Impulse Tools

2022
2023

ZEMO
www.zemo-tools.de

Tightening and Assembly Technology for Production Optimisation

About us

With highly developed torque systems for controlled fastener tightening, ZEMO supports the efficiency of industrial manufacturing processes. This includes selected assembly tools and innovative measuring technology in recognised industrial quality. From tried and tested torque wrenches to excellent testing devices, powerful pneumatic tools and ultra-modern EC tightening systems to individual special solutions according to drawings.

In particular, ZEMO offers you profound personal advice as well as far-reaching service – from individual demonstrations and competent on-site support to authorised calibration and certification to expert repair and maintenance.

The renowned brand tools have been used successfully for decades in vehicle assembly, in mechanical engineering, but also in the aerospace industry and many other branches of industry.

ZEMO's high-class product line reflects the tools preferred in industrial manufacturing and is complemented by reliable pneumatic wrenches for maintenance and repair work (automotive).

Service Features

- Proven torque application tools and top-class EC tightening systems
- Profound personal Advice
- Competent support on site
- Effective user training
- Individual demonstration, trial installation, commissioning
- Authorised testing, calibration and certification
- Professional maintenance / repair
- Information newsletter (@)

Customer references (selection)

ATEK ANTRIEBSTECHNIK, BMW, CAT, EISENMANN, FESTO, GRAMMER, GRIMME, HATZ, Honeywell, JOHN DEERE, JUNGHEINRICH, KERMI, MAN, Mercedes-Benz, OPEL, PORSCHE, RENK, rosenbauer, SIEMENS, Volkswagen

Meaning of pictograms/symbols

- *new in catalog/assortment*
- *with air motor / pneumatically driven*
- *with microprocessor / electronically controlled (EC)*
- *with hardwired signal transmission*
- *Uses radio standard IEEE 802.11 (WLAN)*
- *supports barcode reader (barcode scanner)*
- *Documenting system / protocol printing possible*
- *with rotation angle function*
- *Can be networked data-wise / Ethernet interface*
- *Works in both directions of rotation / right-left reversable*
- *with USB port*
- *only works in the specified direction of rotation (here: clockwise)*
- *Uses Bluetooth standard IEEE 802.15.1*
- *Suitable for bits with 1/4" hexagonal drive according to DIN 3126 E 6.3*
- *Operates on battery or rechargeable battery*
- *Optional components / spare parts*
- *Works in mains operation / is electrically driven*
- *with CE marking according to EU regulation*
- *Complies with Hazardous Substances Directive 2011/65/EU*
- *Suitable for digitalised manufacturing (Industry 4.0)*

- **Efficient bolting technology**
- **Controlled tightening results**
- **Lean production**
- **Service – Quality – Competence**

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Further information available 24 / 7 on our website.

Impulse Tools – Content

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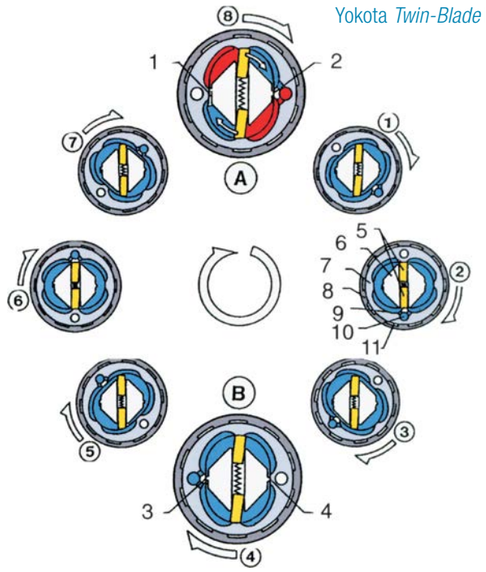
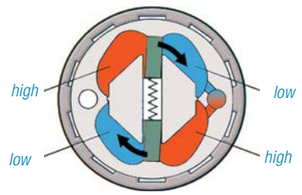
Yokota Hydraulic Impulse Tool Technology

Yokota *Twin-Blade* impulse mechanism



1. Sealing surface
2. Sealing surface
3. Sealing surface
4. Sealing surface
5. Blades
6. Shaft
7. Cylinder
8. Housing
9. Oil bypass
10. Control valve
11. Cooling

Double chamber air motor principle



Twin-Blade Impulse Unit

Yokota's patented Twin-Blade impulse mechanism separates the hydraulic cylinder into two opposing chambers. The impulse (hydraulic pressure) acts on both blades simultaneously. This results in a stable high impulse, which leads to high torque performance when bolting.

The mechanism emits one pulse per revolution. During phases 1-3 and 5-7, the hydraulic fluid can flow freely and there is no oil pressure build-up. In phase 4 (B) there is also no oil pressure build-up because the sealing surfaces on the shaft and in the cylinder cross. Only in phase 8 (A) do the sealing surfaces seal and oil pressure builds up. The duration of the oil pressure build-up and thus also the duration of the impulse is very short. The impulse is transferred to the drive axle through the plates and this causes a build-up of torque at the tightening process.

A „bypass" with an adjustment valve is installed between the primary pressure chamber with the high oil pressure and the secondary low-pressure chamber. During the impulse, hydraulic fluid flows from the high pressure chamber to the low pressure chamber. By changing the cross-section of this valve, one adjusts the power output (torque) of the screwdriver. The transmission of power by means of hydraulic fluid keeps the noise level low and reduces vibration.

Hi-Tec impulse wrenches in assembly and manufacturing

Impulse wrenches are sophisticated tools and offer not only the high working speed but also the control of the torque.

Yokota supplies high-quality tightening tools that are manufactured according to the requirements of today's production plants. The modern technology is based on a first-class production system and 90 years of experience.

Yokota impulse wrenches are used by industry worldwide in bolting applications. The nutrunners have a low noise level, low vibration, a favourable weight/power ratio, integrated cooling of the impulse unit and – especially important – they have **no reaction torque**. Especially for medium torques, the advantages of impulse wrenches are significant:

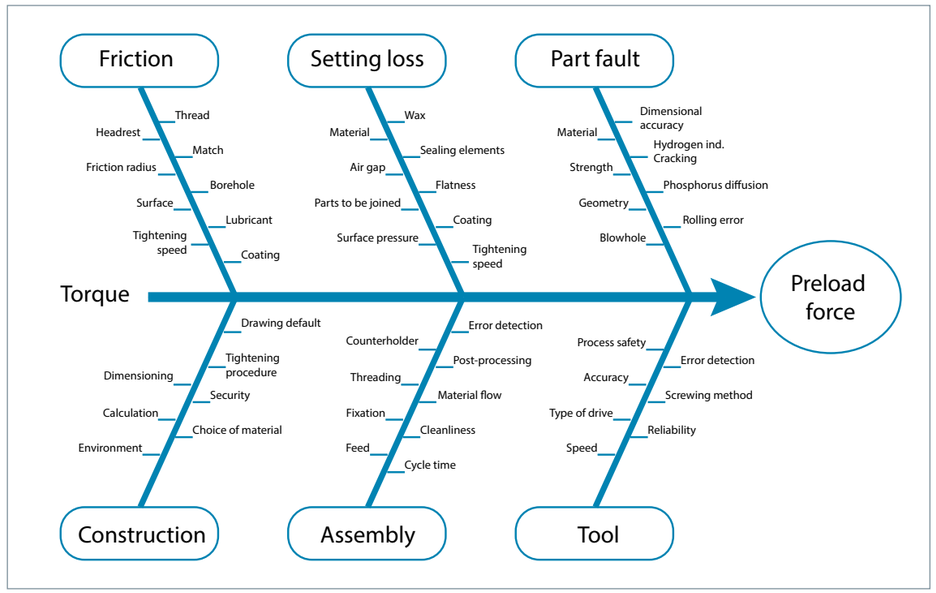
- Fast screw-in speed
- Narrow torque tolerance
- One-hand operation
- Low vibration
- Free from reaction torque
- Low setting losses

High repeatability

With the pneumatic impulse wrench, power is transmitted indirectly: the air motor delivers its power to the impulse cylinder, where a special **hydraulic fluid** is strongly compressed for a short time. The pressure impulse generated in this way acts on the blades of the drive axle. The hydraulic flow from the primary to the secondary chambers is controlled via an oil bypass with a torque adjustment valve. This allows the torque output to be adjusted very precisely and a high level of repeatability is achieved.

Since the high-frequency pulses are too weak to set the tool itself in rotation, there is virtually no reaction torque. **This means that impulse wrenches can be operated with just one hand and no supports or counterholders are needed, even at high torques.**

In the sum of its features, the advantages of the impulse wrench are unsurpassed in productivity, ergonomics and reliability. Particularly effective in terms of quality is the low setting behaviour when tightening, as the fastener already has to „work" during the screwing-in process.



The right tool

Bolted joints are complex physical structures in which numerous influencing factors are co-determining. Most of the applied torque is absorbed by the head and thread friction. Only a small part of about 10% is directly converted into pretensioning force. Basically, the softer the bolt joint, the higher the friction losses and the lower the preload achieved.

Thus, each bolted joint must be considered individually, as the main variables mentioned in the above diagram have a different weighting depending on the bolted joint. The „correct" assessment requires a lot of experience and knowledge. Our competent team will be happy to help you select the appropriate tool.

Faster tool – shorter assembly times

In the manufacturing process, the use of tools serves two primary objectives – cost reduction and competitiveness. To achieve this, four elements must be optimally balanced:

- Productivity
- Ergonomics
- Reliability
- Quality

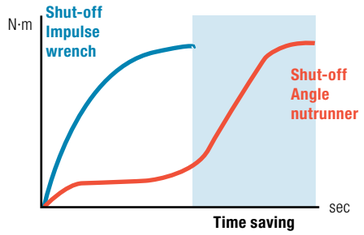
Impulse wrenches are used worldwide in industrial bolting technology. The tool itself is small, light and suitable for one-hand operation.

Another advantage is the reaction-free behaviour of the impulse wrench. Musculoskeletal illnesses such as RSI are avoided compared to other pneumatic nutrunners. The use of impulse wrenches reduces health complaints of the operating personnel and the corresponding financial risks to a minimum. A major advantage of impulse wrenches is the fast wrenching time. This makes it possible to increase the speed of the assembly process. With impulse wrenches one achieves optimal pretensioning force and reduced setting losses.

Save time – increase productivity

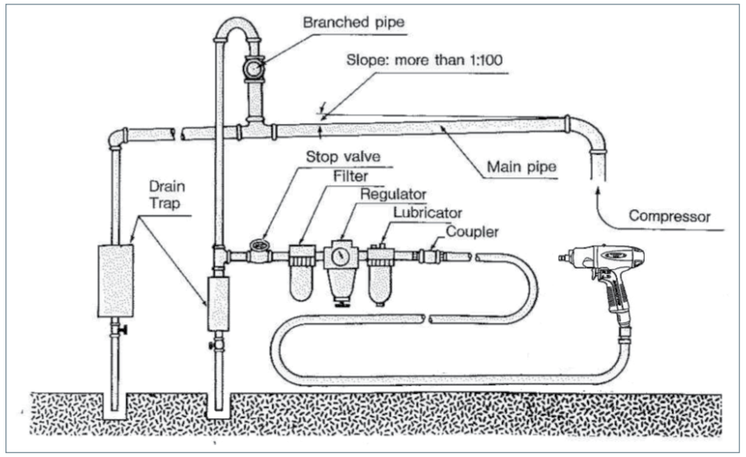
Studies in automotive manufacturing have shown that the bolting processes take up 10% of the total manufacturing time. Working with faster tools saves assembly time!

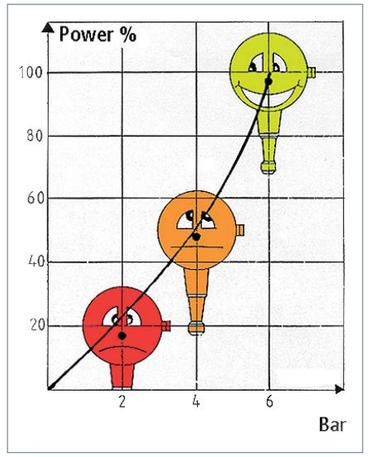
To generate torque, impulse wrenches can operate at high speeds by using hydraulic components. This allows the required torque to be achieved in fractions of a second.



Compared to angle shut-off wrenches, impulse wrenches reach the target torque (horizontal course of the torque curve) almost twice as fast.

Yokota – High Tec & Know How





Hi-Tec Impulse Tools

Yokota impulse wrenches are suitable for all types of bolted joints – hard or soft. They are used wherever fast and precise screwing is required. They are free of reaction torque and thus significantly reduce the risk of musculoskeletal disorders such as RSI or similar.

The Yokota impulse wrench range is constantly expanding. It ranges from 2 N·m for M3 screws up to 600 N·m for M24 bolts. The variety of versions and perfectly coordinated performance ranges of shut-off impulse wrenches and impulse wrenches without shut-off enable a comprehensive range of applications in industrial production. The further expansion of the Yokota impulse tool range is being worked on with high motivation, whereby the quality of the tools always comes first. This is underlined by the remarkably high customer satisfaction.

The torque data of the impulse wrenches given in this catalogue show the performance potential in a hard tightening case, i.e. ≤ 30° from head contact under 0.6 MPa flow pressure. The actual performance achieved in a specific tightening situation may deviate from the standard due to the influencing factors described above or insufficient compressed air supply.

Optimum Flow Pressure

The performance and accuracy of impulse wrenches is only optimal when the air pressure is optimal. Too low operating pressure can result in the tightening time and thus the production time being extended. Too low flow pressure always means loss of performance! Too low operating pressure is mostly caused by:

- Insufficient compressor capacity,
- inadequately dimensioned pipe network,
- major leakage,
- faulty or incorrect compressed air maintenance units,
- Hose or coupling diameters too small.

Impulse Wrench Commissioning

Before operation, fill a few drops of acid- and resin-free compressed air oil into the air inlet of the tool. Clean the coupling and the hose by briefly blowing them free.

Compressed air hoses are rarely selected too large but very often too small. Make sure that the plug-in sleeves and couplings have the same cross-section as the hoses (internal diameter).

It is important that the working air is clean and dry. We recommend a central oil unit for optimal lubrication of the pneumatic tools. For good lubrication, we advise you to use a maximum of 8 metres of hose between the lubricator and the tool. If you need to use a longer hose, then fit a jet lubricator. This has a range of up to 200 metres.

The flow pressure of the air should be 0.6 MPa when the impulse wrench is running. The correct hose diameter is necessary to achieve the desired performance.

Compressed Air Quality

Bad compressed air quality (moisture and dirt) lead to premature failure of the tool. Poor compressed air quality can be caused by:

- lack of maintenance unit,
- improper installation or inferior quality of the maintenance unit,
- outdated or poorly maintained maintenance unit,
- undersized pipes.

Good compressed air quality does not mean a large investment, as the costs are quickly amortised (trouble-free operation and longer service life).

Further information available 24 / 7 on our website.

Air Treatment

By installing an SMC **water separator**, 99% of the water is separated from the compressed air in the simplest way. The water separators are light and compact. Connection size 1/8“ to 2“ - so also very suitable for compressors (1-75 kW). Standard with automatic drain for continuous use. Thanks to a large-mesh special filter element, no filter change is necessary. For optimal functioning of the filter, it should be mounted as far away from the compressor as possible.

SMC **air filters** have a very large air passage and ensure safe, high and uniform air quality through very precise filtration by separating moisture by means of a centrifugal action and filtering out dust particles.

Pressure regulators keep a preset pressure in a compressed air system constant within narrow limits.

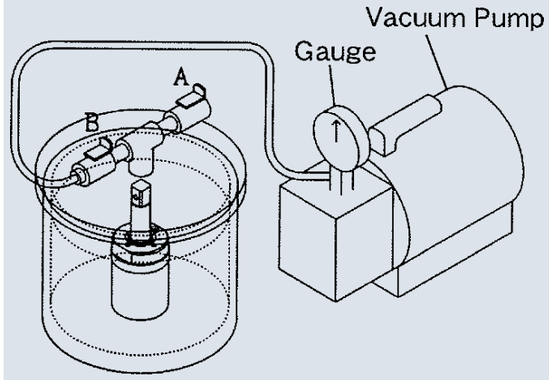
Air lubricators are used for uniform lubrication of the machine components. From type 30, the oilers can be refilled under full line pressure. They have a simple setting. Oil is nebulised even with a small amount of air.

Modular combinations consist of filter, regulator and lubricator or filter/regulator combination plus lubricator.

The SMC **refrigeration dryer** removes moisture from the compressed air system and thus extends the service life of all integrated compressed air tools.

Impulse Wrench Maintenance

Impulse wrenches should be serviced regularly to guarantee a permanently good wrenching result. As the power is transmitted by oil pressure, the oil should be changed at regular intervals. Depending on the application (hard or soft screwdriving) and on the model, the oil can last approx. 120,000 screwdriving operations or 1 year. If one single bolt tightening operation requires more than approx. 25 impulses from the tool, the oil may need to be changed sooner.



Correct filling of the impulse cell is also imperative for trouble-free operation of the nutrunner. Vacuum filling stations ensure filling without air entrapment. In addition to many years of experience, ZEMO has all the necessary assembly/disassembly tools and offers regular maintenance of your impulse wrenches.

Warranty Information

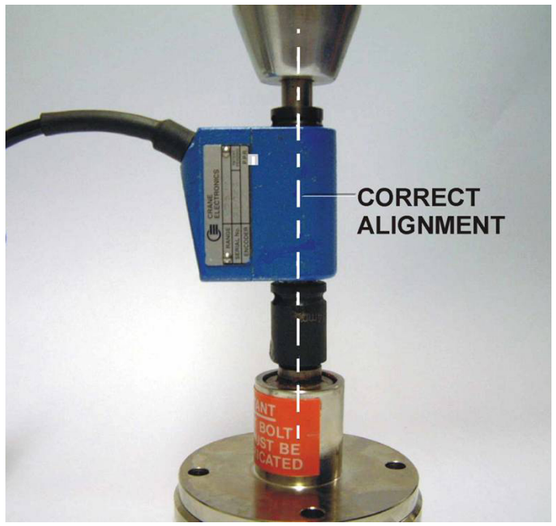
The manufacturer‘s warranty covers verifiable material, design or processing defects. Spare parts and repairs at the sales/service partner are free of charge in the event of a warranty claim. Any shipping costs incurred shall be borne by the customer.

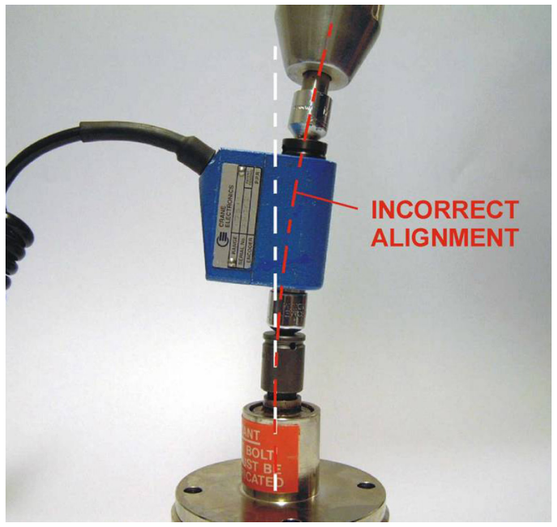
Wear and tear as well as damage due to overloading or improper handling of the impulse wrenches are excluded from the warranty. Be sure to observe the operating instructions enclosed with the impulse tool.

Production failures and other damage are also excluded from the warranty. Warranty repairs can only be carried out if the unit is received by the sales/service partner or the manufacturer in its original condition with a purchase invoice and, if possible, a precise description of the cause of failure. Warranty claims can only be made to the sales/service partner who sold the unit.

Further information available 24 / 7 on our website.

Impulse Tools – Technological Progress



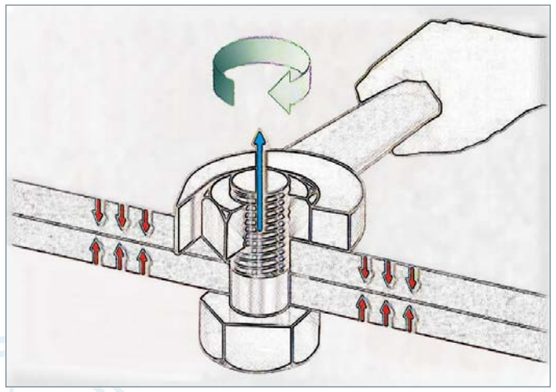


From tightening torque to preload

The functional principle of a bolted connection consists of pressing several parts or components onto each other. In the process, the applied tightening force (tightening torque) is converted via the screw thread into a contact pressure (clamping force) that acts on the screwed workpieces.

Torque (Md) is the physical force acting perpendicularly on an axis of rotation via a defined lever (perpendicular acceleration of rotation). Torque is measured in Newton metres and is the vector product of force arm times force.

The **preload force** (F) acts axially in the screw shank between the screw head and the screw nut and generates the **clamping force** with which the components to be screwed together are pressed together. From the moment the bolt head or the nut is in contact with the material to be tightened (head contact), the pre-tension is effective. The pre-tensioning force causes a constant and permanent connection of the different workpieces to each other.



Handling errors and ambient influences

A common mistake when handling impulse wrenches is that the bolt and tool are not at the correct angle to each other. Also, the tool trigger (start button) is often released too early or the trigger is pressed twice. It is not uncommon for one and the same screw connection to be tightened twice.

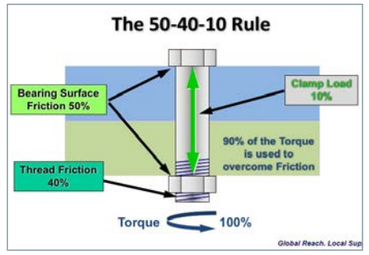
In addition to leaks in the compressed air system, incorrectly selected air hose diameters and flow pressure capacities that are too small, common environmental influences include worn socket spanners and/or extensions.

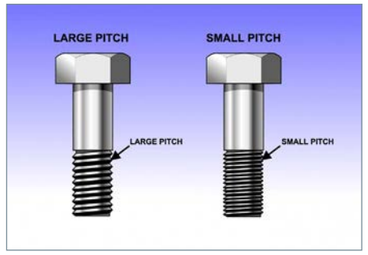
When using motorised tools, it is essential to avoid chrome-plated sockets and adapters. These pose a high potential risk of injury.

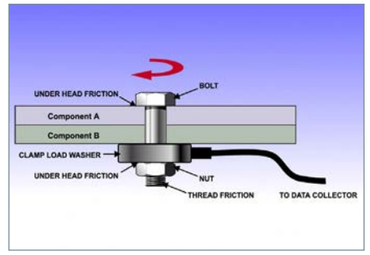
In any case, use only precision-fit power sockets, preferably with sleeve drive. The square drive of the power socket should have the same dimension as the square drive of the impulse tool. Adapters and reducers should be avoided if possible.

High attention should also be paid to the good condition of the power sockets used. Worn sockets cause loss of torque on impulse spanners, reducing torque repeatability, cause incorrect tightening position and create additional vibrations with the associated disadvantages and risks (RSI).

Further information available 24 / 7 on our website.







Friction loss and joint hardness

Frictional resistances in the fastener thread and at the screw head significantly reduce the conversion of the tightening torque into preload. They essentially depend on the material, the machining and the existing friction surfaces. The frictional forces counteract the torque, i.e. they prevent an applied torque from being fully converted into preload force. Around 90% of the applied torque is lost due to friction losses:

- 50% by head friction
- 40% by thread friction

This means that only 10% of the applied torque causes pretensioning force in the fastener connection.

Joint hardness

Each fastener, after resting with its head on the workpiece (head contact), can rotate by a certain amount until the final torque is reached. This rotation is measured in angular degrees. If the angle of rotation between the head contact and the final torque is low, it is referred to as a hard screw joint, if it is high, it is referred to as a soft screw joint.

The fastener joint hardness is influenced by the strength of the materials used, the thread pitch, the number of workpieces (e.g. several sheet metal parts) as well as the securing systems used (e.g. washers).

Torque monitoring

Direct measurement of the pretensioning force can only be carried out in the laboratory or by ultrasound, which is very time-consuming and therefore costly. Therefore, in the vast majority of cases, the preload force is determined via the torque (tightening torque). The torque can be measured in the production process with reasonable effort. Detected torque fluctuations allow conclusions to be drawn about:

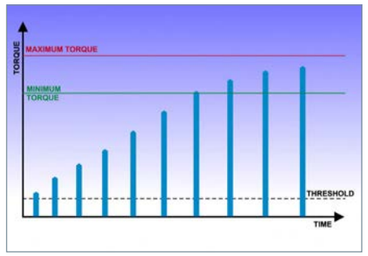
- Component alterations,
- Poor assembly tool,
- Handling mistakes,

  etc.

There are three options for checking:

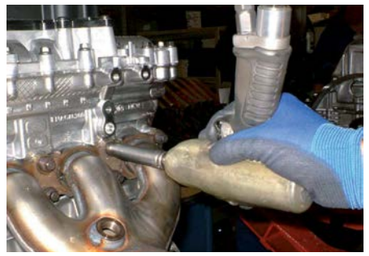
1. dynamically at the bolting point during ongoing assembly,
2. mobile by means of a measuring wrench at the tightening point after assembly,

   or
3. Stationary on the tool during maintenance or repair.



Further information available 24 / 7 on our website.

Impulse Tool Technology – modern & innovative



Impulse wrenches in industrial application

Numerous torque wrenches are in use in industry, which are used to „tighten" fastened connections exactly to the required torque. This operation can be saved by using a system impulse tool. The routine checking of fastener connections tightened with system impulse tools is carried out on a random basis with torque measuring wrenches. This is done in the same way when using torque angle wrenches. This procedure of checking fastened joints of hand-held tightening systems has been common and accepted practice in the automotive industry.

However, a meaningful relationship between the torque accuracy and strength of a joint can only be established by determining the yield strength of a bolt. Although this is technically possible, it requires a lot of work and is therefore very cost-intensive. Another reason for using the Yokota impulse wrench is therefore the maximum clamping force with minimum risk of loosening.

With bolted connections, the clamping is most important – i.e. the axial tensile stress in the bolt that ensures the cohesion of the parts. The way to achieve the right clamping force is to set the tightening torque according to the characteristic values of the bolt. In practice, it turns out that quite high setting losses occur after tightening. This often considerably reduces the tensile stress that is ultimately aimed for. Experience shows, and laboratory tests confirm this, that the setting losses are considerably greater when a fastener is tightened with an angle nutrunner than after using an impulse wrench.

The reason for this is that when using an impulse wrench, the fastener is put into a state of vibration while being tightened. Here, the setting takes place for the most part already during the assembly process. In addition, the use of the angle of rotation with hand-held tools is subject to many uncertainties.

Yokota solves the problem of retightening differently. Retightening takes place through a few additional impulses after the set torque has been reached, the so-called retightening impulses. Between one and fifteen additional impulses can take place. In addition to the vibration during tightening, setting losses during tightening are largely compensated for by these after-pulses. This fulfils an important requirement of the automotive industry.

In addition, there is the possibility of one hundred percent control and documentation. In addition, optical and acoustic warning signals can be integrated separately or together into the system and it is possible to define so-called bolt groups. For example, twelve fasteners can be defined as one group. If one bolt is forgotten when tightening, the system refuses to move on to the next fastener group.

Recommendation

The consideration of the relevant aspects in industrial bolting can now be summarised as follows:

- Only 100% documentation of all bolting operations provides the required safety.
- All torque values must be traceable; this is the only way to ensure that every screw has been tightened.

It follows that impulse wrenches should be used by the automotive industry according to the following recommendation:

Bolted joints according to VDI/VDE 2862	Recommended tool class
Category C (customer critical)	Standard impulse wrenches with high torque repeatability
Category B (functionally critical)	Shut-off impulse wrench or Poka Yoke wrench
Category A (safety critical)	Computer controlled system Impulse wrenches

In this way, a sensible and practical relationship between accuracy, tightening time and working conditions for the operator is ensured.

Yokota is committed to continuous technical development, monitoring production processes, improving efficiency and increasing speed and safety – to the benefit and advantage of the industry and its customers.

Go Green

Yokota supplies innovative systems that are being further developed with ever greater consideration for environmental compatibility. Already today, all solid components can be disposed of without any problems, as they are made of recyclable material and thus pose no danger to the environment or the operator.

Models with automatic air shut-off reduce working time and thus also compressed air consumption.

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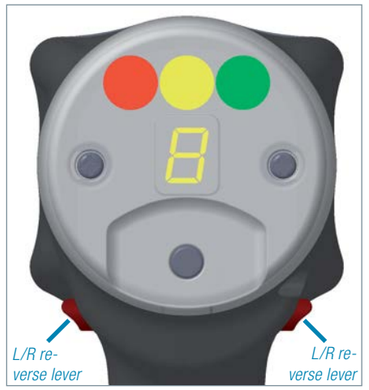
Further information available 24 / 7 on our website.

RED ROOSTER

Battery Shut-Off Impulse Wrench – BIM-T series



- Brushless DC motor
- LED status indication
  - OK / NG,
  - Reverse (left),
  - Battery low
- Run-down speed up to 4500 min^{-1} – increased productivity
- Non-contact trigger with 2 steps
- Minimal setting losses
- Very low vibration
- Low noise level
- Accurate torques with tight tolerances
- High repeatability
- Without reaction torque (non-backlash)
- Easy 1-hand operation
- Fine adjustment to address hardness of joint (electronically)

The Red Rooster BIM-T series battery impulse wrenches with controlled shut-off combine high tightening speed and accurate torque repeatability. There are no reaction forces during the tightening process. The brushless DC motor has a long service life, operates maintenance-free and is highly efficient.

Battery tools are specially designed for use in areas where hoses and/or cables impede the flexibility of action, such as the interior trim of cars, coaches and trains.

The powerful 20 volt lithium-ion battery is inserted horizontally and secured by a sturdy clip lock. If the battery voltage is too low, the tool locks and thus ensures process safety.

The one-hand operated wrench produces low vibration and low noise levels. A diode light makes it easier to find the screw or nut.

The use of reaction-free impulse wrenches in the assembly line can reduce the risk of RSI. As a result, musculoskeletal complaints decrease and operator acceptance increases.

Options, Accs & Spares

- 20V Li-Ion battery 2.5 Ah #BB200D-325 (300-350 bolts) 20V Li-Ion battery 5.0 Ah
- #BB200D-350 (700-750 bolts)
- Charger 18-20V #B84192B incl. EU power cord #E86B-VD
- Back panel cover (ALU) #B10PW15
- Pistol protection cover (s. p. 53)
- Battery protection cover (s. p. 53)
- Setup console for programming of speed, count etc. #B74SC180B
- Tool holder #61022-TH-005

Numerical setting for joint hardness:
- *hard: low (2-3-4)*
- *medium: low to middle (4-5-6)*
- *soft: high (6-7-8-9)*

BIM-T series

Type			Model	Item No.	Bolt Cap.	Free Speed	Torque Range	L A	H B	Weight without / w batt		Vibration	Noise Level
	SqD	Hex			Ø	min^{-1}	N·m	mm	mm	kg	kg	m/s^2	dB(A)
Pistole	–	1/4	BIM-15 AT	520460	M6	4500	7 - 15	227	29	1.16	n.a.	6.3	72
	–	1/4	BIM-25 AT	520464	M6-M8	4500	14 - 23	237	29	1.18	n.a.	7.7	74
	3/8	–	BIM-15 T	520462	M6	4500	8 - 15	224	29	1.16	n.a.	6.3	72
	3/8	–	BIM-25 T	520466	M6-M8	4500	15 - 25	234	29	1.18	n.a.	7.7	74
	3/8	–	BIM-35 T	520468	M8	3500	22 - 35	234	29	1.36	n.a.	8.4	73
	3/8	–	BIM-45 T	520470	M8-M10	3500	32 - 45	244	29	1.42	n.a.	13.3	77
	1/2	–	BIM-65 T	520472	M10	3200	45 - 65	240	29	1.90	n.a.	20.3	83

Further information available 24 / 7 on our website.

ZEMO
www.zemo-tools.de

Battery Impulse Wrench Non Shut-Off – YZ-NP series

Colour of protection cover depending on model

- ▶ Power output via Yokota Twin-Blade hydraulic pulse unit, driven by battery powered brushless DC electric motor.
- ▶ Li-ion battery 18 V / 2.0 Ah:
  - no memory effect
  - Sliding battery
  - Capacity control LED
- ▶ 4 rpm settings: 2000/3000/4000/4800 rpm, to be set according application/ joint conditions.
- ▶ Error LED indication:
  - Overheat error
  - Motor/driver error
  - Battery low
- ▶ Compact design:
  - no planet gear between motor and impulse unit
  - Light weight
  - Very well balanced
  - one-hand operation.
- ▶ Low vibration, low noise.

Yokota YZ-NP battery impulse wrenches are powerful, very accurate and most important, have no kick-back. The very compact design offers great accessibility to the joint.

Tightening bolts M6 up to M10 with torque levels up to 60 Nm with very high speed and remarkably low reaction forces.

The combination of adjustment of the relief valve and speed setting of the motor gives a great fit-for-purpose adaptation to the specific bolted joint.

Battery (BPL-1820) and Charger (BC0075MX) have to be ordered separately.

Applying reaction-free Yokota impulse wrenches at the assembly line reduces the RSI risk significantly. As a result, the number of sick notifications caused by musculoskeletal complaints is noticeably reduced and acceptance by the operator is significantly increased.

Pulse-Check Function: By teaching the tool the impulse cycle as a reference point, the YZ-NP is able to give a warning message for upcoming maintenance needs.

Scope of Supply *

- ✔ Battery impulse tool YZ-NP
- ✔ Rubber protector (pistol)
- ✔ Adjusting pin TF
- ✔ Operating manual

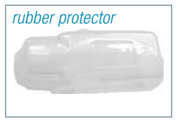
Options, Accs & Spares

- ⬢ Li-Ion battery BPL-1820 # 430110
- ⬢ Charger BC0075MX # 430115
- ⬢ Rubber protection cover (pistol)
  – YZ600 # 0454-0029-00-00 (white)
  – YZ800 # 0455-0029-00-00 (blue)
  – YZ900 # 0456-0029-00-00 (black)
  – YZ950 # 0457-0029-00-00 (green)
- ⬢ Rubber protection cover (battery) # 0446-0029-00-01

battery

charger

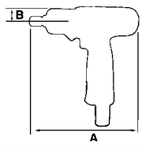
Mechanical adjustment of relief valve on tool.



rubber protector

battery cover

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output.



YZ-NP series

Type			Model *	Item Code	Torque Range	RPM settings	Dimensions mm		Weight without / w Batt		Vibration	Noise Level
	SqD	Hex			N·m	min⁻¹	A	B	kg	kg	m/s²	dB(A)
Pistol	–	1/4	YZ-NP600A	420770P	**7 - 18**	2000 / 3000 / 4000 / 4800	152	29.5	1	1.41	2.5	72
	–	1/4	YZ-NP800A	420772P	**15 - 30**	2000 / 3000 / 4000 / 4800	157	29.5	1.05	1.46	2.5	75
	3/8	–	YZ-NP600E	420771P	**9 - 20**	2000 / 3000 / 4000 / 4800	152	29.5	1	1.41	2.5	72
	3/8	–	YZ-NP800E	420773P	**18 - 35**	2000 / 3000 / 4000 / 4800	157	29.5	1.05	1.46	2.5	75
	3/8	–	YZ-NP900E	420774P	**34 - 50**	2000 / 3000 / 4000 / 4800	164	29.5	1.20	1.61	2.5	77
	3/8	–	YZ-NP950E	420775P	**45 - 60**	2000 / 3000 / 4000 / 4800	164	29.5	1.25	1.66	2.5	78

** Model names with suffix ‚-Z' are delivered without battery.*
Note: For impulse wrenches we recommend our extensive range of sleeve drive power sockets.

Further information available 24 / 7 on our website.

ZEMO
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Battery EC Impulse Wrench w Shut-Off – YZ-T series

Colour of protection cover depending on model

- ▶ Power output via hydraulic Yokota twin-blade pulse unit, driven by a battery powered brushless DC electric motor.
- ▶ Lithium Ion battery 18 V / 2.0 Ah:
  - without memory effect
  - horizontal insert with clip securing
  - charging indicator.
- ▶ 3 speed levels, freely programmable.
- ▶ Feedback via LED:
  - OK / NG
  - LED visible from almost all around.
- ▶ Ergonomic design:
  - no planet gear between motor and impulse unit
  - low weight
  - well balanced
  - one-handed right / left reversible.
- ▶ Very low vibration, low noise level.
- ▶ Non-contact trigger and L/R reverse switch.
- ▶ Main Shaft with spring+pin (type E).
- ▶ Easy maintenance after extended interval.
- ▶ Virtually reaction-free.
- ▶ Parameter input via Laptop or Programming Console (PC-1-YZ-T).
- ▶ Shipping incl. rubber protector, Li-Ion battery, and TF pin.

The Yokota YZ-T cordless impulse wrench is detecting the amplitude of the tightening force from the motor loaded condition. Based on the programmed values, the YZ-T wrench makes self-shut-off intelligently. As a result, the YZ-T achieves highest torque accuracy and safety against misconnections.

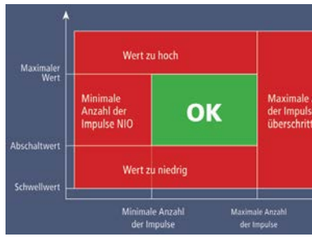
The robust and very compact design provides good accessibility to the screw connection.

An integrated status LED is visible virtually all around. The YZ-T series provides a rugged, impact-resistant housing. Its pulse cell works without a mechanical shut-off mechanism and is easy to maintain. The optimized design allows extended maintenance intervals. The grip fits well in the hand and the tool is perfectly balanced.

Intelligent shut-off

The combination of the adjustment of the pressure relief valve and the speed setting of the motor allows an optimal adaptation to the respective bolt joint to be connected.

Thus the electronically controlled shut-off effects precisely and stable according to the entered parameters for smallest torque tolerances.



Options, Accs & Spares

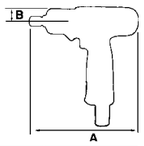
- ⬢ Li-Ion battery BPL-1820 # 430110
- ⬢ Battery charger BC0075G # 430115
- ⬢ Rubber protector (see YZ-NP)
- ⬢ Rubber protector (battery) # 0446-0029-00-01

The intelligent electronics ensure precise shut-off and high repeatability.

Programming Console

- ▶ Program parameters
- ▶ Show/review and analyze results
- ▶ Display OK / NG

Mechanical adjustment of relief valve on tool.



YZ-T series

Type			Model *	Item Code	Torque Range	RPM min⁻¹			Dimensions mm		Weight w Batt	Vibration	Noise Level
	SqD	Hex			N·m	level 1	level 2	level 3	A	B	kg	m/s²	dB(A)
Pistol	–	1/4	YZ-T600A	420570	**5 - 18**	1200-1500	1500-3000	2000-4800	161	29.5	1.4	<2.5	67
	–	1/4	YZ-T800A	420572	**10 - 30**	1200-1500	1500-3000	2000-4800	161	29.5	1.4	<2.5	67
	3/8	–	YZ-T600E	420571	**7 - 20**	1200-1500	1500-3000	2000-4800	166	29.5	1.5	<2.5	68
	3/8	–	YZ-T800E	420573	**15 - 35**	1200-1500	1500-3000	2000-4800	166	29.5	1.5	<2.5	68
	3/8	–	YZ-T900E	420574	**30 - 50**	1200-1500	1500-3000	2000-4800	173	29.5	1.6	<2.5	69
	3/8	–	YZ-T950E	420575	**40 - 60**	1200-1500	1500-3000	2000-4800	173	29.5	1.65	<2.5	70

Further information available 24 / 7 on our website.

** Models "A" equipped with 1/4" hexagonal quick change chuck; models „E" provide spring+pin in square drive shaft. Note: For impulse wrenches we recommend our extensive range of sleeve drive power sockets. (p. 38 ff).*

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WLAN Battery Impulse Tool with electronic shut-off – YS-e series

Colour of rubber protective cap depending on model

In Yokota's EC battery-powered impulse wrench YS-e, a **torque** transducer and a rotation **angle** encoder are integrated directly on the main shaft. This type of tool is the perfect solution for bolt connections that need to be precisely checked, controlled and documented, and where control cables and air hoses would interfere.

The YS-e wrenches communicate wirelessly with the WU-1 control unit, which can be paired with up to four YS-e impulse tools used in parallel. The tightening data can be stored via the RJ45 Ethernet port using TCP/IP communication.

The separate DS-2 display shows the tightening result (torque value) with the no-load angle of rotation, the tightening angle after pressing the push button, the number of remaining tightening operations and the number of pulses. The result evaluation is visualised in colour (IO=green, NIO=red). Connection to the WU-1 control unit via 5-metre cable.

The YS-e impulse wrench, which can be operated with one hand, is also equipped with a diode light that makes it easier to find the bolt or nut. Its powerful 18 volt 2 Ah lithium-ion battery with capacity indicator is inserted horizontally and secured by a robust clip lock. The YS-e also has a battery capacity level monitor, which ensures process safety.

The use of **reaction torque-free** impulse wrenches in the assembly line reduces the risk of RSI. As a result, musculoskeletal complaints decrease and operator acceptance increases.

Options, Accs & Spares

- Battery BPL-1820 (18V Li-Ion 2 Ah)
- Charger BC2075MX
- Wireless controller WU-1 for up to 4 tools
- Programming console PC-2 incl. cable 5 m
- Display DS-2 incl. cable 5 m
- Verlängerungskabel 5 m
- Rubber protection cover (pistol)
- Rubber protector (battery)

- ▶ Measuring head with strain gauge: Torque-controlled, angle of rotation monitored.
- ▶ 100% control with regard to incorrect tightening.
- ▶ High tightening speed, very low settling symptoms.
- ▶ Mobile and flexible due to battery operation and radio transmission.
- ▶ WLAN communication (IEEE802.11n).
- ▶ Acoustic and visual signal about tightening status.
- ▶ 1-hand operation and non-kick-back.
- ▶ Brushless DC motor, adjustable rotation speed.

YS-e series

Type			Model	Item No.	Bolt Capacity Ø	Free Speed min⁻¹	Torque Range N·m	Length A mm	Spindle Offset mm	Weight kg	Vibration m/s²	Noise Level dB(A)
	SqD	Hex										
Pistol	–	1/4	YS-e 600 A	430101	M6	1 200 - 4 800	5 - 18	214	32.5	1.75	< 2.5	72
	–	1/4	YS-e 800 A	430103	M6-M8	1 200 - 4 800	10 - 30	219	32.5	1.80	< 2.5	76
	3/8	–	YS-e 600	430100	M6	1 200 - 4 800	7 - 20	214	32.5	1.75	< 2.5	72
	3/8	–	YS-e 800	430102	M8	1 200 - 4 800	15 - 35	219	32.5	1.80	< 2.5	76
	3/8	–	YS-e 900	430104	M8-M10	1 200 - 4 800	30 - 50	226	32.5	1.90	< 2.5	78
	3/8	–	YS-e 950	430105	M10	1 200 - 4 800	40 - 60	226	32.5	1.94	< 2.5	78

*Note: For impulse wrenches we strongly recommend our extensive range of **Sleeve Drive** power sockets (p. 38 ff).*

Further information available 24 / 7 on our website.

WLAN Battery Impulse Tool with electronic shut-off – YS-e series

Wireless Controller WU-1

- ▶ Up to 4 tools can be paired
- ▶ Parameter input with programming console PC-2 or computer/laptop
- ▶ USB: read/save programme
- ▶ Memory for 10,000 cycles per wrench
- ▶ Tightening results on DS-2 and/or PC-2
- ▶ 4 display connectors
- ▶ 2 interfaces: Ethernet, RS232
- ▶ I/O terminal for input/output signals (e.g. PLC)

Display DS-2

- ▶ shows:
  - Tool,
  - Programme,
  - Torque,
  - Status OK / NG,
  - Rotation angle,
  - Number of pulses,
  - Number of bolted joints.

Oben: Schrauber/Programm/ Drehmoment
Unten: Verschr. Drehwinkel

Unten: Leerlauf Drehwinkel

Unten: Anzahl Impulse

Programming console PC-2

- ▶ Programming parameters
- ▶ View bolting results
- ▶ Display OK / NG

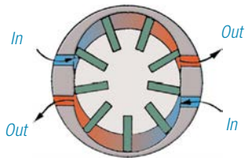
Further information available 24 / 7 on our website.

Pneum. Standard Impulse Wrench – RRI series

Img.: RRI-150


Img.: RRI-30A

Double chamber air motor



- ▶ Hydraulic impulse unit with X-Shape sealing improves repeatability.
- ▶ Easy torque adjustment.
- ▶ Faster power development due to double-chamber air motor with high number of pulses.
- ▶ Reduced workload due to reduced vibration and low noise levels.
- ▶ Smooth-running trigger.
- ▶ Reduced air consumption – reduced CO_2 emission.

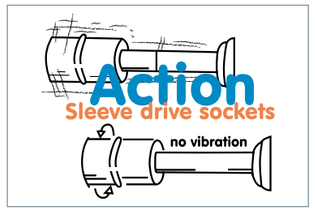
For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.

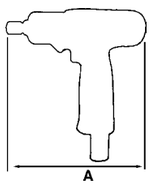
Red Rooster impulse wrenches are driven by a double chamber air motor. This motor generates a high number of pulses per second. Thus the torque is reached even faster, the tightening times are shortened and at the same time the repeatability is increased.

The power output is delivered by a Twin-Drive Roller Blade Pulse Unit. This special designed mechanism reduces noise and vibration levels and improves the effectiveness of the pulses. The cost-effectiveness is increased by the simplified design of the rotor cylinder and the front plate.

The reduced weight and improved balance of the impulse wrench makes it easier to use even in places that are difficult to access.

The ergonomically optimized design facilitates one-handed operation and relieves the operator's wrist. This significantly reduces the risk of tissue diseases such as RSI or similar.





Series RRI

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Weight	Pipe Thread	Hose ID	Dimensions A	Dimensions B	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	kg	Inch	mm	mm		m/s²	dB(A)
Pistol	–	1/4	RRI-30AX	510705	M6	4600	6 - 12,5	3,7	0,89	1/4	6,5	163	n.a.	< 2,5	78
	–	1/4	RRI-40AX	510715	M6-M8	4600	10 - 18	3,7	0,92	1/4	6,5	170	n.a.	< 2,5	78
	–	1/4	RRI-50AX	510725	M8	7200	16 - 26	5,3	0,92	1/4	6,5	170	n.a.	< 2,5	80
	–	1/4	RRI-60AX	510735	M8	6200	20 - 30	6,2	1,0	1/4	8	181	n.a.	< 2,5	82
	–	1/4	RRI-70A	510745	M10	7200	32 - 47	7,0	1,35	1/4	8	194	n.a.	< 2,5	82
	3/8	–	RRI-30X	510710	M6	4600	7 - 12,5	3,7	0,89	1/4	6,5	163	n.a.	< 2,5	78
	3/8	–	RRI-40X	510720	M6-M8	4600	11 - 19	3,7	0,92	1/4	6,5	167	n.a.	< 2,5	78
	3/8	–	RRI-50X	510730	M8	7200	16 - 27	5,3	0,92	1/4	6,5	167	n.a.	< 2,5	80
	3/8	–	RRI-60X	510740	M8-M10	6200	22 - 35	6,2	1,0	1/4	8	178	n.a.	< 2,5	82
	3/8	–	RRI-70	510750	M10	7200	37 - 57	7,0	1,35	1/4	8	194	n.a.	< 2,5	82
	3/8	–	RRI-80	510820	M10-M12	5100	40 - 70	9,3	1,19	1/4	8	194	n.a.	< 2,5	82
	1/2	–	RRI-90	510760	M12	5400	64 - 90	8,3	1,55	1/4	8	200	n.a.	< 2,5	83
	1/2	–	RRI-100	510770	M12-M14	5300	85 - 120	8,7	1,87	1/4	8	209	n.a.	< 2,5	84
	1/2	–	RRI-130	510780	M14-M16	3600	123 - 148	11,6	2,26	1/4	11	216	n.a.	< 2,5	86
	3/4	–	RRI-150	510790	M16	3700	165 - 210	11,6	3,10	1/4	11	239	n.a.	< 2,5	86
	3/4	–	RRI-180	510800	M16-M18	2700	180 - 255	12,2	3,80	1/4	11	263	n.a.	< 2,5	86
	3/4	–	RRI-200	510810	M18-M20	3000	230 - 450	n.a.	4,25	3/8	13	250	n.a.	8,3	88

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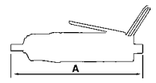
** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

Further information available 24 / 7 on our website.

Pneum. Standard Impulse Wrench – RRI-S / RRI-R series


Img.: RRI-60S


Img.: RRI-30SA

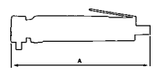


Series RRI-S

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Weight	Pipe Thread	Hose ID	Dimensions A	Dimensions B	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	kg	Inch	mm	mm		m/s²	dB(A)
Straight	–	1/4	RRI-30SA	510505	M6	4200	6 - 11,5	3,7	0,77	1/4	6,5	219	n.a.	2,7	78
	–	1/4	RRI-40SA	510515	M6-M8	4200	10 - 17	3,7	0,8	1/4	6,5	224	n.a.	3,1	78
	–	1/4	RRI-50SA	510525	M8	6800	15 - 25	5,3	0,8	1/4	6,5	224	n.a.	3,4	80
	–	1/4	RRI-60SA	510235	M8	6000	20 - 30	6,2	0,86	1/4	8	225	n.a.	3,8	80
	–	1/4	RRI-70SA	510545	M8-M10	5000	28 - 40	6,2	0,97	1/4	8	n.a.	n.a.	n.a.	80
	3/8	–	RRI-30S	510510	M6	4200	7 - 12,5	3,7	0,8	1/4	6,5	219	n.a.	2,6	78
	3/8	–	RRI-40S	510520	M6-M8	4200	11 - 19	3,7	0,8	1/4	6,5	221	n.a.	2,9	78
	3/8	–	RRI-50S	510530	M8	6800	16 - 27	5,3	0,8	1/4	6,5	221	n.a.	3	80
	3/8	–	RRI-60S	510540	M8-M10	6000	22 - 35	6,2	0,86	1/4	8	231	n.a.	3,4	80
	3/8	–	RRI-70S	510550	M10	5000	31 - 47	6,2	0,97	1/4	8	244	n.a.	3,7	80


Img.: RRI-70R


Img.: RRI-50RA



Series RRI-R

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Weight	Pipe Thread	Hose ID	Dimensions A	Dimensions B	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	kg	Inch	mm	mm		m/s²	dB(A)
Angled	–	1/4	RRI-50RA	510605	M6-M8	4300	9,5 - 16	4,8	1,2	1/4	6,5	253	n.a.	16,5	80
	–	1/4	RRI-60RA	510615	M8	4700	15 - 22	6,2	1,3	1/4	8	264	n.a.	17,2	80
	–	1/4	RRI-70RA	510625	M8	4500	20 - 29	6,2	1,4	1/4	8	272	n.a.	17,5	80
	3/8	–	RRI-50R	510610	M6-M8	4300	10,5 - 17	4,8	1,2	1/4	6,5	253	n.a.	16	80
	3/8	–	RRI-60R	510620	M8	4700	16 - 24	6,2	1,3	1/4	8	264	n.a.	16,8	80
	3/8	–	RRI-70R	510630	M8-M10	4500	22 - 31	6,2	1,4	1/4	8	272	n.a.	17,1	80
	1/2	–	RRI-70RG	510631	M10	2000	32 - 45	6,2	1,6	1/4	8	281	n.a.	17,4	82
	1/2	–	RRI-70RH	510632	M10-M12	2200	46 - 60	6,2	1,6	1/4	8	281	n.a.	17,4	82

Further information available 24 / 7 on our website.

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

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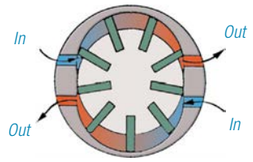
Pneum. Standard Shut-Off Impulse Wrench – RRI-T series

Img.: RRI-70 T


Img.: RRI-30 AT

Double Chamber Air Motor



- Hydraulic impulse unit with X-Shape sealing improves repeatability.
- Easy torque adjustment.
- Faster power development due to double-chamber air motor with high number of pulses.
- Reduced workload due to reduced vibration and low noise levels.
- Smooth-running trigger.
- Reduced air consumption – reduced CO_2 emission.

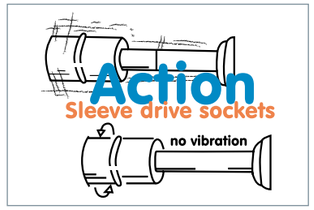
For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.

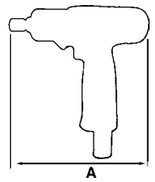
Red Rooster impulse wrenches are driven by a double chamber air motor. This motor generates a high number of pulses per second. Thus the torque is reached even faster, the tightening times are shortened and at the same time the repeatability is increased.

The power output is delivered by a Twin-Drive Roller Blade Pulse Unit. This special designed mechanism reduces noise and vibration levels and improves the effectiveness of the pulses. The cost-effectiveness is increased by the simplified design of the rotor cylinder and the front plate.

The reduced weight and improved balance of the impulse wrench makes it easier to use even in places that are difficult to access.

The ergonomically optimized design facilitates one-handed operation and relieves the operator's wrist. This significantly reduces the risk of tissue diseases such as RSI or similar.





Series RRI-T

Type	Sqd	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N-m	Air Cons. l/s	Weight kg	Pipe Thread Inch	Hose ID mm	Dimensions A mm	Dimensions B mm	Vibration m/s²	Noise Level dB(A)
Pistol	–	1/4	RRI-30 AT	510305	M6	4 600	6 - 12,5	3,7	0,89	1/4	6,5	163	n.a.	< 2,5	78
	–	1/4	RRI-40 AT	510315	M6-M8	4 600	10 - 18	3,7	0,92	1/4	6,5	170	n.a.	< 2,5	78
	–	1/4	RRI-50 AT	510325	M8	7 200	16 - 26	5,3	0,92	1/4	6,5	170	n.a.	< 2,5	80
	–	1/4	RRI-60 AT	510335	M8	6 200	20 - 30	6,2	1,0	1/4	8	181	n.a.	< 2,5	82
	–	1/4	RRI-70 AT	510345	M10	7 200	32 - 47	7,0	1,35	1/4	8	194	n.a.	< 2,5	82
	3/8	–	RRI-30 T	510310	M6	4 600	7 - 12,5	3,7	0,89	1/4	6,5	163	n.a.	< 2,5	78
	3/8	–	RRI-40 T	510320	M6-M8	4 600	11 - 19	3,7	0,92	1/4	6,5	167	n.a.	< 2,5	78
	3/8	–	RRI-50 T	510330	M8	7 200	16 - 27	5,3	0,92	1/4	6,5	167	n.a.	< 2,5	80
	3/8	–	RRI-60 T	510340	M8-M10	6 200	22 - 35	6,2	1,0	1/4	8	178	n.a.	< 2,5	82
	3/8	–	RRI-70 T	510350	M10	7 200	37 - 57	7,0	1,35	1/4	8	194	n.a.	< 2,5	82
	3/8	–	RRI-80 T	510420	M10-M12	5 100	40 - 68	9,3	1,21	1/4	8	194	n.a.	< 2,5	82
	1/2	–	RRI-90 T	510360	M12	5 400	64 - 90	8,3	1,55	1/4	8	200	n.a.	< 2,5	83
	1/2	–	RRI-100 T	510370	M12-M14	5 300	85 - 120	8,7	1,87	1/4	8	209	n.a.	< 2,5	84
	1/2	–	RRI-130 T	510380	M14-M16	3 600	123 - 148	11,6	2,26	1/4	11	216	n.a.	< 2,5	86
	3/4	–	RRI-150 T	510390	M16	3 700	165 - 210	11,6	3,10	1/4	11	239	n.a.	< 2,5	86
	3/4	–	RRI-180 T	510400	M16-M18	2 700	180 - 255	12,2	3,80	1/4	11	263	n.a.	< 2,5	86
	3/4	–	RRI-200 T	510410	M18-M20	3 000	230 - 450	n.a.	4,25	3/8	13	250	n.a.	8,3	88

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** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

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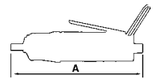
Pneum. Standard Shut-Off Impulse Wrench – RRI-ST / RRI-RT series


Img.: RRI-60 ST


Img.: RRI-30 STA



Series RRI-ST

Type	Sqd	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N-m	Air Cons. l/s	Weight kg	Pipe Thread Inch	Hose ID mm	Dimensions A mm	Dimensions B mm	Vibration m/s²	Noise Level dB(A)
Straight	–	1/4	RRI-30 STA	510105	M6	4 200	6 - 11,5	3,7	0,77	1/4	6,5	219	n.a.	2,7	78
	–	1/4	RRI-40 STA	510115	M6-M8	4 200	10 - 17	3,7	0,8	1/4	6,5	224	n.a.	3,1	78
	–	1/4	RRI-50 STA	510125	M8	6 800	15 - 25	5,3	0,8	1/4	6,5	224	n.a.	3,4	80
	–	1/4	RRI-60 STA	510135	M8	6 000	20 - 30	6,2	0,86	1/4	8	225	n.a.	3,8	80
	–	1/4	RRI-70 STA	510145	M8-M10	5 000	28 - 40	6,2	0,97	1/4	8	n.a.	n.a.	n.a.	80
	3/8	–	RRI-30 ST	510110	M6	4 200	7 - 12,5	3,7	0,8	1/4	6,5	219	n.a.	2,6	78
	3/8	–	RRI-40 ST	510120	M6-M8	4 200	11 - 19	3,7	0,8	1/4	6,5	221	n.a.	2,9	78
	3/8	–	RRI-50 ST	510130	M8	6 800	16 - 27	5,3	0,8	1/4	6,5	221	n.a.	3	80
	3/8	–	RRI-60 ST	510140	M8-M10	6 000	22 - 35	6,2	0,86	1/4	8	231	n.a.	3,4	80
	3/8	–	RRI-70 ST	510150	M10	5 000	31 - 47	6,2	0,97	1/4	8	244	n.a.	3,7	80
	3/8	–	RRI-80 ST	510160	M10-M12	6 100	40 - 68	n.a.	1,15	1/4	8	248	n.a.	4	82


Img.: RRI-70 RT


Img.: RRI-50 RTA

Series RRI-RT

Type	Sqd	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N-m	Air Cons. l/s	Weight kg	Pipe Thread Inch	Hose ID mm	Dimensions A mm	Dimensions B mm	Vibration m/s²	Noise Level dB(A)
Angled	–	1/4	RRI-50 RTA	510205	M6-M8	4 300	9,5 - 16	4,8	1,2	1/4	6,5	253	n.a.	16,5	80
	–	1/4	RRI-60 RTA	510215	M8	4 700	15 - 22	6,2	1,3	1/4	8	264	n.a.	17,2	80
	–	1/4	RRI-70 RTA	510225	M8	4 500	20 - 29	6,2	1,4	1/4	8	272	n.a.	17,5	80
	3/8	–	RRI-50 RT	510210	M6-M8	4 300	10,5 - 17	4,8	1,2	1/4	6,5	253	n.a.	16	80
	3/8	–	RRI-60 RT	510220	M8	4 700	16 - 24	6,2	1,3	1/4	8	264	n.a.	16,8	80
	3/8	–	RRI-70 RT	510230	M8-M10	4 500	22 - 31	6,2	1,4	1/4	8	272	n.a.	17,1	80
	1/2	–	RRI-70 RGT	510231	M10	2 000	32 - 45	6,2	1,6	1/4	8	281	n.a.	17,4	82
	1/2	–	RRI-70 RHT	510232	M10-M12	2 200	46 - 60	6,2	1,6	1/4	8	281	n.a.	17,4	82
	1/2	–	RRI-80 RHT	510242	M12	2 800	50 - 70	n.a.	1,7	1/4	8	281	n.a.	19	82

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Pneum. Hi-Tec Impulse Wrench – YX series

Img.: YX-280 SE

Img.: YX-500 C

Img.: YX-4500

Yokota impulse wrenches are widely used for tightening jobs in the assembly industry, where accurate torque tolerances are necessary. Impulse tools are light, powerful, small and very importantly, have no kick-back, in common with a high repeatability as well as low noise and vibration level. Evaluation of tightening processes in car assembly shows that tightening joints uses 10% of the total assembly time. Working with faster tools therefore can speed up assembly lines substantially.

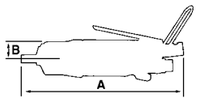
The 3/8 and 1/2 inch output square edge are equipped with a spring pin. This allows sockets to be changed in no time at all.

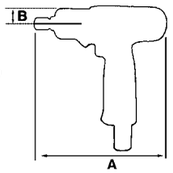
An air maintenance unit should be installed upstream to keep wear and maintenance requirements low.

The use of reaction torque-free Yokota impulse wrenches on the assembly line significantly reduces the risk of illnesses such as RSI. As a result, sick leave due to musculoskeletal complaints decreases noticeably and operator acceptance increases significantly.

- Reliable double blade impulse mechanism (Yokota Twin-Blade).
- Free of reaction momentum.
- Efficient bolt tightening due to 2-step starter/trigger.

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.





Series YX

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Dimensions A	B	Weight	Pipe Thread	Hose ID	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	mm		kg	Zoll	mm	m/s²	dB(A)
Straight	–	1/4	YX-180 SA	410180	M4-M6	11000	20 - 24	4.2	220	23	1.00	1/4	9.5	<2.5	83
	–	1/4	YX-280 SA	410001	M6-M8	10500	23 - 29	5.0	232	23	1.06	1/4	9.5	<2.5	83
	–	1/4	YX-380 SA	410191	M8	9000	29 - 34	5.0	232	25.5	1.25	1/4	9.5	<2.5	81
	–	1/4	YX-500 SA	410104	M8-M10	7500	31 - 40	5.0	241	25.5	1.35	1/4	9.5	2.9	81
	3/8	–	YX-180 SE	410181	M4-M6	11000	24 - 28	4.2	220	23	1.00	1/4	9.5	3.0	83
	3/8	–	YX-280 SE	410003	M6-M8	10500	24 - 33	5.0	232	23	1.07	1/4	9.5	4.1	83
	3/8	–	YX-380 SE	410192	M8	9000	32 - 38	5.0	232	25.5	1.25	1/4	9.5	2.9	81
	3/8	–	YX-500 SE	410101	M8-M10	7500	38 - 46	5.0	241	25.5	1.35	1/4	9.5	3.0	81
	3/8	–	YX-700 SE	410111	M8-M10	5000	39 - 58	5.8	262	26.5	1.75	1/4	9.5	3.9	82
Angled	3/8	–	YX-280 C	410006	M4-M6	10000	20 - 24	5.0	257	16	1.33	1/4	6.5	n.a.	86
	3/8	–	YX-500 C	410105	M6-M8	7500	30 - 36	5.0	266	18	1.66	1/4	9.5	n.a.	80
	3/8	–	YX-700 C	410115	M8-M10	5000	30 - 40	5.8	289	18	2.03	1/4	9.5	n.a.	82
Pistol	3/8	–	YX-180 E	410183	M4-M6	10500	19 - 31	4.2	169	23	1.00	1/4	6.5	3.0	72
	3/4	–	YX-3000	410150	M16-M18	4700	200 - 304	10.0	246	40	5.28	1/4	12.7	3.9	80
	3/4	–	YX-4500	410160	M18-M20	3400	392 - 490	11.6	300	65	10.4	3/8	12.7	3.9	87

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** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

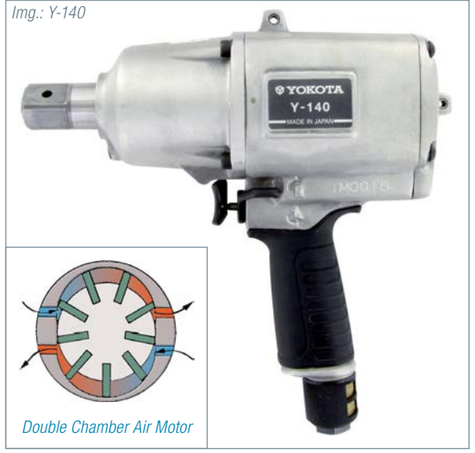
Further information available 24 / 7 on our website.

Pneum. Hi-Tec Impulse Wrench – Y series

Img.: Y-40 SA

Img.: Y-41 A

Img.: Y-140



Double Chamber Air Motor

The Yokota Y series impulse wrenches with double chamber air motor achieve the required torque very quickly. The tools have a high number of impulses per second, and therefore very accurate torques can be realised, resulting in increased production speed.

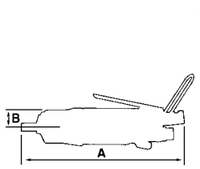
Yokota impulse wrenches are widely used for tightening jobs in the assembly industry, where accurate torque tolerances are necessary. Impulse tools are light, powerful, small and very importantly, have no kick-back. Evaluation of tightening processes in car assembly shows that tightening joints uses 10% of the total assembly time. Working with faster tools therefore can speed up assembly lines substantially.

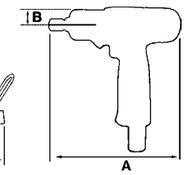
The use of reaction torque-free Yokota impulse wrenches on the assembly line significantly reduces the risk of illnesses such as RSI. As a result, sick leave due to musculoskeletal complaints decreases noticeably and operator acceptance increases significantly.

In order to successfully combine all the advantages of impulse wrenches, it is very important that the right impulse wrench is used for each bolted joint. Every bolted joint is different. We will be happy to advise you on the selection of the right nutrunner for your specific bolted joint.

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.

- Even faster power development due to double-chamber air motor with high pulse number.
- Reliable power performance through Yokota's patented Twin Blade pulse mechanism.
- Reduced workload due to reduced vibration and noise levels.
- Efficient bolt tightening by means of 2-step starter/trigger.





Series Y

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Dimensions A	B	Weight	Pipe Thread	Hose ID	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	mm		kg	Zoll	mm	m/s²	dB(A)
S	–	1/4	Y-40 SA	420028	M5-M6	8000	7 - 10	5.0	229	17	0.84	1/4	6.35	<2.5	80
Pistol	–	1/4	Y-41 A	420031	M5-M6	9000	7.5 - 11	5.8	141	17	0.78	1/4	6.35	<2.5	72
	–	1/4	Y-46 A	420033	M6	8000	17 - 24	5.8	157	19	0.82	1/4	6.35	<2.5	79
	3/8	–	Y-46 E	420035	M6	8000	20 - 29	5.8	157	19	0.81	1/4	6.35	<2.5	79
	3/4	–	Y-140	430210	M16	3200	160 - 270	13.7	226	36	3.1	1/4	12.7	7.7	82

Further information available 24 / 7 on our website.

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

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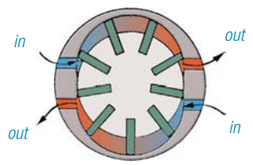
Pneum. Hi-Tec Impulse Wrench – YLA series

Img.: YLa-110E

Img.: YLa-70A



Double Chamber Air Motor

- Significantly reduced weight and increased service life due to design improvements and new materials.
- Longer maintenance intervals due to 2-sided ball bearing pulse cell with improved heat dissipation.
- Faster power development due to double-chamber air motor with high pulse number.
- Reduced workload due to reduced vibration and noise levels.
- Smooth-running trigger.
- Lightweight tool with ergonomic 1-hand operation.

Yokota impulse wrenches of the latest series YLa are driven by a double-chamber air motor. This generates a high number of pulses per second. As a result, the torque is reached even faster, the screwdriving times are shortened, and at the same time the repeat accuracy is increased.

A special coating of the cylinder wall as well as heat-treated rotor lamellas allow operation with oil-free air. This makes malfunctions caused by poorly filled air oilers a thing of the past. In addition, the maintenance effort on the air line is reduced.

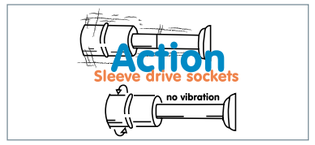
The 3/8 and 1/2 inch output square edge are equipped with a spring pin. This allows sockets to be changed in no time at all.

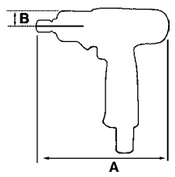
Power is delivered by the proven twin-blade hydraulic impulse unit. This unique Yokota mechanism reduces noise and vibration levels and produces a high pulse frequency.

The reduced weight and improved balance of the screwdriver make it easier to use even in hard-to-reach places.

The ergonomically optimised design facilitates one-handed operation and relieves the worker's wrist. This significantly reduces the risk of tissue disorders such as RSI. As a result, sick leave due to musculoskeletal complaints is noticeably reduced and operator acceptance increases significantly.

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.





Series YLa

Type			Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A mm	Dimensions B mm	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
	SqD	Hex													
Pistol	–	1/4	YLa-60A	420006	M6	4000	11 - 20	5.0	130	21.5	0.78	1/4	6.35	1.4	71
	–	1/4	YLa-70A	420010	M6-M8	7000	20 - 28	5.5	131	21.5	0.79	1/4	6.35	1.4	74
	–	1/4	YLa-80A	420013	M8	7000	24 - 35	5.8	138	21.5	0.81	1/4	6.35	1.2	75
	3/8	–	YLa-60E	420008	M6	4000	13 - 22	5.0	130	21.5	0.78	1/4	6.35	1.4	71
	3/8	–	YLa-70E	420012	M6-M8	7000	24 - 35	5.5	131	21.5	0.79	1/4	6.35	1.4	74
	3/8	–	YLa-80E	420014	M8	7000	32 - 50	5.8	138	21.5	0.81	1/4	6.35	1.2	75
	3/8	–	YLa-90E	420016	M8-M10	6500	47 - 65	6.8	148	23	0.95	1/4	9.5	1.2	78
	1/2	–	YLa-110E	420018	M10-M12	5500	60 - 95	8.8	164	26.5	1.33	1/4	9.5	1.8	81
	1/2	–	YLa-120E	420019	M12	6600	90 - 130	9.3	172	29	1.7	1/4	9.5	2.2	81
	1/2	–	YLa-140E	420020	M14	5400	125 - 160	14.3	185	33	2.2	1/4	9.5	4.7	83

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Further information available 24 / 7 on our website.

Pneum. Hi-Tec Shut-Off Impulse Wrench – YLTX series

Img.: YLT-120E

Double Chamber Air Motor

Img.: YLT-60A

- Significantly reduced weight and increased service life due to design improvements and new materials.
- Longer maintenance intervals due to 2-sided ball bearing pulse cell with improved heat dissipation.
- More precise setting of the desired torque and faster power development due to double-chamber air motor with high pulse number.
- Improved working environment due to low vibration and noise levels.
- Ergonomic 1-hand operation due to optimised design.

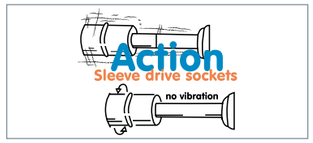
Yokota, renowned Japanese manufacturer of industrial quality air tools, presents this completely newly developed series of lightweight impulse wrenches with automatic shut-off. The YLT series differs from other impulse wrenches through patented technical innovations.

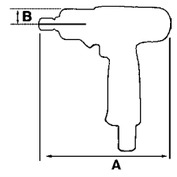
The high efficiency and precision of the motor is reflected in both low air consumption and high repeatability of the torque achieved. A single adjustment screw for torque and shut-off allows easier, more accurate and more reliable adjustment.

The desired torque is achieved quickly thanks to the double-chamber air motor. A hard tightening operation takes only 1-2 seconds. And no torque reactions get into the operator's wrist.

The use of reaction torque-free Yokota impulse wrenches on the assembly line significantly reduces the risk of tissue disorders such as RSI. As a result, sick leave due to musculoskeletal complaints decreases noticeably and operator acceptance increases significantly.

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.





Series YLTX

Type			Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A mm	Dimensions B mm	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
	SqD	Hex													
Pistol	–	1/4	YLTX-50A	430530	M5	4300	4.5 - 8	4.2	164	22.5	0.95	1/4	6.35	1.1	70
	–	1/4	YLTX-60A	430540	M6	5300	6 - 13	5.5	164	22.5	0.95	1/4	6.35	1.4	72
	–	1/4	YLTX-70A	430560	M6-M8	6800	13 - 28	6.0	177	23	1.01	1/4	6.35	1.8	74
	3/8	–	YLTX-50E	430535	M5	4300	4.5 - 8	4.2	164	22.5	0.95	1/4	6.35	1.1	70
	3/8	–	YLTX-60E	430550	M6	5300	7 - 16	5.5	164	22.5	0.95	1/4	6.35	1.4	72
	3/8	–	YLTX-70E	430570	M6-M8	6800	15 - 32	6.0	177	23	1.01	1/4	6.35	1.8	74
	3/8	–	YLTX-80E	430580	M8-M10	6800	30 - 55	7.3	187	24.5	1.12	1/4	9.5	1.9	78
	1/2	–	YLTX-110E	430590	M10-M12	5800	50 - 85	8.3	194	28.5	1.51	1/4	9.5	1.8	81
	1/2	–	YLTX-120E	430600	M12	5400	70 - 115	8.6	201	31	1.79	1/4	9.5	2.2	83
	1/2	–	YLTX-140E	430610	M14	5200	110 - 150	11.8	214	32.5	2.08	1/4	9.5	5.2	85
	3/4	–	YLTX-150	430620	M16	4400	140 - 210	11.7	237	38.5	2.96	1/4	9.5	6.2	86

Further information available 24 / 7 on our website.

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

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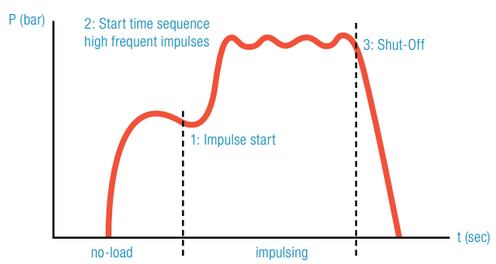
Poka Yoke Tightening System – Tool Controller YTC

Img.: YTC-3

Typical air pressure curve of an impulse wrench



Electronically controlled shut-off

The Poka Yoke concept with error source inspection is mainly used in production lines. Poka Yoke aims to detect and avoid faulty actions, such as forgotten or double tightening or premature release of the start button.

The monitoring of the impulse wrench is based on measurement of the different air pressure at the inlet side of the air motor when idling and tightening. The control unit registers when the screw comes to head contact (graphic above, point 2). When the predefined torque is reached in the horizontal area of the curve, the control unit switches off (point 3). Hard or soft screw connections can be adjusted by setting the timer.

At the same time, the system monitors premature release of the start button. This prevents the torque from falling below the predefined value. Any double tightening is detected and signalled acoustically and visually by the control unit.

Optimal clamping force

Conventional shut-off wrenches already interrupt the flow of force in the rising part of the torque curve (2). The YTC-3 control unit achieves optimum clamping force by controlled shut-off in the horizontal part of the progression curve. It creates „sensitive“ bolted joints and minimises the risk of loose connections. The system is more accurate than mechanical shut-off wrenches and standard impulse tools. The torque is adjusted at the impulse mechanism. Combined with the monitoring parameters of the YTC-3 controller, the system achieves reliable shut-off.

System Features

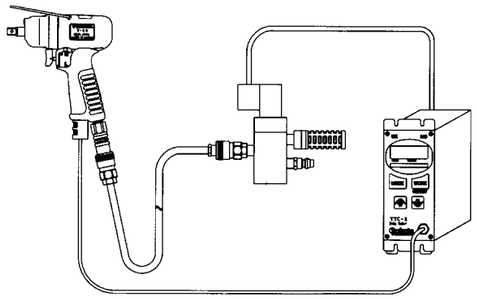
- Group monitoring and manual or automatic group change.
- Controlled shut-off.
- Visual/audible signalling of „iO“ / „NiO“.
- Detection of double tightening.
- Crossed-thread detection.
- Detection of premature release of the start button.
- Oil wear detection.
- Can be linked to the production line (DC 24 V).
- Self-learning function for programming.

Specifications YTC-3

- Air pressure sensor with analogue output 1 - 5 V for 0 - 0.99 MPa.
- 8 signal inputs.
- 4 volt-free relay outputs (opening/closing values: ≤ DC 48 W, AC 220 VA).
- 1 Solenoid valve output (DC 24 V, 2 W).
- Mains voltage: AC 100-240 V, 50/60 Hz.
- Power consumption: ≤ 10 W.
- Dimensions: ca. 71 × 152 × 175 mm (Front panel 71 × 178 mm).
- Weight: 1.8 kg.

Controller YTC-3 A

- Connection for electronic cable up to 20 m with pressure hose adapter.



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Further information available 24 / 7 on our website.

Poka Yoke Impulse Wrench – Y-JQ / YLa-JQ series

Img.: YLa 90 E-JQ

- Higher tightening speed due to double-chamber air motor.
- Power output through patented Yokota Twin-Blade impulse mechanism.
- Improved repeatability due to higher number of pulses.
- Free of reaction torque.
- One-hand operation.
- Prepared for air pressure monitoring.

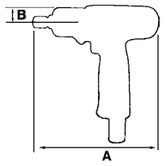
Img.: Y-90 E-JQ

These Yokota impulse wrenches are driven by a **double-chamber air motor**. This means that the set torque is reached very quickly. The wrenches generate a high number of pulses per second and therefore provide high accuracy with a shorter production cycle time. The JQ types are specially equipped with a pressure monitoring tube for connection to the YTC-3 controller.

The power is delivered by the proven twin-blade **hydraulic impulse unit**. This patented Yokota mechanism reduces noise and vibration levels and generates a high pulse frequency.

The use of **reaction torque-free** Yokota impulse wrenches on the assembly line thus significantly reduces the risk of tissue disorders such as RSI or similar.

For impulse tools we recommend power sockets and extensions with sleeve drive – for less play, less wear and a permanently constant power output (see p. 40 ff).



Series Y-JQ

Type	SqD	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A	Dimensions B	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
Pistol	–	1/4	Y-41 A-JQ	430310	M4-M6	9 300	6 - 12	5.0	141	17	0.73	1/4	6.5	2.1	72
	–	1/4	Y-46 A-JQ	430321	M5-M6	8 000	16 - 26	5.8	158	18	0.87	1/4	6.5	1.0	80
	3/8	–	Y-46 E-JQ	430320	M5-M6	8 000	16 - 30	5.8	158	18	0.87	1/4	9.5	1.0	80
	1/2	–	Y-90 E-JQ	430360	M10-M12	5 000	78 - 116	8.3	177	30	1.85	1/4	9.5	1.5	72
	3/4	–	Y-140-JQ	430390	M16	3 300	160 - 270	13.1	226	36	3.20	1/4	12.7	3.3	82

Series YLa-JQ

Type	SqD	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A	Dimensions B	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
Pistol	–	1/4	YLa 60 A-JQ	430405	M6	4 000	11 - 20	5.0	130	22	0.78	1/4	6.35	1.4	71
	–	1/4	YLa 70 A-JQ	430420	M6-M8	7 000	20 - 28	5.5	132	22	0.80	1/4	6.35	1.4	74
	–	1/4	YLa 80 A-JQ	430440	M8	7 000	24 - 35	5.8	139	22	0.90	1/4	6.35	1.2	75
	3/8	–	YLa 60 E-JQ	430400	M6	4 000	13 - 22	5.0	130	22	0.78	1/4	6.35	1.4	71
	3/8	–	YLa 70 E-JQ	430410	M6-M8	7 000	20 - 35	5.5	132	22	0.80	1/4	6.35	1.4	74
	3/8	–	YLa 80 E-JQ	430430	M8	7 000	33 - 50	5.8	139	22	0.90	1/4	6.35	1.2	75
	3/8	–	YLa 90 E-JQ	430450	M8-M10	6 500	47 - 70	6.7	148	24	1.00	1/4	9.5	1.2	78
	1/2	–	YLa 110 E-JQ	430460	M10-M12	6 000	65 - 105	9.6	164	26	1.40	1/4	9.5	1.8	81
	1/2	–	YLa 120 E-JQ	430470	M12	6 600	80 - 130	10	172	28	1.80	1/4	9.5	2.2	82
	1/2	–	YLa 140 E-JQ	430480	M14	6 000	100 - 160	13	190	30	2.20	1/4	9.5	2.4	84

Further information available 24 / 7 on our website.

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.*

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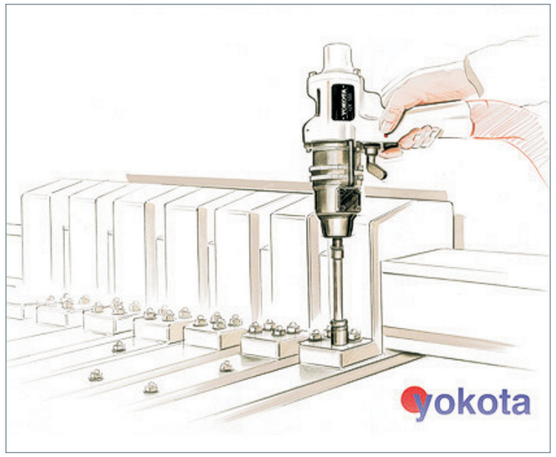
EC Tightening System with Documentation – YETC sample protocols



Sample protocol with Yokota controller YETC

a) with group monitoring switched on

Example for: Upper Torque Limit: 40 N·m
Lower Torque Limit: 35 N·m

Group Name	Group No. / Remaining Number	Torque Value N·m	Pulse No.	Judgement
a	1 - 4	36,1	24	OK
a	1 - 3	37,1	23	OK
a	1 - 2	37,1	23	OK
a	1 - 1	37,0	22	OK
a	2 - 4	36,5	24	OK
a	2 - 3	29,2		UNDER
a	2 - 3	20,6		UNDER
a	2 - 3	31,7		UNDER
a	2 - 3	37,8	27	OK
a	2 - 2	36,2	23	OK
a	2 - 1	36,6	24	OK
a	3 - 4	42,6		OVER
a	3 - 4	37,3	27	OK
a	3 - 3	36,5	25	OK
a	3 - 2	37,1	26	OK
a	3 - 1	38,8	23	OK

NOTE: For the 4-channel type, the tool no.
would be placed before the group name, for example:

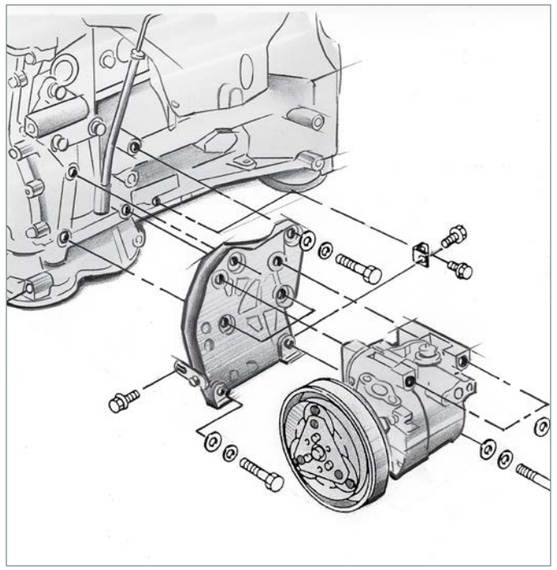
1a	1 - 4	36,1	25	OK

The first example illustrates logging when group monitoring is switched on: The system counts down the individual OK screw connections within the group and only jumps to the next group after the group OK.

It can be seen that group 1 was bolted completely OK without complaint.

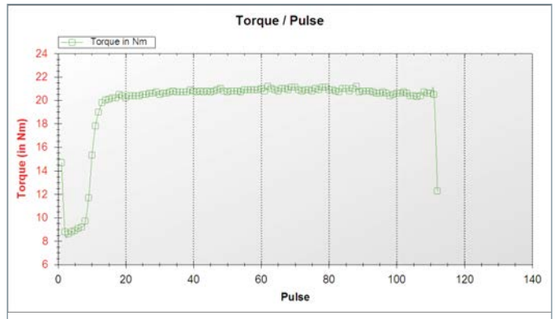
In group 2 on the second bolted joint, the target torque was only reached in the fourth attempt - and then evaluated as OK. Only after all bolted joints of this group have been evaluated as OK does the system release this group and jump to the next group.

In group 3 on the first tightening, the target torque was initially exceeded (OVER). The second tightening was judged OK.



YOKOTA

EC Tightening System with Documentation – YETC sample protocols



Option:

Software tool for analysing the bolting process with torque as the control variable and pulse number as the check variable.

Sample protocol with Yokota controller YETC

b) with group monitoring switched off

Example for: Upper Torque Limit: 40 N·m
Lower Torque Limit: 35 N·m

Group Name	Bolt Number	Torque Value N·m	Pulse No.	Judgement
a	1	36,1	26	OK
a	2	37,1	29	OK
a	3	37,1	27	OK
a	4	37,0	26	OK
a	5	36,5	28	OK
a	6	29,2		UNDER
a	6	10,6		UNDER
a	6	31,7		UNDER
a	6	37,8	24	OK
a	7	36,2	26	OK
a	8	36,6	27	OK
a	9	42,6		OVER
a	9	37,3	25	OK
a	10	36,5	28	OK

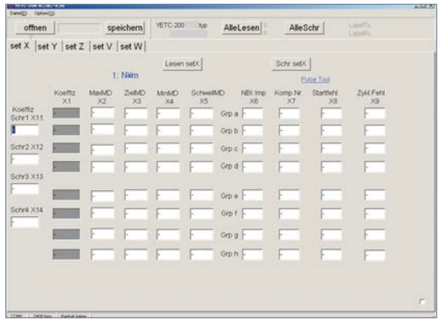
The second example illustrates the logging when group monitoring is switched off: The system counts up the individual screw connections and only jumps to the next screw after iO has been completed.

It can be seen that bolt 1 to 5 were tightened OK without complaint.

On bolt 6, the target torque was not reached three times (UNDER) and was only reached on the fourth attempt - and then judged to be OK.

On bolt 9, the target torque was initially exceeded (OVER). The second tightening was judged OK.

EC Tightening System with Torque Control – YETC-EA



System wrench controller YETC-EA

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** controller, the **TKa**, **YED** or **YEX** impulse wrench, a solenoid valve for compressed air control and other optional system components.

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

The Yokota controller YETC has been specially designed 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 offers comprehensive programming options for individual adjustment to the bolting parameters. The improved electronics allow even more accurate and faster torque calculations.

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

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

Networkable

The YETC 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).

Parameter setting software

A Yokota software tool is available for each YETC controller, with which the parameter sets can be conveniently managed on the workstation computer or laptop.

The control device and the computer are connected to each other via the serial RS-232 interface using a straight cable. The data exchange takes place in ASCII character code. The YETC functions as a data communication equipment (DCE) and the connected computer as a data terminal equipment (DTE).

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 tool 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 impulse wrench is made at the hydraulic pulse unit.

YETC-230EA / -230EA4

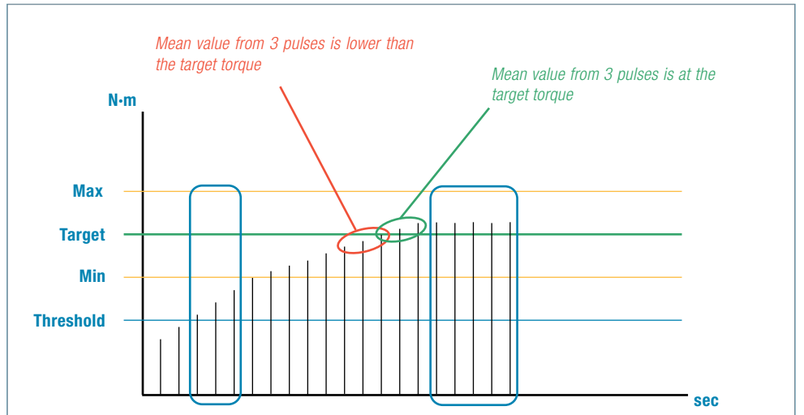
- *1-channel control unit; or as a 4-channel control unit for up to four system wrenches in a definable sequence.*
- *Torque control*
- *Alternatively as 230EA(4)-L with LAN port*

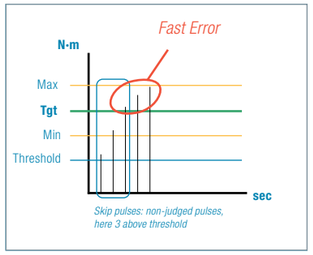
YETC-330EA2

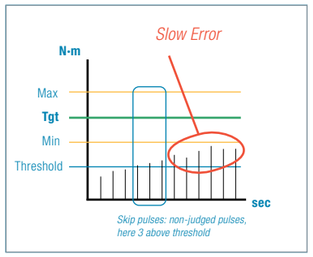
- *2-channel control unit; two system wrenches can be used at the same time*
- *Torque control*
- *Alternatively as 330EA2-L with LAN port*

Further information available 24 / 7 on our website.

EC Tightening System with Torque Control – YETC-EA





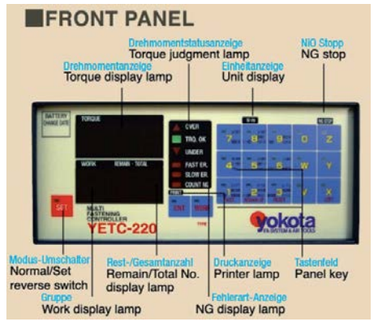


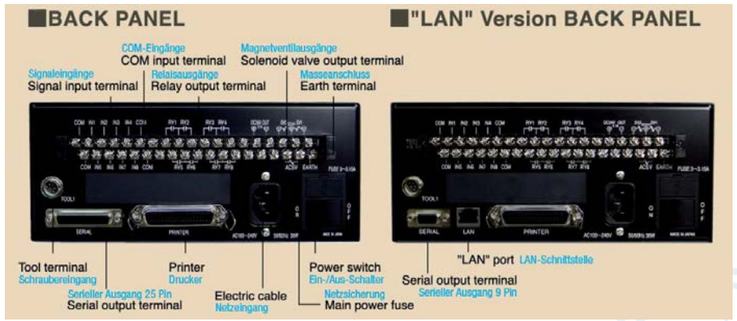
Features & Specifications

- YETC-230 as standard as 1-channel control unit; optionally in 4-channel version (EA4) for up to 4 system wrenches with different torque settings and programming (alternate use).
- YETC-330 in 2-channel version for simultaneous use of 2 impulse wrenches.
- Easy programming according to the bolting parameters.
- Improved electronics for even more accurate and faster torque calculations.
- Torque calculation over several impulses (average value) – ref. to above graph.
- Programmable number of additional pulses to compensate for settling (for soft joints).
- Poka-Yoke: error-free tightening.
- Two-step fastening possible.
- System impulse wrenches with audible buzzer or silent LED indication.
- 8 programming groups with different parameters.
- Printer port (Centronics).
- RS-232C serial output (DB-25).
- External shut-off valve.
- 8 signal inputs, 8 potential-free output relays, allow integration into the production line (PLC), connection of a multi-coloured light signal column („stack light"), etc. (for YETC-330 with 10 inputs / 10 outputs).
- Bi-directional communication.
- Automatic group change (sequence programmable).
- Date/time stamp.
- Timer function for group bolting.
- Can be integrated into all production processes.
- Statistics, process capability factor Cp and Cpk.
- Ring memory for 10,000 bolting cycles.
- Dimensions: 230×110×290 mm (WHD)
- Weight: 4.5 kg
- Voltage: AC 100V - 240V, 50/60 Hz
- Energy consumption: 30 W

LAN version

- Network interface 8P8C (RJ-45).
- Ethernet 100 BASE-TX/10 BASE-T, autodetect.
- Netzwork protocol TCP/IP.
- 9 pin serial interface RS-232 (instead of 25 pin).
- YETC-230 optional as 4 channel version (EA4-L).





Further information available 24 / 7 on our website.

Pneum. EC System Impulse Wrench – TKa / YED series

Img.: TKa-70

Basic system configuration

- Tool controller YETC-
- EC impulse wrench series YEX, YED and TKa
- Solenoid valve SVC
- Air hose/control cable set, 7 m

Optional equipment

- Pair of valves for 2-stage bolt connection
- Protocol printer with data cable
- Air hose/control cable set 10 m or 15 m
- Light signal tower (stack)
- Socket change box
- Spiral hose with integrated control cable, max. 15 m
- Barcode scanner

Yokota system impulse wrench

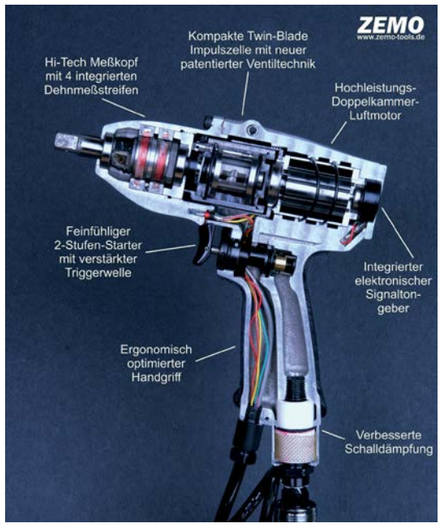
The TKA and YED impulse wrenches are similar to the YEX series, but equipped with a double-chamber air motor. These impulse wrenches quickly reach the desired torque. Due to a high number of impulses per second, an exact torque adjustment is possible.

In addition, the TKa series is lighter, may be operated without oil and offers optimal ergonomic features.

LEDs

The TKa series can optionally be supplied with green/red LEDs instead of the acoustic signal transmitter (ref. small pictures on the right) – silent and visible all around: from above, below, left, right, front, rear.


Img.: YED-240 S



Torsion measurement during fastening

The **strain gauges** are mounted on the main shaft and measure the torsion on the shaft at every impulse and as close as possible to the bolted joint. This minimises tolerances and interference. The electronic signals are transmitted by induction from the drive to the outer housing.

Due to this principle, the Yokota transducer is very reliable, accurate and without wear. In other words: „The perfect tool for tightening connections in production“.

Series TKa / YED

Type	SqD	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A mm	Dimensions B mm	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
Pistol	–	1/4	TKa 60 A	420637	M6	6 000	11 - 16	4.5	179	21	1.26	1/4	6.35	2.1	71
	–	1/4	TKa 70 A	420642	M6-M8	7 000	20 - 27	5.3	179	21	1.26	1/4	6.35	2.1	75
	–	1/4	TKa 80 A	420659	M8	7 000	24 - 33	5.3	186	21	1.33	1/4	6.35	2.1	77
	3/8	–	TKa 60	420638	M6	6 000	14 - 20	4.5	179	21	1.26	1/4	6.35	2.1	71
	3/8	–	TKa 70	420643	M6-M8	7 000	24 - 33	5.3	179	21	1.26	1/4	6.35	2.1	75
	3/8	–	TKa 80	420657	M8	7 000	32 - 46	5.3	186	21	1.33	1/4	6.35	2.1	77
	3/8	–	TKa 90	420645	M8-M10	6 500	47 - 60	6.8	195	23	1.50	1/4	9.5	2.1	78
	1/2	–	TKa 111	420647	M10-M12	5 500	65 - 105	8.8	209	25.5	1.86	1/4	9.5	2.2	80
	1/2	–	TKa 120	420648	M12	5 900	85 - 130	10	223	29	2.46	1/4	9.5	2.2	82
	1/2	–	TKa 140	420649	M14	5 200	100 - 160	13	235	29	2.88	1/4	9.5	2.2	84
	1/2	–	TKa 150	420654	M14-M16	4 200	150 - 220	13.2	241	32.5	3.41	1/4	9.5	2.4	84
S P	3/4	–	YED-200	420976	M18-M20	2 300	220 - 310	18.3	307	40	6.8	1/2	12.7	4.2	86
S P	1	–	YED-240 S	420678	M20-M24	2 300	360 - 470	28.3	452	53	11.2	1/2	12.7	15.0	92

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, values may deviate in practice.*

Further information available 24 / 7 on our website.

Pneum. EC System Impulse Wrench – YEX series


Img.: YEX-150 S

Yokota developed „intelligent“ tightening tools more than 30 years ago – today widely known as system wrenches. The impulse wrenches equipped with electronic torque control are used for the **documented assembly** of bolted connections. The system offers shut-off of the impulse wrench at the desired torque with further indications such as too low or too high torque, fault detection or reporting, counting of bolted joints, group control, line production management, data storage, etc.

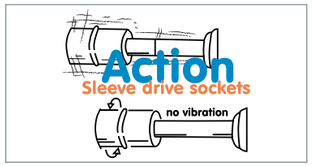
Yokota has equipped the impulse wrenches with an **integrated transducer** (system wrench). In conjunction with the YETC control unit, the torque can be controlled, checked and optionally also printed out or exported via its data interface.

For impulse wrenches we recommend power sockets and extensions with sleeve drive – less tolerance, less wear for a permanently constant power output. In order to achieve maximum productivity, accuracy and durability, it has proven itself to use impulse wrenches up to approx. 80% of their capacity.


Img.: YEX-1400

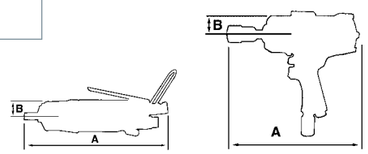
A fastening process takes only 1-2 seconds and is carried out effortlessly with one hand.

The system can be integrated into the assembly process for process-safe tightening.




Img.: Main shaft with strain gauges

The **strain gauges** are mounted on the drive shaft and measure the torsion on the drive shaft at every impulse and as close as possible to the bolted joint. The electronic signals are transmitted by induction from the drive to the outer housing. Due to this principle, the YOKOTA transducer is very reliable, accurate and without wear – in other words „the perfect tool for bolted joints in production“.



Series YEX

Type	SqD	Hex	Model	Item No.	Bolt Capacity Ø	RPM min⁻¹	Torque Range* N·m	Air Cons. l/s	Dimensions A mm	Dimensions B mm	Weight kg	Pipe Thread Zoll	Hose ID mm	Vibration m/s²	Noise Level dB(A)
Straight	–	1/4	YEX-100 SA	420585	M5	8 000	4 - 6	3.7	296	23	1.20	1/4	9.5	3	77
	–	1/4	YEX-120 SA	420596	M4-M5	7 000	5 - 8	4.2	276	23	1.38	1/4	9.5	3	77
	–	1/4	YEX-150 SA	420603	M5-M6	8 000	8 - 13	5.0	276	23	1.37	1/4	9.5	3.3	77
	–	1/4	YEX-300 SA	420615	M6	8 000	9 - 18	5.2	313	27	1.77	1/4	9.5	5.3	78
	–	1/4	YEX-500 SA	420630	M6-M8	7 800	17 - 31	5.5	334	27	2.30	1/4	9.5	6.6	76
	3/8	–	YEX-150 S	420602	M5-M6	9 000	10 - 16	5.0	275	23	1.36	1/4	9.5	3.3	77
	3/8	–	YEX-300 S	420605	M6	8 000	13 - 20	5.2	312	27	1.76	1/4	9.5	5.3	78
	3/8	–	YEX-500 S	420620	M6-M8	7 800	19 - 34	5.5	333	27	2.29	1/4	9.5	6.6	80
	3/8	–	YEX-700 S	420640	M8	7 500	29 - 51	6.2	333	27	2.36	1/4	9.5	6.6	80
Pistol	–	1/4	YEX-120 A	420595	M5-M6	7 000	5 - 8	4.2	223	23	1.58	1/4	9.5	3	74
	–	1/4	YEX-150 A	420601	M5-M6	9 000	8 - 13	5.0	223	23	1.58	1/4	9.5	3	74
	–	1/4	YEX-501 A	420666	M6-M8	8 200	22 - 40	5.8	227	26.5	2.15	1/4	9.5	1.6	76
	3/8	–	YEX-120	420590	M5-M6	7 000	6 - 9	4.2	222	23	1.57	1/4	9.5	3	74
	3/8	–	YEX-150	420600	M5-M6	9 000	10 - 16	5.0	222	23	1.57	1/4	9.5	3	74
	3/8	–	YEX-501	420661	M6-M8	8 200	24 - 44	5.8	234	26.5	2.14	1/4	9.5	1.6	76
	3/8	–	YEX-701	420671	M8-M10	8 000	34 - 62	6.3	246	26.5	2.38	1/4	9.5	1.6	78
	1/2	–	YEX-901	420681	M10	6 100	44 - 78	8.3	257	33.5	2.94	1/4	9.5	2.3	77
	1/2	–	YEX-1400	420685	M10-M12	5 900	78 - 118	10.5	266	34	3.99	1/4	9.5	3	78
	1/2	–	YEX-1900	420690	M12	5 800	88 - 137	10.5	285	39	4.61	1/4	9.5	3	80
	3/4	–	YEX-3000	420695	M16	4 000	176 - 235	12.2	309	40	6.42	1/4	12.7	4	80

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, values may deviate in practice.*

Further information available 24 / 7 on our website.

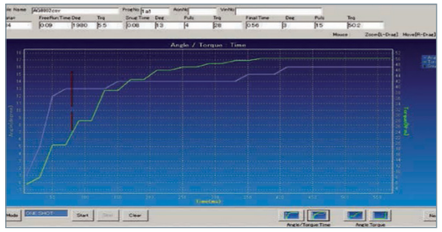
Pneum. EC Tightening System with Angle Monitoring – YETC-ER

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.

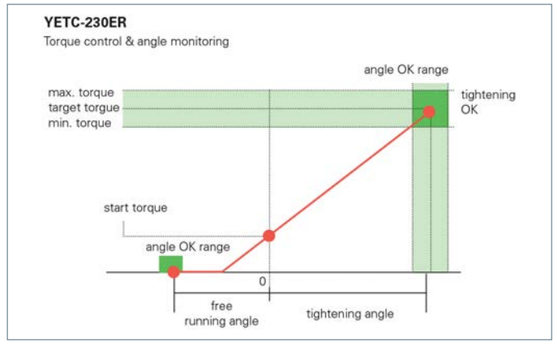
EC impulse wrenches

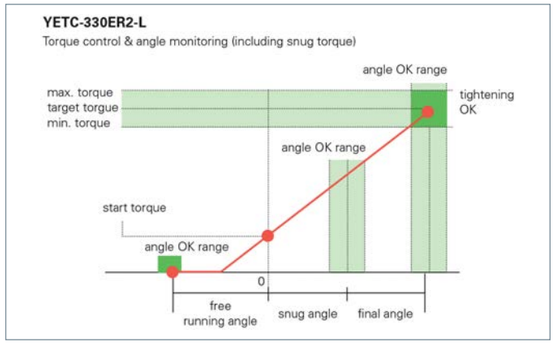
A non-contact **torque sensor** is integrated in the system wrench, which determines the torque generated at the output shaft of the wrench and converts it into an electrical signal. The **strain gauges** mounted on the output shaft of the impulse wrench are inductively supplied with a defined measuring 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.

Further information available 24 / 7 on our website.

Pneum. EC Tightening System with Angle Monitoring – YETC-ER





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

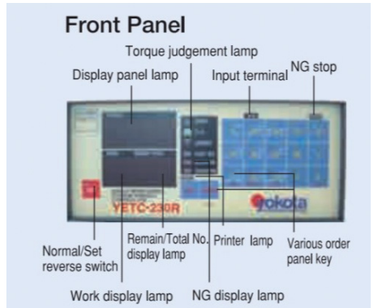
- Network interface 8P8C (RJ-45).
- Ethernet 100 BASE-TX/10 BASE-T, autodetect.
- Network protocol TCP/IP.
- Serial interface 9-pin RS-232C (instead of 25-pin).
- Two IP addresses for YETC-330ER2-L.

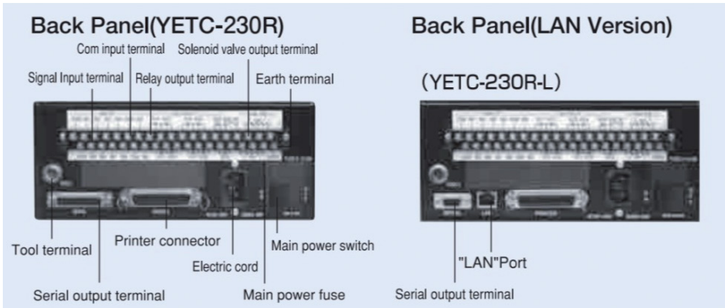
Parameter

- 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)





Further information available 24 / 7 on our website.

Pneum. EC Tightening System 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.

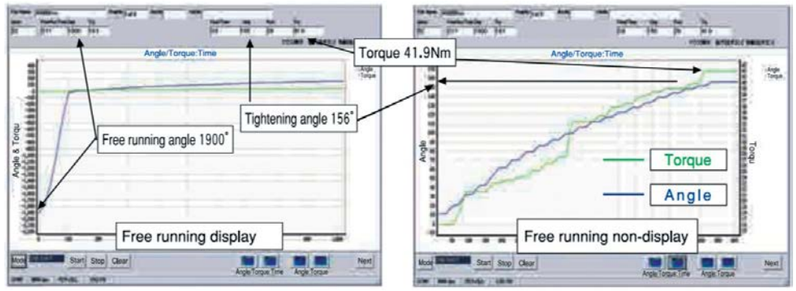
As a display function of the curve progression, the graph can be switched with torque/angle on the vertical axis and time on the horizontal axis or with angle on the vertical axis and torque on the horizontal axis as below.

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°.

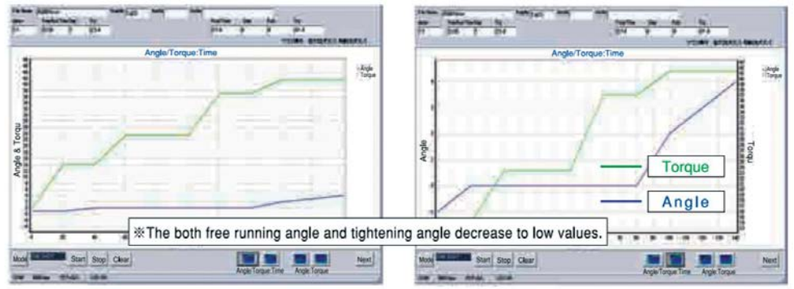
As a corresponding result, the torque value is within the acceptable range, but the free running angle and the end tightening angle are not within the preset range, showing that it may be possible to judge the tightening angle as abnormal.

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.

ZEMO
www.zemo-tools.de

Further information available 24 / 7 on our website.

Pneum. EC-System Impulse Wrench – TKa series w Angle Sensor


Img.: TKa-700


Img.: TKa-900-C


Img.: TKa-1400

System impulse wrench with integrated angle sensor

More than 30 years ago, Yokota developed intelligent bolt tightening tools that fit into a process-safe system. Because of the increasing market demand for accuracy and troubleshooting, Yokota integrated the additional rotation angle monitoring function. Electronic torque and angle management – this is the kind of advanced technology that challenges Yokota.

Fully monitored bolting operations

In addition to the existing torque control, the integration of an angle sensor also enables rotation angle and time monitoring.

Detection of tightening errors

By monitoring the angle of rotation during the tightening process, it is possible to detect all kinds of errors that were previously difficult to detect with conventional torque-controlled tightening tools alone:

- Detection of insufficient or excessive torque
- Coefficient of friction outside the tolerance range
- Fastener too short or too long
- Cross thread detection
- Crooked thread detection
- Damaged thread detection
- Double tightening detection
- Blind hole detection

LEDs

Almost all TKa models are optionally available with green/red LEDs instead of the acoustic signal transmitter – visible all around: from above, below, left, right, front, rear.

Sensitive angle sensor

The extremely compact integrated encoder detects both angle and direction of rotation from 1 degree.

Series TKa with Angle Sensor

Type			Model [1]	Item No.	Bolt Capacity	RPM	Torque Range [2]	Air Cons.	Dimensions A	Dimensions B	Weight	Pipe Thread	Hose ID	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	mm		kg	Zoll	mm	m/s²	dB(A)
Pistol	–	1/4	TKa 600 A	421001	M6	6 000	11 - 16	4.5	189	21	1.34	1/4	6.35	2.1	71
	–	1/4	TKa 700 A	421003	M6-M8	7 000	20 - 27	5.3	189	21	1.34	1/4	6.35	2.1	75
	–	1/4	TKa 700 A-C	421008	M6-M8	7 000	20 - 27	5.3	189	21	1.34	1/4	6.35	2.1	75
	3/8	–	TKa 600	421000	M6	6 000	14 - 20	4.5	189	21	1.34	1/4	6.35	2.1	71
	3/8	–	TKa 600-C	421005	M6	6 000	14 - 20	4.5	189	21	1.34	1/4	6.35	2.1	71
	3/8	–	TKa 700	421050	M6-M8	7 000	24 - 33	5.3	189	21	1.34	1/4	6.35	2.1	75
	3/8	–	TKa 700-C	421015	M6-M8	7 000	24 - 33	5.3	189	21	1.34	1/4	6.35	2.1	75
	3/8	–	TKa 800	421060	M8	7 000	32 - 46	5.3	198	21	1.39	1/4	6.35	2.1	77
	3/8	–	TKa 800-C	421065	M8	7 000	32 - 46	5.3	198	21	1.39	1/4	6.35	2.1	77
	3/8	–	TKa 900	421010	M8-M10	6 500	47 - 60	6.8	204	23	1.50	1/4	9.5	2.1	78
	3/8	–	TKa 900-C	421035	M8-M10	6 500	47 - 60	6.8	204	23	1.50	1/4	9.5	2.1	78
	1/2	–	TKa 1110	421021	M10-M12	5 500	65 - 95	8.8	220	25.5	1.97	1/4	9.5	2.2	80
	1/2	–	TKa 1110-C	421026	M10-M12	5 500	65 - 95	8.8	220	25.5	1.97	1/4	9.5	2.2	80
	1/2	–	TKa 1200	421070	M12	5 900	85 - 130	10	237	29	2.60	1/4	9.5	2.2	82
	1/2	–	TKa 1200-C	421075	M12	5 900	85 - 130	10	237	29	2.60	1/4	9.5	2.2	82
	1/2	–	TKa 1400	421030	M14	5 200	100 - 160	13.1	246	29	3.00	1/4	9.5	2.2	84
	1/2	–	TKa 1400-C	421055	M14	5 200	100 - 160	13.1	246	29	3.00	1/4	9.5	2.2	84
	1/2	–	TKa 1500	421040	M14-M16	4 200	150 - 220	13.2	254	32.5	3.60	1/4	9.5	2.4	84
	1/2	–	TKA 1500-C	421045	M14-M16	4 200	150 - 220	13.2	254	32.5	3.60	1/4	9.5	2.4	84

[1] Models whose designation ends in „-C“ are equipped with LED instead of the acoustic transmitter.
[2] Torque specification is only a guide value, based on the manufacturer's bolting tests at 0.6 MPa. Due to different influencing factors, practical values may deviate.

Further information available 24 / 7 on our website.

ZEMO
www.zemo-tools.de

Electr. EC Tightening System with Angle Monitoring – YETC-500

- Direct measuring of the angle of rotation and contactless signal transfer.
- Reliable detection of damaged threads, double tightenings, obstructions, etc.
- Almost no reaction forces due to the hydraulic impulse mechanism.
- High-intensity LED for illuminating the fastener head.
- Combinations of acoustic signals and/or LED (green/red) for feedback of iO/NiO results to the worker.
- Motor speed freely adjustable in the control, three different speed settings: Trigger start – screwing in – final fixing.
- Pulse cell equipped with separate fan.
- Standard as 2-channel unit; optional 4-channel.*
- Optional with Ethernet/LAN interface RJ-45.

Hybrid Technology

The number of adjustable parameter sets has been increased to 20. This significantly improves adaptability to different work processes.

For each of the 20 parameter sets, the motor speed can be adjusted in three stages to suit the respective bolting operation.

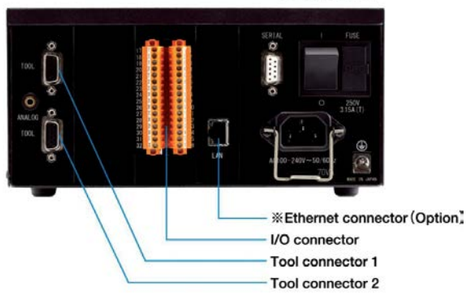
The touch panel LC colour display with plain text allows more comfortable parameter input. In addition to displaying the tightening torque, angle of rotation and number of pulses, it also offers a graphic display of the torque curve.

The measuring coefficient of the impulse wrench is automatically recognised; this saves set-up time and avoids setup errors.

- Group monitoring function (counting); signalling of group end acoustically/optically at the tool as well as at the relay output of the controller.
- Output of the tightening results to PC or PLC via different interfaces: USB, RS-232C, 10 I/O and optional Ethernet interface.
- Storage of parameter sets and tightening results on USB storage medium. This makes it independent of the PC workstation.
- Simultaneous use of two wrenches on one controller possible.
- Connection to existing Yokota controller possible.

Front Panel

Back Panel

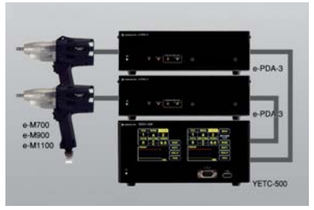


** One amplifier (e-PDA) is required per e-system wrench. With 2-channel specification, 2 tools can be used simultaneously; with 4-channel version, 4 tools can be used in definable order (not simultaneously).*

Further information available 24 / 7 on our website.

Electr. EC System Impulse Wrench – e-M series with Angle Sensor

Img.: e-M900



Yokota's electrically driven EC system wrench with integrated **strain gauge torque transducer** and **angle of rotation sensor** enables a considerable reduction in energy consumption with the highest repeatability and superior working efficiency.

During the tightening process, four different parameters are measured and monitored: torque – angle of rotation – time – number of pulses. The tightening result is evaluated from the curves of torque, angle of rotation and time. This enables the highly accurate detection of double or other incorrect tightening.

Torque and rotation angle are measured directly at the front of the shaft to ensure the highest accuracy of measurement. The rotation angle sensor is an extremely compact (PAT) rotation encoder that detects both angle and direction of rotation with an accuracy of 1° with contactless signal transfer.

Thanks to the newly developed „Outer Rotor Servo Motor" and the composite housing, the Yokota e-wrench has the lowest weight in its class.

To suppress heat generation, the motor is equipped with a newly developed cooling fan. The size of the motor has been reduced and weight saved. In addition, the number of possible fastenings per minute has been increased to 20.

To avoid thread damage: Turning a fastener backwards to adjust to a preset angle of rotation at the beginning of the tightening process.

Sustainability

- Pulse cell supported on two sides by ball bearings (PAT.P).
- Integrated relief valve (PAT.P) to reduce oil pressure on the seals.
- No compressor system needed, no pipes, no hoses, no solenoid valves.
- No compressed air oil required, compatible with the environment and the user, especially in the vicinity of painting lines.
- Reduction of energy consumption – Lean and Green.

Front Panel

Back Panel

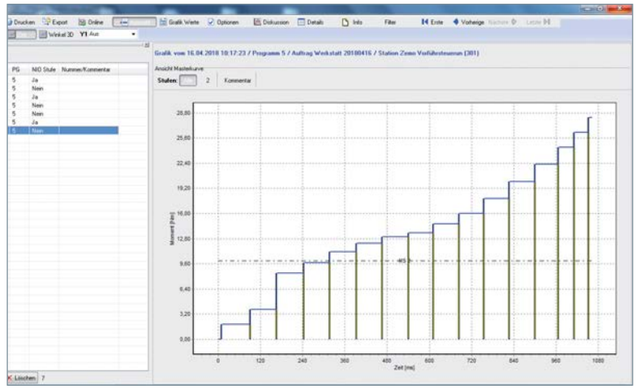
Series e-M

Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Spindle Offset	Length	Weight	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	mm	mm	kg	m/s²	dB(A)
Pistol	3/8	–	e-M500	430700	M5-M6	300 - 4800	3 - 10	32,5	236	2,10	<2,5	75
	3/8	–	e-M700	430710	M6-M8	300 - 4800	7,5 - 35	32,5	236	2,18	<2,5	75
	3/8	–	e-M900	430720	M8-M10	300 - 4800	30 - 60	32,5	236	2,25	<2,5	78
	1/2	–	e-M1100	430730	M10-M12	300 - 4800	50 - 90	32,5	248	2,52	<2,5	80

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, values may deviate in practice.*

Further information available 24 / 7 on our website.

EC Tightening System with Angle Control – CONTROL Pro+



Smart & hybrid – made in Germany

The CONTROL Pro+ provides you with a high-end EC system impulse wrench control for the direct measurement of **torque**, **angle** of rotation and number of **impulses**. The EC impulse wrench is controlled, monitored and switched off reproducibly via individual screw-in procedures that are parameterised according to customer specifications. Even in complex screwdriving applications with the highest precision requirements, the reliable system electronics work with the highest repeat accuracy.

The CONTROL Pro+ is specially designed for controlling and shutting off EC impulse wrenches. For direct measurement of the torque and the angle of rotation, the AT system wrench co-developed by ZEMO is equipped with **strain gauges** and an **angle sensor** system. Standard EC impulse wrenches from Yokota's TKa series can also be connected by means of the **Impulse Converter Electronics** (ICE) specially developed for the CONTROL Pro+.

- Rotation angle, torque and pulse number controlled **AT impulse wrenches**; incl. automatic wrench recognition and control parameterisation for safety-relevant bolted joints according to VDI/VDE guideline 2862, category A.
- Torque and pulse number controlled Yokota system wrenches for safety-relevant bolted joints according to VDI/VDE guideline 2862, category A.

Logical

The customer-specific criteria for a bolting operation or a torque test can be converted into an individual bolting sequence programme. Programming and modification can be carried out directly on the controller by means of plain-text menu guidance that can be switched between two languages - or via the convenient MultiPro software. Up to 3000 instructions can be stored in 256 programmes.

The desired programme is called up via a direct start signal and the fastening process is started with the programmed instructions. With the tool start the bolting process begins and the bolting is carried out in several steps according to the entered parameters (tolerance limits).

During the tightening process, the system continuously takes measurements. An OK/NOK evaluation is carried out for each bolting stage and after the last bolting stage has been completed, the result is displayed on the LC screen – optionally in graphic mode.

The production data can be stored in the unit and recorded in the statistics memory. The data can be output as required for documentation purposes.

Functional

- Measurement according to VDI/VDE 2862.
- Large LCD with graphic display of readings value.
- Three-colour LED status displays for torque, angle of rotation and number of pulses.
- Freely programmable tightening sequences.
- Single-step operation (test of the programme sequence).
- Clear text programming and parameterisation on the unit or via supplied PC software.
- 4 status outputs for OK, NOK, READY and PG ready.
- 4 inputs for the programme selection.
- Output of measured values via printer interface, PC port or Profi-Bus, and/or storage on CF card.
- Optional Ethernet interface (TCP/IP).
- XML-capable, according to Volkswagen Group specifications.
- Convenient integrated statistics function.
- Automatic self-test.
- Access control, access journal, user administration.
- Released in the VW Group.
- Full parameterisation via supplied MulitControl PC software.

Further information available 24 / 7 on our website.

Pneum. EC System Impulse Wrench – AT series w Angle Control

Img.: AT-111

LED status indication (green = OK, red = NOK), visible all around – from above, below, left, right, front, back.

The CONTROL Pro+ can also be used with Yokota system wrenches TKa and YEX.

Clear

The electronics check each parameter for plausibility before, during and after bolting and simultaneously monitor the system stability. In case of irregularities, the control unit displays this in plain text and goes into „malfunction" mode if necessary.

The torque value determined directly via strain gauges as well as the number of pulses and the angle of rotation are shown on the large multifunction display. It is also possible to display a tightening curve. The result of the OK/NOK judgement is also visualised on the screen. The LED fields „Torque" and „Angle" of the limit value monitoring show the status of the determined torque and angle of rotation clearly visible.

Variable

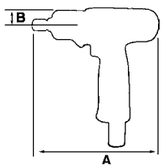
Varying air pressures can be specified via our digital proportional valve. A tightening process in several stages is thus realised.

- Short screw-in times.
- Single-handed operation, without counterholder.
- Best pretensioning force within the connection.
- High repeatability.
- Quick change of position of the pistol.

Options

- Signal light stack for OK/NOK.
- Programme selector switch.
- XML-capable variant according to VW Group standard available.
- I/O extension box.
- ControlPro+ software for programming/parameterisation, administration, backup, process analysis, statistics and data export.
- ControlPro+ Database for traceable documentation of production data.
- Ethernet interface (TCP/IP).

Digital proportional valve



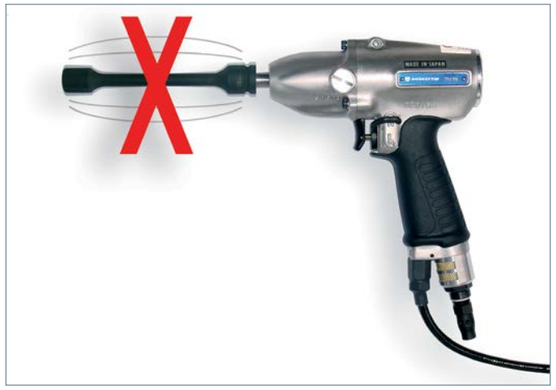
Series AT (Angle/Torque)

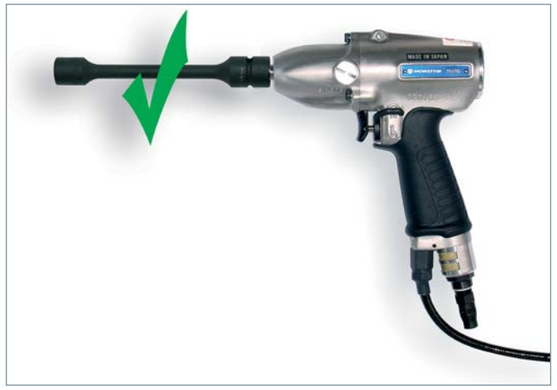
Type			Model	Item No.	Bolt Capacity	RPM	Torque Range*	Air Cons.	Dimensions A	Dimensions B	Weight	Pipe Thread	Hose ID	Vibration	Noise Level
	SqD	Hex			Ø	min⁻¹	N·m	l/s	mm		kg	Zoll	mm	m/s²	dB(A)
Pistol	–	1/4	AT-60 A	D100100	M6	6 000	11 - 16	4.5	209	22	1.4	1/4	6.35	2.1	71
	–	1/4	AT-70 A	D100200	M6-M8	7 000	20 - 27	5.3	211	22	1.4	1/4	6.35	2.1	75
	–	1/4	AT-80 A	D100300	M8	7 000	24 - 33	5.3	231	22	1.5	1/4	6.35	2.1	73
	3/8	–	AT-60	D100150	M6	6 000	14 - 20	4.5	209	22	1.4	1/4	6.35	2.1	71
	3/8	–	AT-70	D100250	M6-M8	7 000	20 - 35	5.3	211	22	1.4	1/4	6.35	2.1	75
	3/8	–	AT-80	D100350	M8	7 000	32 - 46	5.3	231	22	1.5	1/4	6.35	2.1	73
	3/8	–	AT-90	D100400	M8 -M10	6 500	47 - 70	6.8	234	24	1.7	1/4	9.5	2.1	78
	1/2	–	AT-111	D100450	M10-M12	6 000	65 - 105	8.8	242	26	2.1	1/4	9.5	2.2	80
	1/2	–	AT-120	D100500	M12	5 900	85 - 130	10	266	28	2.6	1/4	9.5	2.2	82
	1/2	–	AT-140	D100550	M14	5 200	100 - 160	13	278	30	3.1	1/4	9.5	2.2	84
	1/2	–	AT-150	D100600	M14-M16	4 200	150 - 220	13.2	285	32	3.7	1/4	9.5	2.4	84

Further information available 24 / 7 on our website.

** Torque specification is for guidance only, based on manufacturer's tightening tests at 0.6 MPa. Due to different influencing factors, values may deviate in practice.*

Power Sockets with Sleeve Drive – for impulse tools





Sleeve Drive Power Sockets

Optimum performance and safety when working with hand-held impulse wrenches can only be achieved with particularly suitable power sockets and extensions.

At the request of the renowned Japanese impulse tool manufacturer Yokota, the Action® power sockets with sleeve drive were developed to further improve the quality of the bolted connection with impulse wrenches.

Action® power sockets with spindle guide offer excellent power transmission because they do not sit solely on the square drive of the impulse tool shaft, but are also guided by the round shaft of the drive spindle. This means that these special power sockets have minimal play between the socket and the drive spindle of the impulse tool. Last but not least, the „sleeve drive“ avoids the transmission of vibrations to user and machine.

Effect: The recessed fit reduces „wobbling“, the tightening torques become even more accurate, wear occurs much later, the noise level and vibration are reduced, and the health of the workers is protected.

Key advantages

- ✔ Improved power transmission due to lower torque losses
- ✔ Less wear on plug-in tool and impulse wrench
- ✔ Reduced vibration
- ✔ Reduced noise level
- ✔ Prevention of repetitive strain injury (RSI), carpal tunnel syndrome (CTS), etc.

An O-ring inserted in the drive end of the spindle-guided Action® power sockets optimises the tight fit on the impulse tool shaft and thus ensures the immediate transmission of the specified torque without significant loss of force. In addition, the service life is further increased.

Application advise

INFO

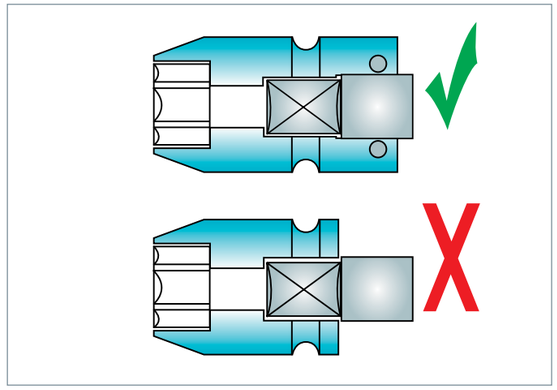
Worn sockets cause a loss of power and also wear out the square drive of the tool. This also causes increasing vibrations, which makes working more difficult.

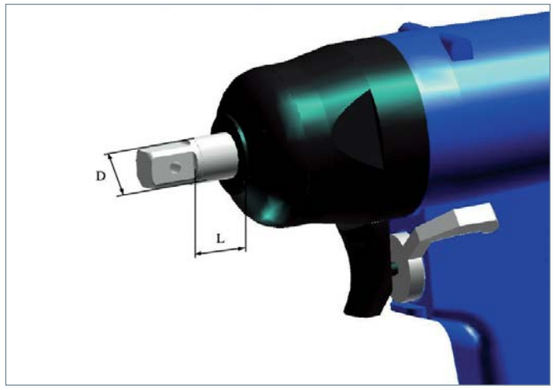
Worn power sockets should therefore be replaced at an early stage.

ZEMO
www.zemo-tools.de

Further information available 24 / 7 on our website.

Power Sockets with Sleeve Drive – for impulse tools





All Action® power sockets are manufactured according to DIN 3121 and DIN 3129. Action® power sockets with sleeve drive are compatible with all impulse tools from the Japanese manufacturers Yokota and Uryu, as well as other brands with identical shaft geometry.

Action® power sockets with sleeve drive can be fitted to impulse wrenches with drive shafts of the following lengths and diameters:

Square Drive inch	D mm	L mm
3/8	12	≥ 10
1/2	16	≥ 10
3/4	25	≥ 11.8

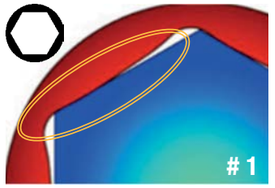
Avoid „surface drive“ sockets with impulse tools

INFO

We strongly advise against using „surface drive“ sockets on impulse tools (whether standard, shut-off, cordless and EC).

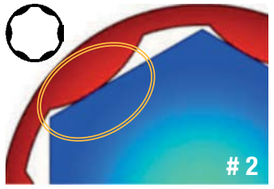
Instead, we recommend using only power sockets with a standard hexagon and, if possible, also with a spindle guide („sleeve drive“).

- *The play of the „Surface Drive“ hexagon (Fig. 2 right) on the bolt head or nut can affect the torque accuracy.*
- *About twice the number of pulses is needed to reach the target torque, as the force flow between the „surface drive“ and the bolt head or nut is considerably smaller than with a standard hexagon (Fig. 1).*
- *The „Surface Drive“ causes higher vibrations.*
- *The „Surface Drive“ causes higher noise levels.*
- *The „Surface Drive“ causes faster wear of the sockets.*



Standard Hexagon:

Small radius in the corner so that the socket engages the flat side of the screw head and not the corner. Larger contact surface ensures improved power transmission.



Hexagon with ‚Surface Drive‘:

Large radius in the corner to facilitate engagement with screw spindles.

With continuously rotating drives, the additional play has no influence on the torque accuracy. With impulse wrenches, on the other hand, this additional play is very disadvantageous, as there is then a kickback with each impulse instead of continuous contact with the socket.

Surface drive‘ sockets should therefore not be used for impulse wrenches.

Further information available 24 / 7 on our website.

ZEMO
www.zemo-tools.de

3/8 Power Sockets with Sleeve Drive – Square Drive 3/8“

6-point – normal

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/8 - 6	300006	6	AS	43	11	19	5
KH 3/8 - 8	300008	8	AS	43	13	19	7
KH 3/8 - 9	300009	9	AS	43	15	19	7
KH 3/8 - 10	300010	10	AS	43	16	19	8
KH 3/8 - 11	300011	11	SA	43	17.5	19	9
KH 3/8 - 12	300012	12	BS	43	19	19	9
KH 3/8 - 13	300013	13	AS	43	20	22	9
KH 3/8 - 14	300014	14	AS	43	21	22	9
KH 3/8 - 15	300015	15	BS	43	22	22	11
KH 3/8 - 16	300016	16	CS	43	24	22	11
KH 3/8 - 17	300017	17	CS	43	25	22	11
KH 3/8 - 18	300018	18	CS	43	26	22	11
KH 3/8 - 19	300019	19	CS	43	27.5	22	11
KH 3/8 - 21	300020	21	CS	43	30	22	13

Torx® E

Model	Item No.	Torx #	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/8-E5	300410	E5	AS	43	8	19	4.5
KH 3/8-E6	300411	E6	AS	43	9	19	5
KH 3/8-E7	300412	E7	AS	43	9,5	19	6
KH 3/8-E8	300413	E8	AS	43	11	19	6.5
KH 3/8-E10	300414	E10	AS	43	13	19	7.5
KH 3/8-E11	300415	E11	AS	43	14	19	8
KH 3/8-E12	300416	E12	AS	43	15.5	19	8.5
KH 3/8-E14	300417	E14	AS	43	17.5	22	10
KH 3/8-E16	300418	E16	AS	43	18.5	22	11

6-point – long

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/8-6-100	300050	6	DS	100	10.5	22	4
KH 3/8-8-100	300051	8	DS	100	12.5	22	8
KH 3/8-10-100	300052	10	DS	100	15	22	8
KH 3/8-12-100	300053	12	DS	100	18	22	9
KH 3/8-13-100	300054	13	DS	100	19	22	9
KH 3/8-14-100	300055	14	DS	100	20	22	9
KH 3/8-15-100	300056	15	DS	100	21	22	11
KH 3/8-16-100	300057	16	DS	100	22.5	22	11
KH 3/8-17-100	300058	17	DS	100	24	22	11
KH 3/8-6-150	300110	6	DS	150	10.5	22	4
KH 3/8-8-150	300111	8	DS	150	12.5	22	8
KH 3/8-10-150	300112	10	DS	150	15	22	8
KH 3/8-12-150	300113	12	DS	150	18	22	9
KH 3/8-13-150	300114	13	DS	150	19	22	9
KH 3/8-14-150	300115	14	DS	150	20	22	9
KH 3/8-15-150	300116	15	DS	150	21	22	11
KH 3/8-16-150	300117	16	DS	150	22.5	22	11
KH 3/8-17-150	300118	17	DS	150	24	22	11
KH 3/8-6-200	300150	6	DS	200	10.5	22	4
KH 3/8-8-200	300151	8	DS	200	12.5	22	8
KH 3/8-10-200	300152	10	DS	200	15	22	8
KH 3/8-12-200	300153	12	DS	200	18	22	9
KH 3/8-13-200	300154	13	DS	200	19	22	9
KH 3/8-14-200	300155	14	DS	200	20	22	9
KH 3/8-15-200	300156	15	DS	200	21	22	11
KH 3/8-16-200	300157	16	DS	200	22.5	22	11
KH 3/8-17-200	300158	17	DS	200	24	22	11
KH 3/8-19-200	300159	19	DS	200	27	22	11

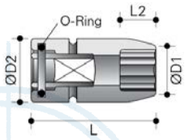
INFO

Application advise

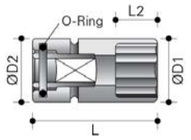
Worn sockets cause a loss of power and also wear out the square drive of the tool. This also causes increasing vibrations, which makes working more difficult.

Worn power sockets should therefore be replaced at an early stage.

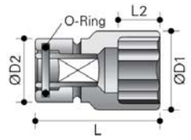
Form AS



Form BS



Form CS



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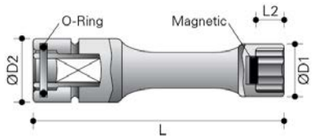

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Further information available 24 / 7 on our website.

ACTION®

3/8 Power Sockets with Sleeve Drive – Square Drive 3/8“

6-point – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 3/8 - 6	300023	6	AS	43	11	19	5
KHM 3/8 - 7	300024	7	AS	43	12	19	5
KHM 3/8 - 8	300025	8	AS	43	13	19	7
KHM 3/8 - 9	300026	9	AS	43	15	19	7
KHM 3/8 - 10	300027	10	AS	43	16	19	8
KHM 3/8 - 11	300028	11	AS	43	17.5	19	9
KHM 3/8 - 12	300029	12	BS	43	19	19	9
KHM 3/8 - 13	300030	13	AS	43	20	22	9
KHM 3/8 - 14	300031	14	AS	43	21	22	9
KHM 3/8 - 16	300033	16	CS	43	24	22	11
KHM 3/8 - 17	300034	17	CS	43	25	22	11
KHM 3/8 - 18	300035	18	CS	43	26	22	11
KHM 3/8 - 19	300036	19	CS	43	27	22	11
KHM 3/8 - 20	300037	20	CS	43	28	22	13
KHM 3/8 - 21	300038	21	CS	43	30	22	13
KHM 3/8 - 22	300039	22	CS	50	31	22	13
KHM 3/8 - 23	300040	23	CS	50	32	22	13
KHM 3/8 - 24	300041	24	CS	50	34	22	13
KHM 3/8 - 25	300042	25	CS	50	35	22	13
KHM 3/8 - 26	300043	26	CS	50	36	22	13
KHM 3/8 - 27	300044	27	CS	50	38	22	13

6-point – deep – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 3/8-10T	300330	10	FS	100	16	19	5
KHM 3/8-12T	300332	12	FS	100	18.5	19	6
KHM 3/8-13T	300333	13	FS	100	20	22	6
KHM 3/8-14T	300334	14	FS	100	21	22	6
KHM 3/8-16T	300336	16	FS	100	24	22	7

6-point – long – with magnet

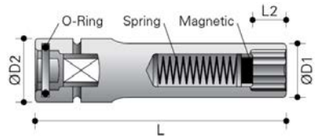
Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 3/8-6-100	300210	6	DS	100	11	19	3
KHM 3/8-7-100	300211	7	DS	100	12	19	3
KHM 3/8-8-100	300212	8	DS	100	13	19	4
KHM 3/8-9-100	300213	9	DS	100	15	19	4
KHM 3/8-10-100	300214	10	DS	100	16	19	4
KHM 3/8-11-100	300215	11	DS	100	17.5	19	5
KHM 3/8-12-100	300216	12	DS	100	18.5	19	5
KHM 3/8-13-100	300217	13	DS	100	20	22	6
KHM 3/8-14-100	300218	14	DS	100	21	22	6
KHM 3/8-15-100	300219	15	DS	100	22	22	7
KHM 3/8-16-100	300220	16	DS	100	24	22	7
KHM 3/8-17-100	300221	17	DS	100	25	22	7
KHM 3/8-8-150	300252	8	DS	150	13	19	4
KHM 3/8-10-150	300254	10	DS	150	16	19	4
KHM 3/8-11-150	300255	11	DS	150	17.5	19	5
KHM 3/8-12-150	300256	12	DS	150	18.5	19	5
KHM 3/8-13-150	300257	13	DS	150	20	22	6
KHM 3/8-14-150	300258	14	DS	150	21	22	6
KHM 3/8-15-150	300259	15	DS	150	22	22	7
KHM 3/8-16-150	300260	16	DS	150	24	22	7
KHM 3/8-17-150	300261	17	DS	150	25	22	7
KHM 3/8-8-200	300312	8	DS	200	13	19	4
KHM 3/8-9-200	300313	9	DS	200	15	19	4
KHM 3/8-10-200	300314	10	DS	200	16	19	4
KHM 3/8-12-200	300316	12	DS	200	18.5	19	5
KHM 3/8-13-200	300317	13	DS	200	20	22	6
KHM 3/8-14-200	300318	14	DS	200	21	22	6
KHM 3/8-15-200	300319	15	DS	200	22	22	7

INFO

Custom-made products

Do you need individual special sockets? We also manufacture special tools according to drawings. Please contact us. We will be happy to provide you with a non-binding offer.

Form FS



Further information available 24 / 7 on our website.

ZEMO
www.zemo-tools.de

3/8 Power Sockets with Sleeve Drive – Square Drive 3/8“

Torx® Driver (TX)

Model	Item No.	Torx #	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/8-T9	300450	T9	ES	75	–	22	2
KH 3/8-T10	300451	T10	ES	75	–	22	2.8
KH 3/8-T15	300452	T15	ES	75	–	22	2.8
KH 3/8-T20	300453	T20	ES	75	–	22	2.8
KH 3/8-T25	300454	T25	ES	75	–	22	3
KH 3/8-T27	300455	T27	ES	75	–	22	3
KH 3/8-T30	300456	T30	ES	75	–	22	3.8
KH 3/8-T40	300457	T40	ES	75	–	22	3.8
KH 3/8-T45	300458	T45	ES	75	–	22	4.3
KH 3/8-T47	300459	T47	ES	75	–	22	5
KH 3/8-T50	300460	T50	ES	75	–	22	5
KH 3/8-T55	300461	T55	ES	75	–	22	5

Hex Driver (Allen)

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/8-A3	300350	3	ES	75	–	22	11
KH 3/8-A4	300351	4	ES	75	–	22	11
KH 3/8-A5	300352	5	ES	75	–	22	11
KH 3/8-A6	300353	6	ES	75	–	22	11
KH 3/8-A7	300354	7	ES	75	–	22	16
KH 3/8-A8	300355	8	ES	75	–	22	16
KH 3/8-A9	300356	9	ES	75	–	22	16
KH 3/8-A10	300357	10	ES	75	–	22	16
KH 3/8-A11	300358	11	ES	75	–	22	16
KH 3/8-A12	300359	12	ES	75	–	22	16
KH 3/8-A13	300360	13	ES	75	–	22	16
KH 3/8-A14	300361	14	ES	75	–	22	16
KH 3/8-A15	300362	15	ES	75	–	22	16
KH 3/8-A16	300363	16	ES	75	–	22	16

INFO

Application advise

Worn sockets cause a loss of power and also wear out the square drive of the tool. This also causes increasing vibrations, which makes working more difficult.

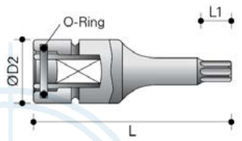
Worn power sockets should therefore be replaced at an early stage.

INFO

Custom-made products

Do you need individual special sockets? We also manufacture special tools according to drawings. Please contact us. We will be happy to provide you with a non-binding offer.

Form ES



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Further information available 24 / 7 on our website.

1/2 Power Sockets with Sleeve Drive – Square Drive 1/2“

6-point – normal

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 1/2-12	310010	12	AS	52	20	25	12
KH 1/2-13	310011	13	AS	52	21	25	12
KH 1/2-14	310012	14	AS	52	22.5	25	12
KH 1/2-15	310013	15	AS	52	23.7	30	12
KH 1/2-16	310014	16	AS	52	25	30	12
KH 1/2-17	310015	17	AS	52	26	30	12
KH 1/2-18	310016	18	AS	52	27.5	30	12
KH 1/2-19	310017	19	AS	52	28.7	30	12
KH 1/2-21	310018	21	BS	52	30	30	12
KH 1/2-22	310019	22	CS	52	32	30	12
KH 1/2-23	310020	23	CS	52	32	30	12
KH 1/2-24	310021	24	CS	52	35	30	12
KH 1/2-25	310022	25	CS	57	36	30	12
KH 1/2-27	310023	27	CS	57	39	30	12
KH 1/2-30	310024	30	CS	62	42	30	12
KH 1/2-32	310025	32	CS	62	44	30	12

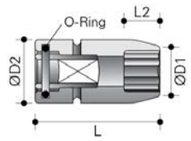
6-point – XL

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 1/2-10-100	310050	10	DS	100	17	25	12
KH 1/2-12-100	310051	12	DS	100	19.5	25	12
KH 1/2-13-100	310052	13	DS	100	20.5	25	12
KH 1/2-14-100	310053	14	DS	100	21.5	25	12
KH 1/2-15-100	310054	15	DS	100	22.5	25	12
KH 1/2-17-100	310055	17	DS	100	25	25	13
KH 1/2-19-100	310056	19	DS	100	28	25	13
KH 1/2-10-150	310110	10	DS	150	17	25	12
KH 1/2-12-150	310111	12	DS	150	19.5	25	12
KH 1/2-13-150	310112	13	DS	150	20.5	25	12
KH 1/2-14-150	310113	14	DS	150	21.5	25	12
KH 1/2-15-150	310114	15	DS	150	22.5	25	12
KH 1/2-17-150	310115	17	DS	150	25	25	13
KH 1/2-19-150	310116	19	DS	150	28	25	13
KH 1/2-10-200	310150	10	DS	200	17	25	12
KH 1/2-12-200	310151	12	DS	200	19.5	25	12
KH 1/2-13-200	310152	13	DS	200	20.5	25	12
KH 1/2-14-200	310153	14	DS	200	21.5	25	12
KH 1/2-15-200	310154	15	DS	200	22.5	25	12
KH 1/2-17-200	310155	17	DS	200	25	25	13
KH 1/2-19-200	310156	19	DS	200	28	25	13

Torx® E

Model	Item No.	Torx #	Form	L mm	D1 mm	D2 mm	L2 mm
KH 1/2-E10	310450	E10	AS	52	14	25	7.5
KH 1/2-E11	310451	E11	AS	52	15	25	8
KH 1/2-E12	310452	E12	AS	52	16	25	8.5
KH 1/2-E14	310453	E14	AS	52	18	25	10
KH 1/2-E16	310454	E16	AS	52	20	25	11
KH 1/2-E18	310455	E18	AS	52	22	25	12.5
KH 1/2-E20	310456	E20	AS	52	25	30	14
KH 1/2-E22	310457	E22	AS	52	27	30	15
KH 1/2-E24	310458	E24	AS	52	29	30	16.5

Form AS



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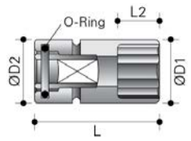

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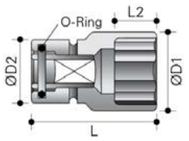

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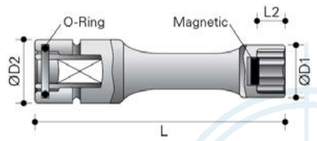

Further information available 24 / 7 on our website.

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1/2 Power Sockets with Sleeve Drive – Square Drive 1/2“

6-point – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 1/2-6	310406	6	AS	52	13	25	5
KHM 1/2-7	310407	7	AS	52	14	25	5
KHM 1/2-8	310408	8	AS	52	15	25	7
KHM 1/2-9	310409	9	AS	52	16	25	7
KHM 1/2-10	310410	10	AS	52	17.5	25	8
KHM 1/2-11	310411	11	AS	52	18.5	25	9
KHM 1/2-12	310412	12	BS	52	20	25	12
KHM 1/2-13	310413	13	AS	52	21	25	12
KHM 1/2-14	310414	14	AS	52	22.5	25	12
KHM 1/2-15	310415	15	AS	52	23.5	30	12
KHM 1/2-16	310416	16	AS	52	25	30	12
KHM 1/2-17	310417	17	AS	52	26	30	12
KHM 1/2-18	310418	18	AS	52	27.5	30	12
KHM 1/2-19	310419	19	AS	52	28.5	30	12
KHM 1/2-20	310420	20	BS	52	30	30	12
KHM 1/2-21	310421	21	CS	52	31	30	12
KHM 1/2-22	310422	22	CS	52	32	30	12
KHM 1/2-23	310423	23	CS	52	34	30	12
KHM 1/2-24	310424	24	CS	52	35	30	12
KHM 1/2-25	310425	25	CS	57	36	30	12
KHM 1/2-26	310426	26	CS	57	38	30	12
KHM 1/2-27	310427	27	CS	57	38.5	30	12

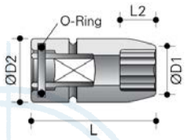
6-point – deep – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 1/2-10T	310330	10	FS	100	17,5	25	5
KHM 1/2-13T	310333	13	FS	100	21	25	6
KHM 1/2-16T	310336	16	FS	100	25	30	7
KHM 1/2-17T	310337	17	FS	100	26	30	7
KHM 1/2-19T	310339	19	FS	100	28,5	30	8

6-point – XL – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 1/2-10-100	310210	10	DS	100	17.5	25	4
KHM 1/2-11-100	310211	11	DS	100	18.5	25	5
KHM 1/2-12-100	310212	12	DS	100	20	25	5
KHM 1/2-13-100	310213	13	DS	100	21	25	6
KHM 1/2-14-100	310214	14	DS	100	22.5	25	6
KHM 1/2-15-100	310215	15	DS	100	23.5	30	7
KHM 1/2-16-100	310216	16	DS	100	25	30	7
KHM 1/2-17-100	310217	17	DS	100	26	30	7
KHM 1/2-18-100	310218	18	DS	100	27.5	30	8
KHM 1/2-19-100	310219	19	DS	100	28.5	30	8
KHM 1/2-10-150	310250	10	DS	150	17.5	25	12
KHM 1/2-11-150	310251	11	DS	150	18.5	25	12
KHM 1/2-12-150	310252	12	DS	150	20	25	12
KHM 1/2-13-150	310253	13	DS	150	21	25	12
KHM 1/2-14-150	310254	14	DS	150	22.5	25	12
KHM 1/2-15-150	310255	15	DS	150	23.5	30	12
KHM 1/2-16-150	310256	16	DS	150	25	30	13
KHM 1/2-17-150	310257	17	DS	150	26	30	13
KHM 1/2-18-150	310258	18	DS	150	27.5	30	13
KHM 1/2-19-150	310259	19	DS	150	28.5	30	13
KHM 1/2-10-200	310310	10	DS	200	17.5	25	12
KHM 1/2-11-200	310311	11	DS	200	18.5	25	12
KHM 1/2-12-200	310312	12	DS	200	20	25	12
KHM 1/2-13-200	310313	13	DS	200	21	25	12
KHM 1/2-14-200	310314	14	DS	200	22.5	25	12
KHM 1/2-15-200	310315	15	DS	200	23.5	30	12
KHM 1/2-16-200	310316	16	DS	200	25	30	13
KHM 1/2-17-200	310317	17	DS	200	26	30	13
KHM 1/2-18-200	310318	18	DS	200	27.5	30	13
KHM 1/2-19-200	310319	19	DS	200	28.5	30	13

Form AS



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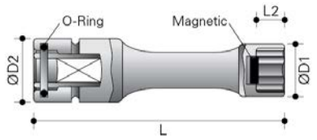

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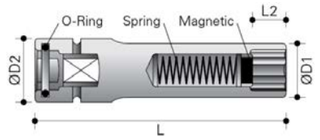


Further information available 24 / 7 on our website.

ACTION®

1/2 Power Sockets with Sleeve Drive – Square Drive 1/2“

Hex Driver (Allen)

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 1/2-A3	310350	3	ES	75	–	25	11
KH 1/2-A4	310351	4	ES	75	–	25	11
KH 1/2-A5	310352	5	ES	75	–	25	15
KH 1/2-A6	310353	6	ES	75	–	25	15
KH 1/2-A7	310354	7	ES	75	–	25	20
KH 1/2-A8	310355	8	ES	75	–	25	25
KH 1/2-A9	310356	9	ES	75	–	25	25
KH 1/2-A10	310357	10	ES	75	–	25	25
KH 1/2-A11	310358	11	ES	75	–	25	25
KH 1/2-A12	310359	12	ES	75	–	25	25
KH 1/2-A13	310360	13	ES	75	–	25	25
KH 1/2-A14	310361	14	ES	75	–	25	25
KH 1/2-A15	310362	15	ES	75	–	25	25
KH 1/2-A16	310363	16	ES	75	–	25	25
KH 1/2-A17	310364	17	ES	75	–	25	25
KH 1/2-A18	310365	18	ES	75	–	25	25
KH 1/2-A19	310366	19	ES	75	–	25	25

Torx® Driver (TX)

Model	Item No.	Torx #	Form	L mm	D1 mm	D2 mm	L2 mm
KH 1/2-T20	310510	T20	ES	75	–	25	2,8
KH 1/2-T25	310511	T25	ES	75	–	25	3
KH 1/2-T27	310512	T27	ES	75	–	25	3
KH 1/2-T30	310513	T30	ES	75	–	25	3,8
KH 1/2-T40	310514	T40	ES	75	–	25	3,8
KH 1/2-T45	310515	T45	ES	75	–	25	4,3
KH 1/2-T47	310516	T47	ES	75	–	25	5
KH 1/2-T50	310517	T50	ES	75	–	25	5
KH 1/2-T55	310518	T55	ES	75	–	25	5,5
KH 1/2-T60	310519	T60	ES	75	–	25	8
KH 1/2-T70	310520	T70	ES	75	–	25	9,4
KH 1/2-T80	310521	T80	ES	75	–	25	10,5
KH 1/2-T90	310522	T90	ES	75	–	25	11,8
KH 1/2-T100	310523	T100	ES	75	–	25	13,1

INFO

Custom-made products

Do you need individual special sockets? We also manufacture special tools according to drawings. Please contact us. We will be happy to provide you with a non-binding offer.

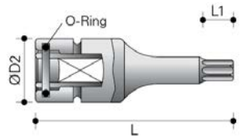
INFO

Application advise

Worn sockets cause a loss of power and also wear out the square drive of the tool. This also causes increasing vibrations, which makes working more difficult.

Worn power sockets should therefore be replaced at an early stage.

Form ES



Further information available 24 / 7 on our website.

3/4 Power Sockets with Sleeve Drive – Square Drive 3/4“

6-point – normal

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/4-17	311010	17	AS	65	31	44	12
KH 3/4-18	311011	18	AS	65	32	44	12
KH 3/4-19	311012	19	AS	65	33	44	14
KH 3/4-21	311013	21	AS	65	35	44	16
KH 3/4-22	311014	22	AS	65	37	44	16
KH 3/4-23	311015	23	AS	65	38	44	16
KH 3/4-24	311016	24	AS	65	39	44	16
KH 3/4-26	311017	26	AS	65	41	44	16
KH 3/4-27	311018	27	AS	65	43	44	16
KH 3/4-28	311019	28	BS	68	44	44	20
KH 3/4-29	311020	29	CS	68	45	44	20
KH 3/4-30	311021	30	CS	68	47	44	20
KH 3/4-32	311022	32	CS	70	49	44	20
KH 3/4-33	311023	33	CS	70	51	44	20
KH 3/4-34	311024	34	CS	70	52	44	20
KH 3/4-35	311025	35	CS	70	53	44	20
KH 3/4-36	311026	36	CS	70	54	44	20
KH 3/4-38	311027	38	CS	72	57	44	22
KH 3/4-41	311028	41	CS	72	60	44	22
KH 3/4-46	311029	46	CS	77	67	54	23
KH 3/4-50	311030	50	CS	77	71	54	23

6-point – with magnet

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KHM 3/4-13	311213	13	AS	65	24,5	44	12
KHM 3/4-14	311214	14	AS	65	25,5	44	12
KHM 3/4-15	311215	15	AS	65	27	44	12
KHM 3/4-16	311216	16	AS	65	28	44	12
KHM 3/4-17	311217	17	AS	65	30	44	12
KHM 3/4-18	311218	18	AS	65	31	44	12
KHM 3/4-19	311219	19	AS	65	32	44	14
KHM 3/4-20	311220	20	AS	68	34	44	14
KHM 3/4-21	311221	21	AS	68	35	44	16
KHM 3/4-22	311222	22	AS	68	37	44	16
KHM 3/4-23	311223	23	AS	68	38	44	16
KHM 3/4-24	311224	24	AS	68	39	44	16
KHM 3/4-25	311225	25	AS	69	41	44	16
KHM 3/4-26	311226	26	AS	69	42	44	16
KHM 3/4-27	311227	27	AS	69	43	44	16

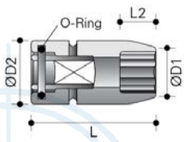
Hex Driver (Allen)

Model	Item No.	A/F mm	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/4-A10	311110	10	ES	100	–	44	20
KH 3/4-A12	311111	12	ES	100	–	44	20
KH 3/4-A14	311112	14	ES	100	–	44	20
KH 3/4-A16	311113	16	ES	100	–	44	20
KH 3/4-A17	311114	17	ES	100	–	44	20
KH 3/4-A19	311115	19	ES	100	–	44	20
KH 3/4-A22	311116	22	ES	100	–	44	20
KH 3/4-A24	311117	24	ES	100	–	44	20
KH 3/4-A27	311118	27	ES	100	–	44	20
KH 3/4-A30	311119	30	ES	100	–	44	20
KH 3/4-A32	311120	32	ES	100	–	44	20
KH 3/4-A33	311121	33	ES	100	–	44	20
KH 3/4-A36	311122	36	ES	100	–	44	20
KH 3/4-A38	311123	38	ES	100	–	44	20

Torx® E

Model	Item No.	Torx #	Form	L mm	D1 mm	D2 mm	L2 mm
KH 3/4-E18	311150	E18	AS	65	26	44	12,5
KH 3/4-E20	311151	E20	AS	65	28	44	14
KH 3/4-E22	311152	E22	AS	65	31	44	15
KH 3/4-E24	311153	E24	AS	65	33	44	16,5

Form AS



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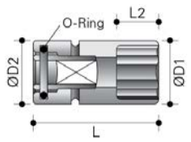

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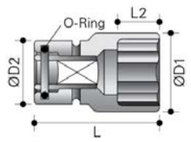

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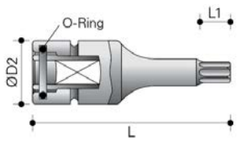

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Power Sockets with Sleeve Drive – Adaptors

Extensions

Model	Item No.	Sq. inch	Form	L mm	D1 mm	D2 mm	L2 mm
KHV 3/8-75	312010	3/8	F	75	–	22	–
KHV 3/8-125	312011	3/8	F	125	–	22	–
KHV 3/8-250	312012	3/8	F	250	–	22	–
KHV 1/2-75	312013	1/2	F	75	–	25	–
KHV 1/2-125	312014	1/2	F	125	–	25	–
KHV 1/2-175	312015	1/2	F	175	–	25	–
KHV 1/2-250	312016	1/2	F	250	–	25	–
KHV 3/4-175	312017	3/4	F	175	–	44	–
KHV 3/4-250	312018	3/4	F	250	–	44	–
KHV 3/4-330	312019	3/4	F	330	–	44	–

Rubber ring and locking pin

Model	Item No.	Sq. inch	Form	L mm	D1 mm	D2 mm	L2 mm
RS-3/8	222050	3/8	–	–	–	–	–
RS-1/2	240510	1/2	–	–	–	–	–
RS-3/4	250810	3/4	–	–	–	–	–

Quick-change holder

Model	Item No.	in inch	out inch	L mm	D1 mm	D2 mm	L2 mm
KHQC 3/8-3/8	314511	3/8	3/8	75	–	19	–
KHQC 3/8-3/8L	314514	3/8	3/8	100	–	19	–
KHQC 3/8-1/2	314509	3/8	1/2	80	–	20	–
KHQC 1/2-3/8	314512	1/2	3/8	75	–	25	–
KHQC 1/2-1/2	314513	1/2	1/2	100	–	25	–
KHQC 3/4-1/2	314510	3/4	1/2	90	–	44	–
KHQC 3/4-3/4	314515	3/4	3/4	125	–	44	–

Bit holder

Model	Item No.	Sq. inch	Hex inch	L mm	D1 mm	D2 mm	L2 mm
KHQC 3/8-H1/4	313585	3/8	1/4	52	–	22	–
KHQC 3/8-H7/16	313591	3/8	7/16	62	–	22	–
KHQC 1/2-H1/4	313583	1/2	1/4	60	–	25	–
KHQC 1/2-H7/16	313593	1/2	7/16	70	–	25	–
KHQC 3/4-H7/16	313595	3/4	7/16	80	–	44	–

INFO

Custom-made products

Do you need individual special sockets? We also manufacture special tools according to drawings. Please contact us. We will be happy to provide you with a non-binding offer.

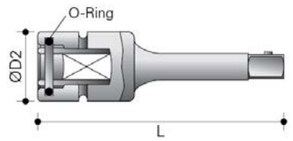
INFO

Application advise

Worn sockets cause a loss of power and also wear out the square drive of the tool. This also causes increasing vibrations, which makes working more difficult.

Worn power sockets should therefore be replaced at an early stage.

Form F



Further information available 24 / 7 on our website.

ZEMO
www.zemo-tools.de

Accessories – Protective caps, batteries, chargers, etc.

Protective rubber caps

for type	Item No.
BB 200 D-325	33116-B200D-01
BB 200 D-350	33116-B200D-02
BL-22	0351-0029-00-01
BPL-1820	0446-0029-00-01
e-M 500	0368-0029-00-01
e-M 700	0368-0029-00-01
e-M 900	0368-0029-00-01
e-M 1100	0378-0029-00-01
RRI-30/40/50 (A/T)	I 40-109-A05
RRI-40X / 50X	I 40X-109
RRI-60X	I 60X-109
RRI-60 (A/T/AT)	I 40X-109
RRI-70 (T)	I 70-109-A05
RRI-80 (T)	I 80-109
RRI-90 (T)	I 90-109-A05
RRI-100 (T)	I 100-109-A05
RRI-130 (T)	I 130-109-A05
RRI-150 (T)	I 150-109-A05
RRI-180 (T)	I 180-109-A05
RRI-200 (T)	I 200-109
RRI BIM-15 T	I40RK
RRI BIM-25 T	I70RK
RRI BIM-35 T	I70RK
RRI BIM-45 T	I80RK
RRI BIM-65T	32399-001
TKa 60	0186-0029-00-00
TKa 70	0186-0029-00-00
TKa 80	0193-0029-00-00
TKa 90	0181-0029-00-00
TKa 110 / 111	0187-0029-00-00
TKa 120	0342-0029-00-00
TKa 140	0341-0029-00-00
TKa 150	0343-0029-00-00
Y-41	0161-0029-00-00
Y-46	0160-0029-00-00
Y-56	0159-0029-00-00
Y-61	0158-0029-00-00
Y-70	0135-0029-00-00
Y-90	0141-0029-00-00
Y-100	0334-0029-00-00
Y-130	0335-0029-00-00
Y-140	0412-0029-00-00
Y-T40	0169-0029-00-00
Y-T45	0164-0029-00-00

for type	Item No.
Y-T55 / 56	0164-0029-00-00
Y-T70	0166-0029-00-00
Y-T90	0167-0029-00-00
YBX-50	0928-0029-00-00
YBX-600 T	0351-0029-00-00
YBX-800 T	0352-0029-00-00
YED-200	0409-0029-00-00
YEX-120	0093-0029-00-00
YEX-150	0093-0029-00-00
YEX-501	0260-0029-00-00
YEX-701	0143-0029-00-00
YEX-901	0261-0029-00-00
YEX-1400	0323-0029-00-00
YEX-1900	0321-0029-00-00
YEX-3000	0407-0029-00-00
YLa 60	0189-0029-00-00
YLa 70	0189-0029-00-00
YLa 80	0191-0029-00-00
YLa 90	0188-0029-00-00
YLa 110	0190-0029-00-00
YLa 120	0345-0029-00-00
YLa 140	0346-0029-00-00
YLT(X) 50	0371-0029-00-00
YLT(X) 60	0371-0029-00-00
YLT(X) 70	0372-0029-00-00
YLT(X) 80	0372-0029-00-00
YLT(X) 110	0379-0029-00-00
YLT(X) 120	0380-0029-00-00
YLT(X) 140	0381-0029-00-00
YLT(X) 150	0382-0029-00-00
YS-e 600	0444-0029-00-00
YS-e 800	0445-0029-00-00
YS-e 900	0446-0029-00-00
YS-e 950	0447-0029-00-00
YX-180	0089-0029-00-00
YX-280	0081-0029-00-00
YX-380	0086-0029-00-00
YX-500	0077-0029-00-01
YX-700	0129-0029-00-01
YX-900	0237-0029-00-01
YX-1100	0241-0029-00-00
YX-1400	0322-0029-00-00
YX-1900	0320-0029-00-00
YX-2400	0406-0029-00-00
YX-3000	0405-0029-00-00
YZ-N(P) 600	0454-0029-00-00
YZ-N(P) 800	0455-0029-00-00
YZ-N(P) 900	0456-0029-00-00
YZ-N(P) 950	0457-0029-00-00
YZ-T 600	0454-0029-00-00
YZ-T 800	0455-0029-00-00
YZ-T 900	0456-0029-00-00
YZ-T 950	0457-0029-00-00

Batteries

Model	Description	for Series
BB 200 D-325, BB 200 D-350	20 Volt / 2.5 Ah, Li-Ion 20 Volt / 5.0 Ah, Li-Ion	RRI BIM-T
BPL-1820	18 Volt / 2.0 Ah, Li-Ion with LED	YS-e, YZ-N, YZ-NP, YZ-T
BL-22	22,2 Volt / 1.5 Ah, Li-Ion with LED	YBX-T

Charger

Model	Item No.	Suitable for battery
B84192B + cable E86B-VD	420450-EU	BB200E-320, BB200D-325, BB200E-340, BB200D-350
BC 200	420789	BL-22
BC 0075 G	(obsolet)	BPL-1820
BC 2075 MX	*NEW*	BPL-1820

Tool Holster

Model	Item No.	Version
Holster black	793106	Rubber with steel core
Holster blue	797864	All-plastic

QC coupling

Model	Item No.	Description
3/8", 1/2" square drive	on req.	–

Cable/Hose Protection Set

Model	Item No.	Description
for EC impulse wrenches	on req.	–

Air Treatment

Model	Item No.	Description
Various combinations, filters, oilers, water separators	misc	see separate brochure

Spiral Hoses & Couplings

Model	Item No.	Description
for impulse wrenches	misc	see separate brochure

Spring Balancers

Model	Item No.	Description
for impulse wrenches	misc	see separate brochure

Further information available 24 / 7 on our website.

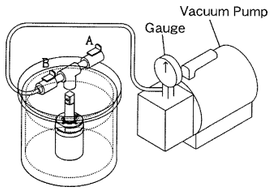
Accessories – Maintenance kits, oils, fluids

Maintenance Kits *

Parts included in the maintenance kit: O-rings, support rings and springs for the pulse blades.

Due to the uncomplicated design (two plates with compression spring, sealing of the shaft, impulse mechanism with cooling), the hydraulic impulse mechanism is reliable and easy to maintain.

A vacuum pump (YEVP-1) and an oil tank (YEVP1T) are recommended for independent professional maintenance.



for type	Item No.
e-M 500	0377-0991-00-99
e-M 700	0377-0991-00-99
e-M 900	0368-0991-00-99
e-M 1100	0378-0991-00-99
RRI-30	I 30 RK
RRI-30 A	I 30 DRK
RRI-30 S	I 30 SRK
RRI-30 SA	I 30 SDRK
RRI-30 ST	IS 30 SRK
RRI-30 T	IS 30 RK
RRI-40 (X)	I 40 RK
RRI-40 A (X)	I 40 DRK
RRI-40 S	I 40 SRK
RRI-40 SA	I 40 SDRK
RRI-40 ST	IS 40 SRK
RRI-40 T	IS 40 RK
RRI-50 (X)	I 50 RK
RRI-50 A (X)	I 50 DRK
RRI-50 R	I 50 RRK
RRI-50 RA	I 50 RDRK
RRI-50 S	I 50 SRK
RRI-50 SA	I 50 SDRK
RRI-50 ST	IS 50 SRK
RRI-50 T	IS 50 RK

for type	Item No.
RRI-60 (X)	I 60 RK
RRI-60 A (X)	I 60 DRK
RRI-60 R	I 60 RRK
RRI-60 RA	I 60 RDRK
RRI-60 S	I 60 SRK
RRI-60 SA	I 60 SDRK
RRI-60 ST	IS 60 SRK
RRI-60 T	IS 60 RK
RRI-70	I 70 RK
RRI-70 A	I 70 DRK
RRI-70 R	I 70 RRK
RRI-70 RA	I 70 RDRK
RRI-70 RG	I 70 RGRK
RRI-70 RH	I 70 RHRK
RRI-70 S	I 70 SRK
RRI-70 SA	I 70 SDRK
RRI-70 ST	IS 70 SRK
RRI-70 T	IS 70 RK
RRI-80	I 80 RK
RRI-80 RH	IS 80 RHRK
RRI-80 ST	IS 80 SRK
RRI-80 T	IS 80 RK
RRI-90	I 90 RK
RRI-90 T	IS 90 RK
RRI-100	I 100 RK
RRI-100 T	IS 100 RK
RRI-130	I 130 RK
RRI-130 T	IS 130 RK
RRI-150	I 150 RK
RRI-150 T	IS 150 RK
RRI-180	I 180 RK
RRI-180 T	IS 180 RK
RRI-200	I 200 RK
RRI-200 T	IS 200 RK
RRI BIM-15 T	140 RK
RRI BIM-25 T	170 RK
RRI BIM-35 T	170 RK
RRI BIM-45 T	180 RK-YO
RRI-BIM-65T	
TKa 60	0186-0991-00-99
TKa 70	0186-0991-00-99
TKa 80	0193-0991-00-99
TKa 90	0181-0991-00-99
TKa 110	0187-0991-00-99
TKa 120	0342-0991-00-99
TKa 140	0341-0991-00-99
TKa 150	0304-0991-00-99
Y-41	0095-0991-00-99
Y-46	0273-0991-01-99
Y-56	0259-0991-01-99
Y-61	0259-0991-01-99
Y-70	0135-0991-03-99
Y-90	0141-0991-00-99
Y-100	0334-0991-01-99
Y-130	0335-0991-00-99
Y-140	0412-0991-02-09

for type	Item No.
YBX-1	0259-0991-01-99
YBX-50	0259-0991-01-99
YBX-600 T	0189-0991-00-99
YBX-800 T	0191-0991-00-99
YED-200	0409-0991-00-99
YED-240 S	0411-0991-01-99
YEX-120	0089-0991-01-99
YEX-150	0089-0991-01-99
YEX-300 S	0086-0991-01-99
YEX-500 S	0077-0991-02-99
YEX-701	0143-0991-00-99
YEX-901	0237-0991-01-99
YEX-1400	0323-0991-00-99
YEX-1900	0320-0991-00-99
YEX-3000	0405-0991-00-99
YLa 60	0199-0991-01-99
YLa 70	0189-0991-00-99
YLa 80	0191-0991-00-99
YLa 90	0188-0991-00-99
YLa 110	0190-0991-00-99
YLa 120	0345-0991-00-99
YLa 140	0346-0991-00-99
YLT 80	0373-0991-01-99
YLT 110	0379-0991-01-99
YLT 120	0380-0991-01-99
YLT 140	0381-0991-01-99
YLT 150	0382-0991-01-99
YLTX 50	0389-0991-00-99
YLTX 60	0390-0991-00-99
YLTX 70	0391-0991-00-99
YLTX 80	0392-0991-00-99
YLTX 110	0395-0991-00-99
YLTX 120	0396-0991-00-99
YLTX 140	0398-0991-00-99
YLTX 150	0399-0991-00-99
YS-e 600	0186-0991-00-99
YS-e 800	0186-0991-00-99
YS-e 900	0181-0991-00-99
YS-e 950	0187-0991-00-99
YX-80	0095-0991-00-99
YX-180	0089-0991-01-99
YX-280	0089-0991-01-99
YX-380	0086-0991-01-99
YX-500 S (C)	0086-0991-01-99
YX-500	0077-0991-02-99
YX-700 (S)	0129-0991-00-99
YX-700 C	0281-0991-01-99
YX-900	0237-0991-01-99
YX-1100	0237-0991-01-99
YX-1400	0322-0991-00-99
YX-1900	0320-0991-00-99
YX-2400	0320-0991-00-99
YX-3000	0405-0991-00-99
YX-4500	0722-0991-00-99
YZ-N(P) 600	0186-0991-00-99
YZ-N(P) 800	0186-0991-00-99

for type	Item No.
YZ-N(P) 900	0181-0991-00-99
YZ-N(P) 950	0187-0991-00-99
YZ-T 600	0186-0991-00-99
YZ-T 800	0186-0991-00-99
YZ-T 900	0181-0991-00-99
YZ-T 950	0187-0991-00-99

Maintenance service

In addition to many years of experience, ZEMO has all the necessary assembly/disassembly tools and offers regular maintenance for your impulse wrenches. If you are interested, please contact us.

Compressed-air oil

Good quality compressed air is vital for every pneumatic tool. The air must always be clean and dry and usually also lightly oiled. Low-oil tools can save up to 80% compressed air oil, which also improves the quality of the breathing air accordingly.

Before putting an impulse wrench into operation, please fill 1-3 drops of acid- and resin-free compressed air oil into the air inlet of the tool.

Pneum./Air Oil

for type	Item No.
All pneumatic tools	353010

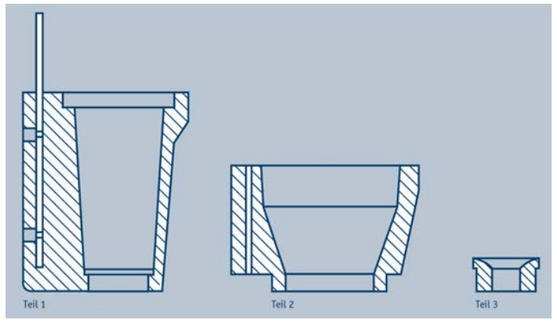
Hydraulic Fluid

for type	Item No.
RRI Impulse wrenches	01-0507
Yokota impulse tools	792156

Further information available 24 / 7 on our website.

** Note: The spare parts in the service kits are for hydraulic replacement only. When replacing, follow the exact filling instructions to achieve optimum performance and minimum hydraulic wear.*

Accessories – Tool holster



- Hard rubber with steel core.
- 3-piece (standard).
- Weight approx. 1.5 kg.
- Fixing with 2 screws M6.

Rubber Holster

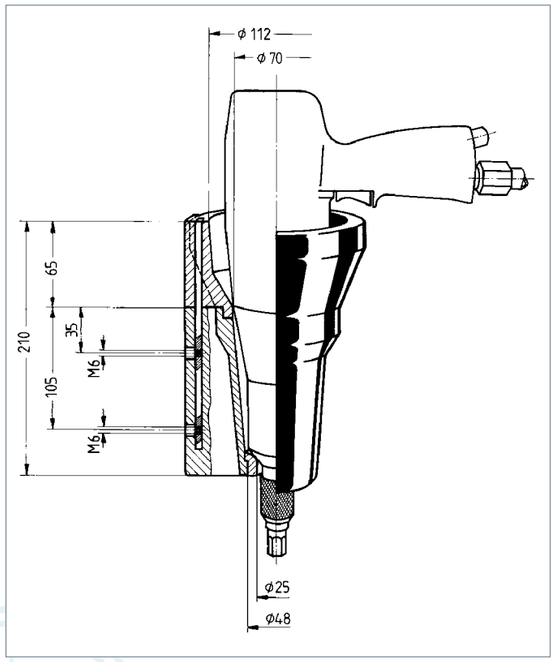
Universal tool holster for all machine-driven tools such as straight screwdrivers, angle screwdrivers, pistol screwdrivers, grinders, etc.

The tools stored in the holder are always within reach and are protected from external influences at the same time. A free workspace ensures increased safety. The holder is made of solid rubber and tapers towards the bottom.

For slim tools (e.g. straight screwdrivers) there is an optional special insert for narrowing the holder.

The holster tapers towards the bottom and is made of solid rubber. This material has the advantage that it can be individually notched, e.g. so that the trigger/starter of a deposited impulse wrench would not be activated unintentionally, causing the screwdriving tool in the quiver to run ahead of itself.

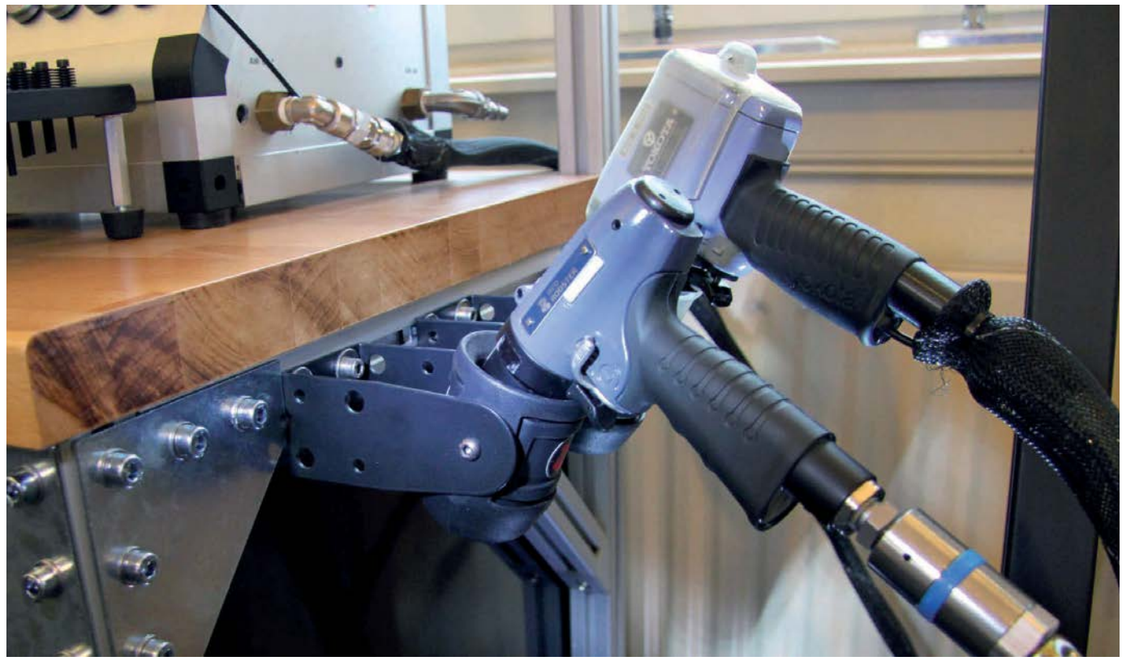
The rubber quiver is always supplied in 3 parts; thus, depending on the dimensions of the tool, the upper and/or lower rubber part can be omitted. The fastening, e.g. to a workbench, is done by means of two M6 screws.



Rubber Holster

Model	Item No.	Weight kg	Variant (pcs)
WK-3	793106	1	3

Accessories – Tool holder



TH – Tool Holder

Model	Item No.	ø mm	for type
TH001	Y61022-001	42	RRI-SP0502, RRI-SP11602, RRI-SP10902, RRI-SP21704, RRI-SP21104, RRI-SP20705, RRI-SP31706, RRI-SP31108, RRI-SP30710, RRI-SP30511, Y-41A(JQ), Y-46A(E)(JQ), Y-56A(E)(JQ), Y-61A(E)
TH002	Y61022-002	47	YS-E600, YS-E800, YS-E900, YS-E950, TKa60(A), TKa70(A), TKa80(A), YEX120(A), YEX150(A), RRI-30T(AT), RRI-40T(AT), RRI-50T(AT), RRI-60T(AT), RRI-30(A), RRI-40X(AX), RRI-50X(A), RRI-60(AX), YLTX50A, YLTX60A, YLTX50E, YLTX60E, YLT60AL(EL), YLTX70A(E), YLT70AL(EL), YLa60A(JQ), YLa70A(JQ), YLa80A(JQ), YLa60E(JQ), YLa70E(JQ), YLa80E(JQ)
TH003	Y61022-003	58	RRI-BS3, RRI-BS6, RRI-BS9, RRI-BI32T, RRI-BI55T, RRI-BI100T RRI-BI120T, RRI-BIM15(A)T, RRI-BIM25(A)T, RRI-BIM35T, RRI-BIM45T, TKa600(A), TKa700(A), TKa800, TKa90, TKa110, TKa120, RRI-70T(AT), RRI-80T, RRI-90T, RRI-70(A)/80/90, YLTX80E, YLT80EL, YLTX110E, YLT110EL, YLa90E, YLa110E, YLa120E, Y70E(JQ)
TH004	Y61022-004	73	YS-M500, YS-M700, YS-M900, YS-M1100, TKa1110, TKa1200, TKa1400, TKa1500, TKa150, YEX-1400, RRI-100T, RRI-130T, RRI-150T, YLTX120E, YLT120EL, YLTX140E, YLT140EL,YLa140E, Y-140(JQ)

TH – Tool Holder

Model	Item No.	for type
TH005	Y61022-005	RRI-BIM Series RRI-BS Series RRI-BI Series RRI-BA Series

Optional Components – Testers & Sensors

YET series

Model	Item No.	Torque Range N·m	Graduation N·m	Weight (TXD) kg	Weight (AMP) kg
YET-501 C	420902	5 - 50	0,02	9,9	3,0
YET-2001 C	420915	20 - 200	0,1	10,0	3,0
YET-5001 C	420925	100 - 500	0,2	22,7	3,0
YET-10001 C	420930	200 - 1000	1,0	22,7	3,0

Yokota's YET series torque testers are specially designed to test and determine the function and performance of impulse wrenches. The peak value reached is measured, selectable in clockwise or anti-clockwise rotation.

The measurement result is displayed by LED, as are the pulses counted. Yokota has determined the torques given in this brochure with YET series testers at 0.63 MPa working pressure. The YET testers have a static transducer. With other measuring devices or connections the torque may deviate.

Measuring System IQVu & CheckStar

Model	Item No.	Torque Range N·m	Angle	Weight (TXD) kg	Weight (AMP) kg
IQVu Plus	misc	–	y	n. a.	1,0
CheckStar Multi	misc	0,2 - 5000	option	0,2 - 5,7	–
CheckStar UTA	misc	0,2 - 5000	option	0,5 - 14	–
CheckStar IS	misc	0,2 - 3000	–	0,2 - 5,7	–

The IQVu is the device of choice for measuring and collecting torque, angle, pulse count and force progression directly on the production line or in quality assurance. The 7-inch touch display shows all relevant information at a glance during the measurement process. The icon-driven menu structure allows the operator to quickly navigate from setup to quick measurement mode. CheckStar torque sensors set the standard for dynamic torque and angle measurements with any type of non-impact screwdriver or nut runner. CheckStars measure „in-line“ between the assembly tool and the screw the actual torque under production conditions. The low mass inertia of CheckStars ensures accurate and repeatable measurements of high-speed jumps, such as at the shut-off point of rotary and angle screwdrivers or the pulsing of impulse wrenches.

Joint Kits

Model	Item No.	Size inch	Spring discs No.	Max. Capacity (soft) N·m	Max. Capacity (hard) N·m	A/F mm	Bolt #
JK-875-06CR-28-0	C718150	1/4	24	5.6	28.25	13	M8
JK-875-07CR-135-0	C718155	3/8	18	67.8	100	19	M12
JK-875-08CR-271-0	C718158	1/2	18	135.6	271	24	M16
JK-875-09CR-1017-0	C718159	3/4	20	460	1017	36	M24
JK-875-10CR-1695-0	C718157	1	10	847	1695	46	M30

Table Top Joint Kits are mounted on a work bench and are suitable for use with rotary torque transducers for off-line testing of impulse wrenches.

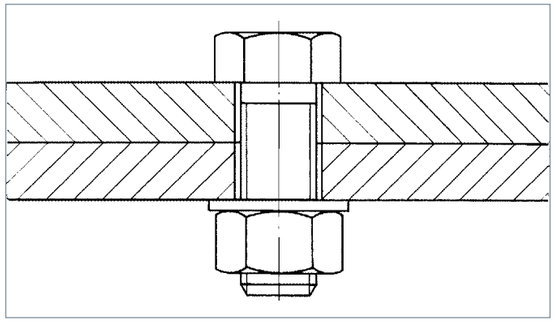
Each joint kit simulator can be configured in a variety of ways to approximate bolt drop hardness. Care should be taken to both approximate the hardness to be simulated as closely as possible and not exceed the maximum torque capacity.

(Further items available.)

Guide Values – for tightening torques

The torques given here are standard values, valid for metric standard threads (ISO threads) according to DIN 13 and head rest dimensions according to DIN 912, 931, 934, 6912, 7984, 7990. They result in an approx. 90% utilisation of the screw yield point.

It should be noted that the coefficient of friction, depending on the surface condition of the screws and nuts as well as the lubrication condition of the thread, has an influence on the stated values and may have to be corrected.



Nominal Size #	A/F internal mm	A/F external mm	Friction coefficient μ	Tightening torque M_A for screw strength class according to DIN 267, ISO 898/1 3.6 N·m	5.6 N·m	6.9 N·m	8.8 N·m	10.9 N·m	12.9 N·m
M2	–	4	0.10			0.26	0.32	0.47	0.55
			0.14	–	–	0.31	0.38	0.56	0.65
M3	–	5,5	0.10	0.30	0.51	0.81	1.1	1.5	1.8
			0.14	0.37	0.62	0.99	1.3	1.9	2.2
M4	3	7	0.10	0.70	1.2	1.9	2.4	3.3	4.0
			0.14	0.85	1.4	2.3	2.9	4.1	4.9
M5	4	8-9	0.10	1.4	2.3	3.6	4.9	7.0	8.0
			0.14	1.7	2.8	4.5	6.0	8.5	10
M6	5	10	0.10	2.4	3.9	6.3	8.0	12	14
			0.14	2.9	4.8	7.7	10	14	17
M8	6	13-14	0.10	5.7	9.5	15	20	28	34
			0.14	7.0	12	19	25	35	41
M10	8	15-17	0.10	11	19	30	40	56	67
			0.14	14	23	37	49	69	83
M12	10	19-21	0.10	20	33	52	69	98	115
			0.14	24	40	65	86	120	145
M14	12	22-23	0.10	31	52	83	110	155	185
			0.14	39	64	105	135	190	230
M16	14	24-26	0.10	48	79	125	170	240	285
			0.14	59	98	155	210	295	355
M18	14	27	0.10	66	110	175	235	330	395
			0.14	81	135	215	290	405	485
M20	17	30	0.10	92	155	245	330	465	560
			0.14	115	190	305	410	580	690
M22	17	34	0.10	125	205	330	445	620	750
			0.14	165	260	415	550	780	930
M24	19	36	0.10	160	265	425	570	800	960
			0.14	200	330	530	710	1000	1200
M27	–	41	0.10	235	390	630	840	1200	1400
			0.14	295	490	780	1050	1500	1800
M30	–	46	0.10	320	530	850	1150	1600	1950
			0.14	395	660	1050	1450	2000	2400
M33	–	50	0.10	430	720	1150	1550	2150	2600
			0.14	540	900	1450	1900	2700	3250
M36	–	55	0.10	550	920	1500	1950	2750	3300
			0.14	690	1150	1850	2450	3450	4150

Product Groups

- **Torque Application Tools**
  - Signaling
  - Indicating
  - Electronically monitored
- **Impulse Tools**
  - Battery tools
  - Pneumatic tools
  - EC systems
- **Torque Measurement**
  - Gauges
  - Testers & Sensors
  - Calibration equipment
- **Pneumatic Pliers**
  - Cutting
  - Squeezing
  - Assembling
- **Power Sockets**
  - w/o or with magnet
  - w Sleeve Drive
  - Adaptors
- **Insert-Bits**
  - Bits & Holders
  - Nutsetter
  - Adaptors
- **Handling Accs**
  - Air treatment
  - Hoses & couplings
  - Balancers

This catalogue replaces all previous editions. Images and technical specifications are correct at the time of going to press. Errors/changes excepted.

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