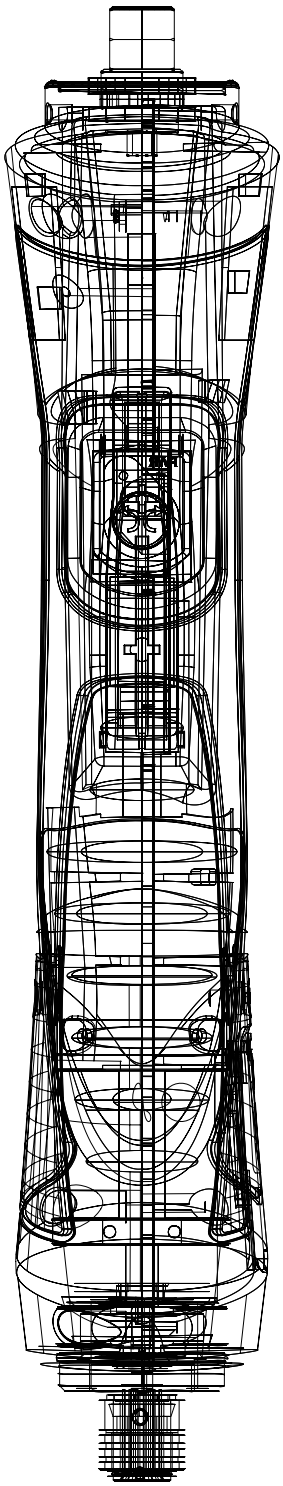
eTensil

Fiam Electric Tightening Solutions



torque s.r.o.

FIAM PEOPLE AND SOLUTIONS

eTensil.
Fiam's electrical revolution.

Fiam has established itself as the leading company in industrial tightening internationally, leaping into the electric screwdriver market with its eTensil range. This selection of screwdrivers has been designed with the intention of raising standards in this sector.

Electric, efficient and accurate, eTensil is the home-grown response to this modern industry's demand for green, versatile and intelligent tools. We have designed them to slot seamlessly into the most up-to-date manufacturers and their working processes: from precision mechanics to automotive, from electronics to household appliances assembly. Design, power, precision in construction and excellence in manufacturing are the cornerstones that make eTensil a proudly Italian solution. This is a systematic project in which every detail has been developed and elaborated around top performance.


PWR

Production efficiency. Precision at work.

Production efficiency defines eTensil. The whole project is tightly wound around perfecting the key functions that ensure **precision, power and control** at all times when using a screwdriver. The advantage to this is a **high-quality final product**.

1. Torque control system.

This control system is vital to **tightening torque**, as it automatically cuts off the power supply.
This ensures **high repeatability** - in other words a low Mean Shift value - **even when faced with a variable joint softness level**.
Values remain unchanged over **million of cycles**, guaranteeing high quality that is consistent over time.

2. Signaling LEDs.

Three LEDs ensure precise and efficient signaling. It is a simple solution that ensures the screwdrivers' settings and correct functioning are immediately apparent to the user. **The blue LED** near the reverse button remains lit to signal that the screwdriver is in "untighten" mode (leftwards rotation). The **white LED in the same** area shows the tool is ready for use.
The **LED at the front**, next to the quick change chuck, lights up the area of work as well as indicating anomalous functioning at the end of a tightening cycle (in conjunction with the blue LED). Once the same LED flashes constantly it means that the programmed maintenance is required.

3. On board electronics.

FIAM has designed and created an **innovative on board electronics** so as the user can easily configure various settings directly on the tool, instead than on the power supply unit.
As a result the system is easier to use, workplace layout is tidier, and data exchange between the tool and the power unit is faster.

4. Safe mechanical clutch control.

A **protective device** controls access to the mechanical clutch, ensuring adjustments are made safely.
This **keeps tightening torque repeatability consistent** and tightening precise and safe, so as to adhere to the highest manufacturing quality standards.


PWR

Reliability. A project for the long-term.

eTensil components are built to guarantee the highest levels of **reliability and safety** throughout the life cycle of any operation. The engineering involved in the mechanics, the elegance of this executive range and performance tests passed, all arise from **Fiam's existing wealth of knowledge and specialist patents in the industrial tightening industry**.

5. Latest generation brushless motor.

Brushless motors are the avant-garde in efficient and consistent performance, due to their **high-precision mechanics**.
eTensil has been designed in order to obtain endless electric lifespan, thanks to the implementation of low wearing components, to low motor inertia and to a lower heating of the assembly. Hall sensors allow the user to **have full control of rotation** and ironless systems **make the motor so light**.

6. Reduction assembly.

Increased performance in output, **duration and noise level are the principles** that guide the latest designs in gear assembly - aims we have achieved through research focused on ensuring gear lifespan and efficiency as well as the careful sizing and the incorporation of treatment options into the manufacturing cycle. **Such innovative** ways of working mean the gear assembly remains practically **unchanged** even after **thousands of operational hours**, as our lab tests prove.

7. Modular structure.

Functionalities integrated into the circuit board, reduced and simplified electrical connections, its clean design, the modularity and the seamless integration of electronic components into the mechanics; all bases of the constructive **strength, designed to last and guarantee safe** and efficient servicing.

8. Connection cable screwdriver - power supply.

The cable is **extremely flexible**, with **sturdy connectors**, designed to last over time and made entirely in Italy upon Fiam's specifications.
Standard length is 3 metres, which can be increased by adding additional cables.
Extremely resilient, flame resistant and hallogen-free, designed to resist oils and to face extreme conditions of use in an industrial environment.

Performance and functions. **Evolved programming.**

The user can **manually programme various work processes on the tools themselves**, without having to change the mechanical setup or having to deal with an external accessory. This strategic choice defines eTensil as one of **the most evolved solutions in terms of efficiency and versatility.**

9. Reversibility.

The reverse command is encased within the screwdriver body to protect it from wear, collision or damage and accidental activation. A single press of the **button when the screwdriver is** not in action inverts the rotation (indicated by the blue LED). Holding the button for at least four seconds starts up the “SMART PRO” **programming mode** (indicated by the LED flashing).

10. Start up ergonomics.

The **start up lever** is another **“smart”** device in the system, designed to grant maximum freedom in terms of use. An analogue sensor with **exceedingly robust mechanics/ electronics** that are **not susceptible to wear** mean it can be **contactless**. Pressed, it slots perfectly into the tool’s casing thus **ergonomically supporting to the user’s hand**.
In addition, the **force** required to start a tool at the beginning of its cycle **is ergonomically irrelevant: work is less tiring thus productivity is at a maximum**.

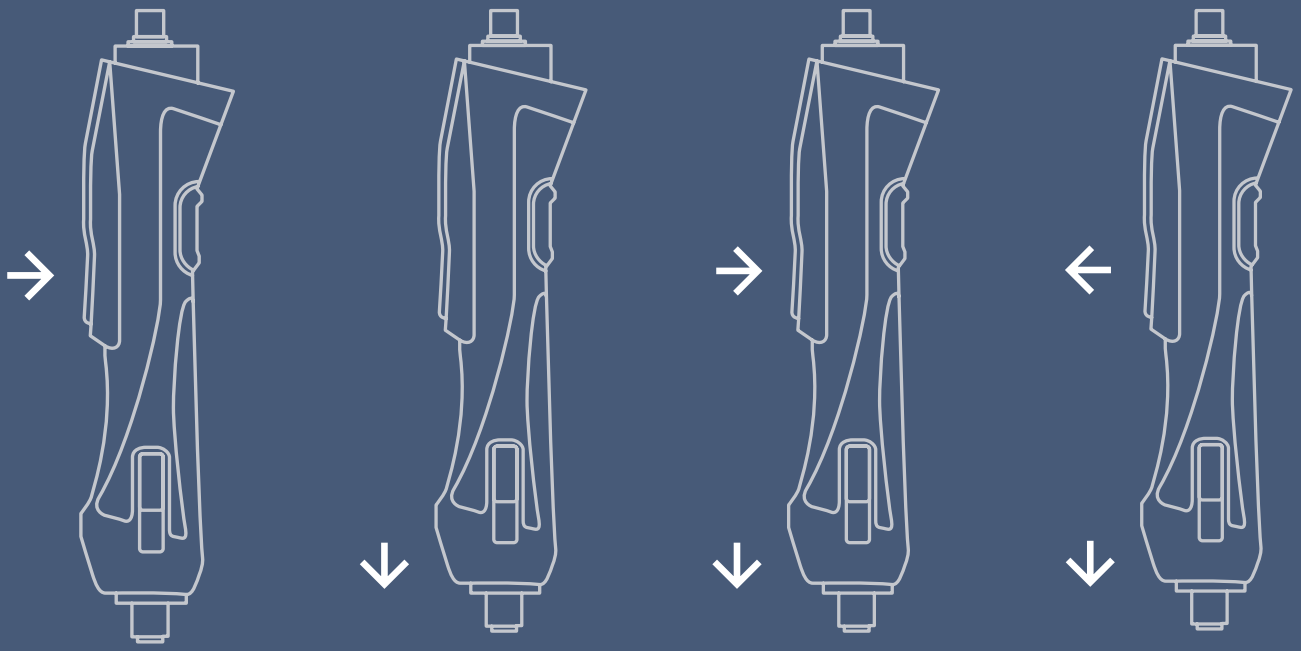
11. Exclusive “Smart Pro” Programming.

With four different start up modalities, eTensil is the **unique screwdriver that allows the change of the start up modality without modifying the mechanical configuration**.
Other three functions are available pressing the reverse button for at least 4 seconds:

- **Switching on/off the automatic start up lock** (in case of an anomaly: motor stalling or the early release of the push when tightening cycle is not complete, in modality 3 and 4);
- Switching the **front** illumination LED on/off;
- **Switching the untightening function on/off.**

Four start up methods.

eTensil is the top choice when it comes to functionality, as **the only screwdriver on the market that allows the user to change work modes this quickly and efficiently** without changing the mechanical set up.
There are four presets:



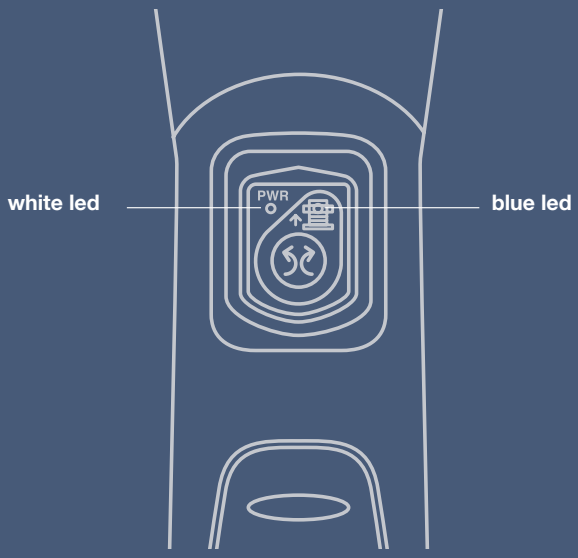
Lever start.

Push to start.

Lever +
Push to start.

*** "Latched lever"**
+ push to start

* The "latched lever" + push to start mode allows the screwdriver to work without need to keep the lever pressed. For safety, the screwdriver activates only when pushing on the bit. In this mode, the first pressure applied to the lever starts the screwdriver until clutch shuts off, whereas a second pressure can eventually stop it before the working cycle is completed.



Reversibility.
"Smart Pro" Programming.

Pressing the reverse button for at least four seconds activates programming of the different functions through the lever.

Ergonomic design. Perfection in handling.

eTensil design takes care of both **appearance and functionality**. Ergonomics has always been the central point of Fiam design and key strength in provided solutions. In perfect Italian style, the design also adheres to the combination of form and matter, with linearity and refined layout.

12. Ergonomic grip.

The grip has been designed and manufactured with the clear goal to reduce any fatigue and optimize productivity.
Materials, horizontal grip-shaping, and the casing layout provide a stable rest point for the hand.
All such details reveal a research for functionality and aesthetics.
The grip is made of **innovative materials** ensuring a better resistance against any form of collision or damage. It is placed close to the tightening area, making
the centring easy and fast.
Easy to handle, **combining low** weight and dimensions.
Suitable for both left and righthanded users, as **well** as for the **smaller and female hands**.

13. Reduced-effort start up.

The **pressure required to activate** lever start up is **much lower** than others available on **the market**. **Reducing the effort** the user needs to sustain over the course of the working day, will result in increase of production efficiency.

14. Modular ergonomics.

The screwdriver is equipped with suitable brackets to enable fixing it to Fiam torque reaction arms (whether telescopic or Cartesian).
Such clamping is useful and safe, **guaranteeing utmost grip ease**.

15. Noise level and comfort.

eTensil ergonomic design also ensures low noise and comfort. All of the screwdrivers' mechanical elements have been designed to be **noiseless** - motor, gears and clutch.
The tool is equipped with quick change chuck: easy and safe to use, it allows the user to quickly change bits.
The presence of a **suspension device** eliminates the need for the user to support the tools. All of these features are essential to eTensil's unparalleled ergonomics.

Safety. Green performance.

Fiam has always **considered as a priority the safety of the working tools**, which play a vital role in the assembly process. The eTensil project has grown into its current strategical importance over a long **certification process** that has involved collaboration between Fiam and three external laboratories in a series of “pre-compliance” tests. Fiam guarantees that its range of electric screwdrivers **fully complies with latest electrical safety**, **EMC and ESD directives**.

16. Low environmental impact.

No sliding electrical contact in the brushless electric motors prevents carbon and blade dust emissions thus creating a safer working environment. All eTensil components are made of **recyclable materials**, making it easy to dispose of them.
The entire system in every element of the eTensil screwdriver range has been designed with the Life Cycle Assessment in mind: from supply chain to finalisation, from production to product transport, from usage to disposal.

17. ESD certification.

Casing of eTensil range has been made using the latest technology in ESD dissipative plastic, **thus avoiding the build up of electrostatic charge**. Any electrical charges transferred by the user to the tool (and vice versa) are discharged to the ground **without intruding upon the tightening area**.
In compliance with the latest European Directives, the eTensil range **is immune to electromagnetic disturbances** generated by cables or as a result of the interference of other devices. The tools do **not influence** other devices either. This is a huge advantage when **assembling high-quality electrical components** that must be protected from the build up of electrostatic charge.

18. “Dust proof” construction.

The casing of eTensil is designed and manufactured to reduce as much as possible dust and other waste or substances infiltrations, that can compromise functionality of the tool. The most exposed parts of the screwdrivers are **duly sealed**. This greatly reduces potential functioning issues linked to external, damaging factors. In addition, all labels are enclosed within the casing to keep them protected from wearing and ensure traceability.

19. Maximum safety.

Operating at low-voltage (32 volts) means **maximum safety**. Special ergonomic grips guarantee perfect **thermal isolation**.

Power supply. **Intelligent energy.**

Power supply unit that works in complete synchronisation with the screwdriver is a key element in making eTensil's electric tightening systems so advanced. **It provides electrical power levels appropriate for each operational mode** while constantly monitoring screwdriver's status and the whole tightening process. It is also used to activate various functionalities and increase programmability and other customisable features, for which the screwdriver is designed.

20. Functional design.

Functionality and aesthetics combine into a power supply design perfectly matched to Fiam's style. Designed in the Research and Development department in conjunction with an Italian design studio, these units capture the same colours and style as the screwdriver range. The casing has been created using an exclusive mould, in a shape perfect for housing the internal technology that still **allows the user practical access** to required functions while the visual signals on the back remain visible. These features are accompanied by a **sturdiness** that makes each unit perfect for a vertical clamp, as a practical alternative to placing the unit on the working horizontally.

21. LEDs.

A power supply and control system is installed inside the unit, which Fiam has designed and created so that **tightening can be managed in a synchronised and efficient way**. High-visibility LEDs are linked to the control devices inside so that the status of key procedures (such as **correct functioning, selected speed, clutch being engaged, anomalies, emergencies**) can be consistently monitored. This means all production activities continuously increase in efficiency.

22. Two models, endless possibilities.

The basic version guarantees each screwdriver receives the **correct electrical supply**, as well as allowing the user to monitor key working procedures. The version with "optoisolated" input and output signals allows **activation and remote control of some functionalities and results**. The unit can handle 5 input signals for activating various functionalities and 5 output signals to indicate the completion of a work process or the screwdriver's status.

23. Speed selection.

A membrane switch allows the user to set **two rotation speeds**. LOW is a reduction of a screwdriver's maximum speed (on the motor nameplate) by approximately 20%.

A.
Green LED: clutch shut off and motor stop.

B.
Red LED: error (stalled motor) or *"Button" + push to start* activated.

C.
Red LED: screwdriver not enabled (external signal stop) (only in TPU2 version).

D.
Status LED (system on/off).

E.
S1 - Available with the TPU2 versions - indicates the emergency warning light on the external signal.
S2 - Tool ready to use.
S3 - Tool in use (RUN).

F.
Button for selecting tightening speed.

G.
Port for connecting the supply cable to the screwdriver.

H.
Start up button with light.

I.
Port for electrical power supply cable.

L.
Start up button with light
Port in TPU2 version:

Input signals
1. H/L speed
2. Motor stop
3. Reverse
4. Emergency
5. Start

Output signals
1. Ready
2. Stalled Motor
3. Run
4. Reverse
5. Clutch engaged

Screwdrivers technical features.

Type of screwdriver		Grip	Tightening torque min.	max.	Idle speed fast/slow	Starting system	Reversibility	Weight	Dimensions mm	Power consumption	Accessories
Model	**Code**	**Type**	**Nm**	**Nm**	**r.p.m.**	**Type**	**Type**	**kg**	**L x Ø**	**Volt**	**Drive**
E8C2A-2000	111712000		0,6	2,5	2000 / 1650	*		0,78	275x39	32	F1/4"
E8C3A-1200	111712001		0,6	3,0	1180 / 980	*		0,78	275x39	32	F1/4"
E8C3A-900	111712002		0,6	3,5	870 / 740	*		0,78	275x39	32	F1/4"
E8C4A-650	111712003		0,6	4,0	640 / 530	*		0,78	275x39	32	F1/4"
E8C5A-350	111712004		0,6	4,5	340 / 285	*		0,78	275x39	32	F1/4"

Legend

E8C4A-650 = Electric screwdriver with automatic shut off • **E** = Electric • **8** = Power of motor in watt/10 • **C** = Screwdriver • **4** = Maximum tightening torque in Nm • **A** = Torque control with automatic shut off • **2000 / 1650** = Fast/slow idle speed

Legend

Reversibility: all models are suitable for tightening and untightening operation

*** Starting system: 4 modalities availables for all models**

- Lever start
- Push to start
- Lever start + push to start
- Latched lever + push to start

• Accessory drive: female hexagonal drive 1/4", 6,35 mm (ISO 1173).

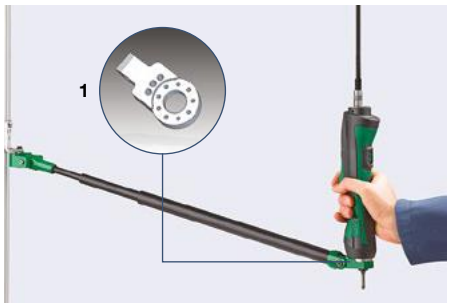
• The code number must be used when ordering.

Data shown in the table are indicative and can be changed without prior notice. Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speed.
Torque values are purely indicative and may be influenced by the softness of the type of joint, by the type and length of the screw, and by the type of accessory used. For any further details, please address to Fiam Technical Service.

Standard equipment (supplied with the tool)

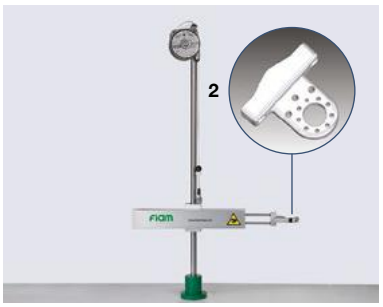
• Connection cable to power supply unit; lenght 3 mt and with error proof connection system • Magnetic bit holder to use with magnetic bit (code 605101140) • Clutch adjustment key • Hanging ring • Use and maintenance manual • Eco-friendly packaging.

Accessories available upon request:



Magnesium telescopic reaction arm BT-MG
To absorbe torque reaction on operator's hand. With 3 telescopic elements, also available with TPM (Tightening Position Monitor) device: allows detection of the screwdriver position and manages 9 sequences, enabling and disabling the screwdriver.

Tool holder accessory (1)
cod. 692079180
Essential to install the screwdriver on BT-MG reaction arm.



BC12 Cartesian arm
cod. 692031020
It eliminates any counterblow, and effort needed to hold the tool. Guarantees extreme working precision, handiness and perpendicularity.

Tool holder accessory (2)
cod. 692039108
Essential to install the screwdriver on BC cartesian arm.

Auxiliary grip
cod. 681041030
Permits a reduction of the torque reaction dividing work load on both hands.

Pistol grip
cod. 681041029
To convert straight models into pistol models.

For further information, see Accessories catalogue or contact the Fiam Technical Consultancy Service.

Power supply unit technical features.

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Led signaling	Weight kg	L x Width x H mm
TPU 1	686200100	Fast/Slow	1	32 VDC	230 Vac ±10% 50-60 Hz	-	yes	0,6	185 x 150 x 63
TPU 2	686200101	Fast/Slow	1	32 VDC	230 Vac ±10% 50-60 Hz	5 inputs 5 outputs	yes	0,6	185 x 150 x 63

Accessories available upon request:

Fixing plate to position the power supply unit on any surface. Code 692080000

Standard equipment (supplied with power supply unit)

Cable feeding supplied with European plug • I/O Connector (only for TPU 2 model) • Use and maintenance manual • Eco-friendly packaging.

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