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INSTALLATION MANUAL



OBEX MODULAR TERMINAL 5M TERMINAL CLASS T50

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ANNEX

Configuration drawings list:

- Drawing n°43 MT 5M-750 (2wave beam)
- · Drawing $n^{\circ}57 MT 5M-840$ (3wave beam)
- Drawing **n°421** MT 5M-750 on plinth (2wave beam)
- Drawing **n°422** MT 5M-840 on plinth (3wave beam)
- Drawing **n°232** MT 5M-750 on socket (2wave beam)
- · Drawing n°233 MT 5M-840 on socket (3wave beam)
- Drawing n°420 MT 5M-750 on concrete foundation (2wave beam)
- · Drawing **n°328** MT 5M-840 on concrete foundation (3wave beam)



1. Scope

The purpose of this manual is to provide the user of the device "OBEX Modular Terminal 5M-750 (2wave version) & 5M-840 (3wave version)", the main information needed for the correct installation and use of the device.

For more technical information, see configuration **drawing 43 (2wave version)** and **drawing 57 (3wave version)**

The function of this terminal is to provide adequate protection to the start and end sections of road safety barriers. In other words, anchor and properly terminate guardrail to meet the requirements of **prEN 1317 Part 7**.











2. Safety Issues

2.1. Safety Compliance

All work shall comply with the following:

- Health and Safety regulations.
- Project specific Site Safety requirements including inductions given by the Main Contractor.

2.2. Safety Management

All site operatives should be experienced in the installation of safety barriers. The nominated Site Manager and Installation Supervisor will ensure safe working practices are adhered to by installers during the duration of any on-site work.

2.3. Safety Training

All installers are to comply with relevant Site Safety Procedures as specified by the Main Contractor. All Plant operators should be trained and certified in the safe operation and use of the equipment they are utilising.

2.4. Personal Protective Equipment (PPE)

All personnel will wear the correct PPE for the task they are carrying out. High Visibility clothing, Safety Footwear and Hard Hats will be worn as a matter of course.

2.5. Safety on Site

All personnel will be given a copy of Method Statement and associated Risk Assessments prior to commencement of work.

2.6. Vehicle Access

Clear vehicular access must be provided for delivery trucks to load/unload material and for personnel vehicles to access the work site.

2.7. Other Operatives

No other trades should have access to work areas where installers are constructing the OBEX terminal unless otherwise agreed.



3. Part list

3.1. 2wave version list

ITEM	DRW N°	CODE	DESCRIPTION	MATERIAL	QTY
1	45	10.00045	ELEMENT A H=750 mm TH. 4,00 mm	S235 JR	1
2	51	10.00051	ELEMENT C H=750 mm TH. 4,00 mm	S235 JR	2
3	52	10.00052	ELEMENT D H=480 mm TH. 4,00 mm	S235 JR	2
4	46	11.00046	PROFILE HE100A L=1400 mm	S275 JR	1
5	85	11.00085	PROFILE HE100A L=650 mm	S275 JR	1
6	44	10.00044	PROFILE L85x65 TH. 4,00 mm L=700 mm	S235 JR	2
7	56	31.00056	WIRE ROPE Ønom 16 L=1645 mm [5M] WITH n°2 HEX. NUT ISO 4032 - M24 - 8	Steel	1
8	95	10.00095	PLATE 90x50 mm TH. 5 mm	S235 JR	2
9	88	10.00088	CONNECTION TERMINAL FOR 2 WAVES BEAM	S275 JR	1
10		21.00145	HH SCREW ISO 4017 - M16 x 45 - 8.8	8.8	37
11		24.00118	THREADED BAR M16x200 4.6	4.6	2
12		22.00146	HEX. NUT ISO 4032 - M16 - 8	8	41
13		23.00147	WASHER ISO 7089 - 16 - 200 HV	200 HV	74

NOTE:

- 1. All steel parts are galvanized in according to ISO 1461.
- 2. All bolts are galvanized in according to ISO 10684



3.2. 3wave version list

ITEM	DRW N°	CODE	DESCRIPTION	MATERIAL	QTY
1	49	10.00049	ELEMENT A H=840 mm TH. 4,00 mm	S235 JR	1
2	50	10.00050	ELEMENT B H=840 mm TH. 4,00 mm	S235 JR	1
3	51	10.00051	ELEMENT C H=750 mm TH. 4,00 mm	S235 JR	1
4	52	10.00052	ELEMENT D H=480 mm TH. 4,00 mm	S235 JR	2
5	54	11.00054	PROFILE HE100A L=1500 mm	S275 JR	1
6	85	11.00085	PROFILE HE100A L=650 mm	S275 JR	1
7	48	10.00048	PROFILE L85x65 TH. 4,00 mm L=790 mm	S235 JR	2
8	56	31.00056	WIRE ROPE Ønom 16 L=1645 mm [5M] WITH n°2 HEX. NUT ISO 4032 - M24 - 8		1
9	95	10.00095	PLATE 90x50 mm TH. 5 mm	S235 JR	2
10	89	10.00089	CONNECTION TERMINAL FOR 3 WAVES BEAM	S275 JR	1
11		21.00145	HH SCREW ISO 4017 - M16 x 45 - 8.8	8.8	41
12		24.00118	THREADED BAR M16x200 4.6	4.6	2
13		22.00146	HEX. NUT ISO 4032 - M16 - 8	8	45
14		23.00147	WASHER ISO 7089 - 16 - 200 HV	200 HV	82

NOTE:

1. All steel parts are galvanized in according to ISO 1461.

2. All bolts are galvanized in according to ISO 10684



4. View of principal elements













Elements for only 3wave version

5. Preparation

5.1. Preliminary phases

Before beginning construction, the contractor should get all available site information about the location of installation in regard to **underground services and the line of existing cables, pipes, wires etc.** Installation cannot proceed unless the installer is satisfied that underground services are not present or are rediverted in accordance with relevant permission and instructions of the service authorities. The installer must satisfy himself that no other obstacles or hazards exist prior to digging or driving posts. All installation work must be undertaken with the provision of appropriate traffic management for the location in accordance with relevant standards and local authority requirements.

The system can be pre-assembled off site or assembled locally.

Prior to installation, the installation team **must be in possession of this manual, all necessary drawings and are suitably trained** for the installation. The installation contractor must also make sure that the use of the product is appropriate for its location and that **it can be correctly connected to the adjoining guardrail** as intended.

5.2. Tools required for installation

- CE marked tape measure
- Spirit level
- Post driver (HE100 mask)
- Chalk line
- Marking paint
- Torque wrench
- Spanners
- Podge bars
- Push / pull apparatus with current calibration certification

5.3. Bolt and torque

The bolt used to assemble the terminal are M16 and M24(only for the rope). Tighten bolts M16 at 70 $_{\pm 20}$ Nm.

Don't tighten the threaded the cable rope to torque. The rope should be tightened until taut.

5.4. Ground Conditions.

OBEX MT T50 should be supported in firm ground appropriate for the anchorage of guardrail systems. A push test is recommended if there is a concern about the capacity of the ground. Apply 8000N to the H post at 0.75m from the ground level and measure the deflection value. If the deflection is less or equal to 75mm at 0.75 m from the ground level, the soil consistency is deemed acceptable. If the deflection is higher, option of localised compaction or the use of concrete foundations should be considered.

6. Installation Procedure

NOTE: this procedure describes the installation of 2wave version terminal. For 3wave version review the system drawing and component list to identify the requirement for a 3 wave connector plate and elements (item 10) together with items A & B and a 1500mm HE100A post.

6.1. Prepare the soil

- 6.1.1. Level and clean the installation area, removing any objects or rocks that could hinder the installation.
- 6.1.2. Mark the ground for the entire length of the device. Use a rope line for proper alignment with the guardrail. Make sure that the distance to the carriageway is in accordance with regulations and specifications
- 6.1.3. If necessary the ground should be made up, compacted and levelled

6.2. Position the first post

6.2.1. Install the 2wave terminal

6.2.2. Temporarily assemble the profile L on first module

6.2.3. Install the threaded bar M16x200 on post HE L=1400 mm

6.2.4. Position the first module aligned on the 2wave terminal. Use the profile L on the module to position the post HE. Mark the position and remove the first module

6.2.5. Drive the post into the ground using a suitable VRS driving machine.

6.2.6. Install the threaded bar M16x200 on post HE L=650 mm (like before) 6.2.7. Drive the second post into the ground.

6.3. Assembly the first module

6.3.1. Disassemble the L profile to the first module and fix to the first HE post.

6.3.2. Fix the first and the second module to the L profile

6.3.3. Fix the first module to the 2wave terminal with M16x45 bolted inwards as shown.

6.4. Connecting the modules

- 6.4.1. Connecting the remaining modules as show below in the following sequence:
 - 2 no. 750mm high modules (ITEM 2)
 - 2 no. 480mm high modules (ITEM 3)

6.5. Fix the rope

6.5.1. Slide the rope from the last module to the first through the large diameter holes (in the image below the modules are hidden for clarity)

6.5.2. Fix the eye bolt to the HE post

6.5.3. Fix the threaded extremity to the HE post (in the image below the modules are hidden for clarity)

6.5.4. Check the rope is stretched & taut. Tighten the nut on the threaded bar until the rope is fully stretched. It is however unnecessary to achieve a torque measurement.

A upward vertical pull by hand should not result in a movement at this location. Should a gap appear between the rope and the first hole, it is likely that the rope needs additional tightening.

6.6. Final operations

- 6.6.1. After completing the assembly, carry out a full inspection to make sure that all dimensional requirements conform to the system drawings. Make sure that the alignment of the terminal is to line and level and properly connected to the guardrail that it is terminating.
- 6.6.2. Apply the self-adhesive reflective label to the front plate. Make sure the label is level and centred on the end plate. Note that 3 Labels are available to facilitate left, right & central applications

7. Alternative installations

7.1. Terminal with post cast in concrete plinth

Concrete foundations are suitable where the ground integrity is deemed to be insufficient for the performance needs of the system.

- The foundations should be a minimum 500 \times 500 mm and start 150 mm from soil surface
- For more technical data see **drawing 421 (2wave version)** and **drawing 422 (3wave version)**

7.2. Terminal on socket

- Cast the steel socket in the concrete foundation and fix the HE post with a threaded M16 bar.
- For more technical data, see drawing 232 (2wave version) and drawing 233 (3wave version)

7.3. Terminal on concrete surface mounted

- Surface mounted posts are available for mounting on concrete plinths. Fix the elements directly on concrete with chemical or mechanical anchors.
- For this configuration it is not necessary to use sliding profiles.
- For more technical data, see drawing 420 (2wave version) and drawing 328 (3wave version)

8. Installation criteria

The following options represent typical configurations that can be considered by designer's subject to local requirements and risk assessments.

8.1. Two ways traffic direction - single side safety barrier

8.2. One-way traffic direction - single side safety barrier

VIEW C

8.3. Two ways traffic direction - double side safety barrier

8.4. One-way traffic direction - double side safety barrier

8.5. Terminal on double side safety barrier

8.6. Terminal on new jersey double side

8.7. Terminal on new jersey single side

9. Routine Inspection and Maintenance

It is recommended that a visual inspection of the terminal is carried out during routine inspections and at minimum every 12 months.

9.1. Guidance for Inspection

To ensure the terminal is complete and in good order check for:

- Absence or looseness of bolts or nuts.
- Check alignement in realtion to the ground profile and check that the cable is taut.
- Remove any accumulation of debris and dirt inside the modules.

9.2. Accident Damage Inspection

For many impacts it is expected that a number of components can be reused. A visual inspection should be undertaken and any component that has been distorted due to impact must be replaced.

- As a basic principle, all parts showing permanent plastic deformation have to be replaced. Special care must be taken to carry out an inspection of the wire rope and should any damage be visible it must be replaced.
- All welding on the U profiles should also be examined for damage.
- All fixings at the area of vehicle impact should be replaced regardless of the condition for safety.
- If the distortion on energy absorbing modules does not exceed a tolerance of 10 mm compared to the original shape it is acceptable that it does not require replacing.
- A visual inspection of the posts will identify if they or if the ground support has been damaged by vehicle impact. It is recommended to compact the ground locally around any posts that have been impacted if there is any doubt about the integrity of the soil.

If in any doubt contact OBEX who can offer immediate technical support.

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Disclaimer: OBEX Systsems Limited take no liability for the performance of the system in the case of poor ground conditions and incorrect installation. The system is an integral part of road furniture to protect road users and under no circumstances should an installation deviate from these instructions without prior approval from the OBEX technical department.