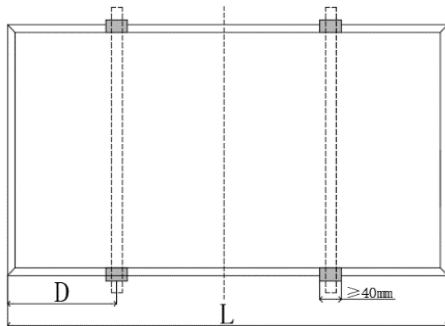


Additional mounting methods (monofacial modules)

Amendment 1 to "20200330 LONGI Solar Installation Manual for PV Modules V5 [..].pdf"

The following methods describe achievable loads to LONGI photovoltaic modules by methods. Pressure (+) indicate push/snow loads while negative pressure (-) indicate pull/wind loads. These static loads are test loads. Required safety factors for systems should be in line with EN 1991-X-X standard series. Outside Europe or if EN 1991-X is not applicable you may use safety factor 1.5 as indicated in IEC 61215-X for system design loads.

Method 1a (4 clamps long frame):



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq L/4 - 50$ | +2.400 -2.400 |
| $L/4 - 50 \leq D \leq L/4 + 50$ (recommended) | +5.400 -2.400 |
| $L/4 + 50 \leq D \leq 625\text{mm}$ | +2.400 -2.400 |

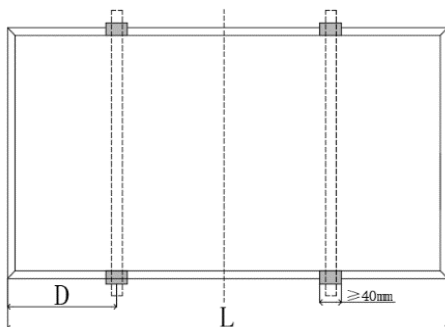
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +1.600 -1.600 |
| $150 \leq D \leq L/4 - 50$ | +2.400 -2.400 |
| $L/4 - 50 \leq D \leq L/4 + 50$ (recommended) | +5.400 -2.400 |
| $L/4 + 50 \leq D \leq 778\text{mm}$ | +2.400 -2.400 |

Applicable for modules

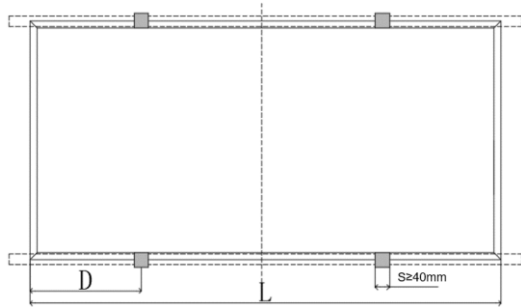
LR6-**72** YYY ZZZ M

YYY = PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 1b (4 clamps long frame):



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq L/4 - 50$ | +2.400 -2.400 |
| $L/4 - 50 \leq D \leq L/4 + 50$ (recommended) | +2.400 -2.400 |
| $L/4 + 50 \leq D \leq 625\text{mm}$ | +2.400 -2.400 |

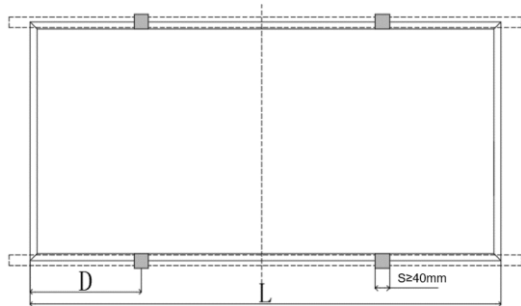
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $150 \leq D \leq L/4 - 50$ | +2.400 -2.400 |
| $L/4 - 50 \leq D \leq L/4 + 50$ (recommended) | +2.400 -2.400 |
| $L/4 + 50 \leq D \leq 778\text{mm}$ | +2.400 -2.400 |

Applicable for modules

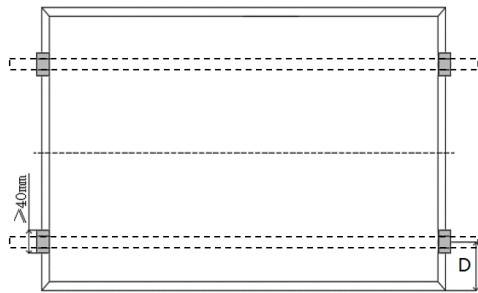
LR6-**72** YYY ZZZ M

YYY = PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 2a (4 clamps short frame):



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +2.400 -1.800 |
| $150 \leq D \leq 250$ (recommended) | +2.400 -2.400 |

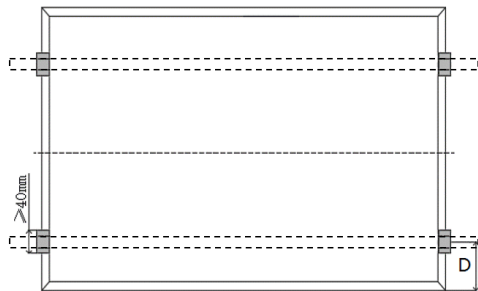
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



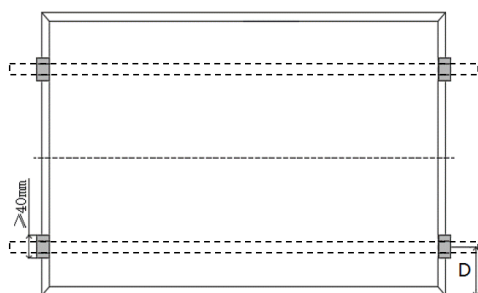
| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +1.200 -1.200 |
| $150 \leq D \leq 250$ (recommended) | +1.200 -1.200 |

Applicable for modules

LR4-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +1.600 -1.600 |
| $150 \leq D \leq 250$ (recommended) | +2.400 -2.400 |

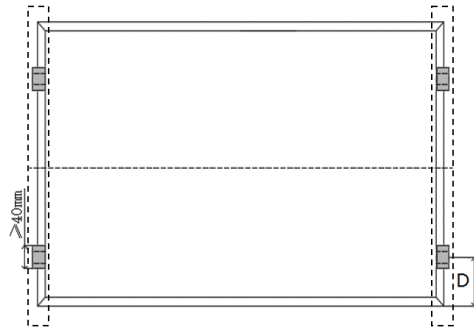
Applicable for modules

LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

Method 2b (4 clamps short frame):



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +2.400 -1.800 |
| $150 \leq D \leq 250$ (recommended) | +2.400 -2.400 |

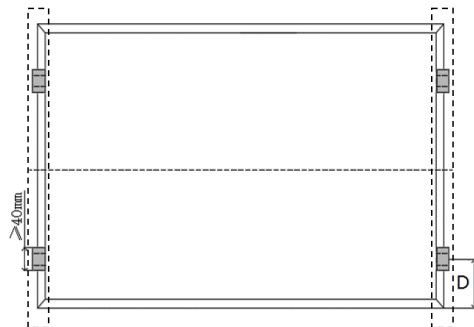
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension D [mm] | Loads [Pa.] |
|--|------------------|
| $20 \leq D \leq 150$ | +1.200 -1.200 |
| $150 \leq D \leq 250$ (recommended) | +1.200 -1.200 |

Applicable for modules

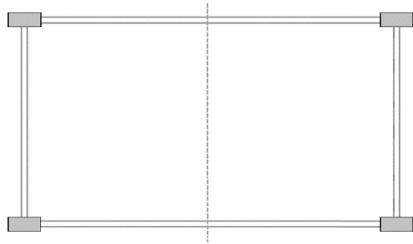
LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 3 (4 clamps long frame edge):



| Dimension D [mm] | Loads [Pa.] |
|-----------------------------|------------------|
| 0 (min. clamp length 100mm) | +2.400 -1.800 |

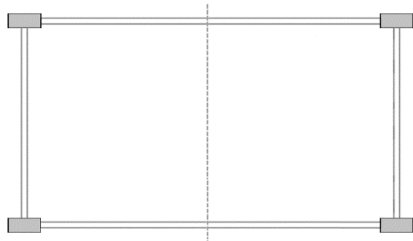
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension D [mm] | Loads [Pa.] |
|-----------------------------|------------------|
| 0 (min. clamp length 100mm) | +1.600 -1.600 |

Applicable for modules

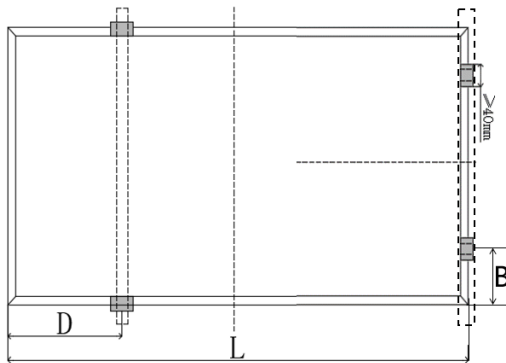
LR6-**72** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 4 (2 clamps each long and short frame):



| Dimension [mm] | D | Dimension B [mm] | Loads [Pa.] |
|-----------------------------|---|-----------------------|------------------|
| $L/4-50 \leq D \leq L/4+50$ | | $150 \leq B \leq 250$ | +2.400 -2.400 |

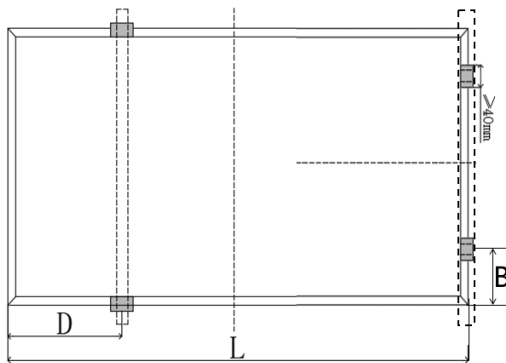
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension [mm] | D | Dimension B [mm] | Loads [Pa.] |
|-----------------------------|---|-----------------------|------------------|
| $L/4-50 \leq D \leq L/4+50$ | | $150 \leq B \leq 250$ | +2.400 -2.400 |

Applicable for modules

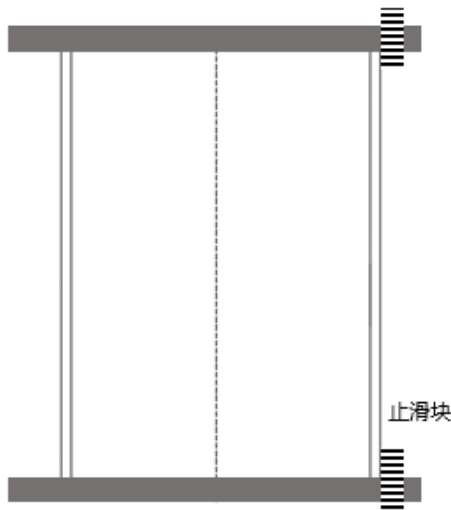
LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 5a (lay in system short frame):



| Dimension D [mm] | Loads [Pa.] |
|---------------------|-------------|
| n/a (lay-in system) | +2.400 |
| | -2.400 |

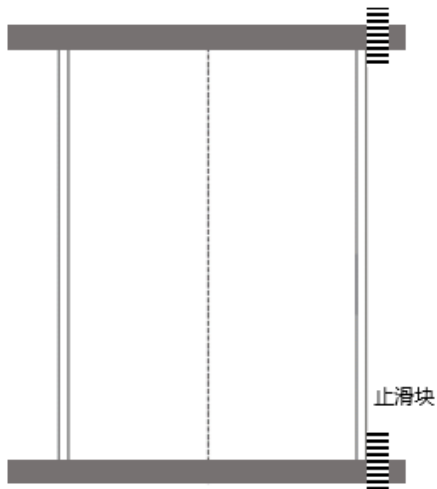
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



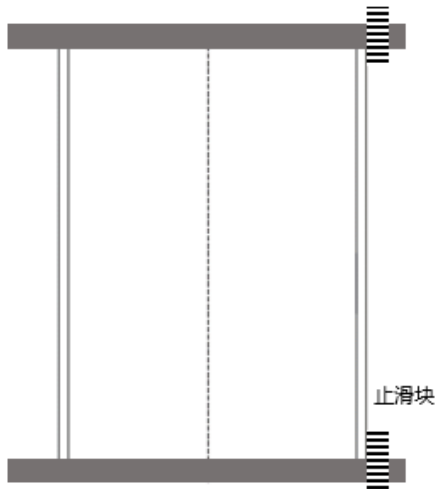
| Dimension D [mm] | Loads [Pa.] |
|---------------------|-------------|
| n/a (lay-in system) | +2.400 |
| (not recommended) | -2.400 |

Applicable for modules

LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power



| Dimension D [mm] | Loads [Pa.] |
|---------------------|-------------|
| n/a (lay-in system) | +1.200 |
| (not recommended) | -1.200 |

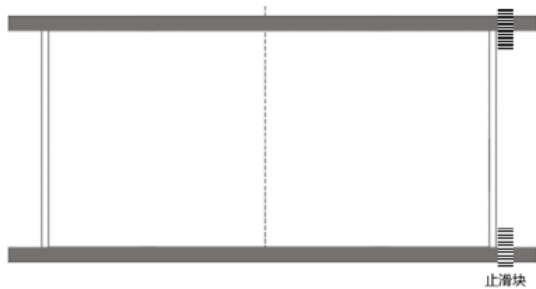
Applicable for modules

LR4-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

Method 5b (lay in system long frame):



| Dimension D [mm] | Loads [Pa.] |
|---------------------|-------------|
| n/a (lay-in system) | +2.400 |
| | -2.400 |

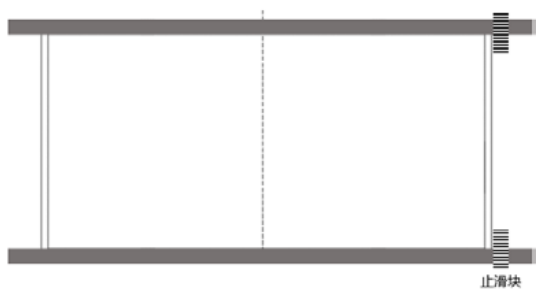
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-**60** YYY ZZZ M



| Dimension D [mm] | Loads [Pa.] |
|---------------------|-------------|
| n/a (lay-in system) | +2.400 |
| | -2.400 |

Applicable for modules

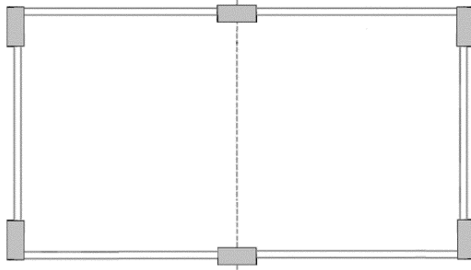
LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Method 6 (six point clamping, 2 clamps each short side corner plus 1 clamps each long center):



| Short Side Clamp [mm] | Long Side Clamp [mm] | Loads [Pa.] |
|-----------------------|-----------------------------|------------------|
| $0 \leq D \leq 250$ | $L/2-50 \leq D \leq L/2+50$ | +3.600 -2.400 |

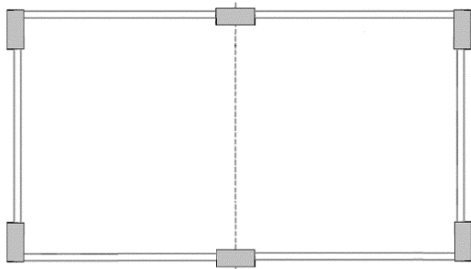
Applicable for modules

LR6-**60** YYY ZZZ M

YYY=PB, PE, PH, HPH, HPB, HIH, HIB

ZZZ=Nominal Power

LR4-60 YYY ZZZ M



| Short Side Clamp [mm] | Long Side Clamp [mm] | Loads [Pa.] |
|-----------------------|-----------------------------|------------------|
| $0 \leq D \leq 250$ | $L/2-50 \leq D \leq L/2+50$ | +2.400 -2.400 |

Applicable for modules

LR6-**72** YYY ZZZ M

YYY=PE, PH, HPH, HIH

ZZZ=Nominal Power

LR4-**72** YYY ZZZ M

Important note for method 6:

Middle support must be clamped / fixed to the PV module frame. A loose middle support is insufficient and would reduce pull forces as described in method 2 to 1.200 Pa.

General Notes:

- **Given loads are test loads the product physically withstands. Design loads are test loads divided by 1.5 (safety factor).**
- **This document applies to glass-foil constructions with 3.2 mm glass only!**
- **For bifacial mounting methods please refer to Amendment 2**
- **Clamp length of minimum 60mm is recommended.**



i.A. Winfried Wahl
Chief Engineer, Head of Product Management