POWER MACS 4000

The winning advantage in tightening control
Every cycle can be a winning performance

State-of-the-art control and class-leading functionality; a good way to begin any fastening cycle, but it’s only the start. The new Atlas Copco Power MACS 4000 represents the pinnacle of automated fastening control and a new generation of upgradeable controller. Intuitive monitoring and communication capabilities combined with advanced management programs allow processes to be fine-tuned and productivity hurdles to be overcome. The Power MACS 4000 has been developed with one overriding goal in mind: To get your production line in the fast lane, and keep it there,
POWER MACS 4000 – THE TOTAL PRODUCTIVITY SOLUTION

Outstanding nutrunner speeds

New QST-nutrunner: Up to 67% faster than QMX nutrunners while delivering the same superior accuracy and durability.

Easy programming

The all-new ToolsTalk Power MACS. Allows easy programming of advanced, flexible tightening strategies via simple and intuitive menus.

DynaTork™ – Correct residual clamp force

Unique torque recovery strategy, patented by Atlas Copco. Delivers optimized fastening through improved clamp loading.

Designed for error-free setup

“Intelligent Chip” in QST spindle provides both spindle and calibration parameters to assure errorfree setup. Digitalcommunications extended cable length.

Modular plug-and-play

System requires no cabinet and therefore less space. Standardized components increase lifetime and reduce maintenance and spare parts costs.

Maximize uptime

Heavy duty controller design and nutrunners that are certified for accuracy to +/- 2.5 %. More than one million cycles between preventive maintenance; reduces maintenance and down time costs.
The new QST nutrunner is based on the proven success of its predecessors. The improvements result in a speed increase of up to 67%. The tightening controller automatically increases the bus voltage for the larger-size nutrunner QST80 and 90, without the need for a different controller or servo, giving unique speed capabilities for high-torque applications. A new, quick-coupling Hot Swap cable connector and electronic chip round up the package of improvements.

**INTRODUCING THE QST – A SMARTER SPINDEL**

- Delivers an accuracy of +/- 2.5% after one million cycles creating longer service intervals.
- Available with extended spring travel (76 and 100 mm) and/or extended socket holder length.
- Simple, easy-to-install sandwich/pilot mount allows flexible maintenance possibilities.
- Electronic chip stores data including calibration value, serial numbers and maintenance intervals – reducing costs and errors.
- Inertia braking – allows nutrunner to run faster without overshooting.
- New QST motor based on the proven QMX nutrunner – up to 67% improved speed characteristics.
- Hot Swap – replace cable or spindle without turning power off.
- Cable connector is adjustable in two directions for optimal cable management.
- New connector design – cable is fastened in just a couple of turns.
- Digital communication between nutrunner and TC – allows spindle calibration to be independent of cable length, reducing the need for a system calibration.
Nutrunners equipped with angle heads with or without spring travel.
GEARED FOR LEAN PRODUCTIVITY

Lean production requires decisions based on facts and the basis for all improvements is the ability to monitor the result of changes. Power MACS 4000 has effective tools to work with statistical process control to ensure that quality issues are identified long before they cause production problems. Connect your complete line to the Atlas Copco ToolsNet software portfolio to maximize the uptime of your production line.

Advanced networking, powerful communication

Power MACS 4000 supports a zero-fault production philosophy with its capacity to collect tightening data for analysis, continuous improvement and traceability. Power MACS processing power and memory are designed to handle and send a large amount of data without influencing the tightening process.

Reject Management

With the Power MACS 4000 you can easily define your tightening strategy based on results to make sure valuable time and resources are not wasted. Reject Management on board can easily be set to fulfill your requirements to handle faulty tightening in the most efficient way, regardless of whether a basic or advanced strategy is used.

Powerful, flexible tightening strategies

Power MACS 4000 library has a wealth of tested tightening strategies so now every joint can be tightened in the best possible way in terms of cycle time and quality. DynaTorkTM is Atlas Copco’s unique tightening strategy that provides optimized fastening of joints that present relaxation challenges.

Main switch box (MSB) and distribution box (DB)

The MSB and DB are used for power distribution and makes power management easy. They are designed for 400-480 VAC 3 ph and leave room for customer adaptations. The E-stop functionality can be upgraded from class 3 to class 4. Each MSB or DB supplies up to 6 controllers with power.

Indicor lamps
- ALL OK
- OK, NOK
- ALARM
- E-stop

Text display
- TC node address
- IP-address
- Error messages
- Software version
- Cycle data

Push buttons
- Toggle between displayed information
- Set IP-address

Reset E-stop button

One model provides the entire torque range

Ethernet switch
- 6 ports
- Internal Redundant E-stop relays
- Class 3
- Digital in/output, optoisolated (TC-4000-P only)
- 4 inputs, 4 outputs
- 24V for external use (TC-4000-P only)
- Anybus slot (TC-4000-P only)
- Fieldbus card
- Double ethernet ports (TC-4000-P only)
- Only 1 factory IP-address
- Internal Ethernet connected to switch interface
- TC communication LAN
- Separated from factory WAN. Eliminates multicasting.

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**POWER MACS 4000 CONTROLLERS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Fieldbus version</th>
<th>Ordering No.</th>
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<tbody>
<tr>
<td>Primary controller</td>
<td></td>
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<tr>
<td>TC-4000-P-ES</td>
<td>No Fieldbus</td>
<td>8435 6511 00</td>
</tr>
<tr>
<td>TC-4000-P-PB-ES</td>
<td>Profibus</td>
<td>8435 6511 10</td>
</tr>
<tr>
<td>TC-4000-P-DN-ES</td>
<td>DeviceNet</td>
<td>8435 6511 30</td>
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<tr>
<td>TC-4000-P-EP-ES</td>
<td>Ethernet IP</td>
<td>8435 6511 60</td>
</tr>
<tr>
<td>TC-4000-P-MTCP-ES</td>
<td>ModBus TCP</td>
<td>8435 6511 70</td>
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<tr>
<td>TC-4000-P-PK-ES</td>
<td>Profi Net</td>
<td>8435 6511 50</td>
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<tr>
<td>TC-4000-P-CC-ES</td>
<td>CC link</td>
<td>8435 6511 80</td>
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<tr>
<td>Secondary controller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC-4000-S-ES</td>
<td>No Fieldbus, no Ethernet switch</td>
<td>8435 6508 00</td>
</tr>
<tr>
<td>TC-4000-S-ES</td>
<td>No Fieldbus, Ethernet switch</td>
<td>8435 6501 00</td>
</tr>
</tbody>
</table>

**Back plates**

<table>
<thead>
<tr>
<th>Model</th>
<th>Ordering No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back plate with 6 port Ethernet switch</td>
<td>4222 0982 90</td>
</tr>
<tr>
<td>Back plate no Ethernet switch</td>
<td>4222 0982 91</td>
</tr>
<tr>
<td>6 port Ethernet switch</td>
<td>4222 0984 90</td>
</tr>
</tbody>
</table>

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**Main switch box (MSB) and distribution box (DB)**

The tool key to the right explains the significance of the letters/numbers forming the name of the tool model.
Tool and extension cable

New, slimmer 12 mm cable offers increased durability and flexibility.

Compatible cables – Use same cable for extensions and double torque/angle transducer QST.

Single cable solution – Power and communication bus cables are combined.

Position marking on cable and connector

Alignment markers on the cable connector and spindle connector guide you to a quick and easy cable installation in those hard to reach locations.

Digital communication channel allows longer cable lengths.

Power cables 4222 1248 xx
E-Stop cable 4222 1247 xx
Motor cable 4222 3799 xx

Ethernet cable 4222 1246 xx

Channel allows longer cable lengths.

ETHERNET CABLES
E-STOP CABLES AND TERMINATION

Length  Ordering No.
0.5 m  4222 1246 00
1 m  4222 1246 01
2 m  4222 1246 02
3 m  4222 1246 03
5 m  4222 1246 05
10 m  4222 1246 10
15 m  4222 1246 15

E-STOP CABLES AND TERMINATION
Components  Length  Ordering No.
E-stop cable 3000 mm  4222 1247 30
E-stop termination  4222 0755 00

POWER CABLES BETWEEN MSB AND TC
Suitable for  Length  Ordering No.
TC1-TC2, TC7-TC8, TC13-TC14  1350 mm  4222 1248 13
TC3-TC4, TC9-TC10, TC15-TC16  1650 mm  4222 1248 16
TC5-TC6, TC11-TC12, TC17-TC18  1950 mm  4222 1248 19
For longer distances
5 m  4222 1248 50
10 m  4222 1248 10
15 m  4222 1248 15
20 m  4222 1248 20

TOOL AND EXTENSION CABLES
Length  Ordering No.
2 m  4220 3799 02
3 m  4220 3799 03
5 m  4220 3799 05
7 m  4220 3799 07
9 m  4220 3799 10
10 m  4220 3799 15
15 m  4220 3799 30
20 m  4220 3799 35
25 m  4220 3799 40

ETHERNET CABLES
System
Power input
Fieldbus
Incoming E-stop
Factory network (1 IP)

With the PowerMACS 4000 controller, multiple-spindle systems are easy to configure. Simply refer to the system ordering table to see which components you need.

SYSTEM ORDERING TABLE FOR A SYSTEM WITH ONE STATION

SYSTEM CABLE KIT

* Based on Atlas Copco suggested set-up.

Easy-to-build system

Cable between MSB or DB and TC
Ethernet cable
E-stop component

Every TC-P comes with an e-stop termination.
Software ToolsTalk Power MACS World Release 10

Choose Basic or Advanced mode – view only the functions you need.

Drag and drop interface – save time with intuitive user interface.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Ordering No.</th>
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</thead>
<tbody>
<tr>
<td>1 user</td>
<td>English</td>
</tr>
<tr>
<td>5 user</td>
<td>English</td>
</tr>
<tr>
<td>10 user</td>
<td>English</td>
</tr>
<tr>
<td>Plant license</td>
<td>English</td>
</tr>
<tr>
<td>1 user</td>
<td>German</td>
</tr>
<tr>
<td>5 user</td>
<td>German</td>
</tr>
<tr>
<td>10 user</td>
<td>German</td>
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<tr>
<td>Plant license</td>
<td>German</td>
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<tr>
<td>1 user</td>
<td>French</td>
</tr>
<tr>
<td>5 user</td>
<td>French</td>
</tr>
<tr>
<td>10 user</td>
<td>French</td>
</tr>
<tr>
<td>Plant license</td>
<td>French</td>
</tr>
</tbody>
</table>

Quick-set variable – trim your process in seconds.

MiniDisplay
8435 3070 00 (software included)

Stacklight
8433 0570 13

Indicator box
8435 3010 03

Touch-screen interface for program selection. Configure input and view cycle data and traces.

Stacklight – gives continuous station feedback on the tightening process.

Indicator box – direct operator feedback on the tightening process.

Com Node 2
8433 2711 10 (touch screen)
8433 2711 00

I/O expander
8433 0564 45

Operator panel
8433 0565 00 (advanced)
8433 0565 10 (basic)

Can act as station PC to run ToolTalk Power MACS.

Provides an additional eight digital inputs and outputs.

With command buttons and integrated lamp for operator feedback. Allows the manual selection of program via selector switch.

Accessory cables
Ordering No.
I/O bus cable 0.5 m 4222 0917 00
1 m 4222 0917 01
3 m 4222 0917 03
5 m 4222 0917 05
10 m 4222 0917 10
15 m 4222 0917 15
I/O Termination plug 4222 0443 00

Indicator box cable
Ordering No.
Indicator box 8435 3010 04
Indicator box cable to PM4K, 1 m 4243 0278 80
Open end cable 5 m 4243 0281 05
Extension cable 3 m 4243 0282 03
5 m 4243 0282 05
10 m 4243 0282 10
15 m 4243 0282 15
20 m 4243 0282 20
25 m 4243 0282 25

All above accessories and I/O bus cables are the same as for Power Focus.
PROVEN, PRODUCTION-LINE PERFORMANCE

ZF AG, Germany

ZF AG is a world leader in driveline and chassis technology. Their customers include the world’s leading automotive manufacturers. They have always used the most modern, productive equipment in their production processes; a fact that makes the results of their experience with the new Power MACS 4000, all the more impressive.

The Power MACS controller eliminates the need of a torque wrench check, reducing cycle times by up to 50%.

The result? An annual saving of several thousand Euro – from just one component assembly process.

Guiseppe de Giacomo, operator, ZF: “Super! Much easier to operate than before, I cannot make any errors with this system!”

Thomas Weissenrieder, Process Engineer, ZF Friedrichshafen:

“The assembly of this component is now faster and safer than before. The Power MACS 4000 is the first system to fulfill the quality demands.”

SERVICE

ToolScan RCM

RCM (Reliability Centered Maintenance) is a widely used process to optimize your overall service. Together we analyse your existing service program and how it can be optimize based on each application together with your operating cost for a failed spindle in your production. A wrong working spindle in the production can have costly impacts all the way to the end-user.

Full Coverage Agreement

Our Full Coverage Service is exactly what it states, a complete tailored maintenance solution with a fixed annual cost. It consists of different standard service modules that secure the needs and availability of your equipment. The service is available in combination with newly purchased equipment as well as for your existing spindles after a review check. It provides much more coverage than the standard warranty i.e. covers as well all unplanned repairs providing the equipment has not been misused. No nasty surprises of costly repairs throughout the contracted period.

Preventive Maintenance Agreement

The Preventive Maintenance Service is our standard recommended maintenance program. Maintenance work is carried out either on your premises or in our central area of all planning and data storage during the agreement.

Calibration Services

On the assembly line, you need to be certain about the performance of your spindles and equipment. The spindles have to be calibrated at regular intervals. These services keep your spindles and torque measurement equipment calibrated for optimum performance. Atlas Copco offers a complete range of calibration services for all your spindles and equipment. Most Atlas Copco Service Centers are today ISO 9000 Certified or accredited.

Training

We offer an established program of training courses and workshops to guarantee optimized use of your equipment. These training can be held either on your own premises or in our Training Centre.

ToolStart

We offer tool installation and start-up by qualified Atlas Copco engineers at a fixed price. The service also includes: programming, test running and operator training.

For more information about above services, please contact your Atlas Copco representative.
COMMITTED TO SUSTAINABLE PRODUCTIVITY

www.atlascopco.com