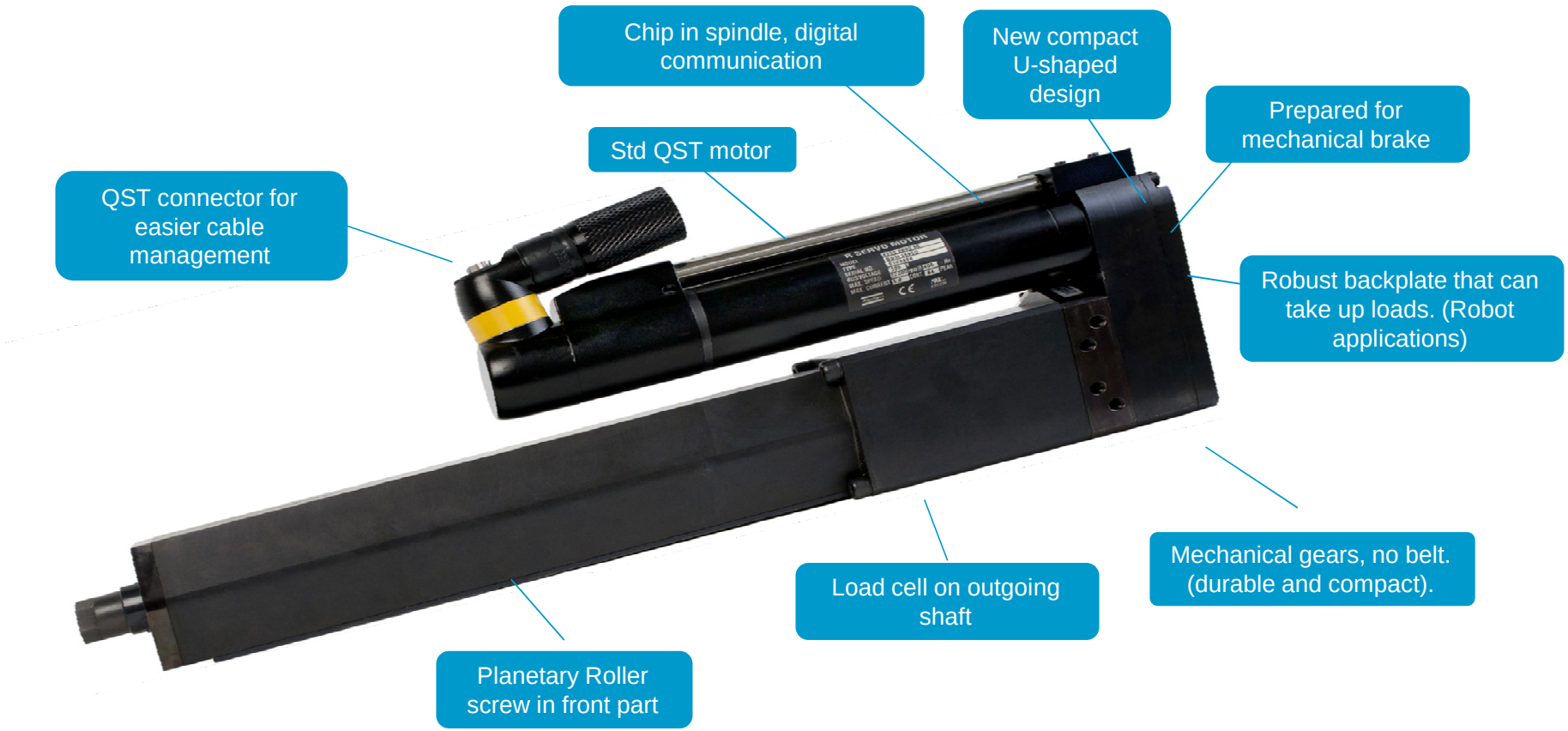
PST - TECHNICAL

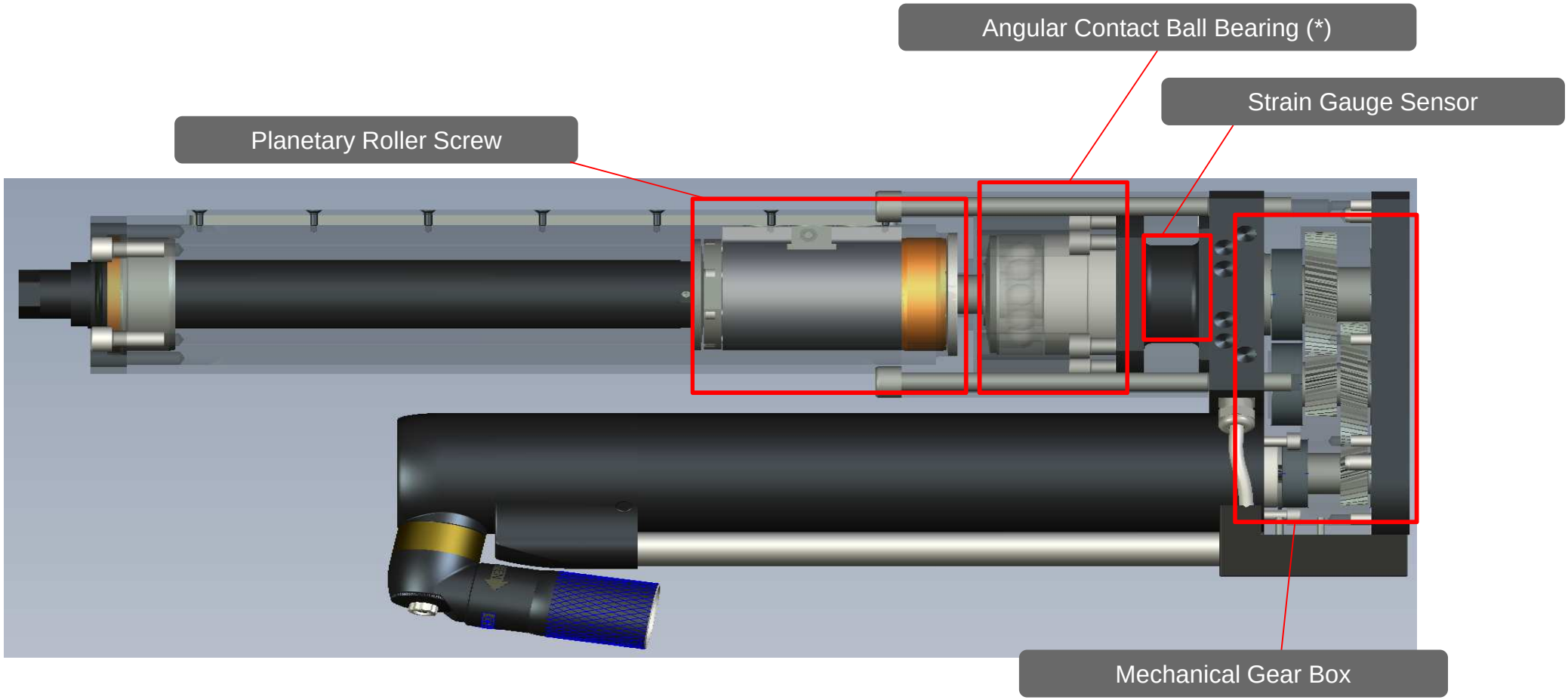
COMMITTED TO SUSTAINABLE PRODUCTIVITY

We stand by our responsibilities towards our customers, towards the environment and the people around us.
We make performance stand the test of time. This is what we call – Sustainable Productivity.

PST

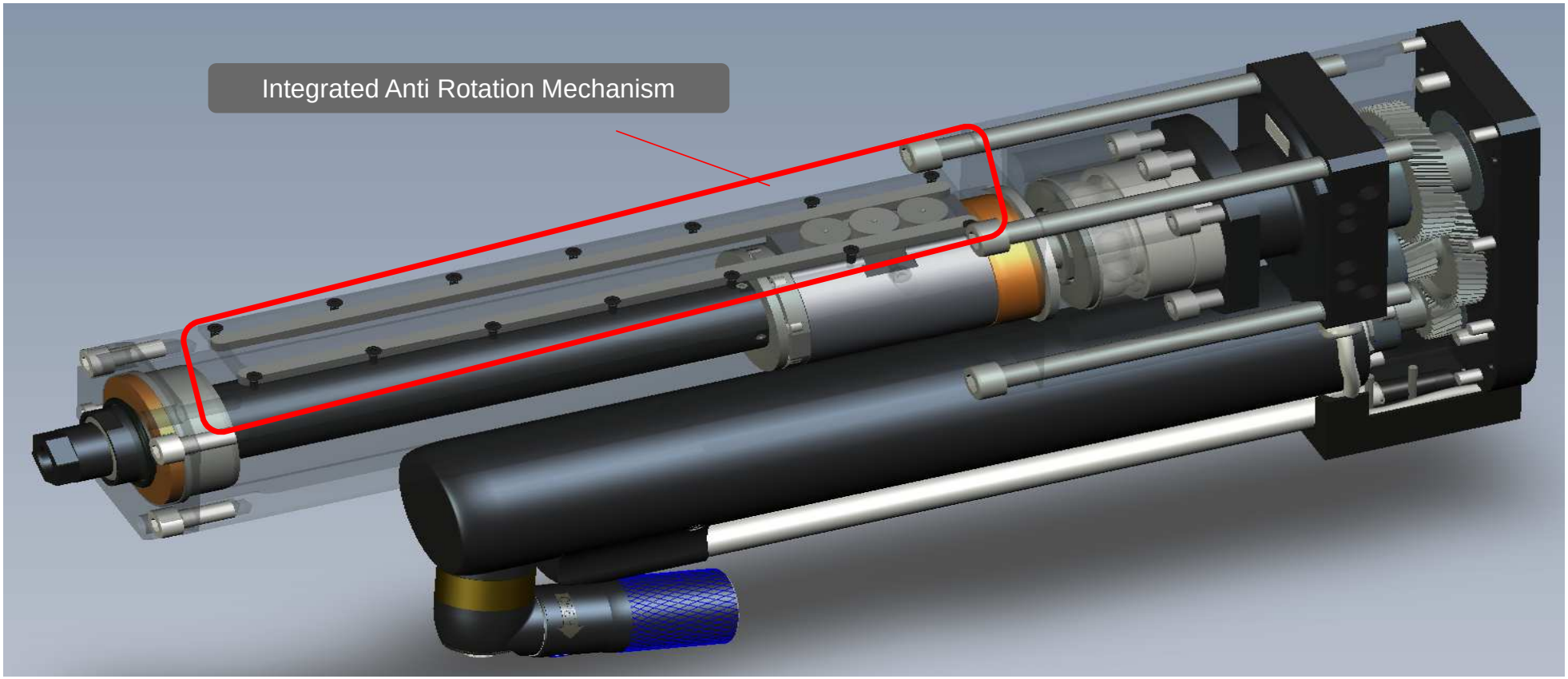

Chip in spindle, digital communication
New compact U-shaped design
Prepared for mechanical brake
Std QST motor
QST connector for easier cable management
Robust backplate that can take up loads. (Robot applications)
Mechanical gears, no belt. (durable and compact).
Load cell on outgoing shaft
Planetary Roller screw in front part

INSIDE PST



(*) = The bearing is handling both axial and radial forces, but it is main function is to handling the axial forces.

INSIDE PST



THE PLANETARY ROLLER SCREW

- The function of a planetary roller screw is to transform a rotation to a linear motion
- The planetary roller screw is thrust bearing assembled. See figure below
- The benefits with a planetary roller screw:
  - It can manage to handle large loads
  - It has a long life time
  - It has a high stiffness which makes it possible to have a high linear speed
  - It has much less dimensions than corresponding ball screw

8 REASONS TO CHOOSE A PLANETARY ROLLER SCREW

- It can manage high load ratings
- It can manage very high rotational speed
- It can manage high acceleration and deceleration rates
- It can achieve long life time at high cycling rates
- It has high reliability
- It is resistance to hostile surroundings
- It has an ability to survive shock loads
- A corresponding ball screw has much larger dimensions than a Planetary Roller Screw

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PLANETARY ROLLER SCREW VS. BALL SCREW

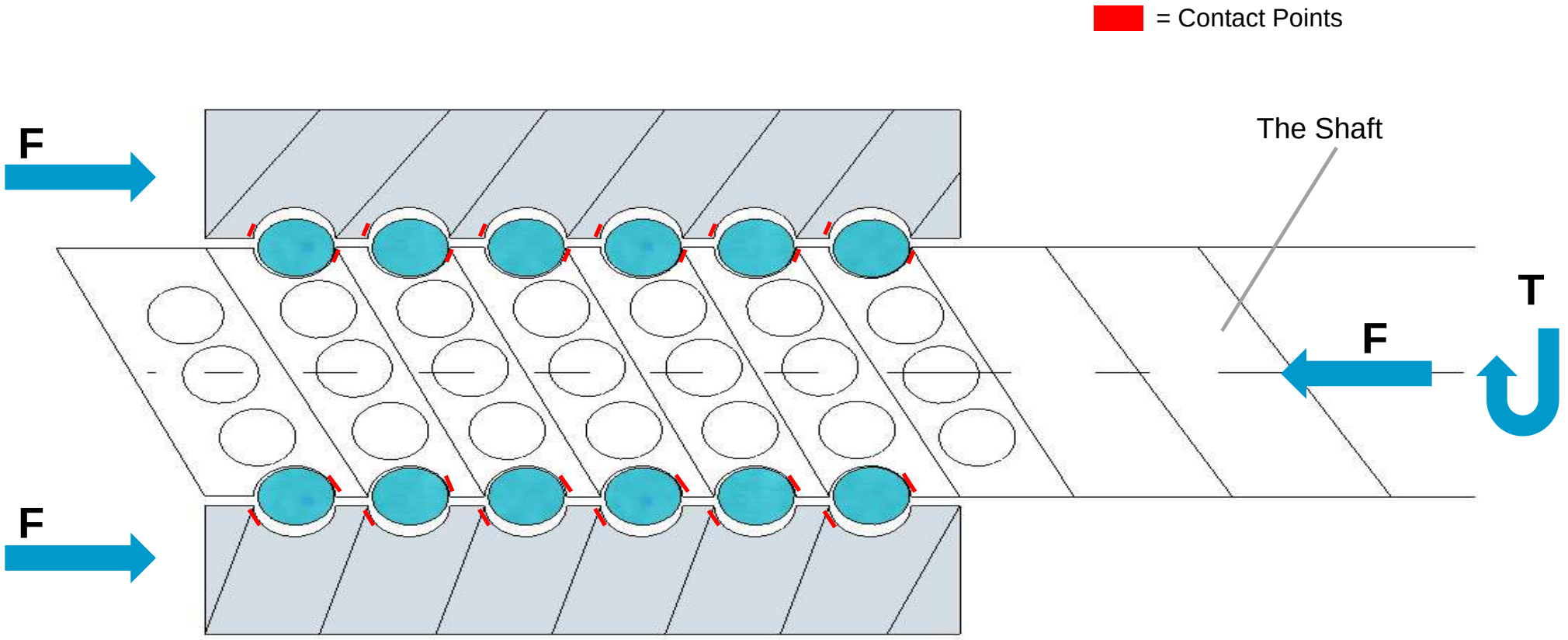
The load carrying capacity of a rolling screw depends on the amount of contact points between the nut and the shaft

The surface of contact points are much larger in the planetary roller screw hence the mechanical tension on the screw is less according to known formula beside:

$$\sigma = \frac{F}{A}$$

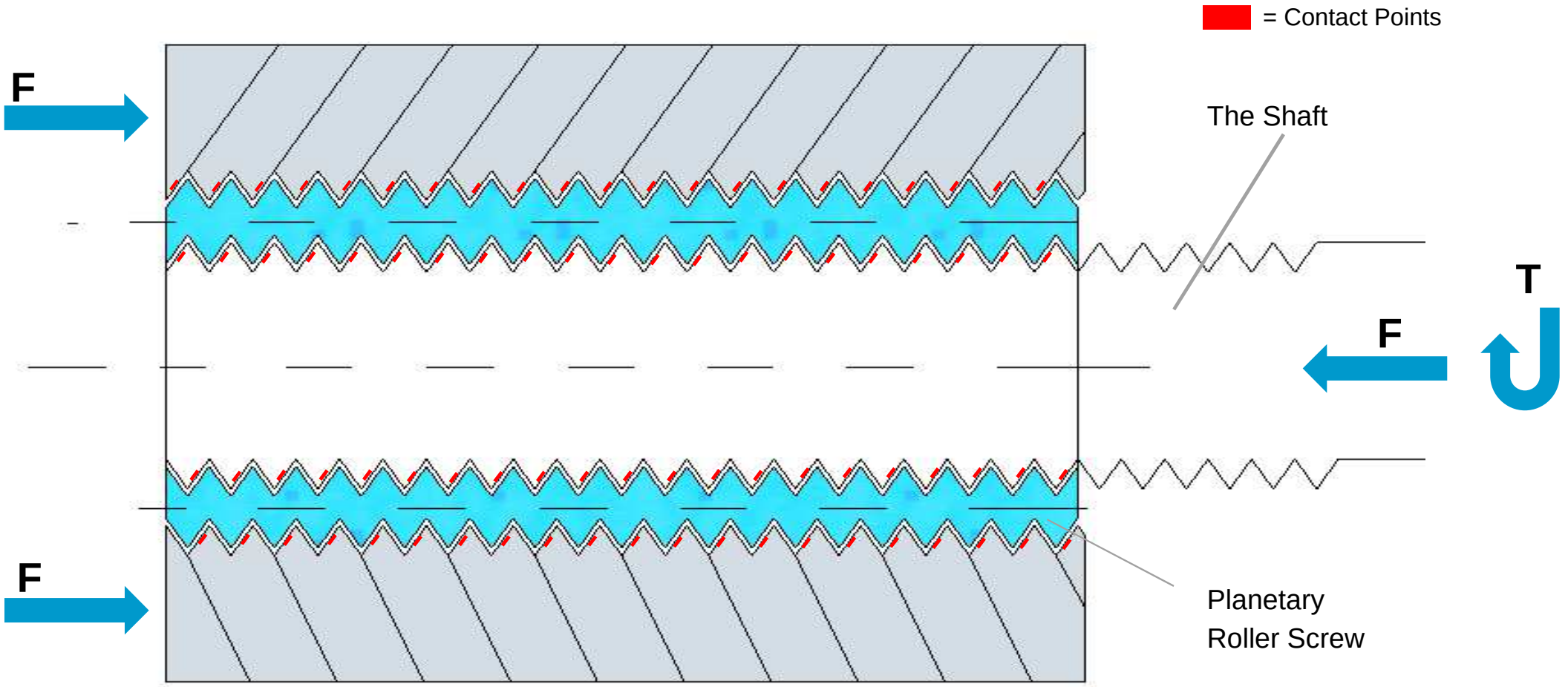
Where:
σ = *Mechanical Tension*
F = *Force*
A = *Area*

BALL SCREW *[SURFACE CONTACT POINTS]*



ANIMATION OF THE BALL SCREW

PLANETARY ROLLER SCREW [SURFACE CONTACT POINTS]



ANIMATION OF THE PLANETARY ROLLER SCREW

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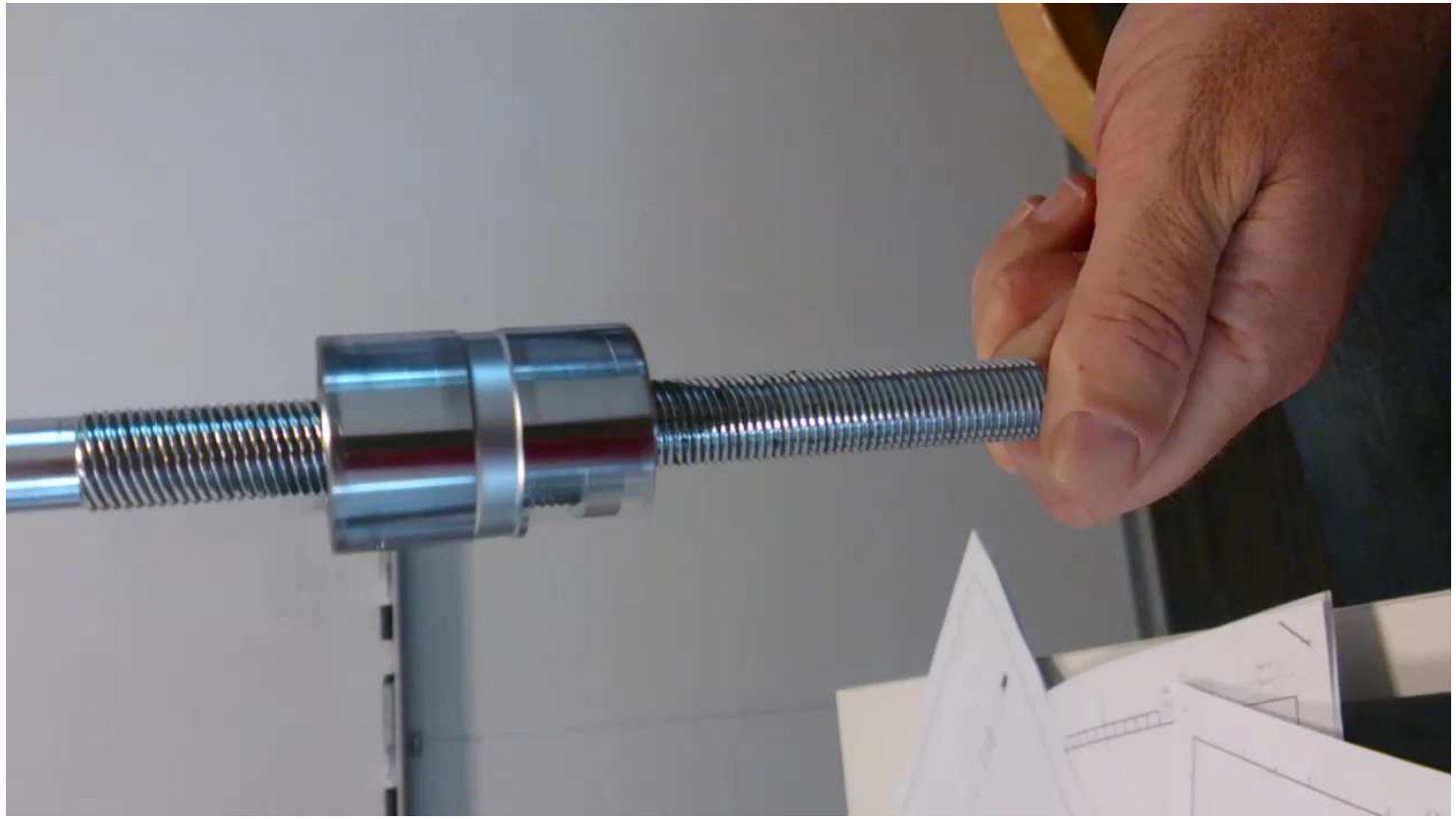
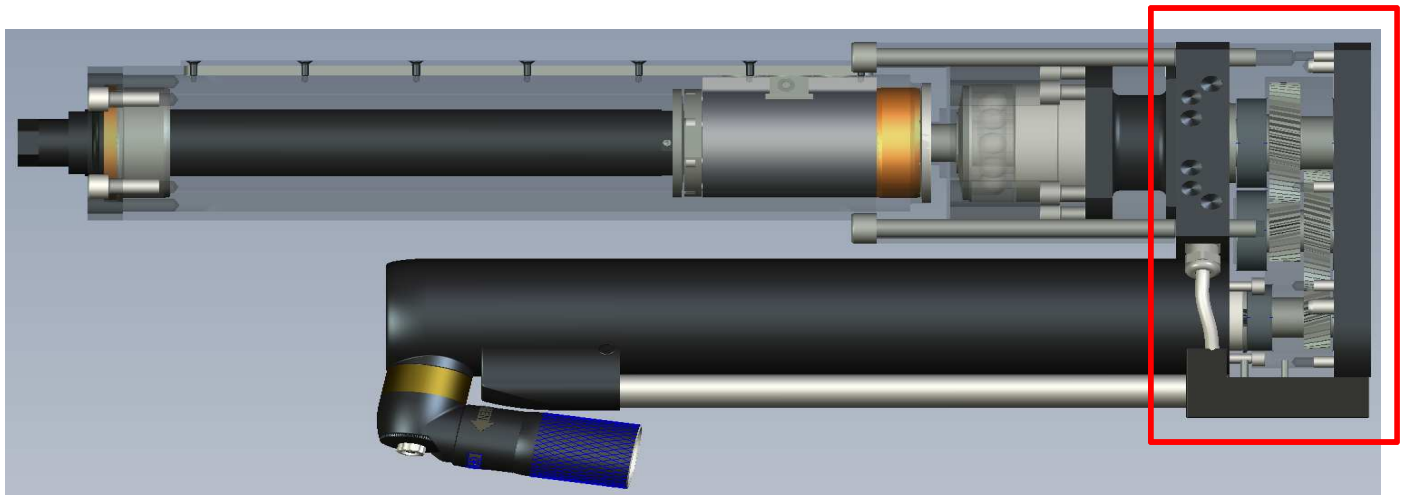
VIDEO OF THE PLANETARY ROLLER SCREW



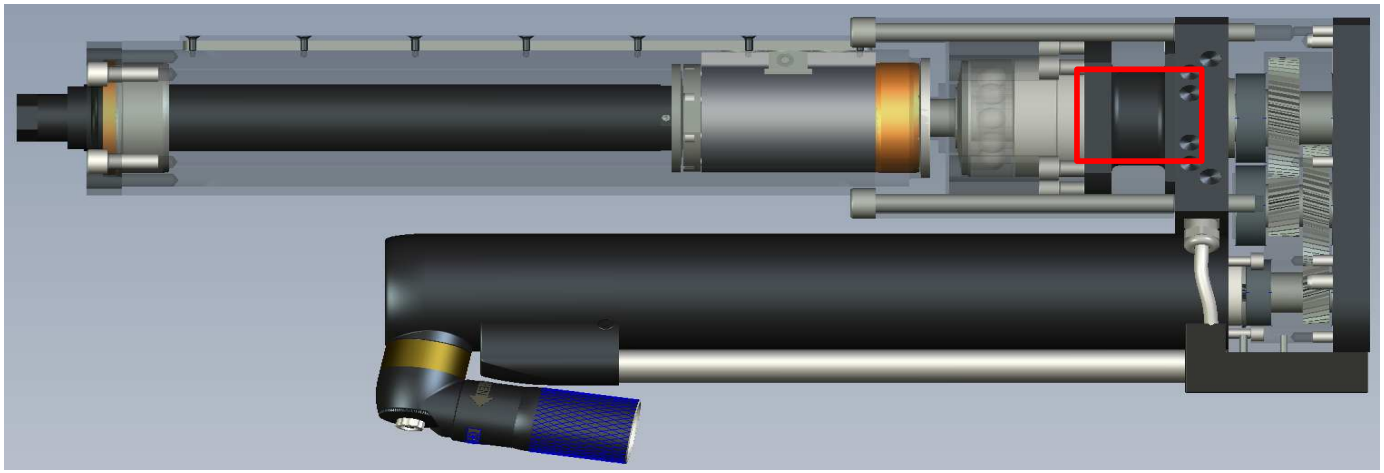
THE MECHANICAL GEAR UNIT

- A mechanical gear unit is being used instead of a belt
- The gear unit is a cylindrical 2 stage gear with helical cogs
- Mechanical gears provide more flexibility in terms of different ratio alternatives
- A higher durability is achieved with a mechanical gear unit comparing to a belt
- The height of the gear package is lower than for beltdrives => more compact installations.



THE LOAD CELL

- The load cell in the press is a strain gauge sensor, not a piezoelectric sensor, placed on the outgoing shaft. Comparing to a piezo electric sensor:
  - A strain gauge sensor shows better linearity
  - A strain gauge sensor has better durability
  - A strain gauge sensor is less sensitive to temperature variations



** A strain gauge sensor is also used in the QST tightening spindle.*

THE BRAKE

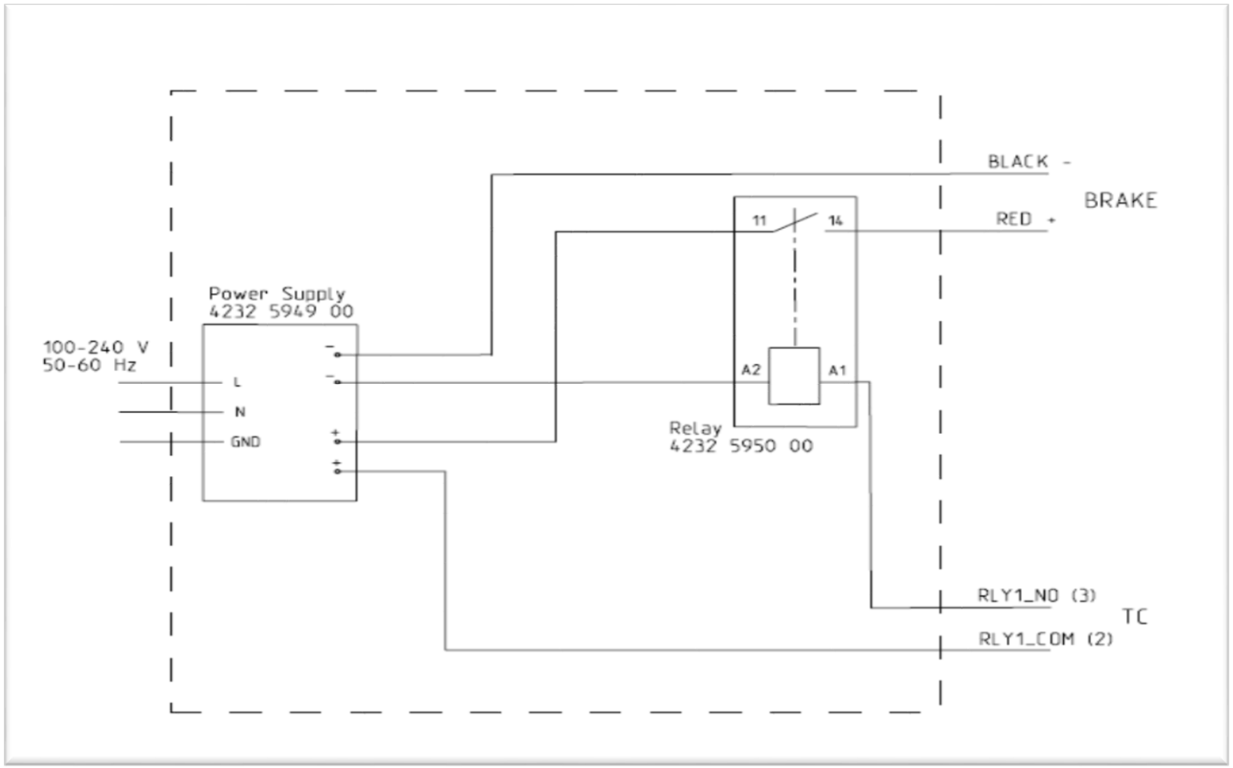
- The brake is an optional feature
- The brake is a friction brake. When the current interrupts, the brake activates
- The brake has two main functions:
  - To hold something instead of letting the motor be working, which can lead to over heating in the motor windings
  - It can also be used as an emergency stop when the press is mounted in a vertical direction

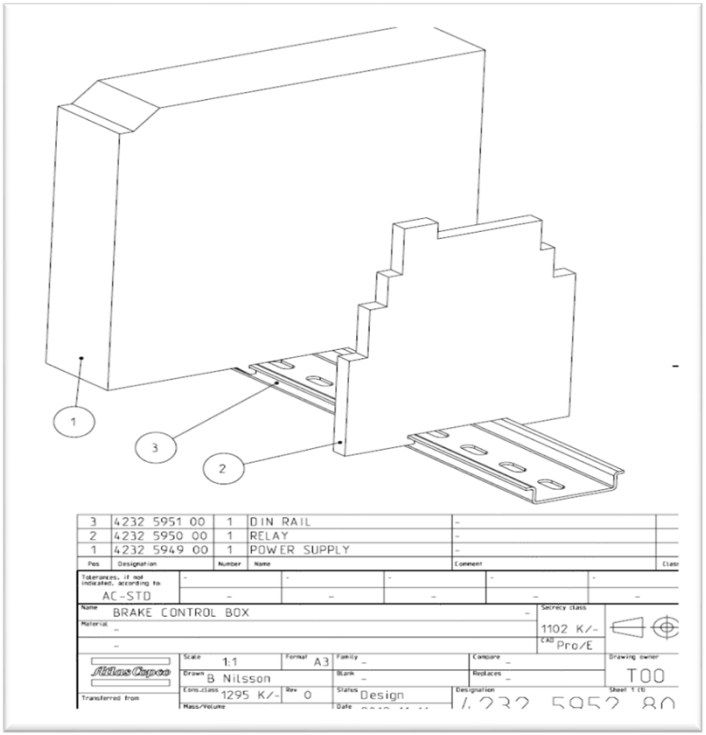
HOW DOES THE BRAKE WORK?

- The brake is controlled by a 24 V digital signal. This signal you can connect to where ever you want.
- If you connect it to the local I/O (direct on the TC) you can let the TC control the brake automatically. Which means that the brake opens when a cycle starts and close when the cycle is completed. This is the recommended way to do it.
- You also have the possibility to let the PLC in the Power MACS control the brake. Then you connect the brake to the local I/O on the TC or to an separate I/O module (Wago or something similar).

THE BRAKE CONTROL BOX

Ordering number: 4232 5952 80





It is <u>NOT</u> included to a press with a brake. It must be ordered separately

CALIBRATION

- The Load Cell is used when calibration of PST is needed
- The Load Cell can be connected to the ACTA and STA with the device below

Ordering Number	Parts Included
4232 6390 80	Load Cell 10 kN & Device between Load Cell and ACTA or STA
4232 6391 80	Load Cell 20 kN & Device between Load Cell and ACTA or STA
4232 6392 80	Load Cell 50 kN & Device between Load Cell and ACTA or STA

Device to connect Load Cell to ACTA/STA

Load Cell

CALIBRATION

Set Up

Tool Cable

The device which connects the Load Cell with the Sta 6000

AVAILABLE MODELS

Model	Max Force kN	Stroke mm	Max Speed mm/s	Weight kg	A mm	B mm	AB mm	C mm	D mm	DB mm	E mm	Ordering No.
PST10-200CUL	10	200	500	14,5	491	329	-	168	70	-	27	9831 4069 62
PST10-200CBUL	10	200	500	15,5	553	329	553	168	70	85	27	9831 4069 78
PST10-300CUL	10	300	500	16,5	591	329	-	168	70	-	27	9831 4069 64
PST10-300CBUL	10	300	500	17,5	653	329	653	168	70	85	27	9831 4069 67
PST20-200CUL	20	200	250	21	508	390	-	198	76	-	28,5	9831 4069 60
PST20-200CBUL	20	200	250	23	570	390	570	198	76	87	28,5	9831 4069 77
PST20-400CUL	20	400	250	25	708	390	-	198	76	-	28,5	9831 4069 63
PST20-400CBUL	20	400	250	27	770	390	770	198	76	87	28,5	9831 4069 66
PST35-200CUL	35	200	255	44	612,5	498	-	244	90	-	56	9831 4069 47
PST35-400CUL	35	400	255	48	812,5	498	-	244	90	-	56	9831 4069 46
PST50-200CUL	50	200	170	50	643	498	-	245	105	-	56	9831 4069 84
PST50-400CUL	50	400	170	57	843	498	-	245	105	-	56	9831 4069 44

NOTE: We are available to design special presses as well, meaning other strokes than above or a pulling press instead of pushing.

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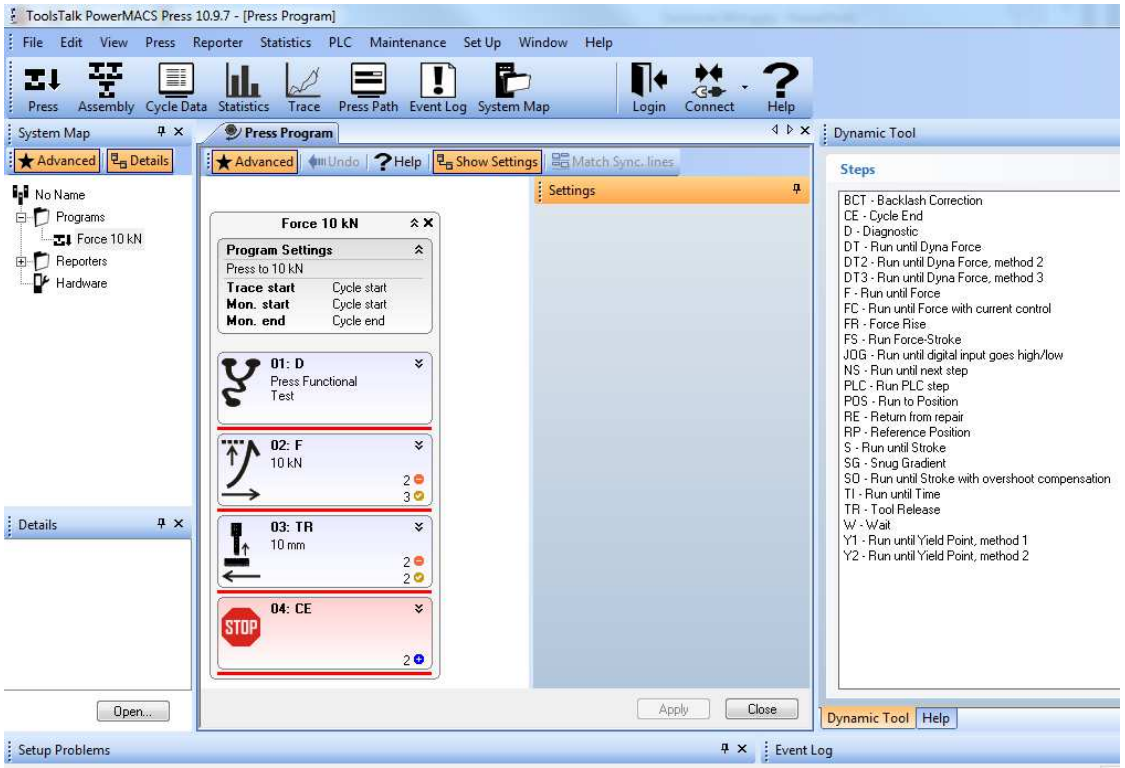
TOOLSTALK PRESS

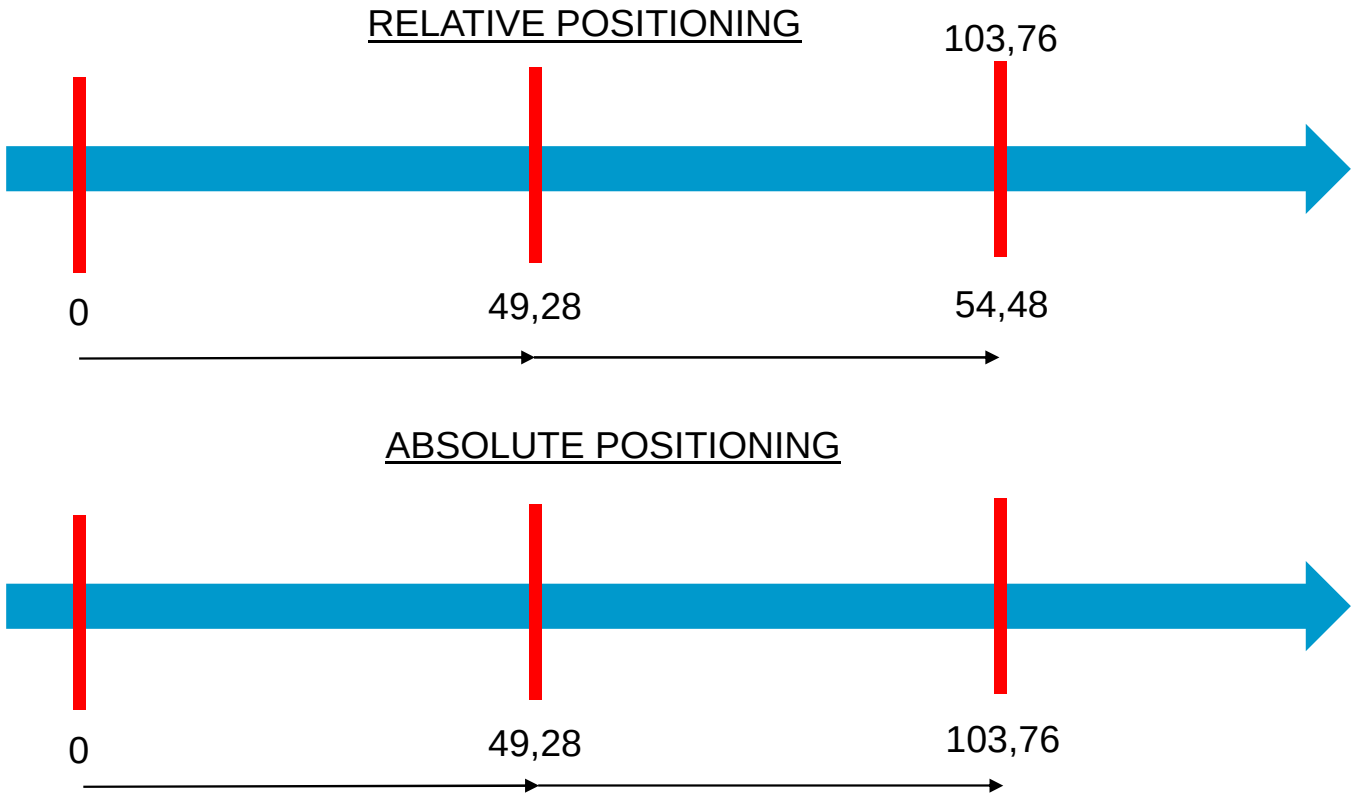
- The appearance of ToolsTalk Press is very similiar to ToolsTalk Tightening and Gauging.
- Symbols and Terminology have been replaced.



TOOLS TALK PRESS

The Difference between Absolute Positioning and Relative Positioning

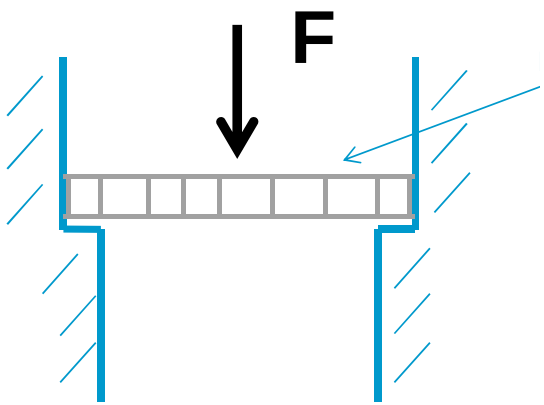
- In Relative Positioning the press calculates the distance from the lastest point.
- In Absolute Positioning the press calculates the distance from a fixed position, a reference point.

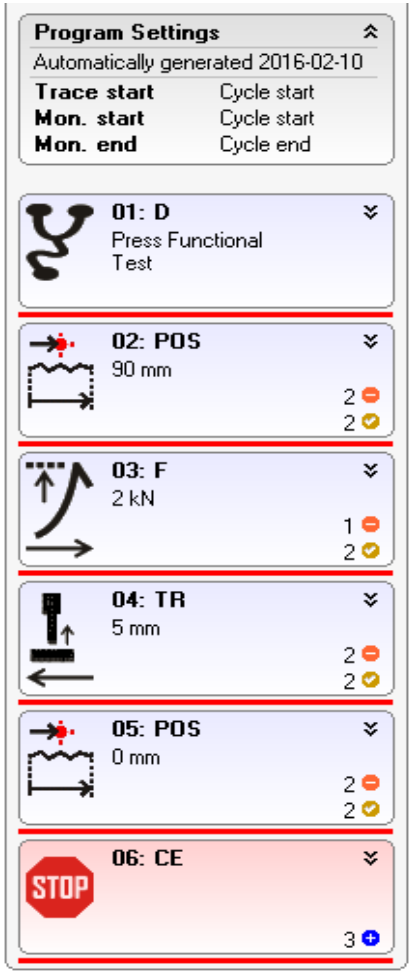


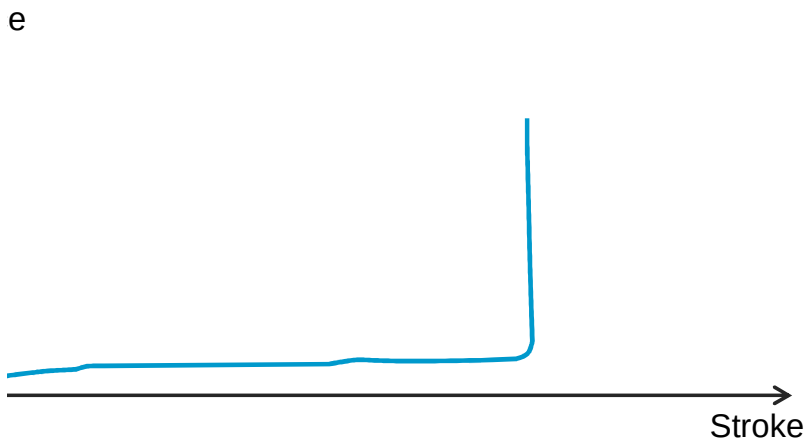
TOOLS TALK

Two simple Press Programs

- Press to a Stop



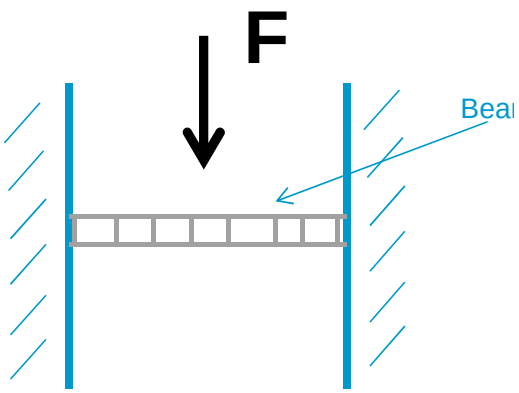


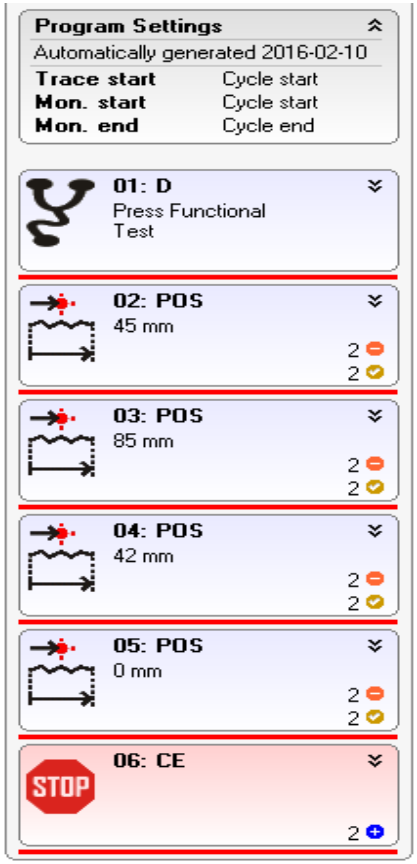


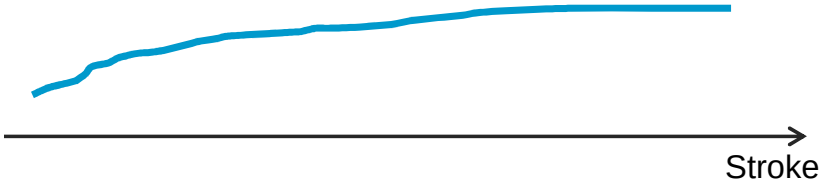
TOOLS TALK

Two simple Press Programs

- Press to a Position



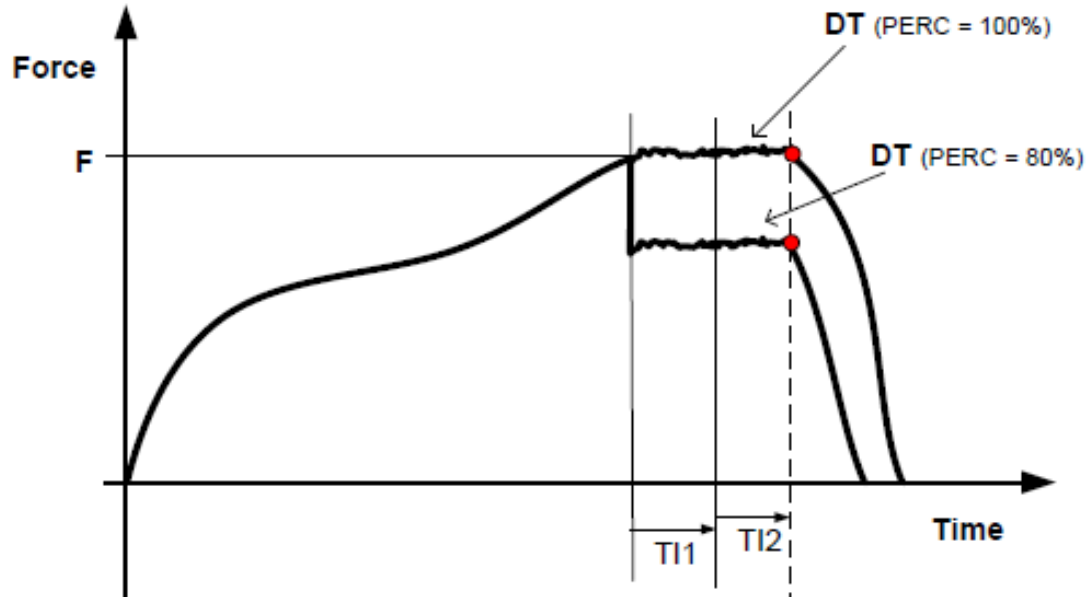


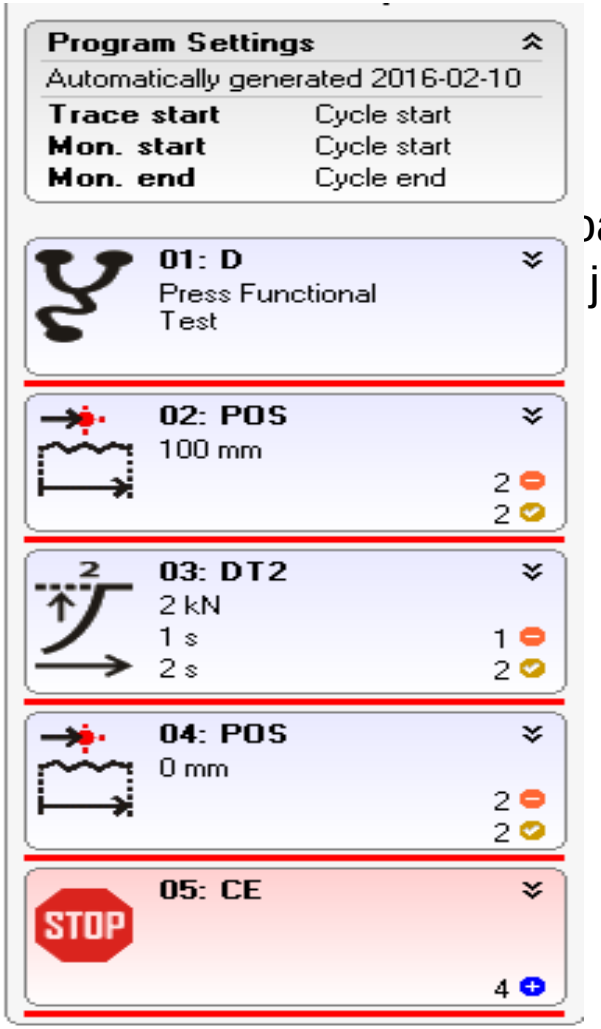


TOOLS TALK

Special Press Steps

- DYNAFORCE
- This step has the function as DynaTorque in tightening m ...oad for a certain amount of time in order to compensate for eventu ... joint.

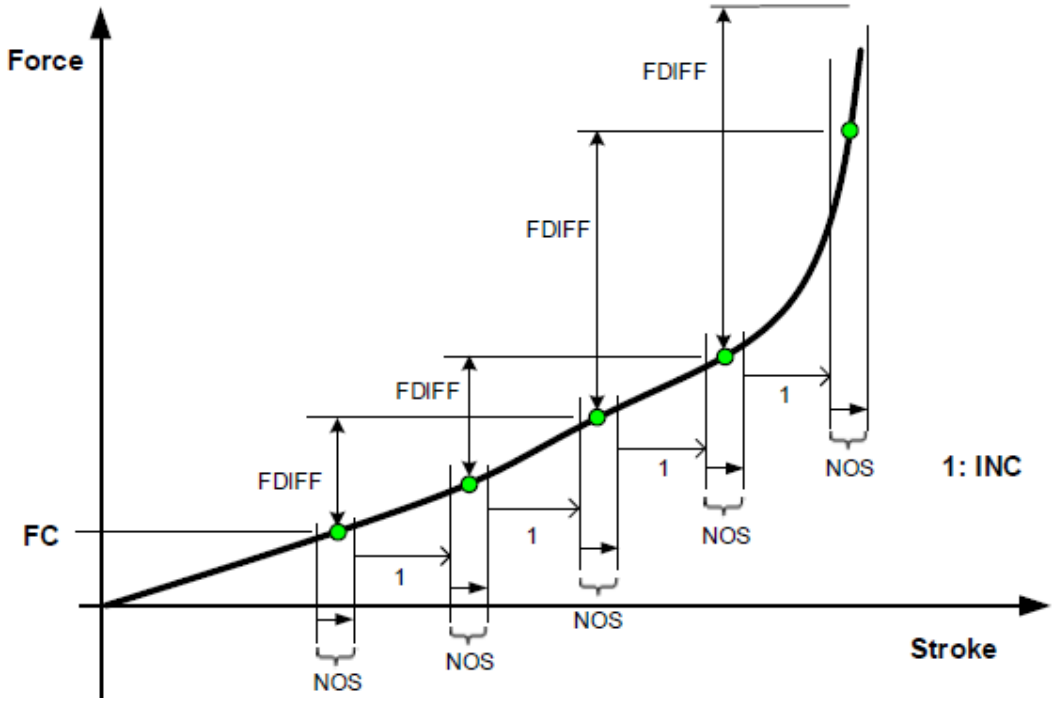


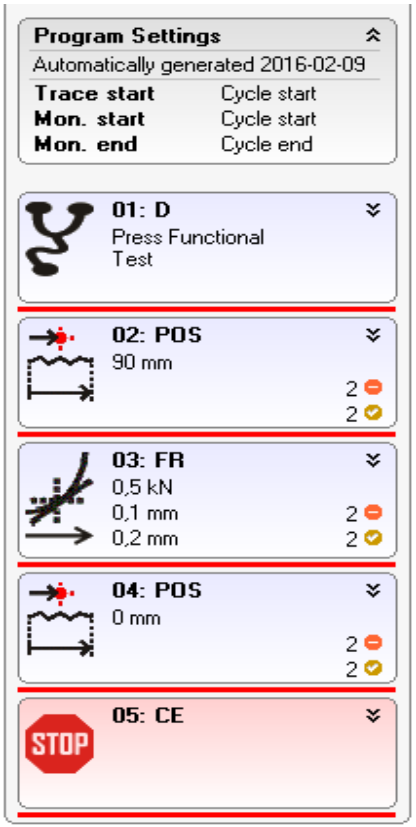


TOOLS TALK

Force Rise Step

- In the Force Rise step you will not define to what force the press should go to. Instead you run the press till you receive a rise of the force. Meaning this is a useful step when you don´t know what force that is required and afraid of pressing to much.

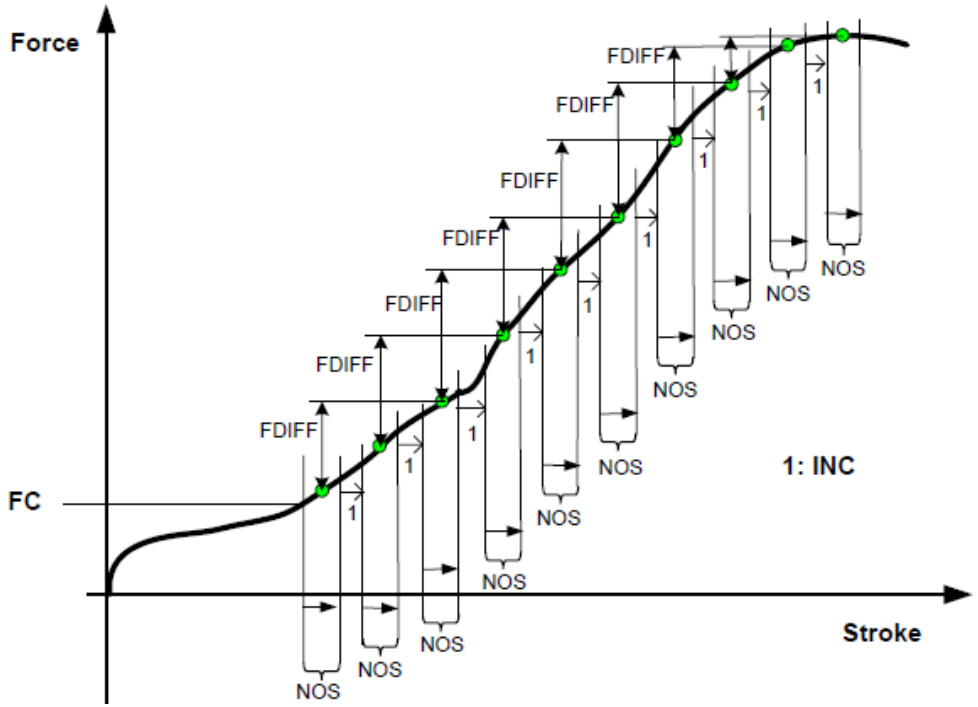


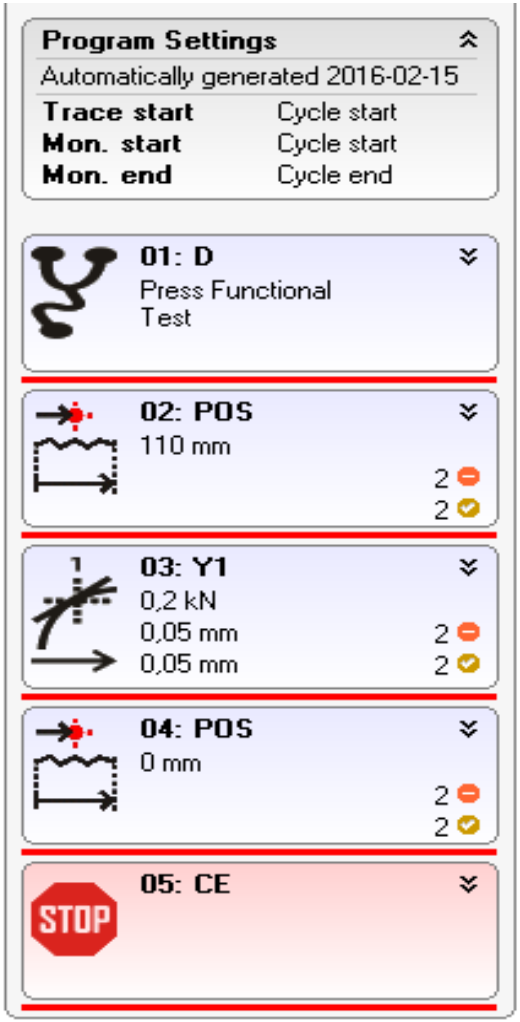


TOOLS TALK

Run until Yield Point Step

- This step is useful when we want to find where the plasti tep is like the opposite to the Force Rise Step due to the fact we ar rce starts to flat out or declining instead of rising.

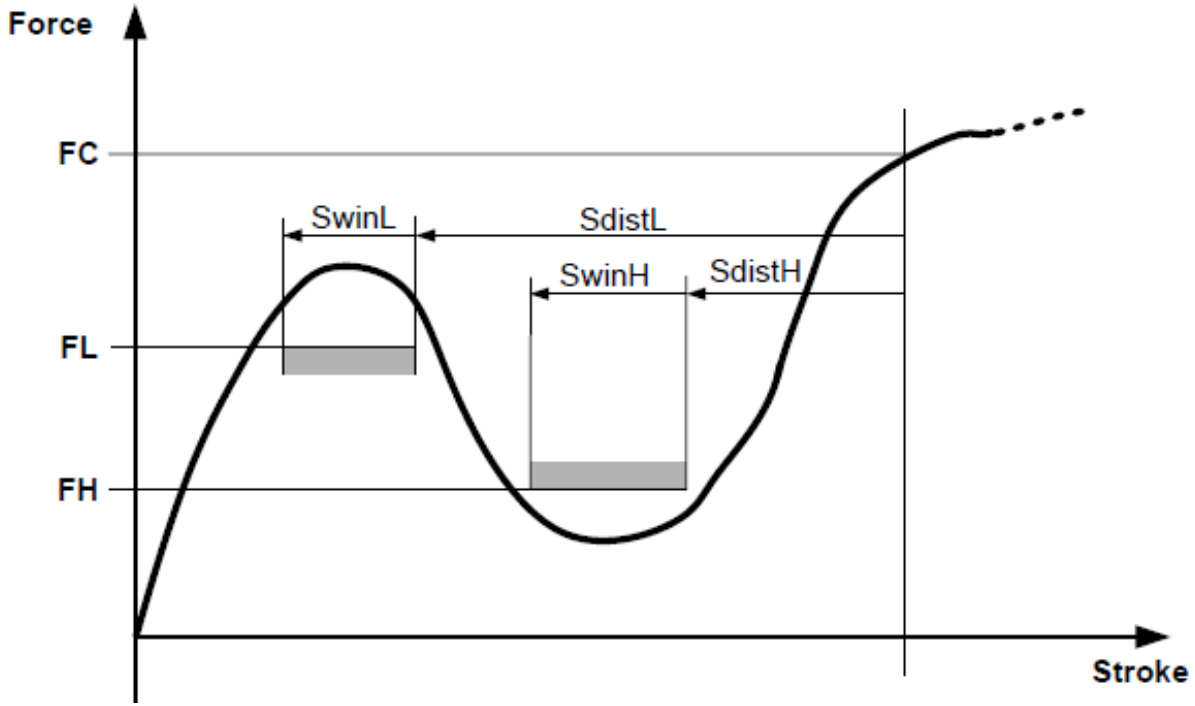




TOOLS TALK

Useful Checks – Post View Force

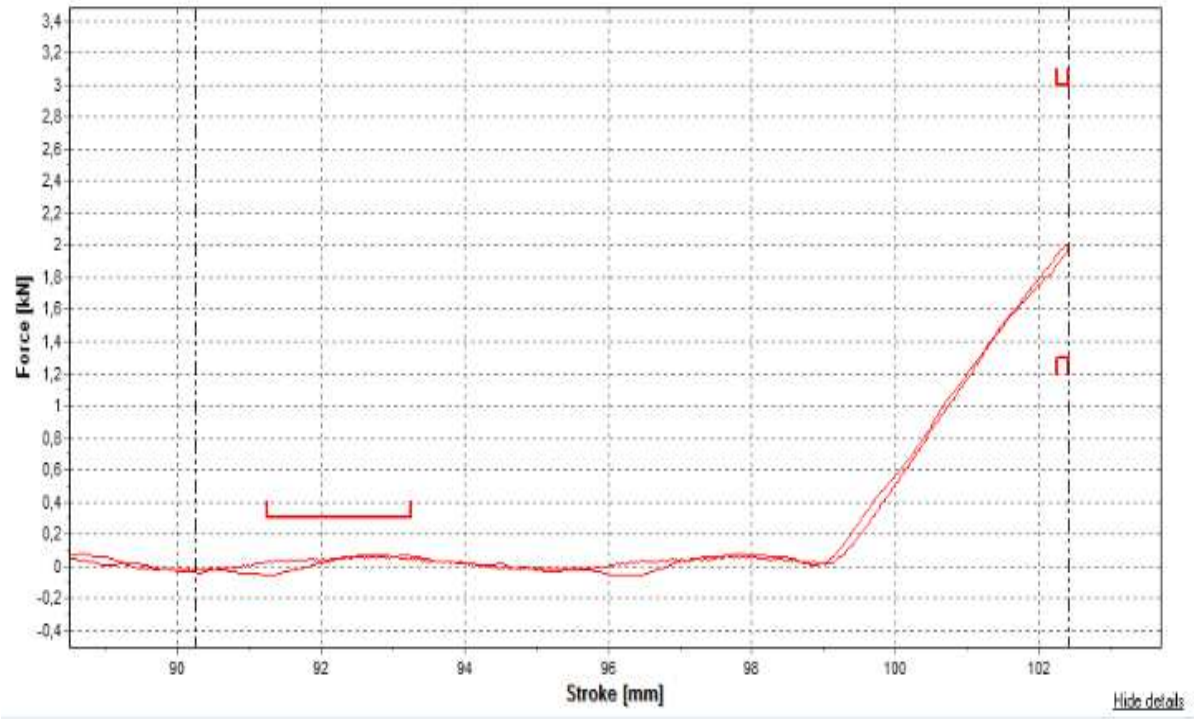
- With this Check you can report what the force is within a certain stroke window. This Check is useful to set when you are pressing to a force and would like to know what the force is before the press reaches the stop.



TOOLS TALK

Useful Restrictions – Motion Profile

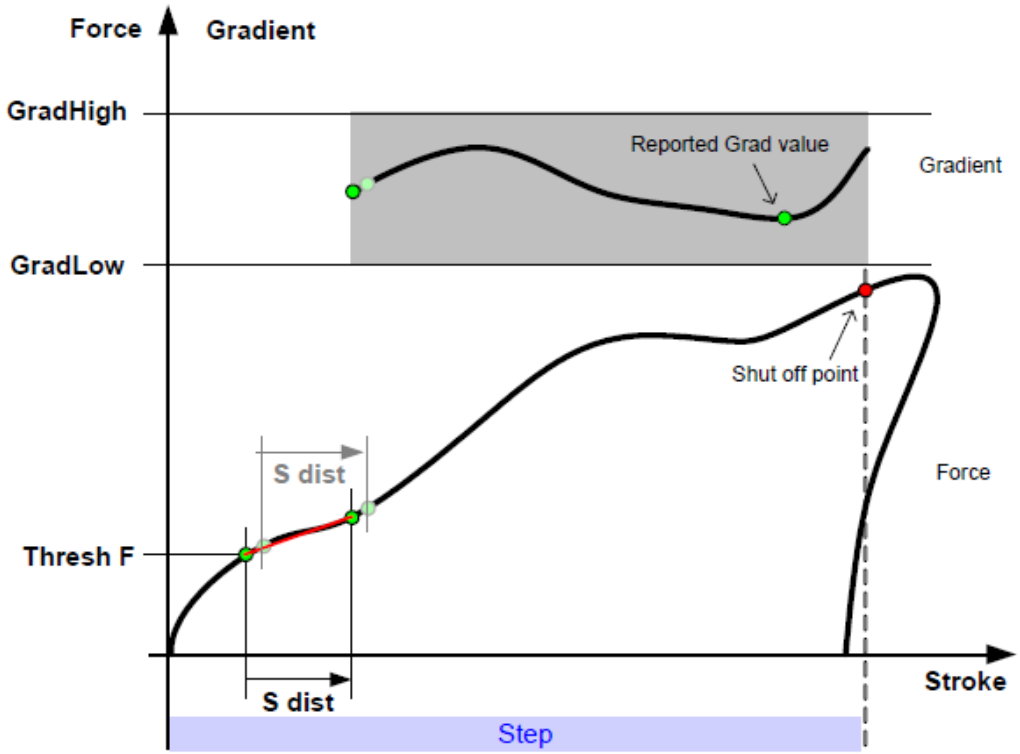
- This Restriction allows you to create windows in the pressing trace which pressing needs to go thru in order to receive a OK pressing. You can setup up to 3 windows in one step.



TOOLS TALK

Useful Restrictions – Gradient Method 2

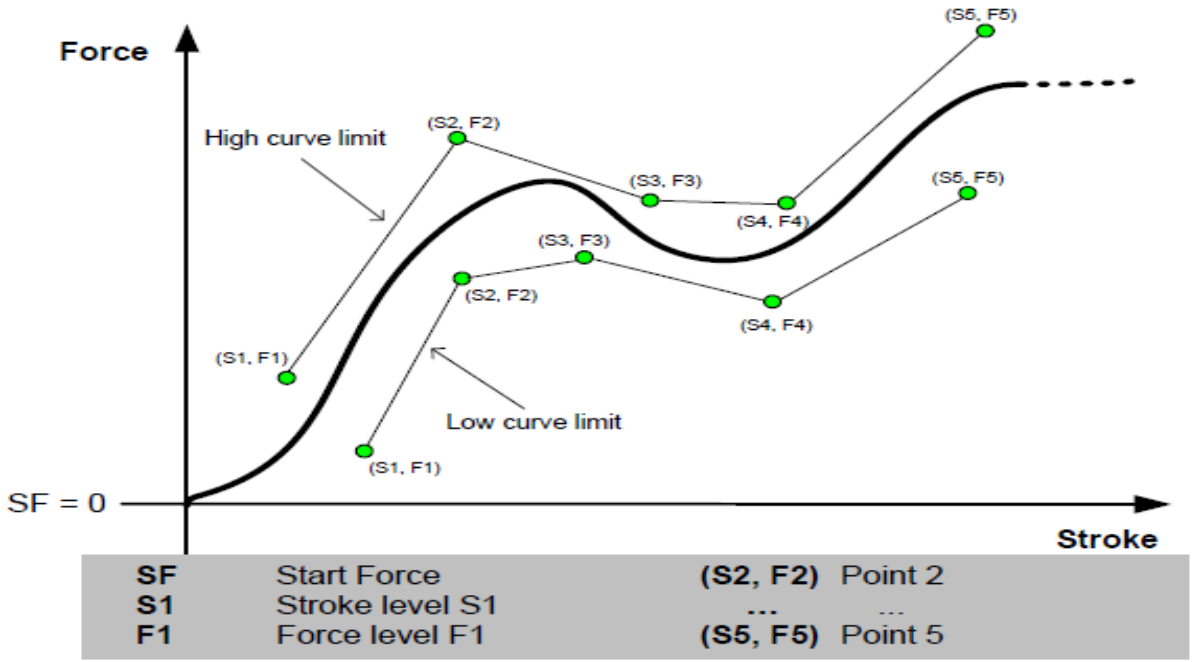
- in this Restriction you define limits based on a gradient based on F/mm. The pressing must be within the limits in order to receive an OK pressing.



TOOLSTALK PRESS

Useful Monitoring Steps – Follow the Curve

This function checks that the Force values are within **High** and **Low curve limits**. A curve limit. If any measured force value is outside the curve limits an event will be generated and an error code will be included in the cycle data.



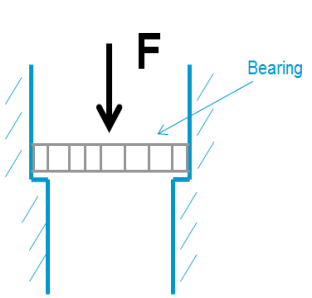
TOOLSTALK PRESS

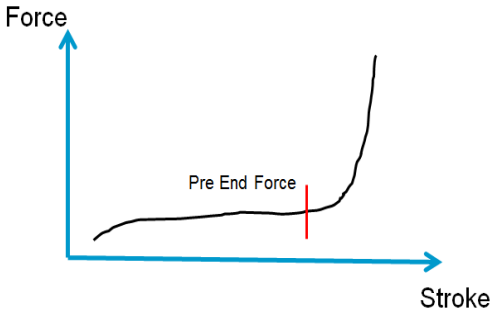
Useful Monitoring Steps – Pre end Force

This function checks that the force at distance, **Dist** before the end of monitoring buffer is between the limits **MaxF** and **MinF**. If the force value is outside the limits an event will be generated and an error code will be included in the cycle data.

This function is used when you press something to a stop and you want to monitor the pressing rundown to check the tolerances. If the bearing or the hole have wrong dimensions the friction will be affected and due to that also the force.

Common	
Ignore monitoring error:	☐
Peak force	
Pre end Force	
Fatal	☐
Identity	2
Monitoring buffer	First
Max Force, MaxF (kN)	10
Min Force, MinF (kN)	1
Distance, Dist (mm)	25



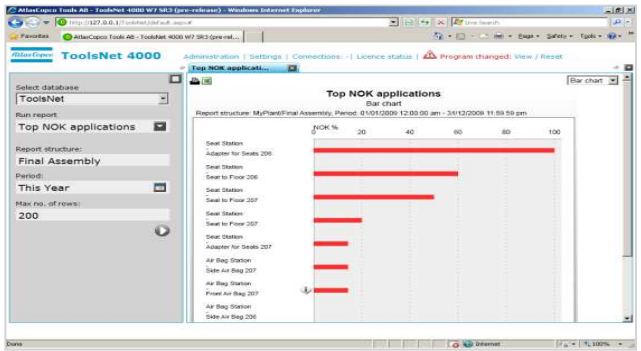


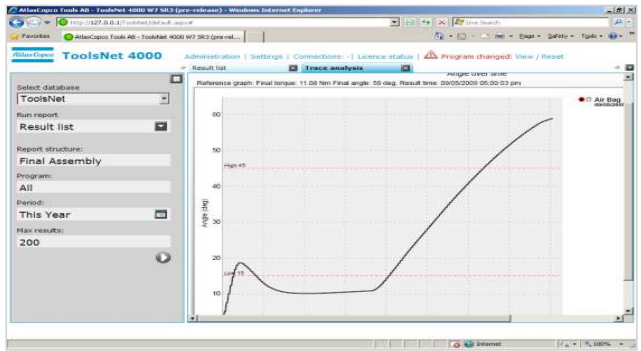
TOOLSNET

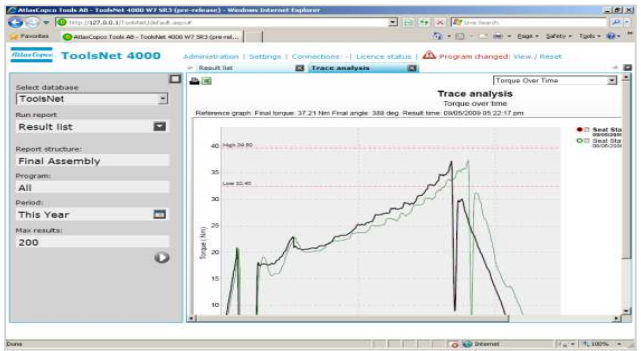
- PST is compatible with ToolsNet 4000
- ToolsNet will make an impact on your:
  - Production
    - Reduce rework
    - Increase Efficiency
  - Quality
    - Find cause of the problem
    - Track changes
    - Guarantee 100 % OK products
  - Service
    - Plan preventive maintenance
    - Reduce down time
    - Faster reaction

TOOLSNET

- Avoid manual data collection
- Combine data from different sources
- Monitor applications performance
- Keep high productivity
  - Easy comparisons over time
- Reduce rework cost
  - Right the first time concept
- Never loose data!
  - Avoid or minimize Recall's effect
  - Automatic upload if network reestablished



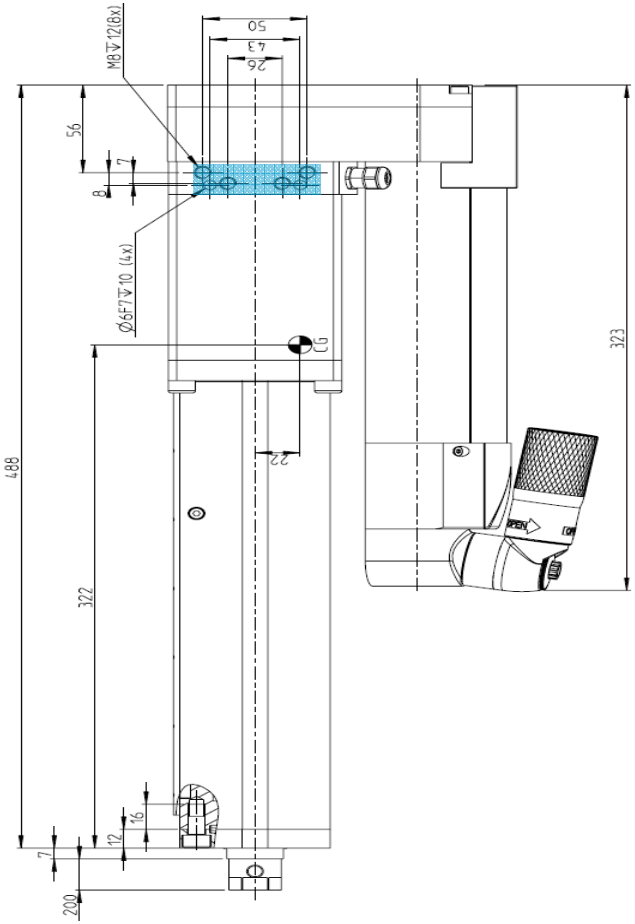




THE QIF PRODUCTS ARE ALSO COMPATIBLE WITH PST

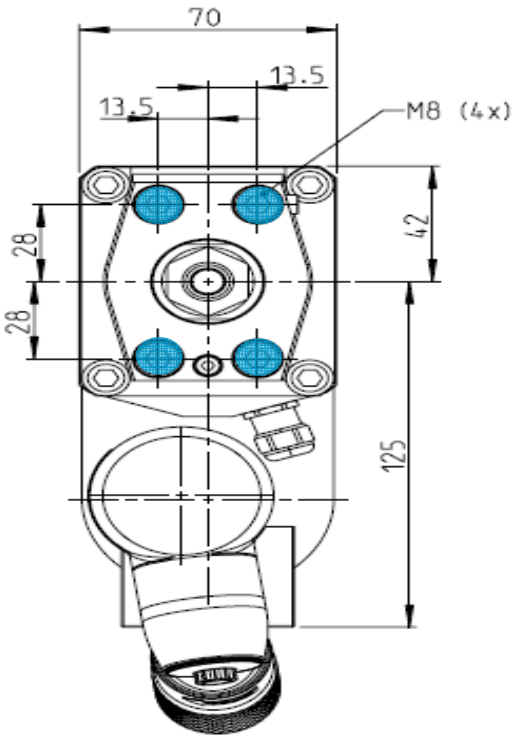
HOW TO MOUNT PST TO A FIXTURE?

- Alternative 1.
  - Mount the press from the side in the marked holes as showing in the figure below.



HOW TO MOUNT PST TO A FIXTURE?

- Alternative 2.
  - Pilot mounting the press in the marked holes as the figure below shows.



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