



## STREAMLINING INSTALLATION TIME AND EFFORT THROUGH POWERED TORQUE WRENCH CAPABILITY

The importance of torquing electrical connections is not a new concept. In fact, research has shown that up to 90% of electrical failures occur at connections. As such a critical part of the process, it's not surprising that the National Electrical Code (2017) states that "listed and labeled equipment shall be installed and used in accordance with any instructions included in the listing and labeling" in installation standard 110.3(B).

A new addition in 2017 provides further clarification in regard to torquing by requiring "where a tightening torque is indicated as a numeric value on equipment or in installation instructions provided by the manufacturer, a calibrated torque tool shall be used to achieve the indicated torque value, unless the equipment manufacturer has provided installation instructions for an alternative method of achieving the required torque." (NEC 2017 110.14(D))

### The Importance of Properly-Applied Torque

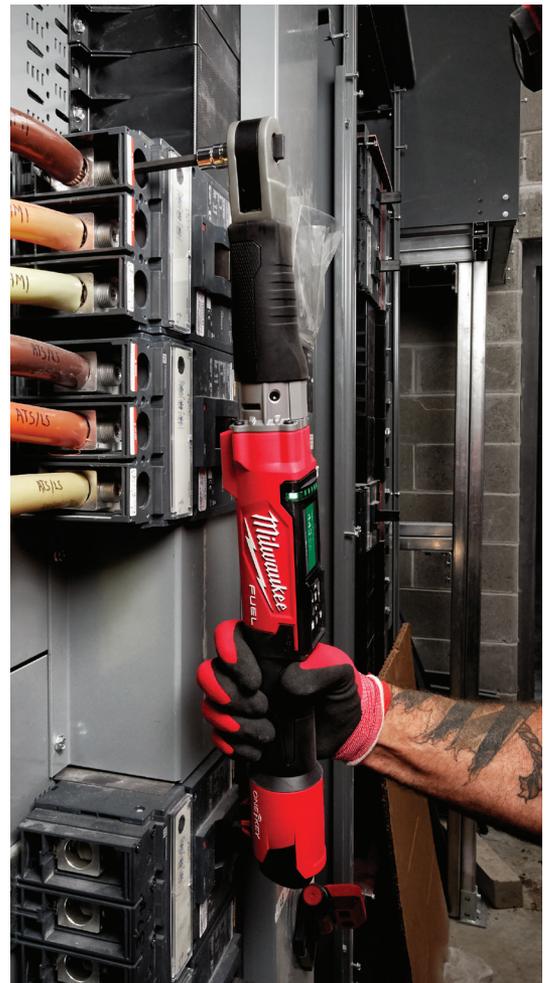
Electricians have a responsibility to install conductors and make connections according to the manufacturers' instructions. Unfortunately, it's commonplace for many electricians to tighten connections one of three common ways: (1) With a torque tool that may not be calibrated properly, (2) Using an impact and then a torque wrench, (3) Manually applying torque with a crescent wrench and using the torque wrench to get to the torque value. These professionals may believe they know how to accurately tighten connections this way because everything has traditionally worked fine once the equipment is energized. Unfortunately, what they rarely see is what happens years down the road when these connections start to fail...

#### Over-Tightened Connections

- Potential to yield a fastener or put too much pressure on the wire, resulting in hot flash.
- Could cause the fastener to break, cut the wire, and damage the connection.
- Over time, the connection could begin to overheat and fail.

#### Loose Connections

- Over time, connection could experience thermal runaway. This could result in high temperatures, leading to equipment damage and, in some cases, structural fires.
- Can result in loss of energy – a problem for building owners who want to cut costs.
- When the conductors aren't making good contact this can create arcing, sparking, and overheating – resulting in fire.



2465-22  
M12 FUEL™ 3/8" Digital Torque Wrench w/ ONE-KEY™



## The Traditional Tools – and Their Shortcomings

Unfortunately, to make proper connections in accordance with the NEC, electricians have had to resort to a lengthy, multi-tool process. This process involves:

1. Taking a hand tool or impact to run down the fastener to ensure precise torque
2. Holding the fastener in place with pliers
3. Following up with a torque wrench to ensure precise torque

4. Recording the read-out via paper or similar spreadsheet (which often includes manually changing in-lbs to ft-lbs)

Additionally, some electricians are often asked to wait for an inspector prior to making these connections so that the documentation is ensured to be accurate – potentially postponing the installation by days or even weeks.

This entire process can ultimately halt productivity to a standstill.

## A Solution to the Multi-Step, Multi-Tool Connection Process

The M12 FUEL™ Digital Torque Wrench w/ ONE-KEY™, the first torque wrench with a motor, streamlines the overall connection process through a fully-digital application and reporting experience all performed on the tool.

### How to Use

- 1 Set Target Torque
- 2 Pull Trigger To Max RPM  
Tool will automatically stop prior to target torque to prevent over-torquing
- 3 Finish By Hand To Reach Target Torque
- 4 Press  To Save Record  
Optional



### How Tool Reporting Works



See next page for an example of generated report through ONE-KEY™



# Digital Torque Wrench Report

## Notes

### Milwaukee® Tool Company

13135 W Lisbon Road  
 Brookfield, WI 53005  
 (414) 729-3878



### Report summary

Date range:  
 08/21/2019-08/23/2019

1

Total tools

60

Total events

✓ 60

Successful events

✗ 0

Out of range

▲ 0

Out of certification

2465-20 | DTW 002

M12 FUEL™ 3/8" Digital Torque Wrench w/ONE-KEY™

Barcode  
 Serial #

Total groups 4

Total events 60

Event ID	Date/Time	Target/Actual	Range	Mode
<b>✓ Box 1</b> 15 total events      15 successful events      0 events out of range				
✓ Bolt A-1	08/21/2019   4:45 pm	51.4/50.0 FT-LBS	-0/+10% (50.0-55.0)	BOLT A 50
✓ Bolt A-2	08/21/2019   4:47 pm	50.9/50.0 FT-LBS	-0/+10% (50.0-55.0)	BOLT A 50
✓ Bolt A-3	08/21/2019   4:50 pm	52.1/50.0 FT-LBS	-0/+10% (50.0-55.0)	BOLT A 50
✓ Bolt A-4	08/21/2019   4:54 pm	52.7/50.0 FT-LBS	-0/+10% (50.0-55.0)	BOLT A 50
✓ Bolt B-1	08/21/2019   4:59 pm	31.4/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-2	08/21/2019   4:50 pm	32.6/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-3	08/21/2019   4:50 pm	31.9/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-4	08/21/2019   5:07 pm	32.6/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-5	08/21/2019   5:12 pm	30.9/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-6	08/21/2019   5:15 pm	31.3/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-7	08/21/2019   5:18 pm	32.3/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-8	08/21/2019   5:21 pm	31.3/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-9	08/20/2019   5:24 pm	32.2/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-10	08/20/2019   5:29 pm	32.6/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-11	08/21/2019   5:34 pm	31.3/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
✓ Bolt B-12	08/21/2019   5:42 pm	30.3/30.0 FT-LBS	-0/+10% (30.0-33.0)	BOLT B 30
<b>✓ Box 2</b> 15 total events      15 successful events      0 events out of range				
<b>✓ Box 3</b> 15 total events      15 successful events      0 events out of range				
<b>✓ Box 4</b> 15 total events      15 successful events      0 events out of range				



## Avoid Electrical Connection Failures... and Attract a Host of Other Benefits

The design and technology built into the M12 FUEL™ Digital Torque Wrench w/ ONE-KEY™ provides users and companies with a range of holistic benefits:

SCAN TO LEARN MORE



### APPLICATION TIME

- Increase productivity by applying torque via a motor first
- Achieve final torque by hand
- Eliminate repetitive motion for faster installation

**CUT APPLICATION TIME BY 50%**

### ACCURACY

- Precise accuracy to meet the spec'd requirements
- Visual indication your torque was met
- More accurate than click styles

**Ensure ACCURACY WITHIN +/- 2%**



### REPORTING

- Save an unlimited number of events through ONE-KEY™
- Easily customize & organize reports for the job
- Simple one-button recording
- Validate the torqued events applied to the fastener with detailed torque information

**GENERATE REPORTS IN LESS THAN 30 SECONDS**

### CALIBRATION

- Calibrate every 12 months or 5,000 cycles
- Certification saved on-tool & available via paper records
- No need to set to 0 after application

**SAME CALIBRATION INTERVAL AS ALL OTHER TORQUE WRENCHES**



### ALL DAY RUN-TIME

#### RUN-TIME

- Utilizes M12™ REDLITHIUM™ Batteries
- Complete up to 90 fasteners per day on one 2.0Ah battery
- Battery pack protected against harsh jobsite conditions

### EASE OF USE



Use 1 tool instead of 2



Quickly change between ft-lbs, in-lbs, Nm, and KG-CM



Creates less user fatigue by reducing repetitive motion



\*Stats above are based off field testing with users

For more information visit [www.milwaukeetool.com](http://www.milwaukeetool.com)