YOKOTA

Made in Japan

YETC-230ER
- 1-channel control unit, for one angle system impulse wrench
- Torque control
- Rotation angle monitoring
- Alternatively as 230ER-L with LAN port

YETC-330ER2
- 2-channel controller, for two angle system impulse wrenches simultaneously
- Torque control
- Rotation angle monitoring
- As 330ER2-L with LAN port (2 IP addresses)

Angle-monitoring system impulse wrench controller

According to the German **VDI guideline 2862** for the use of bolting systems in the automotive industry, bolted joints are divided into clear categories. The guideline is also a guide for the selection and use of suitable tightening tools or bolting systems.

The Yokota EC tightening system consists of the YETC-R control unit, TKa impulse wrench, solenoid valve for compressed air control and other optional system components.

In order to be able to statistically evaluate and document safety-relevant bolt joints of category A and, of course, to tighten them with the correct pre-tensioning force, Yokota has equipped the impulse wrenches with an integrated measuring transducer. In connection with the YETC-R control unit, the **torque** can be controlled, the **angle of rotation** monitored and, of course, recorded. The **number of pulses**, which is also monitored, serves as a control variable. The exact parameterisation for individual tightening situations (soft – hard) is possible.

Zero-error assembly

The Yokota control unit YETC-R has been specially developed to meet the requirements of a process-safe system. All bolted joints are measured, evaluated, counted and stored in the control unit and/or workplace computer.

The YETC-R offers comprehensive programming options for individual adjustment to the bolting parameters. The improved electronics enable even more accurate and faster torque calculations.

The programmable monitoring of bolt groups allows changing from group to group without operating the control unit. Control by external signals is also possible, e.g. by socket spanner change box.

Thus, the Yokota control unit YETC-R fully supports the integration into a **Poka-Yoke** system: accept zero faults, produce zero faults, pass on zero faults.

Networkable

The YETC-R is available in various equipment versions. Several input/output relays also enable a variety of additional uses, such as integration into the production line, signal lights, etc. Thus, the modular and expandable system can be individually configured and installed as required. Optionally, the control unit is also available in a network-compatible version (LAN version).
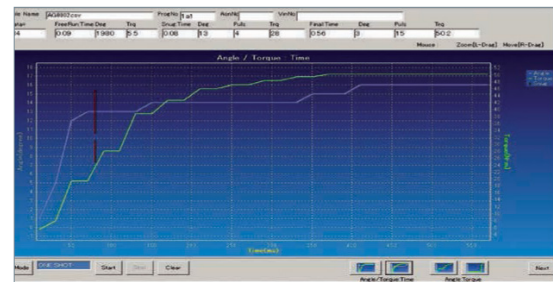
Analysing software

A Yokota software tool is available for each YETC control unit, with which the parameter sets can be conveniently managed on the workplace computer.

After each bolting operation, the control unit can output a rotation angle-torque curve that can be displayed on the computer.
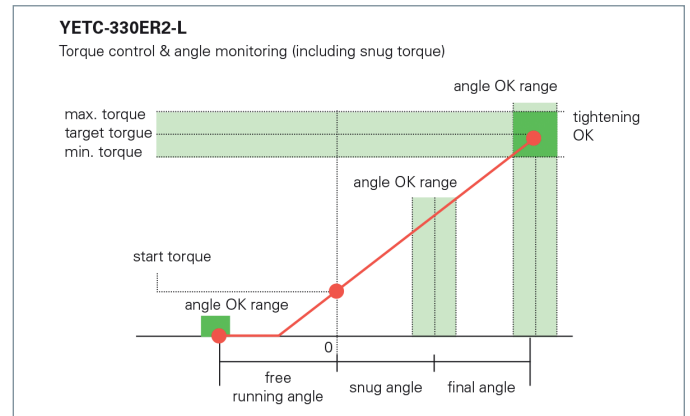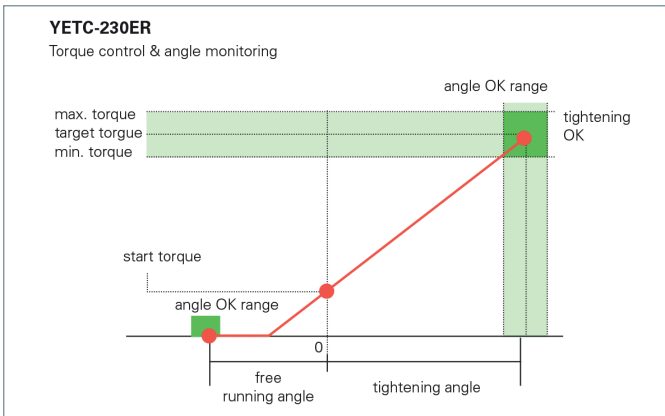
EC impulse wrenches

A non-contact **torque sensor** is integrated in the system wrench, which determines the torque generated at the output shaft of the wrench and converts it into an electrical signal. The **strain gauges** mounted on the output shaft of the impulse wrench are inductively supplied with a defined measuring current. The output current is also tapped inductively and fed to the control system. There, the system processor calculates the torque from the difference between the input and output current, corresponding to the torsion in the output shaft, and compares this with the programmed parameters (upper and lower torque limit, shut-off value). The torque setting of the screwdriver is made at the pulse cell.

In addition to the existing torque control, the integration of an **angle sensor** also enables rotation angle and time monitoring. The extremely compact integrated encoder detects both the angle and direction of rotation from 1 degree.

YOKOTA

4.0

Impulse Tool Controller with Angle Monitoring – YETC-ER

YETC-230ER
Torque control & angle monitoring

angle OK range

max. torque
target torque
min. torque

tightening
OK

start torque

angle OK range

0

free
running angle

tightening angle

YETC-330ER2-L
Torque control & angle monitoring (including snug torque)

angle OK range

max. torque
target torque
min. torque

tightening
OK

angle OK range

start torque

angle OK range

0

free
running angle

snug angle

final angle

Features & Performance

▶ YETC-230 = 1-channel control unit.

▶ YETC-330 = 2-channel control unit for simultaneous use of 2 wrenches.

▶ Easy programming according to the bolting parameters.

▶ Convenient programming on a PC.

▶ Improved electronics for even more accurate and faster torque calculations.

▶ Torque calculation over several impulses (average value) – cf. above graphic.

▶ Programmable number of after-pulses to compensate for settling (on soft joints).

▶ PokaYoke: error-free bolting.

▶ Two-step tightening possible.

▶ System impulse wrenches with acoustic signal or LED display.

▶ 8 programming groups with different parameters.

▶ Automatic group change (sequence programmable).

▶ Date/time stamping.

▶ Timer function for group bolting.

▶ External shut-off valve.

▶ 8 signal inputs, 8 output relays potential-free, allow integration into the production line (SPS), connection of a multi-coloured light signal column („traffic light"), etc. (on YETC-330 with 10 inputs / 10 outputs).

▶ Printer interface (Centronics).

▶ RS-232C serial output (DB-25).

▶ Bidirectional communication.

▶ Can be integrated into all production processes.

▶ Statistics, process capability factor Cp and Cpk.

▶ Ring memory for 10,000 tightening cycles.

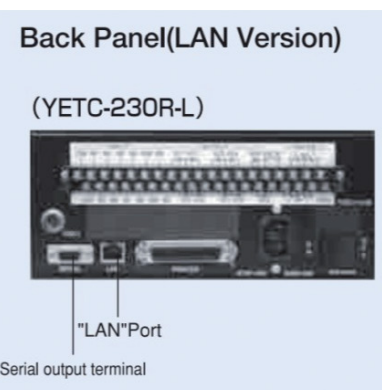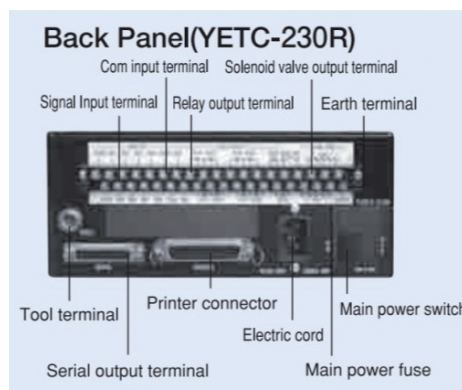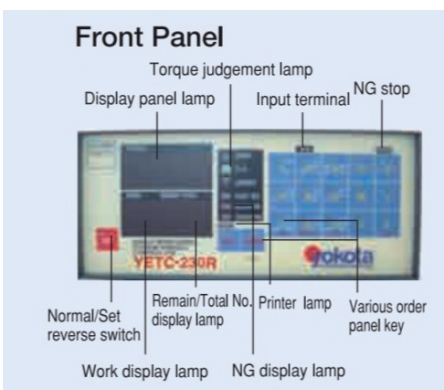▶ Display of a torque-angle curve on the PC.

LAN version

▶ Network interface 8P8C (RJ-45).

▶ Ethernet 100 BASE-TX/10 BASE-T, autodetect.

▶ Network protocol TCP/IP.

▶ Serial interface 9-pin RS-232C (instead of 25-pin).

▶ Two IP addresses for YETC-330ER2-L.

Parameter

▶ Upper/lower torque limit

▶ Target torque (cut-off)

▶ Threshold value

▶ High/low air pressure switch

▶ Upper/lower free wheel angle limit

▶ Upper/lower tightening angle limit

▶ Number of unrated pulses (skip)

▶ Start error (double bolting)

▶ Cycle error (thread seizure)

▶ Number of add-pulses (compensation)

▶ Bolt counting mode

▶ Relay active duration

▶ Co-efficient

▶ Number of pulses for mean value calculation

▶ Evaluation time

General specification

▶ Dimensions: 230×110×290 mm (WHD)

▶ Weight: 4.55 kg

▶ Voltage: AC 100V - 240V, 50/60 Hz

▶ Power consumption: 30 VA

▶ Control cable 5 / 7 / 10 m (optional)

Front Panel

Torque judgement lamp

Display panel lamp

Input terminal

NG stop

Normal/Set
reverse switch

Remain/Total No.
display lamp

Printer lamp

Various order
panel key

Work display lamp

NG display lamp

Back Panel(YETC-230R)

Com input terminal

Solenoid valve output terminal

Signal Input terminal

Relay output terminal

Earth terminal

Tool terminal

Printer connector

Main power switch

Electric cord

Serial output terminal

Main power fuse

Back Panel(LAN Version)

(YETC-230R-L)

"LAN"Port

Serial output terminal

ZEMO

www.zemo-tools.de

Impulse Tool Controller with Angle Monitoring – YETC-ER

With the curve history PC software, free running time/angle/torque and time/angle/pulse count/torque at end tightening can be confirmed, and the angle-torque curve can be displayed as a graph. In addition, the data downloaded from this software can be saved on the PC and the saved data can also be confirmed.

Note: „Angle" means „angle of rotation". As for the curve progression software, it should be necessary to install the original Yokota software.

As a display function of the curve progression, the graph can be switched with torque/angle on the vertical axis and time on the horizontal axis or with angle on the vertical axis and torque on the horizontal axis as below.

Below are examples of curves with the following bolt and setup configuration for normal tightening, double tightening and tightening with a foreign object that has entered the thread.

Screw used: M10x20mm; Setup configuration: Max torque 45 Nm, cut-off torque 40 Nm, min torque 35 Nm, threshold torque 15 Nm, lower limit of free speed angle 30°, upper limit of free speed angle 5040°, lower limit of end tightening

angle 43°, upper limit of end tightening angle 158°.

As a corresponding result, the torque value is within the acceptable range, but the free running angle and the end tightening angle are not within the preset range, showing that it may be possible to judge the tightening angle as abnormal.
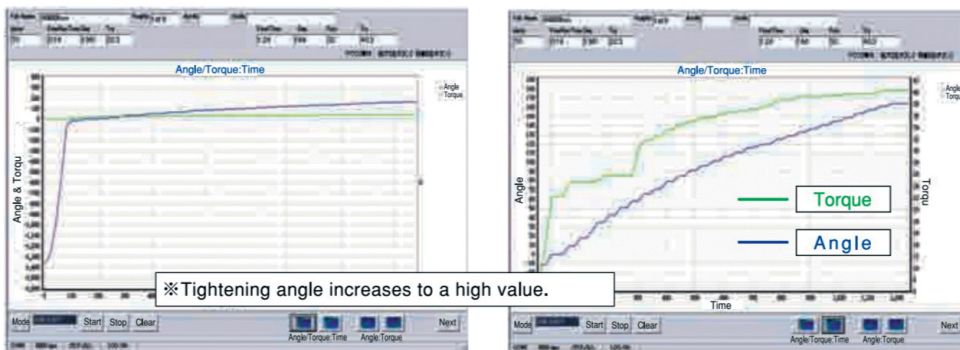
Curve – Normal bolting
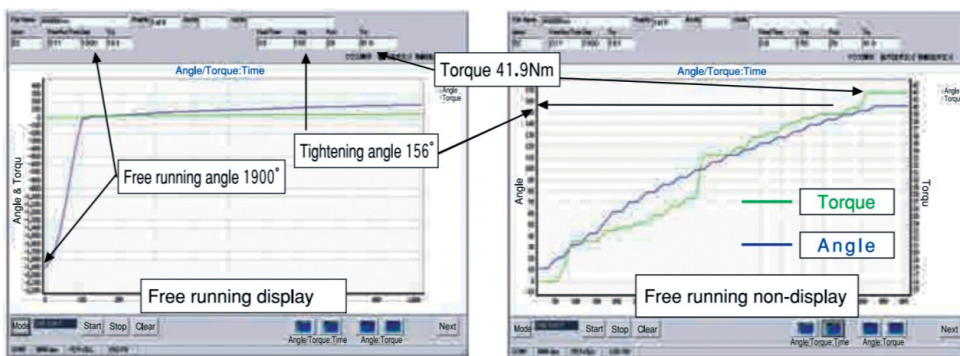
Torque: 41,9 Nm
Free run angle: 1900°
Tightening angle: 156°

Curve – Double hit
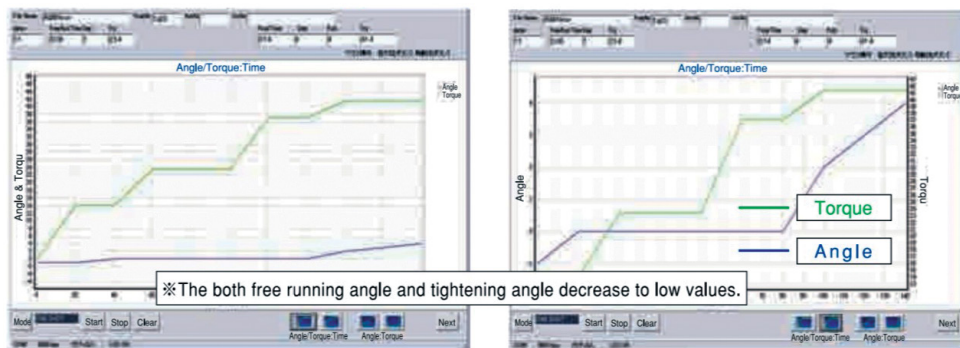
Torque: 41,1 Nm
Free run angle: 1°
Tightening angle: 4°

Curve – Tightening with contaminants in the thread

Torque: 4 0,3 Nm
Free run angle: 1361°
Tightening Angle: 164°

* Free running angle = Angle between the start of rotation of the main axis and the threshold torque.
* End tightening angle = Angle between threshold torque and final tightening.

Note: For the free running display screen in the curve progression software, the angle at the point where the torque reaches the threshold torque is considered 0° and is displayed that way. Therefore, the minus direction is displayed until the drive axis of the tool starts turning.