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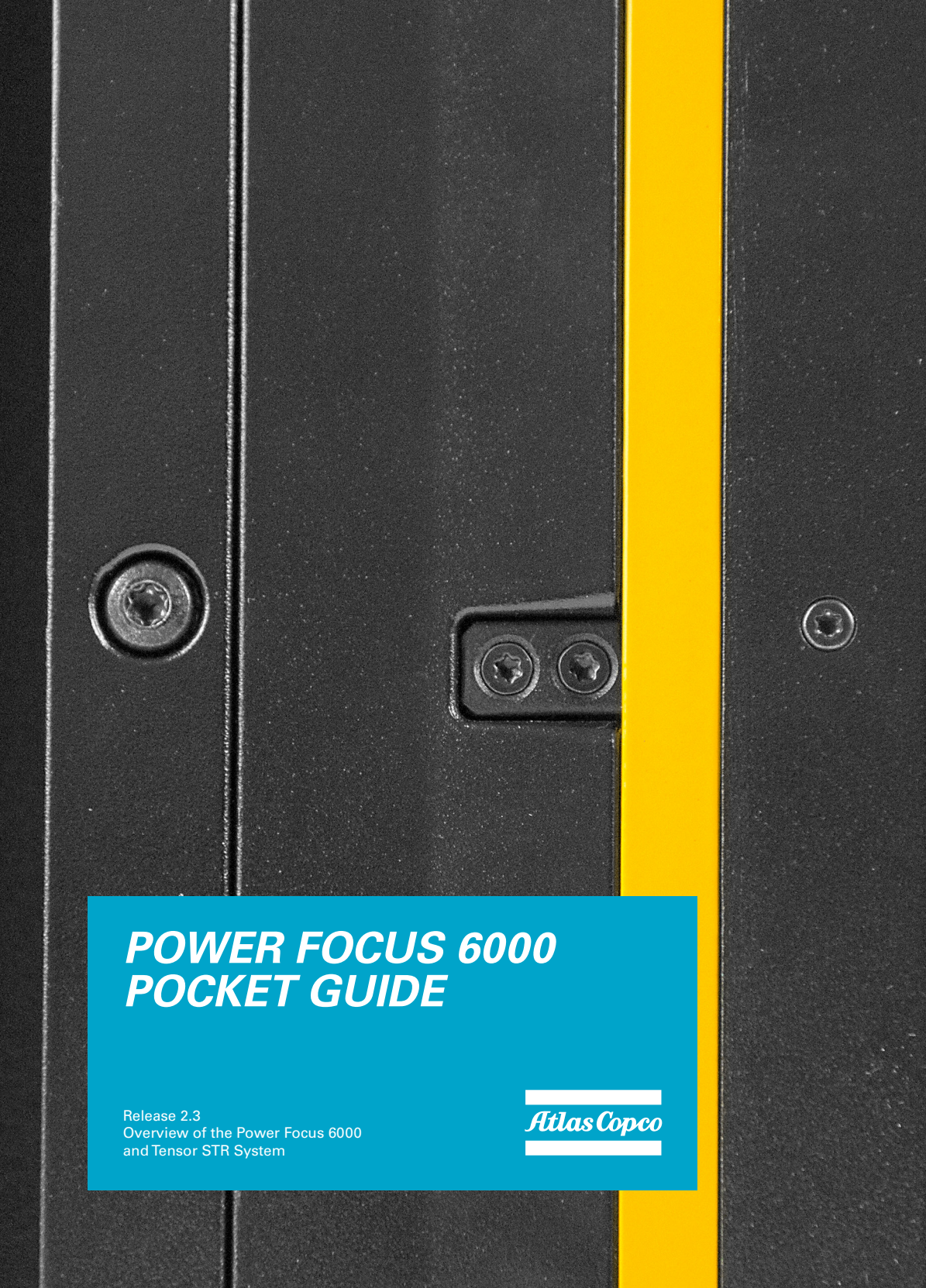
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POWER FOCUS 6000 POCKET GUIDE

Release 2.3
Overview of the Power Focus 6000
and Tensor STR System

Atlas Copco

CONTENTS

SYSTEM OVERVIEW 6
- Power Focus 6000 Controller 6
- Intelligent Application Module (IAM) 7
- Tensor STR Cable 7
- Accessories And Communication Interfaces 8

POWER FOCUS 6000 HARDWARE 9
- Power 9
- Line voltage 9
- Normal Environmental Conditions 9
- Size and Weight 9
- Display 9
- Communication 10
- Audio 10
- Connections 10
- IAM 11

POWER FOCUS 6000 SOFTWARE 12
- Menu Overview 12
- Tightening Menu 12
- Batch Sequence Menu 12
- Sources Menu 12
- Tool Menu 12
- Virtual Station Menu 13
- Controller Menu 13
- Accessories Menu 13
- Reports Menu 13
- Settings Menu 13
- Basic Programming 14
- Open Protocol 15

FUNCTIONALITY MANAGEMENT SYSTEM 16
Introduction 16
Main benefits 16
Order and distribute licenses to customer portal 17
Distribution from customer portal 17
FMS Server based 18
FMS USB device/non network based 19

TIGHTENING STRATEGIES 20
Turbo Tight® Tightening Strategy 20
Fine-tuning the Turbo Tight® Tightening strategy 20
Reduced cycle times 20
Reduced reaction force 21
Easy set-up 21
Sustainability 22
How are cycle times reduced? 22
How is reaction force reduced? 22
How come set-up is so easy? 22
How does Turbo Tight® provide energy savings? 22
Two Step Tightening Strategy 23
Fine-tuning the Two Step Tightening strategy 23
Quick Step Tightening Strategy 24
Three Step Tightening Strategy 25
Rotate Strategy 26
Target Torque Limits 26
Target Angle Limits 27
Stop Stage 28
Soft Stop 29

CONTENTS

VIRTUAL STATIONS 30
- Introduction 30
- Setting up a Virtual Station 31
- Key Benefits 31

STR TOOL 32
- Overview 32
- Models 33
- Tool Modules 33
  - Handle module 33
  - HMI 33
  - Motor 34
  - Torque transducer 34
  - Gears and Angle head 34
  - ETT front part 34
- Accessories (attached to the tool (ETV/ETD)) 35
- Certifications 36
- EC declaration 36
  - Harmonized standards 36
  - Other directives 36
  - IP 54 protection 37
  - Service/Maintenance Intervals 37

STR TOOL ACCESSORIES 38
- Local customization 39

CABLE MANAGEMENT 40
Use of a cable clamp bracket 41
Smaller bending radius for greater accessibility. 43
Innovative 'Cable Twist' design 43
Centralized strain relief to prevent lead damage 44

FIELDBUS 45

TOOL TALK 2 46
User Authentication 46
Plant Structure 46
Multiple Controller Upgrade 47
Controller Programming 47

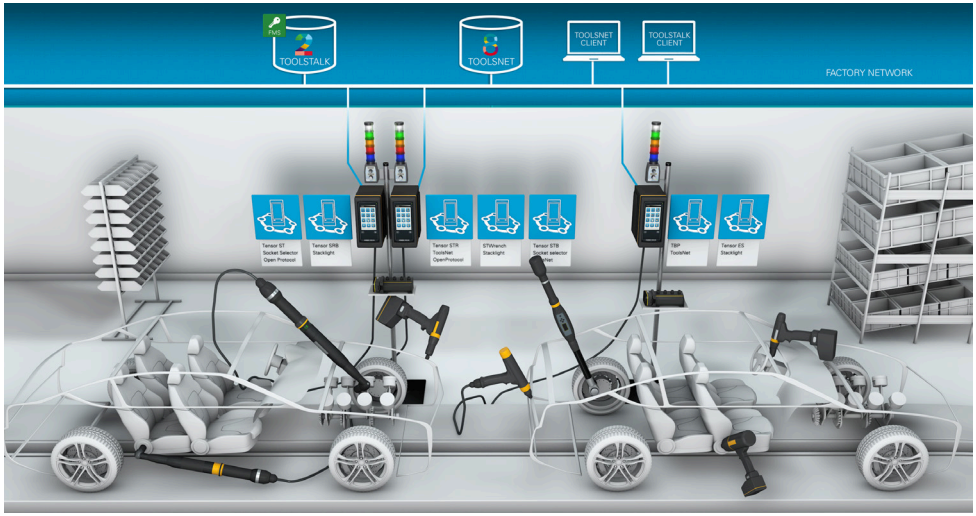
TOOLSNET 8 48
Simple setup in combination with Atlas Copco controllers 48
Simple Data Analysis 48
Production Alarms 49
Dashboard 49
Traceability 49
Tool Service Information 50

SYSTEM OVERVIEW

The core Power Focus 6000 systems consist of the following parts:

- Power Focus 6000 controller
- Intelligent Application Module (IAM)
- Tensor STR tool
- Tensor STR cable
- Accessories and communication interfaces

In the image below you can see how these different parts fit together as a system in a typical customer environment.



Power Focus 6000 Controller

Power Focus controllers are recognized around the globe for their outstanding tightening capabilities. The platform meets the need to enhance error-proofing, connectivity and flexibility, and is the first to introduce software ergonomics to the industry. This won the Power Focus 6000 the prestigious Red Dot design award in 2012. Learn more about the functionality of the software or the hardware connections in the respective chapter.



Intelligent Application Module (IAM)



The intelligent Application Module (IAM) stores a

- Tightening results
- Events
- Configuration
- Logs
- Software

Carry all information in the palm of your hand and transfer it easy from one controller to another. The module is located on the inside of the door to the controller and is available in three different versions:

- IAM Critical control
- IAM Process control
- IAM Process+ control

For a complete overview of the included functionality please see respective chapter.

The Atlas Copco Tensor STR tool is a complete tool designed to work with optimal performance together with the Power Focus 6000 controller.

Tensor STR

This Tensor power tool is a result of years of research and development to improve productivity and quality without compromising ergonomics. Major ergonomics improvements have been made possible by using the latest and greatest technology available.

Tensor STR Cable

Atlas Copco has been producing assembly tool cables since 1987 and has unrivaled experience in the field. Flexibility and durability have steadily improved since the introduction of the company's first generation cables, resulting in today's optimum cable performance.



Atlas Copco's flat-cable design combines maximum flexibility (for access to difficult applications) with

maximum durability.

Accessories And Communication Interfaces

The system connects perfectly to accessories and communication interfaces. Most handheld tools are supported and the Power Focus 6000 system has full connectivity with our QIF offerings and software products such as ToolsNet 8 or ToolsNet 4000 and ToolsTalk 2.

The system also communicates with interfaces such as Fieldbus, Open Protocol or customer specific protocols, creating a seamless integrated solution in the customer environment.

POWER FOCUS 6000 HARDWARE

Power

Power Focus operates on a single-phase 115 or 230 VAC line voltage.

Power rating 1500 W

Line voltage

100-120 / 200-240 VAC (50-60 Hz) Power Focus has a function for sensing the line voltage automatically. This means that the Power Focus automatically switches to the voltage you connect to it.

Normal Environmental Conditions

The equipment is designed to be safe under the following conditions:

- Indoor use
- Altitude up to 2 000 m
- Maximum relative humidity 80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 50 °C

Size and Weight

Height: 316 mm (14.44 inches)

Width: 146 mm (5.75 inches)

Depth: 293 mm (11.54 inches)

Weight: 10.8 kg (23.81 pounds)



Display

7″ resistive touch screen display

480 x 800 pixels

LED back light

Back light lifetime 70 000 hours

Communication

- W-LAN wireless networking; IEEE 802.11a/b/g/n compatible
- Bluetooth 2.1 (3.0 ready) + EDR (Enhanced Data Rate) wireless technology
- 10/100 Mb/s Ethernet (RJ-45 connector)

Audio

Mono speaker

Ambient Temperature

5...+50 °C (41...122 °F)

Transient over voltages typically present on the mains supply.

Connections

- 2 x 2.0 High Speed USB ports
- 2 x 10/100 Ethernet ports
- 4 x digital inputs (24V -15% +20%)
- 4 x digital outputs (24V ±20%, 1A)
- 1 x I/O bus
- 1 x aux. input (24V ±10%, 0.5A min)
- 1 x aux. output (24V, 1.5A max)
- 1 x emergency stop circuit class 3
- 2 x comm. ports (daisy chain)
- 1 x fan power output connector
- 1 x remote start switch
- 1 x Anybus CC connector
- 1 x IAM connector
- 1 x tool cable connector

IAM

With a memory capacity of 8 GB the IAM (Intelligent Application Module) stores all the data for the Power Focus 6000: Licenses, results, events, configurations, controller Firmware and service logs.

If needed, this data is easily transferred to other Power Focus 6000 by simply removing and inserting the IAM.

Firmware updates are secure, as old firmware is kept available. This allows you to quickly switch back to old firmware if needed.



POWER FOCUS 6000 SOFTWARE

Menu Overview

The menus is intuitive and easy to use. Navigate in the controller interface by either tapping on a menu item or swiping across the display to scroll through items. The web interface is identical to the controller display, enabling configuration and programming via a web-browser on a connected computer.



Tightening Menu

The Tightening menu lists the tightening program(Pset) available for configuration, stored on the controller.



Batch Sequence Menu

The Batch menu lists the batch programs (Batch sequences) stored in the controller.



Sources Menu

The Sources menu lists hardware accessories or functions controlling the selection of a tightening program, for example a Pset or a batch sequence. This is also where you configure scanners you may be using with your tools.



Tool Menu

The Tool menu gives you access to information about the connected tool, perform tool calibration, motor tuning, and set up tool maintenance.



Virtual Station Menu

Tools and accessories are connected to the controller but assigned to a virtual station. The task selection is also done in the virtual station.



Controller Menu

The Controller menu makes sure you can administer and install new controller software, view information about the hardware devices installed on the controller, and export or import configurations and reports.



Accessories Menu

The Accessories menu enables you to configure the internal I/Os and the hardware accessories that can be used with the controller such as I/O Expander, Stacklight, Operator Panel, Socket selector and Scanner. The Scanner can also be configured via other menus, such as the Sources menu.



Reports Menu

The Reports menu gives you access to historical tightening results, events, and NOK ratio.



Settings Menu

The Settings menu is where you can set up the controller on a LAN, configure PIN, language date and time. This is also where you set torque unit to be used, set tool alarms, configure Wi-Fi channels for wireless tools, as well as configure how to display events.

Basic Programming

The power focus 6000 tightening programs need parameters such as target torque or target angle to be set in order to perform a tightening. Other settings – soft start, self tap, and torque compensation – are optional, just as setting which tightening strategy to use. Monitor the tightening progress by adding limits for torque, or specified tightening angle.

In the general Pset settings you can set up and manage the Psets by naming them and making general tightening settings. Choose tightening strategy, manual or quick prog mode, and set the Pset target value.

To the right you can see a configured Pset named Two step tight that uses a two step tightening strategy set to the Target torque of 15 Nm

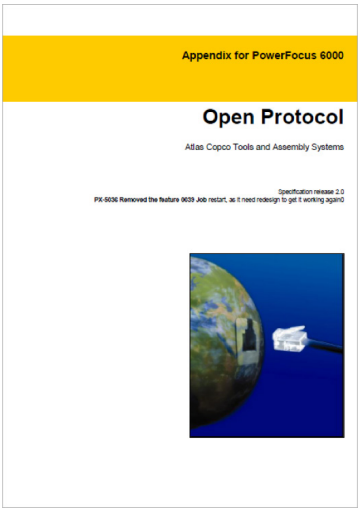


By clicking on “two step” in the strategy box you can change strategy from two step to TurboTight etc. Find more configuration options by clicking on edit under tightening parameters or loosing parameters.

For more information regarding programming please use the power focus 6000 configuration guide with detailed information on each menu item and the configuration.

Open Protocol

The Power Focus 6000 enables communication trough open protocol. The Atlas Copco Open Protocol is a standard communication protocol developed to facilitate communication between our controllers and external parties in the customer's production processes.



Open Protocol is an interface for building applications for remote control or data subscription of controllers. It is platform independent and can be implemented on Linux, PLC, printers, and all Windows platforms. The Open Protocol supports Ethernet connection with the Power Focus 6000.

An Open Protocol message consists of three parts; header, data field and message end. Depending on type of communication, a package includes the message and an encapsulation before and after.

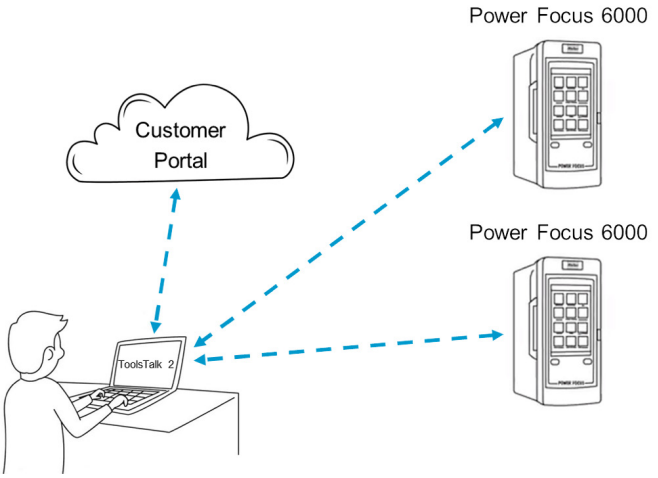
The MID, or message ID, is represented by a four digit number (for example MID 0062 for Vehicle ID Number upload). Each MID can have several revisions. Usually a new revision is created when more data is included and the length of the message needs to be increased. MID revisions are added to ensure backwards compatibility.

For a full overview of what information, or MIDs (Message IDs) and revisions, are supported with the Power Focus 6000 please see the Open Protocol Appendix (picture above) provided in the Marketing and Support Web Portal. The main value with Open Protocol is to provide a standard and easy-to-use communication protocol. It can be set up in minutes and integrated with your production processes in your plant. Through the years "Open Protocol" has become an industry standard to communicate with tightening equipment on assembly lines.

FUNCTIONALITY MANAGEMENT SYSTEM

Introduction

Atlas Copco Functionality Management System (FMS) is our new licensing platform and it is a completely new way of delivering and administering functionality available on Power Focus 6000 controllers. FMS is meant as a way to simplify the way that functionality is added and removed from a controller based on the actual needs on a station.



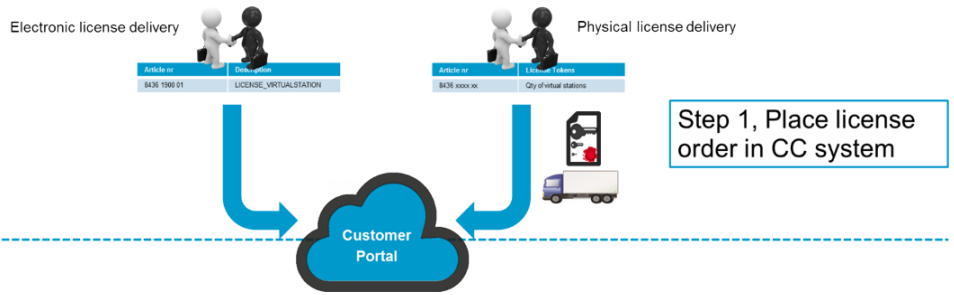
The customer portal is used for activating controller functionality, for getting an overview of previous purchase orders and to map available features to a USB license device or a functionality management system server. All features that has been purchased is easily available from the customer portal. This gives traceability of the functionality that has been bought and also easy access in case a license has been lost.

Main benefits

- Flexible rebalancing
- Customizable and upgradable
- Instant delivery
- Trial licences

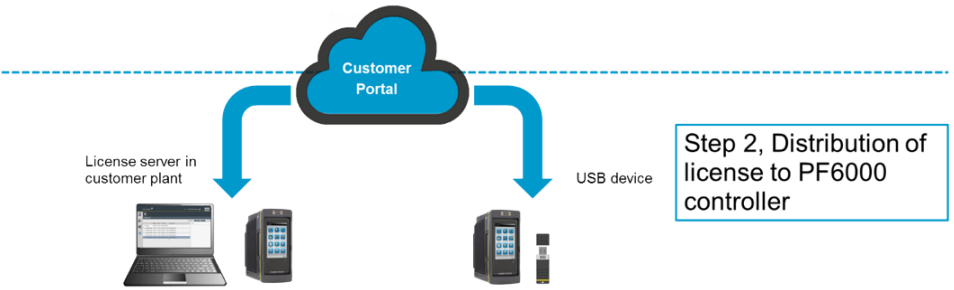
Order and distribute licenses to customer portal

There are two ways to distribute features and licenses to the customer portal, electronic or physical delivery. The electronic delivery is made automatically once the order is put in the local CC system and the features is automatically linked to the customer account in the customer portal. The physical delivery is carried out from PTD as a physical license paper from PTD and a manual registration is required to link the features to the account in the customer portal.



Distribution from customer portal

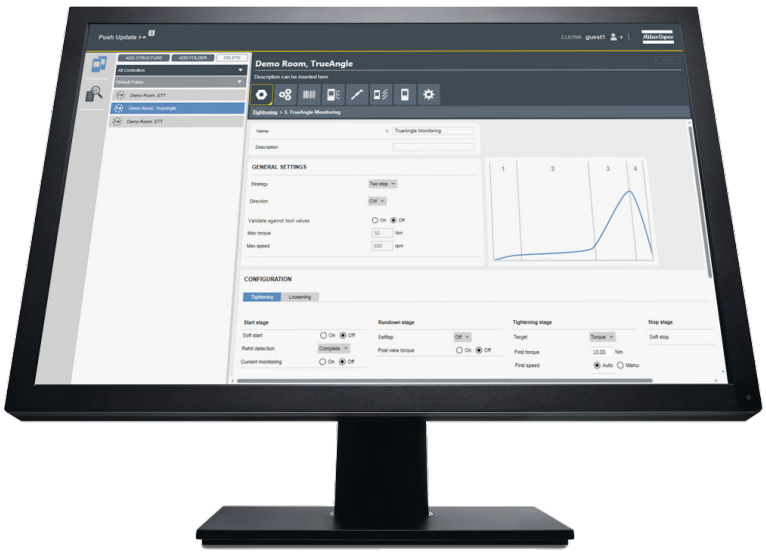
Once the licenses and features are delivered and linked to the customer portal there are two ways to distribute the features to the controllers; a server based solution (electronic way) and a non-network required solution (physical way). The network based solution is meant for production facilities where it is needed to re-balance and move functionality quickly and efficiently between virtual stations. The physical way is the FMS USB license device solution and is perfect for customers where an IP-based network is not available and the need for rebalancing is not as big.



FMS Server based

The Atlas Copco FMS functionality is built into ToolsTalk from start making it the best way to distribute virtual stations and features to the individual controllers. ToolsTalk is also the best way of managing and programming multiple controllers.

Start by uploading the capability request, received from Customer Portal, to ToolsTalk in order to make the licenses available for distribution. After this is done it is a very straight forward process to and features to the Power Focus 6000.



FMS USB device/non network based

The FMS USB license device is a great option for customers that do not have the controllers networked and do not have any need for ToolsTalk and plant level management of their controllers. With the Atlas Copco USB license device it is possible to load and distribute virtual stations and features to individual controllers.

After the USB device has been registered on the Atlas Copco customer portal and the capability file has been downloaded, move the license file to the USB device. The USB device will be used for transporting the virtual stations and features to the controller. Plug in the USB to the controller that needs to have additional virtual stations and features. After the device has been inserted an icon will appear on the top right of the controller screen or in the webHMI and by pressing this icon it is possible to add more virtual stations and/or features to the controller.

When adding a virtual station and/or feature to the controller this means that the amount of available functionality on the USB device will go down based on what is added to the controller.

If a virtual station or a feature needs to be moved from a controller to another one just plug in the same USB stick as the one that was used to add it originally and move it back to the USB device. Now the device contains this functionality and it can be moved to a different virtual station.



TIGHTENING STRATEGIES

Select tightening strategy by choosing the method for applying clamping force (or preload) to the joint. Different joints require different strategies for applying the desired clamping force and to minimize unwanted in-service effects.

The Turbo Tight® strategy enables the option to use Manual programming or Quick prog, see section Strategy. The Quick step, Two step, and Three step strategies enable the choice of tightening towards a Target torque or a Target angle value, see section Target.

All tightening strategies require that you set either Target torque or Target angle value.

Turbo Tight® Tightening Strategy

Turbo Tight® is the default tightening strategy, designed to perform a very fast and ergonomic tightening based on the tool's maximum speed (Tool max speed). This strategy only requires Target torque to be set in order to perform the tightening. Depending on the joint properties, for example if the joint is very stiff or very soft, a different tightening strategy might be needed.

Note! The Turbo Tight® strategy is only available when using the Tensor STR tools.

Fine-tuning the Turbo Tight® Tightening strategy

If the Turbo Tight® strategy gives unwanted results, we recommend you to take look at how the Rundown complete is set.

A Rundown complete set too high could give the Turbo Tight® strategy too little time to work on the needed calculations in the Tightening step, and result in an overshoot. The ambition should be to set the Rundown complete as close to snug as possible. A Rundown speed set too high could also cause the Turbo Tight® not to have enough time to work on the needed calculations in the Tightening step resulting in an overshoot. This is even more important if the joint is very stiff.

Reduced cycle times

Turbo Tight® optimizes the tightening speed to achieve the fastest possible tightening maintaining reliable accuracy. The results are:

- Possibility to remove bottlenecks,
- Possibility to rebalance assembly lines due to increased cycle rate,
- Less heat development, a cooler tool during operation.

Reduced reaction force

With optimized tightening speed, the torque builds up faster, reducing the amount of force transmitted to the operator's hand. The results are:

- Reduced operator fatigue and risk of injury,
- Improved operator comfort during tightening,

Reduced need for reaction absorbing devices in certain situations, giving less cost and reduced tool weight.

Easy set-up

Turbo Tight® is designed to be extremely easy to set up. In most cases, you just need to set the target torque and you're ready to go. Exceptions are discussed in the following chapters. In such cases please contact your local Atlas Copco Tools representative for support. The results are:

- Time savings during set-up,
- Less time and money spent on training,
  Work rotation enabled.



Sustainability

Using Turbo Tight® results in shorter tightening cycles. This in turn means less heat development and a cooler tool. It also helps to reduce energy consumption with 10 % and prolong tool lifetime in high-cycle environments. In general the losses during a tightening can be reduced by speeding up the tightening phase, but remember: the big savings come from standby.

How are cycle times reduced?

Turbo Tight® controls the motor speed to achieve the fastest possible tightening without excessive overshoot. Comparing it to a traditional Two Step strategy, Turbo Tight® runs faster for a longer period.

How is reaction force reduced?

Turbo Tight® uses the tool's mass moment of inertia to reduce the reaction force transmitted to the operator. The increased control of the motor in combination with the fast dynamic regulation enables the tool to minimize the reaction force from the tightening.

How come set-up is so easy?

Turbo Tight® is a strategy that controls the motor speed based on the actual torque rate and the remaining torque of the joint. Since all these parameters are dynamically calculated during the tightening, the only user input required is the target torque.

How does Turbo Tight® provide energy savings?

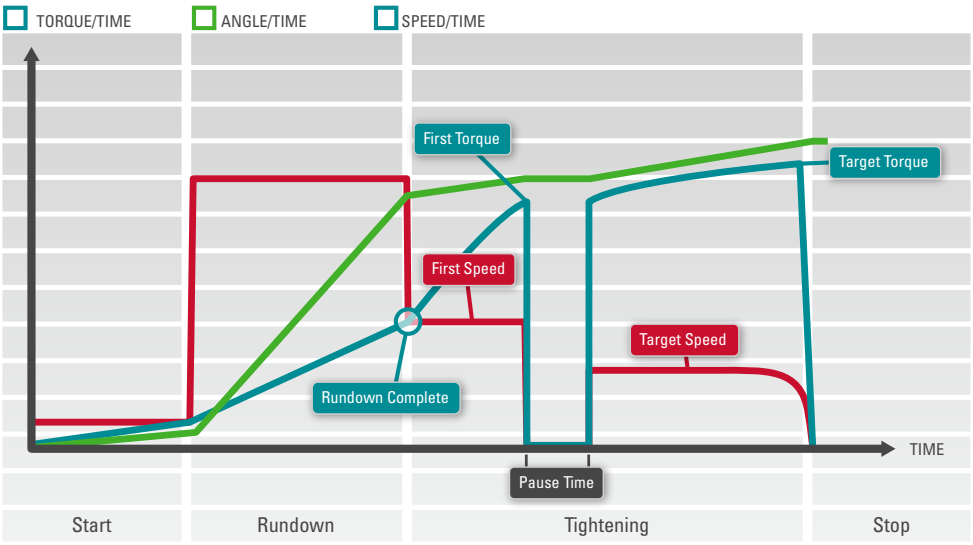
Atlas Copco has been ISO 14001 certified since 2010, ensuring the planning, execution, control and optimization of continuous improvement processes for all Atlas Copco Industrial Technique products. If we compare the energy consumption of a Power Focus 4000 running a Tensor ST tool with a Two Step set-up, with the energy consumption of a Power Focus 600/6000 running a Tensor ES/STR tool with Turbo Tight®, we get the following result.

Two Step Tightening Strategy

The two step tightening strategy is very similar to the Quick step strategy with the exception that it adds a small time delay between the first step and the final step, to further counteract short-term relaxation effects in the joint.

Fine-tuning the Two Step Tightening strategy

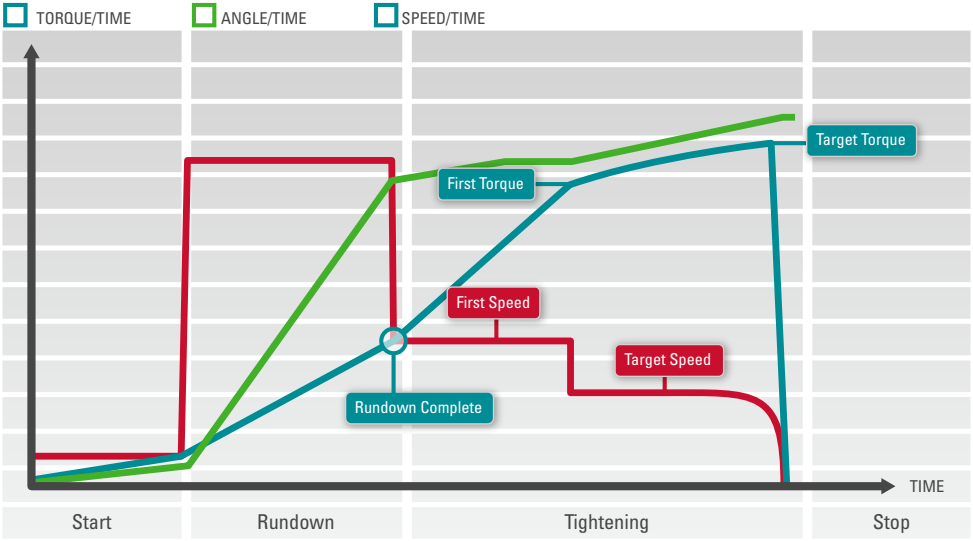
When the First target is reached the tool will make an immediate stop for a specified time before it continues with the final step. The First torque value and the Pause time should be chosen to improve ergonomics for hand-held tools.



Parameter	Description	Default Value
First torque	Target torque for the first step	
First speed	Target speed for the first step	
Pause time	Time between first and second step	50ms

Quick Step Tightening Strategy

Quick step tightening strategy is used to reduce the joint's preload scatter by adding an initial step with a given torque and speed, and then reducing the target speed in the final step.

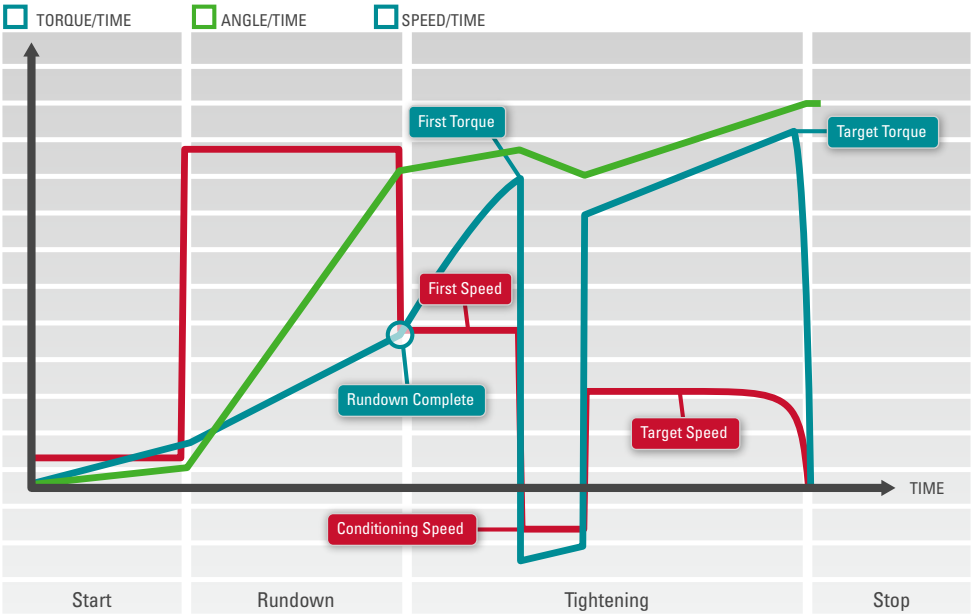


Parameter	Description	Default Value
First torque	Target torque for the first step	
First speed	Target speed for the first step	

Three Step Tightening Strategy

The three step tightening strategy adds a loosening step between the first step and the final step to overcome short-term relaxation effects due to embedment, and reduce preload scatter. This is sometimes called to condition the joint. This can be useful in, for example, joints with many adjoining surfaces and will have greater effect on new parts than on reused ones due to the smoothening of surfaces which will reduce embedment.

Conditioning the joint is done by tightening the first step to a given torque, **First torque**, and then releasing the load by turning the nut a specified **Conditioning angle** and then retightening the nut to its **Target torque**.



Parameter	Description	Default Value
First torque	Target torque for the first step	
First speed	Target speed for the first step	
Conditioning speed	Target speed during the conditioning step	
Conditioning angle	Angle to turn the socket during the conditioning step	180°

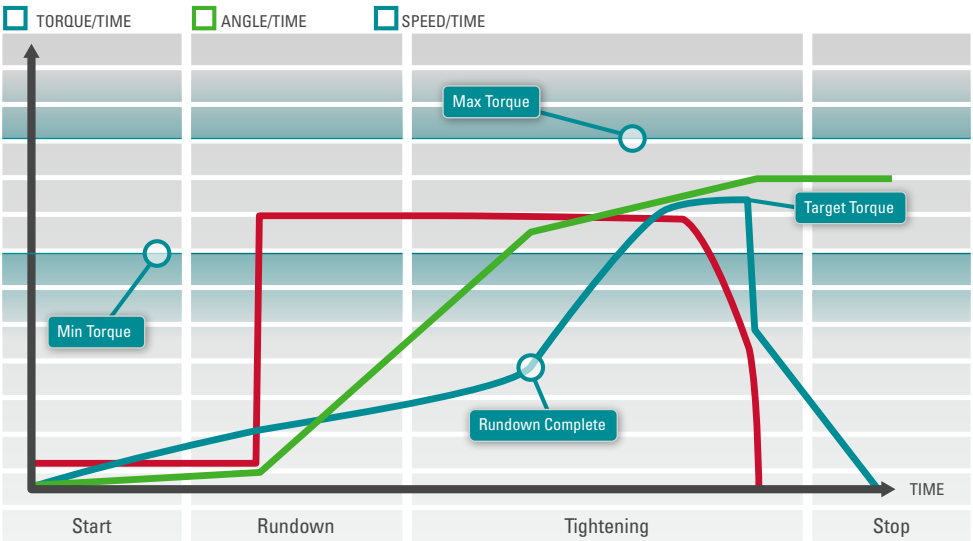
Rotate Strategy

The rotate strategy is primarily a strategy for testing and demo purposes. When letting the tool rotate in free air, it will turn the socket to the specified angle using the lowest torque possible.

Parameter	Description	Default Value
Target speed	Target speed for the Rotate Strategy	
Target angle	Angle to turn the spindle	360°

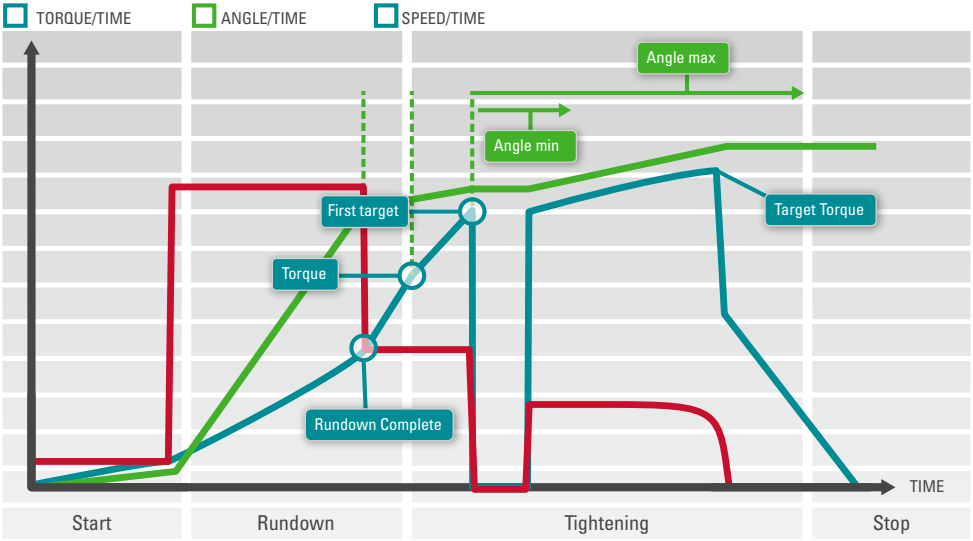
Target Torque Limits

By setting the Target torque limits is it possible to discard a tightening, should the torque result not fall within the specified torque limits. A Torque set too high can cause the bolt to deform or break as a result of passing the yield point. Not enough torque can end up with the clamping force not being enough to withstand the forces for which the joint is designed.



Target Angle Limits

With Target angle limits set, it is possible to monitor if the nut is turned to the desired angle during the tightening.



Parameter	Description	Default Value
Angle limits	Choose the section of the tightening in degrees, where to monitor the angle. **Off:** No limits are checked. **From Rundown complete:** The monitoring window is set from when the *Rundown complete torque* is reached. **From Torque:** The monitoring window is set from when the specified torque value is reached. Torque must be greater than *First torque*. **From First target:** The monitoring is set from when *First target* is reached. This option is not available if TurboTight is chosen.	Target speed
<From torque>	Torque value from where angle limits are set	Target speed
Angle min	Angle value for lower angle limit	90°
Angle max	Angle value for upper angle limit	720°

Torque Compensation

By using torque compensation, the actual clamping force applied to the joint can be better determined and the scatter in the applied clamping force can be reduced.

The torque compensation point is set by using a previously specified angle from Rundown complete and then calculating a value for the torque used during rundown. When creating the preload in the bolt, this is compensated for by adding the torque value calculated in the torque compensation point, to the Target torque.

Parameter	Description	Default Value
Torque compensation	Enables adjusting Target torque for torque used in the rundown stage. **Off:** No compensation made. **On:** Manually sets the Torque compensation point.	Off

Stop Stage

The Stop stage terminates the tightening so that the socket can be released.

Soft Stop

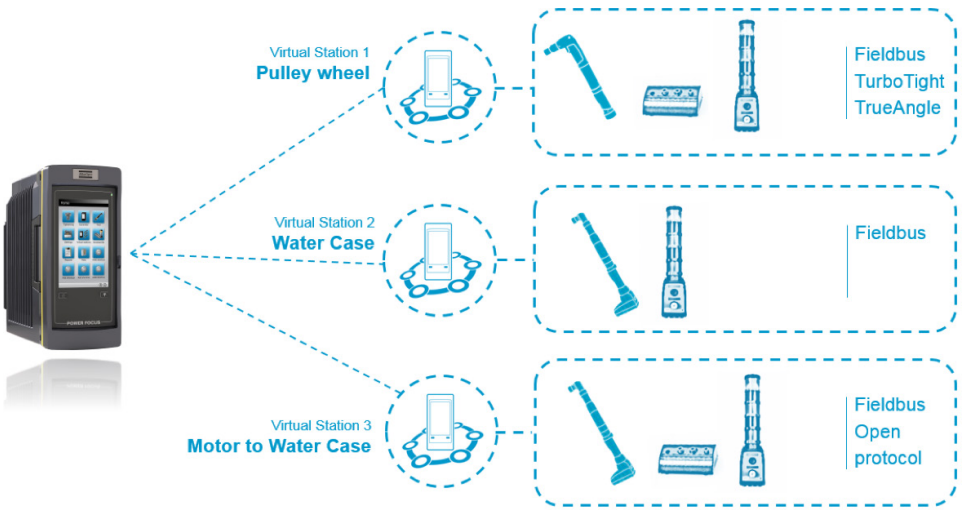
Soft stop makes the tightening stop in a more ergonomic fashion. Avoiding the tool to stop within the time interval of 50-300 ms, since it is known to create an uncomfortable stop.

Parameter	Description	Default Value
Soft stop	Turns the soft stop on or off. **Off:** No soft stop is used. **On:** Soft stop is activated. When target torque is reached the tool speed is immediately decreased to 75%. Then the speed is decreased to zero in at most 40 ms.	Off

VIRTUAL STATIONS

Introduction

The Virtual Station is the enabler of your assembly. It controls the tool, the communication and the accessories in your assembly station. Controlling multiple tools, working with virtual station gives you less cable management, less network connections and less hardware components. You will gain increased flexibility with increased rebalancing speed in your production.



The Virtual Station keeps all information about your assembly process, giving you an instant overview of what is going on in the production.

Tool Control:

Making sure your tool is performing correct tightenings for your assembly.

- Pset selection
- VIN handling
- Batch sequence control

Communication Control:

Communicating for easy and seamless integration with your production systems.

- Open Protocol
- Fieldbus
- Customer Protocols

Accessory Control:

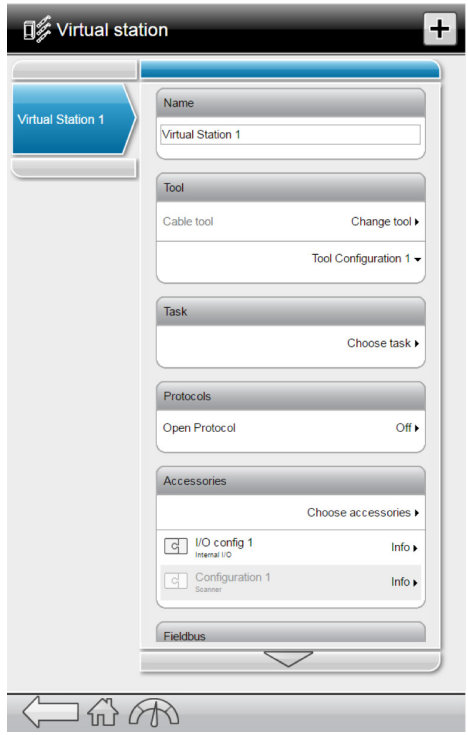
Taking care of multiple accessories per virtual station.

- Stacklight
- Socket selector
- Digital I/O

Setting up a Virtual Station

In every IAM there is at least one Virtual Station included. More virtual stations can be added using the FMS function in ToolsTalk2 or by pre-configured IAMs.

When an additional virtual station has been added a plus sign will appear in the in right corner in the Virtual Station menu. When all Virtual Stations available has been added the plus sign will disappear.





Help

In the help menu there is information on how to configure and setup the Virtual Station. All the help material can be downloaded in PDF from the controller using the WebHMI.

Key Benefits

- Easy to set up
- QIF accessories connected in total
- The same accessory can't be repeated in the same Virtual Station (i.e. 2 stacklights on the same Virtual Station)
- Works with existing accessories (socket selectors, stacklight, operator panel, etc.)
- Copy-Paste psets, Virtual Station configurations (ToolsTalk 2)
- 1 job in different Virtual Stations
- Excellent user interface
- Excellent graphical concept and very easy to configure
- Less wiring complexity

STR TOOL

Overview

Tensor STR tools can be powered by the Power Focus 4000 and the Power Focus 6000 controllers. The full capacity of the tool is available when controlled by the Power Focus 6000.

When running on a Power Focus 4000:

- Tools are generally running on a slightly lower max speed around 90% of maximum.
- Turbo Tight® is not available when running on a Power Focus 4000.
- When connecting the ETT tool to a Power Focus 4000 the front trigger can only be programmed to act as a safety trigger.
- When connecting STR tools to Power Focus 4000 the ST tool cable should be used.

The tool has been designed for a very high level of reliability and durability. Heat transfer has been improved a lot compared to previous generations. The heat is more efficiently transferred over the tool, keeping the hot areas cooler. This increases the life length of grease and in the long run the internal mechanical parts. IP54 classification (ETV and ETD) is another factor that highly contributes to the increased durability, since the tool is better sealed and protected for intrusion of dust and fluids.

ETV and ETD are the full featured STR tools. ETT is missing the IP classification and gyroscope. ETP is of an older base design but offers the same level of connectivity and accuracy as the most recent tools.

Models

ETD



ETV



ETT



ETP



Tool Modules

The STR concept uses modules to increase quality and flexibility. Different modules are combined with new models and all the motors have the same diameter so modules can be interchangeable between different sizes.

Due to matching electronics and hardware tested as a separate unit, the module concept also makes it easier to replace parts. All electronic modules use connectors to make assembly and service fast and simple, no soldering required.

Handle module

The handle module is common for all STR ETV and ETD models. It includes the main electronic board, the board and its components are molded into plastics for extra protection. The module also carries the vibrator, which can be programmed to give feed back to the operator.

The gyroscope is another key component in the handle as it can sense movements of the tool down to 1 degree.

The cable connection has a new generation of pins and sleeves that increases the wear resistance considerably compared to previous generations.

The trigger is easily removed for better accessibility during cleaning.

HMI

The HMI module is where the tool and operator interact with each other. The module has LED lights – yellow, green or red. There is also a blue LED and a tightening direction indicator. The reverse ring is lockable and the module also includes a speaker that can send sound signals to the operator.

The standard HMI and EHMI is available with or without a button on the reverse ring.

Motor

In the STR ETV/ETD range all motors have the same diameter. More powerful motors are made longer.

Focus has been to increase the robustness of the motor. For example the bearing houses are made stronger and in Aluminum. A new insulation system has made it possible for the intermediate shaft to be made with fewer parts and without plastic material.

Motor rotation speed is higher than on ST tools when running with a Power Focus 6000.

RFID tag is included in the motor module. It will be determined at a later point what will be included in the chip.

Torque transducer

The torque transducer is a delicate part that should not be replaced if faulty. The transducer shows a very accurate reading from 100% down to 20% of the nominal torque. STR range is improved so that disturbance from the motor has less effect on the signal, making the reading more exact resulting in an improved tool accuracy.

Gears and Angle head

Planet gears and angle gears are all made of a special steel that is specially developed for Atlas Copco.

The angle head gears are spiral cut for maximum accuracy and durability, larger angle heads are prepared for attaching a reaction plate.

ETT front part

The ETT front part differs from other tools in how the transducer is placed after the angle gear and attached to the output shaft. This gives the ETT tools an accuracy of 2,5% over 3s.



Accessories (attached to the tool (ETV/ETD))

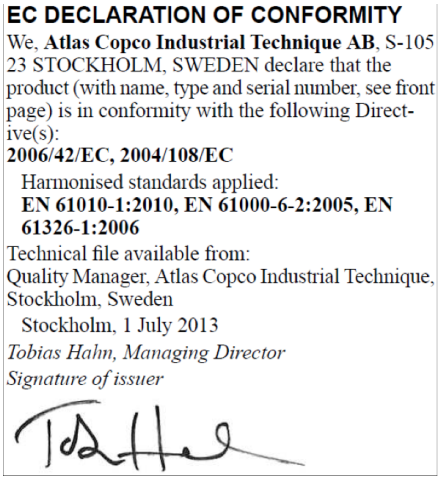
The tool has two connections for accessories, making it possible to combine a number of different combinations of helpful accessories.

Accessory	Function
Lever trigger 135deg	Trigger that is offset for alternative grip, acting as “button”.
Lever trigger?	Same as lever trigger 135 deg but straight, acting as “button”
Button	Button for sending impulse on st bus.
Headlight	Lamp to illuminate tolls work area.
2D scanner	Scanning 2d codes (3d > qr)
Selector ring (button)	Button on ring, acting as “button”
Tool leds	Led card with leds to send operator feedback.
Ehmi	Display with 3 buttons
Tls tag	

Certifications

EC declaration

EC declaration can be found in the Safety information appended to the product. The declaration states responsible manufacturer and shows European product directives and harmonized standards.



EC DECLARATION OF CONFORMITY

We, **Atlas Copco Industrial Technique AB**, S-105 23 STOCKHOLM, SWEDEN declare that the product (with name, type and serial number, see front page) is in conformity with the following Direct-ive(s):

2006/42/EC, 2004/108/EC

Harmonised standards applied:
EN 61010-1:2010, EN 61000-6-2:2005, EN 61326-1:2006

Technical file available from:
Quality Manager, Atlas Copco Industrial Technique, Stockholm, Sweden

Stockholm, 1 July 2013

Tobias Halm, Managing Director

Signature of issuer

European product directives – This is the European Union product legislation. The directives contain high (and low) level requirements on the product and procedures that relate to the product during its life-cycle. The requirements mainly concerns safety. The directives applicable to STR are:

2006/42/EC – The machinery directive

2004/108/EC – The EMC directive (ElectroMagnetic Compatibility)

1994/9/EC- The ATEX directive (Explosive Atmosphere)

Harmonized standards

The directives set out high level product requirements. These may be difficult to interpret. A harmonized standard is generally a safety standard that has been approved by the European Union authorities as compliant with a product directive. In practice, the standards are used as the means for complying with the law. E.g.

EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements.

EN 61000-6-2:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.

En 61326-1:2006 Electrical equipment for measurement, control and laboratory use-EMC requirements Part 1: General requirements.

Other directives

The EC declaration concerns directives required for CE marking. However, there is more legislation that needs to be considered. E.g.

Information concerning Restriction of Hazardous Substances (RoHS) - This product and its information, meets the requirements of the RoHS Directive (2011/65/EU).

Information concerning Waste of Electrical and Electronic Equipment (WEEE) - This product and its information, meets the requirements of the WEEE Directive (2012/19/EU), and must be handled according to the directive.

IP 54 protection

The STR tools are certified for IP protection level 54. The level of protection will prevent foreign particles and fluids from entering the tool. This will make the tool more durable than previous generations, due to less contamination of internal parts.

IP54 – The first number marks the protection level for dust. Level 5 = "Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact (dust proof)". The second number states the protection level for water intrusion. Level 4 = "Water splashing against the enclosure from any direction shall have no harmful effect".

Note! ETT and ETP STR tools are not IP tested and do not meet IP54 requirement.

Service/Maintenance Intervals

Overhaul and preventive maintenance is recommended at regular intervals once per year or after maximum 250.000 tightening depending on which comes first. More frequent overhaul may be needed if the machine is used in heavy-duty operations.

STR TOOL ACCESSORIES

The STR tool can utilize two different accessories at a time.
The accessories consist of two halves, upper and lower and can be combined in different ways, for example a scanner and headlight can be put together on the front bus.

	Used for reading bar codes or QR codes, connects to one of the tool bus slots.
	Button for sending instructions from the operator connects to one of the tool bus slots.
	Used to illuminate the work piece, connects to one of the tool bus slots.
	Suspension that allows the tool to rotate, used when attaching the tool to a balancer.

Mounting Bracket	Used for fixturing the tool
Protection Cover	Protection to avoid scratches caused by the tool in sensitive applications.
	Trigger that is offset for alternative grip connects to one of the tool bus slots.
	Shorter lever that can be used as a safety trigger connects to one of the tool bus slots.
	EHMI, small display that can show information about the tightening and also acts as a Pset selector connects to one of the tool bus slots.

Local customization

The tools can easily be fine-tuned to fit the operator preferences or the application by adding tools accessories. The standardized sizes, fits a wide range of Atlas Copco tools.

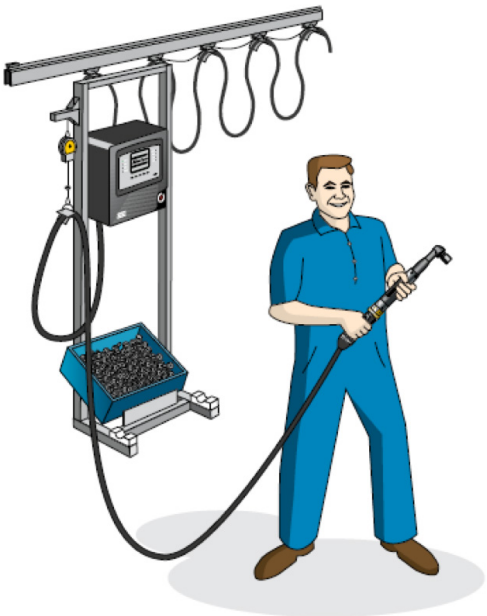
CABLE MANAGEMENT

Cables are used in conjunction with all Atlas Copco tools and assembly equipment, including: hand held tools, fixtured hand tools or when spindle ”motors only” are provided for incorporation into various types of machine automation.

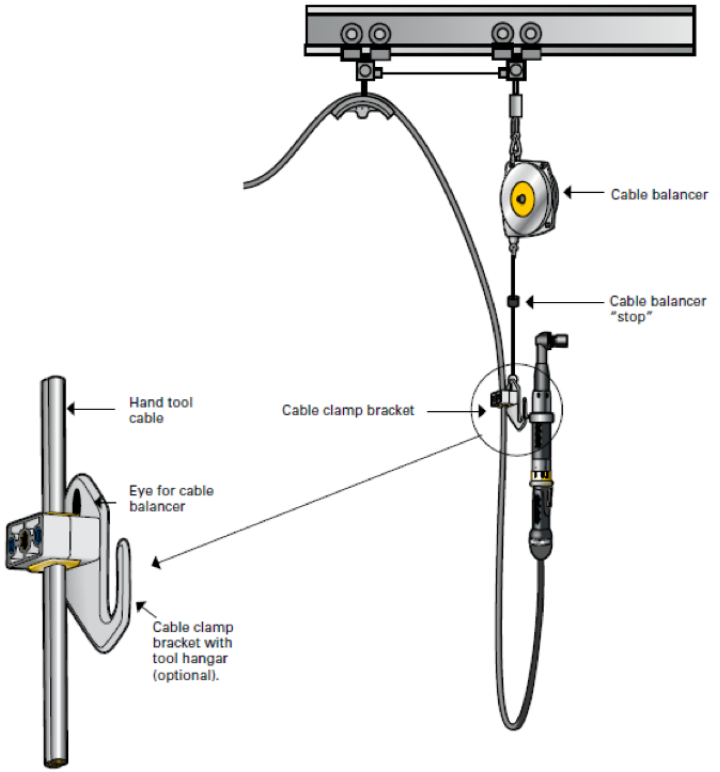
As with many industrial systems, cables are a main failure point – especially in applications where the cables are subject to repetitive motion. Atlas Copco has the knowledge to help the customer find effective solutions to their facilities unique cable needs.

In the case of fastening equipment, cables connect the following functions:

- Power supply
- Controller
- Nutrunner
- Accessory



With a proper cable management you will increase the life of the cable and reduce the risk operators falling over them. In example, using a cable balancer helps to manage the excess cable when the tool and cable are not extended.

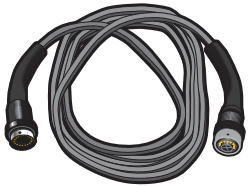


Use of a cable clamp bracket

This clamp bracket can be attached to a hand tool cable and then be attached to a cable balancer. When located properly on the tool cable, the cable balancer will keep the cable off the floor. A hook is provided as a place to "rest" the tool and may be used with or without a cable balancer to "rest" the tool when the cable is spread over the cable shoe.

Types of cables available

Various types of cables are available from Atlas Copco to suit all kinds of applications, as illustrated below.



Tensor S Extension Cable.



Tensor S Tool Cable.



Tensor S Extension Cable for fixtured applications.



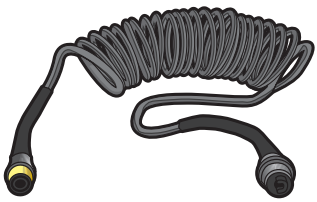
Tensor S Extension Cable with loop. The cable loop makes cable even more flexible if the tool is used in small circles.



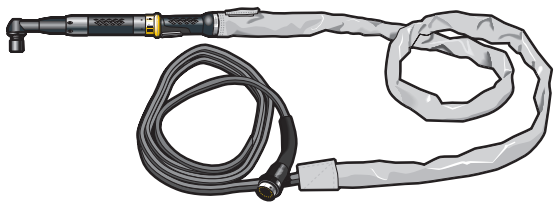
Tensor ST Tool Cable



Tensor S Cable with 90°connector. Angle connection cables for applications where space does not allow the use of normal cables.



Tensor ST Spiral Cable.



Cable cover for workpiece surface protection.

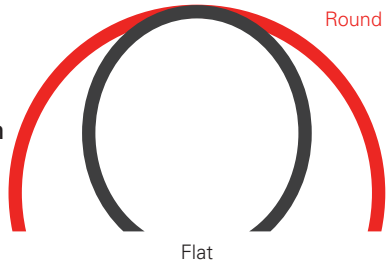
Tensor STR cable

Tensor STR cable has the same functionality but different interfaces towards the controller. However, they have the same interface towards the tool.



Flat cable for greater durability

Atlas Copco has been producing assembly tool cables since 1987 and has unrivaled experience in the field. Flexibility and durability have steadily improved since the introduction of the company's first-generation cables, resulting in today's optimum cable performance. Atlas Copco's flat-cable design combines maximum flexibility (for access to difficult applications) with maximum durability. No other manufacturer can offer such a powerful combination of flexibility and performance.



Smaller bending radius for greater accessibility.

Atlas Copco engineers its tool cables to withstand consistent and long-term flexing. Cable size (diameter) is the most critical factor in terms of flex life. The best way to reduce fatigue affecting the internal cable conductors is to keep cable thickness to a minimum. Atlas Copco's flat-cable design is just under half the thickness of a comparable "round" cable, offering an exponential gain in flex life. When it comes to durability and flexibility, the Atlas Copco cable is unique.

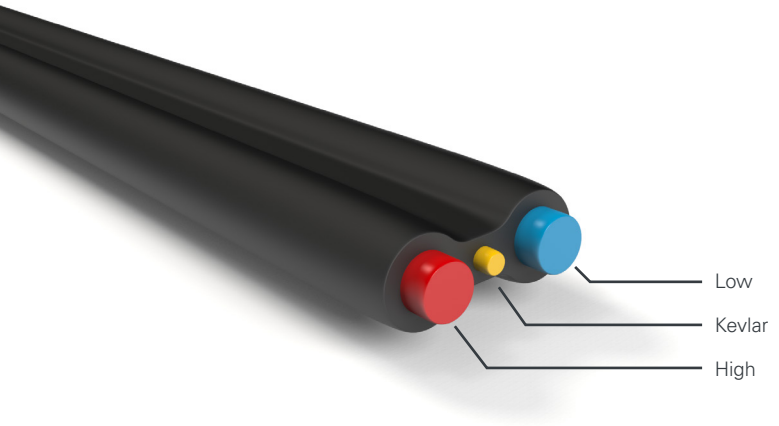


Innovative 'Cable Twist' design

The most critical area for an assembly tool cable is at the point of maximum flex – generally close to the tool connection point. Atlas Copco's "Cable Twist" design spreads the flex load over a greater distance, to minimize flex in the critical area. This patented flat-cable "twist" design is unique to Atlas Copco.

Centralized strain relief to prevent lead damage

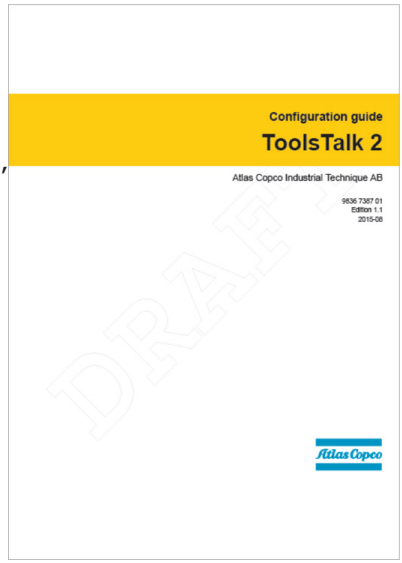
The flat-cable design features a Kevlar-reinforced core, to absorb the tensile loads to which cables can be subjected in tough applications. When subjected to high tensile loads, this centralized load-relief Kevlar core also prevents cable leads being damaged or compressed. For maximum signal integrity, the flat cable design also ensures optimum separation of high and low voltage conductors.



For more information regarding cable management please look in the cable management pocket guide (9833 1640 01). In this pocket guide you will find more information regarding cable management for fixtured and hand held tools and check points before, during an

FIELDBUS

Fieldbus is an industrial network system for real-time distributed control. It is a way to connect instruments in a manufacturing plant, for example Power Focus controllers. Fieldbus works on a network structure which typically allows daisy-chain, star, ring, branch, and tree network topologies. The fieldbus requires only one communication point at the controller level, and allows hundreds of analog and digital points to be connected at the same time. This reduces both the length of the cable required and the number of cables required. Furthermore, since devices that communicate through fieldbus require a microprocessor, multiple points are typically provided by the same device. Some fieldbus devices now support control schemes such as PID control on the device side instead of forcing the controller to do the processing.



The Power Focus 6000 currently (release 2.1) supports three different fieldbus types:

- DeviceNet
- EtherNet/IP
- ProfiNetIO

You can set up the fieldbus parameters using Tool Talk 2. For a full overview of how this is done, please see the user guide for Tool Talk 2.

In short, the value of using a fieldbus communication is to have a real-time control over multiple controllers in a standardized way in your production plant.

Please note that there are a couple of fieldbus types available in the Power Focus 4000 that are not yet implemented on the Power Focus 6000 platform.

TOOL TALK 2

Tool Talk 2 is developed from the ground up, to support the new multi-controller concept delivered in the Power Focus 6000. When the old version of Tools Talk was a software tool to configure a single controller – Tool Talk 2 takes controller programming to a whole new level by making it easy to manage and program multiple controllers.

User Authentication

Tool Talk 2 supports user authentication in the application from the start. This functionality makes sure that no one, except approved users, can make changes to controllers and tightening programs. The second benefit of this is that customers have full traceability of changes to tightening programs in the application. Every change to a tightening program is logged in the application, making it possible to see all the changes that have been made to a program during its life cycle and also exactly which user that made the change. If a problem occurs in production it is easy to identify the person that made the change and by this it is possible to find the reason for the change.

- Full change traceability of tightening programs
- Ensure that only approved users can make changes to tightening programs
- Know which user is making changes on a controller

Plant Structure

The plant structure in Tools Talk 2 makes it possible to organize all Power Focus 6000 controllers into a structure that resembles the structure in the plant. This makes it quicker and easier to administer controllers throughout production.

- Organize controllers according to the layout in the plant
- Quickly find controllers and tightening programs that needs to updated
- Get an overview that everything is running as it should

Multiple Controller Upgrade

ToolsTalk 2 leverages on the dual memory area functionality of the Power Focus 6000, by making it possible to upgrade multiple controllers at once just by one click. When doing an upgrade ToolsTalk 2 loads the new controller firmware into the Power Focus 6000 controller but it does not activate the new software until you are ready. When then time has come to use the new software, it is possible to make the switch from ToolsTalk 2. It also increases safety since you can switch back to the previous version of the software just as easily if needed.

- Upgrade multiple controllers directly from the application
- See exactly which software that is running on all controllers in production
- Switch between software versions running on the controller by selecting the desired preloaded software versions.

Controller Programming

ToolsTalk 2 makes controller programming easier than ever before. All the tightening parameters are available from a single view, creating a great overview of the complete setup. When setting up or updating a tightening program in ToolsTalk 2 all the changes are saved locally in the database of the application, meaning no changes are stored on the controller initially. This makes it possible to make all the needed changes before saving anything to the controller. Thanks to this all the parameters can be adjusted and verified before actually saved on the controller.

ToolsTalk 2 also saves all version of the tightening programs in its database, making it possible to go back to a previous version of a program in case there are any problems or concerns with an update that has been made.

- Great overview of all tightening parameters
- Possibility to setup all parameters before saving on the controller
- Easily go back to a previous version of a program

TOOLSNET 8

ToolsNet 8 is the next generation data collection and production analysis software from Atlas Copco. In order to achieve the highest value in the application the whole web application was rebuilt from scratch, making it possible to leverage on new modern technologies. In the base ToolsNet 8 still has the reliable data collection that has been developed by Atlas Copco for almost 15 years.

With the new additions of the dashboard, statistical center and the tool center we make sure the value of the product is increased to an even higher level.

Reliable Data Collection

Collecting data is easy when using an Atlas Copco controller in combination with ToolsNet 8. After ToolsNet 8 is installed just set the IP-address of the ToolsNet 8 server in the controller and it immediately starts sending over tightening results. ToolsNet 8 also supports competitor tools through ToolsNet 8 Open Protocol. With Open Protocol it is important to check with the competitor regarding what functionality they have implemented on their side.

Simple setup in combination with Atlas Copco controllers

Data buffers both on the controller itself but also on the ToolsNet 8 application server in case the database goes down which ensure high security.

Simple Data Analysis

In ToolsNet 8 the reports have been further enhanced, meaning more of the daily work and analysis can be done directly in ToolsNet 8.

- Possibility to filter directly in the reports
- All users can choose what fields they want to see in their reports
- Possibility to group data directly from the reports
- Save favorite reports which increases the efficiency when working with the application
- Export reports to Excel for further analysis
- Get detailed information about tightening results
- Simple access to all traces

Production Alarms

ToolsNet 8 makes it simple to setup alarms based on specific controller events in production. All the events that are available in the Power Focus and the PowerMACS controller can be setup as events in the notification center of ToolsNet 8. After it has been setup, an email will go out to the configured receiver as soon as there is an event, making it possible to cut down response times and thereby reducing the time it will take to fix production problems.

- Reducing down-time thanks to direct notification about production problems
- Simple setup of notification means customers will use it

Alarms based on statistical trends. Find material problems or process problems automatically.

Dashboard

The dashboard gives a direct overview of the production in the plant. Every user can configure the dashboard in a way that best suits their needs. For example, if a user wants to focus on statistics it is possible to setup multiple widgets showing SPC data in real-time for specific applications making it easier to catch problems related to material or process problems.

Available dashboard widgets are:

- Top NOK applications: Shows the applications with the highest failure rate for a configured part of the tool structure.
- Running SPC: Shows the real-time X-bar and range charts for a configured application.
- Tool maintenance: Shows the tools that need service or calibration, from all the Power Focus tools in production (currently only support Power Focus W10.6+ and W14 controllers).
- Latest results: Shows an overview of the latest results from the chosen part of the of the tool structure.

Traceability

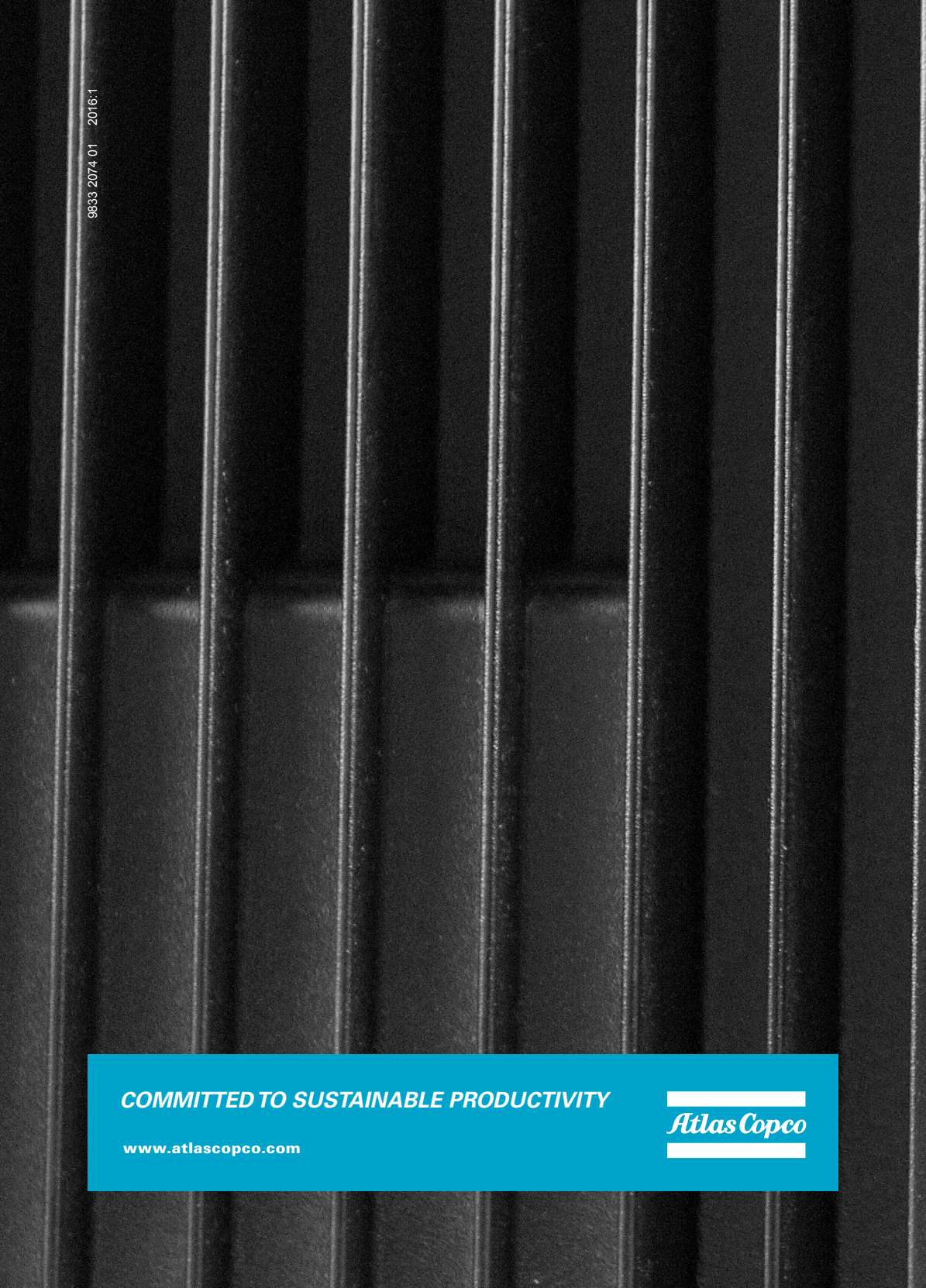
ToolsNet 8 greatly increases the traceability in our customer's production. With the application it is possible to find a specific product and ensure that all tightening have been done correctly by for example analysis the traces.

- Get all results based on a time interval
- Get all results based on a specific VIN number
- Find statistical deviations based on all tightening results.

Tool Service Information

ToolsNet 8 automatically collects information about all the tools in production making it possible to find tools that have not been serviced in a long time or tools in need of calibration. You can also find information about software version of connected tools and the number of rundowns that have been performed since the last service.

- Keep service log of all tools in production
- Get statistics on how a tool is performing on a specific application
- Find information about tool software versions
- Get information about last service and calibration of a specific tool
- Locate to which controller a tool is currently connected by serial number
- Manage custom tool serial numbers in the plant



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