



PC

**Operating and
maintenance manual**

Compact torque multiplier
PC / PC-R Series

Operating and maintenance manual

Introduction

We congratulate you on the purchase of a compressed air powered *alkitronic*[®] torque multiplier. You have chosen a high-quality product that sets new standards around the world and meets high safety standards. To ensure this high level, the product requires regular maintenance and care. We therefore ask you to read these operating and maintenance instructions carefully and to observe the following points:

The *alkitronic*[®] torque multiplier is only to be repaired or serviced by employees of alki TECHNIK GmbH, by those trained by alki TECHNIK GmbH or a certified service provider.

There could be a risk of damage to health and damage to the equipment if the product is not properly maintained or operated. In addition, any warranty claim is then forfeited.

These operating and maintenance instructions contain basic instructions that must be observed during operation and maintenance. They must therefore be read by the operating staff prior to commissioning or maintenance. They must therefore always be available at the area of application of the *alkitronic*[®] torque multiplier.

These operating and maintenance instructions refer exclusively to the *alkitronic*[®] torque multiplier.

Not only the general safety instructions listed under the section „Labeling instructions“ need to be observed but also supplementary regulations, instructions or advice, depending on the situation.

Definition of Symbols



Safety instructions.
Non-compliance may result in personal injury or death.



Safety instructions.
Non-compliance may result in damage to the *alkitronic*[®] torque multiplier, its functions, or the environment.



IMPORTANT! Information for proper and safe operation.



NOTE! Practical advice and information to make work easier.

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alkitronic® Pneumatic Torque Multiplier

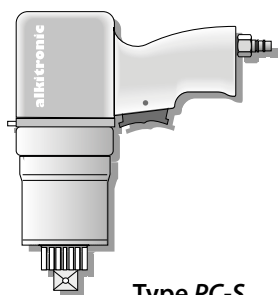
A Incoming goods inspection and packaging



All parts must be visually inspected for possible transport damage. If damage is found, notify the carrier immediately. Returns only in original packaging, by doing so damage is avoided. Therefore, keep the packaging!

B General description

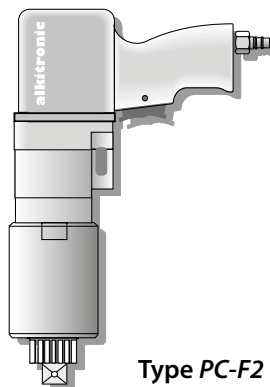
The torque can be regulated via the air supply or via the pressure regulator of a maintenance unit. The accuracy of the torque depends on the stability of the air supply. An air pressure of 3-7 bar (43-10,000 psi) at a flow rate of approx. 10-15 l/sec (122-915 cu.in./min) guarantee optimum working even in explosion-protected working areas.



Type *PC-S*
S = Rotatable

alkitronic® PC-S
Compact Pneumatic torque multiplier

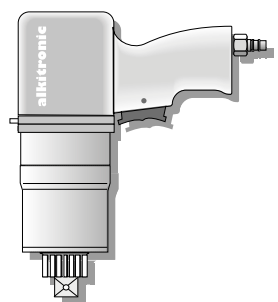
Torque up to approx. 7,225 ft.lbs, clockwise / anti-clockwise rotation, optional positioning of the control unit thanks to rotatable mounting.



Type *PC-F2*

alkitronic® PC-F2
2 gear - Compact Pneumatic torque multiplier

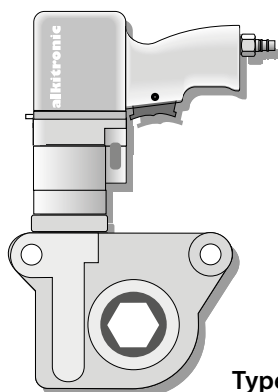
Torques up to approx. 35,855 ft.lbs, 2 gears (overdrive/power gear), right / left rotation.



Type *PC-F*
F = Rigid

alkitronic® PC-F
Compact Pneumatic torque multiplier

Fast rotating assembly multiplier. A secure support for the reaction torque must be ensured!
Torques up to approx. 1,070 ft.lbs, clockwise / anti-clockwise rotation.



Type *PC-R*

alkitronic® PC-R
2 gear radial - Compact Pneumatic torque multiplier

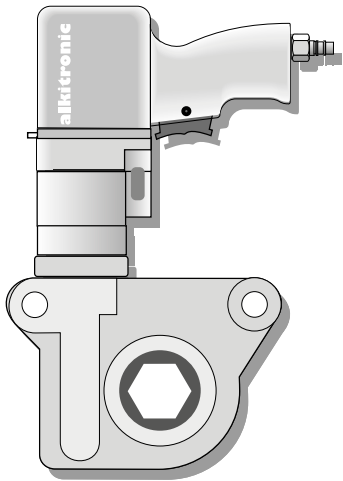
For use on protruding screw ends such as plate heat exchangers. Torques up to approx. 3,390 ft.lbs, 2 gears.

Operating and maintenance manual

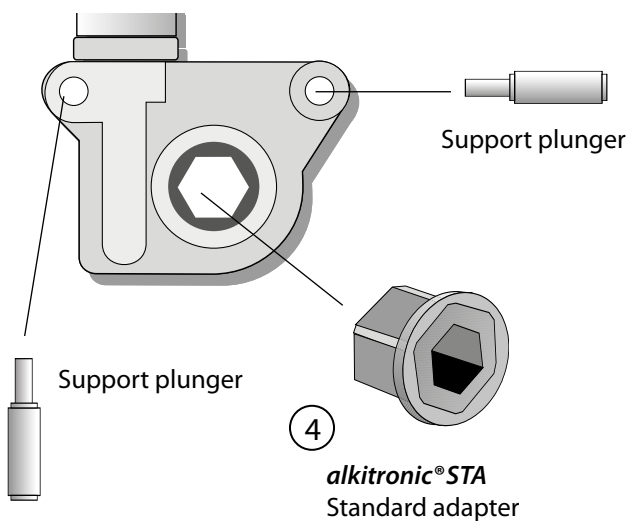


alkitronic® Accessories
Original accessories for every type of bolting job

Type PC-R



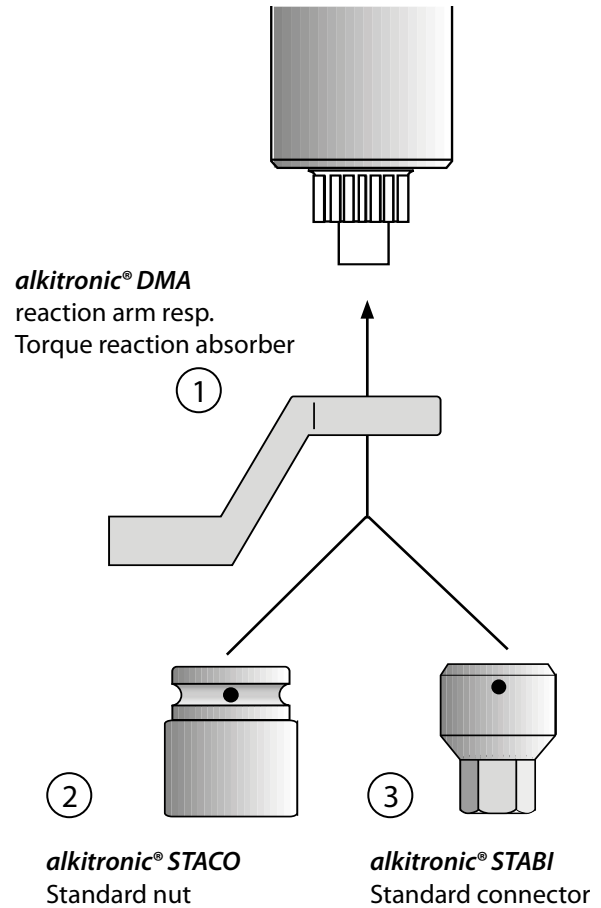
To reduce the wrench size **alkitronic® STA (4)**



Type PC-S, PC-F, PC-F2

For special bolting the original accessories:

- alkitronic® DMA (1)**
- alkitronic® STACO (2)**
- alkitronic® STABI (3)**



The maintenance unit ensures a long service life thanks to the oiled operating pressure of the **alkitronic®** torque multiplier (see also section E, page 11).



- The water separator extends the life of the motor blades.
- Accurate adjustment of the torque is done via the DRV (pressure control valve).

alkitronic® Pneumatic Torque Multiplier

1. Safety instructions

1.1 Obligations of the operator

The user is obliged to read these operating and maintenance instructions before carrying out any operation or service. *alkitronic*® torque multiplier operations may only be performed by persons who are familiar with the purpose, consequences and exact execution.

The user must not be impaired in any way, such as through drugs, alcohol and medication.

1.2 Intended use

alkitronic® torque multiplier are suitable for continuously rotating tightening and loosening of heavy screw connections. Any other use, e.g. as a stirring or drilling machine, can cause damage to the device and the operator. The torque multipliers must not be subjected to external mechanical forces that could lead to deformation. Other types of use not listed here require the approval of alki TECHNIK GmbH.

If you have questions about safety measures and areas of application, your *alkitronic*® Partner will be happy to help you.



Incorrect operation, improper use, operation by unqualified personnel can cause serious personal injury and property damage. The user is responsible to third parties in the work area.

2. Operation

Depending on the work environment and field of application for the *alkitronic*® torque multiplier, local regulations for the wearing of body protection (eg safety shoes, helmet, etc.) may apply.



Failure to comply with such regulations can result in serious bodily injury (e.g. crushing, head injuries from flying metal parts). When operating the *alkitronic*® torque multiplier wearing of hearing protection is mandatory. In continuous operation, the handle housing cools down greatly. Wearing gloves is therefore recommended.

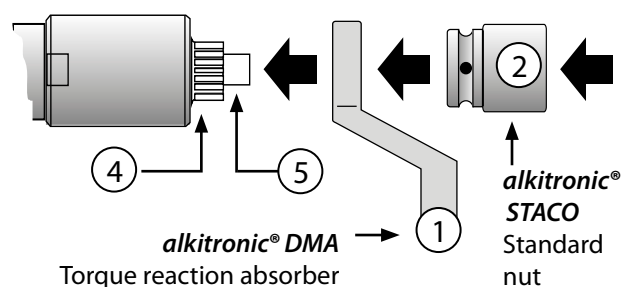
2.1 Commissioning

Depending on the field of application, standard nuts / connectors, special torque transducers or adapters are required for tightening and loosening screw connections (available as accessories). The standard nuts / connectors are attached to the output square and secured. Exchange see also Service, section 3.1.

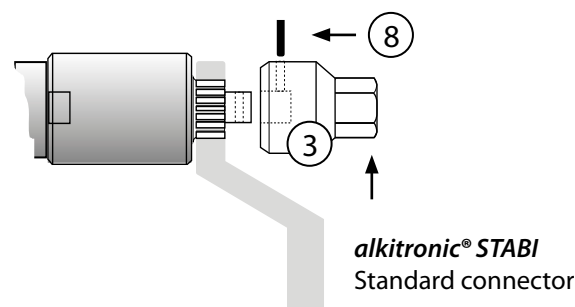
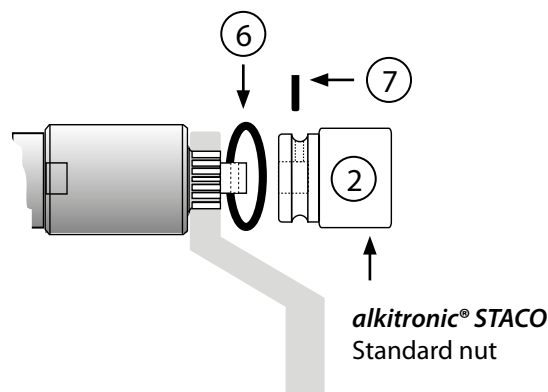
Before the compressed air is connected, the multiplier must be prepared for the process:

- Conducting a security check for correct fit of the adapter
- Check for possible damages of the DMA or adapter
- In case of damage, replace immediately - do not continue working. Only use original *alkitronic*® accessories or spare parts!

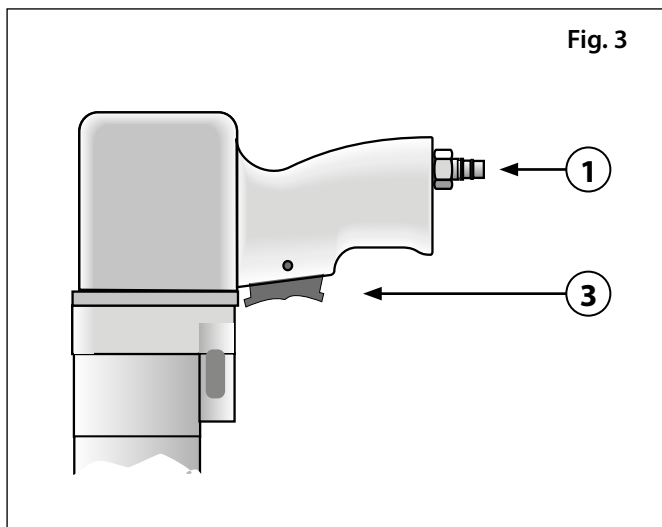
2.2 Preparing for use



- Place the *alkitronic*® PC multiplier on a flat surface
- Put support foot / DMA (1) on the gearing (4)
- Fix the standard nut / connector (2) / (3) to the square shaft (5)
- Insert locking pin (7), secure with rubber ring (6) or screw in the locking screw (8)



alkitronic® Pneumatic Torque Multiplier



2.5 Operation - Safety measures

The operation of (Fig. 3) Clockwise / counterclockwise rotation is set via the rocker switch (3) on the pistol grip. The compressed air is supplied through the coupling on the compressed air hose (1).



Before connecting the air hose, set the air pressure according to the machine type (see technical characteristic data sheet). For safety reasons the maximum operating pressure of approx. 7 bar must not be exceeded. The consequences are increased wear with loss of performance or even destruction of the motor.



Never improperly block the rocker switch (3) (Fig. 3). This will prevent the functions working properly. An uncontrollable pneumatic multiplier can cause physical injury and / or property damage.



Manipulating and/or interfering with the motor or the valves of the *alkitronic*® torque multiplier lead to a loss of warranty.



Be careful with high pressure components. Do not kink hose and check for damage before use. Damaged hoses or couplings must not be used. Defective hoses can burst and whip uncontrollably and cause injury.



The compressed air supplied must be clean and particle-free, without water and other residues. Dirt on the hose couplings or aggressive materials entering the engine via the compressed air hose can damage the blades.

2.6 Tightening and release - Safety measures



Due to a freely rotating DMA or rotating adapter, loose clothing, long hair, cables etc. should always be kept out of the danger / rotation area. When putting the device into operation, ear protection, safety shoes and goggles must be worn.



Never leave the *alkitronic*® torque multiplier unattended during operation and always be ready to switch it off. Maintain safety distance of one arm length. Never reach between the DMA and the support location. High risk of injury through crushing!



Always fit the standard nut / connector or other adapter completely onto the screw / nut. Improper connection can lead to fractures due to material overload, whereby splintering parts can cause physical injury or even life-threatening injuries.



Due to the air-oil mixture which escapes from the multiplier, a respirator mask must be worn, especially when working overhead or in confined spaces.



Due to the high strain of the *alkitronic*® pneumatic motors, it is necessary to ensure an adequate oil supply. Failure to do so may result in increased wear of the slats with loss of performance or even destruction of the motor.



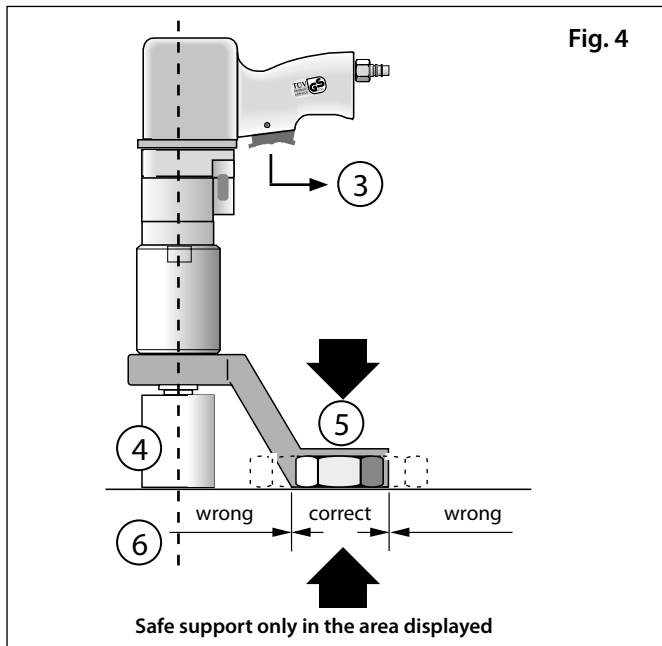
The use of a maintenance unit is strongly recommended in order to maintain a suitable oiled operating air (see also Service, section 3.3 Maintenance). 2-3 drops per min. is sufficient in continuous operation (see also section 4.1 Air lubrication).

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2.6.1 *alkitronic*® PC-S, PC-F, PC-F2



During operation, always hold the *alkitronic*® PC multiplier in the axial direction (6) towards the nut, otherwise this increases the risk of deformation / damage to the standard nut / connector (4) or the screw / nut which is to be loosened. Furthermore, a secure counter-support (5) is no longer guaranteed. (Fig. 4)



For the correct tightening and loosening of screw connections, the following steps are to be carried out (Fig. 4):

- *alkitronic*® PC with standard nut / connector (4), place fully on screw / nut
- The outrigger (DMA) of the *alkitronic*® PC must absorb the reaction moment at the height of the standard nut / connector (4)
- A secure, stable counter support (5) must be ensured
- Always hold the *alkitronic*® PC in axis (6) to the bolt during the process
- After pressing the rocker switch (3) for clockwise rotation, the motor stops when the desired torque is reached:
 - a) Counterforce = Motor power
 - b) Counter torque = Motor torque
 - c) Predetermined torque is reached



Do not retighten the nut. Because the preset torque is exceeded and it can lead to damage to the torque multiplier or to the screw / threaded bolt.

Place on next bolt/nut and start bolting process.

If the torque multiplier is not removable from the bolted joint (torsional forces caused):

- Release the torque multiplier by changing the direction of rotation
- Briefly press the rocker switch (3, Fig. 4) - **counter-clockwise rotation**. In the case of a bolted joint with a left-hand thread, the direction of rotation is clockwise, of course.

This leads to a "run free" of the reaction absorber DMA

For your information:

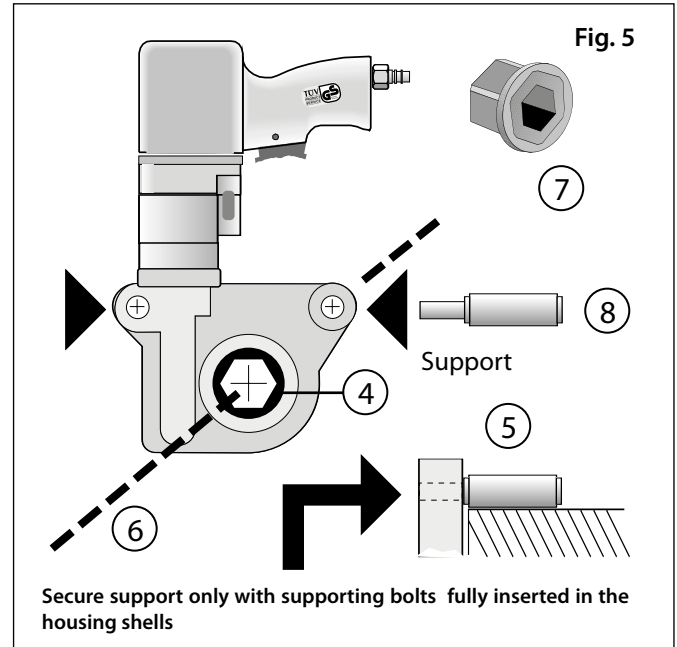
When loosening a bolted connection, up to 20% higher torque may be required (loosening torque)!

- Remove the machine, place on the next bolt / nut
- Repeat the tightening procedure

2.6.2 *alkitronic*® PC-R

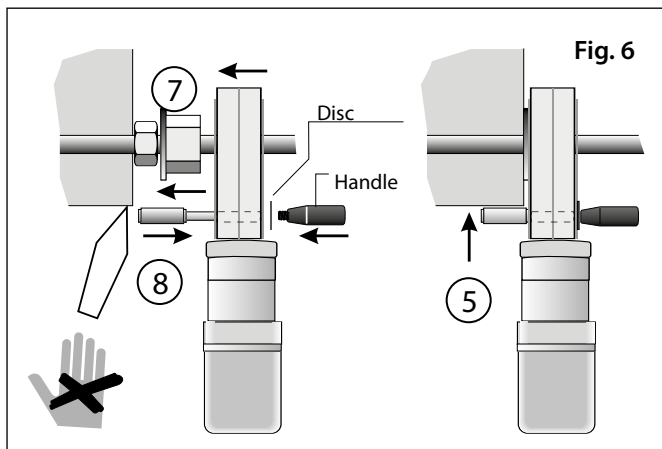


Insert the support pin (8) completely into the intended fixture(s) of the *alkitronic*® PC-R housing to prevent damage to the housing.



The tightening and loosening of bolt connections must be carried out in principle as with multipliers using an axial downforce. Due to the radial downforce of the *alkitronic*® PC-R however, the multiplier is to be operated at a 90 degree angle to the screw axis (6). The output occurs via a fixed wrench size (4). In order to reduce to smaller wrench sizes, *alkitronic*® STA (7) should be used. A support pin (8) is used as a torque transducer. A secure, stable counter support (5) must be ensured (Fig. 5). (See also application drawing Fig. 6.)

alkitronic® Pneumatic Torque Multiplier



2.7 Finishing or interrupting the work (even with change of accessories)

- Interrupt the air pressure in the machine
- Disconnect the compressed air supply to the maintenance unit or to the supply system
- By briefly switching on the machine, remove any residual air
- Decouple the compressed air hose on the machine

Beware of components exposed to high air pressure:



Unintentional operation of the *alkitronic*® torque multiplier may result in injury or property damage.



When removing the compressed air hose from the machine, always disconnect the air supply first. An out of control compressed air hose can cause injury or property damage.



In the event of prolonged periods without use, oil must be supplied to the engine via the compressed air inlet on the pistol grip. This prevents corrosion damage to the motor lamella (see section 3.3 Maintenance and 4.1 Air lubrication).

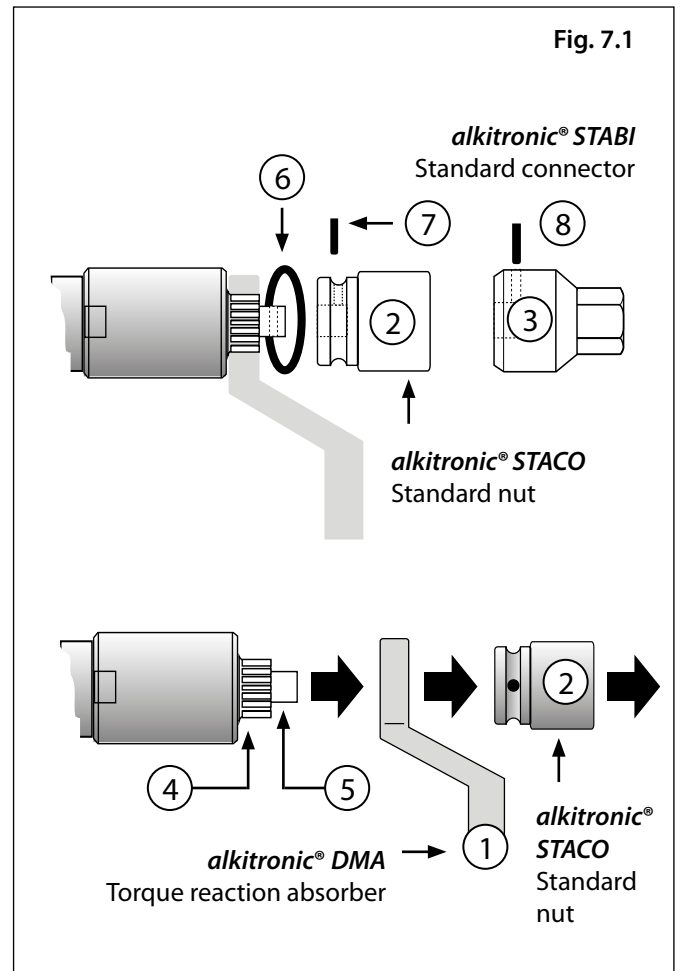
3. Service



Do not use damaged *alkitronic*® torque multipliers and accessories. Only use original *alkitronic*® spare parts / accessories.

3.1 Changing from standard nut, standard connector and DMA (PC-S, PC-F, PC-F2)

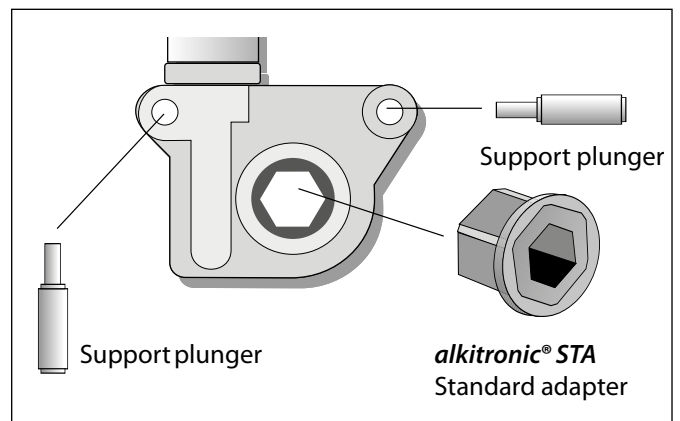
- Interrupt compressed air supply - uncouple the compressed air hose at the machine
- Place the *alkitronic*® PC on a flat surface
- Remove rubber ring (6) and locking pin (7) or locking screw (8)
- Remove standard nut / connector (2) / (3) towards the front (Fig. 7.1)
- Pull DMA (1) out of the gearing (4) towards the front (Fig. 7.1)
- Assembly is in reverse order



3.2 Changing the *alkitronic*® STA (Standard adapter) and the support plunger for type PC-R



Always insert the support pin and / or standard adapter completely, otherwise the housing can be severely damaged during operation.



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3.3 Maintenance



The *alkitronic*® torque multipliers are extremely powerful, robust products. To ensure durability and performance over many years, regular maintenance is required (performance check, engine check, safety check).

Maintenance periods: Regularly 1x per year or after max. 1000 hours of operation if used properly.

alkitronic® multipliers should only be shipped to your *alkitronic*® Partner or to alki TECHNIK GmbH in the original packaging to avoid damage.

In the event of prolonged periods without operation, the motor of the *alkitronic*® multiplier must be supplied with oil via the connector (1) of the compressed air supply at the pistol grip (Fig. 8). This prevents corrosion damage to the motor lamella (see Section 4.1, Air lubrication).

Protect the compressed air supply on the multiplier with a protective cap to prevent dirt from entering.

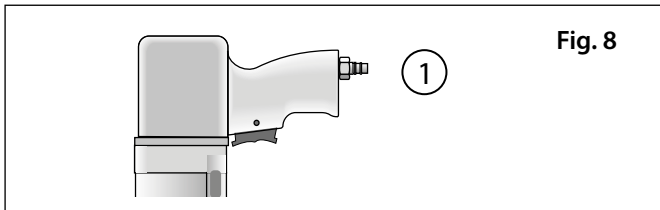


Fig. 8

4. Technical details

4.1 Air lubrication

Brand/Type	Aral /Vitam DE 10
Properties:	Resin and acid-free, moisture-binding, high corrosion- and wear protection
Specification / Use:	SAE 10W Oil viscosity 40°C: -10 cST, 2-3 drops per min. during continuous operation

(The manufacturer does not guarantee for other brands)

4.2 Noise emission and vibrations

The sound pressure level measured at maximum engine power exceeds 85 dB (A). The measurements were carried out in accordance with the noise measurement method DIN EN ISO 15744: 2008-11.

Vibration: There are no significant vibrations.

alkitronic® torque multipliers with lower sound pressure levels (<85 dB (A)) are available as special versions. When fitting with silencer elements, the torque characteristics must be corrected accordingly.

5. Declaration of conformity

alki Technik GmbH declares in sole responsibility: The *alkitronic*® pneumatic multipliers identified by types PC-F, PC-F2, PC-S, PV-F and serial numbers 913001 - 913699, built in 2019, complies with all relevant regulations such as directives / standards / safety regulations:

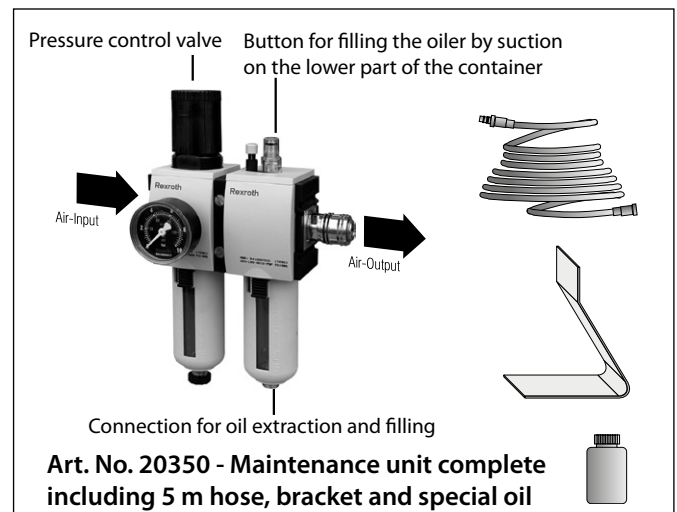
CE 2006/42/EG,
DIN EN ISO 12100:2011-03,
DIN EN ISO 4414:2011-04,
DIN EN ISO 13849-2:2013-02,
DIN EN ISO 11148 6:2013-05,
DIN EN ISO 15744:2008-11

January 2019
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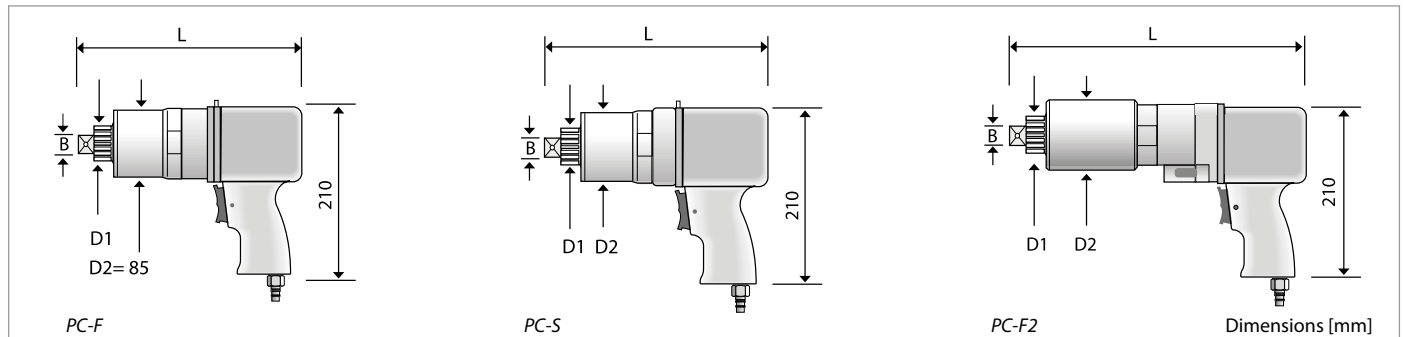
6. Maintenance unit

Regulator type	diaphragm pressure control valves
Controller function	with secondary venting
Pressure supply	on one side
Installation position	vertical
Ambient temperature	-10° C to +50° C/14° F to +122° F
Operating pressure min./max.	1.5 bar (21.75 PSI) / 16 bar (232 PSI)
Control range min./max.	0.5 bar (7.25 PSI) / 8 bar (116 PSI)
Filter element	exchangeable
Container volume Filter	49 cm ³ / 2.45 inch ³
Drain valve	semi-automatic, depressurised open
Filling type	manual oil filling semi-automatic oil filling during operation
Container volume Oiler	80 cm ³ / 4.9 inch ³



alkitronic® Pneumatic Torque Multiplier

7. Technical data



Models PC-F

Type		PC-F 15	PC-F 25	PC-F 35	PC-F 45	PC-F 75	PC-F 95	PC-F 135	PC-F 175	PC-F 255	PC-F 315
Torque range (approx.)*	Nm	75-225	95-280	135-390	165-485	305-895	365-1080	495-1450	645-1900	910-2670	1180-3460
	ft.lbs	55-165	70-205	100-290	120-360	225-660	270-795	365-1070	475-1400	670-1970	870-2555
Square drive	B	1/2" / 3/4"	1/2" / 3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"	1"	1"
Diameter (approx.)	D ₁	mm	41	41	41	41	41	54	54	54	54
Length (approx.)	L	mm	255	255	255	277	277	300	300	330	330
Weight without DMA (approx.)		kg	6	6	6	6	7	7	8	8,5	8,5
Idle speed		rpm	60	38	34	27	19	13	9	7	6

Models PC-S

Type		PC-S 85	PC-S 105	PC-S 125	PC-S 175	PC-S 225	PC-S 280	PC-S 380	PC-S 580	PC-S 780	PC-S 980
Torque range (approx.)*	Nm	305-895	365-1080	495-1450	645-1900	910-2670	1180-3460	1490-4380	2080-6115	2610-7675	3330-9795
	ft.lbs	225-660	270-795	365-1070	475-1400	670-1970	870-2555	1100-3230	1535-4510	1925-5665	2460-7225
Square drive	B	3/4"	3/4"	3/4"	1"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Diameter (approx.)	D ₁	mm	41	41	41	54	54	54	72	72	91
Diameter (approx.)	D ₂	mm	85	85	85	85	85	85	98	109	173
Length (approx.)	L	mm	275	275	275	300	300	300	320	350	370
Weight without DMA (approx.)		kg	7	7	7	7	8,5	8,5	10,5	13	25
Idle speed		rpm	19	13	9	7	5	4	3	2	1,5

Models PC-F2

Type		PC-F2/100	PC-F2/150	PC-F2/300	PC-F2/400	PC-F2/600	PC-F2/800	PC-F2/1000	PC-F2/3400	PC-F2/4800
Torque range 2nd gear (approx.)*	Nm	120-355	170-505	385-1130	540-1585	840-2470	1010-2965	1175-3455	3310-9720	4725-13890
	ft.lbs	90-260	125-375	285-835	400-1170	620-1820	745-2185	865-2550	2440-7170	3485-10245
Torque range 1st gear (approx.)*	Nm	380-1125	550-1615	1225-3595	1720-5055	2675-7865	3210-9435	3745-11010	11575-34025	16540-48610
	ft.lbs	280-830	405-1190	900-2650	1270-3730	1975-5800	2370-6960	2765-8120	8540-25100	12200-35855
Square drive	B	3/4"	1"	1"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	2 1/2"	2 1/2"
Diameter (approx.)	D ₁	mm	41	54	54	72	72	72	91	
Diameter (approx.)	D ₂	mm	85	85	85	98	109	133	173	
Length (approx.)	L	mm	330	330	360	380	410	410	430	
Weight without DMA (approx.)		kg	7	7,5	9	11	12	16	24	58
Idle speed 2nd gear		rpm	36	21	15	9	6	5	4	
Idle speed 1st gear		rpm	12	7	5	3	2	1,5	1	further details upon request

*) When loosening a bolted connection, up to 20% higher torque may be required (loosening torque). We will gladly advise you with details.

YOUR PLUS FOR MORE PERFORMANCE

Increased quality

Premium production
Highest quality materials
Long product life cycles
Since 1984 experience in bolting technology
Made in Germany – international patents

Increased precision

Precise, customer-specific torques
High repeatability
Reliability in permanent operation
Documentation of tightening results
Automatic shut-off

Increased productivity

Quicker tightening without reworking
No environmentally caused failures (IP54, ATEX)
High work safety
Easy to use: clear, simple instructions
Low maintenance and cost efficient

Better service

Technical advice on site
Training offers
Manufacturer's calibration and certification
Lifecycle support
Spare part and repair service

alki TECHNIK GmbH

Development, Production and Distribution of Bolting Systems

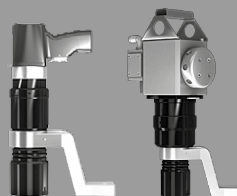
Unterlettenweg 4 – 85051 Ingolstadt/Germany – fon +49 841 97499-0 – fax +49 841 97499-90
info@alkitronic.com – www.alkitronic.com

EXTRACT FROM OUR PRODUCT RANGE



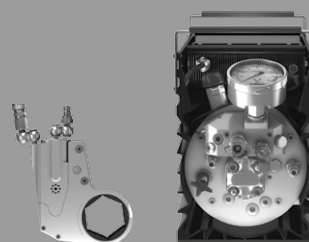
alkitronic XE-SERIES

THE ELECTRICS



alkitronic XP-SERIES

THE PNEUMATICS



alkitronic XH-SERIES

THE HYDRAULICS



alkitronic XM-SERIES

THE MANUALS