



JinkO

Tiger Pro Module

— Unloading Manual —



Content

Part 1: Background Information	1
Summary	1
Information	1
Part 2: Unloading Explanation	2
2.1 Module Package Information	2
2.1.1 Single Pallet Definitions	2
2.1.2 Metal Tray Definition	2
2.2 Equipment Choice	3
2.2.1 Forklift	3
2.2.2 Unloading Platform	3
2.3 Operation Process	4

Part 1: Background Information

Summary

Jinko sales regions distribute the PV modules all over the world, and relevant transportation modes can be mainly distinguished between Domestic and Overseas Market. Flat car has been mainly applied for China, while overseas transportation mostly adopts 40HQ container, where the standardized height of the container is 2580mm. (Figure 1)

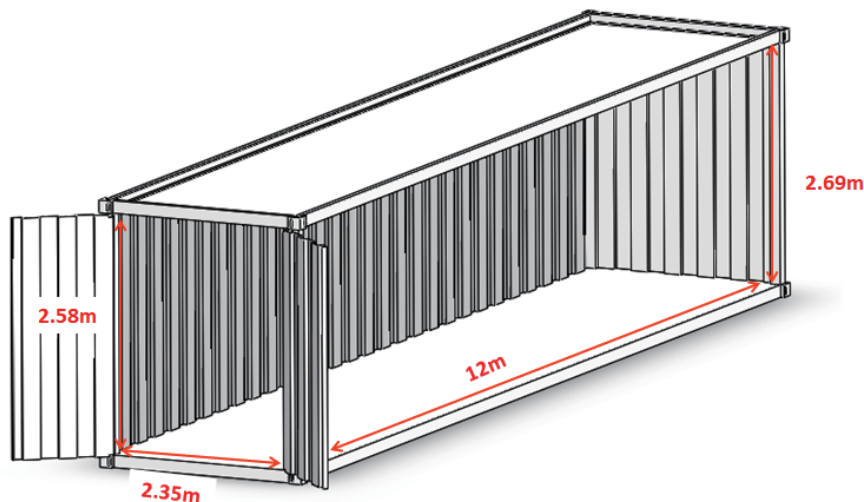


Figure 1. 40HQ Container Size

Tiger Pro series are packed in a conventional mainstream way, which means that the modules are positioned vertically with the short side up and packed in two pallets. In case the stacked height of two pallets exceeds the container height (2580mm), the regular loading cannot be performed.

Tiger Pro module have a width of 1134mm. While considering transportation safety, cost and operation of the module loading and unloading, stacked height of modules achieves 2484mm, which leaves an operational unloading buffer of 96mm. The limitation of operating space requires higher procedure controls and operator ability on product loading and unloading.

This Tiger PRO unloading manual has been developed to standardize the logistic process and to further improve the safety of the complete operation.

Information

- This document only applies to the module type referred earlier, Tiger Pro. It does not apply to other products.
- This document cannot be applied to all geographic scenarios, especially if considering special unloading environment. If in doubt please contact your local Jinko customer service.
- The use of this manual and the conditions of the module installation, operation, and maintenance are beyond Jinko's scope. Jinko is not responsible for any loss, damage, or expense caused by installation, operation, use of O&M.
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Part 2: Unloading Explanation

2.1 Module Package Information

2.1.1 Single Pallet Definitions

- a. Single pallet: It consists of 3 components from bottom to top: tray, module (upper short side method)and carton
- b. Stack-up pallet: 2 single pallet stack up packaging on vertical direction

Table1. Tiger Pro series package size summary

Tiger Pro	Pcs	Tech	Module Size/mm	Container Size/mm
Single-glass	78	TR	2411*1134*35	2441*1125*2484
	72	HC	2274*1134*35	2304*1125*2484
	60	HC	1903*1134*30	1933*1105*2484
Dual-glass	72	HC	2274*1134*30	2304*1125*2484

2.1.2 Metal Tray Definition

For the tray material, Tiger pro series module will use galvanized steel for steel strip.

- a. Tray component: bottom wattle (glued wood), foot pier (compression wood) and steel strip (galvanized steel).

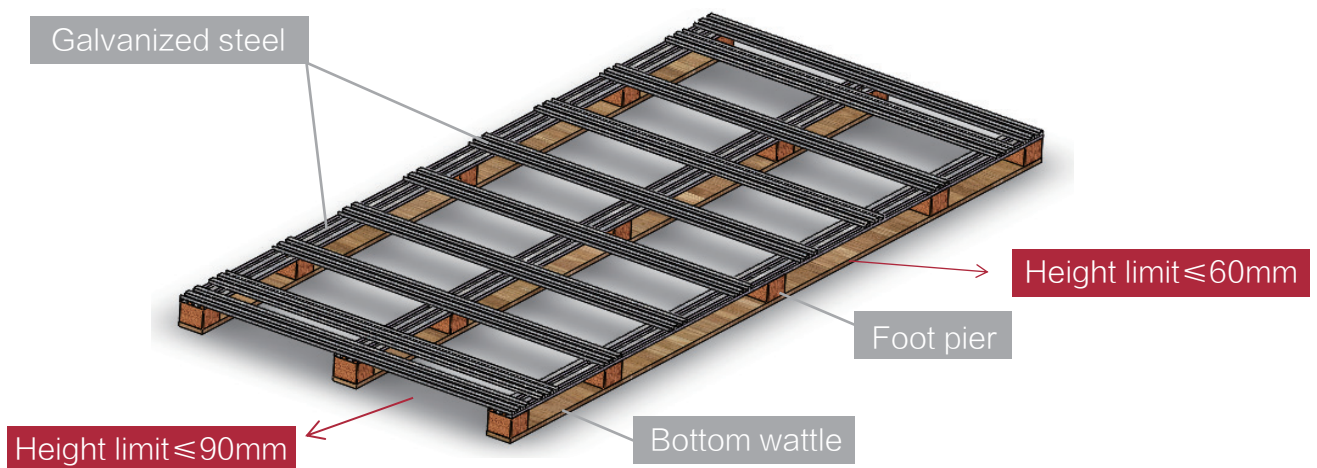


Figure 2. Metal Tray

- b. Tray restrictions: the loading weight should be ≥ 2.5 tons, short side height limit ≤ 90 mm, long side height limit is ≤ 60 mm.

2.2 Equipment Choice

Unloading equipment: Forklift/Unloading platform/Steel Ramp

2.2.1 Forklift

At this stage, the main choices of forklift are electric forklift and LPG forklift.



Figure 3. Forklift types

Requirements for forklift use:

- a. The minimum fork height to the ground should not be above 85mm.
- b. If the fork's thickness is $\leq 85\text{mm}$ ($\geq 60\text{mm}$), the forklift can only lift the pallets on the short side of the cargo. If fork's thickness is $< 60\text{mm}$, the forklift can lift the cargo on both short and long side.
- c. Fork's length requirements may differ depending on the modules type.
 - If the cargo is lifted on the long side, the forks should be longer than 1m.
 - If the cargo is lifted on the short side, when the tray is longer than 2.3m (78P Tiger Pro), the forks should be longer than 1.8m.
 - If the cargo is lifted on short side, when the tray is shorter than 2.3m (60-72P Tiger Pro), the forks should be longer than 1.6m.
- d. The loading weight $> 2.5\text{t}$

2.2.2 Unloading Platform

If unloading process is on the ground , please use a platform.

Platform restrictions:

- a. Platform type.
- b. The height of the platform is required to be kept on the same level with the bottom of the container, and the deviation should be around $\pm 30\text{mm}$.

Unloading on the ground

If the cargo is being unloaded on the flat ground base, please use the steel ramp during the unloading operation.

The horizontal section of the steel ramp should be longer than 5m, and the slope of the inclined section should be around 5 degrees. The steel ramp height should be leveled with container base (If it is standard container, the height of steel ramp should be $156\pm 4\text{mm}$). The loading weight of the steel ramp should be larger than 5 tons.

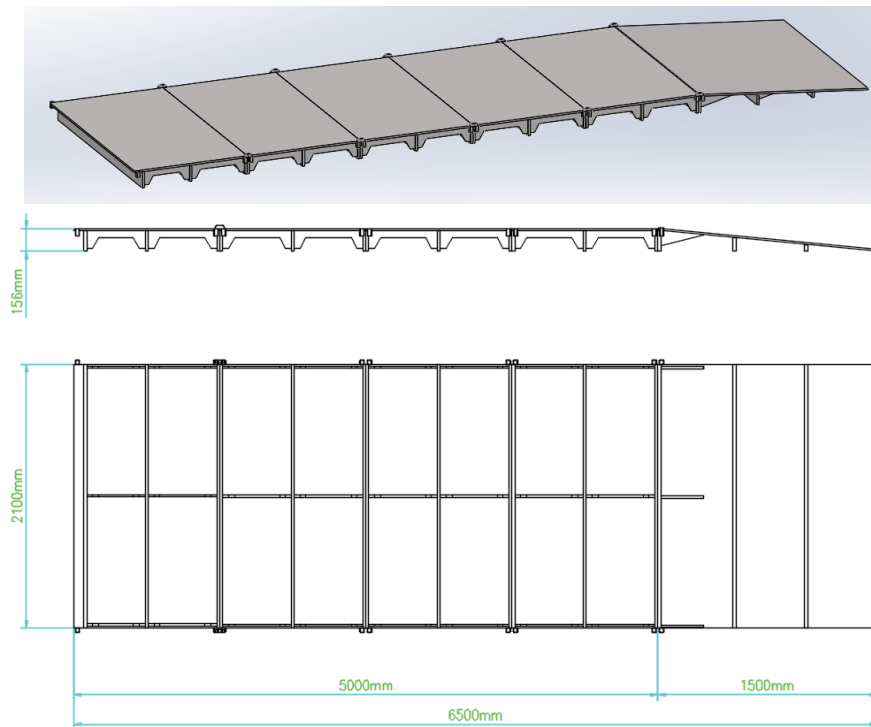


Figure 4. Steel Ramp Design

2.3 Operation Process

- The operator needs to put forks at the lowest height to the ground ; Drive forward until the forks are completely inserted into the pallet, and then lift the cargo of modules slowly by raising the forks slowly.
- Ensure that the height of the pallet, from the ground, is less than 50mm, and maintain the distance ($> 40\text{mm}$) between the top of the module's packages and the container ceiling.
- The forklift drives backward to move the whole pallet of modules slowly out of the container after lifting.
- Once the forklift reaches the entry of the container, slow down to avoid the cargo touching the container ceiling. In case of any risk, adjust the height of the fork immediately.
- This step may occur in the situations when there is a slope at the end of the steel ramp, in this situation the electric forklift cannot transport on the slope. Then the LPG forklift must be used from the other end to unload the modules. When stack up pallet is completely away from the container, pull out the forks from the pallet, replace the electric forklift by the LPG forklift and insert the long side of the pallet to carry the cargo to the target location.