



Tightening automation.
Only excellent solutions.

Air nutrunner motors

- Tightening torque control system:
with air shut-off, with slip clutch,
without clutch (stall type)
- Tightening torque: from 0,4 up to 40 Nm

Fiam[®]
PEOPLE AND SOLUTIONS

Tightening automation

Requirements change, efficiency remains.

Accurate, reliable, compact and performing: these are Fiam **air nutrunner motors**. The ideal solution for many applications in different production fields. Specifically designed and manufactured for **industrial automation**, they are used in single or multi-spindle, manual or fixtured tightening units. Nutrunners can be installed in automatic assembly lines, in rotary-table machines, on multi-spindle tightening units, on fastening slides, anthropomorphic robots. They are suitable for **every type of joint**. Extremely robust, they guarantee constant performances in the long run also when used in heavy duty conditions.



The right solution for every need.

Needs aren't the same for everyone, therefore everybody should be able to get customized solutions. **Different torque control systems are available and can be chosen** depending on application and type of joint and fastener.

AIR NUTRUNNER MOTORS WITH **AIR SHUT-OFF** PAGE 6

Thanks to the automatic and immediate air shut-off device, these motors guarantee **high torque repeatability**. Ideal to assemble components manufactured with high quality materials (for example in assembly of car components). They can be equipped with built-in torque transducer: besides verifying whether the clutch correctly works, it reads the torque the nutrunner delivered and allows data collection: as a consequence the tightening cycle is checked and possible errors identified (partially tightened screws, already tightened screws, crossed thread, etc.).

AIR NUTRUNNER MOTORS WITH **SLIP CLUTCH** PAGE 8

Extremely versatile, their torque control device with slip clutch is suitable for **assembly of several types of materials**.

AIR NUTRUNNER MOTORS **WITHOUT CLUTCH** PAGE 10

A type of motors that, thanks to direct and continuous torque drive, guarantees tightening evenness **also in presence of extremely soft joints** (e.g. assembly of steel components with interposed rubber seals of significant thickness). Upon request they can be equipped with built-in torque transducer that allows torque value measurement. Datas are collected, the tightening cycle is checked and possible errors identified (partially tightened screws, already tightened screws, crossed thread, etc.).

Electric nutrunner motors.

Fiam also manufactures a **range of brushless electric nutrunner motors with computerized control**, that can be used on different types of joint. These solutions are necessary when you have to control, monitor and constantly verify the entire assembly process including the memorization of the tightening datas. They are ideal when it is indispensable to assure the **certified quality of final products**.

For further information about these high technology solutions see 'MCB: high technology electric nutrunner motors' (n. 71) or contact Fiam Technical Consultancy Service.



Be demanding

Reliability

A careful design guarantees long lifetime and reliability of the components which results in high productivity, reduced maintenance and repair costs

Fiam air nutrunner motors aren't standard screwdrivers adjusted to be installed on a machine, instead they are **solutions specifically and accurately designed to be used in the industrial automation field.**

Their main **features** to be used in automation applications are:

- **robust thrust bearings** to stand up to the fast and continuous thrusts of the fastening slides as often happens in the automatic production cycles.
- **ideal external geometries** for fixtured application.
- **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 and use oil separator filters.
- **ported signal**, to interface with line PLC.

Made in Fiam: designed and manufactured by Fiam they guarantee **reliable operation in every working condition**

High resistance: they are manufactured with sturdy and reliable materials

High performances: the reduction gear system guarantees maximum output, long lifetime of the kinematic chain and reduced noise level.

Maximum reliability both in vertical and in horizontal axis in respect to components to be tightened

20MC

MOTRIX: newly conceived air motor ensures high performances and maximum torque **also at low air feed pressure.**

TRACS2: the innovative torque control system ensures a very **high torque repeatability**, i.e. a very low Mean Shift value also in the presence of variability of the joint softness level. This system maintains same torque values for hundreds of thousands of cycles.

Joint monitoring: everything under control.

Are you looking for total reliability? You just found it. When assemblies are difficult, you can use nutrunner motors with air shut-off torque control system and/or without clutch equipped with built-in strain gauge torque transducer. These solutions connected to TOCS-TC control unit guarantee an extraordinary results and eliminate the possibility of error during the tightening process. Nothing will pass unnoticed: the **cycle is monitored, the torque values are under control and the production waste is reduced to the minimum level.**

The strain gauge torque transducer (static type) converts the torque applied into an electrical signal that is then processed by the TOCS-TC computerised unit. So it is possible to:

- read and memorise tightening torque values;
- check the tightening cycle and identify any errors (partially tightened screws, screw already tightened, etc.).

Discover all control unit features on page 22

Don't be satisfied with the maximum

Productivity

Considerable increase of the efficiency of the production cycle thanks to innovative systems

Reduced weight and dimensions: they can be easily installed on machine also with reduced room available

Axial compensator: an accessory to eliminate any difference of screw height on the component, to facilitate entry of screw and reduce axial thrust on the motor's mechanical components protecting the internal components and guaranteeing their long life.

For models without clutch, it is possible to **easily adjust** the torque, speed and direction by using simple control methods.

Air shut-off nutrunner motors permit to control the tightening cycle through a **pneumatic signal** that, interfaced with PLC of machine management, can supply end cycle signals, torque achievement and start the up/down movement of the supporting frames and other cycle sequences. The pneumatic signal can be picked up by appropriate threaded hole of the nutrunner motors.



Perfection is in your hands

Ergonomics Ecology

Enhancement of tool performances in regard to ergonomics and operator's safety

Naturally innovative

Innovative systems designed paying even more attention to the environment and its safeguard

Available in **reversible and non reversible versions.** Reversible motors are provided with two entrances for compressed air that permit alternatively the input and the output of the compressed air.



Models with air shut-off can be also manufactured with clutch for **left tightenings control.**

Available **low revolutions nutrunners:** suitable for different applications and with critical joints.

Customized solutions in respect to type of joint and application.

Reduced noise level: the effective silencing systems guarantee a reduced noise level caused by air exhaust in compliance with International standards. Moreover the accurate study of inner kinematic motions permits to **reduce** considerably **mechanical noise too.**

No risk of overheating also in heavy duty conditions (repetitive use, repetitive stops/starts or change of directions) the performances are unchanged.

Extremely reduced weights and dimensions: they favour the installation on machines that can be easily used also by operators (e.g. tightening multipindle units).

The advanced technological design permits **considerable decrease of compressed air consumption**, without affecting tool performance.

The inner kinematic motions optimize efficiency and transmit the available power with **minimum dispersions.**

20MC

TRACS2: the torque control system allows high running speed which, together with the push-to-start system, reduces working time and compressed air consumption.

Nutrunners design allows use of separator filters for conveying the air exhaust and in order to **eliminate the emission of oil fog into working environment.**

All the components are **easy to dispose of** since built using recyclable materials.

Eco-friendly packaging.

20MC

Innovative design principles guarantee a higher rotating speed of the new air motor at the same tightening torque, with evident reduction of tightening cycle time.

TRACS2: the clutch accuracy reduces to a minimum level the need of quality control at the end of the assembly process, with a remarkable increase of productivity.

New accessory drive with quick change chuck: it favours easier and safer accessory replacement (the spring load effectively prevent incidental bit unlocking).

There are two types of starting system:

Push to start: is a simple and economical system for only right-hand rotation motors. The motor starts automatically when a push of about 2 or 3 Kg 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 multipindle assembly systems where the operator's effort has to be reduced.



Nutrunner motors with air shut-off

Type of motor		Tightening torque on soft joint		Idle speed	Starting system	Reversibility	Weight	Dimensions	Air consumption	Accessories	Noise level*	
Model	Code	Min. Nm	Max. in lb									
20MC2A	112314706	0,4 ÷ 2,5	3.54 - 22.125	2700	↓	↻	0,750	1.65	page 12	5,5	⊕ F1/4"	75
20MC3A	112314707	0,4 ÷ 3	3.54 - 26.55	1400	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
20MC4A	112314708	0,4 ÷ 4	3.54 - 35.4	1000	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
20MC5A	112314709	0,4 ÷ 5	3.54 - 44.25	650	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
MCSEZ4A	114613734	0,9 ÷ 4	7.965 - 35.4	2500	↓	↻	0,930	2.05	page 13	9	⊕ F1/4"	76
MCSE5A	114613735	2,5 ÷ 5	22.125 - 44.25	1500	↓	↻	0,980	2.16	page 13	9	⊕ F1/4"	76
MCSE8A	114613738	2,5 ÷ 8	22.125 - 70.8	1000	↓	↻	0,980	2.16	page 13	9	⊕ F1/4"	76
MCSE10A	114613740	2,5 ÷ 10	22.125 - 88.5	500	↓	↻	0,980	2.16	page 13	9	⊕ F1/4"	76
MCY9A	116313709	7 ÷ 18	61.95 - 159.3	800	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	79
MCY11A	116313711	7 ÷ 24	61.95 - 212.4	550	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	79
MCG25A1	114609198	12 ÷ 25	106.2 - 221.25	600	↓	↻	2,200	4.84	page 15	13	⊕ M3/8"	79
MCG40A1	114609199	18 ÷ 40	159.3 - 354	450	↓	↻	2,200	4.84	page 13	13	⊕ M3/8"	79
20MCS2A	112314226	0,4 ÷ 2,5	3.54 - 22.125	2700	↓	↻	0,750	1.65	page 12	5,5	⊕ F1/4"	75
20MCS3A	112314227	0,4 ÷ 3	3.54 - 26.55	1400	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
20MCS4A	112314228	0,4 ÷ 4	3.54 - 35.4	1000	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
20MCS5A	112314229	0,4 ÷ 5	3.54 - 44.25	650	↓	↻	0,770	1.69	page 12	5,5	⊕ F1/4"	75
MSCSEZ4A	114613234	0,9 ÷ 4	7.965 - 35.4	2500	↓	↻	0,910	2.00	page 13	9	⊕ F1/4"	76
MSCSE5A	114613235	2,5 ÷ 5	22.125 - 44.25	1500	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	76
MSCSE8A	114613238	2,5 ÷ 8	22.125 - 70.8	1000	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	76
MSCSE10A	114613240	2,5 ÷ 10	22.125 - 88.5	500	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	76
MSCY9A	116313209	7 ÷ 18	61.95 - 159.3	800	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	79
MSCY11A	116313211	7 ÷ 24	61.95 - 212.4	550	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	79
20MC2RA	112514716	0,4 ÷ 2,5	3.54 - 22.125	2700	↓	↻	0,760	1.67	page 12	5,5	⊕ F1/4"	77
20MC3RA	112514717	0,4 ÷ 3	3.54 - 26.55	1400	↓	↻	0,780	1.72	page 12	5,5	⊕ F1/4"	77
20MC4RA	112514718	0,4 ÷ 4	3.54 - 35.4	1000	↓	↻	0,780	1.72	page 12	5,5	⊕ F1/4"	77
20MC5RA	112514719	0,4 ÷ 5	3.54 - 44.25	650	↓	↻	0,780	1.72	page 12	5,5	⊕ F1/4"	77
MCSEZ4RA	114813734	0,9 ÷ 4	7.965 - 35.4	2500	↓	↻	0,940	2.07	page 13	9	⊕ F1/4"	78
MCSE5RA	114813735	2,5 ÷ 5	22.125 - 44.25	1500	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	78
MCSE8RA	114813738	2,5 ÷ 8	22.125 - 70.8	1000	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	78
MCSE10RA	114813740	2,5 ÷ 10	22.125 - 88.5	500	↓	↻	0,990	2.18	page 13	9	⊕ F1/4"	78
MCY9RA	116513709	7 ÷ 16	61.95 - 141.6	700	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	81
MCY11RA	116513711	7 ÷ 24	61.95 - 212.4	450	↓	↻	1,500	3.3	page 14	10	⊕ F1/4"	81
MCG25RA1	114807206	12 ÷ 25	106.2 - 221.25	600	↓	↻	2,200	4.84	page 14	13	⊕ M3/8"	81
MCG40RA1	114807308	18 ÷ 40	159.3 - 354	450	↓	↻	2,300	5.06	page 14	13	⊕ M3/8"	81

Nutrunner motors with automatic air shut-off with built-in axial compensator

Type of motor		Tightening torque on soft joint		Idle speed	Starting system	Reversibility	Weight	Dimensions	Air consumption	Accessories	Noise level*	
Model	Code	Min. Nm	Max. in lb									
MCG25A1-TEL	114609196	12 ÷ 25	106.2 - 221.25	650	↓	↻	2,450	5.39	page 15	13	⊕ M3/8"	79
MCG40A1-TEL	114609200	18 ÷ 40	159.3 - 354	450	↓	↻	2,450	5.39	page 15	13	⊕ M3/8"	79
MCG25RA1-TEL	114807293	12 ÷ 25	106.2 - 221.25	600	↓	↻	2,450	5.39	page 15	13	⊕ M3/8"	81
MCG40RA1-TEL	114807294	18 ÷ 40	159.3 - 354	450	↓	↻	2,450	5.39	page 15	13	⊕ M3/8"	81

Legend

- ↻ Screw rotation clockwise
- ↻ Reversibility: The models are suitable for tightening and untightening operations

↓ Direct start

↓ Push-to-start

- * Noise level has been measured in accordance with ISO 3744 and ISO 15744.
 - * Additional factor: 3dB(A) 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).
 - * The code number must be used when ordering.
 - * For installation instructions see 'Use and maintenance manual'.
- Torque values are to be considered purely indicative and may be influenced by the softness of the type of joint, the type and length of the screw, the pressure and quantity of the feeding air, etc. In order to ensure the best performances and long life of air nutrunner motors, in particularly harsh work conditions (high number of cycles per minute and/or high torque values), we advise adjusting torque level not higher than 80% of maximum torque stated in the performances chart. For all further details, please apply to Fiam Technical Consultancy Service.

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

Model	Assembled on the tool – grey colour – Ø wire 3,2 mm code 595103202		Supplied with – black colour – Ø wire 2,2 mm code 595102204	
	Torque range on soft joint Nm	in lb	Torque range on soft joint Nm	in lb
20MC2A / 20MCS2A	0,8 ÷ 2,5	7.08 - 22.125	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 - 35.4	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 hose bore
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 motor)

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

Accessories available upon request

- Bits, sockets, conveyors and other compressed air system accessories: (see Accessories catalogue)
- Accessories for automation (see on page 21)
- Axial compensators and flange brackets (see on page 19)

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 torque transducer, to be connected by cable to TOCS-TC control unit (see on page 22)
- Models with special clutch for left tightening control
- Models with Offset device



OFFSET DEVICE

Fiam air nutrunner motors are designed for use with lubricated compressed air

Nutrunner motors with slip clutch

Model	Code	Tightening torque on soft joint		Idle speed	Starting system	Reversibility	Weight		Dimensions	Air consumption	Accessories	Axial compensator output
		Min. Nm	Max. in lb				Kg	lb				
MCZE2	112311722	0,8 ÷ 2,5	708 - 22.125	2800	Direct start	Reversibility	0,660	1.45	page 16	7	F 1/4"	1/4"
MCZE3	112311723	0,8 ÷ 3	708 - 26.55	1300	Direct start	Reversibility	0,750	1.65	page 16	7	F 1/4"	1/4"
MCZE4	112311724	0,8 ÷ 3,3	708 - 29.205	850	Direct start	Reversibility	0,750	1.65	page 16	7	F 1/4"	1/4"
MCZE5	112311725	0,6 ÷ 4,2	5.31 - 37.17	600	Direct start	Reversibility	0,750	1.65	page 16	7	F 1/4"	1/4"
MCSE4	114611714	1 ÷ 5,8	8.85 - 51.33	2500	Direct start	Reversibility	0,840	1.85	page 17	9	F 1/4"	3/8"
MCSE5	114611715	1,5 ÷ 7,5	13.275 - 66.375	1500	Direct start	Reversibility	0,850	1.87	page 17	9	F 1/4"	3/8"
MCSE8	114611718	1,5 ÷ 9,5	13.275 - 84.075	1000	Direct start	Reversibility	0,850	1.87	page 17	9	F 1/4"	3/8"
MCSE10	114611720	1,5 ÷ 12	13.275 - 106.2	500	Direct start	Reversibility	0,850	1.87	page 17	9	F 1/4"	3/8"
MCY7-1	116311701	4,6 ÷ 13	40.71 - 115.05	1700	Direct start	Reversibility	1,100	2.42	page 18	10	F 1/4"	3/8"
MCY9-1	116311702	6 ÷ 16	53.1 - 141.6	750	Direct start	Reversibility	1,300	2.86	page 18	10	F 1/4"	3/8"
MCY11-1	116311703	6 ÷ 22	53.1 - 194.7	500	Direct start	Reversibility	1,300	2.86	page 18	10	F 1/4"	3/8"
MSCZE2	112311222	0,8 ÷ 2,5	708 - 22.125	2800	Push-to-start	Reversibility	0,720	1.58	page 16	7	F 1/4"	1/4"
MSCZE3	112311223	0,8 ÷ 3	708 - 26.55	1300	Push-to-start	Reversibility	0,730	1.61	page 16	7	F 1/4"	1/4"
MSCZE4	112311224	0,8 ÷ 3,3	708 - 29.205	850	Push-to-start	Reversibility	0,730	1.61	page 16	7	F 1/4"	1/4"
MSCZE5	112311225	0,6 ÷ 4,2	5.31 - 37.17	600	Push-to-start	Reversibility	0,730	1.61	page 16	7	F 1/4"	1/4"
MSCSE4	114611214	1 ÷ 5,8	8.85 - 51.33	2500	Push-to-start	Reversibility	0,910	2.00	page 17	9	F 1/4"	3/8"
MSCSE5	114611215	1,5 ÷ 7,5	13.275 - 66.375	1500	Push-to-start	Reversibility	0,920	2.02	page 17	9	F 1/4"	3/8"
MSCSE8	114611218	1,5 ÷ 9,5	13.275 - 84.075	1000	Push-to-start	Reversibility	0,920	2.02	page 17	9	F 1/4"	3/8"
MSCSE10	114611220	1,5 ÷ 12	13.275 - 106.2	500	Push-to-start	Reversibility	0,920	2.02	page 17	9	F 1/4"	3/8"
MCZE2R	112511722	0,8 ÷ 2,5	708 - 22.125	2800	Direct start	Reversibility	0,790	1.74	page 16	7	F 1/4"	1/4"
MCZE3R	112511723	0,8 ÷ 3	708 - 26.55	1300	Direct start	Reversibility	0,800	1.76	page 16	7	F 1/4"	1/4"
MCZE4R	112511724	0,8 ÷ 3,3	708 - 29.205	850	Direct start	Reversibility	0,800	1.76	page 16	7	F 1/4"	1/4"
MCZE5R	112511725	0,6 ÷ 4,2	5.31 - 37.17	600	Direct start	Reversibility	0,800	1.76	page 16	7	F 1/4"	1/4"
MCSE4R	114811714	1 ÷ 5,8	8.85 - 51.33	2500	Direct start	Reversibility	0,780	1.72	page 17	9	F 1/4"	3/8"
MCSE5R	114811715	1,5 ÷ 7,5	13.275 - 66.375	1500	Direct start	Reversibility	0,870	1.91	page 17	9	F 1/4"	3/8"
MCSE8R	114811718	1,5 ÷ 9,5	13.275 - 84.075	1000	Direct start	Reversibility	0,870	1.91	page 17	9	F 1/4"	3/8"
MCSE10R	114811720	1,5 ÷ 12	13.275 - 106.2	500	Direct start	Reversibility	0,870	1.91	page 17	9	F 1/4"	3/8"
MCY7R-1	116511701	4,5 ÷ 13	39.825 - 115.05	1600	Direct start	Reversibility	1,100	2.42	page 18	10	F 1/4"	3/8"
MCY9R-1	116511702	6 ÷ 16	53.1 - 141.6	700	Direct start	Reversibility	1,300	2.86	page 18	10	F 1/4"	3/8"
MCY11R 1	116511703	6 ÷ 22	53.1 - 194.7	450	Direct start	Reversibility	1,300	2.86	page 18	10	F 1/4"	3/8"

Legend

Screw rotation clockwise

Reversibility: The models are suitable for tightening and untightening operations

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.
- The tightening torque values have been measured in accordance with ISO 5393 standard.
- 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'.

Torque values are to be considered purely indicative and may be influenced by the softness of the type of joint, the type and length of the screw, the pressure and quantity of the feeding air, etc. In order to ensure the best performances and long life of air nutrunner motors, in particularly harsh work conditions (high number of cycles per minute and/or high torque values), we advise adjusting torque level not higher than 80% of maximum torque stated in the performances chart. For all further details, please apply to Fiam Technical Consultancy Service.

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

Model	Torque range on soft joint Nm	Torque range on soft joint in lb	Torque range on soft joint Nm	Torque range on soft joint in lb	Torque range on soft joint Nm	Torque range on soft joint in lb	Torque range on soft joint Nm	Torque range on soft joint in lb
MCZE2	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	
MCZE3	0,8 ÷ 2,5	708 - 22.125	1,8 ÷ 3	15.93 - 26.55	2 ÷ 3,3	17.7 - 29.205	1 ÷ 4,2	8.85 - 31.17
MCZE4	0,8 ÷ 2,2	708 - 19.47						
MCZE5	0,8 ÷ 2,5	708 - 22.125						
MCZE5	0,6 ÷ 1,9	5.31 - 16.815						
MCSE4	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	
MCSE5	3 ÷ 5,8	26.55 - 51.33	1 ÷ 3,2	8.85 - 28.32	1,5 ÷ 4,5	13.275 - 39.825	3,5 ÷ 9,5	30.975 - 84.075
MCSE8	3 ÷ 7,5	26.55 - 66.375					3,5 ÷ 12	30.975 - 106.2
MCSE10	1,5 ÷ 4,5	13.275 - 39.825						
MCSE10	1,5 ÷ 4,5	13.275 - 39.825						
MSCZE2	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	
MSCZE3	0,8 ÷ 2,5	708 - 22.125	1,8 ÷ 3	15.93 - 26.55	2 ÷ 3,3	17.7 - 29.205	1 ÷ 4,2	8.85 - 31.17
MSCZE4	0,8 ÷ 2,2	708 - 19.47						
MSCZE5	0,8 ÷ 2,5	708 - 22.125						
MSCZE5	0,6 ÷ 1,9	5.31 - 16.815						
MSCSE4	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	
MSCSE5	3 ÷ 5,8	26.55 - 51.33	1 ÷ 3,2	8.85 - 28.32	1,5 ÷ 4,5	13.275 - 39.825	3,5 ÷ 9,5	30.975 - 84.075
MSCSE8	3 ÷ 7,5	26.55 - 66.375					3,5 ÷ 12	30.975 - 106.2
MSCSE10	1,5 ÷ 4,5	13.275 - 39.825						
MCSE4R	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	708 - 22.125	1,8 ÷ 3	15.93 - 26.55	2 ÷ 3,3	17.7 - 29.205	1 ÷ 4,2	8.85 - 31.17
MCZE3R	0,8 ÷ 2,2	708 - 19.47						
MCZE4R	0,8 ÷ 2,5	708 - 22.125						
MCZE5R	0,6 ÷ 1,9	5.31 - 16.815						
MCSE4R	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	1,5 ÷ 4,5	13.275 - 39.825	3,5 ÷ 9,5	30.975 - 84.075
MCSE5R	3 ÷ 7,5	26.55 - 66.375					3,5 ÷ 12	30.975 - 106.2
MCSE8R	1,5 ÷ 4,5	13.275 - 39.825						
MCSE10R	1,5 ÷ 4,5	13.275 - 39.825						

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)	Accessories available upon request	Models available upon request
<ul style="list-style-type: none"> Clutch adjustment key Supplementary clutch spring (except for MCY... models) Use and maintenance manual Eco-friendly packaging 	<ul style="list-style-type: none"> Bits, sockets, conveyors and other compressed air system accessories: (see Accessories catalogue) Accessories for automation (see on page 21) Axial compensators and flange bracket (see on page 19) 	<ul style="list-style-type: none"> Models with quick change chuck Models with modified flange and/or with customized casing 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

Nutrunner motors without clutch

These motors without clutch guarantee tightening evenness also in presence of extremely soft joints and maximum versatility: in fact **adjusting air feeding pressure leads to different torque, speed and motor power values**. Available in two versions, reversible and non-reversible, they can have different output shafts.

Type of motor		Tightening torque on soft joint		Idle Speed	Reversibility	Type of output available		
Model	Code	Min Nm	Max in lb			Square	Telescopic square	Telescopic with quick release chuck*
20MC	upon request	2,5 ÷ 10	22.125 - 88.5	600 ÷ 2600	↻	x	x	x
28MC	upon request	4,5 ÷ 20	39.825 - 177	560 ÷ 2650	↻	x	x	x
MNC	upon request	5 ÷ 45	44.25 - 398,25	320 ÷ 2700	↻	x	x	x
MOC	upon request	18 ÷ 90	159.3 - 796.5	400 ÷ 2800	↻	x	x	
20MC.R	upon request	2,5 ÷ 10	22.125 - 88.5	580 ÷ 2500	↻↻	x	x	x
28MC.R	upon request	4,5 ÷ 20	39.825 - 177	395 ÷ 2350	↻↻	x	x	x
MNC.R	upon request	5 ÷ 45	44.25 - 398,25	280 ÷ 2500	↻↻	x	x	x
MOC.R	upon request	15 ÷ 90	159.3 - 796.5	320 ÷ 2200	↻↻	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 are to be considered purely indicative and may be influenced by the softness of the type of joint, the type and length of the screw, the pressure and quantity of the feeding air, etc. In order to ensure the best performances and long life of air nutrunner motors, in particularly harsh work conditions (high number of cycles per minute and/or high torque values), we advise adjusting torque level not higher than 80% of maximum torque stated in the performances chart. For all further details, please apply to Fiam Technical Consultancy Service.

Standard equipment (supplied with the motor)

- Use and maintenance manual
- Eco-friendly packaging

Accessories available upon request

- Bits, sockets, conveyors and other compressed air system accessories: (see Accessories catalogue)
- Accessories for automation (see on page 21)

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 MO)
- Models with special flange and/or with Customized body design
- Models with torque transducer, to be connected by cable to TOCS-TC control unit (see on page 22)



Control unit TOCS-TC

Fiam air nutrunner motors are designed for use with lubricated compressed air

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	Potenza watt	Speed at point of maximum power - r.p.m.	Stall torque Nm
28MC120D	6	280	535	8
Motor	Bar	Potenza 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 decreases)

For further information please contact Fiam Technical Consultancy Service.

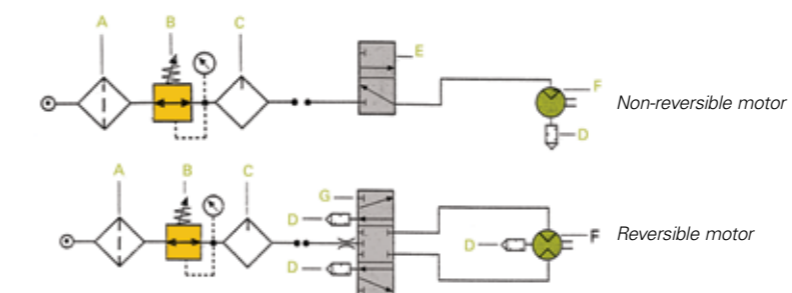
Air feed and its consumption.

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.

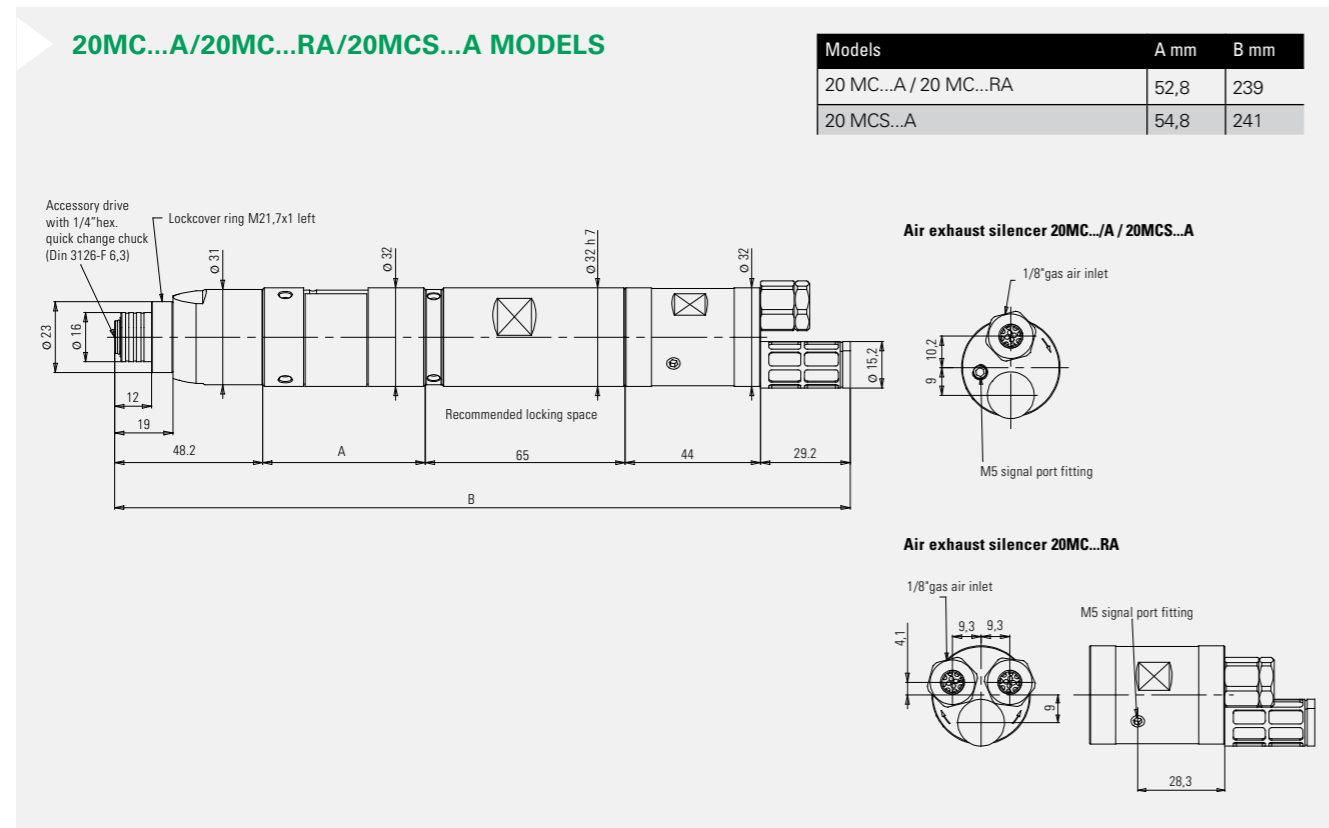
Pneumatic circuit scheme (feed - control of the motor)



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

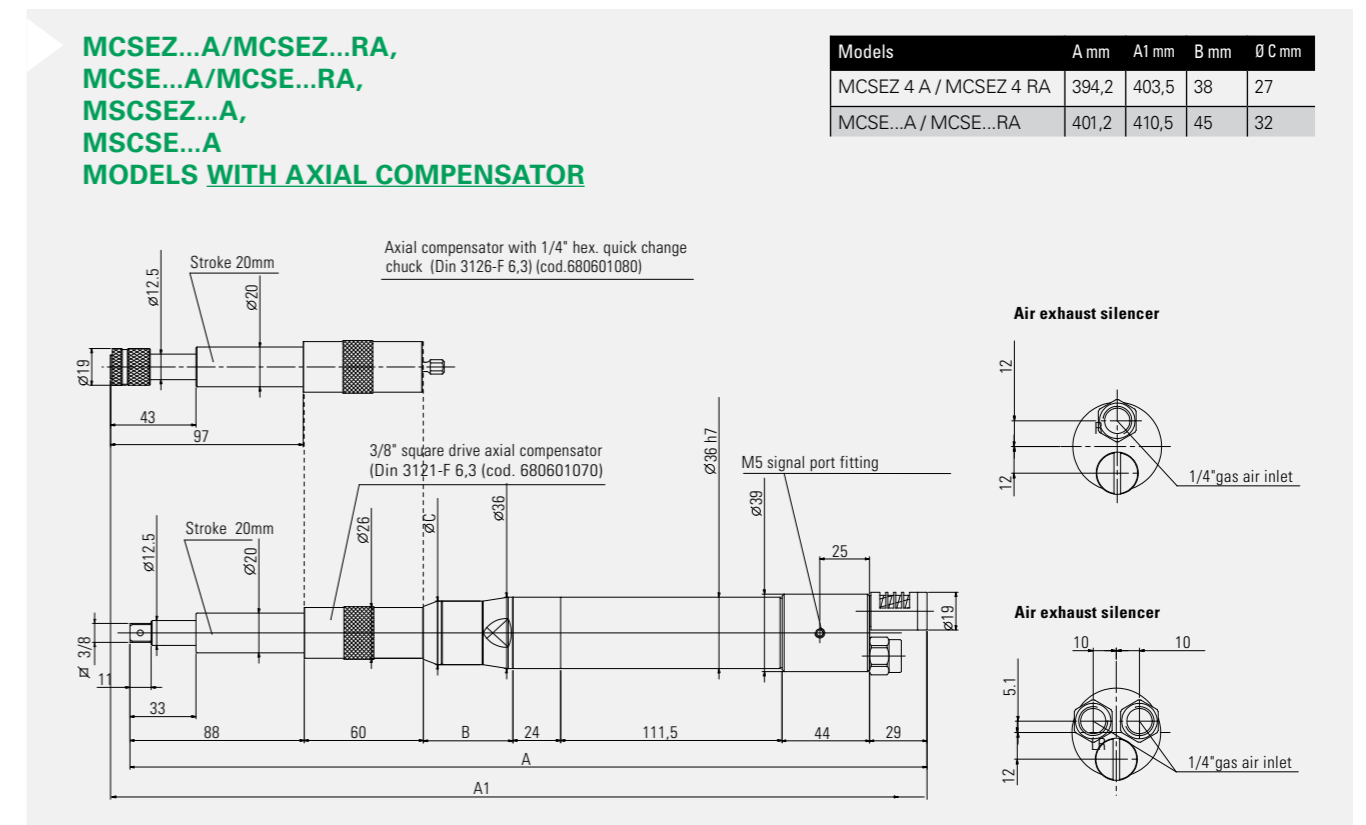
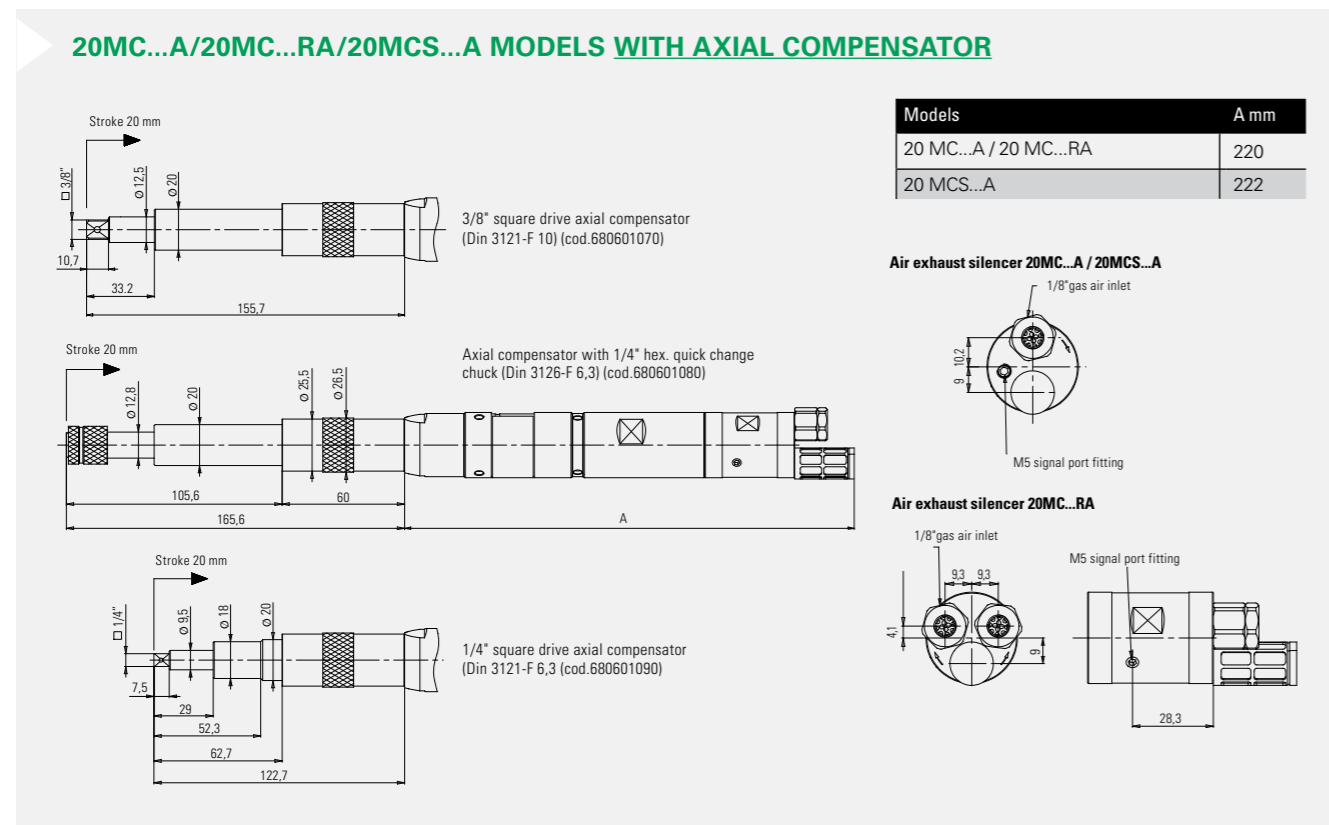
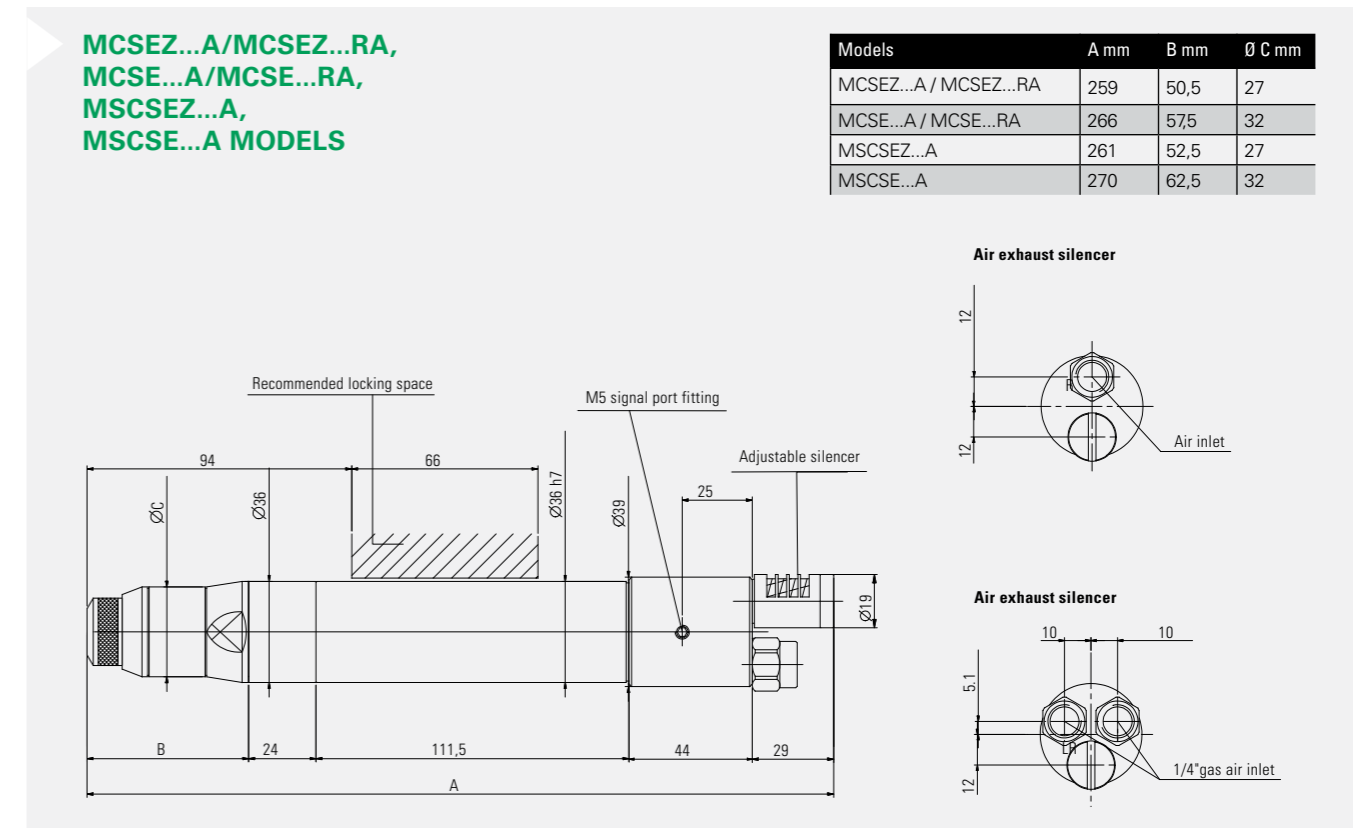
Dimensions

Nutrunner motors with air shut-off



Dimensions

Nutrunner motors with air shut-off

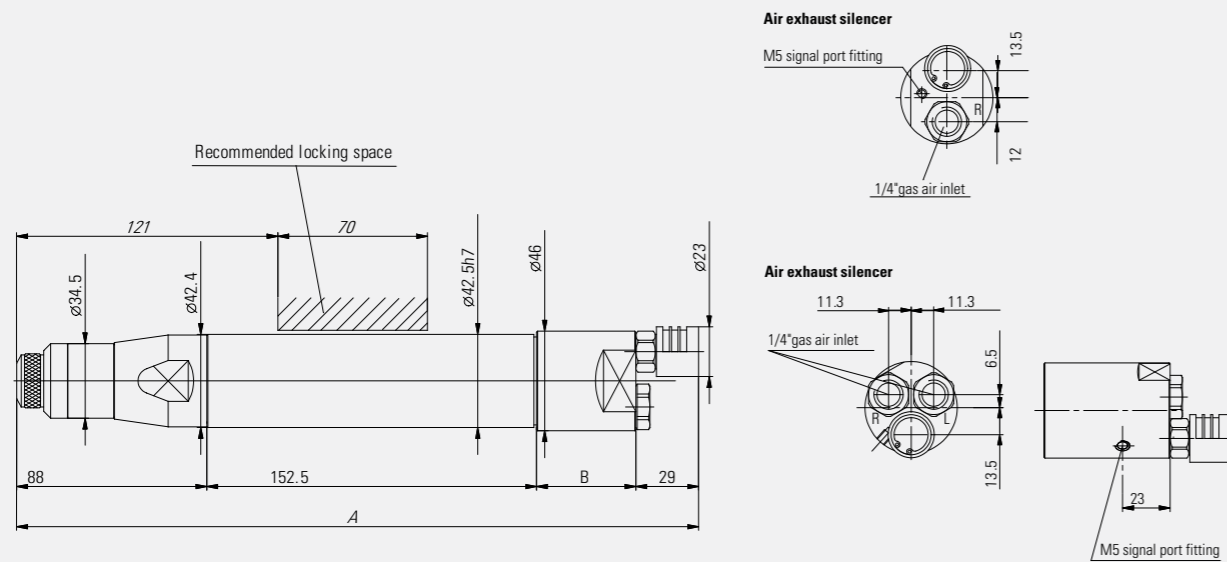


Dimensions

Nutrunner motors with air shut-off

MCY9-11A/MCY9-11RA/MSCY9-11A MODELS

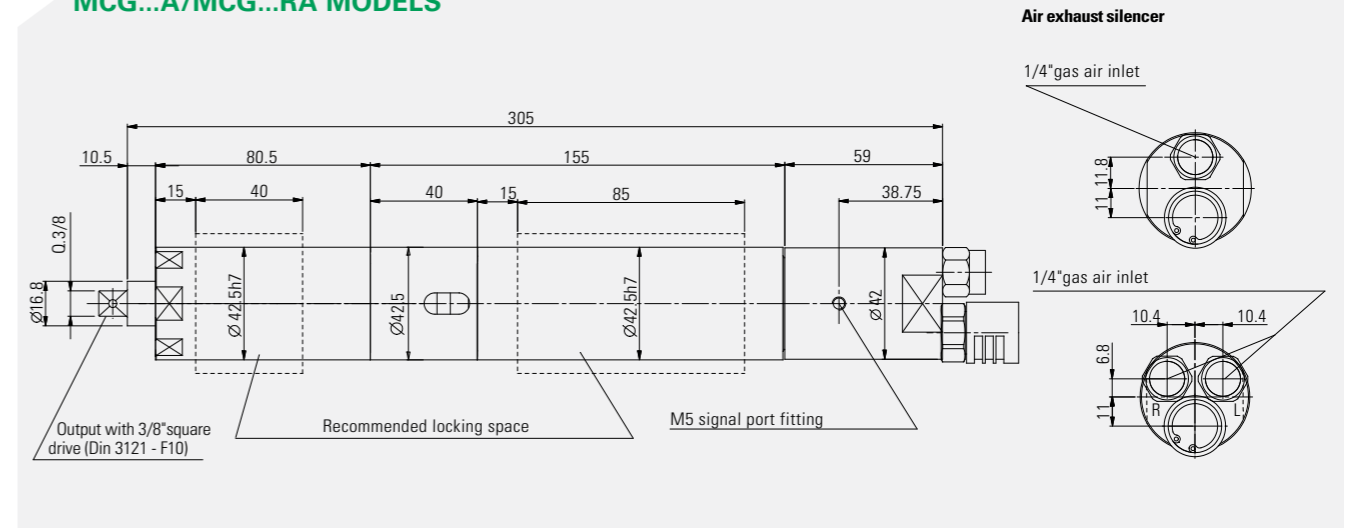
Models	A mm	B mm
MCY 9 A / MCY 11 A	315,5	46
MCY 9 RA / MCY 11 RA	330,5	61
MSCY 9 A / MSCY 11 A	318	46



Dimensions

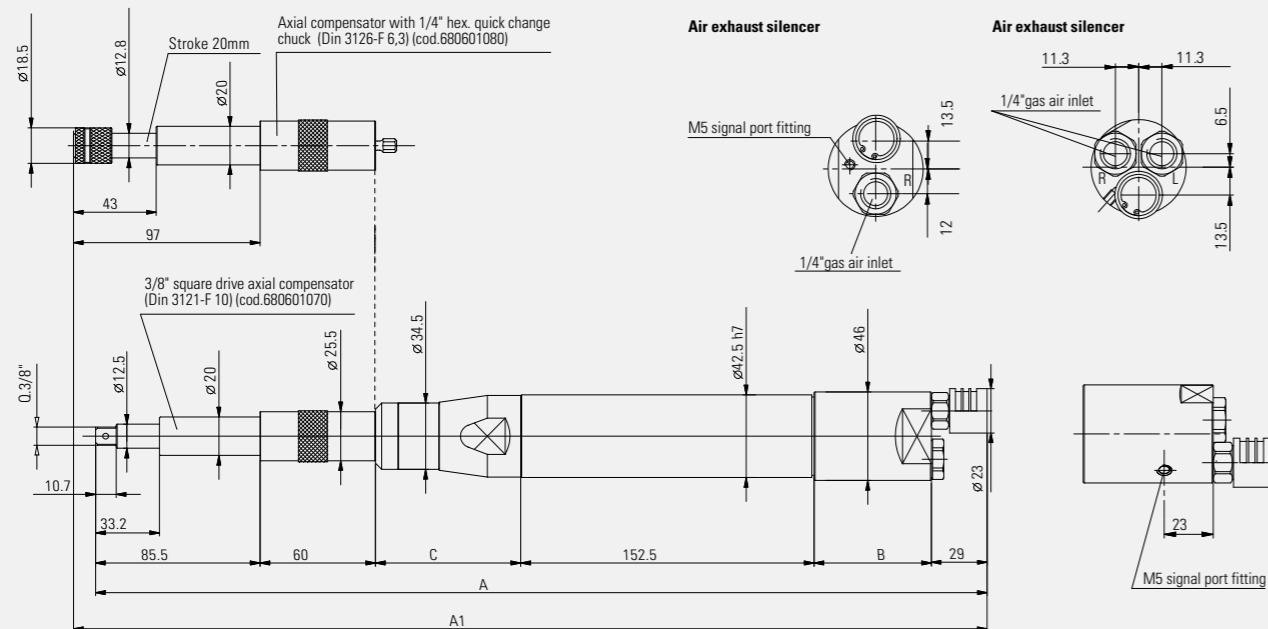
Nutrunner motors with air shut-off

MCG...A/MCG...RA MODELS

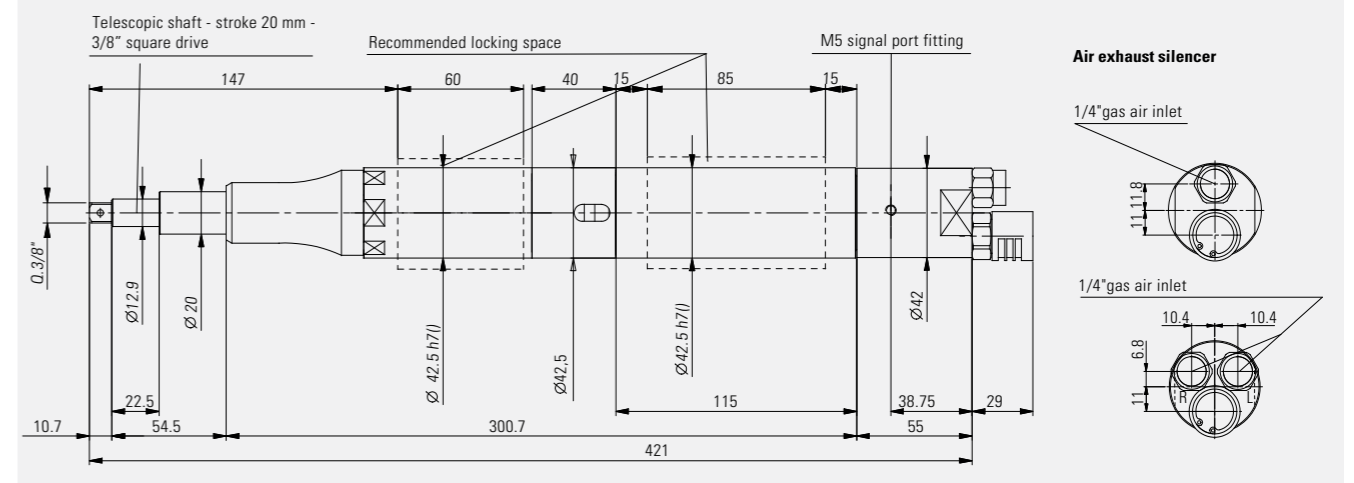


MCY9-11A/MCY9-11RA MODELS WITH AXIAL COMPENSATOR

Models	A mm	A1 mm	B mm	ϕ C mm
MCY 9 A / MCY 11 A	448,5	458,3	46	75,5
MCY 9 RA / MCY 11 RA	463,5	473,3	61	75,5



MCG...A/MCG...RA MODELS WITH AXIAL COMPENSATOR

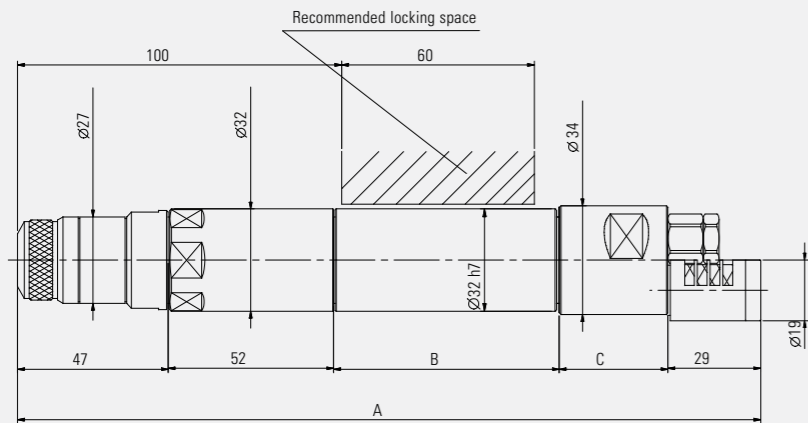


Dimensions

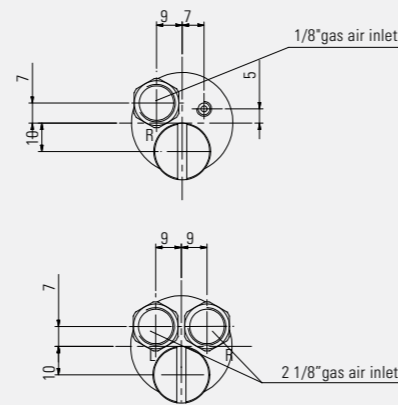
Nutrunner motors with slip clutch

MCZE.../MCZE...R/MSCZE... MODELS

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



Adjustable silencer

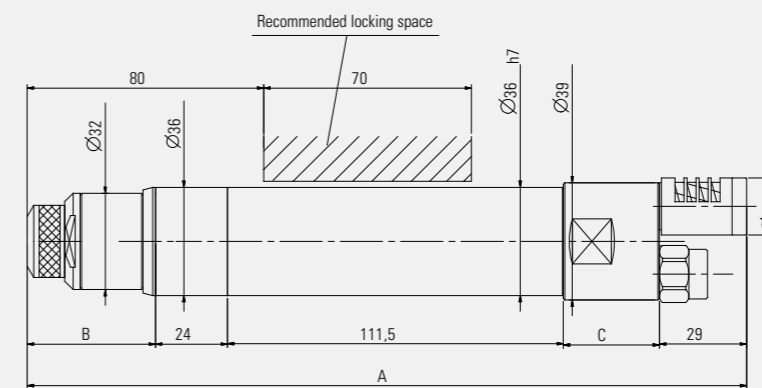


Dimensions

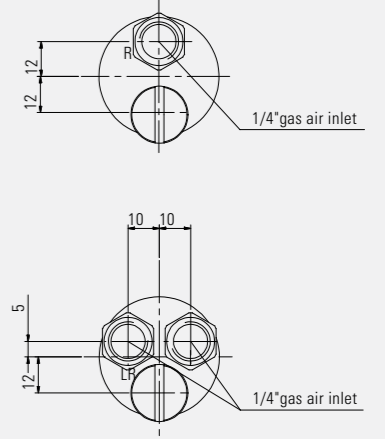
Nutrunner motors with slip clutch

MCSE.../MCSE...R/MSCSE... MODELS

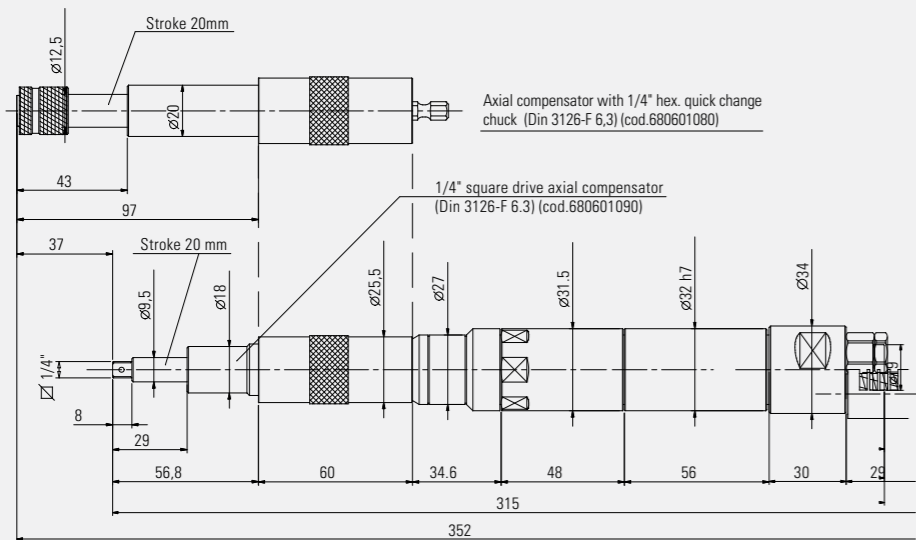
Models	A mm	B mm	Ø C mm
MCSE.../MCSE...R	239	43	32
MSCSE...	253	44,5	44



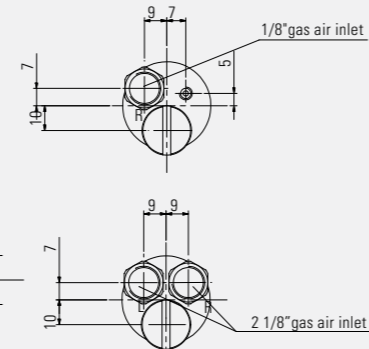
Adjustable silencer



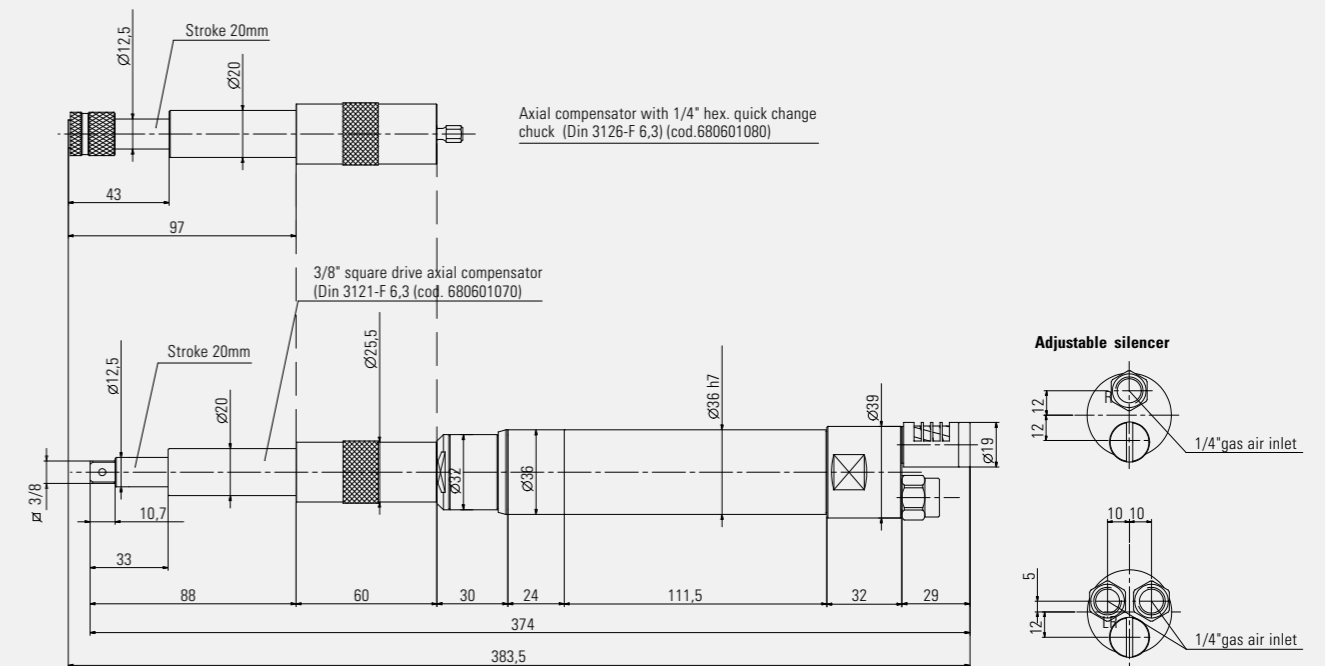
MCZE.../MCZE...R MODELS WITH AXIAL COMPENSATOR



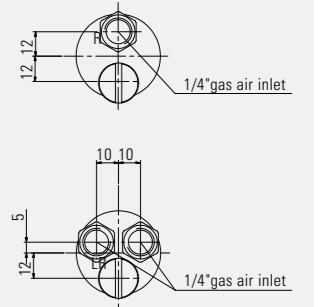
Adjustable silencer



MCSE.../MCSE...R MODELS WITH AXIAL COMPENSATOR



Adjustable silencer

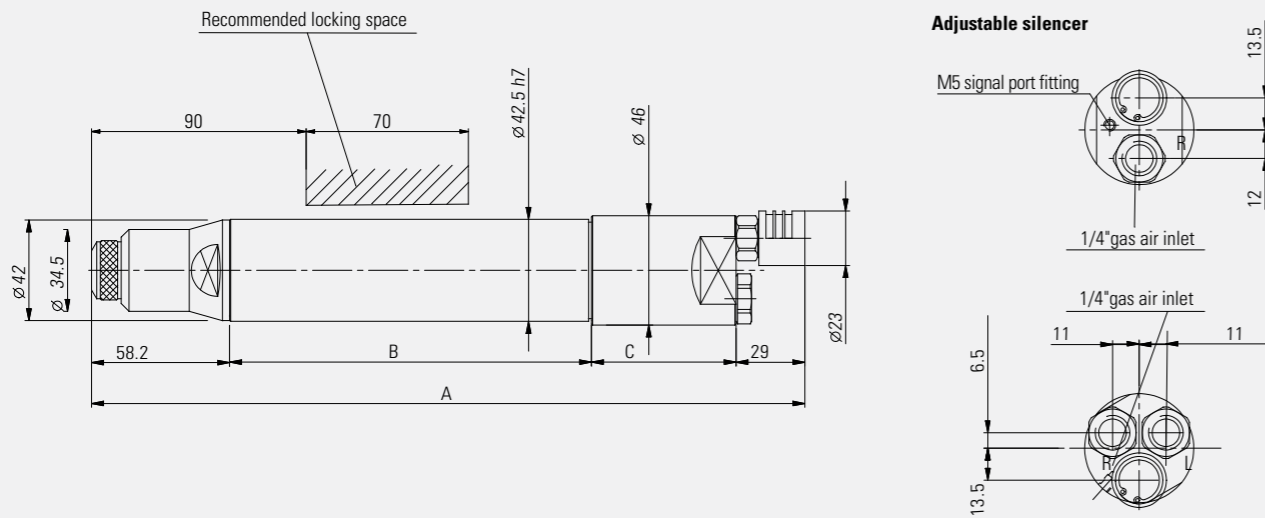


Dimensions

Nutrunner motors with slip clutch

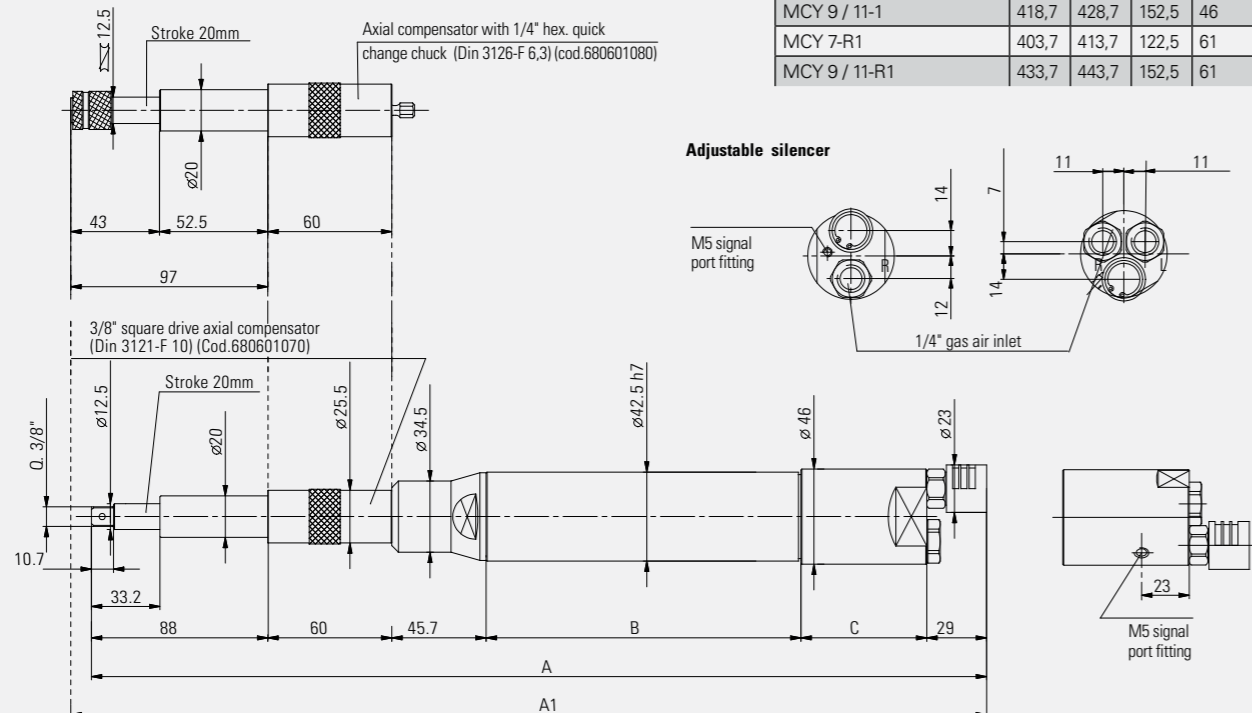
MCY...-1 / MCY...-R1 MODELS

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



MCY...-1 / MCY...-R1 MODELS WITH AXIAL COMPENSATOR

Models	A mm	A1 mm	B mm	Ø C mm
MCY 7-1	388,7	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



Accessories

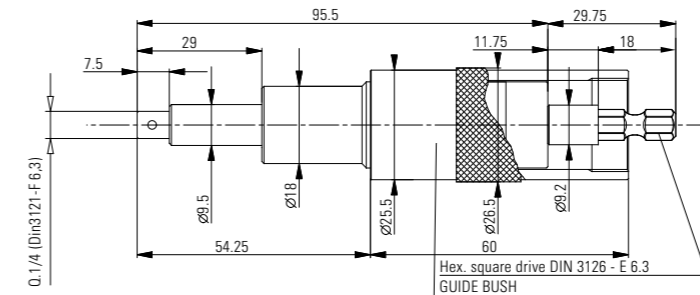
AXIAL COMPENSATORS

Ease entry of screw and reduce axial thrust on the motor's mechanical components. When fastening more screws simultaneously, the axial compensation device in the bit compensates for the differences in height between the screws before starting tightening process.

These bits **feature guide bush designed to ensure that compensation bit is centred correctly on nutrunner**. The bit can be used in conjunction with the accessories illustrated in the Accessories Catalogue, fitting a specific adapter between the bit and accessory if required. The spring load of the axial compensation bits is about 3,5 Kg when fully compressed. To use axial compensators on air nutrunner motors with push start please apply to **Fiam Technical Consultancy Service**. The dimensions of the air nutrunner motors with axial compensation are those reported on page 12 and 19.

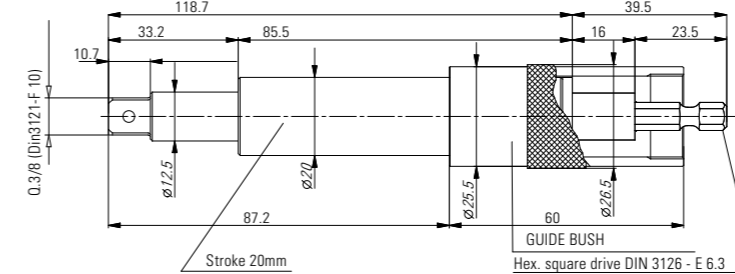
□ 1/4" drive axial compensation bit (DIN 3121 - F 6,3)

Features	Code	Axial compensator (mm)
For all nutrunner motors	680601090	20



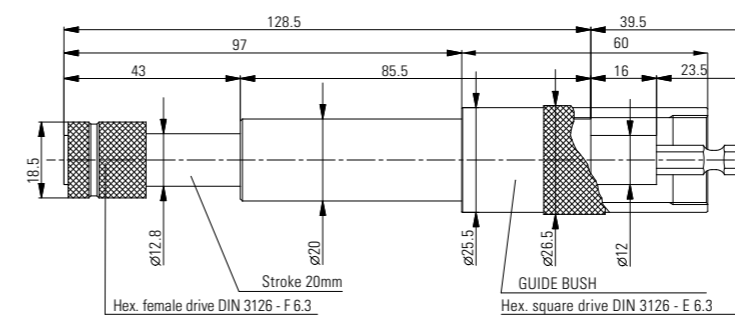
□ 3/8" drive axial compensation bits (DIN 3121 - F 10)

Features	Code	Axial compensator (mm)
For all nutrunner motors	680601070	20



Axial compensation bits with 1/4" quick change chuck (DIN 3126 - F 6,3)

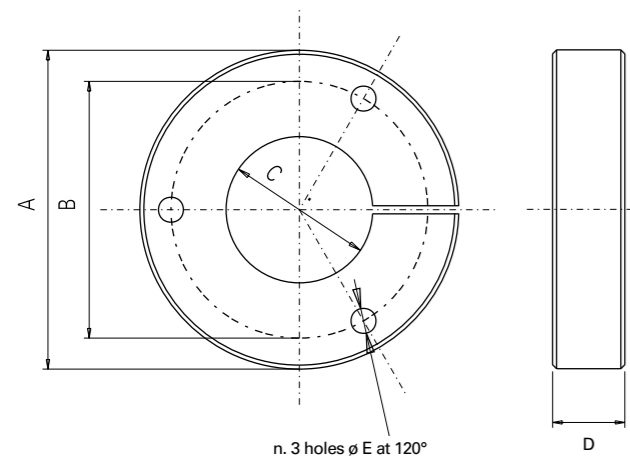
Features	Code	Axial compensator (mm)
For all nutrunner motors	680601080	20



Accessories

FLANGE BRACKET

We recommend using the 3 hole flange bracket to install a nutrunner motor for screwdriving applications on a fixed mounting, since it acts on the entire circumference of the motor casing, avoiding the possibility of any operating problems.



Model	Code	A mm	B mm	C mm	D mm	E mm
20MC...A / 20MC...RA 20MSC...A	684011006	64,5	50	32	18	5,25
MCZE... / MCZE...R MSCZE...						
MCSEZ...A MCSE...A / MCSE...RA MSCSEZ...A MSCSE...A	684011007	69,5	57	36	18	6,25
MCSE... / MCSE...RA MSCSE...						
MCY...A / MCY...RA MCG...A / MCG...RA MSCY...A	684011008	79,5	64	42,5	18	6,25
MCY...-1 / MCY...R-1						

BITS

Fiam supplies different models ideal for different applications. Depending on customer needs, different special bits are available upon request

BIT HOLDER

The bit holder is the accessory used to connect the bit to the nutrunner output shaft. Bit holders are manufactured with high quality materials and treatments that guarantee high resistance to breaking and wear.

PNEUMO-ELECTRIC SIGNAL TRANSDUCER

It is positioned on pick-up signal device of the air motor. It is a fundamental accessory for sending reached-torque signal to a PLC.

SCREW FEED HOSES

They convey the screw from the selector to the screw head. Extremely sturdy and with ideal diameter for a quick screw passage, they are available in 2 versions depending on flexibility required by the application: hard models and flexible shape memory models.

SCREW PASSAGE SENSORS

It is a device aimed at controlling the screw passage in the feed hose. It is available in with 2 different versions: annular sensor with 100ms delay and embedded annular screw passage sensor, which guarantees a more accurate reading and isn't influenced by other sensors.

For further information about technical features and accurate choice of the accessories, see Automation catalogue nr. 1009 or contact Fiam Technical Consultancy Service.

Accessories

FASTENING SLIDES

Fastening slides are important components equipped with air nutrunner motor, screw head, bit and bit holder, suitable for being used in **semi-automatic or automatic industrial tightening solutions**.

These linear actuators are **designed entirely by Fiam and are manufactured in Fiam** with high quality materials guaranteeing very high reliability and resistance over time, also in presence of high production rates

Thanks to their movement, fastening slides ensure **a perfect approach stroke of the motor - screw head to the component** to be tightened and are suitable also for applications with **more tightening points close to each other**. Their compact dimensions and the extremely low weight make these components extremely versatile and **usable with manipulators, electric axis and robots**.



For further information about technical features, see Automation catalogue nr. 1009 or contact Fiam Technical Consultancy Service.

They are available with 3 different versions:

- **Single-stroke fastening slide:** the stroke encompasses approaching fastening point and driving the screw.
- **Dual-stroke fastening slide:** the first stroke brings the nozzle close to the workpiece, the second is used to run the screw.
- **With anti-overturning device:** used to handle screws having a ratio total length/head diameter close to 1. This device allows the "movement of the head" avoiding screw incorrect positions during tightening and preventing screws from getting stuck with consequent production stop.

SCREW HEAD

This component is required in order to hold the screw coming from the bowl feeder through the feeding hose and guide it before it is tightened in the workpiece. Holding the screw is necessary in order to enable the bit to engage the screw head and then tighten the component. The head is equipped with jaws which are opening to release the screw when the bit starts tightening the screw on the component.

Screw heads are **extremely reliable** as they are built with **highest quality materials** through precise and accurate machining which, together with the treatments, **guarantee high resistance to breaking and wearing**.

Available in various models suitable for screw found in the market, these heads are further tailored machined by FIAM basing on design of customer's screw.

Moreover they are available also screw head for M8 flat head screws with screw length/head diameter ratio at 0,9. These special heads must be combined to slides with anti-overturning device.



For further information about technical features, see Automation catalogue nr. 1009 or contact Fiam Technical Consultancy Service.

BUSHES

The bushes are indispensable accessories for connecting the screw feeding hose to the head for holding screws. Bushes are available in 3 sizes basing on the type/size of the screw head and are supplied customized basing on the screw and hose types. Materials of which they are made render bushes **extremely reliable over time also in presence of high production rates**.

For other numerous accessories and components for tightening automation see Fiam Automation catalogues or contact Fiam Technical Consultancy Service.



Accessories: TOCS-TC control unit

Joint monitoring: everything under control.

Are you looking for total reliability? You have just found it. When tightenings are difficult, air nutrunner motors joined with computerised torque controller TOCS-TC guarantee an extraordinary quality and eliminate the possibility of error during the tightening cycle. Nothing will pass unnoticed: the cycle is monitored, the torque values are under control and the production waste is reduced to the minimum level.

TOCS-TC control unit (Tightening Operations Control System – Torque Control) can be connected to **nutrunner motors with air shut-off or without clutch, equipped with built-in strain gauge torque transducer.**

The strain gauge torque transducer (static) converts the torque applied into an electrical signal that is then processed by the TOCS-TC control unit; **it reads and memorises torque value, displays the cycle results (OK and NOT OK), monitors the tightening cycle through torque/time values that can be easily stored.**

Available in two versions with alphanumerical display (TOCS-TC...A) and graphic display (TOCS-TC...G); the latter allows visualizing the torque-time curve.

The two versions can be connected to two tools, even different, working synchronically or asynchronously (independently).



TOCS-TC unit (Tightening Operation-Control-System-Torque Control): technical features

- The complete and simple programming menus offer:
- Up to 20 programme settings (MIN torque, MAX torque, MIN time, MAX time) and password protection;
- Tightening sequences settings with a maximum of 99 screws and a maximum number of repetitions in the event of a reject.

The I/O's of the unit offer:

- OK/KO signalling for each cycle and general OK/KO (end-of-sequence);
- 3 user configurable on-line printing modes;
- The type of possible rejects required can be detected through the correct programming of tightening cycle;
- The internal memory stores torque/time/result data concerning the last 1,000 tightening cycles (circular buffer);
- The system can be networked (proprietary protocol) with supervision (programming + data acquisition) and optional software.

Technical features

- **Built-in membrane programming** keyboard
- **Electrically powered (a.c.);** if power is interrupted, the data **memory** is maintained by a battery
- **Illuminated liquid crystal display** with 4 lines of 20 characters (version ...A) or graphic (version ...G)
- **RS232 output and LPT output** for connection to printer.
- **Visual indicators for signalling tightening status**, located on the panel:
 RED = Tightening KO (incorrect)
 GREEN = Tightening OK (correct) + pallet release signal
- **I/O connectors** with contacts powered at 24 Vdc (max. 0.5A) for connection to PLC and/or signal lights to indicate OK and KO tightening

Control unit			
Model	Description	Code	Dimensions (mm) Width x Depth x h
TOCS-TC 1CH A	Control unit	686000131	210x330x125
TOCS-TC 2CH A	Control unit	686000132	210x330x125
TOCS-TC 1CH G	Control unit	686000133	210x330x125
TOCS-TC 2CH G	Control unit	686000134	210x330x125

Legend
 TOCS -TC= Tightening Operations Control System - Torque Control • 1 CH = 1 channel for connection to one too • 2CH = 2 channels for connection to two different or similar tools, working synchronically or asynchronously • A = alphanumerical display • G = graphic display

Standard equipment (supplied with unit)	Accessories available upon request	Models available upon request
<ul style="list-style-type: none"> • 2m electric power cable • Use and maintenance manual • Eco-friendly packaging 	<ul style="list-style-type: none"> • OK/KO signal light column with built-in buzzer (code 686000182) • Transport handle 	<ul style="list-style-type: none"> • Version with network board for communicating with specific software (computerised unit programming + data acquisition).

Instructions for installation.

Instruction manual supplied with the nutrunner also gives recommendations about:

- Signal that can be received
- Securing the nutrunner motors
- Adjusting the tightening torque
- Accessory replacement

AIR FEED

To obtain the performances on catalogue it is necessary to guarantee a correct air feeding.

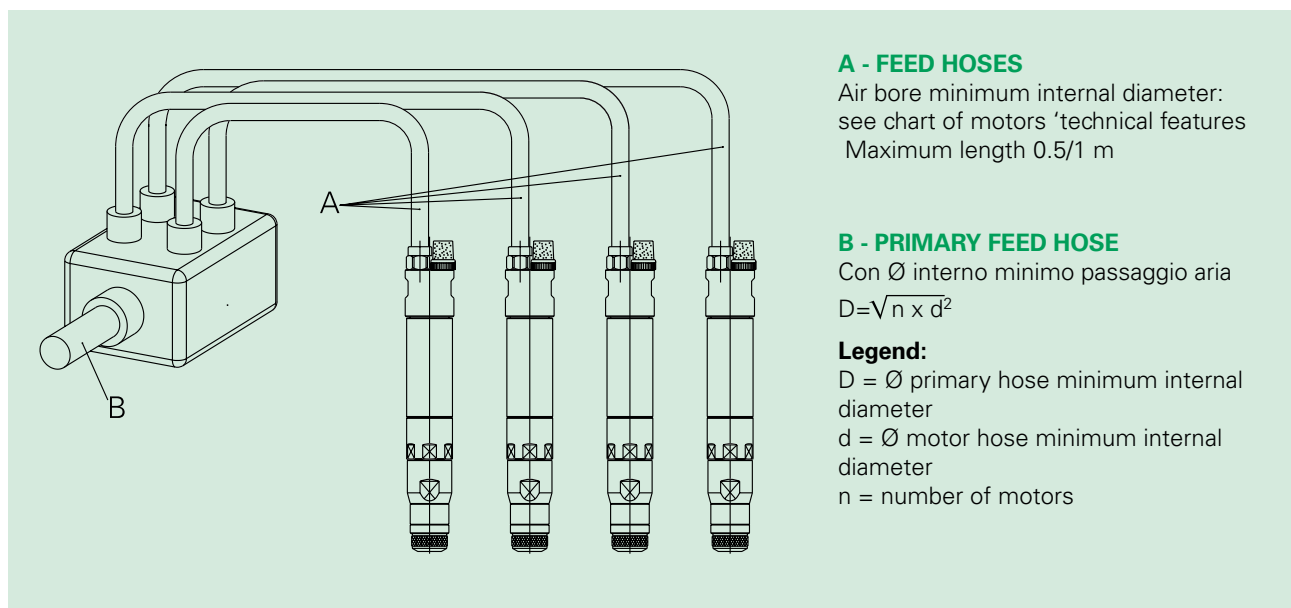
To check whether the nutrunner is being correctly fed, insert a pressure gauge at the air inlet coupling and measure the air pressure with the motor running: it must be about 6 bar. Always respect the air passage recommended by Fiam for feeding hoses.

If possible, avoid joints and quick couplings which locally reduce the air passage.

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.

To convey the air exhaust of more motors follow the instructions below.

Scheme for correct feeding of nutrunner motors



For further information please contact **Fiam Technical Consultancy Service**.

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