TIGHTENING AUTOMATION.

Innovating productivity,
enhancing reliability.

- **Electric and pneumatic nutrunner motors**
- **Components and accessories for automation**

FIAM®
PEOPLE AND SOLUTIONS

SOLUTIONS
FOR TIGHTENING
AUTOMATION

Efficient, fast and safe production cycles.

Innovation in automatic production processes draws on over 70 years' specialist knowledge of the ins and outs of the industrial tightening process in its every form.
A solid and exclusive foundation on which Fiam designs and manufactures all its solutions that integrate effectively into any Smart production.

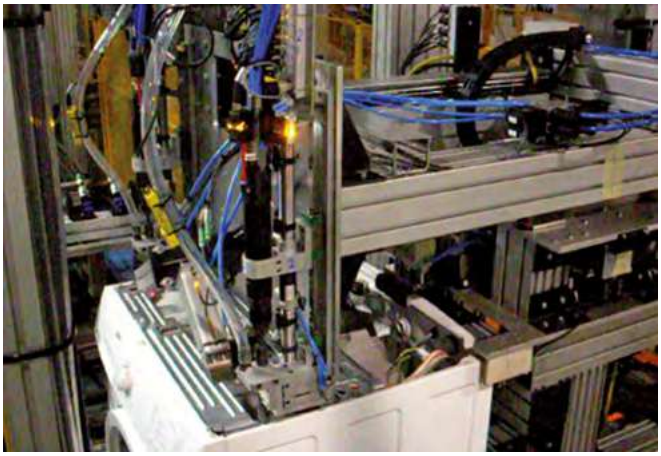
- **NUTRUNNER MOTORS**
  Electric or pneumatic, with different torque and tightening angle control technologies, **they are used to assemble any threaded element**, in single- or multi-spindle tightening units to assemble multiple threaded elements simultaneously. Nutrunner motors can be manually or automatically controlled and can be installed, with maximum reliability, on any operating axis in **automated assembly lines**, in rotary table machines, on **fastening slides**, on **electronic axes** for assembly on different planes, or on versatile and fully reconfigurable articulated **robots**.

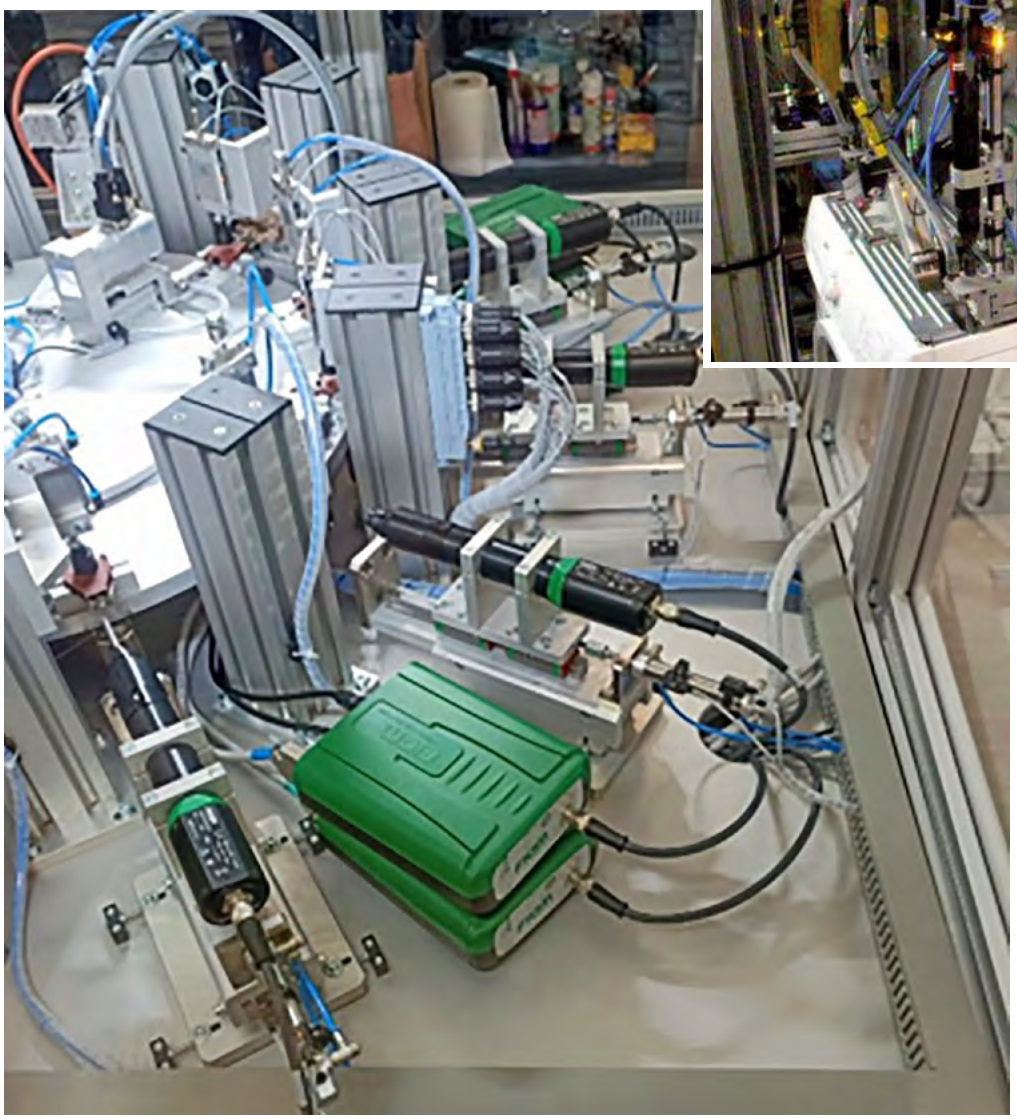
Nutrunner motor operating on Cartesian x, y axes

• AUTOMATION COMPONENTS

From fastening slides to screw feeders, from support structures to the several interconnection devices, all accessories necessary and functional for the efficiency of the automated workstation.

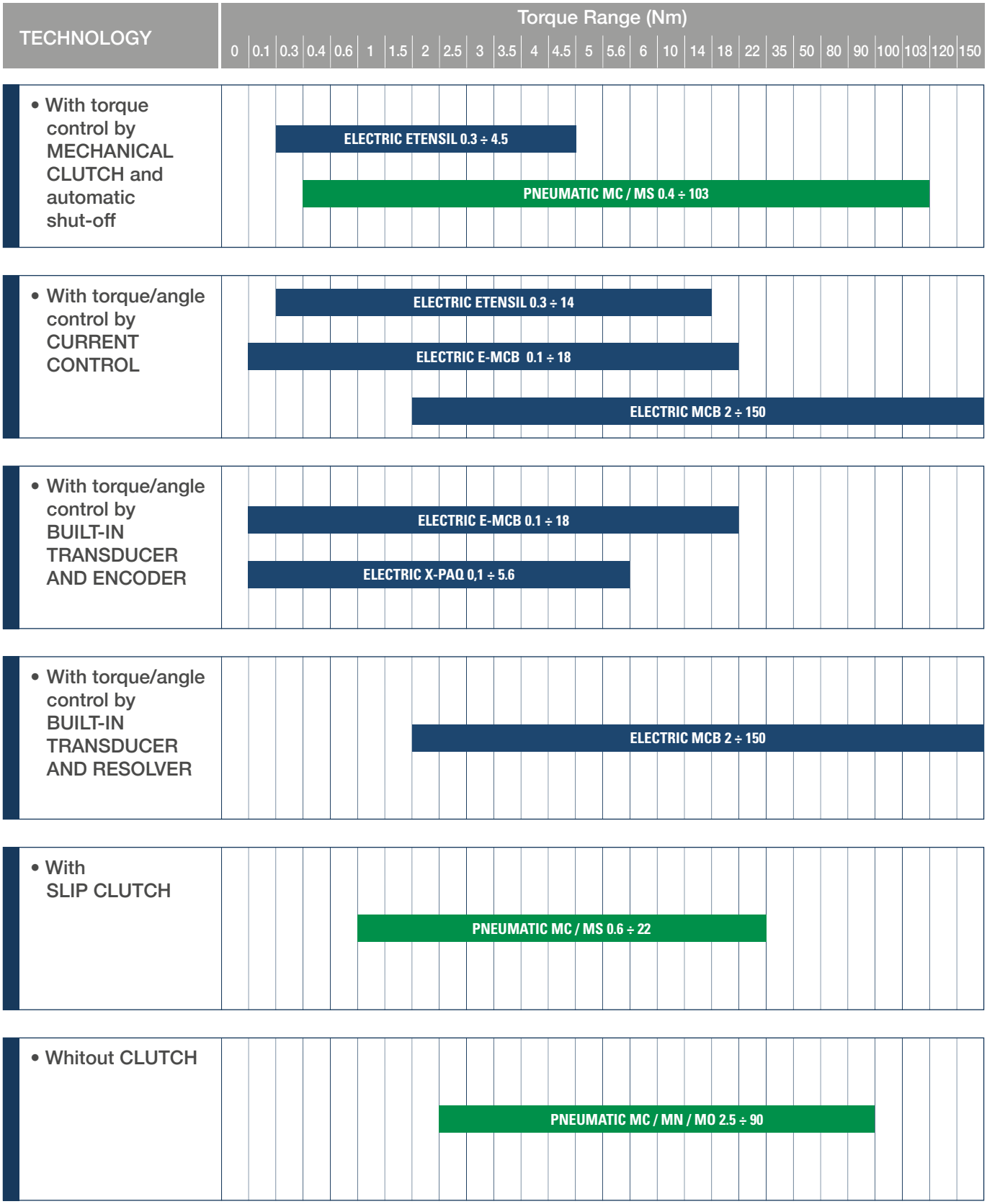
Solutions for tightening process automation ensure **consistent performance over time, even under the most demanding operating conditions**, and must be chosen according to the application, the type of joint and screw, the production layout and the required production rates, as well as the level of monitoring and control desired over the production cycle.





Application of nutrunner motors to assemble washing machine components

AVAILABLE NUTRUNNER MOTORS



Electric eTensil nutrunner motors

- with mechanical clutch and automatic shut-off
  Torque range: 0.3 ÷ 4.5 Nm ..... page 6
- with torque/angle control by current control
  Torque range: 0.3 ÷ 7 Nm ..... page 10
- Accessories..... page 14

Electric E MCB nutrunner motors

- with torque/angle control by current control
  Torque range: 0.1 ÷ 18 Nm ..... page 17
- with torque/angle control with built-in transducer and encoder
  Torque range: 0.1 ÷ 18 Nm ..... page 21

Electric X-PAQ nutrunner motors

- with torque/angle control with built-in transducer and encoder
  Torque range: 0.1 ÷ 5.6 Nm ..... page 28

Electric MCB nutrunner motors

- with torque/angle control by current control ..... page 35
- with torque/angle control with built-in transducer and resolver
  Torque range: 2 ÷ 150 Nm ..... page 37

Pneumatic MC and MS nutrunner motors

- with mechanical clutch and automatic shut-off
  Torque range: 0.4 ÷ 103 Nm ..... page 44
- with slip clutch
  Torque range: 0.8 ÷ 22 Nm ..... page 53
- without clutch
  Torque range: 2.5 ÷ 90 Nm ..... page 58

Multi-spindle screwdrivers ..... page 58

Automation components and accessories

- Fastening slides..... page 62
- Screw feeders and selection units ..... page 67
- Support structures and hoppers ..... page 67
- Axial compensators and mounting flanges ..... page 69
- Automatic Pick & Place: screw vacuum systems and nut picking systems ..... page 72

eTensil electric nutrunner motors
Torque control: 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 mechanichal clutch and automatich 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.

TPU-2

TPU-M1

Application example of nutrunner motor on fastening slide

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

Nutrunner motor technical features

Control type	Torque control with mechanical clutch and automatic electric power shut-off
Torque range	0,3 ÷ 4,5 Nm / 2.6 ÷ 39.8 in lb
Speed	170 ÷ 2000 rpm ✔ HIGH / LOW with TPU-2 unit ✔ Adjustable with TPU-M1 unit up to 50% of max speed
Motor technology	Brushless
ESD certificates	✔
Power supply	Low voltage (32 volts)
Clamping diameter	Ø 36 mm
Overall length	295 mm
Weight	0,87 Kg / 1.91 lb
Flange	Not included

Accessory drive	Quick-change chuck (bits, wrenches, etc.) e.g. F 1/4”
Accessory drive front threaded	M 21.7 x 1 LEFT-HAND (for axial compensators, screw vacuum heads, other devices)
Interconnectivity	- Digital electrical I/O signals for communication with external devices, e.g. PLC - RS-232 (for TPU-M1) - Ethernet protocols: REST API, OPC UA, Cloud connectivity (with accessories available upon request)
Axial compensation	✔
Offset device	✔
Reversible models	✔
Cable	✔ Included 3 m
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

Control unit technical features

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

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 / 0 (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

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		* Idle speed range with TPU-M1	*Idle speed slow-L / fast-H with TPU-2	Reversibility	Weight		Accessories	Dimensions	Axial compensators	Power supply and monitoring unit compatible		Cable	
Model	**Code**	**Nm**	**in lb**	**r.p.m.**	**r.p.m.**	**Type**	**kg**	**lb**	**Drive**	**L x Ø (mm)**		**Model**	**Model**	**Model**	**Code**
E8MC1A-1200	111712706	0,3÷1,6	2.6÷14.1	590÷1180	980 /1180	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC1A-900	111712707	0,3÷1,6	2.6÷14.1	435÷870	740 / 870	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC1A-650	111712708	0,3÷1,6	2.6÷14.1	320÷640	530 / 640	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC2A-2000	111712700	0,6÷2,5	5.3÷22.1	1000÷2000	1650 / 2000	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC3A-1200	111712701	0,6÷3	5.3÷26.5	590÷1180	980 / 1180	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC3A-900	111712702	0,6÷3,5	5.3÷31.0	435÷870	740 / 870	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC4A-650	111712703	0,6÷4	5.3÷35.4	320÷640	530 / 640	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834
E8MC5A-350	111712704	0,6÷4,5	5.3÷39.8	170÷340	285 / 340	↻	0,87	2.0	⬡ F1/4"	298 x 36	see page 9	TPU-2	TPU-M1	included	686903834

Legend

E8MC4A-650 = Electric nutrunner motor with torque control by mechanical clutch

E = Electric
8 = Power of motor in watt/10
MC = Motor

4 = Max torque in Nm
A = Automatic power supply shut-off
650 = Speed

Legend

↻ **Reversibility:** all models are suitable for tightening and untightening operation

Starting system

Remote start

✦ Tools speed range varies according to the unit used:
- **with TPU-2,** the LOW (slow) speed is approximately equal to 80% of the max speed indicated in the table and can only be set through the LOW/HIGH (slow / fast) speed setting. For untightening operations, only HIGH speed is available with these units, i.e. the speed cannot be modified. For this type of requirement, TPU-M1 unit should be used.
- with **TPU-M1**, the speed is instead adjustable and the minimum speed value is equal to 50% of the max speed, as indicated in the table.

• Accessory drive: female hexagonal drive 1/4", 6,35 mm (ISO 1173).
• The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speed and should be considered as indicative. The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service**.

Standard equipment (supplied with the nutrunner motor)

- Connection cable to power supply unit (code 686903834); lenght 3 mt, can be increased by adding additional cables, with error proof connection system. Extremely resilient, flame resistant and hallogen-free.
- Clutch adjustment key
- Eco-friendly packaging
- Use and maintenance manual.

Models and accessories available upon request

- Motors with axial compensator: see page 9
- Motors with offset device (for narrow distances between the axis): see page 9
- Motors with offset device with axial compensator : see page 9
- To use the offset device, you must order the adapter - code 687029248
- Mounting flange 36 mm in diameter - code 684011007. See page 70
- Motors with modified flange and / or with customized body design
- Motors with angled head

Power supply unit technical features

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Visual indicators	Weight kg	lb	L x Width x H mm
TPU-2	686200101	LOW / HIGH (slow / fast)	1	32 VDC	230 Vac ±10% 50-60 Hz	5 inputs 5 outputs	YES	0,6	1.32	185x150x63

Monitoring unit technical features

TPU-M1	686200109	LOW / HIGH (slow / fast)	1	32 VDC	230 Vac ±10% 50-60 Hz	8 inputs 8 outputs	7 LED DISPLAY	0,8	1.76	185x150x105

OTHER MODELS AVAILABLE: with 120V operation or equipped with auto power-on functionality, which allows the unit to be automatically switched on to manage the entire workstation with a single main switch.
- TPU-2 120V - code 686200103
- TPU-M1 - 120V - code 686200110
- TPU-M1 - AutoPowerOn - code 686200114
- TPU-M1 - 120V AutoPowerOn - code 686200118

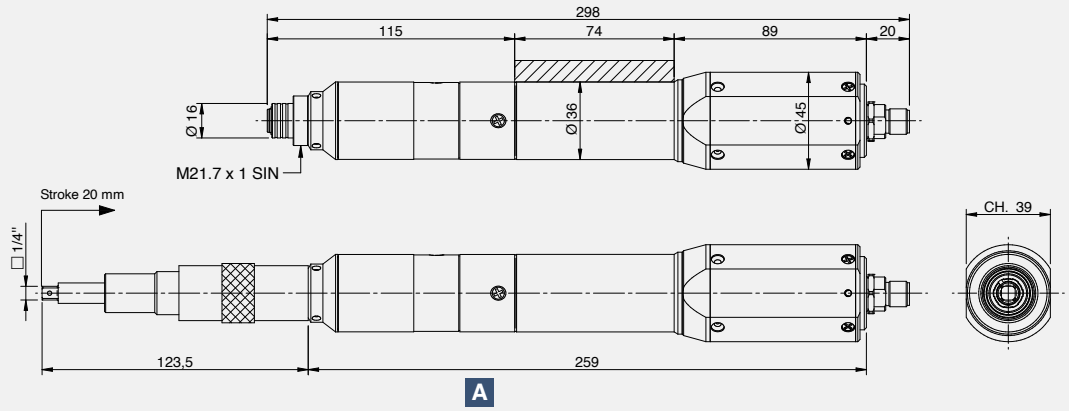
Standard equipment

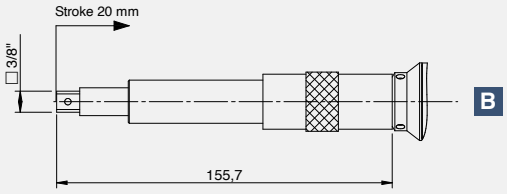
- Units in the table are fitted with cable and European plug
- I/O Connector
- Use and maintenance manual
- Eco-friendly packaging
- The TPU-M1 unit is equipped with adjustable tilt foot.

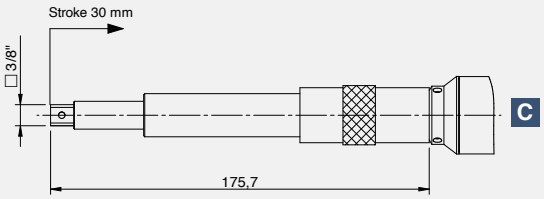
Accessories available upon request

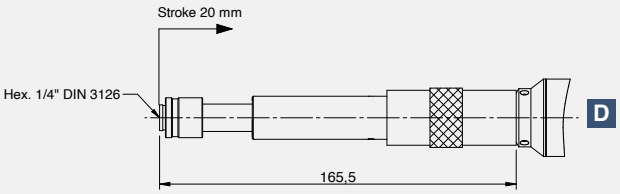
- **Anchoring plate** to mount the TPU unit on any surface. Supplied complete with screws and can be mounted vertically or on a horizontal support - code 692080000
- **Screw vacuum systems** for use with pick & place devices, see page 72
- **Fiam HyperTerminal kit** for managing tightening results: see page 14
- **Bits, wrenches and other accessories**, see catalogue no. 78
- **Other automation accessories**, see page 62

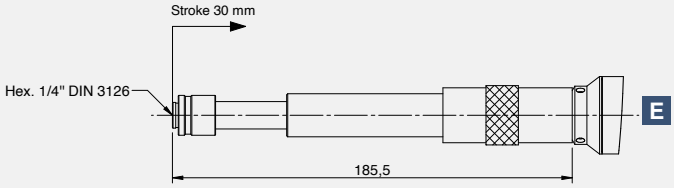
Dimensions

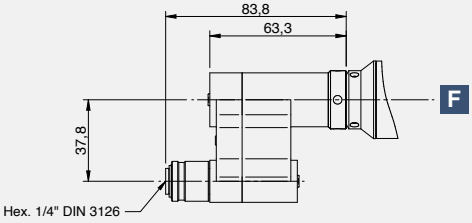


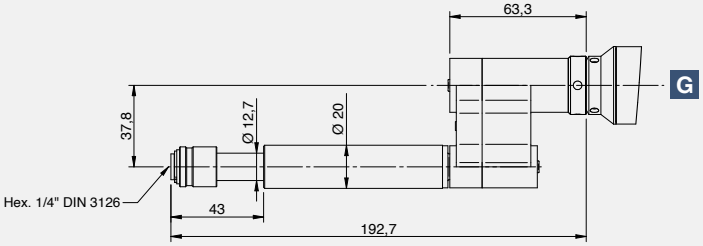


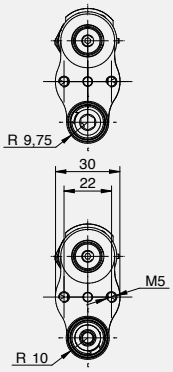












AXIAL COMPENSATORS

Ref.	Type	Code	Axial compensation - stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601091	20	26,5	32,9
B	Drive □ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
B	Drive □ 3/8" (DIN 3121 - F 10)	680601072	20	15,6	34,9
C	Drive □ 3/8" (DIN 3121 - F 10)	680600015	30	12,8	36,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601080	20	1,6	20,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601082	20	11,8	34,9
E	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601083	30	20	38,4

OFFSET DEVICES

F	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601185	20	11,8	34,9
G	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601195	20	1,6	20,8

- For use of the offset device, it is necessary to order the adapter - code 687029248
- The offset device can be used with motors up to 5 Nm.

Offset device for very small centre-to-centre distances code 680601185

Offset device with axial compensator code 680601195

eTensil electric nutrunner motors
Torque/angle current control system

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.**

TPU-C1

TPU-C3

Application example of nutrunner motor on fastening slide

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

Nutrunner motor technical features

Control type	Torque/Angle by current control
Torque range	0,3 ÷ 7 Nm / 2.6 ÷ 61.9 in lb
Speed	55 ÷ 2000 rpm
Motor technology	Brushless
ESD certificates	✔
Power supply	Low voltage (32 volt)
Clamping diameter	Ø 36 mm
Weight	0,68 Kg / 1.49 lb
Fixing Flange	Not included
Accessory drive	Quick-change chuck (bits, sockets etc.) Hex F ¼"

Interconnectivity	- Digital electrical I/O signals for communication with external devices (e.g. PLC) - RS-232 - Ethernet protocols: REST API, OPC UA, Cloud connectivity (with accessories available upon request)
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Cable	✔ Included 3 m
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

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

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**
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- Log of the last 99 tightenings
- Interfacing with working stations
- 8 + 8 programmable I/O (21 + 22 signal types)
- Selection of programs from I / 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

Additional features of TPU-C3 compared to the basic unit (TPU-C1) are highlighted in red on the chart above

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		Idle speed Min. / Max.	Reversibility	Weight		Accessories	Dimensions	Axial compensators	Control unit compatible		Cable	
Model	**Code**	**Nm**	**in lb**	**r.p.m.**	**Type**	**kg**	**lb**	**Drive**	**L x Ø**		**Model**	**Model**		**Code**
E8MCC2A-2000	111712710	0,3÷2	2.6÷17.7	300÷2000	↻	0,68	1.5	⬡ F1/4"	237 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC3A-1200	111712711	0,3÷3	2.6÷26.5	180÷1200	↻	0,68	1.5	⬡ F1/4"	237 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC4A-900	111712712	0,3÷4	2.6÷35.4	135÷900	↻	0,68	1.5	⬡ F1/4"	237 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC5A-650	111712713	0,3÷5	2.6÷44.2	100÷650	↻	0,68	1.5	⬡ F1/4"	237 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC7A-350	111712714	0,4÷7	3.5÷61.9	55÷350	↻	0,68	1.5	⬡ F1/4"	237 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC10A-200	111712720	3÷10	26÷88.4	30÷200	↻	0,80	1.76	⬡ F1/4"	255,4 x 36	see page 13	TPU-C1	TPU-C3	included	686903834
E8MCC14A-160	111712721	4÷14	35.4÷123.8	30÷200	↻	0,80	1.76	⬡ F1/4"	255,4 x 36	see page 13	TPU-C1	TPU-C3	included	686903834

Legend

E8MCC2A-2000 = Electric nutrunner motor with torque/angle current control system
E = Electric
8 = Power of motor in watt/10
MC = Motor
C = Torque/angle current control system
2 = Max torque in Nm
A = Automatic power supply shut-off
2000 = Speed

All nutrunner motors are supplied with a working speed equal to 15% 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**.

Legend	Starting system
↻ **Reversibility:** all models are suitable for tightening and untightening operation	Remote start

• Accessory drive: female hexagonal drive 1/4", 6,35 mm (ISO 1173).
• The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speed and should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service.**

Standard equipment (supplied with the nutrunner motor)

- Connection cable to control unit (code 686903834); lenght 3 mt, can be increased by adding additional cables, with error proof connection system. Extremely resilient, flame resistant and hallogen-free.
- Eco-friendly packaging
- Use and maintenance manual.

Models and accessories available upon request

- Motors with axial compensator, see page 13
- Motors with offset device, see page 13
- Motors with offset device with axial compensator, see page 13
- To use the offset device, you must order the adapter - code 687029248
- Fixing flange 36 mm in diameter - code 684011007, see page 71
- Motors with modified flange and / or with customized body design
- Motors with angled head

N.B.: The offset device can be used with motors up to 5 Nm.

Control unit technical features

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Visual indicators	Weight kg	lb	L x Width x H mm
TPU-C1	686200105	Adjustable	1	32 VDC	230 Vac ±10% 50-60 Hz	8 inputs 8 outputs 9 + 11 signal types	7 LED DISPLAY	0,8	1.76	185x150x105
TPU-C3	686200107	Adjustable	1	32 VDC	230 Vac ±10% 50-60 Hz	8 inputs 8 outputs 21 + 22 signal types	7 LED DISPLAY	0,8	1.76	185x150x105

OTHER MODELS AVAILABLE: with 120V operation or equipped with auto power-on functionality, which allows the unit to be automatically switched on to manage the entire workstation with a single main switch.

- TPU-C1 AutoPowerOn. Code 686200121
- TPU-C1- 120V. Code 6862000106
- TPU-C1 -120V AutoPowerOn. Code 686200120
- TPU-C3 AutoPowerOn. Code 686200115
- TPU-C3- 120V. Code 6862000108
- TPU-C3 -120V AutoPowerOn. Code 6862001198

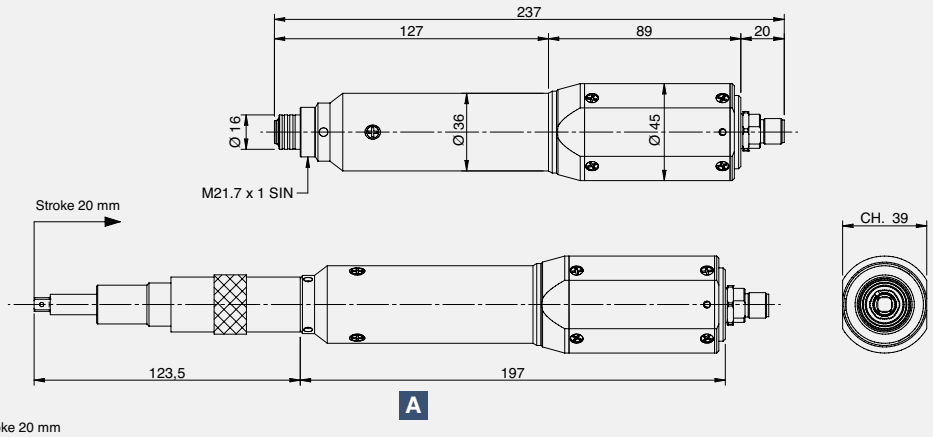
Standard equipment

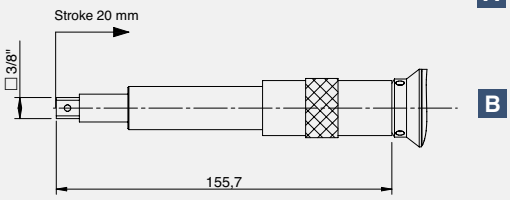
- Control units are fitted with cable and European plug (TPU-C1 and TPU-C3), American plug (TPU-C1-120V and TPU-C3-120V)
- Use and maintenance manual
- Eco-friendly packaging
- The unit is equipped with adjustable tilt foot

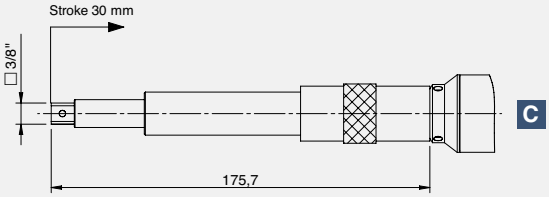
Accessories available upon request

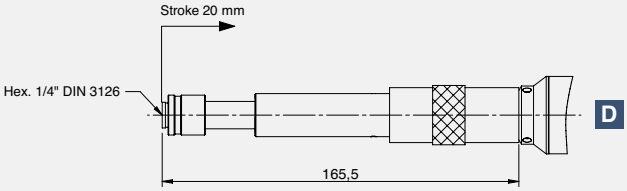
- **Anchoring plate** to mount the TPU unit on any surface. Supplied complete with screws and can be mounted vertically or on a horizontal support - code 692080000
- **Screw vacuum systems** for use with pick & place devices, see page 72
- **Fiam HyperTerminal kit** for managing tightening results: see page 14
- **Bits, wrenches and other accessories**, see catalogue no. 78
- **Other automation accessories**, see page 62

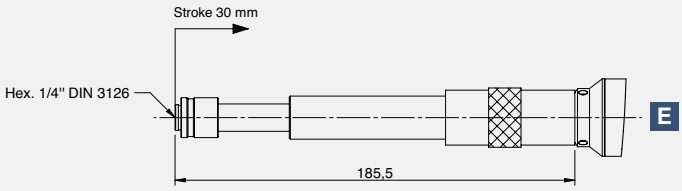
Dimensions

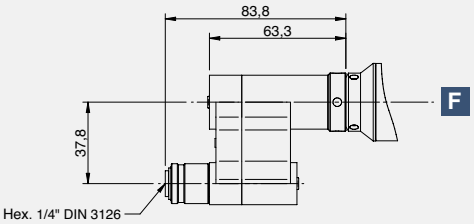


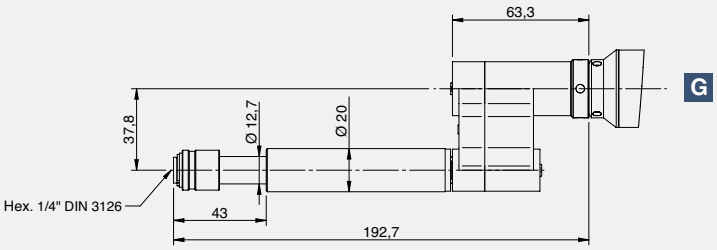


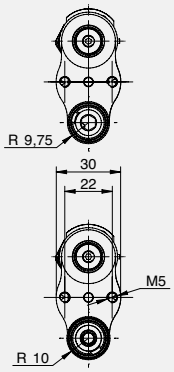












AXIAL COMPENSATORS

Ref.	Type	Code	Axial compensation - stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601091	20	26,5	32,9
B	Drive □ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
B	Drive □ 3/8" (DIN 3121 - F 10)	680601072	20	15,6	34,9
C	Drive □ 3/8" (DIN 3121 - F 10)	680600015	30	12,8	36,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601080	20	1,6	20,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601082	20	11,8	34,9
E	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601083	30	20	38,4

OFFSET DEVICES

F	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601185	20	11,8	34,9
G	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601195	20	1,6	20,8

- For use of the offset device, it is necessary to order the adapter - code 687029248
- The offset device can be used with motors up to 5 Nm.

Offset device for very small centre-to-centre distances code 680601185

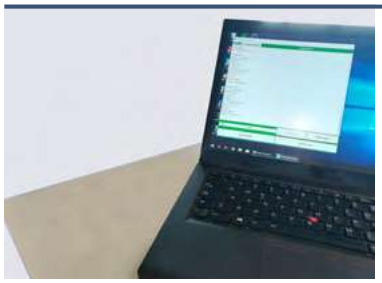
Offset device with axial compensator code 680601195

Accessories for eTensil nutrunner motors

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 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.

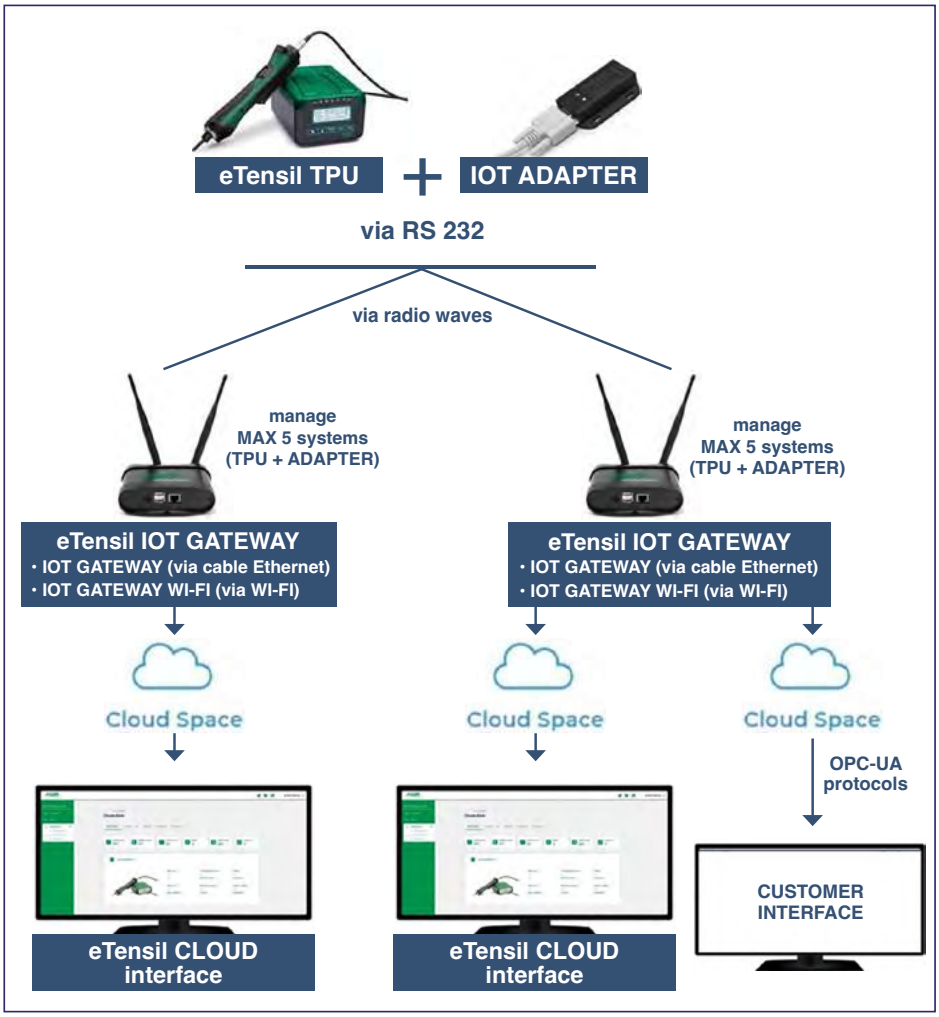
eTensil ETHERNET MODULE

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 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.

E-MCB electric nutrunner motors
With torque/angle current control and built-in 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.

In these models with **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).**

- **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

Nutrunner motor technical features

Control type	Torque/Angle by current control
Torque range	0,10 ÷ 18 Nm / 0.88 ÷ 159.31 in lb
Speed	22 ÷ 2100 rpm - Adjustable
Motor technology	Brushless
ESD certificates	✔
Power supply	Low voltage (32 volt)
On-board electronics	Status LEDs and tightening result
Clamping diameter	3 sizes: Ø 32, 36 and 53 mm
Weight	0,51÷2,1 Kg / 1.12÷4.63 lb - Easy mounting/installation on machines, including compact-sized machines
Fixing flange	✔
Accessory drive	☐ 1/4M - ☐ 3/8M - Quick-change chuck ⎔ 1/4" F
Interconnectivity	Digital electrical I/O signals for communication with external devices (e.g. PLC or other devices) Fieldbus: Profinet - Modbus TCP/IP - EtherNet /IP. To ordered separately.
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Cable	2 types, to be ordered separately: 4 - 7 - 10 m
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

Control unit technical features

E-TCS control unit. For easy and complete management of tightening processes. The navigation menus are simple and intuitive; only a few taps directly on the screen are required to configure tightening parameters, create assembly strategies or display diagnostics. **Discover it on page 25.**

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		Idle speed Min. / Max.	Reversibility	Ø	Weight		Accessories	Axial compensator. Stroke/Initial force/Max force	Control unit compatible		Cables
Model	**Code**	**Nm**	**in lb**	**r.p.m.**	**Type**	**mm**	**kg**	**lb**	**Drive M**	**mm / N / N**	**Model**	**Code**	
E8MCB1C-2000	111619017	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,52	1.15	☐ 1/4”	NO	E-TCS	686200210	
E8MCB1C-2000-MR	111619038	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,51	1.12	MR	NO			
E8MCB1CT-2000	111619016	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,59	1.30	☐ 1/4”	20 / 12.6 / 50.3			
E8MCB2C-900	111619019	0,2÷2	1.77÷17.70	27÷900	↻	32	0,52	1.15	☐ 1/4”	NO			
E8MCB2C-900-MR	111619039	0,2÷2	1.77÷17.70	27÷900	↻	32	0,51	1.12	MR	NO			
E8MCB2CT-900	111619018	0,2÷2	1.77÷17.70	27÷900	↻	32	0,59	1.30	☐ 1/4”	20 / 12.6 / 50.3			
E8MCB3C-480	111619021	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,52	1.15	☐ 1/4”	NO			**Straight cable**
E8MCB3C-480-MR	111619040	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,51	1.12	MR	NO			L=4MT code 686200660
E8MCB3CT-480	111619020	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,59	1.30	☐ 1/4”	20 / 12.6 / 50.3			L=7MT code 686200661
E12MCB2C-1650	111619023	0,25÷2,5	2.21÷22.12	49÷1645	↻	36	0,74	1.63	☐ 1/4”	NO			L=10MT code 686200662
E12MCB2C-1650-MR	111619041	0,25÷2,5	2.21÷22.12	49÷645	↻	36	0,73	1.61	MR	NO			
E12MCB2CT-1650	111619022	0,25÷2,5	2.21÷22.12	49÷1645	↻	36	0,82	1.81	☐ 1/4”	20 / 12.6 / 50.3			
E12MCB4C-730	111619025	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,74	1.63	☐ 1/4”	NO			**Cable to 90°**
E12MCB4C-730-MR	111619042	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,73	1.61	MR	NO			L=4MT code 686200663
E12MCB4CT-730	111619024	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,82	1.81	☐ 1/4”	20 / 12.6 / 50.3			L=7MT code 686200664
E12MCB6C-530	111619027	0,6÷6	5.31÷53.10	16÷530	↻	36	0,74	1.63	☐ 1/4”	NO			L=10MT code 686200665
E12MCB6C-530-MR	111619043	0,6÷6	5.31÷53.10	16÷530	↻	36	0,73	1.61	MR	NO			
E12MCB6CT-530	111619026	0,6÷6	5.31÷53.10	16÷530	↻	36	0,82	1.81	☐ 1/4”	20 / 12.6 / 50.3			
E18MCB12C-380	111619029	1,2÷12	10.62÷106.20	11÷380	↻	53	1,78	3.92	☐ 3/8”	NO			
E18MCB12CT-380	111619028	1,2÷12	10.62÷106.20	11÷380	↻	53	2,1	4.63	☐ 3/8”	20 / 28.7 / 61.5			
E18MCB18C-230	111619031	1,8÷18	15.93÷159.31	7÷232	↻	53	1,78	3.92	☐ 3/8”	NO			
E18MCB18CT-230	111619030	1,8÷18	15.93÷159.31	7÷232	↻	53	2,1	4.63	☐ 3/8”	20 / 28.7 / 61.5			

Legend

E8MCB1C-2000 = Electric nutrunner motor with torque/angle current control
E = Electric
8 = Power of motor in watt/10

MCB = Brushless Motor
1 = Max torque in Nm
C = Torque/angle current control system
T = Telescopic

2000 = Speed
MR = Model with quick-change chuck and 1/4”, 6.35 mm female hex drive

Max speed: FIAM recommends using the tool up to 80% of the declared maximum torque value. This aspect should be taken into consideration according to the specific application.

Legend

↻ **Reversibility:** all models are suitable for tightening and untightening operation

Starting system

Remote start

- Accessory drive: female hexagonal drive 1/4”, 6,35 mm (ISO 1173).
- The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speed and should be considered as indicative. The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the blade), tightening speed, assembly conditions (free standing screwdriver, screwdriver mounted on a torque arm), operator behavior during the tightening phase.
For any further details, please address to **Fiam Technical Service**.

Standard equipment (supplied with the nutrunner motor)

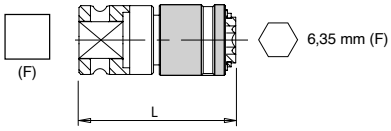
- Fixing Flange
- Eco-friendly packaging
- Use and maintenance manual

Models available upon request

- Special nutrunner motors equipped with offset device and/or offset device with axial compensator

Accessories available upon request

- **Connection cables.** The motor-to-unit connection cable differs only in the available lengths and in the type of motor-side connector, which can be either straight or 90° angled. The connectors are robust, co-molded, and non-metallic. See page 27.
- **Quick-change chuck**

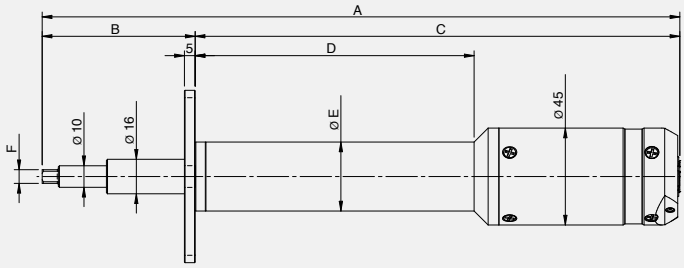


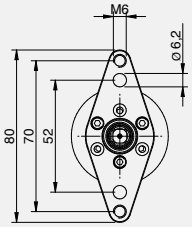
For	L = mm	Code
Nutrunner motors with ☐ 1/4” male square drive	38	654141016
Nutrunner motors with ☐ 3/8” male square drive	41	654141015

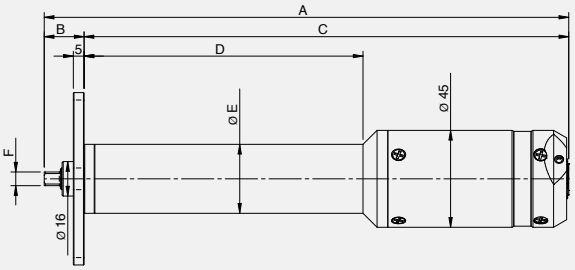
- **Bits, sockets and other accessories,** refer to catalogue No. 78
- **Other automation accessories,** **see page 62**

Dimensions

Models with 32-36 mm diameter

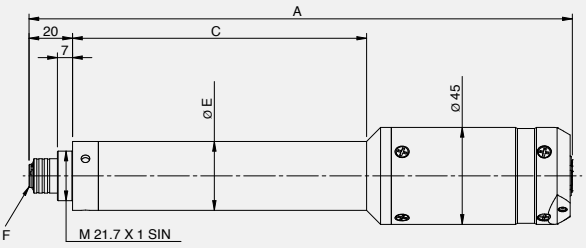






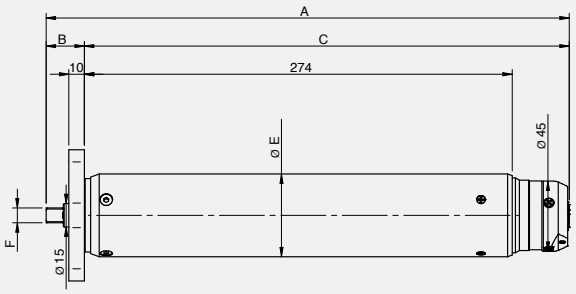
Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	D	Axial compensator YES	NO
E8MCB1C-2000	111619017	32	203,5	18,5	19	87,5		✔
E8MCB2C-900	111619019	32	203,5	18,5	190	87,5		✔
E8MCB3C-480	111619021	32	203,5	18,5	190	87,5		✔
E8MCB1CT-2000	111619016	32	308	71	237	129,5	✔	
E8MCB2CT-900	111619018	32	308	71	237	129,5	✔	
E8MCB3CT-480	111619020	32	308	71	237	129,5	✔	
E12MCB2C-1650	111619023	36	221,5	18,5	203	102		✔
E12MCB4C-730	111619025	36	221,5	18,5	203	102		✔
E12MCB6C-530	111619027	36	221,5	18,5	203	102		✔
E12MCB2CT-1650	111619022	36	302	66	231	130	✔	
E12MCB4CT-730	111619024	36	302	66	231	130	✔	
E12MCB6CT-530	111619026	36	302	66	231	130	✔	

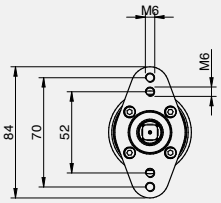
Models with quick-change chuck

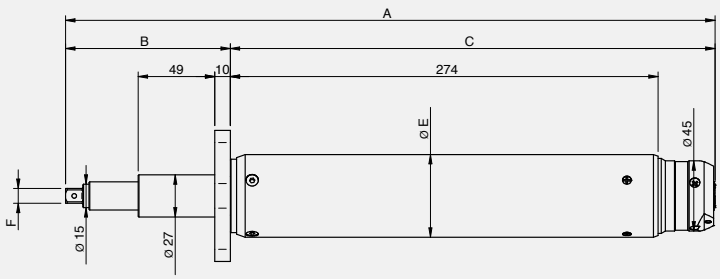


Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	D	Axial compensator YES	NO
E8MCB1C-2000-MR	111619038	32	233	\	213	105		✔
E8MCB2C-900-MR	111619039	32	233	\	213	105		✔
E8MCB3C-480-MR	111619040	32	233	\	213	105		✔
E12MCB2C-1650-MR	111619041	36	238	\	218	105		✔
E12MCB4C-730-MR	111619042	36	238	\	218	105		✔
E12MCB6C-530-MR	111619043	36	238	\	218	105		✔

Models with 53 mm diameter







Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	Axial compensator YES	NO
E18MCB12C-380	111619029	53	311,5	24,5	287		✔
E18MCB18C-230	111619031	53	326,5	24,5	302		✔
E18MCB12CT-380	111619028	53	428	105,5	322,5	✔	
E18MCB18CT-230	111619030	53	443	105,5	337,5	✔	

E-MCB electric nutrunner motors
With torque/angle control by 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.

With these motors, **multiple configurations are possible with different torque, speed, and other parameter settings.** As a result, they can be used for different applications: the same nutrunner motor can tighten the same screw on different joints simply by adapting the programs on the associated control unit. This represents a significant advantage in terms of investment costs.

ESD-certified, ideal for the high-quality electronics industry.

In models **WITH BUILT-IN TRANSDUCER AND ENCODER**, 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

Nutrunner motor technical features

Control type	Torque/Angle by built-in transducer and encoder
Torque range	0,10 ÷ 18 Nm / 0.88 ÷ 159.31 in lb
Speed	22 ÷ 2100 rpm - Adjustable
Motor technology	Brushless
ESD certificates	✔
Power supply	Low voltage (32 volt)
On-board electronics	Status LEDs and tightening result
Clamping diameter	3 sizes: Ø 32, 36 and 53 mm
Weight	0,56÷2,1 Kg / 1.23÷4.62 lb - Easy mounting/installation on machines, including compact-sized machines
Fixing Flange	✔
Accessory drive	☐ 1/4M - ☐ 3/8M - Quick-change chuck ⬡ 1/4" F
Interconnectivity	Digital electrical I/O signals for communication with external devices (e.g. PLC or other devices). Fieldbus: Profinet - Modbus TCP/IP - EtherNet /IP. To ordered separately.
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Compatible accessories	✔ see page 25
Cable	2 types, to be ordered separately: 4 - 7 - 10 m
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

Control unit technical features

E-TCS control unit. For easy and complete management of tightening processes. The navigation menus are simple and intuitive; only a few taps directly on the screen are required to configure tightening parameters, create assembly strategies or display diagnostics. **Discover it on page 25.**

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque on soft joint Min. / Max.		Idle speed Min. / Max.	Reversibility	Ø	Weight		Accessories	Axial compensator. Stroke/Initial force/Max force	Control unit compatible		Cables
Model	**Code**	**Nm**	**in lb**	**r.p.m.**	**Type**	**mm**	**kg**	**lb**	**Drive M**	**mm / N / N**	**Model**	**Code**	
E8MCB1A-2000	111619001	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,57	1.26	☐ 1/4"	NO	E-TCS	686200210	
E8MCB1A-2000-MR	111619032	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,56	1.23	MR	NO			
E8MCB1AT-2000	111619000	0,1÷1	0.88÷8.85	60÷2000	↻	32	0,59	1.30	☐ 1/4"	20 / 12.6 / 50.3			
E8MCB2A-900	111619003	0,2÷2	1.77÷17.70	27÷900	↻	32	0,57	1.26	☐ 1/4"	NO			
E8MCB2A-900-MR	111619033	0,2÷2	1.77÷17.70	27÷900	↻	32	0,56	1.23	MR	NO			
E8MCB2AT-900	111619002	0,2÷2	1.77÷17.70	27÷900	↻	32	0,59	1.30	☐ 1/4"	20 / 12.6 / 50.3			
E8MCB3A-480	111619005	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,57	1.26	☐ 1/4"	NO			**Straight cable**
E8MCB3A-480-MR	111619034	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,56	1.23	MR	NO			L=4MT code 686200660
E8MCB3AT-480	111619004	0,35÷3,5	3.09÷30.97	14÷480	↻	32	0,59	1.30	☐ 1/4"	20 / 12.6 / 50.3			L=7MT code 686200661
E12MCB2A-1650	111619007	0,25÷2,5	2.21÷22.12	49÷1645	↻	36	0,79	1.74	☐ 1/4"	NO			L=10MT code 686200662
E12MCB2A-1650-MR	111619035	0,25÷2,5	2.21÷22.12	49÷645	↻	36	0,78	1.72	MR	NO			
E12MCB2AT-1650	111619006	0,25÷2,5	2.21÷22.12	49÷1645	↻	36	0,82	1.81	☐ 1/4"	20 / 12.6 / 50.3			**Cable to 90°**
E12MCB4A-730	111619009	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,79	1.74	☐ 1/4"	NO			L=4MT code 686200663
E12MCB4A-730-MR	111619036	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,78	1.72	MR	NO			L=7MT code 686200664
E12MCB4AT-730	111619008	0,45÷4,5	3.98÷39.82	22÷730	↻	36	0,82	1.81	☐ 1/4"	20 / 12.6 / 50.3			L=10MT code 686200665
E12MCB6A-530	111619011	0,6÷6	5.31÷53.10	16÷530	↻	36	0,79	1.74	☐ 1/4"	NO			
E12MCB6A-530-MR	111619037	0,6÷6	5.31÷53.10	16÷530	↻	36	0,78	1.72	MR	NO			
E12MCB6AT-530	111619010	0,6÷6	5.31÷53.10	16÷530	↻	36	0,82	1.81	☐ 1/4"	20 / 12.6 / 50.3			
E18MCB12A-380	111619013	1,2÷12	10.56÷105.6	11÷380	↻	53	1,93	4.25	☐ 3/8"	NO			
E18MCB12AT-380	111619012	1,2÷12	10.56÷105.6	11÷380	↻	53	2,1	4.63	☐ 3/8"	20 / 28.7 / 61.5			
E18MCB18A-230	111619015	1,8÷18	15.84÷158.4	7÷232	↻	53	1,93	4.25	☐ 3/8"	NO			
E18MCB18AT-230	111619014	1,8÷18	15.84÷158.4	7÷232	↻	53	2,1	4.63	☐ 3/8"	20 / 28.7 / 61.5			

Legend

E8MCB1A-2000 = Electric nutrunner motor with torque/angle by transducer and encoder
E = Electric
8 = Power of motor in watt/10

MCB = Brushless Motor
1 = Max torque in Nm
A = Torque/angle by transducer and encoder
T = Telescopic

2000 = Speed
MR = Model with quick-change chuck and 1/4", 6.35 mm female hex drive

Max speed: FIAM recommends using the tool up to 80% of the declared maximum torque value. This aspect should be taken into consideration according to the specific application.

Legend	Starting system
↻ **Reversibility:** all models are suitable for tightening and untightening operation	Remote start

- Accessory drive: female hexagonal drive 1/4", 6,35 mm (ISO 1173).
- The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speed and should be considered as indicative. The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the blade), tightening speed, assembly conditions (free standing screwdriver, screwdriver mounted on a torque arm), operator behavior during the tightening phase.
For any further details, please address to **Fiam Technical Service**.

Standard equipment (supplied with the nutrunner motor)

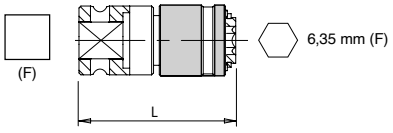
- Fixing Flange
- Eco-friendly packaging
- Use and maintenance manual

Models available upon request

- Special nutrunner motors equipped with offset device and/or offset device with axial compensator

Accessories available upon request

- **Connection cables.** The motor-to-unit connection cable differs only in the available lengths and in the type of motor-side connector, which can be either straight or 90° angled. The connectors are robust, co-molded, and non-metallic. See page 27.
- **Quick-change chuck**

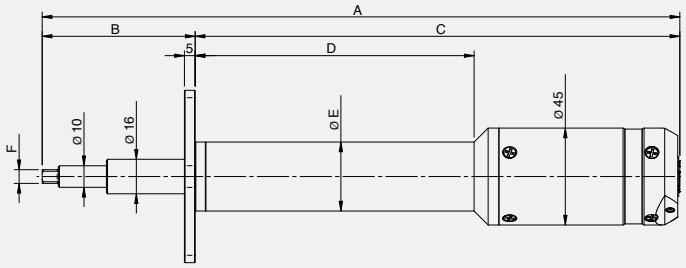


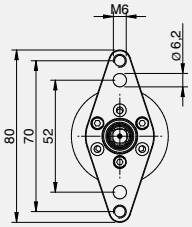
For	L = mm	Code
Nutrunner motors with ☐ 1/4" male square drive	38	654141016
Nutrunner motors with ☐ 3/8" male square drive	41	654141015

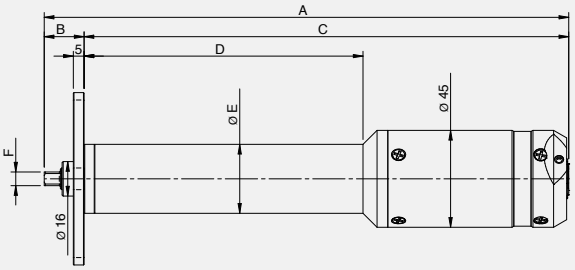
- **Bits, sockets and other accessories,** refer to catalogue No. 78
- **Other automation accessories,** **see page 62**

Dimensions

Models with 32-36 mm diameter

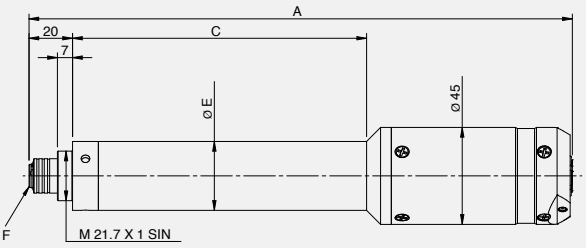






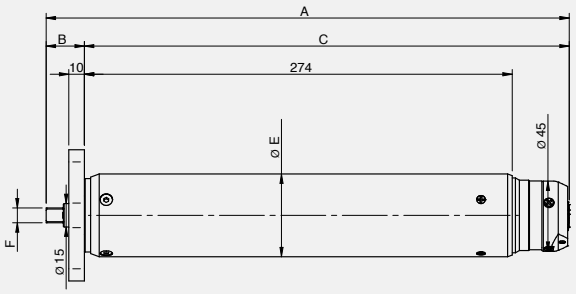
Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	D	Axial compensator YES	NO
E8MCB1A-2000	111619001	32	255,5	18,5	237	129,5		✔
E8MCB2A-900	111619003	32	255,5	18,5	237	129,5		✔
E8MCB3A-480	111619005	32	255,5	18,5	237	129,5		✔
E8MCB1AT-2000	111619000	32	308	71	237	129,5	✔	
E8MCB2AT-900	111619002	32	308	71	237	129,5	✔	
E8MCB3AT-480	111619004	32	308	71	237	129,5	✔	
E12MCB2A-1650	111619007	36	249,5	18,5	231	130		✔
E12MCB4A-730	111619009	36	249,5	18,5	231	130		✔
E12MCB6A-530	111619011	36	249,5	18,5	231	130		✔
E12MCB2AT-1650	111619006	36	302	66	231	130	✔	
E12MCB4AT-730	111619008	36	302	66	231	130	✔	
E12MCB6AT-530	111619010	36	302	66	231	130	✔	

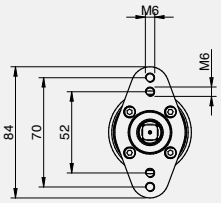
Models with quick-change chuck

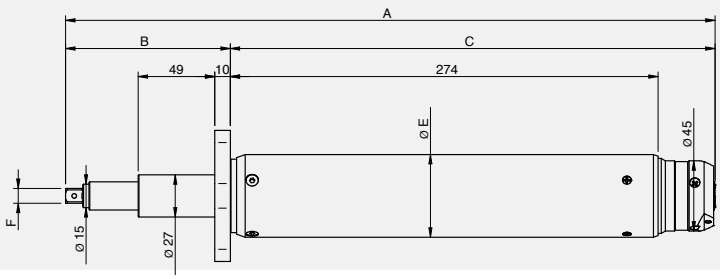


Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	D	Axial compensator YES	NO
E8MCB1A-2000-MR	111619032	32	264	\	244	136		✔
E8MCB2A-900-MR	111619033	32	264	\	244	136		✔
E8MCB3A-480-MR	111619034	32	264	\	244	136		✔
E12MCB2A-1650-MR	111619035	36	268	\	264	136		✔
E12MCB4A-730-MR	111619036	36	268	\	264	136		✔
E12MCB6A-530-MR	111619037	36	268	\	264	136		✔

Models with 53 mm diameter





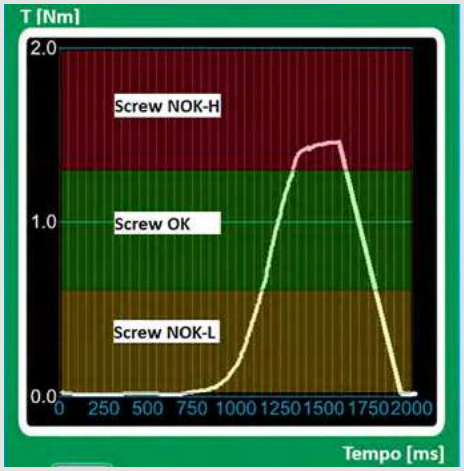


Model	Code	Ø (mm) E	Dimensions (mm) A	B	C	Axial compensator YES	NO
E18MCB12A-380	111619013	53	347	24,5	322,5		✔
E18MCB18A-230	111619015	53	347	24,5	337,5		✔
E18MCB12AT-380	111619012	53	428	105,5	322,5	✔	
E18MCB18AT-230	111619014	53	443	105,5	337,5	✔	

E-TCS control unit technical features

Evolute - Tightening Control System.

It is the new control unit for E-MCB electric nutrunner motors.
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

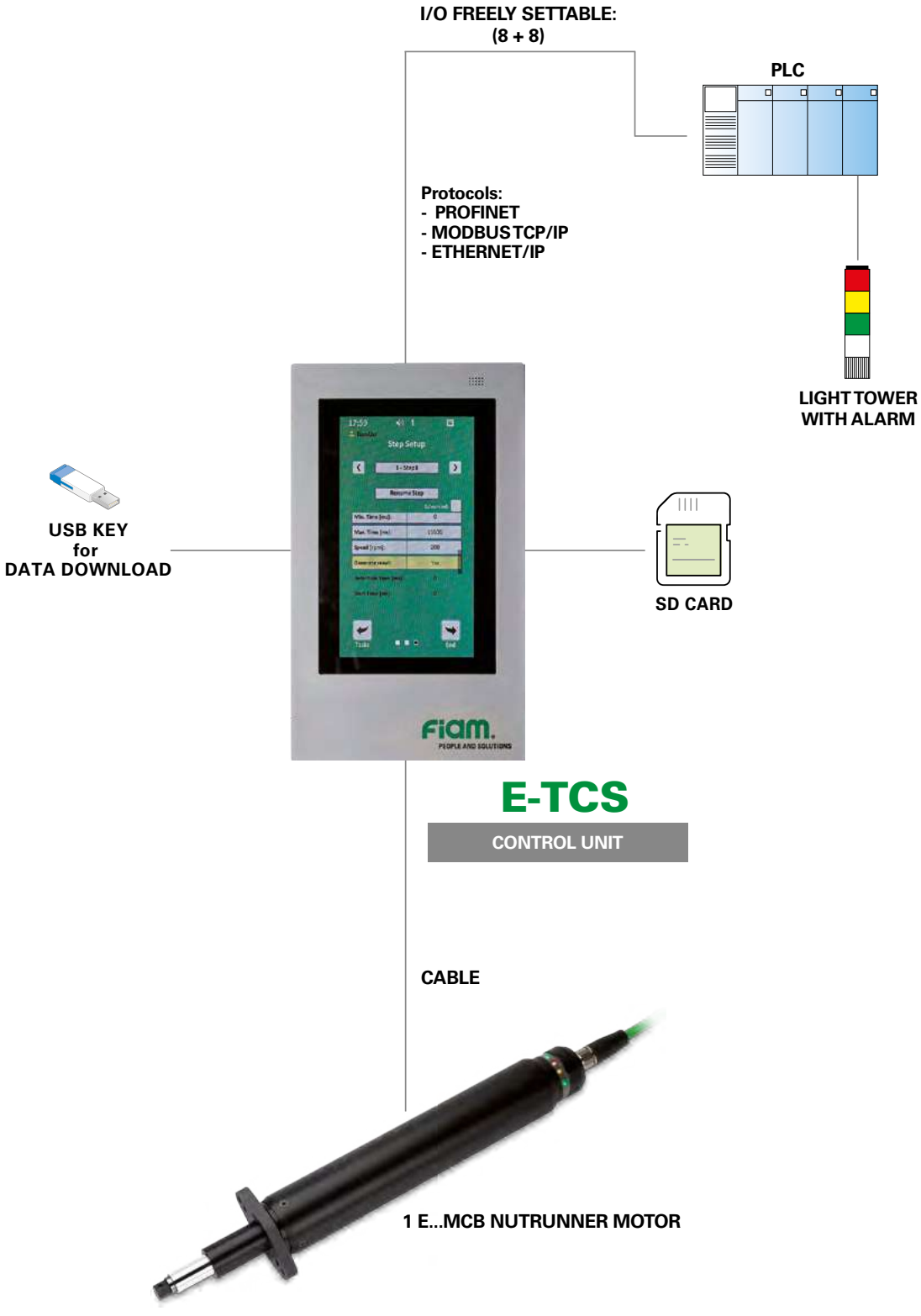
- Tightening logs exportable via Fieldbus (e.g. PROFINET – MODBUS TCP/IP – ETHERNET/IP)
- Import/export of tightening programs
- Data storable on SD-card, and therefore exportable
- The system can handle a capacity of over 1 million tightenings
- USB port for unit and tool firmware updates, for importing/exporting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

Interconnectivity

FIELDBUS port	Profinet - Modbus TCP/IP - EtherNet /IP. To ordered separately. Self-configuring once installed
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



Control unit technical features

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Visual indicators	Weight kg	lb	L x Width x H mm
E-TCS	686200210	Adjustable	1	32 VDC	230 Vac ±10% 50-60 Hz	8 inputs 8 outputs 10 + 8 signal types	7 LED DISPLAY	3,7	8.1	153x172.5x279
E-TCS 110V/240V	686200211	Adjustable	1	32 VDC	230 Vac ±10% 50-60 Hz	8 inputs 8 outputs 10 + 8 signal types	7 LED DISPLAY	3,7	8.1	153x172.5x279

FIELDBUS

Interface modules for network protocols connection	Code
PROFINET	686935004
ETHERNET/IP	686935003
MODBUS TCP/IP	686935005

Connecting cables

The E...MCB nutrunner motor connection cable to the E-TCS unit is unique and available in different lengths; also with 90° connector.
The cable connectors are extremely robust and of the co/molded type.

Model	Code	Length mt	Type of connector to the unit M16 Male	Type of connector to the unit M16 Female
CABLE WITH STRAIGHT CONNECTOR FOR E-TCS L=4mt	686200660	4	Straight	Straight
CABLE WITH STRAIGHT CONNECTOR FOR E-TCS L=7mt	686200661	7	Straight	Straight
CABLE WITH STRAIGHT CONNECTOR FORE-TCS L=10mt	686200662	10	Straight	Straight
CABLE WITH 90° CONNECTOR FOR E-TCS L=4mt	686200663	4	Straight	90°
CABLE WITH 90° CONNECTOR FOR E-TCS L=7mt	686200664	7	Straight	90°
CABLE WITH 90° CONNECTOR FOR E-TCS L=10mt	686200665	10	Straight	90°

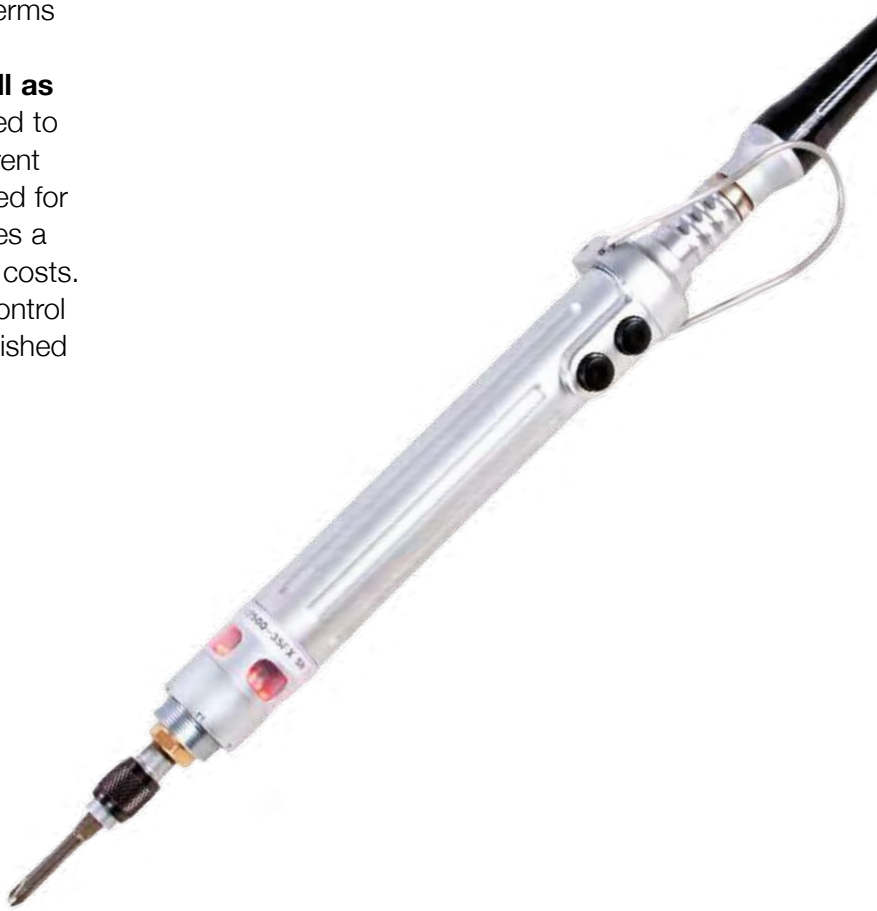
The cables **CANNOT be extended**: exceeding a length of 10 m is not recommended, as it may compromise the reliability of signal transmission.

The E-TCS control unit is compatible with:
• Multiple connector for I/O (code 692079193), see page 14

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.

CT2500

X-PAQ™ PRECISION | ACCURACY | QUALITY

Nutrunner motor technical features

Control type	Torque/Angle by built-in transducer and encoder
Torque range	0,10 ÷ 5,6 Nm / 0.88 ÷ 49.56 in lb
Speed	500 ÷ 1700 rpm - Adjustable
Motor technology	Brushless
On-board electronics	Status LEDs and tightening result
Clamping diameter	Ø 28.5mm
Weight	0,46 ÷ 0,49 Kg / 1.01 ÷ 1.08 lb
Fixing Flange	Not included
Accessory drive	Hex. drive 1/4 F, 6,35 mm
Front threaded connection	7/8–26 UN LH, 2A threaded connection
Interconnectivity	Digital electrical I/O signals for communication with external devices (e.g. PLC or other devices) Acop, Ethernet IP, ToolsNet e Profinet Protocols RS 232
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Quick Change Chuck	✔
Cable	Not included
Custom model	✔

Control unit technical features

CT2500 control unit

- 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

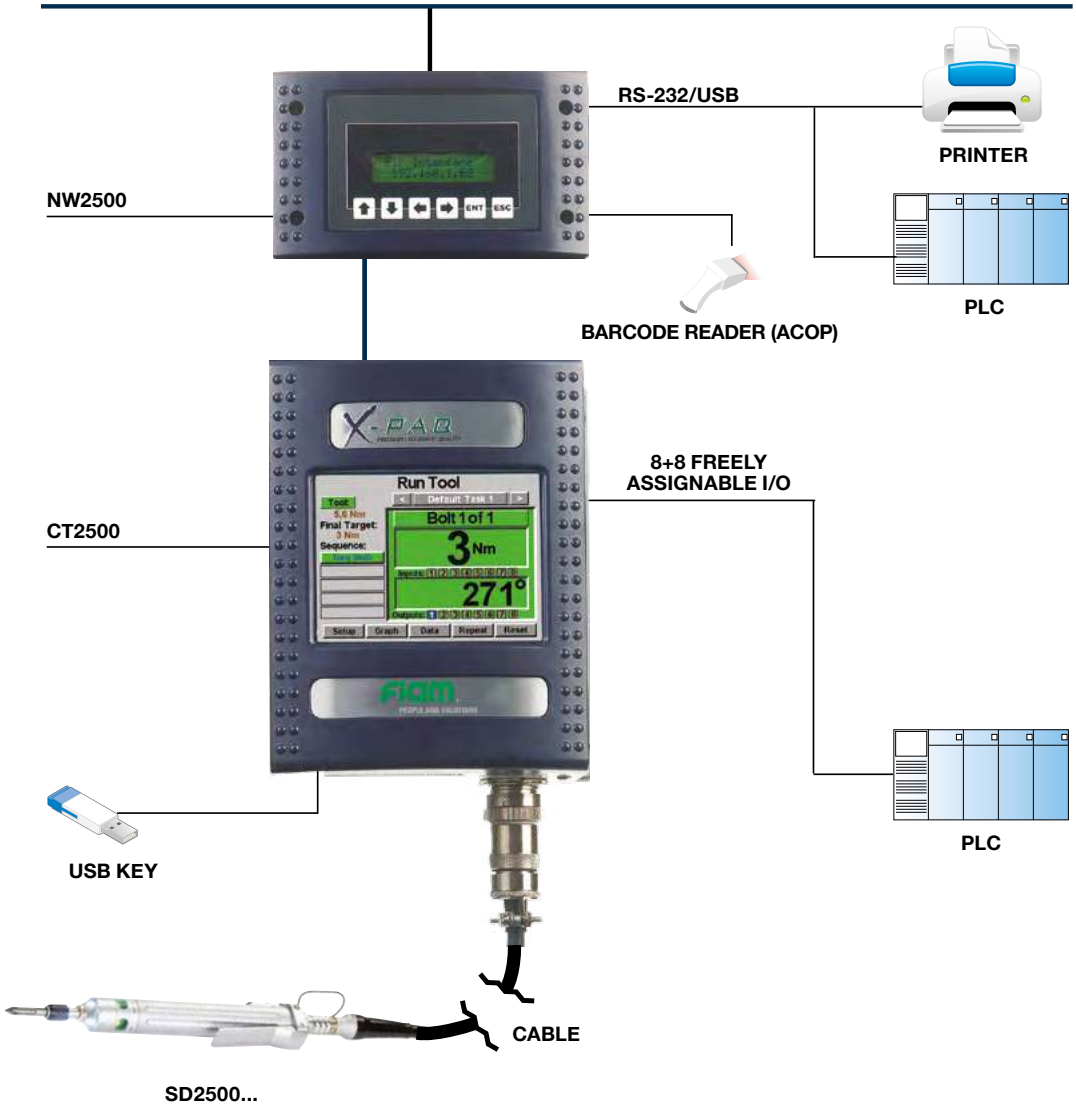
OTHER TYPE OF CONTROL

- 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**

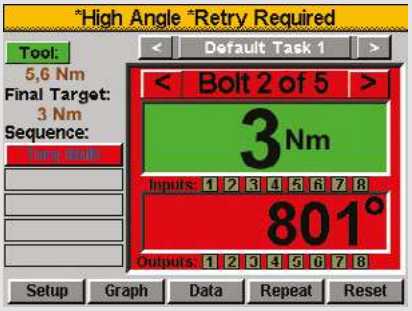
Interconnectivity

Ethernet port: through this port it can interface with Acop, Ethernet IP, ToolsNet and Profinet protocols

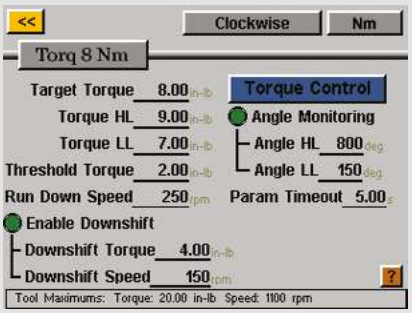


Straightforward and intuitive programming

The navigation menus are simple and intuitive. Just a few taps directly on the screen are enough to configure the tightening parameters, create the assembly strategies or display the diagnostics.



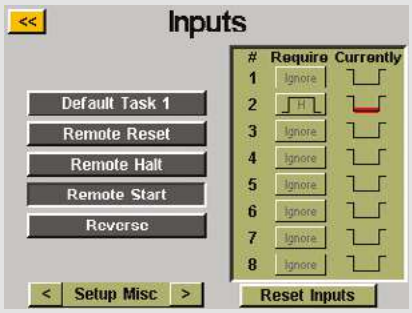
- Green display: tightening OK
- Red display: tightening NOK: when the maximum value set for the parameter (torque or angle) has been exceeded
- Yellow display: when the minimum value set for the parameter (torque or angle) has not been reached



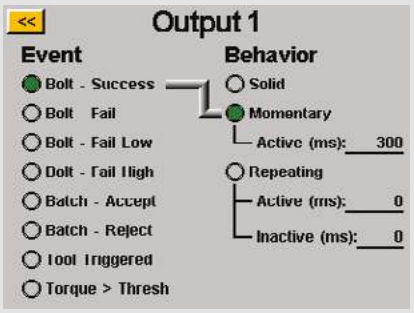
Display of tightening parameters and strategies

Screen for selecting tasks

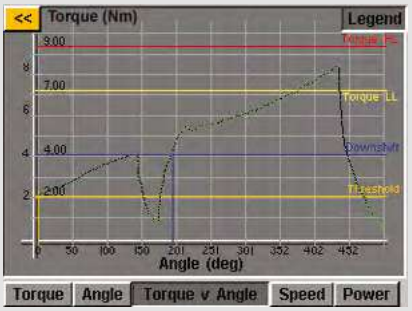
Three different programmable passwords



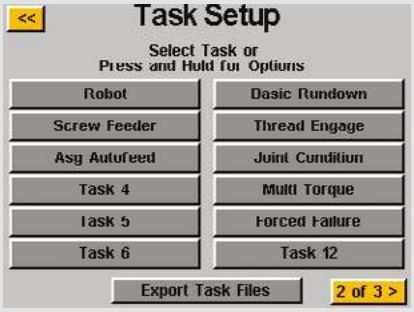
8+8 freely assignable I/O



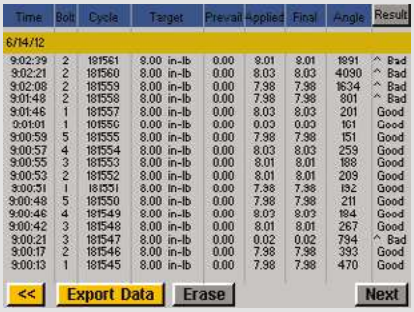
Way of choosing the tightening result display (output signal)



Graph of the last tightening performed.
The graphs can be exported even during the work cycle



The tasks can be downloaded, allowing fast and simple backup of the machine with a simple key press (Export Task Files)



Large internal memory.
All the tightening operations can be downloaded.
Display of the last 100 cycles performed

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		Idle speed Min. / Max.	Reversibility	Ø	Weight		Accessories	Axial compensators	Control unit compatible		Cables	
Model	**Code**	**Nm**	**in lb**	**r.p.m**	**Type**	**mm**	**kg**	**lb**	**Drive M**	**mm/N**	**Model**	**Code**	**Model**	**Code**
SD2500-10FX	112618552	0,1÷1,1	1÷10	1700	↻	28,5	0,46	1.00	⎔ F1/4”	no *	CT-2500	686200341	page 31	page 31
SD2500-20FX	112618553	0,2÷2,3	2÷20	1100	↻	28,5	0,46	1.00	⎔ F1/4”	no *				
SD2500-35FX	112618554	0,4÷3,9	3,5÷35	800	↻	28,5	0,45	1.00	⎔ F1/4”	no *				
SD2500-50FX	112618555	0,6÷5,6	5÷50	500	↻	28,5	0,49	1.10	⎔ F1/4”	no *				

Legend

SD2500-10FX = Electric nutrunner motor with torque/angle by transducer and encoder

10 = Max torque in Nm x 10
FX = Fixtured tool

Legend

↻ **Reversibility:** all models are suitable for tightening and untightening operation

Starting system

Remote start

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

• The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service.**

Standard equipment (supplied with the nutrunner motor)

• Rubber grip
• Eco-friendly packaging
• Use and maintenance manual

Control unit technical features

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Weight kg	lb	Dimensions L x Width x H mm
CT2500	686200341	Adjustable	1	40 VDC	100-240 Vac (50-60 Hz)	8 inputs 8 outputs 5 + 11 signal types	4,1	9	216 x 178 x 137

Standard equipment (supplied with the unit)

• Power supply cable
• Use and maintenance manual
• Rear support plate for mounting on structures

Accessories for X-PAQ nutrunner motors

Connection Cables

- Single cable between the CT2500 unit and the tool → reduced clutter in the work area.
- Robust and flexible cables → resistant to prolonged mechanical stress.
- Designed for secure data transmission.
- Available in two lengths and in ESD version → protection against electrostatic discharge.

(*) CB…-…RA models with 90° connector on the tightening side.

Model	Code	For models	Length mt
CB2500 - 10HW	686200706	All	3
CB2500 - 10ESD	686200707	All	3
CB2500 - 25HW	686200708	All	7,6
CB2500 - 25ESD	686200709	All	7,6
CB2500 - 10 RA *	686200712	All	3
CB2500 - 25 RA *	686200713	All	7,6

NW2500

Module to connect to the CT2500 control unit to interface the system with printers, PLCs and PCs through the RS232 serial port or Ethernet port with communications protocols Acop, Ethernet IP, ToolsNet and Profinet. Allows the programs available in the CT2500 control unit to be recalled in sequence. There are 99 programs available for sequence.

Model	Code	For model
NW2500	686200401	CT2500

Networking module WI-FI NW2500-RFT

Networking module composed by two devices (and feeder) for the PC transmission, in modality wi-fi, of the results of tightening by the unit CT2500, through USB key.

Code: **686200404**

Fixing Flange

- Single Flange AC2500-MPSF
  Code: **676010145**
- Double Flange AC2500-MPDF
  Code: **676010146**
- Double Flange with External Thread AC2500-MPJR
  Code: **676010147**

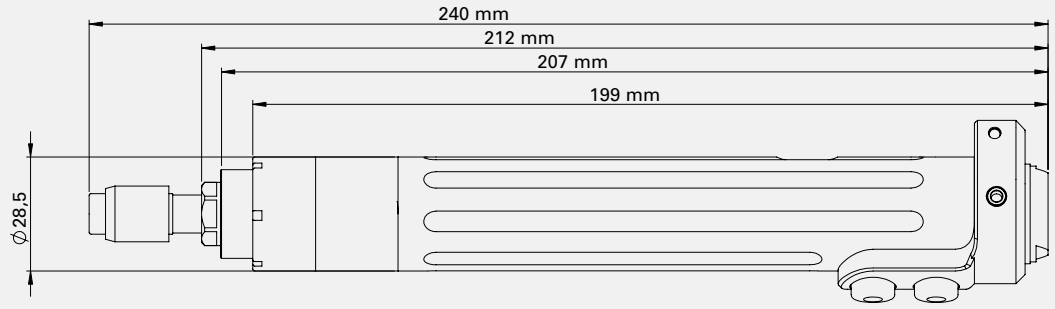
Axial Thrust Bearing

- To use an axial compensator with the nutrunner motor, the axial thrust bearing must be applied, allowing the motor to support significant loads without compromising its functionality.
  Code: **302336030**

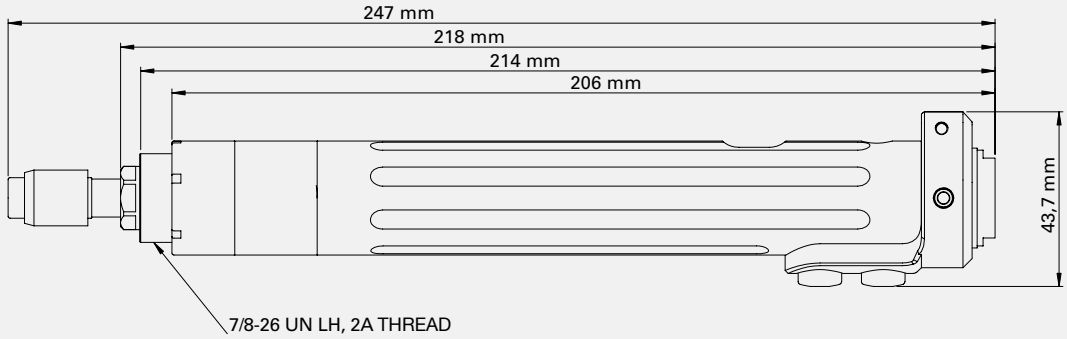
- **Bit, wrenches and other accessories,** see catalogue no. 78
- **Other automation accessories,** see page 62

Dimensions

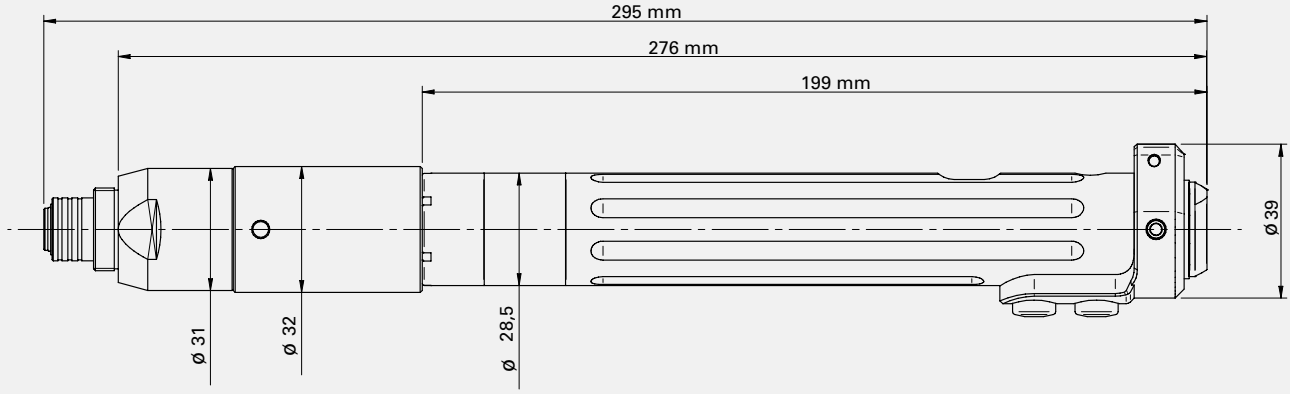
Models: SD2500-10/20/35FX



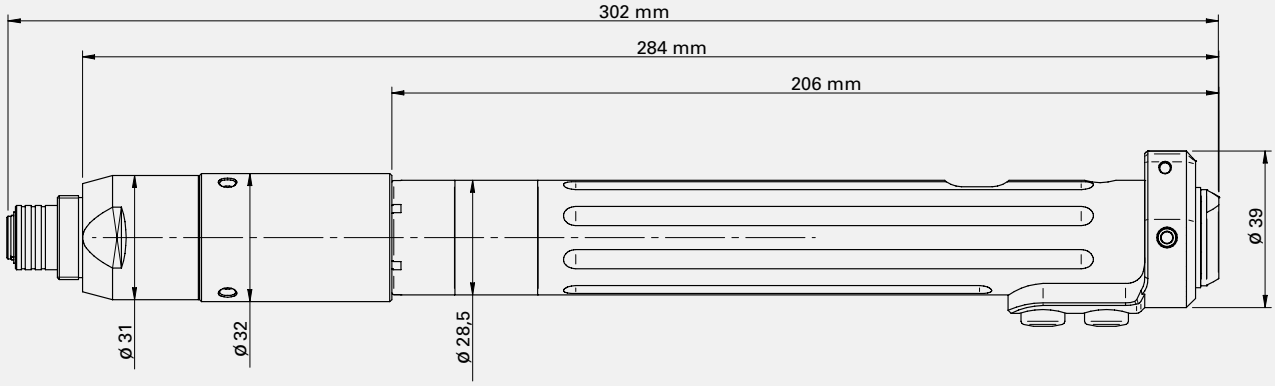
Model: SD2500-50FX



Models: SD2500-10/20/35FX-GRS with Axial Thrust Bearing



Model: SD2500-50FX-GRS with Axial Thrust Bearing



MCB electric nutrunner motors
With torque/angle current control

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.
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.

These are the main features:

- **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
- **Brushless technology** that reduces the maintenance and ensures the absence of dust in the workplace
- Combined with a control unit that supplies electrical power and whose accurate programming enables **real-time control, monitoring, analysis, diagnostics and programming** of the production process, eliminating **post-process** controls.

TCS-B...E

Nutrunner motor technical features

Control type	Torque/Angle by current control
Torque range	4 ÷ 150 Nm / 35.40 ÷ 1327.61 in lb
Speed	320 ÷ 1500 rpm - Adjustable
Motor technology	Brushless
Power supply	Low voltage (32 volt)
Clamping diameter	Ø 42mm for 25 MCB | Ø 55mm for 50 MCB
Weight	max 5,5 Kg / 12.12 lb for 25 MCB - max 7,3 Kg / 16.09 lb for 50 MCB
Interconnectivity	- Digital electrical I/O signals for communication with external devices (e.g. PLC or other devices) - RS-232 - Protocols: Profinet and Modbus TCP-IP (with TCA module)
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Quick Change Chuck	✔
Fixing Flange	✔
Cable	✔ Included: 3m
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		Idle speed Min. / Max.	Reversibility	Weight	Ø	Accessories	Axial compensators Stroke / Initial force Max force	Control unit compatible		Cables	
Model	**Code**	**Nm**	**in lb**	**r.p.m**	**Type**	**lb**	**mm**	**Drive M**	**mm/N**	**Model**	**Code**	**Length**	**Code**
25MCB20C1	111618371	4÷20	35.4÷177	1500	↻	10.34	42	☐ 3/8"	-	TCS-B 25E	686200325	5 mt.	686200607
25MCB20C2	111618376	4÷20	35.4÷177	1500	↻	11	42	☐ 3/8"	51 / 48,3 / 66,3			10 mt.	686200608
25MCB35C1	111618381	7÷35	61.9÷309.7	700	↻	10.34	42	☐ 1/2"	-			15 mt.	686200609
25MCB35C2	111618386	7÷35	61.9÷309.7	700	↻	11	42	☐ 1/2"	51 / 48,3 / 66,3				
25MCB50C1	111618391	10÷50	88.5÷442.5	500	↻	11.44	42	☐ 1/2"	-				
25MCB50C2	111618396	10÷50	88.5÷442.5	500	↻	12.1	42	☐ 1/2"	51 / 48,3 / 66,3				
50MCB45C1	111618401	10÷45	88.5÷398.2	1250	↻	15.4	55	☐ 1/2"	-	TCS-B 50E	686200330		
50MCB45C2	111618406	10÷45	88.5÷398.2	1250	↻	16.06	55	☐ 1/2"	51 / 48,3 / 66,3				
50MCB65C1	111618411	14÷65	123.9÷575.2	600	↻	15.4	55	☐ 1/2"	-				
50MCB65C2	111618416	14÷65	123.9÷575.2	600	↻	16.06	55	☐ 1/2"	51 / 48,3 / 66,3				
50MCB90C1	111618421	18÷90	159.3÷796.5	420	↻	15.4	55	☐ 1/2"	-				
50MCB90C2	111618426	18÷90	159.3÷796.5	420	↻	16.06	55	☐ 1/2"	51 / 48,3 / 66,3				
50MCB150C2	111618456	30÷150	265.5÷1327.5	320	↻	15.4	55	☐ 1/2"	51 / 48,3 / 66,3				

Legend

25MCB20C1 = Electric nutrunner motor with torque/angle current control
25 = Power of motor in watt/10
MCB = Brushless Motor
20 = Max torque in Nm
C = Torque/angle current control system
1 = Output with square drive without axial compensator
2 = Output with square drive with axial compensator

Legend

↻ **Reversibility:** all models are suitable for tightening and untightening operation

Starting system

Remote start

- Noise level has been measured in accordance with ISO 3744 and ISO 15744 standards (inf. to 72 dBA)
- Accessory drive: male square drive in accordance with ISO 1174-1
- The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service.**

Standard equipment (supplied with the nutrunner motor)

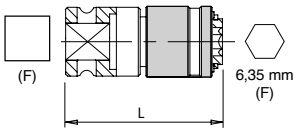
- Axial compensator (where indicate in the chart)
- Fixing Flange
- Test certificate
- Eco-friendly packaging
- Use and maintenance manual

Models available upon request

- Models with square F 3/8" - Hex. F 1/4" quick change chuck: Code 654141010
- Models with modified flange and/or with customized body design
- Models with angle head

Accessories available upon request

- **Quick-change chuck**



For	L = mm	Code
Nutrunner motors with ☐ 3/8" male square drive	41	654141015
Nutrunner motors with ☐ 1/2" male square drive	54	654141017

- **Bits, sockets and other accessories,** refer to catalogue No. 78
- **Other automation accessories,** see page 62

MCB electric nutrunner motors
With torque/angle control by 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.

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.

These are the main features:

- **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.
- **Brushless technology** that reduces the maintenance and ensures the absence of dust in the workplace
- Combined with a control unit that supplies electrical power and whose accurate programming enables **real-time control, monitoring, analysis, diagnostics and programming** of the production process, eliminating **post-process** controls.

TCS-B...E

Nutrunner motor technical features

Control type	Torque/Angle control by transducer and resolver
Torque range	2 ÷ 150 Nm / 17.70 ÷ 1327.61 in lb
Speed	320 ÷ 1500 rpm - Adjustable
Motor technology	Brushless
Power supply	Low voltage (32 volt)
Clamping diameter	Ø 42mm for 25 MCB Ø 55mm for 50 MCB
Weight	max 5,5 Kg / 12.12 lb for 25 MCB max 7,3 Kg / 16.09 lb for 50 MCB
Fixing Flange	Included
Interconnectivity	- Digital electrical I/O signals for communication with external devices (e.g. PLC or other devices) • RS-232 - Protocols: Profinet and Modbus TCP-IP (with TCA module)
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Quick Change Chuck	Ordered separately
Cable	Ordered separately
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

Nutrunner motor technical features

Type of nutrunner motor		Tightening torque Min. / Max.		Idle speed Min. / Max.	Reversibility	Ø	Weight		Accessories	Axial compensators Stroke / Initial force Max force	Control unit compatible		Cables	
Model	**Code**	**Nm**	**in lb**	**r.p.m**	**Type**	**mm**	**kg**	**lb**	**Drive M**	**mm / N / N**	**Model**	**Code**	**Length**	**Code**
25MCB20A1	111618311	2÷20	17.7÷177	1500	↻	42	4,7	10.43	☐ 3/8"	-	TCS-B 25E	686200325	5 mt.	686200607
25MCB20A2	111618316	2÷20	17.7÷177	1500	↻	42	5	11	☐ 3/8"	51 / 48,3 / 66,3			10 mt.	686200608
25MCB35A1	111618321	4÷35	35.4÷309.7	700	↻	42	4,7	10.43	☐ 1/2"	-			15 mt.	686200609
25MCB35A2	111618326	4÷35	35.4÷309.7	700	↻	42	5	11	☐ 1/2"	51 / 48,3 / 66,3				
25MCB50A1	111618331	5÷50	44.2÷442.5	500	↻	42	5,2	11.44	☐ 1/2"	-				
25MCB50A2	111618336	5÷50	44.2÷442.5	500	↻	42	5,5	12.1	☐ 1/2"	51 / 48,3 / 66,3				
50MCB45A1	111618341	5÷45	44.2÷398.2	1250	↻	55	7	15.4	☐ 1/2"	-	TCS-B 50E	686200330		
50MCB45A2	111618346	5÷45	44.2÷398.2	1250	↻	55	7,3	16.06	☐ 1/2"	51 / 48,3 / 66,3				
50MCB65A1	111618351	7÷65	61.9÷575.2	600	↻	55	7	15.4	☐ 1/2"	-				
50MCB65A2	111618356	7÷ 65	61.9÷575.2	600	↻	55	7,3	16.06	☐ 1/2"	51 / 48,3 / 66,3				
50MCB90A1	111618361	9÷90	79.6÷796.5	420	↻	55	7	15.4	☐ 1/2"	-				
50MCB90A2	111618366	9÷90	79.6÷796.5	420	↻	55	7,3	16.06	☐ 1/2"	51 / 48,3 / 66,3				
50MCB150A2	111618455	15÷150	132.70÷1.327.5	320	↻	55	7	15.4	☐ 1/2"	51 / 48,3 / 66,3				

Legend

25MCB20A1 = Electric nutrunner motor with torque/angle by transducer and resolver
25 = Power of motor in watt/10
MCB = Brushless Motor
20 = Max torque in Nm
A = Torque/angle by transducer and resolver
1 = Output with square drive without axial compensator
2 = Output with square drive with axial compensator

Legend

↻ **Reversibility:** All models are suitable for tightening and untightening operation

• Accessory drive: female hexagonal drive 1/4", 6,35 mm (ISO 1173)
• The code number must be used when ordering.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service**.

Standard equipment (supplied with the nutrunner motor)

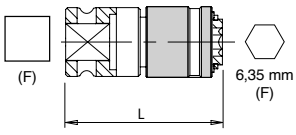
- Axial compensator (where indicate in the chart)
- Fixing Flange
- Test certificate
- Eco-friendly packaging
- Use and maintenance manual

Models available upon request

- Models with square F 3/8" - Hex. F 1/4" quick change chuck: Code 654141010
- Models with modified flange and/or with customized body design
- Models with angle head

Accessories available upon request

- **Quick-change chuck**

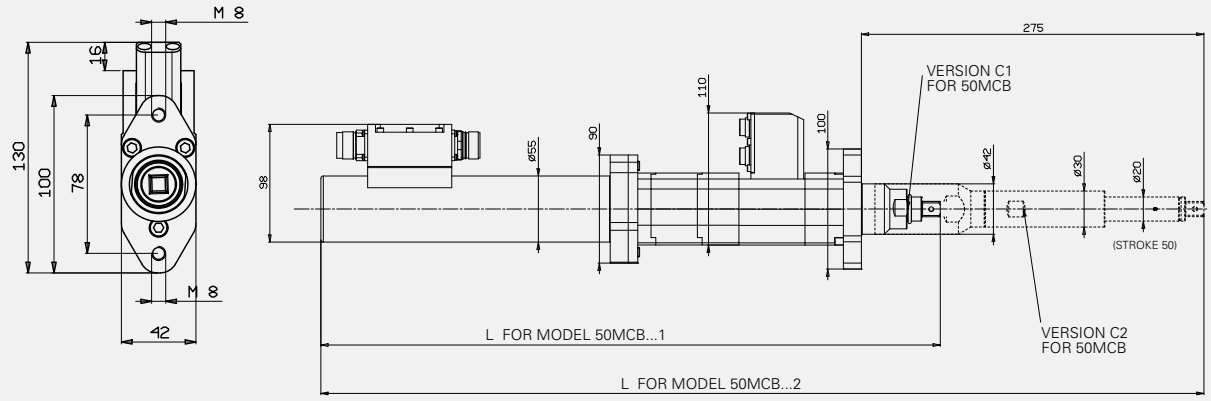


For	L = mm	Code
Nutrunner motors with ☐ 3/8" male square drive	41	654141015
Nutrunner motors with ☐ 1/2" male square drive	54	654141017

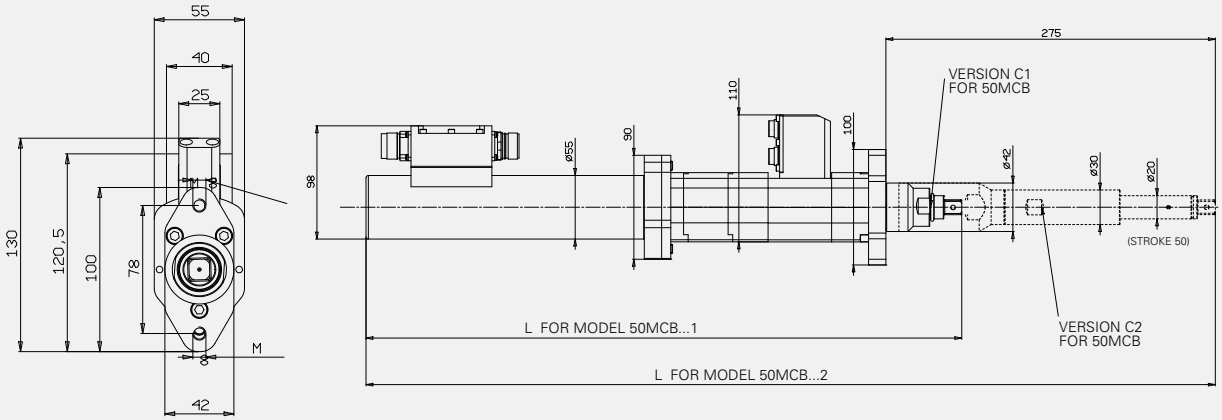
- **Bits, sockets and other accessories,** refer to catalogue No. 78
- **Other automation accessories,** see page 62

Dimensions

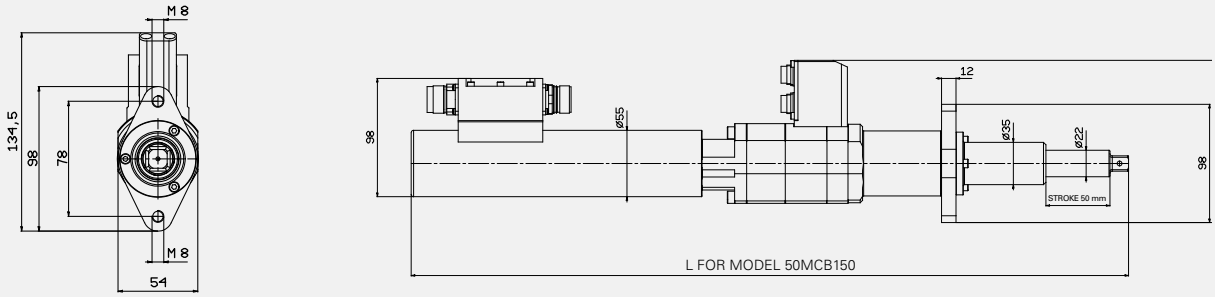
Models 25MCB ...C1/C2 and 25MCB...A1/A2



Models 50MCB ...C1/C2 and 50MCB...A1/A2



Models 50MCB150C2 and 50MCB150A2



Models with torque/angle current control (mm)

Model	L	Drive □	Model	L	Drive □	Model	L	Drive □
25MCB20C1	458	3/8”	50MCB45C1	516	1/2”	50MCB150C2	594	1/2”
25MCB20C2	667	3/8”	50MCB45C2	731	1/2”			
25MCB35C1	508	1/2”	50MCB65C1	561	1/2”			
25MCB35C2	716	1/2”	50MCB65C2	769	1/2”			
25MCB50C1	508	1/2”	50MCB90C1	561	1/2”			
25MCB50C2	716	1/2”	50MCB90C2	769	1/2”			

Models with torque/angle control by built-in transducer and resolver (mm)

Model	L	Drive □	Model	L	Drive □	Model	L	Drive □
25MCB20A1	458	3/8”	50MCB45A1	516	1/2”	50MCB150A2	594	1/2”
25MCB20A2	667	3/8”	50MCB45A2	731	1/2”			
25MCB35A1	508	1/2”	50MCB65A1	561	1/2”			
25MCB35A2	716	1/2”	50MCB65A2	769	1/2”			
25MCB50A1	508	1/2”	50MCB90A1	561	1/2”			
25MCB50A2	716	1/2”	50MCB90A2	769	1/2”			

Control unit technical features

TCS-B control unit

- Tightening result. OK, NOK and RUN: **light indication**
- **I/O:** 5 +5
- RS232 connection for programming, diagnostics and data acquisition
- **Torque/angle/speed adjustment** with pre-configured grid
- **Program storage:** programs can also be saved in text format for exporting and printing
- **Data printing** with information relating to the last tightening strategy performed

PROGRAMMING

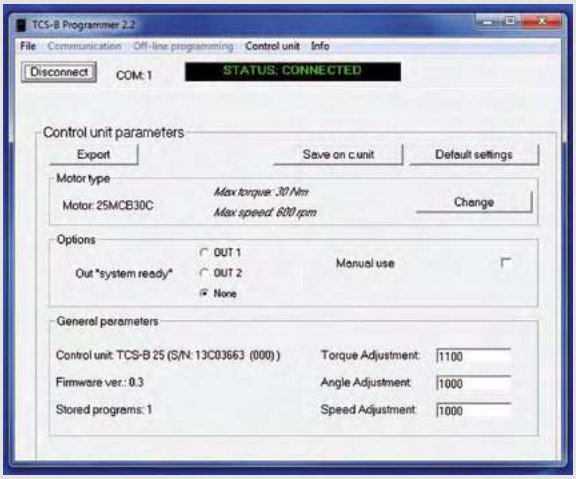
- **Number of programs:** 4+ 4 with 50 instructions per program
- **Supplied software** for easy and intuitive programming, with clear and complete instructions to set and manage tightening strategies
- **Memory:** no
- Easy and intuitive **PC installation** using the supplied service kit (RS232 cable)
- **Fast system configuration** through quick guide
- **Calibration** with automatic parameter setting
- **OFF LINE programming** to create, modify and save tightening programs without the need to connect to the TCS-B E unit
- **ON LINE programming** to manage tightening programs with the PC connected to the unit and acquire and save data on the PC
- **"Accessory release" sequence:** programmable instruction that activates when the accessory and/or the screw recess yield and prevent screw/accessory disengagement, stopping the work cycle
- **"Plug&Play" system:** automatic adjustment of torque transducer signal (in direct control systems)
- **Working test** (inputs and outputs work, motor speed, motor connection control, feedeng tension and temperature values)

INTERCONNECTIVITY

- **TCA-PN INTERFACE for Profinet and Modbus TCP-IP:** on request
- **TCA PB INTERFACE for Profinet:** on request
- **Display of number and type of detected error** (temperature, power supply voltage, diagnostic tests, motor sensor check, resolver, transducer and system)
- **Other available checks:** motor rotation check, analog measurement of power supply voltages, motor feedback signal monitoring

AVAILABLE TIGHTENING STRATEGIES

- Torque control
- Torque control with tightening time monitoring
- Tightening angle control with torque monitoring
- Untightening – screw engagement



Control unit technical features

Model	Code	Speed	Nr. of connectable tools	Tool feed tension	Feed input	I/O	Weight lb	Dimensions L x Width x H mm
TCS-B25 E	686200325	Adjustable	1	48VDC	100-240 V ac (50-60 Hz)	8 inputs 8 outputs	20.94	390 x 155 x 155
TCS-B50 E	686200330							

Standard equipment (supplied with unit)

- Feed Cable with European plug - 2m
- Programming software TCS-B E with 4 programs (max 50 instructions) + 4 upon request
- RS232 serial output – 3 m.
- Quick guide
- Eco-friendly packaging
- Use and maintenance manual on CD

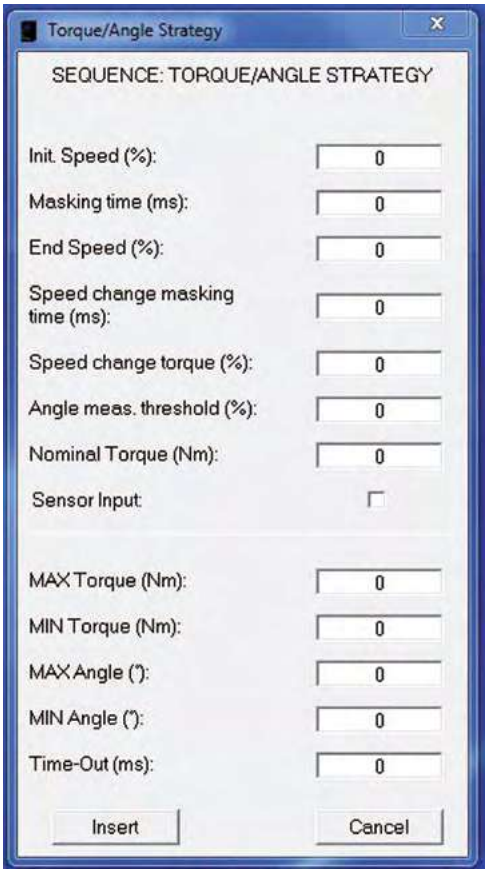
PROGRAMS ESPANSION

TCS-B E units can be activated to further 4 tightening programs (for a max of 8 programs).
It is sufficient to buy the activation code that will be supplied separately. Code 686200904

TCS-B Programmer is the software supplied with the unit and allows a lot of advantages:

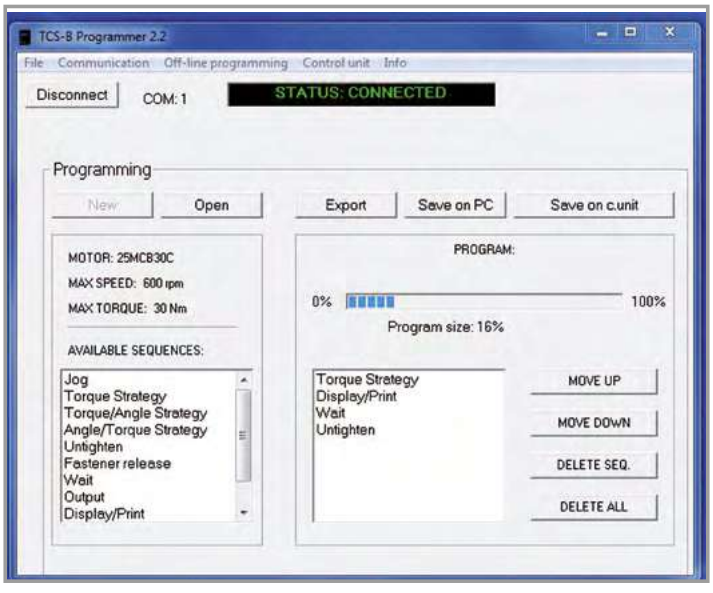
Simple, intuitive connections and programming

- Simple, intuitive **installation on a PC** with the standard equipmentsupplied (RS232 cable)
- **System configuration** through the quick guide, document “step by step” to immediately start the system
- **System calibration:** the motors connected to this unit are on display; it is sufficient to select the motor connected and 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.



Fast arrangement of control process

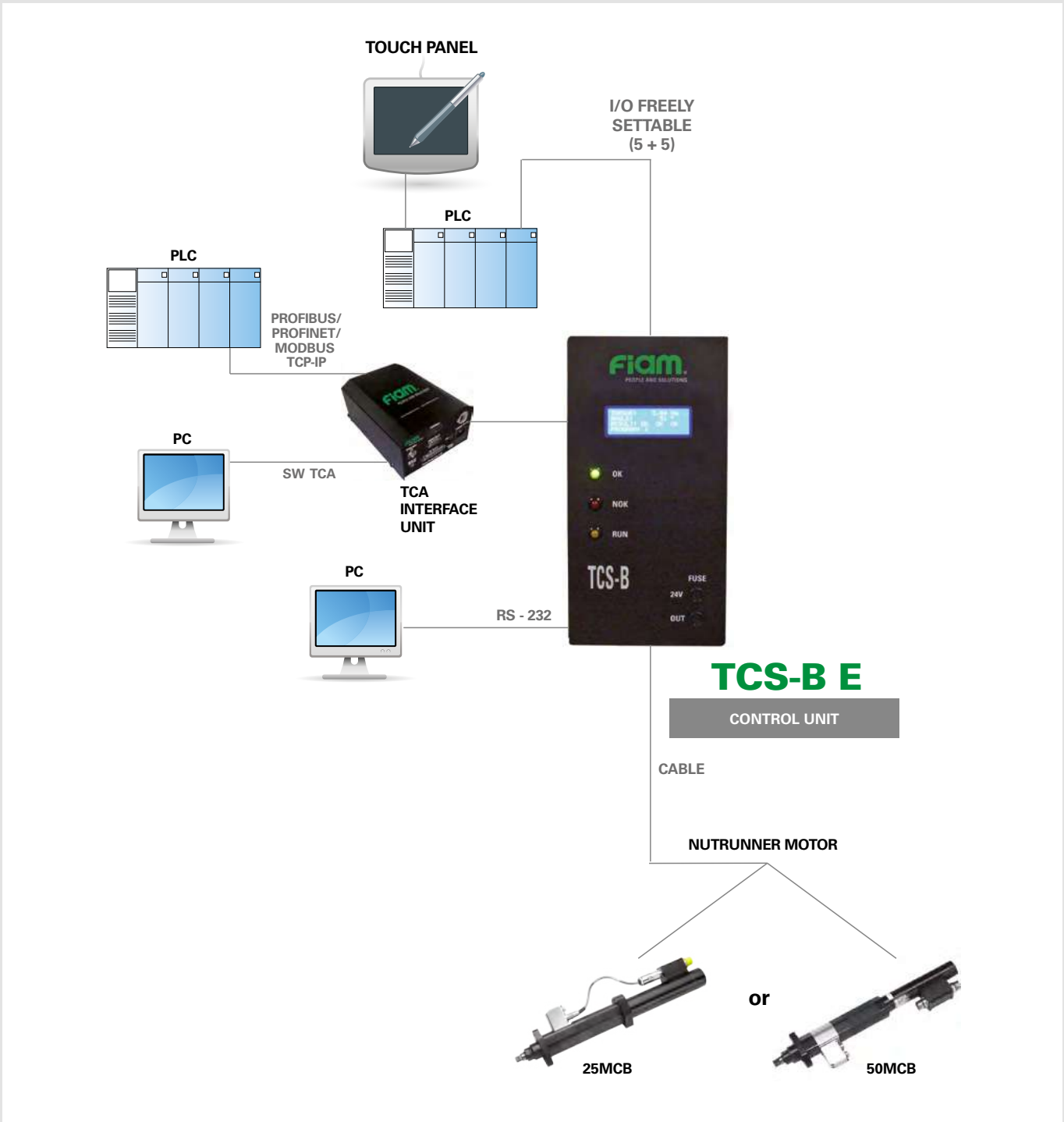
- **Torque/angle/speed adjustment:** easy change od parameters through preset grid
- **Programs storage:** programs can be saved in txt format too, exported and printed
- **Data printout:** combined with ‘view/print” function available for stored programs, allows printing through serial port of a string including main information about last performed rundown.

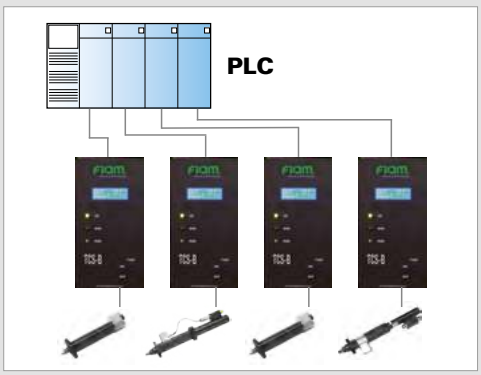


Diagnostic controls

- **Diagnostics:** window displaying the number and type of errors detected (temperature, feeding tension, diagnostic test, check of motor sensors, resolver, transducer and system). Effective way to control system inputs and outputs connected to PLC. Possibility to execute the following diagnostic checks: motor rotation check, analogical measurement of the power tension, control of the motor feedback signals.

Interconnectivity





Accessories upon request

Interface unit TCA

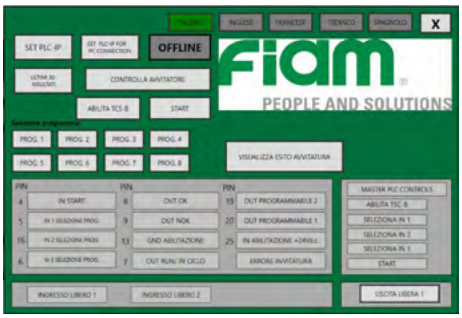
The Interface unit (Tightening Control Adapter) is available in 2 versions:

- TCA-PN Interface Unit for Profinet and Modbus TCP-IP
- TCA-PB Interface Unit for Profibus.

Both units **work with the TCS-B E**, are entirely designed and manufactured by Fiam and allow to interface and to control digital I/Os and export all output data directly through the PROFINET / MODBUS TCP-IP and PROFIBUS comunication protocol.
The TCA-PB model has an additional gateway for Profibus protocol.

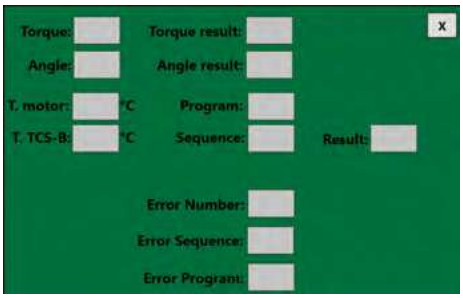
From the PLC Master, through communication protocols TCA is able:

- **To export multiply** data (to es: tightening torque in Nm; angle values; overall outcome of tightening sequence; number of selected tightening program...)
- **To receive all the commands**
- Through the program for PC and connection Ethernet allows of:
  - to visualize the last tightening result and print the last 30 results on file TXT
  - to set TCA Ethernet address
  - to visualize and to command the I/Os of the TCS-B E for diagnostic activities
- It can be installed in rapid and simple way.



Both Units are equipped with the TCA-PC **program** (supplied on electronic format) which allows:

- For PROFINET-MODBUS TCP/IP systems to connect the Ethernet network of the Master PLC
- For PROFIBUS systems to connect the dedicated Ethernet network (integrated into the system).



Following technical features:

- Visualization I/O status TCS-B E
- Possibility to check the overall output of each nutrunner, directly from a remote PC, without interrupting the work process
- Checking the last tightening in real-time
- Memorize the last 30 results and save them on TXT files
- Monitoring the state of the master PLC commands to the TCS-B E units
- Possibility, with disconnected Master PLC, to simulate the PLC master by directly piloting the TCSB E Unit for diagnosis and simulation
- Creating the access address of the two TCA interface Units, both for master PLCs and for the program
- No installation request. Simply save the program (supplied on electronic media) to your PC
- It can work on multiple TCA Units, simply by selecting the Ethernet address of the desired Unit
- Version in 5 languages: Italian, English, French, Spanish and German

Type of Interface Unit

Model	Code	Comunication Protocol	Feed	Dimensions (h x p x l)
TCA-PN	686200402	for Profinet and Modbus TCP-IP	90÷260V / 50/60 Hz	92,7 x 147,5 x 225
TCA-PB	686200403	for Profibus	90÷260V / 50/60 Hz	92,7 x 147,5 x 225

Programm expansion

TCS-B E units can be activated to further 4 tightening programs (for a max of 8 programs). It is sufficient to buy the activation code that will be supplied separately.
Code 686200904

Model	Code	Tightening programs
Programm expansion	686200904	4 + 4

Pneumatic nutrunner motors

They are able to tighten correctly at every level of need and their sturdiness ensures constant performance over time, even under the most demanding operating conditions – continuous operation, frequent stops/starts or rotation reversals – as well as at low supply pressures and without any overheating.

Nutrunner motors with mechanical clutch

Equipped with 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.
Equipped with a device for pneumatic signal pick-up.
On request: with clutch for left-hand tightening control.

Nutrunner motors with slip clutch

Suitable for the **assembly of multiple types of materials**, even of different quality levels, and ideal for use with self-tapping screws. With automatic push start or direct start with remote control.

Nutrunner motors without clutch

Thanks to direct and continuous torque drive, guarantees **tightening eveness also in presence of extremely soft joints** (e.g. assembly of steel components with interposed rubber seals of significant thickness). Easy adjustment of torque, speed and direction of rotation can be carried out using simple control methods.

Start-up is available in 2 versions:

(Only for models with mechanical clutch and automatic shut-off and slip clutch models, and only in the NON-reversible version).

Push to start

Is a simple and economical system for only right-hand rotation motors. The motor starts automatically when a push of about 4.40 or 6.61 lb is applied directly to it. This is the recommended system for starting motors installed on automatic fastening slides.

Direct start from a remote control

Signal is achieved by the application of a 3-way pneumatic control valve (on right hand rotation motors), or 5-way control valve (on reversible motors). Direct start is recommended for multispindle assembly systems where the operator's effort has to be reduced.

Nutrunner motor technical features

Motor technology	- With mechanical clutch and automatic shut-off - With slip clutch - Without clutch
Torque range	0,4 ÷ 105 Nm / 3.5 ÷ 929.3 in lb
Speed	150 ÷ 2800 rpm
Power supply	Pneumatic
Clamping diameter	Available in multiple sizes: Ø 32 - 36 - 42 - mm
Weight	0,66 ÷ 2,2 Kg / 1.45 ÷ 4.85 lb
Fixing Flange	Not included
Accessory drive	Hex. F ¼" - Square M 3/8 -
Quick Change Chuck	Models 20MC
Axial compensation	✔
Offset device	✔
Reversible/No Reversible models	✔
Strong thrust bearings	To stand up to the fast and continuous thrustes of the fastening slides as often happens in the automatic production cycles
Safe unlocking bushes	To avoid the accidental loss of the accessory during the heavy production cycles
Practical pre-arrangement to convey exhaust	In order to reduce noise level
Interfacing with line PLC	**For motors with mechanical clutch and automatic shut-off:** equipped with a pneumatic signal pick-up device for tightening end-of-cycle detection, useful for controlling production sequences.The signal, taken from the dedicated threaded port on the motor and interfaced with the line PLC, can: ✔ provide end-of-cycle signals ✔ indicate reached torque ✔ activate up/down movements of the support equipment ✔ activate other operating sequences / line devices
Modular construction	Safe and cost-effective management of maintenance activities
Custom models	✔

REVERSIBLE NON REVERSIBLE

Pneumatic nutrunner motor with air shut-off: technical features

Type of motor		Tightening torque Min. / Max		Idle speed	Starting system	Reversibility	Weight		Accessories	Dimensions	Air consumption	Noise level*
Model	Code	Nm	in lb	r.p.m.	Type	Type	kg	lb	Drive	mm	l/s	dBA
20MC2A	112314706	0,6÷2,5	5.31÷22.125	2700			0,750	1.75	F1/4"	see page 48	5,5	75
20MC3A	112314707	0,4÷3	3.54÷26.55	1400			0,770	1.69	F1/4"	see page 48	5,5	75
20MC4A	112314708	0,4÷4	3.54÷35.4	1000			0,770	1.69	F1/4"	see page 48	5,5	75
20MC5A	112314709	0,4÷5	3.54÷44.25	650			0,770	1.69	F1/4"	see page 48	5,5	75
20MC5A-250	112307260	0,4÷5	3.54÷44.25	250			0,770	1.69	F1/4"	see page 48	5,5	75
MCSEZ4A	114613734	0,9÷4	7.965÷35.4	2500			0,930	2.05	F1/4"	see page 49	9	76
MCSE5A	114613735	2,5÷5	22.125÷44.25	1500			0,990	2.16	F1/4"	see page 49	9	76
MCSE8A	114613738	2,5÷8	22.125÷70.8	1000			0,990	2.16	F1/4"	see page 49	9	76
MCSE10A	114613740	2,5÷10	22.125÷88.5	500			0,990	2.16	F1/4"	see page 49	9	76
MCY9A	116313709	7÷18	61.95÷159.3	800			1,500	3.30	F1/4"	see page 50	10	79
MCY11A	116313711	7÷24	61.95÷212.4	550			1,500	3.30	F1/4"	see page 50	10	79
MCG25A1	114609198	12÷25	106.2÷221.25	600			2,200	4.84	M3/8"	see page 51	13	79
MCG40A1	114609199	18÷40	159.3÷354	450			2,200	4.84	M3/8"	see page 51	13	79
20MCS2A	112314226	0,6÷2,5	5.31÷22.125	2700			0,750	1,65	F1/4"	see page 48	5,5	75
20MCS3A	112314227	0,4÷3	3.54÷26.55	1400			0,770	1,69	F1/4"	see page 48	5,5	75
20MCS4A	112314228	0,4÷4	3.54÷35.4	1000			0,770	1,69	F1/4"	see page 48	5,5	75
20MCS5A	112314229	0,4÷5	3.54÷44.25	650			0,770	1,69	F1/4"	see page 48	5,5	75
MSCSEZ4A	114613234	0,9÷4	7.965÷35.4	2500			0,910	2.00	F1/4"	see page 49	9	76
MSCSE5A	114613235	2,5÷5	22.125÷44.25	1500			0,990	2.18	F1/4"	see page 49	9	76
MSCSE8A	114613238	2,5÷8	22.125÷70.8	1000			0,990	2.18	F1/4"	see page 49	9	76
MSCSE10A	114613240	2,5÷10	22.125÷88.5	500			0,990	2.18	F1/4"	see page 49	9	76
MSCY9A	116313209	7÷18	61.95÷159.3	800			1,500	3.30	F1/4"	see page 50	10	79
MSCY11A	116313211	7÷24	61.95÷212.4	550			1,500	3.30	F1/4"	see page 50	10	79
20MC2RA	112514716	0,6÷2,5	5.31÷22.125	2700			0,760	1.67	F1/4"	see page 48	5,5	77
20MC3RA	112514717	0,4÷3	3.54÷26.55	1400			0,780	1.72	F1/4"	see page 48	5,5	77
20MC4RA	112514718	0,4÷4	3.54÷35.4	1000			0,780	1.72	F1/4"	see page 48	5,5	77
20MC5RA	112514719	0,4÷5	3.54÷44.25	650			0,780	1,72	F1/4"	see page 48	5,5	77
20MC5RA-250	112507021	0,4÷5	3.54÷44.25	250			0,780	1.72	F1/4"	see page 48	5,5	77
MCSEZ4RA	114813734	0,9÷4	7.965÷35.4	2500			0,940	2.07	F1/4"	see page 49	9	78
MCSE5RA	114813735	2,5÷5	22.125÷44.25	1500			0,990	2.18	F1/4"	see page 49	9	78
MCSE8RA	114813738	2,5÷8	22.125÷70.8	1000			0,990	2.18	F1/4"	see page 49	9	78
MCSE10RA	114813740	2,5÷10	22.125÷88.5	500			0,990	2.18	F1/4"	see page 49	9	78
MCY9RA	116513709	7÷16	61.95÷141.6	700			1,500	3.30	F1/4"	see page 50	10	81
MCY11RA	116513711	7÷24	61.95÷212.4	450			1,500	3.30	F1/4"	see page 50	10	81
MCG25RA1	114807206	12÷25	106.2÷221.25	600			2,200	4.84	M3/8"	see page 51	13	81
MCG40RA1	114807308	18÷40	159.3÷354	450			2,200	4.84	M3/8"	see page 51	13	81
MCG100RA1-1/2	114807613	20÷103	177÷911.55	150			3,700	8.14	M1/2"	see page 52	16	81

Pneumatic nutrunner motor with air shut-off and axial compensator: technical features

Type of motor		Tightening torque on soft joint Min. / Max		Idle speed	Starting system	Reversibility	Weight		Accessories	Dimensions	Air consumption	Noise level*
Model	Code	Nm	in lb	r.p.m.	Type	Type	kg	lb	Drive	mm	l/s	dBA
MCG25A1-TEL	114609196	12÷25	106.2÷221.25	650	▌	↻	2,45	5.39	☐ M3/8"	see page 51	13	79
MCG40A1-TEL	114609200	18÷40	159.3÷354	450	▌	↻	2,45	5.39	☐ M3/8"	see page 51	13	79
MCG25RA1-TEL	114807293	12÷25	106.2÷221.25	600	▌	↻	2,45	5.39	☐ M3/8"	see page 51	13	81
MCG40RA1-TEL	114807294	18÷40	159.3÷354	450	▌	↻	2,45	5.39	☐ M3/8"	see page 51	13	81
MCG100RA1-TEL 1/2	114807594	20÷103	177÷911.55	150	▌	↻	4	8.80	☐ M1/2"	see page 52	16	81

Legend

↻ Screw rotation clockwise

↻ **Reversibility:** The models are suitable for tightening and untightening operations

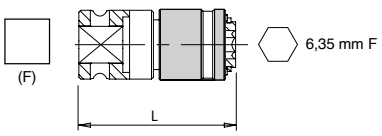
Starting system

▌ **Direct start**

▌↓ **Push-to-start**

- Noise level has been measured in accordance with ISO 3744 and ISO 15744.
* Additional factor: 3dBA spread in method and production (ISO 15744).
- Noise level has been indicated as guide for machine manufacturer that install these motors
- The figures shown are measured at a pressure of 6,3 bar (in accordance with ISO 2787), the recommended operating pressure.
- Tightening torque values have been measured in accordance with ISO 5393 standard.
- Accessory drive: 1/4", 6,35 mm female hexagonal drive (ISO 1173); male square drive (ISO 1174-2).
- The code number must be used when ordering.
- For installation instructions see 'Use and maintenance manual'.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs. For any further details, please address to **Fiam Technical Service**.



For	L = mm	Code
Nutrunner motors with ☐ 3/8" male square drive	41	654141015
Nutrunner motors with ☐ 1/2"male square drive	54	654141017

Chart of torque range obtainable with clutch springs assembled on the tool or supplied with

	Assembled on the tool – grey colour - Ø wire 3,2 mm code 595103202		Supplied with – black colour - Ø wire 2,2 mm code 595102204	
Model	Torque Range on soft joint (Nm)	(lb)	Torque Range on soft joint (Nm)	(lb)
20MC2A/20MCS2A	0,8 ÷ 2,5	7.08 ÷ 22.12	0,6 ÷ 1,2	5.31÷10.62
20MC3A/20MCS3A	0,8 ÷ 3	7.08 ÷ 26.55	0,4 ÷ 1,2	3.54÷10.62
20MC4A/20MCS4A	0,8 ÷ 4	7.08 ÷ 35.40	0,4 ÷ 1,2	3.54÷10.62
20MC5A/20MCS5A	0,8 ÷ 5	7.08 ÷ 44.25	0,4 ÷ 1,2	3.54÷10.62

Model	Air inlet	Recommended air passage
20MC…A, 20MCS...A, 20MC...RA	1/8" gas	Ø 5 mm
MCSE…A, MSCSE…A, MCSE…RA	1/4" gas	Ø 8 mm
MCY…A, MSCY…A, MCY…RA	1/4" gas	Ø 8 mm
MCG...A1, MCG...RA1	1/4" gas	Ø 8 mm
MCG...A1-TEL, MCG...RA1-TEL	1/4" gas	Ø 8 mm

Standard equipment (supplied with the nutrunner motor)

- Clutch adjustment key
- Supplementary clutch spring (only for 20MC... models)
- Use and maintenance manual
- Eco-friendly packaging

Accessories available upon request

- Bits, sockets and other accessories, refer to catalogue No. 78
- Couplings, hoses, filters, governors and other compressed air system accessories (see catalogue nr. 77)
- Axial compensators and Fixing flanges (see page 70)
- Other automation accessories (see page 62)

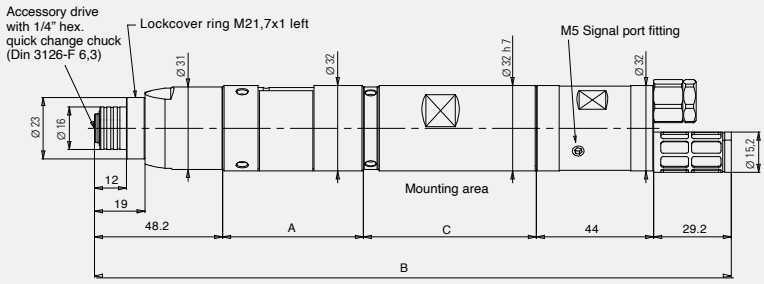
Models available upon request

- Models with quick change chuck
- Models with modified flange and/or with customized body design
- Models with axial compensator
- Models with different speeds than the ones indicated on the chart
- Models with special clutch for left tightening control
- Models with offset device
- Models with offset device with axial compensator

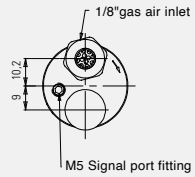
Fiam air nutrunner motors are designed for use with lubricated compressed air.
In the presence of high production rates, it is advisable to provide lubrication appropriate to the number of tightening cycles.
For further information, please contact the **Fiam Technical Assistance Service**.

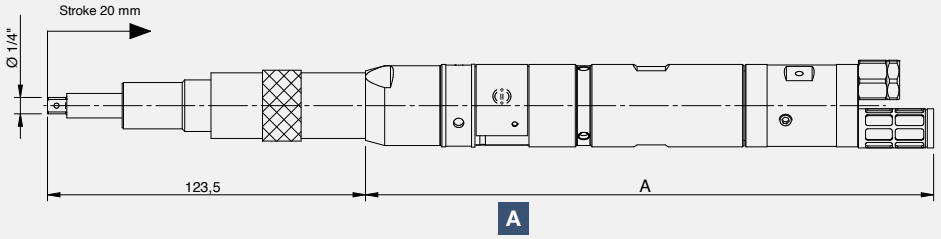
Dimensions

Models: 20MC...A/20MC...RA/20MCS...A/20MC5...-250



Air exhaust silencer
20MC.../A / 20MCS...A / 20MC...RA





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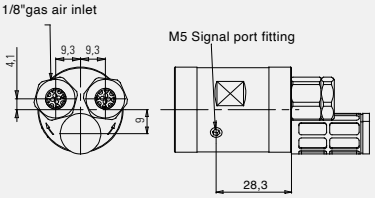
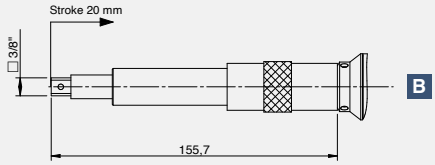
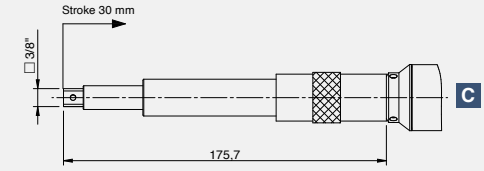




B

Models	A mm	B mm	C mm
20 MC...A / 20 MC...RA	52,8	239	65
20 MCS...A	54,8	241	65
20 MC5...-250	52,8	251	77

Models	A mm
20 MC...A / 20 MC...RA	220
20 MCS...A	222
20 MC5...-250	232



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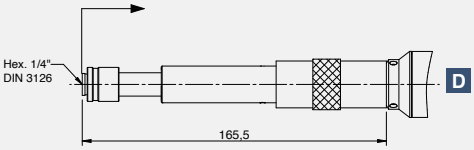

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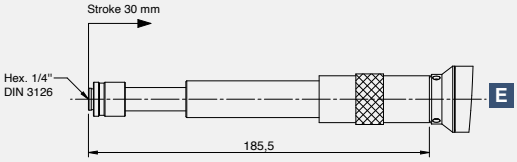

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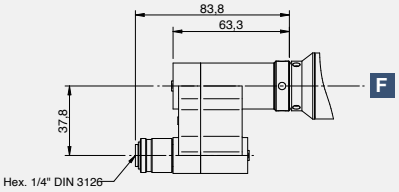

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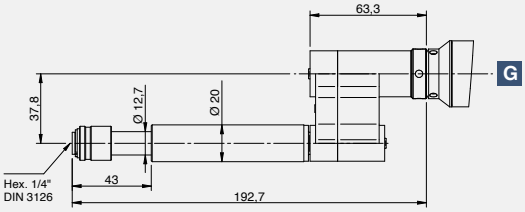
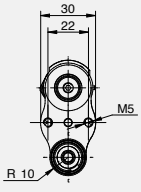


G



AXIAL COMPENSATORS

Ref.	Type	Code	Axial compensation - stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601091	20	26,5	32,9
B	Drive □ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
B	Drive □ 3/8" (DIN 3121 - F 10)	680601072	20	15,6	34,9
C	Drive □ 3/8" (DIN 3121 - F 10)	680600015	30	12,8	36,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601080	20	1,6	20,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601082	20	11,8	34,9
E	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601083	30	20	38,4

OFFSET DEVICES

F	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3))	680601185	20	11,8	34,9
G	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601195	20	1,6	20,8

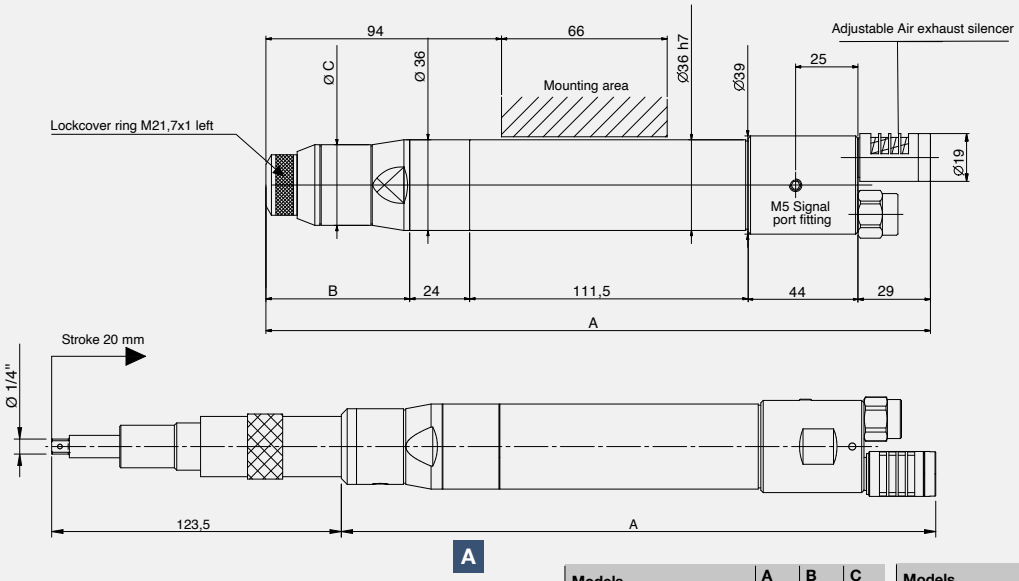
- For use of the offset device, it is necessary to order the adapter - code 687029248
- The offset device can be used with motors up to 5 Nm.

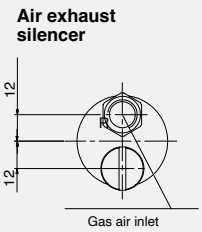
Offset device for very small centre-to-centre distances
code 680601185

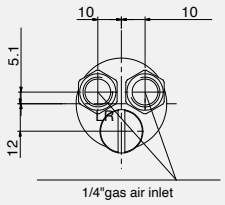
Offset device with axial compensator
code 680601195

Dimensions

Models: MCSEZ...A/MCSEZ...RA, MCSE...A/MCSE...RA, MSCSEZ...A, MSCSE...A

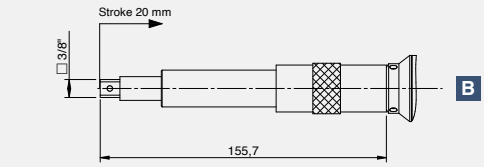


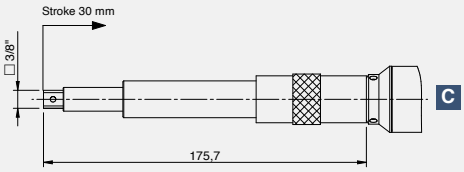


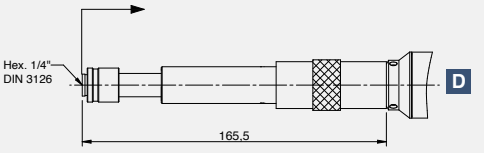


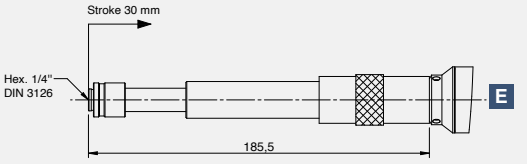
Models	A mm	B mm	C mm
MCSEZ...A / MCSEZ...RA	259	50,5	27
MCSE...A / MCSE...RA	266	57,5	32
MSCSEZ...A	261	52,5	27
MSCSE...A	270	62,5	32

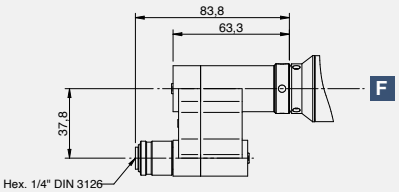
Models	A mm	A1 mm	B mm	C mm
MCSEZ 4 A / MCSEZ 4 RA	394,2	403,5	403,5	27
MCSE...A / MCSE...RA	401,2	410,5	410,5	32

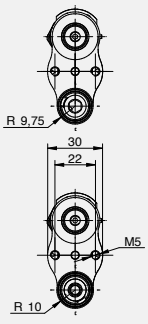


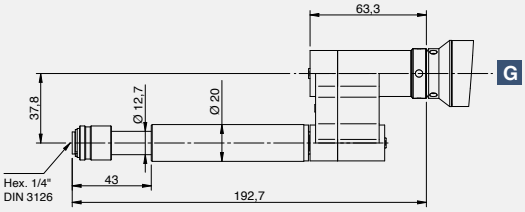












AXIAL COMPENSATORS

Ref.	Type	Code	Axial compensation - stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601091	20	26,5	32,9
B	Drive □ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
B	Drive □ 3/8" (DIN 3121 - F 10)	680601072	20	15,6	34,9
C	Drive □ 3/8" (DIN 3121 - F 10)	680600015	30	12,8	36,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601080	20	1,6	20,8
D	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601082	20	11,8	34,9
E	Quick-change chuck output ⎔ 1/4" (DIN 3126 - F 6,3)	680601083	30	20	38,4

OFFSET DEVICES

F	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3))	680601185	20	11,8	34,9
G	Offset devices ⎔ 1/4" (DIN 3126 - F 6,3)	680601195	20	1,6	20,8

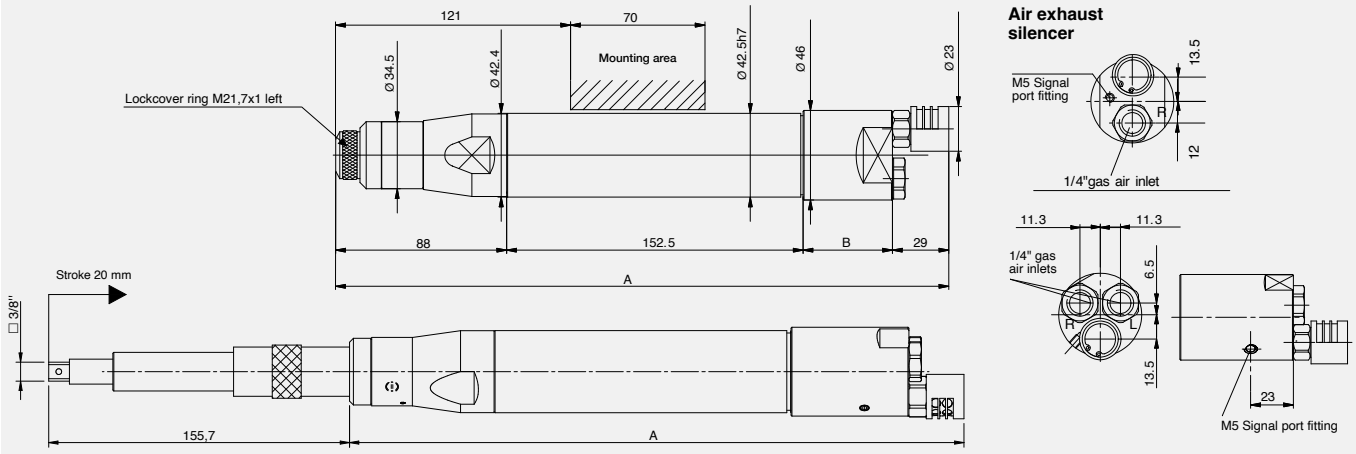
- For use of the offset device, it is necessary to order the adapter - code 687029248
- The offset device can be used with motors up to 5 Nm.

Offset device for very small centre-to-centre distances code 680601185

Offset device with axial compensator code 680601195

Dimensions

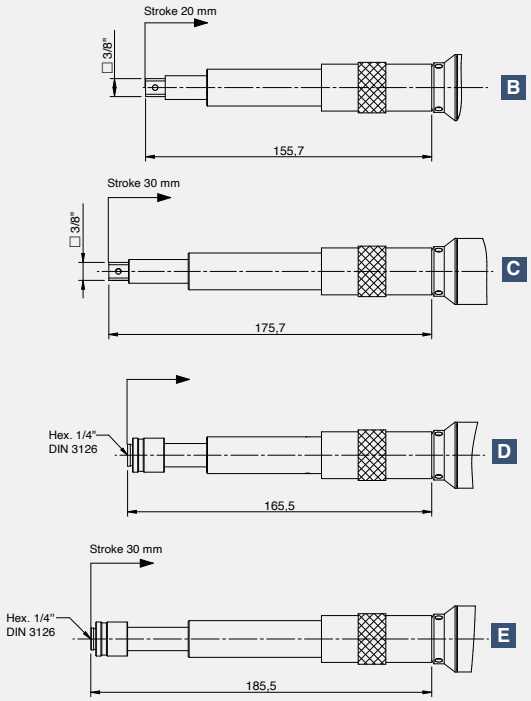
Models: MCY 9-11 A/MCY 9-11 RA/MSCY 9-11 A



A

Models	A mm	B mm
MCY 9 A / MCY 11 A	315,5	46
MCY 9 RA / MCY 11 RA	330,5	61
MSCY 9 A / MSCY 11 A	318	46

Models	A mm	A1 mm	B mm	Ø C mm
MCY 9 A / MCY 11 A	448,5	458,5	46	75,5
MCY 9 RA / MCY 11 RA	463,5	473,5	61	75,5

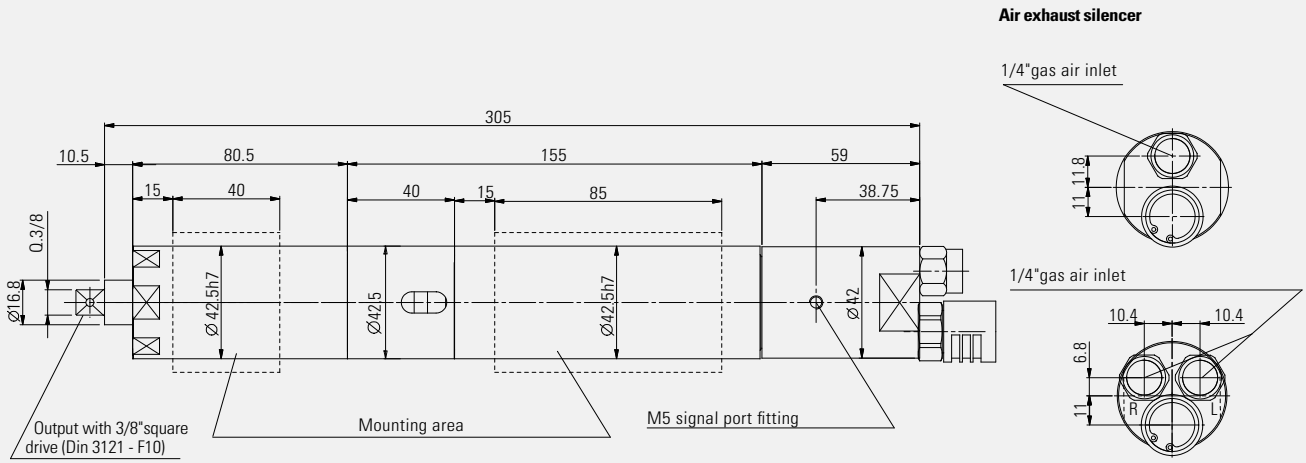


AXIAL COMPENSATORS

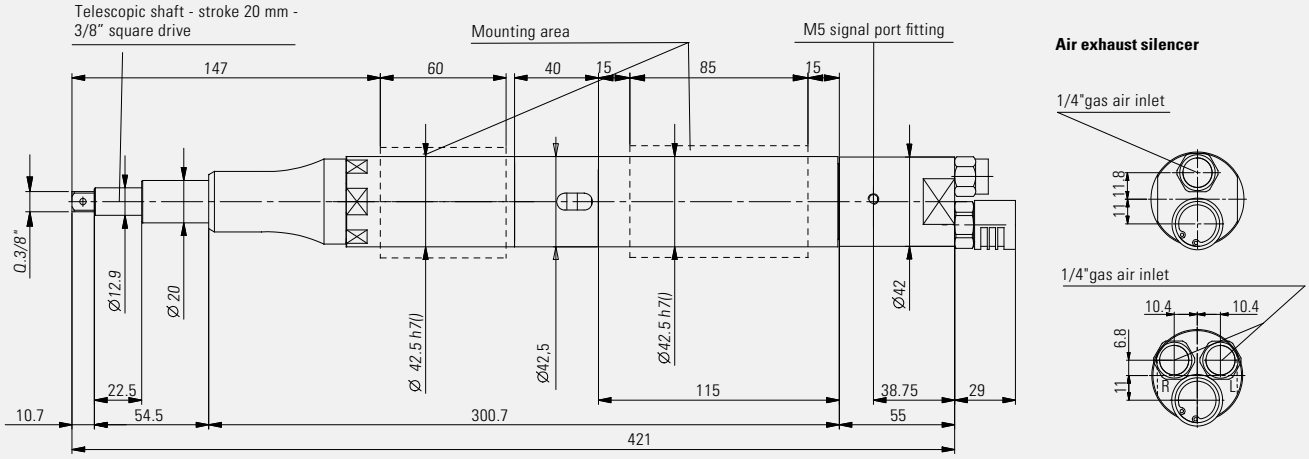
Ref.	Type	Code	Axial compensation - stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
A	Drive □ 1/4" (DIN 3121 - F 6,3)	680601091	20	26,5	32,9
B	Drive □ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
B	Drive □ 3/8" (DIN 3121 - F 10)	680601072	20	15,6	34,9
C	Drive □ 3/8" (DIN 3121 - F 10)	680600015	30	12,8	36,8
D	Quick-change chuck output ⬡ 1/4" (DIN 3126 - F 6,3)	680601080	20	1,6	20,8
D	Quick-change chuck output ⬡ 1/4" (DIN 3126 - F 6,3)	680601082	20	11,8	34,9
E	Quick-change chuck output ⬡ 1/4" (DIN 3126 - F 6,3)	680601083	30	20	38,4

Dimensions

Models: MCG...A/MCG...RA

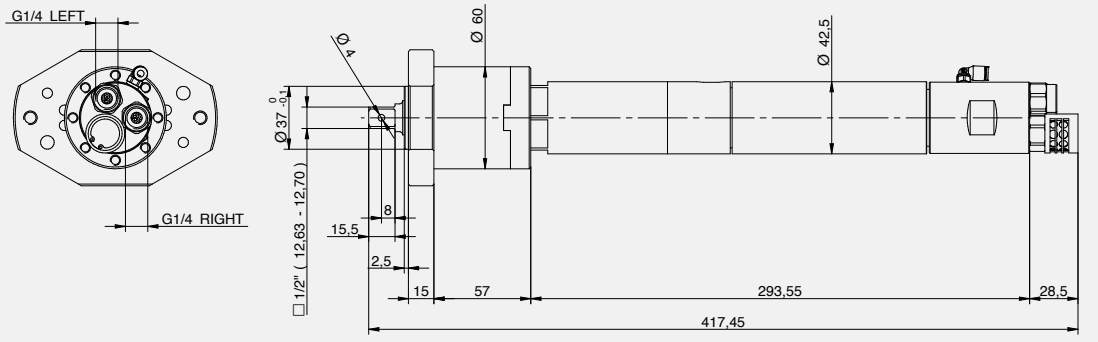


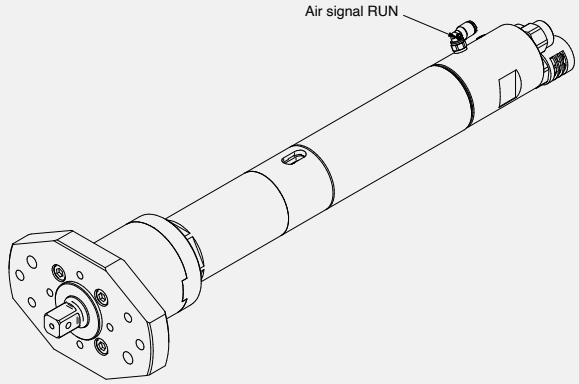
Models: MCG...A/MCG...RA WITH AXIAL COMPENSATOR

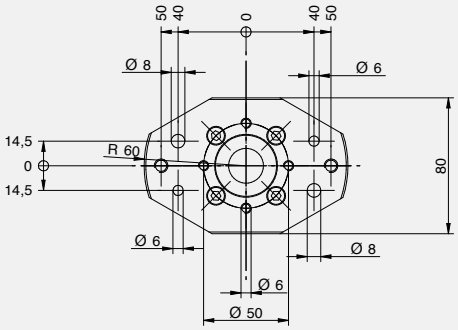


Dimensions

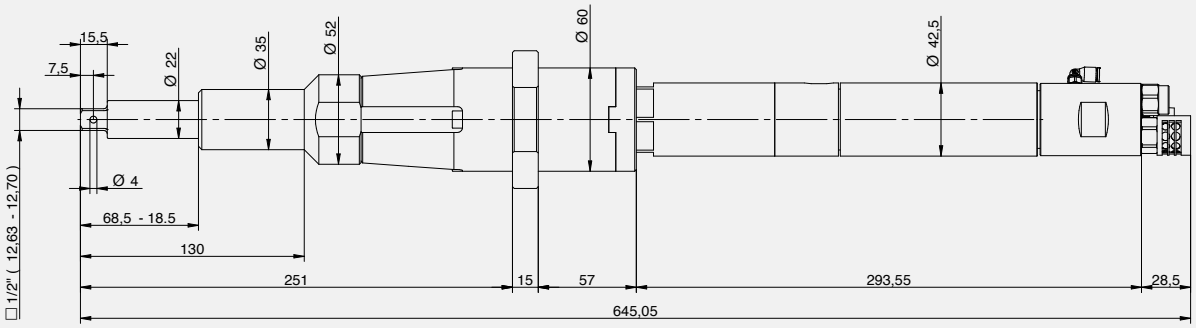
Models: MCG100RA1

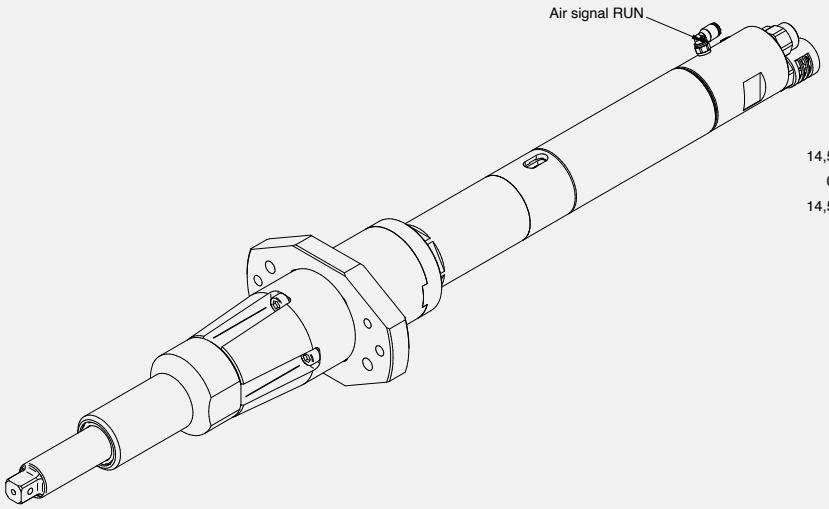


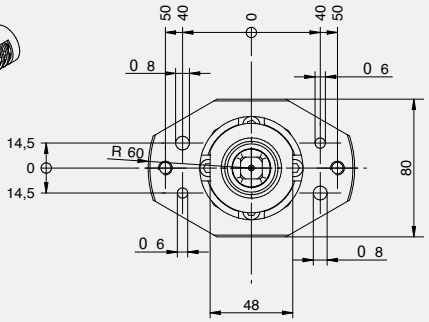




Models: MCG100RA1 WITH AXIAL COMPENSATOR







Slip clutch pneumatic nutrunner : technical features

Type of motor		Tightening torque on soft joint Min. / Max		Idle speed	Starting system	Reversibility	Weight		Dimensions	Air consumption	Accessories
Model	Code	Nm	in lb	r.p.m.	Type	Type	kg	lb	mm	l/s	Drive
MCZE2	112311722	0,8÷2,5	7.1÷22.1	2800			0,66	1.45	see page 55	7	F1/4"
MCZE3	112311723	0,8÷3	7.1÷26.5	1300			0,75	1.65	see page 55	7	F1/4"
MCZE4	112311724	0,8÷3,3	7.1÷29.2	850			0,75	1.65	see page 55	7	F1/4"
MCZE5	112311725	0,6÷4,2	5.3÷37.2	600			0,75	1.65	see page 55	7	F1/4"
MCSE4	114611714	1÷5,8	8.8÷51.3	2500			0,84	1.85	see page 56	9	F1/4"
MCSE5	114611715	1,5÷7,5	13.3÷66.4	1500			0,85	1.87	see page 56	9	F1/4"
MCSE8	114611718	1,5÷9,5	13.3÷84	1000			0,85	1.87	see page 56	9	F1/4"
MCSE10	114611720	1,5÷12	13.3÷106.2	500			0,85	1.87	see page 56	9	F1/4"
MCY7-1	116311701	4,6÷13	40.7÷115	1700			1,1	2.42	see page 57	10	F1/4"
MCY9-1	116311702	6÷16	53.1÷141.6	750			1,3	2.86	see page 57	10	F1/4"
MCY11-1	116311703	6÷22	53.1÷194.7	500			1,3	2.86	see page 57	10	F1/4"
MSCZE2	112311222	0,8÷2,5	7.1÷22.1	2800			0,72	1.58	see page 55	7	F1/4"
MSCZE3	112311223	0,8÷3	7.1÷26.5	1300			0,73	1.61	see page 55	7	F1/4"
MSCZE4	112311224	0,8÷3,3	7.1÷29.2	850			0,73	1.61	see page 55	7	F1/4"
MSCZE5	112311225	0,6÷4,2	5.3÷37.2	600			0,73	1.61	see page 55	7	F1/4"
MSCSE4	114611214	1÷5,8	8.8÷51.3	2500			0,91	2.00	see page 56	9	F1/4"
MSCSE5	114611215	1,5÷7,5	13.3÷66.4	1500			0,92	2.02	see page 56	9	F1/4"
MSCSE8	114611218	1,5÷9,5	13.3÷84	1000			0,92	2.02	see page 56	9	F1/4"
MSCSE10	114611220	1,5÷12	13.3÷106.2	500			0,92	2.02	see page 56	9	F1/4"
MSCZE2R	112511722	0,8÷2,5	7.1÷22.1	2800			0,79	1.74	see page 56	7	F1/4"
MSCZE3R	112511723	0,8÷3	7.1÷26.5	1300			0,8	1.76	see page 56	7	F1/4"
MSCZE4R	112511724	0,8÷3,3	7.1÷29.2	850			0,8	1.76	see page 56	7	F1/4"
MSCZE5R	112511725	0,6÷4,2	5.3÷37.2	600			0,8	1.76	see page 56	7	F1/4"
MSCSE4R	114811714	1÷5,8	8.8÷51.3	2500			0,78	1.72	see page 56	9	F1/4"
MSCSE5R	114811715	1,5÷7,5	13.3÷66.4	1500			0,87	1.91	see page 56	9	F1/4"
MSCSE8R	114811718	1,5÷9,5	13.3÷84.1	1000			0,87	1.91	see page 56	9	F1/4"
MSCSE10R	114811720	1,5÷12	13.3÷106.2	500			0,87	1.91	see page 56	9	F1/4"
MCY7R-1	116511701	4,5÷13	39.8÷115	1600			1,1	2.42	see page 57	10	F1/4"
MCY9R-1	116511702	6÷16	53.1÷141.6	700			1,3	2.86	see page 57	10	F1/4"
MCY11R-1	116511703	6÷22	53.1÷194.7	450			1,3	2.86	see page 57	10	F1/4"

Legend

Screw rotation clockwise

Reversibility: The models are suitable for tightening and untightening operations

Legend

Direct start

Push-to-start

- The figures shown are measured at a pressure of 6,3 bar (in accordance with ISO 2787), the recommended operating pressure.
- Tightening torque values have been measured in accordance with ISO 5393 standard.
- Accessory drive: 1/4", 6,35 mm female hexagonal drive (ISO 1173); male square drive (ISO 1174-2).
- The code number must be used when ordering.
- For installation instructions see 'Use and maintenance manual'.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service**.

Chart of torque range obtainable with clutch springs assembled on the tool or supplied with

Model	Torque range on soft joint Nm	in lb	Torque range on soft joint Nm	in lb	Torque range on soft joint Nm	in lb	Torque range on soft joint Nm	in lb
	Assembled on the tool Brown colour - Ø wire 1,6 mm Code 595201600		*Supplied with Pink colour - Ø wire 2 mm Code 595202000*		*Supplied with Silver colour - Ø wire 2,1 mm Code 595202100*		*Supplied with Gold colour - Ø wire 2,2 mm Code 595202200*	
MCZE2	0,8 ÷ 2,5	7.08 - 22.125						
MCZE3	0,8 ÷ 2,2	7.08 - 19.47	1,8 ÷ 3	15.93 - 26.55				
MCZE4	0,8 ÷ 2,5	7.08 - 22.125			2 ÷ 3,3	17.7 - 29.205		
MCZE5	0,6 ÷ 1,9	5.31 - 16.815					1 ÷ 4,2	8.85 - 31.17
	Assembled on the tool White colour - Ø wire 1,6 mm Code 595102502		*Supplied with Light-blue colour - Ø wire 1,5 mm Code 595101509*		*Supplied with Pink colour - Ø wire 2 mm Code 595102006*		*Supplied with Red colour - Ø wire 3,5 mm Code 595103504*	
MCSE4	3 ÷ 5,8	26.55 - 51.33	1 ÷ 3,2	8.85 - 28.32				
MCSE5	3 ÷ 7,5	26.55 - 66.375			1,5 ÷ 4,5	13.275 - 39.825		
MCSE8	1,5 ÷ 4,5	13.275 - 39.825					3,5 ÷ 9,5	30.975 - 84.075
MCSE10	1,5 ÷ 4,5	13.275 - 39.825					3,5 ÷ 12	30.975 - 106.2
	Assembled on the tool Brown colour - Ø wire 1,6 mm Code 595201600		*Supplied with Pink colour - Ø wire 2 mm Code 595202000*		*Supplied with Silver colour - Ø wire 2,1 mm Code 595202100*		*Supplied with Gold colour - Ø wire 2,2 mm Code 595202200*	
MSCZE2	0,8 ÷ 2,5	7.08 - 22.125			7.08 - 22.125			
MSCZE3	0,8 ÷ 2,2	7.08 - 19.47	1,8 ÷ 3	15.93 - 26.55				
MSCZE4	0,8 ÷ 2,5	7.08 - 22.125			2 ÷ 3,3	17.7 - 29.205		
MSCZE5	0,6 ÷ 1,9	5.31 - 16.815					1 ÷ 4,2	8.85 - 31.17
	Assembled on the tool White colour - Ø wire 1,6 mm Code 595102502		*Supplied with Light-blue colour - Ø wire 1,5 mm Code 595101509*		*Supplied with Pink colour - Ø wire 2 mm Code 595102006*		*Supplied with Red colour - Ø wire 3,5 mm Code 595103504*	
MSCSE4	3 ÷ 5,8	26.55 - 51.33	1 ÷ 3,2	8.85 - 28.32				
MSCSE5	3 ÷ 7,5	26.55 - 66.375			1,5 ÷ 4,5	13.275 - 39.825		
MSCSE8	1,5 ÷ 4,5	13.275 - 39.825					3,5 ÷ 9,5	30.975 - 84.075
MSCSE10	1,5 ÷ 4,5	13.275 - 39.825					3,5 ÷ 12	30.975 - 106.2
	Assembled on the tool Brown colour - Ø wire 1,6 mm Code 595201600		*Supplied with Pink colour - Ø wire 2 mm Code 595202000*		*Supplied with Silver colour - Ø wire 2,1 mm Code 595202100*		*Supplied with Gold colour - Ø wire 2,2 mm Code 595202200*	
MCZE2R	0,8 ÷ 2,5	7.08 - 22.125						
MCZE3R	0,8 ÷ 2,2	7.08 - 19.47	1,8 ÷ 3	15.93 - 26.55				
MCZE4R	0,8 ÷ 2,5	7.08 - 22.125			2 ÷ 3,3	17.7 - 29.205		
MCZE5R	0,6 ÷ 1,9	5.31 - 16.815					1 ÷ 4,2	8.85 - 31.17
	Assembled on the tool White colour - Ø wire 1,6 mm Code 595102502		*Supplied with Light-blue colour - Ø wire 1,5 mm Code 595101509*		*Supplied with Pink colour - Ø wire 2 mm Code 595102006*		*Supplied with Red colour - Ø wire 3,5 mm Code 595103504*	
MCSE4R	3 ÷ 5,8	26.55 - 51.33	1 ÷ 3,2	8.85 - 28.32				
MCSE5R	3 ÷ 7,5	26.55 - 66.375			1,5 ÷ 4,5	13.275 - 39.825		
MCSE8R	1,5 ÷ 4,5	13.275 - 39.825					3,5 ÷ 9,5	30.975 - 84.075
MCSE10R	1,5 ÷ 4,5	13.275 - 39.825					3 5 ÷ 12	30.975 - 106.2

Model	Air inlet	Recommended hose bore
MCZE..., MCZE...R, MCSZE...	1/8" gas	Ø 5 mm
MCSE..., MCSE...R, MSCSE, MCY...-1, MCY...R-1	1/4" gas	Ø 8 mm

Standard equipment
(supplied with the motor)

- Clutch adjustment key
- Supplementary clutch spring (except for MCY.. models)
- Use and maintenance manual
- Eco-friendly packaging

Accessories available upon request

- Bits, sockets and other accessories (see catalogue nr. 78)
- Couplings, hoses, filters, governors and other compressed air system accessories (see catalogue nr. 77)
- Accessories for automation (see on page 62)
- Axial compensators and flange bracket (see on page 70)

Models available upon request

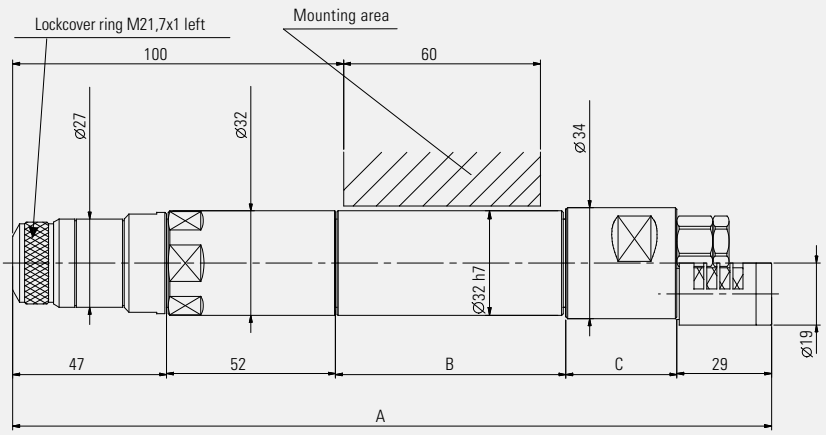
- Models with quick change chuck
- Models with modified flange and/or with customized body design
- Models with axial compensator
- Models with different speeds than the ones indicated on the chart

Fiam air nutrunner motors are designed for use with lubricated compressed air.
In the presence of high production rates, it is advisable to provide lubrication appropriate to the number of tightening cycles.
For further information, please contact the **Fiam Technical Assistance Service**.

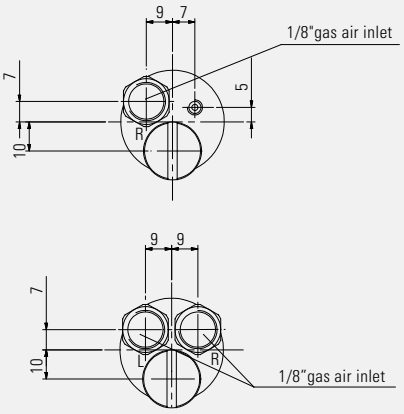
Dimensions

Models: MCZE.../MCZE...R/MSCZE...

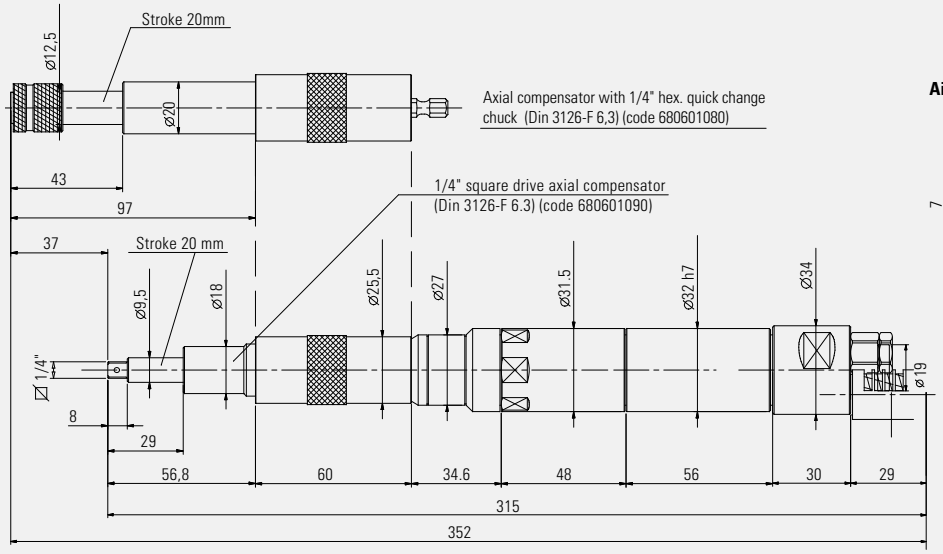
Models	A mm	B mm	C mm
MCZE.../ MCZE...R	211	56,8	30
MSCZE...	232,5	70,5	34



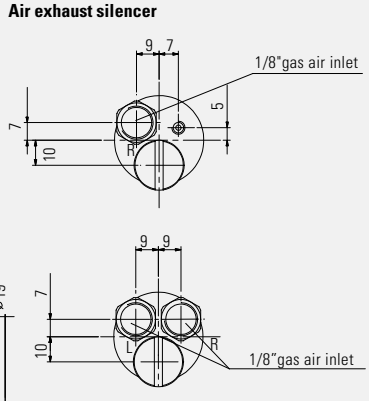
Air exhaust silencer



Models: MCZE.../MCZE...R WITH AXIAL COMPENSATOR



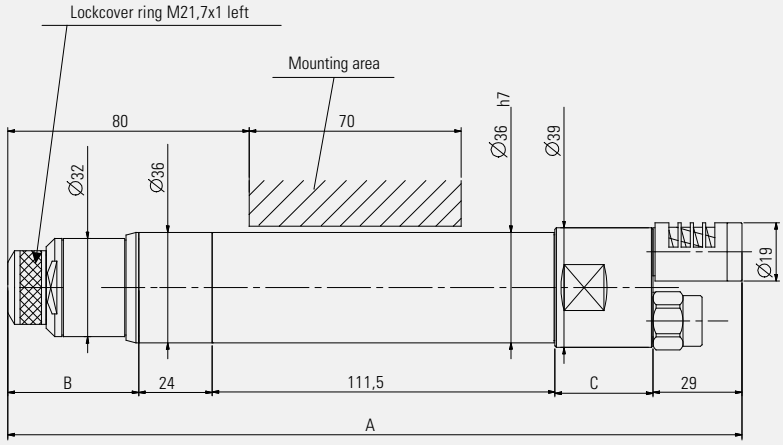
Air exhaust silencer



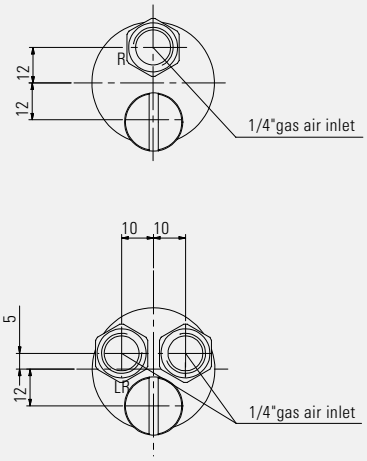
Dimensions

Models: MCSE.../MCSE...R/MSCSE...

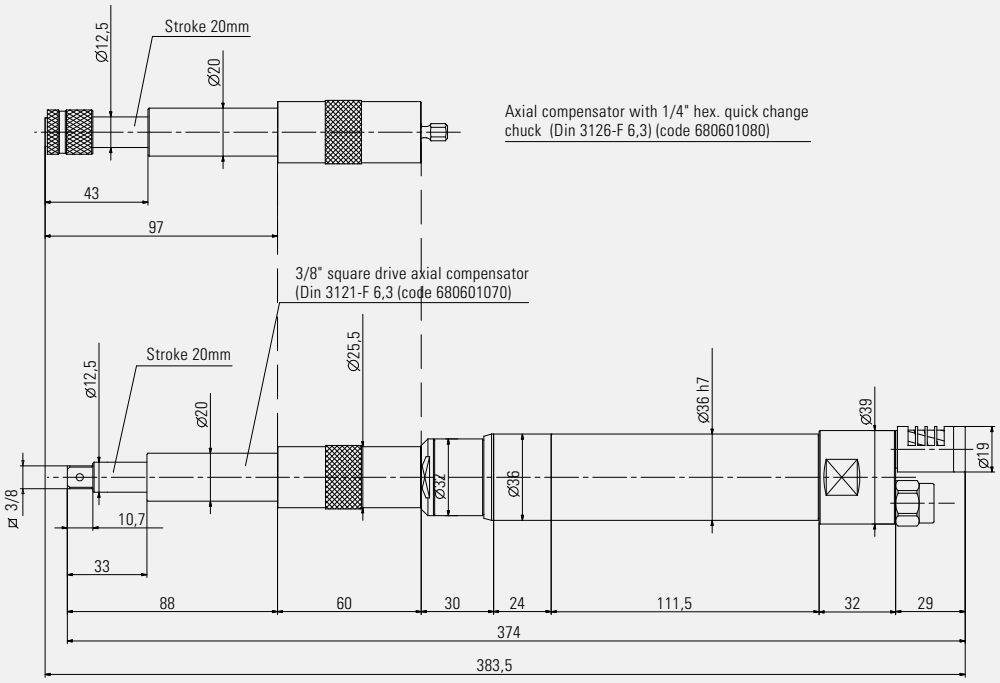
Models	A mm	B mm	C mm
MCSE.../ MCSE...R	239	43	32
MSCSE...	253	44,5	44



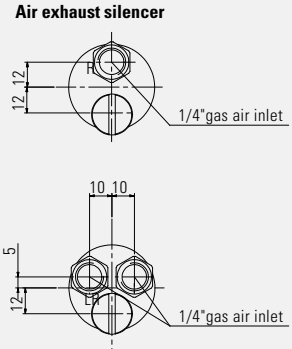
Air exhaust silencer



Models: MCSE.../MCSE...R WITH AXIAL COMPENSATOR



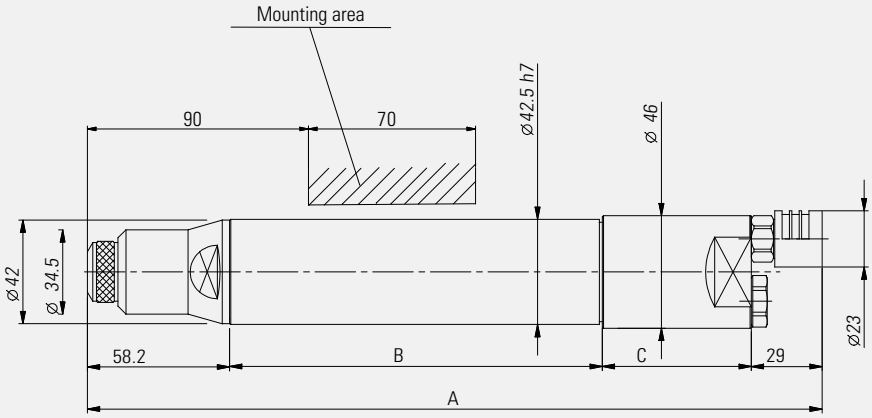
Air exhaust silencer



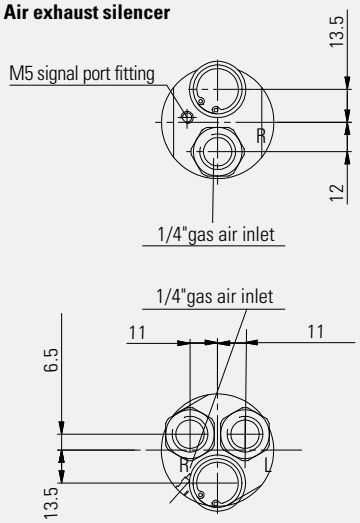
Dimensions

Models: MCY...-1 / MCY...-R1

Models	A mm	B mm	ø C mm
MCY 7-1	255,7	122,5	46
MCY 9 / 11-1	285,7	152,5	46
MCY 7-R1	270,1	122,5	61
MCY 9 / 11-R1	300,7	152,5	61

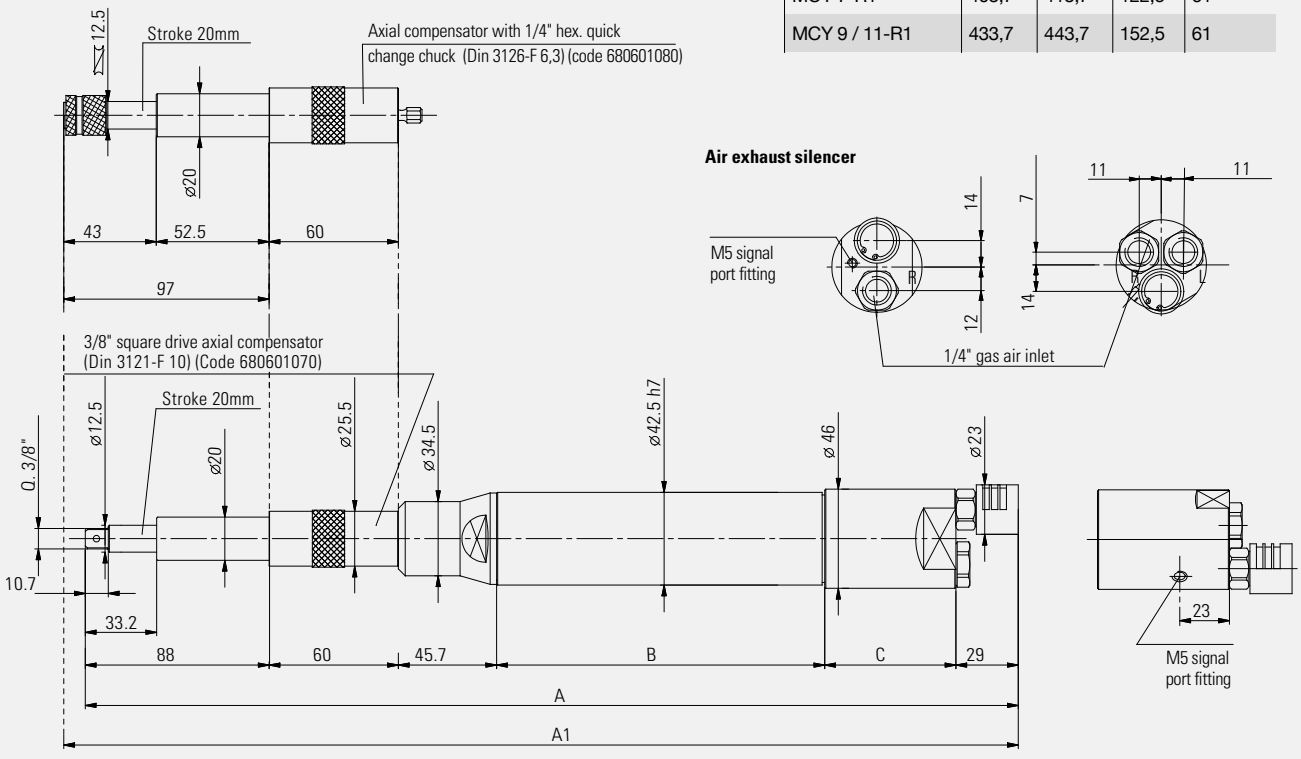


Air exhaust silencer



Models: MCY...-1 / MCY...-R1 WITH AXIAL COMPENSATOR

Models	A mm	A1 mm	B mm	ø C mm
MCY 7-1	387,7	398,7	122,5	46
MCY 9 / 11-1	418,7	428,7	152,5	46
MCY 7-R1	403,7	413,7	122,5	61
MCY 9 / 11-R1	433,7	443,7	152,5	61



Air exhaust silencer

Pneumatic nutrunner without clutch: technical features

Type of motor		Tightening torque on soft joint Min. / Max		Idle speed	Reversibility	Type of output available		
Model	**Code**	**Nm**	**in lb**	**r.p.m.**	**Type**	**Square**	**Telescopic square**	**Telescopic ith quick release chuck***
20MC	upon request	2,5÷10	22.1÷88.5	600 ÷ 2600	↻	x	x	x
28MC	upon request	4,5÷20	39.8÷177	560 ÷ 2650	↻	x	x	x
MNC	upon request	5÷45	44.2÷398.2	320 ÷ 2700	↻	x	x	x
MOC	upon request	18÷90	159.3÷796.5	400 ÷ 2800	↻	x	x	x
20MC.R	upon request	2,5÷10	22.1÷88.5	580 ÷ 2500	↻	x	x	x
28MC.R	upon request	4,5÷20	39.8÷177	395 ÷ 2350	↻	x	x	x
MNC.R	upon request	5÷45	44.2÷398.2	280 ÷ 2500	↻	x	x	x
MOC.R	upon request	15÷90	159.3÷796.5	320 ÷ 2200	↻	x	x	x

Legend

↻ Screw rotation clockwise

↻ **Reversibility:** The models are suitable for tightening and untightening operations

- The figures shown are measured at a pressure of 6,3 bar (ISO 2787), the recommended operating pressure.
- Accessory drive: 1/4", *6,35 mm female hexagonal drive (ISO 1173).
- The code number must be used when ordering.
- For installation instructions see 'Use and maintenance manual'.
- Dimensions are available upon request.

Torque values refer to analysis of laboratory performing tests that comply with the standard ISO 5393 with screwdriver set at to the maximum speedand should be considered as indicative.The values in real applications can be influenced by many factors such as, for example: joint (type of joint, degree of elasticity), screw (type and length), accessory used (type or length of the bit), tightening speed, assembly conditions (how the tool is installed), set tightening strategies and programs.
For any further details, please address to **Fiam Technical Service**.

Standard equipment (supplied with the nutrunner motor)

- Use and maintenance manual
- Eco-friendly packaging

Models available upon request

- Models with different speeds than the ones indicated on the chart
- Models for higher torques than the ones indicated on the chart
- Models with quick change chuck (only for 20 - 28 MC models)
- Models with modified flange and/or with customized body design

Accessories available upon request

- Bits, sockets and other accessories, refer to catalogue nr. 78
- Couplings, hoses, filters, governors and other compressed air system accessories (see catalogue nr. 77)
- Axial compensators and Fixing flanges (see page 70)

Fiam air nutrunner motors are designed for use with lubricated compressed air.
In the presence of high production rates, it is advisable to provide lubrication appropriate to the number of tightening cycles.
For further information, please contact the **Fiam Technical Assistance Service**.

How to get different values of power, torque and speed

Performances of **nutrunner motors** without clutch can be modified with continuity by means of a pressure or throttling regulator that reduces or increases the air quantity in the motor.
Consequently there is a decrease or an increase of the power, torque and speed values according to ratios shown in chart 1.

There are two methods to adjust performances of nutrunner motors without clutch:
- Installing the **air flow governor** on the air inlet coupling, **stall torque is controlled**.
- • installing **air flow governor** on air exhaust coupling **starting torque is maintained and motor's speed is adjusted**.

Chart 1 *Ratios of variation of the performances parameters of an air motor depending on air pressure.*

Pressure (bar)	Power	Torque	Speed	Consumption
7	1,21	1,17	1,03	1,15
6	1,00	1,00	1,00	1,00
5	0,77	0,83	0,95	0,82
4	0,55	0,67	0,87	0,65
3	0,37	0,50	0,74	0,47

If for instance we choose a 28MC nutrunner motor that at 6,3 bar has the performances indicated on chart, at a in-line pressure of 5 bar with reference to ratios of the chart below illustrated the parameters of this motor will be:

Motor	Bar	Power watt	Speed at point of maximum power – r.p.m.	Stall torque Nm
28MC120D	6	280	535	8
Motor	**Bar**	**Power watt**	**Speed at point of maximum power – r.p.m.**	**Stall torque Nm**
28MC120D	5	215,7	508	6,6

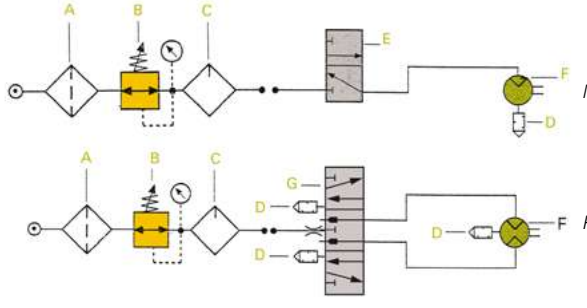
Power: 0,77 (coefficient) x 280 (power of motor) = 215,7 Watt (the power at 5 bar decreases)
Speed: 0,95 (coefficient) x 535 (r.p.m. of motor) = 508 (the r.p.m. at 5 bar decreases)
Maximum torque: 0,83 (coefficient) x 8 (torque of motor) = 6,6 (at 5 bar the torque value decrases)
For further information please contact Fiam Technical Advice service.

Air feed and its consumption

Air consumption of the air motor is at **maximum** when the motor turns at **idle speed**.
To obtain the performances on catalogue it is necessary to guarantee a **correct air feeding** and air exhaust and to **follow these indications**:

- Always respect **recommended air hose bore** for air feed and exhaust hoses.
- It is advisable that the **diameter of the exhaust hose** is greater than that of air supply hose. In the case of reversible motor, two inlets have to permit alternatively the entrance and the exhaust of the air i.e. that the inlet which is not used is left free so that the exhaust air can flow.
- **Avoid joints and quick couplings**; they can cause air leakage thus reducing the air flow.
- It is always advisable to use a FRL group (filter, pressure regulator, lubricator) appropriate to motor consumption.
- It is advisable to connect the exhaust hoses to **oil separator filter with built-in silencing system** that **further reduces the noise** level and lubricates the motor with no emission of air exhaust in working environment, allowing oil to be collected and reused.

Pneumatic circuit scheme (feed - control of the motor)



Non-reversible motor

Reversible motor

A = Filter
B = Pressure regulator
C = Lubricator
D = Silencer
E = Valve 3/2
F = Air motor
G = Valve 5/3 - way valve center exhaust

Multispindle tightening units

Tightening simultaneously and accurately more screws, bolts, nuts has never been easier.
Completely designed and manufactured by Fiam, multispindle tightening solutions can foresee:

TWO OR MORE SPINDLES

to tighten two or more screws, bolts, nuts **simultaneously and accurately** (at the same torque and depth)

USE OF DIFFERENT TYPES OF INDUSTRIAL MOTORS

to choose, depending on the application and type of joint and screw, between solutions **with air motors without clutch or with air shut-off motors** up to high technology solutions with **DC nutrunner motors**

AXIAL COMPENSATION

to eliminate height difference of the screws on the component (during tightening)

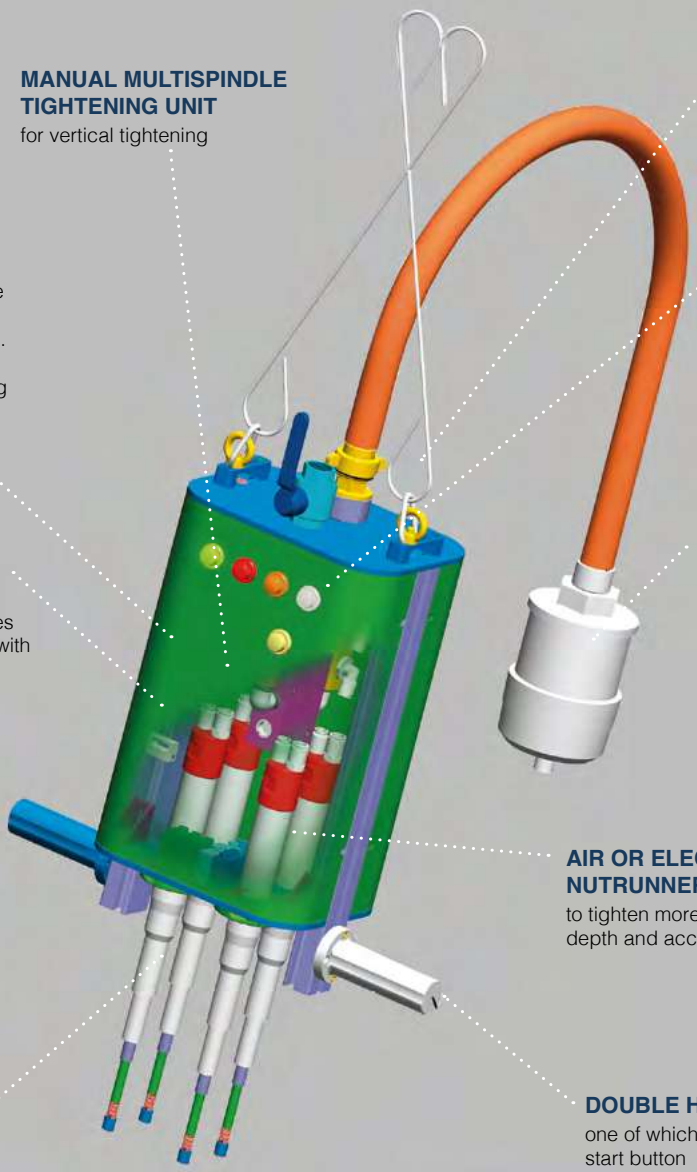
FIXED OR VARIABLE DISTANCE TO THE CENTRE

to tighten different components with a **single multispindle unit, changing only the position of the spindles** depending on the different distance to centre (distance of the screws on the component)

MANUAL SEMI-AUTOMATIC AUTOMATIC

in addition to the solutions that can be used by the operator vertically or horizontally, the multispindle tightening units can be integrated into in line automatic machines or on automatic workstations with manual loading of the piece

Multispindle unit with variable distance to centre equipped with optical device for distance to centre measurement



MANUAL MULTISPINDLE TIGHTENING UNIT
for vertical tightening

BALANCING SYSTEM
with hanging ring for balancer use to compensate the weight of the multispindle tightening unit

PROTECTION COVER
to reduce noise level in the environment (Optional: sometimes it isn't supplied. For example, when DC nutrunner motors are being used)

LIGHT DEVICES
to control/monitor working cycle (optional)

CAN BE CONNECTED TO THE LINE PLC
to manage tightening cycles also remotely (when used with electric nutrunner motors)

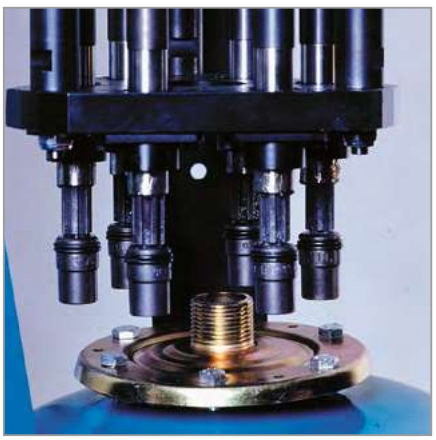
OIL SEPARATOR FILTERS/ AIR EXHAUST CONVEYOR
away from the operator to guarantee healthier working environment

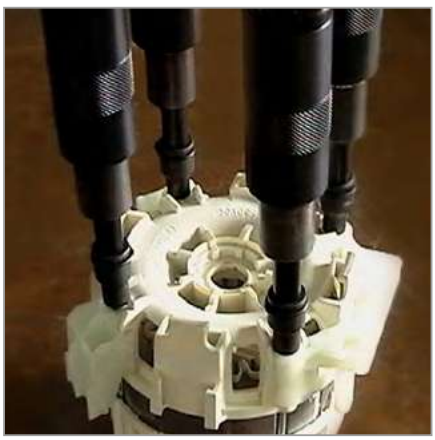
AIR OR ELECTRIC NUTRUNNER MOTORS
to tighten more screws simultaneously, in depth and accurately

DOUBLE HANDLE
one of which is equipped with practical start button

AXIAL COMPENSATORS
to compensate height difference among screws and tighten **on different heights**

Discover how it works!



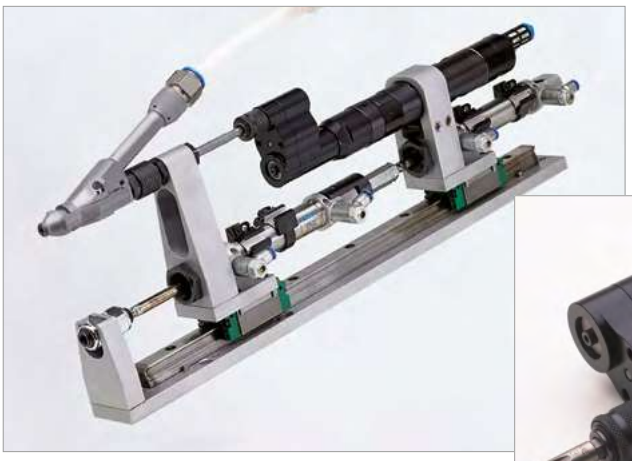


FASTENING SLIDES

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
Offset device:	upon request
Analogic sensor for depth control:	✓
Weight (slide only):	1,8 ÷ 2,2 Kg 3.96 ÷ 4.85 lb



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

"Screw at sight" function

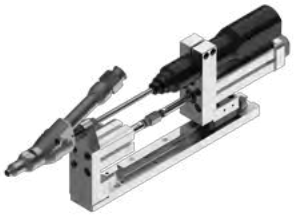
Fastening slide can be supplied with this funcion: the screw is held firmly inside the screwretaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screwretaining head, the imprint is engaged and then further steps of approach and subsequent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

Fastening slide with air nutrunner motor.

Compact fastening slide

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

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.



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:

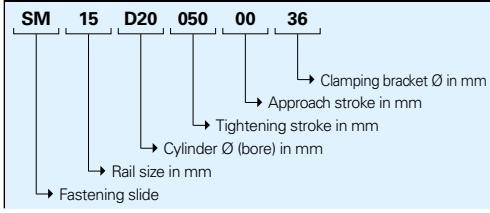
- **tightening torque up to 10 Nm / in lb 88.50**
- **nutrunner motors with ø max 53 mm**

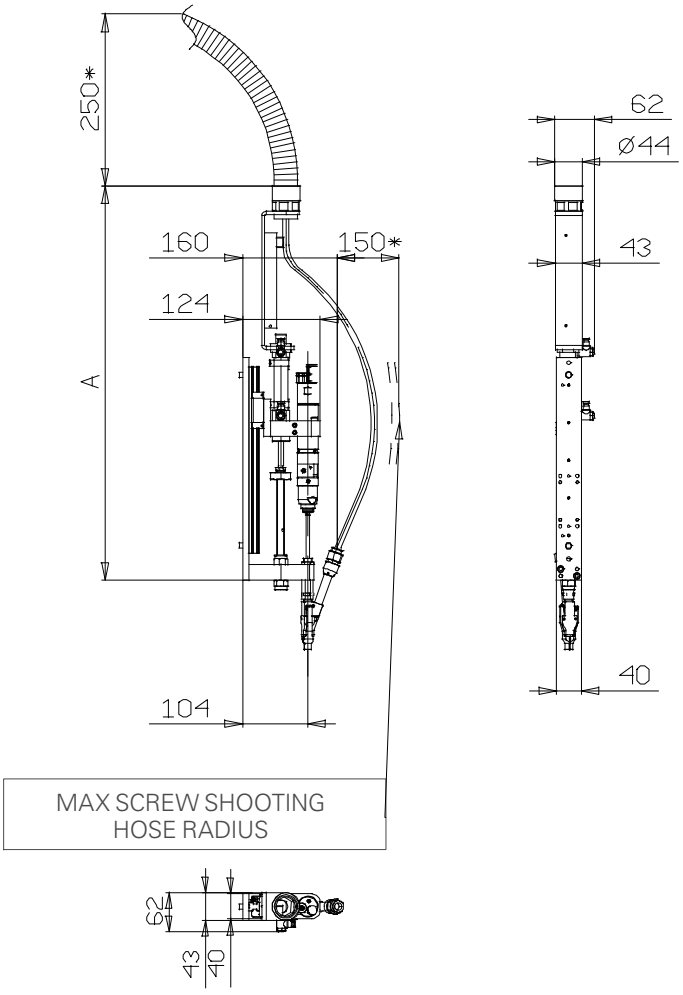
SW MODELS: WITH SCREW AT SIGHT

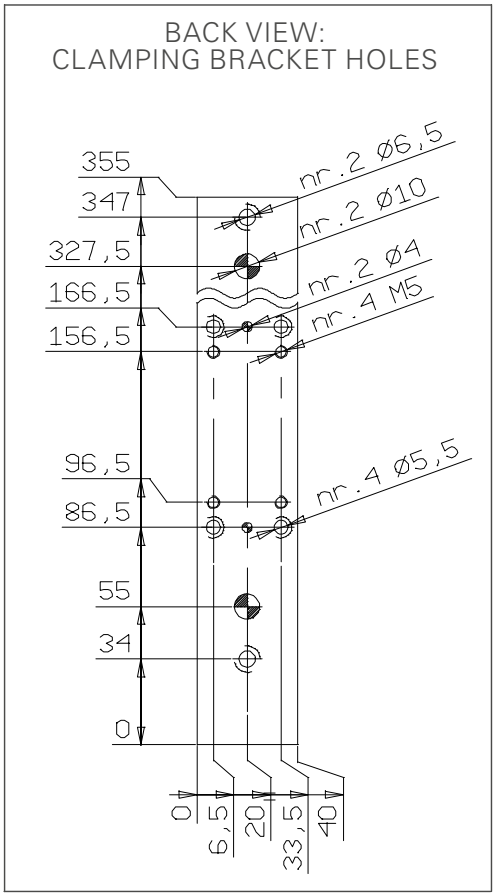
Single-stroke fastening slides, can be supplied wih "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further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

Single-stroke fastening slide	Size (rail track size)	Tightening stroke	Cylinder Ø (bore)
	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







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 / in lb 88.50**
- **nutrunner motors with ø max 36 or 53 mm**

SW MODELS: WITH SCREW AT SIGHT

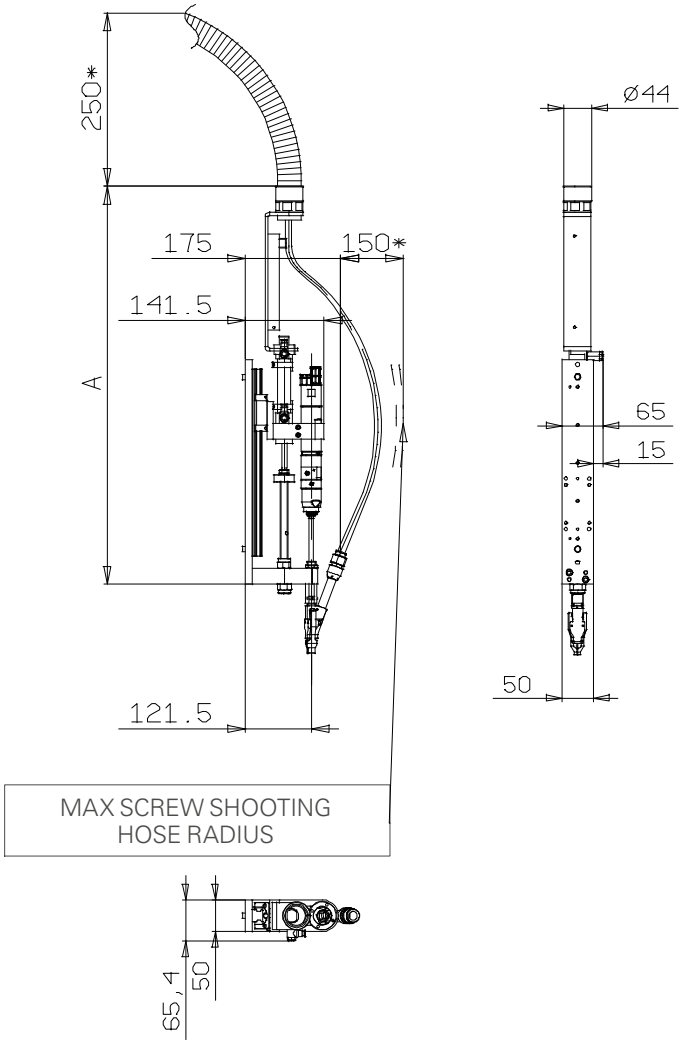
Single-stroke fastening slides, can be supplied wih "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further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

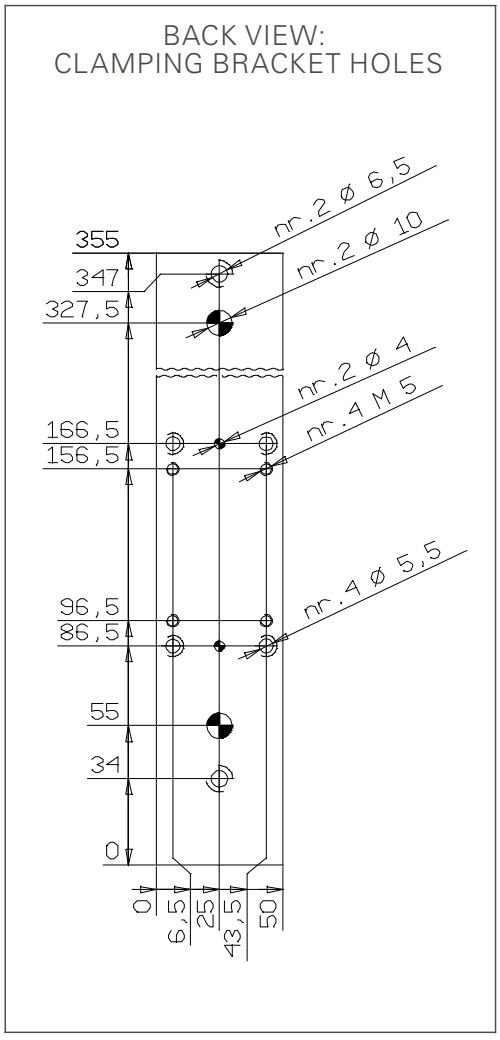
Single-stroke fastening slide	Size (rail track size)	Tightening stroke	Cylinder Ø (bore)
	mm	mm	mm
SM 20D25 050-00 42,5	20	50	25
SM 20D25 080-00 42,5	20	80	25

How to read model names

SM 20 D25 050 00 42,5

- SM: Fastening slide
- 20: Rail size in mm
- D25: Cylinder Ø (bore) in mm
- 050: Tightening stroke in mm
- 00: Approach stroke in mm
- 42,5: 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:

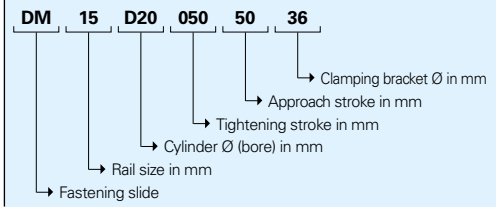
- **tightening torque up to 10 Nm / in lb 88.50**
- **nutrunner motors with ø max 36 or 53 mm**

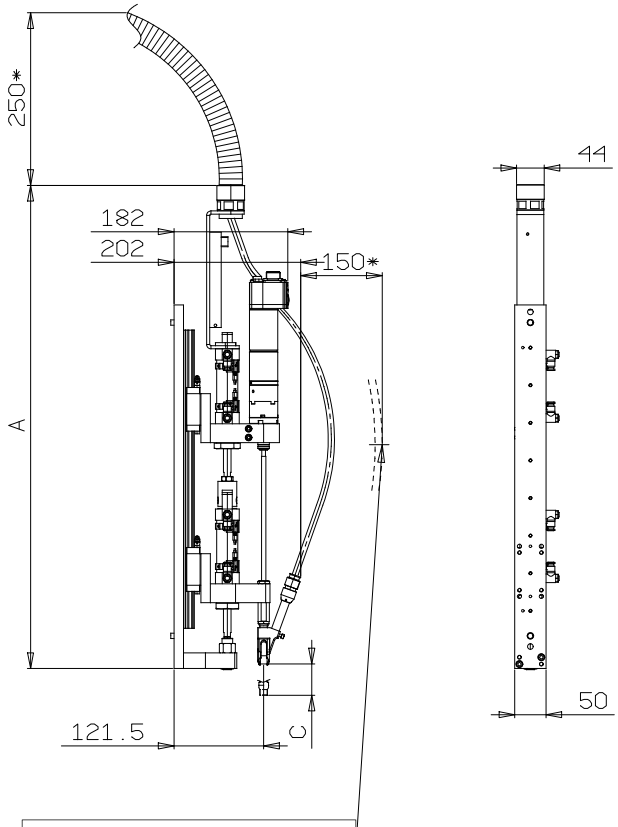
DW MODELS: WITH SCREW AT SIGHT

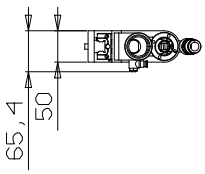
Dual-stroke fastening slides, can be supplied wih "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further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

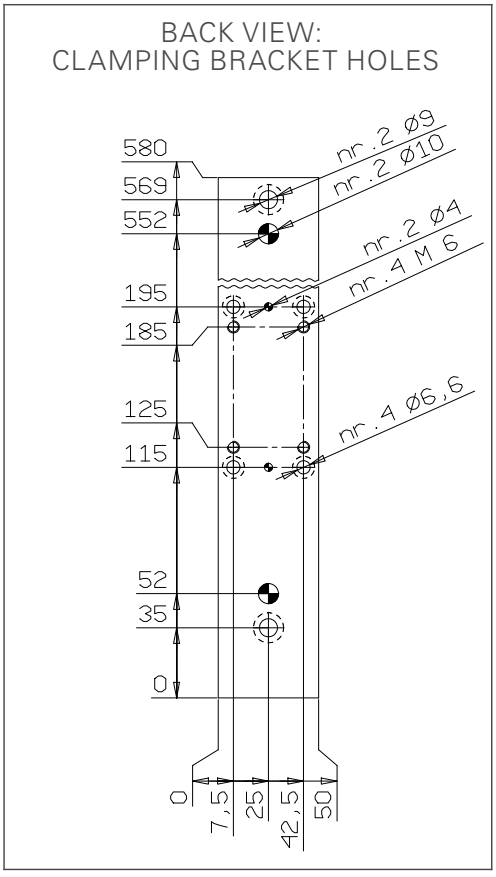
Dual-stroke fastening slide	Size (rail track size)	Tightening and approach strokes	Cylinder Ø (bore)	C distance	A distance
	mm	mm	mm	mm	mm
DM 15D20 050-50 36	15	50-50	20	50	710
DM 15D20 050-50 32	15	50-50	20	50	710
DM 15D20 050-80 36	15	50-80	20	80	770
DM 15D20 050-80 32	15	50-80	20	80	770
DM 15D20 080-50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









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 / in lb 88.50**
- **nutrunner motors with ø max 36 or 53 mm**

DW MODELS: WITH SCREW AT SIGHT

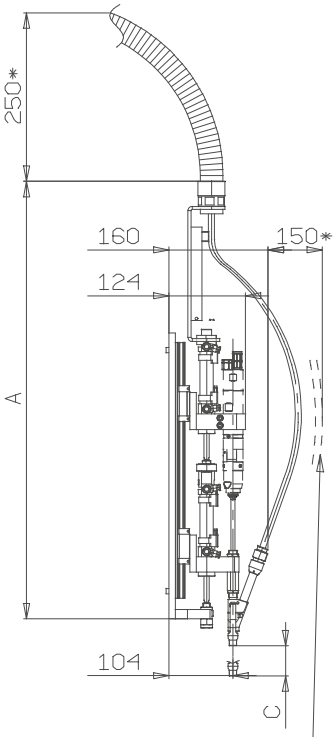
Dual-stroke fastening slides, can be supplied wih "visible screw" function: the screw is held firmly inside the screw-retaining head and screw engagement movement is achieved by means of an additional cylinder. Once the screw has reached the screw-retaining head, the imprint is engaged and then further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

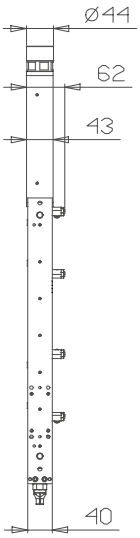
Dual-stroke fastening slide	Size (rail track size)	Tightening and approach strokes	Cylinder Ø (bore)	C distance	A distance
	mm	mm	mm	mm	mm
DM 20D32 050-50 36	20	50-50	32	50	740
DM 20D32 050-50 42,5	20	50-50	32	50	740
DM 20D32 080-50 36	20	80-50	32	50	810
DM 20D32 080-50 42,5	20	80-50	32	50	810
DM 20D32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

How to read model names

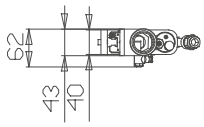
DM 20 D32 050 50 36

- DM — Fastening slide
- 20 — Rail size in mm
- D32 — Cylinder Ø (bore) in mm
- 050 — Tightening stroke in mm
- 50 — Approach stroke in mm
- 36 — Clamping bracket Ø in mm

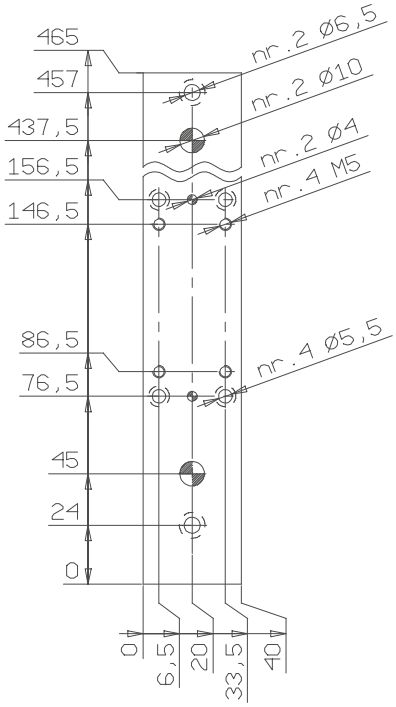




MAX SCREW SHOOTING HOSE RADIUS



BACK VIEW: CLAMPING BRACKET HOLES



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

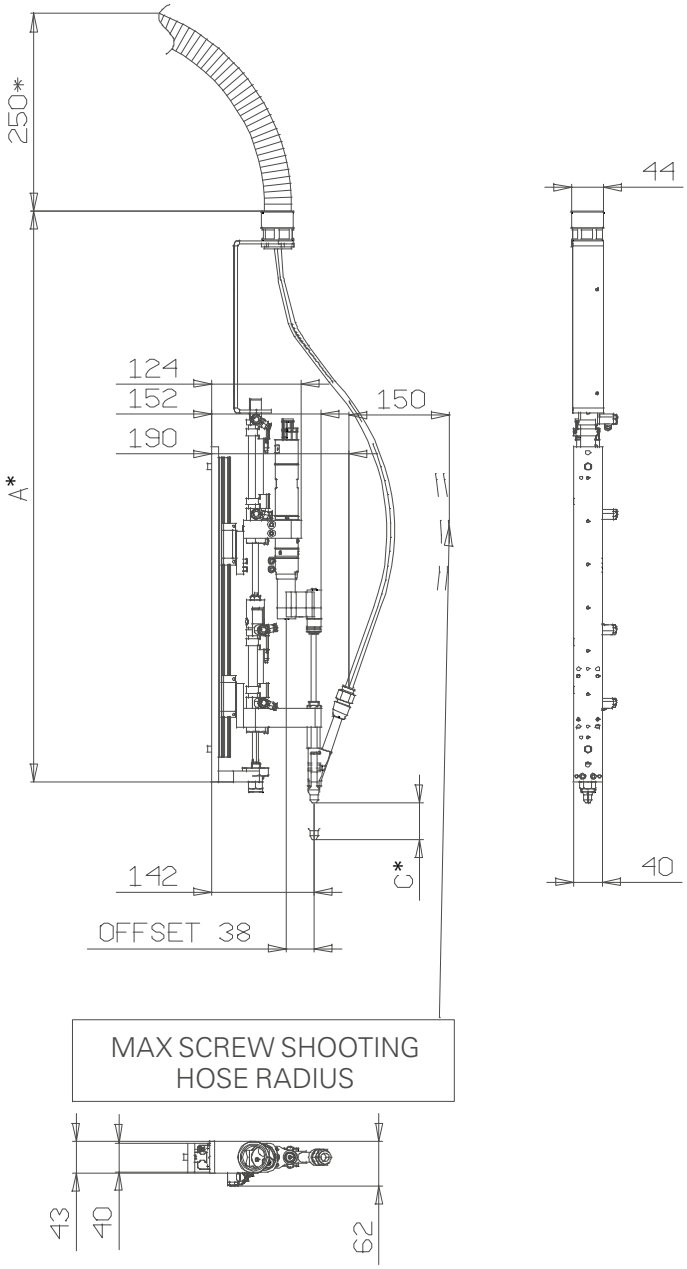
DUAL STROKE FASTENING SLIDES WITH OFFSET DEVICE

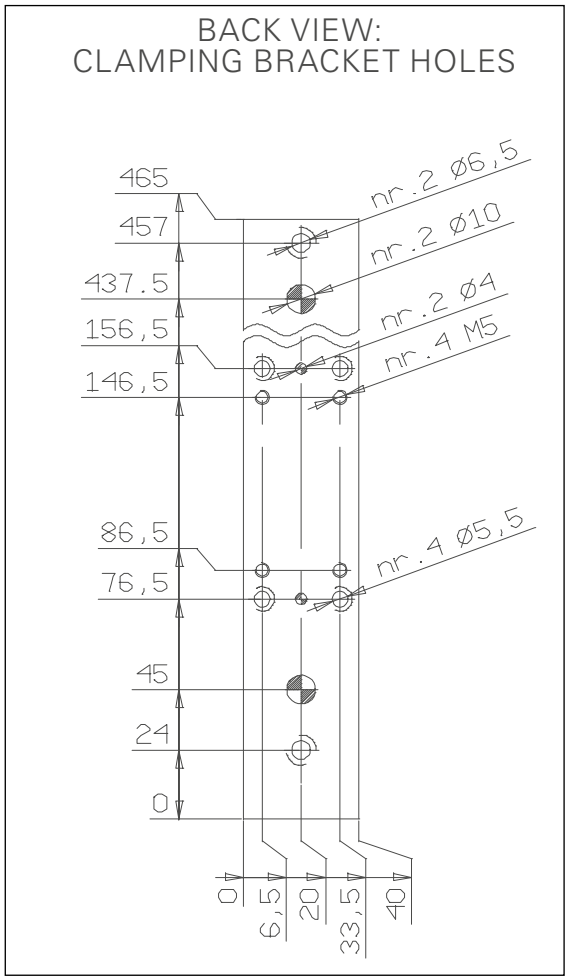
DM 15 model

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

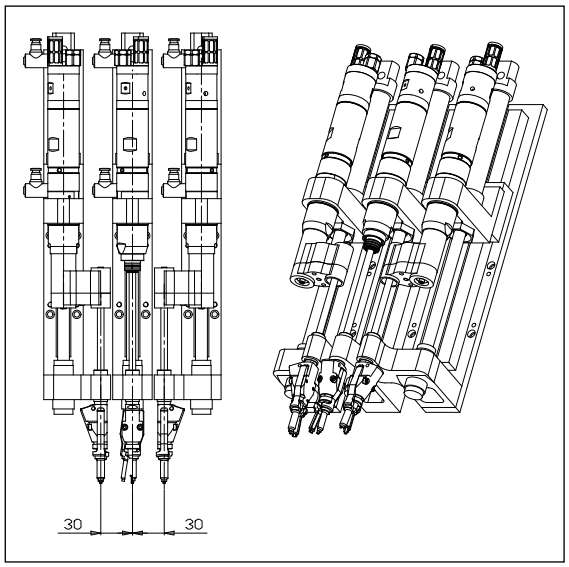
Recommended for:

- **tightening torque up to 10 Nm / in lb 88.50**
- **nutrunner motors with ø max 36 mm**



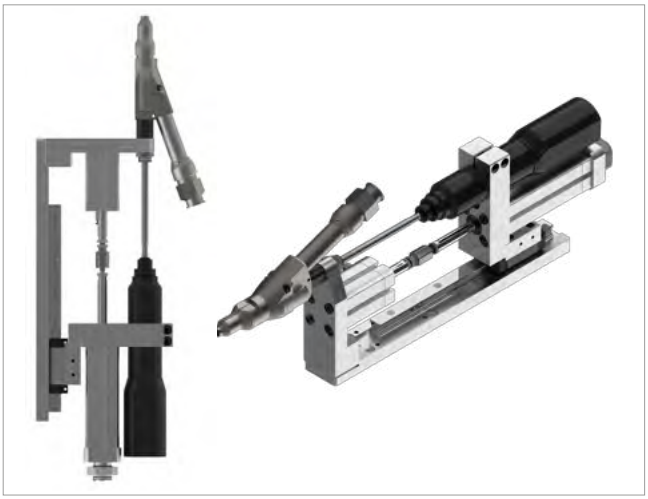


The dimensional drawings are available in different formats on our Fiam reserved area (www.fiamgroup.com)



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.

SCREW FEEDERS AND SELECTOR UNITS

Supplied already assembled, calibrated and tested on the customer's screw type.
Their features allow to rationalize working posts, thanks to the continuous screw feeding and to the high bowl feeder capacity, allowing faster and more productive assembly operations.
Such solutions, designed and built by Fiam, are ideal for customers wanting to integrate such systems in their existing or future production (on machines and/or semi-automatic or automatic assembly lines).
Screw feeding units can be of two types, namely one or two ways.

SUPPORTING STRUCTURES AND HOPPERS

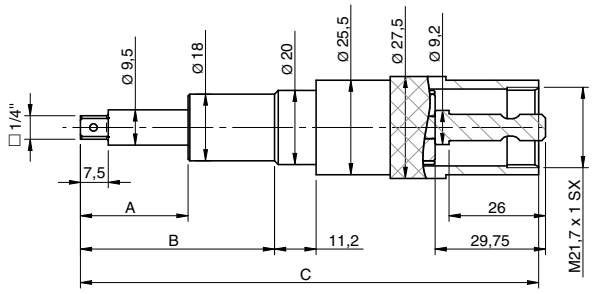
Solutions entirely designed and manufactured by Fiam, suitable for supporting screw feeders and hoppers, used to solve high-speed production needs, as they increase the feeding capacity of screw feeders.
The hoppers are available in vibratory or belt versions.
They ensure cleanliness and functionality of the operating layout.

AXIAL COMPENSATORS

Axial compensators facilitate screw engagement and reduce axial load on the motor's mechanical components.
When there is a need to tighten multiple screws simultaneously, the axial compensation device eliminates height differences between the screws at the tightening start phase.
These compensators **are supplied with a guide bushing to ensure perfect alignment** (compensation bit is centred correctly on nutrunner). The compensator must be combined with the accessories illustrated in the Accessories Catalogue, inserting a specific adapter if required. To use axial compensators on air nutrunner motors with push start please apply to Fiam Technical Service.

For the correct matching of the nutrunner motor with the appropriate axial compensator, please refer to the table below.

☐ 1/4" drive axial compensation bit (DIN 3121 - F 6,3)



AXIAL COMPENSATORS

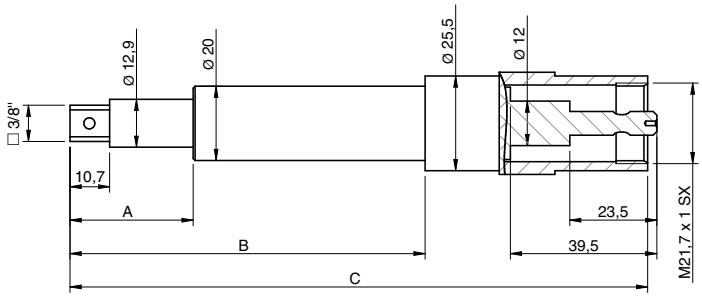
Type	Code	Axial compensation – stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
Drive ☐ 1/4" (DIN 3121 - F 6,3)	680601090	20	9,5	23,7
	680601091	20	26,5	32,9

* Applicable to all nutrunner motors in this catalogue, with the exception of MCY models which, due to their very high torque values, may compromise the square output connection.

Dimensions

A [mm]	B [mm]	C [mm]
29	52,3	123,5
29	52,3	123,5

☐ 3/8" drive axial compensation bits (DIN 3121 - F 10)



AXIAL COMPENSATORS

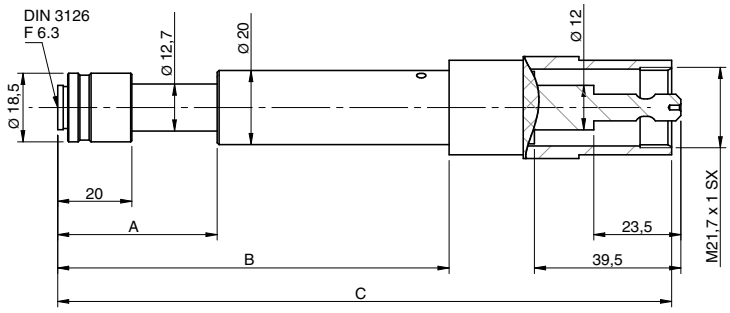
Type	Code	Axial compensation – stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
Drive ☐ 3/8" (DIN 3121 - F 10)	680601070	20	4,8	20,8
	680601072	20	15,6	34,9
	680600015	30	12,8	36,8

* Applicable to all nutrunner motors in this catalogue

Dimensions

A [mm]	B [mm]	C [mm]
33,2	95,7	155,7
33,2	95,7	155,7
43,2	115,7	175,7

with ⎔ 1/4" quick change chuck (DIN 3126 - F 6,3



AXIAL COMPENSATORS

Type	Code	Axial compensation – stroke [mm]	Applied force initial stroke [N]	Applied force maximum stroke [N]
Drive ⎔1/4" (DIN 3121 - F 6,3)	680601080	20	1,6	20,8
	680601082	20	11,8	34,9
	680601083	30	20	38,4

* Applicable to all nutrunner motors in this catalogue

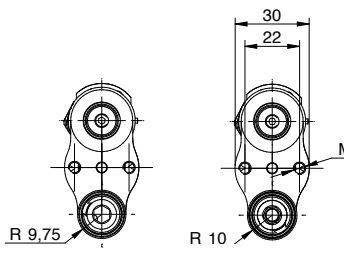
Dimensions

A [mm]	B [mm]	C [mm]
43	105,5	165,5
43	105,5	165,5
53	125,5	185,5

OFFSET DEVICES

Accessory applicable to nutrunner motors, designed to reach tightening points with very tight center distances or that are difficult to access.

Thanks to the lateral offset of the tightening axis with respect to the motor axis, the device allows tightening operations while ensuring accuracy, reliable torque transmission, and continuity with the motor control parameters.



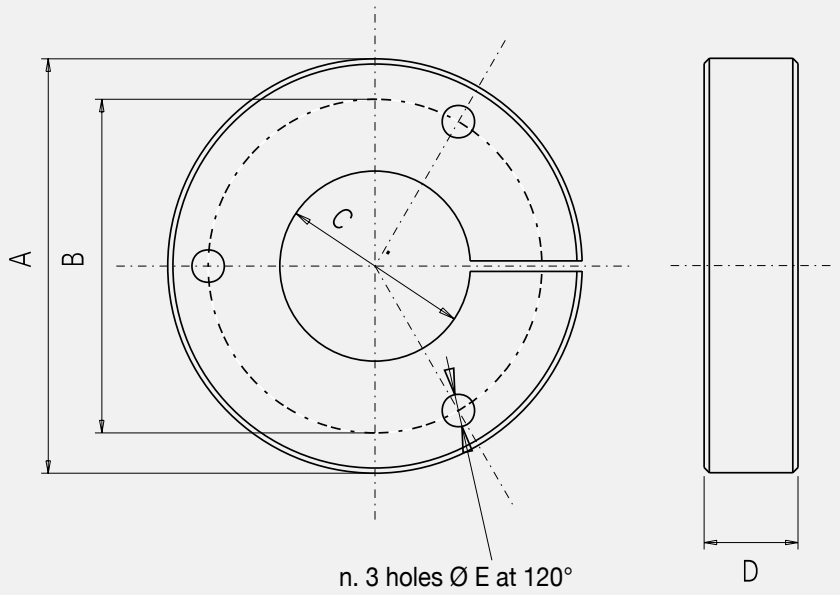
Offset device with axial compensator code 680601195

Offset device for very small centre-to-centre distances code 680601185

- For use of the offset device, it is necessary to order the adapter – code 687029248
- The offset device can be used with motors up to 5 Nm.

FIXING FLANGE

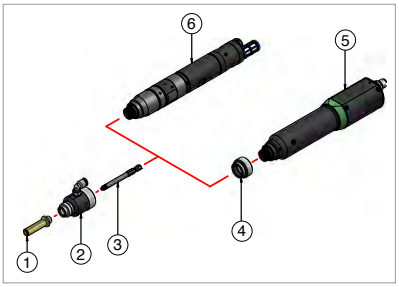
To install a pneumatic or electric eTensil nutrunner motor on a fixed support, it is advisable to use the 3-hole fixing flange which, acting on the entire circumference of the motor spindle collar, prevents operating irregularities.



For	Code	Flange dimensions A mm	B mm	C mm	D mm	E mm
Pneumatic nutrunner motors with mechanical clutch and automatic shut-off • 20MC...A • 20MC...RA • 20MSC...A	684011006	64,5	50	32	18	5,25
Pneumatic nutrunner motors with slip clutch • MCZE... • MCZE...R • MSCZE...						
Pneumatic nutrunner motors with mechanical clutch and automatic shut-off • MCSEZ...A • MCSE...A • MCSE...RA • MSCSEZ...A • MSCSE...A	684011007	69,5	57	36	18	6,25
Electric nutrunner motors • eTensil **Pneumatic nutrunner motors with mechanical clutch and automatic shut-off** • MCSE... • MCSE...RA • MSCSE...						
Pneumatic nutrunner motors with mechanical clutch and automatic shut-off • MCY...A • MCY...RA • MCG...A • MCG...RA • MSCY...A	684011008	79,5	64	42,5	18	6,25
Pneumatic nutrunner motors with slip clutch • MCY...-1 • MCY...R-1						
Electric nutrunner motors • MCB • E MCB	FLANGE INCLUDED					
Electric nutrunner motors X-PAQ • SD2500	SPECIAL FLANGES see page 33					

SCREW SUCTION SYSTEM

Represents an effective and reliable solution for automatic screw pick-up operations in assembly processes.
The vacuum pick-up heads are specifically designed **for eTensil electric nutrunner motors and 15C and 26C pneumatic motors, FT version**, and are designed and manufactured by Fiam according to the screw type in order to ensure high pick-up reliability, precision in screw engagement on the bit, and perfect screw retention during handling. This ensures operational continuity and a significant reduction in cycle times.



Screw suction system

A special **head** (2) to be fitted on the tool by means of the **connection kit** (4 - only for eTensil nutrunner motors) and connected to the SSU vacuum pump.
A dedicated **nozzle** (1), to be customized according to the screws or the component to be assembled, is mounted on the head.
A sample of the screws or components must be sent to Fiam for this purpose.
The **bits** (3) will also be evaluated and selected based on the screw type.

Model	Code
① Nozzle	
② Special Screw Suction Head*	682119050
③ Bit	customized
④ Connection kit (to be used when an eTensil electric nutrunner motor is employed)	681041038
⑤ eTensil electric nutrunner motor	
⑥ Pneumatic nutrunner motor	

* supplied with screw suction **hose** to be connected to the vacuum pump

SSU

SSU-E

Vacuum pump

Designed and manufactured by Fiam. Necessary for the suction of the screws. Supplied with power cable.

Model SSU-E: to be combined with eTensil TPU-2, TPU-M1, TPU-C1 and TPU-C3 units. In addition to the features of the SSU model, it features a screw presence detection system on the nozzle of the screw suction device to which it is connected and that automatically manages, via an external signal, the switch-on and switch-off, optimizing the energy saving and reducing noise. Is equipped with a LED device on the front which indicates the functioning when in the suction phase.

Model	Feed input	Code
Vacuum pump SSU	230Vac-50Hz	676000120
Vacuum pump SSU	120Vac-60Hz	676000132
Vacuum pump SSU-E	230Vac-50Hz	676000121
Vacuum pump SSU-E	120Vac-60Hz	676000133
Connection cable DB15/M - L 3 mt • To connect SSU-E to TPU-2		686990058
Connection cable DB25/M - L 3 mt • To connect SSU-E to TPU-C1, TPU-C3, TPU-M1 or to the client PLC		686990059

The supply includes screw presenter, 1 rail compliant with the chosen model and magnetizing device.
The screw presenter is supplied with **linear rail already installed and calibrated**.
It also works at 120V with the adapter provided.

Automatic screws presenters

NJR automatic screw presenters effectively feed:
- **Any type of screw/head print** even those with Torx or hexagon sockets
- **Different screws** (shank diameter 2 ÷ 5 mm, max shank length 18 mm) simply replacing the rails
- **Convenient pick-up point:** has a screw detection sensor with a signal output cable. The built-in cable provides a signal (on/off) that indicates if there is a screw in the pick-up area and therefor connect the screw presenter to line devices.

Model	Code	For screws with shank ø mm
NJR23-RR20	199923120	2,0
NJR23-RR23	199923123	2,3
NJR23-RR26	199923126	2,6
NJR23-RR30	199923130	3,0
NJR45-RR35	199923135	3,5
NJR45-RR40	199923140	4,0
NJR45-RR50	199923150	5,0

Rail model	Bit code	Screws with shank Ø mm
RR20	649021101	2,0
RR23	649021102	2,3
RR26	649021103	2,6
RR30	649021104	3,0
RR35	649021105	3,5
RR40	649021106	4,0
RR50	649021107	5,0

The supply includes screw presenter, 1 rail compliant with the chosen model and magnetizing device.
The screw presenter is supplied with **linear rail already installed and calibrated**.
It also works at 120V with the adapter provided.

Automatic screws presenters with rotating pick-up point

OM automatic screw presenters effectively feed:
- **Exclusively magnetizable steel screws** from M2 to M6 with under-head length up to 25 mm
- **Convenient pick-up point on the rotating escape:** has a screw detection sensor with a signal output cable. The built-in cable provides a signal (on/off) that indicates if there is a screw in the pick-up area and therefor connect the screw presenter to line devices.

Model	Code	For screws with shank ø mm
OM-26R20	*	2,0
OM-26R23	199924123	2,3
OM-26R26	*	2,6
OM-26R30	*	3,0
OM-26R35	*	3,5
OM-26R40	*	4,0
OM-26R50	199924150	5,0
OM-26R60	*	6,0

Rail model	Bit code
OMR20SET	*
OMR23SET	*
OMR26SET	*
OMR30SET	*
OMR35SET	*
OMR40SET	*
OMR50SET	649021147
OMR60SET	*

* upon request

Automatic nut presenter

NE D nut presenter

Designed for the automatic pickup of **hexagonal metal nuts** and for performing efficient pick-and-place operations.
Ensures high production rates thanks to the adjustable high operating speed.
Nut pickup and retention on the nutrunner motor **are achieved mechanically by means of special wrenches with a very compact radial footprint.**

Discover all the features on the catalogue

Plug&Play MCA tightening solutions

MCA automatic tightening modules

Tightening modules ready and tested for integration into existent production lay out to increase production capacity.

They comprise:
- electric or pneumatic nutrunner motor with any type of torque/angle control
- fastening slide
- customised screw-retaining head
- screw feeder that ca be with vibrating bowl or via segment conveyor

With MCA modules:
- screws are sent continuously and quickly from the bowl feeder to the screw-retaining device
- 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) and can be managed remotely

Discover the Plug & Play MCA solutions in detail

MCA automatic tightening modules for Cobot

These modules pair perfectly with all collaborative robots on the market.

- Being quickly reprogrammed and used for different applications
- Ease of programmingand very fast setup

Strength points:
- **Integrated forward bit stroke device:** the automatic bit advance to the tightening point not allows it to withdraw
- **Quality assembly:** during tightening stage, the screwdriver's head does not rest on the surfaces, protecting them from any potentially damaging contact
- **Safe:** the tip of the screw is never exposed during handling and hence cannot hit the operator

Do you need to automate your tightening processes?

REQUEST A FREE QUOTATION!

By sending us the details through Data Entry 4.0 configurator,
which you can compile directly on our website,
you will quickly receive a no-obligation "turnkey" solution
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