



INSIGHTqc™ CONTROLLER
Simple, Flexible and Capable Solutions

SIMPLY INSIGHTFUL

When trying to achieve simple manufacturing goals in a complex manufacturing world, taking control of and understanding the fastening process doesn't have to be complicated. The new Ingersoll Rand® INSIGHTqc™ is different, by design. The INSIGHTqc™ controller is designed to be easy to use, easy to integrate, and provide a common platform to meet the global assembly needs of our customers. This controller offers advanced tightening control and a simple user experience to improve efficiency on production lines, and get the job done right, every time.



SIMPLE

FLEXIBLE

CAPABLE

WHY DO I CARE?

EXPERTS NOT REQUIRED

EASILY IMPLEMENT CHANGE

MEET YOUR REQUIREMENTS

WHAT DOES THIS MEAN TO ME?

- Save on selection, training and installation costs
- Reduce errors and downtime
- Remove user dependencies

- Reduce line rebalancing costs
- Easy line integration
- Remove device dependency
- Enhanced to Sync several tools to 1 independent controller

- Get the job right, every time
- Assurance via traceability
- Optimize your productivity
- Seamlessly control the Multi Spindle Fastening Solutions

HOW DOES INGERSOLL RAND OFFER THIS?

- Intuitive, Visual Programming Interface
- Plug and Play Accessories and Protocols
- Backwards Capability
- Integrated Backup and Recovery
- Bundled Controller Options
- Context Specific Integrated HELP

- Web Based programming use any operating system via any browser
- Meets current industry communication needs
- Adjustable to meet any tightening control requirements
- Integrated logic controls
- Easy hardware and software upgrades

- Touch Screen Interface
- Industry leading cycle data storage
- Robust audit and system logs
- Advanced tightening strategies and features
- Onboard diagnostics
- Integrated statistical process controls
- Preventative maintenance alarms
- Configurable email alerts

The web-based software eliminates device dependencies and enables full programming capability with any device that can run an Internet browser, including smart phones, tablets or computers. The INSIGHTqc™ controller is easy to integrate with the manufacturing line, provides flexible logic controls for job sequencing, and helps reduce line rebalancing costs through a simple and intuitive user interface. The INSIGHTqc™ Controller Platform has been enhanced to support both single & multi-spindle fastening applications, syncing multiple uses and applications to one controller platform.

Bottom line, the INSIGHTqc™ controller is a Simply Insightful solution.

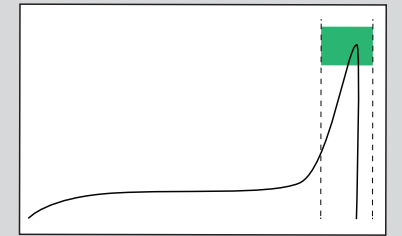
CAPABILITIES

SOFTWARE CAPABILITY									
	Standard	F	M	FM		Standard	F	M	FM
Software Feature	•	•	•	•	License Update	•	•	•	•
Home Screen	•	•	•	•	License Activate	•	•	•	•
JOB Setup	•	•	•	•	Date & Time Settings	•	•	•	•
PSET Setup	•	•	•	•	System Initialization	•	•	•	•
ALL Tightening Strategies	•	•	•	•	Spindle Management	•	•	•	•
Quick Programming	•	•	•	•	IP Address Settings	•	•	•	•
Advanced Programming	•	•	•	•	Email Alerts	•	•	•	•
Cycle Results	•	•	•	•	Digital IO Settings	•	•	•	•
JOB Results	•	•	•	•	EOR Data Out	•	•	•	•
Audit Log	•	•	•	•	Barcode	•	•	•	•
Event Log	•	•	•	•	User Management	•	•	•	•
System Diagnostics	•	•	•	•	System Logs	•	•	•	•
Tool Diagnostics	•	•	•	•	Fieldbus Diagnostics	•	•	•	•
Digital IO Diagnostics	•	•	•	•	Fieldbus Settings	•	•	•	•
Statistics Settings	•	•	•	•	Ethernet IP	•	•	•	•
Statistics Summary	•	•	•	•	ProfiBus	•	•	•	•
Statistics Alarm Settings	•	•	•	•					
Statistics Alarm Summary	•	•	•	•					
Backup and Restore	•	•	•	•	MES Protocols Settings	•	•	•	•
Firmware Update	•	•	•	•	Atlas Copco Open Protocol	•	•	•	•
Preventative Maintenance Alarms	•	•	•	•	Atlas Copco ToolsNet	•	•	•	•
Tool Calibration	•	•	•	•	VW XML 2.1	•	•	•	•
Factory Reset	•	•	•	•	Nissan Serial EOR	•	•	•	•
Network System Discovery	•	•	•	•					

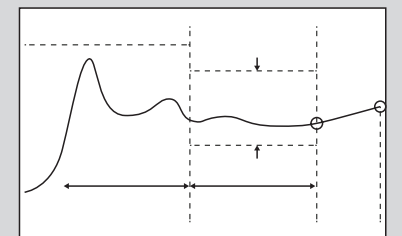
STATISTICAL PROCESS CONTROLS

Statistic Status	Description
Mean	Statistical average - used to derive the central tendency of the tightening data of a particular PSET
Capability	Calculated as $(6 \cdot \sigma / \text{Mean}) \cdot 100$ on a particular PSET
Pass %	Indicates the % of the cycles that have a cycle result of PASS from the sample population of a particular PSET
Fail %	Indicates the % of the cycles that have a cycle result of FAIL from the sample population of a particular PSET
Mean Shift	Calculated as: $\text{MEAN Result Value} - \text{TARGET Result Value}$ for a particular PSET
Range	Calculated as: $\text{MAX Result Value} - \text{MIN Result Value}$ of a particular PSET.
Standard Deviation (σ)	The calculated standard deviation (σ) of the Result Value of a particular PSET.
PP	Process Performance, calculated as: $(\text{USL} - \text{LSL}) / (6 \cdot \sigma)$
CAM	Calculated as: $(\text{USL} - \text{USL}) / (6 \cdot (W / d \cdot S))$
PPK	Process Performance Index, Calculated as: $\text{MIN} ((\text{MEAN} - \text{LSL}) / (3 \cdot \sigma) \text{ OR } (\text{USL} - \text{MEAN}) / (3 \cdot \sigma))$

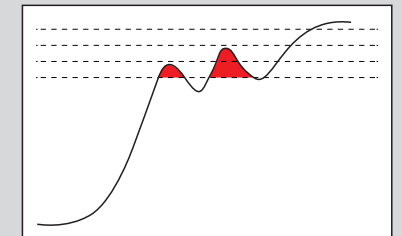
TORQUE/ANGLE CONTROL



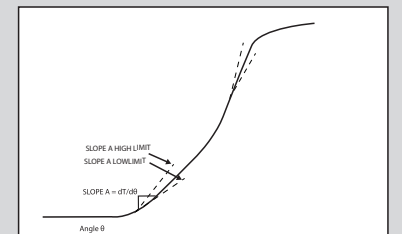
PREVAILING TORQUE



STICK SLIP DETECTION



GRADIENT/ SLOPE ANALYSIS



SPECIFICATIONS



INSIGHTqc™ CONTROLLER

BY THE NUMBERS

Software

256 JOBS PSETs

31 Steps per PSET

OBS

User Logins

Web-Based Programming

NOT Required

- PC Software
- PC License

- Logic rules for JOB sequencing
- Barcode function: USB, Serial, Ethernet
- Manual barcode entry option
- Tubenut controls (configurable modes)
- Quick programming mode
- Advanced programming mode
- Unrestricted programming from controller or remote
- Embedded, context-specific help
- Same hardware for single or multi spindle options
- Multi-language support
- Onboard tool diagnostics
- Trade transfer over open protocol

ONBOARD DATA STORAGE

500k

- Removable SSD Card that stores ALL settings and data
- Complete controller settings and data recovery through SSD swap
- Tightening curve displayed on Home screen of controller
- Full USB Backup and Restore Function

- Audit Logs
- Event Logs
- System Logs
- Tightening Results
- Tightening Curves

Connectivity

2 Fieldbus Options

Ethernet IP, ProfiNet,

7 MES Protocol Options

Open Protocol, Ford Open Protocol, ToolsNet, Toyota PokeYoke, VW XML, IR Ethernet EOR, & Nissan Serial EOR

Hardware

60 sec Boot Time 60Seconds

8 Tool Families

10.9 Volume 10.9 dm³

4 USB 2.0 Ports

7" Touch Screen 7 Inch Color

2 Ethernet Ports 10/100, 10/100/1K

ONE CONTROLLER COUNTLESS CAPABILITIES

Ingersoll Rand's INSIGHTqc™ Controller Platform has been enhanced to support both Single-Spindle and Multi-Spindle fastening applications, syncing multiple uses and applications to one single controller platform. Starting with its simplified setup, this upgrade reduces wasted time and allows its users to quickly adapt to changing needs on the spot—all without the burden of managing multiple platforms.

- **Simplicity:** Now offered as a single controller platform for Multi- and Single-Spindle applications, the simplicity of the INSIGHTqc™ Controller Platform cannot be overstated. By using a single controller to navigate multiple needs and functions, this advanced system simplifies setup, streamlines operations and empowers you to complete intricate jobs accurately.
- **Flexibility:** Designed with the ability to quickly adapt to every changing need without the burden of managing multiple platforms, this single controller system features first-rate flexibility and decreased downtime. And, thanks to its flexibility in programming, users can customize and adjust settings based on their specific needs.
- **Productivity:** Backed by a unified controller platform that's easy to use and navigate, the Multi-Spindle fastening application works cohesively with the INSIGHTqc™ controller to keep your efficiency at an all-time high. Users will appreciate its ability to easily modify program parameters to switch between different profiles, making it simple to accommodate variations in fastener types, torque requirements or assembly configurations.
- **Performance:** As a direct result of its ability to apply torque with precision and consistency across all spindles, this newly enhanced system reduces the likelihood of product failures, loose connections or performance issues, resulting in higher product reliability and overall quality.

Our newly enhanced INSIGHTqc™ controller system works seamlessly with our Multi-Spindle Fastening Solutions to save time, effort and space—without sacrificing Ingersoll Rand's trademark toughness and reliability.



CONTROLLER MODELS

The INSIGHTqc™ Controller is 100% compatible with our QE and QM tools. With the INSIGHTqc™, these tools will have 500K tightening records and 500K tightening traces – compared to 10 to 30K in competitors' products – which will let users understand all facets of the tightening process – torque, angle, time and date.

Model	SYSTEM OPTIONS				FIELDBUS OPTIONS		MES OPTIONS				
	Series	Display	Power	Hardware	Ethernet/P	ProfiNet	IR Ethernet EOR	Atlas Copco Open Protocol	ToolsNet	VW XML 2.1	Nissan SerialEOR
QCD11	QC	Display	120V AC	Standard			•				
QCD11-F	QC	Display	120V AC	Standard	•	•	•				
QCD11-M	QC	Display	120V AC	Standard			•				
QCD11-FM	QC	Display	120V AC	Standard	•	•	•	•	•	•	•
QCD21	QC	Display	230V AC	Standard	•	•	•				
QCD21-F	QC	Display	230V AC	Standard	•	•	•				
QCD21-M	QC	Display	230V AC	Standard			•				
QCD21-FM	QC	Display	230V AC	Standard	•	•	•	•	•	•	•

Multi-Spindle Software License

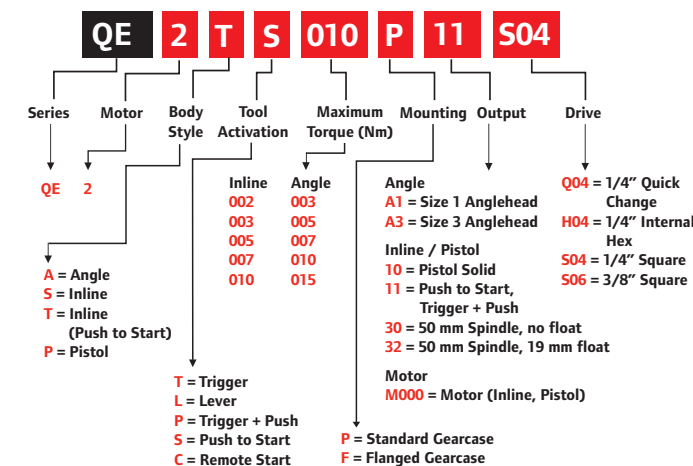
Part Reference	Description	BOM
MS-SW-OPT-1	Multi Spindle Software License, OPT – 1	1. Receptacle, flash drive 2. Adapter, USB to Ethernet 3. Activation Card 4. Information Label 5. Label
MS-SW-OPT-2	Multi Spindle Software License, OPT – 2	
MS-SW-OPT-3	Multi Spindle Software License, OPT – 3	

If customer wants to support 10 spindles, we can cater to requirements by providing licenses in one of the below combination :
 • OPT 3 X 3 + OPT 1
 • OPT 2 X 5

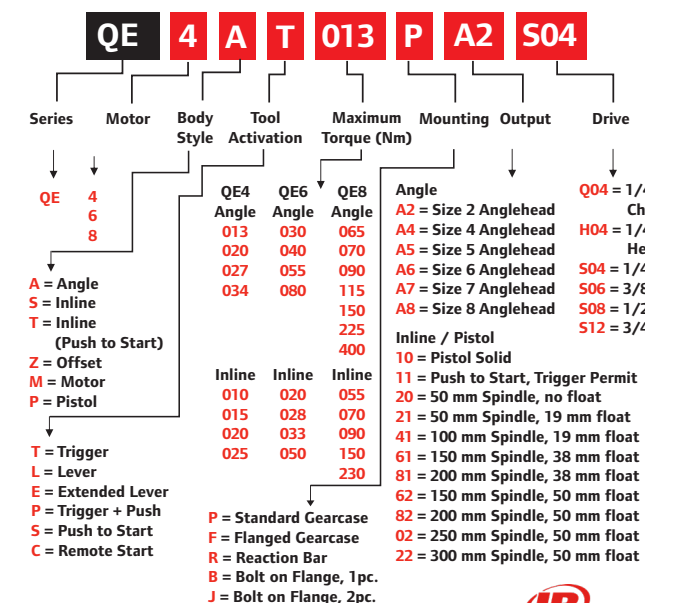
*In this case License Option (OPT) represents number of spindle licenses

DC ELECTRIC NUTRUNNERS

QE2 Series DC electric nutrunners



QE Series DC electric nutrunners



SYSTEM ACCESSORIES

The INSIGHTqc™ Controller provides optimal flexibility for the workstation with compatibility to a variety of plug n play accessories to maximize productivity for your manufacturing line. A variety of cables and extension cables are available to customize your production setup.

Model	Description	Order Number
QC-SKTR	Socket Tray, 4 Position	47615828001
QC-ADPT-1	Serial Interface Adaptor	47601630001
QC-DIO-8CH	Digital I/O Box, 8 Channel	47617332001
QC-BC-SCAN-1	Bar Code Scanner, Cabled USB; HD	47625754001
QC-BC-SCAN-2	Bar Code Scanner, Cabled USB; LD	47625755001
QC-BC-SCAN-WL	Bar Code Scanner, HD, Wireless with USB Cradle	47625756001
QC-DIO-366-K	DIO Box Mounting Bracket Kit	47628739001



DIO Box



USB to Serial Adapter



Socket Tray



Bar Code Scanners

TOOL CABLES

	(3m)	(6m)	(10m)
DC Tool Cables			
Tool Cable (QE2)	CPS2-CORD-3M	CPS2-CORD-6M	CPS2-CORD-10M
90 tool cable (qe2)	-	CPS2-CORD-6M-90	
Tool cable (qm, qe4/6/8)	GEA40-CORD-3M	GEA40-CORD-6M	GEA40-CORD-10M
90 cool cable (qm,qe4/6/8)	GEA40-CORD-3M-90	GEA50-CORD-6M-90	GEA40-CORDX-10-90
	(10m)	(20m)	(40m)
DC Tool Extension Cables			
Extension cable	GEA40-EXT-10M	GEA40-EXT-20M	GEA40-EXT-40M
	(50")	936	
90 extension cable***	GEA40-INT-01		

*** 90 degree extension cable requires a tool cable. Other lengths available.



Learn more at www.ingersollrand.com

Ingersoll Rand (NYSE:IR), driven by an entrepreneurial spirit and ownership mindset, is dedicated to helping make life better for our employees, customers and communities. Customers lean on us for our technology-driven excellence in mission-critical flow creation and industrial solutions across 40+ respected brands where our products and services excel in the most complex and harsh conditions. Our employees develop customers for life through their daily commitment to expertise, productivity and efficiency.

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