

TRI MO TRIMOTERM

Name of product: Gripper of FTV panels for horizontal façades
Types: PHF (60, 80, 100, 120, 133, 150, 172, 200, 240)



INSTRUCTIONS FOR USE

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INTRODUCTION - GENERAL INFORMATION

Purpose of instructions

The producer of a gripper of FTV panels for horizontal façades has prepared these instructions. A copy of the instructions is always supplied to the buyer together with the device.

The information given is intended for persons that are qualified for the performance of assembly of FTV panels.

The purpose of use, i.e. safe and correct use of the gripper of FTV panels for horizontal façades has been clearly defined in the instructions (hereinafter referred to as the gripper).

In order to facilitate the use the instructions have been divided into separate sections; the use of table of contents is recommended for faster search of separate sections that is printed on page No. 2 of these instructions.

Individual notes or warnings are written in bold print and marked by symbols!



The instructions should be strictly followed. Disregard of these instructions might result in injuries or even death.



Warning about a dangerous situation that might arise during useful life of the product and might represent a potential danger for personnel, property or economic loss...



Important information



It represents useful advice related to use of the device - gripper.

Producer of the gripper:

TRIMO d.o.o., Prijateljjeva cesta 12, 8210 Trebnje, Slovenia.

Identification of the gripper

The basic data about your device are marked on the identification plate fixed on the casing of the device. The following data are stated on it:

- Producer,
- Type of the device,
- Load bearing capacity (max. loading allowed),
- Serial number,
- Year of production.

TRI MO Type: PHF _____ Allowed load: 150 kg Serial number: _____ Year and month: 20__ / __	
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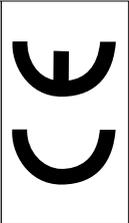
TRI MO Type: PHF _____ Allowed load: 210 kg Serial number: _____ Year and month: 20__ / __	
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Fig. No. 1a: Identification plate for PHF 60-172

Fig. No. 1b: Identification plate for PHF 200 and 240

Interpretation of data stated in the identification plate of the gripper:

- Type PHF _____ : PHF - Gripper of horizontal façade; width of the gripper or panel thickness for which the gripper can be used are stated on the line. Possible width - thickness types are 60, 80, 100, 120, 133, 150, 172, 200 and 240 millimetres.
- The allowed loading has been calculated for panels of max. weight that can still be lifted by the gripper (The fact that panels longer than 2 m should be lifted by two grippers should be taken into account; a panel with max. weight of 300 kg can be lifted and transported by a pair of grippers). With grippers PHF 200 and PHF 240 it is allowed to lift and transfer panels, which do not weigh more than 420 kg. For elements with weight of 300 (420 for FTV 200 and 240) kg and more load bearer with 3 or 4 grippers PHQ has to be used.
- Serial number _____ : the running number of the gripper is stated on the line, e.g.: 001, 002, 003, etc.
- Year and month of production 20__ / __ : The year of production is written on the first line and the month of production is written on the second line; example: gripper produced in August in the year 2002 is marked as: 2002/08.

Marks of grippers

Grippers are manufactured for the assembly of an exactly defined type of FTV panels that differ among each other in thickness. The table shows what kind of gripper is required by the topical variety of FTV panel. Data about the weight of an individual device are stated.

Table No. 1: Marks of gripper regarding panel thickness

	FTV panel (mm)	Mark (type) of the gripper	Gripper weight
1	60	PHF - 60	2.0 kg
2	80	PHF - 80	2.3 kg
3	100	PHF - 100	2.5 kg
4	120	PHF - 120	2.7 kg
5	133	PHF - 133	2.8 kg
6	150	PHF - 150	3.0 kg
7	172	PHF - 172	3.2 kg
8	200	PHF - 200	9.4 kg
9	240	PHF - 240	10.5 kg

DESCRIPTION OF DEVICE - GRIPPER

The gripper is exclusively used as an auxiliary tool **for horizontal assembly of Trimoterm FTV panels**. The use of the gripper for all other purposes is strictly prohibited.

The gripper consists of six components that represent a non-dismountable unit. All load-bearing elements are made of material S355.

Grippers for lifting of panels longer than 2 m are always used in a pair, as shown in Fig. No. 5. By means of its form and force between the latch and the cover that “squeeze” the panel edge the gripper assures safe transport. The gripper cannot be universally used for all types of panel thickness. Each nominal thickness of a panel requires the use of a certain type of a gripper. They differ among each other only in width. Panels with nominal thickness of 60, 80, 100, 120, 133, 150 and 172 mm are used for horizontal façades. From the aspect of force and safety the panel FTV 172 is most suitable for transport of elements since all calculations and tests have been made with the gripper for this type of panel.

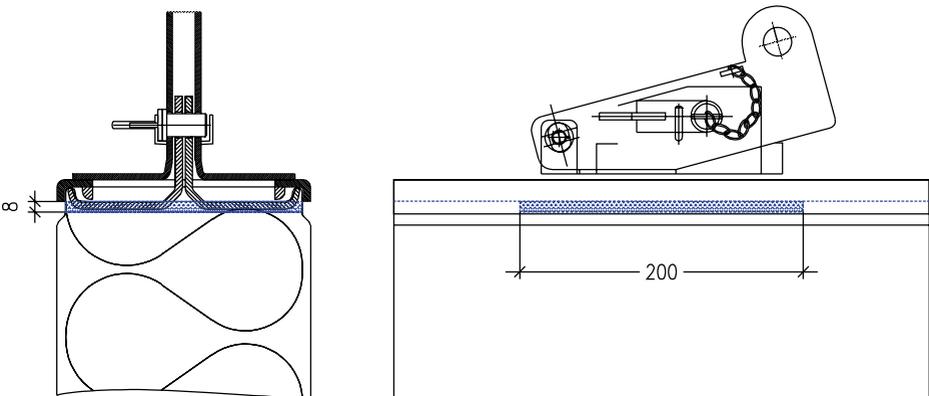
The grippers PHF 200 and PHF 240 have higher load-bearing capacity and for this type of grippers all the calculations and tests have been made.

For elements with weight of 300 (420) kg and more load bearer with more grippers PHF has to be used. For each 150 (210) kg more one gripper has to be added.

System of panel latching is equal in all gripper varieties.

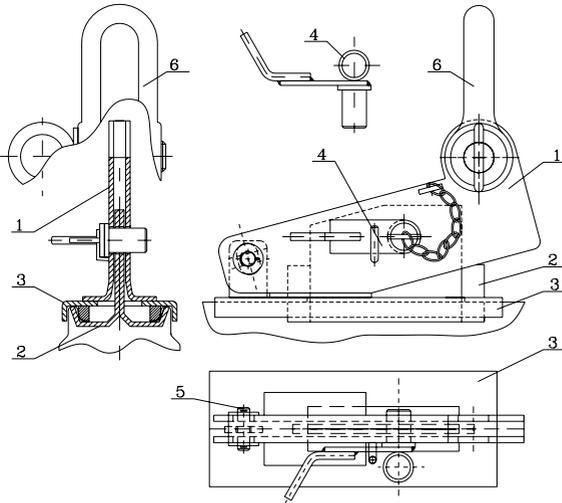
No need for core removal in case of Standard panel with 120 kg/m^3 or lower density core. In case of core with higher density mineral wool removal in gripping area is needed (marked in blue). Fill the gap with mineral wool before placing next panel.

Fig. No. 2: Mineral wool removal in gripping area.



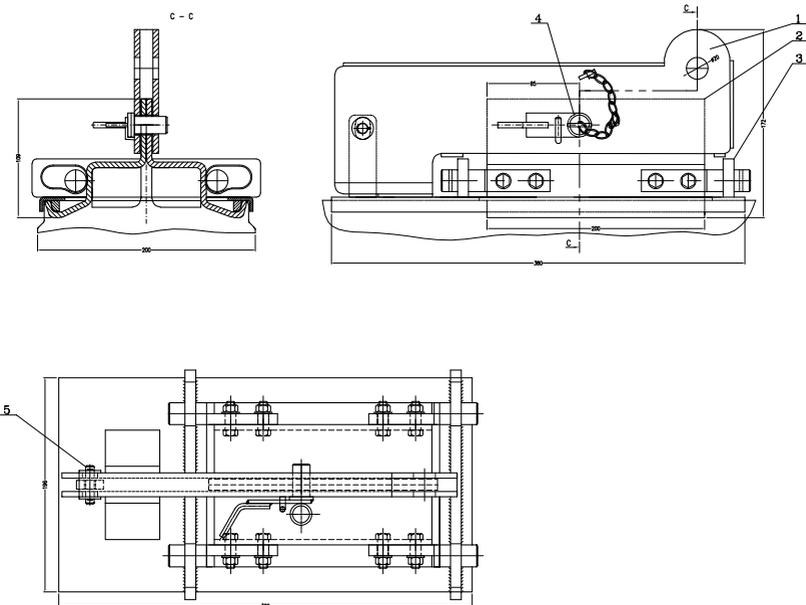
Components of the device

Fig. No. 3a: Components of the device



- Item 1 - Holder of the gripper
- Item 2 - Latch (left + right)
- Item 3 - Cover
- Item 4 - Pin with a protecting device
- Item 5 - Pin with a protecting device
- Item 6 - Lifting element (not a component of the device)

Fig. 3b: PHF 200 /240 component parts



SAFETY CONCEPT

Safety symbols and warnings

Various symbols, whose meaning is explained in the introduction to these introductions for use, are used for the presentation of dangerous situations and consulting in the gripper use. Following of these instructions and advice is of vital importance for safe work with the device.

Safety mechanisms

“Human factor”

The gripper is a mechanical device without any rotating parts. The form of the latch prevents the use not foreseen. A gripper produced exactly for this purpose should be used for the assembly (see panel type and type of gripper in table No. 1). Lifting should not begin until the device is correctly placed on the panel.

System of panel gripping

Panel gripping is assured by the form (by the form of the latch that is placed in the form of the panel sheet metal) and friction between the panel and gripper. The levering system has been planned so that increase in the panel weight lifted increases also the latching force.

The grasping of grippers PHF 200 is provided according to their shape (the shape of a clasp, which fits into the shape of a panel steel sheet) and by rubbing between a panel and a gripper. The distance between the grippers PHF 200 and PHF 240 should make the angle, lower than 80° and higher than 60° (fig. 5).

TRANSPORT AND STORING

Grippers are transported individually and manually, one in each hand. Special attention should be paid during the transport since the device should not be dropped or should not damage feet and/or other parts of the body. When carrying and transporting three or more grippers these are transported in a case or any other packaging. Devices should not get mechanically damaged during the transport. When storing them, grippers are protected against meteorological influences and mechanical damage.

USE



Before use the device should be visually checked. If any mechanical defects are visible, the device should be eliminated from the working process. Any repair or replacement of damaged parts of the device is strictly prohibited.

Obligations of the gripper user

- The gripper can be used only for the purpose, for which the gripper has been produced,
- The use of the gripper is allowed only in compliance with the instructions of the producer,
- User of the gripper should keep records about the use of gripper (Records are in the appendix to these instructions).
- It is not allowed for persons to dwell under the panel when it is being transferred by the grippers PHF.

Loading of the gripper

One gripper PHF can be loaded by max. weight of 150 kg. One gripper PHF 200 and PHF 240 could be loaded by a load, not weighing more than 210 kg. A pair of grippers is always used for transport of panels longer than 2 m.

Allowed length of panels (regarding panel type) that can be transported by a pair of grippers is evident from Table No. 2 and 3: Allowed dimensions - lengths are printed on green background.

The top allowed weight of panel that can be transported by an individual type of gripper is calculated with respect to the type and length of a panel and under consideration of the panel weight per m².

It is visible from Table No. 2 that the gripper - type PHF 172 can be used for transport of panels in a length up to 10.0 m for width 1000 mm. The gripper - type PHF 240 can be used or transport of panels in a length up to 10 m for width 1000 mm. **Elements with weight of 300 (420 for PHF 200/240) kg and more has to be transported by load bearer and additional grippers (3 PHF for 300 - 450 kg, 4 PHF for 450 - 600 kg, ...)**

Table No.2: Weight of panels regarding length and type (steel sheet 0.5/0.5 mm, MW 120 kg/m³, width 1000 mm)

Lenght	FTV 60	FTV 80	FTV 100	FTV 120	FTV 133	FTV 150	FTV 172	FTV 200	FTV 240
2 m	31.6	36.4	41.2	46.0	49.1	53.2	58.6	65.2	74.9
4 m	63.2	72.8	82.4	92.0	98.3	106.4	117.3	130.5	149.7
6 m	94.7	109.2	123.6	138.0	147.4	159.7	175.9	195.7	224.6
8 m	126.3	145.5	164.8	184.0	196.5	212.9	234.5	261.0	299.5
10 m	157.9	181.9	206.0	230.0	245.7	266.1	293.2	326.2	374.3
12 m	189.5	218.3	247.2	276.0	294.8			391.5	
14 m	221.0	254.7	288.4						

Note: Panel weight is stated in kg.

Table No. 2a presents data which might be used in control calculation of the panel weight depending on its length.

Table No. 2a: Weight of individual panel type per m² (steel sheet 0.6/0.6, MW 120 kg/m³, width 1000 mm)

	FTV 60	FTV 80	FTV 100	FTV 120	FTV 133	FTV 150	FTV 172	FTV 200	FTV 240
Weight (kg/m ²)	17.5	19.9	22.3	24.7	26.3	28.3	31.0	34.3	39.1

Table No. 3: Weight of panels regarding length and type (steel sheet 0.8/0.7 mm, MW 140 kg/m³, width 1200 mm)

Lenght	FTV 60	FTV 80	FTV 100	FTV 120	FTV 133	FTV 150	FTV 172	FTV 200	FTV 240
2 m	42.4	48.0	53.6	59.2	62.9	67.6	74.0	92.7	106.2
4 m	84.8	96.0	107.2	118.5	125.8	135.3	147.9	185.5	212.4
6 m	127.2	144.0	160.9	177.7	188.6	202.9	221.9	278.2	318.6
8 m	169.6	192.0	214.5	236.9	251.5	270.6	296.8	370.9	420.0
10 m	212.0	240.0	268.1	296.2					
12 m	254.4	288.1							
14 m	296.8								

Note: Panel weight is stated in kg.

Table No. 3a presents data which might be used in control calculation of the panel weight depending on its length.

Table No. 3a: Weight of individual panel type per m (steel sheet 0.6/0.6, MW 140 kg/m³, width 1200 mm)

	FTV 60	FTV 80	FTV 100	FTV 120	FTV 133	FTV 150	FTV 172	FTV 200	FTV 240
Weight (kg/m ²)	18.6	21.4	24.3	27.1	28.9	31.3	34.4	38.3	43.9



Panels in length types that are marked in the red area of Table No. 2, should not be transported by the 2 grippers discussed. Elements with weight of 300 kg and more has to be transported by load bearer and additional grippers (3 PHF for 300 - 450 kg, 4 PHF for 450 - 600 kg, ...)

Mounting of grippers

First Trimo sealing tape should be cut on a spot touching the gripper in the panel edge and then the latches of grippers (Fig. No. 4) should be placed between the sheet metal faces of the panel. Latches are pressed together, the holder is placed and a pin with a protecting device is inserted in the opening (the pin is inserted in the opening on the side where the load-bearing element for the protecting chain of the pin is fixed). The latches should be turned as it is shown in Fig. No. 5; the distance between the grippers should be such that the angle is smaller than 90°, but not smaller than 60° (Fig. No. 5).

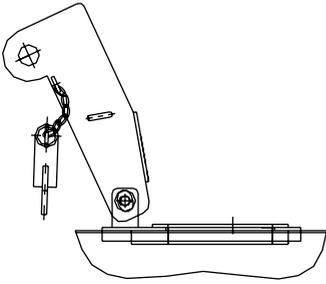


Fig. No. 4: Mounting of a cover

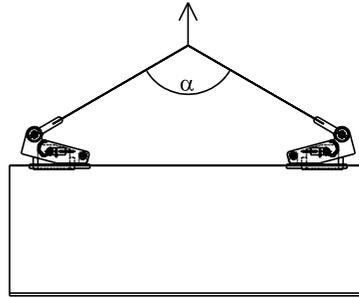


Fig. No. 5: Mounting of a gripper pair PHF

The distance between the grippers PHF 200 and PHF 240 should make the angle, lower than 80° and higher than 60° (fig. 5).

The use of one gripper is exceptionally allowed in cases when panels are not longer than 2 m, but the gripper should be placed so that the centroidal axis runs over the lifting element as it is shown in Fig. No. 6.

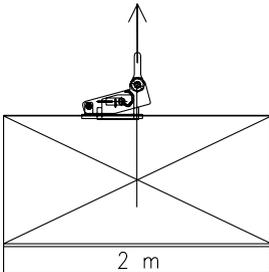


Fig. No. 6: Use in case of panels up to 2 m long

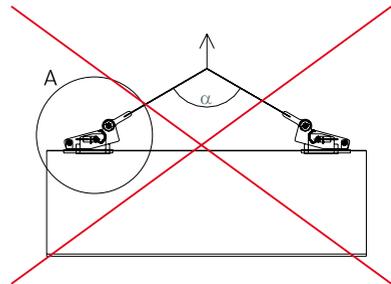


Fig. No. 7: Incorrect mounting of a gripper

Fig. No. 7 presents incorrect fixing of grippers on a panel. The direction of drawing a steel rope should be in direction shown in Fig. No. 8.

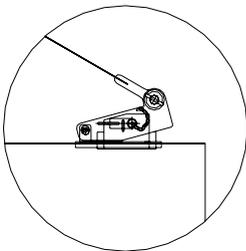


Fig. No. 8: Correct direction of gripper mounting

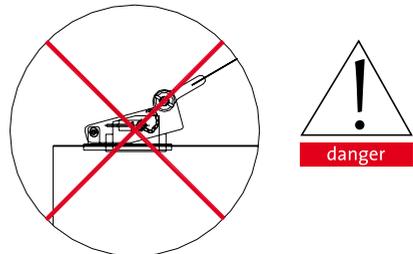


Fig. No. 9: Incorrect mounting (detail A)



Standard elements (steel rope, lifting elements, etc.) are used as elements connecting the lifting device (lift) and gripper that is the subject matter of these instructions. Their characteristics (dimensions, latching systems) should be in compliance with the standards. These elements are not the subject matter of description in these instructions and are not components of the gripper.



Lifting element (Item No. 7) is recommended as a connecting element between the gripper and steel rope as it is presented among components of the device on page No. 6.

Positioning of latches

Fig. No. 10 presents arrangement of latches in the panel edge. The gripper is placed on a panel with a pin drawn out and a holder lifted so that the cover of the gripper can be placed on the panel edge. Latches are inserted in the bearing as it is presented in a small drawing of Fig. No. 10 (it is important that both latches are fixed). The holder of the gripper is placed over a pair of latches (see Fig. No. 10).

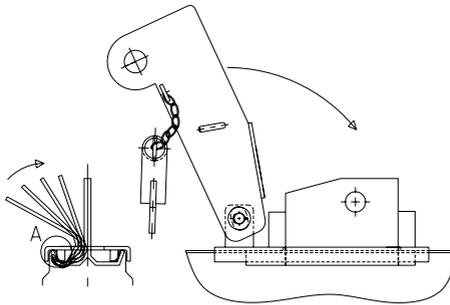
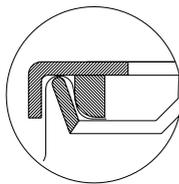


Fig. No. 10: Positioning of latches and gripper holder PHF



Detail A:



A safety pin (Item No. 5) is inserted in the opening between a holder and gripper and turned in the position preventing falling out from the bearing. The pin is inserted from the side where the load-bearing element of the protecting chain of the pin is placed. Any other position of the safety pin is not correct.



Fig. No. 11: Safety pin

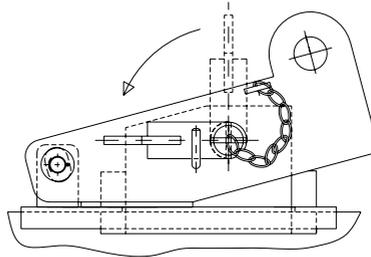


Fig. No. 12: Insertion of a safety pin

Panel lifting

Lifting of a panel should be carried out evenly and without any impact shocks. Thereby attention should be paid that panels at the bottom do not get damaged. Behaviour of the grippers should be monitored during the lifting process and in case of any unforeseen events lifting should be immediately interrupted and mounting of grippers checked again.

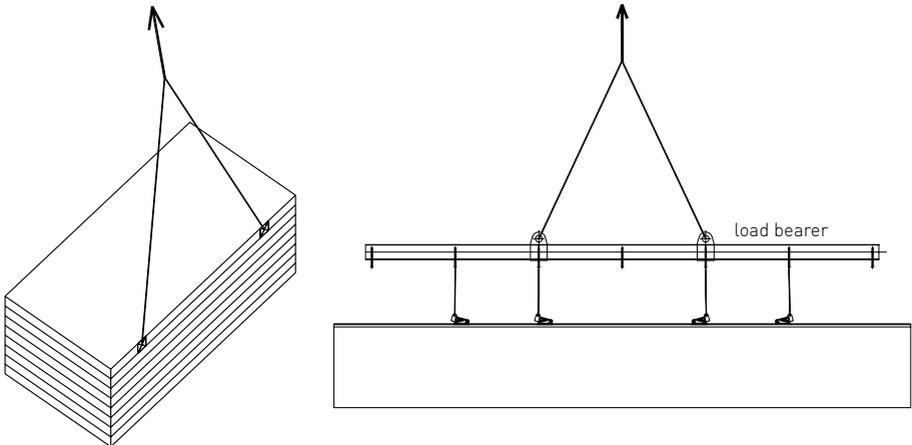


Fig. No. 13: Lifting of a panel from a pallet with gripper or with a load bearer together with 3-4 grippers for FTV elements heavier than 300 (420 kg for FTV 200/240) kg



Use protection gloves when using the gripper. Do not wear loose clothing when using lifting gripper. Check element weight and determine required number of lifting grippers before use. After the grippers have been mounted and before the beginning of lifting all persons should move away and back, safety distance should be kept - danger of panel swinging, function defect.



Elements with weight of 300 kg and more has to be transported by load bearer and additional grippers (3 PHF for 300 - 450 kg, 4 PHQ for 450 - 600 kg, ...). Otherwise the deformation of the joint can occur. Standing under the load is strictly prohibited.



All incorrect matters and dangers shall become evident already at the initial stage of lifting when a part of panel is still on the ground.

Unfastening of grippers

Unfastening of grippers is performed in the opposite sequence as fastening. The gripper is fixed on the load-bearing rope during the complete procedure.

MAINTENANCE

The gripper should be protected against external (weather and mechanical) influences. The gripper that gets very abraded during the use should be protected against the corrosion. Before each use the gripper should be visually checked. If any deformations of the load-bearing elements (safety pin, latches, cover, holder) are observed they should be measured. If they exceed 1 mm, the gripper should be eliminated from use.

Useful life

When the gripper has lifted 10,000 m² FTV panels or after one year of use of the device should be eliminated from use (Records of gripper use). If it is established during daily checking that individual parts are worn and torn and exceed 1 mm over the normal status, the gripper should be eliminated from further use.

Control page

Kind of checking	Kind of activity	Place of checking	Method of performance	Performer	Note
Daily	Control checking of wear and tear	Complete device	Visual	Operator - Connecting person	See Maintenance
Half-yearly	Cleaning, Anti-corrosion protection	Complete device	Visual, anti-corrosion protection if required	Operator - Connecting person	See Maintenance

Appendix No. 1:

RECORD OF GRIPPER USE
(OBLIGATORY USE)

Type of gripper: _____

Serial number: _____

Month and year of production: _____

No.	Date of use		Location	Project	Country	Quantity of built in FTV panels(m ²)	Accepted by (Name and Surname)	Notes
	From	To						
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
19.								
20.								

Note: The gripper can be used for lifting up to 10,000 m² FTV panels or for a period of one year.

DECLARATION OF CONFORMITY

In accordance with the Decree on safety of machines
Official Gazette of the Republic of Slovenia 75/2008, 66/2010

TRIMO d.o.o.
Prijateljjeva cesta 12, 8210 Trebnje, Slovenia

declares with ultimate responsibility that

THE GRIPPER OF FTV PANELS FOR HORIZONTAL FASSADES

Type: PHF (60, 80, 100, 120, 133, 150, 172, 200 and 240)
Date of manufacture: 2011

which this declaration refers to, complies with the requirements of the

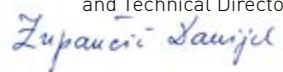
- Decree on safety of machines, Official Gazette of the Republic of Slovenia No. 75/2008, 66/2010 (MD 2006/42/ES),
- SIST EN ISO 12100:2011,
- SIST DIN 15018-1:1996; SIST EN 13155:2004+A2:2009; SIST EN 1993

NOTE:

Gripper for horizontal facade FTV is designed for lifting and carrying
FTV elements thickness of 60, 80, 100, 120, 133, 150, 172, 200 and 240 mm.

Date and place:
Trebnje, November, 2011

Person in charge:
Danijel Zupančič, MSc
Deputy Managing Director
and Technical Director



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