

Tightening automation.

Only excellent solutions.



High-tech automatic
tightening solutions



Fiam[®]
PEOPLE AND SOLUTIONS

Automatic tightening solutions.

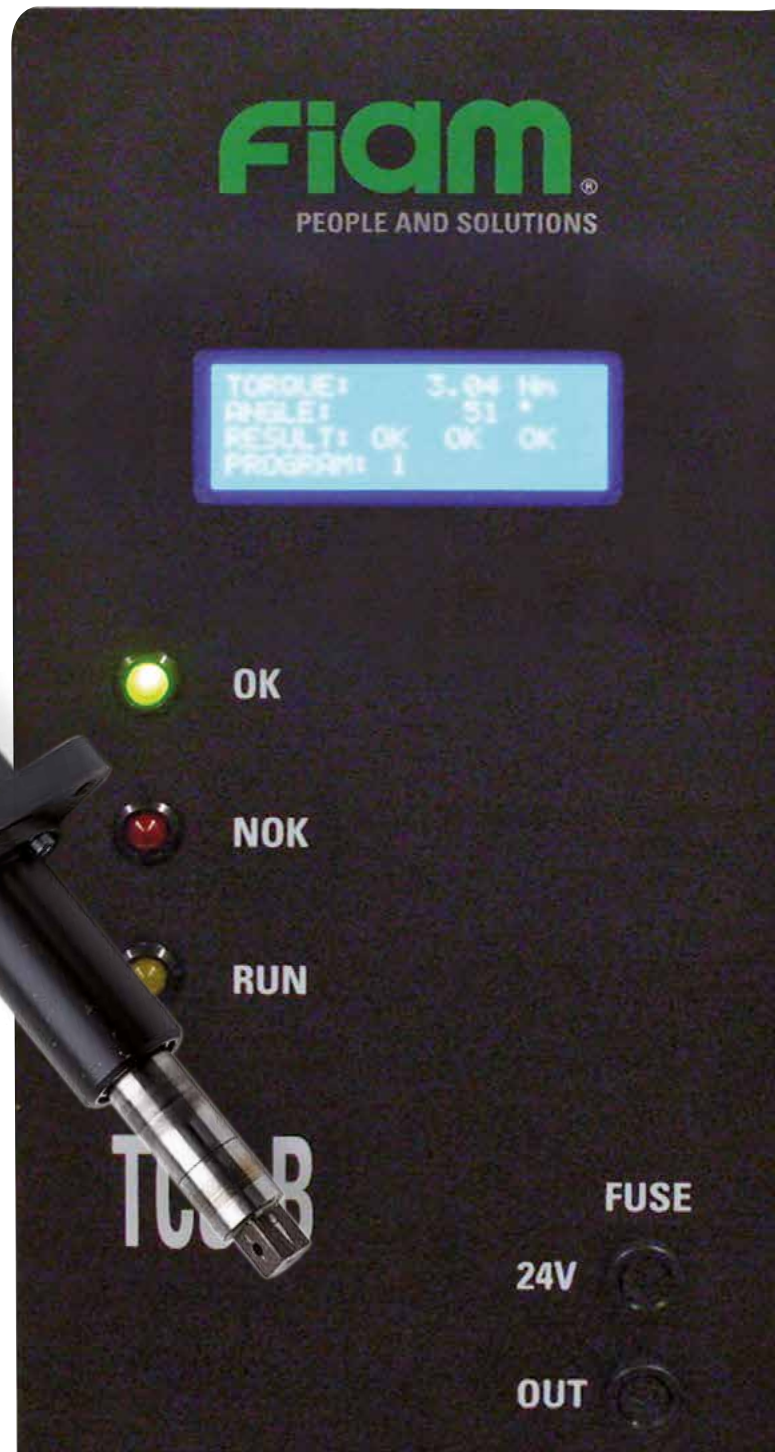
The best of Fiam for your production.

They allow to control, monitor, analyze, diagnose and programme in real-time.

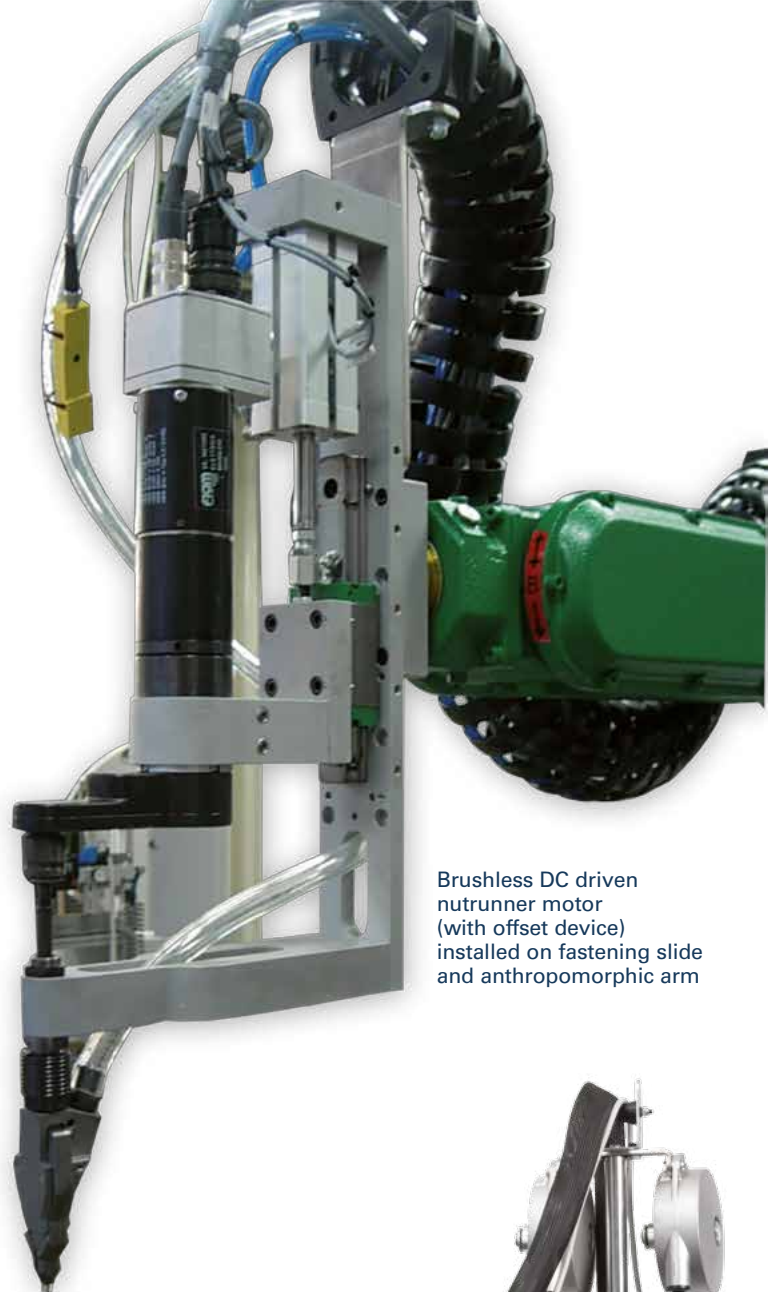
They can be integrated perfectly with the network control systems of the production site.

They guarantee a very high control of the productive process and consequently of the quality of the assembled products.

These are the new Fiam solutions for industrial tightening:
a concentrate of innovation
and reliability.



- ➔ **For any threaded element**
- ➔ **Semi-automatic solutions: a valuable help for operators**
- ➔ **Multi-spindle tightening units: they assemble several fasteners simultaneously**
- ➔ **Anthropomorphic robot, versatile and always convertible**
- ➔ **Electric axis to ease assembly on different surface**



Brushless DC driven nutrunner motor (with offset device) installed on fastening slide and anthropomorphic arm



Pallets automatic line to fasten the screws on thermo-hydraulic collectors



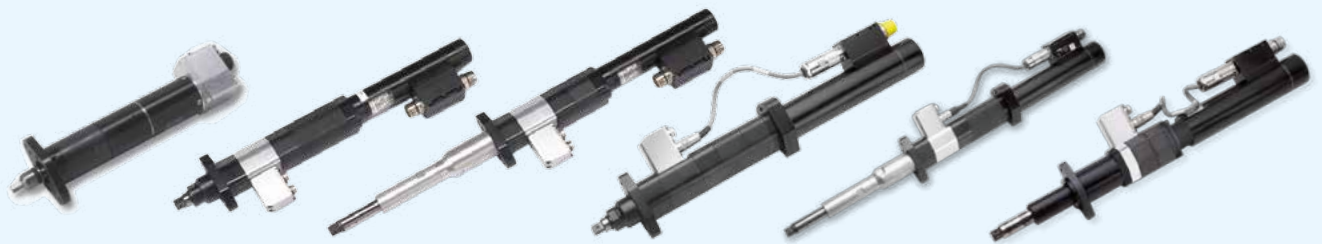
Manual use on cartesian arm

Configurations

High technology DC driven nutrunner motors with feed and control unit:
perfect synergy for high quality assemblies

- This wide range of high-tech DC electric nutrunner motors along with the controller guarantees extreme precision and accuracy of every industrial assembly
- Several configurations with different modes of torque control and monitoring to solve any tightening need, even most difficult ones
- Suitable for all industrial fields from motor vehicle to aerospace, from electric household appliances to electro-mechanical field. These solutions guarantee allover:
high flexibility of tightening process, easy integration in the productive lines, traceability of all tightening data, costs reduction thanks to reduction of waste.

RANGE: 0,5 ÷ 150 Nm



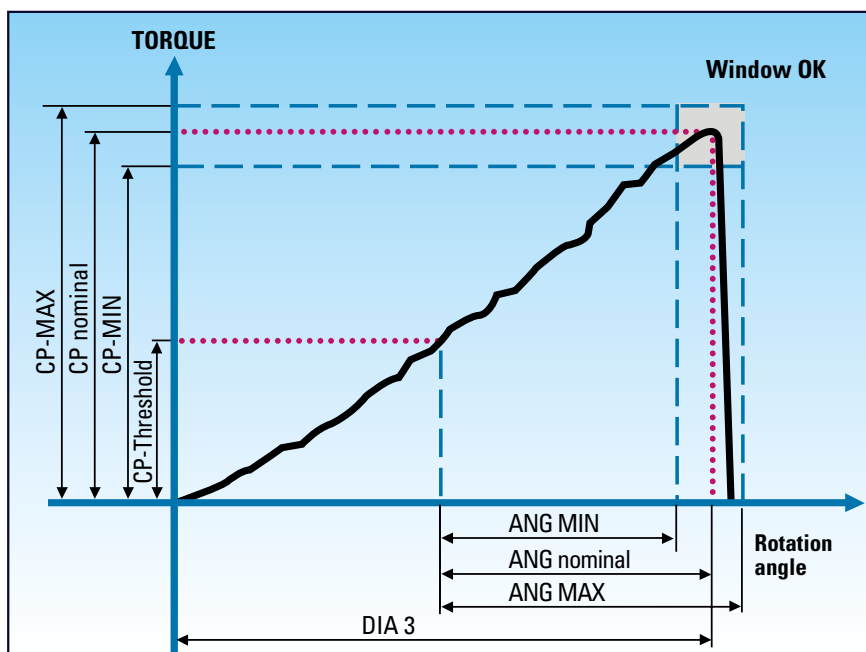
- INDIRECT (current control) and DIRECT (torque/angle control with built-in transducer) brushless DC driven nutrunner motors

RANGE: 0,5 ÷ 90 Nm



- INDIRECT (current control) and DIRECT (torque/angle control with built-in transducer) brushless DC driven nutrunner motors

Different control modalities available: torque control with angle monitoring, angle control with torque monitoring, only torque control.



• Feed and control unit



• Driver



• Control unit



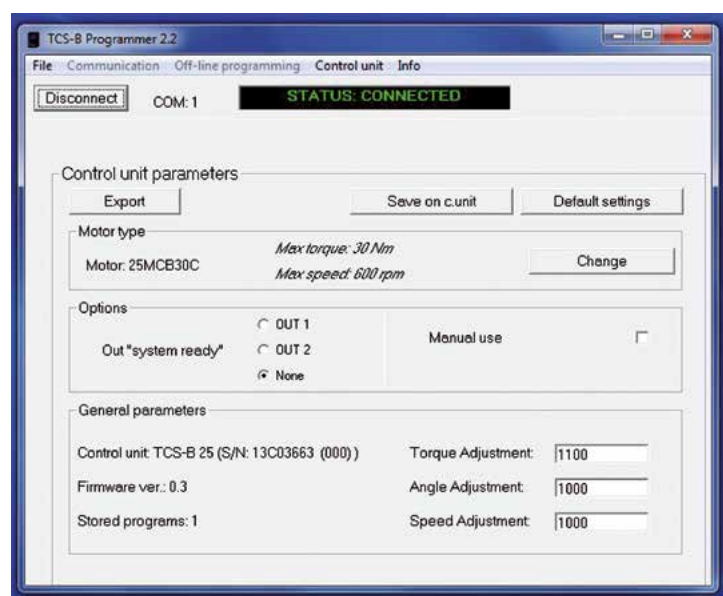
Feed and control unit TCS-B E: the intelligent simplicity

TCS-B E (*Tightening Control System - Basic - Evolution*) are innovative and compact units that include **electric feeding to the motors, programming and control of each stage of tightening cycle**. They control both current control and torque/angle nutrunner motors.

- ➔ **5 strategies:** it is possible to choose between screw drive-engagement, torque, torque/angle, angle/torque, loosening. 5 programmable modalities, to guarantee reliability and working speed
- ➔ **Optical outcomes visualization** for an immediate understanding through OK, NOK, RUN leds
- ➔ **Wide connectivity:** 5 inputs and 5 outputs for connection to signal tower light or external devices; they control and assure working continuity. RS232 connection for programming, diagnostics and data collection
- ➔ **Software is supplied with standard equipment,** for a simple and intuitive programming, with clear and complete instructions to set and manage the tightening strategy



- **“Accessory release” sequence:** programmable instruction to be used when the accessory and/or screw drive collapse preventing release of screw/accessory, thus stop the working cycle. Therefore it guarantees operating continuity and high productivity in the automatic working cycles
- **“Plug&Play” system:** automatic adjustment of torque transducer signal (for torque/angle control systems)
- **Working test**
(inputs and outputs work, motor speed, motor connection control, feeding tension and temperature values)



System Display

TCS-B Programmer

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 equipment supplied (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 of 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.

SEQUENCE: TORQUE/ANGLE STRATEGY	
Init. Speed (%):	0
Masking time (ms):	0
End Speed (%):	0
Speed change masking time (ms):	0
Speed change torque (%):	0
Angle meas. threshold (%):	0
Nominal Torque (Nm):	0
Sensor Input:	<input type="checkbox"/>
MAX Torque (Nm):	0
MIN Torque (Nm):	0
MAX Angle (°):	0
MIN Angle (°):	0
Time-Out (ms):	0
Insert Cancel	

TCS-B Programmer 2.2

File Communication Off-line programming Control unit Info

Disconnect COM:1 STATUS: CONNECTED

Programming

New Open Export Save on PC Save on c.unit

MOTOR: 25MCB30C
MAX SPEED: 600 rpm
MAX TORQUE: 30 Nm

AVAILABLE SEQUENCES:

- Jog
- Torque Strategy
- Torque/Angle Strategy
- Angle/Torque Strategy
- Untighten
- Fastener release
- Wait
- Output
- Display/Print

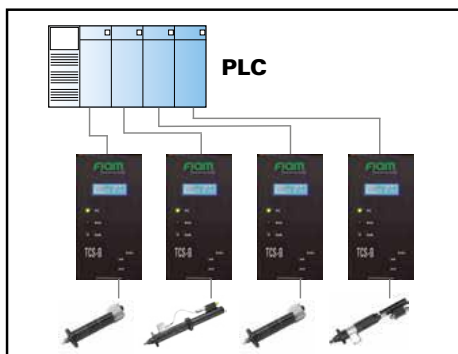
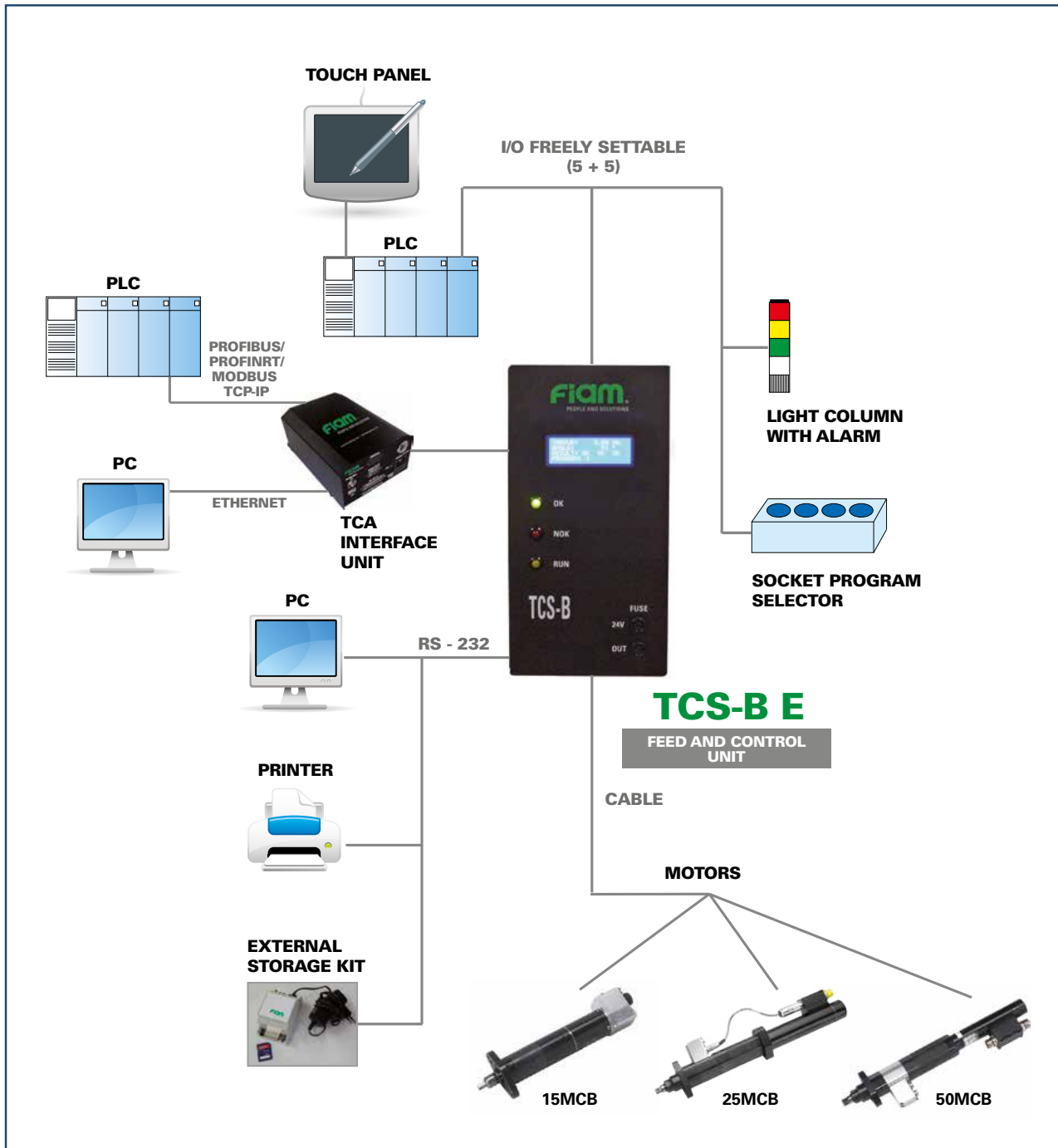
PROGRAM:

0% 100%
Program size: 16%

- Torque Strategy
- Display/Print
- Wait
- Untighten

MOVE UP
MOVE DOWN
DELETE SEQ.
DELETE ALL

Layout



Accessories upon request

INTERFACE UNIT TCA

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

- TCA-PN Interface Unit for Profinet e 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 communication protocol.

The TCA-PB model has an additional gateway for Profibus protocol.

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

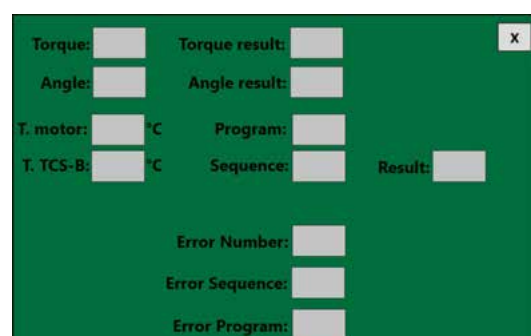
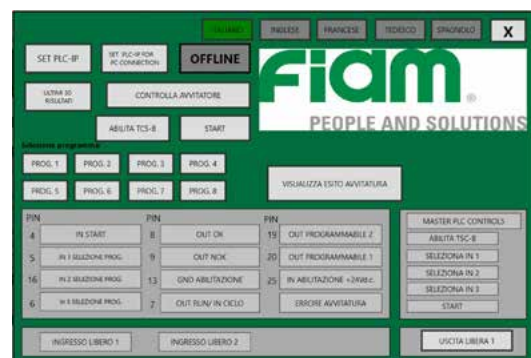
- **To export multiply data** (to es: tightening torque in Nm; angle values; overall outcome of tightening sequence; number of selected tightening program...)
- **To receive all the commands**
- It allows to assign to TCS-B E unit an univocal Ethernet address
- Through the program for PC and connection 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 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		Communication Protocol	Feed	Dimensions (h x p x l)
Model	Code			mm
TCA-PN	686200402	for Profinet and ModbusTCP-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

EXTERNAL STORAGE KIT

Device able to collect serial data processed by the unit, couple them with date and hour and store them in digital storage card supplied with. The card has a 2GB capacity and can be used with PC for data storage and processing. Supplied with electric supply unit (IN100-240Vac 50-60Hz / OUT 12 Vdc), serial interface cable for unit, 2GB capacity digital storage card. Programming.

Model	Code	Storage capacity
External storage kit	686001005	2 GB



Example of data stored

File	Modifica	Formato	Visualizza	?
2012/04/17	17:09:46	S	:	10.65
2012/04/17	17:09:49	S	:	10.20
2012/04/17	17:09:51	S	:	10.53
2012/04/17	17:09:54	S	:	10.12
2012/04/17	17:09:56	S	:	10.39
2012/04/17	17:09:58	S	:	10.61
2012/04/17	17:10:01	S	:	10.08
2012/04/17	17:10:03	S	:	10.39
2012/04/17	17:10:06	S	:	10.08
2012/04/17	17:10:08	S	:	10.22
2012/04/17	17:10:10	S	:	10.68
2012/04/17	17:10:13	S	:	10.01
2012/04/17	17:10:15	S	:	10.22
2012/04/17	17:10:17	S	:	10.69
2012/04/17	17:10:20	S	:	10.19
2012/04/17	17:10:22	S	:	10.08
2012/04/17	17:10:25	S	:	10.54
2012/04/17	17:10:28	S	:	10.69
2012/04/17	17:10:30	S	:	10.27
2012/04/17	17:10:33	S	:	10.05
2012/04/17	17:10:35	S	:	10.32
2012/04/17	17:10:38	S	:	10.74
2012/04/17	17:10:40	S	:	10.07
2012/04/17	17:10:42	S	:	10.43
2012/04/17	17:13:36	S	:	10.57
2012/04/17	17:13:39	S	:	10.20
2012/04/17	17:13:42	S	:	10.68
2012/04/17	17:13:44	S	:	10.07
2012/04/17	17:13:47	S	:	10.53
2012/04/17	17:13:49	S	:	10.36
2012/04/17	17:13:52	S	:	10.57
2012/04/17	17:13:54	S	:	10.36

1 = Tightening date

2 = Tightening hour

3 = Character of start of printing string

4 = Tightening torque in Nm

5 = Tightening torque outcome (Y = yes, N = No)

6 = Space for angle values (detected in degrees but not present in this example)

7 = Tightening angle outcome (Y = yes, N = No)

8 = Overall outcome of tightening sequence (Y = yes, N = No)

9 = Parameter of motor temperature

10 = Temperature of feeding and control unit (in °C degrees)

11 = Number of selected tightening sequence

12 = Selected program number

PROGRAM 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. Cod. 686200904

Model	Code	Tightening programs
Program Expansion	686200904	4 + 4



Technical features

Feed and control unit TCS-B E

Weight (Kg)	9,5÷10,6
Dimensions (mm)	390x155x305
Output tension driver motor (dc link)	70/300 Volt
Max power	600VA - 2kVA
Display (lines/columns)	4x20
Graphic display	No
Programming keypad	No
Display torque/time curve	No
Italian – English	Yes (software)
French	Yes (software)
German	No
Spanish	No
Automatic nutrunner configuration	No
Led (OK NOK RUN)	Yes
Number of Motors to manage (channels)	1

STORAGE

Results to be stored	No
OK /NOT OK cycles	-
Torque/angle/time values	-
General statistics	-

BASIC FUNCTIONS

Programs number	4 (+4)
Strategies number	5
OK NOT OK results	Yes
Error	Yes
Tightening sequence programming	Yes
Program instructions	Up to 50

ADVANCED FUNCTIONS

Number of screws for tightening sequence	1
Chart	No
Programming software	Yes
Diagnostics	Yes
Accessory release	Yes

TIGHTENING STRATEGIES

Screw feeding function	Yes
Torque	Yes
Torque/time	No
Torque /angle	Yes
Angle/ torque	Yes
Untightening	Yes

CONNECTIVITY

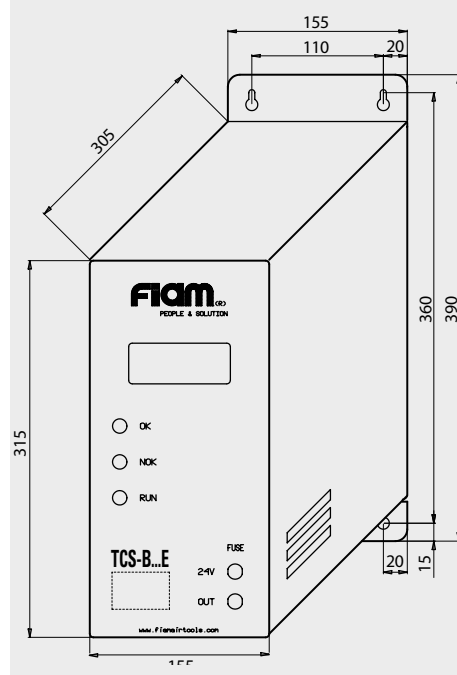
I/O (24 Vdc)	5+5
RS 232	Yes
Ethernet output	No
Fieldbus output	No
BAR Code	No

ACCESSORIES

Programming software	Included
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Feed and control unit TCS-B E

Dimensions (mm)



Voltage

- Voltage: 220-240 Volt, 50-60 Hz

Standard equipment (supplied with unit)

- Programming software TCS-B E
- Feed cable – 2m.
- RS232 serial output – 3 m.
- Quick guide
- Eco-friendly packaging
- Use and maintenance manual on CD

Models available upon request

- Addition of 4 more programs.
Code 686200904

Control unit + driver: for a perfect communication



Control unit

For all DC driven nutrunner motors, TOC units ensure a **complete monitoring of the tightening cycle** thanks to visualization of the OK NOK cycles, torque/time values and different control strategies. All can be stored and elaborated statistically.

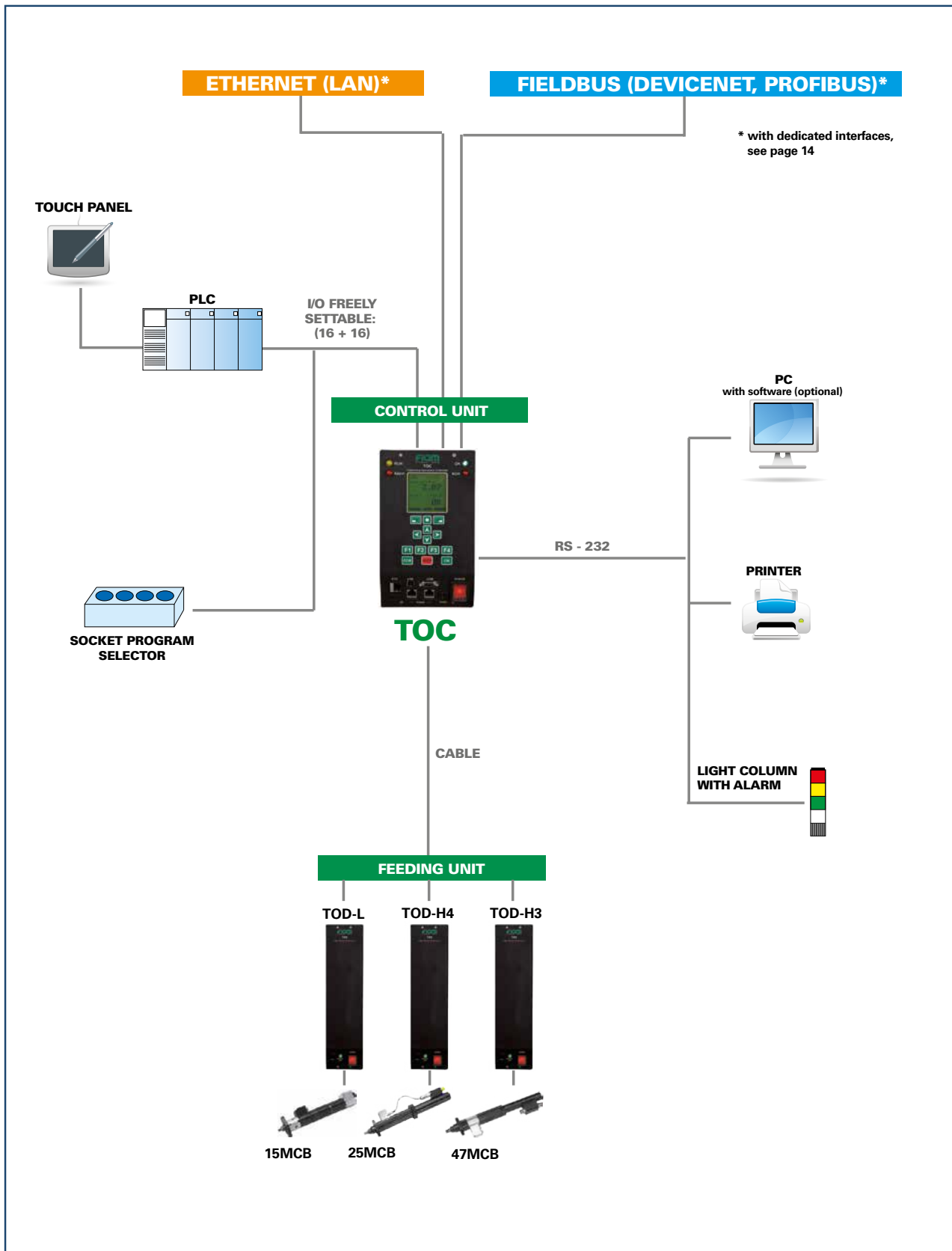
- Several programs and working steps are available, for and **accurate cycle setting** at all stages: start, speed, time, angle value, torque value, tightening time value, management of inputs to connect...
- **Immediate display of fastening outcomes** (angle, torque, working time)
- **Visualization and printing** of last rundown diagram
- **Only one unit controlling two motors at the same time** which can be also different, working synchronously (ideal for multispindles units) or asynchronously (independent assembly channels)
- **Nutrunner rotation test** (CW - CCW)

Driver

TOD models supply correct electricity feed and tension parameters to different motors according to the parameters pre-set in the control unit to be connected.

- **Failure signal** attraverso LED through LED (TOD-H series)

Layout



Accessories upon request

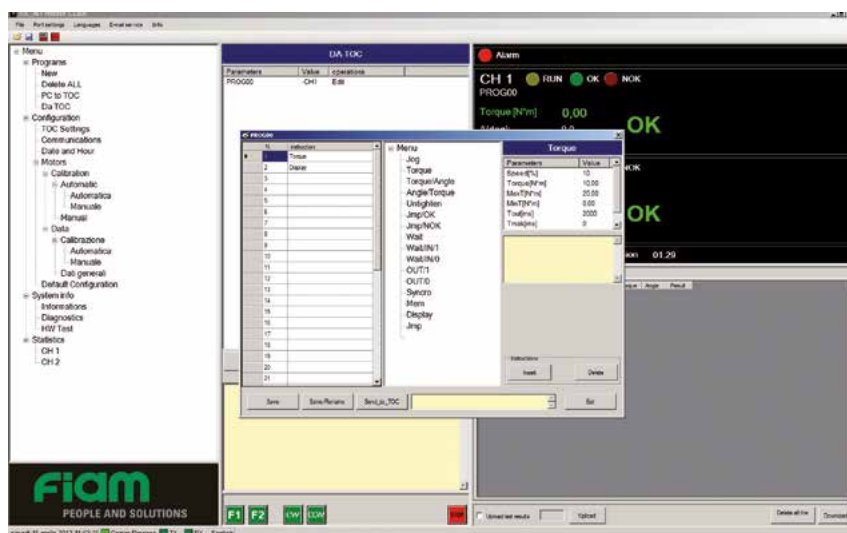
Software TOC-NET-L

Software to be combined with the TOC control unit and ideal for production facilities without Ethernet networks.

- The software can be installed on a PC running **Windows XP**, placed nearby and serial ports
- Connection between PC and TOC unit through serial cable
- Programming data and acquired **data are all displayed in real-time**
- **This software** can be used to generate **countless programs which can be stored in the PC, in addition to the 30 programs you can load into TOC**
- **Upload: exporting tightening outcomes from the TOC** and storing them into PC, with 14.000 results (7.000 for channel)
- The **data exported** from the TOC **are opened automatically in Excel**, ready to be processed
- The software is available in **Italian** and **English**
- Only one TOC control unit at a time can be connected to the PC in “remote” mode.

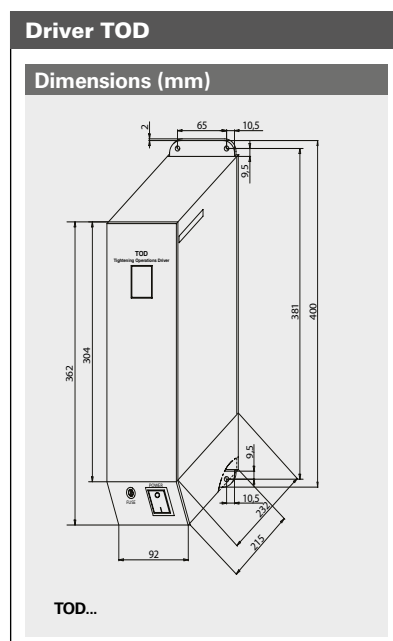
Model	Code	Type of control unit
Software TOC-NET-L	686000461	TOC 1/2 CH

On request fieldbus interface PROFIBUS-DP cod. **686000886** to expand connectivity.



Technical features

Control unit		TOC
Weight (Kg)		9,5÷10,6
Dimensions (mm)		390x155x305
Output tension driver motor (dc link)		70/300 Volt
Max power		600VA - 2kVA
Display (lines/columns)		4x20
Graphic display		No
Programming keypad		No
Display torque/time curve		No
Italian – English		Yes (software)
French		Yes (software)
German		No
Spanish		No
Automatic nutrunner configuration		No
Led (OK NOK RUN)		Yes
Number of Motors to manage (channels)		1
STORAGE		
Results to be stored		No
OK /NOT OK cycles		-
Torque/angle/time values		-
General statistics		-
BASIC FUNCTIONS		
Programs number		4 (+4)
Strategies number		5
OK NOT OK results		Yes
Error		Yes
Tightening sequence programming		Yes
Program instructions		Up to 50
ADVANCED FUNCTIONS		
Number of screws for tightening sequence		1
Chart		No
Programming software		Yes
Diagnostics		Yes
Accessory release		Yes
TIGHTENING STRATEGIES		
Screw feeding function		Yes
Torque		Yes
Torque/time		No
Torque /angle		Yes
Angle/ torque		Yes
Untightening		Yes
CONNECTIVITY		
I/O (24 Vdc)		5+5
RS 232		Yes
Ethernet output		No
Fieldbus output		No
BAR Code		No
ACCESSORIES		
Programming software		Included



- Voltage: 220 - 240 Vac 50 Hz

Standard equipment (supplied with unit)

- Electric feeding cable lenght to 2 mt
- Eco-friendly packaging
- Use and maintenance manual

Functioning signal through led

- Generic led of functionality (mod. TOD)

Keyboard operations

- General switch
- Clockwise and counterclockwise rotation

Control unit TOC	
<div> <div>Dimensions (mm)</div> </div>	<ul style="list-style-type: none"> • Voltage: 220 - 240 Vac, 50 Hz
	<div>Standard equipment (supplied with unit)</div> <ul style="list-style-type: none"> • Electric feeding cable lenght to 2 mt • Eco-friendly packaging • Use and maintenance manual
	<div>Modelos disponibles bajo demanda</div> <ul style="list-style-type: none"> • Modelos con software personalizado (también para otros idiomas) • Modelos con módulos para bus di campo • Modelos predispuestos para la conexión Ethernet (exclusivamente mediante software TOC-NET R)
	<div>Accessories available upon request</div> <ul style="list-style-type: none"> • OK/KO torque signal light column cod. 686000182 (for 1-channel-version, for 2-channel-version). • 9 pin connection cable for connecting the PC to the printer - (5 mt long). • Programmes manual selector • RJ485 cable cod. 686000465 • Cable for RS232 cod. 686000879 (serial) • USB cable cod. 686000464 • Cartesian arms for torques up to 500 Nm

High technology DC driven nutrunner

Brushless solutions for every need

- ➔ **High technology DC driven nutrunner motors (brushless)** don't need maintenance and thanks to absence of coal dust eliminate pollution in the working area
- ➔ **Built-in resolver/encoder:** they guarantee an elevated resolution in the angle measurement and therefore it assures an excellent tightening process control
- ➔ **Motor appropriate selection and accurate programming** (angle, torque, time etc...) reduce the need of post process controls with remarkable production benefits
- ➔ **Compact design, reduced dimensions and weights:** ideal with multi-spindle tightening units and robots
- ➔ Wide torque range: **from 0,5 up to 150 Nm**

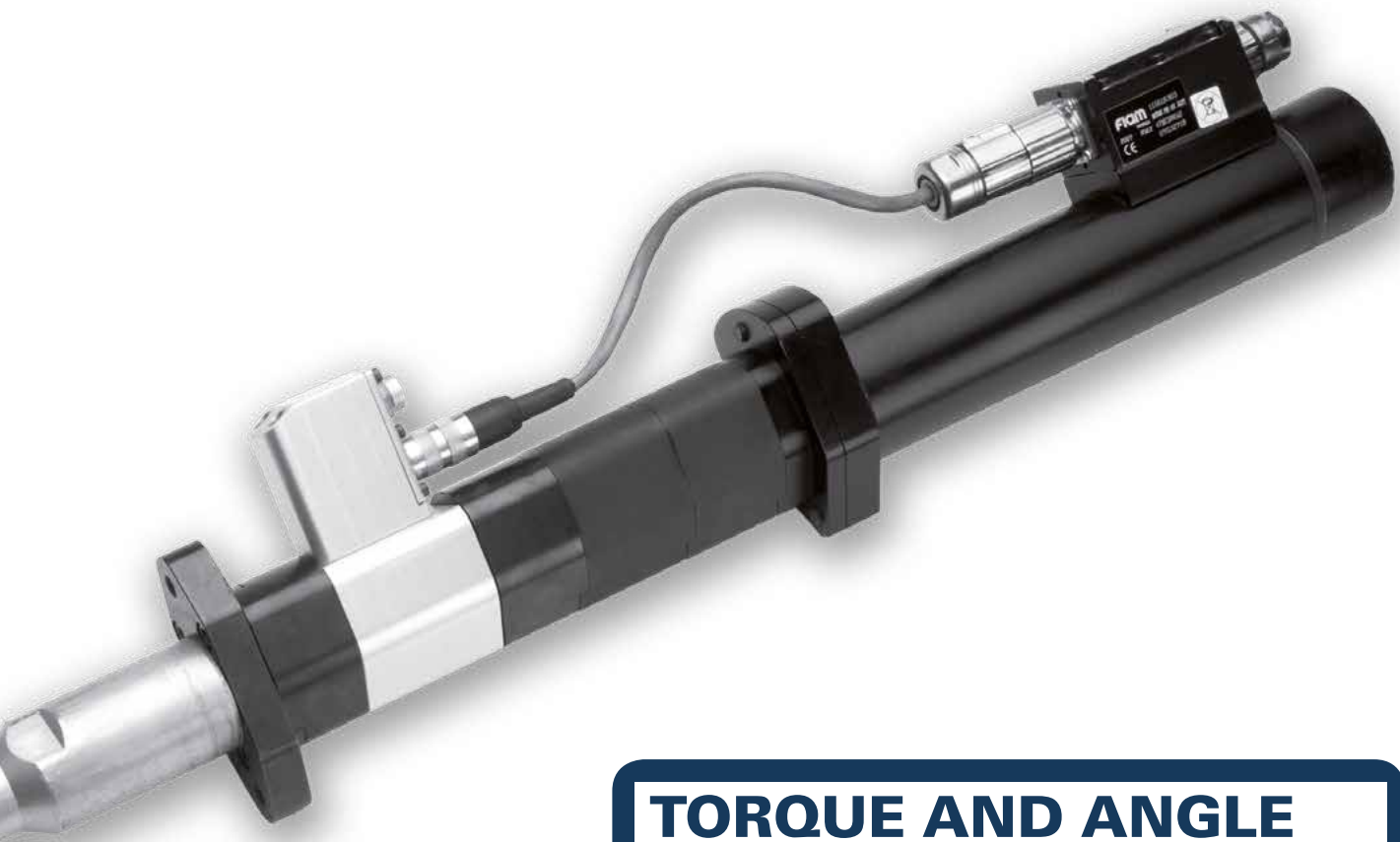
CURRENT CONTROL

The torque parameters are achieved by measuring the current absorbed by the brushless motor; the angle parameters are achieved by appropriate sensors.



CURRENT CONTROL DC DRIVEN NUTRUNNER MOTORS										RPM
15 MCB 05C1/2	1÷5									1700
15 MCB 10C1/2	2÷10									700
15 MCB 20C1/2	4÷20									350
25 MCB 20C1/2	4÷20									1500
25 MCB 35C1/2	7÷35									700
25 MCB 50C1/2	10÷50									500
47 MCB 45C1/2	10÷45									1250
47 MCB 65C1/2	14÷65									600
47 MCB 90C1/2	18÷90									420
50 MCB 45C1/2	10÷45									1250
50 MCB 65C1/2	14÷65									600
50 MCB 90C1/2	18÷90									420
50 MCB 150C2	30÷150									320

Torque range 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 150



TORQUE AND ANGLE CONTROL

Equipped with an **electronic transducer** to read the torque applied to the screw; while the **angle** is read directly by appropriate sensors.

DC DRIVEN NUTRUNNER MOTORS WITH TORQUE AND ANGLE CONTROL										RPM
15 MCB 05A1/2	0,5÷5									1700
15 MCB 10A1/2	1÷10									700
15 MCB 20A1/2	2÷20									350
25 MCB 20A1/2	2÷20									1500
25 MCB 35A1/2	4÷35									700
25 MCB 50A1/2	5÷50									500
47 MCB 45A1/2	5÷45									1250
47 MCB 65A1/2	7÷65									600
47 MCB 90A1/2	9÷90									420
50 MCB 45A1/2	5÷45									1250
50 MCB 65A1/2	7÷65									600
50 MCB 90A1/2	9÷90									420
50 MCB 150A2	30÷150									320

Torque range051015202530354045505560657075808590150

Current control



Type of brushless DC driven nutrunner motor		Recommended tightening torque		Idle speed	Reversibility	Weight		Accessories	Axial compensator bit stroke/load
Model	Code	Nm	in lb	rpm	Type	Kg	lb	Drive	mm/N
15MCB05C1	111618201	1 ÷ 5	8.85 - 44.25	1700	↻	1,7	3.74	<input type="checkbox"/> 3/8"	-
15MCB05C2	111618206	1 ÷ 5	8.85 - 44.25	1700	↻	2	4.4	<input type="checkbox"/> 3/8"	20/35
15MCB10C1	111618231	2 ÷ 10	17.7 - 88.5	700	↻	1,8	3.96	<input type="checkbox"/> 3/8"	-
15MCB10C2	111618236	2 ÷ 10	17.7 - 88.5	700	↻	2,1	4.62	<input type="checkbox"/> 3/8"	20/35
15MCB20C1	111618261	4 ÷ 20	35.4 - 177	350	↻	1,8	3.96	<input type="checkbox"/> 3/8"	-
15MCB20C2	111618266	4 ÷ 20	35.4 - 177	350	↻	2,1	4.62	<input type="checkbox"/> 3/8"	20/35
25MCB20C1	111618371	4 ÷ 20	35.4 - 177	1500	↻	4,7	10.34	<input type="checkbox"/> 3/8"	-
25MCB20C2	111618376	4 ÷ 20	35.4 - 177	1500	↻	5	11	<input type="checkbox"/> 3/8"	50/65
25MCB35C1	111618381	7 ÷ 35	61.95 - 309.75	700	↻	4,7	10.34	<input type="checkbox"/> 1/2"	-
25MCB35C2	111618386	7 ÷ 35	61.95 - 309.75	700	↻	5	11	<input type="checkbox"/> 1/2"	50/65
25MCB50C1	111618391	10 ÷ 50	88.5 - 442.5	500	↻	5,2	11.44	<input type="checkbox"/> 1/2"	-
25MCB50C2	111618396	10 ÷ 50	88.5 - 442.5	500	↻	5,5	12.1	<input type="checkbox"/> 1/2"	50/65
47MCB45C1	111618400	10 ÷ 45	88.5 - 398.25	1250	↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB45C2	111618405	10 ÷ 45	88.5 - 398.25	1250	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
47MCB65C1	111618410	14 ÷ 65	123.9 - 575.25	600	↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB65C2	111618415	14 ÷ 65	123.9 - 575.25	600	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
47MCB90C1	111618420	18 ÷ 90	159.3 - 796.5	420	↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB90C2	111618425	18 ÷ 90	159.3 - 796.5	420	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB45C1	111618401	10 ÷ 45	88.5 - 398.25	1250	↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB45C2	111618406	10 ÷ 45	88.5 - 398.25	1250	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB65C1	111618411	14 ÷ 65	123.9 - 575.25	600	↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB65C2	111618416	14 ÷ 65	123.9 - 575.25	600	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB90C1	111618421	18 ÷ 90	159.3 - 796.5	420	↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB90C2	111618426	18 ÷ 90	159.3 - 796.5	420	↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB150C2	111618456	30÷150	265.5- 1327.5	320	↻	7	15.4	<input type="checkbox"/> 1/2"	50

Legend

15 = Power of the motor/10 • MC = Nutrunner motor • B = Electric brushless • 05 = Maximum torque in Nm • C = Current absorption control
 • 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

- 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.

Data shown in the table are indicative and can be changed without prior notice. Torque values are purely indicative and may be influenced by the softness of the type of joint, by the type and length of the screw, and by the type of accessory used. For all further details, please apply to Fiam Technical Consultancy Service.

Standard equipment (supplied with motor)

- Axial compensator (where indicated: see chart)
- Flange bracket to fix the motor
- Test certificate
- Use and maintenance manual
- Eco-friendly packaging

15MCB models use Hall sensors to read the angle value. The 25, 47 and 50 MCB models are equipped with a built-in angle transducer (resolver) that guarantees an elevated resolution in the angle measurement.



Feed and control unit to use		Cables		Driver to use		Control unit to use		Cables	
Model	Code	Lenght	Code	Model	Code	Model	Code	Lenght	Code
TCS-B 15E	686200320	5 mt.	686200601	TOD - L	676120001	TOC 1/2/CH	686000398 686000399	5 mt.	686000872
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 15E	686200320	10 mt.	686200602	TOD - L	676120001	TOC 1/2/CH	686000398 686000399	10 mt.	686000873
TCS-B 15E	686200320	15 mt.	686200603	TOD - L	676120001	TOC 1/2/CH	686000398 686000399	15 mt.	686000874
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325	5 mt.	686200607	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399	5 mt.	686000863
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325	10 mt.	686200608	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399	10 mt.	686000864
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325	15 mt.	686200609	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399	15 mt.	686000865
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399	5 mt.	686000863
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399	10 mt.	686000864
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399	15 mt.	686000865
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
TCS-B 50E	686200330	5 mt.	686200607						
TCS-B 50E	686200330								
TCS-B 50E	686200330								
TCS-B 50E	686200330	10 mt.	686200608						
TCS-B 50E	686200330	15 mt.	686200609						
TCS-B 50E	686200330								
TCS-B 50E	686200330								

Models available upon request

- Models with offset device (to be used for motors up to 8 Nm) (for narrow distances between the axis)
- Models with quick change chuck
- Models with modified flange and/or with customized body design
- Models with angle head

Accessories available upon request

- Addition of 4 more programs for TCS-B E. Code 686200904



OFF-SET DEVICE

Torque and angle control



Type of brushless DC nutrunner motor		Recommended tightening torque		Idle speed	Reversibility	Weight		Accessories	Axial compensator bit stroke/load
Model	Code	Nm	in lb	rpm	Type	Kg	lb	Drive	mm/N
15MCB05A1	111618216	0,5 ÷ 5	4.43 - 44.25	1700	↺↻	2,3	5.06	<input type="checkbox"/> 3/8"	-
15MCB05A2	111618221	0,5 ÷ 5	4.43 - 44.25	1700	↺↻	2,6	5.72	<input type="checkbox"/> 3/8"	20/35
15MCB10A1	111618246	1 ÷ 10	8.85 - 88.5	700	↺↻	2,4	5.28	<input type="checkbox"/> 3/8"	-
15MCB10A2	111618251	1 ÷ 10	8.85 - 88.5	700	↺↻	2,7	5.94	<input type="checkbox"/> 3/8"	20/35
15MCB20A1	111618276	2 ÷ 20	17.7 - 177	350	↺↻	2,4	5.28	<input type="checkbox"/> 3/8"	-
15MCB20A2	111618281	2 ÷ 20	17.7 - 177	350	↺↻	2,7	5.94	<input type="checkbox"/> 3/8"	20/35
25MCB20A1	111618311	2 ÷ 20	17.7 - 177	1500	↺↻	4,7	10.34	<input type="checkbox"/> 3/8"	-
25MCB20A2	111618316	2 ÷ 20	17.7 - 177	1500	↺↻	5	11	<input type="checkbox"/> 3/8"	50/65
25MCB35A1	111618321	4 ÷ 35	35.4 - 309.75	700	↺↻	4,7	10.34	<input type="checkbox"/> 1/2"	-
25MCB35A2	111618326	4 ÷ 35	35.4 - 309.75	700	↺↻	5	11	<input type="checkbox"/> 1/2"	50/65
25MCB50A1	111618331	5 ÷ 50	44.25 - 442.5	500	↺↻	5,2	11.44	<input type="checkbox"/> 1/2"	-
25MCB50A2	111618336	5 ÷ 50	44.25 - 442.5	500	↺↻	5,5	12.1	<input type="checkbox"/> 1/2"	50/65
47MCB45A1	111618340	5 ÷ 45	44.25 - 398.25	1250	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB45A2	111618345	5 ÷ 45	44.25 - 398.25	1250	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
47MCB65A1	111618350	7 ÷ 65	61.95 - 575.25	600	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB65A2	111618355	7 ÷ 65	61.95 - 575.25	600	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
47MCB90A1	111618360	9 ÷ 90	79.65 - 796.5	420	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
47MCB90A2	111618365	9 ÷ 90	79.65 - 796.5	420	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB45A1	111618341	5 ÷ 45	44.25 - 398.25	1250	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB45A2	111618346	5 ÷ 45	44.25 - 398.25	1250	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB65A1	111618351	7 ÷ 65	61.95 - 575.25	600	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB65A2	111618356	7 ÷ 65	61.95 - 575.25	600	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB90A1	111618361	9 ÷ 90	79.65 - 796.5	420	↺↻	7	15.4	<input type="checkbox"/> 1/2"	-
50MCB90A2	111618366	9 ÷ 90	79.65 - 796.5	420	↺↻	7,3	16.06	<input type="checkbox"/> 1/2"	50/65
50MCB150A2	111618455	30÷150	265.5 - 1327.5	320	↺↻	7	15.4	<input type="checkbox"/> 1/2"	50

Legend

15 = Power of the motor/10 • MC = Nutrunner motor • B = Electric brushless • 05 = Maximum torque in Nm • A = Torque and angle control
 • 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

- 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.

Data shown in the table are indicative and can be changed without prior notice. Torque values are purely indicative and may be influenced by the softness of the type of joint, by the type and length of the screw, and by the type of accessory used. For all further details, please apply to Fiam Technical Consultancy Service.

Standard equipment (supplied with motor)

- Axial compensator (where indicated: see chart)
- Flange bracket to fix the motor
- Test certificate
- Use and maintenance manual
- Eco-friendly packaging

15MCB models use Hall sensors to read the angle value. The 25, 47 and 50 MCB models are equipped with a built-in angle transducer (resolver) that guarantees an elevated resolution in the angle measurement.



Feed and control unit to use		Cables		Driver to use		Control unit to use		Cables	
Model	Code	Lenght	Code	Model	Code	Model	Code	Lenght	Code
TCS-B 15E	686200320	5 mt.	686200611	TOD - L	676120001	TOC 1/2/CH	686000398 686000399		686000860
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 15E	686200320	10 mt.	686200612	TOD - L	676120001	TOC 1/2/CH	686000398 686000399		686000861
TCS-B 15E	686200320	15 mt.	686200613	TOD - L	676120001	TOC 1/2/CH	686000398 686000399		686000862
TCS-B 15E	686200320			TOD - L	676120001	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325	5 mt.	686200607	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		686000863
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
TCS-B 25E	686200325	10 mt.	686200608	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		686000864
TCS-B 25E	686200325	15 mt.	686200609	TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		686000865
TCS-B 25E	686200325			TOD - H4	676120013	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		686000863
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		686000864
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		
				TOD - H3	676120010	TOC 1/2/CH	686000398 686000399		686000865
TCS-B 50E	686200330	5 mt.	686200607						
TCS-B 50E	686200330								
TCS-B 50E	686200330								
TCS-B 50E	686200330	10 mt.	686200608						
TCS-B 50E	686200330	15 mt.	686200609						
TCS-B 50E	686200330								
TCS-B 50E	686200330								

Models available upon request

- Models with offset device (to be used for motors up to 8 Nm) (for narrow distances between the axis)
- Models with quick change chuck
- Models with modified flange and/or with customized body design
- Models with angle head

Accessories available upon request

- Addition of 4 more programs for TCS-B E. Code 686200904

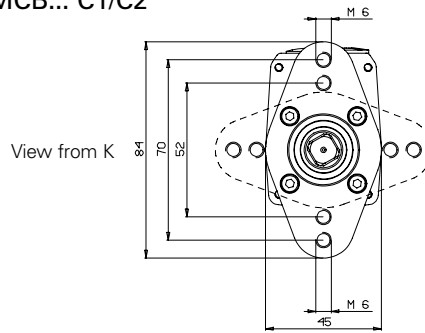


OFF-SET DEVICE

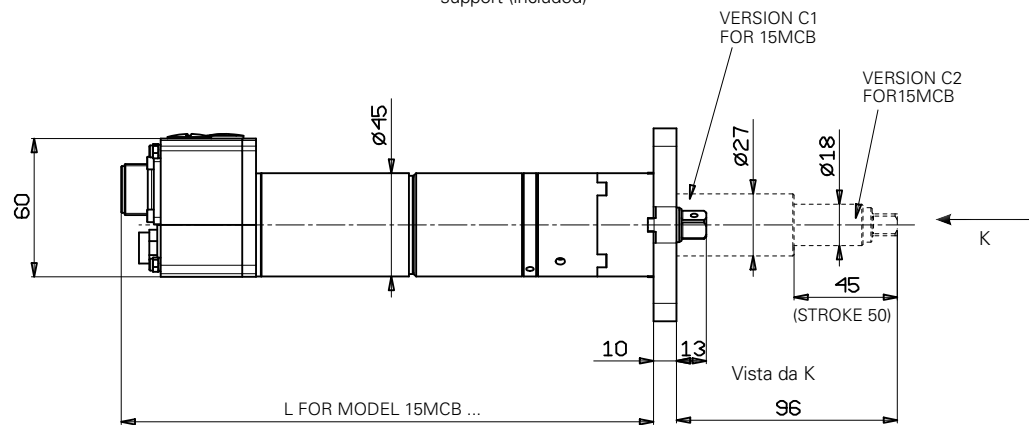
Overall dimensions (mm) of current control DC

DC driven nutrunner motors 15MCB... C1/C2

Model	L	Drive
15MCB05C1	232	3/8"
15MCB05C2	244	3/8"
15MCB10C1	256	3/8"
15MCB10C2	267	3/8"
15MCB20C1	256	3/8"
15MCB20C2	267	3/8"

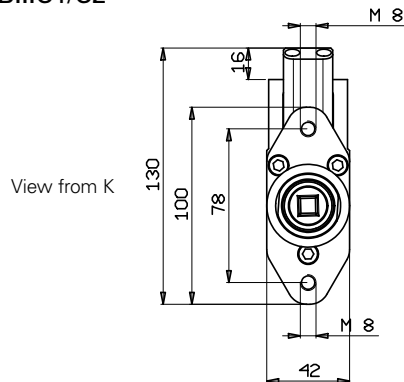


Flange bracket to fix the motor to the support (included)

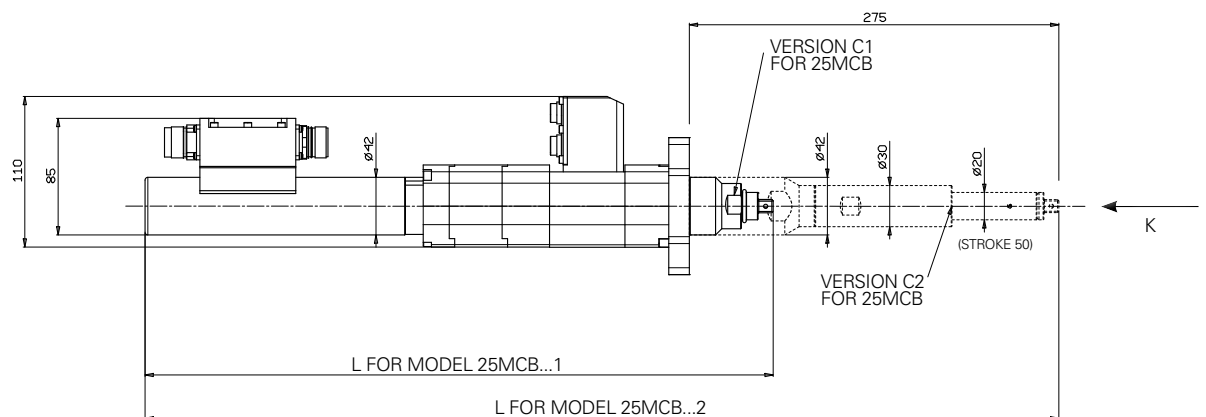


DC driven nutrunner motors 25MCB...C1/C2

Model	L	Drive
25MCB20C1	458	3/8"
25MCB20C2	667	3/8"
25MCB35C1	508	1/2"
25MCB35C2	716	1/2"
25MCB50C1	508	1/2"
25MCB50C2	716	1/2"



Flange bracket to fix the motor to the support (included)

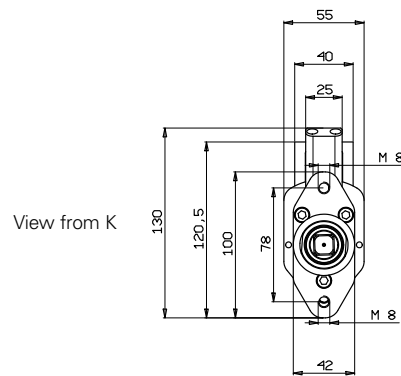


driven nutrunner motors

DC driven nutrunner motors 47MCB...C1/C2 and 50MCB...C1/C2

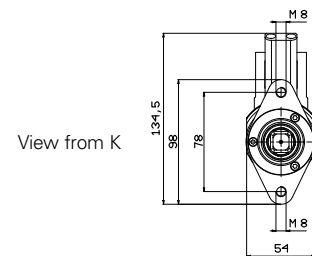
Version 50MCB150C2

Model	L	Drive □
47/50MCB45C1	516	1/2"
47/50MCB45C2	731	1/2"
47/50MCB65C1	561	1/2"
47/50MCB65C2	769	1/2"
47/50MCB90C1	561	1/2"
47/50MCB90C2	769	1/2"
50MCB150C2	594	1/2"



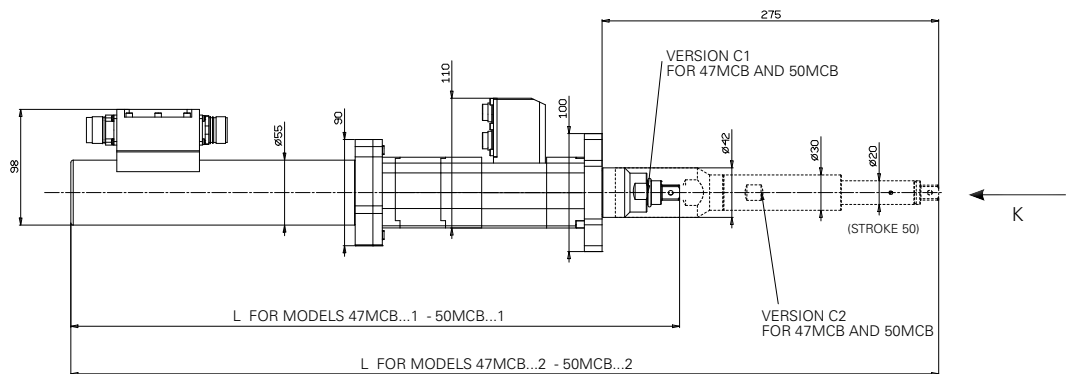
View from K

Flange bracket to fix the motor to the support (included)

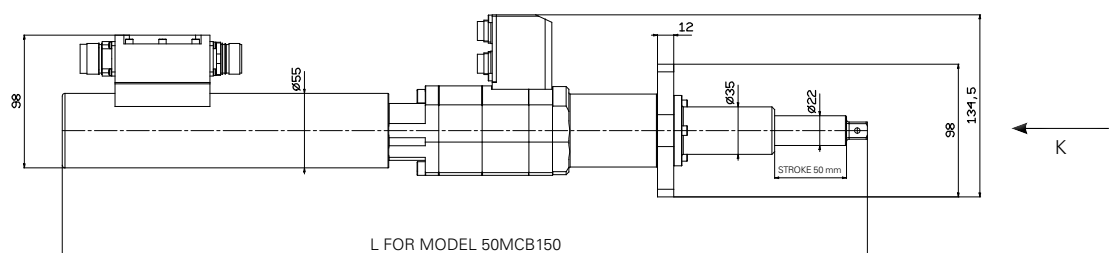


View from K

Flange bracket to fix the motor to the support (included)



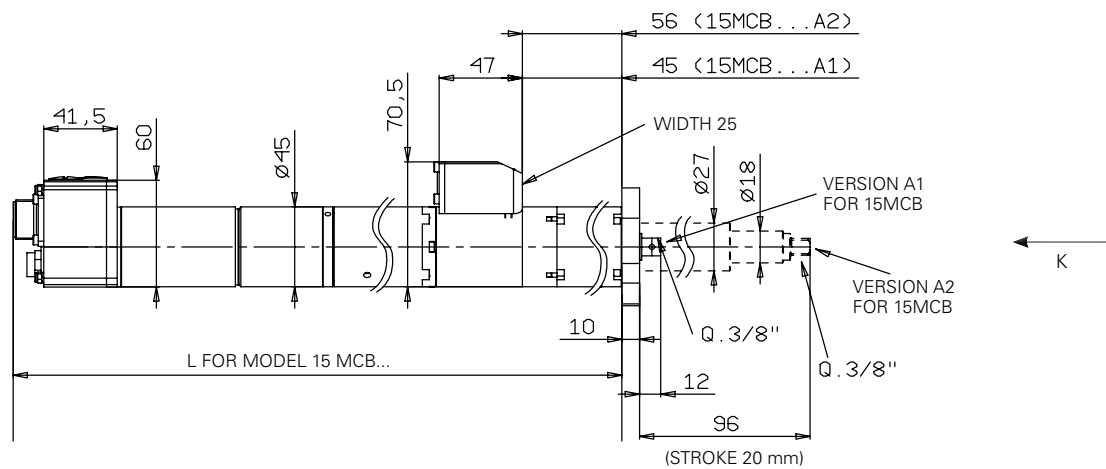
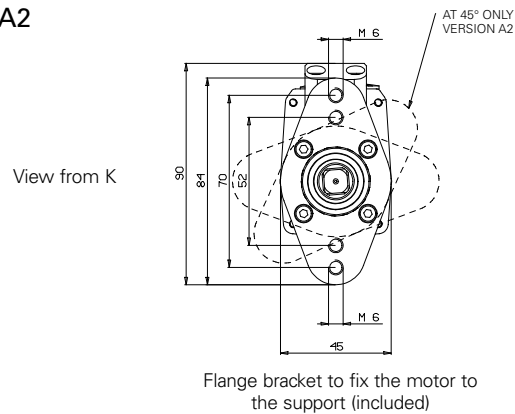
DC driven nutrunner motors 50MCB150C2



Overall dimensions (mm) of DC driven nutrunner

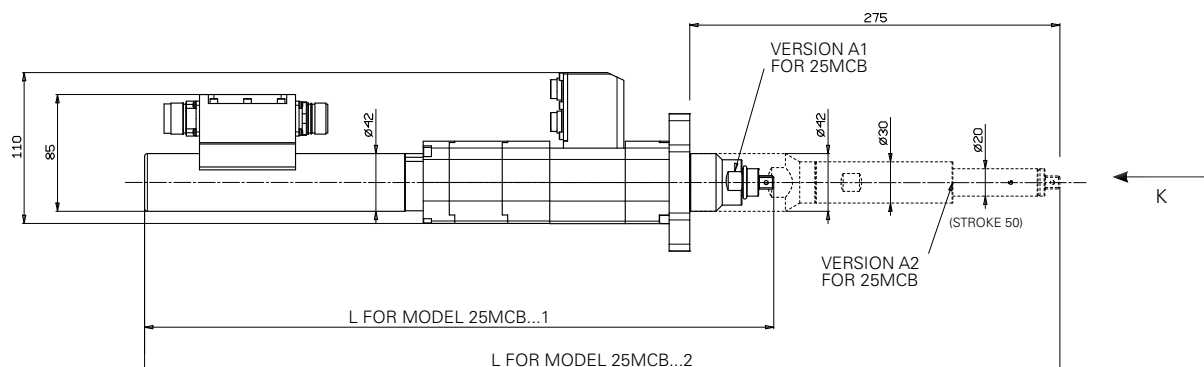
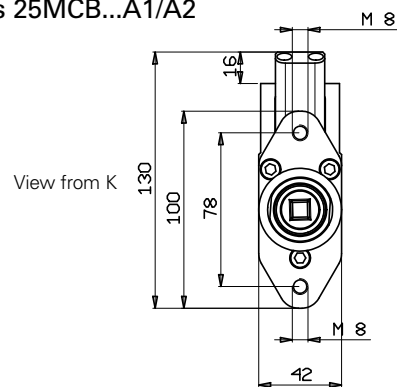
DC driven nutrunner motors 15MCB...A1/A2

Model	L	Drive
15MCB05A1	309	3/8"
15MCB05A2	320	3/8"
15MCB10A1	332	3/8"
15MCB10A2	343	3/8"
15MCB20A1	332	3/8"
15MCB20A2	343	3/8"



DC driven nutrunner motors 25MCB...A1/A2

Model	L	Drive
25MCB20A1	458	3/8"
25MCB20A2	667	3/8"
25MCB35A1	508	1/2"
25MCB35A2	716	1/2"
25MCB50A1	508	1/2"
25MCB50A2	716	1/2"

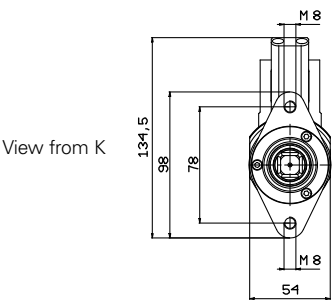
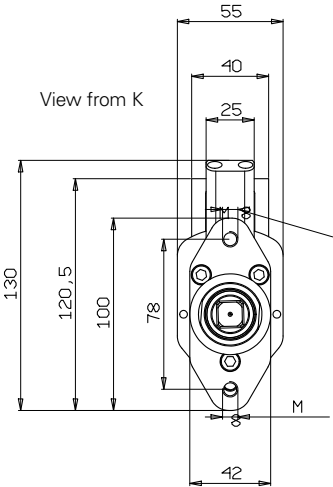


motors with torque and angle control

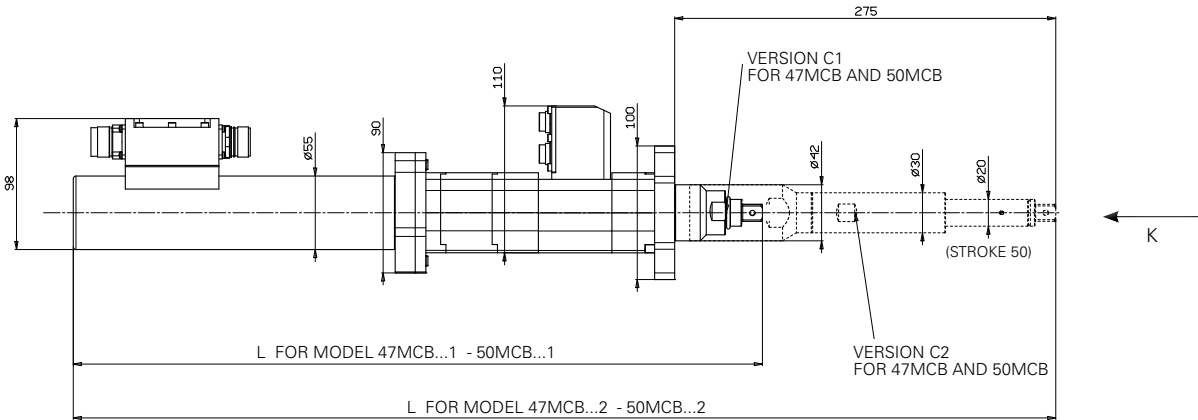
DC driven nutrunner motors 47MCB...A1/A2 and 50MCB...A1/A2

Version 50MCB150A2

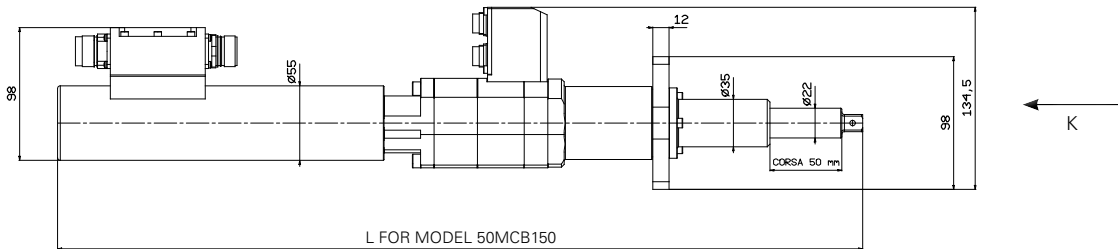
Model	L	Drive
47/50MCB45A1	516	1/2"
47/50MCB45A2	731	1/2"
47/50MCB65A1	561	1/2"
47/50MCB65A2	769	1/2"
47/50MCB90A1	561	1/2"
47/50MCB90A2	769	1/2"
50MCB150A2	594	1/2"



Flange bracket to fix the motor to the support (included)



DC driven nutrunner motors 50MCB150A2



Accessories

FASTENING SLIDES

Running on ball recirculating runners:	with dovetail, size 15/20 mm
Magnetic cylinders:	(cylinder bore Ø 20 mm, upon request Ø 25 mm)
Pneumatic decelerators:	✓
Limit switch position sensors:	✓
Air flow governors:	✓
Max possible nutrunner motor diameter:	42,5 mm
Fastening slides can be equipped with precision sensor (with the possibility to define the accuracy of reading range):	✓
Weight (slide only):	1,8 ÷ 2,2 Kg

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 SL15 models. min. 51 mm for SL 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 DC-driven nutrunner motors.

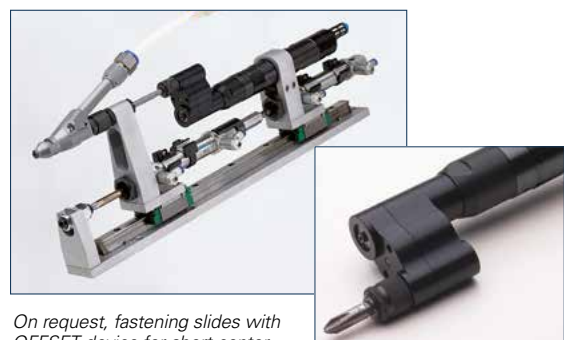
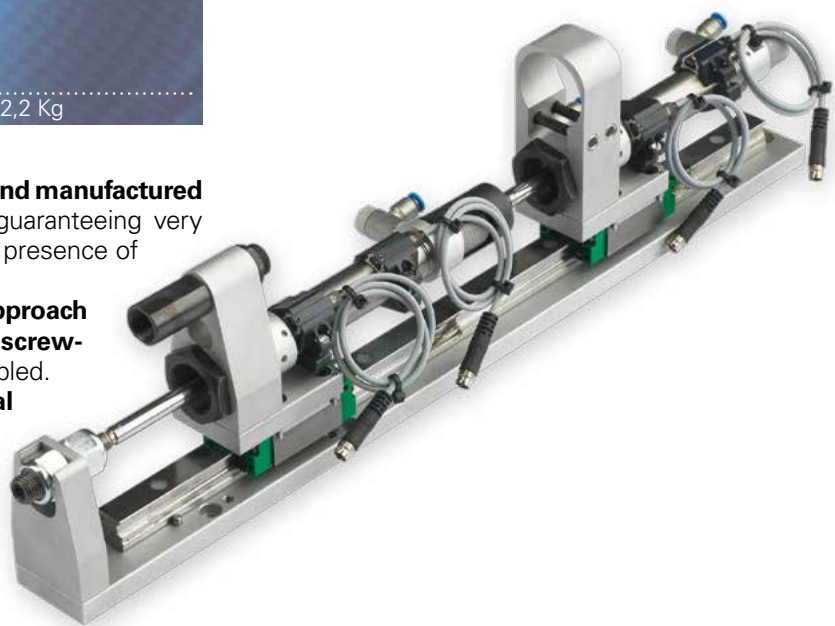
Numerous available models allow **the installation of nutrunner motors of different sizes and are suitable for applications where high axial thrust is required (e.g. in assemblies with self-tapping screws).**

SINGLE STROKE-FASTENING SLIDE runs only the movement performed by the motor in order to reach the tightening point and tighten.

DUAL STROKE FASTENING SLIDES besides the motor stroke to effect tightening, runs also have an additional approaching stroke of the head to the component.

TRIPLE-STROKE FASTENING SLIDES are equipped with an additional anti-overturning device which handles screws having a ratio total length/head diameter more or less to 1 ($1,1 < H/D < 1,5$).

For further information about Fiam fastening slides and available sizes consult catalogue n. 73 - MCA: auto feed tightening module.



On request, fastening slides with OFFSET device for short center distances.

Automatic screw feeding systems for maximum efficiency of the cycles

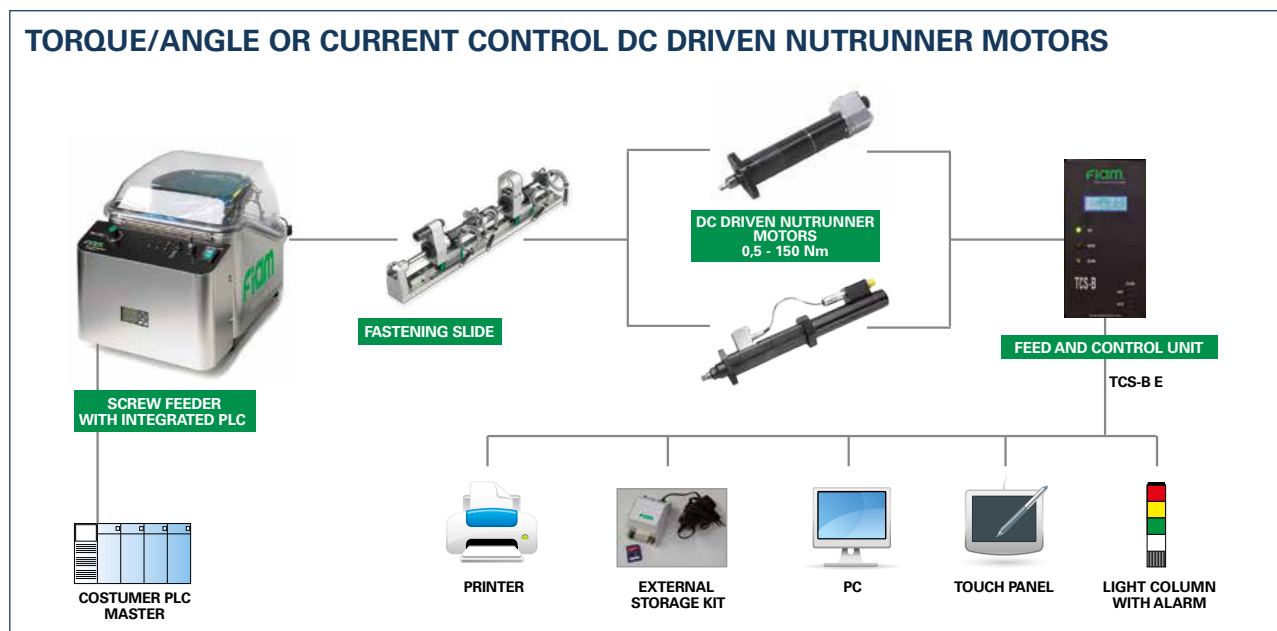
All Fiam high tech DC driven nutrunner motors can be installed on automatic screw feeding tightening modules **EasyDriver MCA**.

Easydriver: controls machine parameters, allows integration with automatic solutions, controls input signals: fastening start, reset, emergency, controls output and input signals.

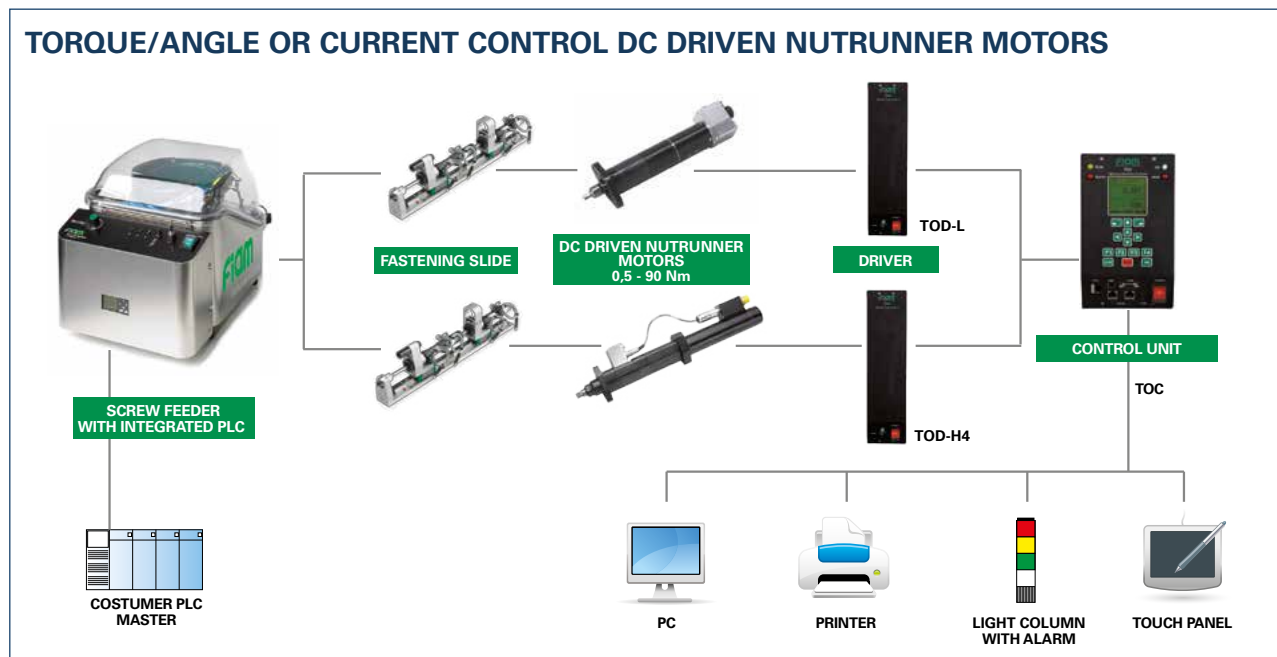


Discover how it works!

TORQUE/ANGLE OR CURRENT CONTROL DC DRIVEN NUTRUNNER MOTORS



TORQUE/ANGLE OR CURRENT CONTROL DC DRIVEN NUTRUNNER MOTORS



**To choose your
tightening
solutions,
read the
following
catalogues
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**Components
for tightening
automation**



MCA
Tightening module to be
integrated into automatic
production systems



Air nutrunner motors

www.fiamgroup.com