



POWER MACS 4000

The winning advantage
in tightening control

Atlas Copco

THE RACE FOR LEAN PRODUCTION IS OVER

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,



**Total
control**

**Absolute
flexibility**

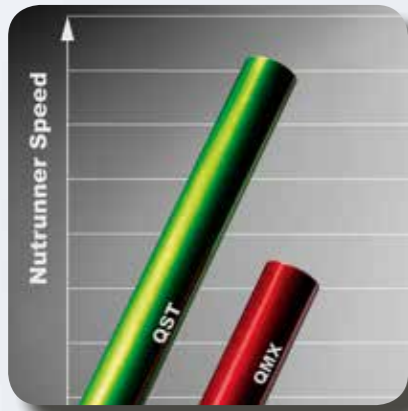
**Easy
programming**

**Uncompromised
reliability**



POWER MACS 4000 – THE TOTAL PRODUCTIVITY SOLUTION

Outstanding nutrunner speeds



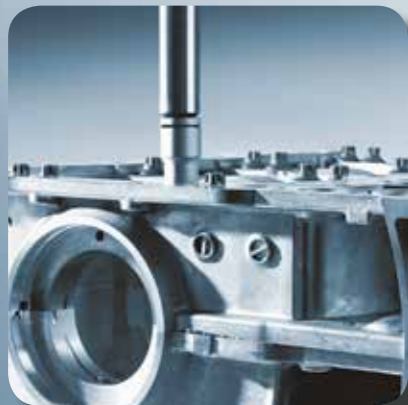
New QST-nutrunner:
Up to 67% faster than
QMX nutrunners while
delivering the same
superior accuracy and
durability.

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



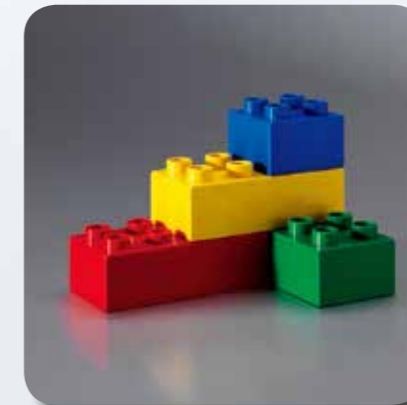
Unique torque
recovery strategy,
patented by
Atlas Copco.
Delivers optimized
fastening through
improved clamp
loading.

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

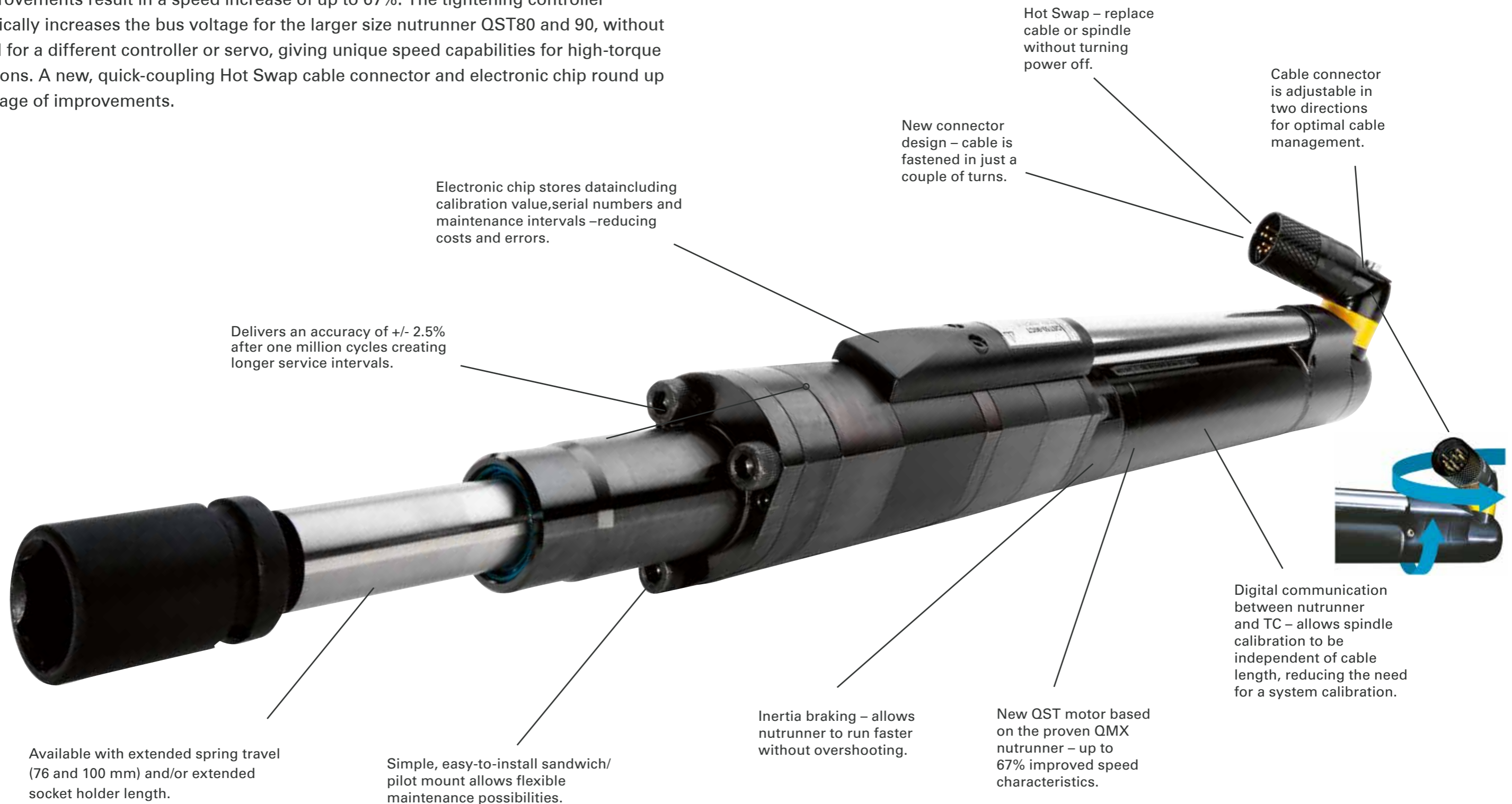


Heavy duty controller design
and nutrunners that are
certified for accuracy to +/- 2.5 %.
More than one million cycles
between preventive
maintenance; reduces
maintenance and down time
costs.

INTRODUCING THE QST – A SMARTER SPINDEL

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.



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.

Indicator lamps

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

Text display

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

Push buttons

- Toogle between displayed information
- Set IP-address

Reset E-stop button

(TC-4000-P only)

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.

Primary and secondary controller



Primary Controller (TC-P)

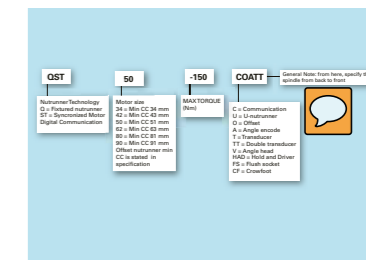


Secondary Controller (TC-S)

Back plates



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



POWER MACS 4000 CONTROLLERS

Model	Fieldbus version	Ordering No.
Primary controller		
TC-4000-P-ES	No Fieldbus	8435 6511 00
TC-4000-P-PB-ES	Profibus	8435 6511 10
TC-4000-P-DN-ES	DeviceNet	8435 6511 30
TC-4000-P-EIP-ES	Ethernet IP	8435 6511 60
TC-4000-P-MTCP-ES	ModBus TCP	8435 6511 70
TC-4000-P-PN-ES	Profi Net	8435 6511 50
TC-4000-P-CC-ES	CC link	8435 6511 80
Secondary controller		
TC-4000-S	No fieldbus, No Ethernet switch	8435 6500 00
TC-4000-S-ES	No fieldbus, Ethernet switch	8435 6501 00

Back plates*

Model	Ordering No.
Back plate with 6 port Ethernet switch	4222 0982 90
Back plate no Ethernet switch	4222 0982 91
6 port Ethernet switch	4222 0984 90

Model	Ordering No.
MSB	
Main switch box (Max 6 channels)	8435 5660 00
DB	
Distribution box (Max 6 channels) + Power cable 1800 mm	8435 6560 50
GB	
General box	4222 1249 85

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 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. DynaTork™ is Atlas Copco's unique tightening strategy that provides optimized fastening of joints that present relaxation challenges.



Main Switch Box (MSB)



Distribution Box (DB)

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.

Tool and extension cable

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

Digital communication channel allows longer cable lengths.

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.

Alignment markers



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 1370 10
	15 m	4222 1370 15
	20 m	4222 1370 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
10 m	4220 3799 10
15 m	4220 3799 15
20 m	4220 3799 20
25 m	4220 3799 25
30 m	4220 3799 30
35 m	4220 3799 35
40 m	4220 3799 40

ETHERNET CABLES

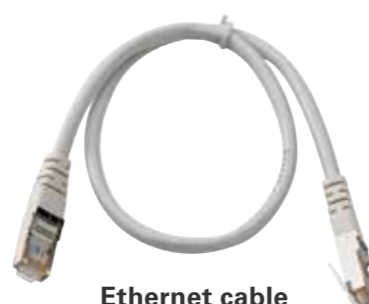
Length	Ordering No.
0.5 m	4222 1246 00
1 m	4222 1246 01
2 m	4222 1246 02
3 m	4222 1246 03
5 m	4222 1246 05
10 m	4222 1246 10
15 m	4222 1246 15

E-STOP CABLES AND TERMINATION

Components	Length	Ordering No.
E-stop cable	1200 mm	4222 1247 12
E-stop cable	3000 mm	4222 1247 30
E-stop termination		4222 0755 00



Cable between MSB or DB and TC



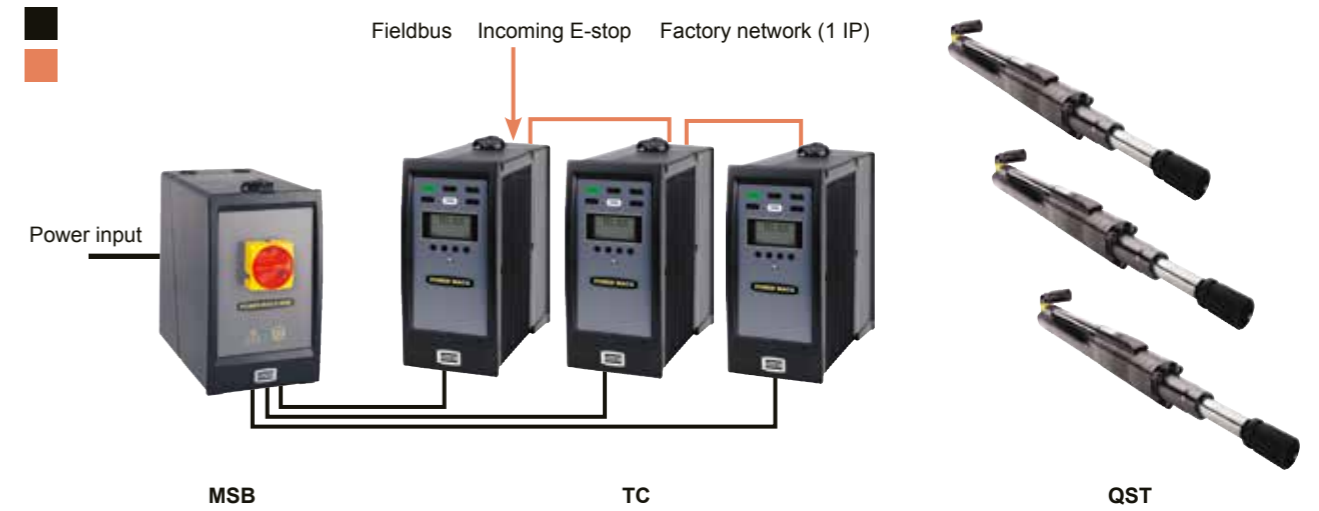
Ethernet cable



E-stop component
Every TC-P comes with an e-stop termination.

Easy-to-build system

Power cables	4222 1248 xx	Ethernet cable	4222 1246 xx
E-Stop cable	4222 1247 xx	Motor cable	4220 3799 xx



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

No. of spindles	Number of					tool cables	System cable kit ^a	No. of spindles	Number of					tool cables	System cable kit ^a
	TC-P	TC-S	MSB	DB					TC-P	TC-S	MSB	DB			
1	1	0	1	0		1	1	10	1	9	1	1	10	1	
2	1	1	1	0		2	1	11	1	10	1	1	11	1	
3	1	2	1	0		3	1	12	1	11	1	1	12	1	
4	1	3	1	0		4	1	13	1	12	1	2	13	1	
5	1	4	1	0		5	1	14	1	13	1	2	14	1	
6	1	5	1	0		6	1	15	1	14	1	2	15	1	
7	1	6	1	1		7	1	16	1	15	1	2	16	1	
8	1	7	1	1		8	1	17	1	16	1	2	17	1	
9	1	8	1	1		9	1	18	1	17	1	2	18	1	

^a See system cable kits below.

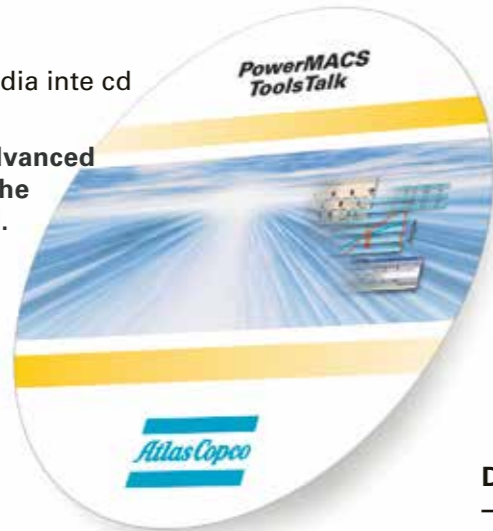
SYSTEM CABLE KIT

No. of spindles	Power cable			Ethernet cable			E-stop cable		Ethernet switch incl. Backplate 4222 0982 90	Ordering No. ^b
	1350 mm 4222 1248 13	1650 mm 4222 1248 16	1950 mm 4222 1248 19	1 m 4222 1246 01	2 m 4222 1246 02	3 m 4222 1246 03	1200 mm 4222 1247 12	3000 mm 4222 1247 30		
1	1	-	-	-	-	-	-	-	-	8435 6560 01
2	2	-	-	1	-	-	1	-	-	8435 6560 02
3	2	1	-	1	1	-	1	1	-	8435 6560 03
4	2	2	-	1	2	-	2	1	-	8435 6560 04
5	2	2	1	1	3	-	3	1	-	8435 6560 05
6	2	2	2	4	1	-	4	1	1	8435 6560 06
7	4	3	-	5	1	-	5	1	1	8435 6560 07
8	4	4	-	6	1	-	6	1	1	8435 6560 08
9	4	3	2	4	1	3	7	1	1	8435 6560 09
10	4	4	2	5	1	3	8	1	2	8435 6560 10
11	4	4	3	6	1	3	9	1	2	8435 6560 11
12	4	4	4	7	1	3	10	1	2	8435 6560 12
13	5	4	4	7	1	4	10	2	2	8435 6560 13
14	6	4	4	8	1	4	11	2	3	8435 6560 14
15	6	5	4	9	1	4	12	2	3	8435 6560 15
16	6	6	4	10	1	4	13	2	3	8435 6560 16
17	6	6	5	10	2	4	14	2	3	8435 6560 17
18	6	6	6	11	2	4	15	2	4	8435 6560 18

^b Based on Atlas Copco suggested set-up.

STANDARDIZED MODULAR SOLUTIONS

annat media inte cd



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

Quick-set variable – trim your process in seconds.

	Designation	Ordering No.
1 user	English	8092 1308 01
5 user	English	8092 1308 05
10 user	English	8092 1308 10
Plant license	English	8092 1308 97
1 user	German	8092 1308 11
5 user	German	8092 1308 15
10 user	German	8092 1308 20
Plant license	German	8092 1308 98
1 user	French	8092 1308 21
5 user	French	8092 1308 25
10 user	French	8092 1308 30
Plant license	French	8092 1308 99

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

MiniDisplay

8435 3070 00 (software included)



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

Stacklight

8433 0570 13



Stacklight – gives continuous station feedback on the tightening process.

Indicator box

8435 3010 03



Indicator box – direct operator feedback on the tightening process.

Com Node 2

8433 2711 10 (touch screen)
8433 2711 00



Can act as station PC to run ToolTalk Power MACS.

I/O expander

8433 0564 45



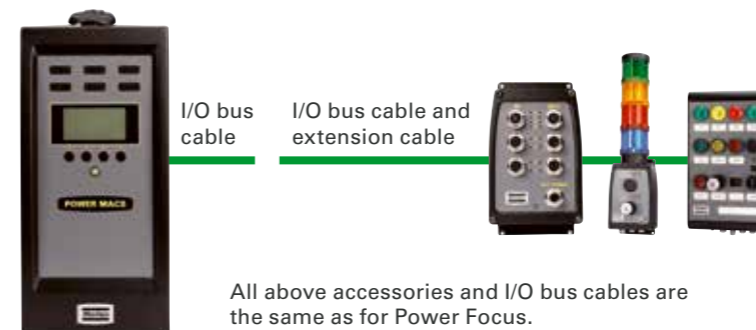
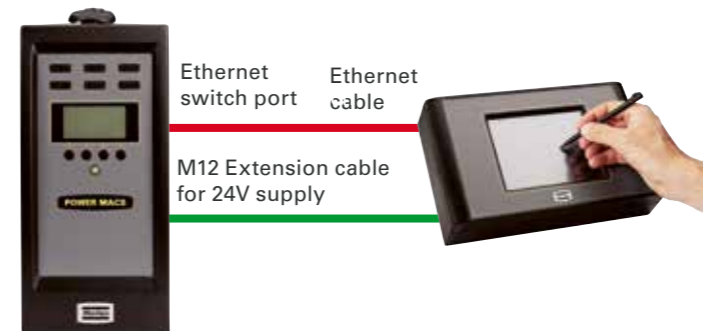
Provides an additional eight digital inputs and outputs.

Operator panel

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



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



All above accessories and I/O bus cables are the same as for Power Focus.

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 for Power Macs 4000	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



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.



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."

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



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 optimized 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.

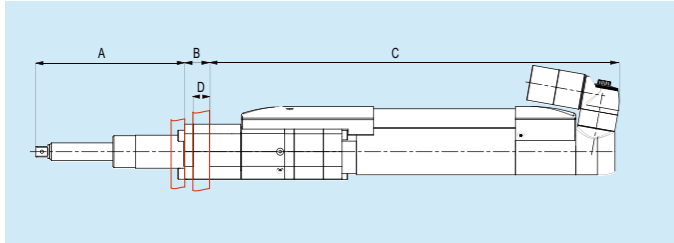
ToolStart

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.

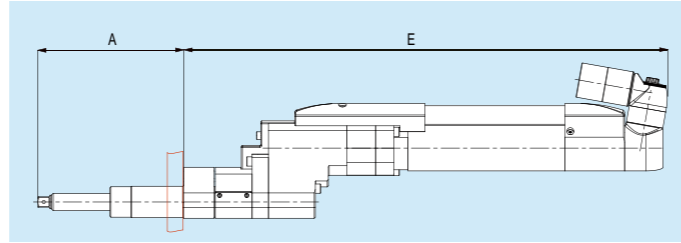
For more information about above services, please contact your Atlas Copco representative.



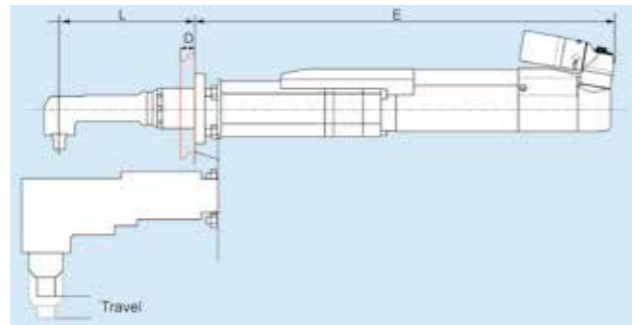
QST – CT, CTT & CATT nutrunner



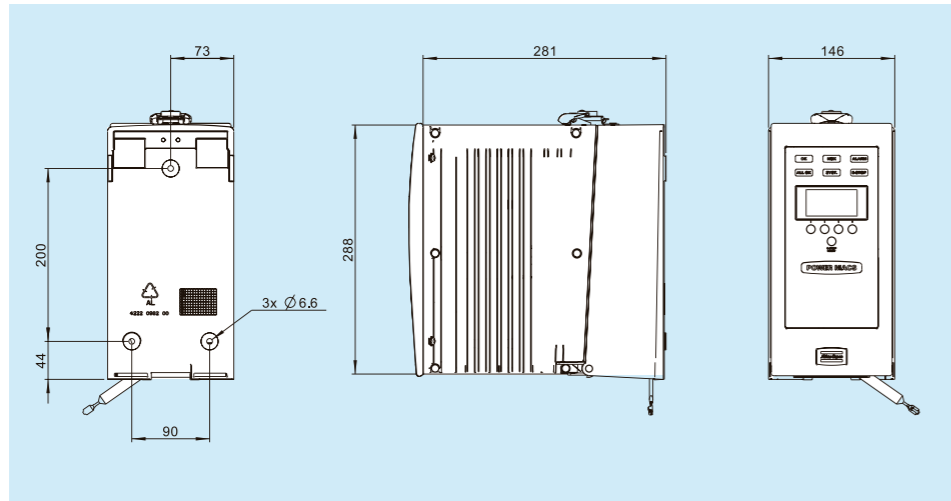
QST – COT & COTT nutrunner



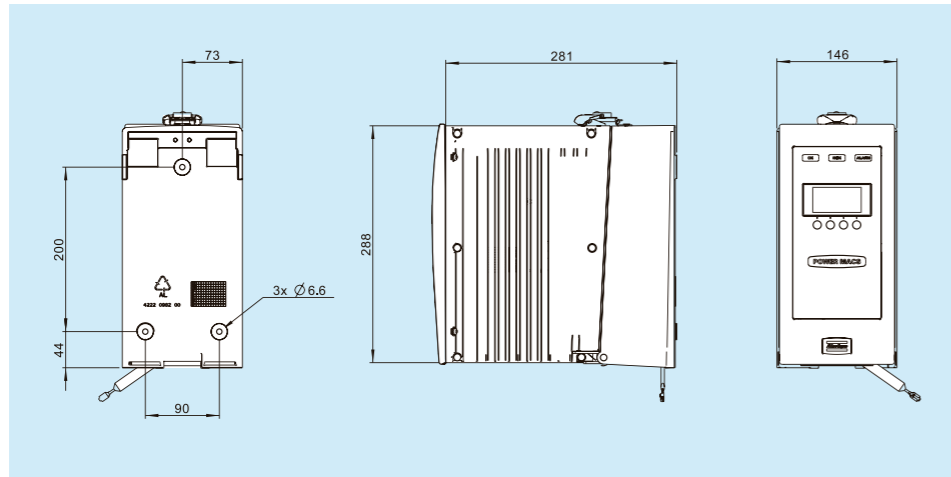
QST - CTV nutrunner



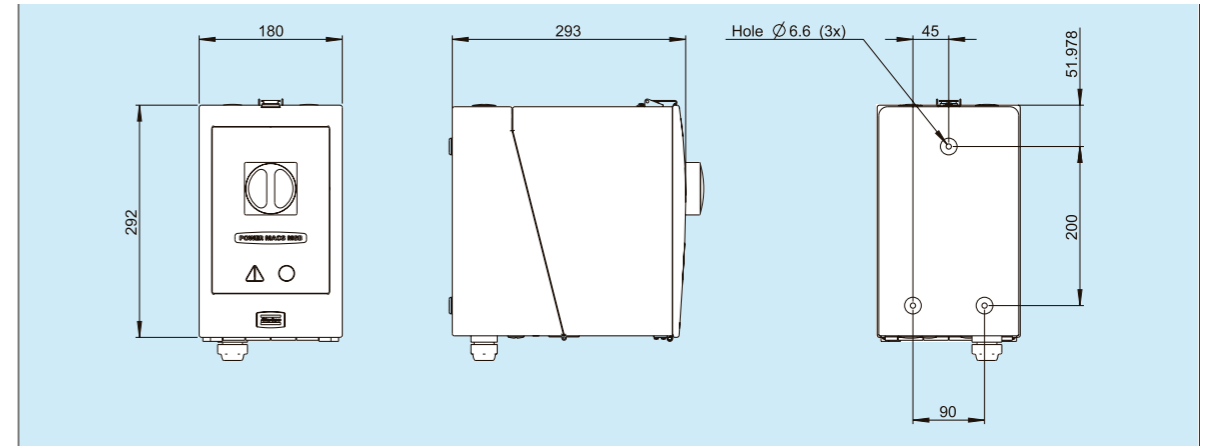
Power MACS 4000 Primary TC



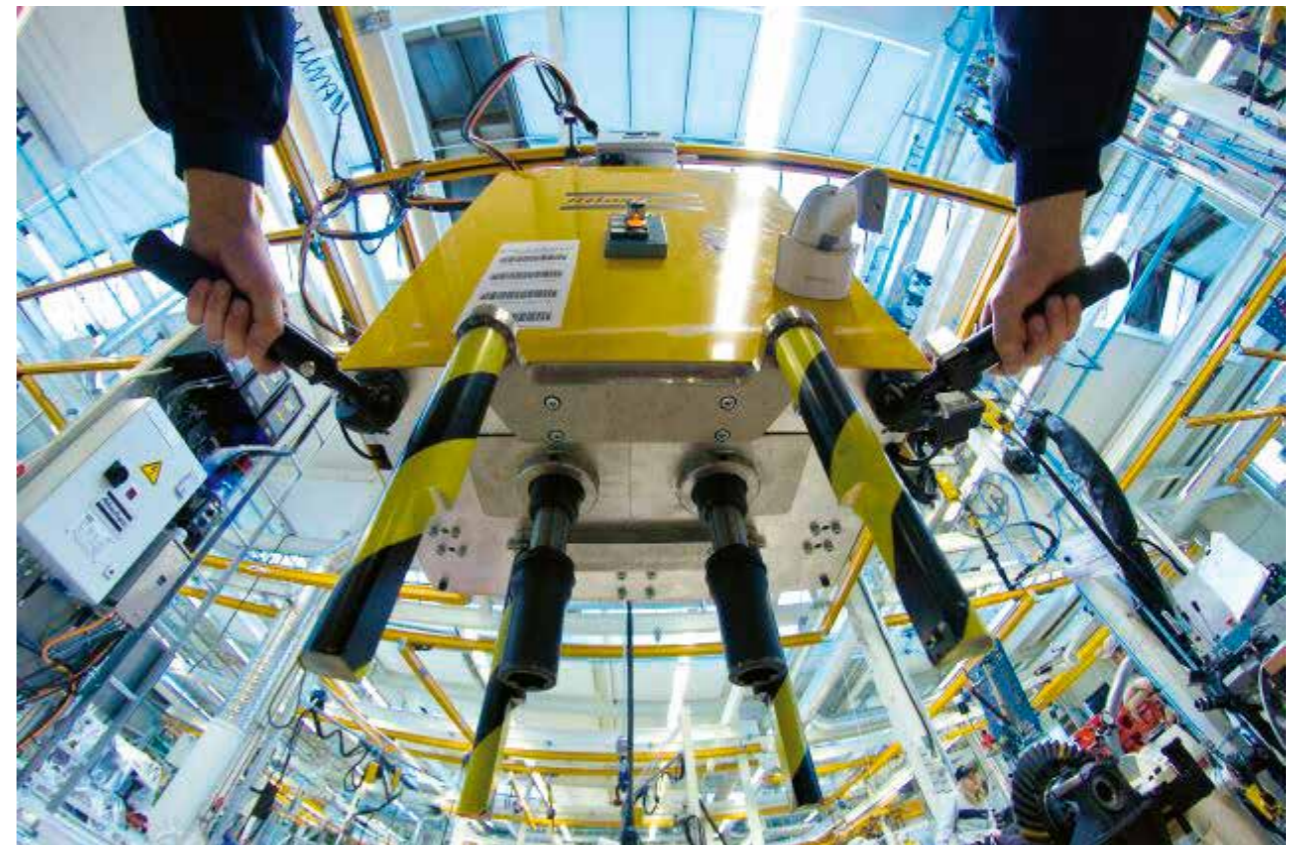
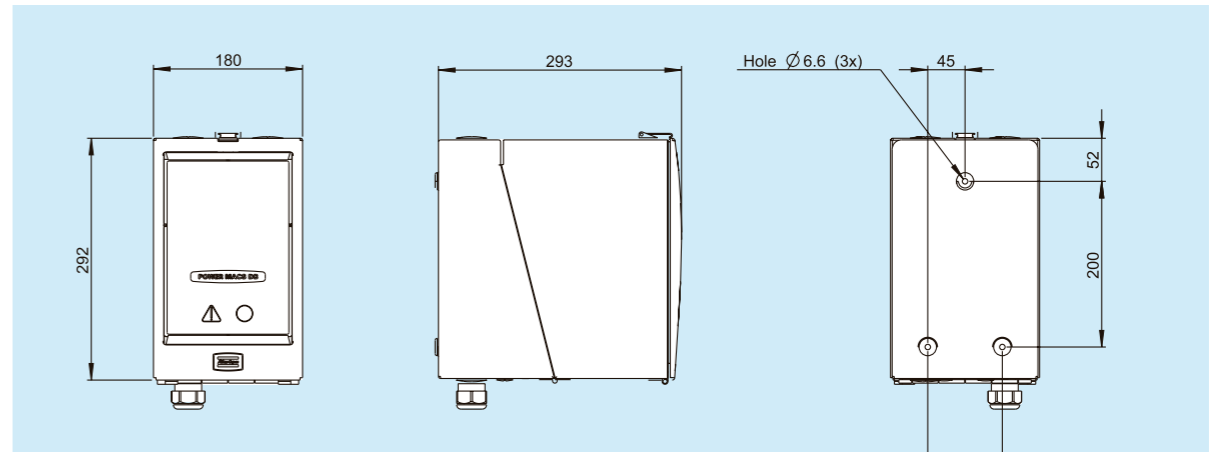
Power MACS 4000 Secondary TC



Main switch box



Distribution box





COMMITTED TO SUSTAINABLE PRODUCTIVITY

www.atlascopco.com

