



# INSIGHTqc™ Controller



**REAL TOOLS FOR REAL WORK.™**

# 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.



	<b>SIMPLE</b>	<b>FLEXIBLE</b>	<b>CAPABLE</b>
<b>WHY DO I CARE?</b>	<b>EXPERTS NOT REQUIRED</b>	<b>EASILY IMPLEMENT CHANGE</b>	<b>MEET YOUR REQUIREMENTS</b>
<b>WHAT DOES THIS MEAN TO ME?</b>	<ul style="list-style-type: none"> <li>• Save on selection, training and installation costs</li> <li>• Reduce errors and downtime</li> <li>• Remove user dependencies</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce line rebalancing costs</li> <li>• Easy line integration</li> <li>• Remove device dependency</li> </ul>	<ul style="list-style-type: none"> <li>• Get the job right, every time</li> <li>• Assurance via traceability</li> <li>• Optimize your productivity</li> </ul>
<b>HOW DOES INGERSOLL RAND OFFER THIS?</b>	<ul style="list-style-type: none"> <li>• Intuitive, Visual Programming Interface</li> <li>• Plug and Play Accessories and Protocols</li> <li>• Backwards Capability</li> <li>• Integrated Backup and Recovery</li> <li>• Bundled Controller Options</li> <li>• Context Specific Integrated HELP</li> </ul>	<ul style="list-style-type: none"> <li>• Web Based programming use any operating system via any browser</li> <li>• Meets current industry communication needs</li> <li>• Adjustable to meet any tightening control requirements</li> <li>• Integrated logic controls</li> <li>• Easy hardware and software upgrades</li> </ul>	<ul style="list-style-type: none"> <li>• Touch Screen Interface</li> <li>• Industry leading cycle data storage</li> <li>• Robust audit and system logs</li> <li>• Advanced tightening strategies and features</li> <li>• Onboard diagnostics</li> <li>• Integrated statistical process controls</li> <li>• Preventative maintenance alarms</li> <li>• Configurable email alerts</li> </ul>

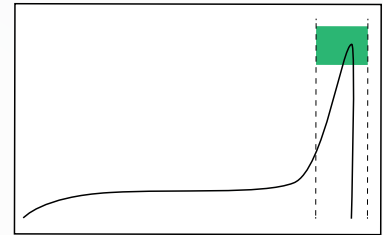
The web-based software eliminates device dependencies and enables full programming capability with any device that can run an Internet browser, including smart phones, tablets or computers. The INSIGHTqc™ controller is easy to integrate with the manufacturing line, provides flexible logic controls for job sequencing, and helps reduce line rebalancing costs through a simple and intuitive user interface.

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

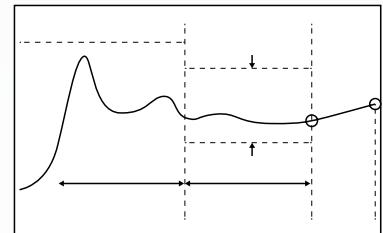
# Capabilities

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	•	•	•	•	ProfiNet		•		•
Statistics Alarm Settings	•	•	•	•	ProfiBus		•		•
Statistics Alarm Summary	•	•	•	•	DeviceNet		•		•
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	•	•	•	•					

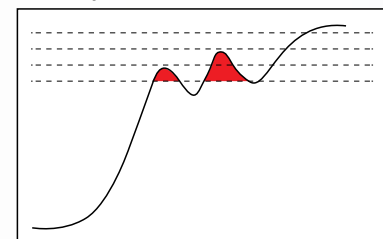
## Torque/Angle Control



## Prevailing Torque



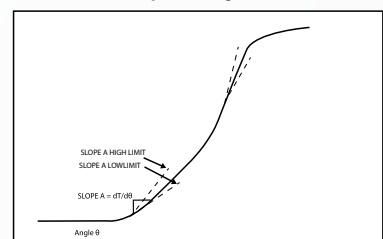
## Stick Slip Detection



## 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 $(6 * \sigma / \text{Mean}) * 100$ 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 ( $\sigma$ )	The calculated standard deviation ( $\sigma$ ) of the Result Value of a particular PSET.
PP	Process Performance, calculated as: $(\text{USL} - \text{LSL}) / (6 * \sigma)$
CAM	Calculated as: $(\text{USL} - \text{USL}) / (6 * (\text{W} / \text{d} * \text{S}))$
PPK	Process Performance Index, Calculated as: $\text{MIN} ((\text{MEAN} - \text{LSL}) / (3 * \sigma) \text{ OR } (\text{USL} - \text{MEAN}) / (3 * \sigma))$

## Gradient/ Slope Analysis



# Specifications



<b>Hardware</b>	
Weight (Kg) lbs	(5.6) 12.3
Volume (dm3)	10.9
Color Touchscreen	7 inch
Ethernet Port (10/100)	1
Ethernet Port (10/100/1K)	1
USB 2.0 Ports	4
Hot Swap Tools	Y
Boot Time (seconds)	40
Voltage / Current Requirement	115V / 20A or 220V / 8A
IP Rating	IP52
Onboard Circuit Breaker	Y
Integrated E-Stop	Y
<b>Software</b>	
PC Software	Not Required
PC License	Not Required
Number of JOBs	256
Number of PSETs	256
Number of Steps	31
Logic Rules for JOB Sequencing	Y
Barcode function: USB, Serial, Ethernet	Y
Manual Barcode Entry Option	Y
Tubenut Controls (Configurable modes)	Y
Number of Configurable User Logins	Unlimited
Quick Programming Mode	Y
Advanced Programming Mode	Y
Unrestricted programming function from controller screen	Y
Unrestricted remote programming from any device via any authorized browser	Y
Embedded, Context-Specific Help	Y
Email Statistics Alarms Direct From Controller*	Y
Email Preventative Maintenance Alarms Direct from Controller*	5
Multi-language Support	Y
Onboard Tool Diagnostics	Y
<b>*Requires proper authorization and network settings by plant IT Administrator for each controller</b>	
<b>Onboard Data Storage</b>	
Removeable SSD Card that stores ALL settings and data	Y
Complete controller settings and data recovery through SSD swap	Y
Tightening Results	50,000
Tightening Curve	50,000
Tightening curve displayed on Home screen of controller	Y
Audit Log	50,000
Event Log	50,000
System Log	50,000
Full USB Backup and Restore Function	Y
<b>Connectivity</b>	
<b>Fieldbus Options</b>	
Ethernet IP, ProfiNet , ProfiBus, DeviceNet	
<b>MES Protocol Options</b>	
Atlas Copco Open Protocol, Atlas Copco Toolsnet, VW XML 2.1, Nissan Serial EOR, IR Ethernet EOR	
<b>Supported Languages</b>	
English, French, German, Italian, Spanish, Czech, Russian, Portuguese, Simplified Chinese	

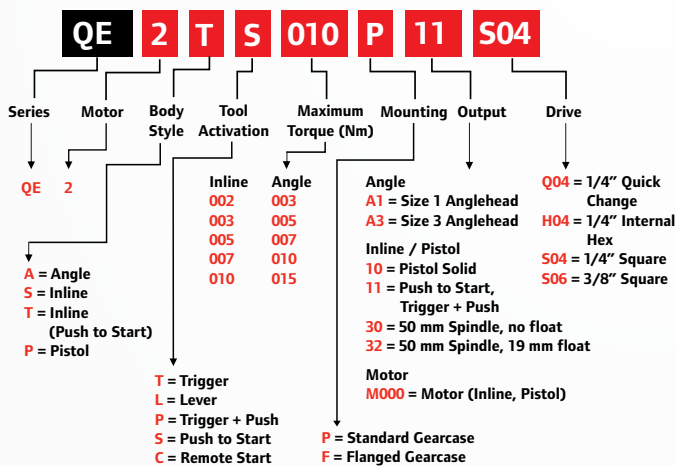
# Controller Models

The INSIGHTqc™ Controller is 100% compatible with our QE and QM tools. With the INSIGHTqc™, these tools will have 50K tightening records and 50K 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.

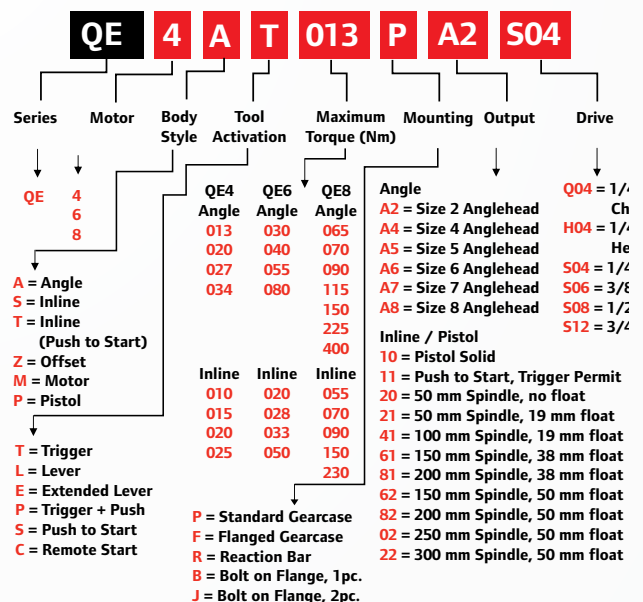
Model	SYSTEM OPTIONS				FIELDBUS OPTIONS				MES OPTIONS				
	Series	Display	Power	Hardware	Ethernet/P	ProfiNet	ProfBUS	DeviceNET	IR Ethernet EOR	Atlas Copco Open Protocol	ToolsNet	VW XML 2.1	Nissan SerialEOR
QCD11	QC	Display	120V AC	Standard					•				
QCD11-F	QC	Display	120V AC	Standard	•	•			•				
QCD11-M	QC	Display	120V AC	Standard					•	•	•	•	•
QCD11-FM	QC	Display	120V AC	Standard	•	•			•	•	•	•	•
QCD12-F	QC	Display	120V AC	Standard plus ProfiBus Card	•	•	•		•				
QCD12-FM	QC	Display	120V AC	Standard plus ProfiBus Card	•	•	•		•	•	•	•	•
QCD13-F	QC	Display	120V AC	Standard plus DeviceNet Card	•	•		•	•				
QCD13-FM	QC	Display	120V AC	Standard plus DeviceNet Card	•	•		•	•	•	•	•	•
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					•	•	•	•	•
QCD22-F	QC	Display	230V AC	Standard plus ProfiBus Card	•	•	•		•				
QCD22-FM	QC	Display	230V AC	Standard plus ProfiBus Card	•	•	•		•	•	•	•	•
QCD23-F	QC	Display	230V AC	Standard plus DeviceNet Card	•	•		•	•				
QCD23-FM	QC	Display	230V AC	Standard plus DeviceNet Card	•	•		•	•	•	•	•	•

# 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.



**DIO Box**  
QC-DIO-8CH  
• QC-DIO-366-K mounting kit included



**USB to Serial Adapter**  
QC-ADPT1



**Socket Tray**  
QC-SKTR  
• If a bit tray is needed order IC-BIT-8, IC-19PIN-10M, & QC-DIO-8CH



**Bar Code Scanners**  
QC-BC-SCAN-WL Wireless  
QC-BC-SCAN-1 Wired-Heavy Duty  
QC-BC-SCAN-2 - Wired-Light Duty



**Light Tower**  
QC-TL-4



**Bit Tray**  
IC-BIT-8

# Tool Cables

	(3m)	(6m)	(10m)
<b>DC Tool Cables</b>			
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)
<b>DC Tool Extension Cables</b>			
Extension cable	GEA40-EXT-10M	GEA40-EXT-20M	GEA40-EXT-40M
	<b>(50")</b>	936	
90 extension cable***	GEA40-INT-01		

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



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