



# PLARAD<sup>®</sup>

Torque & Tension Systems

Products & Services

| [www.plarad.de](http://www.plarad.de) |

# Quality made in Germany



# Professional bolting technology

Since 1962 Maschinenfabrik Wagner and its brand „Plarad“ has been the benchmark for quality, innovation and reliability in the field of bolting technology.

SME's and large, globally engaged companies in various industries rely on our competence where tailor-made bolting solutions are concerned. Our customers benefit from our flexibility and our know-how, acquired continuously since the early 1960s.

The new generation of Plarad bolting systems are thinner, more powerful and lighter than the preceding models. Due to continuous development of our products, Plarad is always a step ahead. We are driven by customer's requirements as well as market demands.

When developing new designs, we do not only focus on achieving a high level of quality, but at the same time we test extensively the function and handling features using our own testing devices. The result is a new generation of products for bolting technology which do not only technically fulfil the highest demands.

With eight product lines, from manual torque multipliers through to completely automatic bolting systems, we can offer you the broadest product range in the market. You benefit from perfectly optimised tooling while all the products for your bolted joints come from a single source.

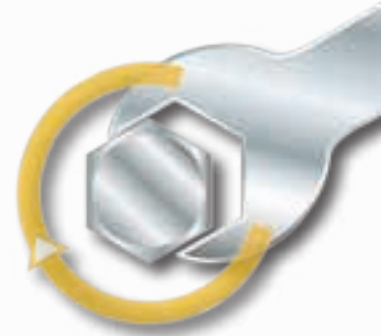


# Our solutions

## 1

### Torque-controlled tightening

- In the majority of cases where bolts are used, torque-controlled tightening is the method used to tighten.
- With this method the friction on the thread and head of the bolt act as a precise pre-tensioning force, therefore the use of accurate tools is imperative.
- Effectively the bolt can be tightened quicker.
- This method is more practical and easy.
- Light, compact tools can be used where space is limited.



## 2

### Hydraulic Tensioning

- As the nut is not rotated under load, there is no torsional load on the bolt.
- After achieving the desired applied load, the nut can be tightened without causing stresses on it. The correct applied bolt load is therefore achieved.
- Even different co-efficients (levels) of friction have no effect on the tensioning process.

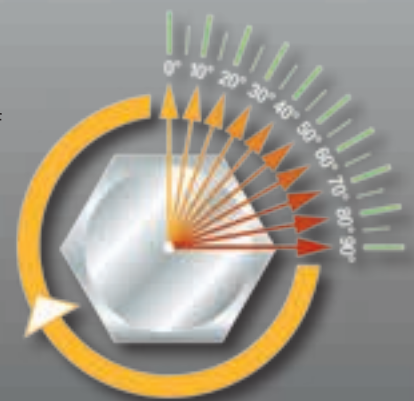


Via the hydraulic cylinder tensioning force is exerted on the bolt causing it to elongate.

## 3

### Torque/torque-angle-controlled tightening

- Torque/torque-angle-controlled tightening is more precise than purely torque-controlled tightening.
- The defined amount of rotation of the bolt (torque angle) provides automatically and accurately the required pretension.
- Control is achieved directly from the power pack, by means of microprocessor technology within the pump.
- Higher quality bolting joints are achieved.
- Results can be stored and used at a later date for documentation required in quality assurance processes.
- The whole control process is achieved without the need of external sensors, hence no need for extra cables from the tool.





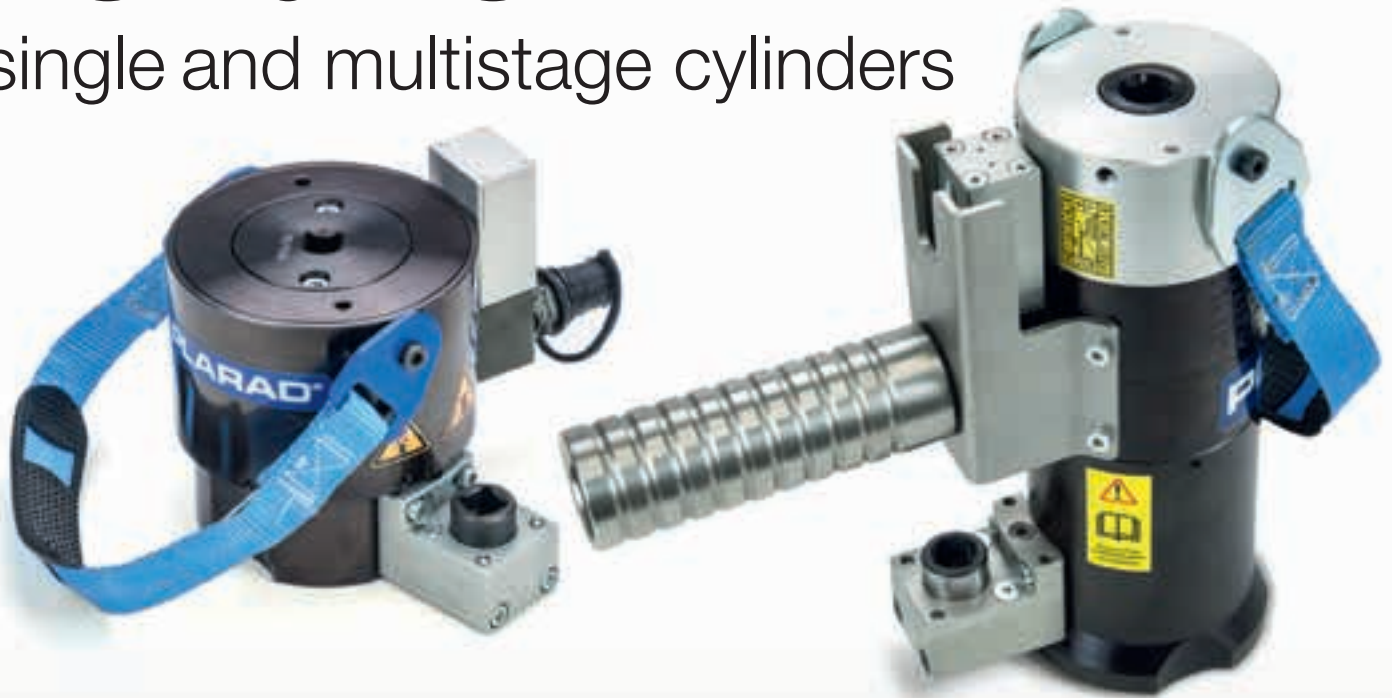
# Hydraulic Tensioners



**PLARAD**

# PSE & PSD

single and multistage cylinders



- Bolted joint assembly and disassembly without inducing torsional stress in the bolt
- Applied load precisely adjustable
- Individual adjustment for every bolting need
- Available in single stage and multi stage versions
- 1 500 bar maximum operating pressure
- Available in a range of sizes

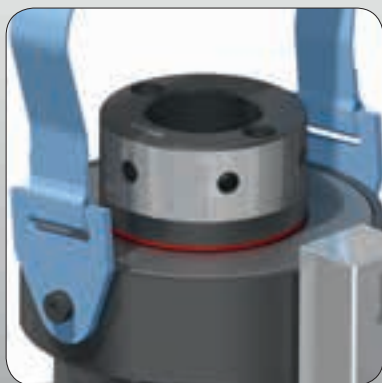


# PSE single stage

Its flat design makes the single stage tensioner particularly advantageous in axially restricted spaces. The knurled attachment additionally included will also ensure successful tensioner application with bolt protrusions of excessive length. Furthermore the PSE also includes all market relevant features of the PSD (see cross sectional 3d model).



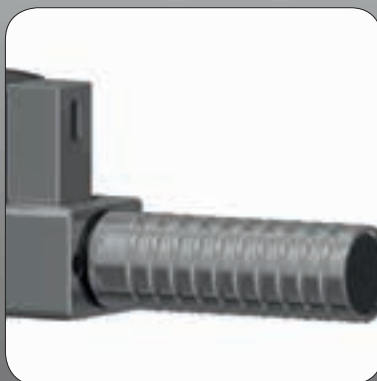
Standard attachment



Knurled attachment for long bolt protrusions



Spacer rings and washers for different bolting cases



Handle



Hose coupling can be positioned for optimum use

Type	Maximum force applied load (kN)	AF (mm)
<b>PSE 24-305</b>	305	36
<b>PSE 30-482</b>	482	46
<b>PSE 36-681</b>	681	55
<b>PSE 42-980</b>	980	65
<b>PSE 48-1235</b>	1 235	75
<b>PSE 52-1458</b>	1 458	80
<b>PSE 56-1676</b>	1 676	85
<b>PSE 64-2259</b>	2 259	95

Other sizes and dimensions on request.



# PSD two stage

The two stage hydraulic tensioner PSD enables screw joint assembly and disassembly without torsional stress for the bolt. The pre-tensioning power is precisely adjustable.

## Safety indicator – green (optional)

Safe controlled operation: Verification of sufficient engagement of the bolt/stud.

## Maximum stroke indicator

Optical safety: Visual indication of maximum stroke (max distance piston can move out of the tensioner body).

## Automatic piston return

Swift operation: The puller is automatically returned to its original position once the pressure has been released.

## Stroke limiter – mechanical

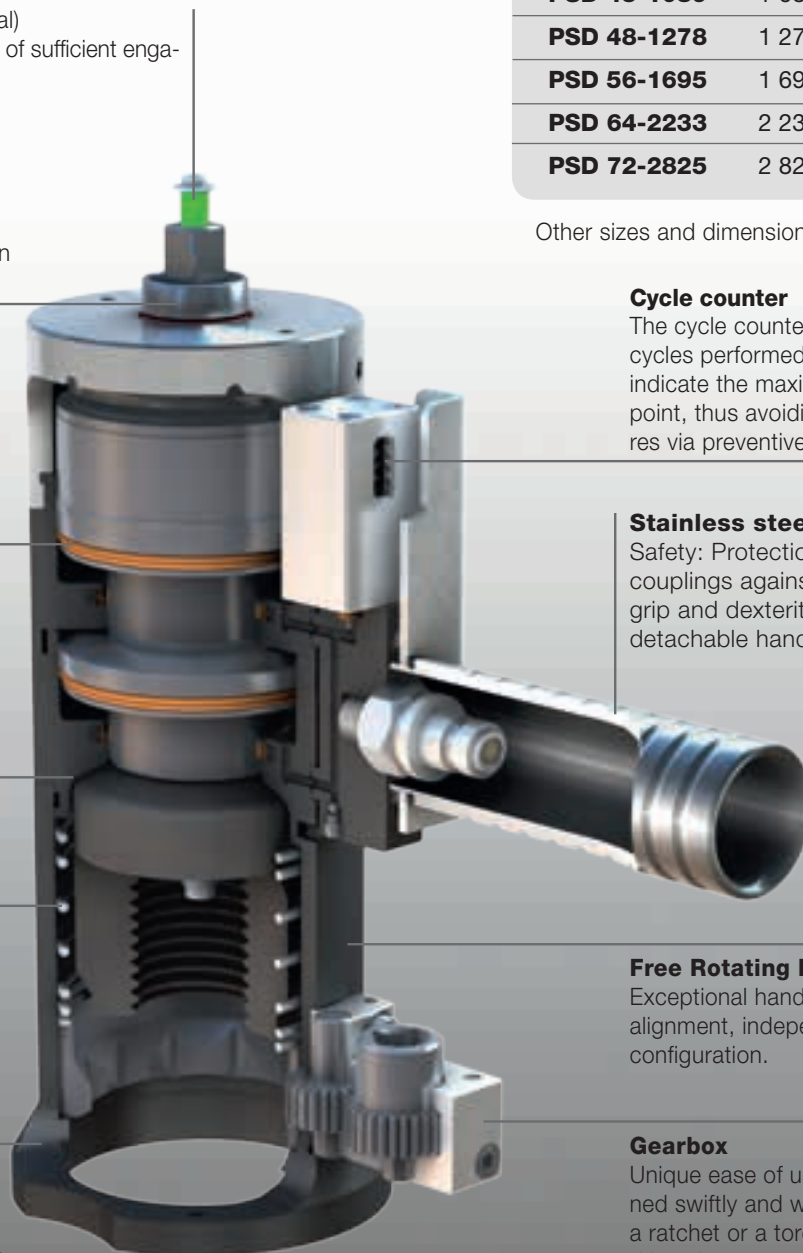
Ultimate safety: The mechanical end stop prevents the over extension of the piston (even under maximum load).

## Rotating socket – spring-loaded

Prevention of installation damage during the positioning of the tensioner: The spring affords the rotating socket axial flexibility.

## Supporting surface – optimized

Outstanding versatility in any environment: The tensioner is especially well suited for use in tight spaces thanks to its optimal shape.



Type	Maximum force applied load (kN)	AF (mm)
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<b>PSD 30-471</b>	471	46
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<b>PSD 33-581</b>	581	50
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<b>PSD 36-678</b>	678	55
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<b>PSD 39-808</b>	808	60
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<b>PSD 42-937</b>	937	65
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<b>PSD 45-1089</b>	1 089	70
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<b>PSD 48-1278</b>	1 278	75
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<b>PSD 56-1695</b>	1 695	85
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<b>PSD 64-2233</b>	2 233	95
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<b>PSD 72-2825</b>	2 825	105
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Other sizes and dimensions on request.

## Cycle counter

The cycle counter indicates number of cycles performed and will consequently indicate the maximum cycle service point, thus avoiding damage and failures via preventive maintenance.

## Stainless steel handle

Safety: Protection of the hose couplings against damage. Optimal grip and dexterity provided by the detachable handle of the tensioner.

## Free Rotating Bridge

Exceptional handling: Straightforward alignment, independent of the bolt configuration.

## Gearbox

Unique ease of use: The nut can be turned swiftly and with perfect ease using a ratchet or a torque wrench that is driven by a gear drive (maximum input torque: < M36=40 Nm, > M36=80 Nm).

# Manual Torque Multipliers



**PLARAD**

# XVR/XVK

- Manually operated torque multiplier
- Ideal for use with no external power supply
- Available for use anywhere and at any time

Torque multiplier	Height (mm)	ø (mm)	Performance range (Nm)	Weight (kg)
<b>XVK 15</b>	172	81	220 - 1 700	2.6
<b>XVR 25</b>	302	81	440 - 2 300	5.2
<b>XVR 35</b>	273	81	510 - 3 600	5.0
<b>XVR 40</b>	238	95	560 - 4 000	6.1
<b>XVR 65</b>	244	114	820 - 6 200	8.4
<b>XVR 70</b>	302	128	980 - 6 800	11.4
<b>XVR 90</b>	300	172	1 780 - 8 600	21.8
<b>XVR D 45</b>	310	128	1 000 - 10 100	16.0

All weights are without reaction arm/subject to amendment.

Compatible torque wrenches



**XVK**  
Single stage torque multiplier

**XVR**  
Multi stage torque multiplier with reversing safety mechanism ensures extra safety for users

Flexibility thanks to height-adjustable reaction arm





# General accessories

Trolley for hydraulic power packs – for mobility in plants and workshops

Aluminum frame, 2 integrated handles, lockable quick-lock, rollers with solid rubber tires and roller bearings, brake and caster wheels



Assortment of hoses and coupling adapters

Plarad hoses with a fourfold safety factor up to 800 bar (bursting pressure 3 200 bar)







Lubricants



Valve wheel driver for valves



Various reaction arms



Various sockets and fittings

# GMV 2 & PH

## torque measuring device

### Checking bolting joints

The microprocessor controlled GMV 2 unit is our key test instrument.

Used in conjunction with a transducer, it enables precision measurement of torque while bolts are being done up. The values can be saved, along with the date and time, and can then be printed out by the instrument itself or uploaded to a PC for further evaluation.



### Equipment testing

The PH test system, used with the GMV 2, is the ideal combination for testing and setting up hydraulic tools.

Combining the DRT reaction torque sensor with the GMV 2 enables static testing of impact tools, electric torque tools and other equipment of various designs.

PLARAD Torque & Tension Systems									
Test No.	Date	Time	Value	Unit	Operator	Location	Notes	Print	Exit
1	12/12/01	10:00	100.0	Nm	Jones	Workshop	Test of...	Print	Exit
2	12/12/01	10:05	150.0	Nm	Jones	Workshop	Test of...	Print	Exit
3	12/12/01	10:10	200.0	Nm	Jones	Workshop	Test of...	Print	Exit
4	12/12/01	10:15	250.0	Nm	Jones	Workshop	Test of...	Print	Exit
5	12/12/01	10:20	300.0	Nm	Jones	Workshop	Test of...	Print	Exit
6	12/12/01	10:25	350.0	Nm	Jones	Workshop	Test of...	Print	Exit
7	12/12/01	10:30	400.0	Nm	Jones	Workshop	Test of...	Print	Exit
8	12/12/01	10:35	450.0	Nm	Jones	Workshop	Test of...	Print	Exit
9	12/12/01	10:40	500.0	Nm	Jones	Workshop	Test of...	Print	Exit
10	12/12/01	10:45	550.0	Nm	Jones	Workshop	Test of...	Print	Exit

Bolting joints can be evaluated on a PC



# TC1

## mobile measuring unit

The TC1 measuring unit is an innovation in the field of mobile measuring equipment. It measures the applied torque, and hence the bolting process, directly where it happens. The system works wirelessly in the bolting process and can simply be attached to the nutrunner.

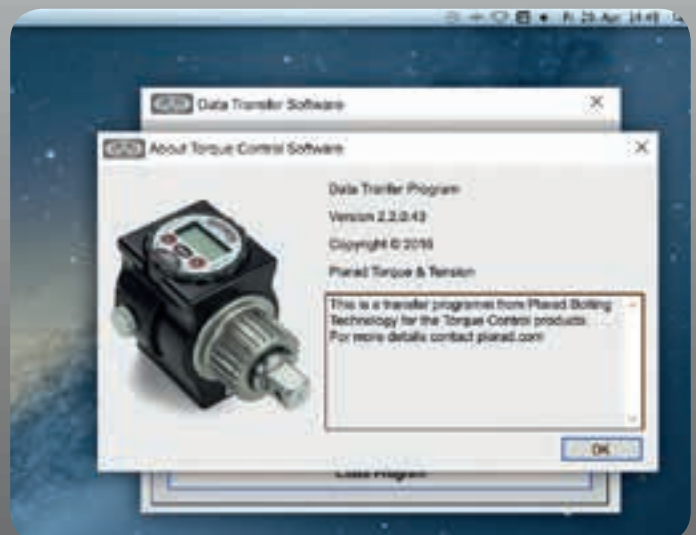
- Measures the applied torque directly at the point of application
- Measuring range up to 5 500 Nm
- Torque is shown in the sensor display
- Acoustic warning signal if the defined tolerance is exceeded
- An LED display provides information about the torque result
- Integrated memory for 250 values
- Transfer and analysis to the PC
- Appliances are compatible with the current Plarad nutrunner range and virtually maintenance-free
- Including transport box, Data-Trans software, power cable and USB cable



Type	Measurement range (Nm)	Square drive	Spline teeth quantity	Weight (kg)
<b>TC1 - 11</b>	110 - 1 100	3/4"	26	2.60
<b>TC1 - 31</b>	310 - 3 100	1"	45	4.70
<b>TC1 - 41</b>	410 - 4 100	1"	26	2.70
<b>TC1 - 55</b>	550 - 5 500	1 1/2"	45	5.00

## Torque Control Software

- Documentation from: Screw connection date, time, OK/NO OK result
- Storage of screw connection data
- Evaluation/statistics/archive
- Optimised documentation and process security
- Quality assurance guarantee





# Comprehensive service

Sustained long-term success will only be possible if you are able to respond to market and customer requirements quickly. With over 50 years' worth of bolting expertise and the broadest product range, we can offer you the most economical solution.

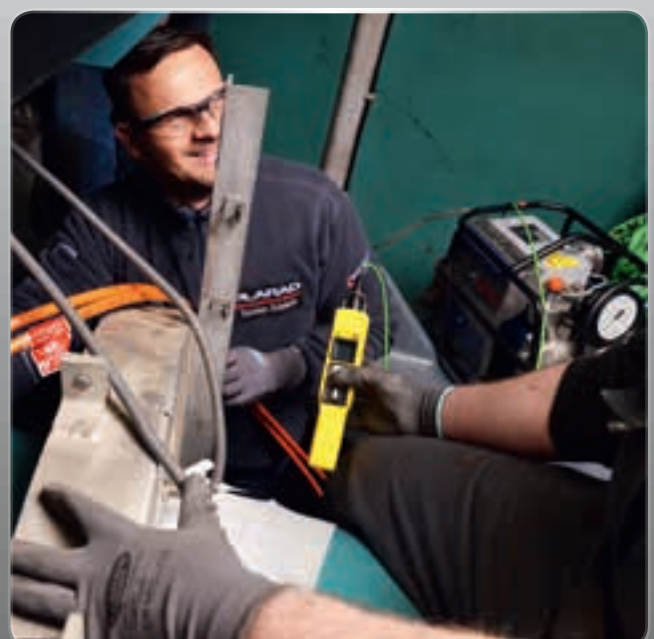
In close cooperation with our clients, we develop tailor-made tools that are perfectly customised to their respective requirements. Extensive support is meanwhile an integral part of our service. This is because we will accompany you before, during and after the project phase.

We are actively involved in various panels and standardisation committees. This enables the accommodation of the latest changes in standards and of future bolting requirements in our competent service portfolio.

- Project Consulting
- Bolting Case Analysis
- 3D-CAD Analysis
- Product Demonstrations
- Trainings/Instructions/Seminars
- Measuring/Testing/Calibrating
- Repair and Spare Part Service
- 24-hour Service
- Renting/Leasing/Financing



Product advice from our specialists on-site



Test equipment and product demonstrations available



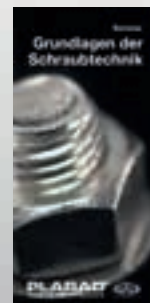
# We pass on our knowledge

We continually offer advanced training within the organisation to enhance the know-how of our employees.

We cooperate with PSA Sicherheitstechnik GmbH & Co. KG in operations worldwide, providing detailed support for training and safety instruction (for example, working at height, where this is a risk of falling), both for our own employees and for yours.

## Training and seminars for your employees

- Maintenance and repair of torque tools:
  - Relevant maintenance
  - Fault diagnosis
  - Repairs
  - Adjustment, calibration and testing
- User training:
  - Basic bolt fitting and technology
  - Safety aspects
  - Handling and positioning torque tools
  - Equipment settings
- Training courses in colleges and academies:
  - e.g. basic bolting techniques



# 3D CAD analysis

Give us the data on your bolting joints in whatever format you want:

E.g. hand-drawn sketch, with the aid of our bolting survey or as a CAD file.



We will use your information to create a 3D model on our own CAD system. This enables us to recommend the optimum tools for your needs. Where appropriate, we can customise a bolting system for your individual needs.



You will receive our recommended solution in the form of a printout and a 3D animation (use "Autodesk" dwf viewer).

Our wide range of products enables us to find the most economical solution for you.



# Special solutions



## **Offset drive**

For nutrunner when space is limited (e.g. plate heat exchangers)



## **Speedy**

Pneumatic speedy nutrunner: fast operation in low torque applications

## **XB 1**

Hydraulic power pack with protective shields and an extra manometer



## **Threaded column connection mechanism**

for pre-stressed concrete reinforcement



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Torque & Tension Systems



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