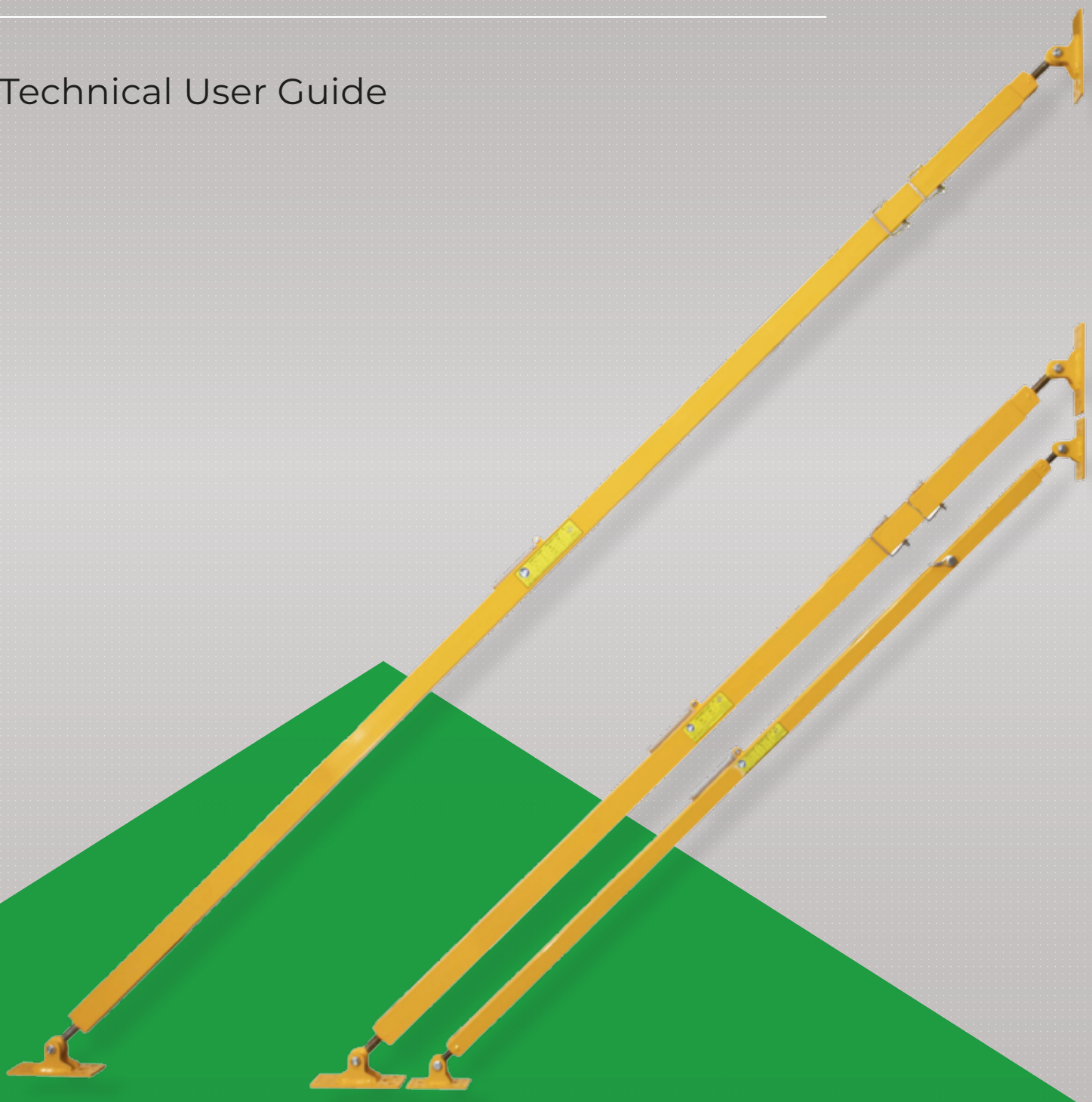
WESTPORT
EQUIPMENT

Technical User Guide



# LIGHTWEIGHT PUSH PULL
# USER GUIDE & SAFETY INFORMATION

Scaffolding | Shoring | Safety

# ABOUT THE PRODUCT

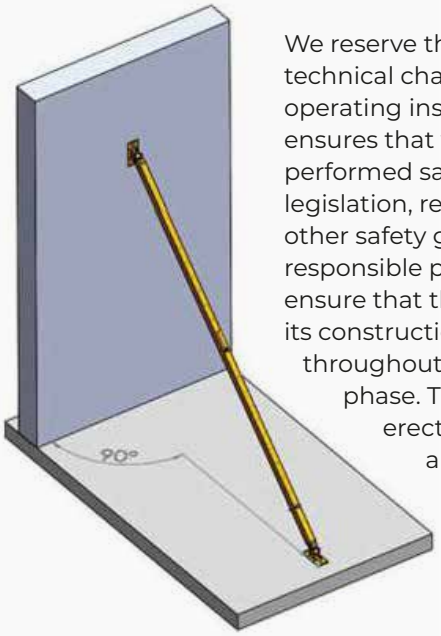
**Lightweight Push Pull is a wall brace specifically designed for timber structures.**

**To use the wall brace, follow these steps:**

1. Extend the brace to the desired length using its telescopic function in 100 mm increments.
2. Lock the brace in place using the locking pin.
3. Attach the brace to both the wall and floor securely.
4. Utilize the fine adjusting function by rotating the brace.

# GENERAL

This operating instruction contain important information on how Lightweight Push Pull Support can be used safely. It is therefore crucial that the instructions are read prior to use of the wall brace. The operating instructions are always to be held at hand on the construction site. Lightweight Push Pull products are intended to be used only by qualified professionals.




We reserve the right to make technical changes to the operating instructions. This ensures that work can be performed safely with current legislation, regulations and other safety guidelines. The responsible person must ensure that the building and its construction remain stable throughout the construction phase. This also includes the erection, dismantling, and handling of the wall braces. The building in its entirety is to be inspected after both erection and dismantling of the wall braces.

# SAFETY AND OPERATING INSTRUCTIONS

## Symbols

This symbol is used in conjunction with the instructions to place special attention to matters essential from a safety point of view:

**Always obey the safety instructions to avoid personal injuries and property damage.**

## Risk assessment

A risk assessment must always be carried out by the responsible person, covering the risks associated with the work to be performed. Always work in accordance with the instructions produced from the risk assessment.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## Installation instructions

The responsible person must ensure that all necessary documentation regarding the use of the wall braces is always available, regardless of how the wall brace is used or in which application. Appropriate documentation includes this operating instruction and suitable drawings and instructions for the job.

**Always use at least two wall braces per element**

**The wall brace is to be attached above the center of gravity of the element! For tall elements where this is not possible, it is crucial to support them in other ways so the element cannot under any circumstance topple over.**

**The wall brace is to be attached above the center of gravity of the element! For tall elements where this is not possible, it is crucial to support them in other ways so the element cannot under any circumstance topple over.**

**The locking pin(s) must be in place before the wall brace is to be loaded! The wall brace may not be used without a locking pin!**

**Always attach the wall brace perpendicular to the supported element!**

## Use

The wall braces are intended for professional use only. They may only be used by professionals under the supervision of qualified persons. The operating instructions are part of the wall brace and must always be followed.

Any addition, exception or deviation from these instructions (for example using other wall braces or methods) is a potential risk for which the responsible person remains solely accountable for any damages.

The use of other braces or procedures must always be planned appropriately. The responsible person is also accountable for all necessary supplementary planning and documentation.

**Always ensure that permissible loads are not exceeded, and where and how the wall braces can be securely fastened.**

## Information on the construction site

The responsible person must ensure that the operating instructions are always available on the construction site. Personnel are to be informed about the contents of the instructions and where they are stored, before using the wall braces.

## Illustrations

The operating instructions show parts of a construction under assembly and are therefore not complete from an occupational safety point of view. Always follow the given safety instructions even if they are not shown here.

## Checking the wall brace

Check the wall brace before each use. The Lightweight Push Pull  may not be modified or changed in any way. A broken or damaged wall brace may not be used.

## Checkpoints

- Permanent deformations, e.g.:
  1. Stretched holes
  2. Dents
  3. The straightness of tubes and end brackets
- Condition of the threads
- Missing or loose parts
- Locking pin, undamaged and straight
- Tubes move without resistance
- Stop- and allowable loads decals

Contact customer service if you need support, spares or advice. If the product is damaged or broken, stop using it immediately. Repair, replace or dispose


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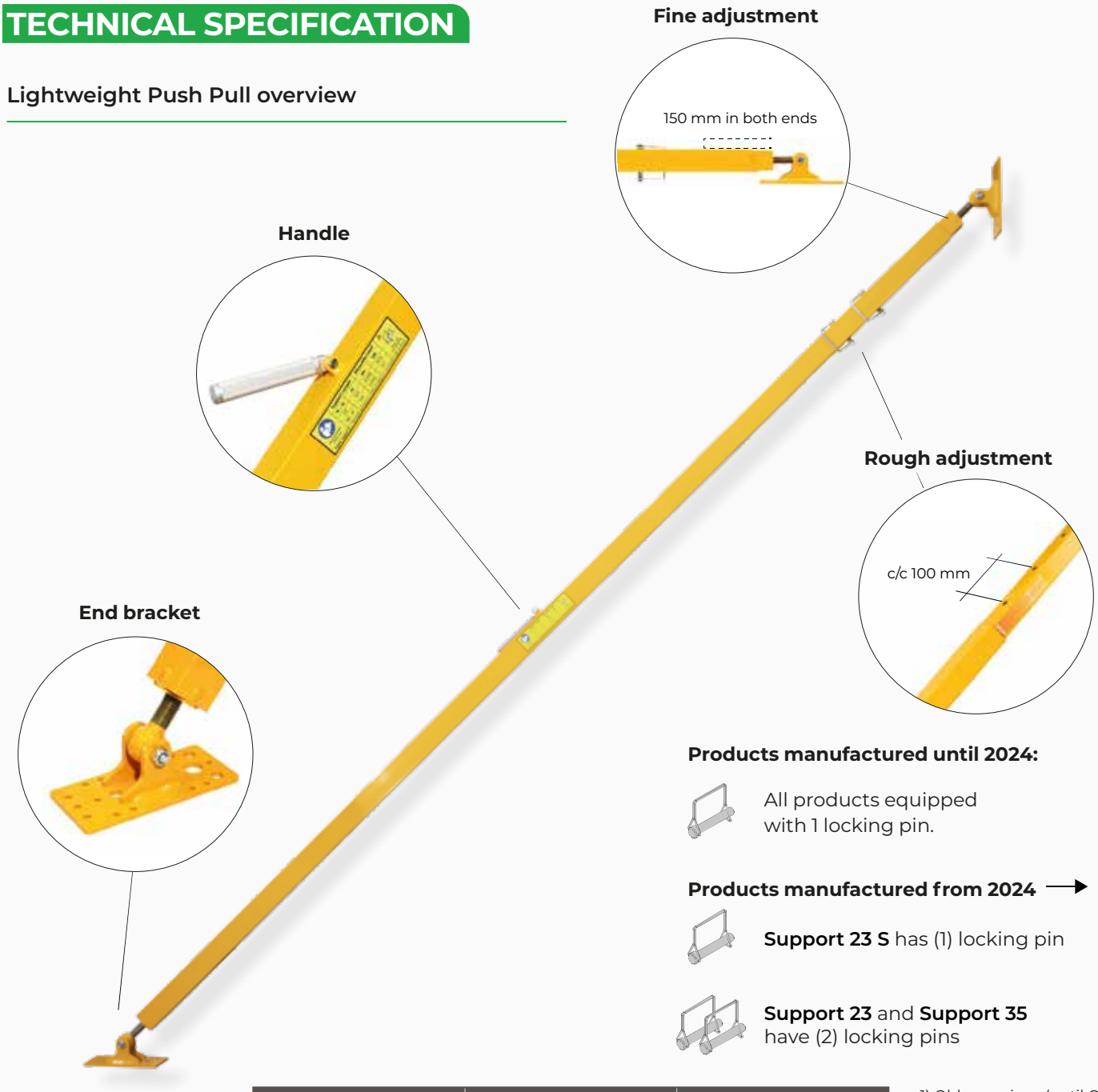
# TECHNICAL SPECIFICATION

## Lightweight Push Pull overview




**Products manufactured until 2024:**

All products equipped with 1 locking pin.

**Products manufactured from 2024** →

**Support 23 S** has (1) locking pin

**Support 23** and **Support 35** have (2) locking pins

| | Lightweight Push Pull 23 S | Lightweight Push Pull 23 | Lightweight Push Pull 35 |
|---|---|---|---|
| Minimum length (mm)[1)] | 1770 | 1950 | 2850 |
| Maximum length (mm)[1)] | 3100 | 3380[2)] | 4970 |
| Rough adjustment (mm) | c/c 100 | c/c 100 | c/c 100 |
| Fine adjustment (mm) | 328 | 328 | 328 |
| Weight (kg) | 7,2 | 13,2 | 18 |
| Rust protection | Continuous strip galvanization + powder coating | | |

1) Older versions (until Q2 2025) of Lightweight Push Pull 23 can extend up to approximately 3184 mm.

2) Minimum and maximum lengths are rounded values measured from the absolute longest point, with both end brackets rotated 90° perpendicular to the wall brace.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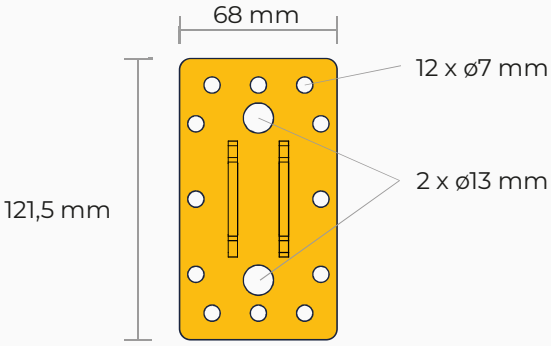
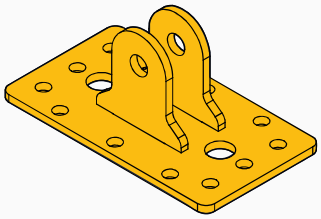
# END BRACKET GEOMETRY

## Lightweight Push Pull 23 S:

| Plate thickness | 4 mm |
|---|---|

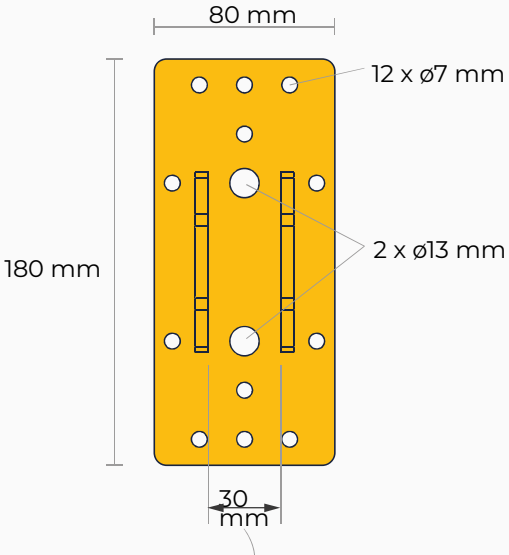


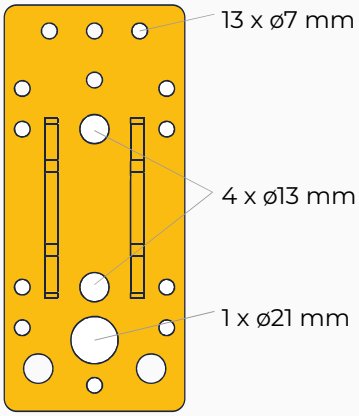
## Lightweight Push Pull 23 and Support 35

| Plate thickness | 6 mm |
|---|---|

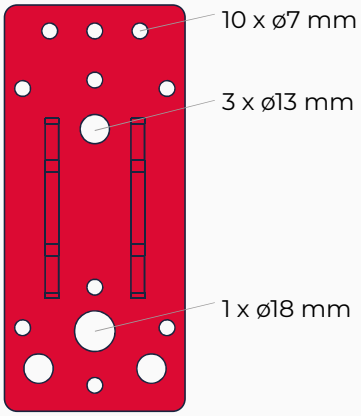
**Version 1.0** (until 2024)

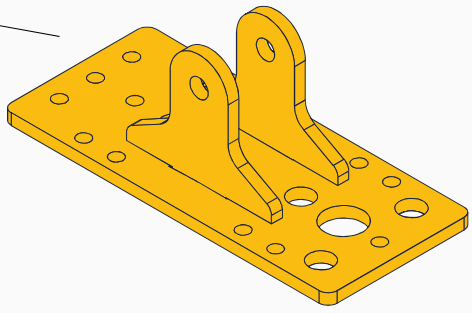



**Version 2.0** (from 2024)




**Peri configuration** (from 2025)



**All Support 23 and 35 end brackets have 30 mm spacing between the ”ears”.**

**This fits a 12 mm bolt or screw with 19 mm head size, and most 19 mm sockets slide in easily.**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# STRUCTURAL VALUES

## Load tables and charts

Load tables and charts are based on theoretical calculations according to Eurocode 3 standards, as well as verified tests performed in certified construction laboratories.

### Exceeding the maximum permissible load

Exceeding the specified load capacity may cause locking pin hole deformation or brace buckling, which can result in serious injury or death.

### Before use:

- All loads to be supported by the wall braces must be calculated by a qualified engineer.
- Each load value should be verified and double-checked prior to installation.

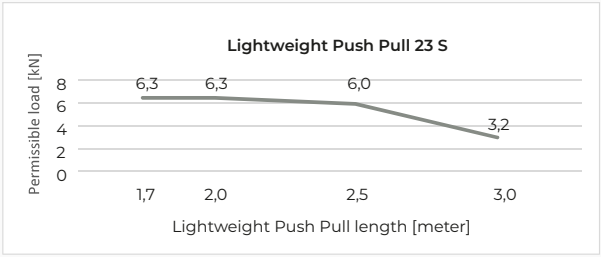
**Under no circumstances, the maximum permissible load should be exceeded!**

## Lightweight Push Pull 23 S:

Lightweight Push Pull 23 S | 1,7 - 3,0 m | 7,2 kg

| Lightweight Push Pull length [meter] | 1,7 | 2,0 | 2,5 | 3,0 |
|---|---|---|---|---|
| Permissible load* [kN] | 6,3 | 6,3 | 6,0 | 3,2 |

1) Permissible loads include a safety factor of 1,5




## Lightweight Push Pull 23 and 35 | With single locking pin

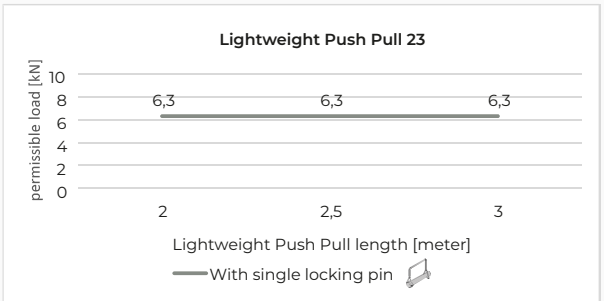
**Products manufactured until 2024 have 1 locking pin only.**

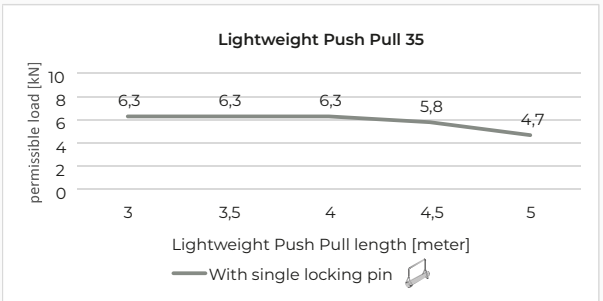
Lightweight Push Pull 23 | 2 - 3 m | 13,2 kg

Lightweight Push Pull 35 | 3 - 5 m | 18 kg

| Lightweight Push Pull length [meter] | 2 | 2,5 | 3 | 3,5 | 4 | 4,5 | 5 |
|---|---|---|---|---|---|---|---|
| Permissible load* with single locking pin [kN] | 6,3 | 6,3 | 6,3 | 6,3 | 6,3 | 5,8 | 4,7 |

1) Permissible loads include a safety factor of 1,5





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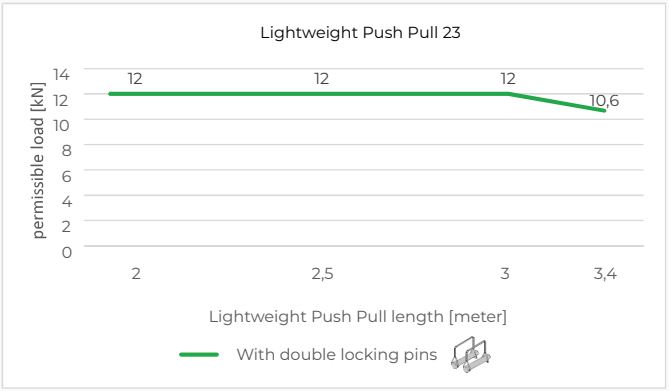
## **Lightweight Push Pull 23 and 35 |** With double locking pins

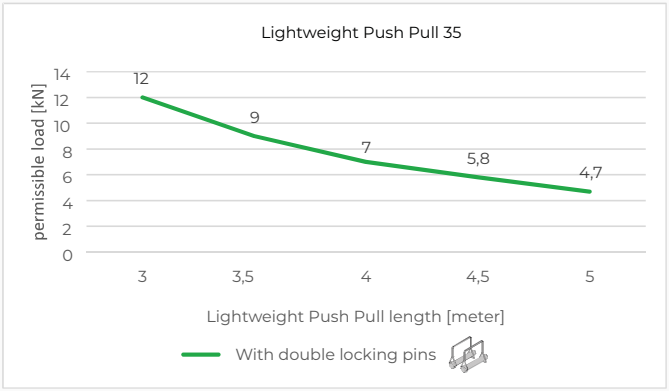
Lightweight Push Pull 35 | 3 - 5 m | 18 kg

Lightweight Push Pull 23 | 2 - 3,4 m | 13,2 kg

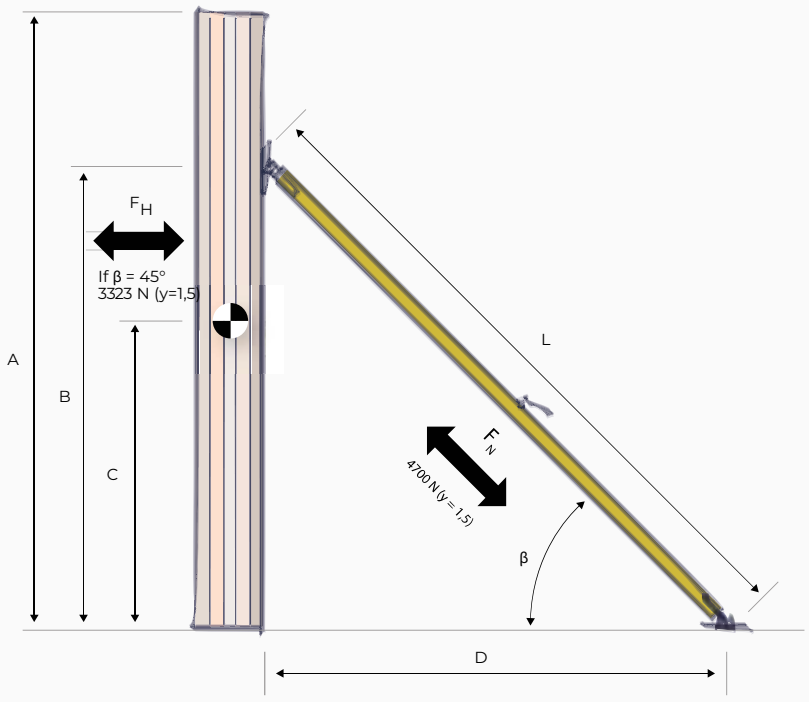
| Lightweight Push Pull length [meter] | 2 | 2,5 | 3 | 3,4 | 3,5 | 4 | 4,5 | 5 |
|---|---|---|---|---|---|---|---|---|
| Permissible load* with double locking pins [kN] | 12,0 | 12,0 | 12,0 | 10,6 | 9,0 | 7,0 | 5,8 | 4,7 |

1) Permissible loads include a safety factor of 1,5




## Example: Load and force calculation — Lightweight Push Pull 35 at 5 meters




| | | |
|---|---|---|
| $F_H$ | = Horizontal force from the element | [N] |
| $F_N$ | = Axial force in the wall brace | [N] |
| L | = Length of the wall brace | [mm] |
| A | = Height of the element | [mm] |
| B | = Mounting height of the wall brace | [mm] |
| C | = Center of gravity for the element | [mm] |
| D | = Support point from the element | [mm] |
| β | = Support angle from horizontal | [°] |
| γ | = Factor of safety | |
| | = Center of gravity for the element | |

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NOTE! The force $F_N$ can be tensile or compressive.

| Angle β [°] | cos(β) | With safety factor, γ = 1,5 | |
|---|---|---|---|
| | | Supporting force FH [N] | Axial force in the wall brace at 5 meters FN [N] |
| 30 | 0,866 | 4070 | 4700 |
| 35 | 0,819 | 3849 | |
| 40 | 0,766 | 3600 | |
| 45 | 0,707 | 3323 | |
| 50 | 0,643 | 3022 | |
| 55 | 0,574 | 2698 | |
| 60 | 0,5 | 2350 | |

| | |
|---|---|
| The wall brace angle β from horizontal, must be: | $30° \leq \beta \leq 60°$ |
| The wall brace fastening height B must be higher than the center of gravity C. | B≥C |
| Recommended that the center of gravity C is at most 2/3 of the fastening height B: | B ≥ 1,5C |
| The axial load of the wall brace is always to be less than the maximum permissible force including safety factor: | FN ≤ ±4700 N |
| If the element is homogeneous the height of its center of gravity can be calculated: | C=A/2 |
| The angle from horizontal of the wall brace can be calculated from: | $\beta = \arctan(B / D)$ |
| The maximum permissible load in horizontal direction is: | $FH = FN \cdot \cos(\beta)$ |

**It is the responsibility of a qualified engineer to verify all loads and confirm that the wall brace is securely fastened for the intended application.**


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## NOTE

When the threads at both ends bottom out, extend the wall brace by moving the locking pin to the next hole. Before use, ensure the threads are equally extended on both ends to reach maximum length without causing damage. Each thread can be extended up to ~150 mm.

**Never remove the locking pin(s) unless the element is properly supported by a crane or another suitable support method.**

## SERVICE AND SPARE PARTS

Only original Lightweight Push Pull spare parts may be used, and maintenance must be performed by qualified personnel.

Keep the wall brace in good condition by washing and lubricating the threads if dirty, rusty, or exposed to moisture. Lubricate and fully thread them through at least twice per year. Always inspect the product as described in Chapter 4.7.

**Only use original spare parts!**

## HANDLING

To minimize weight, the wall thickness in the product is thin. It can therefore be dented if handled carelessly.

**A broken or damaged product must be replaced or repaired immediately.**

## STORAGE

Maximum longevity is achieved by storing the product clean and protected from moisture. If the wall brace is subjected to moisture it is reasonable to store it standing so moisture can be drained.

During prolonged storage the product is to be protected from corrosion.

## IN CASE OF AN ACCIDENT

In the event of an accident when using Lightweight Push Pull, do the following in this order:

- Prevent personal injuries
- Prevent property damage
- Inform the person in charge on site


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