



Pulse Systems

Tools, Qualifiers, and Controllers



Productivity
redefined

Because every assembly is critical



There's much more to an assembly application than merely putting wrench to bolt. It's an intricate matter of linking tool users and fasteners to deliver an uncompromised combination of ergonomics, speed, and accuracy. The solution: Ingersoll Rand pulse systems.

Pulse tools feature an air-driven hydraulic impulse mechanism that creates an internal pressure differential and a resulting "rotary-type" blow. By adjusting the pressure differential, and (in the case of transducerized tools) by also monitoring the onboard transducer, the user is able to control the torque output of the tool. This makes pulse tools more accurate than standard impacting tools, while still maintaining the high power-to-weight ratio, speed, and near reactionless one-handed performance users love. And, since pulse tools use a hydraulic mechanism rather than metal-on-metal blows, the tools' noise and vibration levels are significantly lower than those of other tools. The result is extremely fast, ergonomic, and accurate tightening that users striving for lean, streamlined processes will value.

Trusted tools, proven experience


At Ingersoll Rand, we have extensive experience with threaded fastening processes. For over 100 years, we've worked with many of the world's leading manufacturers in various industries, and we understand the interface of the tool and operator. We know how to leverage the power of ergonomically designed equipment to maximize productivity and inspire progress.

Ingersoll Rand Fastening Portfolio

Ingersoll Rand offers a full line of production fastening equipment, including air and electric screwdrivers, nutrunners, drills, riveters, pulse tools, as well as hand-held and multi-spindle fixtured DC nutrunners. Whether you need a solution for a single, specific application or an entire assembly line, you can trust our century of tool design experience to meet your needs.




PULSE SYSTEMS



Non-shutoff

- Accurate
- Adjustable torque control
- Extremely lightweight
- Extremely fast
- Very low reaction
- Excellent power-to-weight ratio
- Quiet


Non-shutoff tools are recommended for the majority of applications where speed and ergonomics are important. They are the easiest to set up, maintain, and they provide good accuracy.



Shutoff

- Adjustable torque control
- Tool shuts off at preset torque
- Lightweight
- Extremely fast
- Very low reaction
- Quiet


Shutoff tools are recommended as substitutes for non-shutoff tools when increased error-proofing is desired. They can be beneficial for less experienced operators, since they automatically shut off at a preset torque level.



Qualifiers

- Error-proofing process qualifier
- Batch and cycle counting
- I/O for process flow control
- Provides shutoff function for non-shutoff pulse tools
- Compatible with most brands of standard pulse tools
- No tool modification required

Qualifiers are recommended when additional error proofing, operator feedback, and process control are desired. They work with most brands of pulse tools and many impact tools.



Transducerized

- Very accurate
- Transducerized torque control
- I/O and data display and transfer
- Fastening strategies
- Batch count and process control
- Extremely fast and quiet
- Visible and audible OK / NOK

Transducerized systems are recommended when a process requires data output, accuracy, process control, and feedback to the operator.

Standard Pulse Tools

Ingersoll Rand offers a full line of standard shutoff and non-shutoff pulse tools in pistol, angle, and in-line configurations to meet your needs. These extremely lightweight tools offer excellent power, speed, accuracy, and ergonomics.

The Q-Series is the latest generation of pulse tools engineered with the end-user in mind — making them the tools of choice for operators looking for the best combination of speed, ergonomics, and accuracy.

If you're looking for error proofing and process control, both shutoff and non-shutoff pulse tools are fully compatible with the QC Air Tool Qualifier.



Improved ergonomics — lighter, smaller, quieter, lower trigger force, vibration, and reaction force

Improved durability — new mechanism design improves sealing characteristics

Longer life — specially coated blades last two times longer than conventional blades

Improved operating cost — improved motor efficiency means more power with less air

Environmentally enhanced — lube-free, dual-chamber air motor and self-lubricating blades and cylinder reduce oil mist in the environment

Easy torque adjustment — quick setup for repeatable torque accuracy



Twin blade pulse mechanism — compact size and low weight

Patented cooling system — reduces maintenance and extends life





Ergonomic grip and one-hand reverse — improves operator comfort

Multiple configurations — pistol, angle, and in-line

Shut-Off Pulse Tools

	Model	ft-lb (Nm)	rpm	lb (kg)	in (mm)	in (mm)	cfm	Drive
POWER PULSE PLUS								
Pistol								
	40PSQ1	M4 - M5	4 - 10 (5 - 13)	5000	2.1 (1.0)	7.2 (183)	0.73 (19)	13 1/4" ☉
	45PS3	M5 - M6	6 - 14 (8 - 20)	7000	2.4 (1.1)	7.3 (185)	0.83 (21)	12 3/8" □
	45PSQ1	M5 - M6	5 - 13 (7 - 17)	7000	2.4 (1.1)	7.3 (185)	0.83 (21)	12 1/4" ☉
	55PS3	M6 - M8	7 - 21 (10 - 28)	6000	2.4 (1.1)	7.3 (185)	0.83 (21)	15 3/8" □
	55PSQ1	M6 - M8	6 - 16 (8 - 22)	6000	2.4 (1.1)	7.3 (185)	0.83 (21)	15 1/4" ☉
	70PS3	M8 - M10	26 - 42 (36 - 58)	5500	3.5 (1.6)	8.1 (206)	0.97 (25)	17 3/8" □
	90PS4	M10 - M12	37 - 59 (51 - 78)	5000	4.4 (2.0)	7.9 (201)	1.15 (29)	18 1/2" □
POWER PULSE								
Pistol								
	500PS3	M6 - M8	10 - 40 (14 - 54)	10500	4 (1.8)	7.9 (201)	1.2 (30)	12 3/8" □
	700PS3	M8 - M10	20 - 60 (27 - 81)	9250	4.5 (2.0)	8.5 (216)	1.2 (30)	14 3/8" □
	900PS4	M10	30 - 70 (41 - 95)	8000	5.9 (2.7)	9.1 (231)	1.3 (33)	14 1/2" □
	1100PS4	M10 - M12	40 - 85 (54 - 115)	6500	6.2 (2.8)	9.2 (234)	1.3 (33)	16 1/2" □
	1900PS4	M12 - M14	70 - 140 (108 - 190)	7000	8.6 (3.9)	10.2 (259)	1.5 (38)	18 1/2" □

Non-Shutoff Pulse Tools

	Model	ft-lb (Nm)	rpm	lb (kg)	in (mm)	in (mm)	cfm	Drive
POWER PULSE PLUS								
Pistol								
	46PQ1	M5 - M6	10 - 18 (14 - 24)	8000	2.0 (0.9)	7.3 (185)	0.7 (18)	12 1/4" ☉
	46P3	M5 - M6	8 - 21 (16 - 29)	8000	2.0 (0.9)	7.3 (185)	0.7 (18)	12 3/8" □
	Q70PQ1	M6 - M8	15 - 20 (20 - 28)	7000	1.8 (0.8)	5.2 (131)	0.9 (22)	12 1/4" ☉
	Q70P3	M6 - M8	18 - 25 (24 - 35)	7000	1.8 (0.8)	5.2 (131)	0.9 (22)	11 3/8" □
	Q80PQ1	M8	18 - 25 (24 - 35)	7000	1.9 (0.9)	5.4 (138)	0.9 (22)	12 1/4" ☉
	Q80P3	M8	25 - 36 (34 - 50)	7000	1.9 (0.9)	5.4 (138)	0.9 (22)	12 3/8" □
	Q90P3	M8 - M10	35 - 48 (47 - 65)	6500	2.1 (1.0)	5.8 (148)	0.9 (23)	14 3/8" □
	Q110P4	M10 - M12	48 - 74 (65 - 100)	5500	3.0 (1.4)	6.5 (164)	1.1 (27)	20 1/2" □
	100P4	M12	48 - 107 (65 - 145)	4000	4.7 (2.2)	7.4 (188)	1.3 (33)	20 1/2" □
	130P4	M14	56 - 141 (75 - 190)	3600	5.8 (2.6)	7.9 (200)	1.3 (34)	25 1/2" □
	140P6	M16	78 - 174 (105 - 235)	3200	6.8 (3.1)	8.9 (226)	1.4 (36)	3/4" □
POWER PULSE								
Pistol								
	100PQ1	M4 - M5	3 - 8 (4 - 11)	9300	1.6 (0.7)	5.6 (142)	0.7 (18)	12 1/4" ☉
	180PQ1	M4 - M6	6 - 22 (8 - 30)	10500	2.2 (1.0)	6.5 (165)	0.9 (23)	9 1/4" ☉
	280PQ1	M6 - M8	10 - 26 (14 - 35)	9500	2.5 (1.1)	7.0 (178)	0.9 (23)	11 1/4" ☉
	280P	M6 - M8	12 - 28 (16 - 38)	9500	2.5 (1.1)	7.0 (178)	0.9 (23)	11 3/8" □
	380PQ1	M8	15 - 32 (20 - 44)	8500	2.9 (1.3)	7.0 (178)	1.0 (26)	11 1/4" ☉
	380P	M8	18 - 36 (24 - 49)	8500	2.9 (1.3)	7.9 (178)	1.0 (26)	11 3/8" □
	500PQ1	M8 - M10	18 - 38 (38 - 52)	8500	3.2 (1.5)	6.5 (165)	1.2 (31)	12 1/4" ☉
	500P	M8 - M10	20 - 43 (27 - 58)	8500	3.2 (1.5)	6.5 (165)	1.2 (31)	12 3/8" □
	700P	M8 - M10	24 - 58 (33 - 79)	8500	3.6 (1.6)	6.5 (165)	1.2 (31)	14 3/8" □
	900P	M10	30 - 80 (41 - 109)	7500	4.6 (2.1)	7.9 (200)	1.3 (33)	14 1/2" □
	1100P	M10 - M12	35 - 90 (48 - 122)	5000	4.9 (2.2)	8.2 (208)	1.4 (36)	16 1/2" □
In-line								
	100SQ1	M4 - M5	3 - 9 (4 - 12)	10000	1.8 (0.8)	8.9 (226)	0.8 (20)	12 1/4" ☉
	180SQ1	M4 - M6	6 - 22 (8 - 30)	9000	2.0 (0.9)	8.7 (221)	0.9 (22)	9 1/4" ☉
	280SQ1	M6 - M8	7 - 26 (10 - 35)	8000	2.1 (1.0)	9.0 (229)	0.9 (22)	11 1/4" ☉
	380SQ1	M8	15 - 32 (20 - 44)	8500	2.6 (1.2)	9.1 (231)	1.0 (25)	11 1/4" ☉
Angle								
	500A	M6 - M8	12 - 30 (16 - 41)	7000	3.3 (1.5)	10.5 (267)	1.1 (27)	11 3/8" □
	700A	M8 - M10	19 - 36 (26 - 49)	5500	4.4 (2.0)	11.2 (284)	1.1 (27)	12 3/8" □

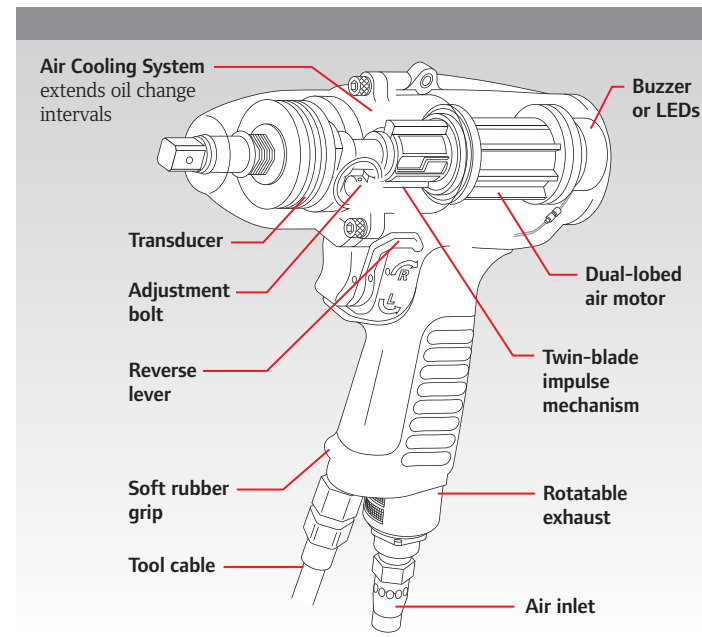
Model	dBa	1/4" NPT	3/8" (10 mm)
40P - 90P	78 - 82	1/4" NPT	3/8" (10 mm)
100P - 140P	82 - 83	1/4" NPT	1/2" (13 mm)
Q70P - Q80P	74 - 75	1/4" NPT	3/8" (10 mm)
Q90P - Q110P	78 - 81	1/4" NPT	3/8" (10 mm)



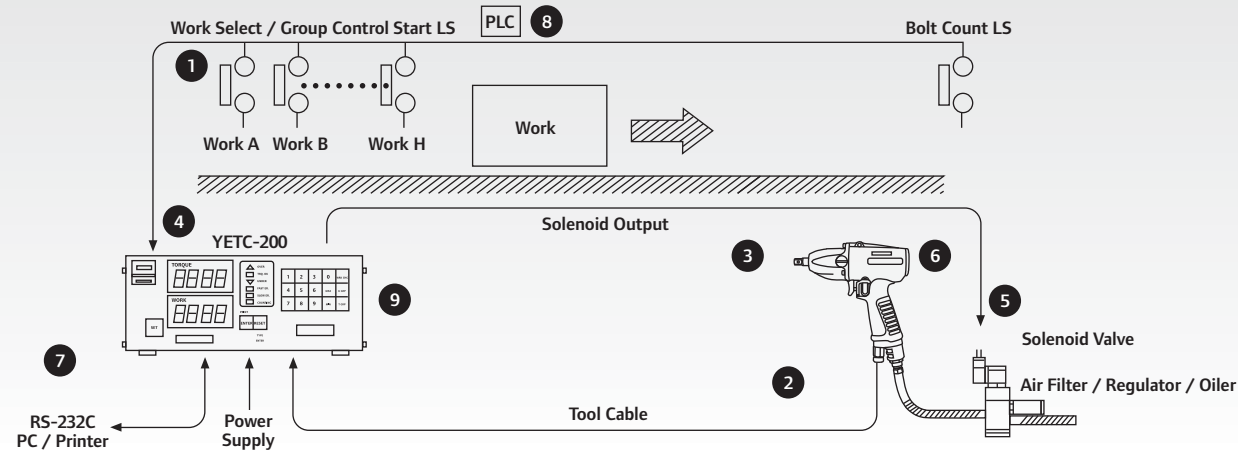
Transducerized Pulse Tools

Ingersoll Rand combines the power, speed, and ergonomics of the pulse tool with the sophistication of a torque transducer and microprocessor to create a more powerful, convenient, and accurate fastener tightening system. This closed-loop system offers all the advantages of a pulse tool, while providing advanced torque control and data output typically found in DC fastening systems.

- Strain gauge on tool anvil and close to socket for more accurate measurement of torque
- Non-contacting pick-up reduces signal noise, improving torque repeatability
- Torque readout
- End-of-run data
- Operator notification
- I/O signals for line control
- Simple programming for fast and easy set-up



Pulse Tool System Layout



Operation

- Operator or factory system selects one of eight possible configurations
- Operator engages pulse tool to work piece
- Transducer senses torque in anvil with each pulse and sends data to the controller
- Controller:
 - Interprets data and compares it to selected parameters
 - Makes decision to either shut off tool or continue
 - Upon reaching shut-off decision, sends signal to solenoid valve
 - OK, NOK, or "gang complete" sent to tool buzzer or LED
 - EOR data is sent to RS-232C and printer ports
 - I/O signals sent to PLC or other devices
 - System resets and runs self-diagnostics test



The new QXP Series pulse tools offer a new level of speed, convenience, accessibility, and comfort to the assembly process. A complete range of tools to cover the most popular bolt sizes along with YETC Series controllers make these the tools of choice for applications requiring the accuracy and process control offered by system pulse tools.

Transducerized Pulse Tools

	Model		ft-lb (Nm)	rpm	lb (kg)	in (mm)	in (mm)	Drive
QXP Series								
Pistol								
	QXP60P6	M6	7.4 – 14.5 (10 – 19.5)	6,000	2.8 (1.26)	7.0 (179)	0.8 (21)	3/8" □
	QXP60Q4	M6	6.3 – 11.8 (8 – 16)	6,000	2.8 (1.26)	7.0 (179)	0.8 (21)	1/4" ○
	QXP70P6	M6 – M8	13 – 24 (18 – 33)	7,000	2.8 (1.26)	7.0 (179)	0.8 (21)	3/8" □
	QXP70Q4	M6 – M8	11 – 20 (15 – 27)	7,000	2.8 (1.26)	7.0 (179)	0.8 (21)	1/4" ○
	QXP80P6	M8	17 – 33 (24 – 46)	7,000	3 (1.3)	7.3 (186)	0.8 (21)	3/8" □
	QXP90P6	M8 – M10	26 – 44 (35 – 60)	6,500	3.3 (1.5)	7.7 (195)	0.9 (23)	3/8" □
	QXP110P8	M10 – M12	35 – 70 (48 – 95)	5,500	4.1 (1.86)	8.2 (209)	1.0 (25.6)	1/2" □
	QXP120P8	M12	48 – 92 (65 – 125)	5,900	5.4 (2.46)	8.8 (223)	1.1 (29.0)	1/2" □
QXP140P8	M14	55 – 114 (75 – 155)	5,200	6.3 (2.86)	9.3 (235)	1.1 (29.0)	1/2" □	
QXP150P8	M16	81 – 162 (110 – 220)	4,200	7.5 (3.41)	9.6 (241)	1.3 (32.5)	1/2" □	
YE Classic Series								
Pistol								
	YEX-120A	M5 – M6	2.6 – 6.5 (3.5 – 8.8)	7,000	3.2 (1.43)	8.8 (223)	0.93 (23.5)	1/4" ○
	YEX-120	M5 – M6	2.9 – 7.2 (3.9 – 9.8)	7,000	3.2 (1.43)	8.7 (222)	0.93 (23.5)	3/8" □
	YEX-150A	M5 – M6	3.6 – 11.1 (4.9 – 15)	9,000	3.2 (1.43)	8.8 (223)	0.91 (23.0)	1/4" ○
	YEX-150	M5 – M6	4.0 – 13.3 (5.4 – 18)	9,000	3.2 (1.43)	8.7 (222)	0.91 (23.0)	3/8" □
	YEX-501A	M6 – M8	11.1 – 31.7 (15 – 43)	8,200	4.4 (2.0)	8.9 (227)	1.04 (26.5)	1/4" ○
	YEX-501	M6 – M8	12.5 – 35 (17 – 48)	8,200	4.4 (2.0)	9.4 (234)	1.04 (26.5)	3/8" □
	YEX-701	M8 – M10	18.4 – 55 (25 – 75)	8,000	4.9 (2.2)	9.7 (246)	1.04 (26.5)	3/8" □
	YEX-901	M10	23.6 – 65 (32 – 88)	6,100	5.9 (2.7)	10.1 (257)	1.32 (33.5)	1/2" □
	YEX-1400	M10 – M12	38 – 105 (52 – 142)	5,900	7.7 (3.5)	10.5 (266)	1.34 (34.0)	1/2" □
	YEX-1900	M12	43 – 123 (58 – 167)	5,800	9.0 (4.1)	10.9 (277)	1.54 (39.0)	1/2" □
	YEX-3000	M16	90 – 209 (122 – 284)	4,000	14.1 (6.4)	12.2 (309)	1.57 (40.0)	3/4" □
	YED-200	M18 – M20	129 – 265 (175 – 360)	2,300	15.0 (6.8)	12.0 (307)	1.60 (40.0)	3/4" □
Inline								
	YEX-120SA	M5 – M6	2.7 – 5.3 (3.6 – 7.2)	10,000	2.6 (1.18)	10.5 (267)	1.22 (31.0)	1/4" ○
	YEX-120S	M5 – M6	3.0 – 5.6 (4.0 – 7.6)	10,000	2.6 (1.18)	10.5 (267)	1.22 (31.0)	3/8" □
	YEX-150SA	M5 – M6	3.6 – 11 (4.9 – 15)	9,000	3.0 (1.43)	10.9 (276)	0.91 (23.0)	1/4" ○
	YEX-150S	M5 – M6	4.0 – 13 (5.4 – 18)	9,000	3.2 (1.45)	10.8 (275)	0.91 (23.0)	3/8" □
	YEX-300SA	M6	5.8 – 15 (7.8 – 20)	8,000	4.0 (1.80)	12.3 (313)	1.06 (27.0)	1/4" ○
	YEX-300S	M6	6.5 – 16 (8.8 – 22)	8,000	4.0 (1.80)	12.3 (313)	1.06 (27.0)	3/8" □
	YEX-500SA	M6 – M8	8.1 – 27 (11 – 37)	7,800	4.6 (2.10)	13.2 (334)	1.06 (27.0)	1/4" ○
	YEX-500S	M6 – M8	9.6 – 30 (13 – 41)	7,800	4.6 (2.10)	13.1 (333)	1.06 (27.0)	3/8" □
YEX-700S	M8	14.8 – 45 (20 – 61)	7,500	5.1 (2.30)	13.1 (333)	1.06 (27.0)	3/8" □	

Model			
QXP	75 – 87 dBa	1/4" NPT	3/8" (10 mm)
YEX	74 – 80 dBa	1/4" NPT	3/8" (10 mm)
YED	86 dBa	1/2" NPT	1/2" (13 mm)

Controllers

YETC-200 Series

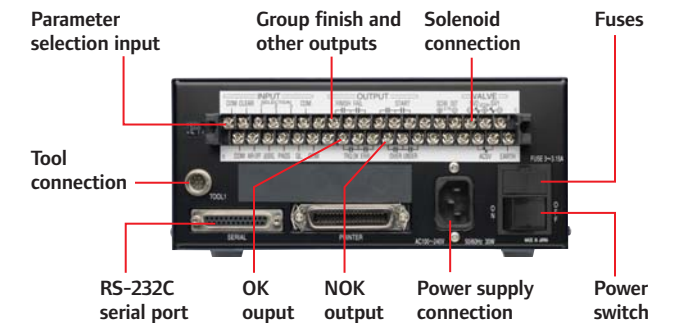
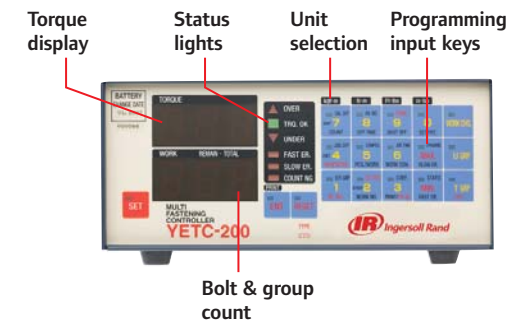
A YETC-200 series controller is a microprocessor-based system that provides accurate torque control when combined with Ingersoll Rand torque control pulse tools. The system monitors the signals from the tool transducer and then makes decisions based on the parameters that you have programmed into the unit.

Each YETC-200 series controller provides a full set of visual, audible, digital, and I/O outputs. Up to eight separate tightening strategies can be preprogrammed and selected via line control or switches. The unit features strategies that help identify cross threading, double tightening, and high or low torque. It also provides "gang count" and other advanced tightening strategies.

The unit includes the necessary cable, hose, regulator, fittings, and solenoid valve to connect to a QXP or YE Series transducerized tool and an air system.



Model						Configs	
	mm	mm	mm	lb (kg)	volts		
YETC-200ETB	230	110	290	5.2 (11.4)	117 VAC	8	1
YETC-200ETB-4	230	110	290	5.3 (11.4)	117 VAC	4 x 2	4
YETC-200ETF	230	110	290	5.2 (11.4)	117 VAC	8	1



Standard equipment

Controller	
10-meter tool cable	Y-7642-0908-0117
Solenoid valve	
Tool air hose with quick couplers	
Air regulator	

Optional equipment

15-meter tool cable	Y-7642-0908-0119
20-meter extension tool cable	Y-7642-0908-0122
3/8" solenoid valve	Y-9191-1026-0000
1/2" solenoid valve	YETV-12KIT
Printer	Y-CTZ

Features:

- Torque display (Nm, ft-lb, in-lb, Kgf-m)
- Fastener count display
- Gang (batch) control
- RS-232C digital EOR data
- Printer port
- I/O signals
- Easy programming
- 8 selectable configurations
- Pulse count

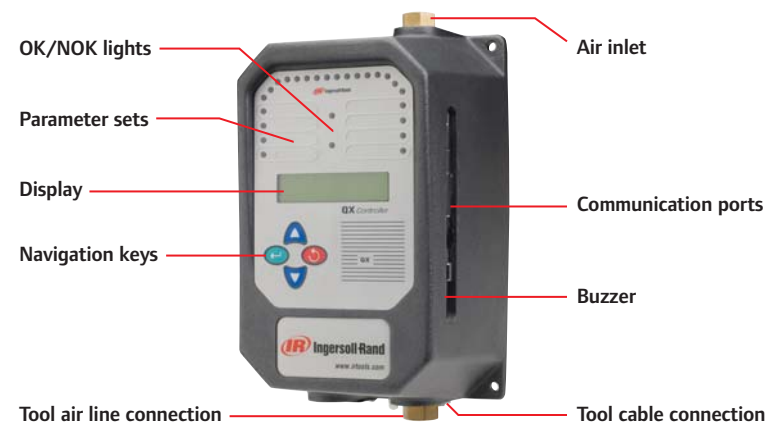
Programmable parameters:

- Maximum torque
- Minimum torque
- Target torque
- Threshold torque
- Tool coefficient
- Fast error (Pre-tightened)
- Slow error (Cross thread)
- Gang control
- Additional advanced parameters

See accessories section for additional equipment

QXC Series

QXC Series controllers are vertically mounted with air systems and controls integrated within the controller housing. A simple program menu and "learn joint" system allows for quick set-up. The QXC system works with QXLH hoses to provide visual OK / NOK signals to the tool operator. The system also includes various input, output, and digital signals to communicate with other devices.



Features:

Torque display	
Gang count	4 outputs
8 parameter sets	Cycle — accept, reject
5 inputs	Batch — accept, reject
Batch reset	Buzzer
Parameter select (3)	
Disable	

Model					
	mm	mm	mm	volts	
QXC-STD-12	216	356	153	100 - 240 VAC 50 / 60 HZ	None
QXC-PFCS-12	216	356	153	100 - 240 VAC 50 / 60 HZ	PFCS

QC Air Tool Qualifiers



Ingersoll Rand Air Tool Process Qualifiers enable users to improve quality and process efficiency in their assembly line applications.

Qualifiers provide error proofing, batch and cycle time counting, process flow control, and factory floor networking capabilities to ensure that each and every fastener is installed per their specifications.

In addition, QC100 qualifiers provide shutoff capabilities when used with non-shutoff pulse and impact tools, allowing standardization across the plant floor.

Process Qualification

- Provides OK/NOK signal based on air flow rundown signature.
- Verifies batch/gang count and cycle time completion.
- Multiple parameter sets for different joint applications.
- Compatible with PFCS protocol commonly used at DCX facilities.
- Optional hose light gives operator visual feedback right at the tool.

Error-Proofing

- Detects rehits, cross-threads, and early throttle release.

Easy Setup

- Simple menu prompts quickly lead users through parameter setup.
- Process Flow Control and Alarms
- I/O ports interface with alarms, lights, or process control devices.
- Total cycle count alarm prompts for preventive maintenance.

Shutoff Capability

- Solenoid Valve provides shutoff capability on non-shutoff tools.

Tool Compatibility

- NO tool modifications are required (such as special valves, porting)
- Independent of brand — works with Ingersoll Rand pulse, impacts and compatible nutrunners as well as many competitive models



QC Air Tool Process Qualifiers



Model	OK / NOK	Batch Count	Batch Timing	Error Proofing	I/O	Parameter Sets	Comm Protocol	Solenoid Valve
For Use with Non-shutoff Tools								
QC100-S-K	●	●	●	●	●	2	—	●
QC100-N-K	●	●	●	●	●	2	PFCS	●
For Use with Shutoff Tools								
QC200-S-K	●	●	●	●	●	2	—	●
QC200-N-K	●	●	●	●	●	2	PFCS	●

Accessories

Ingersoll Rand offers a full array of parts and accessories designed to help you get the most out of your pulse tools, qualifiers, and controllers.

Tune up kits

For models Q70, QXP70, Q80, QXP80, Q90, QXP90	
Q70P-TK1	Motor tune-up kit
Q70P-TKMS1	Mechanism tune-up kit
For models Q110 and QXP110	
Q110P-TK1	Motor tune-up kit
Q110P-TKMS1	Mechanism tune-up kit

Manuals

Tool Series	Tool	Product	Parts	Maintenance
Standard Non-shutoff				
Q Series	Q70	80206667	80206618	80212671
	Q80	80206667	80206618	
	Q90P3	80206667	80206618	
	Q110P4	80206667	80206618	
Power Pulse Plus	46PQ1	P7589	16574774	
	46P3	P7589	16574774	
	100P4	P7680	16574782	
Power Pulse Plus	130P4	P7680	16574782	
	140P6	P7680	16574782	
	100PQ1	P7090us		
Power Pulse	180PQ1	P7058us	16574790	
	280PQ1	P7058us	16574790	
	280P	P7073us		
	380P	P7073us		
	500PQ1	P7072us		
	500P	P7072us		
	700P	P7072us		
	900P	P7072us		
	1100P	P7074us		
	100SQ1	P7089us		
380SQ1	P7075us			
500A	P7079us			
700A	P7079us			

Standard Shutoff		
Power Pulse Plus	80167570	1654766
Power Pulse	500PS3	P7191us
	700PS3	P7191us
	900PS4	P7191us
	1100PS4	P7192us
	1900PS4	P7192us

Transducerized		
QXP Series	80206675	80206642 80194574
YED Series	P7584	
YETC-200 ETF	P7395	
YETC-200 ETB	P7396	

Optional Equipment

Hose lights

QXLH-08-14	8' (2.4 m) hose and light with 1/4" fittings
QXLH-16-14	16' (4.8 m) hose and light with 1/4" fittings
QXLH-25-14	25' (7.6 m) hose and light with 1/4" fittings
QXLH-16-38	16' (4.8 m) hose and light with 3/8" fittings
QXLH-25-38	25' (7.6 m) hose and light with 3/8" fittings

Visit our website irtools.com or check manuals for more information about options to enhance your pulse system setup.



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Solenoid valves



QC & QXC Hose Light



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