



**PAMEC**  
Concrete pumping & placing systems

**CONCRETE PLACEMENT BOOM**

**BVR 12C/N - 55M**

**SERIAL NUMBER: 18 H 01**

**Instruction Manual**

**PAMEC S.r.l. - 66054 VASTO - Italia - Z.I. Punta Penna**  
Tel.: +39.0873.310000 - Fax: +39.0873.311787 - E-mail: [info@pamec.com](mailto:info@pamec.com)





## REGULATIONS

***EN ISO 12100-1***

Security of machinery  
Basic concepts, general design principles  
Part 1: Basic terminology and practice

***EN ISO 12100-2***

Security of machinery  
Basic concepts and general design principles  
Part 2: Specifications and technical principles

***EN ISO 13850***

Security of machinery  
Emergency shut down equipment, functional aspects  
Design standards

***EN 60204-1***

Security in the use of machinery  
Electrical equipment in machinery

***UNI EN 12001***

Conveying, spraying and placing machines for concrete and mortar  
Safety requirements



## SAFETY MEASURES

These safety measures are those adopted by PAMEC during the design stage and those adopted by the user, in respect of regulation **EN ISO 12100-2**

### SAFETY MEASURES ADOPTED BY THE DESIGNER

REDUCTION OF RISK THROUGH THE DESIGN	PROTECTIONS	OPERATING INSTRUCTIONS	ADDITIONAL PRECAUTIONS
<i>EN ISO 12100-2</i>	<i>EN ISO 12100-2</i>	<i>EN ISO 12100-2</i>	<i>EN ISO 12100-2</i>

PERSONAL MEANS OF PROTECTION	TRAINING PROCEDURES SUPERVISION
------------------------------	---------------------------------

### SAFETY MEASURES ADOPTED BY THE USER

In respect of the guidelines laid down in the Regulation **EN ISO 12100-2**, the project for the concrete placement boom was developed in the following phases:

- specification of the limits concerning the use of the concrete placement boom
- identification of the dangers and evaluation of the risks
- elimination of the dangers and limitation of the risks
- design of safety guards and other safety devices against possible risks still present
- information for the user regarding possible risks still present (operational instructions)
- identification of any supplementary precautions
- identification of individual protective devices which are the responsibility of the user.

### Ergonomics

The principles of ergonomics were followed during the design phase of the concrete placement boom which has contributed to increasing safety, and the reduction of stress and physical effort for the operator; thus improving the effectiveness and reliability of its operation and so also reducing the possibility of making mistakes during all phases of the use of the machinery.

### Interface operator-concrete placement boom

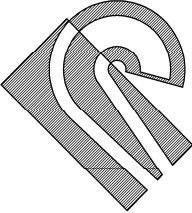
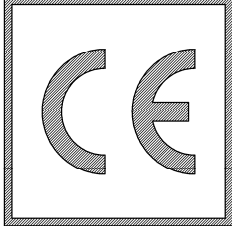
All the elements of the interface operator-concrete placement boom, such as the command controls and the devices for the indication or visualisation of data, have been designed so as to guarantee a clear and unambiguous interaction between the operator and the boom.

### Reliability

In the concrete placement boom, components of renown reliability have been used for the command systems, the security functions and all other aspects.



## IDENTITY TAG

		<b>PAMEC</b> VASTO (CH) - Italia			
Modello Model	<input type="text"/> <b>1</b>				
N° Matr. Serial N°	<input type="text"/> <b>2</b>		Anno Year	<input type="text"/> <b>3</b>	
Peso Kg Weight Kg	<input type="text"/> <b>4</b>				
Power Kw Potenza Kw	<input type="text"/> <b>5</b>		Voltage V Voltaggio V	<input type="text"/> <b>6</b>	
P. max Bar Max P. Bar	<input type="text"/> <b>9</b>				
Fasi Phases	<input type="text"/> <b>7</b>		Frequency Hz Frequenza Hz	<input type="text"/> <b>8</b>	

Item	DESCRIPTION
<b>1</b>	<b>MODEL:</b> description
<b>2</b>	<b>SERIAL N°:</b> serial number of the boom
<b>3</b>	<b>YEAR:</b> year of manufacture of the boom
<b>4</b>	<b>WEIGHT:</b> weight of the boom
<b>5</b>	<b>POWER:</b> installed power
<b>6</b>	<b>VOLTAGE:</b> voltage allowed
<b>7</b>	<b>PHASES:</b> phases of the electric motor
<b>8</b>	<b>FREQUENCY:</b> frequency allowed
<b>9</b>	<b>MAX P.</b> max OIL pressure



## GUARANTEE

PAMEC srl guarantees its products for any possible production faults that might render them no longer suitable for the purpose for which they were designed.

PAMEC srl undertakes, strictly at its own discretion, to provide for the substitution, repair, or modification of the parts shown to have production faults, providing that the following conditions are respected:

- The Purchaser must give PAMEC srl a detailed written report of any production defects found, within 8 days of the discovery.
- The Purchaser must send the parts or sections of the product considered to be defective, to the PAMEC srl factory, without incurring any expenses or costs whatsoever for PAMEC srl.
- The guarantee is valid for 12 months from the date of delivery of the products to which the previous paragraphs refer.
- The following are excluded from the guarantee: expendable material, parts subject to normal wear and tear, and electrical components.
- The guarantee does not apply in cases where the products present damage deriving from one of the following causes:
  - \* Negligence regarding transport, protection and conservation, that is, insufficient or negligent maintenance of the products.
  - \* Assembly or use of the products ignoring the instructions and warnings given by PAMEC srl.
  - \* Carelessness, negligence, lack of skill of the persons carrying out the assembly or using the products.
- The Purchaser will lose his guarantee rights if he should, without prior written authority from PAMEC srl, modify or otherwise alter the products.
- PAMEC srl declines all responsibility for possible damage to persons or things caused by the improper use of the equipment.  
Damages resulting from a shut down of an operational unit are not included in the guarantee.



## Index

**1** Introduction

**2** Transport and disposal

**3** Operation

**4** Safety

**5** Maintenance

**6** Lubrication

**7** Annexes







# 1

## Introduction

- 1.1 Preliminary recommendations
- 1.2 Overall drawing
- 1.3 Working area
- 1.4 Counterweight drawing
- 1.5 Loads and Moments
- 1.6 Technical data
- 1.7 Description and terminology



## 1.1 Preliminary recommendations



### **WARNING!**

In order to ensure correct functioning and to obtain the best possible results, we strongly advise reading carefully all parts of this manual before beginning any practical trials.



### **WARNING!**

Do not operate this equipment until all the instructions have been read and understood, including the warnings contained in this manual and in the documentation that comes with the technical kit.  
Failure to respect the instructions and warnings could cause very serious accidents.

All rights reserved by PAMEC srl.

The reproduction in whole or in part of text, of sketches and designs is expressly forbidden without the prior authorisation in writing by the manufacturer.

PAMEC srl may, at any time, modify the technical and operational characteristics described in this manual and in the technical manuals supplied in the kit accompanying the machinery.

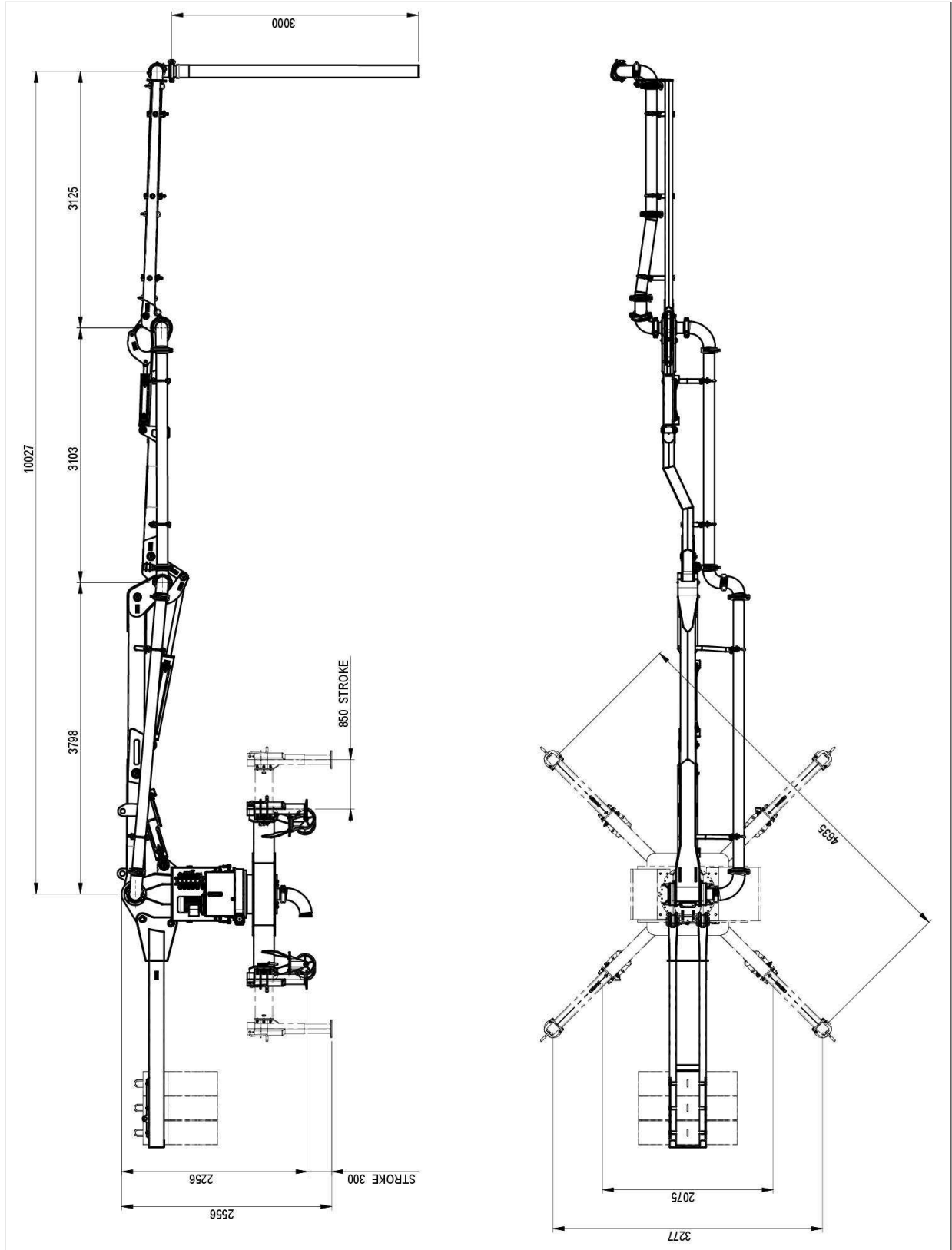
For all communications with PAMEC srl, always quote the data set out on the machine identity tag.

This manual is made up of :

- **N° 51 Pages**

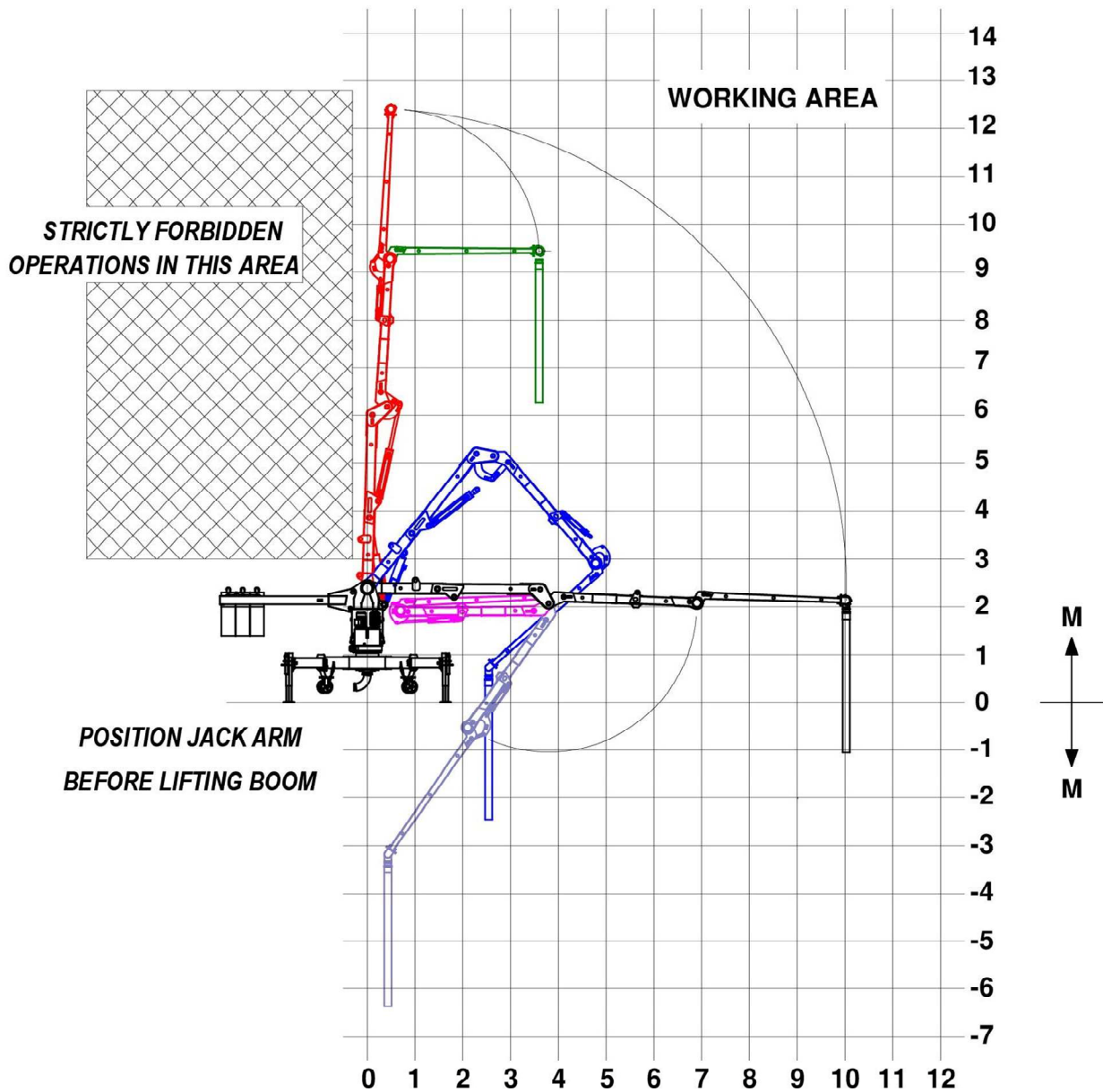


## 1.2 Overall drawing





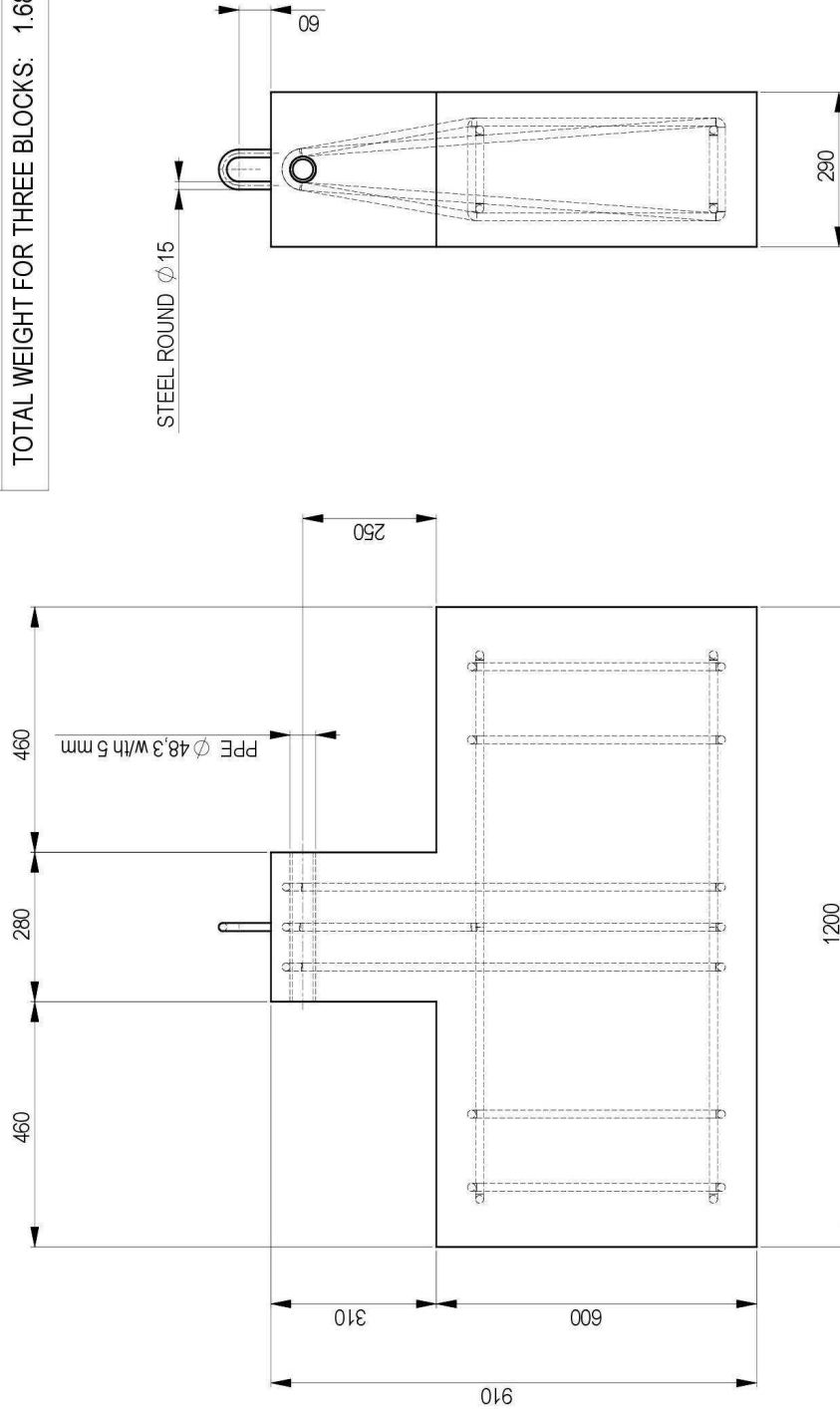
# 1.3 Working Area





# 1.4 Counterweight drawing

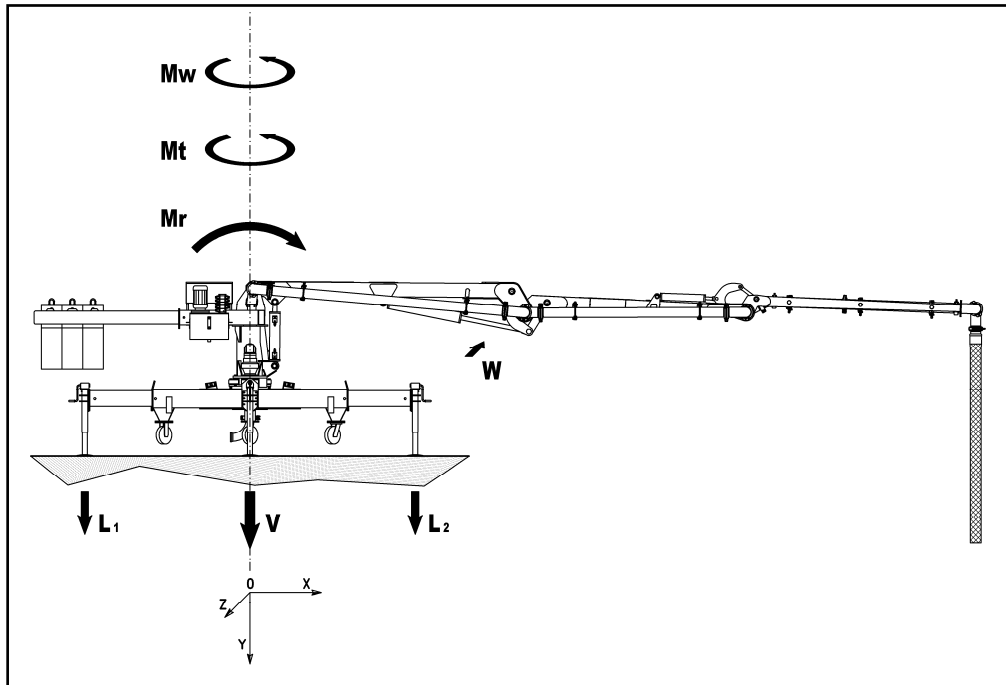
BLOCK VOLUME:	0,234	m <sup>3</sup>
SPECIFIC WEIGHT:	2.400	kg/m <sup>3</sup>
BLOCK WEIGHT:	560	kg
TOTAL WEIGHT FOR THREE BLOCKS: 1.680 kg		



BVR.N12551-2



## 1.5 Loads and moments



MAX LOADS AND MOMENTS ACCORDING TO **DIN 24117**

$V$	(vertical load):	5889 daN
$L1 \text{ min}$	(vertical load at outrigger):	454 daN
$L2 \text{ max}$	(vertical load at outrigger):	2491 daN
$W$	(wind force):	130 daN
$Mr$	(overturning moment):	+5200/-4750 daNm
$Mt$	(torque moment):	300 daNm
$Mw$	(wind moment):	498 daNm

### WARNING!

THE MAX WORKING WIND SPEED FOR THE CONCRETE BOOM IS 72 km/hr (**25 Kg/m<sup>2</sup>**)  
A WIND SPEEDMETER NEEDS TO BE PLACED AT THE TOP OF THE CLIMBING FORMWORK IN ORDER TO CHECK THE WIND SPEED DATA **AT THE OPERATING WORKING HEIGHT.**

WHEN SPEED WIND INCREASE OVER 15% OF THE MAXIMUM WORKING ONE (20 m/sec = 72 km/hr), IT IS ADVISABLE TO CLOSE THE BOOM **IN THE NOT WORKING POSITION. (THREE ARMS CLOSED AND IN VERTICAL POSITION)**



## 1.6 Technical data

### *Dimensions and space occupied by the boom*

---

Height	2,408 <i>m</i>
Width	2,388 <i>m</i>
Length	7,000 <i>m</i>

### *Weight and loads*

---

Weight of complete boom	3105 <i>daN</i>
Counterweight	1648 <i>daN</i>
Total weight	4753 <i>daN</i>
Total weight at each jack arm	2491 <i>daN</i>

### *Technical data for the basic set up*

---

Electric power	380/44 0 <i>V</i>
Three-phase + neutral + earth	
Frequency	50/60 <i>Hz</i>
Power of the electric motor	4 <i>kW</i>

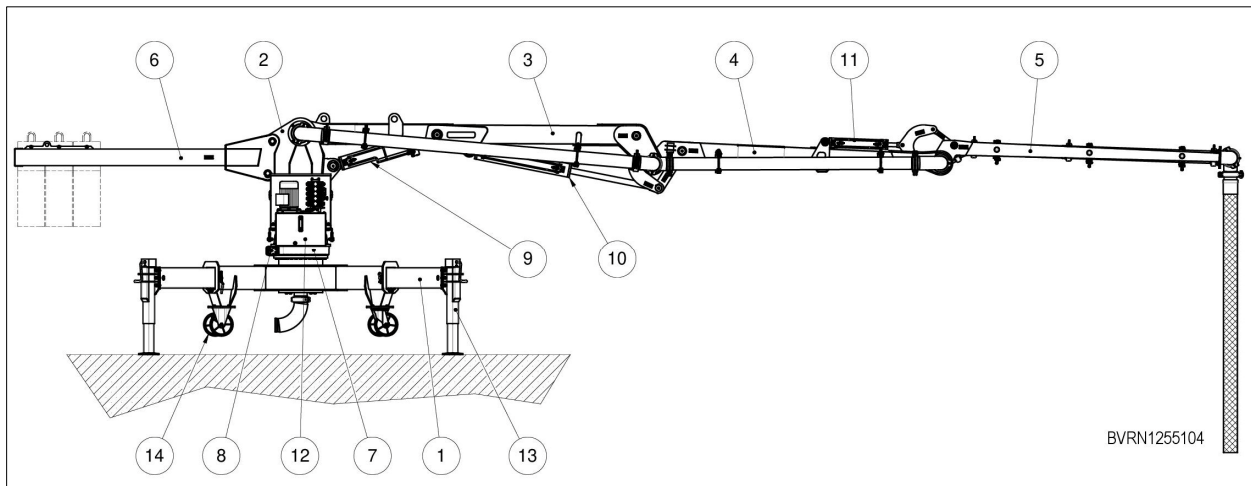
### *Technical data for the hydraulic power pack*

---

Oil flow	8.7 <i>lit/min.</i>
Maximum pressure	245 <i>bar</i>



## 1.7 Description and terminology



**NOTE:** the following names for the various assembly components are given to make it easier to understand safety warnings and operation and maintenance instructions for the concrete boom

The concrete placement boom **BVR 12 C/N** is made up of the following parts:

- **BASE UNIT (No. 1) and accessories**

The base unit is made of a robust metal structure complete with telescopic jack arms fitted with outriggers (**No. 13**) which can be adjusted vertically to allow for a perfectly horizontal disposition of the base unit itself.

The base unit is also fitted with four wheels (**No. 14**) so that the equipment can be moved when not in operation and with the boom in the closed position.

- **TURRET (No.2) and accessories**

Forming an integral part with the motorized thrust bearing, the turret serves as the support to which the boom is hinged.

The counterweight support (**No. 6**) is attached to the other end of the boom, whereas the rotating assembly is positioned on the lower part.

The rotating connection between the base unit and the turret (on which the three arms hinge making up the articulated boom) is achieved with a serrated motorized thrust bearing (**No. 7**) on a vertical rotation axle.

The motorized thrust bearing is fixed between the base unit and turret, and it is moved by a hydraulic motor (**No. 8**).

To protect the power cable for the electrical panel, two limit switches have been incorporated, which restrict the rotation to an angle of about 353°, thus preventing continuous rotation of the turret which would lead to the cable becoming entangled.

Further mechanical stops come into play should the electrical switches fail.





## 1.7 Description and terminology

- **ARMS – PIPE SUPPORT (No. 3,4 and 5) and accessories**

The three arms are made up essentially of robust metal structures which are hinged together. All the respective movements are effected by connecting rods moved by hydraulic cylinders. They are completed by the pipeline supports  
The whole boom is hinged to the rotating turret.

- **COUNTERWEIGHT SUPPORT (No. 6) and accessories**

The counterweight support is made up essentially of a robust metal structure connected to the turret.  
The mounting of the pins is facilitated by special seats formed in the upper part of the carpentry.

- **Piping**

The tube transporting the concrete, held up by the supporting structure of the arm, is articulated in connection with the axles themselves. This articulation is obtained with special connecting joints which allow for the reciprocal rotation between the two pipes which are connected.

This distributor is fitted with pipes DN125 - thickness of 4mm – Ø125/148 mm collars

The max length of the rubber hose is 3 m

Pipes of other diameters and thickness cannot be used.

- **Hydraulic system**

The hydraulic power pack (**No. 12**) and the valve bank are connected to the turret, and serve to control both the rotation assembly and the arm cylinders.

All the hydraulic cylinders (**No. 9, 10 and 11**) are fitted with safety valves which regulate the speed of the cylinder action and which, as well, intervene automatically if a break in the oil pipes should occur, locking the movement of the cylinders in question.

The thrust bearing (**No. 7**) is provided with a multiple disk brake with negative action, with the hydraulic opening commanded by oil under pressure sent to the hydraulic motor.

The three arms making up the boom which supports the tube carrying the concrete have, in the closed position, the form of a "z". This set up enables the distributor to cover the maximum work area and to arrive at points of delivery out of reach with the distributor arms in other positions.

The movement of the three arms takes place on a vertical plane and is obtained for the first arm by a hydraulic cylinder which connects the turret with the arm itself, making an angle of about 90°.

For the second and third arms, the movement is, as before, obtained with hydraulic cylinders. The movement is amplified by a system of connecting rods which make angles of about 200° in both cases.

- **Electrical equipment**

The electrical panel is installed on the turret. All the commands for the movement of the boom and the command to stop the hydraulic panel are affected from a push-button panel. The electrical panel contains the line switch, the start switch for the hydraulic panel and an emergency stop switch. The power supply must be 440±10V - 60 Hz.





## 2

## Transport and disposal

**2.1** Transport and movement

**2.2** Disposal

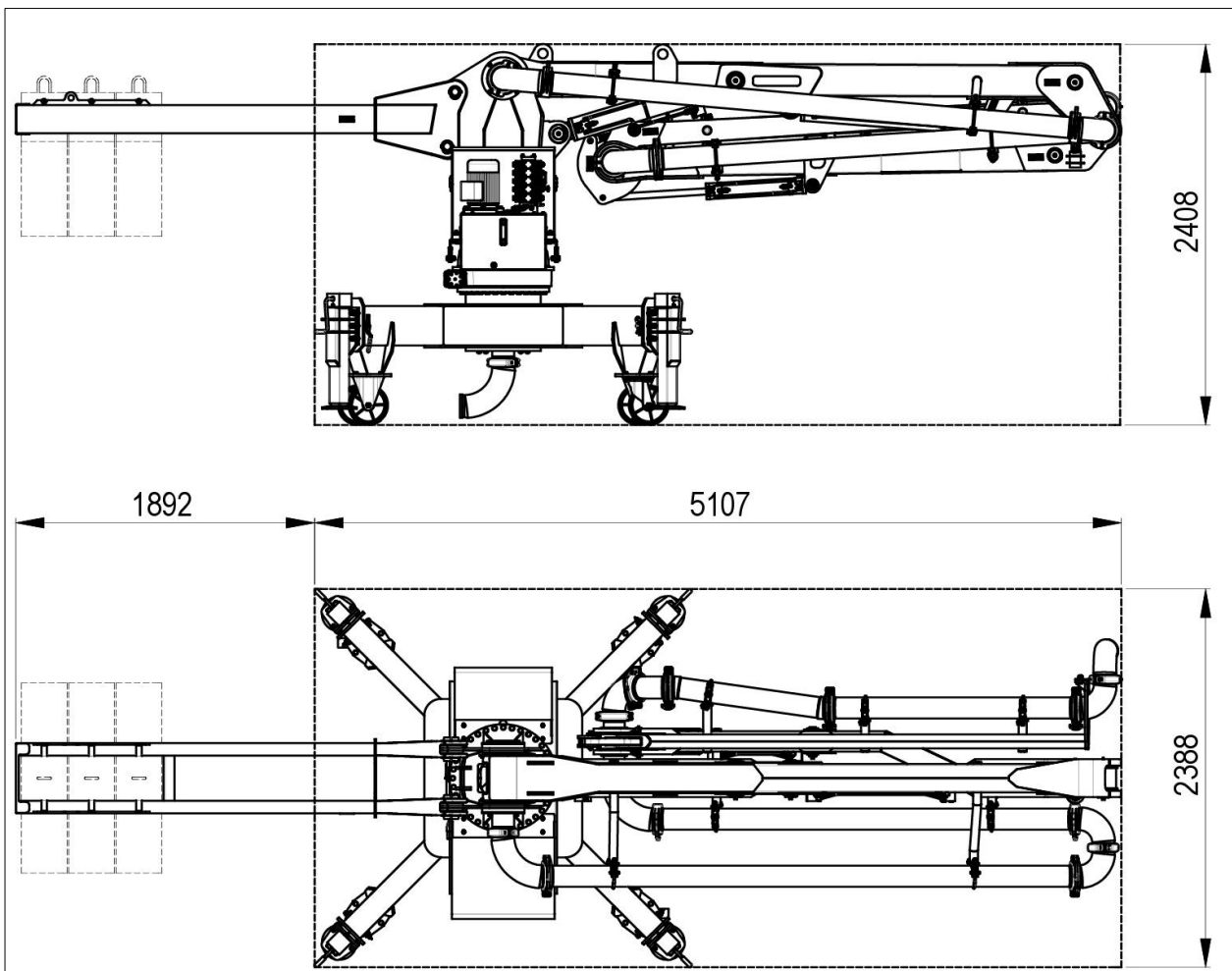


## 2.1 Transport and movement

The concrete placement boom must be transported assembled (except for the counterweights, not supplied) with the boom in a horizontal and **closed** position, with the jack arms positioned **inwards** resting on the four outriggers adjusted to a low position and resting on a trestle placed under the boom.

As well, the machinery must be well secured to the means of transport so as to avoid damage, especially during braking.

**WARNING:** during transportation the rubber hose must be disassembled.





## 2.2

## Disposal

If it is necessary to eliminate the concrete placement boom, it must be disposed of in suitable dumps, bearing in mind current legislation.

Used oils must be disposed of at the collection points for this purpose.  
The material in the concrete placement boom is classified as follows:

- **Structure of the boom**
  - Steel (AC)
  - Polyamides (PA)
  - Rubber
  
- **Electric motor**
  - Aluminium (AL)
  - Steel (AC)
  - Copper (CU)
  - Polyamides (PA)





## 3

## Operation

- 3.1 Preliminary warning
- 3.2 Installation
- 3.3 Operating instructions
- 3.4 Emergencies



## 3.1

## Preliminary warning



### **WARNING!**

**Do not allow non-authorized personnel into the work area when the equipment is in operation**





## 3.2 Installation

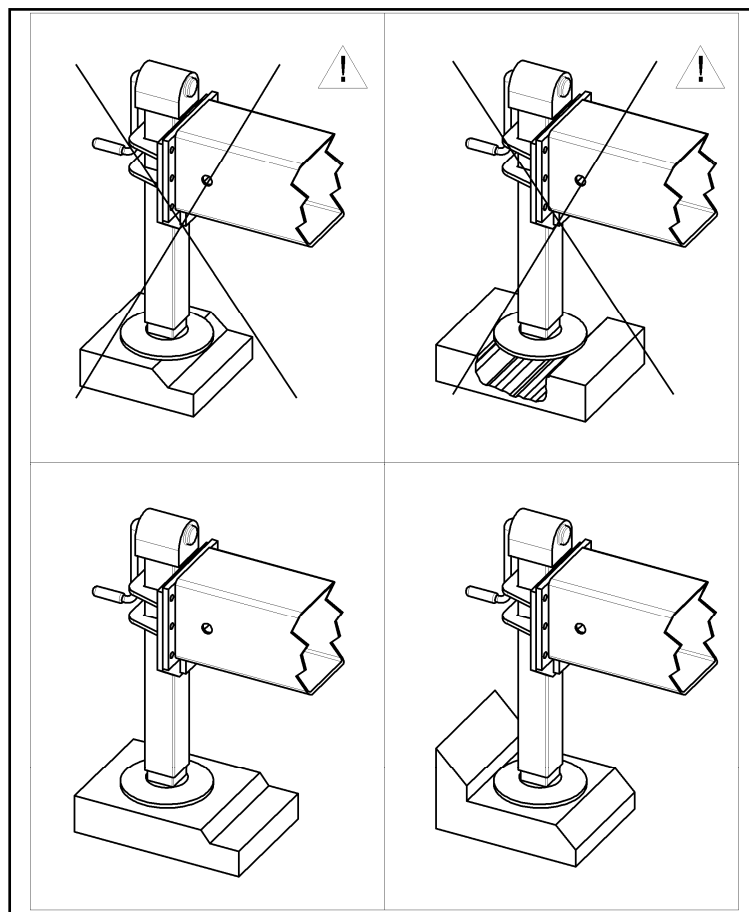
Check that the underlying surface for the concrete placement boom is level and able to support a vertical load of **2.491 daN** at each outrigger.

Unload the boom from its transport with the three arms closed and without the counterweight in place.

Before placing it on the work surface, spread the four telescopic jack arms as far as possible and fix them in this position with the fastening pins for this purpose.

Using the adjustable outriggers, establish the height of the base unit so that the entrance elbow the concrete, mounted under the base unit, is kept 50-70 mm above the ground, controlling at the same time that the base unit is horizontal making use of a spirit level, which should rest on the top panel of the base unit itself.

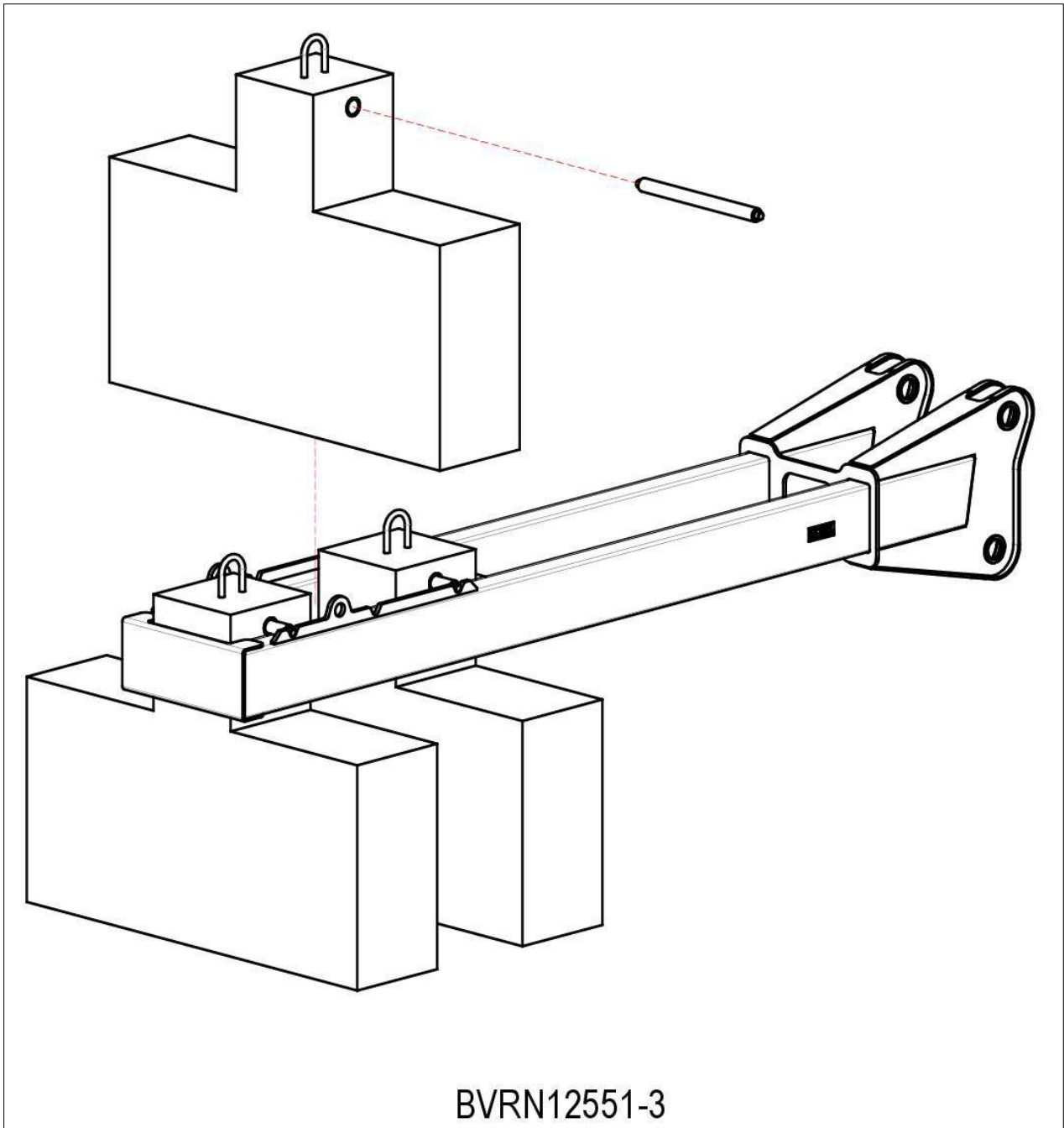
Mount the three counterweights as set out in drawing making use of the three pins provided with the boom, as supports.





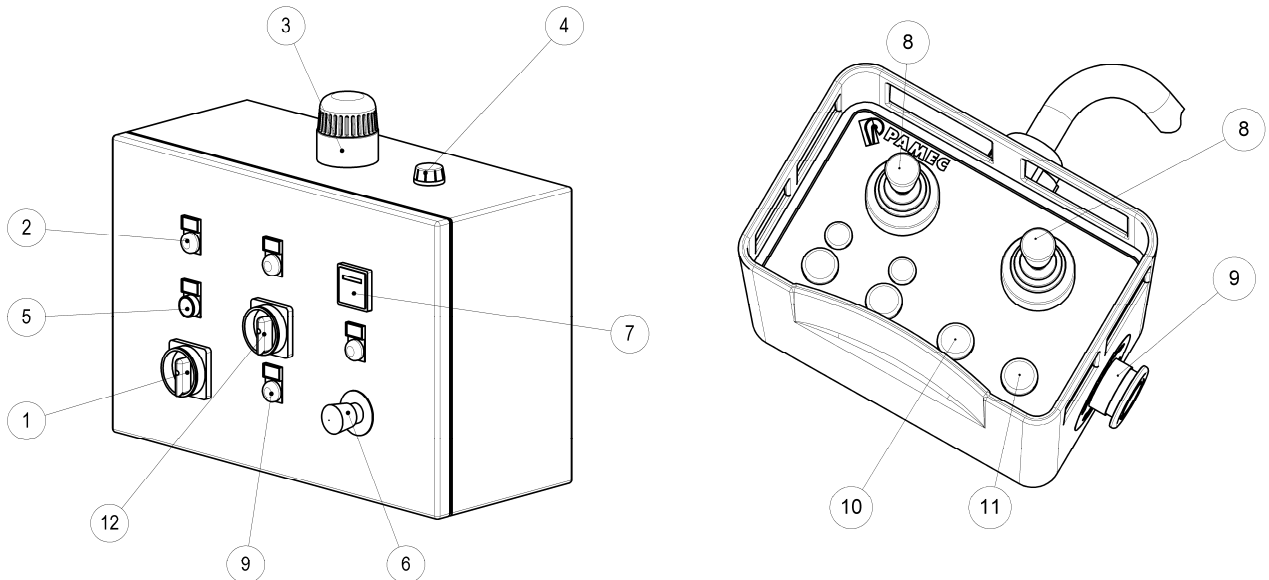
## 3.2

## Installation





### 3.3 Operating instructions



<i>Item</i>	<i>Description</i>
<b>1</b>	LINE SWITCH
<b>2</b>	“CURRENT PRESENT” LIGHT
<b>3</b>	FLASHING LIGHT
<b>4</b>	LED BUZZER
<b>5</b>	EMERGENCIES RESET
<b>6</b>	POWER PACK STOP BUTTON/EMERGENCIES
<b>7</b>	TIME METER
<b>8</b>	JOYSTICKS
<b>9</b>	POWER PACK STOP BUTTON/EMERGENCIES
<b>10</b>	POWER PACK ON
<b>11</b>	POWER PACK OFF

**WARNING: PO. 8,9,10 AND 11 ONLY FOR STANDARD VERSION EQUIPPED BY REMOTE CONTROL CABLE**



### 3.3 Operating instructions

To start and operate the boom under normal conditions, the following steps must be affected:

<i>ITEM</i>	<i>WHERE</i>	<i>ACTION</i>
<b>CONNECTION TO THE LINE</b>	PANELBOARD	turn the main switch in ' <b>ON</b> ' position All is OK if the white light remain ON
<b>RIGHT PHASE</b>	PANELBOARD	turn the commutator in ' <b>1</b> ' o ' <b>2</b> ' positions. All is OK if the red light remain ON
<b>POWER RADIO REMOTE CONTROL</b>	REMOTE CONTROL	push the green button <b>ON/HORN</b> located on remote control.
<b>EMERGENCIES RESET</b>	PANELBOARD	push the blue button located on panelboard All is OK if the light remain ON.
<b>POWER PACK READY</b>	REMOTE CONTROL	push the green button <b>ON/HORN</b> located on remote control. The remote control is ready to start.

When the work is ended:

<i>ITEM</i>	<i>WHERE</i>	<i>ACTION</i>
<b>SHUT DOWN</b>	PANELBOARD	push the red mushroom-shaped button
	PANELBOARD	turn the main switch in ' <b>OFF</b> ' position. All is OK if the white light is off.



## 3.4 Emergencies

If during normal operation it should prove necessary to bring movements of the boom to an immediate halt, the red mushroom-shaped button on the command panel must be pushed, or alternatively the red stop-button on the remote control must be pressed.

The actions described above will cause a break in power supply to the electric motor of the hydraulic panel, with a consequent stoppage of all movement. In this emergency situation, only the indicator light showing the presence of current will be lit.

After removing the cause of the emergency intervention, reactivate the normal functioning of the equipment by using the following procedure:

<i>ITEM</i>	<i>WHERE</i>	<i>ACTION</i>
<b>RELEASE MUSHROOM SHAPED BUTTON</b>	PANELBOARD REMOTE CONTROL	on the command panel, reactivate the button by turning it in the direction of the arrow shown on it.
<b>POWER RADIO REMOTE CONTROL</b>	REMOTE CONTROL	push the green button <b>ON/HORN</b> located on remote control.
<b>EMERGENCIES RESET</b>	PANELBOARD	push the blue button located on electrical cabinet. All is OK if the light remain on.
<b>POWER PACK READY</b>	REMOTE CONTROL	push the green button <b>ON/HORN</b> located on radio remote control.





## 4

## Safety

- 4.1 General information
- 4.2 Safety devices
- 4.3 Danger to being crushed
- 4.4 Stability of the machine
- 4.5 Safety signs
- 4.6 Description of safety signs



## 4.1

## General Informations



### **WARNING!**

#### **IMPORTANT SAFETY INFORMATION!**

Failure to follow the instructions and take basic precautions may cause accidents during operation, maintenance and repair of the machine.

An accident can often be avoided by recognising the potentially dangerous situation before the accident happens.

The operator must pay the greatest attention to all the potential dangers and possess the necessary competence and tools to carry out his work correctly.

Safety precautions and warnings are set out in this manual and on the concrete distributor.

If attention is not given to these danger warnings, the operator may cause accidents with serious consequences for himself and others.

Structural damage, modifications, alterations or incorrect repairs, may modify the built-in capacity for protection of the concrete distributor, and will thus make this warranty void.

PAMEC srl cannot foresee every possible circumstance which might involve a potential danger. The warnings contained in this publication and on the concrete placement boom are thus not exhaustive.

If tools, procedures or methods of operation are used that are not explicitly suggested by PAMEC srl, it will be necessary to ensure that these do not hamper the correct and safe functioning of the machine.

Furthermore, it is necessary to ensure that the boom has not been damaged or made unsafe due to incorrect methods of operation, lubrication, maintenance or repair.





## 4.2 Safety Devices

### Emergency buttons

The electric panel and the remote control are fitted with a mushroom-shaped emergency button. This is a mechanical device which causes the immediate opening of all the auxiliary circuits and the complete stop all movements of the concrete placement boom.

Eliminating the cause of the stop does not lead to an automatic re-start of the boom itself. In order to re-activate the boom it is necessary to repeat the start up procedure, checking first that all the protective devices have been activated and reset.

As well the remote control panel has an emergency stop button which can be used to stop the machine at any time by shutting down the electric motor of the power pack.

### Other protection

The joysticks that connect the three arms and the rotation are interconnected and interdependent so as to avoid ambiguity regarding the command given. The joysticks related to a specific movement make it impossible to select moving the opposite movement.

The turret is fitted with two limit switches which prevent it from making a complete rotation of more than 353°.

If during normal functioning there should occur a problem of power overload with the electric motor of the hydraulic control panel, the heat sensor will intervene and this will cause the motor to stop and the system to close down.

On the command panel, the indicator showing the presence of current remains alight, whereas the indicator of current present on the button panel is turned off, and the button panel is disabled.

The concrete placement boom is fitted with a protective crank case placed around the crown gear of the rotation section of the turret. This crankcase stops the operator from having direct access to the moving parts.



## 4.3 Danger of being crushed



All parts of the machine have been designed, constructed and set up so as to avoid risk.

As well, the moving parts are equipped with protective devices to prevent any risk of contact that might cause injury to the operator.

The concrete placement boom in fact is fitted with valves to control the speed of movement of the boom arms and to prevent the arms from falling if a break in the hydraulic pipelines should occur.



## 4.4

## Stability of the machine



The machine, including its parts and equipment, has been designed and constructed so that, under the operating conditions envisaged, it can be operated without the risk of its turning over, falling or making any other sudden movement.

However an incorrect installation of the concrete placement boom, and in particular of the counterweight and of the support base, may not guarantee sufficient stability.

In order to eliminate this problem, the section regarding **Installation (3.2)** contains instructions concerning the assembly of the machine together with explanations regarding the relative means of support and attachment.



## 4.5

## Safety signs



### **ATTENTION!**

Various safety signs are present on the concrete placement boom itself.

This section of the manual describes their meaning and exact location.

The operator is invited to dedicate the necessary time to become familiar with these safety symbols.


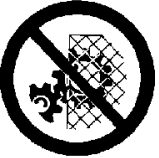




Ensure that all the safety symbols can be read. Clean them and replace them if the texts and figures can no longer be seen properly. Clean the signs using a cloth dampened with soapy water. Do not use solvents, petrol etc.

Signs that are damaged, missing or difficult to read should be replaced.

Where necessary, ask PAMEC srl for new signs or for information regarding the correct use of these.



## 4.6 Descriptions Safety signs

Sign	Meaning	Location
	<b>Danger:</b> <i>Electric current - 440±10 Volt.</i>	Command panel cover
	<b>It is strictly forbidden</b> <i>to remove safety devices.</i>	Protective casing thrust-bearing and pinion
	<b>Warning:</b> <i>Pressurised concrete placing system.</i>	Concrete delivery pipe
	<b>Warning:</b> <i>Do not open before turning off the electric current.</i>	Command panel cover
	<b>It is strictly forbidden</b> <i>to lubricate or clean the machine when operating</i>	Protective casing thrust-bearing gear
	<b>It is strictly forbidden</b> <i>to remain in or pass trough the machine operating area.</i>	Boom arms





## 5

## Maintenance

- 5.1 Preliminary procedures
- 5.2 Checks and general maintenance
- 5.3 Hydraulic power pack
- 5.4 Electrical system
- 5.5 Identification of parts and settings



## 5.1 Preliminary procedures



### **WARNING!**

Display a warning sign on the command panel whenever maintenance or repairs are being carried out to the equipment.



### **WARNING!**

Before effecting any maintenance work, cut off the electric power supply to the control panel.





## 5.2 Checks and general maintenance

At the consignment of the concrete placement boom or after a prolonged period of inactivity, it is necessary to carry out a very careful inspection of all its parts.

### General rules

- Check for oil leaks
- See that all nuts are properly tightened
- Take note of the presence of any damage
- Control the state of all lubrication points
- Check the condition of all welds

### Specifically

- Check the working state of the hydraulic power pack, the cylinders, the flexible tubes, the valves, the reduction unit and the thrust-bearing
- See that the electrical control panel and button panel are in working order
- Control that the electrical cables are in perfect condition

### Every evening and in any case at the end of a work session

- Wash the concrete pipes very carefully as well as all other equipment used

### Every 50 hours of use

- Grease the pinion and crown wheel on the rotation turret
- Grease the rotating points on the articulated concrete pipe joints

### Every 100 hours of use

- Grease the joints between the arms, the joints between the connecting rods, the hydraulic cylinder connections, and the turret thrust bearing
- Check the oil level in the hydraulic unit
- Control the oil level in the reduction unit
- Check the safety valves on the cylinders
- Check the tension of all nuts giving particular attention to the securing nuts for the thrust bearing

### Every 200 hours of use

- Check the tension of the locking nuts of the pivots on the joints

### Periodically

- Check the condition of the hydraulic hoses and the electric cables
- Ensure that the limit switches are working perfectly
- Check the thickness of the concrete pipes and replace any worn out pipes as soon as possible
- Grease the connecting couplings of the parts that rotate
- Grease the jack arms
- Ensure that the chromed cylinder heads are kept clean
- Check that there are no broken or damaged parts and be particularly certain that there are no cracks in the welding.



## 5.3 Hydraulic power pack

The hydraulic power pack does not usually require special maintenance apart from the oil which must maintain its physical and chemical properties and which must be clean.

For this reason it is important to pay particular attention to the oil filtering system and to the fact that during normal operating conditions the temperature should not exceed 60°-70°C

We thus advise you to follow the suggestions set out below:

After the first 100 hours of operation, check the state of the filter cartridges. If these are dirty, have them cleaned with a liquid solvent or thinners and with an air jet.

After that, carry out a control of the filters approximately every 1000 hours.

Every 3000 to 5000 hours of operation, change the oil.

From time to time you, check the oil level in the unit's tank and if this should prove to be below the minimum level it must be topped up after the cause of the drop in level has been ascertained.

When you fill or top up the oil level in the tank, you should always use new oil with identical characteristics to the oil already contained in it, taking care that the charging cap contains its filter cartridge to filter the new oil.

Whenever the oil is markedly polluted, it is necessary to clean the tank and the filters thoroughly before replacing the oil.

Never use cloths or rags of cotton with threads.

It is recommended to repeat the above mentioned controls at regular intervals according to the work schedule that the machinery follows.

During the operation of the equipment, it is a good rule to pay particular attention to the noise produced since its presence or its change may indicate problems already present or about to present themselves.

When starting the equipment after a long period of inactivity, it is essential to follow the procedures set out in the start up instructions.

Whenever a long period of disuse is envisaged it is necessary to protect the chromed surfaces of the hydraulic cylinder heads with an anti-corrosive product.



## 5.4 Electrical system

The electrical system does not usually require any special maintenance.

However, as electric energy is highly dangerous, it is necessary to carry out thorough controls in order to exclude all risks to authorised and unauthorised personnel working in the vicinity and who might come into contact with electrical elements no longer correctly insulated due to damage to the insulation over time.

For this reason it is of vital importance to check that all the insulation on the electrical cables is in perfect condition, as well as that on the cable plugs, the fuse and junction boxes etc., bearing in mind that all controls and especially any work may only be carried out after disconnecting the power supply to the equipment. Check that all the indicators that show the presence of current are off.

Check from time to time that all the cable supports are in good condition and attached properly so as to avoid having a cable detach itself.

It is also necessary to control occasionally, the state of the cable winder to see if it takes up and releases the cable in the correct way, that is to say, without placing excessive tension on the cable itself.

Check from time to time to see that the buttons relative to emergency actions are functioning correctly. This can be done by carrying out a practice shut down.

Fuses must be replaced only with others of the same capacity, as indicated in the circuit diagram.

Electrical and heat fuses with break values higher than those recommended may cause damage to the electrical components.

If it is necessary to work on the electrical circuit at a distance from the command panel, you must take every precaution possible to work in the absence of danger, being sure to affix a sign indicating the presence of work in progress.

**Everything described above must be carried out by personnel specialised in this sort of work.**



## 5.5 Identification of parts and settings



### **WARNING!**

We strongly recommend that, when dismantling the electrical or hydraulic parts, you should label the various elements in order to facilitate its reassemble.



### **WARNING!**

Do not change in any way the adjustment values set by PAMEC Srl



## 6 Lubrication and hydraulic fluid

### 6.1 Lubricants and oil for hydraulic system



## 6.1 Lubricants and oil for hydraulic system

Set out below are the lubricants and the oils suitable for central and southern Europe and similar climates (A).

For the areas with different temperature conditions, use lubricants and oils of a lower viscosity if colder (B), and higher viscosity if hotter (C):

	Area	AGIP	ESSO	MOBIL	CASTROL
<b>Grease for GREASE NIPPLES</b>	B	1	1	46	
	A	<b>GR MU EP 2</b>	<b>BEACON 2</b>	<b>MOBILPLEX 47</b>	
	C	3	3	48	
<b>Grease for THRUST BEARING</b>	B	1	1	46	<b>OPTIMOL LONGTIME PD0</b>
	A	<b>GR MU EP 2</b>	<b>BEACON 2</b>	<b>MOBILPLEX 47</b>	
	C	3	3	48	
<b>Oil for HYDRAULIC POWERPACK</b>	B	32	32	24	
	A	<b>OSO 46</b>	<b>NU TO H 46</b>	<b>MOBIL DTE 25</b>	
	C	68	68	26	



7.1 Bolts tightening guidelines

7.2 Bolts tightening

7.3 Wall thickness



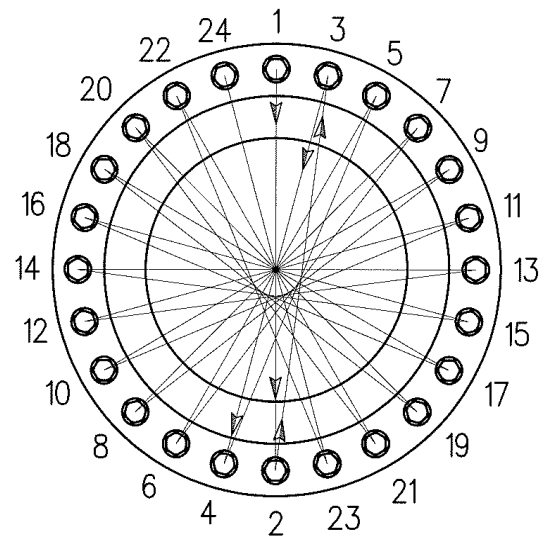
## 7.1 Bolts tightening guidelines

### GENERAL INSTRUCTIONS

- You have to use ALWAYS the dynamometrical key to tighten the bolts.
- Before doing this, set the key to the correct tightening torque for the bolts.
- The high resistance bolts must be fitted with 2 washers, one under the head of the screw and the other just before the thicker nut.
- To tighten the bolt you should turn always the thicker nut and only exceptionally the head of the screw.
- Always mount lock nuts after each nut to avoid bolt unscrewing.

### MOUNTING INSTRUCTIONS

- Step 1) Check the mounting kit material (item list):
- Step 2) Tighten all bolts, in any particular order, to 60% of the final setting using the thicker nuts only.
- Step 3) Complete the tightening of the bolts as shown in the diagram: this will guarantee an uniform distribution of forces on the plate. Note: the first bolt may be chosen at random.
- Step 4) Once the tightening of nuts is complete, after each thicker nut, tight a lock nut (thinner type) to avoid a possible unscrewing (use max 20 Nm).
- Step 5) Paint all the bolts to protect them against corrosion and water infiltration.



**(★) DISCLAIMER: Following these guidelines is mandatory to save product guarantee. In any case, PAMEC srl assumes no responsibility for personal injury or property damage to vendees, users or third parties caused by the boom when it is not totally assembled by PAMEC srl personnel.**





## 7.2 Bolts tightening

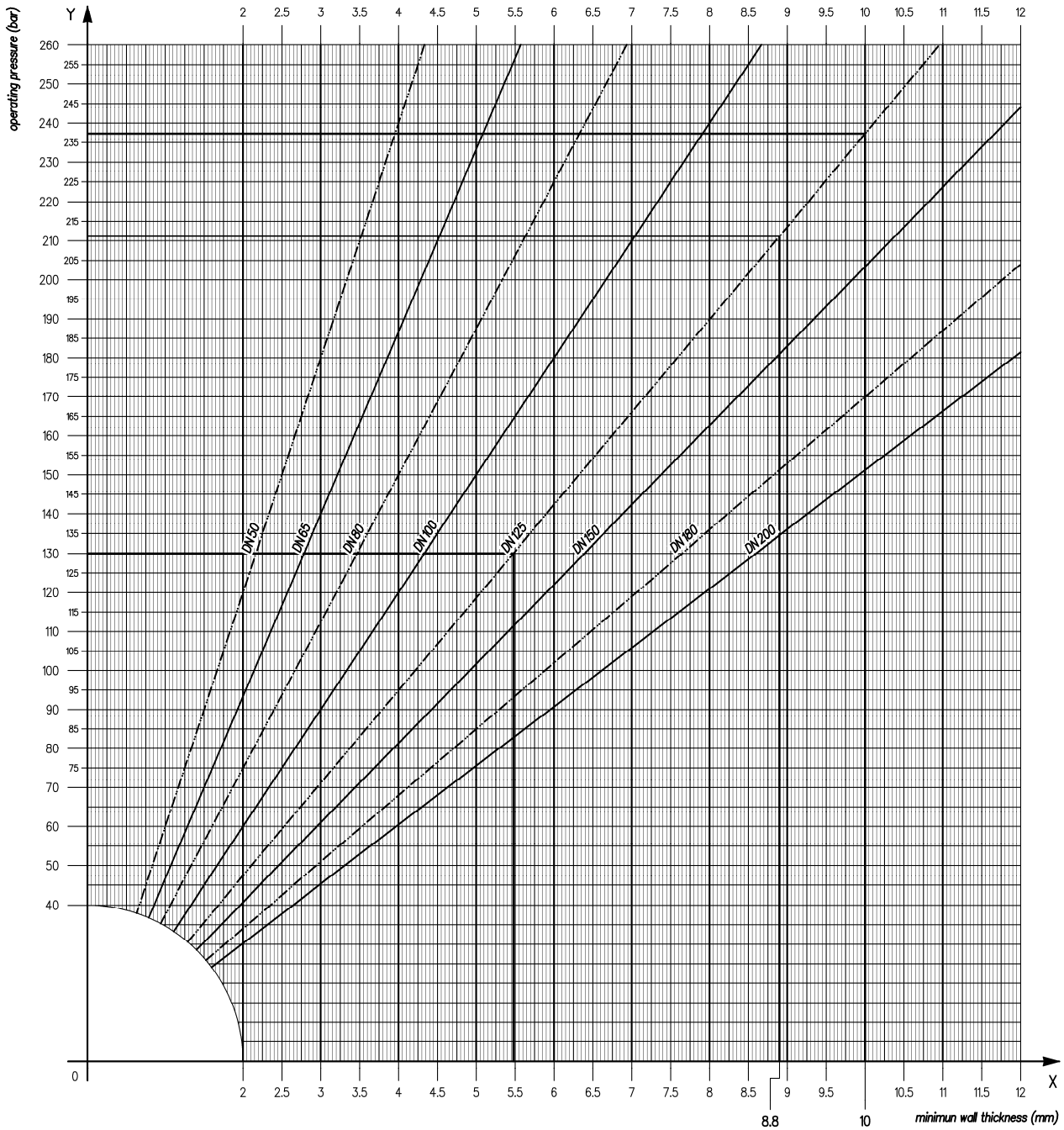
Tighten all the screws, of the boom, respecting the following table.

THREAD DIAMETER	SECTION RESISTANT	CLASS 8.8		CLASS 10.9	
		TIGHTENING TORQUE	FORCE	TIGHTENING TORQUE	FORCE
mm	mm <sup>2</sup>	Nm	KN	Nm	KN
<b>12x1.75</b>	84	90	38	113	47
<b>14x2</b>	115	144	52	180	64
<b>16x2</b>	157	225	70	281	88
<b>18x2.5</b>	192	309	86	387	108
<b>20x2.5</b>	245	439	110	549	137
<b>22x2.5</b>	303	597	136	747	170
<b>24x3</b>	353	759	158	949	198
<b>27x3</b>	459	1110	206	1388	257
<b>30x3.5</b>	561	1508	251	1885	314

(values in the table according to technical standards CNR 74/80)



# 7.3 Wall Thickness



**MATERIAL:** E355 (ST.52)



## 7.3 Wall Thickness

**EXAMPLE FOR MINIMUM WALL THICKNESS:**

**GIVEN:**

- **working pressure:** 130 bar
- **nominal diameter:** DN 125

From Y axis (130) extended a horizontal line to the right to the line DN125, then vertically to the X axis.  
The minimum wall thickness is 5.5 mm

**NOTE:**

**DAILY CHECKING THE WALL THICKNESS OF PIPE AND REPLACE WORN PARTS**