 tighten for each program
- Work cycle stop case of error

ACOUSTIC SIGNALS

- Screw ok
- Program end
- Error
- Sequence end

For an in-depth study of the different features offered by the unit, consult the online [catalog 99](#).

• Language selection (IT, EN, ES, DE, FR)

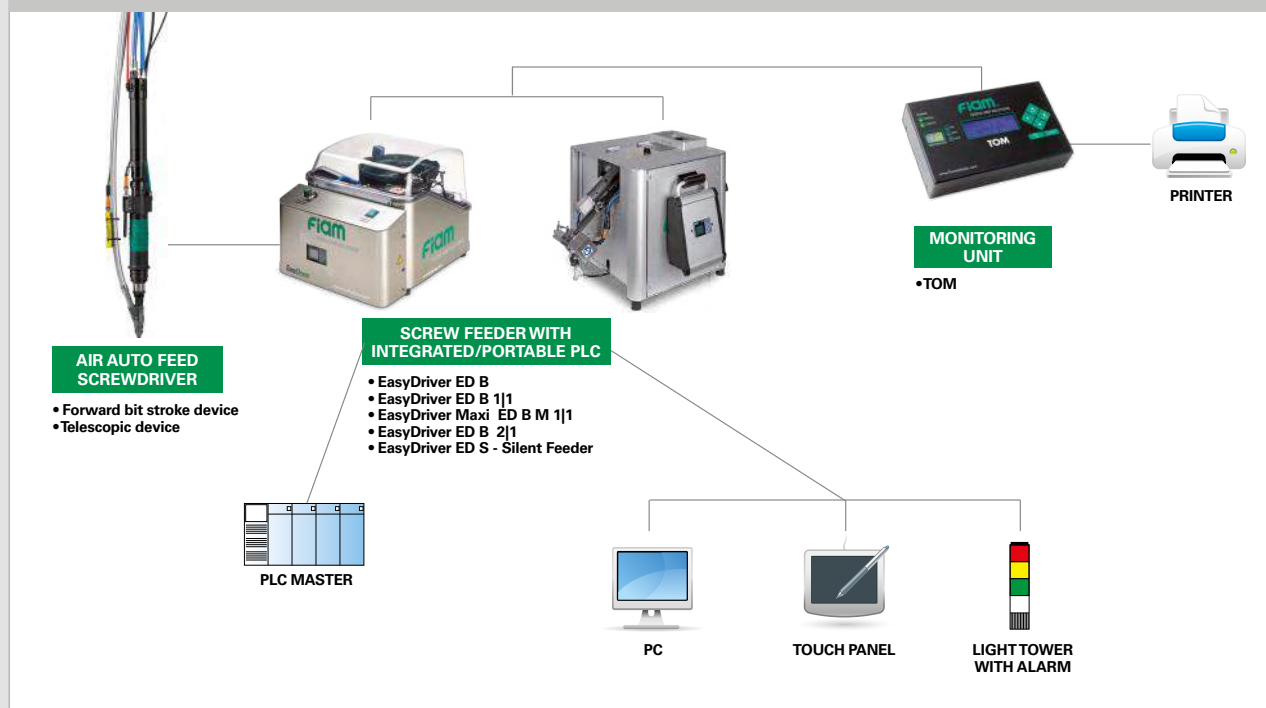
• I/O 20 + 24

- Statistical memory and print of tightening outcomes
- Memory up to 6.000.000 screws (pieces OK, wrong screws, Reset pressed, total screws)
- Tool functionality test
- RS 232 port for printing results
- Supplied with power supply

The features shown are those **expressed by the unit when matched with CA handheld tightening system.**

For more information, [Fiam Technical Assistance Service](#) is at your disposal.

CA HANDHELD TIGHTENING SYSTEM CONFIGURATION WITH AIR SCREWDRIVER



eTensil ELECTRIC AUTO FEED SCREWDRIVERS WITH MECHANICAL CLUTCH

The innovative auto feed screwdrivers eTensil ensure **high levels of performance and reliability with maximum safety** given their low voltage operation and perfect thermal insulation.

They stand out for:

- ▶ **Torque control with mechanical clutch and automatic shut off.** This ensures **high repeatability** – in other words a low Mean Shift value – **even when faced with a variable joint softness level** as well as to manage low torque
- ▶ Cutting-edge brushless technology in terms of performance stability: **the high-precision mechanics and the absence of brushes ensure limited maintenance and absence of dust in the workplace**
- ▶ **Modular construction and constructive strength, designed to last and guarantee safe** and efficient servicing
- ▶ Combination with power supply or monitoring units which, in addition to providing the correct power supply parameters, integrate numerous programming functions and accurate monitoring of each phase of tightening process
- ▶ High silence and safety.

eTensil
Fiam Electric Tightening Solutions



eTensil screwdrivers, nutrunner motors and control units, are covered by an extended warranty of 24 months or 1.000.000 cycles (first goal achieved).



Units features

It is possible to combine TPU 2 power supply unit or TPU-M1 monitoring unit which is able not only to supply the tools with the correct power supply but also to **monitor and manage all tool functions thanks to the large number of functions available** and programmable, such as detecting process anomalies such as threads or screws already tightened.

TPU-2 - POWER SUPPLY UNIT

- 5 "opto-isolated" signals in input and 5 in output
- Correct functioning LED
- Clutch shut off LED
- Anomalies / emergencies LED
- Two rotation speeds: LOW / HIGH

TPU-M1- MONITORING UNIT

- 8 programs to control tightening process
- 1 programmable sequence up to a max of 8 steps
- Screw counter - Poka Yoke system
- OK / NOK: tightening result displayed
- Min / Max tightening time control - Poka Yoke system
- Serial communication (RS232)
- Language selection (IT, EN, DE, FR, ES)
- Log of the last 99 tightenings
- Programmable I/O
- Selection of programs from I / O (remotely)
- Min / Max tightening angle control - Poka Yoke system

SMART PRO EVO PROGRAMMING

- Soft Start - acceleration ramp
- Settable rotation speed

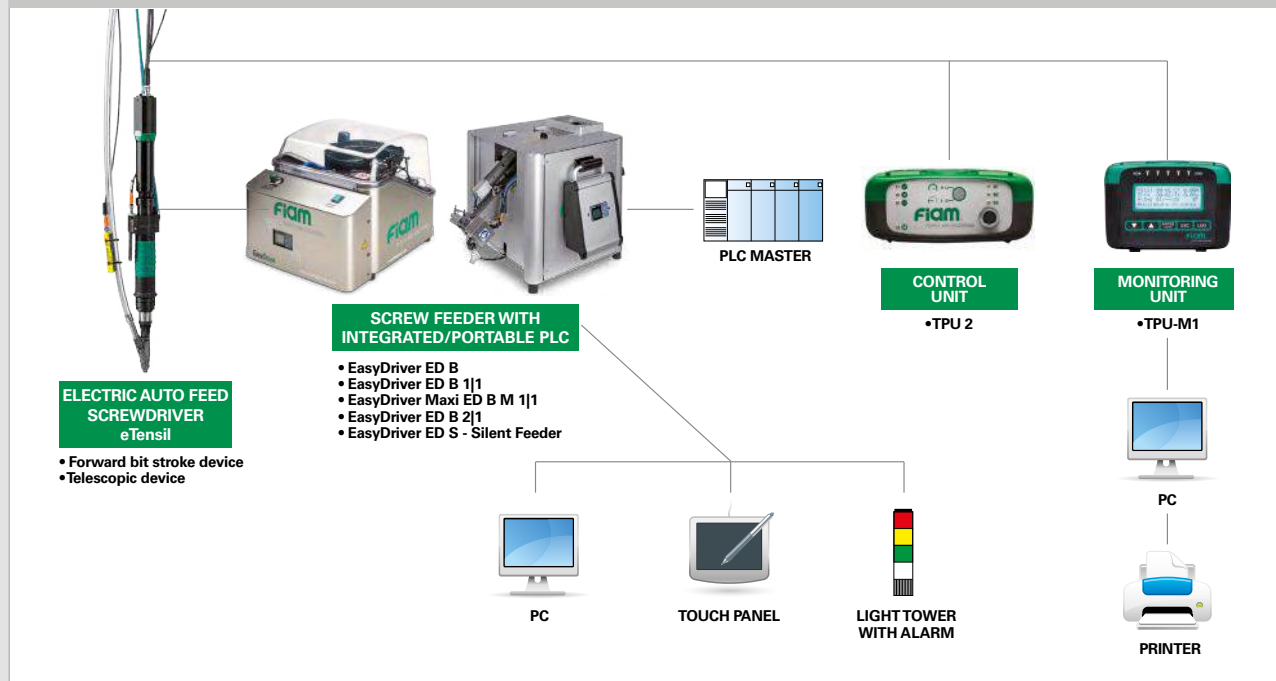
TIGHTENING STRATEGIES

- Torque control with mechanical clutch
- Torque control with mechanical clutch and tightening time monitoring
- Time control (Stop-by-time tightening)
- Angle control and tightening time monitoring

For an in-depth study of the different features offered by the units, consult the online [catalog 105](#).

The features shown are those **expressed by the units when matched with CA handheld tightening system**.
For more information, [Fiam Technical Assistance Service](#) is at your disposal.

CA HANDHELD TIGHTENING SYSTEM CONFIGURATION WITH eTensil ELECTRIC SCREWDRIVER WITH MECHANICAL CLUTCH



eTensil ELECTRIC AUTO FEED SCREWDRIVERS WITH TORQUE/ANGLE CURRENT CONTROL

The innovative control system that distinguishes these brushless electric auto feed screwdrivers is in great demand in assembly lines where components to be assembled include several variants are processed which imply, with the different geometries and different types of screws, extreme operational flexibility.

Great production flexibility

With these screwdrivers **various assemblies are possible with different parameters of torque, speed, etc. and therefore they can be used for different applications:** the same tightening system can tighten the same screw on different joints by simply adapting the programs on the machined unit. A considerable advantage in terms of investment costs.

These are their main features:

- ▶ The **torque** is detected by measuring the current used by the motor while the **angle** is detected through integrated Hall sensors
- ▶ Cutting-edge brushless technology in terms of performance stability: **the high-precision mechanics and the absence of brushes ensure limited maintenance and absence of dust in the workplace**
- ▶ **Modular construction and constructive strength, designed to last and guarantee safe and efficient servicing**
- ▶ Combination with control units that allow **controls, monitoring, analysis, diagnostics e real-time scheduling** of production process and **eliminate post-process controls.**

eTensil
Fiam Electric Tightening Solutions



eTensil screwdrivers, nutrunner motors and control units, are covered by an extended warranty of 24 months or 1.000.000 cycles (first goal achieved).



Units features

TPU-C1 - CONTROL UNIT

- 1 program to control tightening process
- Automatic recognition of the tool and configuration
- Screw counter - Poka Yoke system
- OK / NOK and torque value display in Nm or other unit of measurement
- "Smart Thread" function
- "Smart Speed" function
- Min / Max tightening time control - Poka Yoke system
- 2 levels password: to protect the set parameters or totally block the system
- Unit calibration
- Available measurement units Nm / Lb / In. / Kgf.cm
- Serial communication (RS232)
- Language selection (IT, EN, DE, FR, ES)
- Log of the last 99 tightenings
- Interfacing with working stations
- Programmable I/O

SMART PRO EVO PROGRAMMING

- Soft Start - acceleration ramp
- Settable rotation speed

TIGHTENING STRATEGIES

- Torque control
- Torque control with tightening time monitoring

TPU-C3 - CONTROL UNIT

- 8 programs to control the tightening process
- 1 programmable sequence up to a max of 8 steps
- Automatic recognition of the tool and configuration
- Screw counter - Poka Yoke system
- OK/NOK and torque value display in Nm or other unit of measurement
- "Smart Thread" function and "Smart Speed" function
- Min / Max tightening time control - Poka Yoke system
- 2 levels password: to protect the set parameters or totally block the system
- Unit calibration • Language selection (IT, EN, DE, FR, ES)
- Available measurement units Nm / Lb / In. / Kgf.cm
- Serial communication (RS232)
- Log of the last 99 tightenings
- Interfacing with working stations
- Programmable I/O
- Selection of programs from I / O (remotely)
- Min / Max tightening angle control - Poka Yoke system

SMART PRO EVO PROGRAMMING

- Soft Start - acceleration ramp
- Settable rotation speed

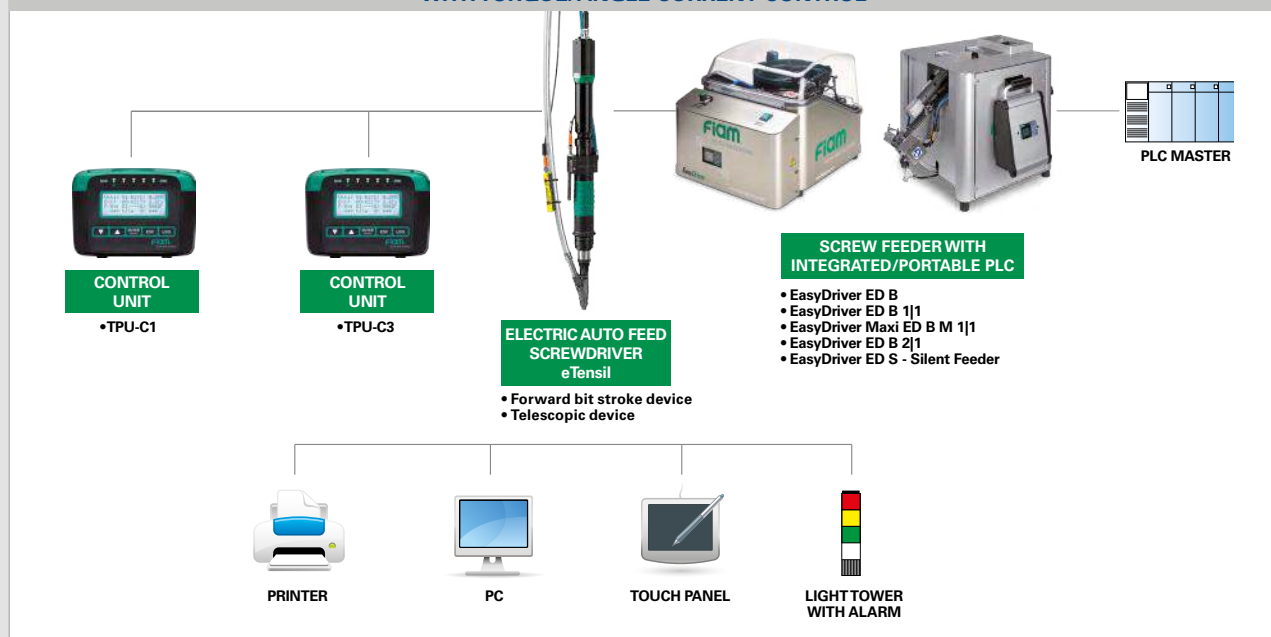
TIGHTENING STRATEGIES

- Torque control
- Torque control with tightening time monitoring
- Torque control with tightening angle monitoring
- Torque control with time and tightening angle monitoring
- Angle control and torque monitoring
- Time control and torque monitoring (Stop-by-time tightening)

For an in-depth study of the different features offered by the units, consult the online [catalog 106](#).

The features shown are those **expressed by the units when matched with CA handheld tightening system**.
For more information, [Fiam Technical Assistance Service](#) is at your disposal.

CA HANDHELD TIGHTENING SYSTEM CONFIGURATION WITH eTensil ELECTRIC SCREWDRIVER WITH TORQUE/ANGLE CURRENT CONTROL



X-PAQ ELECTRIC AUTO FEED SCREWDRIVERS WITH TORQUE/ANGLE CONTROL BY BUILT-IN TRANSDUCER AND RESOLVER

The high technology offered by X-PAQ electric auto feed screwdrivers fulfills every need in terms of accuracy and precision of tightening. They represent a versatile investment as well as beneficial as each system **can be programmed to perform various assembly operations** with different torque, speed, etc. parameters **so it can be used for several applications**. A conversion which ensures a considerable advantage in terms of investment costs.

Very light and silent, they tighten with perfect control over the tightening process, resulting in high finished product quality.

They are equipped with:

- ▶ **Built-in torque transducer and resolver** to ensure high resolution torque/angle parameter measurements
- ▶ **Indicator LED** to check the result of the tightening cycle directly on the tool.
 - ✓ OK (green)
 - ✓ NOK (red): when the maximum value set for the parameter (torque or angle) has been exceeded
 - ✓ NOK (yellow): when the minimum value set for the parameter (torque or angle) has not been reached
- ▶ Latest generation **brushless technology**
- ▶ **Innovative control unit** that combines the power supply (voltage, current, etc. parameters) and programming functions, with accurate control of each step of the assembly process
- ▶ **Traceability** of all assembly job data.



Units features

CT2500A - CONTROL UNIT

- Quick programming on color touch screen
- Fully displays the tightening process: parameters and strategies
- Graphic display of the tightening
- Instantaneously controls the tightening torque and angle, and indicates the outcome by colouring the whole display
- 32 pre-settable "tasks" that can be recalled
- 8 programs available for each task, within which it is possible to set 3 different tightening strategies available (torque control, torque control-angle, monitoring, angle control-torque monitoring) and setting of the other tightening cycle parameters
- Screw counter
- Controls tightening sequences
- Exports tightening result files /tasks /tightening graphs
- Programmable I/O (input/output) for process control and remote commands
- DEDICATED INTERFACE DEVICE designed to communicate with the screw feeder and the exterior
- Automatic recognition of the tool and parameters
- Password protection for three different users
- High internal memory. All tightening stored are downloadable
- Display of the last 100 cycles performed

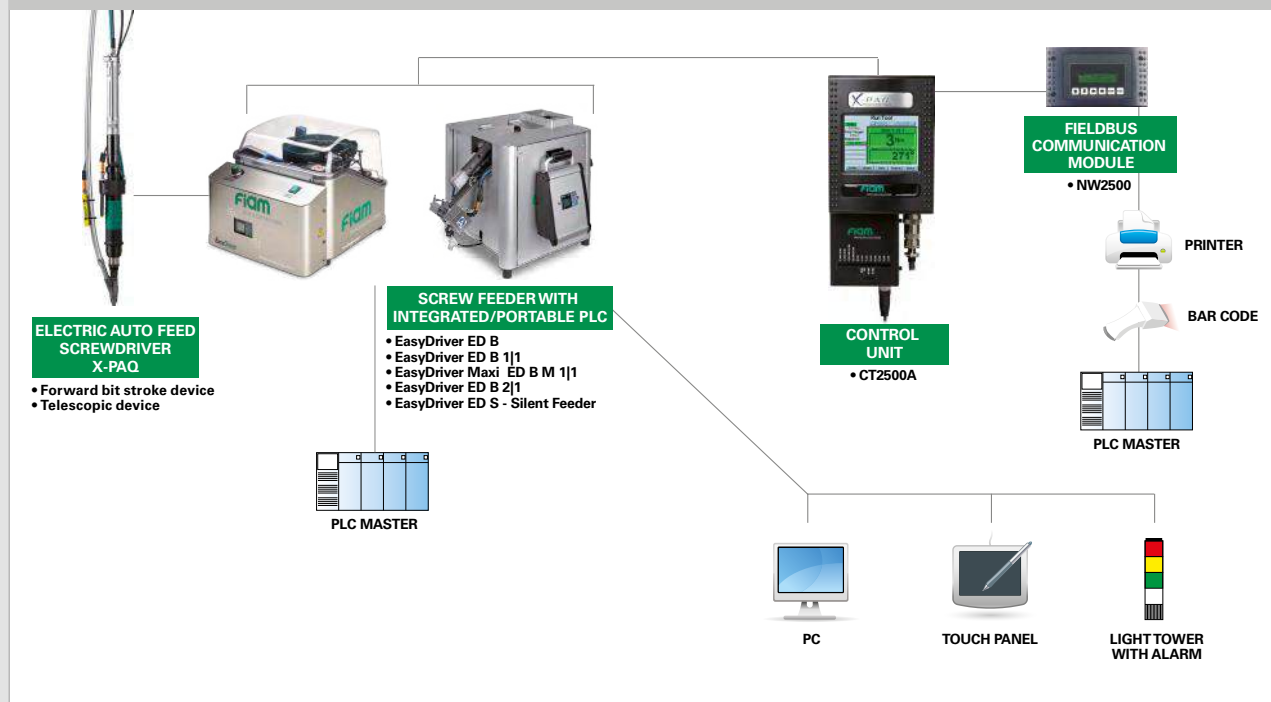
NW2500 - Combinable module (upon request)

- Module to interface the system with printers, PLCs and PCs via RS232 serial port or Ethernet port with communications protocols ACOP, Ethernet IP, ToolsNet and Profinet
- Allows the 32 programs available in the CT2500 unit to be recalled in sequence
- 99 programs/sequence

For an in-depth study of the different features offered by the units, consult the online [catalog 104](#).

The features shown are those **expressed by the unit when matched with CA handheld tightening system.**
For more information, [Fiam Technical Assistance Service](#) is at your disposal.

CA HANDHELD TIGHTENING SYSTEM CONFIGURATION WITH X-PAQ ELECTRIC SCREWDRIVER WITH TORQUE/ANGLE CONTROL BY BUILT-IN TRANSDUCER AND RESOLVER



Heads that make the difference!

The screw retaining heads (nose piece) **hold the screw coming from the feeder and guide it correctly and safely** to allow the bit to go down and tighten on the component.

They are the result of lengthy experience and, being a fundamental element for high quality tightening, are designed and manufactured entirely by Fiam.

The benefits:

- ▶ **an excellent screw hold**
- ▶ **perfect control of the screw on the tightening point**
- ▶ **any depth can be reached**
- ▶ **quick and easy assembly and disassembly**

High resistance to breaking and wearing:

they are built with highest quality materials through precise and accurate machining together with the treatments

Safe and reliable screw holding:

heads are equipped with jaws which are opening to release the screw when the bit starts tightening the screw on the component. They can be of different types, depending on the screw or dimensions of the component to be tightened



Examples of special heads with friction jaws to access to deep tightening points, behind shoulders or for entering very narrow holes.

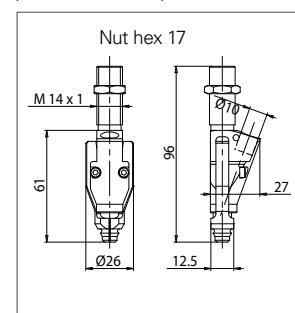
For all types of screw:

the heads have 3 different sizes to take all the various screw types on the market and additionally they can always be customised

EVERY SCREW HAS ITS SIZE

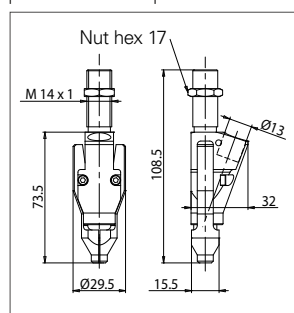
TTV - P

Ø screw head (mm)	L Total length of the screw (mm)
4,5 ÷ 7,0	max 25



TTV - G

Ø screw head (mm)	L Total length of the screw (mm)
7,1 ÷ 10,0	max 35





SOME OF THE MODELS AVAILABLE



WITH ANTI-OVERTURNING DEVICE

when you have screws with screw length / head diameter, between 1.1 (approx) and 1.5, to avoid the screw jamming



WITH FRICTION JAWS

that hold the screw on the head and not on the stem: no opening to allow the head to insert, without further encumbrances, even inside holes and deep tightening points



FOR BIG SCREWS

to tighten screws up to 45 mm length



WITH HOSE

to reach deep tightening points or inside holes

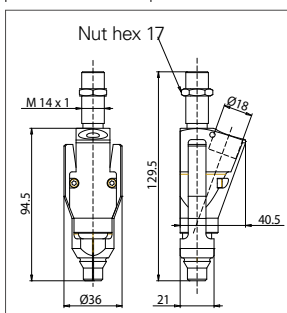


WITH SUPPORTS OR WITH SPECIAL MATERIALS

to facilitate safe and easy positioning. Special materials and geometries are designed not to damage the components during assembly

TTV - M

Ø screw head (mm)	L Total length of the screw (mm)
10,1 ÷ 13,5	max 35



See how it works in the video!



WITH ELASTIC HOSE AND MECHANICAL SCREW GRIPPING

the hose not only holds the screw perfectly on the head but it rotates together with the screw during tightening. Ideal situation not only for embedded tightening points but also as a substitute for screw suction systems that can become inefficient in the case of assemblies on materials that create dust during tightening

CA WITH AUTO FEED SCREWDRIVERS WITH FORWARD BIT STROKE DEVICE

TYPE OF SCREWDRIVER Technology	Model	Tightening torque range of nutrunner motor, on soft joint		Idle speed	Grip	Reversibility	Air consumption	Type of matched control unit
		Nm	in lb		Tipo	Tipo	l/s	
PNEUMATIC SCREWDRIVERS torque control by mechanical clutch	CA ... D AA	0,4÷12	3,5÷106,2	500 ÷ 2700			5÷9	-
	CA ... PA AA							
ELECTRIC SCREWDRIVERS "eTensil" torque control by mechanical clutch	CA E8MC D AA U2/M1...	0,3÷4,5	2,6÷39,8	285÷2000*			5÷9	TPU2 /TPU-M1
	CA E8MC PA AA U2/M1...							
ELECTRIC SCREWDRIVERS "eTensil" torque/angle by current control	CA E8MCC D AA C1/C3...	0,3÷10	2,6÷88,5	30÷2000**			-	TPU-C1 /TPU-C3
	CA E8MCC PA AA C1/C3 ...							
ELECTRIC SCREWDRIVERS "X-paq" torque/angle control by built-in transducer and resolver	CA SD2500 D AA CT ...	0,1÷5,6	1÷50	500÷1700			-	CT2500A
	CA SD2500 PA AA CT ...							

Values to be considered reduced by 20% if used screw feeder EasyDriver ED B

CA WITH AUTO FEED SCREWDRIVERS WITH TELESCOPIC DEVICE

TYPE OF SCREWDRIVER Technology	Model	Tightening torque range of nutrunner motor, on soft joint		Idle speed	Grip	Reversibility	Air consumption	Type of matched control unit
		Nm	in lb		Type	Type	l/s	
PNEUMATIC SCREWDRIVERS torque control by mechanical clutch	CA 20MC D TE ...	0,4÷12	3,5÷106,2	650 ÷ 2700			5÷9	-
	CA 20MC PA TE ...							
	CA MCSE D TE ...	0,3÷4,5	2,6÷39,8	500 ÷ 2500			5÷9	-
	CA MCSE PA TE ...							
	CA MCY D TE ...	0,3÷7	2,6÷62	550 ÷ 800			5÷9	-
	CA MCY PA TE ...							
	CA 15C P TE ...	0,4÷12	1÷50	650 ÷ 2200			5÷9	-
	CA 26C P TE ...							
ELECTRIC SCREWDRIVERS "eTensil" torque control by mechanical clutch	CA E8MC D TE U2/M1 ...	0,3÷4,5	2,6÷39,8	285÷2000*			-	TPU2 /TPU-M1
	CA E8MC PA TE U2/M1 ...							
ELECTRIC SCREWDRIVERS "eTensil" torque/angle by current control	CA E8MCC D TE C1/C3 ...	0,3÷10	2,6÷88,5	30÷2000**			-	TPU-C1 /TPU-C3
	CA E8MCC PA TE C1/C3 ...							
ELECTRIC SCREWDRIVERS "X-paq" torque/angle control by built-in transducer and resolver	CA SD2500 D TE CT ...	0,1÷5,6	1÷50	500÷1700			-	CT2500A
	CA SD2500 PA TE CT ...							

Values to be considered reduced by 20% if used screw feeder EasyDriver ED B

Key:

Tightening system	CA
Type of screwdriver	20MC Pneumatic technology MCSE Pneumatic technology MCY Pneumatic technology 15C Pneumatic technology 26C Pneumatic technology E8MC Electric technology eTensil E8MCC Electric technology eTensil SD2500 Electric technology X-paq
Type of grip	D Straight P Pistol PA Forward pistol
Tightening device	AA Forward bit stroke device TE Telescopic device
Type of control units	TM = TOM – Monitoring unit U2 = TPU 2 – Power supply unit eTensil M1 = TPU-M1 - Monitoring unit eTensil C1 = TPU-C1 - Control unit eTensil C3 = TPU-C3 - Control unit eTensil CT = CT2500A - Control unit X-paq
Type of screw feeder	B = Easy Driver ED B B11 = Easy Driver ED B 1 1 BM11 = Easy Driver ED B M 1 1 B21 = Easy Driver ED B 2 1 S = EasyDriver ED S

Air inlet: 1/4" gas
 Recommended air passage: ø 8 mm
 Accessories drive: 

TOM monitoring unit: see page 21
 TPU 2 power supply unit: see page 23
 TPU-M1 monitoring unit: see page 23

TPU-C1 e TPU-C3 control units: see page 25
 CT2500A control unit: see page 27

* For eTensil solutions with mechanical clutch, tool speed range varies according to the unit used:
 - with **TPU 2**, LOW speed is approximately 80% of the maximum speed specified in the table, and can only be set with the LOW/HIGH button
 - with **TPU-M1**, the speed is adjustable and the minimum speed value is equal to 50% of the max speed, as indicated in the table.
 For torques and speeds other than those indicated, contact **Fiam Technical Consultancy Service**

** eTensil screwdrivers with torque/angle current control, are supplied with a working speed equal to 25% of the nominal one to guarantee tightening quality and precision.
 In order to obtain the nominal torque and speed range, it is necessary to set parameters following the instructions given in Use and Maintenance Manual.
 For any further information, contact the Fiam Technical Service.

Standard equipment

- **EasyDriver feeder**
- **With air auto feed screwdrivers:**
 - Clutch adjustment key
 - Clutch spring
- **With eTensil auto feed screwdrivers:**
 - Power supply unit/control unit with connection cables
 - Clutch adjustment key (for models with mechanical clutch)
- **With electric auto feed screwdrivers (X-paq):**
 - Control Unit
 - Kit of cables
 - Test certificate
 - **For ED S screw feeder:** the portable PLC is equipped with a 3 m long cable. On request: 10 m cable
 - **Ethernet connection cable**
 - **Screw-retaining head** customized for the screw, completed with bush
 - **4 tightening bits** (1 fitted + 3 spares)
- **Extension for spare blade**
- **Screw shooting hose**
- **Shielded screw transit sensor** (only for screwdrivers with forward bit stroke device)
- **Hanging ring**
- **Collar bracket** to clamp the tool on Reaction Arms
- **Operation and maintenance manual**
- **Eco-friendly packaging**
 Dimensions mm: L 600 x 450 x h 520

Models available upon request

- **Models equipped with rotating piston device:** for tightening on flat surfaces with particular encumbrances and with the screw visible
- **Models with screw heads** different from those shown in the catalogue, all customised depending on the component

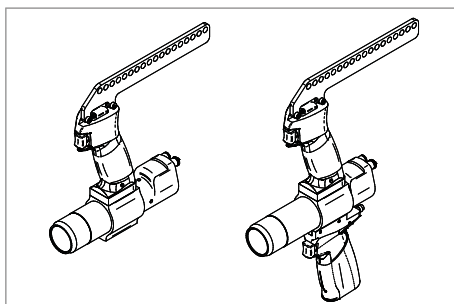


Pistol model

- **UpGrip pistol models:** an exclusive model to access to those working places otherwise unreachable by the traditional screwdrivers
- **Pistol models with double grip** for ergonomic access to tightening points placed at different heights on vertical surfaces



"UpGrip" pistol model



Some of the handles available on request to work in full ergonomics on every production layout

Accessories available upon request

REACTION ARMS

Fiam telescopic and cartesian arms **completely counteract the reaction on the operator's hand, the force required to support the tool and the vibrations to the hand-arm system.**

They make it possible to **keep the wrist in a good position with the tool perpendicular to the work point**, improving working accuracy and production process quality.

They are entirely designed and produced by Fiam as are all the accessories and numerous devices to improve the ergonomics of the workplace and safeguard the health of the operators.



BC Cartesian Arm



BCA Articulated Cartesian Arm



BCA-TOP Articulated Cartesian Arm

Available in several versions:

- **Cartesian arms**
- **Articulated Cartesian arms**
- **Cartesian arms and Articulated Cartesian arms to be fixed to the surface or upper structure (TOP)**
- **Assisted Cartesian arms**
- **Telescopic arms to be mounted on the top of the workbench**

Thanks to these devices, all work operations take place without any oscillation and their **movements are extremely fluid and flowing** and this translates into a significant increase in work precision, the consequent quality of the production process as well as ergonomics for the operator.

ALSO WITH PNEUMATIC LOCKING DEVICE

The BC40LK model is specific for use with auto feed screwdrivers with forward bit stroke device, which provide an automatic pushing force on the workpiece to aid operators so that they do not have to apply force while tightening.

With this Cartesian arm, in addition to all the benefits offered by Fiam Cartesian arms, operators can also profit from a **special device that counteracts the "recoil" caused by the tool bit during tightening and redirects this force to the mechanical arm rather than that of the operator.**

When there is no power supply, the system stops automatically to prevent the pneumatic device from slipping and avoid any risk of crushing and/or accidental movement. Cartesian arms are also available in the "TOP" version, with TOP clamping.

Model	Code	Max torque Nm	Max torque lb	Min - max work range R1 (mm)	Min - max work range R2 (mm)
BC40 Cartesian Arm	692031033	40	354	274-450	564-740
BC40/7 Cartesian Arm	692031038	40	354	274-450	564-740
BC40-TOP Cartesian Arm	692031077	40	354	274-450	564-740
BC40/7-TOP Cartesian Arm	692031078	40	354	274-450	564-740
BCA40 Articulated Cartesian Arm	692031037	40	354	110-260	610-730
BCA40-TOP Articulated Cartesian Arm	692031070	40	354	110-260	610-730
BC40LK Cartesian Arm	692031055	40	354	274-450	564-740

Maximum applicable load:

Models BC40 - BCA40: 2 Kg

Model BC 40/7: 7 Kg

Model BC40LK: 4 Kg

For more information, please see the [on-line catalogue 79](#).

ASSISTED ASSEMBLY SYSTEMS

BC/BCA models are also **available with a position detection device, for processing the angular and linear displacement of the tool on the working point.**

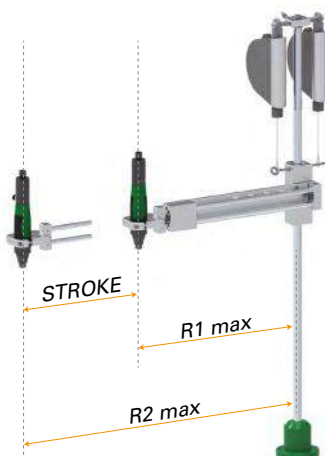
- The operator is guided in assembly operations
- Reduces the mental overload of the operator
- Reduces the fatigue due to the attention given by the continuous supervision of operations
- Ease of programming and immediate visual and sound feedback lead to ease of work



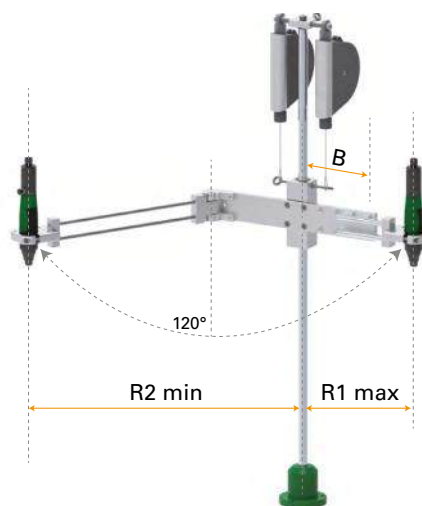


BC40LK Cartesian Arm with pneumatic locking device

• Cartesian Arm



• Articulated Cartesian Arm



TPM - Monitoring unit



Code 692078019

The BCA Cartesian arms are arranged only with the TPM2 device being configured to monitoring the angular and linear positions.

For more information, please see on-line catalogue n. 79.

ARMS WITH POSITION MONITORING DEVICE

All Fiam arms can be fitted with a **position monitoring device and, combined with the TPM monitoring unit**, help make tightening systems very suitable for "Poka-Yoke" processes, while increasing the efficiency and speed of the production cycle.

The system locates the positions of the screwdriver on the different tightening points and it memories the sequence (up to 35 positions/program for 8 programs).

There are two types:

- BC... TPM1 arms, models with **single angle** movement detection
- BC... TPM2 arms, which also measure the **linear** movement of the arm in addition to its **angular** movement.

MODELS WITH SINGLE ANGLE MOVEMENT DETECTION

Model	Code	Max torque Nm lb	Min - max work range R1 (mm)	Min - max work range R2 (mm)
BC40 - TPM1	692031049	40 354	274-450	564-740

MODELS WITH ANGLE AND LINEAR MOVEMENT DETECTION

Model	Code	Max torque Nm lb	Min - max work range R1 (mm)	Min - max work range R2 (mm)
BC40 - TPM2	692031045	40 354	274-450	564-740
BCA40 - TPM2	692031053	40 354	110-250	564-740

The BC40 / 7 models with position detection device are available only upon request.



ERGONOMIC GRIP

To use with screwdrivers installed on BC and BCA Cartesian Arms.

It allows correct gripping at any point in which the arm can operate, preventing incongruous hand-arm system positions.

The grip can be installed on the right or left of the boom, with vertical or horizontal gripping.

In all these positions, **the grip turns around its axis or can be locked, depending on how it needs to be used.**

It has a housing for the screwdriver connector as well as a lever to load and shoot screws.

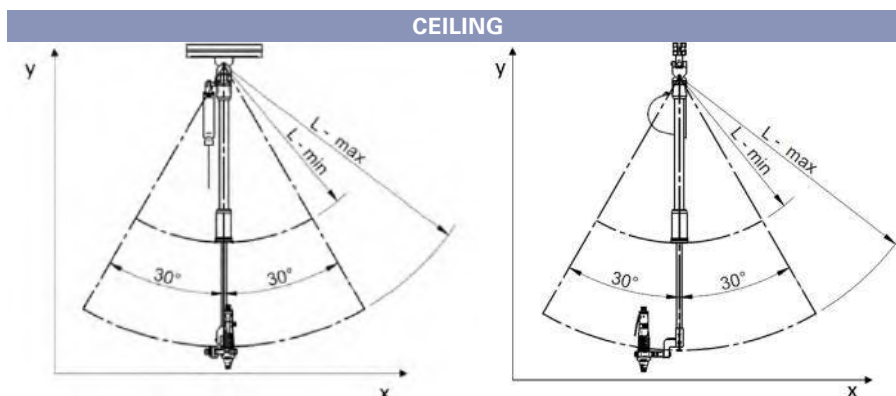
Model	Code
Grip for auto feed screwdrivers	692039237



BT-TOP TELESCOPIC ARMS

Designed and produced by Fiam **to be mounted on the top of the workbench**, offering an ergonomic and compact layout in spaces with side encumbrances or for working on workpiece clamping jig.

- **NO SPIN anti-rotation device integrated** that prevents the boom from rotating on its axis by counteracting the reaction on the operator's hand as the counterblow is unloaded on the telescopic arm
- Telescopic **stroke limiter** to adapt the arm stroke to the operational layout.



Model	Code	Max torque (Nm)	Working area min-max
BT-TOP Telescopic Arms 40-1100	692071454	40	L 400 - L 640

STROKE LIMITER FOR BT-TOP 40

code 692039089.

Useful when the component to be tighten changes and it is necessary to adapt the arm stroke to the operational layout.



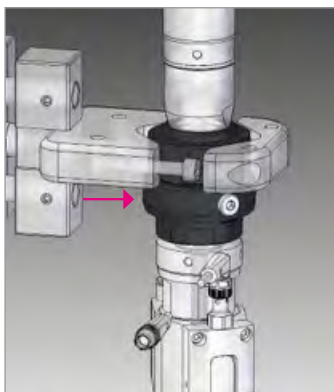
LINEAR SLIDE RAILS

They allow the installed reaction arm to slide **smoothly on a single working axis** along the operating area, improving overall ergonomics

- easy and immediate installation because it is made of pre-drilled steel
- two different sizes available: 1000 mm or 2000 mm, customizable by the customer
- trolley with eccentric wheels, adjustable with the keys provided and which slides along the length

Model	For Reaction Arms	Code	Max Length of the pre-drilled rail mm
SL 1000 for BT -TOP	BT -TOP	692078061	1.000
SL 2000 per BT -TOP	BT -TOP	692078062	2.000
SL 1000 for BC and BCA 40	BC 40	692078065	1.000
	BCA 40		
	BC 40LK		
	BC40TOP		
	BCA 40TOP		
SL 2000 for BC and BCA 40	BC 40	692078066	2.000
	BCA 40		
	BC 40LK		
	BC40TOP		
	BCA 40TOP		

• SL = Sliding Rail • 1000/2000 = Length max in mm



ROTARY CLAMP

To use with all Fiam arms, is a specific accessory for CA auto feed screwdrivers with FORWARD BIT STROKE DEVICE on 4 Nm joints.

Allows to bracket and **tool to be rotated on its axis**. The rotation can be managed in 3 modes by simply placing a screw:

- With the screw on 0° = the clamp does NOT rotate
- With the screw at 220° = it is possible to operate on a limited area of 220°
- Without screw = rotation is free over 360°

Thanks to these features, the clamp has the following advantages:

- Allows the **operator to always maintain a proper grip on the tool and on start lever** even when moving the tool to different working points
- The clamp is inserted between the drive and the forward bit stroke device: in this way, the tool counterblow when the torque is reached, is completely discharged to the arm instead of to the operator's hand-arm system.

The use of the clamp involves an **increase in the total length of the system (tool+clamp) by about 4.5 cm**. To compensate for this increase, a 4.5 cm long blade is supplied to replace the one already presents in the screwdriver.

The clamp is available in three different models, each designed to adapt to the different strokes of the forward bit stroke device being used.

Model	Code
Rotary Clamp for CA autofeed screwdriver with forward bit stroke L 65	692039253
Rotary Clamp for CA autofeed screwdriver with forward bit stroke L 100	692039254
Rotary Clamp for CA autofeed screwdriver with forward bit stroke L 110	692039255
Rotary Clamp for CA autofeed screwdriver with telescopic device	692039264

Standard equipment

- 4.5 cm long blade



BA75 BALANCING ARM

Practical **bench** suspension to support **tools with diameters ranging from 25 to 50 mm and a maximum torque of 75 Nm**. Ensure **extremely high working accuracy** since the tool is held perfectly perpendicular to the workpiece being assembled. This **prevents** accidental **damage** to the materials and **improves finished product quality**.

Model	Code
BA75 Balancing arm	692031008



LED INDICATOR

Provide 3 types of bright, to be connected to control and monitoring units through 1,5 mt long cable included in supply. It allows the immediate feedback of the tightening process status. It can be fixed to the workbench.

Model	For units	Code
Led indicator	TPU-C1	686990039
	TPU-C3	686990039
	TPU 2	686990034
	TPU-M1	686990039



LIGHT TOWER WITH AUDIBLE BUZZER

3 colour tower-light equipped with a sound device. To be connected to control unit through the supplied cable 3 meters long. It allows immediate verification of the state of the tightening process. With a diameter of 55 mm, it can be fixed to the workbench.

Model	For units	Code
Light tower with alarm	TPU-C1	686990040
	TPU-C3	
	TPU-M1	



LIGHT TOWER

To use with air auto feed screwdrivers. 3 colours tower-light, to be connected to TOM Monitoring unit. It allows, with lights the immediate feedback of the tightening process status. Diameter of 55 mm, it can be fixed to the workbench.

Model	For units	Code
Light tower	TOM	687041018



TOM – MONITORING UNIT FOR THE TIGHTENING PROCESS

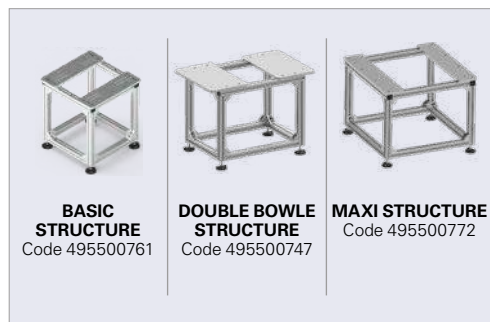
For real-time verification of the tightening process to eliminate the need for post process controls. Available for all models except the auto feed air screwdriver with telescopic device.

Code TOM: **685001062**.

Code connecting cable TOM/CA: **685001074**

For more information, please see page 19 and the [on-line catalogue](#).

SUPPORTING STRUCTURES AND HOPPERS



SUPPORTING STRUCTURES

Entirely designed and manufactured by Fiam, they are useful to support EasyDriver feeders and their hoppers when used to solve needs production at high rates. They ensure greater cleanliness and functionality of the operational layout thanks to:

- **An aluminum base plate already prepared with the holes** that allow to fix the suitable feeder on it
 - **Aluminum profiles with channels for cables and tube bundles inside the slots** positioned under the support surface
 - **Support adjustable feet in height** and possibility of having additional brackets for floor fixing through a simple anchoring with supplied squares.
- They are available in three sizes: basic structure, double bowl structure or maxi.



HOPPERS

The hoppers are available **on request** and are used to solve **high-speed** production needs, as they increase the feeding capacity of the EasyDriver feeders.

They are available with two different technologies

- **Vibration hoppers** (5, 10 and 50 Lt).
- **Belt hopper** (12 Lt), for greater silence requirements in the production line, in combination with the ED S – Silent Feeder.

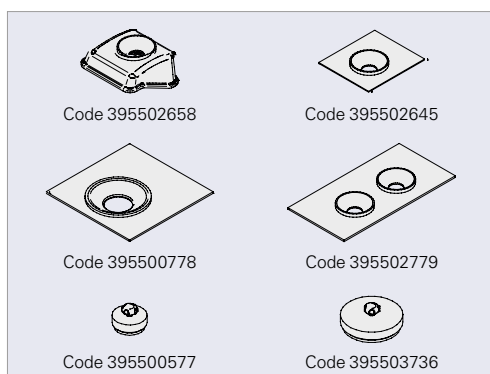
Hoppers are coordinated by the low lever sensor integrated on the EasyDriver screw feeder.



SUPPORTING STRUCTURES COMPLETE WITH HOPPERS

The complete support structure with hopper (vibration or belt) is the **optimal complete configuration** that allows the EasyDriver feeder to be correctly positioned together with the chosen hopper (with the exception of the ED B 2|1 feeder, which cannot be fed with hoppers).

Available in the BASIC or MAXI configuration depending on the feeder chosen for the production layout.



COVER WITH FUNNEL AND CAP

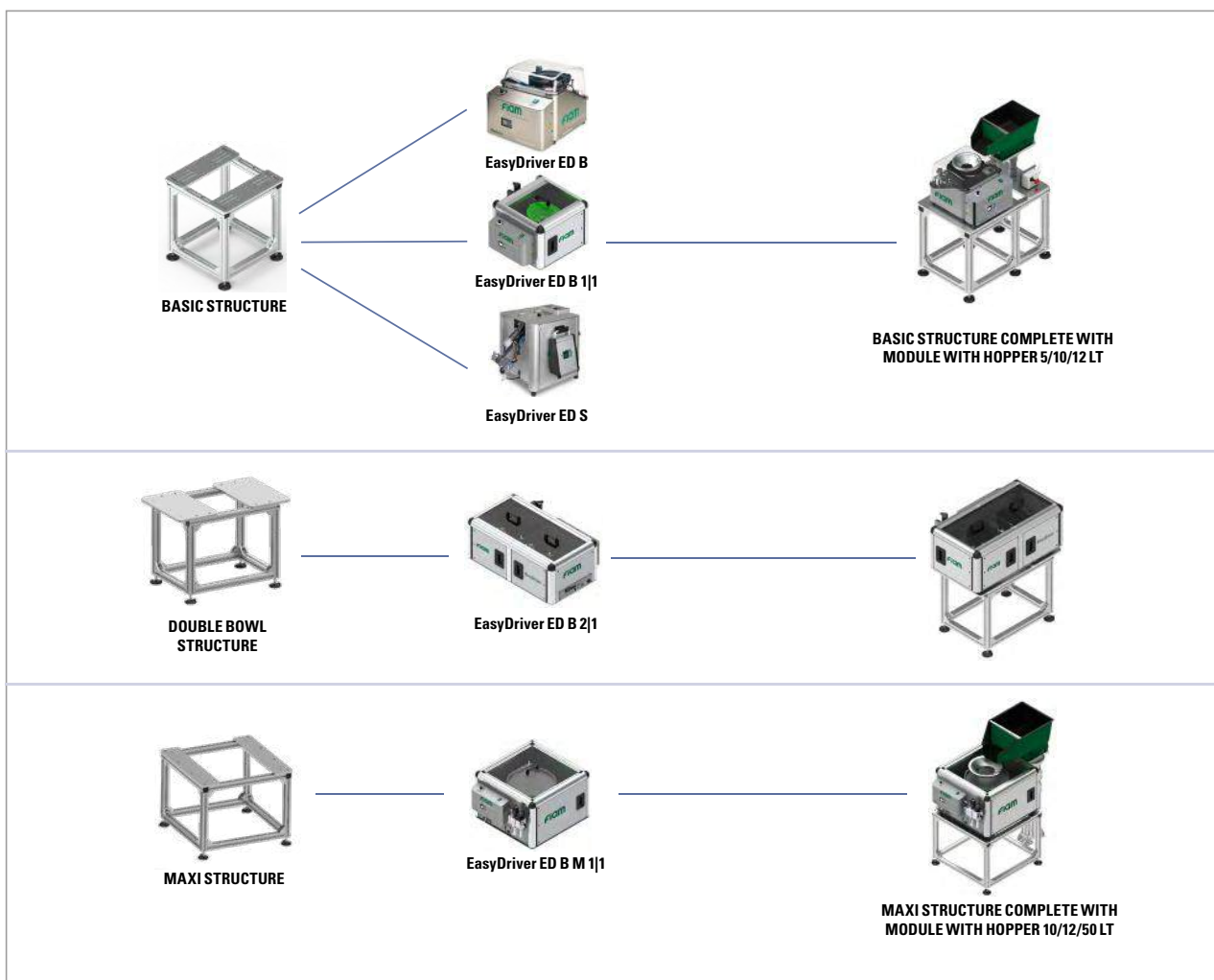
To facilitate the refilling of screws, each feeder can be equipped with:

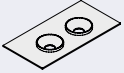
- a customized **lid** with **funnel**
- the relative **cap** for closing the cover with funnel.

These accessories allow easier loading of screws: both manually by the operator, and automatically in the case of use with the hopper.

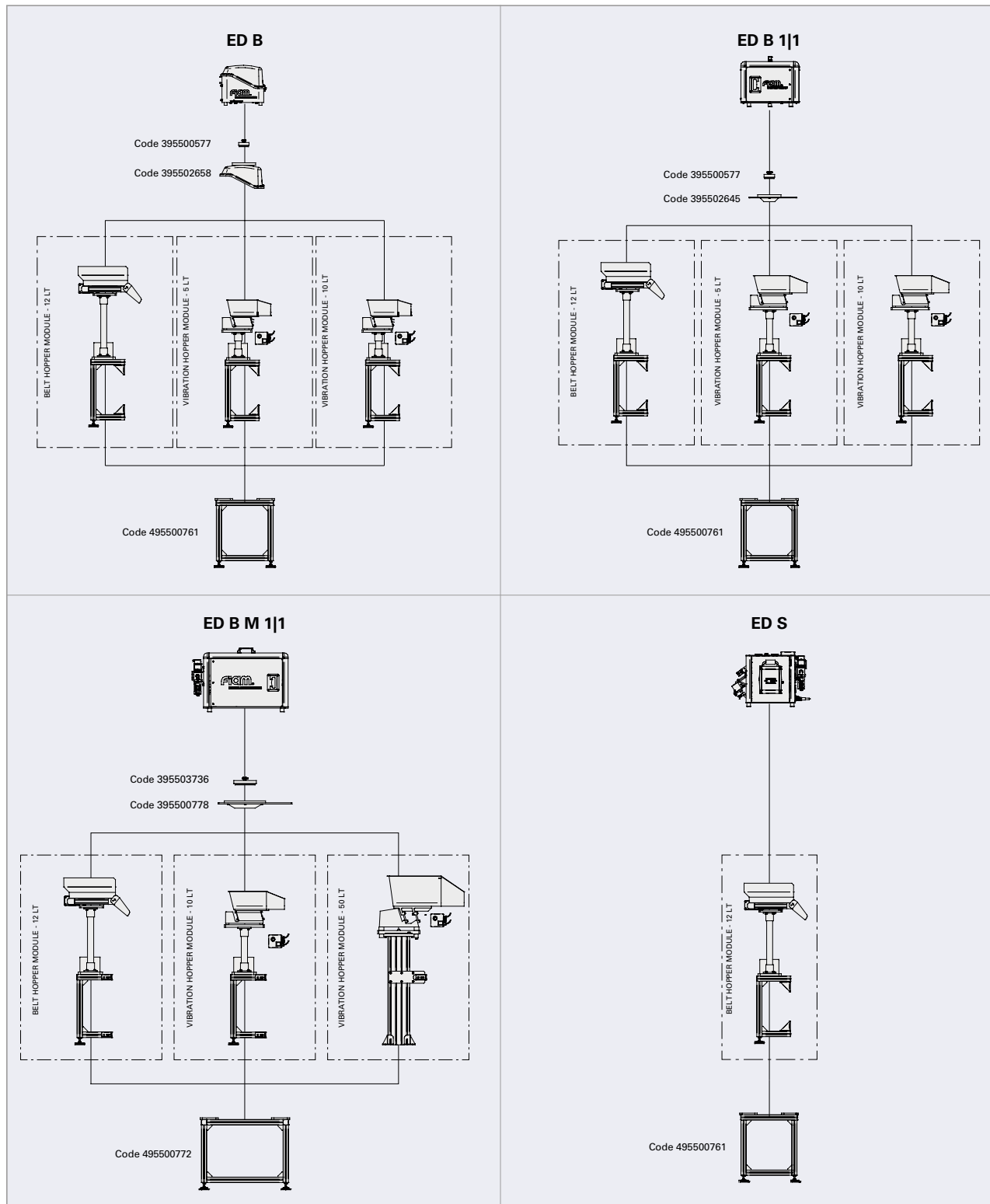
SUPPORTING STRUCTURES AND HOPPERS

	EASY DRIVER				
	ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED S
					
Basic structure	✓	✓			✓
Double bowl structure (not suitable for the combination with modules for hoppers)				✓	
Basic structure complete with hopper 5 Lt	✓	✓			
Basic structure complete with hopper 10 Lt	✓	✓			
Basic structure complete with hopper 12 Lt	✓	✓			✓
MAXI structure			✓		
MAXI structure complete with hopper 10 Lt			✓		
MAXI structure complete with hopper 50 Lt			✓		
MAXI structure complete with hopper 12 Lt			✓		



COVER WITH FUNNEL AND CAP		EASY DRIVER				
		ED B	ED B 1 1	ED B M 1 1	ED B 2 1	ED S
						
Cover with funnel	 Code 395502658	✓				
	 Code 395502645		✓			
	 Code 395500778			✓		
	 Code 395502779				✓	
Cap for funnel	 Code 395500577	✓	✓		✓ x 2	
	 Code 395503736			✓		

CONFIGURATIONS OF FEEDERS, SUPPORTING STRUCTURES AND HOPPERS



OTHER ACCESSORIES FOR WORKSTATION ERGONOMICS

- **Balancer** (code 690011220); this suspension device for tools allows the operators:
 - working safely (tools and accessories suspended in a bad way may hit the operator) and comfortably, eliminating any effort to lift the tool
 - keeping a good wrist position
- **Exhaust air hose conveyors:** suitable for CA systems with pneumatic screwdriver, they are used to convey and drive away the tool exhaust air from the operator.

CRITICAL TRANSPORT PACKAGING

A wooden crate is available for critical transport. Dimensions: mm L650x500xh715; Weight: 11 kg.

EasyDriver screws feeders: a solution also for automation.

EasyDriver screw feeder, if used in conjunction with fastening slide and electric or pneumatic nutrunner motor, can become a versatile tightening module to be **incorporated into existing production systems** such as **assembly lines, manipulators, electric Cartesian axes and collaborative robots**, in order to obtain complete and independent tightening cycles using a simple external start (from PLC, dual command, start button, pedal, etc.)

This tightening module offers concrete productivity benefits because the approach and subsequent tightening of the screw on the component is fully automatic and accurate and the whole tightening cycle is controlled and monitored by the integrated PLC that interfaces with the automated production systems (Industry 4.0).



Find out in the [online catalog 73](#).

EasyDriver screw
feeder



Fastening slide or
module for Cobot



Air or electric
nutrunner motor



Example of MCA tightening module with collaborative robot



Example of MCA tightening module for shutters field: assembly from the top towards the bottom and from bottom towards the top

REQUEST A FREE QUOTATION!

To choose a CA handheld tightening system with automatic screw feeding, we have to consider:

- **Material to tighten** (plastic, wood, steel, etc.)
 - **Dimensions and encumbrance** of component to assemble
 - Tightening **torque and speed**
- But the most important element to consider is the **screw**.

By sending us the features through **the configurator "Data Entry 4.0"** you can directly compile on our **website**, you will receive a quick and no obligation, "turnkey" solution that will save you time and money!



<https://www.fiamgroup.com/en/request-a-quotation/>

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Fiam
PEOPLE AND SOLUTIONS

Fiam Utensili Pneumatici Spa
Viale Crispi 123
36100 Vicenza, Italy
Tel. +39.0444.385000
Fax +39.0444.385002

**Fiam France
Succursale**
73, cours Albert Thomas
69003 Lyon, France
Tel. +33 (0)7 60955413

**Fiam España
Succursale**
Travessera de Gràcia, 11, 5ª planta
08021 Barcelona, España
Tel. +34.636808112

**Fiam Deutschland
Niederlassung**
Kupferstrasse 5
70565 Stuttgart, Deutschland
Tel. +39.0444.385000

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www.fiamgroup.com

info@fiamgroup.com

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